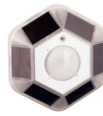


Installation Guide

MOS-MT wireless ceiling mount

IoT sensor



Overview

This guide covers the MOS-MT IoT Ceiling Sensor.

MOS-MT-xA Motion, photo, temperature and audio sensor with small motion short range lens (1000 sq. ft.)

MOS-MT-xB Motion, photo, temperature and audio sensor with large motion large range lens (1900 sq. ft.)

Where x is the frequency of the unit: U=902 MHz or Y=868 MHz.

The package includes the occupancy sensor, lens mask sticker and installation guide. A programming guide with detailed information on implementation is available for download on www.echoflexsolutions.com.



Note: *The sensors are intended for indoor use only in a dry location.*

MT Sensor Description

The IoT ceiling sensor is a self-powered wireless sensor offering occupant detection, light level, temperature and sound level monitoring for the collection of and sharing of data for Internet of Things. Facility operations use the IoT sensor data via gateways or interfaces to track occupancy levels and environment mapping for building-use optimization. Areas not being used can be placed into set-back mode to conserve energy. Used for indoor applications, the detector is optimized for ceiling heights of 8 - 10 feet (2.4 - 3 meters).

Sensor Operation

The MOS-MT sensor monitors occupancy, light level, temperature and sound level in interior spaces. The sensor is powered by solar energy from natural or artificial light sources. Powered by six solar cells, the sensor can operate without battery up to 7 days. The sensor will operate even with a brief exposure to light, however for best results the sensor should be mounted in a location with exposure for 2.5 hours of natural or artificial light (minimum of 500 lux or 46 foot-candles) on a daily basis.

The sensor must be within range of any receiving gateway or interface. The MOS-MT and gateway/interface should be installed within 80' (24m) of each other. For applications exceeding 80' (24m) range, telegram repeaters may be needed to extend reception range.



Note: *The MOS is a solar powered device that absorbs solar energy storing it for use during low light periods. Before assigning the MOS device to a receiver/controller, the device should be exposed to a good light source for a minimum of 5 minutes or install the start assist battery.*

Agency Listings and Compliance

CEC Title 24 Compliant

Built in an ISO9001 certified facility

FCC Part 15.231

Contains FCC ID: SZV-STM300U

The enclosed device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(i.) this device may not cause harmful interference and

(ii.) this device must accept any interference received,

including interference that may cause undesired operation.

IC RSS-210FCC Part 15.231

Contains FCC ID: SZV-STM300U



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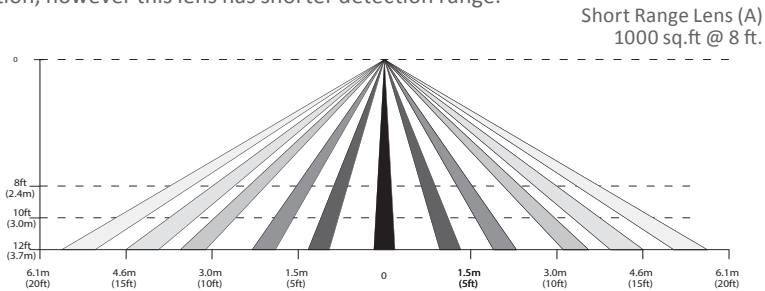
Wireless System Layout Hint

- Reception range of 24 m (80 ft) - commercial office spaces (typical), up to 100m (330 ft) line of sight
- Avoid locating transmitters and receivers on the same wall.
- Avoid locating transmitters and receivers where the telegrams must penetrate walls at acute angles. This increases the material the telegram must pass through reducing the signal power.
- Avoid large metal obstructions as they create radio shadows. Place receivers in alternate locations to avoid the shadow or use repeaters to go around the obstacle.
- Do not locate receivers close to other high frequency transmitters.
- Leave at least 3' between the receiver and any other source of interference including, ballasts, LED drivers, computers, video equipment, Wi-Fi/LAN routers, GSM modems and monitors.

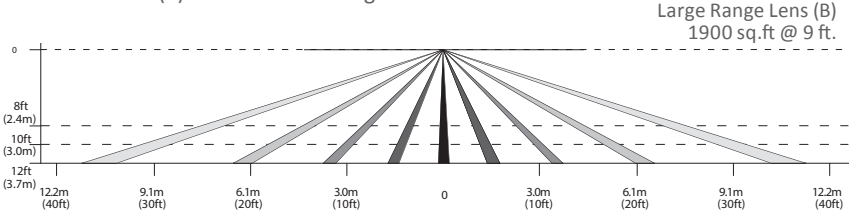
Sensor Range

The sensor is offered with different lens options.

There is a lens with a high sensor ray density pattern (lens A) suitable for small motion detection, however this lens has shorter detection range.



The second lens (B) has a broader range but is less sensitive for small motion detection.



Mounting the Sensor

The mounting location of the sensor is important as this will directly affect the receivers reception of the telegrams. Before installing, refer to the sections in the guide detailing the installation of wireless devices, layout tips and test operation modes.



Note: *The sensor cannot detect motion through solid objects including items placed by a tenant, such as file cabinets or shelves.*



Note: *Do not locate the sensor near forced air vents as hot moving air may cause the sensor to false trigger movement. Leave at least 4' (1.2 m) minimum between air vents and the sensor*

For the best sensor performance, mount the sensor so at least one of the solar cells is facing a light fixture. The sensor will operate in low light levels however for best performance, a minimum of 5 foot candles (54 lux) must be maintained. If the controlled lights in the space are dimmable either manually or via daylight harvesting, insure the light level at the lowest dimmed level meets this 5 FC requirement. If the light value does not meet this requirement, install a battery.

Installing or Replacing the Start Assist Battery

The battery is not required for normal operation of the A and B lens models. The battery (model CR2032) may be useful for installation purposes (test mode operation and linking) or for applications where there are long periods of no light.

1. Using a small screwdriver for leverage, insert under the clear plastic cover at one of the relief tabs in the base plate and pull up. You will need to repeat with at least two tabs until the cover pops free.
2. Using a finger, remove the old battery by pulling the battery free from the holder. Do not use a screwdriver.
3. Insert the new battery with the + positive side facing up and press in place with your finger.
4. Replace the cover over the sensor aligning the button hole with the teach button and press in place.

Linking the Sensor to a Receiver

The MOS-MT must be linked with a receiver, via a GP teach-in process, before its data messages can be properly interpreted. See the programing guide for more information

Test Operating Modes

The following tests can be selected when in test mode:

- Light Level Test
- Walk Test Mode,
- Sensitivity Adjust Mode
- LED indication disable

Light Level Test: This test provides visual feedback of the immediate energy produced by the solar panels.

1. To enter Light Level Test mode, press and hold the teach button until the green LED begins to blink (about 6 seconds).
2. Press and hold the teach button again until the green LED stops blinking, about 6 seconds. The green LED will start blinking faster in accordance to the light level it is detecting, see table below.

Light Level Test Indication			
Blinks	Lux / Foot candles	Time to Fully Charge	Discharge Time
0	0 / 0	below operating level	n/a
1	20-40 / 2-4	operational	n/a
2	40-80 / 4-8	48 hours	100 hours
3	80-160 / 8-16	24 hours	150 hours
4	160-320 / 16-32	12 hours	200 hours
5	320 + / 32+	6 hours	225 hours

The time to fully charge is based on the storage capacitor charging from a non-operational condition. Discharge time indicates how long a fully charged sensor will operate in the dark. The test will repeat every 2 seconds and run for a duration of 100 seconds. You may quit the test at any time by pressing the teach button for 6 seconds.

Walk Test Mode

Walk test mode allows the installer to verify areas that are within range of the motion sensor.

1. To enter walk test mode, press and hold the teach button until the green LED begins to blink (about 6 seconds).

2. A quick press and release of the button at this point will allow you to select between test modes. Pressing and releasing the teach button scrolls through the LED indicators. When the red LED is blinking, go to step 3.
3. Press and hold the teach button again for 6 seconds to select walk test.

The red LED will blink every time a motion sensor trigger is detected. The test times out in 100 seconds. If a faster exit from walk test mode is required, press and hold the teach button for 10 seconds.

Sensitivity Adjust Mode

The sensitivity adjust mode allows the user to change the PIR sensitivity. False occupancy states caused by other elements can be reduced by selecting the minimum sensitivity level. The default setting is high sensitivity.

1. To enter sensitivity adjust mode, press and hold the teach button until the green LED begins to blink (about 6 seconds).
2. A quick press and release of the button at this point will allow you to select between test modes. Pressing and releasing the teach button scrolls through the LED indicators. When the red and amber LEDs are blinking, go to step 3.
3. Press and hold the teach button again for 6 seconds to select sensitivity adjust mode.

A press and release of the button will allow you to scroll through the settings as shown in the table below.

Setting	Indication
High	Green LED blinking
Medium	Amber LED blinking
Low	Red LED blinking

To select a setting press and hold the teach button for 6 seconds when the desired LED is blinking. To exit without saving, allow the test to time-out in 60 seconds or press the teach button to exit immediately without saving.

LED Indication Enable/Disable

Note: The settings do not take effect until you save and exit.

Enter Test mode as usual, press and hold the teach button until the green LED begins to blink (about 6 seconds).

1. A quick press and release of the button at this point will allow you to select between test modes. When the green and red LEDs are both blinking simultaneously, go to step 3.
2. Press and hold the teach button again for about 6 seconds until they stop blinking.
3. The red LED blinking indicates the motion detection LED is active. The green LED blinking indicates the LEDs are inactive. Tapping the teach button will toggle between these two states. Save and exit by press and holding the teach button for 5 seconds.

Lens Masking

Lens mask stickers are provided in the packaging for your convenience.

As needed, peel off the lens masks to fit the desired area to be blocked.

Apply the mask gently to the section of the lens exterior to block the required area from occupancy sensing.

A programming guide with detailed information on implementation is available for download on www.echoflexsolutions.com.

