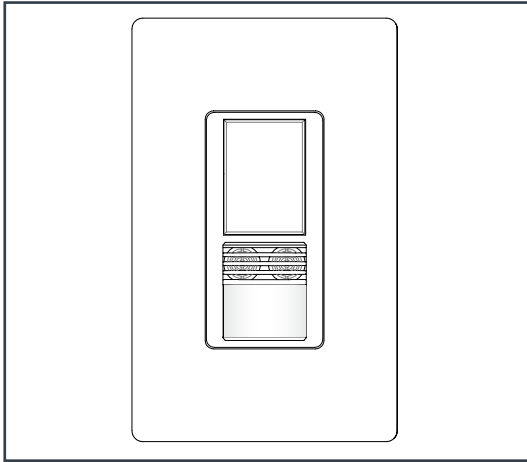


DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)



APPLICATIONS

- Small offices • Conference rooms • Lounges • Classrooms

SPECIFICATIONS

ELECTRICAL	
Regulatory Approvals	<ul style="list-style-type: none"> • ULR Listed to U.S. and Canadian safety requirements • NOM certified • Title 20 / 24 certified lighting control device – Complies with Title 20 and Title 24 section 110.9
Power	• 120 – 277 V \ominus 50 / 60 Hz
SYSTEM	
Key Design Features	<ul style="list-style-type: none"> • Dual Sensing Technology • Switches all lighting loads • 6 A of lighting load per circuit at 120 – 277 V\ominus • 4.4 A (1/6 HP) of fan load per circuit at 120 V\ominus • Crush/tamper resistant lens • Smart Ambient Light Detection (ALD) • Fixed Ambient Light Detection • Adaptive zero-cross switching algorithm for extended relay life (patent pending) • Programmable Circuit Swapping eliminates need for rewiring to reassign circuits after installation of a dual-circuit product. (patent pending) • Product ground current does not exceed 0.5 mA
Switching	• Adaptive zero-cross switching—maximizes relay life by switching at the point of minimum energy on the AC power curve (patent pending). Actively adapts to variations in relay timing
Sensor Detection	• Dual Tech sensors operate by triggering initial occupancy using PIR technology, and maintain occupancy using both ultrasonic and PIR technology
ENVIRONMENTAL	
Ambient Operating Temperature	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C)
Relative Humidity	0% – 90% humidity, non-condensing, indoor use only
OTHER	
Warranty	5 Year Limited Warranty



OVERVIEW

The Dual Technology Occupancy/Vacancy Sensor Switch applies Lutron's exclusive XCT Technology to the ultrasonic as well as the passive infrared technology in this sensor to create a product that can detect very fine motion, such as typing. This product also includes: adaptive relay switching, smart ambient light detection, and simple button presses for changing settings. This switch is available in single-circuit and dual-circuit versions.

The single-circuit versions (WS XX DT) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as “automatic shutoff”. The dual-circuit version (WS OS DTDR) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as “automatic shutoff” and “multi-level lighting control”.

FEATURES

- Lutron's XCT Technology for major, minor, fine, and very fine motion detection
- 180° sensor field-of-view
- Tamper-resistant PIR lens
- Up to 900ft² (81m²) major motion coverage and 400ft² (36m²) minor motion coverage
- Two Ambient Light Detect (ALD) options:
 - Learning ALD Mode: sensors use adaptive algorithm to learn preferred light level over time
 - Fixed ALD mode: four selectable light level thresholds (Hi, Med, Low, Min)
- Occupancy models (WS OS DT, WS OS DTDR) can be set to Auto-ON / Auto-OFF or Manual-ON / Auto-OFF per circuit
- The dual-circuit model (WS OS DTDR) meets Title 24 requirements for multi-level lighting control
- Single-circuit “Vacancy” model (WS VS DT) available to meet Title 24 / Title 20 requirements for vacancy sensors
- Adjustable timeout for each circuit (1, 5, 15, or 30 minutes)
- Sensitivity adjustment: PIR (Hi, Med, Low, Min); Ultrasonic (Hi, Med, Low, Off)
- Switches all lighting loads: incandescent, halogen, ELV, MLV, CFL, LED, magnetic fluorescent, electronic fluorescent
- Switches fan loads at 120 V \ominus

CUSTOM SETTINGS — Default settings shown in **bold**

- Timeout: 30 min, **15 min**, 5 min, 1 min
- Ultrasonic Sensitivity: High, **Med**, Low, Off
- Passive Infrared Sensitivity: **High**, Med, Low, Min
- Mode - Sensor Modes (lights automatically turn off in all sensor modes)
 - **Occ -Occupancy mode (No ALD)** ^{1,2,3}
 - Lrn - Occupancy with learning ALD mode
 - Fixd - Occupancy with fixed ALD mode
 - Vac - Vacancy mode (No ALD) ^{2,3}

¹ WS OS DT default is Occ

² WS VS DT is locked as Vac

³ WS OS DTDR defaults are: Circuit 1 - Occ, Circuit 2 - Vac

ADDITIONAL SETTINGS

- Fixed ALD Light Level: Hi, Med, **Low**, Min
- Off While-Occupied: **Enabled**, Disabled
- Walk-Thru Mode: Enabled, **Disabled**



DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

CUSTOM SETTINGS — DETAILS

Ambient Light Detection (ALD) mode

Lights turn on only when natural light in the room is below the set threshold.

- Learning: The ambient light threshold adjusts to the user's preference via manual interaction with the sensor switch.
- Fixed: Choose a fixed ALD light level from four pre-set options: High, Medium, Low, and Minimum

Manual Off While-Occupied Options

ENABLED (default setting)

- When the sensor switch is manually turned off, the sensor switch will not turn the lights back on automatically while the room is occupied.
- Once the room is vacated, the Auto-On feature returns to normal operation after the timeout period has expired.
- This may be the preference in conference rooms or classrooms while viewing presentations. This feature requires motions to keep the lights off.

DISABLED

- When the sensor switch is manually turned off, the Auto-On feature will return to normal operation after 25 seconds.
- This may be the preference in a restroom if the user always wants the lights to turn on upon entering and the lights to turn off when the room is vacant.

Walk-Thru Mode

ENABLED ¹

- If motion is not detected within 3 minutes after initial occupancy, the lights will turn off after 3 minutes, instead of the current timeout.
- This setting may be the preference in commercial applications where personnel may briefly trigger sensors during non-working hours.

DISABLED (default setting)

- When motion is detected, the lights will ALWAYS remain on for the entire timeout duration, regardless of the duration of occupancy detection.

¹ 1 minute timeout would be overridden if walk-thru mode is also enabled

SENSOR SWITCH PLACEMENT

- The sensor switch performs better with an unobstructed view of room occupants.
- Hot objects and moving air currents can affect the performance of the sensor switch. The sensor switch performs best when located 6ft (1.8m) or more away from hot objects or moving air currents.
- The PIR performance depends on a temperature differential between the ambient room temperature and that of room occupants. Warmer rooms may reduce the ability of the sensor switch to detect occupants.
- The ultrasonic performance can be affected by air currents and moving objects. Consider the effects of fans, HVAC vents, open windows, or moving objects when installing the sensor switch.

DEFINITIONS

Major motion: movement of a person entering or passing through an area.

Minor motion: movement of a person occupying an area and engaging in small activities (e.g., reaching for a telephone, turning the pages of a book, opening a file folder, picking up a coffee cup).

Fine Motion: movement of a person occupying an area and engaging in very small activities (e.g., reading a magazine).

Very Fine Motion: movement of a person occupying an area and engaging in very small activities (e.g., typing on a keyboard).

ORDERING INFORMATION

PART NO.	CAT. NO.	DESCRIPTION
623707WHT	WS OS DT WH	Wall Switch Occupancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in White
623707IV	WS OS DT IV	Wall Switch Occupancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in Ivory
623707LA	WS OS DT LA	Wall Switch Occupancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in Light Almond
632710WHT	WS VS DT WH	Wall Switch Vacancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in White
632710IV	WS VS DT IV	Wall Switch Vacancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in Ivory
632710LA	WS VS DT LA	Wall Switch Vacancy Sensor Dual Technology – Single Circuit, 6AMP Capacity in Light Almond
632714WHT	WS OS DTDR WH	Wall Switch Occupancy Sensor Dual Technology – Dual Circuit, 6AMP Capacity in White
632714IV	WS OS DTDR IV	Wall Switch Occupancy Sensor Dual Technology – Dual Circuit, 6AMP Capacity in Ivory
632714LA	WS OS DTDR LA	Wall Switch Occupancy Sensor Dual Technology – Dual Circuit, 6AMP Capacity in Light Almond



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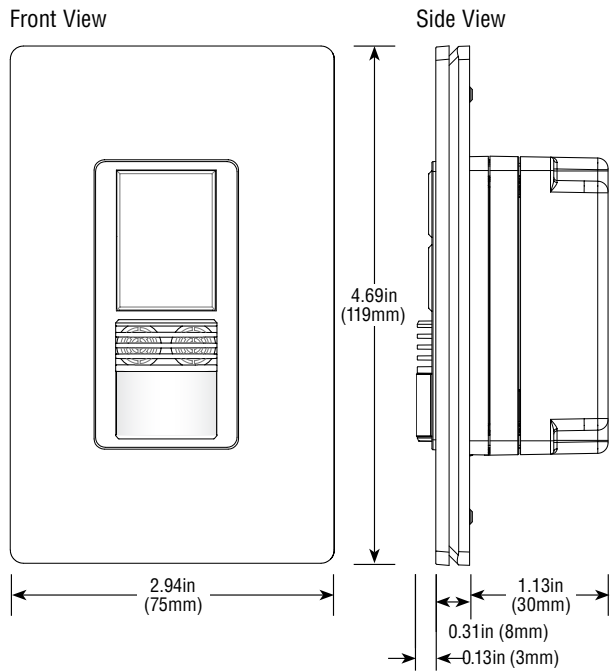
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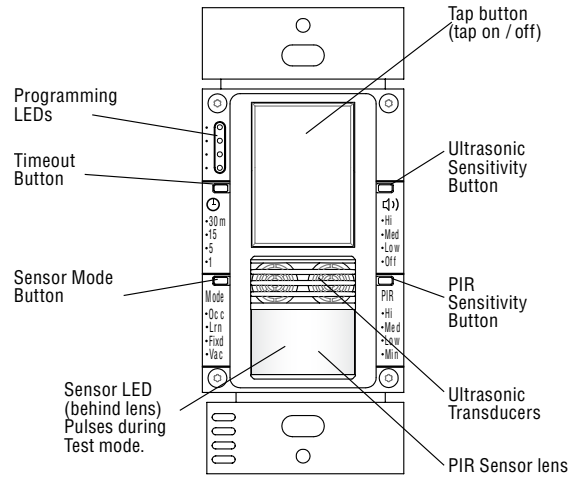
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DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

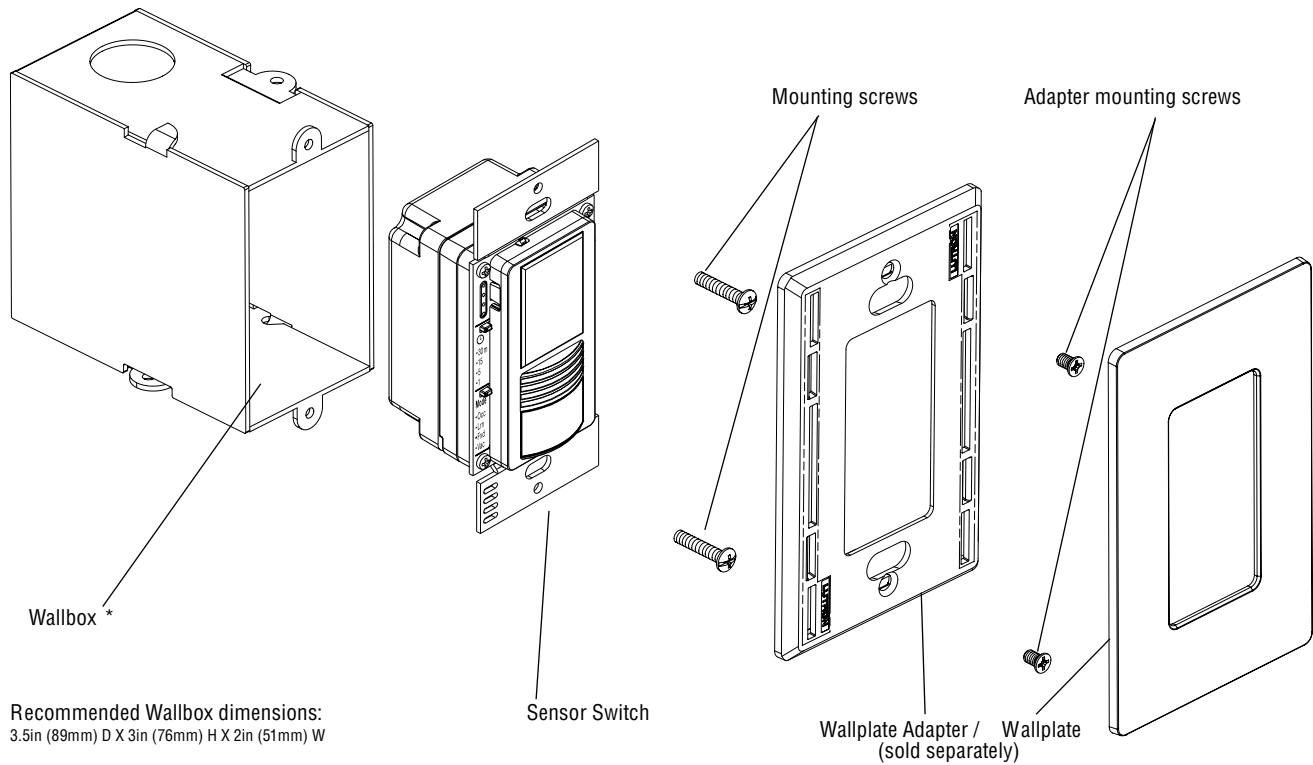
DIMENSIONS – SINGLE-CIRCUIT (WS XX DT)



OPERATION



MOUNTING



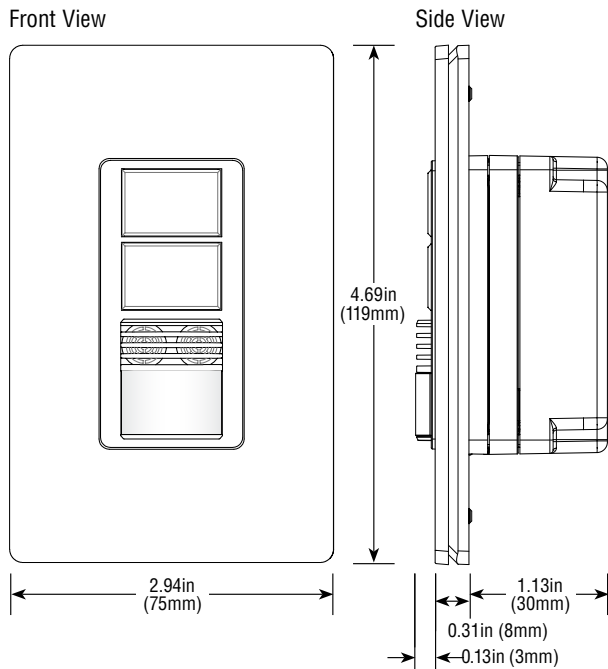
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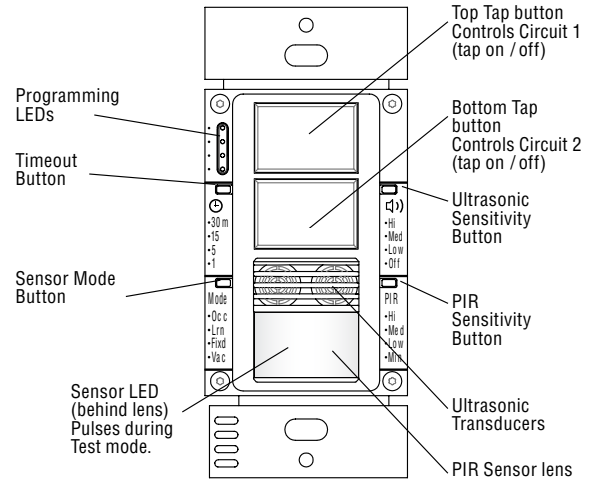
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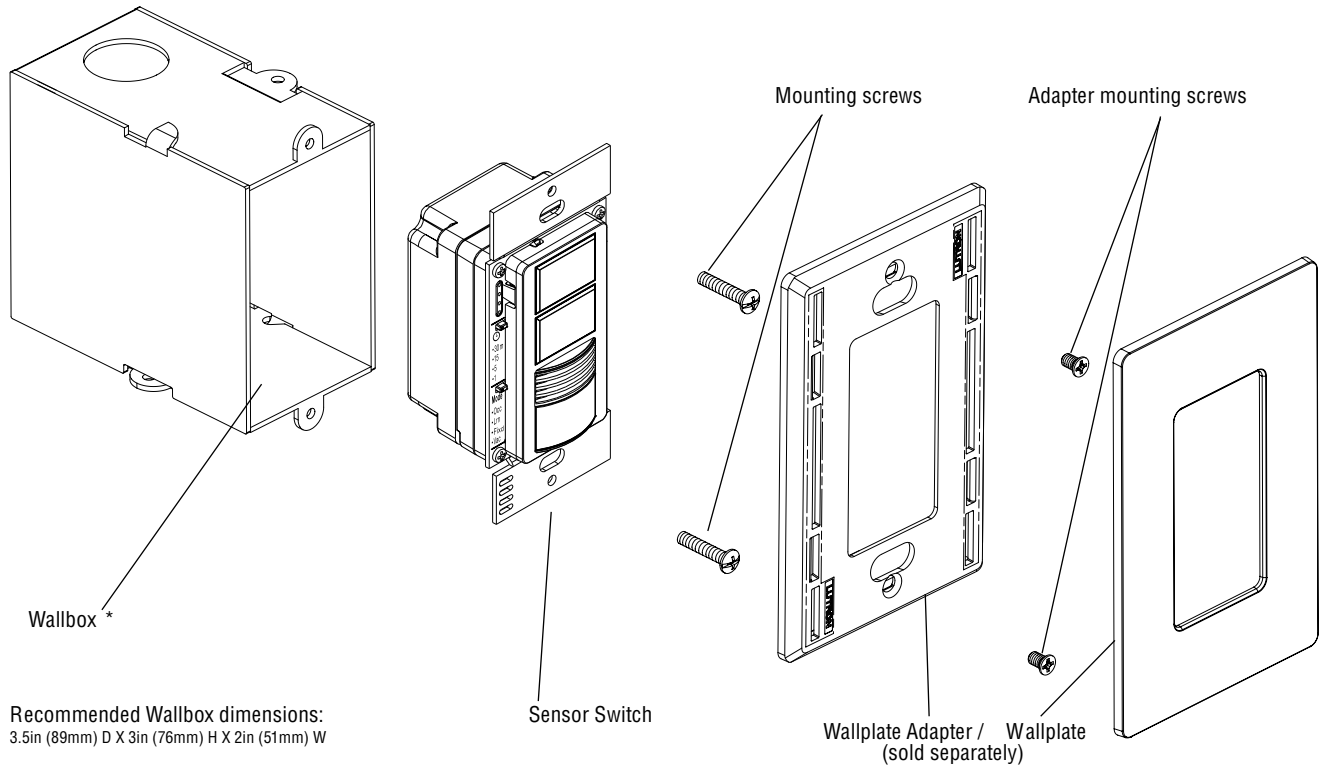
DIMENSIONS – DUAL-CIRCUIT (WS OS DTDR)



OPERATION



MOUNTING



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DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

LOAD TYPE AND CAPACITY

CONTROL	NEUTRAL CONNECTION REQUIRED	VACANCY ONLY	NUMBER OF CIRCUITS	VOLTAGE/LOAD TYPE/MAX. LOAD (ANYWHERE IN GANG) ¹	MIN. LOAD	3-WAY WITH MECHANICAL SWITCH	MULTI-LOCATION WITH ACCESSORY SWITCH
WS OS DT	✓		1	120-277V⊖ Lighting 6A ² 120V⊖ Fan 4.4A (1/6 HP) ³	0A	✓	✓
WS VS DT	✓	✓	1		0A	✓	✓
WS OS DTDR	✓		2		0A	✓	

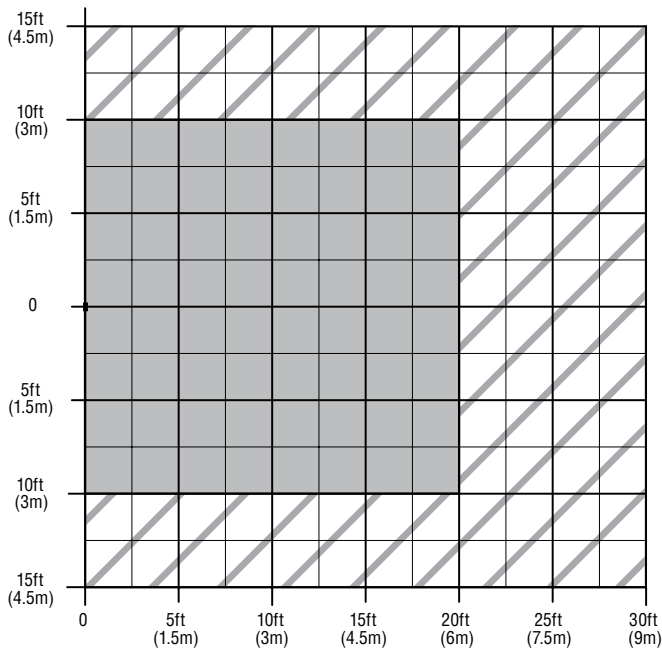
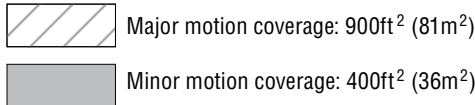
1 Ratings shown are per circuit.

2 Sensor Switch Load Type: Designed for use with permanently installed incandescent, halogen, MLV, ELV, CFL, LED, magnetic fluorescent, and electronic fluorescent lighting loads.

3 When controlling light and fan loads simultaneously on a single-circuit, maximum load capacity per circuit is 4.4 A at 120 V⊖

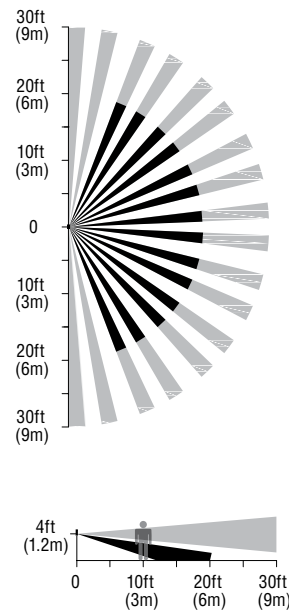
COVERAGE PATTERNS

NEMA WD7 Coverage

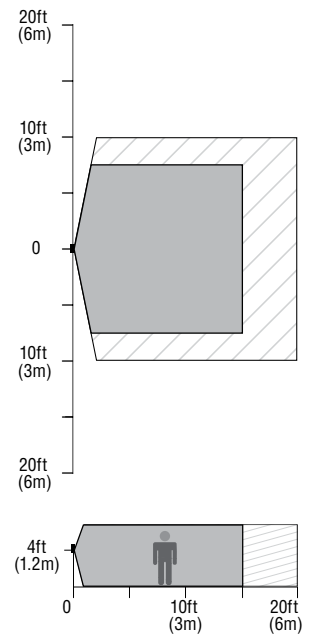


Test Room Dimensions: 37ft x 38ft (11.28m x 11.6m)
 Test Floor Surface Material: Carpet
 Sensor Coverage Angle: 180 °
 Major motion coverage: Initial trigger motion detection
 Minor motion coverage: Maintained motion detection

Passive Infrared Beam Diagram (For Reference Only)



Ultrasonic Coverage (For Reference Only)



Ultrasonic Frequency: 40 kHz



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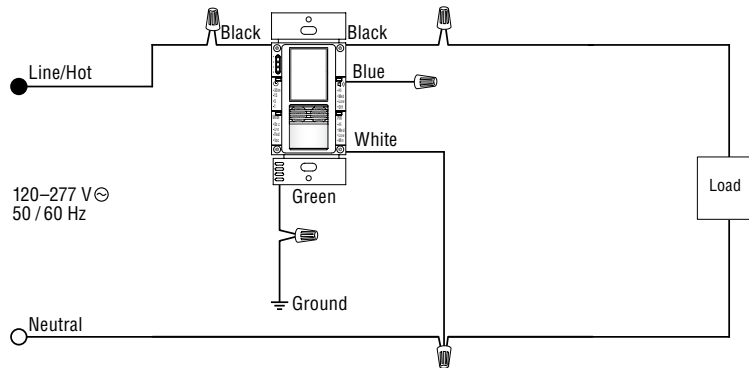
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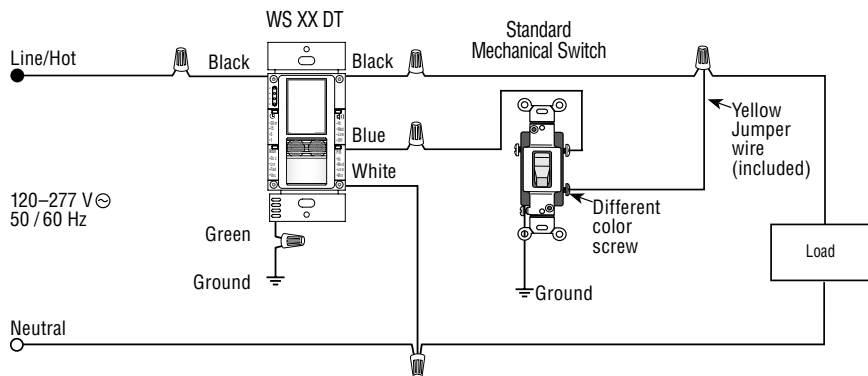
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DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

SINGLE POLE WIRING DIAGRAM – Single-circuit (WS XX DT)



3-WAY INSTALLATION – Single-circuit (WS XX DT)

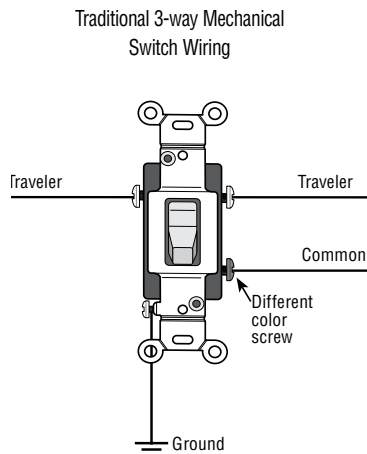


NOTE: Dual Tech Sensor Switch can be installed in any location. However, optimum performance of sensor may depend upon installation location, see sensor switch placement guidelines on page 2.

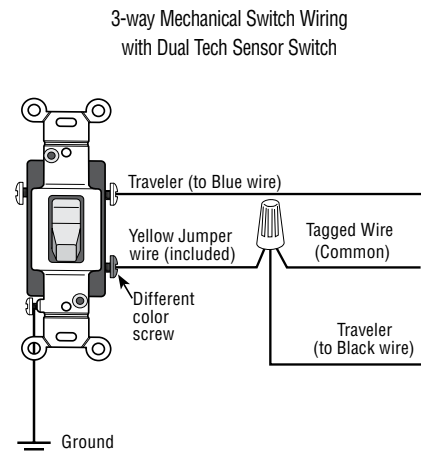
3-WAY INSTALLATION

For retrofit 3-way installations the mechanical switch needs to be rewired as shown in the diagram below after wiring the Dual Tech Sensor Switch. Otherwise the 3-way installation will not work as expected. Single Pole mechanical switches may also be used in a 3-way installation with both single and dual-circuit models.

1. Connect Ground: Ensure the bare copper or green ground wire from the wallbox is connected to the green ground screw of the mechanical switch.
2. Tag circuit Common: Your 3-way mechanical switch should have three screw terminals, two of the same color, and one of a different color. Tag the wire that is connected to the screw terminal of a different color.
3. Identify the wire that matches the color of the wire you connected to the blue wire of the Dual Technology Occupancy Sensor Switch. Connect this wire to one of the two terminals of the same color.
4. Combine the tagged wire, the remaining wire and yellow jumper wire (included) using a wire connector. Connect the other end of jumper wire to the different color screw.

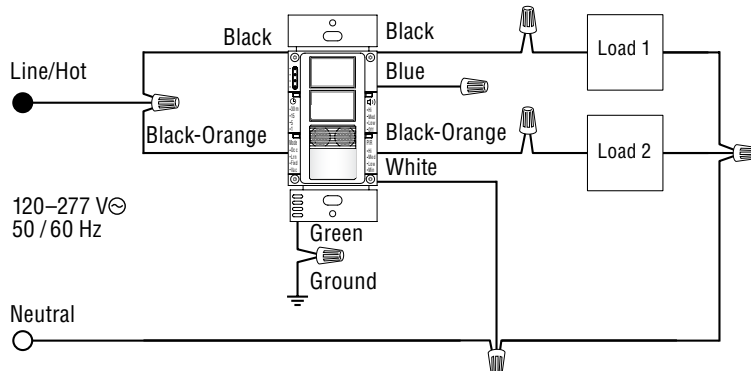


Rewire to

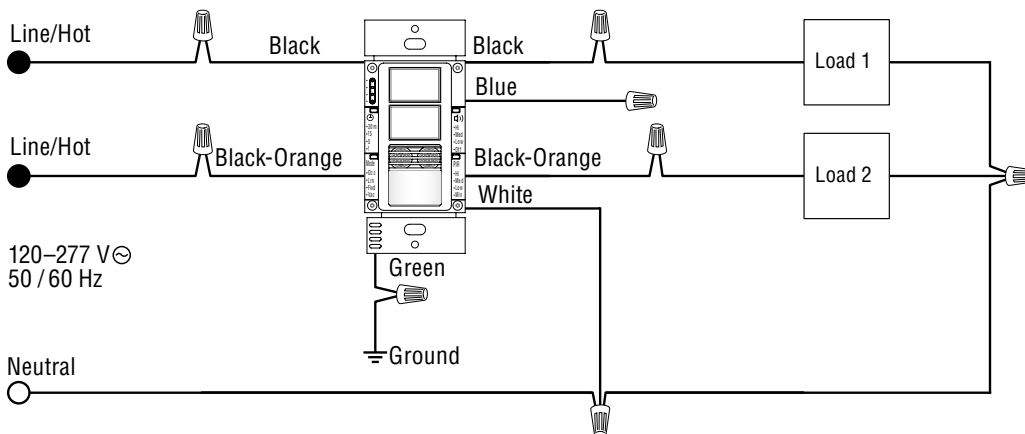


DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

SINGLE POLE, SINGLE BREAKER FEED WIRING DIAGRAM – Dual-circuit (WS OS DTDR)

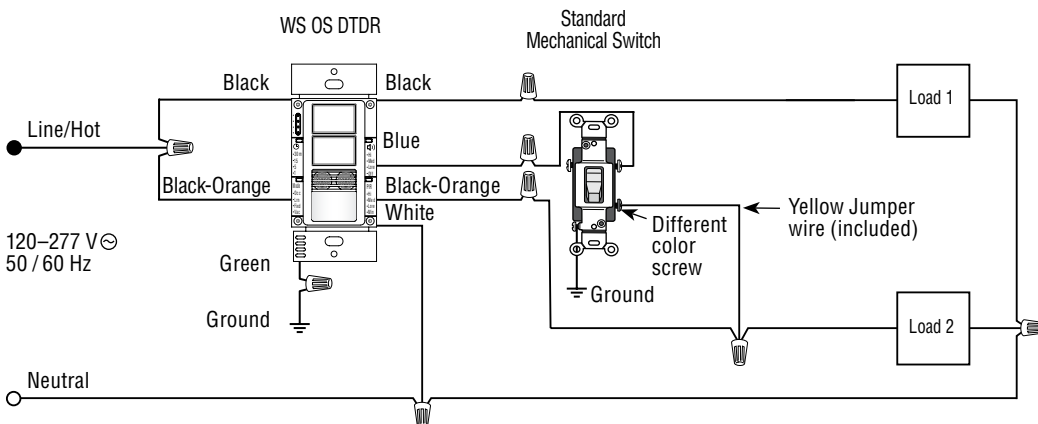


SINGLE POLE, TWO BREAKER FEED WIRING DIAGRAM – Dual-circuit (WS OS DTDR)



NOTE: Wiring must comply with NEC® code for wiring multiple branch circuits. Where two or more branch circuits supply devices or equipment on the same yoke, a means to simultaneously disconnect the ungrounded conductors supplying those devices shall be provided at the point at which the branch circuits originate.

3-WAY INSTALLATION, SINGLE BREAKER FEED – Dual-circuit (WS OS DTDR)

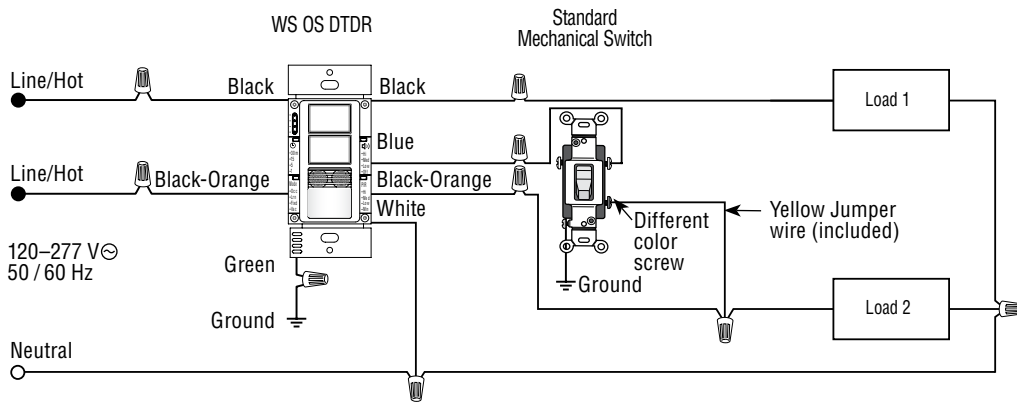


NOTE: Optimum performance of sensor may depend upon installation location, see sensor switch placement guidelines on page 2.



DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR SWITCH (WS XX DT XX/WS OS DTDR XX)

3-WAY INSTALLATION, TWO BREAKER FEED – Dual-circuit (WS OS DTDR)



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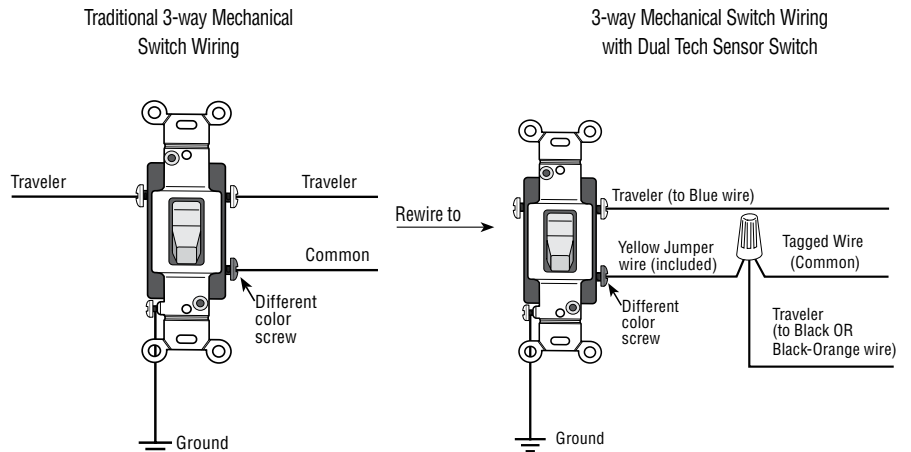
NOTE: Optimum performance of sensor may depend upon installation location, see sensor switch placement guidelines on page 2.

- 1 Dual Tech Sensor Switch can be installed in any location.
- 2 Mechanical switch may be wired to either circuit, and will control both. Do not wire mechanical switch to both circuits.
- 3 You may use no more than one mechanical switch with a dual-circuit Dual Tech Sensor Switch.

3-WAY INSTALLATION – Dual-circuit (WS OS DTDR)

For retrofit 3-way installations the mechanical switch needs to be rewired as shown in the diagram below after wiring the Dual Tech Sensor Switch. Otherwise the 3-way installation will not work as expected. Single Pole mechanical switches may also be used in a 3-way installation with both single and dual-circuit models.

1. Connect Ground: Ensure the bare copper or green ground wire from the wallbox is connected to the green ground screw of the mechanical switch.
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4. Combine the tagged wire, the remaining wire and yellow jumper wire (included) using a wire connector. Connect the other end of jumper wire to the different color screw.



HOW LOADS OPERATE IN 3-WAY DUAL-CIRCUIT SENSOR SWITCH – (WS OS DTDR)

	INITIAL LOAD STATE		AFTER FLIPPING 3-WAY MECHANICAL SWITCH	
	CIRCUIT 1	CIRCUIT 2	CIRCUIT 1	CIRCUIT 2
When all lights are OFF	Off	Off	On	On
When all lights are ON	On	On	Off	Off
When one circuit is ON	On	Off	Off	Off
	Off	On	Off	Off

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