Occupancy Sensor with 0-10V Dimming Control

Cat. No. HBE11 - 120/277/347VAC, 60Hz

LEVITON®

WARNINGS AND CAUTIONS

- **TO AVOID FIRE, SHOCK, OR DEATH: TURN OFF POWER** at circuit breaker or fuse and test that power is off before wiring!
- To be installed and/or used in accordance with electrical codes and regulations.
- Confirm that device ratings are suitable for application prior to installation.
- Use this device **with copper or copper clad wire only**.
- DO NOT install if product appears to be damaged.
- Read these instructions before installation and retain for future reference.

DI-401-HBE11-05A

INSTALLATION INSTRUCTIONS — ENGLISH

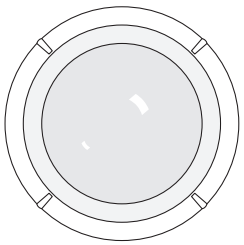
DESCRIPTION

The HBE11 Outdoor Occupancy Sensor is specifically designed to provide 0-10VDC output for the control of dimmable fixtures. Easy to use DIP switches allow the user to set unoccupied and occupied dimming levels. Interchangeable twist-on lenses eliminate need for field masking (lenses sold separately). The HBE11 features a daylight sensor for ON/OFF control of fixtures when there is sufficient natural light. The gasketed design of the enclosure makes it impervious to dust and able to withstand water ingress making it an ideal sensor for outdoor and wet locations including those with temperatures of -40° F/C.

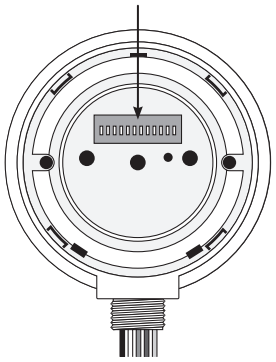
SPECIFICATIONS

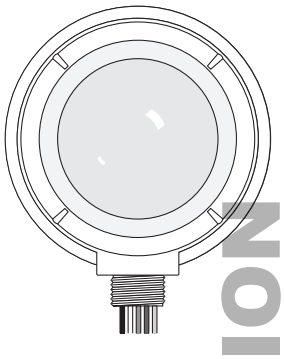
Timer Timeouts	Primary (8 second test mode, 4, 8, 16, 30 minutes) Full Off Timer (Disabled, 60 Minutes)
Passive Infrared	Dual element pyrometer and lens designed for reliable detection of a walking person. **NOTE:** When used with program start ballast and LED drivers, a 1-2 second delay from occupancy detection to turn-on may be experienced. Leviton recommends that you consult your fixture/ballast manufacturer for suitability with occupancy sensors.
Load Ratings (each relay)	120VAC, 60Hz: 800W tungsten or standard ballast / 600W electronic ballast 277VAC, 60Hz: 1200W ballast 347VAC, 60Hz: 1500W ballast 1/4-HP motor load @ 120V, 1/6-HP @ 347V
Daylight Sensor Range	1 FC to 50 FC or 5 FC to 500FC
Operating Environment	IP65 Compliant -40° to 149°F (-40° to 65°C)

Lens



DIP switches (1-12)



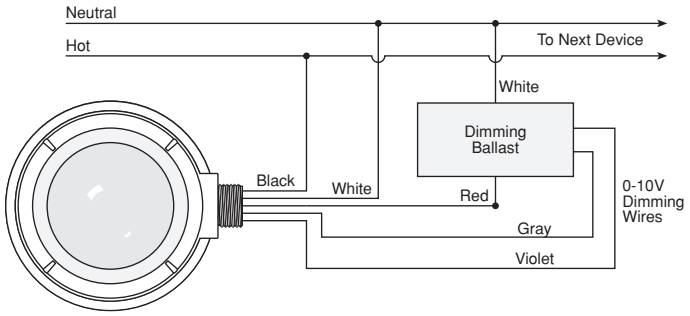


INSTALLATION

1. **WARNING: TO AVOID FIRE, SHOCK, OR DEATH: TURN OFF POWER** at circuit breaker or fuse and test that power is off before wiring!
2. Insert the sensor's wires and threaded nipple into a 1/2" knockout on the fixture body or an electrical junction box.
3. Thread the sensor's wires through the lock-nut.
4. Verify that the sensor is positioned correctly (i.e. lens facing downward).
5. Screw lock-nut onto the sensor's threaded nipple and tighten.
6. Connect the sensor to the lighting system per wiring diagram.
7. Adjust sensor operation by setting DIP switches.
8. Attach sensor lens to sensor module and rotate clockwise approximately five degrees to lock into place.
9. Turn power ON and allow sensor 2 minutes minimum to stabilize.
10. Verify sensor is functioning by waving hand under lens and observing that the sensor's red light (located under the lens) flashes.

NOTE: Low Temp/Water Tight/ Indoor/ Outdoor sensors feature a water tight gasket that goes onto the chase nipple. Gasket must be installed onto the sensor's chase nipple to insure that a proper water tight seal is made between the sensor and the fixture.

WIRING DIAGRAM



SENSOR / RANGE TESTING

Putting the sensor into test mode provides a means to confirm that the sensor's coverage pattern is aligned properly in the lighted space as well as verifying the basic functionality of the sensor.

1. Remove lens from sensor module by rotating lens assembly counter clockwise approximately five degrees and lift off.
2. Set sensor's switch settings according to desired functionality.
3. Place sensor into Test Mode (8 seconds) by putting Switch 1 into the ON (Test) position.
   NOTE: The sensor must be powered when placed into Test Mode. If switch is already in the ON position, switch it OFF then back to the ON position. The sensor's LED will blink in bursts of 3 to indicate that Test Mode is active. When testing low voltage sensors, all sensors connected to power pack must be in Test Mode.
4. Re-install sensor lens to sensor module and rotate clockwise approximately five degrees to lock into place.
5. Vacate the sensor detection pattern. Remove obstructions (i.e. ladder or lift) from the sensor detection area as necessary. If DIP Switch #5 is set to OFF (default) indicating dimming only operation, the light(s) will dim to low approximately 8 seconds after vacating the detection pattern area. If DIP switch #5 is set to ON indicating that the desired operation is for the light(s) to go to full off, the light(s) will dim low approximately 8 seconds after vacating the area, then turn off after an additional 8 seconds.
6. Wait for at least 4 seconds, then re-enter sensor detection pattern area and observe that lights turn on.
7. Step out of sensor detection pattern area and observe that lights respond as in Step 5 above.
8. Repeat steps 5 and 6 from different entry points on the detection pattern area as necessary to verify proper detection pattern area coverage.
9. If necessary, modify sensor detection pattern area by adjusting sensor and/or lens orientation.
10. Sensor will automatically exit Test Mode after 1 hour. Sensor detection will be indicated by a single blink of the LED. **To manually exit Test Mode:** remove lens assembly, set Switch 1 to the OFF (Normal) position and re-install lens. The sensor may also be power cycled in order to take it out of Test Mode.

FOR CANADA ONLY

For warranty information and/or product returns, residents of Canada should contact Leviton in writing at **Leviton Manufacturing of Canada Ltd to the attention of the Quality Assurance Department, 165 Hymus Blvd, Pointe-Claire (Quebec), Canada H9R 1E9** or by telephone at **1 800 405-5320.**

WEB VERSION

SWITCH SETTINGS

State	Switch 1
Normal Mode	OFF
Test Mode	ON

Switch 1 - Test Mode: Controls the operational mode of the sensor. When placed in Test Mode (ON Position), the sensors will timeout after 8 seconds of no occupancy. The sensor's LED will blink in bursts of 3 to indicate that Test Mode is active. The sensor must be powered to be set into Test Mode. Default: Normal (OFF Position). *NOTE: If switch is already in the ON position, turn the switch OFF then back to the ON position to enter Test Mode. Sensor will automatically exit Test Mode after 1 hour. Sensor detection will be indicated by a single blink of the LED. To manually exit Test Mode, return switch to the OFF position.*

State	Switch 2
Bypass Disabled	OFF
Bypass Enabled	ON

Switch 2 - Bypass Override (Forces Light On): When set to the ON position, sensor is bypassed and load is turned on at 100%. Default: Bypass Disabled (Switch OFF)

State	Switch 3	Switch 4
8 Mins	OFF	OFF
4 Mins	OFF	ON
16 Mins	ON	OFF
30 Mins	ON	ON

Switches 3 & 4 - Timer Delay: Controls time interval to dim after the lighted space becomes unoccupied. Available settings are 4, 8, 16 and 30 minutes.
Default: 8 minutes (Switches 3 & 4 – OFF Position)

Full Off Timer Delay	Switch 5
Disabled	OFF
60 Mins	ON

Switch 5 - Full Off Timer Delay: Controls sensor operation. When set to the ON position sensor will turn off the lights after 60 minutes of no occupancy. When set to the Off position sensor will maintain Unoccupied Dimming Level Setting.
Default: Disabled (OFF Position)

Mode	Switch 6
100%	OFF
80%	ON

Switch 6 - Occupied Dimming Level: Controls dimming level of the sensor while occupancy is detected.
Default: 100% (Switch 6 OFF)

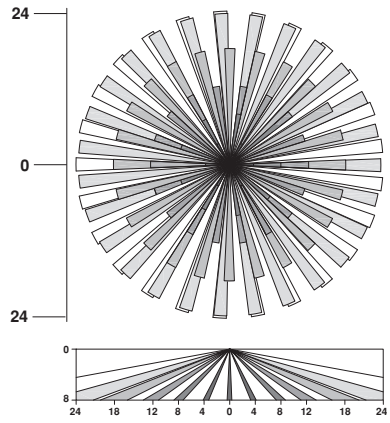
State	Switch 7	Switch 8
50%	OFF	OFF
70%	OFF	ON
60%	ON	OFF
20%	ON	ON

Switches 7 & 8 - Unoccupied Dimming Level: Controls the level the sensor will be at when no occupancy is detected. Default: 50% (Switches 7& 8 OFF) *NOTE: The percentage values shown in the chart and selected by the switches are for the dimming control voltage output from the sensor. These values are based on a linear relationship between the control signal and the fixture output. The actual percentage of light or power delivered will be a factor of the lamp and ballast/driver used in the controlled fixture.*

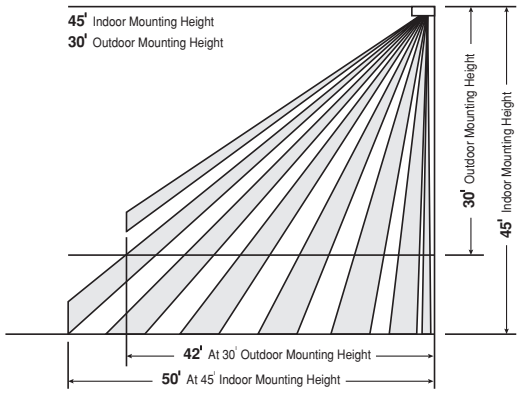
Daylight Sensor	Switch 9
Downward	OFF
Upward	ON

Switch 9 - Daylight Sensor Selection: Selects either the downward looking or upward looking daylight sensor.
Default: Downward (OFF Position) *NOTE: Upward looking daylight sensor is only available on end mount versions of the sensor.*

Top view coverage - 8 ft



Side view coverage - 30 ft, 45 ft



Switches 10, 11 & 12 – Daylight Sensor Set Point Levels: Enables or disables daylight sensor operation and controls the set point. When enabled, the sensor turns lights on in response to occupancy when light levels are below the daylight sensor set point. Daylight sensor setting should be set to a value that turns off artificial lighting when natural light levels reach the required design level. To determine this value, light level measurements should be taken when the natural light levels are at their highest peak (typically between 10am – 2pm). With artificial lighting on, measure the light level. When the measurement is twice the design level measure the light level at the sensor. Default: Daylight Sensor Disabled (Switches 10-12 – OFF Position)
NOTE: light meter should be oriented in the same direction as the selected upward or downward looking daylight sensor. Configure switches 10-12 to the value closest to the meter's reading.
NOTE: When the daylight sensor is disabled the light fixture will be controlled by occupancy only. When the daylight sensor is enabled, the sensor will turn the light fixture OFF when sufficient daylight is available.
NOTE: Dead band is factory set. To prevent unwanted cycling, the light level at the sensor face must exceed the FC set point by the amount of dead band before the lights will turn off. Conversely, the light level must drop below the set point plus the dead band before the lights will turn on.

When set to "Down Looking" Daylight Sensor

Dead Band	Set Point Levels	Switch 10	Switch 11	Switch 12
NA	Daylight Sensor Disabled	OFF	OFF	OFF
20%	50 FC	OFF	OFF	ON
20%	25 FC	OFF	ON	OFF
20%	15 FC	OFF	ON	ON
20%	10 FC	ON	OFF	OFF
20%	5 FC	ON	OFF	ON
33%	3 FC	ON	ON	OFF
50%	1 FC	ON	ON	ON

When set to "Up Looking" Daylight Sensor

Dead Band	Set Point Levels	Switch 10	Switch 11	Switch 12
NA	Daylight Sensor Disabled	OFF	OFF	OFF
20%	500 FC	OFF	OFF	ON
20%	250 FC	OFF	ON	OFF
20%	150 FC	OFF	ON	ON
20%	100 FC	ON	OFF	OFF
20%	50 FC	ON	OFF	ON
20%	30 FC	ON	ON	OFF
30%	10 FC	ON	ON	ON

The HBE11 will provide a sequence of operation based on the switch settings as indicated in the text below. IMPORTANT: The Daylight Sensor Set Point Level must be set to one of the available choices in order to prevent the lights from turning on during daylight hours.

High/Low Sequence of Operation
When the ambient light level drops below the Daylight Sensor Set Point Level (set by switches 10, 11 & 12), the lights will turn ON and dim up to the Unoccupied Dimming Level (set by switches 7 & 8). When motion is detected, the lights will dim up to the Occupied Dimming Level. After the sensor has not detected motion for a selected period of time (set by switches 3 & 4), the lights will dim down and remain at the Unoccupied Dimming Level (set by switches 7 & 8). When the ambient light level rises above the Daylight Sensor Set Point, the lights will turn off.

High/Low/Off Sequence of Operation
Regardless of the ambient light level, with the Full Off Timer Delay (switch 5) set to ON, the lights will not turn on until motion is detected.
When motion is detected, the lights will dim up to the Occupied Dimming Level. After the sensor has not detected motion for a selected
period of time (set by switches 3 & 4), the lights will dim down to the Unoccupied Dimming Level (set by switches 7 & 8). If no motion is detected
for an additional 60 minutes, the lights will turn off.

CLASS 2 INSTALLER NOTE
The 0-10 V DC dimmer control circuit can be installed as Class 1 or Class 2. If installed as Class 2, all devices in the circuit must be Class 2 rated and this switch must be wired per instructions below, which are in accordance with NEC Code NFPA 70, paragraph 725.136 (d). For Class 2 Installation: The 0-10V control wires must be mechanically separated from Class 1, line, neutral and ground power lines. This can be accomplished by performing the following:

1) Installing a mechanical barrier, in the form of silicone tubing or other non-conducting sleeve, over the length of the individual 0-10V (Violet & Gray) control wires contained within the electrical box and to the point where they extend out of the electrical box.[1 3]
2) Use of approved wire connectors shall be used to join the 0-10V control wires to building control wires. [2 3]
3) When CL3, CL3R or CL3P rated control cables (or permitted substitute) are used to connect devices within the building silicone tubing, or other non-conducting sleeve, shall be installed over the cable starting from the switch to the point where they extend out of the electrical box. [1 2 3]

1 Silicone tubing shall be NRTL (UL/CSA/ETL) recognized or equivalent to provide mechanical separation equal to .25" in air.
2 Connectors joining 0-10V control wires shall be approved LISTED connectors.
3 Wire connectors and wire tubing shall be provided by the installation contractor.

WEB VERSION