

# Motion Sensor(PIR)

## User Manual

**Thank you for your support!**

Please read the user manual carefully before operating.  
Please keep the user manual for future reference.



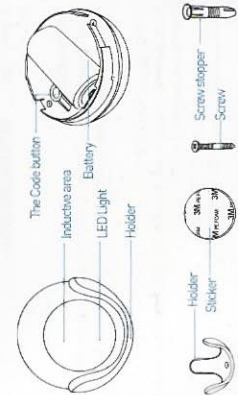
### Product Introduction

Motion sensor(PIR) is a passive infrared detector or physical sensor. This sensor doesn't emit any energy but only passively receive and detect infrared radiation from outside. Under room temperature, all items have radiation. Human beings are warm-blooded animals with stable infrared radiation, so are most easily to be detected. That's why we also call it body sensor. PIR send messages via Z-Wave network to Z-Wave gateway. In the Z-Wave network communications, PIR can be connected to any Z-Wave gateway. Different countries or areas, the radio frequency is different. In the communication between PIR and Z-Wave gateway, PIR can only send messages, not be able to receive messages. When PIR is triggered, PIR will send message to Z-Wave gateway, and associate devices to work through Z-Wave gateway. PIR is battery powered, is small and can be installed easily.

### Technical Parameters

- Motion detection
  - Measure the light sensitivity
  - Compatible with 300 series and 500 series
  - Easily installed on wall or any surface
  - Range: up to 50m outdoor up to 30m indoor
  - Power supply: CR123A x1
  - Standby current: 10uA
  - Battery life: 1 year
  - Radio Protocol: Z-Wave
  - Radio Frequency: 868.4MHz EU; 908.4MHz US; 921.4MHz ANZ; 869.2MHz RU
  - Detection range: 7 meters
  - Viewing angle: 90 degree
  - Operation temperature: 0-40°C
  - Storage temperature: 0-60°C
  - Size (DxWxH): 45mmx45mmx48mm
- ### Technical Information
- Use passive IR sensor to detect what is moving.
  - When PIR is triggered, LED lights would flash red color and send alerts.
  - Easily installed with screws or sticker on wall or table.
  - When there are people or animals that are moving within PIR detection area, PIR will send alarm messages to Z-Wave gateway.
  - Compatible with any Z-Wave gateway.

### Product Configuration



### Items List

- Motion sensor 1pc
- Holder 1pc
- Battery 1pc
- Screw 2pcs
- Sticker 1pc
- User manual 1pc

### Installation Steps

- **Holder Installation**
  - **Option One**  
Fix the holder with screws and screw stopper.
  - **Option Two**  
Put the sticker on the bottom of door sensor then fix it on the wall.
- **Battery Installation**  
Open the cover of PIR
- **Fix PIR in the Holder**  
Assemble the cover
- **Install the battery**  
Put the battery in the holder
- **Fix PIR in the Holder**  
Assemble the cover

### Tips

1. Make sure PIR placed within the Z-Wave network range of gateway.
2. PIR is recommended to be fixed at the height of 2-4 meters off the ground.
3. When install PIR, please keep it far away from places where air temperature changes sensitively, e.g., around air conditioners.

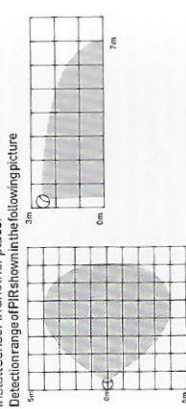
### LED Color Indicator

LED Color	LED Display Status	Description
Red	Blink 5 Times (1s interval)	Motion Sensor PIR is powered on, and has not added to Z-Wave network yet
	Blink 5 Times (500ms interval)	Enter inclusion mode, exclusion mode or send node info
	Blink 5 Times (300ms interval)	Motion Sensor PIR has already added to Z-Wave network, and make it powered on again
	Blink 1 Time first, then 5 times and off alternately	Press and hold the reset button for 10-15 seconds to restore PIR sensor to factory settings
	Blink 1 Time	1. Direct Measurement 2. Press the Button shortly to Send Wakeup information to gateway

### Add Motion Sensor (PIR) to Z-Wave Network

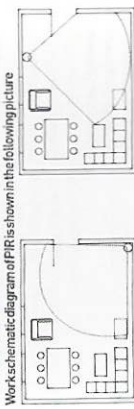
1. Motion sensor can be added to Z-Wave network by pressing the code button on it.
2. Disassemble PIR main body and insert battery into PIR sensor.
3. After making it powered on, please do not operate it within 20s.
4. Make sure PIR sensor is located within the Z-Wave network range of gateway.
5. Set Z-Wave gateway into inclusion mode (Refer to gateway user manual).
6. Press the code button in PIR sensor three times continuously.

Actual detection range of this sensor can be influenced by environment conditions. If there are false alarms reported, check if there are any moving objects within sensor's detection area, such as trees blowing in the wind, cars passing by, windmills. False motion alarms may be caused by masses of moving air and heat as well. If sensor keeps on reporting false alarms, despite eliminating all of above-mentioned factors, then install sensor in another place.



### Working Conditions

If there is someone moving within the detection area, then alarm would be triggered, and LED lights would flash in the inductive area at the same time.



4. Furniture, large bonsai or other spacers shouldn't be placed within PIR's detection area.
5. When installing PIR, please keep it away from stairs, elevators and other obstructions. Make sure these obstructions are outside of PIR's detection area.
6. After installing PIR, please test whether PIR works properly or not. If there is false alarm from PIR, please install PIR in another place.
7. Direct association can be allowed between PIR and other Z-Wave network devices if preset association functionality. Z-Wave gateway will not take part in such communication. Using this mechanism, PIR can communicate with other devices even when gateway is damaged.

### Battery Usage Tips

Battery life of motion sensor is approximately 1 year. The power level of battery would be displayed in the gateway. Red icon means the battery needs replacing, and then mobile app would receive a message "power level is low, please remember to replace battery" from gateway. In order to avoid false alarm, before replacing battery, please disconnect association of motion sensor with other devices.  
**Note:** PIR motion sensor is powered by battery, and please use battery in a correct way to avoid exploding.  
When handling the battery, refer to environmental law please.  
**Detection Range**  
PIR has to be installed in a corner of room or perpendicularly to door.

### Associations

This Sensor supports 4 association groups; each group supports max 4 associated nodes.  
This has the effect that when PIR sensor is triggered, all devices associated with it will receive relevant reports. Through association, PIR sensor can control another Z-Wave network device, e.g. alarm device, wall plug, lamp, etc.  
Every group can be supported to associate 4 devices max.  
**GROUP 1** is a lifetime service that assigned to motion sensor status  
- Open/Close, it enables PIR sensor to send reports and readings to Z-Wave Controller or Z-Wave Gateway whenever the sensor is triggered. This Group Support:  
NOTIFICATION\_REPORT\_V4  
NOTIFICATION\_REPORT\_V2  
SENSOR\_BINARY\_REPORT\_V7  
BATTERY\_REPORT  
DETECT\_RESET  
**LOCALLY NOTIFICATION**  
**GROUP 2** allows sending control commands to associated devices such as relay module, lighting, etc. This association group is configured through the advanced parameters no. 2, 3, 5 and 8. This Group Support BASIC.SET  
**GROUP 3** allows Sending Notification to associated devices in this group. This Group Support NOTIFICATION\_REPORT\_V4  
**GROUP 4** allows Sending Sensor Binary Report to associated devices in this group. This Group Support:  
SENSOR\_BINARY\_REPORT\_V2



**NotificationCommandClass**  
Once the sensor detects a movement, it will send NOTIFICATION\_REPORT and SENSOR\_BINARY\_REPORT to the nodes (line to inform there is an intrusion event: when the movement is stopped, NOTIFICATION\_REPORT and SENSOR\_BINARY\_REPORT will be sent again to the nodes in lifetime)

For compliant to Z-Wave 300 series, There also realize the Binary Sensor Command Class

**NotificationReportCommand:**  
Event Present:  
**CommandClass:** COMMAND\_CLASS\_NOTIFICATION  
**Command:** NOTIFICATION\_REPORT  
**NotificationType:** NOTIFICATION\_TYPE\_HOME\_SECURITY  
**Event:** NOTIFICATION\_EVENT\_HOME\_SECURITY\_MOTION\_DTECTION\_UNKNOWN\_LOCATION  
Event Clear:

**CommandClass:** COMMAND\_CLASS\_NOTIFICATION,  
**Command:** NOTIFICATION\_REPORT,  
**NotificationType:** NOTIFICATION\_TYPE\_HOME\_SECURITY,  
**Event:** NOTIFICATION\_EVENT\_HOME\_SECURITY\_NO\_EVENT

**BinarySensorReportCommand:**  
Event Present:  
**CommandClass:** COMMAND\_CLASS\_SENSOR\_BINARY  
**Command:** SENSOR\_BINARY\_REPORT  
**SensorType:** SENSOR\_MOTION  
**Value:** 0xFF  
Event Clear:

**CommandClass:** COMMAND\_CLASS\_SENSOR\_BINARY  
**Command:** SENSOR\_BINARY\_REPORT  
**SensorType:** SENSOR\_MOTION  
**Value:** 0x00

**MultilevelSensor**  
Motion Sensor supports ambient luminance measurement, the scale is LUX. And the default Multilevel sensor is luminance too.

**WakeUp Command Class**  
Motion sensor stays in sleep status for the majority of time in order to conserve battery life.  
The minimum wake up interval is 300s.  
The maximum wake up interval is 16,777,200s (about 194 days)  
Allowable interval among each wake up interval is 40second, such as 360, 420, 480, ... Note: The default value is 12 hours. This value is longer, the battery life is greater.

**Battery Check Command**  
Users can also inquire the battery status of motion sensor by sending BATTERY\_GET command. Once motion sensor receives the command, it will return BATTERY\_REPORT command. Motion Sensor will send BATTERY\_LEVEL = 0xFF command to Z-Wave gateway to inform that motion sensor is in dead battery status, otherwise BATTERY\_LEVEL value range is 0% to 100%.

**Command Classes**  
This Sensor (Motion Detector) supports Command Classes as Below:

- \* COMMAND\_CLASS\_ZWAVEPLUS\_INFO(V2)
- \* COMMAND\_CLASS\_VERSION(V2)
- \* COMMAND\_CLASS\_MANUFACTURER\_SPECIFIC(V2)
- \* COMMAND\_CLASS\_DEVICE\_RESET\_LOCALLY(V1)
- \* COMMAND\_CLASS\_POWERLEVEL(V1)
- \* COMMAND\_CLASS\_BATTERY(V1)
- \* COMMAND\_CLASS\_ASSOCIATION(V2)
- \* COMMAND\_CLASS\_WAKE\_UP(V2)
- \* COMMAND\_CLASS\_NOTIFICATION(V4)
- \* COMMAND\_CLASS\_SENSOR\_BINARY(V2)
- \* COMMAND\_CLASS\_CONFIGURATION(V1)
- \* COMMAND\_CLASS\_SENSOR\_MULTILEVEL(V1)



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## Advanced Configuration

The following information is for someone that has some experience in setting up a Z-Wave system or someone that has computer software running a Z-Wave controller or Z-Wave Gateway. Please get familiar with software of Z-Wave controller or Z-Wave Gateway before getting started.

**1. Sensitivity Level Setting**  
This parameter defines the sensitivity of PIR sensor. At the first time of test, it is recommended to test the sensor with movements from a farthest end of the coverage area. If movements cannot be detected sensitively, simply adjust the sensitivity level by changing this parameter. This parameter can be configured with the value of 8 through 255, where 8 means highest sensitivity and 255 means lowest sensitivity.

**Function:** Sensitivity Level Setting.  
**Parameter Number:** 1.  
**Parameter Size:** 1 Byte.  
**Available Settings:** 8 - 255.  
**Default Setting:** 12.

**2. On/Off Duration**  
This parameter can determine how long the associated devices should stay ON status. For instance, this parameter is set to 30second, PIR sensor will send a BASIC.SET Command to an associated device with value basic set level if PIR sensor is triggered, and the associated devices will be turned on, and stay

in this status for 30second) before it is turned off automatically. This Parameter value must be larger than Parameter 6#.

**Function:** On/Off Duration Setting  
**Parameter Number:** 2  
**Parameter Size:** 2 Byte  
**Available Settings:** 5 - 600(second)  
**Default Setting:** 30

**3. Basic Set Level**  
Basic Set Command will be sent where contains a value when motion sensor is triggered. Z-Wave gateway will take it for consideration; for instance, if a lamp module is received the Basic Set Command of which value is decisive as to how bright of dim level of lamp module shall be. This Parameter is used to some associated devices.

**Function:** Basic Set Level.  
**Parameter Number:** 3  
**Parameter Size:** 1 Byte  
**Available Settings:** 0, 1 - 99 or 255, 0 - OFF; Alarm cancelling or turning a device off; 1 - 99 or 255 - ON (Binary Switch Device, Dim Level) (Multilevel Switch Device)  
**Default Setting:** 99

**4. PIR Detecting Function Enabled/Disabled**  
This parameter can enable or disable PIR detector detecting function.  
**Function:** Enabled/Disabled PIR Function  
**Parameter Number:** 4  
**Parameter Size:** 1 Byte

**Available Settings:** 0 or 255, 0 - Disable PIR Detector Function, 255 - Enable PIR Detector Function  
**Default Setting:** 255

**5. Ambient Illumination Lux Level**  
This parameter can be set a lux level value which determines when light sensor is activated. If the ambient illumination level falls below this value, and a person moves across or stands within the detected area, PIR detector will send a Z-Wave ON command (i.e. BASIC.SET value = parameter 3#) to an associated device and activate it.

**Function:** Lux Level Set  
**Parameter Number:** 5  
**Parameter Size:** 2 Byte  
**Available Settings:** 0 - 1000(Lux)  
**Default Setting:** 100(Lux)

**6. Re-trigger Interval Setting**  
This Parameter can be used to adjust the interval of being re-triggered after PIR sensor has been triggered. This Parameter value must be less than Parameter 2# if user set this parameter to default by Configure CC, the parameter #2 will be set to default value

**Function:** Re-trigger Interval Setting.  
**Parameter Number:** 6  
**Parameter Size:** 1 Byte  
**Available Settings:** 1 - 8(s)  
**Default Setting:** 8

**7. Light Sensor Polling Interval**  
This Parameter can be set as interval time for light sensor measuring ambient illumination level.  
**NOTE:** This Value Must Be Less than Wakeup Interval Time.  
**Function:** Light Sensor Polling Interval  
**Parameter Number:** 7  
**Parameter Size:** 2 Byte  
**Available Settings:** 60 - 3600(second)  
**Default Setting:** 180(s)

**8. Lux Level Function Enable**  
If this parameter is set to "1", and when Lux level is less than the value defined by parameter #5, PIR sensor will send a BASIC.SET command frame (i.e. BASIC.SET value = parameter 3) to an associated device and activate it. If Lux Level is greater than the value defined by parameter #5, PIR sensor will not send a BASIC.SET command frame.

**Function:** Lux Level Enable  
**Parameter Number:** 8  
**Parameter Size:** 1 Byte  
**Available Settings:** 0, 1  
**Default Setting:** 0

**9. Ambient Illumination Lux Level Report**  
This parameter defines how much Lux must be changed first, then PIR sensor will report to Z-Wave gateway.  
**Function:** Lux Level Report  
**Parameter Number:** 9  
**Parameter Size:** 1 Byte

**Available Settings:** 0 - 255(Lux)  
**Default Setting:** 100(Lux)

**10. Led Blink Enable**  
This parameter defines the Led on/off enable. If this parameter is set to "1", led blink will be enabled, the led will blink once when motion sensor detect a movement. Otherwise, the led will be turned off always.

**Function:** Led Blink Enable  
**Parameter Number:** 10  
**Parameter Size:** 1 Byte  
**Available Settings:** 0, 1  
**Default Setting:** 1

**99. Ambient light intensity calibration**  
This parameter defines the calibrated scale for ambient light intensity. Because the method and position that the sensor is mounted, and the cover of sensor will bring measurement error, user can get more real light intensity by this parameter setting. User should run the steps as follows for calibrating error: user can get more real light intensity by this parameter setting. User should run the steps as follows for calibrating error: user can get more real light intensity by this parameter setting. User should run the steps as follows for calibrating error: user can get more real light intensity by this parameter setting.

**Function:** Ambient light intensity calibration  
**Parameter Number:** 99  
**Parameter Size:** 2 Byte  
**Available Settings:** 1 - 45536  
**Default Setting:** 1000

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