Dual Technology Occupancy Sensor

OS-550DT

Installation Instructions

GENERAL

The IR-TEC OS-550DT is an advanced dual technology occupancy sensor that combines passive infrared (PIR) and microwave (MW) sensing technologies into one housing. By integrating two sensing technologies with intelligent firmware control, the OS-550DT provides second-to-none occupancy verification capability and advanced features for professional lighting and HVAC energy management. Before installing this sensor, please read the following instructions carefully.

OPERATION PATTERN

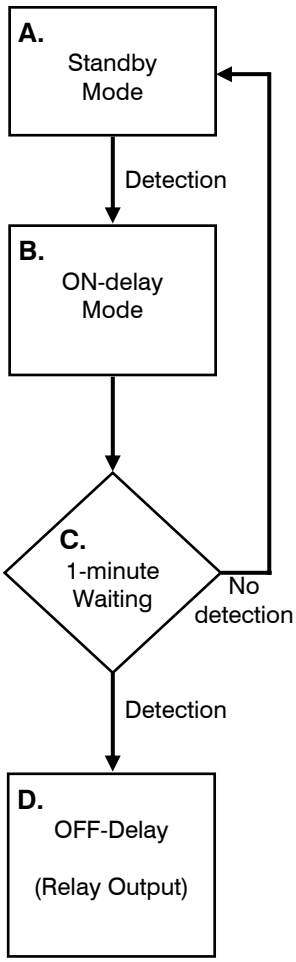
The OS-550DT is able to detect and verify occupancy status of a certain area/room and provide relay contact output for various control applications.

A. Standby mode
After warm-up period expires, the sensor will enter into standby mode. The relay remains inactive during standby mode.

B. ON-delay mode
When PIR detects the presence of occupant, the senor enters into ON-delay mode (if set). This delay allows OS-550DT to verify true occupancy before activating the relay contact. Any further detection during ON-delay mode will NOT reset the timer.

C. 1-minute Waiting
Once the ON-delay expires, the sensor enters into an 1-minute waiting time. If no activity is detected by either PIR or MW within 1 minute, then sensor will return to standby mode. If any activity is detected, then relay output will be activated and OFF-delay will be initiated.

D. OFF-Delay Mode
OFF-delay is the time that relay remains activated. Every activity detected by PIR or MW during this period will reset the timer.



DETECTION PATTERN

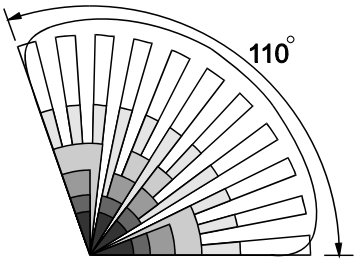
Assuming there is no physical obstructions within the detection area, the detection pattern will be an 110° arc centered directly below the OS-550DT. Depending upon the obstacles, such as furniture or partitions, the detection coverage may be less or more than the pattern shown below. This should be taken into consideration when planning the number of sensors and their placement.

Masking PIR detection

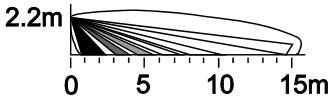
If PIR detection reaches to the unwanted area, such as hallways outside of the desired coverage, thus cause unwanted activation, the supplied masking sticker can be applied to mask the respective segments of PIR lens, thus blocking the detection to the unwanted area.

110°, 15 x 15m at 25°C

Top View

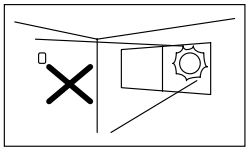


Side View

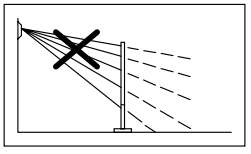


PLACEMENT GUIDELINES

Do not install the sensor so that it will face direct sunlight or strong air flow.

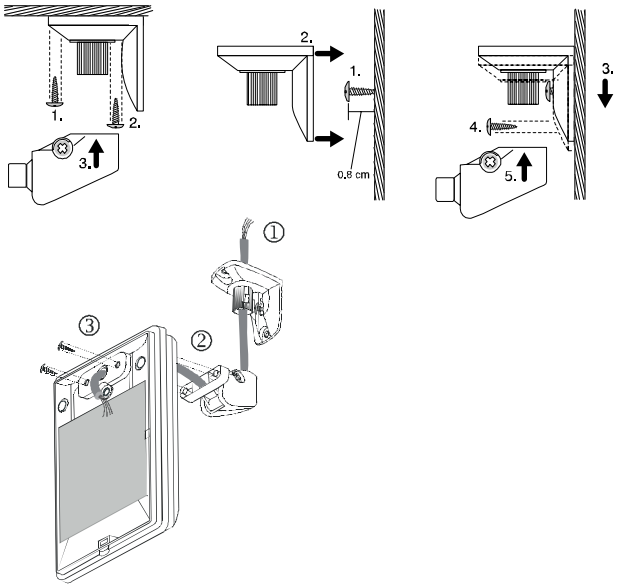


Ensure the detection area does not have any solid obstruction (plants, large pieces of furniture, curtains etc.) which may block sensor detection.



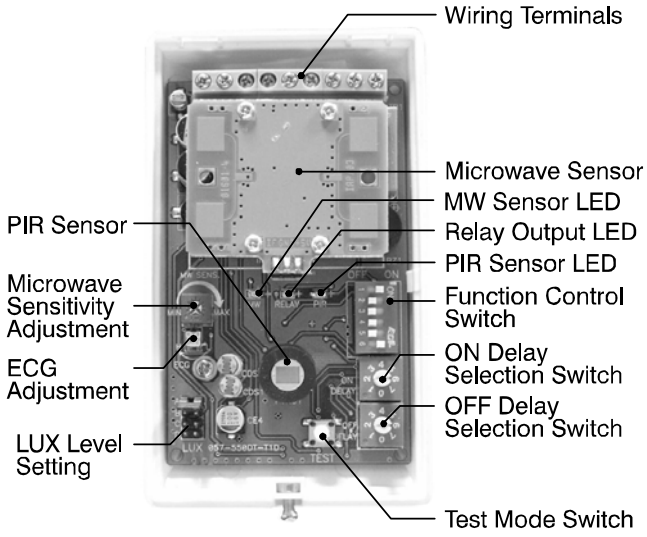
PIR sensor is more sensitive to the movements “across” the

Ceiling Mount **Wall Mount**



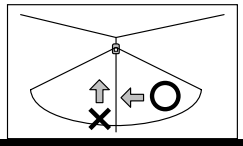
detection zones than “toward” or “away” the sensor.

SENSOR DESCRIPTION

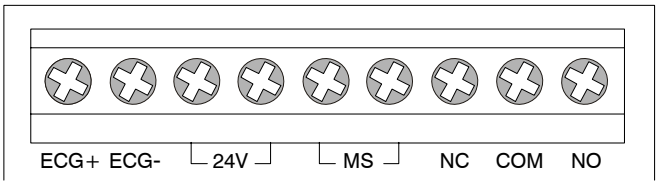


SENSOR MOUNTING

1. Mount the base of mounting bracket at the selected position on wall or ceiling.
2. Lead the cable through the central hole of mounting bracket.
3. Open the front cover of sensor by loosening the locking bolt. Carefully remove the PCB from the unit base.
4. Lead the cable into the unit base. Assemble the base with the mounting bracket. Replace the PCB on the unit base and assemble the sensor with the base of mounting bracket.
5. Connect the cable to the corresponding terminals according to the wiring instructions.



WIRING TERMINALS



ECG+, ECG- : For 0 ~ 10V ECG (Electronic Control Gear) dimmable ballast control connection.

24 V : Power input terminals.

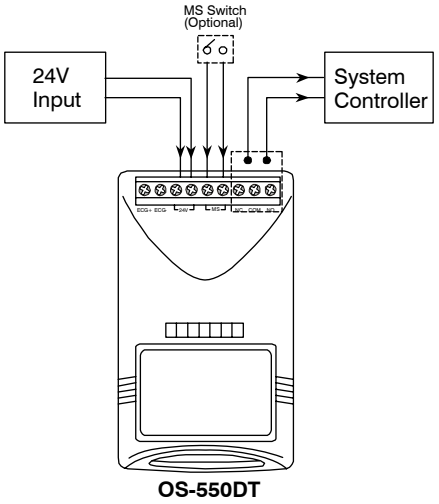
MS : Manual override signal (momentary) input.

NC-COM-NO : Form C relay contact output.

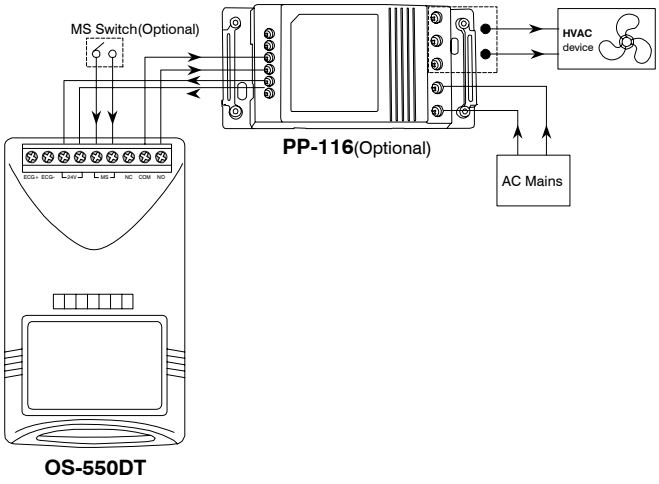
TYPICAL CONTROLS

The OS-550DT can be used to control lighting or HVAC devices in different formats. The followings connection diagrams are some typical controls for application references;

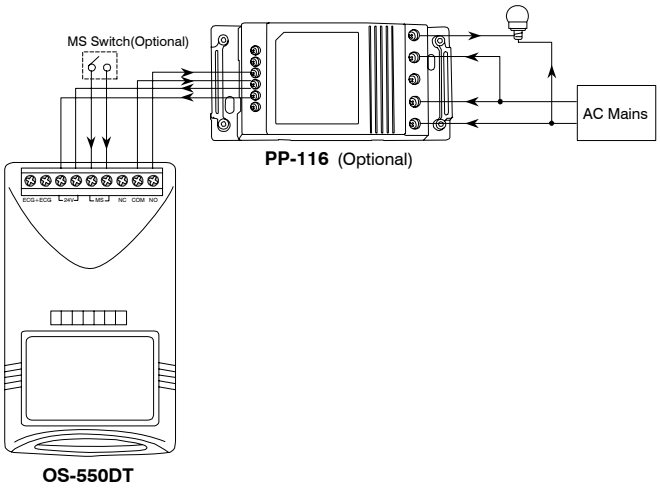
A. General control with 24 V power supply



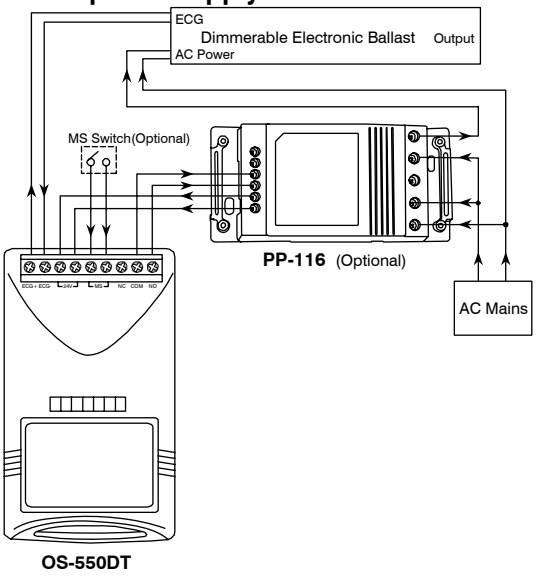
B. HVAC control with AC mains power supply



C. Light control with AC mains power supply



D. ECG Dimmable Electronic Ballast with AC mains power supply



Note:

1. PP-116 Power Pack & Controller is optional.

2. If manual override control is needed, please connect the momentary contact signal to terminal masked "MS".

ON-DELAY & OFF-DELAY

ON delay is a selectable time given to the sensor to verify true occupancy before activating the relay. This can avoid unnecessary activation of associated devices due to short-time stay or passage.

OFF delay is the time that relay remain activated after the last verified occupancy. Both ON and OFF delays can be easily set by rotating the shaft of rotary type DIP switch respectively as below table shown.

Set	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
ON Delay	0	5"	10"	20"	30"	1'	3'	5'
OFF Delay	10"	1'	3'	5'	10'	20'	30'	60'

WALK TEST

After the sensor is installed and wiring completed, the installer should carry out a walk test to verify normal sensor operation and optimum detection coverage.

When power is first applied to the unit, the PIR LED will flash about 60 seconds for sensor to warm up. Stay still during PIR warm-up time as any motion detected will extend the warm-up time. After the warm-up period expires, the unit will be ready for walk test.

For test convenience, pressing the "**TEST**" mode switch located at the bottom of PCB and the sensor will enter a 5-minute "**TEST**" mode (buzzer will beep twice). During the duration of test mode, the ON-delay will be inhibited and the OFF-delay will shorten to 10 seconds. Pressing the button during test mode will return to standby mode immediately.

Before walk testing, ensure the following things;

- All furniture and partitions are installed.
- LED indication is enabled.
- No other people or animal moves within the area.
- All wires are correctly connected.

Then walk around within the desired coverage and observe the LED. The RED LED should light on (relay is activated) whenever sensor detects the movement.

Stop and wait until the LED is off. Walk at different places and see if the LED is on. Adjust PIR sensitivity or mask the detection if necessary.

The radio signal of MW sensor may penetrate the wall (depends on the wall material) and detect the movement outside. Please adjust the potentiometer to reduce the MW sensitivity, if following situations occurred;

1. Walk around outside of wall or partition and if microwave sensor detects the movement.
2. If OS-550DT is installed in a small room and the MW LED remains on even no movement.

FUNCTIONS SETTINGS

A 6-pole DIP switch is available for installer to set various function controls as the following table shown;

Sw. No.	Control	OFF	ON
1	LED indication	Disabled	Enabled
2	Buzzer output	Disabled	Enabled
3	Smart Delay setting	Disabled	Enabled
4	Walk through mode	Disabled	Enabled
5	Automatic OFF	Disabled	Enabled
6	PIR sensitivity	Normal	Low

1. LED indication

There are 3 LED's on the unit to indicate different operation statuses. The center one (RED) indicates relay status, on means the relay is activated. The left one (GREEN) indicates microwave sensor detection status and the right one (ORANGE) indicates PIR sensor detection status. On means the sensor detects the activity of occupant.

2. Buzzer output

The built-in buzzer can be enabled to provide audible Delay-End Warning and operation indication.

3. Smart Delay setting

Smart Delay is a unique way of setting OFF-delay by monitoring the pattern of occupant activities, and automatically set and adjust the optimal OFF-delay from 3 to 30 minutes. The OFF-delay will be constantly refined as history of occupancy pattern is collected.

Note: *Once the Smart Delay is enabled, the original OFF-delay setting will be ignored.*

4. Walk-through (WT) mode

Walk-through mode turns the load off 3 minutes after the area is initially occupied, if no activity is detected after the first 30 seconds. If activity is detected beyond the first 30 seconds, the selected OFF-delay applies.

Note: *The WT mode is not available if OFF-delay is set shorter than 3 minutes. Once WT mode is enabled, the ON-delay will be inhibited.*

5. Automatic OFF

As microwave sensor may detect out-of-room activities and result in unwanted OFF-delay extension, thus the AUTO-OFF function can be enabled. If the OS-550DT receives trigger signals only from MW sensor during OFF-delay duration, it will automatic deactivate its relay at 5 times of selected OFF-delay time.

6. PIR sensitivity

The sensitivity of PIR can be decreased by switching #6 DIP switch. Set it to ON position will lower the PIR sensitivity to avoid unwanted trigger, if any.

7. LUX level setting

The relay output will be inhibited if the ambient light exceeds the set lux level. 4 different levels can be set by placing the jumper head at various pin positions. Following table shows relay active condition under different setting.

Pin	Relay active condition	Lux level (approximate)
A	Dark nighttime	< 3 LUX
B	Late dusk or early dawn	5~8 LUX
C	Early dusk or late dawn	8~12LUX
D	Day and night	ALL

SPECIFICATIONS

Power supply	18 ~ 26 VAC/DC, typical 24V
Current drain	20 mA @ 24 VDC
Detection range	110°, 15 m @25°C
Relay output	Form C, 5A @ resistive load
Mounting height	1.8 ~ 3.6 m (6 ~ 12 ft)
ON delay	0-5"-10"-20"-30"-1'-3'-5' selectable
OFF delay	10"-1'-3'-5'-10'-20'-30'-60' selectable
LUX level setting	1 ~ 2,000 lux, 4-level settings

Detectable speed	0.1 ~ 3 m/sec. (0.3 ~ 10 ft/sec)
Manual override	Momentary contact
Auto-off time	5 times of OFF-delay time, if enabled.
Walk-thru mode	3 min. if no activity within 30 sec.
RFI immunity	Average 25 V/m (10 ~ 1,000 MHz)
Operation temp.	-10°C ~ 60°C (14°F ~ 140°F)
Humidity	95% RH max.
Dimensions	112 x 66 x 45 mm (4.4 x 2.6 x 1.8")

Specifications are subject to change without prior notice.

058-55061-001 06/06'