

Echoflex Installation Guide

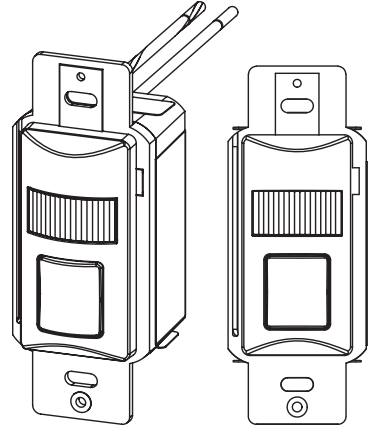
Wall Switch Sensor

OWS

Overview

The Wall Switch Sensor (OWS) combines a switch for manual light control and an occupancy sensor that uses standard passive infrared (PIR) or Dual Technology to monitor occupancy and transmit status wirelessly.

The sensor fits well in applications where energy codes require the lights to be manually turned ON and automatically turned OFF when the space is vacant. It is available as a line-powered or battery-powered model. The line-powered models are no-neutral conductor devices that connect to line voltage and earth ground. Battery-powered models can operate for 12 years in typical office use conditions.



Model	Description
OWS-IR-UW-120/277	PIR sensor detection, line-powered
OWS-DT-UW-120/277	Dual Tech sensor detection, line-powered
OWS-IR-UW-BTY	PIR sensor detection, battery-powered
OWS-DT-UW-BTY	Dual Tech sensor detection, battery-powered

The Dual Tech models use PIR and passive microphone technology to provide full coverage of audible human activity. Innovative noise filtering prevents false triggers that could keep lights on in empty spaces.

This document covers installation, testing, and settings for all the OWS models. The product package includes the sensor and two mounting screws. Battery-powered models include non-replaceable lithium batteries. A white faceplate is sold separately (part number: HW8563).



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Prepare for Installation

To ensure optimal function, consider the installation environment and the following guidelines:

- For indoor use only. Operating temperature -10°C to 45°C (14°F to 113°F), 5%–92% relative humidity (non-condensing).
- High-density construction materials and large metal appliances or fixtures in the space may disrupt wireless transmissions.
- Install the sensor within range of linked receivers or controllers, 24 m (80 ft). Consider adding a repeater to extend reception range.
- Avoid locating the sensor where it can easily sense movement outside of the intended space, such as hallways or adjacent rooms.
- The warnings and ***IMPORTANT SAFEGUARDS on the facing page*** apply to line-powered models.
- Install within the standard height range for a switch: 90–150 cm (3–5 ft) from the floor.

Supplies required to install (not provided):

- Appropriately sized wire nuts
- Small cable ties
- Faceplate

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IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS



WARNING: RISK OF ELECTRIC SHOCK! This device utilizes high voltage and should only be installed by a qualified installer or electrician. Follow all local codes for installation. Before terminating the AC power wiring verify that the main breaker is in the off position and follow the proper lockout/tag out procedures required by NFPA Standard 70E.

AVERTISSEMENT : RISQUE DE DÉCHARGE ÉLECTRIQUE! Cet appareil utilise une haute tension et ne doit être installé que par un installateur qualifié ou un électricien. Suivez tous les codes locaux pour l'installation. Avant de raccorder le câblage du courant alternatif, vérifiez que le disjoncteur principal est en position d'arrêt et suivez les procédures de verrouillage/étiquetage prescrites par la norme NFPA 70E.



WARNING: For indoor use only! Must install to an electrical junction box or wireway.

AVERTISSEMENT : Uniquement pour usage d'intérieur! Doit être installé sur une boîte de raccordement électrique ou un chemin de câbles.

- This product is suitable for use in dry locations where the ambient temperature is -10°C to 45°C (14°F to 113°F).
- Do not use outdoors.
- Do not mount near gas or electric heaters.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than its intended use.
- Servicing should be performed by qualified service personnel.
- Pollution Degree: 2.

SAVE THESE INSTRUCTIONS

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Installation

The location and position of the sensor directly affects the quality of messages received by the linked controller. The sensor can be attached to a standard indoor electrical box, preferably non-metallic.

1. Locate the circuit breaker panel and turn off the power to the circuit.
2. Make sure the antenna wire is seated in the antenna channel as shipped. Do not cut or cap the antenna wire.
3. Remove the faceplate from the junction box.
4. Do one of the following according to the model:
 - For battery-powered models, ensure the junction box is suitable and safe; clear of debris and existing wires are capped.
 - For line-powered models, refer to the [Wiring Instructions below](#) to connect the line power and ground. Use wire nuts on all connections.
5. Attach the OWS to the junction box with the two mounting screws (provided) through the oval mounting holes.
6. Restore power to the circuit.



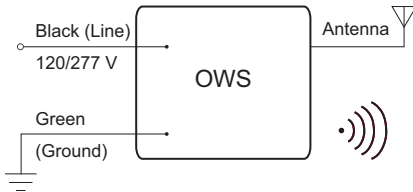
Note: Consider linking the OWS before installing the faceplate so you can access the **[Teach]** button. See [Link to a Controller on the facing page](#).

7. Install a non-metallic faceplate (not included).

Wiring Instructions

The black (line) wire, 120 or 277 VAC, connects to the input power. The green (ground) wire connects to the building ground and is required for proper operation and safety. The OWS is a no-neutral conductor design; a white (neutral) wire is not required.

Minimum wire specifications: size 300 V, 14 AWG, 60°C (140°F).



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Link to a Controller

The compatible target controller must be installed, powered, and within range of the OWS. Both the occupancy sensor and the manual switch must be linked separately using the following two processes.



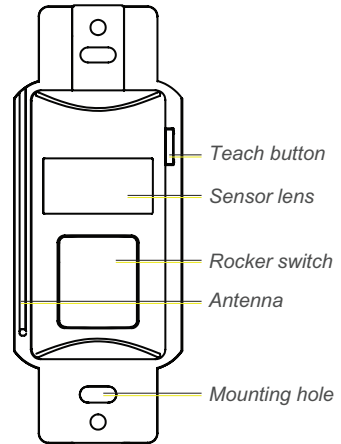
Note: *The linking process can be used both to link a device to a controller and to unlink a linked device from a controller.*

To link the occupancy sensor:

1. Remove the OWS faceplate to access the **[Teach]** button on the side of the sensor.
2. Press the **[Learn]** button on the controller to activate Link mode. If necessary, refer to the related product documentation.
3. Press the **[Teach]** button once to send a link message.
4. Deactivate Link mode on the controller.

To link the manual switch:

1. Press the **[Learn]** button on the controller to activate Link mode. If necessary, refer to the related product documentation.
2. Click the top side of the OWS rocker switch three times quickly.
3. Deactivate Link mode on the controller.



Sensor Operation

The sensor is optimized to detect small movements 3.6 m (12 ft) away and larger motion up to 11 m (36 ft) away. Dual Tech models provide an audio detection range up to 7.3 m (24 ft).

Sensing Technology

PIR sensing is calibrated to detect motion in the heat range of human bodies. The sensor is more sensitive to movements that cross the detection zones than those moving toward or away from the detection zones. The closer the movement is to the sensor, the more sensitive the sensor's response. See [Sensor Coverage on page 11](#).

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Audio sensing filters out background noise level averaged over a 30-second window and sets its threshold slightly higher. If sound exceeds the threshold while the timers are active, the sensor's occupied state is maintained. For example, if a fan is running in the background of an occupied space, only a sound slightly louder than the fan registers.

Key Timers

The **Audio Enabled Timer** defines the maximum duration that audio sensing is active. Each PIR detection resets the Audio Enabled Timer. The timer setting is 60 minutes and is not configurable.

The **Sensor Occupancy Timer** defines the time that detection, PIR or audio sensing, is required to keep the audio active. Each audio or PIR event resets the timer. The default is 20 minutes and is configurable.

The sensor transmits an occupied message to the controller:

- Minimum every 100 seconds, or
- Immediately when a change to the occupied state is detected

Echoflex controllers also have a configurable occupancy timer that controls when the lights shut off after a period of vacancy. See the controller's Configuration Guide for details on setting up timers and occupancy or vacancy modes of control.

Dual Technology (DT Models)

When both PIR and audio sensing are enabled, the following logic is used:

- When the space is occupied, PIR and audio detection can reset both the sensor's Occupancy Timer and the controller's Occupancy Timer.
- When the space is vacant and all timers have expired, only PIR detection or manual control can change the state to occupied, if the sensor is configured for occupancy.
- When audio is detected in an occupied space, the sensor's Occupancy Timer is reset, but not the Audio Enabled Timer; it expires after 60 minutes or is reset by PIR detection.
- After 20 minutes (default) of no detection, a vacancy message is sent and then 40 seconds later the audio is disabled. The 40-second grace timer allows an occupant sufficient time to use sound to reset the sensor's Occupancy Timer.

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PIR Sensing Only (IR Models)

For PIR sensing only, the following logic is used:

- When the space is occupied, PIR detection and manual control can keep the lights on and reset the controller's Occupancy Timer.
- When the space is vacant and the controller is configured for *occupancy*, a PIR detection or manual control can change the state to occupied.
- When the space is vacant and the controller is configured for *vacancy*, only manual control can change the state to occupied.
- After 200 seconds of inactivity, a vacancy message is sent and then subsequent messages every 1000 seconds.

Tests and Settings

Use the **[Teach]** button and color LEDs to navigate the Tests and Settings menu. Remove the faceplate to access the **[Teach]** button. The LEDs display through the sensor lens.

- **Walk Test** (red LED)
- **Range Confirmation** (yellow LED) battery-powered models only
- **Sensor Setting** (red and yellow LEDs)
- **LED Display** (red and green LEDs)
- **Restore Defaults** battery-powered models only

The menu times out after two minutes of inactivity. An LED sequence flashes to confirm entry to the menu or if you exit before it times out.

Walk Test

The Walk Test verifies the boundaries or limits of the sensor's range.

1. Press and hold the **[Teach]** button until all the LEDs blink once. Release the button to enter the menu and display the first item, the blinking red LED.
2. Press and hold the **[Teach]** button until the LED stops blinking to initiate the Walk Test.
3. Move throughout the space including corners and areas that may be obscured from line of sight to the sensor. Each time the sensor detects movement, the red LED blinks. If audio sensing is enabled (DT model), the green LED blinks when sound is detected.

The Walk Test times out after 100 seconds of inactivity. To exit before the time-out, press and hold the **[Teach]** button for 10 seconds.

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Range Confirmation

The Range Confirmation test quantifies the strength of the wireless signal to a linked controller that has range confirmation capability.



Note: *Only one controller can be linked to the OWS to run the test properly. Disable repeaters that are in range.*

1. Press and hold the **[Teach]** button until all the LEDs blink once. Release the button to enter the menu and display the first item, the blinking red LED.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the yellow LED is blinking.
3. Press and hold the **[Teach]** button until the LED stops blinking to initiate the Range Confirmation test.

After the OWS transmits and receives a Range Confirmation message, the signal strength status is displayed as an LED color.

LED Blink	Signal Strength
Green	-41 to -70 dBm (best)
Yellow	-70 to -80 dBm (good)
Red	-80 to -95 dBm (poor, move closer)
No LED	No linked controllers detected

The test repeats every five seconds and runs for 50 seconds. To exit before the time-out, press and hold the **[Teach]** button.

Sensor Setting

The Sensor Setting adjusts PIR Sensitivity, Audio Sensitivity, and Sensor Occupancy Timer. Two additional settings in the line-powered model adjust how long the microphone remains enabled after a PIR detection and fine-tune the audio trigger level if Audio Sensitivity is set to Auto (default). To reduce false occupancy states caused by external elements, consider adjusting the sensitivity setting.

1. Press and hold the **[Teach]** button until all the LEDs blink once. Release the button to enter the menu and display the first item, the blinking red LED.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the red and yellow LEDs are both blinking.
3. Press and hold the **[Teach]** button until the LEDs stop blinking to select Sensor Setting.

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4. Press and release the **[Teach]** button to cycle through the options:
 - Two green blinks: PIR Sensitivity
 - Two yellow blinks: Audio Sensitivity (DT models only)
 - Two red blinks: Occupancy Timer (DT models only)
 - Two red and green blinks: Audio Timer (line-powered DT model only)
 - Two green and yellow blinks: Audio Trigger (line-powered DT model only)
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Note: *Echoflex Dual Tech sensors have a configurable Occupancy Timer that sends a vacancy message when expired. If using another brand of controller with a DT model, you may want to adjust the Occupancy Timer on the sensor to control vacancy messaging.*

5. Press and hold the **[Teach]** button again to select an option. The corresponding LED blinks according to the current setting.
6. Press and release the **[Teach]** button to cycle through the settings.

Blinks	PIR Sens. Green LED	Audio Sens. Yellow LED	Occ. Timer Red LED	Audio Timer Red & Green LEDs	Audio Trigger Green & Yellow LEDs
1	High*	Auto*	Disabled	5 mins	Level A (high)
2	Medium	Low	5 mins	10 mins	Level B
3	Low	Disabled	10 mins	15 mins	Level C*
4			15 mins	30 mins	Level D
5			20 mins*	60 mins*	Level E
6			25 mins	120 mins	Level F
7					Level G (low)

* default setting

7. Press and hold the **[Teach]** button for 10 seconds to save and exit.
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Note: *If the Occupancy Timer is disabled, the audio remains active the full duration of the Audio Enabled Timer. Disabling both the Occupancy Timer and Audio Sensitivity sets the sensor to detect PIR only.*

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LED Display

The LED Display setting enables or disables the LEDs. Blinking LEDs are informative but not suitable for every location. Disabling the LEDs eliminates distractions as well as conserves battery power. If disabled, the LEDs still operate to run tests and indicate low battery.



Note: LEDs display on the sensor lens's left side for line-powered models and on the right side for battery-powered models.

1. Press and hold the **[Teach]** button until all the LEDs blink once. Release the button to enter the menu and display the first item, the blinking red LED.
2. Press and release the **[Teach]** button to cycle the menu of color LEDs and stop when the red and green LEDs are both blinking.
3. Press and hold the **[Teach]** button until the LEDs stop blinking to select LED Display.
4. Press the **[Teach]** button to toggle between the two states:
 - Red LED blinking - enable LEDs for detection
 - Green LED blinking - disable LEDs for detection
5. Press and hold the **[Teach]** button for five seconds to save and exit.

Restore Defaults

You can restore factory defaults for battery-powered models. Make sure you want to restore all of the factory defaults for the OWS. You cannot undo this command.

1. Press and continue to hold the **[Teach]** button.
2. Press and hold the ON rocker on the switch.
3. Hold both buttons until the LED blink sequence: green, yellow, and then red.

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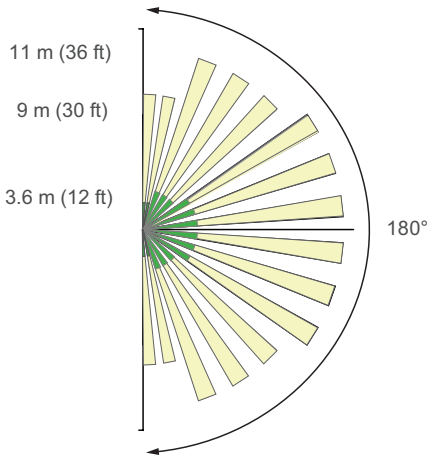
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Sensor Coverage

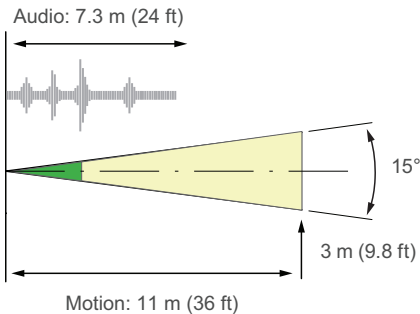
The sensor provides a reliable small motion detection range of 3.6 m (12 ft), for example to detect hand movements, and a large motion detection range up to 11 m (36 ft).

In addition to motion detection, Dual Tech models provide an audio detection range up to 7.3 m (24 ft) to maximize coverage of monitored spaces.

Top View



Side View



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Compliance

For complete regulatory compliance information, see the Wall Switch Sensor datasheet at echoflexsolutions.com.

FCC Compliance

Echoflex Wall Switch Sensor

(For any FCC matters):

Echoflex Solutions, Inc.

3031 Pleasant View Road

Middleton, WI 53562

+1 (608) 831-4116

echoflexsolutions.com

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received; including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Any modifications or changes to this product not expressly approved by Electronic Theatre Controls, Inc. could void the user's authority to operate the product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

Contains FCC ID: SZV-TCM320U

ISED Compliance

This device contains a license-exempt transmitter/receiver that complies with Innovation, Science, and Economic Development Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Contains IC ID: 5713A-TCM320U

Conformité ISDE

Cet appareil contient un émetteur/récepteur conforme aux CNR d'Innovation, Sciences et Développement économique Canada (ISDE) applicables aux appareils radio exempt de licence. Son fonctionnement est soumis aux deux conditions suivantes:

1. L'appareil ne doit pas produire d'interférences.
2. L'utilisateur de l'appareil doit accepter toute interférence, même si l'interférence est susceptible d'en compromettre le fonctionnement.

Contient ID IC: 5713A-TCM320U