iR-TEC

Smart Lighting Control Solutions

Product Selection Guide 22-23

About IR-TEC

Premier Sensor and Control Solutions Specialist

Found in 1982, as a pioneer of infrared motion sensing technology, IR-TEC has established a solid reputation as a truly Innovative, Reliable, Technological, Efficient, and Cooperative business partner. All IR-TEC products are designed, manufactured, and tested by a professional team under a well-maintained ISO-9001 quality management system in a state-of-the-art ISO-14001 certified manufacturing facility in Taiwan.

With continuous research and development, IR-TEC has created a wide range of occupancy/vacancy sensors, daylight sensors, power packs and controllers for commercial and industrial buildings to achieve the highest level of energy savings with occupancy/vacancy sensing based smart lighting and HVAC controls, while still maintain high level of occupant's comfort.

Celebrating 40 years of Excellence

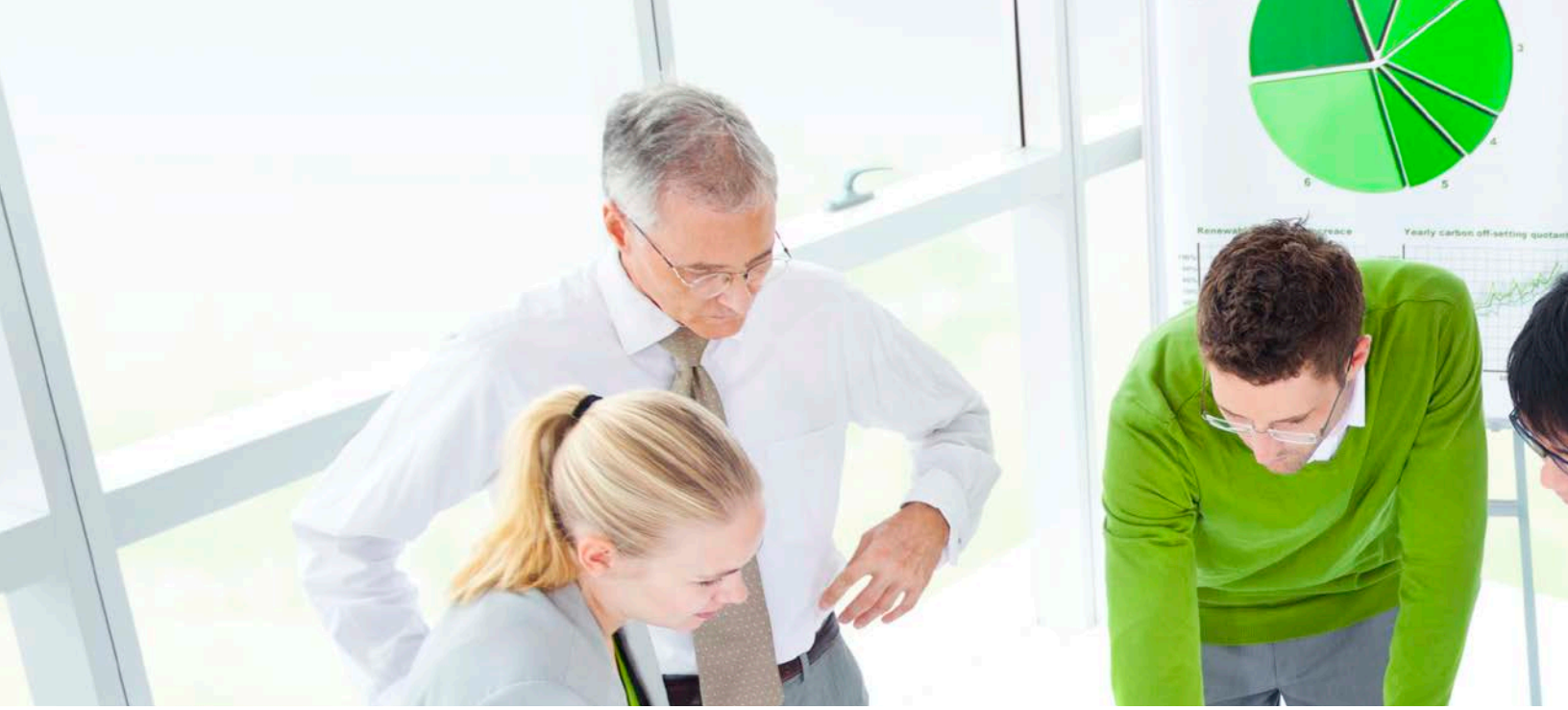
It has never been easy for a business to survive 40 years in treacherous market competition. Fortunately, IR-TEC could have such privilege to celebrate reaching this remarkable milestone with our sincere gratitude to our hard working staffs and supportive customers.

Herewith we are very pleased to present our latest IR-TEC Product Selection Guide for your information. Selecting the right products for smart lighting control can be challenging as different applications may require different product combinations. Therefore, we created this guide to try helping luminaire designers, lighting consultants, and system designers quickly select the right products for the ever-changing smart lighting requirements.

As usual, we categorized IR-TEC products into Network and Standalone Control Solutions. The section of Network Control Solution introduces system concept and devices of OS-NET, a simpler and smarter wireless lighting control solution featuring unsurpassed level of Flexibility, Functionality, and Simplicity. The section of Standalone Control Solution introduces a wide variety of occupancy and daylight sensors designed for general lighting controls of commercial and industrial environments.

All IR-TEC products are designed, manufactured, and tested by a professional team under a well-maintained ISO-9001 Quality Management System in a state-of-the-art ISO-14001 certified manufacturing facility in Taiwan. We cordially invite you to experience supreme product quality and service from IR-TEC, the premier specialist in building sensors with 40 years of excellence.

IR-TEC America, Inc.



Enable Smart Lighting with Ease

Smart lighting control requires different sensor and control strategies to meet versatile requirements from facility management, users, and local authorities.
IR-TEC offers a wide range of sensor and control solutions with occupancy, vacancy, and daylight sensing control functionalities for providing automatic on/off, 0-10V or DALI dimming control. Whether for network or standalone control through OEM luminaire, lighting circuit or BMS integration, you can always count on IR-TEC products to enable smart lighting with ease.

Table of Contents

NETWORK CONTROL SOLUTION

OS-NET

A Simpler and Smarter Wireless Lighting Control Solution

Introducing the OS-NET, a second-to-none wireless occupancy sensing network solution developed for lighting industry to enable smart lighting control with unsurpassed level of Flexibility, Functionality and Simplicity.

By simply installing the luminaires and lighting circuits integrated with OS-NET Sensors featuring smart sensing controls and networking capabilities, a ZigBee based wireless mesh network can be effortlessly deployed to execute different sensing control schemes, including occupancy or vacancy sensing with daylight harvesting, bi-level StepDIM or continuous SmartDIM control for commercial and industrial lighting systems through wireless communication.

With easy and intuitive settings via a handheld remote programmer, the OS-NET Sensors can be programmed on an individual or a group basis to execute specific sensing control to the connected lights as desired. If necessary, the installed OS-NET enabled lighting can be easily re-configured to provide different control schemes or re-assigned to a new group.

IR-TEC's OS-NET is not only a simple solution for OEM manufacturers to enable their luminaires with embedded smart control and wireless connectivity, but also an ideal solution for renovating the legacy lighting with solid state lighting featuring maximum energy savings from human-centric smart controls.

Deploy an IoT wireless mesh network effortlessly

A Zigbee based wireless mesh network can be effortlessly deployed while installing lighting and control devices for commercial and industrial environments. A wireless mesh network broadly established throughout the entire space will be a valuable infrastructure of Internet of Things (IoT).

Flexible device integration allows easy installation

The OS-NET Sensors can be flexibly integrated with OEM luminaires or mounted on the ceiling for lighting circuit control. Unparalleled integration flexibility allows installing the OS-NET enabled lighting system just like installing the conventional luminaires, occupancy sensors and wall switches.

All functionalities in one and one for all controls

Each OS-NET Sensor is packed with multiple sensing and control functionalities to meet different control requirements. Specific control scheme be easily set to execute even the most sophisticated control to the connected lights without requiring complicated devices, wiring, and commissioning.

Individual sensing control with group activation

When a specific OS-NET Sensor of the group detects the presence of occupant, the sensor not only controls the connected lighting as set according to the local condition, but also broadcasts the occupancy status for other devices of the group to activate the programmed controls respectively.

Single device can be member of multiple groups

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

Hybrid Switching protects from inrush current

An advanced Hybrid Switching technology is employed to protect every OS-NET Sensor from being damaged by exceptionally high inrush current while switching on the LED driver. With Hybrid Switching protection, the service lifetime of OS-NET Sensor is guaranteed much longer than others.

SmartDIM constant lighting control technology

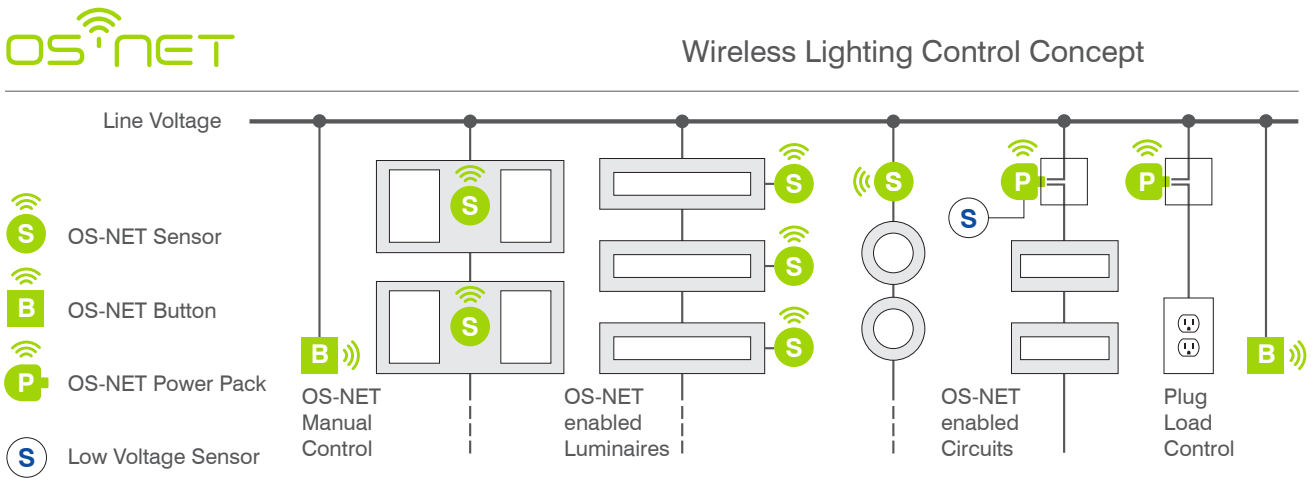
SmartDIM control can be programmed in each OS-NET Sensor to perform constant lighting control. This advanced dimming control technology will continuously adjust the lighting output to maintain the overall light level within a preset range based on the occupancy status and ambient light level.

Easy and intuitive IR remote programming tool

Unlike many other network control solutions, OS-NET does not require any proprietary management software, operation app or expensive hardware to make the system run. All you need is just a 2-way IR remote to set up the network, group the devices, set the control scheme, and all other configurations.

Latest ASHRAE 90.1 & CA Title 24 compliant

Versatile functionalities of OS-NET devices are developed and built to comply with the latest building energy codes and standards for non-residential buildings. With simple OS-NET devices installed, you can easily meet most lighting control requirements via some simple remote setting operations.



OS-NET Devices

An OS-NET system is formed by various types of OS-NET devices. Each OS-NET device not only provides its distinctive functionalities, but also operates as a node of wireless network to transmit, receive, and/or forward commands to other nodes. OS-NET devices mainly include OS-NET Sensors with different form factors for various applications and OS-NET Buttons for mounting into different type of wall boxes.

OS-NET Sensors					
M1	M2	M2P	M3	M3P	T5
					

OS-NET Sensors	
A6	Z7
	

OS-NET Buttons	
1-channel	4-channel
	

OS-NET Power Packs


M : Multiple mounting options

L : Multiple lens options

OS-NET Sensors

The OS-NET Sensors (ONS) are fundamental network devices of an OS-NET system. Each ONS is packed with multiple sensing and control functionalities, including occupancy/vacancy sensing, ambient light sensing, 0-10V or DALI control output, and wireless mesh networking capabilities required to achieve sophisticated smart lighting control. Followings are brief introductions of ONS with different form factors.

M1 ONS

The ONS with M1 form factor housing is a remote OS-NET Sensor unit designed for integrating with office luminaire or recess mounting on the ceiling via a 1" look down hole. Through plug-in connection with different power pack controllers (see page 31 for more detail), you can easily enable typical LED panel lighting or troffer luminaires powered by DALI/0-10V or typical LED driver with state-of-the-art wireless smart control capability.

Model	Power Input	Control Output	Mounting
ON-MRD-124S	DALI bus	DALI	Luminaire integrated Ceiling recess mount

M2 ONS

The ONS with M2 form factor housing is a compact OS-NET Sensor designed for integrating with general commercial luminaire via a 1" look down hole.

Model	Power Input	Control Output	Mounting
ON-LRD-209S	120/277VAC	0-10V, Switched live	Luminaire integrated
ON-MRD-210S	230VAC/DALI bus	DALI	

M2P ONS

The ONS with M2P form factor housing is a compact OS-NET Sensor designed for assembly with general linear luminaires via a 1/2" knockout hole on the end cap.

Model	Power Input	Control Output	Mounting
ON-LRD-209SP	120/277VAC	0-10V, Switched live	1/2" knockout hole
ON-MRD-200SP	230VAC/DALI bus	DALI	

M3 ONS

The ONS with M3 form factor housing is designed for assembly with luminaires via a 1.34" look down hole. Multiple lens options are available for providing distinctive detection coverage.

Model	Power Input	Control Output	Mounting	Lens available
ON-LRD-309S	120/277VAC	0-10V, Switched live	Luminaire integrated	**a/b/c/d/f/g/h/l**

NOTE: Please purchase lens seperately.

M3P ONS

The ONS with M3P form factor housing is designed for assembly with linear luminaires via a 1/2" knockout hole on the end cap. Multiple lens options (purchased seperately are available for providing distinctive detection coverage.

Model	Power Input	Control Output	Mounting	Lens available
ON-LRD-309SP	120/277VAC	0-10V, Switched live	1/2" knockout hole	**a/b/c/d/f/g/h/l**

NOTE: Please purchase lens seperately.

T5 ONS

The ONS with T5 form factor housing offers second-to-none flexibility for OEM luminaire integration and ceiling installation with multiple mounting and lens options.

Model	Power Input	Control Output	Mount	Lens
ON-BRD-500S	12-24VDC	0-10V, Digital output	**F/W/E/P/ S/C/R**	**A/B/C/D/ F/G/H/L**
ON-LRD-509S	120/277VAC	0-10V, Switched live		
ON-MRD-510S	230VAC/DALI bus	DALI		

NOTE: While ordering the T5 ONS, please specify the Model No. with mount and lens codes.

A6 ONS

The ONS with A6 form factor housing is an IP66 OS-NET Sensor designed for attaching to circular high bay luminaires and enabling with smart control capability. Multiple lens options are available for providing distinctive detection coverage.

Model	Power Input	Control Output	Mount	Lens
ON-LRD-609S	120/277VAC	0-10V, Switched live	**A**	**A/B/C/D/ F/G/H/L**
ON-MRD-600S	230VAC/DALI bus	DALI		

NOTE: While ordering the A6 ONS, please specify the Model No. with mount and lens codes.

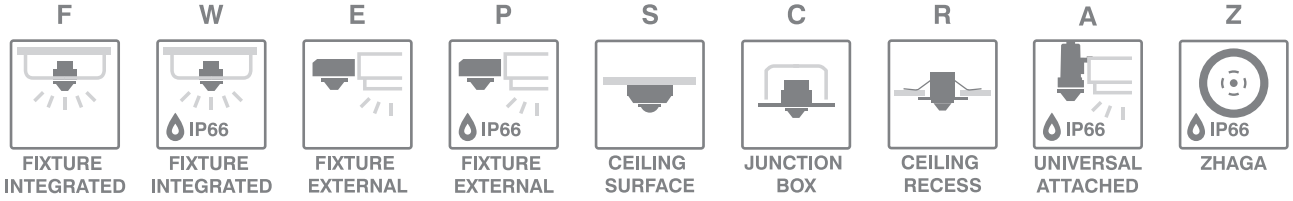
Z7 ONS

The ONS with Z7 form factor housing is an IP66 OS-NET Sensor designed for outdoor luminaire with Zhaga Book 18 socket. Multiple lens options are available for providing distinctive detection coverage at different mounting heights.

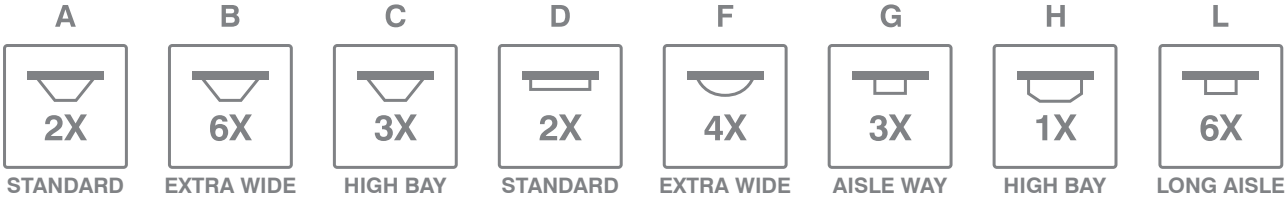
Model	Power Input	Control Output	Mount	Lens
ON-BRD-734S	12-24VDC	0-10V, Digital output	**Z**	**A/B/C/D/ F/G/H/L**
ON-MRD-734S	Aux (+24V)	DALI		

NOTE: While ordering the Z7 ONS, please specify the Model No. with mount and lens codes.

Mounting Options



Lens Options



OS-NET Buttons

The OS-NET Buttons are optional network devices designed for providing manual on-off and/or dimming control to the associated lighting groups.

The ON-PBD-70xW is for mounting into standard NEMA wall box.

Model No.	Channel	Power Input	Mounting
ON-PBD-705W	1	120/277VAC	NEMA wall box
ON-PBD-708W	4	120/277VAC	NEMA wall box

ON-PBD-705W

ON-PBD-708W

OS-NET Power Pack & Load Controller

The OS-NET Power Pack is an optional OS-NET enabled controller that can easily enable wireless smart lighting control. Subject to the model, wiring connection and control setting, it can be easily configured to execute occupancy or vacancy sensing control to the connected light, or plug load control for codes compliance.

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

OS-NET Remote

The SRP-281 is a universal programming tool for configuring an entire OS-NET enabled lighting system, including network build-up, devices grouping and linking to the network, setting sensor control scheme and parameters, and all other management associated tasks.

Model No.	Power Input
SRP-281	2x AAA Battery

Mounting Options

The OS-NET Sensors are designed for integrating with OEM luminaires and/or mounting on the ceiling for sensing presence, controlling light while also operating as network nodes. Following table highlights mounting brackets and accessories available for the OS-NET Sensors with T5 form factor. Detailed information is available on the mounting datasheet from www.irtec.com.

Mounting option	Code	Bracket #	Appearance	Application Description
Fixture Integrated	**F**	---		F-mount is the original form factor of T5 ONS for integrating with OEM luminaire through a 2" hole or mounting on ceiling with different brackets.
IP66 Fixture Integrated	**W**	---		W-mount is the original form factor of T5 ONS for IP66 fixture integration through a 2" hole or with a PMB-500.
Fixture External	**E**	EMB-500		The EMB-500 is a bracket for mounting the F-mount T5 ONS with indoor luminaire through a 1/2" hole.
IP66 Fixture External	**P**	PMB-500		The PMB-500 is a bracket for mounting the W-mount T5 ONS with IP66 luminaire through a 1/2" hole.
Ceiling Surface	**S**	SMB-500		The SMB-500 is a bracket for mounting the F-mount T5 ONS on the surface of luminaire and hard lid ceiling with or without junction box.
Junction Box	**C**	CMB-500		The CMB-500 is a bracket for mounting the F-mount T5 ONS with an octagonal or square junction box.
Ceiling Recess	**R**	RMB-500		The RMB-500 is a bracket for recess mounting the low voltage T5 ONS through a 2.8" hole.

Accessories
Following accessories can be applied to extend or change sensor position for the OS-NET Sensor with E/P mount.

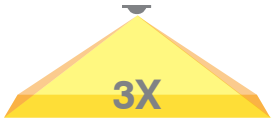
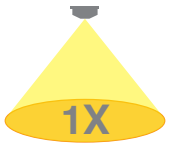
EJ-30F
30 mm extension joint

EJ-50F
50 mm extension joint

EL-40F
40 mm elbow joint

Lens Options

Every PIR sensor requires an optical lens to collect infrared energy emitted from human/vehicle. Lenses with different Fresnel segment designs provide different detection patterns and for different mounting heights. Following lenses are available for the OS-NET Sensors with T5, A6, and Z7 form factors. For more details, please refer the lens datasheet available from www.irtec.com.

Code	Lens	Coverage & Mounting Height	Feature and Application Notes
A	 Cone	8~15 ft (2.4~4.5 m) 	Lens A is a standard lens with 2X height coverage. It can be used to cover small to medium areas with major and walking motions.
B	 Cone	8~10 ft (2.4~3.0 m) 	Lens B is a wide angle lens with 6X mounting height coverage. It provides good detection to the major motions across the detection zones.
C	 Cone	15~30 ft (4.5~9.0 m) 	Lens C is a high bay lens with coverage up to 3X mounting height for using at warehouse or area up to 30 ft high.
D	 Round flat	8~20 ft (2.4~6.0 m) 	Lens D is a flat round lens with 2X height coverage. This lens provides better minor motion detection for using at office areas.
F	 Dome	8~20 ft (2.4~6.0 m) 	Lens F is a wide-angle lens with 4X height coverage ideal for general application. It has good picking up for major and minor motions.
G	 Arch	8~40 ft (2.4~12.0 m) 	Lens G is 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	 Dome	30~50 ft (9.0~15.0 m) 	Lens H is a high bay lens with 1X height coverage. This diamond cut lens is specially designed for high bay application.
L	 Arch	8~10 ft (2.4~3.0 m) 	Lens L is 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 77°F. 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 40/50/60 ft 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 IP66 rated.

STANDALONE CONTROL SOLUTION

In addition to the state-of-the-art network control solution, IR-TEC also offers a wide range of standalone control occupancy and daylight sensor solutions for today's sustainable buildings.

Wall Switch Sensor

Wall switch sensors are designed to replace conventional wall switches, and provide occupancy or vacancy sensing control to the lighting of various applications.

WALLSENZR Wall Switch Sensor **pg 12**

Occupancy Sensor

IR-TEC offers a variety of occupancy sensors that can be applied to provide energy efficient occupancy sensing controls with high level of installation flexibility. Ranging from the innovative TRANS family to legacy OS-series, all IR-TEC Occupancy Sensors offer reliable controls and superior performances for applications in most commercial and industrial lighting environments.

TRANS Occupancy Sensors **pg 18**

Fixture Internal Occupancy Sensor **pg 24**

OS-series Occupancy Sensor **pg 26**


Under Cabinet Occupancy Sensor **pg 27**


Daylight Sensor

IR-TEC daylight sensors are designed to control the amount of electric light in a day lit area by measuring either the level of daylight contribution or the overall combined natural and electric light as the key component to achieve an optimal lighting level. IR-TEC offers not only the typical on/off switching type daylight sensors, but also the innovative SmartDIM control daylight sensors with 0-10V control.

TRANS Daylight Sensor **pg 28**


Power Pack Controller & Push Button Switch

In addition to a wide range of sensor selection, IR-TEC also offers power packs and push buttons for achieving high level smart control while still maintaining occupant's comfort and controllability.

PPU-series Power Pack **pg 30**



Emergency Lighting Controller **pg 32**

Push-Button **pg 33**


Push-Button Dimmer Switch **pg 33**

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.

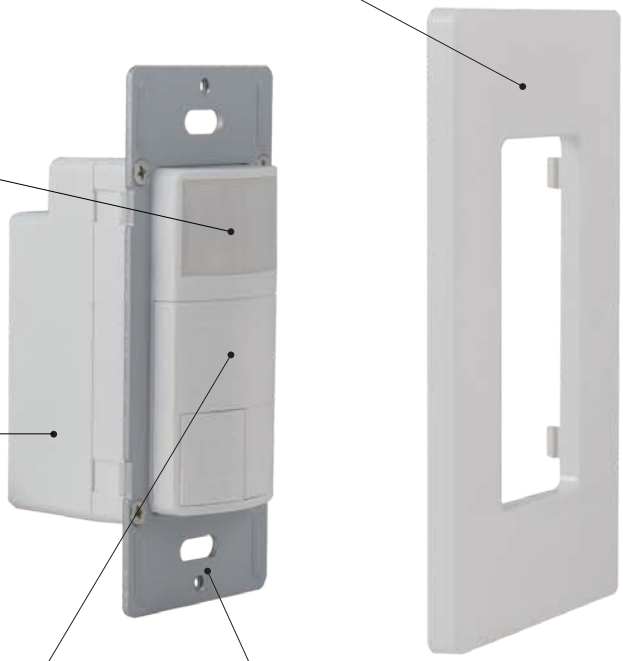
*WALLSENZR will allow for off-the-shelf wall plates with screws as well.

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.



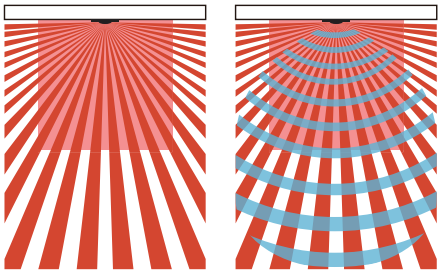
Appealing Aesthetics Profile

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).

Product Matrix

Line Voltage Wall Switch Sensor

Sensor Series	Color	Tech	ALS	Power	Output	Control Pole	HIC Protection	Neutral Required	Ground Required
LBS-700N	**W/I/L**	PIR		120/277 VAC	SLV	1 pole	●		●
LBS-700S	**W/I/L**	PIR	●	120/277 VAC	SLV	1 pole	●		●
LBT-700N	**W/I/L**	PIR		120/277 VAC	SLV	2 pole	●		●
LBT-700S	**W/I/L**	PIR	●	120/277 VAC	SLV	2 pole	●		●
LDS-700S	**W/I/L**	PIR+HFD	●	120/277 VAC	SLV	1 pole	●	●	●
LDT-700S	**W/I/L**	PIR+HFD	●	120/277 VAC	SLV	2 pole	●	●	●
LDD-700S	**W/I/L**	PIR+HFD	●	120/277 VAC	SLV 0-10V	1 pole	●	●	●

Low Voltage Wall Switch Sensor

Sensor Series	Color	Tech	ALS	Power	Output	Control Pole	Contact Rating	Multi-way Manual	Power Pack Required
BBS-700S	**W/I/L**	PIR	●	12-24 VDC	IDC	1 pole	2A, 30VDC		●
BBS-702S	**W/I/L**	PIR	●	12-24 VDC	IDC+DO	1 pole	2A, 30VDC	●	●
BBT-700S	**W/I/L**	PIR	●	12-24 VDC	IDC	2 pole	2A, 30VDC		●
BBT-702S	**W/I/L**	PIR	●	12-24 VDC	IDC+DO	2 pole	2A, 30VDC	●	●
BDS-700S	**W/I/L**	PIR+HFD	●	12-24 VDC	IDC	1 pole	2A, 30VDC		●

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

Legends **SLV:** Switched Line Voltage **IDC:** Isolated Dry Contact **DO:** Digital Output **HIC:** High Inrush Current
Color **W:** White **I:** Ivory **L:** Light Almond

PIR, 1-pole

PIR, 2-pole

Dual-Tech, 1-pole

Dual-Tech, 2-pole

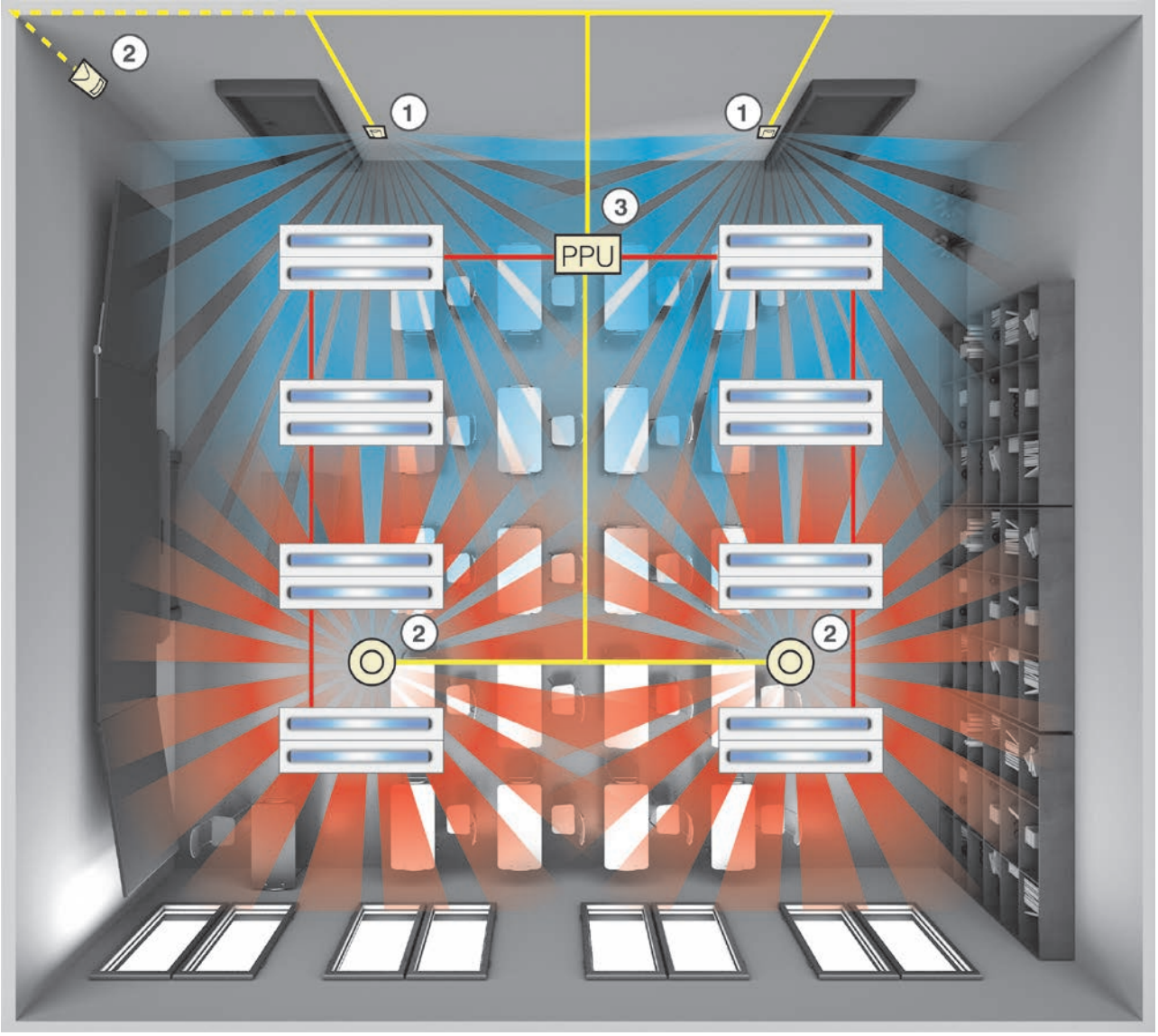
Dual-Tech, Dimming

Multi-way Manual Control (MMC)

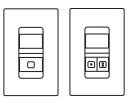
Multi-way Manual Control is a unique feature that allows occupant to manually turn on/off the local lighting via pressing the push button on ANY one of the low voltage wall switch sensors connected to the power pack. The MMC can be applied in large areas with multiple entrances/exits where multiple low 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

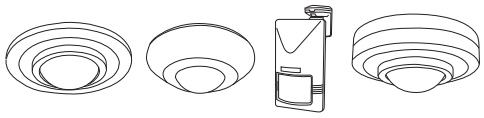
- Classroom
- Open office
- Lecture hall
- Long corridor with turns
- Grand conference room
- Large and open space



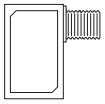
1 **BBS/BBT-702S Series**
Wall Switch Sensor



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

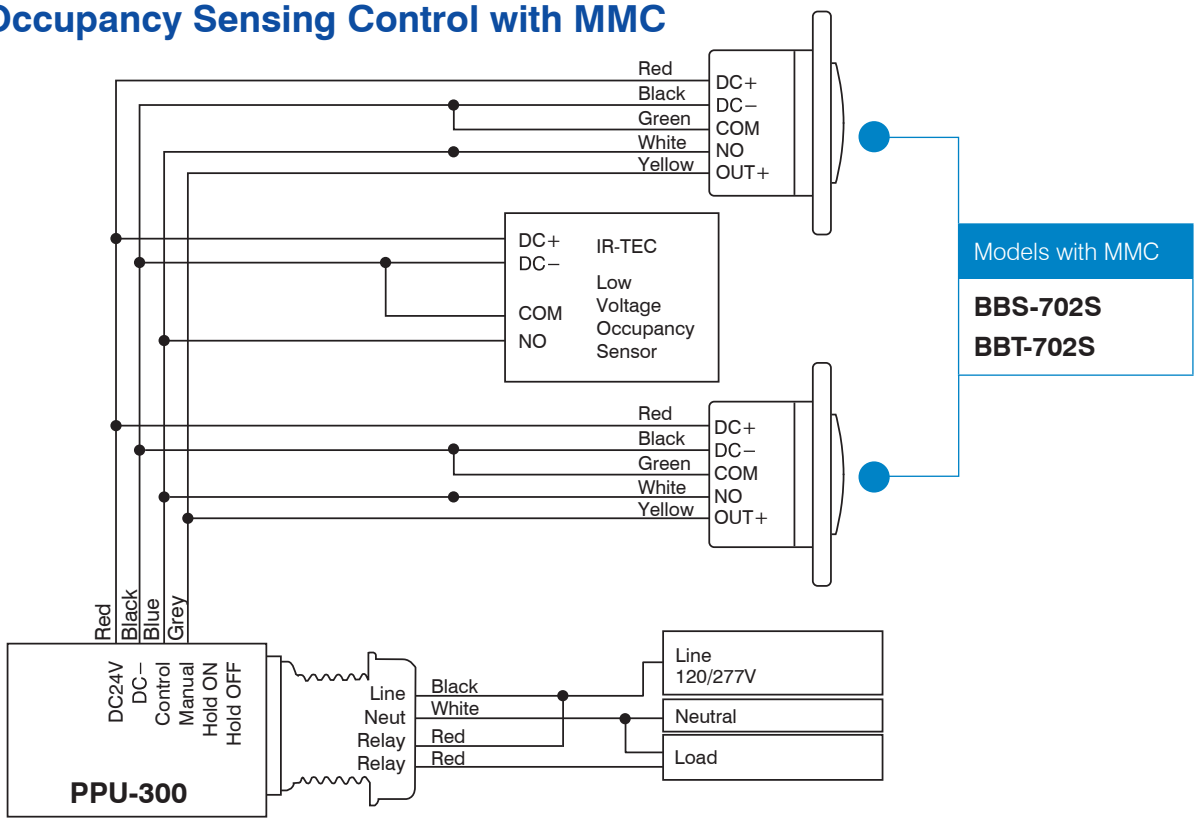


3 **PPU-300**
Power Pack & Controller

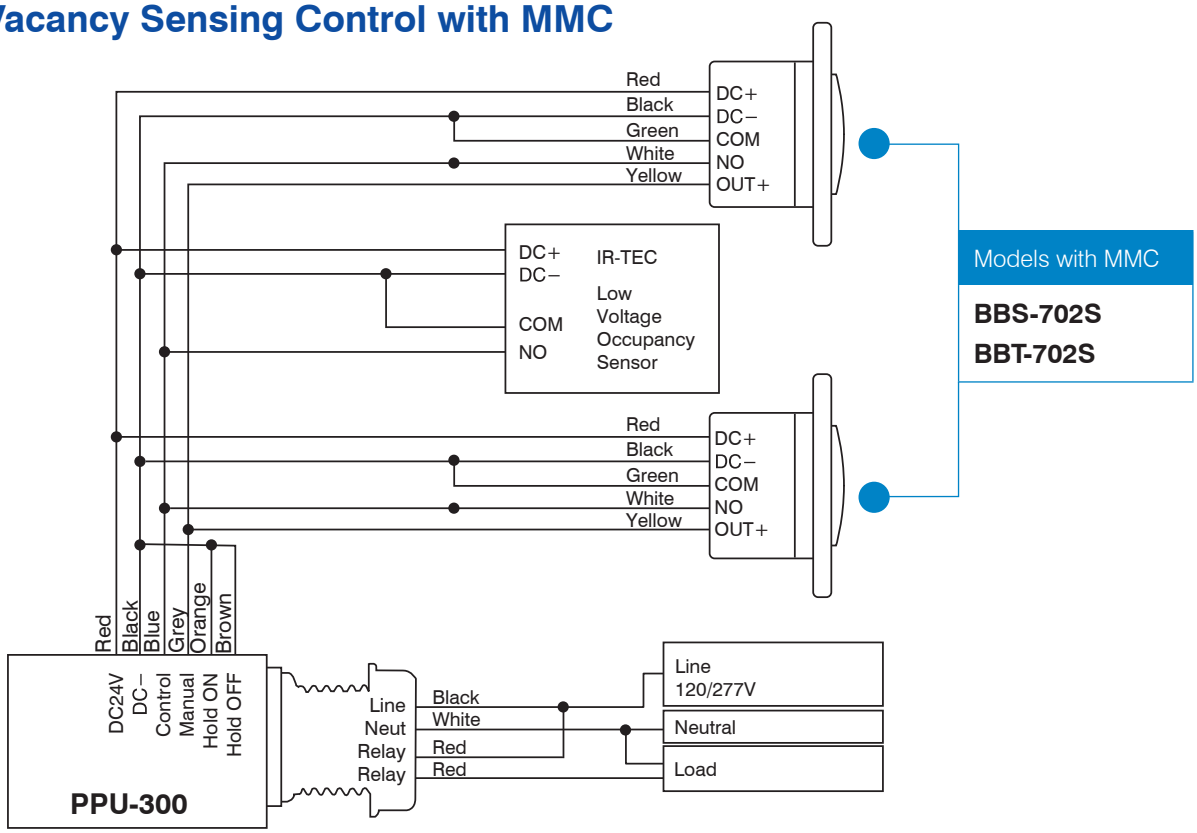


MMC Wiring Diagrams

Occupancy Sensing Control with MMC

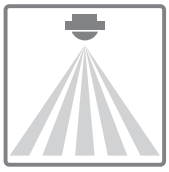


Vacancy Sensing Control with MMC



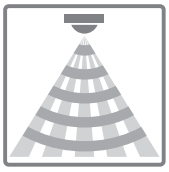
TRANS Occupancy Sensors

Originated from a second-to-none design concept **"Interchangeable EMO"**, IR-TEC has created numerous members to its TRANS sensor family. Today, TRANS occupancy sensors are available with various sensing technologies (PIR/HFD/DUO), distinctive electrical characteristics, versatile control functionalities, multiple mounting options, and different form factors for your selection.



TRANS-PIR

TRANS-HFD



TRANS-DUO

TRANS-PIR Occupancy Sensors

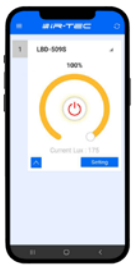
Passive Infrared (PIR) is the most popular and widely used occupancy sensing technology in the market. PIR sensor senses the presesnce and motions of occupant by detecting the change of infrared energy emitted from warm object (ex. human body or vehicle) in motion.

Every PIR sensor requires an optical lens, generally a plastic part with multiple segments called Fresnel lens, to collect the infrared energy to the sensing component. A 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.

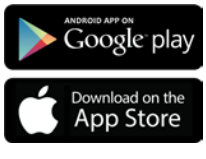
TRANS-PIR sensors with T5 form factor are renowned with multiple mounting and lens options. The sensors with M3, T5, A6, and Z7 form factors all feature multiple lens options. Page 22-23 highlight details of available mounting and lens options of specific sensor.

By means of control setting, TRANS-PIR sensors are available with "manual" and "remote" types. A universal 2-way IR remote programmer (SRP-280) and a slim-card remote (URP-100) can be used to configure most sensors modeled with the 2nd letter **R**. The sensors modeled with 2nd letter **B** are Bluetooth enabled, which can be wirelessly configured via the IR-TEC Sensor Config app available from App Store (iOS) or Google Play (Android).

Remote



APP



M1 sensor

M2P sensor

M3/M3P sensor L

T5 sensor M L

A6 sensor L

Z7 sensor L

TRANS-HFD Occupancy Sensors

High Frequency Doppler (HFD) sensing technology is different from Passive Infrared, 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.

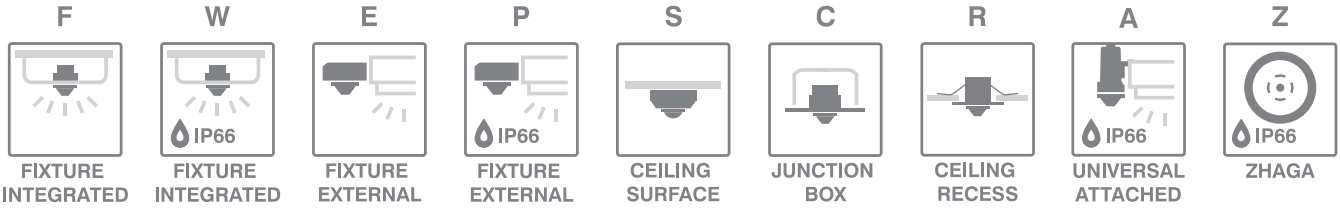
M

TRANS-DUO Occupancy Sensors

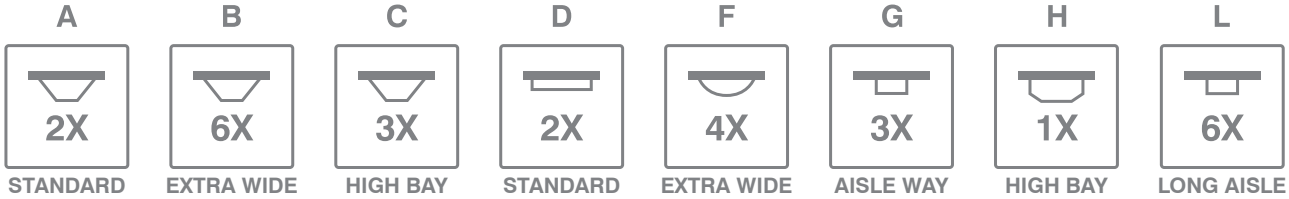
As no any single occupancy sensing technology is perfect, thus we created TRANS-DUO occupancy sensor to provide better reliability and performance by combining PIR and HFD sensing technologies into a low profile sensor housing. By utilizing the advantages of each single sensing technology with advanced 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.

L

Mounting Options M



Lens Options L



Remote setting sensors

Model No.	Tech	Control	Power	Output	HS	Dimming	Setting	Application	Appearance
MRD-124S *	PIR ALS	DALI	DALI bus	DALI		StepDIM SmartDIM	IR remote	Luminaire integrated, Ceiling recess	
LRS-202SP	PIR ALS	On-Off	120/277VAC	SLV		N/A	IR remote	Batten mount External via M20, IP65	
LRS-209SP	PIR ALS	On-Off	120/277VAC	SLV	●	N/A	IR remote		
BRD-310S ** L	PIR ALS	On-Off & Dim	12-32VDC	DO 0-10V		StepDIM SmartDIM	IR remote	Luminaire integrated	
LRD-309S ** L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	IR remote		
LRD-309SP ** L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	IR remote	Batten mount External via M20, IP66	
BBD-500S M L	PIR ALS	On-Off & Dim	12-24VDC	IDC 0-10V		StepDIM SmartDIM	APP	Luminaire integrated F  E  W  P  Ceiling mounted S  R  C 	
BRD-500S M L	PIR ALS	On-Off & Dim	12-24VDC	IDC 0-10V		StepDIM SmartDIM	IR remote		
LBD-509S M L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	APP		
LRD-509S M L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	IR remote		
LRS-509S M L	PIR ALS	On-Off	120/277VAC	SLV	●	N/A	IR remote		
MRD-510S M L	PIR ALS	DALI	230VAC/ DALI bus	DALI		StepDIM SmartDIM	IR remote		
HRD-600SP L	PIR ALS	On-Off & Dim	347/480VAC	SLV 0-10V		StepDIM SmartDIM	IR remote	Luminaire integrated External via M20, IP66	
LBD-609SA L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	APP	Luminaire integrated Universal attached IP66	
LRD-609SA L	PIR ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM SmartDIM	IR remote		
MRD-600SA L	PIR ALS	DALI	230VAC/ DALI bus	DALI		StepDIM SmartDIM	IR remote		
MRD-734SZ L	PIR ALS	DALI	AUX (+24V)/ DALI bus	DALI		StepDIM SmartDIM	IR remote	Zhaga book18 (type B), IP66	new 

* M1 sensor power pack controller required, please see page 31 for more detail.
** Please purchase lens seperately.

Manual setting sensors

Model No.	Tech	Control	Power	Output	HS	Dimming	Application	Appearance
MOD-510S M L	PIR ALS	DALI	230VAC/ DALI bus	DALI		StepDIM	Luminaire integrated Ceiling mounted	F 
LOS-509S M L	PIR ALS	On-Off	120/277VAC	SLV	●	N/A		W 
LOS-505S M L	PIR ALS	On-Off	120/277VAC	IDC		N/A		E 
COS-516S M L	PIR ALS	On-Off & Dim	12-48VDC	RDP		StepDIM		P 
BOA-516S M L	PIR ALS	On-Off & Dim	12-24VDC	0-10V		StepDIM		S 
BOA-517S M L	PIR ALS	On-Off & Dim	12-24VDC	DO 0-10V		StepDIM		C 
BOS-515S M L	PIR ALS	On-Off	12-24 VAC/DC	IDC		N/A		R 
BOS-515N M L	PIR	On-Off	12-24 VAC/DC	IDC		N/A		
BOM-515S M L	PIR ALS	BMS	12-24VDC	DO x 2		N/A		
LMS-509S M	HFD ALS	On-Off	120/277VAC	SLV	●	N/A	Luminaire integrated Ceiling mounted	See page 22 for sensor appearances with different mounting options
LMD-509S M	HFD ALS	On-Off & Dim	120/277VAC	SLV 0-10V	●	StepDIM		
BDS-600SS L	PIR HFD ALS	On-Off	12-24VDC	IDC		N/A	For occupancy sensing based lighting/BMS control	

NOTE: While ordering the T5/A6/Z7, please specify the Model No. with mount and lens codes.

Legends **HS:** Hybrid switching **PIR:** Passive infrared **HFD:** High frequency doppler
ALS: Ambient light sensor **SLV:** Switched line voltage **IDC:** Isolated dry contact
DO: Digital output **RDP:** Regulated DC power
M **:** Multiple mounting options L **:** Multiple lens options

Mounting Options

All TRANS sensors with T5 form factor housing can be integrated with luminaire or ceiling mounted in various options with specific mounting bracket. Same mounting bracket can be used with different sensor series, disregard the sensing technology, power, control output, wiring connection and functionality.

Mounting option	Code	Bracket #	TRANS-PIR	TRANS-HFD	Application Description
Fixture Integrated	**F**	---			This is the original form factor of TRANS T5 sensor for integrating with OEM luminaire through a 2" hole or mounting on ceiling with different brackets.
IP66 Fixture Integrated	**W**	---		---	This is the original form factor of TRANS T5 sensor for IP66 fixture integration through a 2" hole or with a PMB-500.
Fixture External	**E**	EMB-500			The EMB-500 is a bracket for mounting the F-mount T5 sensor with indoor luminaire through a 1/2" hole.
IP66 Fixture External	**P**	PMB-500		---	The PMB-500 is a bracket for mounting the W-mount T5 sensor with IP66 luminaire through a 1/2" hole.
Ceiling Surface	**S**	SMB-500			The SMB-500 is a bracket for mounting the F-mount T5 sensor on the surface of luminaire and hard lid ceiling with or without junction box.
Junction Box	**C**	CMB-500			The CMB-500 is a bracket for mounting the F-mount T5 sensor with an octagonal or square junction box.
Ceiling Recess	**R**	RMB-500			The RMB-500 is a bracket for recess mounting the F-mount low voltage T5 sensor through a 2.8" hole.
Fixture Internal	**I**	IMB-500	---		The IMB-500 is a bracket for mounting the T5 HFD sensor within a luminaire or behind a diffuser.

Accessories
Following accessories can be applied to extend or change sensor position for the sensor with E/P mount.

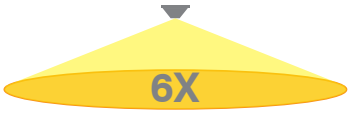
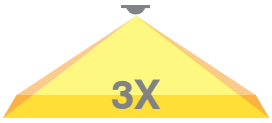
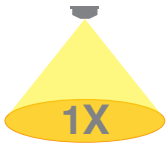
EJ-30F
30 mm extension joint

EJ-50F
50 mm extension joint

EL-40F
40 mm elbow joint

Lens Options

Following lens options are available for TRANS PIR and DUO sensors to provide different detection coverage at various mounting heights. Following lenses are available for the T5, A6, and Z7 form factors. For more details, please refer the lens datasheet available from www.irtec.com.

Code	Lens	Coverage & Mounting Height	Feature and Application Notes
A	 Cone	8~15 ft (2.4~4.5 m) 	Lens A is a standard lens with 2X height coverage. It can be used to cover small to medium areas with major and walking motions.
B	 Cone	8~10 ft (2.4~3.0 m) 	Lens B is a wide angle lens with 6X mounting height coverage. It provides good detection to the major motions across the detection zones.
C	 Cone	15~30 ft (4.5~9.0 m) 	Lens C is a high bay lens with coverage up to 3X mounting height for using at warehouse or area up to 9m high.
D	 Round flat	8~20 ft (2.4~6.0 m) 	Lens D is a flat round lens with 2X height coverage. This lens provides better minor motion detection for using at office areas.
F	 Dome	8~20 ft (2.4~6.0 m) 	Lens F is a wide-angle lens with 4X height coverage ideal for general application. It has good picking up for major and minor motions.
G	 Arch	8~40 ft (2.4~12.0 m) 	Lens G is 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	 Dome	30~50 ft (9.0~15.0 m) 	Lens H is a high bay lens with 1X height coverage. This diamond cut lens is specially designed for high bay application.
L	 Arch	8~10 ft (2.4~3.0 m) 	Lens L is 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 77°F. 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 40/50/60 ft 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 IP66 rated.

Fixture Internal Occupancy Sensor

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 option, 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.

Product Matrix

Model	Setting	Tech	ALS	Power	Output	Control	Dimming	HS	Application
LMS-109	Manual	HFD	●	120/277VAC	SLV	On/Off	---	●	Fixture internal
LMD-109	Manual	HFD	●	120/277VAC	SLV, 0-10V	Bi-level	StepDIM	●	Fixture internal

Legends **HFD:** High Frequency Doppler **SLV:** Switched Line Voltage **HS:** Hybrid Switching

LMS-109 Line Voltage Occupancy Sensor

The LMS-109 is a line voltage occupancy sensor designed for integrating with OEM luminaire internally to provide occupancy sensing based on/off switching control. This occupancy sensor utilizes the advanced High Frequency Doppler (HFD) technology which is capable of detecting the occupant's presence and movement through non-metallic enclosure, such as plastic cover or diffuser.

The Accu-Set digitalized potentiometers make the sensor setting easier, faster and more accurate than conventional analog ones. 4 levels of sensitivity can be selected via DIP switch settings to provide different coverage. An exclusive Hybrid Switching technology makes the LMS-109 perfect to control lighting with exceptionally high inrush current (HIC) during switching, such as having multiple LED lights connected in parallel. The sensor comes with an ambient light sensor (ALS) to inhibit switching on the light if the ambient light level is higher than the threshold set.

LMD-109 Line Voltage Bi-Level Occupancy Sensor

The LMD-109 is a line voltage occupancy sensor designed for OEM luminaire internal integration with 0-10V output to provide occupancy sensing based on/off switching or multi-mode, bi-level dimming control. This occupancy sensor utilizes the advanced High Frequency Doppler (HFD) technology which is capable of detecting the occupant's presence and movement through non-metallic enclosure, such as plastic cover or diffuser.

The Accu-Set digitalized potentiometers make the sensor setting easier, faster and more accurate than conventional analog ones. Four different sensitivity levels and control modes can be selected via DIP switch settings. An exclusive Hybrid Switching technology makes the LMD-109 series perfect to control lighting with exceptionally high inrush current (HIC) during switching, such as having multiple LED lights connected in parallel. The sensor comes with an ambient light sensor (ALS) to inhibit switching on the light if the ambient light level is higher than the threshold set.

OS-series Occupancy Sensor

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

The **OS-361** series occupancy sensor can be surface or recess mounted on the ceiling to provide 360° look-down detection. The **OS-551** series occupancy sensor can be mounted on the wall or ceiling with a multi-directional mounting bracket supplied to provide horizontally/vertically adjustment of its 110° look-out detection.

Product Matrix

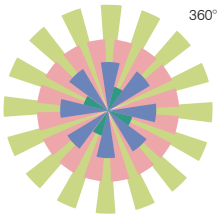
Sensor	Model	Tech	Aux sensor	Power	Output	Mount
	**OS-361**	PIR		24 VAC/DC	FCDC	Ceiling
	OS-361DT	PIR+HFD		24 VDC	FADC	Ceiling
	**OS-551**	PIR		24 VAC/DC	FCDC	Wall/Ceiling
	OS-551T	PIR	Temp	24 VAC/DC	FCDC	Wall/Ceiling
	OS-551DT	PIR+HFD	ALS	22-26 VAC/DC	FCDC	Wall/Ceiling

Legends **PIR:** Passive infrared **HFD:** High frequency doppler **ALS:** Ambient light sensor
FCDC: Form C Dry Contact **FADC:** Form A Dry Contact

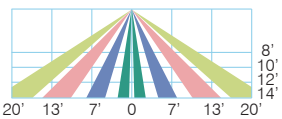
Detection Coverage

OS-361

Top View



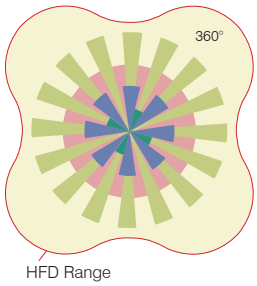
Side View



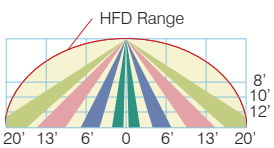
Mounting Height	8'	10'	12'	14'
Coverage (dia.)	20'	25'	30'	35'

OS-361DT

Top View



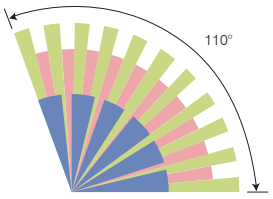
Side View



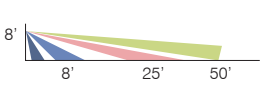
Mounting Height	8'	10'	12'
Coverage (dia.)	20'	24'	30'

OS-551/551T

Top View

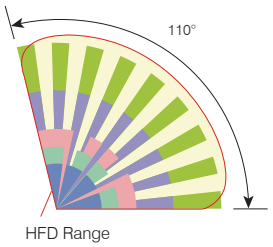


Side View

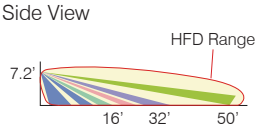


OS-551DT

Top View



Side View



Under Cabinet Occupancy Sensor

IR-TEC offers a series of occupancy sensors specially designed 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.

POA-900

The POA-series provides 0-10V analog output to control the connected LED lighting in one of four different control modes selected by DIP switch setting. The POH-series features PWM control to regulate the DC power from a constant voltage LED driver to control the connected LED lighting in specific control mode.

POH-946

Product Matrix

Model	Tech	ALS	Power	Driver	Control Description
POA-900	PIR	●	12-48 VDC	CC	The sensor offers 4 different control modes with 4 different delay times selectable via DIP switch setting. Refer to the datasheet for details about control mode.
POH-946MBW	PIR	●	12-48 VDC	CV	The sensor will inhibit the LED lighting when ambient light level is higher than 50 lux. When ambient light level is lower than 20 lux, the sensor will automatically dim the LED at 30% to provide a safety night light, and turn on the LED to 100% when it detects occupancy. The LED will be dimmed to 30% if no movement is detected within 5 minutes.
POH-946MCW	PIR	●	12-48 VDC	CV	The sensor will inhibit the LED lighting when ambient light level is higher than 50 lux. When ambient light level is lower than 20 lux, the sensor will automatically turn on the LED to 100% when it detects occupancy. If no movement is detected within 5 minutes, the sensor will dim the LED to 30% for 10 minutes. The LED will be switched off if no further movement is detected within 10 minutes.
POH-946MDW	PIR		12-48 VDC	CV	The sensor will turn on the LED with 100% power when it detects occupancy, and dim to 30% if no movement is detected within 5 minutes.
POH-946MEW	PIR		12-48 VDC	CV/CC	The sensor will turn on the LED with 100% power when it detects occupancy, and turn off if no movement is detected within 5 minutes.

TRANS Daylight Sensor

To provide the most delicate daylighting control with the best installation flexibility for today's sustainable buildings, IR-TEC redefined the daylight sensors by an industry leading design innovation - Interchangeable EMO.

This innovative design concept has helped creating the TRANS ceiling sensor family, which consists of numerous types of occupancy and daylight sensor feature distinctive functionality and electrical characteristics for all applications of energy efficient lighting control. All TRANS ceiling daylight sensors can be mounted in various options with specific mounting brackets.

Product Matrix

The table below outlines TRANS daylight sensors with available mounting options, description, specifications, feature, and output for product selection reference. For more details of specific sensor, please refer to the respective datasheet from www.irtec.com.

Model No.	Control	Setting	Power	Output	Dimming	Application
LPS-509S M	On-Off	Manual	120/277VAC	SLV	N/A	7-level LUX and TIME selection Standalone on/off control
BED-500S M	On-Off & Dim	Remote	12-24VDC	IDC 0-10V	StepDIM SmartDIM	SmartDIM control for continuous dimming, with wire leads
BED-510S M	On-Off & Dim	Remote	12-24VDC	IDC 0-10V	StepDIM SmartDIM	SmartDIM control for continuous dimming, with terminal block
BPD-500S M	On-Off	Manual	12-24VDC	IDC 0-10V	N/A	Provide IDC for on/off control and AO for BMS control, with wire leads
BPD-510S M	On-Off	Manual	12-24VDC	IDC 0-10V	N/A	Provide IDC for on/off control and AO for BMS control, with terminal block
BPD-502S M	On-Off & Dim	Manual	12-24VDC	IDC 0-10V	SmartDIM	Provide IDC for on/off switching and AO for SmartDIM control, with wire leads
BPD-512S M	On-Off & Dim	Manual	12-24VDC	IDC 0-10V	SmartDIM	Provide IDC for on/off switching and AO for SmartDIM control, with terminal block

NOTE: While ordering the TRANS daylight sensors, please specify the Model No. with mount code.

Legends **SLV:** Switched line voltage **IDC:** Isolated dry contact M **:** Multiple mounting options

Mounting Options

All TRANS daylight sensors can be mounted in various options with specific mounting bracket.

Mounting option	Code	Bracket #	Appearance	Application Description
Fixture Integrated	**F**	---		This is the original form factor of TRANS sensor for integrating with OEM luminaire through a 2" hole or mounting on ceiling with different brackets.
IP66 Fixture Integrated	**W**	---		This is the original form factor of TRANS Sensor for IP66 fixture integration through a 2" hole or with a PMB-500.
Fixture External	**E**	EMB-500		The EMB-500 is a bracket for mounting the F-mount TRANS Sensor with indoor luminaire through a 1/2" hole.
IP66 Fixture External	**P**	PMB-500		The PMB-500 is a bracket for mounting the W-mount TRANS Sensor with IP66 luminaire through a 1/2" hole.
Ceiling Surface	**S**	SMB-500		The SMB-500 is a bracket for mounting the F-mount TRANS Sensor on the surface of luminaire and hard lid ceiling with or without junction box.
Junction Box	**C**	CMB-500		The CMB-500 is a bracket for mounting the F-mount TRANS Sensor with an octagonal or square junction box on the ceiling.
Ceiling Recess	**R**	RMB-500		The RMB-500 is a bracket for recess mounting the low voltage TRANS Sensor through a 2.8" hole.

Accessories
(for E/P mount sensors)

EJ-30F
30 mm extension joint

EJ-50F
50 mm extension joint

EL-40F
40 mm elbow joint

PPU-series Power Pack

IR-TEC's PPU-series Power Pack not only provides 24 VDC power supply for the operation of IR-TEC low voltage sensors, but also accepts control signals from the connected sensors or push-button switches to control the lighting circuits, motors, self-contained air-conditioners, VAV systems, fans and motorized damper controller. The PPU-series can be attached to a junction box through a 1/2" knockout with the designed threaded nipple and locknut. It may also be mounted into fixture cable trays or located inside an adjacent junction box for specific local code requirements.

When selecting a power pack to operate with low voltage sensors, keep the following factors in mind;

- Voltage of power input
- Total current consumption of all connected devices
- Total wattage and type of load to be switched
- Signaling from multiple low voltage sensors

Product Matrix

Model	Power Input	DC Output	Control Input	Max. Load	Control
PPU-300	120/277 VAC	24 V 150mA	Digital	20A	Automatic on/off, Manual on bi-level switching, BMS Hold On/Hold Off
PPU-301	120/277 VAC	24 V 150mA	Digital	20A	Sensor control automatic on/off

PPU-300

The PPU-300 power pack is an isolated class-2 power supply and load switching device for connecting with IR-TEC's low voltage sensors and push-button switches to provide both automatic off and bi-level switching with manual-on control required by specific energy codes. Following controls can be achieved via different wiring connections as shown on the installation instruction.

- **Sensor Control ON/OFF (Occupancy Sensing Control)**
- **Manual ON, Sensor Control OFF (Vacancy Sensing Control)**
- **Manual ON with Bi-Level Switching Control**
- **Hold ON Control with BMS Override**
- **Hold OFF Control with BMS Override**

PPU-301

The PPU-301 power pack is an isolated class-2 power supply and load switching device for connecting with IR-TEC's low voltage sensors to provide occupancy sensor control automatic on/off to the connected lighting.

PPU-1 series Power Pack

Two models of low-profile power pack controller are available for connection with M1 SmartDALI Sensors to provide standalone or networked smart lighting control. A momentary push button can be connected to enable manual on/off and dimming control while allowing the sensor to automatically shut off the light after the area is vacated for a period of time.

Product Matrix

Model	Power Input	Control Output	Remarks
PPU-100DP	120/277VAC	DALI	Manual control input available
PPU-109DA	120/277VAC	DALI, 0-10V, Switched live	

PPU-100DP for DALI Control

The PPU-100DP is a low-profile DALI power supply unit for IR-TEC's SmartDALI sensor to provide standalone or networked smart lighting control. This device can also be used as a local DALI bus power source for typical DALI devices.

Through easy plug-in connection with the MRD-124S or ON-MRD-124S SmartDALI sensor, a cost effective occupancy or vacancy sensing based DALI lighting control can be easily achieved via some easy and intuitive settings. A momentary push button input can be used for manual control while allowing the sensor to automatically shut off the light after the area is vacant for a period of time.

PPU-109DA for DALI/0-10V Control

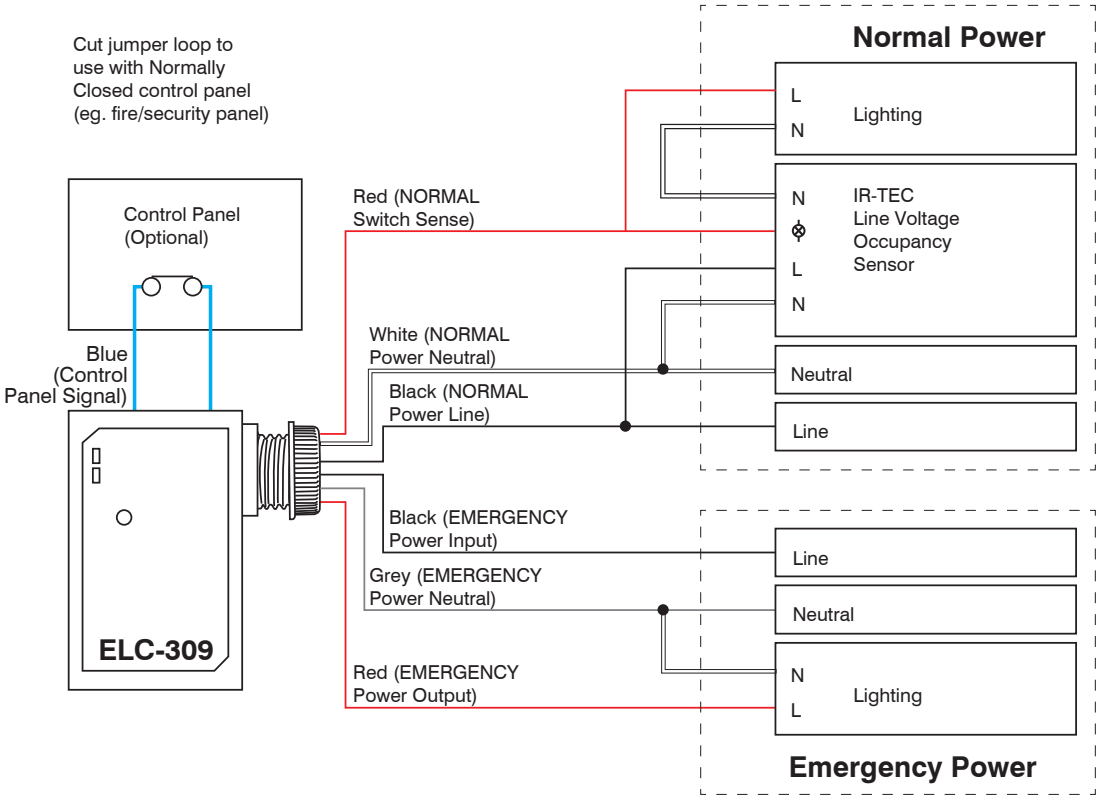
The PPU-109DA is a low-profile, DALI/0-10V selectable power pack and controller designed to provide standalone or network based smart lighting control with the connection of IR-TEC's SmartDALI sensor. This device not only supplies DALI bus power for the operation of connected sensor, but also provides DALI or 0-10V output to control the integrated luminaire in response to the sensor detection.

Through easy plug-in connection with the MRD-124S or ON-MRD-124S SmartDALI sensor, an occupancy/vacancy sensing based lighting control can be easily achieved. IR-TEC's exclusive Hybrid Switching technology is employed to protect the relay contacts from being fused by the inrush current generated while switching on the LED driver. A momentary push button input can be connected to enable manual on/off and dimming control while allowing the sensor to automatically shut off the light after the area is vacant for a period of time.

Emergency Lighting Controller

IR-TEC's ELC-309 Emergency Lighting Controller allows the emergency lighting to be controlled as sensor set mode when normal power is available is a control unit designed to allow sensor control for both the normal lighting and emergency lighting that needs to turn on when normal power is unavailable. The emergency lighting circuit is designed with an exclusive Hybrid Switching technology ideal to control the lighting with exceptionally high inrush current (HIC) while switching on, such as multiple LED or CFL lightings connected in parallel.

With an occupancy sensor connected, the ELC-309 allows the emergency lighting to be controlled as sensor set mode when normal power is available. Once normal power is unavailable, the emergency lighting will stay on using the emergency power. This control unit can be attached to the existing junction box with 1/2" knockout or mounted into fixture cable trays.



Push Buttons Switch

Product Matrix

Model	Power Input	Pole	Control	Mounting
PBS-721W	---	1	Momentary contact	NEMA wall box
PBS-722W	---	2	Momentary contact	NEMA wall box
PBD-720W	12-24VDC	1	0-10V, momentary contact	NEMA wall box

PBS-series Push Buttons

IR-TEC's PBS-series is a sleek, low profile push-button switch designed to mount in a standard NEMA wall box. The switch provides low voltage momentary contact signal for a power pack or BMS to control the operation of electrical load manually by pressing the button. The innovative pluggable terminal makes wiring connection a super easy job. A screwless snap-on Decora wall plate is supplied to create modern, high-end appearance for all kinds of commercial spaces.

PBS-721W

PBS-722W

PBD-series Push Button Dimmer Switch

IR-TEC's PBD-series is a single pole, low voltage push-button dimmer switch designed to mount into a standard NEMA wall box. This sleek, low profile switch provides a momentary contact signal for IR-TEC power pack to manually control the connected lighting, together with an adjustable 0-10V output to dim the connected light as desired through intuitive button operation.

A short press on the button will activate the manual on/off control signal, and a long press at upper/lower position of the button will increase/ decrease 0-10V dimming control output. LED light bars will indicate the operational status and dim level while pressing the button. Pluggable type terminal block makes low voltage wiring connection quick and easy.

A screwless snap-on Decora wall plate is supplied to create a modern, high-end appearance for all kinds of commercial spaces.

PBD-720W

APPENDIX

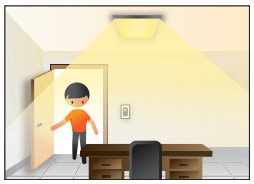
Lighting Control Strategies

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.



Occupant presence
Light auto on

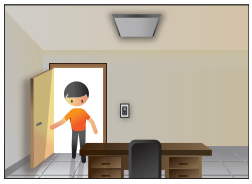
Occupant leave
Light remains on

Delay time start
Light remains on

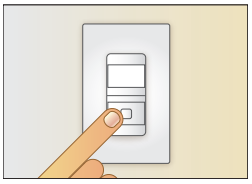
Delay time end
Light auto off

Vacancy Sensing Control (VSC)

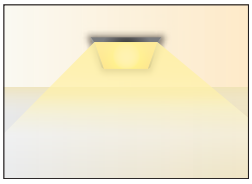
Vacancy Sensing Control typically refers to the use of a **VACANCY SENSOR** that will require the occupant to manually turn on the lights if needed, and sensor will automatically turn lights off after the area is vacant and delay time elapses. This strategy is proven with enhanced energy savings because 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.



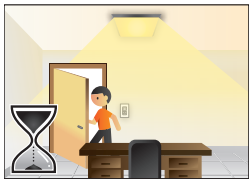
Occupant presence
Light is off



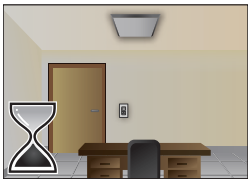
Press button



Light on



Occupant leave - Delay time start
Light remains on



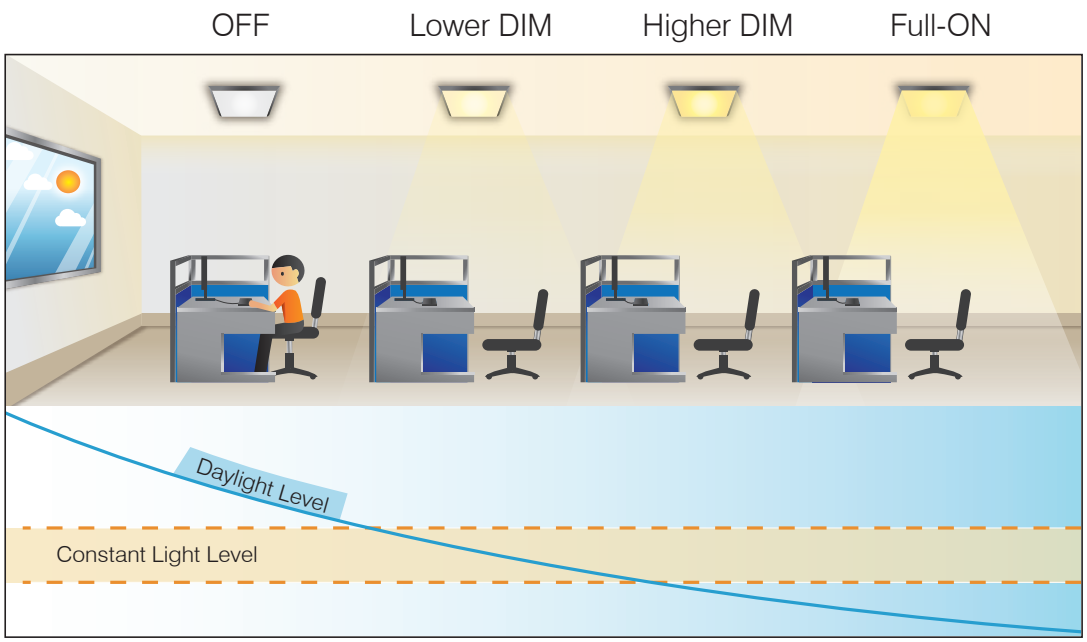
Delay time end
Light auto off

No energy saving solution will succeed if it doesn't fulfill basic human needs.

Daylight Sensing Control (DSC)

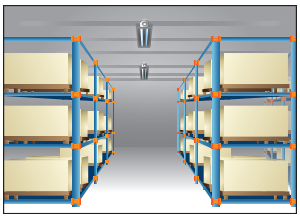
Daylight Sensing Control typically refers to the use of a **DAYLIGHT SENSOR** to inhibit or dim the electric lights in a daylight area by sensing the available natural light. The principle is simple, an ambient light sensor (ALS), some may refer it as photocell sensor, measures either the level of daylight 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.



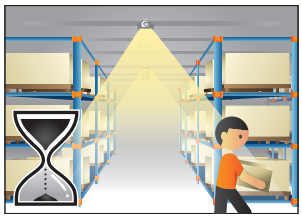
On/Off Switching (OOS)

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.

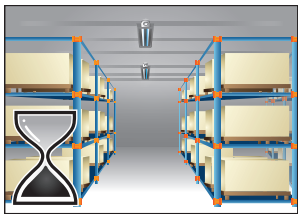


Space vacant
Light is off

Occupancy presence
Light auto on



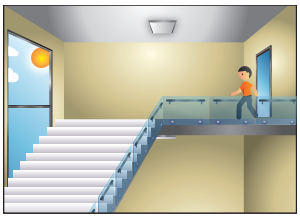
Occupant leave - Delay time start
Light remains on



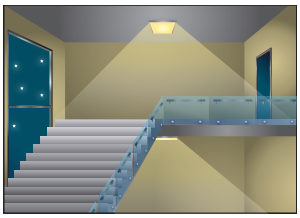
Delay time end
Light auto off

Bi-Level Control (BLC)

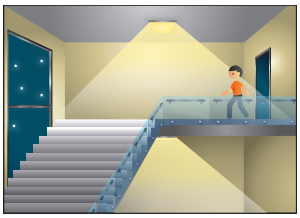
Bi-level control is an ideal control strategy with proven performance in energy savings, while still maintaining certain level of lighting for public safety and comfort. This control strategy requires using a bi-level occupancy/vacancy sensor that will keep the dimmable lighting at a low-dim level or 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.



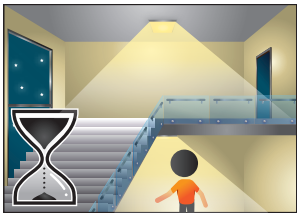
Light is off @day



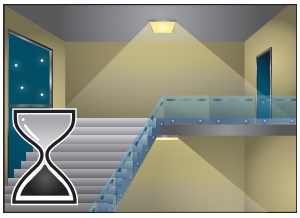
LOW DIM @night



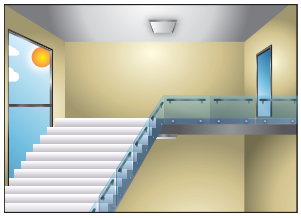
Occupant presence
HIGH DIM or 100% on



Occupant leave
Delay time start



Delay time end
LOW DIM @night



Light off @day

Continuous Dimming Control (CDC)

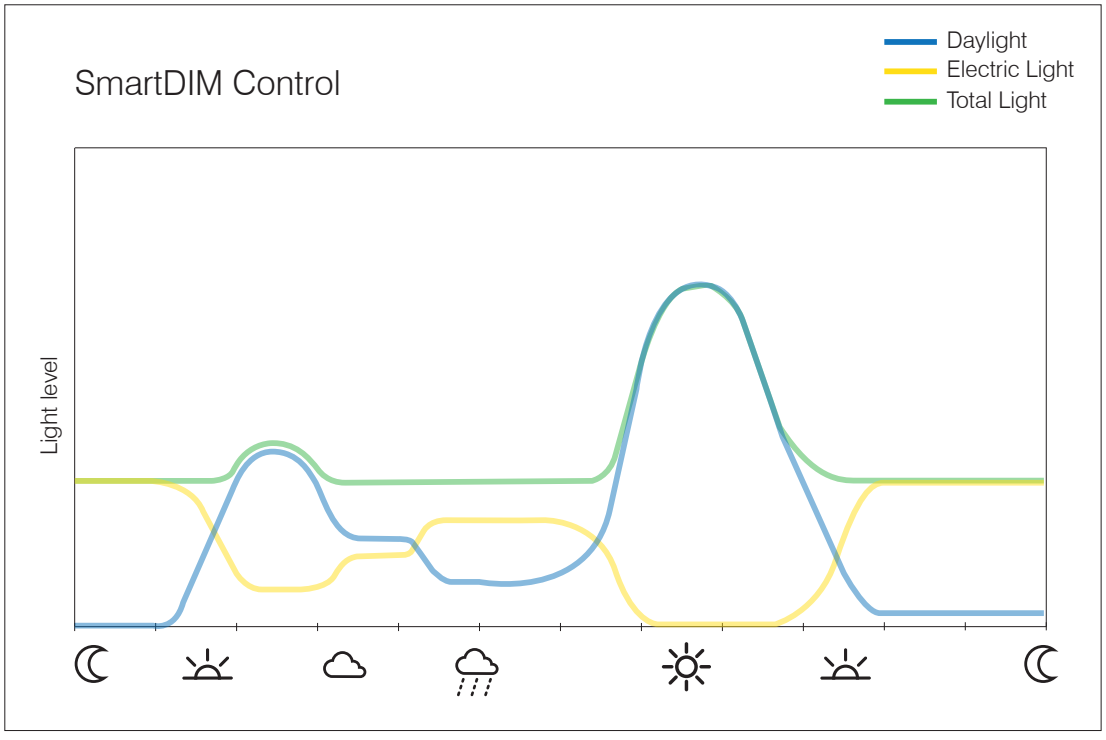
Continuous dimming is an advanced control strategy to achieve maximum energy savings for the lighting in the daylight zones. This strategy typically refers to the use of a sensor with CDC capability that will continuously adjust the lighting output to maintain the ambient light level within a pre-determined 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 - Wall Sensor

The following schemes are what IR-TEC wall switch sensors have to offer.

OSOC - Occupancy Sensing Only Control
OSOP - Occupancy Sensing Only with Presentation Mode (PM)
OSAC - Occupancy Sensing with ALS Control
OSAP - Occupancy Sensing with ALS & Presentation Mode (PM)
VSOC - Vacancy Sensing Only Control
POED - Pole One with Extended Delay
ALSO - Ambient Light Sensing Only

OSOC – Occupancy Sensing Only Control

The sensor will turn the load on automatically whenever it detects the presence of occupant, and switch the load off automatically if no occupant motion has been detected before the time delay elapses.


Space vacant
Light is off

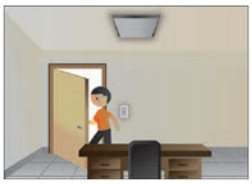

Occupant presence
Light auto on

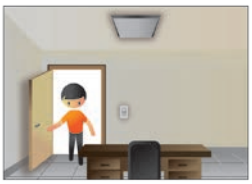

Occupant leave – Delay time start
Light remains on


Delay time end
Light auto off

Push-Button Operation


Press button – Switch to manual
Light manual off


Occupant leave
Light remains off


Next occupancy
Light remains off


Press button – Switch to auto
Light manual on


Press button – Switch to auto
Light manual on


Occupant leave – Delay time start
Light remains on


Delay time end
Light auto off


Next occupancy
Light auto on

OSOP – Occupancy Sensing Only with Presentation Mode (PM)

The sensor operates as in OSOC, but with Presentation Mode (PM) via push-button operation for specific requirement.

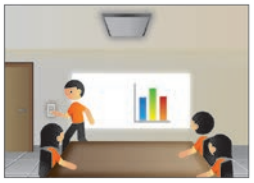
Space vacant
Light is off

Occupant presence
Light auto on

Occupant leave – Delay time start
Light remains on

Delay time end
Light auto off

Push-Button Operation



Press button – Switch to PM
Light manual off

Occupant leave – Delay time start
Light remains off

Delay time end – Reset to auto
Light remains off

Next occupancy
Light auto on

Press button
Light manual on

Occupant leave – Delay time start
Light remains on

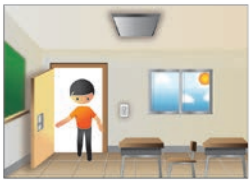
Delay time end
Light auto off

Next occupancy
Light auto on

OSAC – Occupancy Sensing with ALS Control

The sensor operates as in OSOC, but with the ALS to inhibit switching on the light when ambient light level is higher than the set threshold.

Space vacant
Light is off



Occupant presence
Light remains off

Space vacant
Light is off

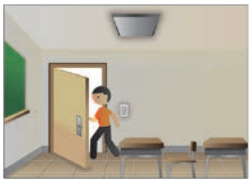
Occupant presence
Light auto on

Occupant leave – Delay time start
Light remains on

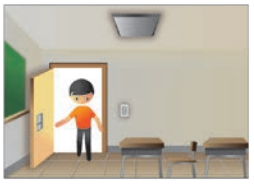
Delay time end
Light auto off

Push-Button Operation

Press button – Switch to manual
Light manual off



Occupant leave
Light remains off



Next occupancy
Light remains off

Press button – Switch to auto
Light manual on

Press button – Switch to auto
Light manual on

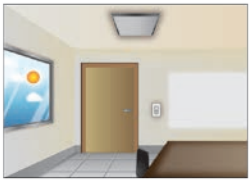
Occupant leave – Delay time start
Light remains on

Delay time end
Light auto off

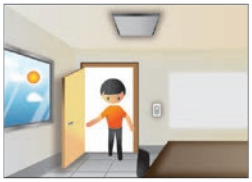
Next occupancy
Light auto on

OSAP – Occupancy Sensing with ALS & Presentation Mode (PM)

The sensor operates as in OSAC, but with the ALS and PM (Presentation Mode) both enabled.



Space vacant
Light is off



Occupant presence
Light remains off

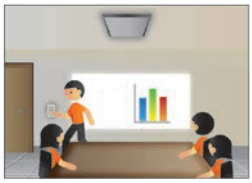
Space vacant
Light is off

Occupant presence
Light auto on

Occupant leave – Delay time start
Light remains on

Delay time end
Light auto off

Push-Button Operation



Press button – Switch to PM
Light manual off

Occupant leave – Delay time start
Light remains off

Delay time end – Reset to auto
Light remains off

Next occupancy
Light auto on

Press button
Light manual on

Occupant leave – Delay time start
Light remains on

Delay time end
Light auto off

Next occupancy
Light auto on

VSOC – Vacancy Sensing Only Control

This requires occupant to press the push-button to turn on the load connected, and the sensor will switch off the load automatically if no occupant motion has been detected before the time delay elapses. The sensor will automatically turn on the load if it detects occupant activity within 30 seconds after time delay elapsed.

VSOC mode is only available on pole 2 of double pole sensors with pole 1 set as OSOC, OSOP, OSAC or OSAP mode.

Space vacant
Light is off

Occupant presence
Light remains off

Push-Button Operation

Press button
Light manual on

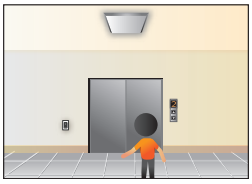
Occupant leave – Delay time start
Light remains on

Delay time end
Light auto off

Sensor will automatically turn on the light if occupancy is detected within 30 seconds after time delay elapsed.

Press button
Light manual off

Occupant leave
Light remains off



Next occupancy
Light remains off

Press button
Light manual on

POED – Pole One with Extended Delay

The sensor will control the connected load of pole-2 as per pole-1 set with an Extended Delay (ED) for 5 minutes.

Pole 1 - OSOC and Pole 2 - POED

Space vacant
Pole 1 Light is off
Pole 2 Light is off

Occupant presence
Pole 1 Light auto on
Pole 2 Light auto on

POED mode is only available
on pole-2 with pole-1 set as OSOC, OSOP or OSAP mode.

Pole 1 controls 

Pole 2 controls 

The following illustrates the operation after occupant leave under auto control.

Occupant leave – Delay time start
Pole 1 Light remains on
Pole 2 Light remains on

Delay time end – 5 minutes start
Pole 1 Light auto off
Pole 2 Light remains on

5 minutes elapsed
Pole 1 Light remains off
Pole 2 Light auto off

ALSO – Ambient Light Sensing Only

The sensor will automatically turn on the connected load of pole-2 when ambient light is lower than the LUX level set, and turn off the load when ambient light is higher than the threshold.

Pole 1 - OSAC and Pole 2 - ALSO

Space vacant
Pole 1 Light is off
Pole 2 Light is off

Occupant presence
Pole 1 Light remains off
Pole 2 Light remains off

ALSO mode is only available
on pole 2 with pole 1 set as OSAC mode.

Pole 1 controls 

Pole 2 controls 

Space vacant
Pole 1 Light is off
Pole 2 Light is on

Occupant presence
Pole 1 Light auto on
Pole 2 Light remains on

Occupant leave – Delay time start
Pole 1 Light remains on
Pole 2 Light remains on

Delay time end
Pole 1 Light auto off
Pole 2 Light remains on

Push-Button Operation

Below illustrates pole 2 operation only.

Press button 2
Pole 2 Light manual off

Occupant leave – Delay time start
Pole 2 Light remains off

Delay time end – If day
Pole 2 Light remains off

Delay time end – If night
Pole 2 Light auto on

Press button 2
Pole 2 Light manual on

Occupant leave – Delay time start
Pole 2 Light remains on

Delay time end – If day
Pole 2 Light auto off

Delay time end – If night
Pole 2 Light auto on

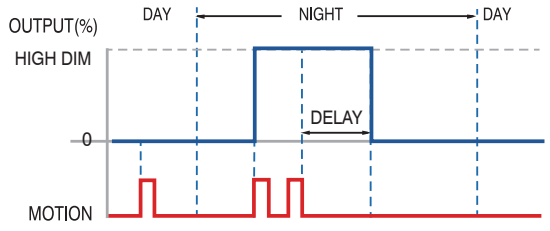
Sensing Control Schemes - Sensor

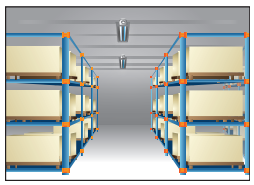
The following schemes are what IR-TEC sensors have to offer to satisfy today's lighting control needs.

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

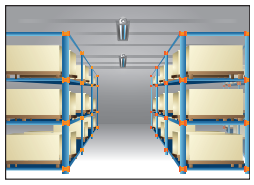
This is a typical occupancy sensing control scheme, which is applicable in all types of area. The OOS mode can be applied in the spaces with or without daylight available.

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.	



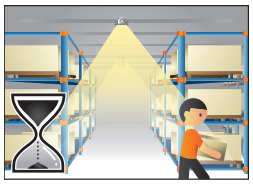
Space vacant
Light is off

Occupant presence
Light remains off

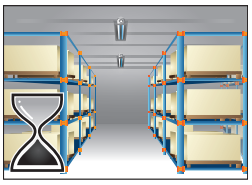


Space vacant
Light is off

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



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

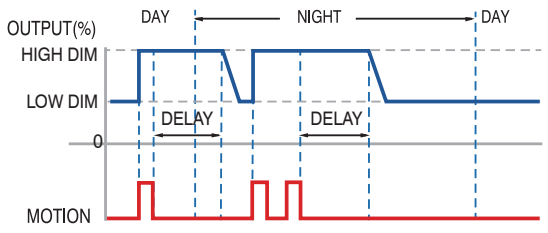


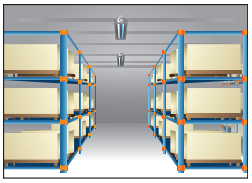
Delay time end
Light auto off

* 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.

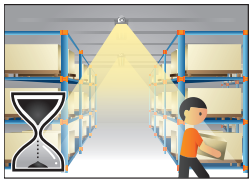
OSO – Occupancy Sensing Only

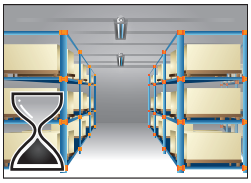
The OSO mode can be applied in the spaces without daylight but requiring certain light level for safety, security or emergency purpose even under vacancy. Typical applications include underground parking garages, 24-hour operation warehouses, stairwells, internal public hallways…etc..

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*

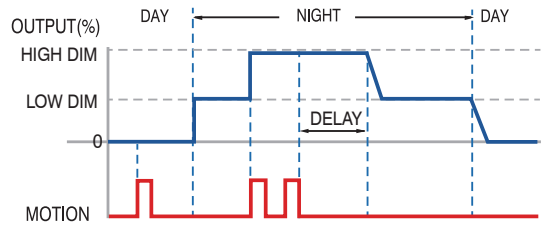

Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

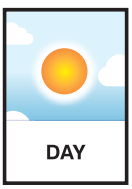

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

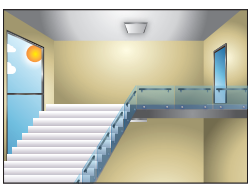

Delay time end
Light is at LOW DIM*

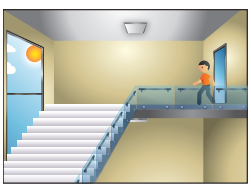
OSLA/OSMA/OSHA – Occupancy Sensing at Low/Medium/High Ambient

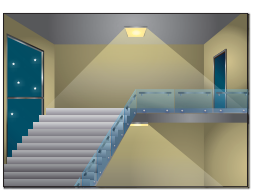
The OSLA/OSMA/OSHA control scheme can be applied in the spaces with daylight available but requiring an automatic low level lighting when ambient light level is lower than the threshold. Typical applications include perimeter zones of parking structures, stairwells/hallways/restrooms/elevator lobbies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

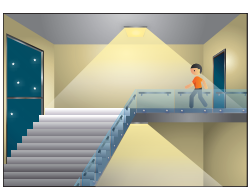
Sensor Control Description	Control Chart
Lighting will be inhibited if the ambient light level is higher than the set threshold, regardless of occupancy or vacancy. When the ambient light level is lower than the set threshold, the sensor will automatically control the light at LOW DIM level. When sensor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

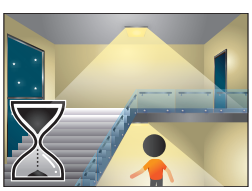


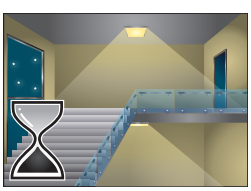

Space vacant
Light is off


Occupant presence
Light remains off


Space vacant
Light is at LOW DIM*

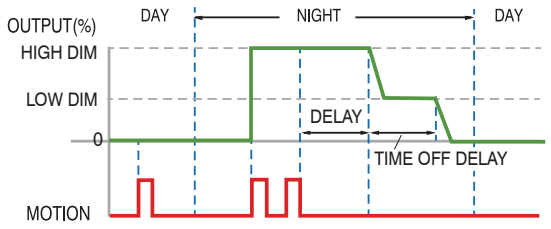

Occupant presence
Light auto on to HIGH DIM/
SmartDIM**

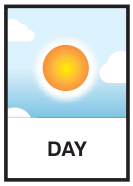

Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**

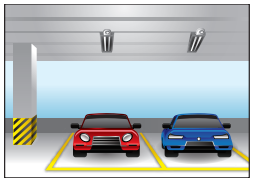

Delay time end
Light is at LOW DIM*

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

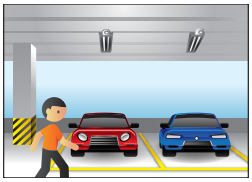
The OSLATO/OSMATO/OSHATO control scheme can be used in the spaces with minor motions that the sensors may not be able to pick up all the time. The sensor provides a low level lighting to remind the occupants before shutting off the light. Typical applications include parking lots, private offices, reading/writing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

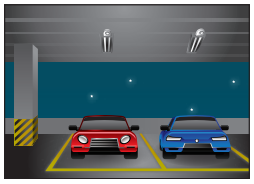




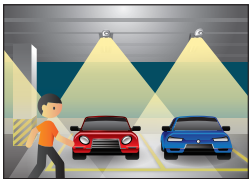
Space vacant
Light is off



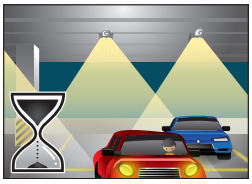
Occupant presence
Light remains off



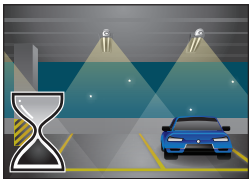
Space vacant
Light is off



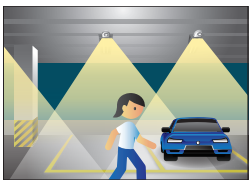
Occupant presence
Light auto on to HIGH DIM/
SmartDIM**



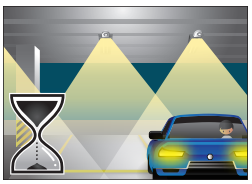
Occupant leave - Delay time start
Light remains at HIGH DIM/
SmartDIM**



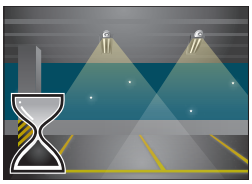
Delay time end - TIME OFF start
Light is at LOW DIM*



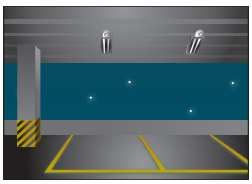
Occupant presence
Light auto on to HIGH DIM/
SmartDIM**



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



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

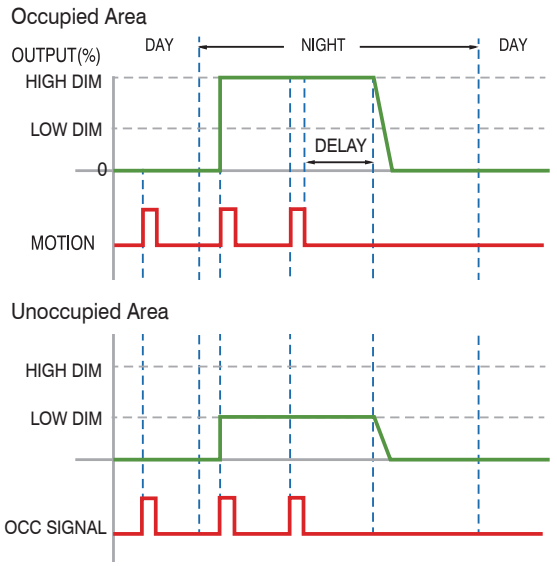


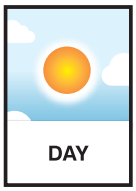
TIME OFF end
Light auto off

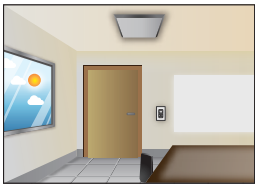
* If LOW DIM is set at “0%”, the sensor will control the light as on-off switching, bi-level control will be void.
** Continuous dimming control, only available with sensors featuring SmartDIM.

OSB – Occupancy Sensing with Background Lighting

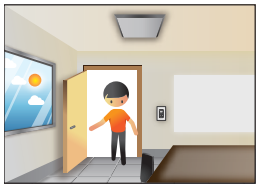
This is an advanced occupancy sensing control scheme that is suitable for open offices to provide background light level before the area of entire lighting group is vacant. This control scheme is only available with OS-NET devices.

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.	



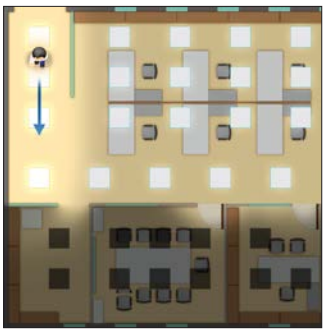


Space vacant
Light is off



Occupant presence
Light remains off

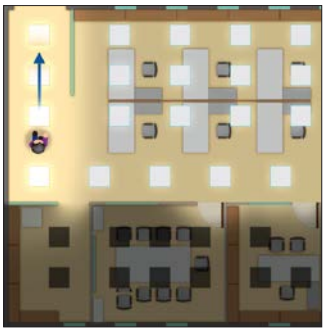
Space vacant
Light is off



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.



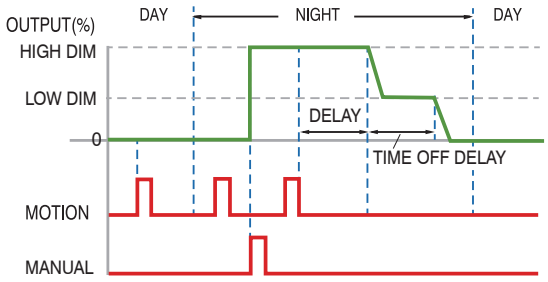
Last occupant leaves - Delay time start
Light remains at LD*/HD/SD

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.

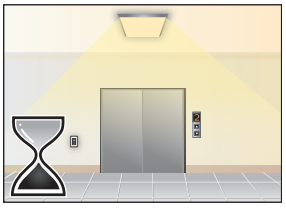
Sensor Control Description	Control Chart
The occupant would have to press the OS-NET Button to turn on the lighting group assigned. The sensor will control the lights at HIGH DIM level or continuously regulate the output to maintain overall lighting level within the pre-set range by SmartDIM control.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

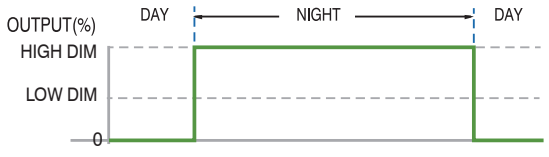
Next occupancy
Light remain off

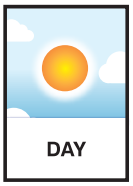
Press button
Light manual on to HIGH DIM/
SmartDIM**

* 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.	

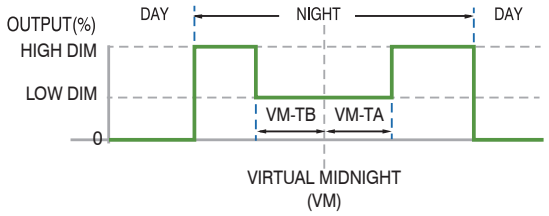


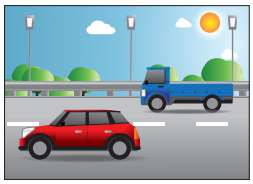
Light is off

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

Sensor Selection Index

Sensor Model			Power	Output	Tech	Setting	Sensing Strategy			Dimming Mode		Page
Type	Mount	Lens					Occ.	Vac.	Day.	SmartDIM	StepDIM	
ON-MRD-124S	---	---	DALI bus	DALI	PIR	IR remote	●	●	●	●	●	5
ON-LRD-209S	---	---	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-MRD-210S	---	---	230VAC/DALI bus	DALI	PIR	IR remote	●	●	●	●	●	
ON-LRD-209SP	---	---	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-MRD-200SP	---	---	230VAC/DALI bus	DALI	PIR	IR remote	●	●	●	●	●	
ON-LRD-309S	---	L	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-LRD-309SP	---	L	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-BRD-500S	M	L	12-24VDC	DO+0-10V	PIR	IR remote	●	●	●	●	●	6
ON-LRD-509S	M	L	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-MRD-510S	M	L	230VAC/DALI bus	DALI	PIR	IR remote	●	●	●	●	●	
ON-LRD-609S	**A**	L	120/277VAC	SLV+0-10V	PIR	IR remote	●	●	●	●	●	
ON-MRD-600S	**A**	L	230VAC/DALI bus	DALI	PIR	IR remote	●	●	●	●	●	
ON-BRD-734S	**Z**	L	12-24VDC	DO+0-10V	PIR	IR remote	●	●	●	●	●	
ON-MRD-734S	**Z**	L	Aux (+24V)	DALI	PIR	IR remote	●	●	●	●	●	
MRD-124S	---	---	DALI bus	DALI	PIR	IR remote	●			●	●	20
LRS-202SP	---	---	120/277VAC	SLV	PIR	IR remote	●					
LRS-209SP	---	---	120/277VAC	SLV	PIR	IR remote	●					
BRD-310S	---	L	12-32VDC	DO+0-10V	PIR	IR remote	●	▲		●	●	
LRD-309S	---	L	120/277VAC	SLV+0-10V	PIR	IR remote	●			●	●	
LRD-309SP	---	L	120/277VAC	SLV+0-10V	PIR	IR remote	●			●	●	
BBD-500S	M	L	12-24VDC	IDC+0-10V	PIR	APP	●	▲		●	●	
BRD-500S	M	L	12-24VDC	IDC+0-10V	PIR	IR remote	●	▲		●	●	
LBD-509S	M	L	120/277VAC	SLV+0-10V	PIR	APP	●			●	●	
LRD-509S	M	L	120/277VAC	SLV+0-10V	PIR	IR remote	●			●	●	
LRS-509S	M	L	120/277VAC	SLV	PIR	IR remote	●					
MRD-510S	M	L	230VAC/DALI bus	DALI	PIR	IR remote	●			●	●	
HRD-600S	**P**	L	347/480VAC	SLV+0-10V	PIR	IR remote	●			●	●	
LBD-609S	**A**	L	120/277VAC	SLV+0-10V	PIR	APP	●			●	●	
LRD-609S	**A**	L	120/277VAC	SLV+0-10V	PIR	IR remote	●			●	●	
MRD-600S	**A**	L	230VAC/DALI bus	DALI	PIR	IR remote	●			●	●	
MRD-734S	**Z**	L	Aux (+24V)/DALI bus	DALI	PIR	IR remote	●			●	●	
MOD-510S	M	L	230VAC/DALI bus	DALI	PIR	Manual	●				●	21
LOS-509S	M	L	120/277VAC	SLV	PIR	Manual	●					
LOS-505S	M	L	120/277VAC	IDC	PIR	Manual	●					
COS-516S	M	L	12-48VDC	RDP	PIR	Manual	●				●	
BOA-516S	M	L	12-24VDC	0-10V	PIR	Manual	●				●	
BOA-517S	M	L	12-24VDC	0-10V+DO	PIR	Manual	●				●	
BOS-515S	M	L	12-24VAC/DC	IDC	PIR	Manual	●	▲				
BOS-515N	M	L	12-24VAC/DC	IDC	PIR	Manual	●	▲				
BOM-515S	M	L	12-24VDC	DO x 2	PIR	Manual	●					
LMS-509S	M	---	120/277VAC	SLV	HFD	Manual	●					
LMD-509S	M	---	120/277VAC	SLV+0-10V	HFD	Manual	●				●	
BDS-600S	**S**	L	12-24VDC	IDC	PIR+HFD	Manual	●	▲				
LMS-109	---	---	120/277VAC	SLV	HFD	Manual	●					24
LMD-109	---	---	120/277VAC	SLV+0-10V	HFD	Manual	●				●	

Sensor Selection Index

Sensor Model			Power	Output	Tech	Setting	Sensing Strategy			Dimming Mode		Page
Type	Mount	Lens					Occ.	Vac.	Day.	SmartDIM	StepDIM	
LBS-700N	---	---	120/277VAC	SLV	PIR	Manual	●	●				15
LBS-700S	---	---	120/277VAC	SLV	PIR	Manual	●	●				
LBT-700N	---	---	120/277VAC	SLV x 2	PIR	Manual	●	●				
LBT-700S	---	---	120/277VAC	SLV x 2	PIR	Manual	●	●				
LDS-700S	---	---	120/277VAC	SLV	PIR+HFD	Manual	●	●				
LDT-700S	---	---	120/277VAC	SLV x 2	PIR+HFD	Manual	●	●				
LDD-700S	---	---	120/277VAC	SLV+0-10V	PIR+HFD	Manual	●	●			●	
BBS-700S	---	---	12-24VDC	IDC	PIR	Manual	●					
BBS-702S	---	---	12-24VDC	IDC+DO	PIR	Manual	●	▲				
BBT-700S	---	---	12-24VDC	IDC x 2	PIR	Manual	●					
BBT-702S	---	---	12-24VDC	IDC+DO x 2	PIR	Manual	●	▲				
BDS-700S	---	---	12-24VDC	IDC	PIR+HFD	Manual	●					
OS-361	---	---	24VAC/DC	FCDC	PIR	Manual	●	▲				26
OS-361DT	---	---	24VDC	FADC	PIR+HFD	Manual	●	▲				
OS-551	---	---	24VAC/DC	FCDC	PIR	Manual	●	▲				
OS-551T	---	---	24VAC/DC	FCDC	PIR	Manual	●	▲				
OS-551DT	---	---	22-26 VAC/DC	FCDC	PIR+HFD	Manual	●	▲				
POA-900	---	---	12-48VDC	0-10V	PIR	Manual	●				●	27
POH-946MBW	---	---	12-48VDC	RDP	PIR	---	●				●	
POH-946MCW	---	---	12-48VDC	RDP	PIR	---	●				●	
POH-946MDW	---	---	12-48VDC	RDP	PIR	---	●				●	
POH-946MEW	---	---	12-48VDC	RDP	PIR	---	●					
LPS-509S	M	---	120/277VAC	SLV	ALS	Manual			●			28
BED-500S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●	●	●	
BED-510S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●	●	●	
BPD-500S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●			
BPD-510S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●			
BPD-502S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●	●		
BPD-512S	M	---	12-24VDC	IDC+0-10V	ALS	Manual			●	●		

▲ denotes that vacancy control is available with IR-TEC's power pack.

Legends

PIR: Passive infrared
IDC: Isolated dry contact
FADC: Form A dry contact
HFD: High frequency doppler
DO: Digital output
M **:** Multiple mounting options
ALS: Ambient light sensor
RDP: Regulated DC power
L **:** Multiple lens options
SLV: Switched line voltage
FCDC: Form C dry contact

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