



SENSORWORX®

# LINE VOLTAGE WALL SWITCH SENSORS

INSTALLATION & OPERATION INSTRUCTIONS

MODEL #	PIR	ACOUSTIC	PHOTOCELL	DEFAULT MODE
SWX-101-xx*	•			OCC
SWX-103-xx	•			VAC
SWX-104-xx	•			VAC
SWX-111-xx	•		•	OCC
SWX-113-xx	•		•	VAC
SWX-121-xx	•	•		OCC
SWX-123-xx	•	•		VAC
SWX-124-xx	•	•		VAC
SWX-131-xx	•	•	•	OCC
SWX-133-xx	•	•	•	VAC

\* xx = color (WH, IV, AL, GY)

## SPECIFICATIONS

### ELECTRICAL

#### OPERATING VOLTAGE

120/277 VAC, 50/60 Hz

#### LOAD RATINGS

MAX: 800W @ 120VAC  
1200W @ 277VAC

MIN: None

#### LOAD TYPES

LED Driver/Lamps  
CFL, Electronic/Magnetic Ballasts (Fluorescent)  
Tungsten (Incandescent)

### ENVIRONMENTAL

#### OPERATING TEMP

32°F to 122°F (0°C to 50°C)

#### RELATIVE HUMIDITY

0-95% Non-Condensing,  
Indoor Use Only

### CODE COMPLIANCE

Wall Switch sensors can be used to meet many requirements of ASHRAE 90.1(2016), IECC (2015), and Title 24 (2016). In particular, Manual On (e.g., Vacancy) operation is prescribed for many building spaces.

### PHYSICAL

#### SIZE

2.74"H x 1.68"W x 1.39"D  
(6.96 x 4.27 x 3.53 cm)  
Not Including Mounting Strap

#### WEIGHT

4.5 oz

#### MOUNTING

Single Gang Switch Box

## OVERVIEW

SENSORWORX wall switch sensors detect movement in the infrared energy that radiates from occupants as they move within the devices field-of-view. Once occupancy is identified, the sensor's internal relay switches power on to the connected lighting. Units can also be configured to operate in Vacancy Mode (e.g., require lights be manually switched on). Once lights are on and if equipped with passive dual technology (PIR/Acoustic), the unit's microphone is enabled to further enhance detection. An internal timer is set to keep lights on during brief periods of inactivity and is reset every time occupancy is signaled by either the passive infrared or acoustic detection technologies. Ambient daylight detection can also be enabled in the unit so that lights are held off in rooms with sufficient light contribution from windows or skylights.



## FEATURES

### ELECTRICAL FEATURES

- Interchangeable Line & Load Wires - Impossible to Wire Backwards
- Accommodates Neutral (3-wire) and No-Neutral (2-Wire) Installation
- Electronically Timed Switching Ensures Long Relay Life
- Compatible with LED, Fluorescent and Incandescent Lighting
- Meets NEC Guidelines Regarding Current Leakage

### PHYSICAL FEATURES

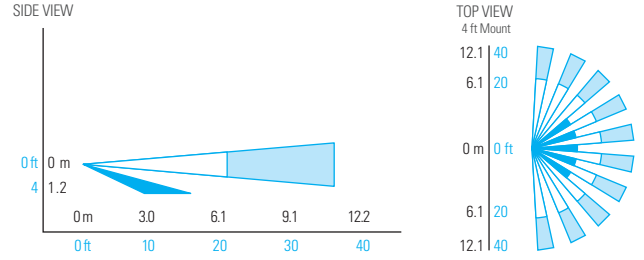
- Enclosure is 25-40% Shallower than Other Sensors (< 1" depth into wallbox)
- Unique Bat-Wing Shaped Lens Provides Enhanced Peripheral Detection
- Self-Grounding Mounting Strap
- Modern Look and Intuitive Easy-Tap Button
- Rugged Vandal Resistant Lens
- Settings are Adjustable Without Removing Cover Plate

### OPERATIONAL FEATURES

- Wall-To-Wall Passive Infrared Small Motion Detection
- Passive Acoustic Detection (Optional) - Prevents False Offs when No Motion is Present
- 100% Passive Detection Methods - No Interference Potential from External Devices
- Ambient Daylight Override Mode Increases Energy Savings
- Configurable Time Delays and Operating Modes
- Blue Locator LED when Lights are Off

# COVERAGE

- 30" to 48' (0.76 - 1.22 m) recommended mounting height
- Wall to wall (~180 degree) coverage
- Small motion (e.g., hand movement) detection up to 20 ft (6.10 m), ~625 ft<sup>2</sup>
- Large motion (e.g., walking) detection greater than 36 ft (10.97 m), ~ 2025 ft<sup>2</sup>
- Overlapping acoustic detection of occupants over entire coverage area
- Advanced signal processing filters out nuisance noises while not effecting overall sensitivity
- As an added safety convenience, the acoustic detection is left active for 10 seconds after sensor turns the lights off to allow for voice reactivation

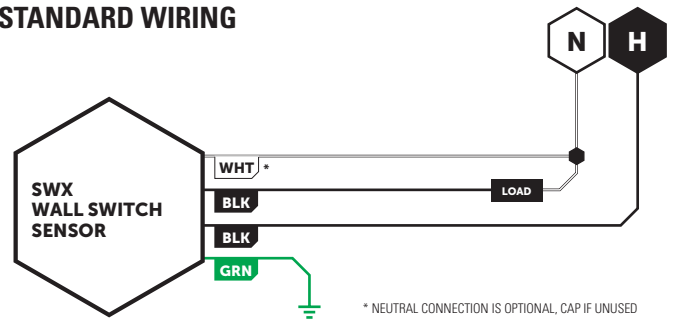


# INSTALLATION

## WIRING

- For supply connections, use 14 AWG (90° C) or larger wires
- Risk of Electric Shock - more than one disconnect switch may be required to de-energize the equipment before servicing
- It is recommended that wiring the unit's ground connection be done first.
- Unit works both in installations where Neutral connection is available as well as installations where only Ground connection is present
- The unit's two black wires are interchangeable (e.g., one connects to line power, one connects to load)
- After wiring and mounting, install wall plate (not included) before turning back on power at the circuit breaker

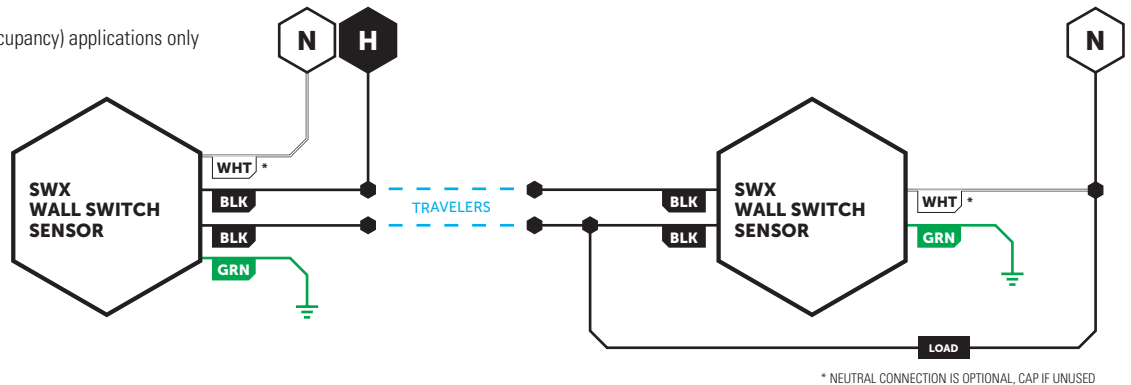
## STANDARD WIRING



## 3-WAY WIRING

### TWO SENSORS IN PARALLEL

- Both sensors must time out for lights to turn off (or both buttons must be switched)
- Recommended for Automatic On (Occupancy) applications only

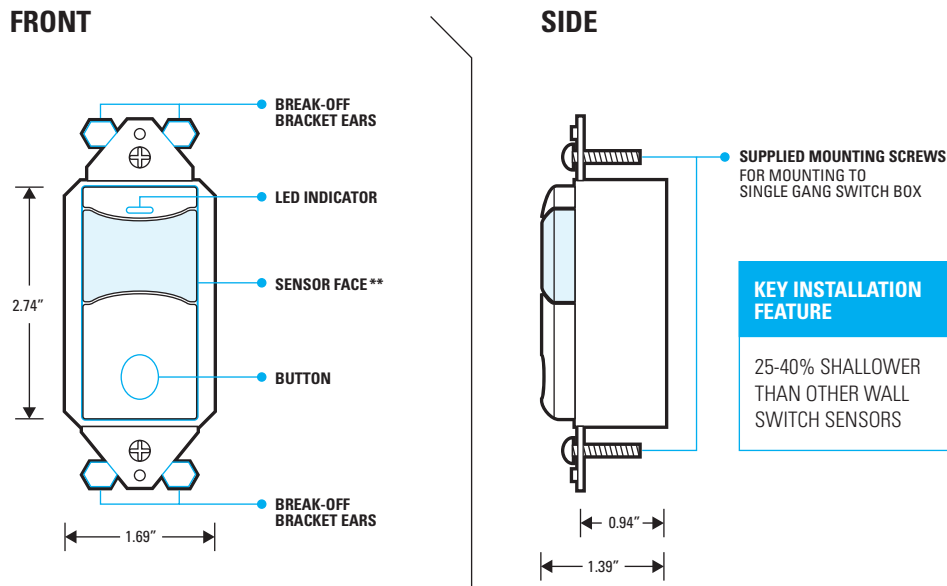


**⚡ WARNING: TURN POWER OFF AT THE CIRCUIT BREAKER BEFORE WIRING ⚡**

# INSTALLATION CONT.

## MOUNTING

- Designed to mount in 1-gang wall box with 3.28" hole spacing
- Units also can share multiple gang wall boxes with other devices



\*\* SENSOR FACE IS FIELD REMOVABLE IN ORDER TO CHANGE COLORS. CONTACT FACTORY FOR ADDITIONAL FACES

# CONFIGURATION SETTINGS

There are several settings that can be modified. To change a setting, follow the below steps:

- 1 Press and hold the push button until blue LED begins flashing rapidly, then release.
- 2 Tap the button the number of times corresponding to the Function # to be changed (e.g., 2 times for Time Delay).
- 3 The LED will blink back white the number of times equal to the current setting (e.g., 4 times for 10 minutes). Following a short pause, this blink back sequence will repeat.
- 4 Interrupt blink back by pressing the button the number of times corresponding to the new setting. (e.g., 3 times for 5 minutes). The LED will blink back white the number as confirmation.
- 5 To exit and save, press and hold the push button until blue LED changes to white, then release. Unit will blink white twice indicating save was successful. If LED blinks twice blue, an error condition occurred.

## FUNCTION #2 OCCUPANCY TIME DELAY SETTINGS

Lights are held on following all occupancy events for the selected period.

SETTING #	DESCRIPTION
1	Test Mode*
2	30 sec
3	5 min
4	10 min [Default]
5	15 min
6	20 min
7	30 min

\* TEMPORARY 5 SEC TIME DELAY, REVERTS AFTER 10 MIN

# CONFIGURATION SETTINGS CONT.

## FUNCTION #3 OPERATIONAL MODES

Several pre-programmed operational modes are available to accommodate both preferences and applicable energy codes.

### 2 Vacancy Mode (Manual On / Automatic Off)

This mode provides increased energy savings but requires the user to initially turn on the lights by pressing the button. Lights can also be switched off manually. Models SWX-103, SWX-104, SWX-113, SWX-123, SWX-124, and SWX-133 default to Vacancy mode.

### 3 Occupancy Mode (Automatic On / Automatic Off)

Automatic On and Automatic Off operation. If lights are switched off manually, the Automatic On functionality is temporarily disabled to allow the occupant a few seconds to leave the room before returning to Automatic On operation. However, if the person remains in the space, the unit will stay in a manual on state until the switch is pressed again. This mode is the default operation of SWX-101, SWX-111, SWX-121, and SWX-131 models. Not available for models SWX-104 and SWX-124.

### 4 Automatic On w/ Exit Time Mode (Automatic On/Automatic Off)

If lights are switched off manually, the Automatic On functionality is disabled for a fixed 30 seconds to allow a person time to leave the room. Not available for SWX-104 and SWX-124 models.

### 5 Override Off Mode

Automatic On and Automatic Off operation until lights are switched off manually, at which point Automatic On functionality is disabled until the button is pressed again. Not available for SWX-104 and SWX-124 models.

### 6 Disabled Switch Mode

Automatic On and Automatic Off operation only. Switch functionality to manually turn on/off lights is disabled. Not available for SWX-104 and SWX-124 models.

### 7 Presentation Mode

If lights are switched off manually, the Automatic On functionality is disabled until the space becomes unoccupied and the sensor's time delay expires.

## FUNCTION #4 AMBIENT LIGHT OVERRIDE (PHOTOCELL)

Sensor will prevent lights from automatically turning on when measured light level exceeds selected setpoint (e.g., ambient light threshold). LED blinks blue every 10 seconds when lights are being overridden. If ambient light level falls below threshold for more than 45 seconds, lights will switch on. During transition time, the LED will blink blue at an increasingly faster rate. Once on, lights will stay on until occupancy time delay expires, regardless of ambient light level.

SETTING #	DESCRIPTION
2	Disabled [Default]
3	Run Auto-Setpoint*
4	2 fc
5	5 fc
6	15 fc
7	30 fc
8	50 fc
9	75 fc
10	99 fc

**Manual Setpoint Options**

\*Instead of blinking back setting #, the value of the setpoint will be blinked back in two alternating digits:

- Blue LED = 10's digit (1-9 blinks or rapid blink or 0)
- White LED = 1's digit (1-9 blinks or rapid blink or 0)

## OPERATION MODES

SETTING #	DESCRIPTION
2	Vacancy Mode
3	Occupancy Mode
4	Automatic On with Exit Time
5	Override Off Mode
6	Disabled Switch Mode
7	Presentation Mode

## AUTO-SETPOINT SELECTION DETAILS

- Once setting 3 "run auto-setpoint" has been selected, exit programming mode by pressing button until LED changes from blue to white. The sensor's LED will rapid flash white twice confirming programming change.
- LED will then blink back blue at an increasing rate for 15 sec. In order to provide user time to exit area in front of sensor.
- Lights will then be cycled in order for sensor to calculate the *controlled [artificial]* light level. This is done by subtracting the light level with the lights off (relay open) from the light level with the lights on (relay closed).
- Setpoint selection
  - If controlled level is less than 2 fc, setpoint will be set to measured level when relay is open (minimum 2 fc)
  - If controlled level is greater than 75 fc, setpoint will be set to 99 fc
  - If controlled level is between 2 and 35 fc, setpoint will be set to that level plus a reflectivity ratio factor.
  - If controlled level is between 35 and 70 fc, setpoint will be set to 75 fc
- To check auto selected setpoint, press and hold button again until LED flashes rapidly. Release and press button 4 times. Setpoint will be blinked back in two alternating digits:
  - Blue LED = 10's digit (1-9 blinks or rapid blink or 0)
  - White LED = 1's digit (1-9 blinks or rapid blink or 0)

# CONFIGURATION SETTINGS CONT.

## FUNCTION #5 AUTO ON SENSITIVITY

This setting indicates the sensor's PIR sensitivity when the lights are off. Typically this setting should be FULL, but if reflective surfaces (like windows) are causing false-ons the REDUCED setting should be used. Note that the unit returns to full sensitivity after initial detection.

SETTING #	DESCRIPTION
2	Full
3	Reduced

## FUNCTION #6 MICROPHONE

Dual technology (i.e. PIR + acoustic) sensors prevent non-occupant sounds from resetting the time delay by dynamically reducing the microphone's sensitivity at specific frequencies. In some environments, decreasing the sensitivity across all frequencies so that lights go off sooner, may be preferred. A unit's microphone can also be disabled (effectively changing sensor to a PIR only version).

SETTING #	DESCRIPTION
2	Normal
3	Reduced
4	Disabled

## FUNCTION #7 LED FUNCTIONALITY

By default, the sensor's LED will be solid blue when the unit's relay is in the open/off state. This serves as a switch locator. Once the lights are on, the LED will blink white whenever the sensor detects PIR motion. A unit with dual technology will also blink the LED white when it acoustically detects occupancy. The blue and/or white LED functionality can also be disabled.

SETTING #	DESCRIPTION
2	Blue locator LED enabled
3	Blue locator LED disabled
4	Blue & White LED disabled

## FUNCTION #8 FACTORY RESET

SETTING #	DESCRIPTION
3	Restore Factory Settings

# OPERATIONAL NOTES

## TEST MODE

A test mode with a 5 second time delay is provided in order to efficiently perform walk testing. The sensor will blink White on any detected PIR event and Blue on any detected acoustic event, although its time delay will only be reset by a PIR event. While in test mode, the blue locator LED also will not be lit when the lights are off (i.e. relay open).

### TO PUT A SENSOR IN TEST MODE FOR 10 MINUTES:

- Press and hold the push button until blue LED begins to rapid flash, then release
- Press sensor's pushbutton 2 times, then wait two seconds
- Press button 1 time to select Test Mode
- To exit and save, press and hold the push button again until blue LED changes to white, then release. Unit will blink white twice indicating save was successful. If LED blinks twice blue, an error condition has occurred.
- After 10 minutes, the sensor's time delay will revert to previous saved time delay

## VACANCY MODE

- If sensor is configured for vacancy (manual on) operation, the ambient light override setting will be overwritten to "DISABLED" and any attempted modifications to the setting will trigger an error condition (indicated by double blue LED flash after exit/save). The ambient light override feature (i.e. photocell) can only be enabled when the sensor is in an automatic on operating mode.
- There is a 15 second "grace" period after the sensor times out when the sensor will switch lights back on automatically. After 15 seconds the sensor will revert to vacancy (manual on) operation.

## MICROPHONE GRACE TIMER

- As an added safety and convenience feature, a sensor with acoustic detection will keep its microphone enabled for an additional 10 secs. after lights are automatically turned off to enable voice reactivation.

