

The OMNI-DT Series Occupancy Sensor

- Composite Infrared & Ultrasonic
- Simple, Fast Installation
- Self Adjusting (Adaptive)
- All-digital, Complete Reliability
- Optional Photocell & Extra Contacts
- Ceiling Mount

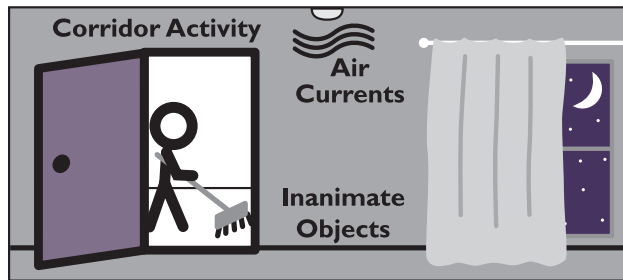
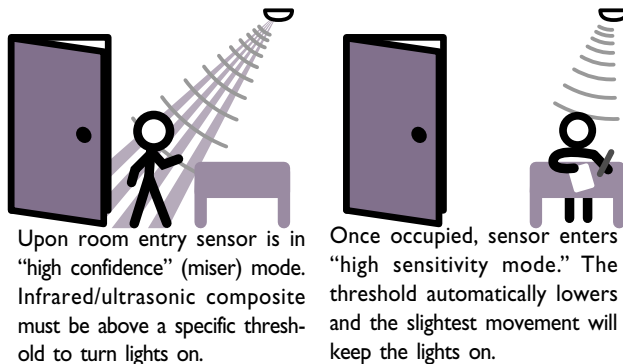


The most advanced sensor available. Combines dual technology with all-digital architecture. Eliminates false triggering. The result is a trouble-free, "install and forget" solution for lighting control.

GENERAL OPERATION

Occupancy sensors have two tasks: keeping the lights on while the room is occupied and, conversely keeping the lights off when unoccupied.

Ultrasonic (doppler shift) motion detection gives maximum sensitivity yet can be vulnerable to false triggering from air conditioning currents, corridor activity and movement of inanimate objects. Infrared motion detection gives immunity to false triggering, but lacks sensitivity at greater distances.



When unoccupied, lights stay off while air conditioning system cycles on and off, and cleaning crews occupy corridors.

COMPOSITE DUALTECH SENSING

Using infrared sensing (high error immunity) with ultrasonic (high sensitivity) provides good performance. Conventional dual tech sensors use a simple formula for operation: BOTH for ON, EITHER for KEEP ON. This method

requires that both sensors receive fixed-strength signals for ON or a single fixed-level signal for KEEP ON.

The OMNI uses a more sophisticated method called a composite signal where the signal strengths are added together to form a composite sum. The advantage of this method is that a weak IR signal plus a strong US signal will turn the lights on because the sum is enough. The installer need not worry that the signal level be balanced for reliable lights on.

ADAPTIVE FUNCTIONS

The OMNI constantly analyzes and adapts to changing conditions:

Period	Time	Action
Installation	60 min.	Timer automatically resets from Test (8 sec.) to 8 minutes.
Learning	Four weeks	1. Response to Error Conditions: (false-ons, false-offs) 2. Air current adaptation 3. Timer optimization

**Adjustments Made:**  
Ultrasonic sensitivity  
Infrared sensitivity  
Timer  
Air current threshold

Post Learning - Occupancy Periods (Circadian)	After four weeks	1. 24 hour occupancy periods learned (circadian) 2. Weekly occupancy periods learned
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**Adjustments Made:**  
a. Generally occupied periods: Threshold=High Sensitivity mode  
b. Generally unoccupied periods: Threshold=Miser mode

Note: two major errors in Circadian mode (such as a false-off) will cause Learning Phase to restart.

FEATURES

- Two Operating Modes:** Once the sensor has adapted to current room conditions, a threshold is set to determine which mode the sensor will reside in for that period. Once in Circadian Learning, the change between Miser and High Sensitivity modes is automatic.
- Self-adjusting Settings:** Callbacks for adjustment are eliminated. Ultrasonic and infrared sensitivity, timer, and air current compensation are continuously analyzed.
- Non-Volatile Memory:** Learned and adjusted settings saved in protected memory. Power outages will not cause status loss.
- Wide Coverage:** Select the approximate area needed. Units from 500 to 2000 sq. ft. available.
- Small Size:** The spherical-section shape makes the installation almost invisible.
- Accurate, Consistent Switching:** Occupant complaints are eliminated; lights are on when room is occupied, off when empty. Annoying false-offs are minimized and lights on at night is eliminated.
- Visual Status Reporting:** By waving 5 times at the sensor, the status is visually reported through a coded light sequence.
- Fast, Simple Installation:** a single mounting post and three color-coded wires make installation easy.

OPTIONS/ACCESSORIES

- RP:** Relay and Photocell Included (both). Relay: NO + NC contacts, 500ma rated @ 24vdc, three wire, isolated relay. Photocell: 0-1000 Lux adjustable, prevents lights from turning on when the room is adequately lit by natural light, mounts under the infrared lens.
- WMR:** Sensor mounting ring for surface raceway (5 pack)

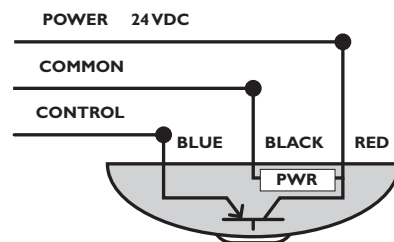
SPECIFICATIONS  
Indicator

- Green LED Lamp:** Ultrasonic motion; operational status code (every 2 minutes).
- Red LED Lamp:** Infrared motion.

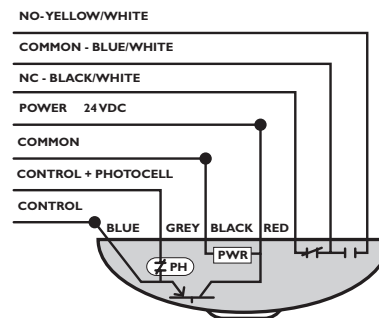
Specifications

- Construction:** Two ultrasonic transmitters and two narrow bandwidth receivers each 16mm in diameter. Frequency -- Crystal controlled to  $\pm 0.005\%$ . Transducers -- Oriented north and south (DT2000 only, others use single pairs), angled 30° down from horizontal. Housing -- Rugged, high-impact, injection molded plastic KJB ABS Cyolac (UL-945VA) flame class rating, UV inhibitors. Color coded leads are 6".
- Size & Weight:** 4.5" dia., 1.5" height; 5 oz. (114 mm dia., 38 mm height; 142 g.)
- Color:** White.
- Power Requirements:** 24 VDC, 33 mA (use MP-series power pack.)
- Output:** 24 VDC active high logic control signal with short circuit protection and optional dry contact (see -RP option).
- Operating Environment:** 32°F to 104°F (0°C to 40°C); 0% to 95% non-condensing, relative humidity. For indoor use only.
- Warranty:** 5 years.

Wiring

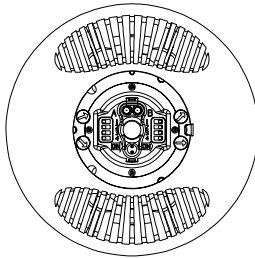


OMNI-DT (Standard)



OMNI-DT (-RP Option)

## CONTROLS



### DIP Switch Settings (all switches OFF for full automatic operation):

Function	Full Automatic Switch Position OFF	Manual Switch Position ON	Switch
A Bank			
Auto/Manual Threshold	Automatic (Normal)	Manual On (Override)	A1
LED Motion Indicators	Auto Threshold Adjust	High Sensitivity (Low turn-on threshold)	A2
Reset Learned Settings	Lights Indicate Motion	Disable LED Indicator	A3
	Retain Settings (Normal)	Erase All Learned Settings, Restart Learning (toggle on)	A4
B Bank			
Strong Airflow Compensation	Disable Compensation (Normal)	Enable Compensation	B1
Over Doorway Installation? Timer Adjust	No (Normal)	Yes, (Use increased turn-on threshold)	B2
	Adjust Timer Automatically	Use manual timer setting (No adjustment)	B3

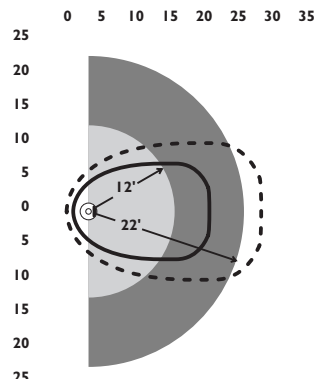
Knob Color: Control	Function	Automatic Operation	Conditions Analyzed in Automatic Operation	Knob Setting Under Manual Operation**	Recommended Manual Setting
Green: Ultrasonic Sensitivity	Sets the ultrasonic range	Sensor analyzes room and sets sensitivity to optimal setting	Air currents False-on occurrences False-off "	Linear range setting Full CCW = min (off) Full CW = max range	50%
Red: Infrared Sensitivity	Sets the infrared range	Same as above	Room (surface) temp Lens dirt Signal to noise ratio	Same as above	75%
Black: Timer	Sets the length of time lights will remain on after last motion is sensed	Timer setting generally increased during learning period, then decreases to minimize "on" time	False-off occurrences Error free operation decreases the timer setting	Linear range setting Full CCW = min (8 sec.) Full CW = max (30 min.)	33% 10 min.
Blue: Photocell	Sets level of daylight needed to prevent the lights from turning on	No automatic operation	N/A	Linear range setting Full CCW = min daylight Full CW = max (off)	Off unless used

\*\* When a function is set to "Automatic Operation" the initial setting is determined by the position of the knob. CCW is counter clockwise, CW is clockwise

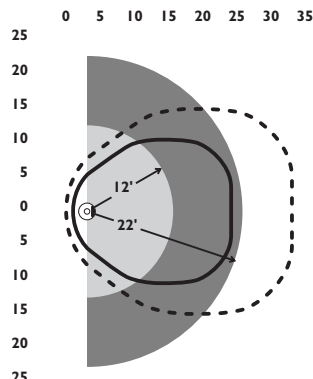
## MODELS

Part Number	Coverage	Transducer Pairs	Operating Frequency	Infrared Lens	Additional Features
OMNI-DT500	500 sq. ft.	One	40kHz	Standard	
OMNI-DT500-RP	500 sq. ft.	One	40kHz	Standard	Isolated Relay; Photocell
OMNI-DT1000	1000 sq. ft.	One	32kHz	Standard	
OMNI-DT1000-RP	1000 sq. ft.	One	32kHz	Standard	Isolated Relay; Photocell
OMNI-DT2000	2000 sq. ft.	Two	32kHz	Standard	
OMNI-DT2000-RP	2000 sq. ft.	Two	32kHz	Standard	Isolated Relay; Photocell

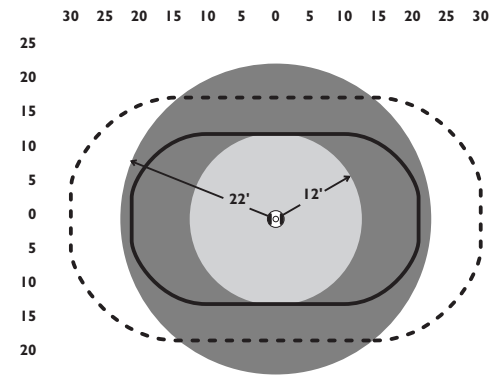
## RANGES



**OMNI-DT500**



**OMNI-DT1000**



**OMNI-DT2000**

### Ultrasonic Range Key



Minor Motion



Major Motion

### Infrared Range Key



Minor Motion

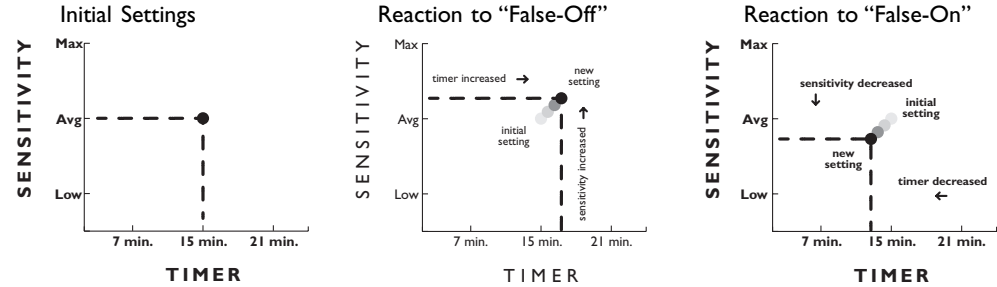


Major Motion

Ceiling height = 8 ft.

## AUTOMATIC TIMER & AUTOMATIC SENSITIVITY

The automatic timer and automatic sensitivity features of the Omni-DT work independently to prevent “false-offs” and “false-ons.” When the sensor detects motion immediately after it turns the lights out, a “false-off” is detected, timer and sensitivity are increased. If the sensor turns the lights on, but detects no immediate follow-up motion, “false-on” is detected, timer and sensitivity are decreased.



## AUTOMATIC STATUS REPORTING

To speed installation and insure reliable operation, each sensor has an LED status lamp which flashes in red or green. Short Red flash = infrared motion detected. Short green flash = ultrasonic motion detected. A user may wave at the sensor five times rapidly (within five seconds) and the sensor will immediately flash its status and timer setting.

The following information is transmitted by the Green LED:

Timer setting: 0 - 90.

Ultra sonic sensitivity: 0 - 64.

Infrared sensitivity: 0 - 64.



Green light "S" Normal operation

Green light "W" Range reduced due to air currents -- suggest moving to another ceiling location

Code Explanation:

**Timer #'s:** See installation manual.

## PHYSICAL WIRING

