

# TRANS

## Occupancy & Daylight Sensor Solutions



Flexibility • Versatility • Simplicity



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## FOREWORD

Many unoccupied spaces with continued lighting operations result in a substantial waste of energy for non-residential buildings. Numerous case studies and reports have concluded substantial energy savings through broad application of occupancy and daylight sensing controls. As a dedicated manufacturer of sensor and control solutions for sustainable buildings, IR-TEC strive to develop more sensors that not only provide excellent occupancy and daylight sensing performances, but also offer versatile controls to help achieve maximum energy savings.

Maximizing energy savings  
through broad application of  
occupancy and daylight sensing controls





## About TRANS Sensor Family

Introducing the TRANS from IR-TEC, a standalone control sensor family developed from an industry leading design innovation that delivers interchangeable Electrical, Mechanical, and Optical options to its members.

This innovative modular concept has helped creating the TRANS family with numerous types of occupancy and daylight sensors featuring distinctive functionality and electrical characteristics to achieve the highest level of energy saving performance.

The TRANS sensor family ranges

- from occupancy to daylight sensors
- from line voltage to low voltage power
- from single PIR/HFD to dual technology
- from for indoor use to IP-66 wet location
- from for high-bay to wide angle detection
- from for load switching to BMS signaling
- from manual setting to remote programming
- from 24-hour sensing to ambient light inhibited
- from for fixture integration to building installation
- from for standalone control to system integration
- from for on-off switching to DALI/0-10V dimming
- from multi-level StepDIM to continuous SmartDIM

## Interchangeable EMO

Not all applications have the same conditions and control requirements, thus different types of sensor may be required for mounting at different heights in different ways. The innovative “Interchangeable EMO” design concept helps create the TRANS sensor family with unparalleled flexibility.



**E** Electrical

**M** Mechanical

**O** Optical

Numerous types of sensor featuring distinctive power supply, switching/dimming control, and signaling output are available in the same appearance. Most TRANS sensors can be flexibly integrated with OEM luminaires or mounted on the ceilings with different mounting brackets. Multiple lens options can be selected for PIR based TRANS sensors to provide different detection coverage at different mounting heights.

## Simple and User Friendly Configurations



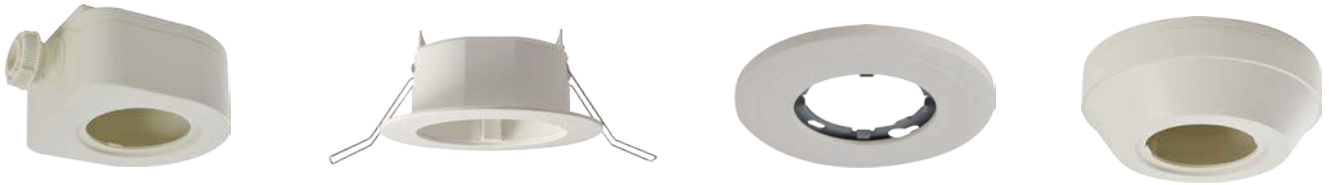
Most sensors require certain settings, such as control scheme, delay time, ambient lux threshold, dim level...etc. to achieve optimal control performance. TRANS sensors employ DIP switches, Accu-Set potentiometers, or 2-way IR remote programmer to make sensor setting an easy, intuitive, and always accurate job.



## Diverse Mounting Options

Not only does the structural diversity of today's building spaces require ceiling sensors to be mounted in many different options, the diversity of luminaires in the market today can also make sensor integration a challenge.

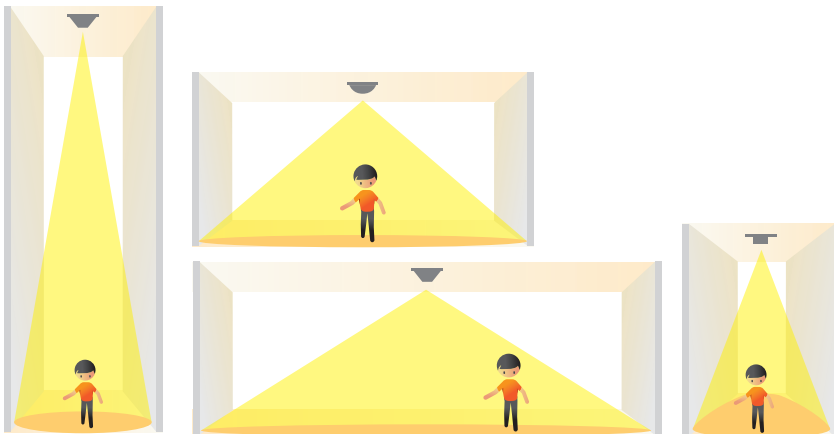
To spread the use of sensors, TRANS offers diverse mounting options for all types of applications. The TRANS sensor can be directly integrated or externally attached with OEM luminaires for indoor or outdoor, flexibly installed on the ceiling with junction box, surface or recess mounting bracket.



## Changeable Lens Options

Every PIR based sensor requires an optical lens to "see" the occupant within its range, which also determines the detection pattern by lens design. Lenses with different segment formats will provide different detection pattern and ranges.

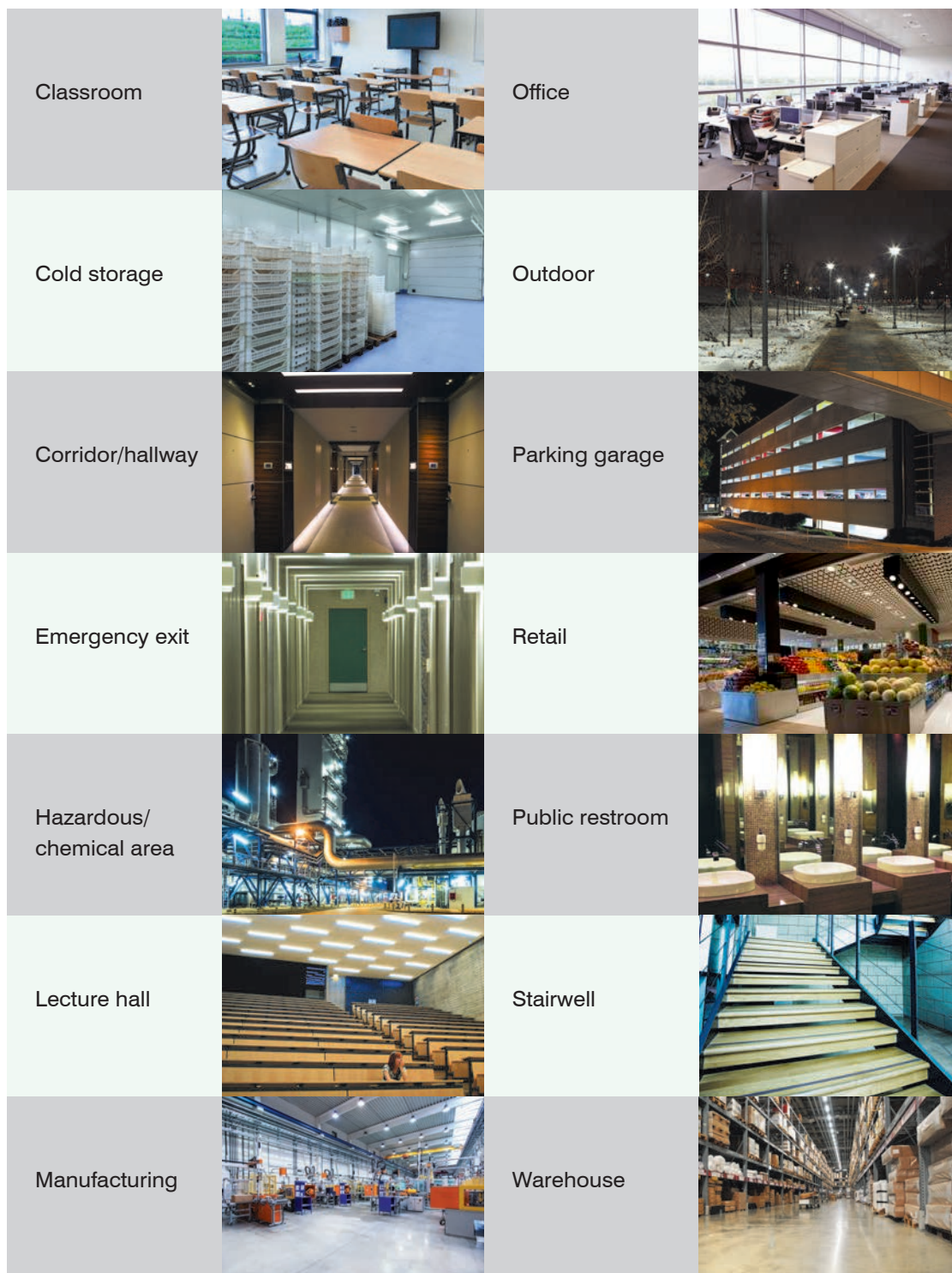
Different building spaces require different lenses to provide optimal detection ranges. Every PIR based TRANS occupancy sensor is designed with an innovative twist-lock mechanism which allows an installed sensor to provide different detection coverage by simply changing a lens.





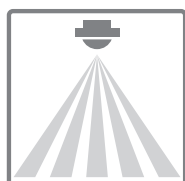
# Maximize Savings through Broad Applications

To meet the fast changing mandatory requirements of energy savings, TRANS sensor family offers a wide range of line voltage and low voltage sensors for broad applications. These sensors are packed with innovative features, superior performance, and versatile controls for direct load switching or control signal output.



# TRANS Occupancy Sensors

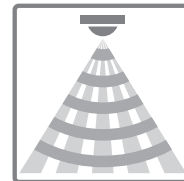
Occupancy sensors ensure maximum energy savings through automatically turning off or dimming the lights to a lower level where and when they are not needed. IR-TEC's TRANS family offers a broad range of occupancy sensors utilizing different sensing technologies for your selection.



TRANS-PIR



TRANS-HFD



TRANS-DUO

## TRANS-PIR Occupancy Sensor

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

Every PIR sensor requires an optical device, generally a plastic lens with multiple segments called Fresnel lens, to collect the infrared energy emitted by the occupant to the infrared sensing component. The Fresnel lens divides the detection coverage into multiple zones corresponding to the respective segments. In general, PIR sensors are more sensitive to the movements across the detection zones than toward the sensors. The closer the occupant is to the sensor, the better detection to the motion.

TRANS family offers many types of PIR based occupancy sensors for selection (refer to page 9 or Appendix).



with lens F



M3 sensor with Lens F



M3 sensor with Lens A

## Mounting Options



FIXTURE  
INTEGRATED



FIXTURE  
INTEGRATED  
IP66



FIXTURE  
EXTERNAL



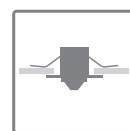
FIXTURE  
EXTERNAL  
IP66



CEILING  
SURFACE



JUNCTION  
BOX

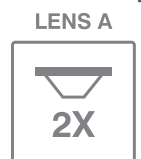


CEILING  
RECESS

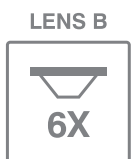


UNIVERSAL  
ATTACHED  
IP66

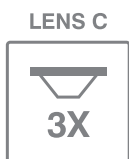
## Lens Options



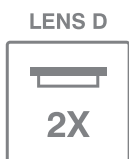
LENS A  
2X  
STANDARD



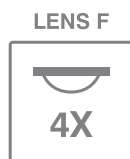
LENS B  
6X  
EXTRA WIDE



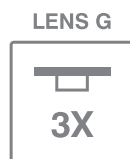
LENS C  
3X  
HIGH BAY



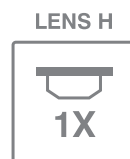
LENS D  
2X  
STANDARD



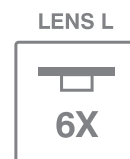
LENS F  
4X  
EXTRA WIDE



LENS G  
3X  
AISLE WAY



LENS H  
1X  
HIGH BAY



LENS L  
6X  
LONG AISLE



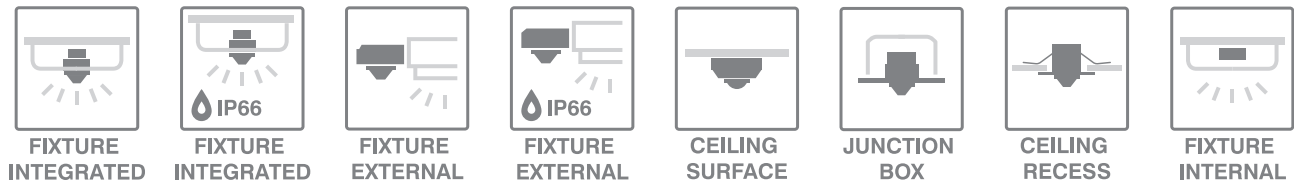
## TRANS-HFD Occupancy Sensor

High Frequency Doppler (HFD) technology senses the presence and motions of occupant by detecting the frequency shift bounced back from a moving object. TRANS-HFD occupancy sensor employs a HFD transceiver module operating with very high frequency radio waves to provide excellent minor motions detection, without requiring an unobstructed line-of-sight placement like PIR sensor, thus making the TRANS-HFD sensor suitable for applications such as an office with partitions, a library with cubicles or a restroom with stalls.



All TRANS-HFD occupancy sensors can be supplied with specific mounting options as below.

### Mounting Options



## TRANS-DUO Occupancy Sensor

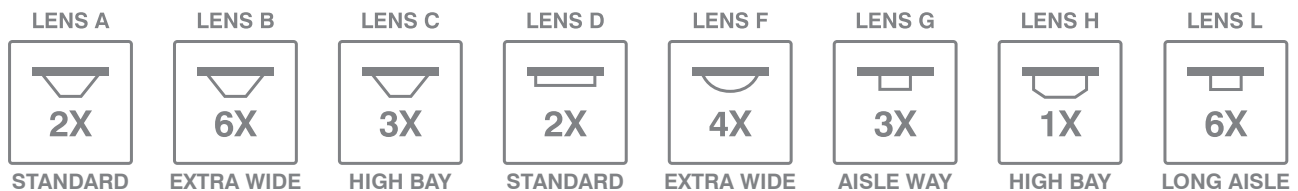
As no single occupancy sensing technology is perfect, thus the TRANS-DUO occupancy sensor is created to provide better reliability and performance by combining PIR and HFD sensing technologies into a low profile housing. By utilizing the advantages of each single sensing technology with advanced processing logic from both TRANS-PIR and TRANS-HFD sensors, the TRANS-DUO occupancy sensor is the best for most applications, as it not only provides superior sensing performance, but also greatly reduces the possibility of false activating caused by environmental interference.



with lens A/B/C

The TRANS-DUO Occupancy Sensor can be supplied with specific lens to provide different PIR detection coverage.

### Lens Options

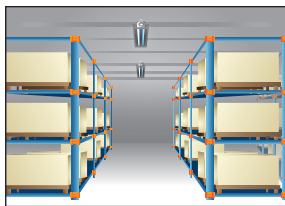


# Lighting Control Strategies

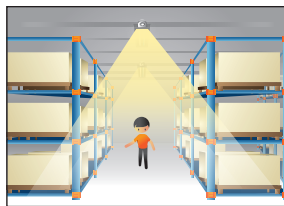
IR-TEC's TRANS occupancy sensors are designed with different lighting control strategies to fulfill different requirements of applications. In addition to the typical ON/OFF switching, many TRANS sensors also offer Bi-Level StepDIM and/or sophisticated continuous SmartDIM control.

## On/Off Switching

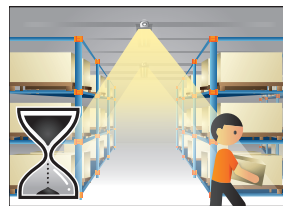
On/Off switching has been a typical lighting control strategy commonly used in most applications. Most energy codes require automatic shutoff control to save energy from unused lighting in many spaces, most TRANS occupancy and daylight sensors are designed, or can be set to switch on the electrical lights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



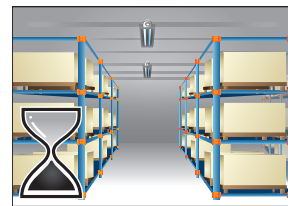
Space vacant  
Light is off



Occupancy presence  
Light auto on



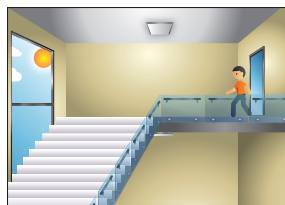
Occupant leave - Delay time start  
Light remains on



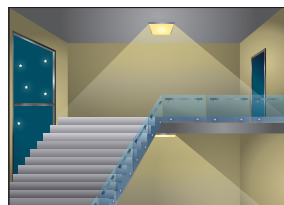
Delay time end  
Light auto off

## Bi-Level StepDIM Control

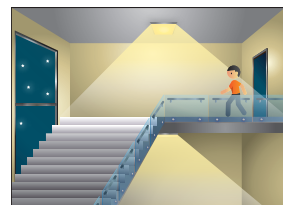
Bi-level StepDIM control is an ideal control strategy with proven performance in energy savings, while still maintaining certain level of lighting for public safety and comfort. This control strategy requires using an occupancy sensor designed with bi-level control functionality that will keep dimmable lighting at a low-dim level during vacancy period or nighttime, instead of complete shutoff.



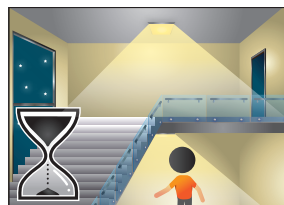
Light is off @day



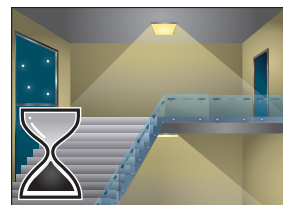
LOW DIM @night



Occupant presence  
HIGH DIM or 100% on



Occupant leave  
Delay time start



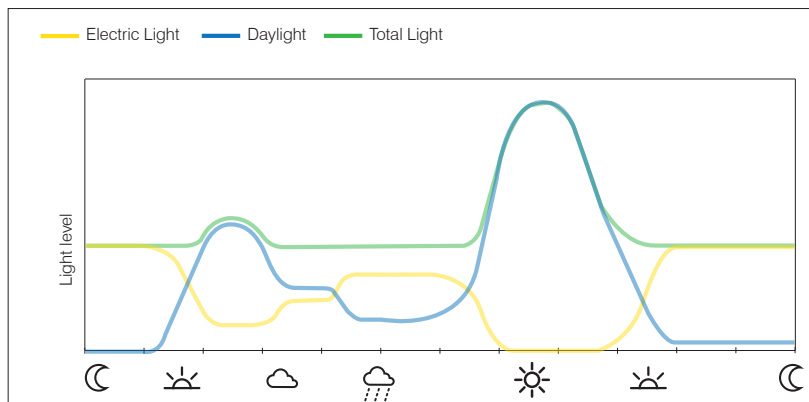
Delay time end  
LOW DIM @night



Light off @day

## Continuous SmartDIM Dimming

**SmartDIM** is a sophisticated dimming control technology developed by IR-TEC to enable the sensor to maintain the ambient light level within a pre-set range by continuously adjusting the lighting output, based on the amount of daylight available in the space. IR-TEC's SmartDIM control not only provides a smooth dimming performance to ensure occupant satisfaction while achieving maximum energy savings, but also helps extend the operational life of luminaire through dynamically adjusting the lighting output at optimal level.



## TRANS Occupancy Sensor Selection Reference

Model No.	x - Mounting	y - Lens	On/Off	StepDIM	SmartDIM	Tech	Setting	ALS	Power	Output	HS
HRD-600Sxy	P	A/B/C/D/F/G/H/L	●	●	●	PIR	Remote	●	347/480 VAC	SLV & AO	
LRD-609Sxy	A	A/B/C/D/F/G/H/L	●	●	●	PIR	Remote	●	120/277 VAC	SLV & AO	●
LRD-509Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●	●	●	PIR	Remote	●	120/277 VAC	SLV & AO	●
LRD-309S*	--	--	●	●	●	PIR	Remote	●	120/277 VAC	SLV & AO	●
LRD-309SP*	--	--	●	●	●	PIR	Remote	●	120/277 VAC	SLV & AO	●
LRS-509Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●			PIR	Remote	●	120/277 VAC	SLV	●
LOD-509Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●		●	PIR	Manual	●	120/277 VAC	SLV & AO	●
LOD-500Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●	●		PIR	Manual	●	120/277 VAC	SLV & AO	
LOS-509Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●			PIR	Manual	●	120/277 VAC	SLV	●
LMD-509Sx	F/W/E/P/S/C/I	--	●	●		HFD	Manual	●	120/277 VAC	SLV & AO	●
LMS-509Sx	F/W/E/P/S/C/I	--	●			HFD	Manual	●	120/277 VAC	SLV	●
MRD-510Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●	●	●	PIR	Remote	●	230 VAC or DALI	DALI	
MOD-510Sxy	F/W/E/P/S/C	A/B/C/D/F/G/H/L	●	●		PIR	Manual	●	230 VAC or DALI	DALI	
BRD-500Sxy	F/W/E/P/S/C/R	A/B/C/D/F/G/H/L	●	●	●	PIR	Remote	●	12-24 VDC	IDC & AO	
BOA-516Sxy	F/W/E/P/S/C/R	A/B/C/D/F/G/H/L	●	●		PIR	Manual	●	12-24 VDC	AO	
BOA-517Sxy	F/W/E/P/S/C/R	A/B/C/D/F/G/H/L		●		PIR	Manual	●	12-24 VDC	DO & AO	
BOM-515Sxy	S/C/R	A/B/C/D/F/G/H/L	●			PIR	Manual	●	12-24 VDC	DOx2	
BOS-515Sxy	S/C/R	A/B/C/D/F/G/H/L	●			PIR	Manual	●	12-24 VAC/DC	IDC	
BOS-515Nxy	S/C/R	A/B/C/D/F/G/H/L	●			PIR	Manual		12-24 VAC/DC	IDC	
COS-516Sxy	F/W/E/P/S/C/R	A/B/C/D/F/G/H/L	●	●		PIR	Manual	●	12-48 VDC	RDP	
BDS-600Sxy	S	A/B/C/D/F/G/H/L	●			DUO	Manual	●	12-24 VDC	IDC	

\* Please purchase lens separately

**Legends** HS: Hybrid Switching

SLV: Switched Line Voltage

AO: Analog Output (0-10V)

IDC: Isolated Dry Contact

DO: Digital Output

RDP: Regulated DC Power

# TRANS Daylight Sensors



TRANS-LUX

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

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

## Mounting Options



FIXTURE  
INTEGRATED



FIXTURE  
INTEGRATED  
IP66



FIXTURE  
EXTERNAL



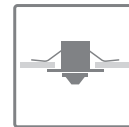
FIXTURE  
EXTERNAL  
IP66



CEILING  
SURFACE



JUNCTION  
BOX



CEILING  
RECESS

## TRANS Daylight Sensor Selection Reference

Model No.	x - Mounting	On/Off	SmartDIM	Setting	Power	Output	HS
LPS-509Sx	F/W/E/P/S/C	●		Manual	120/277 VAC	SLV	●
BED-500Sx	F/W/E/P/S/C/R	●	●	Remote	12-24 VDC	IDC & AO	
BED-510Sx	F/W/E/P/S/C/R	●	●	Remote	12-24 VDC	IDC & AO	
BPD-500Sx	F/W/E/P/S/C/R	●		Manual	12-24 VDC	IDC & AO	
BPD-510Sx	F/W/E/P/S/C/R	●		Manual	12-24 VDC	IDC & AO	
BPD-502Sx	F/W/E/P/S/C/R		●	Manual	12-24 VDC	IDC & AO	
BPD-512Sx	F/W/E/P/S/C/R		●	Manual	12-24 VDC	IDC & AO	

**Legends** HS: Hybrid Switching

SLV: Switched Line Voltage

AO: Analog Output (0-10V)

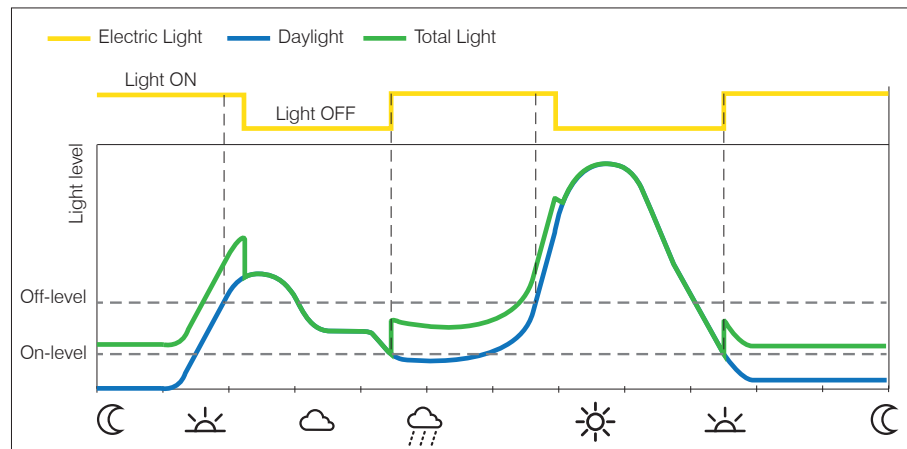
IDC: Isolated Dry Contact



# Control Strategies

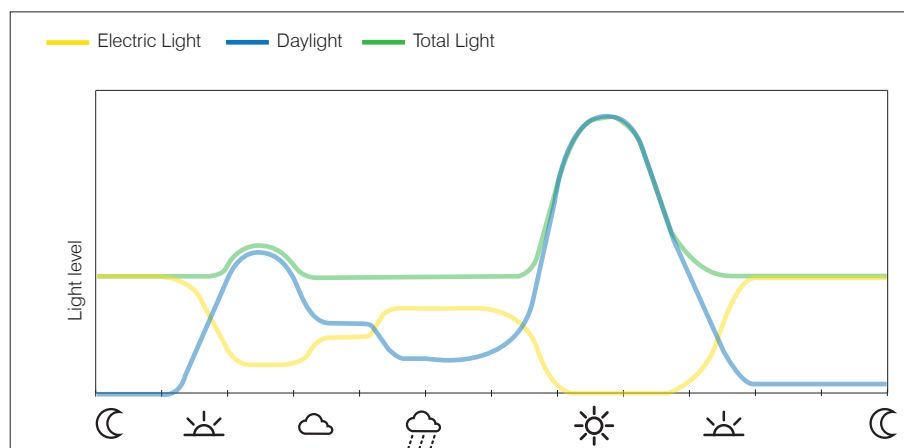
## On/Off Switching

On/Off switching is a typical daylighting control strategy used in many commercial spaces. The sensor will turn on and off the electric lights based on the amount of daylight available in the space. This type of control may require setting an adjustable delay time before shutting off the electric lights to prevent frequent on-off switching behavior. However, the space may be over lit just before there is enough daylight to provide the minimum required light level.



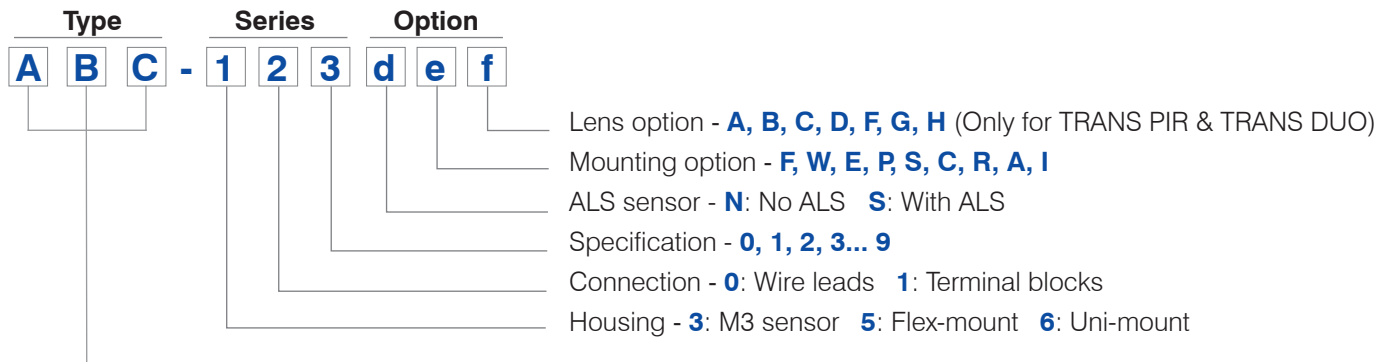
## SmartDIM Continuous Dimming

Continuous Dimming, some may refer as Constant Lighting, is an advanced control strategy for the lighting in the daylight zones. This strategy typically refers to the use of a daylight sensor with SmartDIM capabilities that will continuously adjust the output of electric lights to maintain the combined light level within a desired range, based on the amount of daylight available in the space. This control can only be achieved by using the sensor designed with continuous dimming capability, and the lighting under controlled MUST be “dimnable” as specified. A smooth continuous dimming control is the key to ensure occupant satisfaction while achieving energy savings as expected.



# Appendix

## TRANS Sensor Family Product Code











Type	Tech	Sensor Description & Functionality	Power	Output	Setting
<b>HRD</b>	PIR	Line voltage SmartDIM occupancy sensor	347/480 VAC	SLV & AO	Remote
<b>LRD</b>	PIR	Line voltage SmartDIM occupancy sensor	120/277 VAC	SLV & AO	Remote
<b>LRS</b>	PIR	Line voltage occupancy sensor	120/277 VAC	SLV	Remote
<b>LOD</b>	PIR	Line voltage occupancy sensor	120/277 VAC	SLV & AO	Manual
<b>LOS</b>	PIR	Line voltage occupancy sensor	120/277 VAC	SLV	Manual
<b>LMD</b>	HFD	Line voltage bi-level occupancy sensor	120/277 VAC	SLV & AO	Manual
<b>LMS</b>	HFD	Line voltage occupancy sensor	120/277 VAC	SLV	Manual
<b>MRD</b>	PIR	SmartDALI occupancy sensor	230 VAC or DALI	DALI broadcast	Remote
<b>MOD</b>	PIR	DALI occupancy sensor	230 VAC or DALI	DALI broadcast	Manual
<b>BRD</b>	PIR	Low voltage SmartDIM occupancy sensor	12-24 VDC	IDC & AO	Remote
<b>BOA</b>	PIR	Low voltage bi-level occupancy sensor	12-24 VDC	DO & AO	Manual
<b>BOM</b>	PIR	Low voltage occupancy sensor	12-24 VDC	DOx2	Manual
<b>BOS</b>	PIR	Low voltage occupancy sensor	12-24 VAC/DC	IDC	Manual
<b>COS</b>	PIR	LED control occupancy sensor	12-48 VDC	RDP	Manual
<b>BDS</b>	DUO	Low voltage dual-tech occupancy sensor	12-24 VDC	IDC	Manual
<b>LPS</b>	LUX	Line voltage daylight sensor	120/277 VAC	SLV	Manual
<b>BED</b>	LUX	Low voltage SmartDIM daylight sensor	12-24 VDC	IDC & AO	Remote
<b>BPD</b>	LUX	Low voltage daylight sensor	12-24 VDC	IDC & AO	Manual

**Legends**    **HS:** Hybrid Switching      **SLV:** Switched Line Voltage      **AO:** Analog Output (0-10V)  
                  **IDC:** Isolated Dry Contact      **DO:** Digital Output      **RDP:** Regulated DC Power

## Mounting Options

Mounting option	Code	Bracket #	TRANS-PIR	TRANS-HFD	TRANS-LUX
Fixture Integrated	<b>F</b>	---			
IP-66 Fixture Integrated	<b>W</b>	---			
Fixture External	<b>E</b>	EMB-500			
IP-66 Fixture External	<b>P</b>	PMB-500			
Ceiling Surface	<b>S</b>	SMB-500			
Junction Box	<b>C</b>	CMB-500			
Ceiling Recess	<b>R</b>	RMB-500			
Fixture Internal	<b>I</b>	IMB-500	---		---
IP-66 Universal Attached	<b>A</b>	---		---	---

## Lens Options

Lens	Standard	Extra Wide	High Bay	Standard	Wide Angle	Aisle Way	High Bay	Long Aisle
Code	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>L</b>
M. Height (X)	8~15 ft	8~10 ft	15~30 ft	8~20 ft	8~20 ft	8~40 ft	30~50ft	8~10ft
Coverage	2X	6X	3X	2X	4X	3X	1X	6X
Exterior								


Lens C/G may be mounted up to 40/50 ft or higher at the area providing with motions of large objects, such as forklift trucks. Before installing all sensors, please ensure that the sensor can have optimal detection at expected height.


# TRANS



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1-855-464-7832

 1-714-255-1452

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