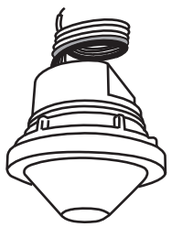
ON-LRD-509 series

Line Voltage OS-NET Sensor

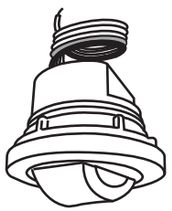
INSTALLATION INSTRUCTIONS



w/Lens A/B/C

w/Lens D

w/Lens F



w/Lens G

*More lens options are available for this sensor.
Please refer to the Lens Datasheet for more details.

⚠ WARNING & CAUTION

- **Risk of Electric Shock - Disconnect power supply before servicing.**
- **Do NOT touch the square window of infrared sensor under the lens assembly.**
- **Open Type Photoelectric Switches.**
- **Install this device in accordance with electrical codes and protect with circuit breaker.**
- **Install the sensor at least 1 ft. away from any occupant.**

⚠ AVERTISSEMENT & PRUDENCE

- **Risque de choc électrique - Débranchez l'alimentation avant l'entretien.**
- **Ne PAS toucher la fenêtre carrée de capteur infrarouge sous l'ensemble de l'objectif.**
- **Ouvrir Type commutateurs optoélectroniques.**

OVERVIEW

The ON-LRD-509 series is a fundamental device of OS-NET wireless mesh network solution packed with multiple functionalities including occupancy/vacancy sensing, daylight harvesting, bi-level StepDIM or continuous SmartDIM, and wireless network communication for top-notch intelligent lighting control.

Numerous design innovations allow this device to be flexibly integrated with an OEM luminaire, or mounted on the ceiling in a variety of options. Interchangeable lenses allow the sensor to be mounted at various heights with different detection patterns for all applications. All functionalities can be easily and intuitively configured by a 2-way remote programmer from the floor. With ON-LRD-509, you can effortlessly achieve energy efficient, code-compliant smart lighting control through a state-of-the-art wireless mesh network synchronously established while installing the OS-NET enabled lighting.

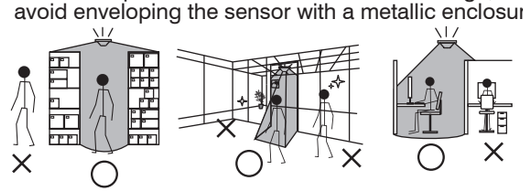
SPECIFICATIONS

Power supply	120/230/277VAC, 50/60Hz		
Maximum Load	120VAC	230VAC	277VAC
-Fluorescent Ballast/CFL	800/*500W(VA)	5A	1200/*750W(VA)
-Incandescent/Halogen	800/*500W(VA)	5A	1200/*750W(VA)
-Ballast Electronic (LED)	540/*500VA	5A	1200/*750VA
Infrared sensor	Digital quad-element pyroelectric sensor		
◆Dim control	0-10V, isolated, max 25mA		
HIC protection	Max. 80A for 16.7msec.		
Wireless protocol	Modified Zigbee Light Link (ZLL)		
Radio frequency	2405~2480MHz		
Number of Channel	16ch		
Radio range	15/90 m @indoor/outdoor, open space		
Radio Power Output	6.98dBm		
Detectable speed	0.15 ~ 3 m/sec. (0.5~10 ft./sec.)		
Mounting height	Subject to the lens applied		
Detection range	As per lens applied and mounting height		
Remote range	Typ. 10 m (33 ft), indoor with no backlight		
Op. humidity	Max. 95% RH		
Op. temperature	-40°C~70°C (-40°F~158°F)		
Dimensions	Ø60 x H37mm (Ø2.36"x H1.45")		

*Max load for operating temperature at 55°C~70°C(131°F~158°F)
◆Dim voltage tolerance is ±5%

APPLICATION NOTES

1. The sensor is more sensitive to the movements "crossing" the detection zones than "toward" or "away" the sensor unit. To obtain better sensitivity, avoid placing the sensor in line with occupant path.
2. The closer the movement is to the sensor, the more sensitive the sensor is. The higher the sensor is installed, the larger movement is required to be detected.
3. Ensure to place the sensor at least at 1.5m (5 ft.) away from air supply ducts as rapid air flow may cause false activations.
4. The sensor cannot "see" the movements behind obstacles, such as tall furniture, shelf, glass or partitions. Avoid placing the sensor where obstructions may block the sensor's line of sight.
5. The partition of workstation could block the sensor view to occupant movements, it is best to place the sensor over the intersection of workstation. For large open office, place multiple sensors so that there is overlap coverage with each adjacent sensor.
6. To obtain optimal wireless communication range, avoid enveloping the sensor with a metallic enclosure.

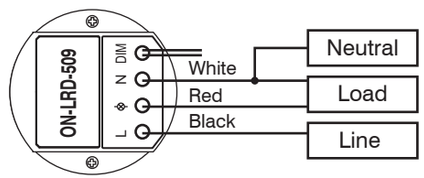


MOUNTING

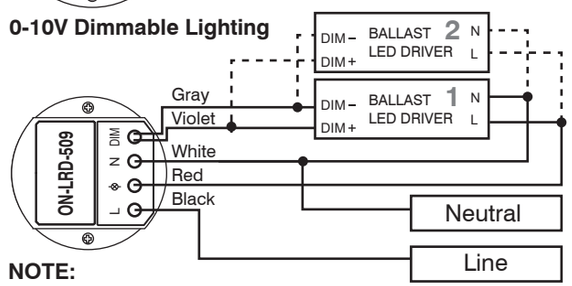
This device can be integrated with a luminaire or mounted on the ceiling in various formats via specific mounting bracket. Please refer to the mounting instruction sheet separately attached for more details about mounting options available.

WIRING DIAGRAM

Non-dimmable Lighting (ON-OFF Switching only)



0-10V Dimmable Lighting



NOTE:

1. Use 0/1-10V dimmable driver/ballast to enable dimming control.
2. Ensure to connect the LINE and NEUTRAL wires correctly. Reverse connection may damage the sensor permanently.
3. Ensure TOTAL isolation between DIM+/DIM- and GROUND of line voltage to avoid damaging the sensor.
4. Always conduct factory test with GROUND connected.

OPERATION

The ON-LRD-509 employs a digital PIR sensor together with an ALS to detect occupancy status and ambient light level. The sensor not only controls the connected lighting as programmed when it detects the presence of an occupant/vehicle, but also broadcasts an OCC signal to other devices of the group to activate the respective controls. Each sensor can be assigned to be member of maximum 4 groups for coordinated control.

Federal Communication Commission Interference Statement FCC ID: NRIRS350900

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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SETTING

All sensor settings can be configured, in individual or group basis, by an OS-NET Remote Programmer SRP-281. Following table highlights the setting items and options available with ON-LRD-509. For detailed setting operation, please refer to the OS-NET Programming Guide available for download from www.irtec.com.

Programming Guide

Settings	Description	Options (*Denotes factory default)
INDIV-SET	To setup an individual device	
GROUP-SET	To setup all devices of the group with same settings	
CONTROL	Control modes available for OS-NET sensor and controller.	ON/OFF, OSO, OSLA, **OSLATO***, DSVM, DSC, VSC, OFF
AMBIENT LUX	Thresholds of ambient light level for OS-NET sensor and controller to execute the control.	10/20/40/60/80/200/400/600/1000/2000/**DISABLE***/CURRENT
DELAY	Delay time that sensor/controller will turn off or fade down the light.	1/3/5/**10***/15/20/30/60 min.
TIME OFF	Delay time that sensor/controller will keep the light at low dim level after the OFF delay time elapsed.	10sec./3/5/**10***/15/20/30/45/60 min.
HIGH DIM	High dim is the output level set to control the light during occupancy, or when ambient light is lower than the threshold if daylight sensing control is selected.	50/55/60/65/70/80/90/100% **SmartDIM***
LOW DIM/SmartDIM	Low dim is the output level set to dim the light when space is vacant for bi-level control. Low dim setting will become SmartDIM bar if SmartDIM control is selected.	0/5/10/15/20/25/**30***/40%
RAMP UP	Speed of lighting output increase.	**INSTANT***/SOFT/SLOW
FADE DOWN	Speed of lighting output decrease.	INSTANT/**SOFT***/SLOW
VM-TB	Time duration BEFORE Virtual Midnight. Only available if DSVM is selected.	0.5/1/1.5/2/**2.5***/3/3.5/4/4.5/5/5.5/6 hour
VM-TA	Time duration AFTER Virtual Midnight. Only available if DSVM is selected.	0.5/1/1.5/2/2.5/3/3.5/**4***/4.5/5/5.5/6 hour
SENSITIVITY	Sensitivity of occupancy sensor.	**HIGH***/NORMAL/LOW

SETTING ACKNOWLEDGEMENT

The sensor will acknowledge setting success or failure with different indications by device LED or connected lighting.

INDICATION	ACKNOWLEDGEMENT	REMARKS
Device LED fast blinking in GREEN and BLUE.	The device is scanning and linking to the network.	The fast blinking (on-off per 0.2 second) only appears during network linking.
Device LED blinks twice every 2-second in GREEN or BLUE.	The sensor detects occupant's motion.	GREEN means the device is network linked. BLUE means the device is unlinked.
Device LED blinks twice every 2-second for 5 minutes, and then 15-second after power applied.	The device is set with daylight sensing control. (DSVM or DSC)	GREEN means the device is network linked. BLUE means the device is unlinked.
Device short beeps twice.	Receiving a single setting or control command.	
Device beeps one long and two short. The connected lights flash twice.	1. Multiple setting data UPLOAD successful. 2. GROUP LINK successful.	
The connected lights flash twice.	1. Factory default setting resumed. 2. SmartDIM setting completed.	

CONTROL MODE

The ON-LRD-509 series can be programmed to control the connected lighting in one of the modes as below.

CONTROL	DESCRIPTION
ON/OFF	This is a commonly used **occupancy sensing control** mode. Lighting will be inhibited when the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold, the controlled light will be automatically turned on once the sensor detects the presence of occupant, and turned off after the delay time has elapsed. **NOTE**: This mode is available for **dimmable** or **non-dimmable** lighting, but **not for HID** lighting.
OSO	This is an **occupancy sensing control** mode can be applied in spaces that require lighting for 24 hours a day. When the space is vacant, lighting output will be reduced to Low Dim level to save energy. When space is occupied, lighting output will be instantly increased to High Dim level or continuously regulated to maintain within a pre-set range by SmartDIM control. NOTE: This mode requires **dimmable** lighting to enable dimming control.
OSLA	This is an **occupancy sensing control** mode can be applied in spaces that require automatic lighting when the ambient light level is lower than the set threshold. Lighting will be inhibited when the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold, the sensor/controller will automatically set the light to the Low Dim level. Once the sensor detects the presence of an occupant, the lighting output will be instantly increased to the High Dim level or continuously regulated within a pre-set range by SmartDIM control. Lighting output will be reduced to the Low Dim level after delay time has elapsed or shut off if ambient light level is higher than the set threshold. **NOTE**: This mode requires **dimmable** lighting to enable dimming control. If lighting is **non-dimmable**, all lights will remain on whenever the ambient light level is lower than the set threshold.
OSLATO	This is an **occupancy sensing control** mode can be applied in spaces that require maintaining Low Dim lighting for a period of time after the delay time has elapsed. Lighting will be inhibited when the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold and any sensor detects the presence of occupant, the sensor/controller will instantly increase the lighting output to the High Dim level or continuously regulate the output to maintain overall lighting level within a pre-set range by SmartDIM control. After the delay time has elapsed, lighting output will be reduced to the Low Dim level for a period of TIME OFF delay before turning off. **NOTE**: This mode requires **dimmable** lighting to enable dimming control. If lighting is **non-dimmable**, there will be no dim control and the delay time will be extended with the TIME OFF (TO) delay.
DSVM	This is a **daylight sensing control** mode can be applied in spaces that require automatically dimming the lighting output to a low level between a certain time before and after midnight. When the ambient light level is lower than the set threshold, the sensor/controller will turn the light to the High Dim level or continuously regulate the output to maintain overall lighting level within a pre-set range by SmartDIM control. Lighting output will be reduced to the Low Dim level from a certain time before virtual midnight to a certain time after. Lighting will be inhibited during daytime. **NOTE**: This mode requires **dimmable** lighting to enable dimming control. If lighting is **non-dimmable**, all lights will remain on whenever ambient light level is lower than the set threshold.
DSC	This is a **daylight sensing control** mode can be applied in spaces that require automatic lighting whenever the ambient light is lower than the set threshold. The sensor/controller will automatically turn on the light to the High Dim level or continuously regulate the output to maintain overall lighting level within a pre-set range by SmartDIM control when the ambient light level is lower than the set threshold, and automatically turn off the light when the ambient light level is higher than the set threshold. **NOTE**: This mode requires **dimmable** lighting to enable dimming control. If lighting is **non-dimmable**, all lights will remain on whenever ambient light level is lower than the threshold.
VSC	This is a **vacancy sensing control** mode can be applied in spaces that require users to turn on the light manually, and have the sensor/controller turn off the light automatically. The occupant would have to press the OS-NET button to turn on the light to the High Dim level or continuously regulated by the connected sensor/controller to maintain overall lighting level within a pre-set range by SmartDIM control. The sensor/controller will control the connected lighting as per OSLATO mode. **NOTE**: This mode requires **dimmable** lighting to enable dimming control. If lighting is **non-dimmable**, there will be no dim control and the delay time will be extended with the TIME OFF (TO) delay.
OFF	This is a **manual control** mode can be used when you need the light to be off for a certain period of time. Once this mode is set, all lighting controlled by the sensor/controller will remain off until another mode is selected.