sensorswitch®

WSD
FAMILY

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

PRODUCT OVERVIEW

The **WSD** is a stylish, easy to install, and simple to use Wall Switch Decorator style Passive Infrared (PIR) sensor. It is ideal for private offices, copy rooms, closets, or any small enclosed space without obstructions. A user programmable time delay ensures that once the room is vacated the sensor will time out and turn off the lights. Additionally, the WSD sensor has several On Modes and Switch Modes that can be programmed using the front push-button. For rooms with obstructions, the Dual Technology WSD PDT Series sensor is recommended. Additionally, all **WSD** Family sensors have a patent-pending wiring method that enables them to function either with or without a neutral connection. **WSD** 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 **WSD** 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, or bathrooms with a light and a fan.

SENSOR OPERATION — WSD 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.

WSD 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.

WSD
WSD PDT

WSD 2P
WSD PDT 2P

KEY OPTIONS

VACANCY OPERATION (SA and VA)
Increased energy savings and required by many codes
• The unit's push button must first be pressed to initiate the lights on
• SA version can be reprogrammed to Auto-On operation
• VA version operates in Manual On mode only

DUAL RELAY (2P, 2P-SA, and 2P-VA)
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
• 2P-SA and 2P-VA versions are factory set with both poles set to manual on

LOW TEMPERATURE / HIGH HUMIDITY (LT)
Required for cold or 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

• 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

• Green 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

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

• 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 Vacancy only versions.

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

• Non-volatile settings memory

• Available in 5 colors (White, Ivory, Gray, Light Almond, and Black)

• Includes matching wall plate

OPERATIONAL SETTINGS

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

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

1 30 sec	**4** 7.5 min	**7** 15.0 min	**10** 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 initially only detect large motions, such as a person entering a room. 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
• WSD (PDT) Series default: Automatic On
• Default for units with -SA, -VA, or -NL option: Manual On
• WSD (PDT) 2P Series default: Pole 1 Auto On, Pole 2 Manual
• Default for 2P units with -2SA option: 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 during this period 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 WSD (PDT) units & Pole 1 of WSD (PDT) 2P units
** Default for units with -SA or -VA options, Pole 2 of WSD (PDT) 2P units, and both poles of 2P units with -2SA 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*	**3** 0.5 fc	**5** 2 fc	**7** 8 fc	**9** 32 fc
2 Auto Set-pt.	**4** 1 fc	**6** 4 fc	**8** 16 fc	**10** 64 fc

Note: Sensor will be changed to Automatic On mode if photocell is enabled. LED flashes while Auto-Setpoint mode is running. Photocell not present in -VA versions.

7 = LED Operation
Indicates behavior of device's LED.
1 Occupancy Indication*   **3** Disabled

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   **3** 15 sec*

12 = Dual Technology (Microphonics™)
Relative responsiveness of Microphonics detection. Included in -PDT versions only.

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. Included in -PDT versions only.

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.

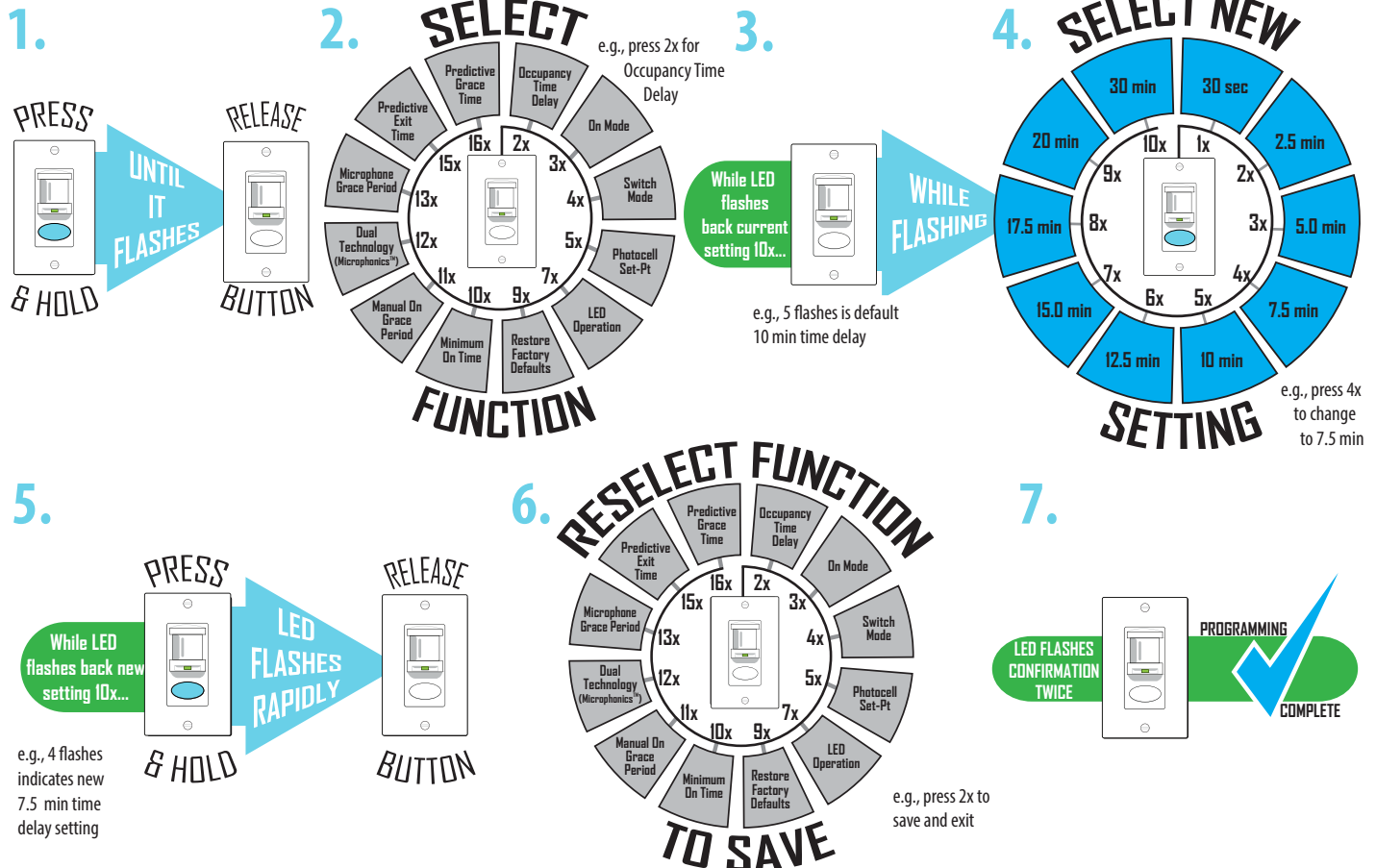|				
1 5 sec	**3** 7 sec	**5** 9 sec	**7** 15 sec	**9** 30 sec
2 6 sec	**4** 8 sec	**6** 10 sec*	**8** 20 sec

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

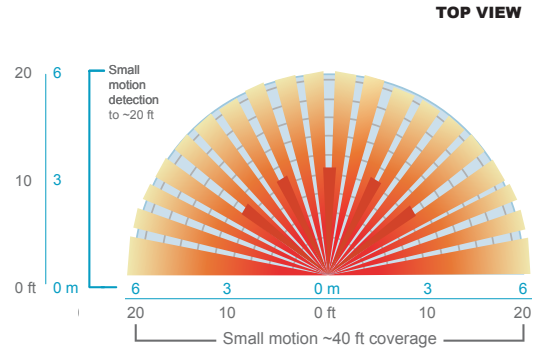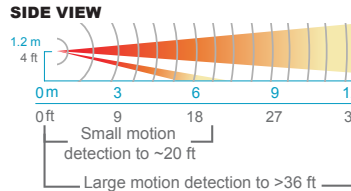|			
1 0 sec	**3** 10 sec	**5** 30 sec*	**7** 50 sec
2 5 sec	**4** 20 sec	**6** 40 sec	**8** 60 sec

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.
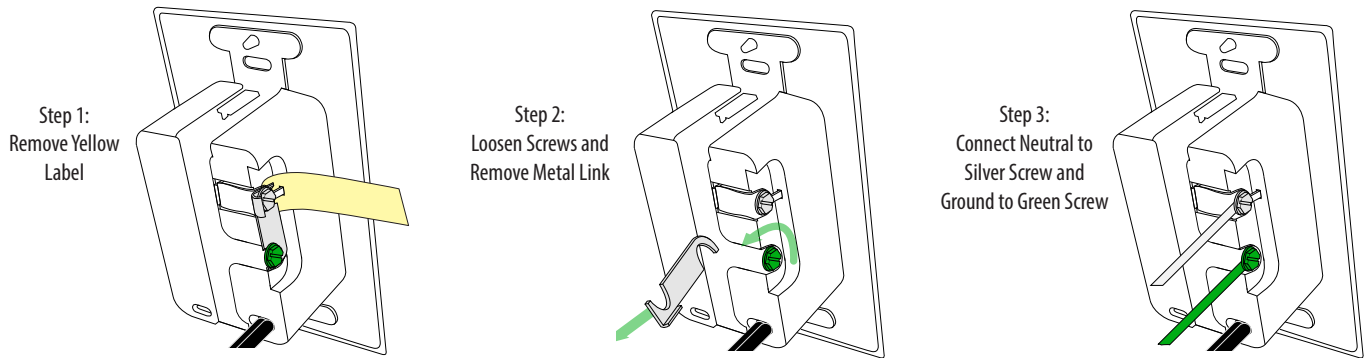
1. PRESS & HOLD UNTIL IT FLASHES — RELEASE BUTTON

2. SELECT FUNCTION

Predictive Grace Time 16x · Occupancy Time Delay 2x · On Mode 3x · Switch Mode 4x · Photocell Set-Pt 5x · LED Operation 7x · Restore Factory Defaults 9x · Minimum On Time 10x · Manual On Grace Period 11x · Dual Technology (Microphonics™) 12x · Microphone Grace Period 13x · Predictive Exit Time 15x

e.g., press 2x for Occupancy Time Delay

3. While LED flashes back current setting 10x... WHILE FLASHING

e.g., 5 flashes is default 10 min time delay

4. SELECT NEW SETTING

30 min 10x · 30 sec 1x · 2.5 min 2x · 5.0 min 3x · 7.5 min 4x · 10 min 5x · 12.5 min · 15.0 min 6x · 17.5 min 7x · 8x · 9x · 20 min

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

Predictive Grace Time 16x · Occupancy Time Delay 2x · On Mode 3x · Switch Mode 4x · Photocell Set-Pt 5x · LED Operation 7x · Restore Factory Defaults 9x · Minimum On Time 10x · Manual On Grace Period 11x · Dual Technology (Microphonics™) 12x · Microphone Grace Period 13x · Predictive Exit Time 15x

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 ft^2
- Large motion (e.g., walking) detection greater than 36 ft (10.97 m), ~2025 ft^2
- 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.
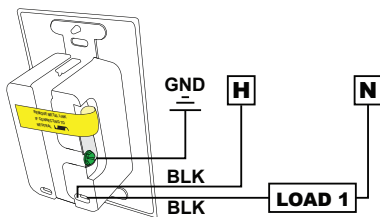
SIDE VIEW

Small motion detection to ~20 ft

Small motion detection to ~20 ft

Large motion detection to >36 ft

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
LOAD 2
BLU
BLU
BLK
BLK
LOAD 1

WIRE COLOR KEY

120/277 VAC WIRING

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

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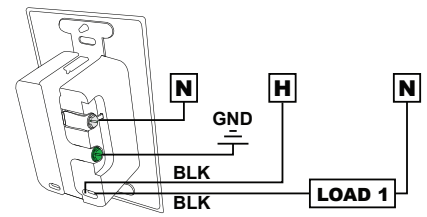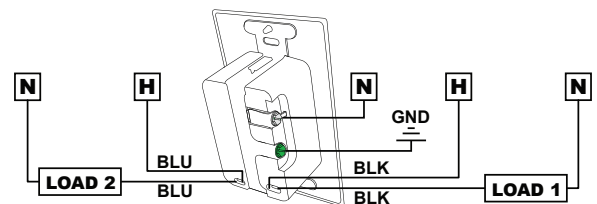Red wires replace Black wires.
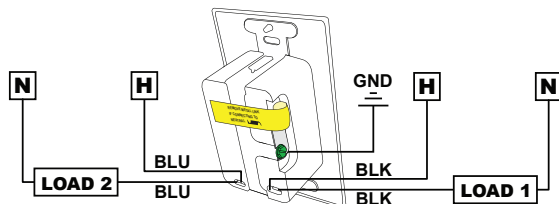
WIRING TO NEUTRAL

SINGLE RELAY

N
H
N
GND
BLK
BLK
LOAD 1

DUAL RELAY

N
H
N
H
N
LOAD 2
BLU
BLU
GND
BLK
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: WSD PDT WH)

Series		Operating Mode[1]		Voltage		Color[3]		Temp/Humidity	
WSD	Passive Infrared (PIR)	**Blank**	Auto On (default) or Vacancy	**Blank**	120/277 VAC	**WH**	White	**Blank**	Standard
WSD 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		

DUAL RELAY   (example: WSD PDT 2P WH LT)

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

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

Sheet#: TS-WSNB-001A

WARRANTY
5-year limited warranty. Complete warranty terms located at
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

AcuityBrands.
Expanding the boundaries of lighting™