

User Manual

Motion On-Off Switch

Model: ZB11B

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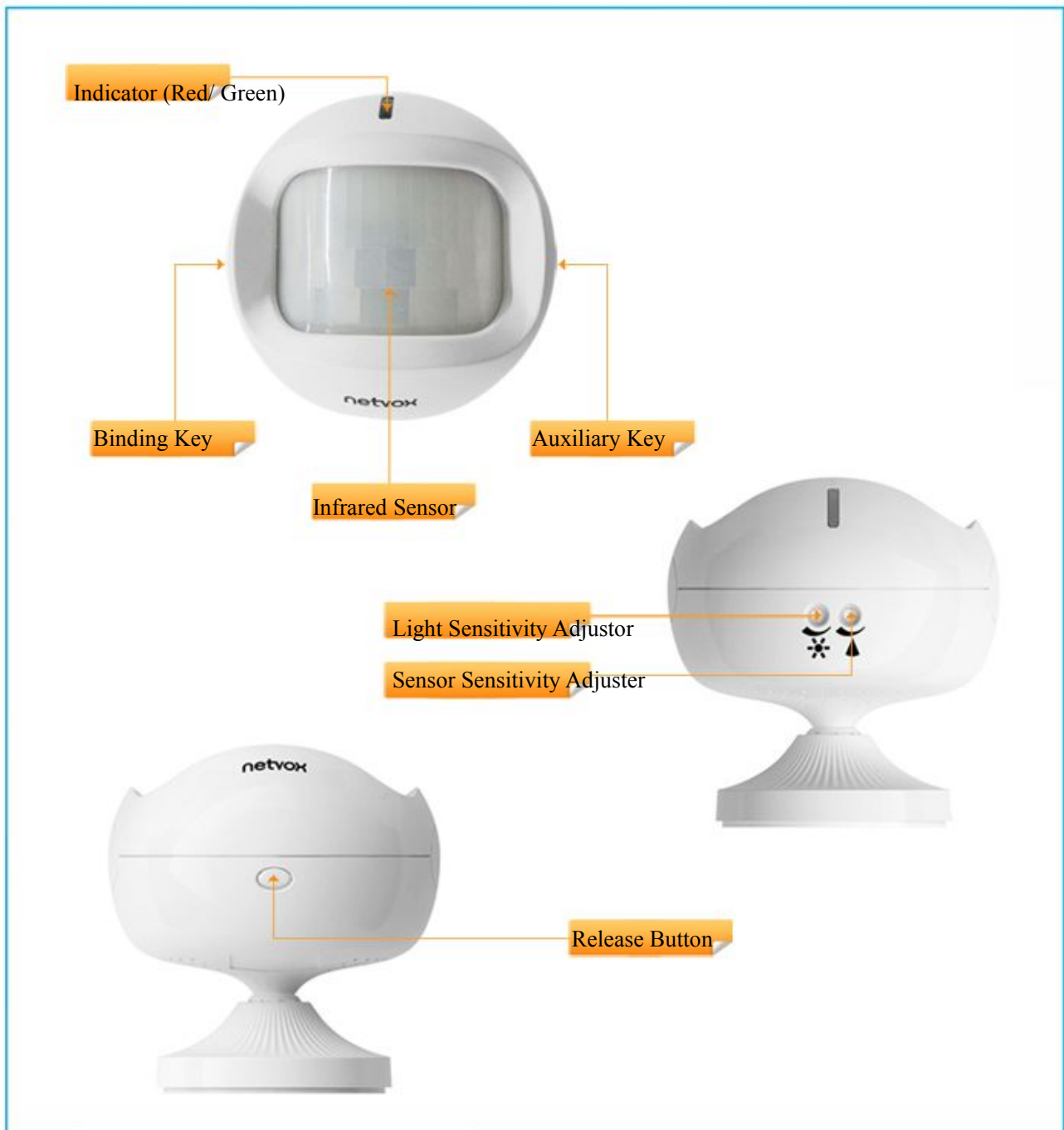
1. Introduction

Netvox ZB11B, an infrared radiation (IR) motion sensor, acts as an End Device in ZigBee network. It does not perform permit-join function as a coordinator or a router for other devices to join the network. When ZB11B detects movement, it reports the message based on how bright the location is. Users can assign specific ON/OFF task to the binding devices according to different report.

What is ZigBee?

ZigBee is a short range wireless transmission technology based on IEEE802.15.4 standard and supports multiple network topologies such as point-to-point, point-to-multipoint, and mesh networks. It is defined for a general-purpose, cost-effective, low-power-consumption, low-data-rate, and easy-to-install wireless solution for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation and home automation, etc.

2. Product Appearance



3. Specification

- Fully IEEE 802.15.4 compliant (ZigBee Pro)
- Utilizes 2.4GHz ISM band; up to 16 channels
- Power supply: 2 x ER14505 3.6V AA batteries
- Operating consumption: $\leq 45\text{mA}$
- Standby consumption: $\leq 100\mu\text{A}$
- Sensing angle- horizontal: 110° ; vertical: 60°
- Equipped with light sensor
- Up to 70 meters wireless transmission range in non-obstacle space
- Easy installation and configuration

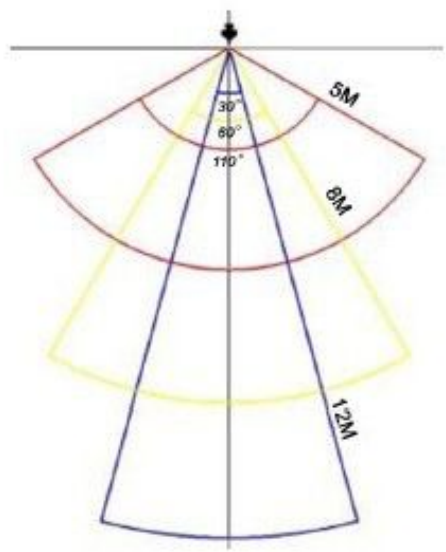
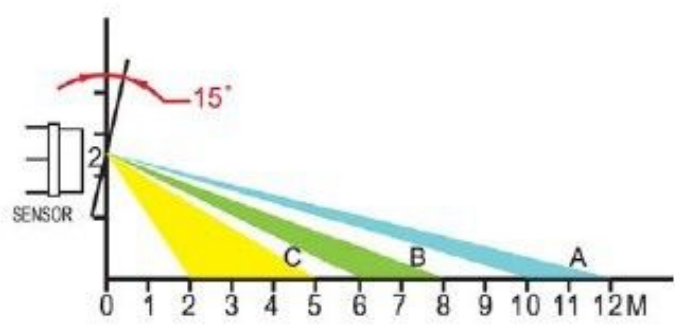
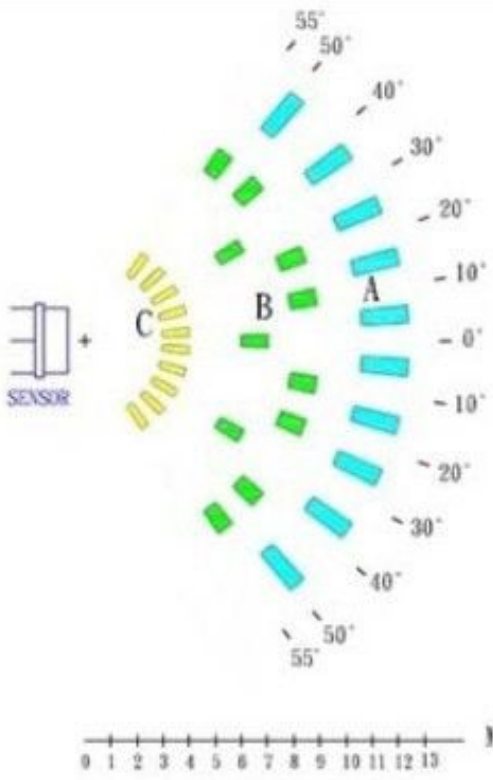
4. Installation

- A mounting height between 2 and 2.2 meters is recommended.
- Do not aim the passive infrared sensor to a heat or cold source.
- The sensor should not face open door/windows as sunlight will affect its operation.
- The sensor must be mounted on a vibration-free surface.
- IR coverage range:

The coverage area A- Distance: 12 meters; sensing angle: 30° .

The coverage area B- Distance: 8 meters; sensing angle: 60° .

The coverage area C- Distance: 5 meters; sensing angle: 110° .



5. Setting up ZB11B

5-1. Turn On/ Turn Off ZB11B

Under the circumstances ZB11B is first time used or after resetting, when it is powered on and cannot successfully search a network, ZB11B will go into [turn-off mode](#).

To manually turn on or turn off ZB11B, please use the following instructions:

- A. **Turn it on:** Press the *Binding Key* once. The indicators will flash **once**, and the device is ready to be used.
- B. **Turn it off:** Press and hold the *Binding Key* for 15 seconds. The indicator will keep flashing. Release the *Binding Key*, and the device would be turned off.

It is recommended that having a 5-second interval between turning on and turning off ZB11B.

5-2. Join the ZigBee Network

After ZB11B is turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While ZB11B is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, ZB11B will be permitted to join the network.

- Step1. Enable the permit-join function (valid for 60 seconds) of a coordinator or a router (please refer to the user manual of the coordinator or the router to enable the permit-join feature).
- Step2. Turn on ZB11B. It will start to search and join the network.
- Step3. The indicator will flash **green once** when it finds out a network to join.
- Step4. The indicator will flash **green 5 times** after it is joined successfully. Otherwise, the indicator will not flash.

5-3. Binding

To make ZB11B work with another device, users need to bind the two devices:

- Step1. Press the *Binding Key* to broadcast the binding request. The indicator will flash **green once**.
- Step2. The indicator flashes **green 5 times** after the binding is completed; otherwise, it flashes **green 10 times**.

5-4. Sleeping Mode

ZB11B is designed to go into sleeping mode for power-saving in some situations:

- A. While the device is in the network → the sleeping period is 5 minutes; it will wake up every 5 minutes to keep online.
- B. When it doesn't find a network to join →ZB11B will go to sleeping mode. It will wake up every 15 minutes to search a network to join.
- C. Once ZB11B was joined to a network and by any chance the network is no longer existed or the device is out of the network →ZB11B will wake up every 15 minutes to find the network it joined before.

It never keeps in sleeping mode and continues to find out a network every 15 minutes. This condition would consume up to 30 times power spending compared to normal-operating status. To prevent this unwanted power consumption, we recommend that users remove the batteries to power off the device.

5-5. Wake up ZB11B

When users would like to setup or acquire data from the device which is in sleeping mode, we have to wake up the device as the following steps:

Step1. Press the *Auxiliary Key*.

Step2. The indicator flashes **green 5 times** when ZB11B is online.

Step3. ZB11B will broadcast the device data to the ZigBee network.

ZB11B would be in active status for 2 minutes for communication.

5-6. Battery

ZB11B will send a low-power report to the ZigBee network when the operating voltage is lower than 3.2V by default.

The related data:

- Power configuration cluster (ID:0x0001)
- Battery voltage attribute (ID:0x0020)

The reporting voltage can be adjusted. There are 4 voltages for choosing: 3.5V/ 3.4V/ 3.3V/ 3.2V.

It is recommended that the minimal reporting interval is longer than 3-minute.

5-7. Infrared Sensor Detection and Report

When the infrared sensor detects a movement, ZB11B would send the ON task to the binding device based on how bright the location is. The light sensitivity can be adjusted by user. After ZB11B sends the ON task, there will be 2 conditions:

A. No additional movement is detected in 30 seconds → it sends the OFF task to the binding device.

B. Further movement is detected → the infrared sensor will be inactive for 21 seconds (30 seconds x 70%).

In the 22nd ~ 30th second, it sends the OFF task while no additional movement is detected; otherwise, it goes to condition B again.

Users could change the light sensitivity by adjusting the Light Sensitivity Adjuster.

- Clockwise adjustment → Send the task message in **brighter** location

Users could change the detecting sensitivity by adjusting the Sensor Sensitivity Adjuster.

- Clockwise adjustment → Higher sensitivity

NOTE: After ZB11B is turned on, the infrared sensor is not active for 1 minute.

5-8. Restore to Factory Setting

To restore it to factory setting, please follow the steps:

Step1. Press and hold the *Auxiliary Key* for 10 seconds.

Step2. Release the button after the indicator shows fast **green** flashes to complete the restore.

6. Home Automation Clusters for ZB11B

A cluster is a set of related attributes and commands which are grouped together to provide a specific function. A simple example of a cluster would be the On/Off cluster which defines how an on/off switch behaves. This table lists the clusters which are supported by ZB11B.

- 1.End Point(s) : 0x01:
- 2.Device ID : HA On/Off Switch (0x0000)
- 3.EndPoint Cluster ID

Server side	Client side
Mandatory	
Basic(0x0000)	On/Off Switch(0x0006)
Power configuration(0x0001)	
Identify(0x0003)	
Commissioning(0x0015)	
Poll control(0x0020)	
Diagnostics Cluster(0x0B05)	

This lists the attributes of the basic information.

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	--	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	--	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	--	O
0x0004	<i>ManufacturerName</i>	Character string	0 – 32 bytes	Read only	netvox	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 32 bytes	Read only	ZB11BE3E D	O

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	--	O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 – 0xff	Read only	0x03	M
0x0010	<i>LocationDescription</i>	Character string	0 – 16 bytes	Read/write	--	O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 – 0x01	Read/write	0x01	M

7. Important Maintenance Instructions

- Please keep the device in a dry place. Precipitation, humidity, and all types of liquids or moisture can contain minerals that corrode electronic circuits. In cases of accidental liquid spills to a device, please leave the device dry properly before storing or using.
- Do not use or store the device in dusty or dirty areas.
- Do not use or store the device in extremely hot temperatures. High temperatures may damage the device or battery.
- Do not use or store the device in extremely cold temperatures. When the device warms to its normal temperature, moisture can form inside the device and damage the device or battery.
- Do not drop, knock, or shake the device. Rough handling would break it.
- Do not use strong chemicals or washing to clean the device.
- Do not paint the device. Paint would cause improper operation.

Handle your device, battery, and accessories with care. The suggestions above help you keep your device operational. For damaged device, please contact the authorized service center in your area.

FCC Statement:

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.

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.

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

Note:

1. Use the product in the environment with the temperature between -10°C and 50°C .

For the following equipment:

CE 0700

Is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC,
The equipment was passed. The test was performed according to the following European standards:

EN 301 489-1 V1.9.2: 2011-09

ETSI EN 301 489-17 V2.1.1: 2009-05

ETSI EN 300 328 V1.7.1:2006-10

EN62311:2008

EN 60950-1:2006+A11:2009+A1:2010+A12:2011

**CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS**