



SENSORWORX®

LINE VOLTAGE WALL SWITCH SENSORS w/ 0-10V DIMMING

INSTALLATION & OPERATION INSTRUCTIONS

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

* XX = COLOR (WH, IV, AL)

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 for On/Off, Raise, & Lower
- 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
- Configurable Dimming Parameters including High/Low Trims, Turn on Levels, and Curve Types
- Ambient Daylight Override Mode Increases Energy Savings
- Blue Locator LED when Lights are Off

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)

DIMMING CAPABILITY

0-10 VDC ballasts or drivers compliant with IEC 60929 Annex E.2

DIMMING LOAD

- 50 mA (sink only)

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

ENVIRONMENTAL

OPERATING TEMP

32°F to 122°F (0°C to 50°C)

RELATIVE HUMIDITY

0-95% Non-Condensing,

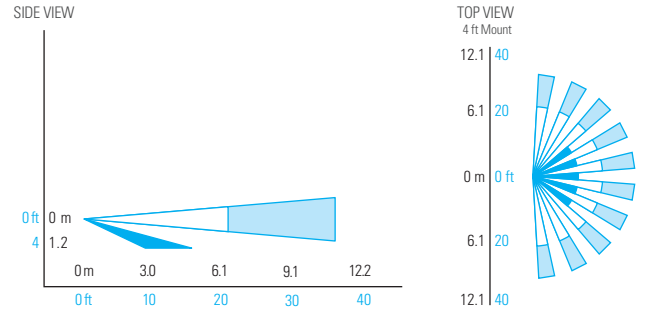
Indoor Use Only

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.

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 ft²
- Large motion (e.g., walking) detection greater than 36 ft (10.97 m), ~ 2025 ft²
- 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

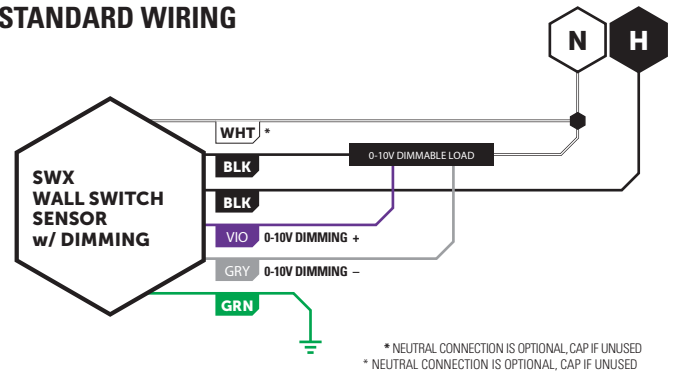


INSTALLATION

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

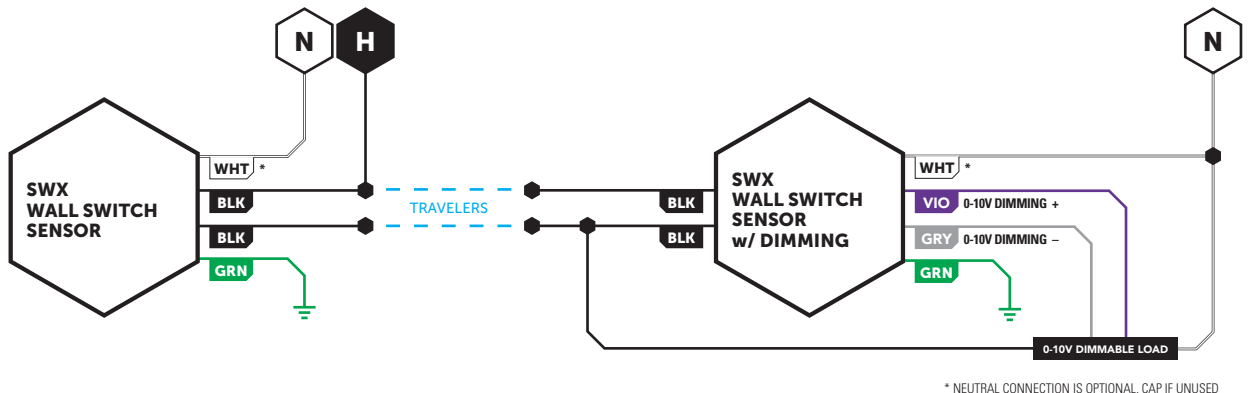
STANDARD WIRING



3-WAY WIRING

TWO SENSORS IN PARALLEL

- Only one sensor can be model with 0-10V Dimming
- Both sensors must time out for lights to turn off (or both buttons must be switched)
- Recommended for Automatic On (Occupancy) applications only



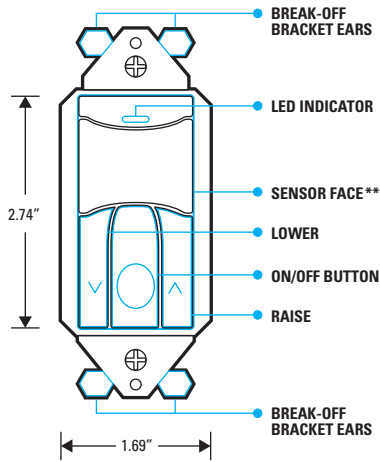
⚡ WARNING: TURN POWER OFF AT THE CIRCUIT BREAKER BEFORE WIRING ⚡

INSTALLATION CONT.

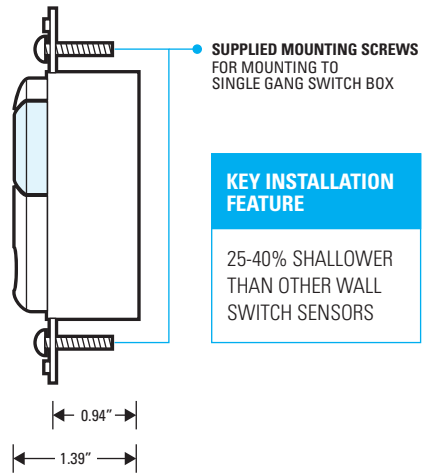
MOUNTING

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

FRONT



SIDE



KEY INSTALLATION FEATURE

25-40% SHALLOWER THAN OTHER WALL SWITCH SENSORS

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

DIMMING APPLICATION OVERVIEW

DIMMING APPLICATION TABLE

MODEL #	DETECTION TYPE		DEFAULT OPERATING MODE ^{1,2}	
	PIR	ACOUSTIC	NAME	DESCRIPTION
SWX-101-D	•		Partial On	Auto-On to 50%
SWX-103-D	•		Vacancy	Manual On to Last Level
SWX-111-D	•		Partial On	Auto-On to 50%
SWX-121-D	•	•	Partial On	Auto-On to 50%
SWX-123-D	•	•	Vacancy	Manual On to Last Level
SWX-131-D	•	•	Partial On	Auto-On to 50%

1. ALL MODES ARE ENERGY CODE COMPLIANT
 2. MODES ON ALL UNITS ARE FIELD CONFIGURABLE

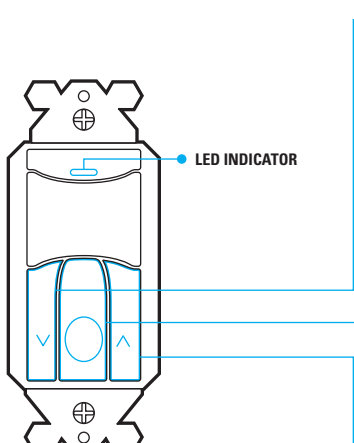
CONFIGURATION SETTINGS

CONFIGURATION PROGRAMMING

- 1 From the lists of Configuration Functions below, note the Button Position and number (#) of the Function to be changed. For example, HIGH TRIM setting is the Right Button, #3.
- 2 Enter programming mode by pressing and holding the CENTER button until the blue LED begins rapid flashing.
- 3 Press and release the applicable button for the chosen function. For example, press the RIGHT button 3 times for the HIGH TRIM setting.
- 4 The LED will flash back the setting number of the current value as it appears in each function's detailed table of values. For example, the default HIGH TRIM is setting #2 (10V) for the RIGHT button.
- 5 Press and release the applicable button the number of times equal to the new setting #. For example, RIGHT button 3 times (for 9V).
- 6 The LED will flash back the new setting number as confirmation.
- 7 To exit programming mode, press and hold the function's applicable button again until the LED flashes rapidly. The LED will then blink white twice as confirmation of success.

NOTE IF THE LED DOUBLE FLASHES TWICE BLUE AT ANY POINT, REPEAT THE ABOVE PROCEDURE.

CONFIGURATION FUNCTIONS



LED INDICATOR

LEFT BUTTON

DIMMING

FUNCTION NAME	BUTTON POSITION	FUNCTION #
Turn Off Scheme	Left	2
Low Trim	Left	3
Fade Off Time	Left	4

CENTER BUTTON

FUNCTION NAME	BUTTON POSITION	FUNCTION #
Time Delay	Center	2
Operating Mode	Center	3
Photocell Setpoint	Center	4
Auto-on Sensitivity	Center	5
Microphone	Center	6
LED	Center	7
Factory Reset	Center	8

RIGHT BUTTON

DIMMING

FUNCTION NAME	BUTTON POSITION	FUNCTION #
Turn On Dimming Level	Right	2
High Trim	Right	3
Fade On Time	Right	4
Dimming Curve Type	Right	5

CONFIGURATION SETTINGS CONT.

DETAILED FUNCTION TABLES FOR NON-DIMMING FEATURES

FUNCTION #2 TIME DELAY

CENTER BUTTON

SETTING #	DESCRIPTION	FUNCTION #
1	Test Mode	Temporary 5 sec time delay, reverts after 10 min
2	30 Sec	
3	5 Min	
4	10 Min	Default for all models
5	15 Min	
6	20 Min	
7	30 Min	

FUNCTION #3 OPERATIONAL MODES

CENTER BUTTON

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

SETTING #	DESCRIPTION	NOTES
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.	Default for models SWX-1x3-D and SWX-1x4-D.
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.	Default for SWX-1x1-D models. Not available for SWX-1x4-D models.
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.	
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-1x4-D models.
6	Disabled Switch Mode Automatic On and Automatic Off operation only. Switch functionality to manually turn on/off lights is disabled.	
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 #5 AUTO ON SENSITIVITY

CENTER BUTTON

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	NOTES
2	Full initial PIR sensitivity	Default for all models
3	Reduced PIR sensitivity for initial turn-ons in order to eliminate false on's caused by reflective surfaces like windows. Full sensitivity after initial turn-on.	

FUNCTION #6 INITIAL ACOUSTIC SENSITIVITY

CENTER BUTTON

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	NOTES
2	Normal	Default for all models
3	Reduced	
4	Disabled	

FUNCTION #7 LED FUNCTION

CENTER BUTTON

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	NOTES
2	White LED for occupancy, blue locator LED enabled	Default for all models
3	White LED for occupancy, blue locator LED disabled	
4	All LED functionality disabled.	
5	White LED for PIR, blue LED for acoustic detection. Blue locator LED enabled.	
6	White LED for PIR, blue LED for acoustic detection. Blue locator LED disabled.	

FUNCTION #8 RESTORE FACTORY DEFAULTS

CENTER BUTTON

SETTING #	DESCRIPTION
3	Restore Factory Defaults

CONFIGURATION SETTINGS CONT.

FUNCTION #4 AMBIENT LIGHT OVERRIDE (PHOTOCELL)

CENTER BUTTON

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)

AUTO-SETPOINT SELECTION DETAILS

- A** 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.
- B** 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.
- C** Lights will then cycle 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).
- D** 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
- E** 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)

DETAILED DIMMING FUNCTION TABLES

FUNCTION #2 TURN OFF SCHEME

LEFT BUTTON

SETTING #	VALUES	NOTES
2	Unit's relay opens immediately, switching power off to load	Default for all models, wired in either 2-way or 3-way
3	Unit fades dimming output down to low trim level then opens relay.	For applications wired in 2-way configuration only
4	Unit fades dimming output down to 0 volts (i.e. below a connected driver's electronic off level). Relay remains closed	
5	Unit fades dimming output down to low trim level. Relay remains closed	

FUNCTION #2 TURN ON DIMMING LEVEL

RIGHT BUTTON

SETTING #	VALUES	NOTES
2	Fade on to 100% of High Trim	
3	Fade on to 50% of High Trim	Default for SWX-101, SWX-111, SWX-121, SWX-131 models
4	Fade on to last user level	Default for SWX-103, SWX-123
5	Fade on to current (custom) level	Saves unit's current dim level

FUNCTION #3 LOW TRIM

LEFT BUTTON

SETTING #	VALUES	NOTES
2	Saves current level as low trim	
3	0%	
4	10% (Default)	
5	20%	Exact output voltage level depends on Dimming Curve selected (e.g. Linear, Log). Light output at each level depends on driver/ballast and luminaire.
6	30%	
7	40%	
8	50%	

FUNCTION #3 HIGH TRIM

RIGHT BUTTON

SETTING #	VALUES	NOTES
2	Saves current level as high trim	
3	100% (default)	
4	90%	Exact output voltage level depends on Dimming Curve selected (e.g. Linear, Log). Light output at each level depends on driver/ballast and luminaire.
5	80%	
6	70%	
7	60%	
8	50%	



CONFIGURATION SETTINGS CONT.

FUNCTION #4 FADE OFF TIME

LEFT BUTTON

SETTING #	VALUES	NOTES
2	0.75 Sec	
3	1.5 Sec	Default for all models
4	3 Sec	
5	5 Sec	
6	15 Sec	

FUNCTION #4 FADE ON TIME

RIGHT BUTTON

SETTING #	VALUES	NOTES
2	0.75 Sec	
3	1.5 Sec	Default for all models
4	3 Sec	
5	5 Sec	
6	15 Sec	

FUNCTION #5 MANUAL DIMMING RESPONSE CURVE

RIGHT BUTTON

SETTING #	VALUES	NOTES
2	Linear	Default for all models
3	Log	
4	Square Log	

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.

