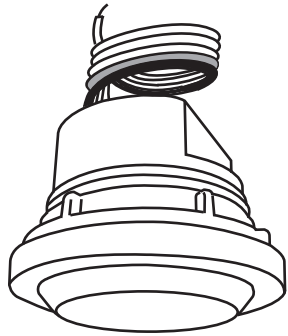# OS·NET

ON-LCD-509 series

Line Voltage OS-NET Controller

INSTALLATION INSTRUCTIONS

OVERVIEW

The ON-LCD-509 series is a supplementary device of OS-NET wireless mesh network solution that can be used to provide top-notch intelligent controls to the connected lighting by receiving the occupancy status signal from OS-NET sensor of the same group wirelessly. These sophisticated lighting controls include occupancy/vacancy sensing, daylight harvesting with bi-level StepDIM or continuous SmartDIM technology.

Numerous design innovations allow this device to be flexibly integrated with an OEM luminaire, or mounted on the ceiling in a variety of options. All functionalities can be easily and intuitively configured by a 2-way remote programmer from the floor. With ON-LCD-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
◆ 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		
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 OS-NET Controller can be used to provide different controls to the connected luminaires or circuits in the area with the grouped OS-NET Sensor available to detect the occupancy status.

2. To obtain optimal wireless communication range, avoid enveloping the controller 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)
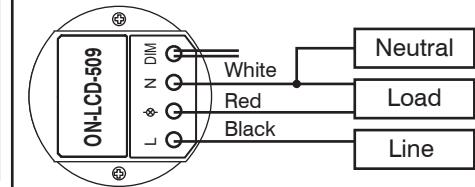
0-10V Dimmable Lighting
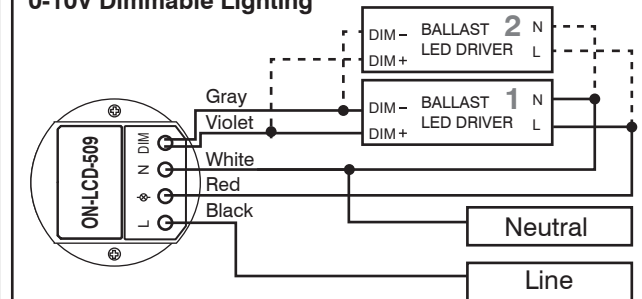
NOTE:

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 controller permanently.
3. Ensure TOTAL isolation between DIM+/DIM- and GROUND of line voltage to avoid damaging the controller. Always conduct factory test with GROUND connected.
4. Associated OS-NET sensor is required to achieve occupancy/vacancy sensing control.

OPERATION

The ON-LCD-509 will activate the programmed control to the connected lighting by receiving the occupancy (OCC) signal from any OS-NET sensor of the group. In addition, it also acts as a node of wireless mesh network to relay the radio communication commands within network. Each controller can be assigned to be member of maximum 4 groups for coordinated control.

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SETTING

All control settings can be configured, in individual or group basis, by a 2-way handheld remote programmer. Following table highlights the setting items and options available with ON-LCD-509. For detailed setting operation, please refer to the OS-NET Programming Guide available for download from www.irtec.com.

Item	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.	10 sec./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

SETTING ACKNOWLEDGEMENT

The device will acknowledge the setting success or failure with different indications by device LED and the 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 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-LCD-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.

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