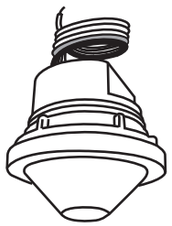
ON-LRD-509 series

Line Voltage OS-NET Sensor

INSTALLATION INSTRUCTIONS



w/Lens A/B/C

w/Lens D

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

APPLICABLE REMOTE (order separately)

Model	Description	Remarks
SRP-281	OS-NET Remote Programmer	Full functionality
URP-100	User Remote	Manual ON/OFF/DIM TIME/LUX setting

⚠ 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.**
- **Cycling the power to the sensors will cause failure over time.**

⚠ 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.

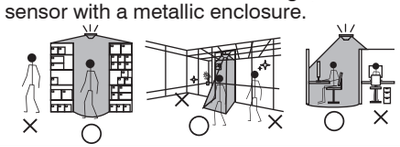
SPECIFICATIONS

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	Omni-directional pyroelectric		
Dim control	0-10V, ±5%, 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)
**Actual radio range may differ depending on environmental conditions.

APPLICATION NOTES

1. Actual radio range may differ depending on environmental conditions. Always do a site survey to understand existing Wi-Fi usage.
2. Ensure to place the sensor at least at 1.5m (5 ft.) away from any Wi-Fi router as they can mask or delay signals.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. To obtain optimal wireless communication range, avoid enveloping the sensor with a metallic enclosure.



MOUNTING

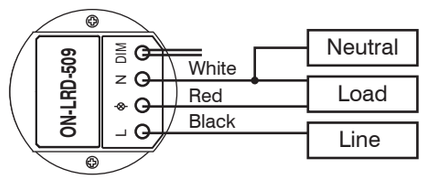
This device can be integrated with a luminaire or mounted on the ceiling in various formats via specific mounting bracket. Please refer to the mounting instruction sheet separately attached for more details about mounting options available.

LENS OPTIONS

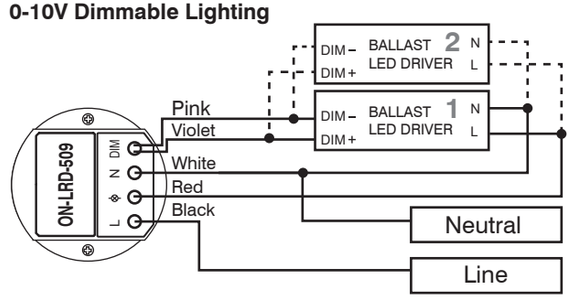
Different lenses can be applied to provide specific coverage at different mounting heights. Please refer to the lens datasheet attached for more details.

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.

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 SRP-281 OS-NET Remote Programmer. 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	Default
INDIV-SET	To setup an individual device		
GROUP-SET	To setup all devices of the group with same settings		
CONTROL	Control schemes available for OS-NET sensor.	ON/OFF, OSO, OSLA, OSLATO, DSVM, DSC, VSC, OSB, OFF	OSLATO
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 scheme is selected.	50/55/60/65/70/80/90/100%/SmartDIM	100%
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%	30%
DAY/NIGHT SYNC	Setting the master OS-NET sensor in charge of sensing the ambient light level and reporting the day/night status to other sensors of the group.	PRIMARY/SECONDARY/DISABLED	DISABLED
AMBIENT LUX	Thresholds of ambient light level for OS-NET sensor to execute the control.	10/20/40/60/80/200/400/600/1000/2000 LUX DISABLED/CURRENT	DISABLED
DELAY	Delay time that sensor will turn off or fade down the light.	30 sec./1/3/5/10/15/20/30/60 min.	10 min.
TIME OFF	Delay time that sensor will keep the light at low dim level after the OFF delay time elapsed.	10/30 sec./3/5/10/15/20/30/45/60 min.	10 min.
RAMP UP	Speed of lighting output increase.	INSTANT/SOFT/SLOW	INSTANT
FADE DOWN	Speed of lighting output decrease.	INSTANT/SOFT/SLOW	SOFT
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	2.5 hours
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	4 hours
SENSITIVITY	Sensitivity of occupancy sensor. To disable the occupancy sensing capability, select OFF.	HIGH/NORMAL/LOW/OFF	HIGH
LED INDICATOR	Enable or disable the LED indicator of the sensor.	ENABLED/DISABLED	ENABLED
DAY O'RIDE	Enable/disable daylight override control. Sensor will shut off the light when ambient lux exceeds the override level set below. Only available if AMBIENT LUX is enabled.	ENABLED/DISABLED	DISABLED
O'RIDE LEVEL	The ambient lux level to enable daylight override. Only available if DAY O'RIDE is enabled.	HIGH(~1.8X)/NORMAL(~1.5X)/LOW(~1.3X)	NORMAL
MIN. DIM	The lowest dim level applicable on the sensor.	12/15%/DISABLED	DISABLED

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 SCHEME

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

Scheme	Description
ON/OFF	This is a typical **occupancy sensing control** scheme. 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 elapsed. **NOTE:** This scheme can be used with **dimmable** or **non-dimmable** lighting, but not for HID lighting.
OSO	This is an **occupancy sensing control** scheme can be applied in areas that require 24-hour lighting. When space is vacant, the lights will be maintained at Low Dim level. Whenever space is occupied, lighting output will be increased to High Dim level or continuously regulated to maintain within the pre-set range by SmartDIM control. **NOTE:** Do **NOT** use this scheme to control **non-dimmable** lighting.
OSLA	This is an **occupancy sensing control** scheme can be applied in spaces that require automatic lighting when the ambient light level is lower than the set threshold. Lighting will be inhibited if 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 will automatically control the light at Low Dim level. When sensor detects the presence of an occupant, lighting output will be increased to the High Dim level or continuously regulated within the pre-set range by SmartDIM control. After the delay time elapsed, lighting output will be reduced to Low Dim level or shut off if the ambient light is higher than the set threshold. **NOTE:** Do **NOT** use this scheme to control **non-dimmable** lighting.
OSLATO	This is an **occupancy sensing control** scheme can be applied in spaces that require maintaining Low Dim lighting for a period of time before shutting off. Lighting will be inhibited if 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, lighting output will be increased to High Dim level or continuously regulated to maintain overall lighting level within the pre-set range by SmartDIM control. After the delay time elapsed, lighting output will be reduced to Low Dim level for a period of TIME OFF delay before shut off. **NOTE:** This scheme 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** scheme can be applied in spaces that require automatically dimming the lighting output to a low level between a certain time before and after virtual midnight. Lighting will be inhibited if the ambient light level is higher than the set threshold. When the ambient light level is lower than the set threshold, the sensor will turn the light to High Dim level or continuously regulate the output to maintain overall lighting level within the pre-set range by SmartDIM control. Lighting output will be reduced to Low Dim level from a certain time before virtual midnight to a certain time after. **NOTE:** This scheme 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** scheme can be applied in spaces that require automatic lighting whenever the ambient light is lower than the set threshold. The sensor will automatically turn on the light to High Dim level or continuously regulate the output to maintain overall lighting level within the 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 scheme 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** scheme can be applied in spaces that require users to manually turn on the light, and have the sensor turn off the light automatically. The occupant would have to press the OS-NET Button to turn on the lighting group assigned. The sensor will control the lights at High Dim level or continuously regulate the output to maintain overall lighting level within the pre-set range by SmartDIM control. The sensor will control the connected lighting as per OSLATO scheme. **NOTE:** This scheme 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.
OSB	This is an advanced **occupancy sensing control** scheme can be applied in open offices to provide background light level before the area of entire lighting group is vacant. Lighting will be inhibited if 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 the first occupant is detected by a grouped sensor, the output of sensor connected light will be increased to High Dim level or continuously regulated within the pre-set range by SmartDIM control during occupancy, and the unoccupied areas of entire lighting group will brighten up to Low Dim level as background light. The entire lighting group turns off after the last person leaves and delay time elapsed. **NOTE:** Do **NOT** use this scheme to control **non-dimmable** lighting.
OFF	This is a **manual control** scheme can be used when you need the light to be off for a certain period of time. Once this scheme is set, all OS-NET controlled lighting will remain off until another scheme is selected.