Catalog Numbers: WDT301, WDT321
Country of Origin: Made in China

WDT301   **WDT321**
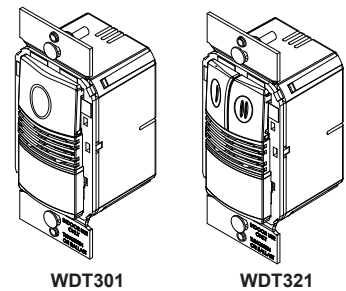
SPECIFICATIONS

Voltages:	120/277 VAC, 50/60 Hz
Load Limits for relay 1:	
@120 VAC	1000-W tungsten, ballast, E-ballast, LED, 1/4 HP
@277 VAC	1200-W ballast, E-ballast, LED, 1/4 HP
Load Limits for relay 2:	
@120 VAC	800-W tungsten, ballast, E-ballast, LED, 1/6 HP
@277 VAC	1200-W ballast, E-ballast, LED, 1/6 HP
Time Delay Adjustment	5 to 30 minutes
Walk-Through Mode	3 minutes if no activity after 30 sec.
Test Mode	10 min. with 5-sec. time delay
PIR Adjustment	High or Low
Ultrasonic Adjustment	Minimum to Maximum, Off
Frequency	40 kHz
Light Level Adjustment	8fc to 180+fc
Alerts	Selectable Audible & Visual
Optional Neutral	All models
Multi-Way Capability	All models
Terminal screw torque	16 lbf-in (18 kgf-cm)

UNIT DESCRIPTION AND OPERATION

The WDT Dual Technology Multi-Way Wall Switch sensors combine advanced passive infrared (PIR) and ultrasonic technologies into one unit. The combined technologies help to eliminate false triggering even in difficult applications. Selectable operating modes allow the sensor to turn a load **ON**, and hold it **ON** as long as either or both technologies detect occupancy. It allows for up to 4 sensors to be connected to the same circuit. The first sensor to detect occupancy will turn **ON** all the lights that are connected to the same circuit. After the room is unoccupied, the last sensor that detected occupancy turns **OFF** all the lights once the time delay has expired. The occupant can turn **OFF** the load at any time by pressing the **ON/OFF** button of any sensor that is connected to the circuit. A "walk-through" mode can turn lights off after only 3 minutes if no activity is detected after 30 seconds following an occupancy detection.

The WDT301 has one relay and one **ON/OFF** button. The WDT321 contains two relays and two **ON/OFF** buttons to allow control of one or two loads independently. Pressing a button toggles the state of the corresponding relay. Optional Neutral is also available on all models.

WDT sensors contain a light level sensor. If adequate daylight is present, the sensor holds the load **OFF** until light levels drop, even if the area is occupied. In the WDT321, light level only affects the load on Relay 2. Users can override this function by pressing the **ON/OFF** button. See the **Light Level Adjustment** section.

Turning Load(s) ON (ON Mode)
The relays are programmed independently for either **Auto ON** or **Manual ON**. In either mode, the load can be turned **ON** or **OFF** using the **ON/OFF** button.

Manual ON DIP 8 **ON** for Relay 1 DIP 9** **ON** for Relay 2	With an **ON** Mode DIP switch in the **ON** position, the occupant must press the **ON/OFF** button to turn **ON** the load. The sensor keeps the load **ON** until no motion is detected for the selected time delay. There is a 30 second re-retrigger delay. If occupancy is detected during the delay, the sensor turns the load back **ON**. After the re-trigger delay elapses the **ON/OFF** button must be pressed to turn **ON** the load.
Auto ON DIP 8 **OFF** for Relay 1 DIP 9** **OFF** for Relay 2	With an **ON** Mode DIP switch in the **OFF** position, the load turns **ON** and **OFF** automatically based on occupancy. If the load is turned **OFF** manually, Presentation Mode operation applies. This prevents the load from turning **ON** automatically after it was deliberately turned **OFF**. Pressing the button to turn lights **ON** returns the sensor to **Auto ON** mode.

WDT301: Switch 9 is not used. WDT302: Switch 9 default is **ON to comply with CA Energy Commission Title 24 bi-level switching requirements.

Model #	Relay	Default ON Mode	DIP switch #	Setting
WDT301	1	Manual ON	8	ON
WDT321	1	Auto ON	8	OFF
	2	Manual ON	9	ON

Presentation Mode
Presentation Mode is a feature of the **Auto ON** mode. When both relays are manually turned **OFF** the WDT holds the lights **OFF** until no motion has been detected for the duration of the Time Delay. With subsequent occupancy, the WDT turns the load **ON**. If both relays are **ON** and one relay is manually turned **OFF** this relay remains **OFF** until both the Time Delay and retrigger delay expires for the relay that is **ON**, after that time the **ON** Mode control settings again apply.

Time Delays
The WDT sensor holds the load **ON** until no motion is detected for the selected time delay. Select the time delay using **DIP switch settings**. In the WDT321, both relays use the same delay. See DIP SWITCH SETTINGS for more information.

Test/20 min (DIP 1, 2, OFF)	A Test Mode with a short time delay of five seconds is set when DIP switches 1 & 2 are OFF. It cancels automatically after ten minutes, or when you set a fixed time delay. When the Test Mode times out, the sensor will assume a 20 minute time delay. To restart Test Mode, change the time delay setting to any fixed amount and then return it to the Test setting.
Time Delay (15 min. DIP 1 ON & 2 OFF)	Time delays are 5, 15 (default), or 30 minutes are available.

Walk-Through
The Walk-Through mode shortens the time delay to reduce the amount of time the load is **ON** after a brief moment of occupancy, such as returning to an office to pick up a forgotten item then immediately exiting.

Walk-Through Mode (DIP #3 **ON**)	The WDT sensor turns the load OFF 3 minutes after the area is initially occupied if no motion is detected after the first 30 seconds. If motion continues beyond the first 30 seconds, the set time delay applies.
No Walk-Through	Walk-Through mode disabled (default).

PIR Sensitivity Adjustment
The WDT sensor constantly monitors the controlled environment and automatically adjusts the PIR to avoid common ambient conditions that can cause false detections, while providing maximum coverage.

High (DIP #5 **OFF**)	Default setting. Suitable for most applications.
Low, 50% (DIP #5 **ON**)	Reduces sensitivity by approximately 50%. Useful in cases where the PIR is detecting movement outside of the desired area (also consider masking the lens) and where heat sources cause unnecessary activation.

Alerts
The WDT can provide audible alerts as a warning before the load turns **OFF**.

Audible Alerts (DIP #7 **ON**)	Unit will beep at one minute*, at 30 seconds and at 10 seconds before turning **OFF** load. When Walk-Through is active, the unit beeps three times at 10 seconds before the load goes **OFF**.
No Audible Alerts (DIP #7 **OFF**)	No audible warnings provided.

Trigger Mode
The WDT sensor has four occupancy trigger options, set with DIP switches 5 and 6. Determine the appropriate option using the Trigger matrix.

In the Trigger Mode DIP switch setting table, in order to deem the area occupied:
- **Both** requires motion detection by the PIR and the Ultrasonic.
- **Either** requires motion detection by only one technology.
- **PIR** requires motion detection by the PIR.

Initial Occupancy: The method that activates a change from "Standby" (area unoccupied and load off) to "Occupied" (area occupied and load may turn ON).

Maintain Occupancy: The method indicating that the area is still occupied and the lights should remain ON.

Re-trigger: In Auto On Mode, after the load turns off, detection by the selected technology within the number of seconds indicated turns the lights back ON. If the load was configured as Manual ON, the re-trigger time is 30 seconds.

Trigger Mode	Initial Occupancy	Maintain Occupancy	Re-trigger (seconds duration)	5	6
Standard	Both	Either	Either (5)	↓	↓
Option A	PIR	Either	Either (5)	↓	↑
Option B	PIR	PIR	PIR (5)	↑	↓
Option C	Both	Both	Both (5)	↑	↑

COVERAGE PATTERNS
Coverage testing has been performed according to the NEMA WD 7 guideline. For best performance, use in spaces not larger than 18' x 15'.

PIR Sensor
The sensor has a two-tiered, multi-cell viewing Fresnel lens with 180 degree field of view. The red LED on the sensor flashes when the PIR detects motion.

Masking the Lens
Opaque adhesive tape is supplied so that sections of the PIR sensor's view can be masked. This allows you to eliminate coverage in unwanted areas. Since masking removes bands of coverage, remember to take this into account when troubleshooting coverage problems.

Ultrasonic Sensor
The sensor has two ultrasonic transceivers operating at 40 kHz. Detection sensitivity can be adjusted using the trimpot under the **ON/OFF** buttons.

Major motion
Minor motion

PIR Coverage   **Ultrasonic Coverage**

Side View   Top View
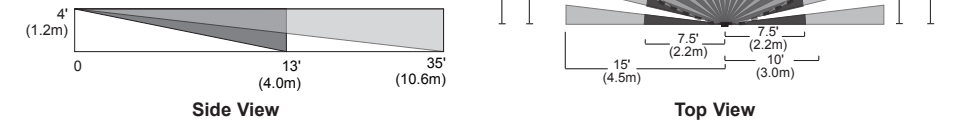
ADJUSTMENTS

Sensor Adjustment
Remove the wall plate. Remove the button cap by firmly squeezing together the top sides of the button assembly. Gently pull it away from the unit.

When the adjustments are completed, replace the button cap by inserting its hinges into the tabs on the main unit and then squeeze the top of the button while pressing it into the unit. Reinstall the cover plate.

Light Level Adjustment
The light level can be set with loads **ON** or **OFF**. To enable light level control and set the threshold:
1. Make sure the room is lit appropriately.
2. Put the sensor into **TEST** mode (see **Time Delay** switches). You have **10 minutes** to complete the procedure.
3. Press and hold the **ON/OFF** button (**Relay 1** button on the WDT321) for 3 seconds, until you hear a beep.
4. Step away from the sensor. After 10 seconds a beep sounds, indicating that the threshold level is set. This threshold is retained, even if power is lost, until it is re-set or disabled. In the WDT321, light level control only affects **Relay 2**.

To disable light level control, press and hold the **Relay 1** button for **7 seconds** until a double beep tone sounds.

Reset to Default
Use the DIP Switch Settings tables to return features to factory settings. To reset the WDT, **press** and **hold** the **Relay 1** button for **10 seconds** until a triple beep sounds. This resets the sensor and disables light level control (the brightest ambient light will not hold the light **OFF**).
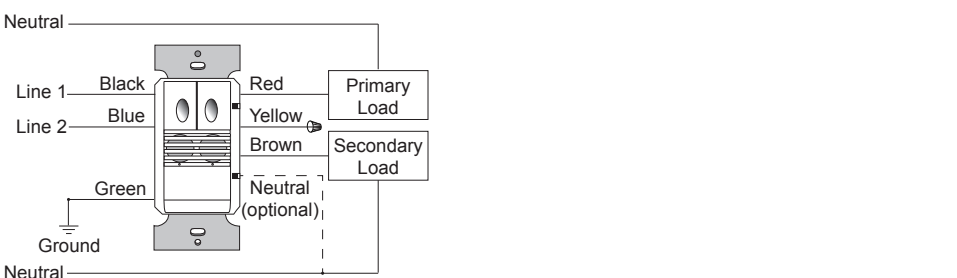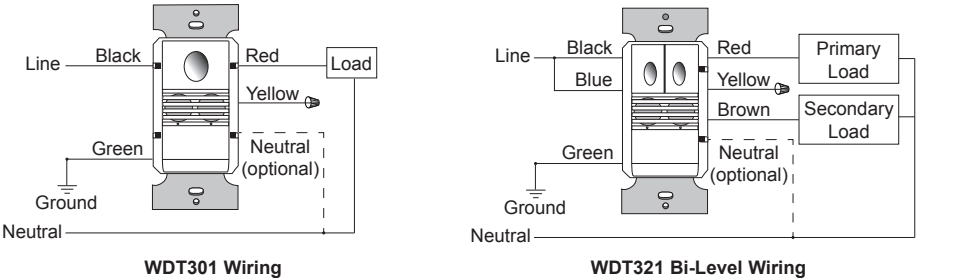
INSTALLATION

> **WARNING**
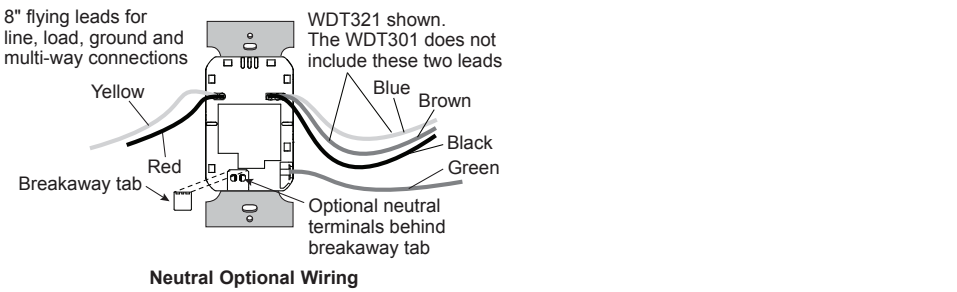> **Turn off the power at the circuit breaker before installing the sensor or working on the load.**

1. Make sure that the power has been turned OFF at the circuit breaker.
2. Connect wires to the WDT flying leads as shown in the wiring diagram that is appropriate to the WDT model and electrical supply. **The ground wire (green) must be fastened to ground for the sensor to work properly.**
3. Attach the sensor to the wall box by inserting screws into the two wide holes on the top and bottom of the attached metal bracket. Match them up with the holes in the wall box and tighten.
4. Turn the circuit breaker **ON**. Wait one minute, then push the Auto **ON/OFF** switch for each load and the lights will turn **ON**. There is a delay due to initial power-up of the sensor that only occurs during installation.
5. Test and adjust the sensor if necessary.
6. Install industry standard decorator wall switch cover plate (not included).

Strip Gage
1/2"
12.7 mm
Copper Wire Only
#12–#14 AWG

WDT301 Wiring

WDT321 Bi-Level Wiring

WDT321 Dual Circuit Wiring

OPTIONAL NEUTRAL WIRING
For applications requiring neutral wiring, remove tab as shown to expose terminals for wiring.

8" flying leads for line, load, ground and multi-way connections

WDT321 shown. The WDT301 does not include these two leads

Yellow   Blue   Brown
Red   Black   Green
Breakaway tab   Optional neutral terminals behind breakaway tab

Neutral Optional Wiring

MULTI-WAY

The Multi-Way capability is available on all models. Sensors can easily be wired together for convenient control of a common load. When wiring this way, only use WDT300 series sensors.

The following principles apply for Multi-Way:

- All units can see each other's push button events and respond accordingly.
- All units can see each other's trigger event. The response will be determined by the Light Level setting and/or conditions of the space of the detecting sensor.
- The time delay for all units is defined by the unit with the smallest time delay.
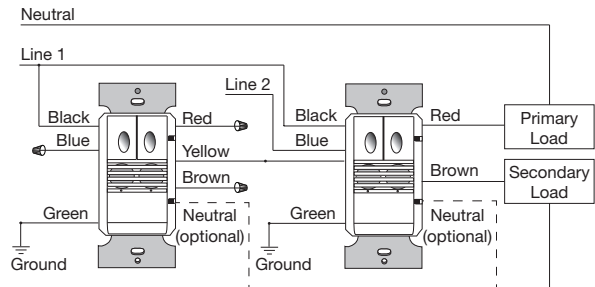
Multi-Way Wiring Examples
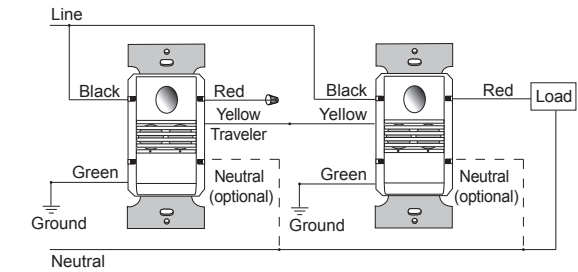
Typical Wiring
(WDT301 up to 4 sensors)
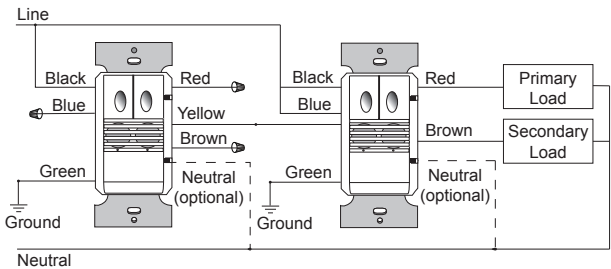
Bi-level Wiring
(WDT321 up to 4 sensors)

Note: Button 1 on any sensor controls load #1 and wbutton 2 on any sensor controls load #2.

Two-phase Wiring

SENSOR OPERATING MODES

Sensor #1	Sensor #2	Light Fixture
Auto-ON	Auto-ON	The load turns **ON** and **OFF** automatically based on occupancy detection by either one of the sensors. The sensors keep the load **ON** until no motion is detected and will use the time delay of the sensor with the lowest value. At any time, the light can be turned **ON** and **OFF** using the **ON/OFF** button of any one of the sensors. If the load is turned **OFF** manually by pressing either one of the **ON/OFF** buttons, the unit will enter Presentation mode.
Auto-ON*	Manual ON*	The load can only be turned **ON** automatically by the sensor set in **Auto-ON** mode. The sensors keep the load **ON** until no motion is detected and will use the time delay of the sensor with the lowest value. There is either a 30 second re-trigger delay for the sensor set in **Manual-ON** mode or instant re-trigger for the sensor set in **Auto-ON** mode. After the re-trigger delay elapses, the **ON/OFF** button of the sensor set in **Manual-ON** mode must be pressed to turn the load back on unless the sensor set in **Auto-ON** mode detects motion. If the light is turned **OFF** manualy by pressing the **ON/OFF** button set in **Auto-ON**, it will enter Presentation mode.
Manual-ON	Manual-ON	The occupant must press the **ON/OFF** button on either one of the sensors to turn the light **ON**. The sensors keep the load **ON** until no motion is detected and will use the time delay of the sensor with the lowest value. There is a 30 second re-trigger delay, meaning the occupant has 30 seconds to be detected for the sensor to turn the load back on automatically. After the re-trigger delay elapses, the **ON/OFF** button of any one of the sensors must be pressed to turn the load back **ON**.

* Although this configuration may be selected, it is not recommended.

Time Delay

Time Delay	1	2
Test/20 min	↓	↓
5 minutes	↓	↑
15 minutes	↑	↓
30 minutes	↑	↑

Walk-Through

Walk-Through	3
Enabled	↑
Disabled	↓ ◄

PIR Sensitivity

PIR Sensitivity	4
Low, 50%	↑
High	↓ ◄

↑ =ON ↓ =OFF

Trigger Mode

Trigger Mode	Initial Occupancy	Maintain Occupancy	Re-trigger (seconds duration)	5	6
Standard	Both	Either	Either (5)	↓	↓ ◄
Option A	PIR	Either	Either (5)	↓	↑
Option B	PIR	PIR	PIR (5)	↑	↓
Option C	Both	Both	Both (5)	↑	↑

On Mode

Time Delay / Trigger Mode / On Mode Relay 1 / Relay 2
Walk-Through / PIR Sensitivity / Audible Alerts

Audible Alert

Audible Alert	7
Enabled	↑ ◄
Disabled	↓

Relay 1 On Mode

Relay 1 On Mode	8
Manual On	↓ △
Auto On	↓ △△

WDT321 ONLY

Relay 2 On Mode

Relay 2 On Mode	9
Manual On	↓ ◄
Auto On	↓

Factory Settings:
◄ All models
△ WDT301
△△ WDT321

ON/OFF Buttons
Relay 1
Relay 2

Ultrasonic Sensitivity Adjustment Trimpot

Dip Switches

Ultrasonic Cones

Detection LED
Red = PIR
Green = Ultrasonic

PIR Lens

Button Hinges
Tabs
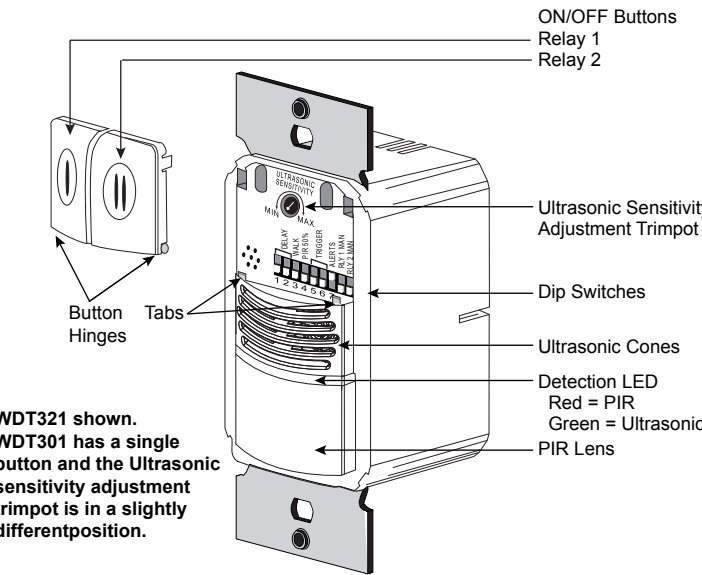
WDT321 shown. WDT301 has a single button and the Ultrasonic sensitivity adjustment trimpot is in a slightly differentposition.

TROUBLESHOOTING

Lights do not turn ON with motion (LED does flash)

1. Press and release each button to make sure that the correct lights come ON for each relay. **If the lights do NOT turn ON**, check wire connections, especially the Load connection. **If the lights turn ON**, verify that the correct On Mode is selected in DIP switches 8 and 9.
2. Check to see if light level control is enabled: cover the sensor lens with your hand. If the lights come **ON**, adjust the light level setting.
3. If lights still do not turn **ON**, call 800.223.4185 for technical support.

Lights do not turn ON with motion (LED does not flash)

1. Press and release each button to make sure that the correct lights come **ON** for each relay. If the lights turn **ON**, set PIR and Ultrasonic Sensitivity to **High**.
2. Check the wire connections, in particular, the Neutral, Line and Ground connections. Verify that connections are tightly secured.
3. If lights still do not turn **ON**, call 800.223.4185 for technical support.

Lights do not turn OFF

1. There can be up to a 30-minute time delay after the last motion is detected. To verify proper operation, set DIP switch 1 to **ON**, then reset switches 1 and 2 to **OFF** to start Test Mode. Move out of view of the sensor. The lights should turn **OFF** in approximately 5 seconds.
2. Verify that the sensor is mounted at least six feet (2 meters) away from any heating/ventilating/air conditioning device that may cause false detection. Verify that there is no significant heat source (e.g., high wattage light bulb) mounted near the sensor.
3. If the lights still do not turn **OFF**, call 800.223.4185 for technical support.

Sensing motion outside desired areas

1. Select PIR Sensitivity – Low (DIP switch 5 = **ON**) if necessary.
2. Mask the PIR sensor's lens to eliminate unwanted coverage area.
3. Adjust the Ultrasonic Sensitivity. Rotate the trimpot conterclockwise to reduce sensitivity.

Red LED is OFF all the time and the sensor features don't work.

1. Check the Ultrasonic trimpot. If it is set at fully counter-clockwise (MIN) the unit is in Service Mode. Set the trimpot to a mid-range position.
2. If resetting the Time Delay switches does not set the sensor features, call 800.223.4185 for technical support.

COVER PLATES

Legrand WDT series wall switches fit behind industry standard decorator-style switch cover plates. Cover plates are not included.

Units come in the following colors, which are indicated by the final suffix of the catalog number (shown here in parentheses):

- White (-W)
- Light Almond (-LA)
- Ivory (-I)
- Grey (-GRY)
- Black (-BK)

For covering patents, see www.legrand.us/patents

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