sensorswitch ®

PRODUCT OVERVIEW

The **WSX** Family of wall switch occupancy sensors provides simple and cost effective solutions for commercial and residential lighting control applications. All **WSX** Family sensors have a stylish low profile appearance, soft-click buttons, and provide small motion detection up to 20 ft (6.10 m), making them perfect for private offices, private rest rooms, closets, copy rooms, or any other small enclosed space. Additionally, all **WSX** Family sensors have a patent-pending wiring method that enables them to function either with or without a neutral connection. **WSX** units come pre-configured for wiring without a neutral, however if connection to neutral is required by code, contractors can convert the unit in seconds (see page 3).

All **WSX** Family sensors utilize 100% digital Passive Infrared (PIR) detection. Dual Technology (**PDT** option) versions add Microphonics detection and are recommended for offices and rooms with obstructions. Additional versions include units with dual relays - perfect for bi-level applications, and units with an integrated nightlight - perfect for restrooms and residential applications.

SENSOR OPERATION — WSX sensors detect changes in the Passive Infrared (PIR) energy given off by occupants as they move within the field-of-view. In an Auto-On sensor, once occupancy is detected, an internal relay switches on the connected lighting load. In a Vacancy (Manual On) sensor, the unit's push button must first be pressed to initiate the lights on. In a dual relay sensor, once occupancy is detected the unit will automatically close Pole 1's relay while still requiring Pole 2's push-button be pressed in order to close Pole 2's relay. All modes are user adjustable (see On Modes section).

After the lights are turned on, an internal timer keeps them on during brief periods of inactivity. Once the time delay has expired, lights are turned off automatically. The default time delay is 10 minutes - chosen in order to maximize energy savings while preventing false-offs. This timer is programmable from 30 seconds to 30 minutes, and is reset every time occupancy is re-detected. Patented LampMaximzer technology is also present in these sensors, providing an additional minimum on time (disabled by default) to be utilized if desired.

WSX sensors with Passive Dual Technology (**PDT** option) first see motion using Passive Infrared (PIR) and then engage Microphonics to listen for sounds that also indicate continued occupancy. This patented technology dynamically adapts a sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity.

WSX
FAMILY

WALL SWITCH SENSOR w/ CONVERTIBLE NEUTRAL / NO NEUTRAL WIRING, PASSIVE INFRARED (PIR) or DUAL TECH (PDT)

| WSX
WSX PDT | WSX NL
WSX PDT NL | WSX 2P
WSX PDT 2P |

KEY OPTIONS

NIGHT LIGHT (NL)
Ideal for bathrooms (hotel / hospital) or residential applications
• Ultra low power White LED night light (24/7 operation)
• Capable of powering over Ground (no Neutral required)
• Manual On / Auto Off operation of lights (default)
• Available with Single or Dual Relays

DUAL RELAY (2P)
Ideal for bi-level switched rooms or restroom with light & fan
• Includes two isolated relays, Pole 1 defaulted to Auto On, Pole 2 to Vacancy
• Enables separate time delay per pole - programmed via each pole's push-button
• UL listed to switch different loads per pole - e.g. 277 VAC lights on Pole 1 and 120 VAC fan on Pole 2

LOW TEMPERATURE / HIGH HUMIDITY (LT)
Required for cold / humid areas
• Device electronics are coated for corrosion resistance
• Operates down to -40º F/C (-4º F / 20º C for PDT)

FEATURES

• 100% digital PIR detection - excellent RF immunity

• Ruggedized assembly, vandal resistant lens standard

• Small motion detection to 20 ft

• Dual Technology (PDT) utilizes PIR / Microphonics detection (patented)

• 100% passive detection, no potential for interference with other building systems

• Self-grounding mounting strap

• White LED status indicator

• Device accommodates powering over ground or neutral connection (patent pending)

• Ultra low current leakage (<0.5 mA) when connected via ground

• Fully meets NEC 2011 Section 404.2C neutral requirements - no current leakage to ground when connected to neutral

• Line power and load wires are interchangeable - impossible to wire backwards (patented)

• Compatible w/ LEDs, Electronic & Magnetic Ballasts, CFLs, & Incandescents

• Photocell standard (disabled by default) - prevents lights from initially turning on if sufficient daylight is present, but does not turn lights off. Photocell not available in Night Light or Vacancy only versions.

• Integrated LampMaximizer minimum on time (patented) provides increased fluorescent lamp life - disabled by default

• Push-button programmable without removing cover plate - adjustable time delays & operating modes

• Non-volatile settings memory

• Includes wall plate (screwless sold separate)

OPERATIONAL SETTINGS

NOTE: (∗) Indicates factory default (unless otherwise marked)

2 = Occupancy Time Delay
Time sensor keeps lights on after last occupancy detection.

1 30 sec	**4** 7.5 min	**7** 15.0 min	**13** 30.0 min
2 2.5 min	**5** 10.0 min*	**8** 17.5 min
3 5.0 min	**6** 12.5 min	**9** 20.0 min

For additional time settings, contact technical support at 1.800.PASSIVE

3 = On Mode
Automatic On turns lights on when occupancy is detected. Manual On requires a button press to turn the lights on. Reduced Turn-On directs the sensor to only turn on when a large motion, such as a person entering a room, is detected. Weaker signals, such as reflections from glass, are ignored. Once lights are on, the sensor returns to maximum sensitivity.

    1 Automatic On   **2** Manual On   **3** Reduced Turn-On

Settings 1 & 3 not available on -VA (Vacancy only) sensors.

Notes on Default Settings
- *WSX (PDT) Series default: Automatic On*
- *Default for units with -SA, -VA, or -NL option: Manual On*
- *WSX (PDT) 2P Series default: Pole 1 Auto On, Pole 2 Manual*
- *Default for 2P units with -2SA, -2VA, or NL options: Both poles Manual On*

4 = Switch Modes
These modes dictate switch functionality.

Pressing the button in Override Off mode (setting 1) turns off and keeps lights off until pressed again.

Disabling the Switch (setting 2) prevents the button from turning the lights on. (continued next column)

Predictive Mode (setting 3) determines if a user has left the room after the lights are switched off. It does this by monitoring the space for a period after the button is pressed (Predictive Grace Time), following a delay to allow exiting the room (Predictive Exit Time). If occupancy is detected the device will disable Auto-On & hold the lights off until manually switched. If no occupancy is detected the sensor instantly reverts to auto-on mode.

If Predictive Mode with Expiration (setting 4) is enabled, once the sensor has disabled Auto-On it will continue to monitor the space. When no occupancy is detected for a duration equal to the occupancy time delay, the sensor will revert to Auto-On mode.

    1 Override Off **
    2 Switch Disable
    3 Predictive Mode
    4 Predictive Mode with Expiration*

* Default for WSX (PDT) units & Pole 1 of WSX (PDT) 2P units
** Default for units with -SA, -VA, or -NL options, Pole 2 of WSX (PDT) 2P units, and both poles of 2P units with -2SA, -2VA, or -NL options

5 = Photocell Set-Point
The ambient light level at which the sensor prevents the lights from initially turning on. Once on, the lights will remain on until the occupancy time delay expires and turns them off.

1 Disabled*	**5** 2 fc	**9** 32 fc
2 Auto Setpoint	**6** 4 fc	**10** 64 fc
3 0.5 fc	**7** 8 fc	
4 1 fc	**8** 16 fc	

Note: Sensor changes to Auto On mode if photocell is enabled. Photocell not present in -NL versions.

7 = LED Operation
Indicates behavior of device's LED.

    1 Occupancy Indication*   **3** Disabled
    2 Relay Indication   **4** Override On***

*Standard Factory Default   *** Factory Default for -NL version

9 = Restore Factory Defaults
Returns all functions to original settings.

    1 Maintain Current*   **2** Restore Defaults

10 = Minimum On Time
Required initial time for lamps to be on after each switch on, regardless of occupancy status. Once met, lights resume following occupancy time delay.

    1 0 min (disabled)*   **3** 30 min   **5** 60 min
    2 15 min   **4** 45 min

11 = Manual On Grace Period
Time period after lights automatically turn off that they can be reactivated by motion. (Manual On (Semi-Auto) mode only)

    1 0 sec   **2** Unused

12 = Dual Technology (Microphonics™)
Relative responsiveness of Microphonics detection.

    1 Normal*   **3** Medium   **5** Phase Off
    2 Off   **4** Low   (15-10-5 min)

13 = Microphone Grace Period
Time period after lights are automatically turned off that they can be voice reactivated.

1 0 sec	**3** 20 sec	**5** 40 sec	**7** 60 sec
2 10 sec*	**4** 30 sec	**6** 50 sec	

15 = Predictive Exit Time
Time period after manually switching lights off for occupant to leave the space.

1 5 sec	**3** 7 sec	**5** 9 sec	**7** 15 sec	**9** 30 sec
2 6 sec	**4** 8 sec	**6** 10 sec*	**8** 20 sec	

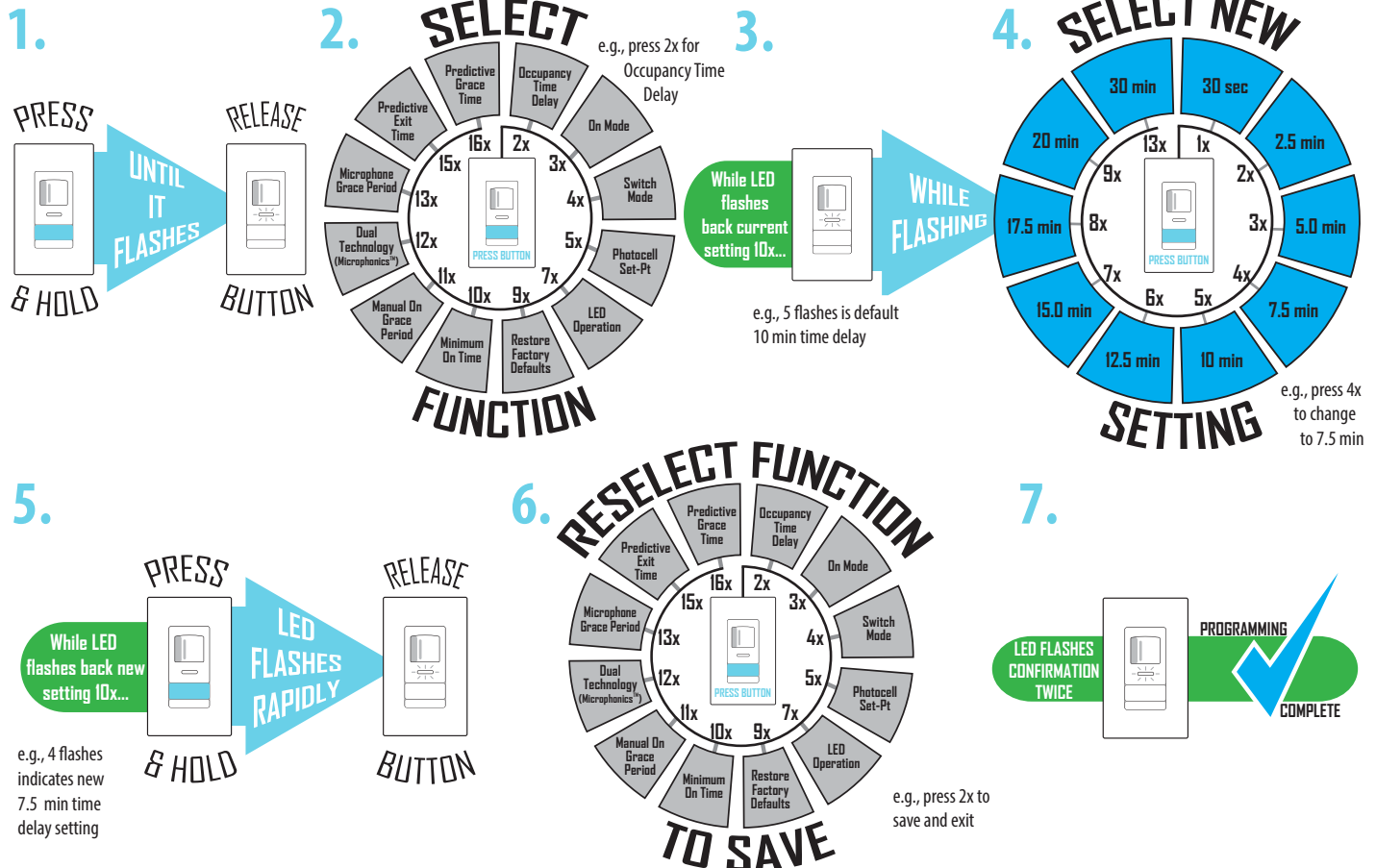### 16 = Predictive Grace Time
Time period after Predictive Exit Time that sensor rescans the room for remaining occupants.

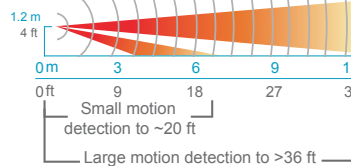|			
1 0 sec	**3** 10 sec	**5** 30 sec*	**7** 50 sec
2 5 sec	**4** 20 sec	**6** 40 sec	**8** 60 sec

PROGRAMMING INSTRUCTIONS

Operational settings can be changed via the push-button sequence outlined below (note the example used is for changing occupancy time delay). Programming for 2P units done with each pole's corresponding push-button.

1. PRESS → UNTIL IT FLASHES → RELEASE BUTTON

2. SELECT FUNCTION — PRESS BUTTON
e.g., press 2x for Occupancy Time Delay

3. WHILE FLASHING — While LED flashes back current setting 10x...
e.g., 5 flashes is default 10 min time delay

4. SELECT NEW SETTING — PRESS BUTTON
e.g., press 4x to change to 7.5 min

5. While LED flashes back new setting 10x... PRESS & HOLD → LED FLASHES RAPIDLY → RELEASE BUTTON
e.g., 4 flashes indicates new 7.5 min time delay setting

6. RESELECT FUNCTION TO SAVE — PRESS BUTTON
e.g., press 2x to save and exit

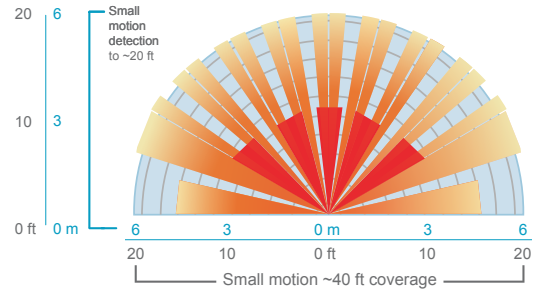**7.** LED FLASHES CONFIRMATION TWICE — PROGRAMMING COMPLETE

COVERAGE PATTERN

- Small motion (e.g., hand movements) 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
- Wall-to-Wall coverage
- Passive Dual Technology (Microphonics) provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is utilized to prevent non-occupant noises from keeping the lights on.

SIDE VIEW

1.2 m
4 ft

0 m   3   6   9   12
0 ft   9   18   27   36

Small motion detection to ~20 ft

Large motion detection to >36 ft

20 6
10 3
0 ft 0 m

Small motion detection to ~20 ft

6   3   0 m   3   6
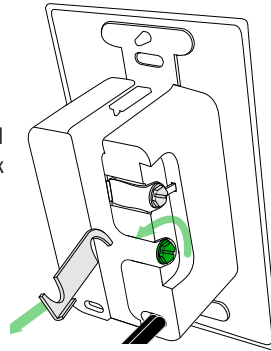20   10   0 ft   10   20

Small motion ~40 ft coverage

CONVERSION FROM GROUND ONLY (NO NEUTRAL) TO NEUTRAL WIRING

This product is pre-configured for wiring without a neutral, however if connection to neutral is required by code, contractors can quickly and easily convert the unit in seconds.
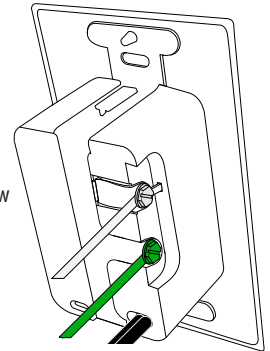
Step 1:
Remove Yellow Label
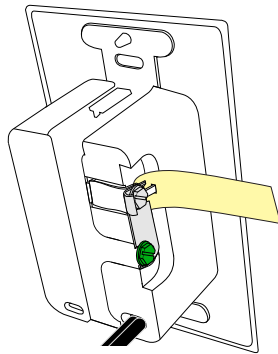
Step 2:
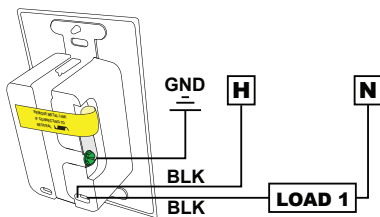Loosen Screws and Remove Metal Link

Step 3:
Connect Neutral to Silver Screw and Ground to Green Screw
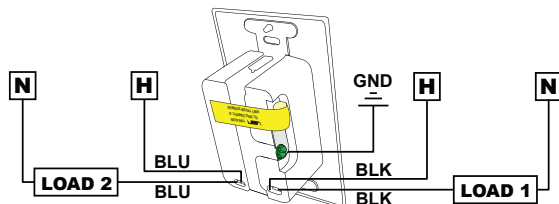
WIRING TO GROUND (NO NEUTRAL)

SINGLE RELAY

GND   H   N

BLK

BLK   LOAD 1

DUAL RELAY

N   H   GND   H   N

BLU   BLK

LOAD 2   BLU   BLK   LOAD 1

WIRE COLOR KEY

120/277 VAC WIRING

BLACK* - Line 1 Input   } *BLACK wires
BLACK* - Load 1 Output } can be reversed
BLUE*   - Line 2 Input   } *BLUE wires
BLUE*   - Load 2 Output } can be reversed

347 VAC WIRING (-347 Option)
Red wires replace Black wires.

WIRING TO NEUTRAL

SINGLE RELAY

N   H   N

GND

BLK

BLK   LOAD 1

DUAL RELAY

N   H   N   H   N

BLU   GND   BLK

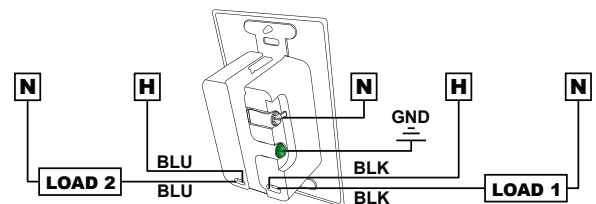LOAD 2   BLU   BLK   LOAD 1
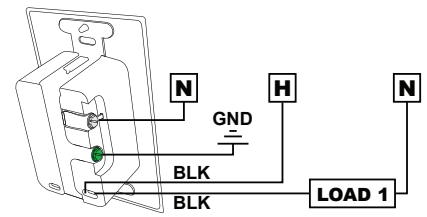
Notes:
- Unit will draw power from either line connection.
- Both poles' line connection must be same phase.

SPECIFICATIONS

PHYSICAL SPECS
SIZE: 2.74"H x 1.68"W x 1.63"D (6.96 cm x 4.27 cm x 4.14 cm)
   (not including ground strap)
WEIGHT: 5 oz
MOUNTING: Single Gang Switch Box
MOUNTING HEIGHT: 30-48 in (76.2-121.9 cm)
SILICONE FREE
ROHS COMPLIANT

ELECTRICAL SPECS
MAXIMUM LOAD / POLE (RELAY)
   800 W @ 120 VAC
   1200 W @ 277 VAC
   1500 W @ 347 VAC
MINIMUM LOAD: None
MOTOR LOAD: 1/4 HP
FREQUENCY: 50/60 Hz (timers are 1.2x for 50 Hz)

ENVIRONMENTAL SPECS
OPERATING TEMP
   Standard: 14º to 122º F (-10º to 50º C)
   LT Option (PIR): -40º to 122º F (-40º to 50º C)
   LT Option (PDT): -4º to 122º F (-20º to 50º C)
RELATIVE HUMIDITY:
   Standard: 20 to 75% non-condensing
   LT Option: 20 to 90% non-condensing
   (electronics coated for corrosion resistance)

ORDERING LOGIC

SINGLE RELAY

EXAMPLE: WSX PDT WH

Series	Operating Mode[1]	Voltage	Color[3]	Temp/Humidity
WSX Passive Infrared (PIR)	**Blank** Auto-On (default) or Vacancy	**Blank** 120/277 VAC	**WH** White	**Blank** Standard
WSX PDT Dual Technology (PIR / Microphonics)	**SA** Vacancy (default) or Auto-On	**347**[2] 347 VAC	**IV** Ivory	**LT** Low Temp
	VA Vacancy only		**GY** Gray	
			AL Lt. Almond	
			BK Black	
			RD Red	

DUAL RELAY

EXAMPLE: WSX 2P WH LT

Series	Operating Mode[1]	Voltage	Color[3]	Temp/Humidity
WSX 2P Passive Infrared (PIR)	**Blank** Pole 1 Auto-On Pole 2 Vacancy (default)	**Blank** 120/277 VAC	**WH** White	**Blank** Standard
WSX PDT 2P Dual Technology (PIR / Microphonics)	**2SA** Both Poles Vacancy (defaut)	**347**[2] 347 VAC	**IV** Ivory	**LT** Low Temp
	2VA Both Poles only Vacancy		**GY** Gray	
			AL Lt. Almond	
			BK Black	
			RD Red	

NIGHTLIGHT

EXAMPLE: WSX 2P NL WH

Series[4]	Voltage	Color[3]	Temp/Humidity
WSX NL Passive Infrared (PIR)	**Blank** 120/277 VAC	**WH** White	**Blank** Standard
WSX PDT NL Dual Technology (PIR / Microphonics)	**347**[2] 347 VAC	**IV** Ivory	**LT** Low Temp
WSX 2P NL Dual Relay, Passive Infrared (PIR)		**GY** Gray	
WSX PDT 2P NL Dual Relay, Dual Technology (PIR / Microphonics)		**AL** Lt. Almond	
		BK Black	
		RD Red	

Notes:
1 Operating Modes reprogrammable via push-button except for VA version
2 Wall plates included in white or ivory only for 347 VAC units
3 Matching wall plate provided for 120/277 VAC units
4 Units factory set to Vacancy (Manual On) Operating Mode

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**TITLE 24
ASSEMBLED in U.S.A.
5 YEAR WARRANTY**

Sheet#: TS-WSX-001A

WARRANTY: Sensor Switch warrants these products to be free of defects in manufacture and workmanship for a period of 60 months. Sensor Switch, upon prompt notice of such defect, will, at its option, provide a Returned Material Authorization number and repair or replace returned product.
LIMITATIONS AND EXCLUSIONS: This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch be liable for any incidental or consequential property damages or losses.

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