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 gatwway, 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.

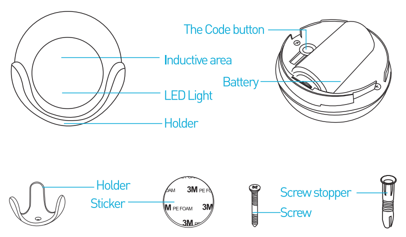
Technical Parameters

- 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 x 1
- Standby current: 16uA
- 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 temper: 0-40°C
- Storage temperature: 0-60°C
- Size (D x W x H): 45mm x 45mm x 48mm

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
Screw stopper	2pcs
Sticker	1pc
User manual	1pc

Installation Steps

- Holder Installation
- Battery Installation
- Fix PIR in the holder

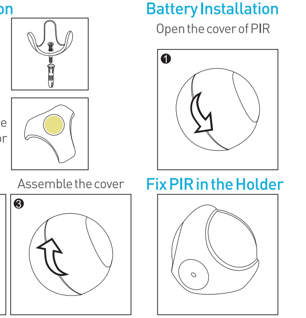
Holder Installation

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



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, refrigerators, stoves and so on.
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 instaling 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

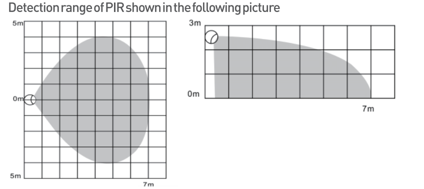
Battery life of motion sensor is approximately 1 year.The power level of battery would be displayed in the gateway. Red icon means the battery needs replacing, and then mobile app would receive a message "power level is low, please remember to replace battery" from gateway. In order to avoid false alarm, 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.

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.

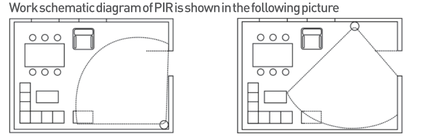
Detection range of PIR shown in the following picture



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.

Work schematic diagram of PIR is shown in the following picture



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 includsion mode, excluison 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 on and off alternately	Press and hold the reset button for 10-15 seconds to restore PIR sensor to factory settings
	Blink 1 Time	1, Detect a Movement
		2,Press the Button shortly to Send Wake up information to gateway

Add Motion Sensor (PIR) to Z-Wave Network

Motion sensor can be added to Z-Wave network by pressing the code button on it.
1) Disassemble PIR main body and insert battery into PIR sensor. After making it powered on, please do not operate it within 20s.
2)Make sure PIR sensor is located within the Z-Wave network range of gateway.
3) Set Z-Wave gateway into inclusion mode (Refer to gateway user manual).
4) Press the code button in PIR sensor three times continuously, then PIR sensor will enter inclusion mode. Meanwhile, LED light would flash red color five times on and off alternately.
5) PIR will be detected and included in the Z-Wave network.
6) Wait for gateway to configure PIR sensor.

Remove Motion Sensor (PIR) to Z-Wave Network

1) Remove cover of PIR motion sensor
2) Make sure PIR is powered.
3) Set Z-Wave gateway into exclusion mode (Refer to gateway user manual)
4)Press the code button in PIR three times continuously, then PIR will enter exclusion mode. Meanwhile, LED lights would flash red color five times on and off alternately.
5) Wait for gateway to remove the sensor.

Restore Motion Sensor (PIR) to Factory Default Settings

Reset procedure will delete all information in the Z-Wave network or Z-Wave gateway, and restore PIR to factory default settings.
1. Remove the cover of PIR sensor.
2. Make sure the sensor is powered.
3. Press and hold the reset button for 10-15 seconds, then LED lights would flash red color 1 time first, then 5 times on and off alternately.
4. Release the code button.
NOTE: During the process of resetting, please make sure PIR motion ensor is powered on all the time.

Wakeup Motion Sensor

You can press the button once to wake up the sensor and send wakeup notification to gateway. If press successfully, LED light will blink one time.

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. a alarm device, wall plug, lamp etc.
Every group can be supported to associate 4 devices max.

GROUP 1 is lifeline 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
SENSOR_BINARY_REPORT_V2
SENSOR_MULTILEVEL_REPORT_V7
BATTERY_REPORT
DEVICE_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

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 30(second), 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 30(second) before it is turned off automatically.
This Parameter value must be large 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 - 36000(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 blows for calibrating
Function: Ambient light intensity calibration
Parameter Number: 99
Parameter Size: 2 Byte
Available Settings: 1 ~ 65536
Default Setting: 1000

Notification Command Class

Once the sensor detects a movement, it will send NOTIFICATION_REPORT and SENSOR_BINARY_REPORT to the nodes lifeline 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 lifeline
For compliant to Z-Wave 300 series,There also realize the Binary Sensor Command Class

Notification Report Command:

Event Present:
Command Class: COMMAND_CLASS_NOTIFICATION
Command: NOTIFICATION_REPORT
Notification Type: NOTIFICATION_TYPE_HOME_SECURITY
Event: NOTIFICATION_EVENT_HOME_SECURITY_MOTION_DETECTION_UNKNOWN_LOCATION
Event Clear:
Command Class: COMMAND_CLASS_NOTIFICATION,
Command: NOTIFICATION_REPORT,
Notification Type: NOTIFICATION_TYPE_HOME_SECURITY,
Event:NOTIFICATION_EVENT_HOME_SECURITY_NO_EVENT

Binary Sensor Report Command:

Event Present:
Command Class: COMMAND_CLASS_SENSOR_BINARY
Command: SENSOR_BINARY_REPORT
Sensor Type: SENSOR_MOTION
Value: 0xFF
Event Clear:
Command Class: COMMAND_CLASS_SENSOR_BINARY
Command: SENSOR_BINARY_REPORT
Sensor Type: SENSOR_MOTION
Value: 0x00

Multilevel Sensor

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 wakeup interval is 300s
The maximum wakeup interval is 16,777,200s (about 194 days)
Allowable interval among each wakeup interval is 60second, 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 enquire the battery status of motion sensor by sending BATTERY_GET command. Once motion sensor receivers 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_ASSOCIATION_GRP_INFO (V1)
*COMMAND_CLASS_WAKE_UP (V2)
*COMMAND_CLASS_NOTIFICATION (V4)
*COMMAND_CLASS_SENSOR_BINARY (V2)
*COMMAND_CLASS_CONFIGURATION (V1)
*COMMAND_CLASS_SENSOR_MULTILEVEL (V7)

Guarantee

1.The Guarantee is provided by Shenzhen NEO Electronics Co., Ltd (hereinafter "Manufacture")
2.The Manufacturer is responsible for equipment malfunction resulting from physical defects (manufacturing or material) for 12 months from the date of its purchasing.
3.During the Guarantee period, the Manufacturer shall repair or replace any defects, free of charge.
4.In special cases, when the device cannot be replaced with the device of the same type (e.g. the device is no longer available in the commercial offer), the Manufacturer may replace it with a different device which has similar technical parameters as the faulty one. Such activity shall be considered as fulfilling the obligations of the Manufacturer. The Manufacturer shall not refund money paid for the device.
5.The guarantee shall not cover:
mechanical damages (cracks, fractures, cuts, abrasions, physical deformations caused by impact, falling or dropping the device or other object, improper use or not observing the operating manual);damages resulting from external causes, e.g.: flood, storm, fire, lightning, natural disasters, earthquakes, war, civil disturbance, force
majeure, unforeseen accidents, theft, water damage, liquid leakage ,battery spill, weather conditions, sunlight, sand, moisture, high or low temperature, air pollution
damages caused by malfunctioning software, attack of a computer virus, or by failure to update the software as recommended by the Manufacturer;

All above is for reference only, please see the subject products.

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