iR-TEC

Smart Sensing Controls for Lighting & Building Automation

Product Selection Guide

Enable Smart Sensing Control with Ease

Smart sensing control requires different sensor and control strategies to meet different requirements from facility managers, users, and local authorities. IR-TEC offers a wide range of sensor and control solutions featuring occupancy, vacancy, and daylight sensing control functionalities for commercial and industrial applications. In addition to common on/off switching, you can easily find IR-TEC sensors with 0-10V, DALI/DALI-2, PWM, Modbus or dry contact outputs for energy efficient lighting/HVAC control. Whether it is wired or wireless control through OEM luminaires, lighting circuits or BA/BMS integration, you can always count on IR-TEC products to enable smart sensing control with ease.

About this guide

We are pleased to present the latest occupancy sensing control products selection guide from IR-TEC. This guide is created to help luminaire designers, BA consultants, and BMS system integrators quickly find the right products for achieving occupancy/vacancy sensing based lighting/HVAC control in commercial and industrial applications.

In this guide, IR-TEC's occupancy/vacancy sensing control products are classified into different categories according to the functionality and applications. We recommend spending a few minutes reviewing the table below to gain a brief overview of the products in each category, then proceeding to the relevant category to find the products that suit your control requirements.

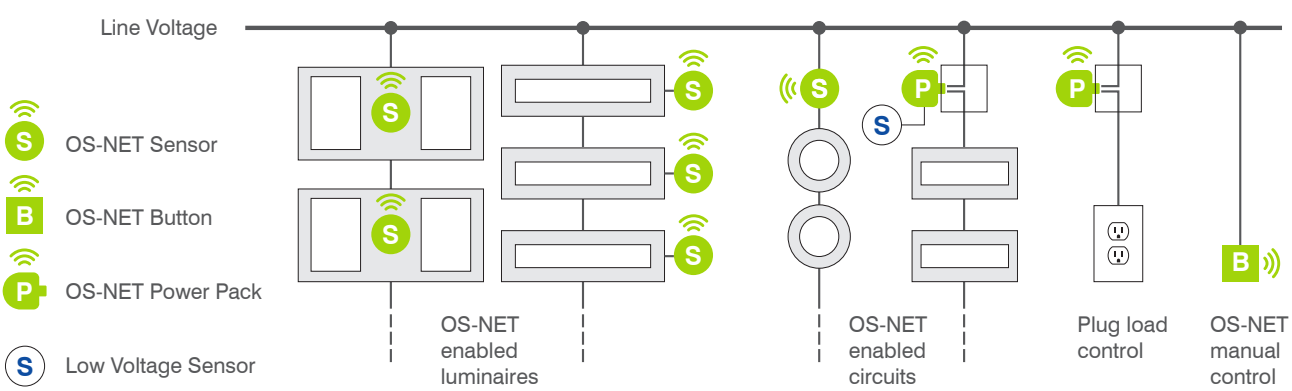
A Simpler and Smarter Wireless Lighting Control Solution

OS-NET is a simple and easy wireless lighting control solution developed by IR-TEC to enable smart lighting control with unprecedented Flexibility, Functionality and Simplicity.

Through installing the OS-NET enabled luminaires and/or OS-NET devices for lighting circuit, a wireless mesh network controlled lighting system can be effortlessly deployed and established. With simple and intuitive setting via a handheld remote programmer, all OS-NET devices, including sensors, buttons and controllers, can be wirelessly connected to execute smart control as individual or group basis. If necessary, all OS-NET controlled lighting can be easily re-configured to provide different control or re-assigned to different groups.

OS-NET is not only a simple solution for OEM manufacturers to deliver luminaires featuring state-of-the-art Luminaire Level Lighting Control (LLLC) with embedded smart sensing control and wireless connectivity, but also a cost effective solution for renovating the legacy luminaires with energy efficient LED lighting featuring state-of-the-art smart control functionalities.

Wireless Lighting Control Concept



All controls in one and one for all applications

Each OS-NET sensor is packed with multiple sensing and control functionalities for fulfilling different control requirements. Specific control scheme can be easily set to provide sophisticated control for all networked luminaires without requiring complex wiring and complicated commissioning.

Deploy a wireless mesh network effortlessly

A ZigBee based wireless mesh network can be effortlessly deployed while installing the OS-NET enabled luminaires and lighting system within commercial and industrial environments. Establishing a wireless mesh network throughout the entire building can never be so simple and easy.

Flexible fixture integration and mounting options

OS-NET sensor can be flexibly integrated with OEM luminaires or mounted on the ceiling with multiple options. The unparalleled integration flexibility allows installing the OS-NET enabled lighting system in the same way as installing conventional luminaires and occupancy sensors.

Single device can be assigned to multiple groups

A single OS-NET device can be assigned to be member of up to 4 groups. This feature allows multiple lighting groups to be activated simultaneously by the sensor located at the spot with multi-directional traffics. Advanced control setting enables pre-lighting or directional lighting.

Individual sensing control with group activation

When a grouped OS-NET sensor detects the presence of occupant, it not only controls the connected luminaires as per scheme set, but also simultaneously broadcasts occupied status to other OS-NET devices of the group to execute the programmed controls respectively.

Hybrid Switching protects from inrush current

An advanced Hybrid Switching technology is employed to protect every OS-NET sensor from being damaged by high inrush current while switching on the LED driver. With Hybrid Switching technology, the service lifetime of OS-NET device is thus guaranteed.

SmartDIM constant lighting control technology

SmartDIM control can be individually programmed to achieve constant lighting. This advanced dimming control technology continuously regulates lighting output to maintain the luminance within the preset range according to the occupancy status and ambient light level.

Easy and intuitive IR remote programming tool

Unlike other lighting control solutions that require operating proprietary management software, APP or additional hardware for commissioning. All you need is a handheld 2-way IR remote to link the network while grouping the devices, set the control scheme and parameters.

IR-TEC PSG

OS-NET Sensors

OS-NET sensors are primary network devices of OS-NET system. Each sensor is packed with multiple sensing control functionalities, including occupancy/vacancy sensing and ambient light sensing, 0-10V or DALI control output, and wireless mesh network connectivity. Table below presents various form factors of OS-NET sensors with available mount, coverage and application descriptions;

Form	Mount	Coverage	Application Description
M1 	Fixture Ceiling	Fixed	Miniature sensors for luminaire integration or ceiling recess mount via a 25mm hole. Specific power pack controllers can be easily connected to control LED panel or troffer luminaires powered by DALI/0-10V and typical LED drivers.
M2 	Fixture	Fixed	Compact sensors designed for integrating with general commercial luminaires through a 25mm hole. Available with DALI broadcast or 0-10V control.
M2P 	Batten IP-65	Fixed	Compact IP-65 sensors designed for assembly with batten mount luminaires via a 1/2” knockout hole on the end cap. Available with DALI broadcast or 0-10V control.
M3 	Fixture	Changeable L	Compact sensors designed for integrating with general commercial luminaires through a 34mm hole. Multiple lens options are available for providing distinctive detection coverage.
M3P 	Batten IP-66	Changeable L	Compact IP-66 sensors designed for integrating with linear commercial luminaires via a 1/2” knockout hole on the end cap. Multiple lens options are available for providing distinctive detection coverage.
T5F 	Fixture Ceiling Batten M	Changeable L	For integrating with OEM luminaire through a 2" hole. This form factor can be transformed into batten mount or ceiling mount sensors with optional mounting brackets. Multiple lens options are available for providing distinctive detection coverage.
T5W 	Fixture Batten M IP-66	Changeable L	For integrating with IP-66 OEM luminaire through a 2" hole. This form factor can be transformed into batten mount with the optional mounting bracket. Multiple lens options are available for providing distinctive detection coverage.
A6 	Attached IP-66	Changeable L	IP-66 sensor designed for attaching to circular high bay luminaires. Multiple lens options are available for providing distinctive detection coverage.
Z7 	Zhaga Z10 IP-66	Changeable L	IP-66 sensors with Zhaga or Z10 connector. Multiple lens options are available for providing distinctive detection coverage.

M : Multiple mounting options L : Multiple lens options

Following tables present all OS-NET sensors categorized by control output with respective characteristics for selection.

Model No.	Form	Options	Tech	ALS	IP	Power	Control output
DALI control							
ON-MRD-600SA	A6	L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast
ON-MRD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast
ON-MRD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast
ON-MRD-210S	M2	--	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast
ON-MRD-200SP	M2P	--	PIR	●	65	230-240 VAC / DALI bus	DALI broadcast
ON-MRD-514SF	T5F	M L	PIR	●	--	DALI bus	DALI broadcast
ON-MRD-514SW	T5W	M L	PIR	●	66	DALI bus	DALI broadcast
ON-MRD-124S	M1	--	PIR	●	--	DALI bus	DALI broadcast
ON-MRD-124W[1]	M1	--	PIR	●	--	DALI bus	DALI broadcast
0-10V control							
ON-LRD-609SA	A6	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-209S	M2	--	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-209SP	M2P	--	PIR	●	65	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V
ON-LRD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V
ON-BRD-500SF	T5F	M L	PIR	●	--	12-24 VDC	0-10V
ON-BRD-500SW	T5W	M L	PIR	●	66	12-24 VDC	0-10V
ON-BRD-510SF	T5F	M L	PIR	●	--	12-24 VDC	0-10V
ON-BRD-510SW	T5W	M L	PIR	●	66	12-24 VDC	0-10V
Zhaga connection							
ON-MRD-734SZ	Z7	L	PIR	●	66	Aux (+24V)	DALI broadcast
ON-BRD-734SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	0-10V
Z10 connection							
ON-BRD-735SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	0-10V

[1]Wide angle detection.

Mounting Options refer to page 33 for more information

T5F

EMB-500
Fixture External

SMB-500
Ceiling Surface

CMB-500
Junction Box

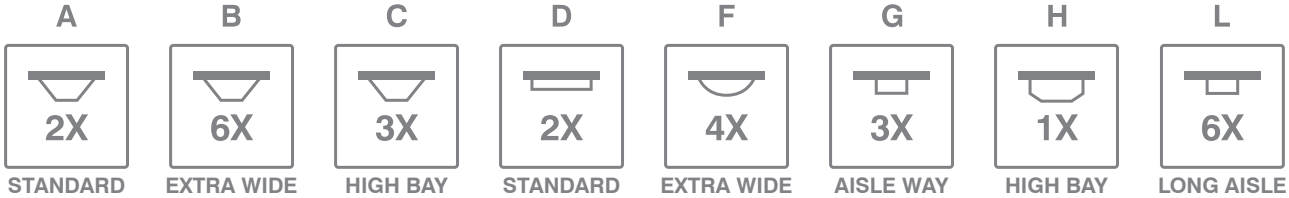
RMB-500
Ceiling Recess

LMB-500
Ceiling Recess with cable strain relief

T5W

PMB-500
IP-66 Fixture External

Lens Options refer to page 34 for more information



OS-NET Buttons

OS-NET buttons are optional network devices designed to provide manual on-off and dimming control to the associated lighting groups. Available in two form factors for different wall boxes; the ON-PBD-815 is for standard EURO type wall box, and the ON-PBD-70x is for standard NEMA single wall box.

Model No.	Description	Ch.	Wall Box	Power Input
ON-PBD-815W	OS-NET button	1	EURO	230 VAC
ON-PBD-705W	OS-NET button	1	NEMA	120-277 VAC
ON-PBD-708W	4-channel OS-NET button	4	NEMA	120-277 VAC
ON-PBD-709W	OS-NET scene controller	1	NEMA	120-277 VAC

ON-PBD-815W

ON-PBD-705W

ON-PBD-708W

ON-PBD-709W

OS-NET Controllers

OS-NET controllers are network devices designed to provide 24VDC power for low voltage wired occupancy sensors with heavy duty load switching capacity for area lighting control.

Model No.	Functional Description	Power Input	DC Output	Max. Load
ON-PPU-301	Power pack & load controller, plug load control	120-277 VAC	24 V, 100mA	20A
ON-PPU-302	Power pack & load controller with 0-10V dimming	120-277 VAC	24 V, 100mA	20A
ON-PPU-303	Demand response controller	120-277 VAC	--	--
ON-PPU-304	Override controller	120-277 VAC	--	--

Configuration Tools

Following configuration tools can be used to configure OS-NET system and control setting.

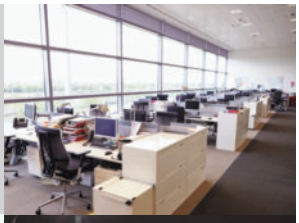
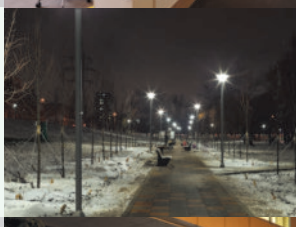
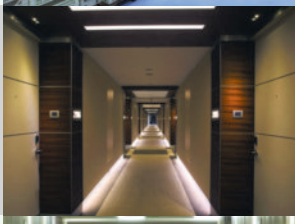
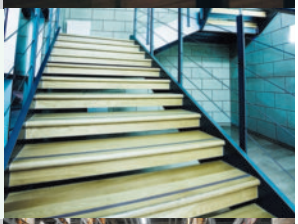
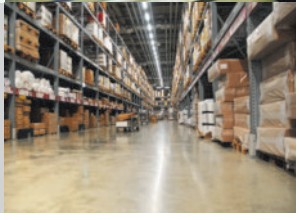
Model No.	Functional Description
SRP-281	Universal programming tool for configuring the entire OS-NET system, including network build-up, devices grouping and linking to the network, setting sensor control scheme and parameters, and all other system management associated tasks.
URP-100	A slim remote programmer designed for user to change certain control setting items, such as delay time, day/night threshold lux level, manual on/off/dim.

URP-100

SRP-281

Scalable Intelligent Lighting for All Applications

The OS-NET solution can be used indoors or outdoors in most applications of commercial, industrial, and institutional lighting environments to maximize energy efficiency through a wirelessly interconnected, versatile, simple to use, intelligent lighting control network.

Classroom		Office	
Cold storage		Outdoor	
Corridor/hallway		Parking garage	
Emergency exit		Retail	
Hazardous/ chemical area		Public restroom	
Lecture hall		Stairwell	
Manufacturing		Warehouse	

TRANS Occupancy / Vacancy Sensors

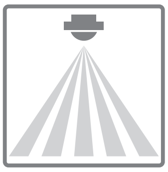
Originated from a second-to-none "Interchangeable EMO" design concept, IR-TEC has created a wide range of occupancy sensors under TRANS family name. TRANS family consists of numerous types of occupancy sensors utilizing Passive Infrared (PIR), High Frequency Doppler (HFD), or combining PIR and HFD sensing technologies with advanced micro-processers to deliver distinctive electrical characteristics and versatile control functionalities.

T5F/T5W M L

E Electrical

M Mechanical

O Optical



TRANS-PIR

TRANS-PIR Occupancy/Vacancy Sensors

Passive Infrared (PIR) is the most widely used occupancy sensing technology in the market. PIR sensor senses the presence and motions of occupant by detecting the change of infrared energy emitted from a warm object (ex. human body or vehicle) in motion.

Every PIR sensor would require an optical lens, generally a plastic part with multiple segments called fresnel lens, to collect the infrared energy to the sensing component. The fresnel lens divides the detection coverage into multiple zones corresponding to the respective segments of concentric circles. Thus, lenses with different segments provide different detection patterns. In general, PIR sensor is more sensitive to the movements across the detection zones than toward the sensor. The closer the occupant is to the sensor, the better detection to the motion.

TRANS-PIR sensors with T5F/T5W form factor are renowned with multiple mounting and lens options. The sensors with M3/M3P, T5F/T5W, A6, and Z7 form factors all feature multiple lens options. Refer to page 3 for more information on form factors.

TRANS-PIR sensors can be configured using manual switches, remote programmers or mobile applications depending on the model. Selected models support configuration via a universal 2-way IR remote programmer (SRP-280) or a slim-card remote (URP-100). Models with Bluetooth capabilities can be wirelessly configured via the IR-TEC Sensor Config app.

A6 L

Z7 L

M1

M2

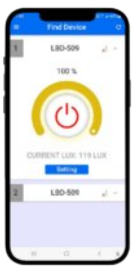
M2P

M3 L

M3P L

URP-100

SRP-280



APP

ANDROID APP ON Google play

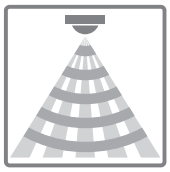
Download on the App Store

TRANS-HFD

TRANS-HFD Occupancy Sensors

High Frequency Doppler (HFD) sensing technology is different from PIR, it senses the presence and motions of occupant by detecting the frequency shift bouncing back from a moving object. HFD sensor provides better minor motion detection without requiring an unobstructed line-of-sight placement like PIR. TRANS-HFD occupancy sensor employs an advanced HFD radar module operating with very high frequency radio waves, thus making it suitable for applications like office with partitions, library with cubicles or restroom with stalls. All TRANS-HFD occupancy sensors are available with multiple mounting options.

T5F M



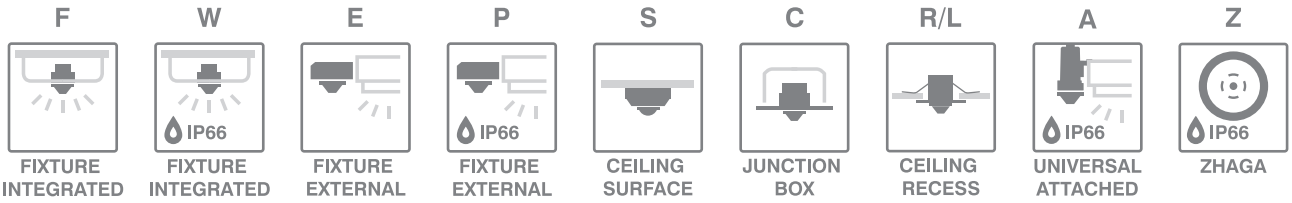
TRANS-DUO

TRANS-DUO Occupancy Sensors

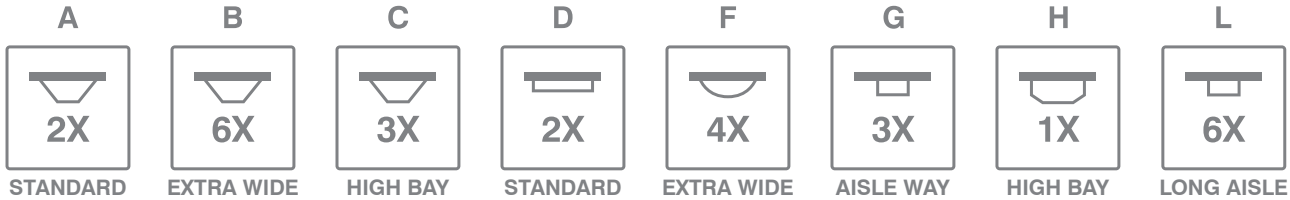
As no any single occupancy sensing technology is perfect, thus we created TRANS-DUO occupancy sensor to provide better reliability and performance by combining PIR and HFD sensing technologies into a low profile sensor housing. By utilizing the advantages of each single sensing technology with advanced processing logic from TRANS-PIR and TRANS-HFD sensors, TRANS-DUO occupancy sensor is ideal for most applications, as it not only provides superior sensing performance, but also greatly reduces the possibility of false activating caused by environmental interferences. TRANS-DUO occupancy sensor can be ordered to supply with specific lens to provide different PIR detection coverage.

T6 L

Mounting Options M



Lens Options L



Following tables present all TRANS occupancy/vacancy sensors categorized by control output with respective characteristics for selection.

Model No.	Form	Options	Tech	ALS	IP	Power	Control output	Setting
DALI/DALI-2 control								
MBD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	APP
MBD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	APP
MRD-600SA	A6	L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-210S	M2	--	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-200SP	M2P	--	PIR	●	65	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-124S	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
MRD-124W[1]	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
MOD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Manual
MOD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Manual
MRA-514SF	T5F	M L	PIR	●	--	DALI bus	DALI-2	Network
MRA-514SW	T5W	M L	PIR	●	66	DALI bus	DALI-2	Network
MRA-124S	M1	--	PIR	●	--	DALI bus	DALI-2	Network
MRA-124W[1]	M1	--	PIR	●	--	DALI bus	DALI-2	Network
0-10V control								
HRD-600SP	T6	L	PIR	●	66	347/480 VAC	Switched live w/0-10V	Remote (IR)
LBD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LRD-609SA	A6	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LMD-509SF	T5F	M	HFD	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
BBD-500SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-500SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-510SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-510SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	APP
BRD-500SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-500SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-510SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-510SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-310S	M3	L	PIR	●	--	12-24 VDC	Open collector active low w/0-10V	Remote (IR)

[1]Wide angle detection.

Model No.	Form	Options	Tech	ALS	IP	Power	Control output	Setting
On-Off control								
LRS-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid)	Remote (IR)
LRS-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid)	Remote (IR)
LRS-202SP	M2P	--	PIR	●	65	120-277 VAC	Switched live	Remote (IR)
LOS-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid)	Manual
LOS-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid)	Manual
LOS-505SF	T5F	M L	PIR	●	--	120-277 VAC	Isolated dry contact	Manual
LOS-505SW	T5W	M L	PIR	●	66	120-277 VAC	Isolated dry contact	Manual
LMS-509SF	T5F	M	HFD	●	--	120-277 VAC	Switched live (hybrid)	Manual
LVS-508NF[2]	T5F	M L	PIR		--	220-240 VAC	Switched live (hybrid)	Manual
LVS-508NW[2]	T5W	M L	PIR		66	220-240 VAC	Switched live (hybrid)	Manual
Zhaga connection								
MRD-734SZ	Z7	L	PIR	●	66	Aux (+24V) / DALI bus	DALI broadcast	Remote (IR)
MRA-734SZ	Z7	L	PIR	●	66	Aux (+24V) / DALI bus	Zhaga D4i	Network
BRD-734SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	Isolated dry contact w/0-10V	Remote (IR)
Z10 connection								
BRD-735SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	Isolated dry contact w/0-10V	Remote (IR)
PWM control								
COS-516SF	T5F	M L	PIR	●	--	12-48 VDC	PWM	Manual
COS-516SW	T5W	M L	PIR	●	66	12-48 VDC	PWM	Manual
BMS/BA integration								
BOS-515SF	T5F	M L	PIR	●	--	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515SW	T5W	M L	PIR	●	66	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515NF	T5F	M L	PIR		--	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515NW	T5W	M L	PIR		66	12-24 VAC/DC	Isolated dry contact	Manual
BDS-600SS	T6	L	PIR+HFD	●	--	12-24 VDC	Isolated dry contact	Manual
BDS-610SS	T6	L	PIR+HFD	●	--	12-24 VDC	Isolated dry contact	Manual
Modbus control								
MRB-510SF	T5F	M L	PIR	●	--	12-24 VDC	Modbus	Network
MRB-510SW	T5W	M L	PIR	●	66	12-24 VDC	Modbus	Network

[2] Models with manual-on control. Push-button required.

Mounting Options refer to page 33 for more information

T5F

EMB-500
Fixture External

SMB-500
Ceiling Surface

CMB-500
Junction Box

RMB-500
Ceiling Recess

LMB-500
Ceiling Recess with cable strain relief

T5W

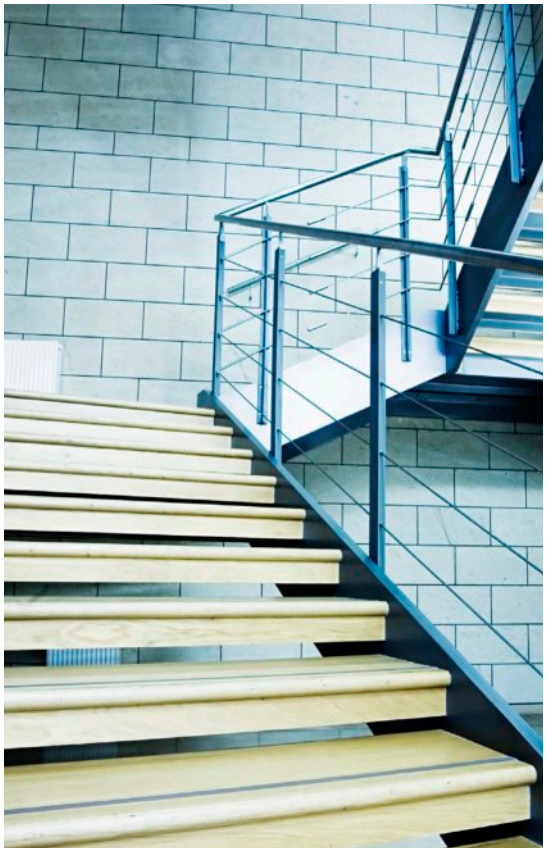
PMB-500
IP-66 Fixture External

Lens Options refer to page 34 for more information

Luminaire Internal Occupancy Sensors

Passive Infrared (PIR) technology based sensor requires unobstructed line-of-sight to detect the occupant's presence and motions. For the luminaire that requires sensor to be placed internally, PIR technology may not be an adequate sensing technology, but the High Frequency Doppler (HFD) instead. The HFD technology operates with high frequency radio waves that are capable of detecting the occupant's presence and movement through non-metallic material like plastic, glass, plywood or plaster board. IR-TEC offers a series of HFD occupancy sensors available for mounting inside the OEM fixtures and providing occupancy sensing based on/off switching or multi-mode, bi-level dimming control.

Model No.	Tech	ALS	IP	Power	Control output	Setting
0-10V control						
LMD-109	HFD	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
On-Off control						
LMS-109	HFD	●	--	120-277 VAC	Switched live (hybrid)	Manual



LMS-109

LMD-109

HVAC/Fan Control Occupancy Sensors

The OS-series is a series of wall and/or ceiling mount low voltage occupancy sensors employing single PIR or PIR+HFD dual technology in the same housing. These sensors can be applied to provide occupancy sensing outputs with adjustable delay time for Lighting, HVAC, and BMS controls.

The **OS-36x** sensor can be surface or recess mounted on the ceiling to provide 360° look-down occupancy detection. The **OS-550** sensor can be mounted on the wall or ceiling with a multi-directional mounting bracket to provide horizontally/vertically adjustment of its 110° look-out occupancy detection.

OS-363
OS-361DT

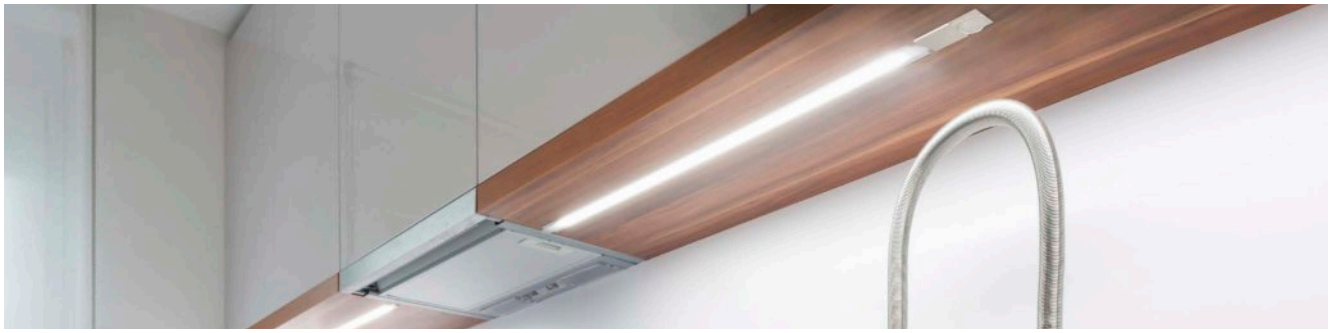
OS-550

Model No.	Tech	ALS	IP	Power	Control output	Setting
OS-363	PIR		--	24 VAC/DC	Form C dry contact	Manual
OS-550	PIR		--	24 VAC/DC	Form C dry contact	Manual
OS-361DT	PIR+HFD		--	24 VDC	Form A dry contact	Manual

Under Cabinet Occupancy Sensors

IR-TEC offers a specially designed occupancy sensor for under-cabinet or under-shelf LED lighting control. The sensor combines a cutting edge passive infrared sensor with an advanced signal processor in a compact housing. Thanks to its low profile design, the sensor can be easily mounted under a cabinet or shelf to provide energy-efficient occupancy sensing based automatic LED lighting control.

Model No.	Tech	ALS	IP	Power	Control output
POH-946MEW	PIR		--	12-48 VDC	PWM



WALLSENZR Wall Switch Sensors

The WALLSENZR family is a combination of commercial wall switch sensors featuring innovative designs and superior functionalities that IR-TEC has designed to deliver the best sustainability for today's building control.

Created for achieving the maximum energy savings, IR-TEC's wall switch sensors can easily replace legacy toggle switches to provide occupancy, or vacancy sensing based load control in various modes to meet control requirements. This state-of-the-art wall switch sensor family consists of a wide range of line voltage or low voltage PIR and PIR+HFD dual technology sensors with single or double pole output for on/off switching or bi-level control.

Standing on the commitment of providing more green innovations in building control sector, IR-TEC sees every manual wall switch as an opportunity to create a more sustainable future. Let the WALLSENZR shape a smarter and greener building.

RELIABILITY · AESTHETICS · PERFORMANCE

Screwless Snap-in Wallplate*

Contemporary wallplate provides interior decorator pleasing appearance.

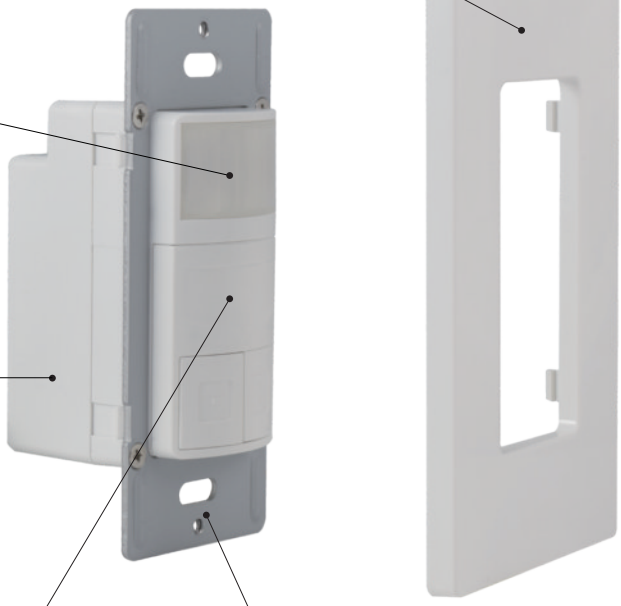
*WALLSENZR will allow for off-the-shelf wall plates with screws as well.

Vandalism Protection Lens

Specialized lens prevents vandalism while keeping optimum detection.

Hybrid-Switching Control

Provide superior service life for controlling load with high inrush current.



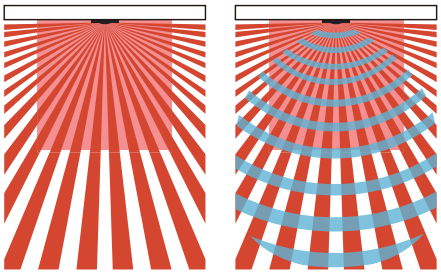
Appealing Aesthetics Profile

Low profile appealing aesthetics design with no grid opening on the front.

NEMA Standard Mounting Plate

Superior Sensing Capability

180° field of view detection with superior minor motion sensing capability.



PIR

PIR+HFD Dual-Tech

Easy and Accurate Settings

Accu-Set digital potentiometers provide fast, easy and accurate settings.

Benefits of Using WALLSENZR

Reducing the Energy Cost

IR-TEC WALLSENZR can effectively reduce the energy consumption in building spaces by ensuring that lights are turned off or to a lower level when spaces are unoccupied. Depending on the spaces and areas applied, using IR-TEC WALLSENZR will maximize the energy savings as per guidelines below;

- **The more lighting and loads controlled by sensors, the better energy efficiency is**
- **The lower occupancy rate of the space applied, the higher energy saving potential**

Energy Codes Compliance

In addition to energy savings, IR-TEC WALLSENZR is embracing manual-on operation to maximize Return on Investment (ROI). With either in auto-on or manual-on control, the WALLSENZR family meets the automatic shutoff requirements of current energy codes such as; ASHRAE 90.1, IECC and CA Title 24.

Bi-level Switching Control

By offering two control outputs, one that comes on automatically and another comes on manually as demand, the 2-pole WALLSENZR provides bi-level switching control options that have the potential to save more energy by enabling the occupants to use as much light as needed.

No Compromise in Safety

Programmable Delay-OFF timing provides safety and comfort so no one has to leave the room in the dark. Occupancy/vacancy sensors ensure to only turn off the light after the delay time elapsed.

Interior Décor Satisfaction

IR-TEC WALLSENZR family is created to satisfy interior decorators with an aesthetically pleasing low profile design. The world's first PIR+HFD dual-tech wall switch sensor features a fully enclosed sensor front without grid openings.

Rebate and Tax Deduction

Using occupancy/vacancy sensors can help commercial building owners earn the tax deduction and/or receive rebates from utilities based on superior energy savings.

Sustainable Building Design

The wall switch sensors that meet, or exceed, current code requirements can contribute to increasing a building's energy efficiency, and earn additional points for LEED certification.

Occupancy/Vacancy Sensor Convertible

Every WALLSENZR wall switch sensor can be programmed to control the lighting as an occupancy sensor (auto-on/auto-off) or a vacancy sensor (manual-on/auto-off).

Model No.	Color	Tech	ALS	Pole	Power	Control output	Setting
0-10V control							
LDD-700S	**W/I**	PIR+HFD	●	1 pole	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
On-Off control							
LBS-700S	**W/I**	PIR	●	1 pole	120-277 VAC	Switched live (hybrid)	Manual
LBS-700N	**W/I**	PIR		1 pole	120-277 VAC	Switched live (hybrid)	Manual
LBT-700S	**W/I**	PIR	●	2 pole	120-277 VAC	Switched live (hybrid)	Manual
LBT-700N	**W/I**	PIR		2 pole	120-277 VAC	Switched live (hybrid)	Manual
LDS-700S	**W/I**	PIR+HFD	●	1 pole	120-277 VAC	Switched live (hybrid)	Manual
LDT-700S	**W/I**	PIR+HFD	●	2 pole	120-277 VAC	Switched live (hybrid)	Manual
BMS/BA integration							
BBS-700S	**W/I**	PIR	●	1 pole	12-24 VDC	Isolated dry contact	Manual
BBS-702S[1]	**W/I**	PIR	●	1 pole	12-24 VDC	Isolated dry contact w/active low	Manual
BBT-700S	**W/I**	PIR	●	2 pole	12-24 VDC	Isolated dry contact	Manual
BBT-702S[1]	**W/I**	PIR	●	2 pole	12-24 VDC	Isolated dry contact w/active low	Manual
BDS-700S	**W/I**	PIR+HFD	●	1 pole	12-24 VDC	Isolated dry contact	Manual
BDT-700S	**W/I**	PIR+HFD	●	2 pole	12-24 VDC	Isolated dry contact	Manual

NOTE: While ordering WALLSENZR, please specify the Model No. with color code.

[1] Models with multi-way manual control (MMC), see page 17.

W: White

PIR 1 pole

PIR 2 pole

PIR+HFD 1 pole

PIR+HFD 2 pole

PIR+HFD 1 pole
Dimming

I: Ivory

PIR 1 pole

PIR 2 pole

PIR+HFD 1 pole

PIR+HFD 2 pole

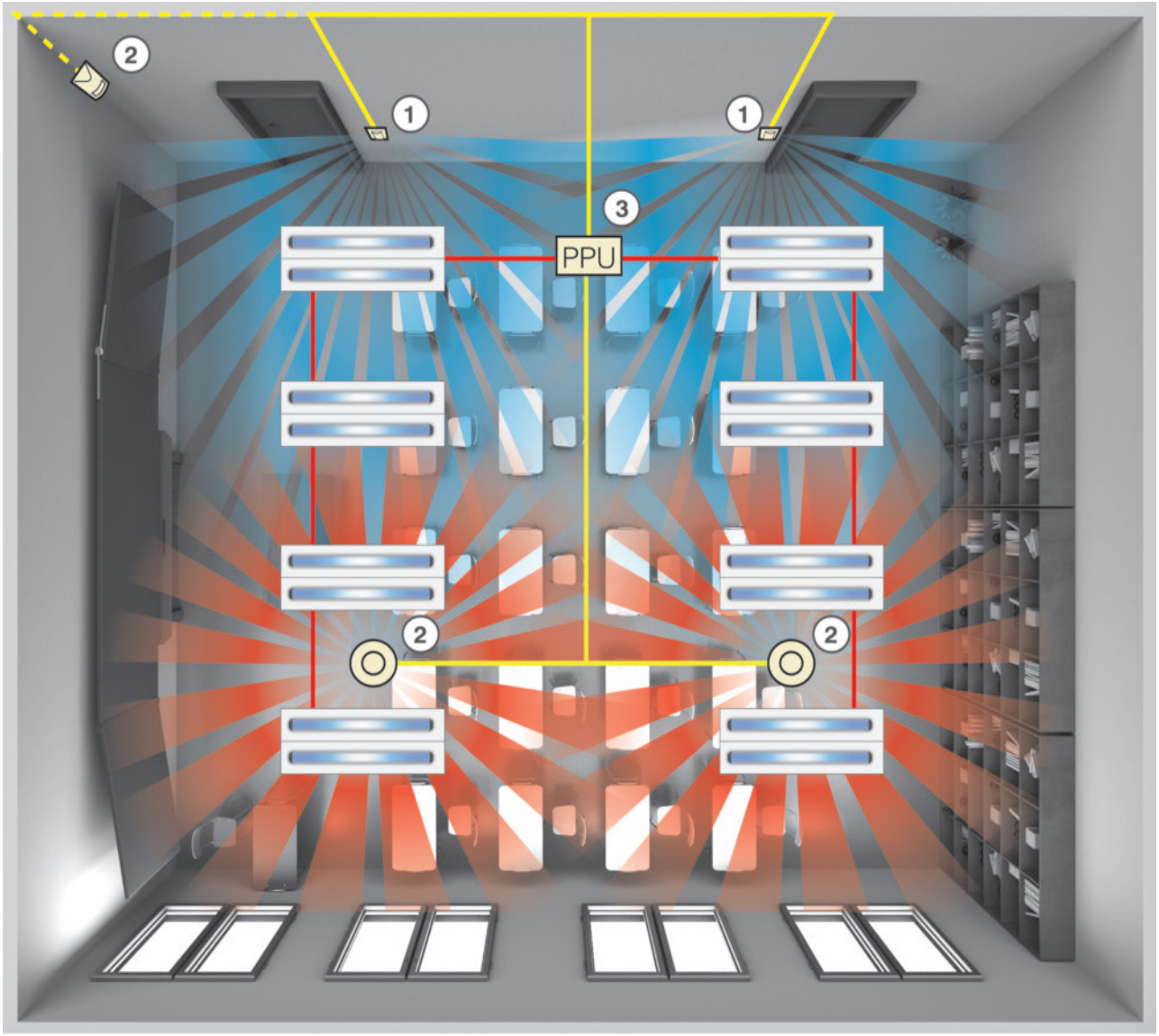
PIR+HFD 1 pole
Dimming

Multi-way Manual Control (MMC)

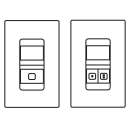
Multi-way Manual Control is a unique feature that allows occupant to manually turn on/off the local lighting via pressing the push button on ANY one of the low voltage wall switch sensors connected to the power pack. The MMC can be applied in large areas with multiple entrances/exits where multiple low voltage wall switch sensors and ceiling sensors may be required to cover the whole area, and yet still be able to provide occupant accessible manual on/off control at multiple positions.

Typical Applications

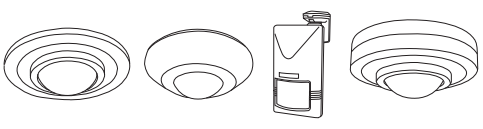
- Classroom
- Open office
- Lecture hall
- Long corridor with turns
- Grand conference room
- Large and open space



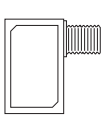
(1) **BBS/BBT-702S Series**
Wall Switch Sensor



(2) **BOS/OS/BDS Series**
Low Voltage Occupancy Sensor

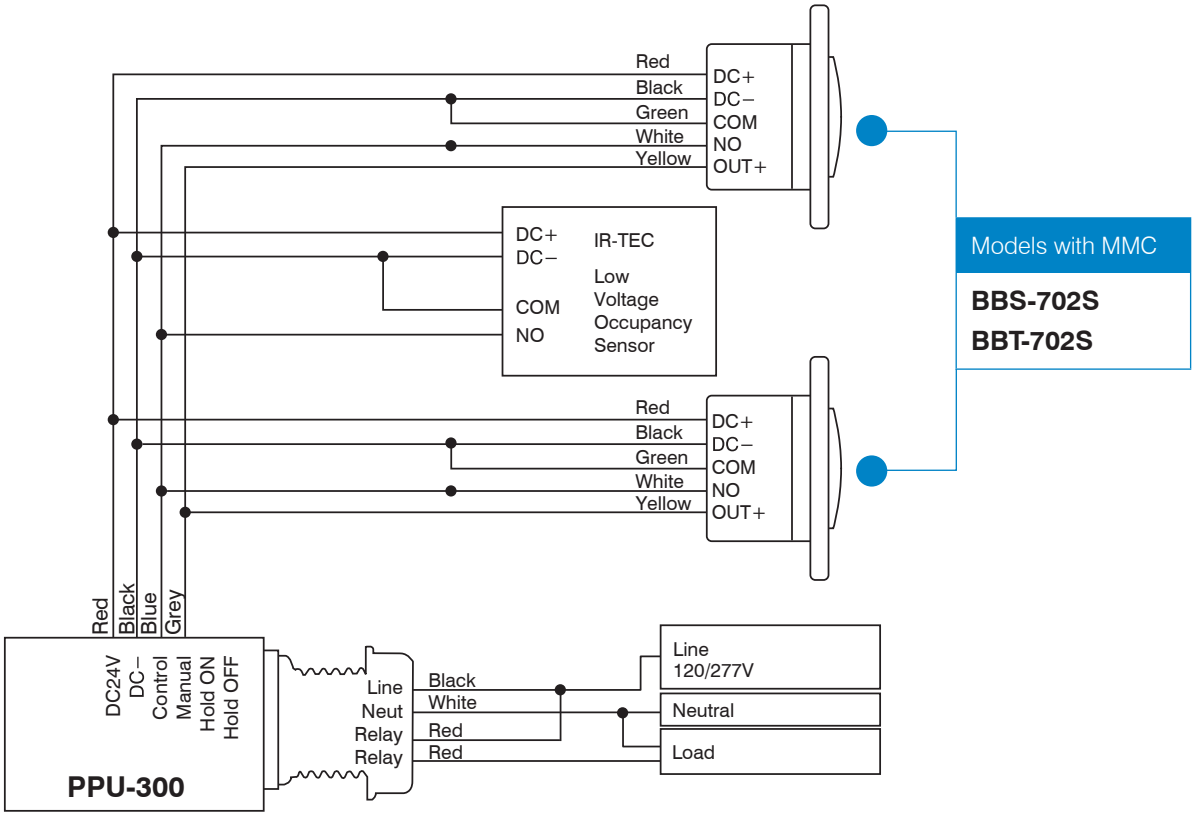


(3) **PPU-300**
Power Pack & Controller

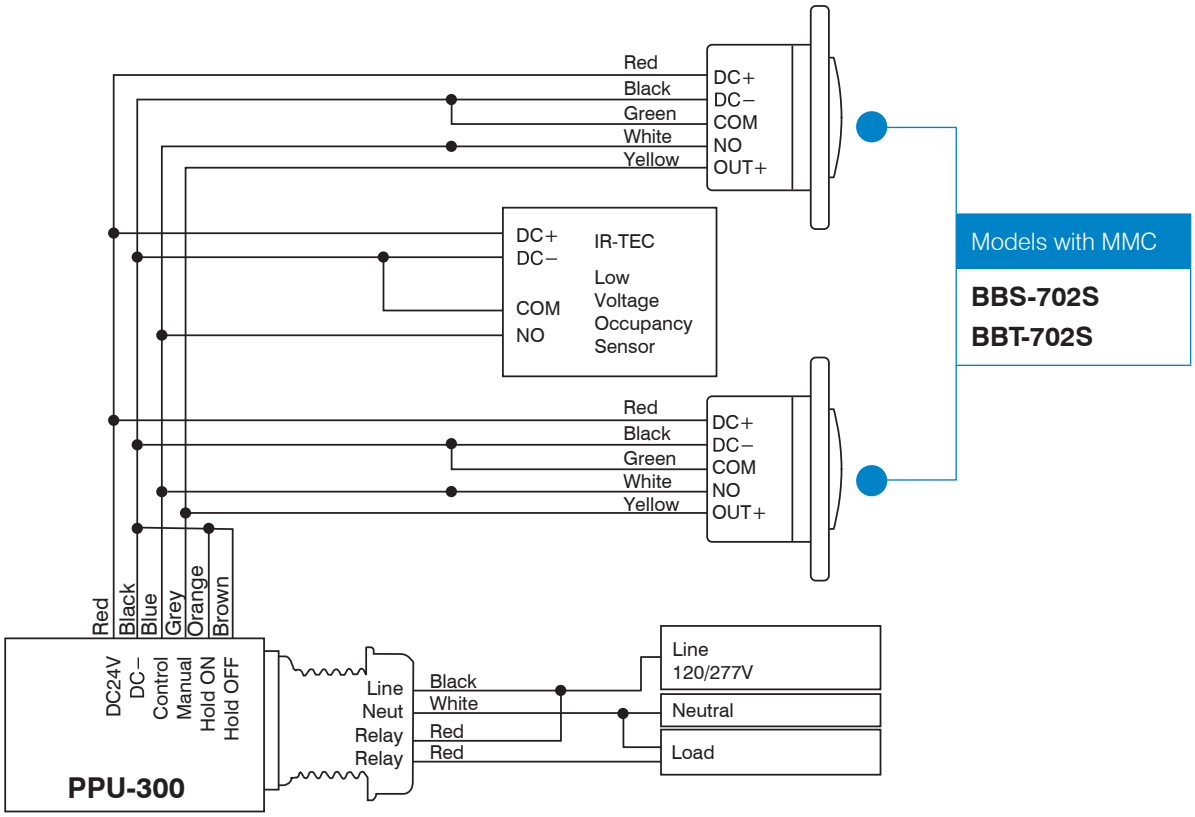


MMC Wiring Diagrams

Occupancy Sensing Control with MMC



Vacancy Sensing Control with MMC

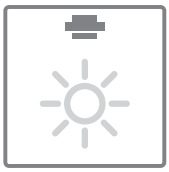


Photocell Daylight Sensors

IR-TEC offers a wide range of daylight sensors designed to measure ambient light levels for daylight-responsive lighting control.

These sensors provide on/off switching outputs or 0-10V analog signals representing ambient light level (ALS), enabling external controllers, LED drivers, or BMS systems to make appropriate lighting control decisions.

By continuously monitoring available natural light, IR-TEC daylight sensors help reduce unnecessary electric lighting while maintaining visual comfort and compliance with energy codes.

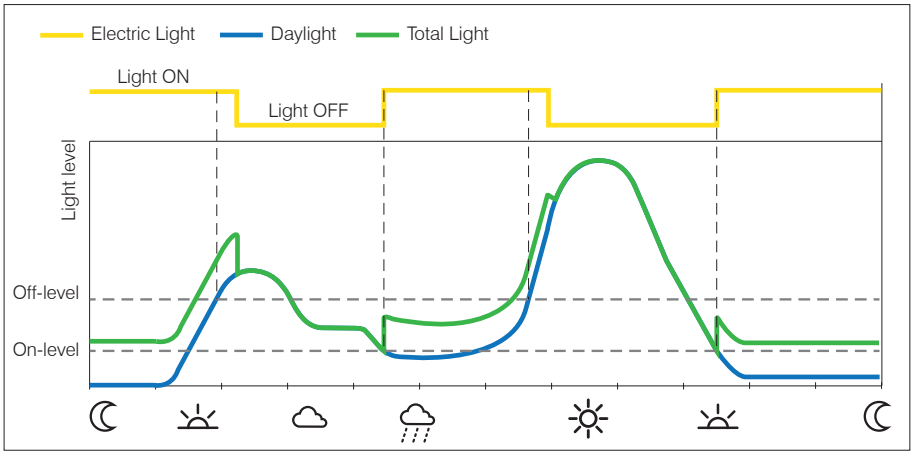


TRANS-LUX

TRANS-LUX Daylight Sensors

Daylight sensing control is a common lighting control strategy. It typically refers to the use of a daylight sensor to inhibit or dim the electric lights in a daylight area by sensing the available natural light. The principle is simple, an ambient light sensor (ALS) measures either the level of daylight contribution or the overall combined natural and electric light as the key component of switching or dimming the controlled lights in one or multiple zones to achieve an optimal lighting level based on the pre-determined parameters.

To provide the most delicate daylight sensing control with the best installation flexibility for today's sustainable buildings, the TRANS daylight sensors can be supplied with specific mounting options.



Model No.	Form	Options	Tech	IP	Power	Control output	Setting
On-Off control							
LPS-509SF	T5F	M	ALS	--	120-277 VAC	Switched live (hybrid)	Manual
LPS-509SW	T5W	M	ALS	66	120-277 VAC	Switched live (hybrid)	Manual
BMS/BA integration							
BPD-500SF	T5F	M	ALS	--	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-500SW	T5W	M	ALS	66	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-510SF	T5F	M	ALS	--	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-510SW	T5W	M	ALS	66	12-24 VDC	Isolated dry contact w/0-10V	Manual

Mounting Options refer to page 33 for more information

T5F

EMB-500
Fixture External

SMB-500
Ceiling Surface

CMB-500
Junction Box

RMB-500
Ceiling Recess

LMB-500
Ceiling Recess with cable strain relief

T5W

PMB-500
IP-66 Fixture External

Power Pack & Controller

IR-TEC power packs and controllers provide system-level control by supplying low-voltage DC power for sensors, while offering reliable load switching, dimming interface, or emergency control functions.

Depending on the application, IR-TEC controllers can be used for:
- Centralized on/off or dimming control with multiple low-voltage sensors
- DALI or 0-10V lighting systems
- Emergency lighting and load override applications

This flexible controller portfolio allows designers to select the appropriate solution for standard lighting control, advanced dimming, or life-safety related requirements.

Model No.	Power Input	Output	DC Output	Control Signal	Max. Load
DALI control					
PPU-100DP	120-277 VAC	DALI	Bus power: 16 VDC, 100mA max.	DALI / Momentary contacts	--
DALI & 0-10V control					
PPU-109DA	120-277 VAC	DALI or Switched live (hybrid) w/0-10V	Bus power: 16 VDC, 100mA max.	DALI / Momentary contacts	6A
On-Off control					
PPU-300	120-277 VAC	Switched live	24 VDC, 150mA max.	Isolated dry contact w/active low	20A
PPU-301	120-277 VAC	Switched live	24 VDC, 150mA max.	Isolated dry contact w/active low	20A
Emergency					
ELC-309	120-277 VAC	Switched live (hybrid)	--	24 VDC sourced, dry contact closure	20A

PPU-100DP

PPU-109DA

PPU-300

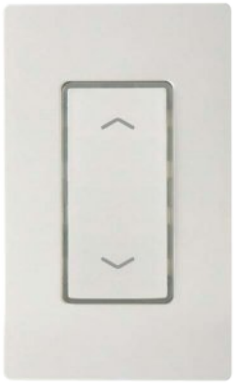
PPU-301

ELC-309

Manual Button & Dimmer

Following push-buttons and dimmers can be used to provide manual on-off and dimming control together with smart sensing control applications.

Model No.	Description	Pole	Wall Box	Power Input
0-10V dimmer				
PBD-720W	Push-button dimmer switch w/0-10V	1 pole	NEMA	12-24 VDC
On-Off button				
PBS-721W	Push-button switch w/momentary contact	1 pole	NEMA	--
PBS-722W	Push-button switch w/momentary contact	2 pole	NEMA	--
PBS-811W	Push-button switch w/momentary contact	1 pole	EURO	--



PBD-720W

PBS-721W

PBS-811W

PBS-722W

Appendix

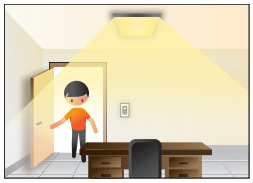
Lighting Control Strategies

Lighting control strategies refer to the types of **sensing** and **switching/dimming** control that will be used to meet the requirements. Applying proper control strategies is the key to deliver a successful lighting control project with high level of occupant satisfaction by taking their needs into account, while ensuring compliance with mandatory energy codes and maximum energy savings.

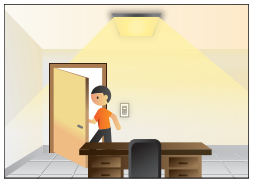
The following strategies are what IR-TEC sensors have to offer to satisfy today's lighting control needs. The first three (OSC, VSC, and DSC) refer to the types of sensing control, and the next three (OOS, BLC, and CDC) refer to the types of light switching/dimming control.

Occupancy Sensing Control (OSC)

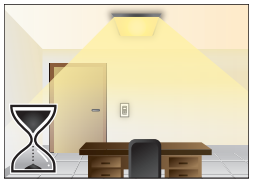
Occupancy Sensing Control typically refers to the use of an **OCCUPANCY SENSOR** that will automatically turn lights on when it detects the presence of an occupant, and automatically turn lights off after the area is vacated for a period of time normally adjustable via setting. This control strategy is considered the most convenient and popular in many applications, especially the areas for public use, since the users never have to operate the control devices. Occupancy sensor may be described as "presence detector/sensor" in Europe.



Occupant presence
Light auto on



Occupant leave
Light remains on

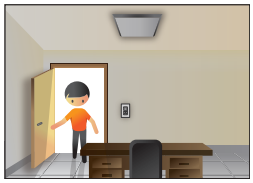


Delay time start
Light remains on

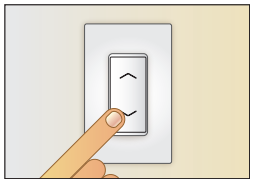
Delay time end
Light auto off

Vacancy Sensing Control (VSC)

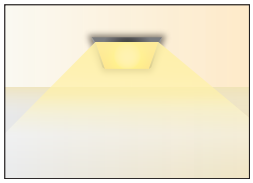
Vacancy Sensing Control typically refers to the use of a **VACANCY SENSOR** that will require the occupant to manually turn on the lights if needed, and sensor will automatically turn lights off after the area is vacant and delay time elapses. This strategy is proven with enhanced energy savings because occupants are less likely to turn the lights on when temporarily entering a space, or passing a corridor if certain light level is available. The latest energy codes in California, Title 24 requires using vacancy sensors in more spaces, especially the residential buildings. Vacancy sensor may be described as "absence detector/sensor" in Europe.



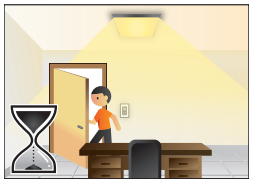
Occupant presence
Light is off



Press button



Light on



Occupant leave - Delay time start
Light remains on

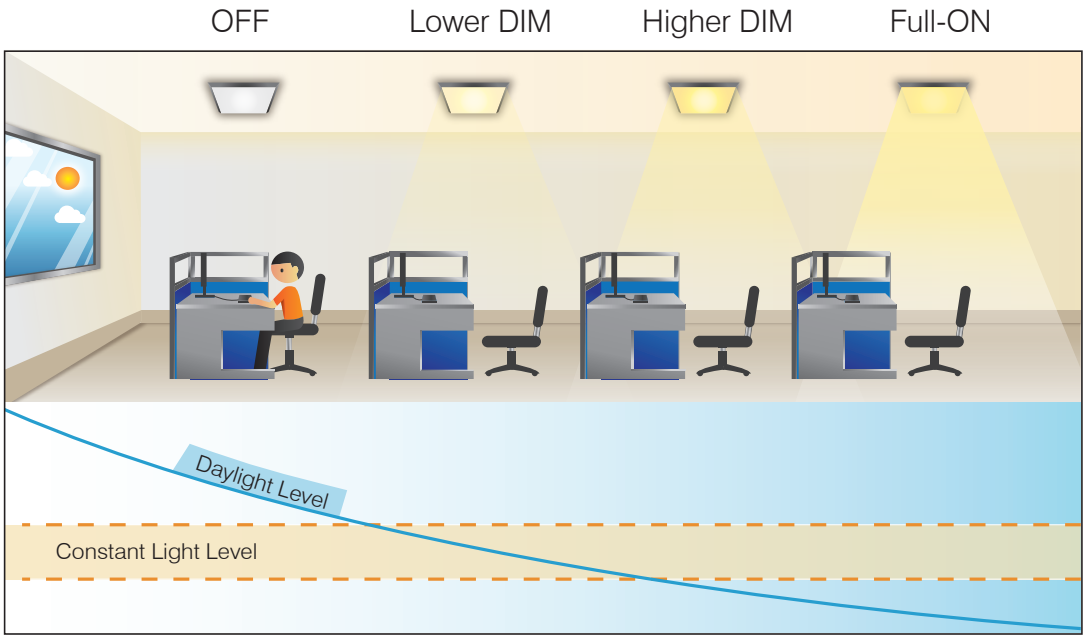
Delay time end
Light auto off

No energy saving solution will succeed if not fulfilling basic human needs.

Daylight Sensing Control (DSC)

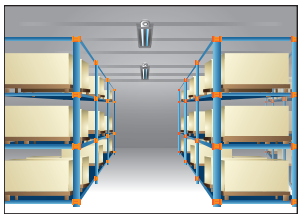
Daylight Sensing Control typically refers to the use of a **DAYLIGHT SENSOR** to inhibit or dim the electric lights in a daylight area by sensing the available natural light. The principle is simple, an ambient light sensor (ALS), some may refer it as photocell sensor, measures either the level of daylight contribution or the overall combined natural and electric light as the key component of dimming or switching the controlled lights in one or multiple zones to achieve an optimal lighting level based on pre-determined parameters.

The Daylight Sensing Control, some may refer to Daylight Harvesting, is an effective control strategy for spaces with ample daylight to save lighting energy up to 60%, and also increases the quality of visual environment. Other benefits of daylight sensing control including helps reduce operating cost while improving user satisfaction, meets the mandatory requirements of energy codes, and contributes to obtaining points in several LEED credits categories.



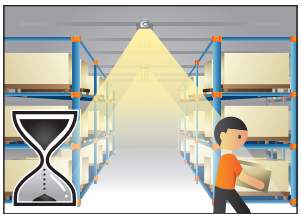
On/Off Switching (OOS)

On/Off switching has been a typical lighting control strategy commonly used in most applications. Most energy codes require automatic shutoff control to save energy unused in many spaces, most IR-TEC occupancy/vacancy and daylight sensors are designed, or can be set to switch on the electrical lights as needed, and automatically switch off when electrical lights are unneeded.

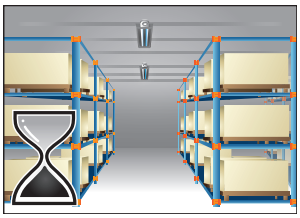


Space vacant
Light is off

Occupancy presence
Light auto on



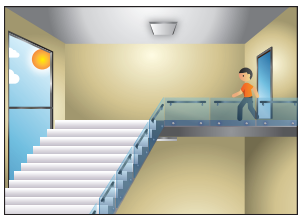
Occupant leave - Delay time start
Light remains on



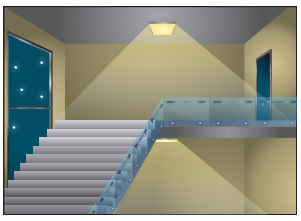
Delay time end
Light auto off

Bi-level Control (BLC)

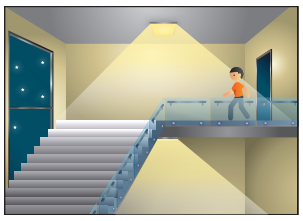
Bi-level control is an ideal control strategy with proven performance in energy savings, while still maintaining certain level of lighting for public safety and comfort. This control strategy requires using a bi-level occupancy/vacancy sensor that will keep the dimmable lighting at a low-dim level or non-dimmable lighting partial on during vacancy period or nighttime, instead of complete shutoff. IR-TEC offers variety types of occupancy sensors with various control modes selectable for bi-level control.



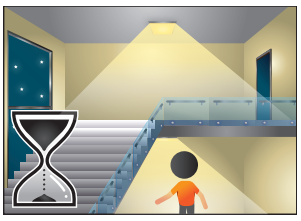
Light is off @day



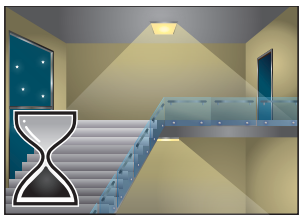
LOW DIM @night



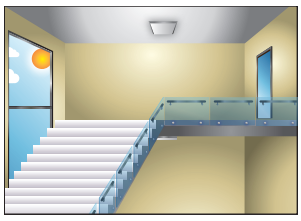
Occupant presence
HIGH DIM or 100% on



Occupant leave
Delay time start



Delay time end
LOW DIM @night



Light off @day

Continuous Dimming Control (CDC)

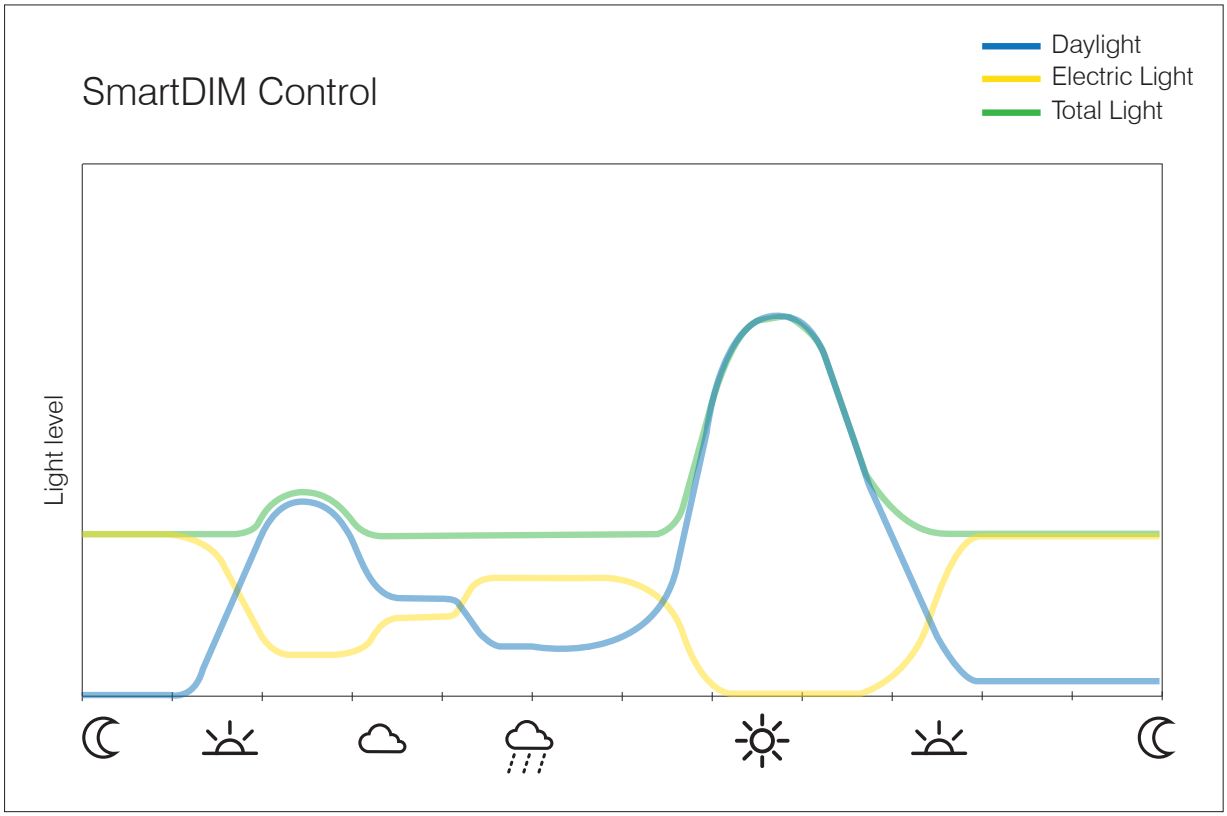
Continuous dimming is an advanced control strategy to achieve maximum energy savings for the lighting in the daylight zones. This strategy typically refers to the use of a sensor with CDC capability that will continuously adjust the lighting output to maintain the ambient light level within a pre-determined range, based on the amount of daylight available in the space. The latest energy codes require more lighting in the daylight zones to be controlled by continuous dimming. This control can only be achieved by using the sensors specially designed with continuous dimming capability.

What is SmartDIM?

SmartDIM is an exclusive dimming control algorithm developed by IR-TEC for the sensors with continuous dimming capability. It is specially designed to provide a smooth and flicker-less dimming performance to ensure occupant satisfaction while achieving maximum energy savings. In addition to the smooth dimming performance, IR-TEC's SmartDIM also helps extend the operational life of lighting fixture through dynamically adjusting the output of electrical lights at optimal level.

Benefits of SmartDIM Control

- **Achieve the highest level of energy savings**
- **Increase productivity and occupant comfort**
- **No compromise in safety while saving energy**
- **Comply with the latest building energy codes**
- **Help obtain the highest building sustainability**



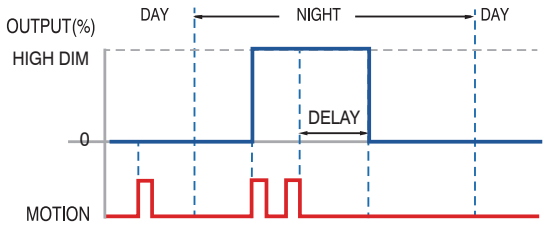
Sensing Control Schemes

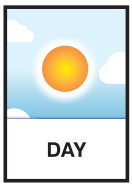
All IR-TEC sensors are designed with single or multiple sensing control schemes to meet versatile requirements of today's smart lighting control. This section describes how the sensor will control the light under different conditions with specific control scheme. The following pages describe the control schemes available with IR-TEC sensors.

OOS - On/Off Switching
OSO - Occupancy Sensing Only
OSLA/OSMA/OSHA - Occupancy Sensing at Low/Medium/High Ambient Light
OSLATO/OSMATO/OSHATO - Occupancy Sensing at Low/Medium/High Ambient Light with Time Off
OSB - Occupancy Sensing with Background Lighting
VSC - Vacancy Sensing Control
DSC - Daylight Sensing Control
DSVM - Daylight Sensing with Virtual Midnight

OOS – On/Off Switching

The OOS is a typical occupancy sensing control scheme that can be applied in most spaces with or without daylight available.

Sensor Control Description	Control Chart
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 turned on to HIGH DIM level or SmartDIM automatically once the sensor detects the presence of occupant, and turned off after the delay time elapsed.	

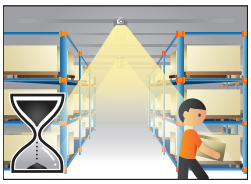


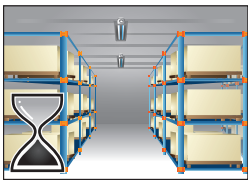

Space vacant
Light is off


Occupant presence
Light remains off


Space vacant
Light is off


Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

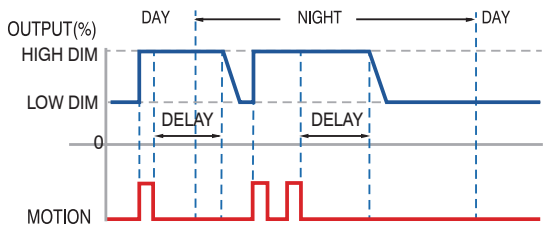

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

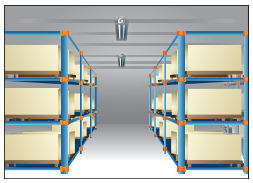

Delay time end
Light auto off

* If LOW DIM is set at "0%", the sensor will control the light as on-off switching, bi-level control will be void.
** Continuous dimming control, only available with sensors featuring SmartDIM.

OSO – Occupancy Sensing Only

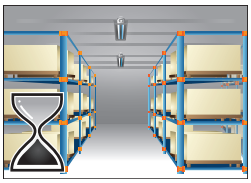
The OSO mode can be applied in the spaces without daylight but requiring certain light level for safety, security or emergency purpose even under vacancy. Typical applications include underground parking garages, 24-hour operation warehouses, stairwells, internal public hallways…etc..

Sensor Control Description	Control Chart
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.	


Space vacant
Light is at LOW DIM*

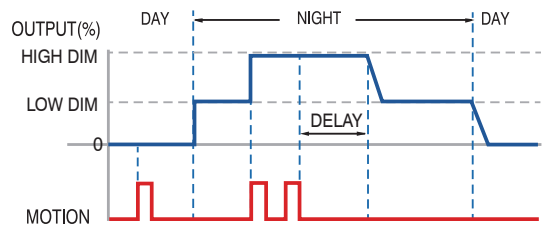

Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

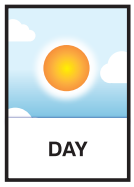

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

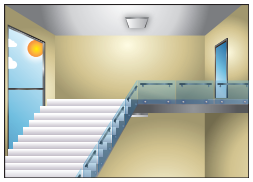

Delay time end
Light is at LOW DIM*

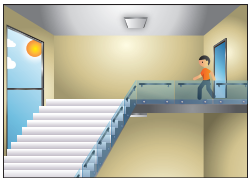
OSLA/OSMA/OSHA – Occupancy Sensing at Low/Medium/High Ambient

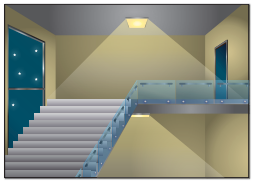
The OSLA/OSMA/OSHA control scheme can be applied in the spaces with daylight available but requiring an automatic low level lighting when ambient light level is lower than the threshold. Typical applications include perimeter zones of parking structures, stairwells/hallways/restrooms/elevator lobbies with window…etc.

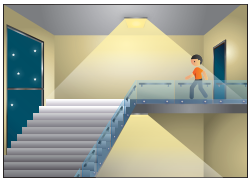
Sensor Control Description	Control Chart
Lighting will be inhibited if the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold, the sensor will automatically control the light at LOW DIM level. When sensor 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.	



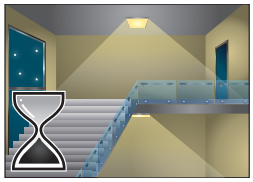

Space vacant
Light is off


Occupant presence
Light remains off


Space vacant
Light is at LOW DIM*

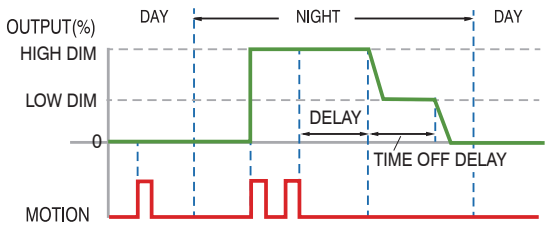

Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

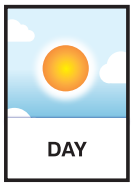

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

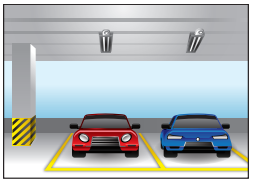

Delay time end
Light is at LOW DIM*

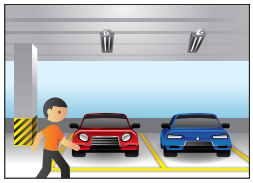
OSLATO/OSMATO/OSHATO –
Occupancy Sensing at Low/Medium/High Ambient with Time Off

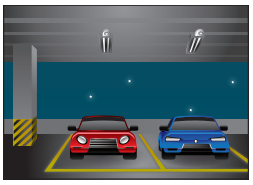
The OSLATO/OSMATO/OSHATO control scheme can be used in the spaces with minor motions that the sensors may not be able to pick up all the time. The sensor provides a low level lighting to remind the occupants before shutting off the light. Typical applications include parking lots, private offices, reading/writing areas, reception rooms…etc..

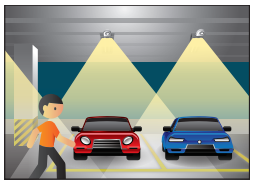
Sensor Control Description	Control Chart
Lighting will be inhibited if the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold, and any sensor detects the presence of occupant, lighting output will be increased 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.	

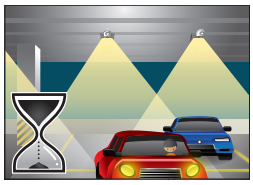


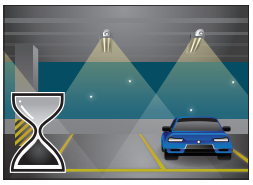

Space vacant
Light is off

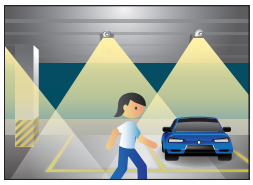

Occupant presence
Light remains off

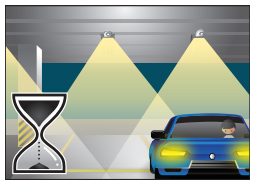

Space vacant
Light is off

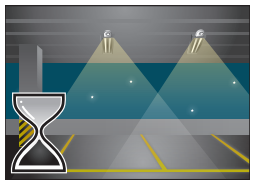

Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

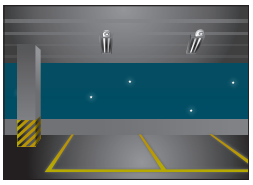

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**


Delay time end - TIME OFF start
Light is at LOW DIM*


Occupant presence
Light auto on to HIGH DIM/
SmartDIM**


Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

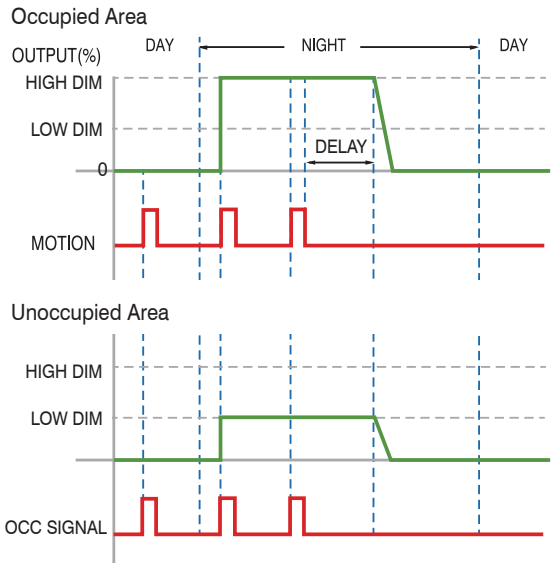

Delay time end - TIME OFF start
Light is at LOW DIM*

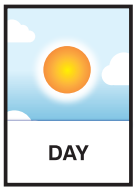

TIME OFF end
Light auto off

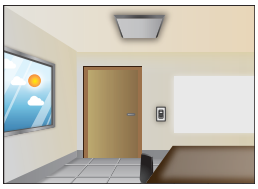
* If LOW DIM is set at "0%", the sensor will control the light as on-off switching, bi-level control will be void.
** Continuous dimming control, only available with sensors featuring SmartDIM.

OSB – Occupancy Sensing with Background Lighting

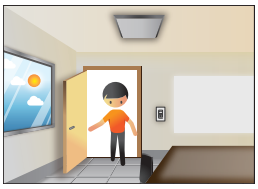
This is an advanced occupancy sensing control scheme that is suitable for open offices to provide background light level before the area of entire lighting group is vacant. This control scheme is only available with OS-NET devices.

Sensor Control Description	Control Chart
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.	



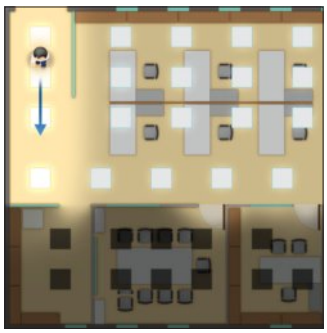


Space vacant
Light is off



Occupant presence
Light remains off

Space vacant
Light is off



The 1st occupant enters,
Lights of sensing area: HD/SD
Rest of entire lighting group: LD

More occupant enters,
More lights of occupied areas brighten up to HD/SD.

People leave the space,
Local lights down to LD after delay elapsed.

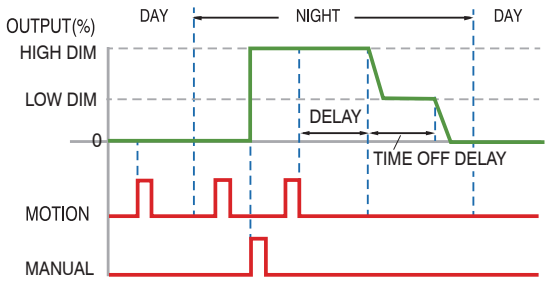
Last occupant leaves - Delay time start
Light remains at LD*/HD/SD

Delay time elapsed, all lights turn off.

LD: Low Dim, HD: High Dim, SD: SmartDIM
* If LOW DIM is set at “0%”, the sensor background lighting will be void.

VSC – Vacancy Sensing Control

The VSC is a vacancy sensing control scheme suitable for spaces that require users to manually turn on the light, and have the sensor turn off the light automatically. This control scheme is only available OS-NET devices.

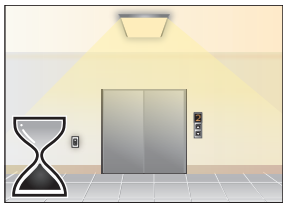
Sensor Control Description	Control Chart
The occupant would have to press the OS-NET Button to turn on the lighting group assigned. The sensor will control the lights at HIGH DIM level or continuously regulate the output to maintain overall lighting level within the pre-set range by SmartDIM control. The sensor will control the connected lighting as per OSLATO.	

Space vacant
Light is off

Occupant presence
Light remains off

Press button
Light manual on to HIGH DIM/
SmartDIM**

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**



Delay time end - TIME OFF start
Light is at LOW DIM*

TIME OFF end
Light auto off

Press button
Light manual off

Occupant leave
Light remains off

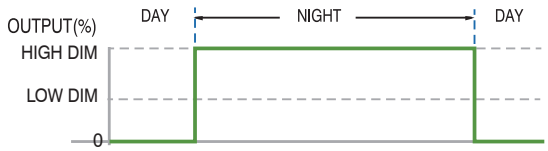
Next occupancy
Light remain off

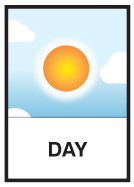
Press button
Light manual on to HIGH DIM/
SmartDIM**

* If LOW DIM is set at “0%”, the sensor will control the light as on-off switching, bi-level control will be void.
** Continuous dimming control, only available with sensors featuring SmartDIM.

DSC – Daylight Sensing Control

The DSC is a daylight sensing control scheme suitable for spaces that require automatic lighting whenever the ambient light is lower than the set threshold.

Sensor Control Description	Control Chart
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.	

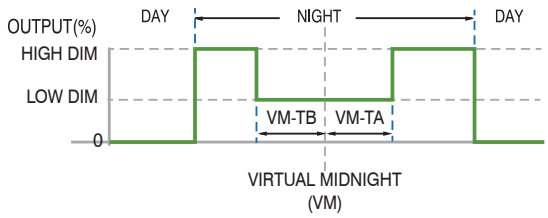


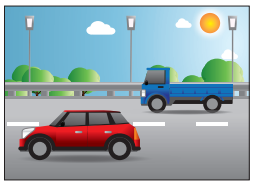

Light is off


Light auto on to HIGH DIM/ SmartDIM**

DSVM – Daylight Sensing with Virtual Midnight

The DSVM is a daylight sensing control scheme suitable for outdoor spaces that require automatically dimming the light to a low level between a certain time before and after virtual midnight to achieve more energy savings.

Sensor Control Description	Control Chart
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.	


Light is off


Light auto on to HIGH DIM/ SmartDIM**


Light auto decrease to LOW DIM from a set time before midnight (VM-TB) to a set time after midnight (VM-TA)


Light auto increase to HIGH DIM/ SmartDIM** from VM-TA to daytime

Mounting Options For T5F/T5W sensors

IR-TEC sensors with T5F/T5W form factor housing can be integrated with luminaire or ceiling mounted in various options with specific mounting bracket.

PIR T5F

PIR T5W

LUX T5F/T5W

HFD T5F

Mounting option	Bracket #	Appearance	Application Description
Form factor T5F			
Fixture External	**EMB-500**		The EMB-500 is a bracket for mounting the sensor with indoor luminaire through a 1/2” hole.
Ceiling Surface	**SMB-500**		The SMB-500 is a bracket for mounting the sensor on the surface of luminaire and hard lid ceiling with or without junction box.
Junction Box	**CMB-500**		The CMB-500 is a bracket for mounting the sensor with an octagonal or square junction box.
Ceiling Recess	**RMB-500**		The RMB-500 is a bracket for recess mounting the low voltage sensor through a 70mm hole.
Ceiling Recess with cable strain relief	**LMB-500**		The LMB-500 is a bracket for recess mounting the sensor through a 70mm hole with a tool removable back cover for cable connection.
Form factor T5W			
IP-66 Fixture External	**PMB-500**		The PMB-500 is a bracket for mounting the sensor with IP-66 luminaire through a 1/2” hole.

Accessories
Following accessories can be applied to extend or change sensor position for the T5F/T5W Sensor with EMB-500/PMB-500.

EJ-30F
30 mm extension joint

EJ-50F
50 mm extension joint

EL-40F
40 mm elbow joint

Lens Options For M3/M3P/T5F/T5W/A6/T6/Z7 PIR sensors

IR-TEC PIR or PIR+HFD sensors with M3/M3P/T5F/T5W/A6/T6/Z7 form factor housing comes with lens that is designed to provides different detection coverages at various mounting heights.

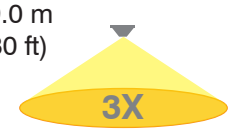
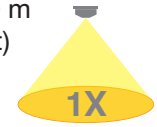
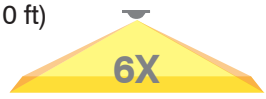
PIR M3

PIR M3P

PIR A6

PIR Z7

PIR+HFD T6

For M3/M3P	For T5F/T5W/A6/Z7/T6	Coverage & Mounting Height	Application Description
a 2X Standard 	**A** 2X Standard 	2.4~4.5 m (8~15 ft) 	A standard lens with 2X height coverage. It can be used to cover small to medium areas with major and walking motions.
b 6X Extra wide 	**B** 6X Extra wide 	2.4~3.0 m (8~10 ft) 	A wide angle lens with 6X mounting height coverage. It provides good detection to the major motions across the detection zones.
c 3X High bay 	**C** 3X High bay 	4.5~9.0 m (15~30 ft) 	A high bay lens with coverage up to 3X mounting height for using at warehouse or area up to 9 m high.
d 2X Standard 	**D** 2X Standard 	2.4~6.0 m (8~20 ft) 	A flat round lens with 2X height coverage. This lens provides better minor motion detection for using at office areas.
f 4X Extra wide 	**F** 4X Extra wide 	2.4~6.0 m (8~20 ft) 	A wide-angle lens with 4X height coverage ideal for general application. It has good picking up for major and minor motions.
g 3X Aisle way 	**G** 3X Aisle way 	2.4~12.0 m (8~40 ft) 	A universal aisle way lens with 3X height coverage ideal for aisle way detection. This lens can be rotated to align with the direction of aisle.
h 1X High bay 	**H** 1X High bay 	9.0~15.0 m (30~50 ft) 	A high bay lens with 1X height coverage. This diamond cut lens is specially designed for high bay application.
I 6X Long aisle 	**L** 6X Long aisle 	2.4~3.5 m (8~10 ft) 	A wide-angle lens with 6X height coverage designed for long corridor. This lens can be rotated to align with the direction of corridor.

NOTES
1. Coverage data is based on walking across the detection zones at 25°C. Higher temperature or walking toward the sensor will result in smaller coverage.
2. Mounting heights are recommended for obtaining optimal detection. Using at higher or lower is possible.
3. Lens C/G/H may be used up to 12/15/18 m at the areas with motions of large objects, such as forklift or trucks. To use the sensor higher than the recommended maximum height, please first ensure that the sensor with specific lens can pick up the motion at desired mounting height.
4. Lens G/L are not IP-66 rated.
5. Some models have maximum mounting height, please refer to the product datasheet for more detail.

Sensor Selection Index

OS-NET Sensors (page 4)

Model No.	Form	Options	Tech	ALS	IP	Power	Control output	Setting
DALI control								
ON-MRD-600SA	A6	L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
ON-MRD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
ON-MRD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
ON-MRD-210S	M2	--	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
ON-MRD-200SP	M2P	--	PIR	●	65	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
ON-MRD-514SF	T5F	M L	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
ON-MRD-514SW	T5W	M L	PIR	●	66	DALI bus	DALI broadcast	Remote (IR)
ON-MRD-124S	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
ON-MRD-124W[1]	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
0-10V control								
ON-LRD-609SA	A6	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-209S	M2	--	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-209SP	M2P	--	PIR	●	65	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-LRD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
ON-BRD-500SF	T5F	M L	PIR	●	--	12-24 VDC	0-10V	Remote (IR)
ON-BRD-500SW	T5W	M L	PIR	●	66	12-24 VDC	0-10V	Remote (IR)
ON-BRD-510SF	T5F	M L	PIR	●	--	12-24 VDC	0-10V	Remote (IR)
ON-BRD-510SW	T5W	M L	PIR	●	66	12-24 VDC	0-10V	Remote (IR)
Zhaga connection								
ON-MRD-734SZ	Z7	L	PIR	●	66	Aux (+24V)	DALI broadcast	Remote (IR)
ON-BRD-734SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	0-10V	Remote (IR)
Z10 connection								
ON-BRD-735SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	0-10V	Remote (IR)

[1] Wide angle detection. M : Multiple mounting options L : Multiple lens options

TRANS Occupancy/Vacancy Sensors (page 9)

Model No.	Form	Options	Tech	ALS	IP	Power	Control output	Setting
DALI/DALI-2 control								
MBD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	APP
MBD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	APP
MRD-600SA	A6	L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-210S	M2	--	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-200SP	M2P	--	PIR	●	65	230-240 VAC / DALI bus	DALI broadcast	Remote (IR)
MRD-124S	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
MRD-124W[1]	M1	--	PIR	●	--	DALI bus	DALI broadcast	Remote (IR)
MOD-510SF	T5F	M L	PIR	●	--	230-240 VAC / DALI bus	DALI broadcast	Manual
MOD-510SW	T5W	M L	PIR	●	66	230-240 VAC / DALI bus	DALI broadcast	Manual
MRA-514SF	T5F	M L	PIR	●	--	DALI bus	DALI-2	Network
MRA-514SW	T5W	M L	PIR	●	66	DALI bus	DALI-2	Network
MRA-124S	M1	--	PIR	●	--	DALI bus	DALI-2	Network
MRA-124W[1]	M1	--	PIR	●	--	DALI bus	DALI-2	Network

[1] Wide angle detection. M : Multiple mounting options L : Multiple lens options

TRANS Occupancy/Vacancy Sensors cont.

Model No.	Form	Options	Tech	ALS	IP	Power	Control output	Setting
0-10V control								
HRD-600SP	T6	L	PIR	●	66	347/480 VAC	Switched live w/0-10V	Remote (IR)
LBD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LBD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	APP
LRD-609SA	A6	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-309S	M3	L	PIR	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LRD-309SP	M3P	L	PIR	●	66	120-277 VAC	Switched live (hybrid) w/0-10V	Remote (IR)
LMD-509SF	T5F	M	HFD	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
BBD-500SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-500SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-510SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	APP
BBD-510SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	APP
BRD-500SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-500SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-510SF	T5F	M L	PIR	●	--	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-510SW	T5W	M L	PIR	●	66	12-24 VDC	Isolated dry contact w/0-10V	Remote (IR)
BRD-310S	M3	L	PIR	●	--	12-24 VDC	Open collector active low w/0-10V	Remote (IR)
On-Off control								
LRS-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid)	Remote (IR)
LRS-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid)	Remote (IR)
LRS-202SP	M2P	--	PIR	●	65	120-277 VAC	Switched live	Remote (IR)
LOS-509SF	T5F	M L	PIR	●	--	120-277 VAC	Switched live (hybrid)	Manual
LOS-509SW	T5W	M L	PIR	●	66	120-277 VAC	Switched live (hybrid)	Manual
LOS-505SF	T5F	M L	PIR	●	--	120-277 VAC	Isolated dry contact	Manual
LOS-505SW	T5W	M L	PIR	●	66	120-277 VAC	Isolated dry contact	Manual
LMS-509SF	T5F	M	HFD	●	--	120-277 VAC	Switched live (hybrid)	Manual
LVS-508NF[1]	T5F	M L	PIR		--	220-240 VAC	Switched live (hybrid)	Manual
LVS-508NW[1]	T5W	M L	PIR		66	220-240 VAC	Switched live (hybrid)	Manual
Zhaga connection								
MRD-734SZ	Z7	L	PIR	●	66	Aux (+24V) / DALI bus	DALI broadcast	Remote (IR)
MRA-734SZ	Z7	L	PIR	●	66	Aux (+24V) / DALI bus	Zhaga D4i	Network
BRD-734SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	Isolated dry contact w/0-10V	Remote (IR)
Z10 connection								
BRD-735SZ	Z7	L	PIR	●	66	12-24 VDC (Aux)	Isolated dry contact w/0-10V	Remote (IR)
PWM control								
COS-516SF	T5F	M L	PIR	●	--	12-48 VDC	PWM	Manual
COS-516SW	T5W	M L	PIR	●	66	12-48 VDC	PWM	Manual
BMS/BA integration								
BOS-515SF	T5F	M L	PIR	●	--	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515SW	T5W	M L	PIR	●	66	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515NF	T5F	M L	PIR		--	12-24 VAC/DC	Isolated dry contact	Manual
BOS-515NW	T5W	M L	PIR		66	12-24 VAC/DC	Isolated dry contact	Manual
BDS-600SS	T6	L	PIR+HFD	●	--	12-24 VDC	Isolated dry contact	Manual
BDS-610SS	T6	L	PIR+HFD	●	--	12-24 VDC	Isolated dry contact	Manual
Modbus control								
MRB-510SF	T5F	M L	PIR	●	--	12-24 VDC	Modbus	Network
MRB-510SW	T5W	M L	PIR	●	66	12-24 VDC	Modbus	Network

[1] Models with manual-on control. Push-button required.

M : Multiple mounting options

L : Multiple lens options

Luminaire Internal Occupancy Sensors (page 11)

Model No.	Tech	ALS	IP	Power	Control output	Setting
0-10V control						
LMD-109	HFD	●	--	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
On-Off control						
LMS-109	HFD	●	--	120-277 VAC	Switched live (hybrid)	Manual

HVAC/Fan Occupancy Sensors (page 12)

Model No.	Tech	ALS	IP	Power	Control output	Setting
OS-363	PIR		--	24 VAC/DC	Form C dry contact	Manual
OS-550	PIR		--	24 VAC/DC	Form C dry contact	Manual
OS-361DT	PIR+HFD		--	24 VDC	Form A dry contact	Manual

Under Cabinet Occupancy Sensors (page 12)

Model No.	Tech	ALS	IP	Power	Control output	Setting
POH-946MEW	PIR		--	12-48 VDC	PWM	--

Wall Switch Sensors (page 16)

Model No.	Color	Tech	ALS	Pole	Power	Control output	Setting
0-10V control							
LDD-700S	W/I	PIR+HFD	●	1 pole	120-277 VAC	Switched live (hybrid) w/0-10V	Manual
On-Off control							
LBS-700S	W/I	PIR	●	1 pole	120-277 VAC	Switched live (hybrid)	Manual
LBS-700N	W/I	PIR		1 pole	120-277 VAC	Switched live (hybrid)	Manual
LBT-700S	W/I	PIR	●	2 pole	120-277 VAC	Switched live (hybrid)	Manual
LBT-700N	W/I	PIR		2 pole	120-277 VAC	Switched live (hybrid)	Manual
LDS-700S	W/I	PIR+HFD	●	1 pole	120-277 VAC	Switched live (hybrid)	Manual
LDT-700S	W/I	PIR+HFD	●	2 pole	120-277 VAC	Switched live (hybrid)	Manual
BMS/BA integration							
BBS-700S	W/I	PIR	●	1 pole	12-24 VDC	Isolated dry contact	Manual
BBS-702S[1]	W/I	PIR	●	1 pole	12-24 VDC	Isolated dry contact w/active low	Manual
BBT-700S	W/I	PIR	●	2 pole	12-24 VDC	Isolated dry contact	Manual
BBT-702S[1]	W/I	PIR	●	2 pole	12-24 VDC	Isolated dry contact w/active low	Manual
BDS-700S	W/I	PIR+HFD	●	1 pole	12-24 VDC	Isolated dry contact	Manual
BDT-700S	W/I	PIR+HFD	●	2 pole	12-24 VDC	Isolated dry contact	Manual

NOTE: While ordering WALLSENZR, please specify the Model No. with color code.

[1] Models with multi-way manual control (MMC).

Photocell Daylight Sensors (page 19)

Model No.	Form	Options	Tech	IP	Power	Control output	Setting
On-Off control							
LPS-509SF	T5F	M	ALS	--	120-277 VAC	Switched live (hybrid)	Manual
LPS-509SW	T5W	M	ALS	66	120-277 VAC	Switched live (hybrid)	Manual
BMS/BA integration							
BPD-500SF	T5F	M	ALS	--	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-500SW	T5W	M	ALS	66	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-510SF	T5F	M	ALS	--	12-24 VDC	Isolated dry contact w/0-10V	Manual
BPD-510SW	T5W	M	ALS	66	12-24 VDC	Isolated dry contact w/0-10V	Manual

M : Multiple mounting options

About IR-TEC

Premier Sensor and Control Solutions Specialist

Established in 1982, as a pioneer of infrared motion sensing technology in Taiwan, IR-TEC has committed itself to build a company stands for Innovation, Reliability, Technology, Efficiency, and Cooperation. After 40 years of continuous research and development, IR-TEC has made itself a renowned specialist of sensor and control solutions for smart lighting and HVAC controls.

All IR-TEC products are designed and manufactured by a professional team under a well-maintained ISO-9001 quality management system in a state-of-the-art ISO-14001 certified manufacturing facility. We cordially invite you to experience supreme product quality and excellent business service offered by IR-TEC, a business partner you can trust at all time.

Specializing in Building Sensors

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