



Catalog Number	
Notes	Type

## 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 setting).

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 LampMaximizer 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.

## 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

## WSD FAMILY

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



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 -40° F/C (-4° F / 20° C for PDT)

### 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   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 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

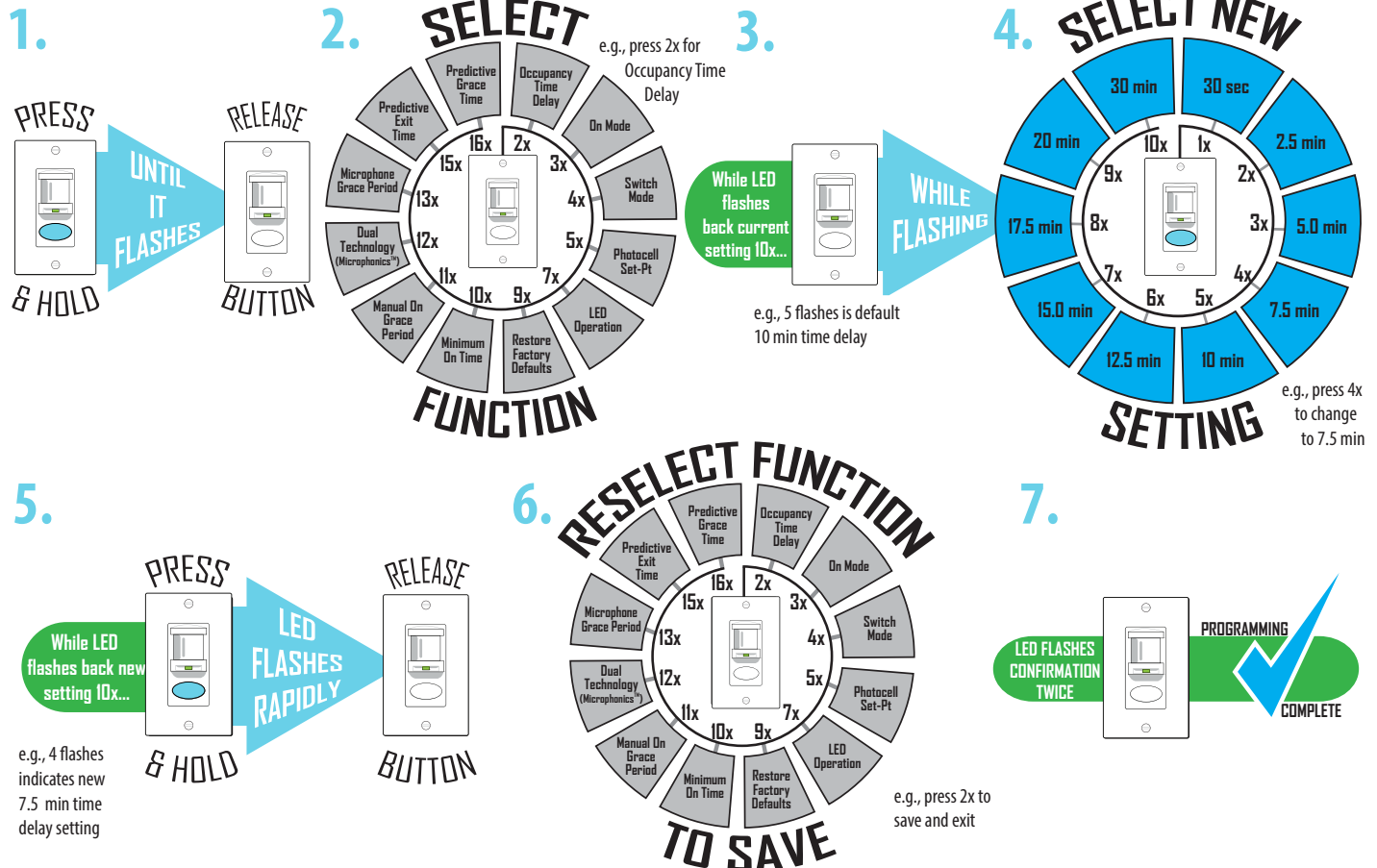
#### 16 = Predictive Grace Time

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

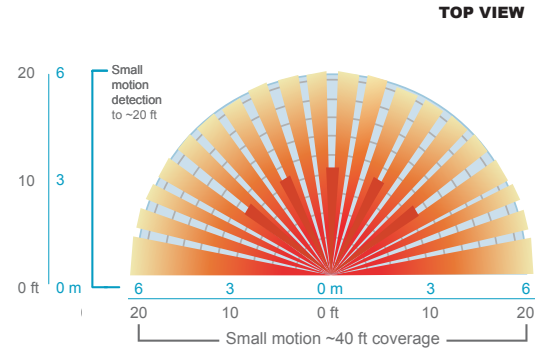
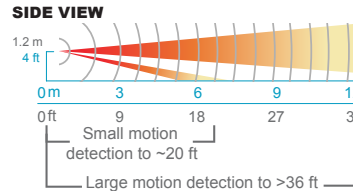
### PROGRAMMING INSTRUCTIONS

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.



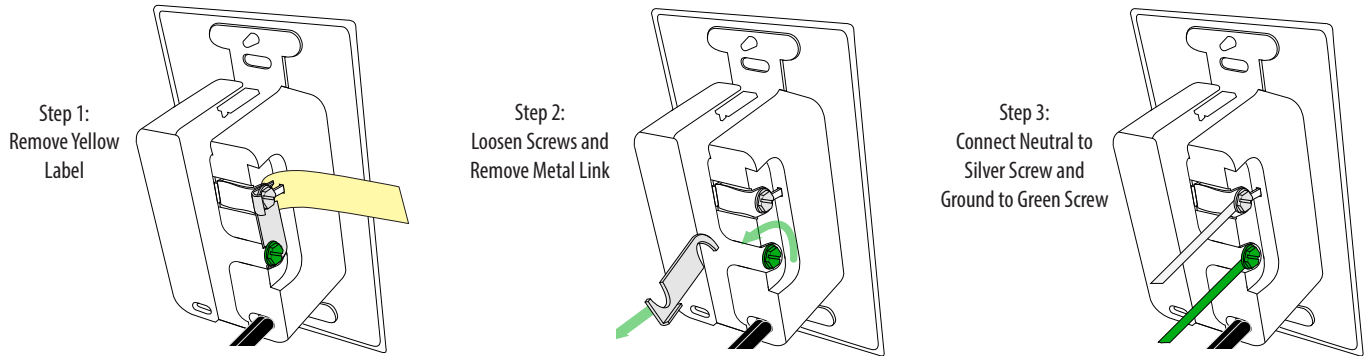
### COVERAGE PATTERN

- Small motion (e.g., hand movements) 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>
- 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.



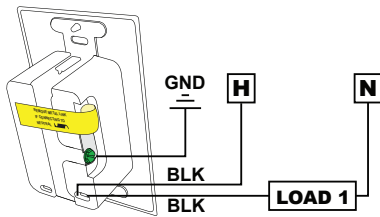
### CONVERSION FROM GROUND ONLY (NO NEUTRAL) TO NEUTRAL WIRING

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.



### WIRING TO GROUND (NO NEUTRAL)

#### SINGLE RELAY



#### WIRE COLOR KEY

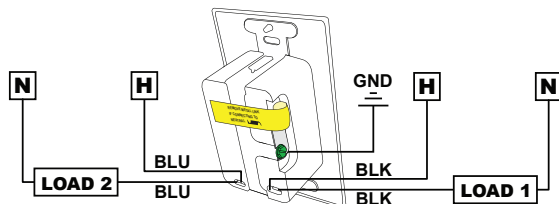
##### 120/277 VAC WIRING

- |        |                 |                                |
|--------|-----------------|--------------------------------|
| 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)

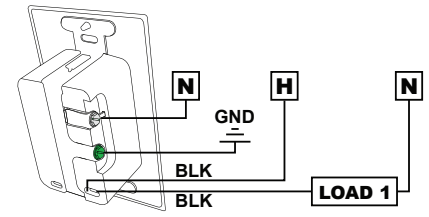
Red wires replace Black wires.

#### DUAL RELAY

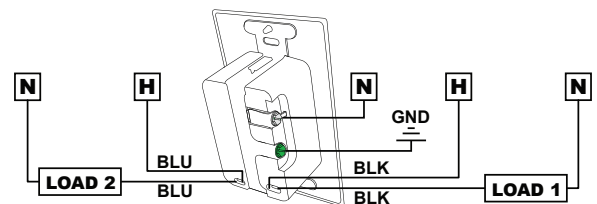


### WIRING TO NEUTRAL

#### SINGLE RELAY



#### DUAL RELAY



#### Notes:

- Unit will draw power from either line connection.
- When switching 277 VAC or 347 VAC on both relays, the line inputs must be of the 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: 14° to 122° F (-10° to 50° C)  
 LT Option (PIR): -40° to 122° F (-40° to 50° C)  
 LT Option (PDT): -4° to 122° F (-20° to 50° 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 <sup>1</sup>	Voltage	Color <sup>3</sup>	Temp/Humidity
<b>WSD</b> Passive Infrared (PIR)	<b>Blank</b> Auto On (default) or Vacancy	<b>Blank</b> 120/277 VAC	<b>WH</b> White	<b>Blank</b> Standard
<b>WSD PDT</b> Dual Technology (PIR / Microphonics)	<b>SA</b> Vacancy (default) or Auto-On	<b>347<sup>2</sup></b> 347 VAC	<b>IV</b> Ivory	<b>LT</b> Low Temp
	<b>VA</b> Vacancy only		<b>GY</b> Gray	
			<b>AL</b> Lt. Almond	
			<b>BK</b> Black	

### DUAL RELAY

(example: WSD PDT 2P WH LT)

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



Expanding the boundaries of lighting™



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 5 YEAR WARRANTY

Sheet#: TS-WSNB-001A

**WARRANTY**

5-year limited warranty. Complete warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx)