Dual Technology Ceiling Mount Sensor

The ULOS-CDT Series ceiling-mount dual-technology sensors can integrate into Lutron systems or function as stand-alone controls using a Lutron power pack. The technology eliminates manual sensitivity and timer adjustments during installation and over the life of the product.

Features
- Intelligent, continually adapting sensor
- Ultrasonic (US) combined with passive infrared (PIR) sensing provide high sensitivity, high noise immunity, and excellent false tripping immunity
- Suited for complex environments that are difficult to control with single-technology sensors
- Snap-locks to ceiling-mounted cover plate
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 500 to 2000 sq ft (46 to 186 m²) coverage when mounted on an 8 - 12 ft (2.4 to 3.7 m) ceiling; 180° and 360° field of view
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.
- Assembled in the USA.

Models Available

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Color</th>
<th>Coverage</th>
<th>Field of View</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULOS-CDT-500-WH</td>
<td>White</td>
<td>500 sq ft</td>
<td>180°</td>
</tr>
<tr>
<td>ULOS-CDT-500R-WH</td>
<td>White</td>
<td>500 sq ft</td>
<td>180°</td>
</tr>
<tr>
<td>ULOS-CDT-1000-WH</td>
<td>White</td>
<td>1000 sq ft</td>
<td>180°</td>
</tr>
<tr>
<td>ULOS-CDT-1000R-WH</td>
<td>White</td>
<td>1000 sq ft</td>
<td>180°</td>
</tr>
<tr>
<td>ULOS-CDT-2000-WH</td>
<td>White</td>
<td>2000 sq ft</td>
<td>360°</td>
</tr>
<tr>
<td>ULOS-CDT-2000R-WH</td>
<td>White</td>
<td>2000 sq ft</td>
<td>360°</td>
</tr>
</tbody>
</table>

Self-Adaptive Feature

The ULOS-CDT Series ceiling-mount occupant sensors combine both (US) motion detection for maximum sensitivity and passive infrared (PIR) motion detection for false triggering immunity. The self-adapting internal microprocessor analyzes the composite sum of both signals to eliminate time-consuming adjustments and callbacks found in non-intelligent sensors.
Specifications

Timer Adjustment
- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 8 to 30 minutes
- Test mode: 8 seconds

LED Lamp
- Red: infrared motion detected
- Green: ultrasonic motion detected

Housing
- Rugged, high-impact, injection-molded plastic
- Color-coded leads 6 in (15 cm)

Power
- Operating voltage: 20 - 24 V, PELV (Class 2: USA) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V active high logic control signal with short-circuit protection, open collector when unoccupied

Operating Environment
- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Adaptive Functions
- Installation: 60 minutes
- Learning: 4 weeks for response to error conditions, air current adaptation, and timer optimization
- Post-learning occupancy periods
  - 24-hour circadian occupancy periods learned
  - Weekly occupancy periods learned
- Adjustments in post-learning period
  - Generally occupied periods (threshold = high-sensitivity mode)
  - Generally unoccupied periods (threshold = miser mode)

Contact Rating (R Models only)
- SPDT 500 mA rated at 24 V isolated relay

Photo Cell (R Models only)
- Prevents light from turning on when there is sufficient natural light
- Sensitivity: 0 - 1000 LUX adjustable

Dimensions
Measurements are in inches (mm)

Front View

<table>
<thead>
<tr>
<th>1.4 (38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 (114)</td>
</tr>
</tbody>
</table>

Side View

Contact Rating (R Models only)
- SPDT 500 mA rated at 24 V isolated relay

Photo Cell (R Models only)
- Prevents light from turning on when there is sufficient natural light
- Sensitivity: 0 - 1000 LUX adjustable
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System

**Lighting control system**

- Red (+20 - 24 V)
- Blue* (signal)
- Black (common)

2 or More Sensors to System

**Lighting control system**

- Red (+20 - 24 V)
- Blue* (signal)
- Black (common)

To additional sensors, maximum determined by lighting controller

*Note: Use gray wire for -R model.

Power Supply Options

<table>
<thead>
<tr>
<th>Lutron Lighting Control System</th>
<th>Power Pack Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital microWATT™</td>
<td>No</td>
</tr>
<tr>
<td>EcoSystem®</td>
<td>No</td>
</tr>
<tr>
<td>GRAFIK 5000 / 6000 / 7000™</td>
<td>No, when used with seeTouch® wallstations with occupant sensor connections.</td>
</tr>
<tr>
<td>GRAFIK Eye® 3000 / 4000</td>
<td>Yes</td>
</tr>
<tr>
<td>HomeWorks®</td>
<td>Yes</td>
</tr>
<tr>
<td>LCP128™</td>
<td>No, when used with seeTouch® wallstations with occupant sensor connections.</td>
</tr>
<tr>
<td>microWATT®</td>
<td>No</td>
</tr>
<tr>
<td>RadioRA®</td>
<td>Yes</td>
</tr>
<tr>
<td>RadioTouch®</td>
<td>No</td>
</tr>
<tr>
<td>Softswitch128®</td>
<td>No, when used with seeTouch® wallstations with occupant sensor connections.</td>
</tr>
</tbody>
</table>

**NOTE:** Power Pack may be required for more than one Occupant Sensor. Consult factory for multiple sensor requirements.
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack

120 / 277 / 347 V ~ 60 Hz;
230 V ~ 50 / 60 Hz

Power Pack

Lighting Load

Neutral

Red (+20 - 24 V)
Blue* (signal)
Black (common)

Note: Maximum 3 occupant sensors.

Switching Multiple Loads with Auxiliary Power Packs

120 / 277 / 347 V ~ 60 Hz;
230 V ~ 50 / 60 Hz

Power Pack

Lighting Load

Note: Maximum of 3 devices total (occupant sensors and auxiliary power packs) can be connected to a power pack.

*Note: Use gray wire for -R model.
Wiring

Relay Model Option
LOS-CDT-xxxxR only

Choose wire based on functionality):
- Yellow/White: NO (normally open)
  Open: Unoccupied
  Closed: Occupied
- Black/White: NC (normally closed)
  Open: Occupied
  Closed: Unoccupied
  Cap off unused wire.

Gray wire logic with photo cell active:

<table>
<thead>
<tr>
<th>Room First Occupied</th>
<th>During Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light level:</td>
<td>Light level:</td>
</tr>
<tr>
<td>Below set value</td>
<td>Falls below set value</td>
</tr>
<tr>
<td>Above set value</td>
<td>Moves above set value</td>
</tr>
<tr>
<td>Lights:</td>
<td>Lights:</td>
</tr>
<tr>
<td>Turn on</td>
<td>Turn on</td>
</tr>
<tr>
<td>Remain off</td>
<td>Remain on</td>
</tr>
</tbody>
</table>

*Note: May require power pack
Installation

Sensor Placement

• The occupant sensor must have an unobstructed view of the room. Do not mount behind or near tall cabinets, shelves, indirect hanging fixtures, etc.
• Do not place sensor within 6 ft (1.8 m) of air vents, air handlers, windows, fans, etc., as this may cause false triggering.
• If installing a 180° occupant sensor (500 and 1000 models), place the sensor on the same wall as the doorway so that traffic in a hallway will not affect the sensor; otherwise, place in center of room.
• Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
• Decrease total coverage area by 15% for “soft” rooms (for example, heavy draperies or heavy carpeting).

Range Diagrams

LOS-CDT-500

LOS-CDT-1000

LOS-CDT-2000
Installation

Mounting

Normal Mounting
Twist and lock threaded mounting post onto cover plate. Drill through ceiling tile with assembly, using cutter end of the threaded mounting post. Secure with washer and nut.

Mounting to Non-Standard Ceiling or Fixture
Mount twist-lock cover plate using mounting screws, nuts, and washers (included). Drill/punch wire routing hole through ceiling tile at center of cover plate.

Wire Lengths

<table>
<thead>
<tr>
<th># Sensors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>1</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td># Aux. PP</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>22 AWG</td>
<td>750 ft</td>
<td>375 ft</td>
<td>250 ft</td>
<td>375 ft</td>
<td>250 ft</td>
<td>250 ft</td>
</tr>
<tr>
<td>0.5 mm²</td>
<td>365 m</td>
<td>180 m</td>
<td>90 m</td>
<td>120 m</td>
<td>120 m</td>
<td></td>
</tr>
<tr>
<td>20 AWG</td>
<td>1200 ft</td>
<td>600 ft</td>
<td>400 ft</td>
<td>400 ft</td>
<td>400 ft</td>
<td></td>
</tr>
<tr>
<td>0.75 mm²</td>
<td>730 m</td>
<td>365 m</td>
<td>240 m</td>
<td>365 m</td>
<td>240 m</td>
<td>365 m</td>
</tr>
<tr>
<td>18 AWG</td>
<td>2400 ft</td>
<td>1200 ft</td>
<td>800 ft</td>
<td>800 ft</td>
<td>800 ft</td>
<td></td>
</tr>
</tbody>
</table>

Using the Infrared Mask

Center Ceiling Mount
(Mask blocks sensor seeing out doorway into hall)

Corner Ceiling Mount
(No mask needed)

Typical Mask Patterns

- Conference Room Mask
- 180° Mask
- Full Mask
- Rectangular Areas
- Over the Door
- Specific Areas You Wish to Mask

LUTRON® SPECIFICATION SUBMITTAL

<table>
<thead>
<tr>
<th>Job Name:</th>
<th>Model Numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Job Number:
Sensor Adjustments

Override Settings

A
- Off (Default)
  1. Automatic (Normal)
  2. Auto Threshold Adjustment
  3. Lights indicate motion
  4. Retain Settings (Normal)

On
- Manual on/off (Override)
- High Sensitivity (Low turn-on threshold)
- Disable LED Indicator
- Erase all learned settings, restart Learning (Toggle On)

B
- Off
  1. Disable Compensation (Normal)
  2. No (Normal)
  3. Adjust Timer Automatically
  4. Adjust Sensitivity Automatically

On
- Enable Compensation
- Yes (Use increased turn-on threshold)
- Use Manual Setting (No adjustment)
- Adjust Sensitivity Manually

Timer Test Mode

1. Remove the retainer cover.
2. Rotate the black timer adjustment knob to about midway (12 o’clock).
3. Return setting to minimum setting (full CCW).

Factory Settings

- Red: Infrared sensitivity 75% default
- Black: Timer 8 min.
- Green: Ultrasonic range 50% default
- Blue: Photo cell (R model only) 100% default

Note: The timer will remain in the 8-second test mode for 1 hour, then automatically reset to 8 minutes.
4. To manually take the timer out of the 8-second test mode, turn the timer adjustment approximately 1/16 in (1.5 mm) clockwise to make the setting slightly above minimum (just above the 8-minute setting).
Installation

Adjusting the “Lights Not On” Level
ULOS-CDT-xxxxR only

1. Place timer in Test Mode (see page 7).
2. Set photo cell to max.
   Turn the blue knob full clockwise (lights on no matter how bright the natural light is), then about 30 degrees counterclockwise.
3. Check for Lights-Out.
   Move from underneath the sensor, and remain still until the lights turn off. Move around normally to turn the light on.
4. Adjust to desired level.
   If lights remain off, adjust the blue knob another 30 degrees counterclockwise and repeat step 3 until the lights turn on.

Note: Set blue knob to 100% to disable photo cell functionality and leave secondary dry contact closure output functionality intact.

Control Settings (Blue Knob)
ULOS-CDT-xxxxR only

Minimum (low):
Lights will never come on, even though room is occupied.

Maximum (high):
Photo cell has no effect on operation (factory setting).

Normal:
200 to 600 LUX is normal range.