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Shenzhen Neo Electronics PIR Infrared Detector/Body Motion Sensor Instruction Manual

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Shenzhen Neo Electronics Co., LTD

Product Introduction

The PIR is a passive infrared detector or body sensor with a temperature probe, the 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 animal with stable infrared radiation, are most easily to be detected. That's why we also call it body sensor. PIR send messages via Z-wave network to the Z-wave main controller. In the Z-wave network communications, PIR can be connected to any Z-wave main controller, Different countries or areas, the radio frequency is different of the Z-wave network. In the communication between the PIR and Z-wave main controller, PIR can only send messages, not be able to receive messages. When the PIR is triggered, PIR will send message to the Z-wave main controller, and associate devices to work through the Z-wave main controller. The PIR is battery powered, is small and can be installed easily.

Technical Parameters

- Motion detection
- Measure the light sensitivity
- Detection temperature
- Compatible with 300 series and 500 series
- Easy installation 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 years
- Radio Protocol: Z-wave
- Radio Frequency: 868.4MHz EU; 908.4MHz US
- Detection range: 7 meters
- Viewing angle: 110 degree
- Temperature range 0-99℃
- Operation temper: 0-40℃

- Storage temperature: 0-60℃
- Size (D x W x H): 45mm x 45mm x 48mm

Technical Information

- Use passive IR sensor to detect what is moving.
- When the PIR is triggered, LED light flashes in the detection area.
- Easily install with screws or sticker on the wall or the table.
- When there are people or animal that is moving in the PIR detection area, PIR will send alarm messages to the Z-wave main controller.
- Compatible with any Z-wave main controller.

Brief introduction of function

1. motion detection function
2. illumination value detection function
3. function of temperature detection
4. power saving function

Data reporting rule

Illumination reporting rule:

1. after power on, there will be a report data;
2. when the illumination change value is more than 100 lux (set), then update data is reported;

Temperature reporting rule:

1. after power on, there will be a data report,
2. when the temperature changes more than 0.5 degrees Celsius, that is reported to update data; 3. check and report the updated temperature every three minutes.

Product Configuration

Inductive area
Code button
Battery
LED light
Holder
Sticker
Screw
Screw stopper
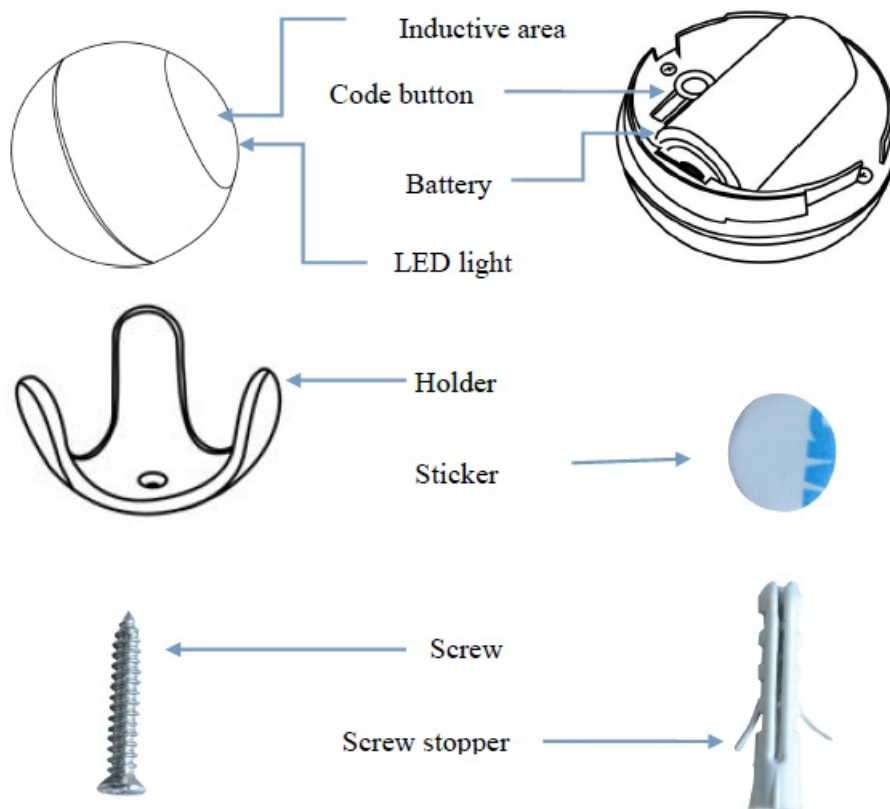
Product List

- Holder 1pc
- Battery 1pc
- Screw 2pcs
- Screw stopper 2pcs
- Sticker 1pc
- Instruction manual 1pc

Including Sensor (PIR) to Z-wave Network
The PIR can be included to the Z-wave network by pressing on the code button.

1. Disassemble the PIR main body and insert the battery into the contact sensor. Make sure the device is located within the direct range of the controller.
2. Set the controller into the learning mode (see mail controller's operating manual).
3. Quickly, triple click the code button, LED light will flash red for 5 times.
4. PIT will be detected and included in the Z-wave network.
5. Wait for the main controller to configure the PIR.

Excluding Sensor (PIR) from Z-wave Network

1. Make sure the sensor is connected to power source.
2. Set the main controller into the learning mode (see main controller's operating manual).
3. Quickly, triple click the code button, LED light will flash red for 5 times.
4. Wait for the main controller to delete the sensor.

Restore PIR to Factory Default Settings
Reset procedure will delete all information on the Z-Wave network and Z-Wave controller or Z-Wave Gateway, and restore the sensor to factory default settings.

1. Remove the device cover.
2. Make sure the sensor is powered.
3. Press and hold the button for 10 seconds,LED will blink 5 times.
4. Release the button.

Installation Steps

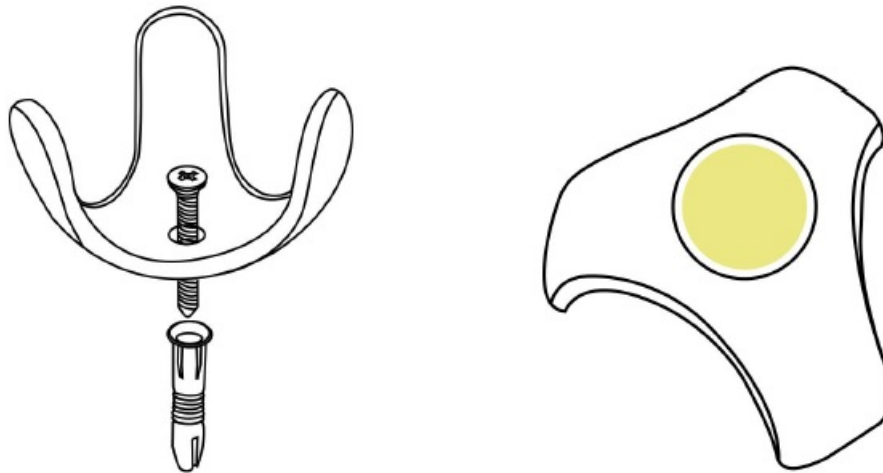- Holder Installation
- Battery Installation
- Fix PIR on the holder

Holder Installation
Option One
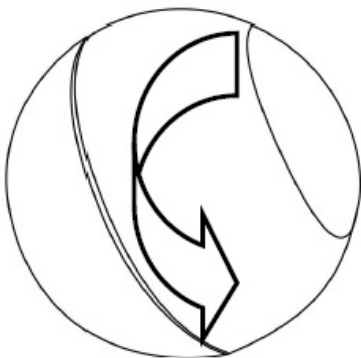Fix the holder with screws and screw stopper adhesive
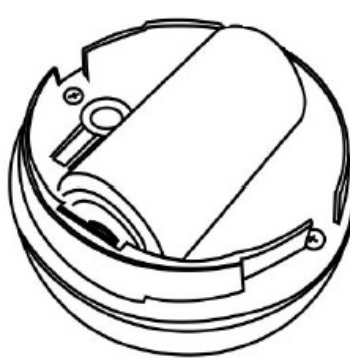
Option Two
Fix the holder with double-sided

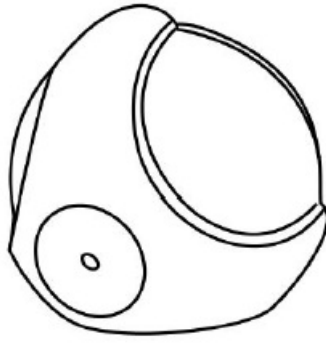**Battery Installation**

Open the PIR   Install the battery   Close the PIR

Fix PIR on the Holder

Detection Range and Working Conditions

PIR has to be installed in a corner of the room or perpendicularly to the doors.

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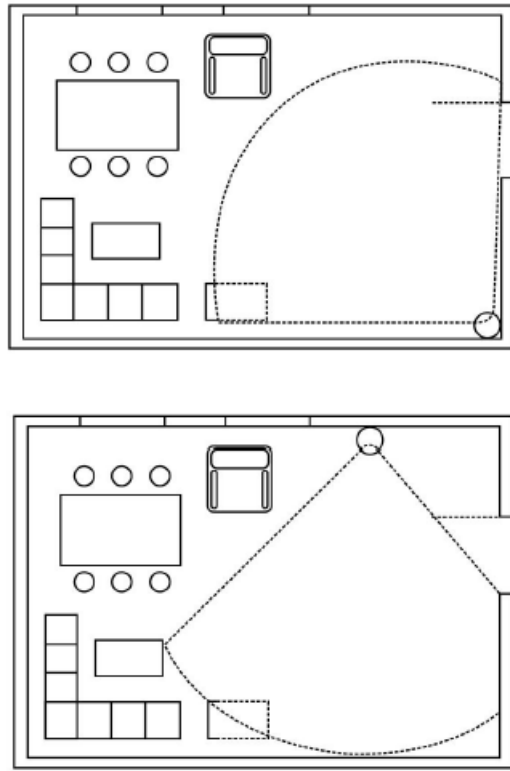
Detection range of PIR shown in the following picture
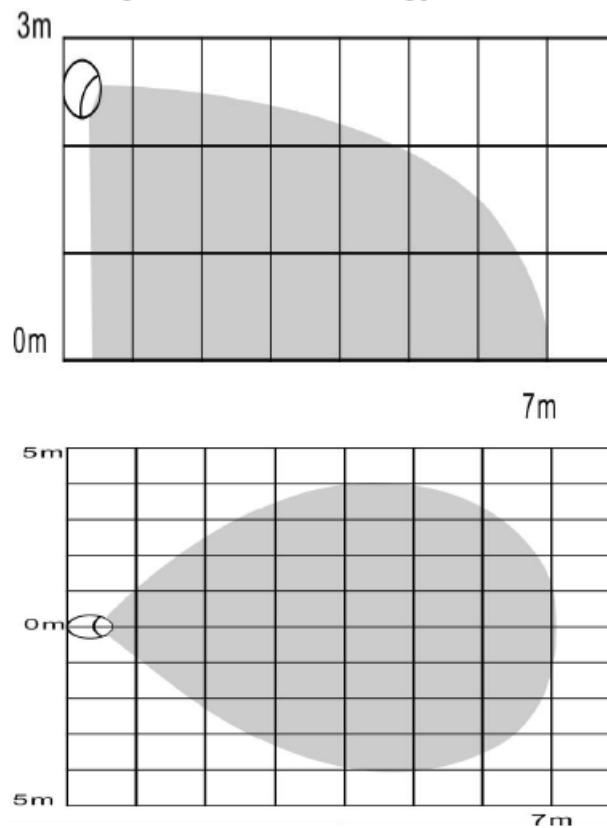
Working Condition

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

Work schematic diagram of PIR shown in the following picture

Tips

1. Make sure the PIR is within the Z-wave network.
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 the place where the air temperature changed sensitively, e.g., the neighborhood of air conditioners, refrigerators, stoves and so on.
4. Furniture, large bonsai or other spacers shouldn't be placed within the PIR's detection area.
5. When installing the PIR, please avoid stairs elevators and other obstructions within the PIR's detection area.
6. After installation of the PIR, please test whether the PIR works properly or not, if there is false alarm from PIR, please change the location of the PIR.
7. Association allows for direct communication between Z-wave network devices.

Main controller does not take part in such communication. Using this mechanism, PIR may communicate with other devices even when the main controller is damaged.

The Status of LED

1. When the PIR is triggered, LED light flashes red for 1 times.
2. When the PIR installs battery, LED light will flash red for 5 times.
3. Quickly, triple click the code button ,add the PIR to the Z-wave network or delete PIR from Z- wave network , LED light flashes red for 5 times.
4. Press on the code button for 10 seconds, the PIR will be restored to factory default settings, LED light flashes red for 1 times.
5. In the normal condition, the LED light keeps being off.
6. Wakeup motion detector, press the button once to wake up the device and send wakeup notification to controller, LED light flashes red for 1 times.

Associations
This has the effect that when the sensor is triggered, all devices associated with the sensor will receive the relevant reports. Through an association the sensor may control another Z-wave network device, e.g. the alarm device, wall plug, lamp etc.
This Sensor supports two association groups.
Association group 1 is assigned the status of the device status – send the BASIC SET control frame to the associated to the associated devices having detected motion.
Association group 2 reports relay's status to just one device, Z-wave network's main controller by default. It's not recommended to modify settings of this association group.
NOTE: Association allows for direct communication between Z-wave network devices. Main controller does not take part in such communication.

NOTE: When the PIR is being restored factory settings, please make sure power source is connected.

Battery Usage Tips
Battery life of the contact sensor is approximately 1 years at factory default settings. The current battery level is displayed in the gateway. Red battery icon means the battery needs replaced. In order to avoid tamper detection, while replacing the battery, please disconnect the association of the contact sensor with other devices.

Note: Contact sensor is battery powered. Using batteries other than specified may result in explosion. Dispose of properly, please observe environmental protection rules.

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.

Sensitivity Level Setting
This parameter defines the sensitivity of PIR 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 with this parameter. This Parameter can be configured with the value of 8 through 255, where 8 means high sensitivity and 255 means lowest sensitivity.
Function: Sensitivity Level Setting.
Parameter Number: 1.
Parameter Size: 1 Byte.
Available Settings 8 ~ 255.
Default Setting: 12.
On/Off Duration
This parameter can be determined how long the associated devices should stay ON status. For instance, this parameter is set to 30(second), the PIR detector will send a BASIC_SET Command to an associated device with value basic set level if PIR detector is triggered and the associated device will be turned on 30(second) before it is turned off. This Parameter value must be large than Parameter 6#. If user set this parameter to default by Configure CC, the parameter #6 will be set to default value. Function: On/Off Duration Setting
Parameter Number: 2
Parameter Size: 2Byte
Available Settings 5 ~ 600(second)
Default Setting: 30
Basic Set Level
Basic Set Command will be sent where contains a value when PIR detector is triggered, the receiver 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 canceling or turning a device off
1 ~ 99 or 255 – ON (Binary Switch Device)

Dim Level (Multilevel Switch Device)
Default Setting: 255

PIR Detecting Function Enabled/Disabled
This parameter can be enabled or disabled the 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

Ambient illumination Lux Level
This parameter can be set a lux level value which determines when the light sensor is activated. If the ambient illumination level falls below this value and a person moves across or within the detected area , PIR detector will send a Z-Wave ON command (i.e. BASIC_SET (value = parameter3) 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)

Re-trigger Interval Setting
This Parameter can be used to adjust the interval of being re-triggered after the PIR detector 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

Light Sensor Polling Interval
This Parameter can be set the light sensor measure ambient illumination level interval time.
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)

Lux Level Function Enable
If this parameter is set to '1', and when Lux level less than the value define by parameter #5, PIR detector will send a BASIC_SET command frame(i.e. BASIC_SET (value = parameter 3) to an associated device and activate it. If Lux Level greater than the value define by parameter #5, PIR detector 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

Ambient illumination Lux Level Report
This parameter defines by how much Lux Level must change, in lux, to be reported to the main controller.
Function: Lux Level Report
Parameter Number: 9
Parameter Size: 1 Byte

Available Settings 0 ~ 255(Lux)
Default Setting: 100(Lux)

Ambient Temperature Differential Report
This parameter is configured the value that differential between current measured and previous report value. If the differential value larger than the settings, device will report this measured temperature value to nodes associated in lifeline.
Differential Value = [Value] × 0.1°CFunction: Temperature Report Parameter Number: 10
Parameter Size: 1 Byte
Available Settings 0 ~ 127 Default Setting: 5

Led Blink Enable
This parameter defines the Led on/off enable. If this parameter is set to '1', the 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

Motion Event Report One Time Enable
'1' – The motion detected event will be sent to controller only once until device report motion cleared event.
'0' – The motion detected event will be sent to controller when device detects a movement event.
Function: Motion Event Report One Time Enable
Parameter Number: 11
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 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

1. Set this parameter value to default(Assumes the sensor has been added in a Z-Wave Network).

2. Place a digital luxmeter close to sensor and keep the same direction, monitor the light intensity value (Vm)

   which report to controller and record it. The same time user should record the value (Vs) of luxmeter.

3. The scale calibration formula: k = Vm / Vs.

4. The value of k is then multiplied by 1000 and rounded to the nearest whole number.

5. Set the value getting in 5) to this parameter, calibrate finished.

   For example, Vm = 300, Vs = 2000, then

   k = 300 / 2600 = 0.11538

   k = 0.11538 * 1000 = 115.38 ≈ 115

   The parameter should be set to 115.

   Function: Ambient light intensity calibration

   Parameter Number: 99

   Parameter Size: 2 Byte

   Available Settings 1 ~ 65536

   Default Setting: 1000

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) of the device for 12 months from the date of its purchasing.
3. During the Guarantee period, the Manufacturer shall remove any defects, free of charge, by repairing or replacing.
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 having technical parameters similar to 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;

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FCC Warning

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.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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 or more 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 equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The equipment conforms to the RF specification and the use is not restricted.

Documents / Resources

	[Shenzhen Neo Electronics PIR Infrared Detector/Body Motion Sensor](#) [pdf] Instruction Manual NAS-PD01ZU-T, NASPD01ZUT, Z52NAS-PD01ZU-T, Z52NASPD01ZUT, PIR Infrared Detector Body Motion Sensor, PIR Infrared Detector Body, Motion Sensor