

Project Name	
Project #	
Model #	
Type	

## SEN-053-LMS-509 series Line Voltage Occupancy Sensor



### OVERVIEW

The **SEN-053-LMS-509** series member of the TRANS family is a line voltage switching occupancy sensor designed for all-purposes energy efficient lighting control. This occupancy sensor employs an advanced High Frequency Doppler (HFD) sensing technology to provide superior sensing performance of minor motions, such as typing, writing, or reading. The HFD technology is operating with high frequency (4~12GHz) radio waves which is capable of detecting the occupant's presence and movements without requiring unobstructed line-of-sight like PIR sensors.

The Accu-Set digital potentiometer makes the sensor setting easier, faster and more accurate than the conventional analog potentiometer. 4 levels of sensitivity can be selected to provide optimum range via DIP switch setting. An exclusive Hybrid Switching technology make LMS-509 series ideal to control the lighting with exceptionally high inrush current (HIC) while switching on, such as multiple LED or CFL lightings connected in parallel. The sensor comes with ambient light sensor (ALS) to inhibit switching on the light if the ambient light level is higher than the threshold set.

Like all sensors in the TRANS family, the LMS-509 series is also available in various mounting options. This provides a second-to-none design and installation flexibility.

### FEATURES

- High Frequency Doppler sensing technology
- 120/277 VAC line voltage operation
- Hybrid switching for controlling loads with HIC
- Accu-Set potentiometer for quick and easy setting
- 4 levels of HFD sensitivity setting programmable
- Ambient light sensor to inhibit unneeded lighting
- Available with a variety of mounting options

### APPLICATION

Light Control



Fan Control

The **SEN-053-LMS-509** series occupancy sensor can be used to directly control the connected light, or other loads, by sensing the presence and movements of the occupant without requiring unobstructed line-of-sight. This makes the sensor suitable for applications such as an open office with partitions, a library reading area with cubicles, a restroom with stalls, inside a plastic wall box safety cover, or mounted inside of an enclosed lighting fixture.

NOTE: Do NOT place the sensor behind a metal plate or within an enclosure with high metallic wall.

# SEN-053-LMS-509 series

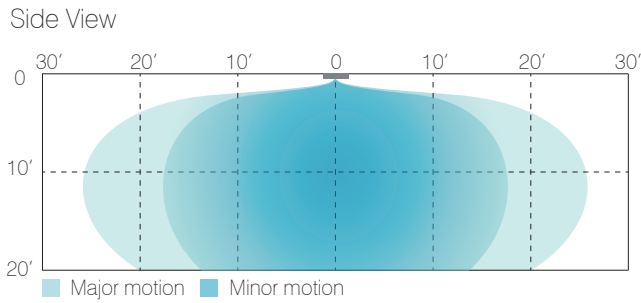
## Line Voltage Occupancy Sensor OPERATION

The **SEN-053-LMS-509** series is a line voltage operating occupancy sensor with hybrid switching output to control the operation of connected load. The sensor will switch on the light when it detects the presence and movement of a moving object (human, or vehicle) within its coverage, and automatically shut off the light after the delay time elapses. Different delay times can be programmed by an Accu-Set digital potentiometer. An ambient light sensor is built-in to inhibit switching on the light when ambient light level is higher than the threshold set.

## DETECTION PATTERN

Mounting Height	10'	20'
Coverage (sq. ft.)*	2,000	1,200

\*Sensitivity 100%



## Mounting Options

The **SEN-053-LMS-509xX** series can be mounted into the ceiling or integrated with an OEM lighting fixture in various options. The mounting options are available by combining a specific mounting bracket (if applicable) from the table below. The bracket will be shipped with the sensor when ordered with the respective code.

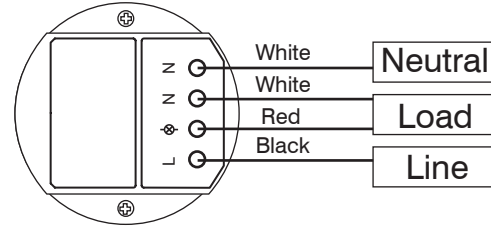
Code	Mounting Option	Mounting Bracket
F	Fixture Integrated	---
W*	Wet Location	---
E	Fixture External	<b>SEN-053-EMB-500</b>
P*	IP-66 Fixture External	<b>SEN-053-PMB-500</b>
S	Ceiling Surface	<b>SEN-053-SMB-500</b>
C	Junction Box	<b>SEN-053-CMB-500</b>
I*	Fixture Internal	<b>SEN-053-IMB-500</b>

\*Available for IP-66 fixture integration

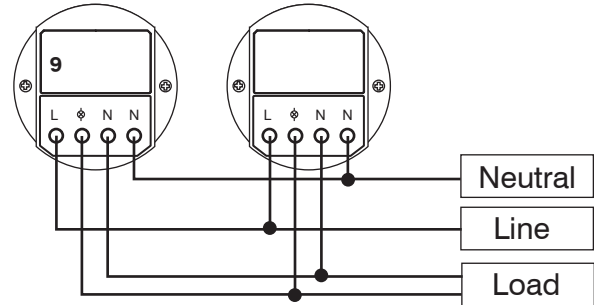
## Wiring Diagram

Various control modes may be achieved by different wiring connections. Basic wiring diagrams are included as below for reference. Consult with a team member if a more complex control is required.

### A. Single sensor control



### B. Multiple sensors control



## SPECIFICATIONS

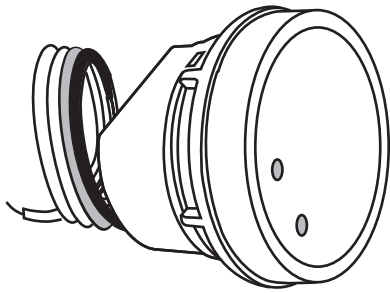
Power supply	120/277VAC
Maximum Load @ -40°F~131°F (-40°C~55°C)	Incandescent/Halogen – 800/1200W(VA)@120/277V
	Fluorescent Ballast/CFL – 800/1200W(VA)@120/277V
	Ballast Electronic (LED) – 540/1200VA@120/277V
Maximum Load @ 131°F~158°F (55°C~70°C)	Incandescent/Halogen – 500/750W(VA)@120/277V
	Fluorescent Ballast/CFL – 500/750W(VA)@120/277V
	Ballast Electronic (LED) – 500/750VA@120/277V
HFD sensitivity	25/50/75/100% selectable via DIP switch setting
Load switching	Zero-cross Hybrid-Switching
HIC protection	Max. 80A for 16.7msec.
Detection range	Up to 2,000 sq. ft. @ 10 ft
Mounting height	8 ~ 20 ft (2.4 ~ 6 m)
Ambient light level	7 level Accu-Set digital potentiometer
Delay time setting	T/1'/3'/5'/10'/20'/30', T=10 sec. for testing
Op. humidity	Max. 95% RH
Op. temperature	-40°F~158°F (-40°C~70°C)
Dimensions	Ø2.36"x H1.65" (Ø60 x H42mm)

# TRANS

## SEN-053-LMS-509 series

Line Voltage Occupancy Sensor

### INSTALLATION INSTRUCTIONS



#### ⚠ WARNING & CAUTION

- Risk of Electric Shock - Disconnect power supply before servicing.
- Open Type Photoelectric Switches.
- Install the sensor at least 1ft. away from any occupant.
- Cycling the power to the sensors will cause failure over time.

#### ⚠ AVERTISSEMENT & PRUDENCE

- Risque de choc électrique - Débranchez l'alimentation avant l'entretien.
- Ouvrir Type commutateurs optoélectroniques.

IR-TEC hereby declares that the LMS-509 complies with Directive 2014/53/EU issued by the Commission of the European Community. The complete declaration of conformity is available on our website: [www.ir-tec.com](http://www.ir-tec.com). The frequency and maximum transmitted power in EU are listed as 5800 MHz; -11,28dBm.

#### Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not properly installed and used, may cause interference to other equipment. It is the user's responsibility to ensure that this equipment does not cause interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

### OVERVIEW

The SEN-053-LMS-509 series member of the TRANS family is a line voltage occupancy sensor designed for all-purposes energy efficient lighting control. This occupancy sensor employs an advanced High Frequency Doppler (HFD) sensing technology to provide superior sensing performance of minor motions, such as typing, writing, or reading. The HFD technology is operating with high frequency radio waves which are capable of detecting the occupant's presence and movements without requiring unobstructed line-of-sight like PIR sensor.

The Accu-Set digitalized potentiometers make the sensor setting easier, faster and more accurate than the conventional analog ones. 4 levels of sensitivity can be selected via DIP switch setting to provide different coverage. An exclusive Hybrid Switching technology makes LMS-509 series perfect to control the lighting with exceptionally high inrush current (HIC) while switching on, such as multiple LED or CFL lightings connected in parallel. The sensor comes with ambient light sensor (ALS) to inhibit switching on the light if the ambient light level is higher than the threshold set. Like all sensors in the TRANS family, the LMS-509 series is also available in various mounting options.

### WARRANTY

IR-TEC International Ltd. warrants this product to be free of defects in materials or workmanship for a period of five years from date of shipment. There are no obligations or liabilities on the part of IR-TEC International Ltd. for consequential damages arising out or in connection with the use or performance of this product or other indirect damages with respect to loss of property, revenue, profit, or cost of removal, installation or reinstatement.

-Reorient or relocate the receiving antenna.  
-Increase the separation between the equipment and receiver.  
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.  
-Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**Radiation Exposure Statement:** This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This transmitter should be installed and operated with minimum distance 20cm between the radiator & your body.

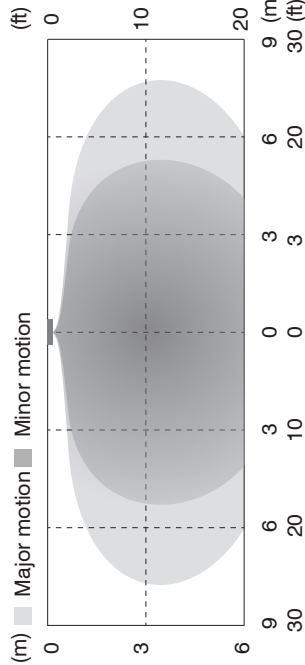
### APPLICATION NOTES

- Avoid placing the sensor in an area surrounded with metallic wall which may block or absorb the radio wave. If possible, place the sensor to the opening as close as possible.
- Fluorescent light may cause interference to the HFD sensor operation, and result in lighting permanent on. If possible, avoid placing the HFD sensor within 1m (3ft.) of fluorescent light.
- Avoid sensor placement facing doors, corridors or exits as HFD sensor may detect the traffics at adjacent area.
- HFD sensors are best for use in areas with partitions and high dividers, or high level of minor motion activities.
- The HFD sensor is more sensitive to the movements "toward" than "across" the sensor, so ensure to place the sensor at the position "toward" the movements of occupant.

### DETECTION PATTERN

Mounting Height	3 m (10 ft)	6 m (20 ft)
Coverage*	180 m <sup>2</sup> (2,000 ft <sup>2</sup> )	100 m <sup>2</sup> (1,200 ft <sup>2</sup> )

\*Sensitivity 100%



#### Industry Canada statement:

IC : 22993-509HS1AC601

This device complies with ICES-003, except RSSs. Operation is subject to the following two conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

#### Radiation Exposure Statement:

This equipment complies with ICED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed, and operated, such that a minimum distance 20cm between the radiator & your body.

**Déclaration d'exposition aux radiations:** Cet équipement est conforme aux limites d'exposition aux rayonnements ICED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

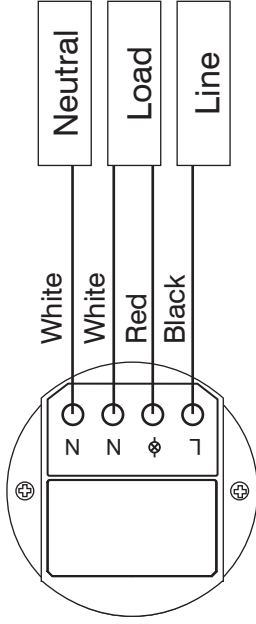
## OPERATION

The SEN-053-LMS-509S is an occupancy sensor designed to provide switched line voltage power to switch on the controlled lighting when it detects the presence of occupant. The sensor will automatically turn off the light after the area is no longer occupied for a period of time. An ambient light sensor (ALS) is built-in to inhibit switching on the light if daylighting level is higher than the threshold set.

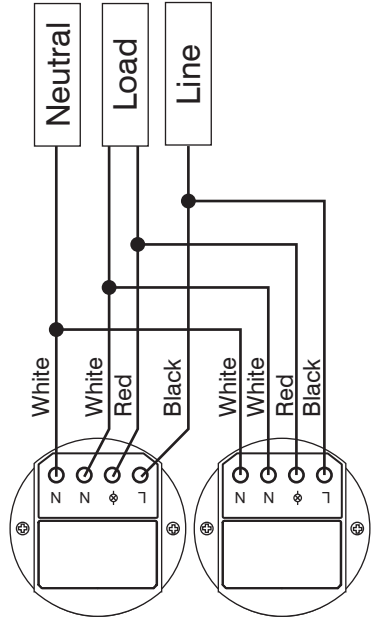
## WIRING DIAGRAM

The SEN-053-LMS-509 series can be mounted with a junction box into the ceiling, internally integrated or externally attached to a fixture to control the lighting with specific mounting bracket. Please refer to the mounting instructions separately attached for details of mounting options available.

A. Single sensor control

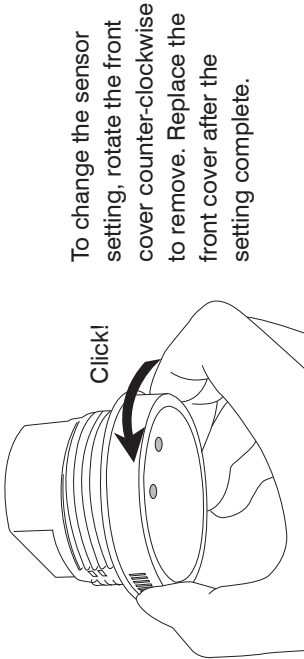


B. Multiple sensors control

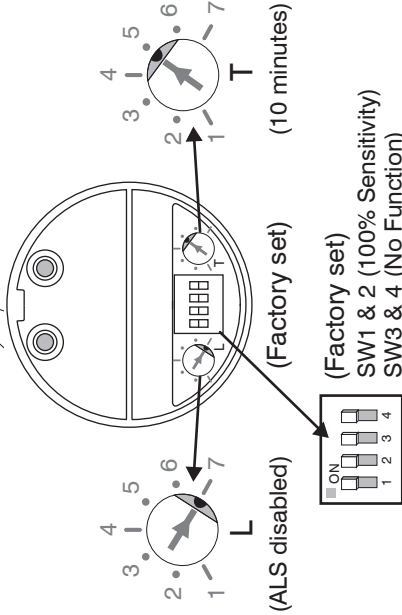


## SENSOR SETTINGS

The SEN-053-LMS-509 provides 7 different light-Off delay time and daylight threshold settings via 2 potentiometers marked T and L respectively. 4 levels of sensitivity can be set via combination DIP switch #1 and #2.



To change the sensor setting, rotate the front cover counter-clockwise to remove. Replace the front cover after the setting complete.



Position	1	2	3	4	5	6	7
T (min.)	T*	1'	3'	5'	10'	20'	30'
L (lux)	5	10	15	20	25	60	24H

### Factory Set

\*T=10 seconds shorten delay for testing convenience. The sensor will automatically resume to the factory default delay setting after 10 minutes, if the potentiometer has not been adjusted to other position.

## T - Delay Time

The potentiometer T sets the period of delay time that sensor will turn off the connected lights after the area is vacated.

## L - Ambient Light Level

The potentiometer L sets the ambient light level that the sensor will activate occupancy sensing control.

## Sensitivity

The sensitivity and detection pattern of HFD sensor may vary with the furniture placement, partition layout, wall material, and shape of the space. For example, the detection pattern will become long rectangular if sensor is placed in a long corridor. 4 levels of sensitivity can be set via combinations of DIP switch #1 and #2.

Sensitivity	100%	75%	50%	25%
DIP switch setting				
	ON-ON	ON-OFF	OFF-ON	OFF-OFF

**NOTE:** DIP switch #3 and #4 are not functional for LMS-509S.

## SPECIFICATIONS

Power supply	120/240/277VAC, 50/60 Hz			
Maximum load	120VAC	240VAC	277VAC	
-Incandescent/Halogen	800/*500W(VA)	5A	1200/*750W(VA)	
-Fluorescent Ballast/CFL	800/*500W(VA)	5A	1200/*750W(VA)	
-Ballast Electronic (LED)	540/*500VA	5A	1200/*750VA	
HFD sensitivity	25/50/75/100% selectable via DIP switch setting			
Load switching	Zero-cross Hybrid-Switching			
HIC protection	Max. 80A for 16.7msec.			
Detection range	Up to 180 sq. m. @ 3 m (2,000 sq. ft @ 10 ft)			
Mounting height	2.4 ~ 6 m (8 ~ 20 ft)			
Ambient light level	7 level Accu-Set digital potentiometer			
Delay time setting	T/1'S/5'/10'/20'/30', T=10 sec. for testing			
Op. humidity	Max. 95% RH			
Op. temperature	-40°C~70°C (-40°F~158°F)			
Dimensions	Ø60 x H42mm (2.36"x H1.65")			
*Max load for operating temperature at 55°C~70°C (131°F~158°F)				