

LOD-509 series

Line Voltage SmartDIM Occupancy Sensor



OVERVIEW

The LOD-509 series member of the TRANS family is a line voltage occupancy sensor featuring SmartDIM control to the lighting with 0-10V dimmable ballast or driver. SmartDIM is a state-of-the-art continuous dimming control technology developed by IR-TEC, which is capable of maintaining the overall ambient light level with the preset range through a smooth continuous dimming control to the connected lighting. The LOD-509 is designed to provide multi-mode occupancy sensing based continuous dimming control, ease of use, and the simplest installation.

This sensor will turn on the connected lighting to the preset SmartDIM level when it detects the presence of an occupant or vehicle, and switch off or to 1/2 of SmartDIM level (as per mode selected) after the area is vacant for a period of time. The LOD-509 offers 8 selectable control modes via a rotary DIP switch setting. Additionally, 7 different delay times can be easily and accurately set by an Accu-Set digital potentiometer. The SmartDIM level can be manually adjusted to provide consistent lighting as required. An exclusive Hybrid Switching technology makes this sensor ideal to control lighting with exceptionally high inrush current (HIC) while switching on, such as multiple LED or CFL lights connected in parallel.

Like all sensors in the TRANS family, the LOD-509 series is available with various mounting options and interchangeable lenses. This provides a second-to-none design and complete installation flexibility. The sensor is designed to operate in the coldest of environments, down to -40°F/°C.

FEATURES

- Omni-directional quad element infrared sensor
- 120/277VAC line voltage power operation
- Hybrid switching for controlling loads with HIC
- 0-10V output for continuous dimming control
- Walk test and sensor operation LED indicator
- Direct lead wires for easy wiring connections
- 8 control modes selectable by rotary DIP switch
- Accu-Set potentiometer delay time setting
- Individually adjustable SmartDIM level setting
- Variety of mounting options, including IP66
- Available with interchangeable lens options

APPLICATIONS

0-10V Continuous Dimming Control

The LOD-509S series occupancy sensor can be used to directly control the lighting with 0-10V dimmable ballasts, or drivers, in different modes by sensing the presence and movements of the occupant. Within the maximum load allowed, one LOD-509 sensor can control up to 50 dimmable ballasts/drivers in parallel with sinking current less than 0.5mA each. A basic wiring diagram is included on the next page for reference. Consult with an IR-TEC team member if a more complex wiring diagram is required.

MOUNTING OPTIONS

OVERVIEW

Each member of IR-TEC's TRANS sensor family is available with multiple mounting options with or without a mounting bracket. These mounting options allow the sensor to be integrated with lighting fixture or mounted on the ceiling in various ways. All applicable sensors can be supplied in specific mounting option as ordered with the respective code.

Sensor Product Code



Mounting Option	Code	Bracket Model
Fixture Integrated	F	---
IP-66 Fixture Integrated	W	---
Fixture External	E	EMB-500
IP-66 Fixture External	P	PMB-500
Ceiling Surface	S	SMB-500
Junction Box	C	CMB-500
Ceiling Recess*	R	RMB-500
Fixture Internal	I	IMB-500

*Line voltage sensors not applicable

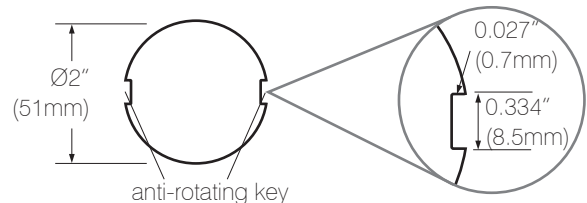
F/W-mount Sensor

Fixture Integrated

The sensors in **F** and **W**-mount are original form factor of TRANS family. Both options can be directly integrated with OEM lighting fixture through a 2" (51mm) diameter hole.

For IP-66 fixture integration, ensure to place the rubber gasket of **W**-mount sensor in between the fixture enclosure and sensor unit. Apply proper torque (0.3 lb-ft) to tighten the plastic screw nut while assemble the sensor.

Assembly Hole



Occupancy sensor - PIR	Occupancy sensor - HFD	Daylight sensor

TRANS PIR Occupancy Sensor LENS DATASHEET

OVERVIEW





All TRANS PIR based Occupancy Sensors feature with interchangeable lens options. Each lens provides different sensing coverage which varies with the actual mounting height.

The specified detection coverage and mounting height of each lens are based on the test result of human motion walking across the detection zones. The actual coverage may be reduced if the motion is moving toward or away the sensor. High ambient temperature (above 82°F/28°C) could reduce the coverage of PIR sensor. If ambient temperature at the covered area are expected to be high sometimes, consider adding more sensors or reduce the mounting height, if possible.

The followings are all available lens options and their respective detection patterns at printing time. For details of latest lens options available, please visit www.irtec.com.



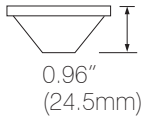
LENS OPTIONS

Lens		Shape	Recommended Mounting Height		Coverage
A		Standard	Cone	8~15 ft. 2.4~4.5m	2X height
B		Extra wide	Cone	8~10 ft. 2.4~3.0m	6X height
C		High bay	Cone	15~30 ft. 4.5~9.0m	3X height
D		Standard	Round flat	8~20 ft. 2.4~6.0m	2X height
F		Extra wide	Dome	8~20 ft. 2.4~6.0m	4X height
G		Aisle way	Arch	8~40 ft. 2.4~12.0m	3X height

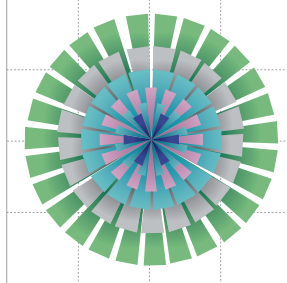
NOTE:

- Lens G can be rotated to change the direction of coverage. Its 3X height coverage refers only to the total length, the width of coverage will vary with the mounting height (see table of Lens G section). This lens is not IP-66 rated.
- Lens C/G may be mounted up to 40/50 ft. (12/15m) or higher at the area, providing with large moving object such as forklift trucks. Before installing all sensors, please ensure that the sensor can have optimal detection at desired height.

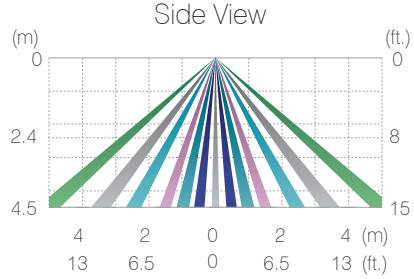
LENS A 2X Standard



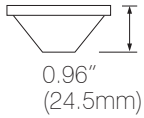
Top View



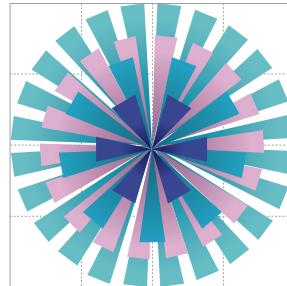
Mounting Height	ft. (m)	8 (2.4)	10 (3.0)	12 (3.6)	15 (4.5)
Max. Coverage Diameter	ft. (m)	16 (4.8)	20 (6.0)	24 (7.2)	30 (9.0)



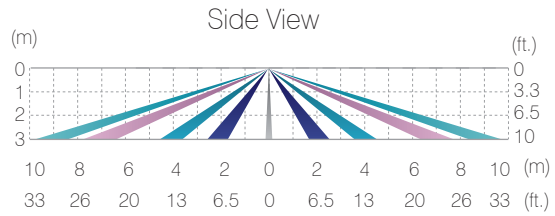
LENS B 6X Extra wide



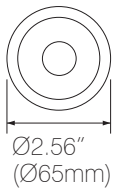
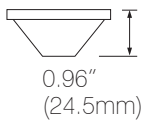
Top View



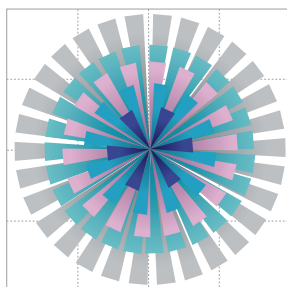
Mounting Height	ft. (m)	8 (2.4)	8.5 (2.6)	9 (2.8)	10 (3.0)
Max. Coverage Diameter	m (ft.)	48 (15.6)	51 (16.8)	54 (17.8)	60 (19.8)



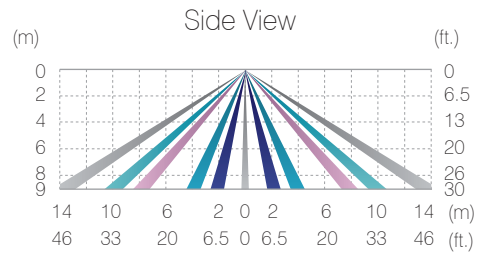
LENS C 3X High bay



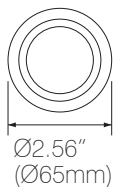
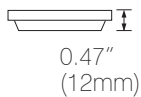
Top View



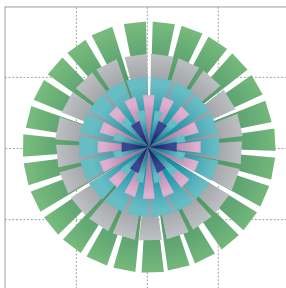
Mounting Height	ft. (m)	15 (4.5)	20 (6.0)	26 (8.0)	30 (9.0)
Max. Coverage Diameter	ft. (m)	45 (13.5)	60 (18.0)	78 (24.0)	90 (27.0)



LENS D 2X Standard

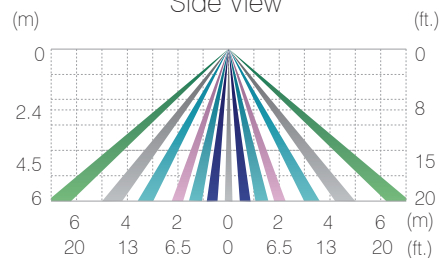


Top View

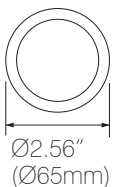
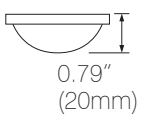


Mounting Height	ft. (m)	8 (2.4)	10 (3.0)	15 (4.5)	20 (6.0)
Max. Coverage Diameter	ft. (m)	16 (4.8)	20 (6.0)	30 (9.0)	40 (12.0)

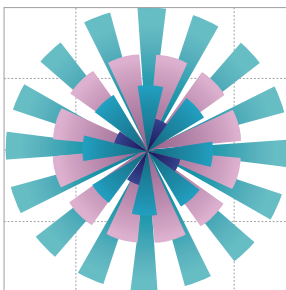
Side View



LENS F 4X Extra wide

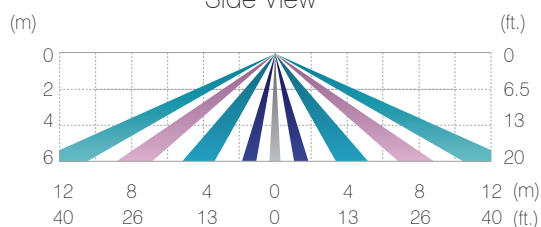


Top View

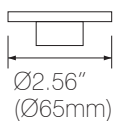
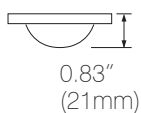


Mounting Height	ft. (m)	8 (2.4)	10 (3.0)	15 (4.5)	20 (6.0)
Max. Coverage Diameter	ft. (m)	32 (9.6)	40 (12.0)	60 (18.0)	80 (24.0)

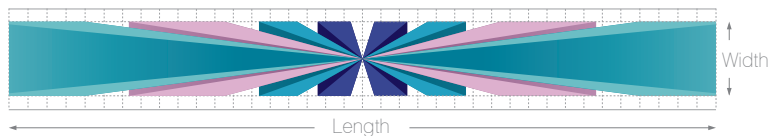
Side View



LENS G 3X Aisle way

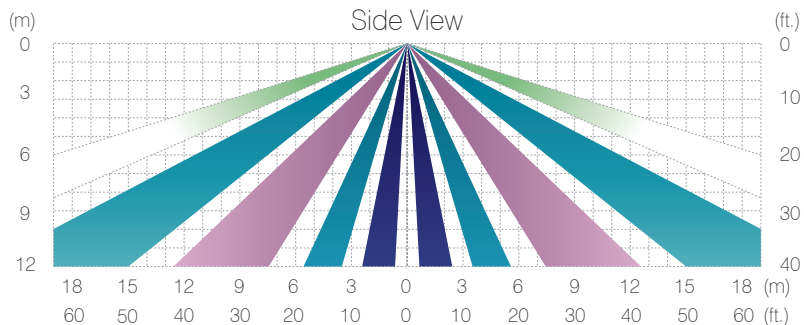


Top View



Mounting Height	ft. (m)	10 (3.0)	20 (6.0)	30 (9.0)	40 (12.0)
Max. Coverage Length x Width	ft. (m)	30 x 3.3 (9.0 x 1)	60 x 6.5 (18.0 x 2)	90 x 10 (27.0 x 3)	120 x 13 (36.0 x 4)

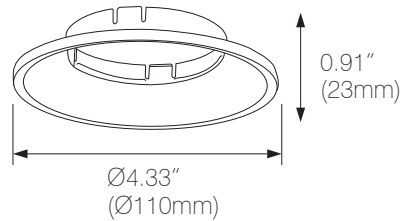
Side View



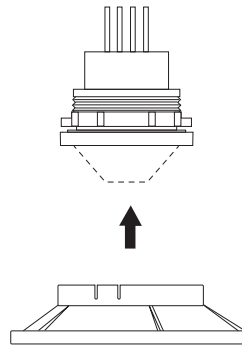
ACCESSORIES

LENS HOOD LH-110

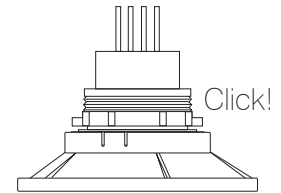
The LH-110 is designed for bi-level control sensors to prevent its ambient light sensor from being saturated by the excessive lighting nearby.



1

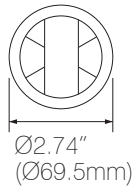
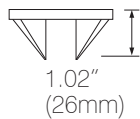


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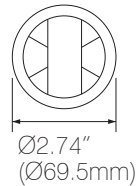
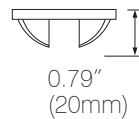


LENS MASK

LM-12C
For Lens A/B/C

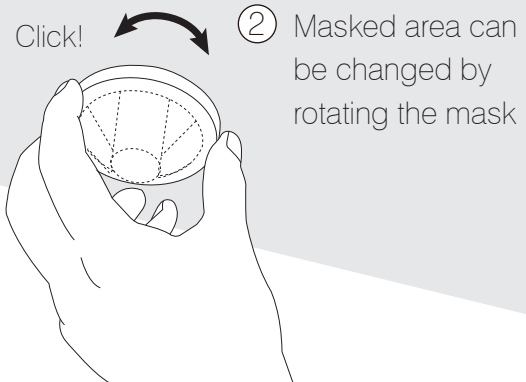


LM-12D
For Lens F



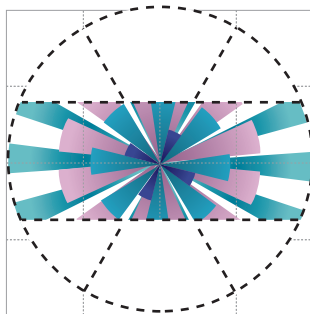
① Push the mask onto the installed lens

1

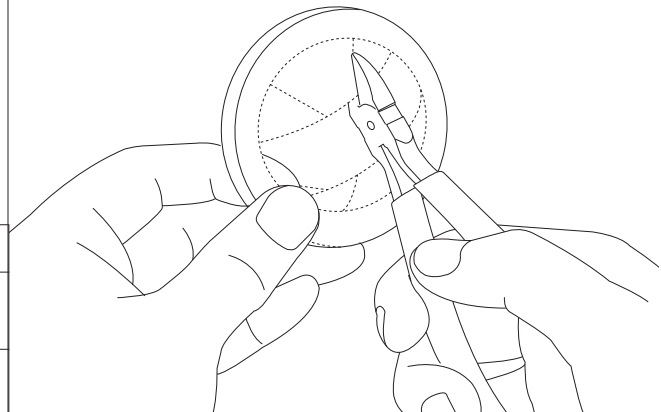


Example: Lens F with LM-12D

Top View








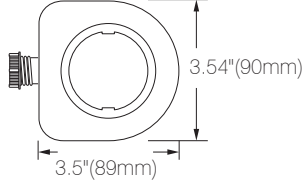


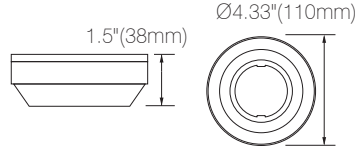


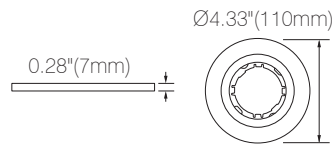

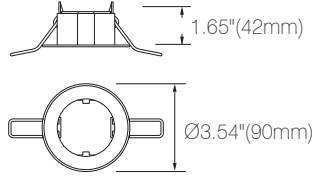

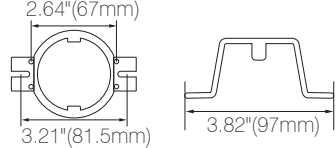
If necessary, the masked area can be altered by cutting off the respective grooved segments with a wire cutter or knife.




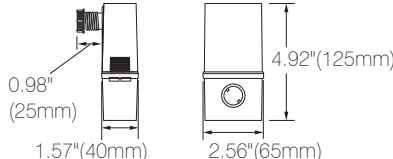


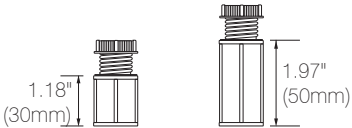
Coverage Area with Lens F and Mask

Mounting Height	ft. (m)	8 (2.4)	10 (3.0)	15 (4.5)	20 (6.0)
Max. Coverage Length x Width	ft. (m)	32 x 3.3 (9.6 x 1)	40 x 6.5 (12.0 x 2)	60 x 10 (18.0 x 3)	80 x 13 (24.0 x 4)

Mounting Brackets

Bracket	Code	Description	Dimensions
 EMB-500 	E	Fixture External The EMB-500 is a mounting bracket for mounting the sensor with indoor lighting fixture through a 1/2" knockout hole.	
 PMB-500 	P	IP-66 Fixture External The PMB-500 is a mounting bracket for mounting the sensor with IP-66 lighting fixtures or outdoor pole mount through a 1/2" knockout hole.	
 SMB-500 	S	Ceiling Surface The SMB-500 is a mounting bracket designed to mount the sensor on the surface of hard lid ceiling with or without junction box. Mounting on the surface of lighting fixture is also available.	
 CMB-500 	C	Junction Box The CMB-500 is a ceiling mounting bracket designed to mount the sensor with an octagonal or square junction box.	
 RMB-500	R	Ceiling Recess The RMB-500 is for recess mounting the sensor through a 2.8" (70mm) hole on the ceiling. An optional back cover (BC-500) is available for separate purchase if cable strain relief is required.	
 IMB-500	I	Fixture Internal The IMB-500 is a mounting bracket exclusively designed for mounting the HFD sensor inside of an OEM lighting fixture.	

Accessories

Accessory	Description	Dimensions
 EMA-500	Extension Mounting Adaptor The EMA-500 is an extension mounting adaptor for lowering the position of E-mount sensor to avoid the coverage being blocked by the fixture body.	
 EJ-30 EJ-50 	Extension Joint The EJ-30 and EJ-50 are extension joints that can be used to horizontally extend the E/P mount TRANS sensor position for 30 and 50 mm. If longer extension is required, combine two joints for 60/80/100 mm. For outdoor use, order EJ-30F or EJ-50F .	

LOD-509 series

Line Voltage SmartDIM Occupancy Sensor

TRANS

SmartDIM

SmartDIM is an exclusive automatic dimming control algorithm developed by IR-TEC to provide a smooth continuous dimming performance. The output of the controlled lighting will be constantly adjusted to maintain the overall ambient light level within the pre-set range by sensing the daylight available in the space.

Control Modes

The LOD-509 series can be set to control the lighting in one of the following modes. For more details of specific control modes, please visit www.irtec.com or contact an IR-TEC team member directly.

Mode	Day ¹	Night ²	Remarks
A ON/OFF	Vac: OFF Occ: ON	Vac: OFF Occ: ON	For non-dimmable lighting. ALS disabled at all time.
B OSO	Vac: LD Occ: SmartDIM	Vac: LD Occ: SmartDIM	LD: 1/2 of SmartDIM (min. 1V)
C OSLA	Vac: OFF Occ: OFF	Vac: LD Occ: SmartDIM	LA threshold: 20-50 lux MA threshold: 50-80 lux HA threshold: 80-130 lux
D OSMA			
E OSHA			
F OSLATO	Vac: OFF Occ: OFF	Vac: OFF Occ: SmartDIM	
G OSMATO		Time-Off: LD	
H OSHATO			

Vac : Vacant **Occ** : Occupied

¹While ambient light level is higher than the respective ALS threshold.

²While ambient light level is lower than the respective ALS threshold.

Mounting Options

The LOD-509SX series can be mounted into the ceiling, attached to a fixture or mounted into a junction box. The mounting options are available by combining a specific mounting bracket (if applicable) from the chart below. The bracket will be shipped with the sensor when ordered with the respective code. Codes F and W allow the sensor to be integrated with OEM light fixtures in any environment.

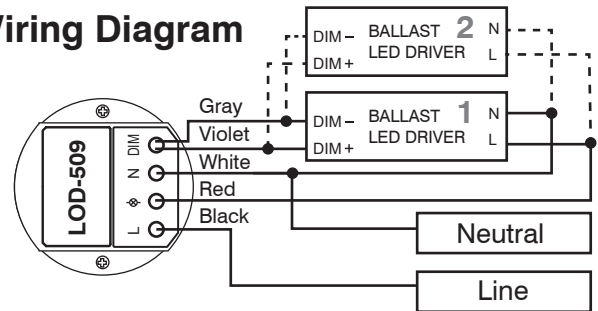
Code	Mounting Option	Mounting Bracket
F	Fixture Integrated	---
W	IP-66 Fixture Integrated	---
E	Fixture External	EMB-500
P	IP-66 Fixture External	PMB-500
S	Ceiling Surface	SMB-500
C	Junction Box	CMB-500

Lens Options

The LOD-509xxX series is available with following lens options which provide different coverage at different mounting height (H). When adding the lens code the lens is then automatically shipped with the sensor.

Lens	Shape	Mounting Height	Coverage
A	Standard	Cone 8~15 ft. 2.4~4.5m	2X height
B	Extra wide	Cone 8~10 ft. 2.4~3.0m	6X height
C	High bay	Cone 15~30 ft. 4.5~9.0m	3X height
D	Standard	Round 8~20 ft. 2.4~6.0m	2X height
F	Extra wide	Dome 8~20 ft. 2.4~6.0m	4X height
G	Aisle way	Arch 8~40 ft. 2.4~12.0m	3X height

Wiring Diagram



SPECIFICATIONS

Power supply	120/277VAC, 50/60Hz
Maximum Load @ -40°F~131°F (-40°C~55°C)	Incandescent/Halogen – 800/1200W(VA)@120/277V
	Fluorescent Ballast/CFL – 800/1200W(VA)@120/277V
	Ballast Electronic (LED) – 540/1200VA@120/277V
Maximum Load @ 131°F~158°F (55°C~70°C)	Incandescent/Halogen – 500/750W(VA)@120/277V
	Fluorescent Ballast/CFL – 500/750W(VA)@120/277V
	Ballast Electronic (LED) – 500/750VA@120/277V
Infrared sensor	Omni-directional quad element pyroelectric
Photo sensor	Digital ambient light sensor
HIC protection	Max. 80A for 16.7msec.
Dim control	0-10V, max 25mA sinking current
Detectable speed	0.5~10 ft./sec. (0.15 ~ 3 m/sec.)
Mounting height	Subject to the lens applied
Detection range	As per lens applied and mounting height
Delay time setting	T/3/5/10/15/20/30 min., T: 10 sec.
Time-off delay	10 min., OSxATO modes only
Op. humidity	Max. 95% RH
Op. temperature	-40°F~158°F (-40°C~70°C)
Dimensions	Ø2.36" x H1.45" (Ø60 x H37mm)

*10 lux equals to approximately 1 ft. candle.