# SP814 MOTION DETECTOR

The Motion Detector is a Z-Wave™ enabled device and is fully compatible with any Z-Wave™ enabled network. Z-Wave™ enabled devices displaying the Z-Wave™ logo can also be used with it regardless of the manufacturer, and ours can also be used in other manufacturer's Z-Wave™ enabled networks. This Motion Detector can control our modules via controller setting. Inclusion of this Motion Detector on other manufacturer's Wireless Controller menu allows remote turn-on of connected modules and their connected lighting when the Detector is triggered. Z-Wave™ nodes in the system also act as repeaters if they support that function.

The Motion Detector is designed with dual detecting mode: Security Mode and Home Automation Mode. In security mode, the detector can be used as a security device to detect movements only in protected area by detecting changes in infra-red radiation levels (e.g. when a person moves within or across the devices field of vision, a trigger radio signal will be transmitted). In home automation mode, the detector can be used to detect movements in protected area as well as darkness in ambient illumination by detecting changes in percentage of lux level (e.g. once night falls, the percentage of ambient illumination is lower than preset value, and a person moves within or across the devices field of vision, a trigger radio signal will be transmitted). Along with detecting mode, users can decide to mount the detector on a wall for farther detecting distance but narrower coverage; while for ceiling mounting, shorter detecting distance can be made but desired coverage can be expected at user's disposal.

Adding to Z-Wave™ Network
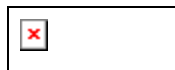
In the rear casing, there is a learning key which is used to carry out inclusion, exclusion or association. Put a Z-Wave™ Wireless Controller into inclusion/exclusion mode, press the learning key on the detector for more than 3 seconds. The LED will illuminate green steadily along with 3 times of short beeps follow by a medium beep, which implies that the detector enters code learning mode. To complete the inclusion/exclusion process, the Motion Detector supports one association group with five nodes. This has the effect that when the Detector triggers, all devices associated with Detector will be operated.

Note: If code learning fails, the LED will flash orange on and off alternately along with short beep tones.

Product Overview

| ① Front View | ② Inside View | ④ | Rear View | ⑤ |
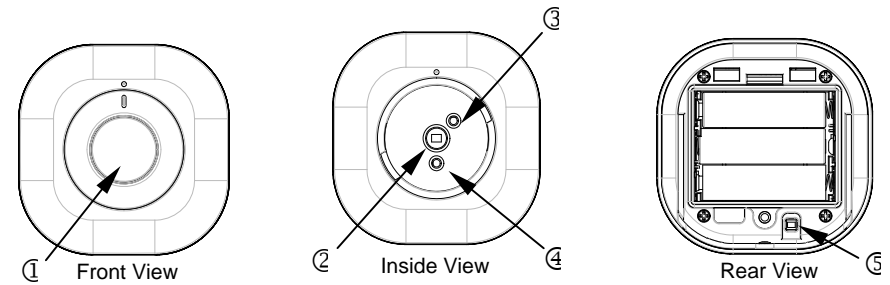
① Lens Cover (Wall-Lens Cover and Ceiling-Lens Cover)	
② LED Indicator	④ PIR Sensor
③ Light Sensor	⑤ Learning Key

Choosing a Mounting Location

The Motion Detector can be mounted either on a wall or under a ceiling. Before selecting a position for Motion Detector, the following points should be noted:

1. Do not locate the detector facing a window/fan/air-conditioner or direct sunlight. Motion Detectors are not suitable for use in conservatories or draughty areas. (FIGURE 1)
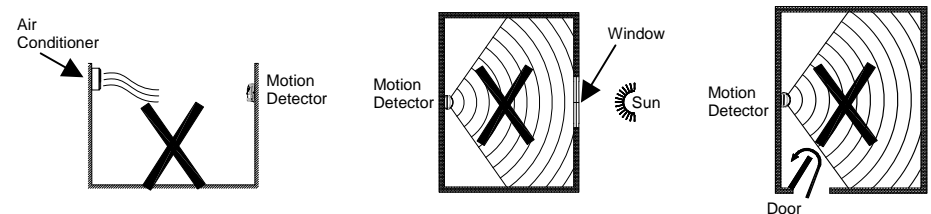

FIGURE 1

2. Do not position the detector directly above or facing any source of heat, e.g. fires, radiators, boiler etc. (FIGURE 2)
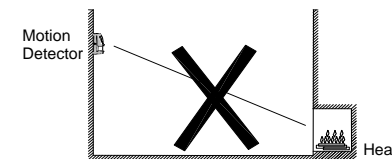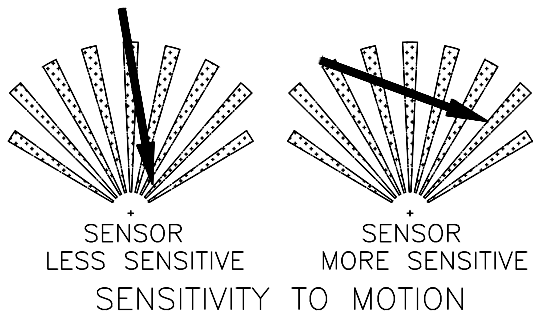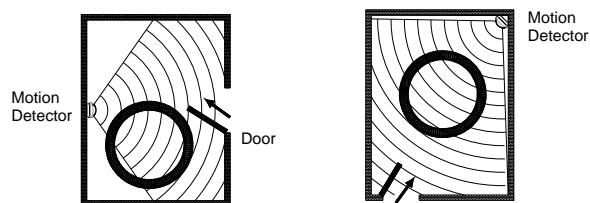

FIGURE 2

3. Where possible, mount the detector so that the logical path of an intruder would cut across the fan pattern rather than directly towards the detector. (FIGURE 3)

SENSOR
LESS SENSITIVE

SENSOR
MORE SENSITIVE

SENSITIVITY TO MOTION

FIGURE 3

4. For best results, locate the detector directly facing entrance. (FIGURE 4)

Motion Detector

Motion Detector

Door

Door

FIGURE 4

Installation

The unit can apply to two installations.   Select a location for the unit based on the coverage angles shown in FIGURE 6b and FIGURE 7b. To install a detector:

1. Undo and remove the screw from the bottom edge of the detector to detach the rear cover. (FIGURE 5a)
2. Insert 3 AA-size 1.5V alkaline batteries to the battery compartment, ensuring that correct polarity is put.   (FIGURE 5b)
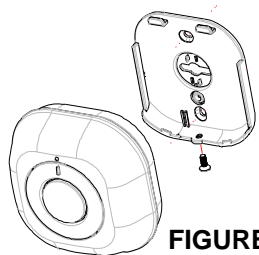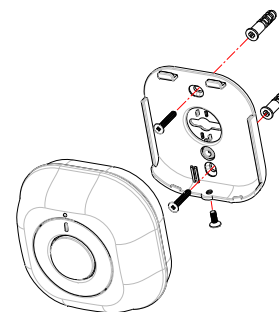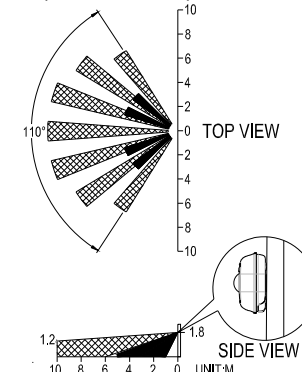

FIGURE 5a
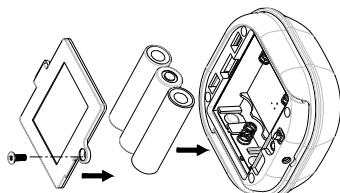
FIGURE 5b

3. Decide the detector is to be wall-mounted (FIGURE 6a) or ceiling-mounted (FIGURE 7a).   Hold the rear cover in position and mark the two mounting holes.   Drill the holes, insert the plastic wall plugs and screw the rear cover to the wall or ceiling using the screws supplied.

4. Engage the detector to the rear cover firmly.

(1) Wall Mounting

The recommended position for wall mounting is at the height of 1.8m (5.91 ft) from the floor.   At this height, the optimum detection range is up to 10m (32.81 ft) with coverage range of 110 degrees (FIGURE 6b).
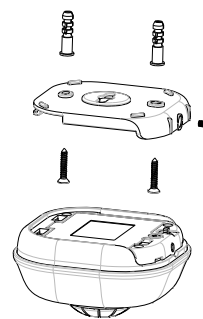

TOP VIEW
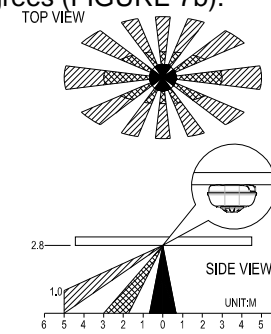
110°

SIDE VIEW

UNIT:M

FIGURE 6a

FIGURE 6b

(2) Ceiling Mounting

The recommended position for ceiling mounting is at the height of 2.8m (9.19ft) from the floor.   At this height, the optimum detection range is up to 5m (16.41ft) with coverage range of 360 degrees (FIGURE 7b).

TOP VIEW

2.8

1.0

SIDE VIEW

UNIT:M

FIGURE 7a

FIGURE 7b

2

Settings

Coverage Range Adjustments

Two types of lens covers are provided for the detector. Wall-lens cover (FIGURE 8a) is to be used when the detector is wall-mounted, whereas ceiling-lens cover (FIGURE 8b) is to be used when the detector is ceiling-mounted. The coverage range adjustment is only applicable to ceiling-lens cover; choose correct lens cover before mounting.
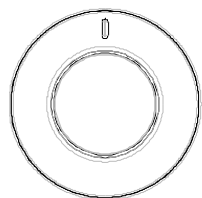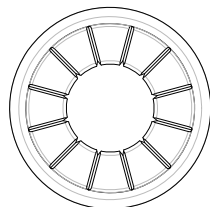

FIGURE 8a   **FIGURE 8b**

The ceiling-lens cover is composed of 12 segments for limiting the detection coverage, and each segment covers detection angle of 30 degrees. Follow the grooves on the cover, the cover can be cut to suitable size (FIGURE 8c). The remained segments are used for blanking off an undesirable detection area.
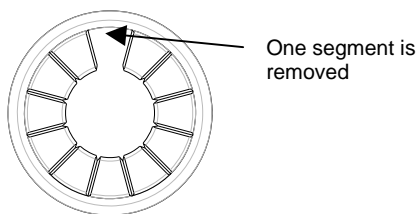

One segment is removed

FIGURE 8c

Please remove the wall-lens cover from the detector. To change cover, simply turn the cover anticlockwise (FIGURE 8d).
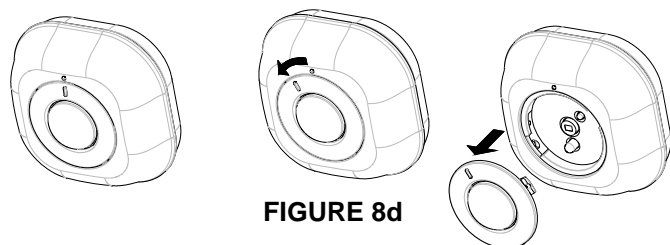

FIGURE 8d

Once the wall-lens covers has been removed, reload the ceiling-lens cover and turn it clockwise, ensure that the mark on the cover is pointing towards and aligned with the mark on the detector (FIGURE 8e).
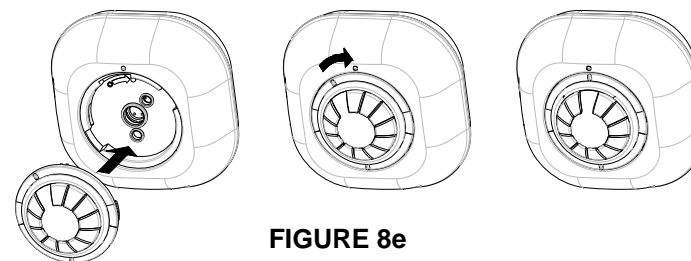

FIGURE 8e

Note: For detection of 360 degrees, simply remove wall-lens or ceiling-lens (FIGURE 8f). Loading the full size of ceiling-lens (12 lens segments) will lead to poor movement detection (FIGURE 8g).
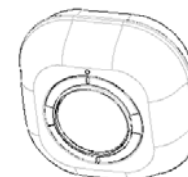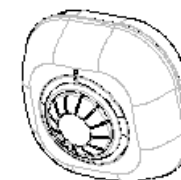
FIGURE 8f   **FIGURE 8g**

Operation

The following information is provided for setting the functions of the detector via a controller. Please get familiar with any software of Z-Wave controller before getting started.

Mode Selection

The detector can be set in security mode or home automation mode. In security mode, only PIR sensor is enabled, whereas in home automation mode, both PIR sensor and light sensor are enabled. To select mode type via a controller, please configure with following:

Parameter number: 3
Size: 1
Value: 1 (security mode)
                               2 (home automation mode)

Note: The default value is set in 1, which implies security mode.

Security Mode

The detector is triggered after it detected an intruder despite in the daytime or nighttime. (FIGURE 9a)   For example, a connected lighting turns on to indicate an invasion has occurred in order to frighten intruders away.
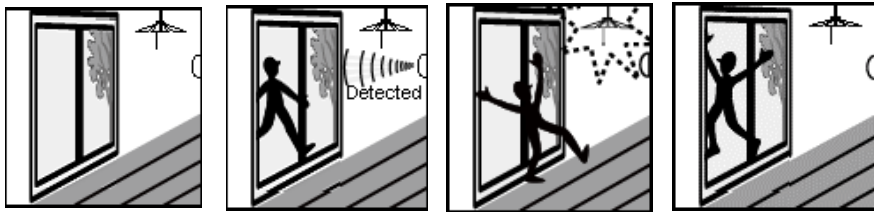

FIGURE 9a

Home Automation Mode

In darkness, the percentage of ambient illumination falls below a preset value. The detector is triggered after it detected a person and a connected lighting turns on to provide lights in stairway (FIGURE 9b).
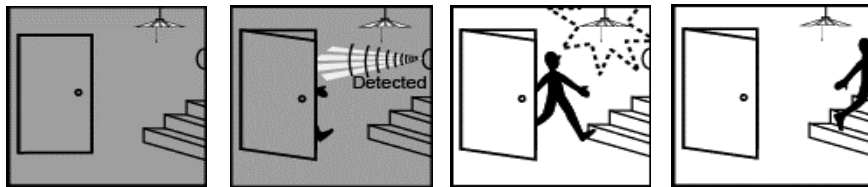

FIGURE 9b

Enabling/Disabling Sensor Detecting Function

There might be times where users wish to suspend the detecting functions of detector temporarily.   To enable or disable PIR sensor and light sensor, please configure with following:

Parameter number: 4
Size: 1
Value: 0 (sensor disabled)
                         1 (sensor enabled)

Note: The default value is set in 1, which implies that the sensor detecting function is on.   Reconnection of power supply will enable the sensor detecting function automatically.

Sensitivity Level (PIR sensor only)

In order to provide a best efficiency of the detector, it is recommended to test the detector with movements from a farthest end of the coverage area at first time of use.   If movements cannot be detected sensitively, simply adjust the sensitivity level. The sensitivity level is between 0 to 10.   To adjust sensitivity level of the detector, please configure with following:

Parameter number: 5
Size: 1
Value (range):   1 ~ 10 (the larger the number, the higher the sensitivity)

Note: The default value is set in 6, which implies medium sensitivity.

Re-trigger Interval Setting (PIR sensor only)

This function is designed for setting the interval which allows PIR sensor to be re-triggered after the detector has been triggered.   For example, the interval is set for 20 seconds.   If a movement is detected, only wait after 20 seconds the detector can be triggered again if it detects another movement.   During 20 seconds period, the detector will not detect (FIGURE 10).   The time interval can be set between 0 seconds to 3600 seconds.   To adjust time interval, please configure with following:

Parameter number: 6
Size: 1
                           2 (if value is set larger than 255)
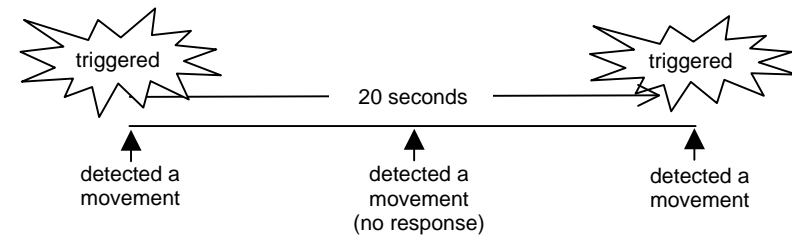Value (range):   5 (sec) ~ 3600 (sec)

FIGURE 10

Note: The default value is set in 5, which implies that the detector can only be re-triggered after 5 seconds of interval.

4

On-Off Duration Setting

The function of on-off duration setting will be useful if the detector is connected with a module or lighting.   Once these associated appliances are activated (turn to "On" status) after the detector has been triggered, they can be set to turn off after 5 to 3600 seconds of duration which is set by users beforehand.   To adjust the on-off duration, please configure with following:

Parameter number: 8
Size: 1
                               2 (if value is set larger than 255)
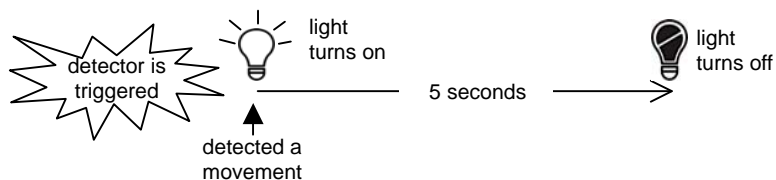Value (range):   5 (sec) ~ 3600 (sec)

FIGURE 11

Note: The default value is set in 15, which implies that the detector will send a Z-Wave off command to associated appliances 15 seconds after triggered.

Lux Level Setting (home automation mode only)

When the detector is set in home automation mode, the user can set a detecting percentage of lux level for light sensor.   If the percentage of lux level of ambient illumination falls below this percentage, and a person moves across or within the protected area, the detector will emit Z-Wave ON command to controller and activate connected modules and lighting.   Percentage can be set between 0% to 100%.   To adjust percentage of lux level, please configure with following:

Parameter number: 7
Size: 1
Value (range):   1 (%) ~ 100 (%)

Note: The default value is set in 10, which implies 10% of lux level.

Low Battery Indication:

When the battery level on the Detector drops to a certain level, the detector will emit a Z-Wave low battery command to controller; meanwhile, the detector will flash red LED once every 30 seconds.   Replace batteries as soon as possible.

Troubleshooting

Symptom	Possible Cause	Recommendation
LED cannot be displayed	Run out of battery power	Replace a new battery
	Check if reverse battery polarity	Refit the battery with correct polarity
The detector not working	Check if mounting location is proper	Reposition its mounting location
		Remove the source of interference
	Check if the detector is out of order	Do not open the detector; and send it to the local retailer.

Specifications

Battery	1.5V AA type size x 3
Range	Up to 70 meters line of sight
Warm Up Time	About 2 minutes
PIR Detection Coverage	**Wall-Mounted:** Up to 10m x 110° (at 1.8m mounting height & 25℃) **Ceiling-Mounted:** Up to 5m x 360° (at 2m mounting height & 25℃)
Frequency Range	868 MHz

*Specifications are subject to change without notice

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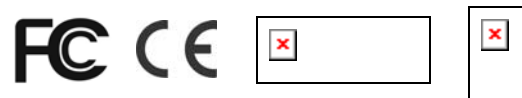
Federal Communication Commission Interference Statement

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 installed and used in accordance with the instructions, may cause harmful interference to radio communications.   However, there is no guarantee that interference will not occur in a particular installation.   If this equipment does cause harmful 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:

- 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.

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.

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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

WARNING:

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.