SENSORWORX®

LINE VOLTAGE FIXTURE MOUNT SENSORS

INSTALLATION & OPERATION INSTRUCTIONS

(Units w/ Date Code 220103 and later)

MODELS

MODEL #	INCLUDED FUNCTIONALITY				
	OCCUPANCY ON/OFF	OCCUPANCY HIGH/LOW	ON/OFF PHOTOCELL	DAYLIGHT HARVESTING	NIGHT LIGHT OPERATION
SWX-501	•				
SWX-511	•		•		
SWX-501-HL	•	•			
SWX-511-D	•	•	•	•	•
SWX-511-NL	•	•	•	•	•

ADDITIONAL UNIT OPTIONS

- **HE:** High Humidity Environment

OVERVIEW

SENSORWORX 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. An internal timer is set to keep lights on during brief periods of inactivity, and is reset every time occupancy is signaled. Enhanced options for this sensor family include a photocell that will override lights off if sufficient ambient light is present, active daylight harvesting for 0-10V lighting, high/low occupancy operation, and combination daylight harvesting with night light operation.

SPECIFICATIONS

ELECTRICAL

OPERATING VOLTAGE
MVOLT (120-277 VAC)

LOAD RATINGS
800W @ 120 VAC
1000W @ 208 VAC (2-Phase)
1200W @ 277 VAC

LOAD TYPES
Tungsten
Ballast
LED

DIMMING COMPATIBILITY
(Units with -D, -HL & -NL option)
0-10 VDC Ballasts or Drivers Compliant with IEC 60929 Annex E.2

ENVIRONMENTAL

OPERATING TEMP
32°F to 122°F (0°C to 50°C) - Standard
-40° F/C (with **-HE** Option)

RELATIVE HUMIDITY
0-95% Non-Condensing, Indoor Use Only

PHYSICAL

SIZE
4.00" Diameter x 3.00" H
(10.16 x 7.62 cm)

WEIGHT
5.00 oz

COLOR
White

OPERATION

TIME DELAYS
30 sec to 30 min (Typical)
10 Minute Default

TEST MODE
5 sec Time Delay
Expires After 10 min

CODE COMPLIANCE

Sensors can be used to meet ASHRAE 90.1, IECC, & Title 24 energy code requirements

c UL US LISTED

FEATURES

- **Universal Lens Works for High Bay, Low Bay, & AisleWay Applications**
- **Greater Detection Range & Density than Leading Highbay 360° & Aisleway sensors**
- **Digital Passive Infrared (PIR) Detection**
- **Snap-In Chase Nipple Makes Installation Quick**
- **Integrated Bracket Drops Sensor Below Bottom of Fixture**
- **Electronically Timed Switching Designed for LED Fixture Control**
- **Convenient Test Mode and Adjustable Time Delays**
- **On/Off Phototcell & 0-10V Daylight Harvesting (Optional)**
- **High/Low Occupancy Operation (Optional)**
- **Combination Daylight Harvesting with NightLight Operation (Optional)**

TITLE 20 LISTED TITLE 24 COMPLIANT

MADE IN THE USA

TAA COMPLIANT

BAA COMPLIANT

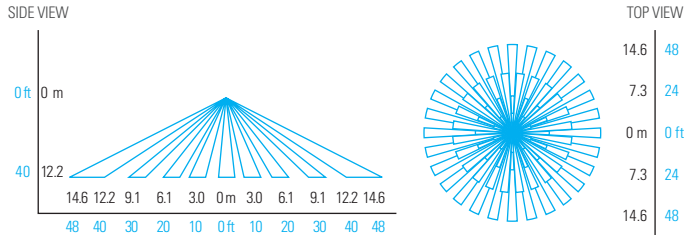
LEAD FREE RoHS COMPLIANT

COVERAGE PATTERNS

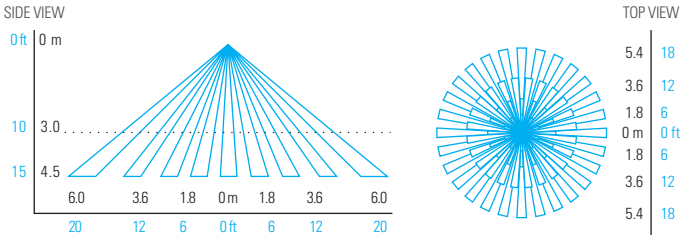
UNIVERSAL LENS

- Detects walking size motion or larger (e.g., forklifts)
- Single lens provides detection at mounting heights from 8 ft to 40 ft +
- Detection range improves when walking askew to sensor compared to directly at it
- Typical coverage radius ~1.2 x mounting height

HIGH BAY MOUNTING

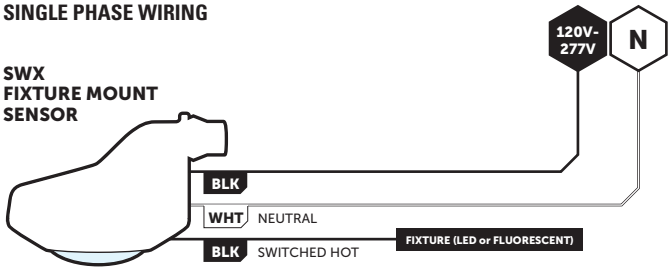


LOW BAY MOUNTING

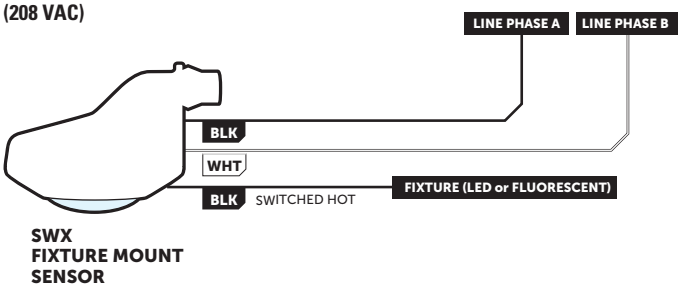


WIRING

SINGLE PHASE WIRING

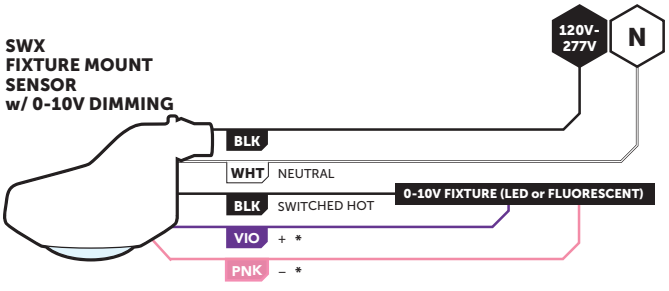


2-PHASE WIRING (208 VAC)



DIMMING WIRING

- Dimming wires are present on models with -D, - HL or -NL option



* VIO/PNK DIMMING WIRES (0-10V) SHOULD BE TREATED AS CLASS 1

TESTING & TROUBLESHOOTING

RESET

To restore factory settings, press and release the pushbutton 8 times, wait 2 seconds, then press and release the pushbutton 3 times again.

TEST MODE

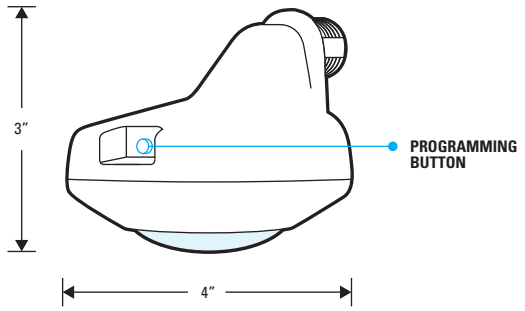
A test mode with a 5 second time delay is provided in order to efficiently perform walk testing. The sensor will blink white on any detected occupancy. Note that while in test mode all LED activity related to ambient light override (photocell) functionality is overridden. See procedure for entering test mode on right.

TO PUT A SENSOR IN TEST MODE FOR 10 MINUTES:

- Press sensor's pushbutton 2 times, then wait two seconds.
- Press button 1 time to start test mode. After 10 minutes, the sensor's time delay will revert to previous setting.

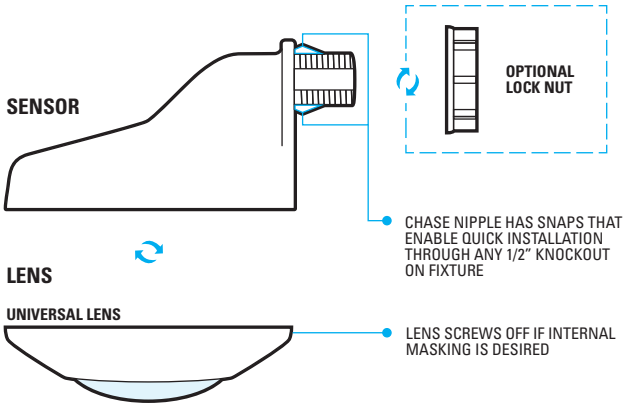
INSTALLATION

FRONT



ENCLOSURE INTEGRATES
~ 3" OF DROP DOWN
FROM FIXTURE KNOCKOUT

SIDE



GENERAL CONFIGURATION

FUNCTION 2 - TIME DELAY CONFIGURATION

The length of time after the last detected occupancy event that the sensor will stay in the occupied state.

CHANGING TIME DELAY SETTINGS:

1. Read through the Time Delay Settings list on the right and note the number of the desired time delay setting (e.g., default is 4 = 10 minutes).
2. Press and release the unit's pushbutton twice, then wait 2 seconds. The white LED will blink back the number of the current setting.
3. At any time after blink back starts, enter number of new setting (from Time Delay Settings table on right).
4. New setting is saved after white LED blinks new number back 3 times. If blue LED double flashes at any time, start process over.

FUNCTION #2 - TIME DELAY SETTINGS

SETTING #	DESCRIPTION	
1	Test Mode*	
2	30 sec	
3	5 min	
4	10 min	(default)
5	15 min	
6	20 min	
7	30 min	

* 5 SEC TIME DELAY, EXPIRES AFTER 10 MIN

EXTENDED TIME DELAYS**

SETTING #	DESCRIPTION
8	1 hr
9	2 hr
10	4 hr
11	8 hr

** EXTENDED TIME DELAYS GREATLY REDUCE ENERGY SAVINGS

FUNCTION 7 - LED INDICATION

By default, the sensor blinks its white LED whenever it detects PIR motion. The intensity of this LED can be decreased or disabled.

TO CHANGE LED INDICATION SETTINGS:

- Press unit's pushbutton 7 times, then wait two seconds. The white LED will blink back the number of current setting.
- Change to new setting by pressing the button equal times to numbered choices listed on the right.
- New setting will be saved after white LED blinks back number three times. If blue LED double flashes at any time, start process over.

FUNCTION #7 - LED INDICATION SETTINGS

SETTING #	DESCRIPTION	
2	White LED for occupancy, low intensity level	
3	White LED for occupancy, high intensity level	(default)
4	Disable LED	

OPERATIONAL MODE INFORMATION & CONFIGURATION

All sensor operational modes provide occupancy based control. Units with an integrated photocell can also provide on/off control of lighting based on the amount of ambient light present. Additionally, units with the daylight harvesting option can directly dim 0-10V lighting. Further optional operational modes include occupancy high/low (-HL option) and combination daylight harvesting with night light operation (-NL option). See the model number table on page 1 for details on included features for each unit. Descriptions of modes are below.

ON/OFF PHOTOCELL CONTROL

- Recommended for spaces (warehouse, hallways, entryways, etc) where switching of lighting off and on will not cause distraction of occupants.
- Lights are switched off if ambient light level surpasses threshold and back on if level drops.

DAYLIGHT HARVESTING

- Lights will gradually dim in order to maximize energy savings while maintaining desired overall lighting level.
- Option to dim just to low trim or turn lighting complelety off (see Function #10 - Turn Off Scheme)

OCCUPANCY HIGH/LOW/OFF

- Sensors drop the lighting level to a low setting after the occupancy time delay (Function #2 - Time Delay) expires.
- After a second time delay (Function #9 - Secondary Time Delay), the sensors will switch the fixture off completely (configureable to leave level at low trim instead of switching off) for the duration of the unoccupied period.
- Alternatively, leaving the sensor's relay disconnected will cause the fixture to stay at the full dim setting (but never turn completely off) for the duration of the unoccupied period.

COMBINATION DAYLIGHT HARVESTING WITH NIGHT LIGHT

- Fixtures will be gradually dimmed and then turned completely off during periods with sufficient daylight.
- During periods with insufficient daylight (i.e. at night) lights are held at a dimmed level during unoccupied periods and never turned completely off.
- Provides enhanced nighttime safety in facilities while still achieving energy savings.

INITAL INHIBIT ONLY PHOTOCELL CONTROL

- Lighting is held off if sufficient ambient light level is present upon initial occupancy.
- Lighting will turn on if light level drops below setpoint.
- Once on, lighting will only turn off from vacancy, never from daylight.

FUNCTION #3 - OPERATIONAL MODE CONFIGURATION

Sensors equipped with a photocell or dimming have additional operational modes and different defaults than standard sensors. To change between modes, use the following procedure:

1. Read through the FUNCTION #3 - OPERATIONAL MODE table on the right and note the number of the desired operational mode.
2. Press and release the unit's pushbutton 3 times, then wait 2 seconds. The white LED will blink back the number of the current setting.
3. At any time after blinking starts, enter number of new setting (e.g., 2 for OCCUPANCY - ON/OFF) from OPERATIONAL MODES table.
4. New setting is saved after white LED blinks new setting back 3 times. If blue LED double flashes at any time, an error condition exists and process must be repeated.

FUNCTION #3 - OPERATIONAL MODES

SETTING #	DESCRIPTION	MODEL # NOTES
2	Occupancy - On/Off (photocell disabled if present)	Default for SWX-501
3	Occupancy + On/Off Photocell Control **See on/off operation notes below.**	Default for SWX-511
4	Occupancy - High/Low (photocell disabled if present)	Default for SWX-501-HL
5	Occupancy - High/Low/Off (photocell disabled if present)	
6	Occupancy + Daylight Harvesting - Night Light Operation **See on/off operation notes below.**	Default for SWX-511-NL
7	Occupancy + Daylight Harvesting to Off **See on/off operation notes below.**	Default for SWX-511-D
8	Occupancy + Daylight Harvesting to Low Trim	
9	Occupancy + Initial Inhibit Only Photocell Control	

ON ON/OFF PHOTOCELL OPERATION NOTES

- During periods of occupancy, when the measured light level is high enough for 5 min. such that turning the lights off will not drop the level below the selected setpoint, the sensor will turn connected lighting off.
- During this 5 min. transition time the LED will blink blue at 0.5 second intervals.
- After lights are turned off, the sensor's LED double blinks blue every 15 seconds as an indication that sufficient ambient light is the reason the lights are being held off.
- If the ambient light level falls below the setpoint for more than 30 seconds, lights will switch back on. During this transition time the LED also will blink blue at 0.5 second intervals.

PHOTOCELL CONFIGURATION

FUNCTION #4 - PHOTOCELL SETPOINT

The minimum overall light level that is to be maintained in a space by the sensor is referred to as the "setpoint". This value is user selectable or can be chosen by the Auto-Setpoint function that is built into the sensor.

SETPOINT CONFIGURATION

1. Read through the below setpoint values list and note the number of the desired setpoint (e.g., default is 7 = 25 fc).
2. Press and release the unit's pushbutton 4 times, then wait 2 seconds. The LED will blink back the value of the current setting in two alternating digits:
   Blue LED = 10's digit (1-12 blinks or rapid blink for 0)
   White LED = 1's digit (1-9 blinks or rapid blink for 0)
3. At any time after blinking starts, enter number of new setting (from Setpoint Value Table).
4. New setting is saved after white LED blinks new setting back 3 times. If blue LED double flashes at any time, an error condition exists and process must be repeated.

FUNCTION #4 - SETPOINT VALUE TABLE

SETTING #	DESCRIPTION	
2	Run Auto-Setpoint*	
3	2.5 fc	Manual Setpoint Options
4	5.0 fc	
5	10.0 fc	
6	15.0 fc	
7	25 fc (default)	
8	35 fc	
9	50 fc	
10	75 fc	
11	100 fc	

*AUTO-SETPOINT SELECTION DETAILS

A Once setting 2 "Run Auto-Setpoint" has been selected (by following above steps 1-4), the sensor's LED will alternate blue and white for 30 seconds. During this time user should move away from sensor.

B 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).

C A setpoint will then be chosen using the following conditions:
- If controlled level is less than 3 fc, the application is considered open loop and the setpoint will be set to 25 fc.
- If controlled level is between 3 and 100 fc, setpoint will be set to that level times 1.25.
- If controlled level is greater than 100 fc the setpoint will be set to 125 fc.

D Unit will immediately start operating with new setpoint (i.e. blue LED may begin flashing indicating it will transition lights soon)

E To check auto selected setpoint, press and release 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 CONFIGURATION

CHANGING DETAILED DIMMING SETTINGS

The settings listed in the below function tables can be adjusted using the following programming procedure.

1 From the below tables of detailed functions, note the number (#) of the function to be modified. For example, the **HIGH TRIM** setting is #5.

3 To access a particular function, press and release the programming button the number of time of the chosen function. For example, press the button 5 times to access the **HIGH TRIM** function.

4 The LED will flash back white the setting number of the current value as it appears in each function's detailed table below. For example, the default **HIGH TRIM** is setting #2 (10V)

5 To change the setting number, press and release the button the number of times equal to the new setting #. For example, 3 times (for 9V).

6 The LED will flash back white the new setting number as confirmation and will be saved after three confirmations. If LED double flashes blue at any time, start process over.

DETAILED DIMMING FUNCTION TABLES

FUNCTION #5 - HIGH TRIM

The maximum voltage to which the sensor is allowed to raise its dimming output in the full bright state.

SETTING #	VALUES		NOTES
2	~10 VDC	(default)	
3	~9 VDC		Light output at each voltage level depends on driver/ballast and luminaire.
4	~8 VDC		
5	~7 VDC		
6	~6 VDC		
7	~5 VDC		

FUNCTION #6 - LOW TRIM

The minimum voltage to which the sensor is allowed to reduce its dimming output when measuring high levels of ambient light (or when unoccupied in an Occupancy - High/Low operational mode).

SETTING #	VALUES		NOTES
2	~0 VDC		
3	~1 VDC		Light output at each voltage level depends on driver/ballast and luminaire.
4	~2 VDC		
5	~3 VDC	(default)	
6	~4 VDC		
7	~5 VDC		

FUNCTION #9 - SECONDARY TIME DELAY

For sensors in Occupancy - High/Low/Off operational mode, the amount of time the dimming voltage will stay at the low trim level before turning the lights completely off (assuming space remains unoccupied).

SETTING #	DESCRIPTION	
2	0 Sec	
3	30 Sec	
4	2.5 Minutes	
5	5 Minutes*	(default)
6	10 Minutes	

FUNCTION #10 - TURN OFF SCHEME

The method by which a sensor with dimming turns off connected lighting.

SETTING #	VALUES	NOTES
2	Drop to Off	Dimming output drops to low trim level & relay opens.
3	Fade to Off (default)	Dimming output fades to low trim & relay opens.
4	Fade to 0V	Dimming output fades to low trim level and then drops to 0 volts (e.g. below a connected driver's electronic off level). Unit's relay remains closed.
5	Fade to Low Trim	Dimming output fades down to low trim level. Unit's relay remains closed.
6	Drop to Low Trim	Dimming output drops down to low trim level. Unit's relay remains closed.
7	Drop to 0V	Dimming output drops to 0 volts (e.g. below a connected driver's electronic off level. Unit's relay remains closed.

FUNCTION #11 - FADE OFF TIME

Adjustable time interval for lights to ramp down to off (or low trim).

SETTING #	VALUES	
2	0.75 Sec	
3	1.5 Sec	(default)
4	3 Sec	
5	5 Sec	
6	15 Sec	
7	Disabled	

FUNCTION #12 - FADE ON TIME

Adjustable time interval for lights to ramp up when sensor is in the occupied state.

SETTING #	VALUES	
2	0.75 Sec	
3	1.5 Sec	(default)
4	3 Sec	
5	5 Sec	
6	15 Sec	
7	Disabled	