Dual Technology Wall Switch Occupancy Sensor

Manual & Specification

> **PRODUCT MUST BE INSTALLED IN ACCORDANCE WITH LOCAL ELECTRICAL CODES**

1. INTRODUCTION

1.1. GENERAL DESCRIPTION

The Di*versa* Occupancy sensors use Passive-Infrared (PIR) and Accurate Detection Intelligence (ADI) Voice sensing technologies to determine the presence of people within a defined region of detection and perform designed control actions when occupancy (or vacancy) is detected.

The WOS*DD Series of sensors are designed replace a low voltage wall switch giving a 180° coverage pattern. The low voltage edition of the sensor gives the capability of operating and controlling the WP-PP20-D power pack and other Diode Pulse equipment.

The WOS*DU Series of sensors are designed to replace a wall switch giving a 180° coverage pattern. The line voltage edition of the sensor gives the capability of operating and controlling 120/277Vac circuits with no neutral.

The WOS*D3 Series of sensors are designed to replace a wall switch giving a 180° coverage pattern. The line voltage edition of the sensor gives the capability of operating and controlling 347Vac circuits with no neutral.

This manual covers the following part numbers:

Low Voltage:

WOSSDD2-P-VW

WOSSDD2-DPR-VW

Line Voltage:

WOSSDU1-P-VW

WOSSDU2-P-VW

WVSSDU2-P-VW

WOSSD31-P-VW

WOSSD32-P-VW

1.2. OPERATIONS

Low voltage sensors are powered by 24Vac from either the WP-PP20-D or a 24Vac transformer. If a single base model sensor is used to operate a relay directly, the sensor can be powered using only the white and red wires.

When in operation the sensor will detect initial motion using PIR. Once motion is detected, the signal to turn on the lights is sent to the power pack. ADI-Voice is then is activated to work alongside PIR to maintain the occupied condition as long as people are within the sensing range.

Line voltage sensors draw control power directly from the lighting circuit they are intended to control. When in operation the sensor will detect initial motion using PIR; once motion is detect, the internal contact will close. ADI-Voice is then is activated to work alongside PIR to maintain the occupied condition as long as people are within the sensing range.
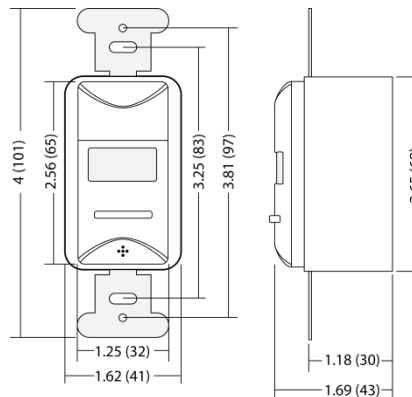
There are two LEDs behind the lens: Orange/Amber indicates ADI-Voice detection, Green indicates PIR detection. These indicators can be disabled.
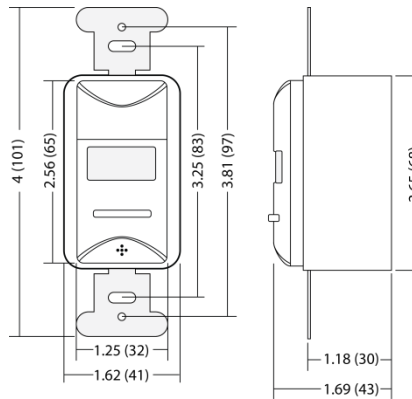
1.3. SPECIFICATIONS

1.3.1 Low Voltage Dimensions & Mounting:

Weight: 4 oz.
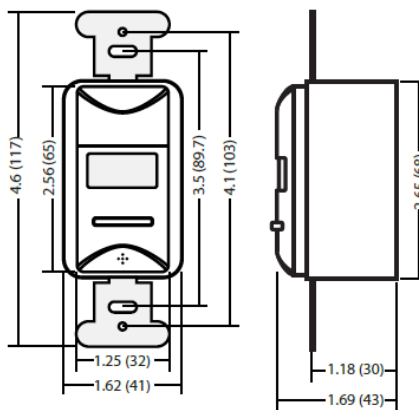Mounting: Recessed into a single gang switch box.
Color: White

![dversa logo]

Line Voltage 120/277Vac Dimensions & Mounting:

Weight: 4.8 oz.
Mounting: Recessed into a 120/277Vac single gang switch box.
Color: White

Line Voltage 347Vac Dimensions & Mounting:

Weight: 4.8 oz.
Mounting: Recessed into a single 347Vac gang switch box.
Color: White

1.3.2 **Power:**

Low Voltage:	24 VAC ±25% Class 2 Source.
Frequency:	60 Hz
Consumption:	9.5 mA Standard
	14.0 mA with Auxiliary Relay

Line Voltage:	120/277 VAC or 347VAC
	Select correct model for the line voltage.
Frequency:	60 Hz
Consumption:	400 Micro Amps

1.3.3 **Inputs – Low Voltage:**

Sensor Link: 24VAC, Maintained/Diode Pulse.
Type defines function as explained in the 'Sensor Link' section.

1.3.4 **Outputs – Low Voltage:**

Diode Pulse: Each output is capable of driving one WP-PP20-D
0-10V Dimming   Each output channel can sink up to 25mA. The devices are compatible with control currents less than 2mA in accordance with IEC60929, E.4.1.2. Confirm actual control current with ballast specifications.
Aux Relay   SPDT Form-C contact rated for 1A at 30VDC

1.3.5 **Contact Ratings:**

Load Rating / Pole:

Voltage	Standard Ballasts	Electronic Ballasts
120V	800W	800W
277V	1800W	1200W
347V	1500W	1500W

1.3.6 **Operation Temp:**

32° to 104°F   (-10° to 60°C)
Low temp and high humidity option [-L] products: PCB conformal coated for resistance to damp environments and operation to -40°C/F

1.3.7 **Storage temp:**

-14° to 140°F   (-25° to 60°C)

1.3.8 **Approvals:**

Certified to UL 508, UL244A, CSA C22.2 #14, Title 24
Low voltage: FCC

*Application and Performance Specification Information Subject to Change without Notification.

1.4. OPTIONS

Series	Range	Tech	Voltage	Poles	Options	Environmental
WOS	S = Standard	D = Dual I = PIR Only	D = Diode Pulse U = 120/277V 3 = 347V	1 2	-N = None -P = Photo -D = Dimming -R = Aux. Relay	-V = Vandal

Range:

Standard (S)   Vandal resistant lens designed for installations with a 15ft range and a 180° view; 4ft mounting height.

Technology:

Dual (D)   Utilizes PIR and ADI-Voice technology

PIR Only (I)   Utilizes PIR Only

Voltage:

Low Voltage   Sensor is powered from 24VAC Class 2 power source

120/277 (U)   Sensor can be powered from and switch 120/277 VAC

347 (3)   Sensor can be powered from and switch 347 VAC

Poles:

1   Single pulse output

2   Two pulse outputs

Options:

Photo (P)   Photo Sensor controlled loads.

Dimming (D)   The sensor regulates a 0-10VDC dimmable ballasts to maintain a constant light level even if natural ambient light changes.

Aux. Relay (R)   Auxiliary contact relay for interfacing with other systems. An isolated SPDT form-C contact is provided for signaling.

1.5. ACCESSORIES

WIR-3110   IR Setting Unit. The WIR-3110 Setting Unit is used for touchless programming of the sensor.

2. INSTALLATION & WIRING DIRECTIONS
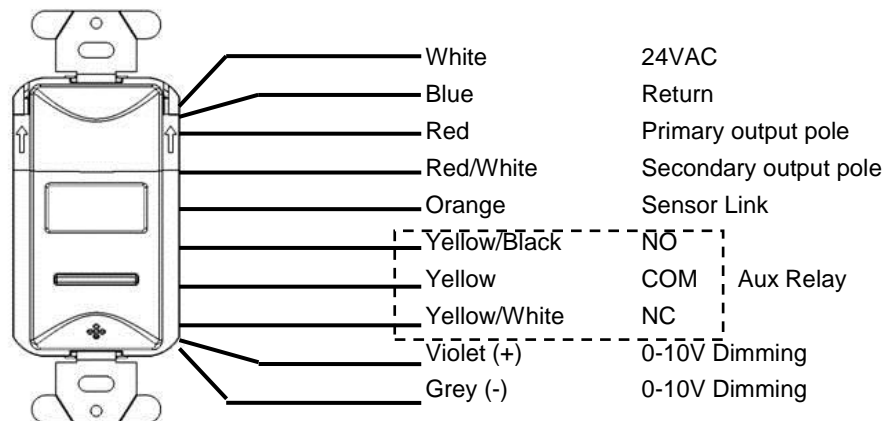
2.1. Installation

Mounting of the device requires a 2-1/8" deep, octagonal junction box. Install by recessing the device into the octagon box; lining up the mounting holes and securing it using the screws provided.
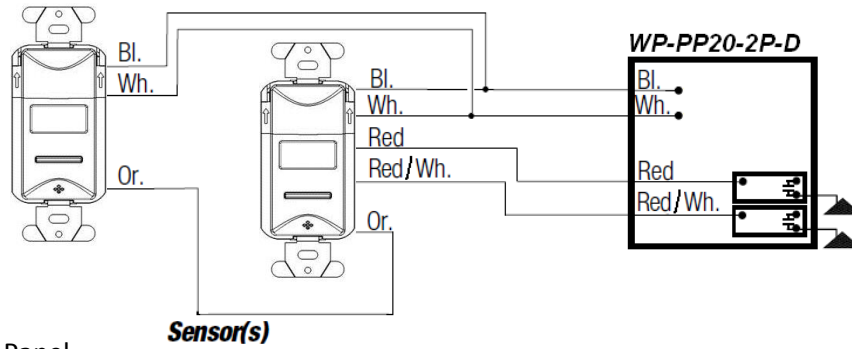
2.2. Wiring

The WOS Series Low Voltage sensors are equipped with plug-in harness for easy installation. This harness has #18 AWG leads. Use appropriate sized wire-nuts to connect the wires to the incoming load terminations.

2.3. Electrical Connections

Wire Legend – Low Voltage

| White	24VAC
Blue	Return
Red	Primary output pole
Red/White	Secondary output pole
Orange	Sensor Link
Yellow/Black	NO
Yellow	COM Aux Relay
Yellow/White	NC
Violet (+)	0-10V Dimming
Grey (-)	0-10V Dimming

Wiring to a Power Pack

Wiring to a Relay Panel
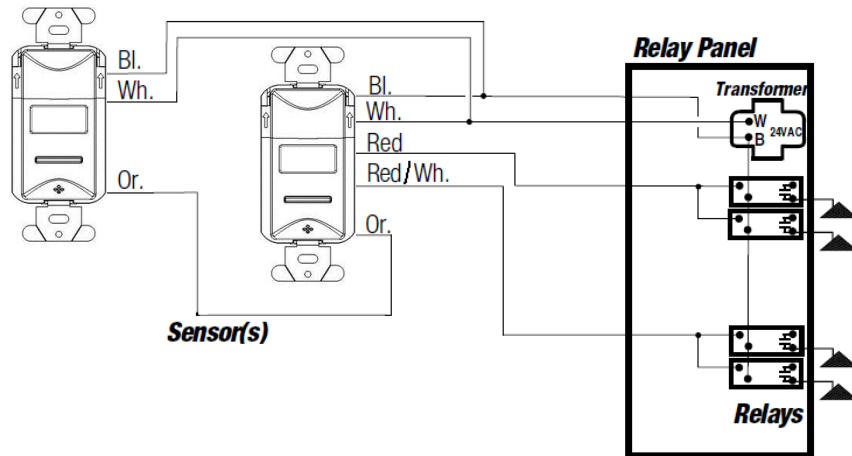
2.4.   Wiring

⚠ **CAUTION** ⚠

TURN POWER OFF AT THE CIRCUIT BREAKER BEFORE WORKING WITH OR NEAR HIGH VOLTAGE

The WOS Series Line Voltage sensors are equipped with #14 AWG stranded leads. Use appropriate sized wire-nuts to connect the wires to the incoming load terminations. For installation with field-installed conductors of 60ºC minimum rating.

2.5.   Electrical Connections – Line Voltage 120/277Vac

WOSSDU*-*-*

WOSSDU2-*-*
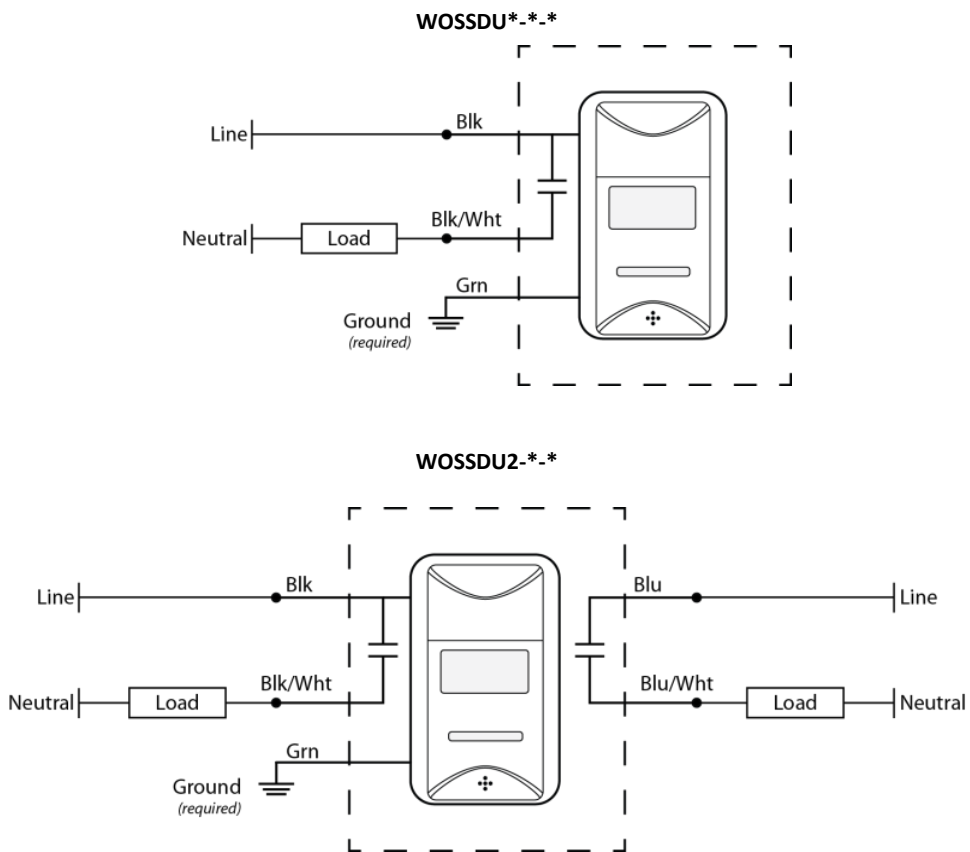
2.6.   Electrical Connections – Line Voltage 347Vac

WOSSD3*-*-*

WOSSD32-*-*
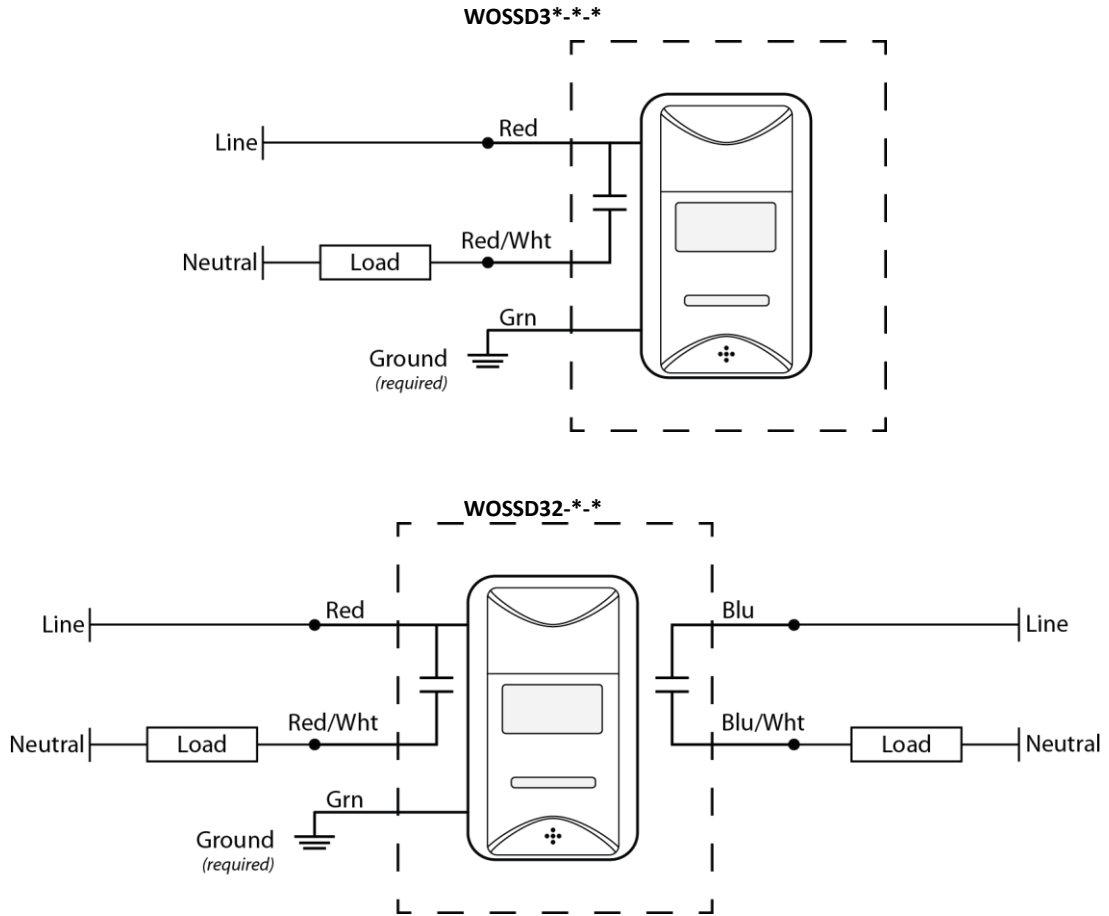
3. FEATURES AND OPTIONS

3.1. DIP Switches

A bank of eight DIP switches and two rotating controls are used to manually setup and configure the sensor.

WOS - - - - '-N'-				
DIP	Function	ON	Off	Default
1	Voice Detection	Disabled	Enabled	OFF
2	Motion Detection Sensitivity	High	Normal	OFF
3	Detection LED	Disabled	Enabled	OFF
4	Auto or Manual ON	Occupancy (auto on)	Vacancy (manual on)	ON
5	Not Used	n/a	n/a	OFF
6	Not Used	n/a	n/a	OFF
7	Manual Override Button	Disabled	Enabled	OFF
8	Setting Input	IR Setting Unit (WIR-3110)	Manual Dips/dials	ON

*Available in 2-Pole models (Wxxxxx2) only

WOS - - - - '-P'- & WOS - - - - '-PR'				
DIP	Function	ON	OFF	Default
1	Voice Detection	Disabled	Enabled	OFF
2	Motion Detection Sensitivity	High	Normal	OFF
3	Detection LED	Disabled	Enabled	OFF
4	Auto or Manual ON	Occupancy (auto-on)	Vacancy (Manual On)	ON
5	Photo Sensor Inhibit**	Disabled	Enabled	OFF
6	Photo Sensor Control	Inhibit Primary Pole Only	Inhibit Both Poles	OFF
7	Manual Override Button	Disabled	Enabled	OFF
8	Settings Input	IR Setting Unit (WIR-3110)	Manual Dips/Dials	ON

*Available in 2-Pole models (-2) only

Douglas Lighting Controls   Page 13   November 19, 2014
14038200 RevD

www.DouglasLightingControls.com

3.2. Programming - IR / Manual Setting

Programming can be done either with the DIP switches and dials on-board the device or with the WIR-3110 setting unit. For more details and additional options please see the "WIR-3110 Manual"

3.3. Detection (Dual or PIR Only)

When in operation, the sensor will detect initial motion using Passive Infrared; once motion is detected the ADI-Voice is then is activated to work alongside the PIR to maintain occupancy. The ADI-Voice can be disabled on any dual tech sensors.

3.4. Automatic Timeout

By setting the timeout dial to maximum, the sensor will be put into automatic mode which will adjust the time out automatically to maximize energy savings and occupant comfort. The "Auto Timeout LED" will be lit to indicate that this mode is activated.

3.5. Smart Sensing

When vacancy occurs, sensitivity of the ADI-Voice technology transitions from maximum to zero over an adaptively determined time period, based on occupancy tendencies. During this period, ADI-Voice can turn the lights back on immediately, even with no line-of-sight to the sensor, assuring the best combination of user convenience and energy savings.

Energy consumption due to false triggers is minimized by the automatic walk-through mode. This feature turns the lights off after 3 minutes if no occupancy detection occurs in the first 30 seconds after initial turn on.

If the PIR detection is not triggered after 2 hours, the lights will turn off regardless of the ADI-Voice status. This compensates for situations such as a radio being left on.

3.6. Vacancy Sensor

The sensor can be selected as a vacancy (Off only) sensor. This provides additional energy savings by forcing the user to turn the lights on manually.

The sensor has a built-in override button; this allows for the sensor to be operated as a vacancy sensor by giving the ability to a switch to turn the lights on. For two pole sensors, it provides multi-level control capability.

If it is setup for occupancy ON/OFF control, the switch input may be used for manual control of the lights. Reset (to auto on/off control) occurs when occupancy is no longer detected and the timeout expires.

3.7. Low Voltage Sensor Link

The low voltage sensor is equipped with a connection which facilitates communication between sensors. The sensor link (orange wire) allows multiple sensors to coordinate their signals and act together as a cohesive zone.

This connection provides additional control functions as described below.

Diode Pulse: When a Douglas (pulse) switch is connected to the sensor link it provides manual control. This can be used to toggle the lights ON/OFF. In the case of two pole sensors, it provides optional multi-level sequencing control.

Maintained AC: If a maintained AC signal is applied to the sensor link by connecting orange and white wires on the harness, the sensors will be in disabled mode. By default the sensor will turn the lights ON when disabled. This is adjustable via the IR setting unit.

Please see the "WIR-3110 Manual".

3.8. Multi-Level Switching (2-Pole without Photo Sensing option)

The switch can be used to either trigger both poles simultaneously (default), or if required step through a multi-level sequence. Please see the "WIR-3110 Manual".

3.9. Photo Sensing (-P)

Photo-switching control can be enabled or disabled. The photo sensing option can be configured for 2 types of functionality. Please see "WIR-3110 manual section 2.8"

3.9.1 Type: Inhibit

When enabled, occupancy alone will not trigger the output state to on. If occupancy is detected **AND** there is a deficiency of natural light (as determined by a programmable set point off), the output is triggered on. Once on, the output remains on until a vacancy condition is determined by expiration of the vacancy timer. An increase in natural light will not force the lights off. Inhibit function can be configured to inhibit override switch as well.

3.9.2 Type: On/Off

If occupancy is detected **AND** there is a deficiency of natural light (as determined by a programmable set point), the output is triggered on. Once on, the output remains on until a vacancy condition is determined by expiration of the vacancy timer. An increase in natural light will allow the lights to turn off and as the ambient light level drops the lights will turn on automatically.

3.10. Daylight Harvest Dimming (0-10V Output) (-D)

This section ONLY describes the dial functionality for DPR models.

In P and PR models, the dial is used to set the threshold at which the relays will be inhibited by excessive ambient light. Set the closure to "Lo" if you want to keep the lights from turning on even if there is only a small amount of ambient light. Set the dial closer to "Hi" if you want the light to always come on except in the case of very bright ambient light.

The 0-10V output can operate up to 50 ballasts. This output can be used for either a fixed tuned lighting level or a fully active daylight harvesting.

When set to fixed dim the dial can be used to raise or lower the light level. When set for photo dimming the dial is used to select top trim. This dial is used to set the maintained light level by initiating a photo capture.

To trigger a photo capture from the device:
1. First adjust the light level using the dimming dial to the desired level.
2. Set the "Button Enable/Disable" Dip Switch (#7) to Disable.
3. Hold down the manual button
4. While holding down the button, set the "Button Enable/Disable" dip switch (#7) to enable. At this point the yellow LED will blink for 1 second.
5. Release button and step away from the sensor.
6. Wait 15 seconds. The yellow LED will blink, the device photo captures the current light level.
7. 15 seconds after this, the dimming override will expire and the sensor will return to normal.
8. Raise the dimming dial to the set the top trimmed level and flip the manual button override dip (#7) for to normal operation.
9. After 30 seconds the light will regulate.

3.11. Multi-Level Photo Sensing (2-pole with Photo Sensing Option)

This feature will inhibit the manual switching, if adequate light is present.

Photo sensing on a 2-pole sensor can be configured to inhibit both poles or only the primary pole. In either case, the manual override button will also be inhibited if ambient light exceeds the set-point. The functionality can be changed using the WIR-3110 setting unit.
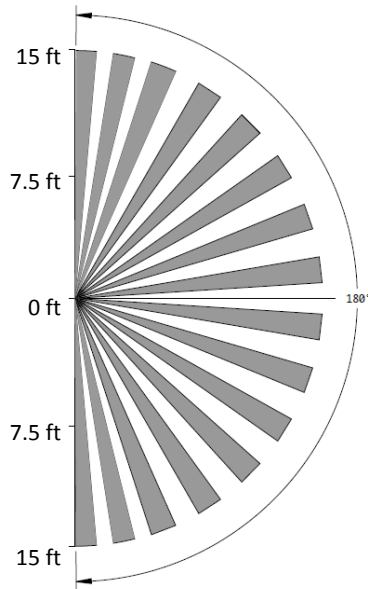
Please see the "WIR-3110 Manual".

4. COVERAGE PATTERNS

4.1.   Standard Lens

- Optimal usage is to detect small motions such as hand movements
- Designed for a mounting height of upto 4ft
- ADI-Voice can detect around corners that PIR cannot to maintain occupancy

Top View

Side View