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User Manual

Motion Detector

Model: ZB11A

Firmware:V2.1
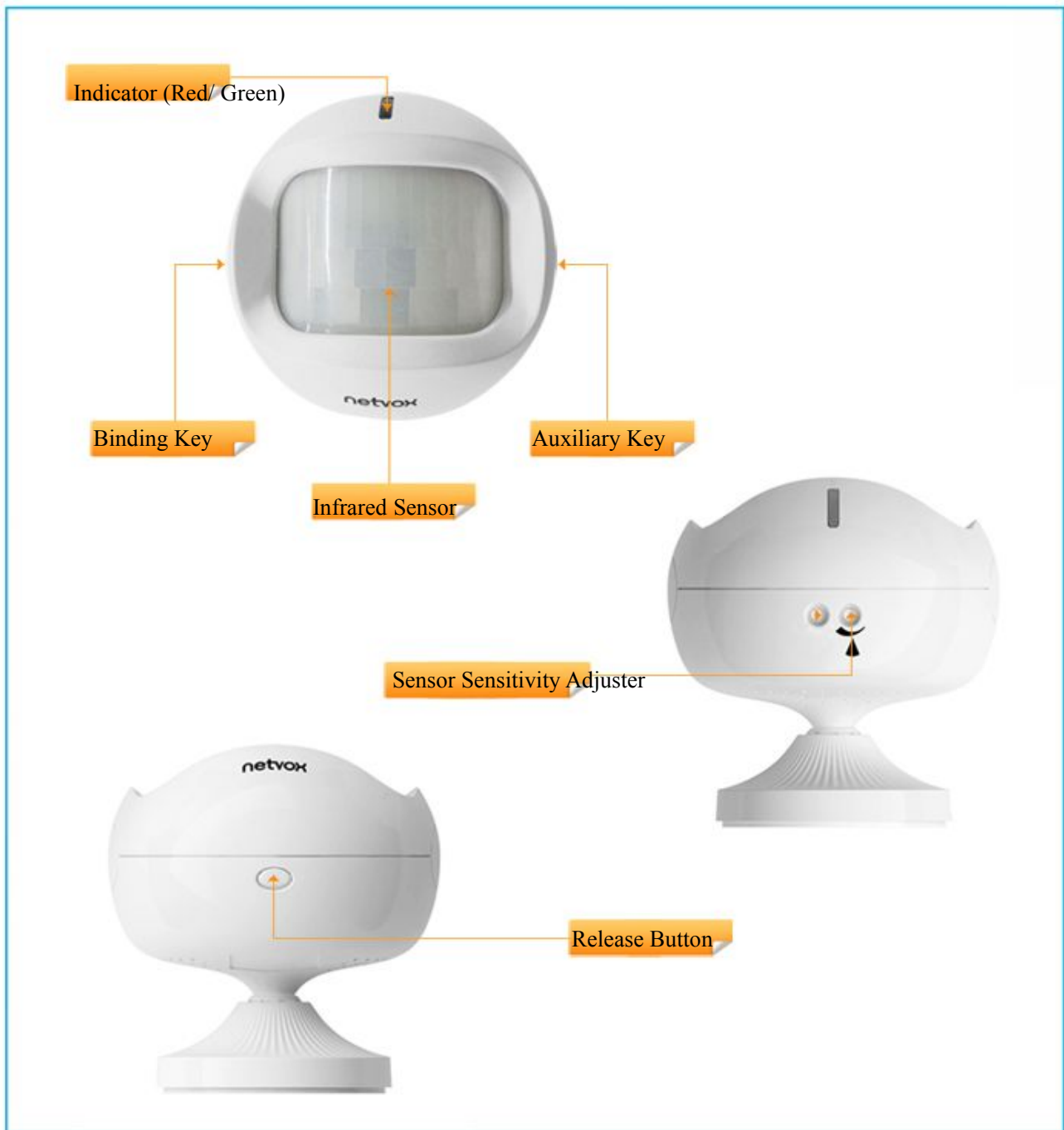
Hardware:V1.0(20140411)

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1. Introduction

Netvox ZB11A, an infrared radiation (IR) occupancy 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 ZB11A detects movement, it reports the message to the ZigBee network. Users can assign specific task to other devices based on different report. ZB11A is also featured to play a role of the sensor (Zone device) in the ZigBee security system. When the movement is detected, ZB11A will notify the central security unit, CIE (Control and Indicating Equipment) device, to send commands to a siren device to trigger an alarm.

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

Indicator (Red/ Green)

Binding Key

Auxiliary Key

Infrared Sensor

Sensor Sensitivity Adjuster

Release Button

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: ≤ 45mA

- Standby consumption: ≤ 100uA

- Sensing angle- horizontal: 110°; vertical: 60°

- Build-in tamper alarm

- 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: 11 meters; sensing angle: 30°.

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

  The coverage area C- Distance: 5 meters; sensing angle: 120°.
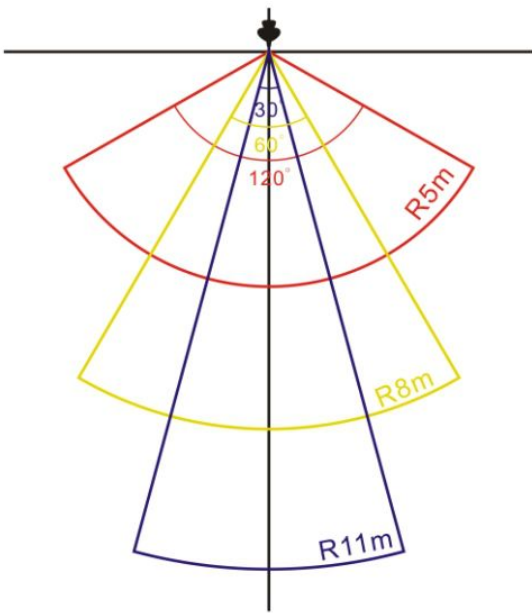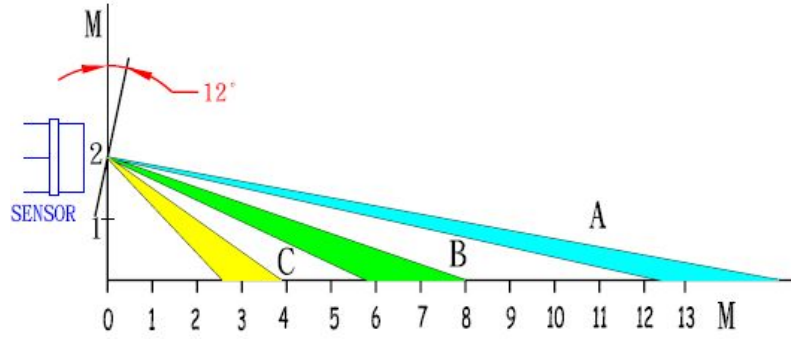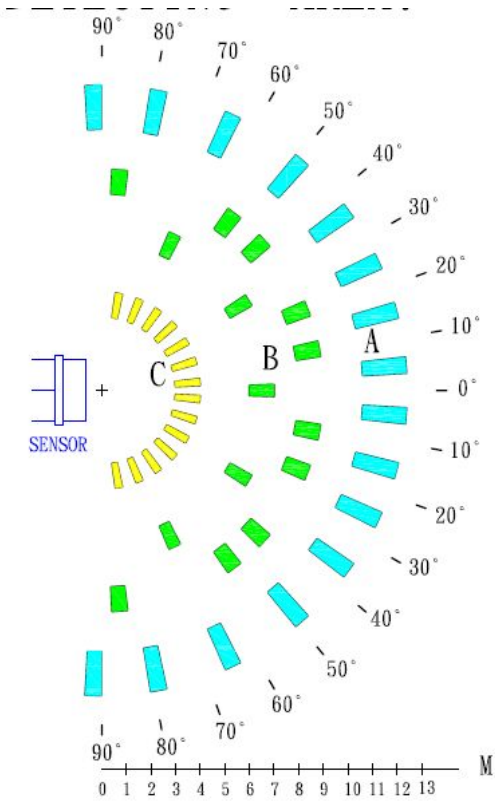
Horizontal projected area
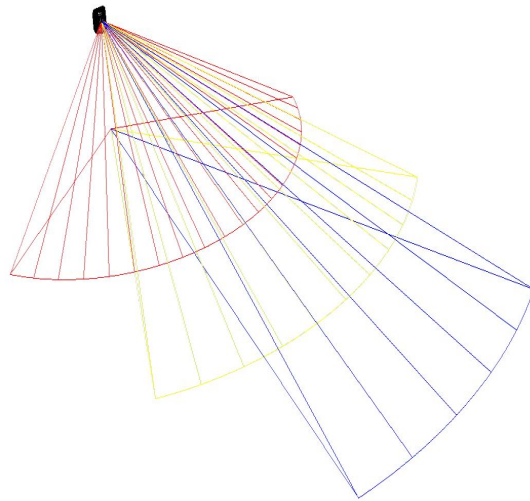
Space projected area
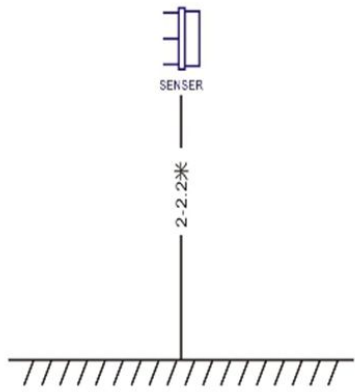
Place at 2-2.2 meters from ground	Away from air conditioners, refrigerators, stove
No bonsai, glass, curtain between sensor and IR events	Do not point to direct sunlight
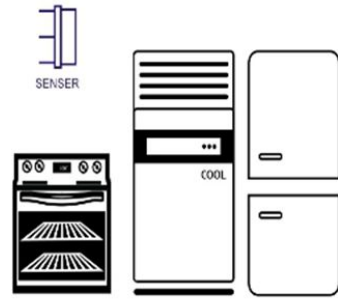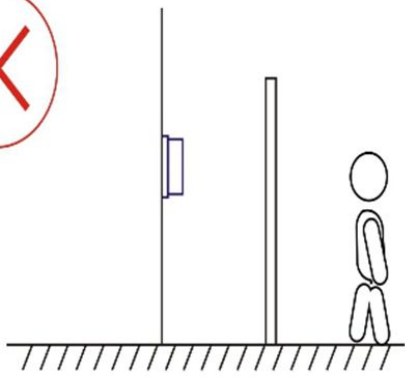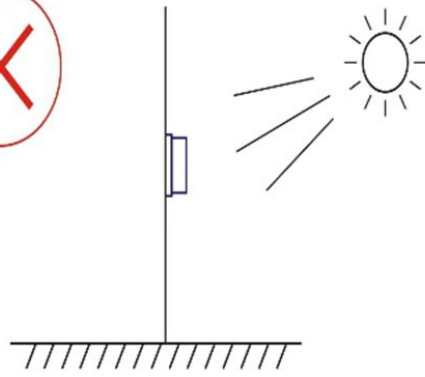
SENSER

2-2.2米

COOL

Less sensitivity moving direction

Most sensitivity moving direction

Sensor
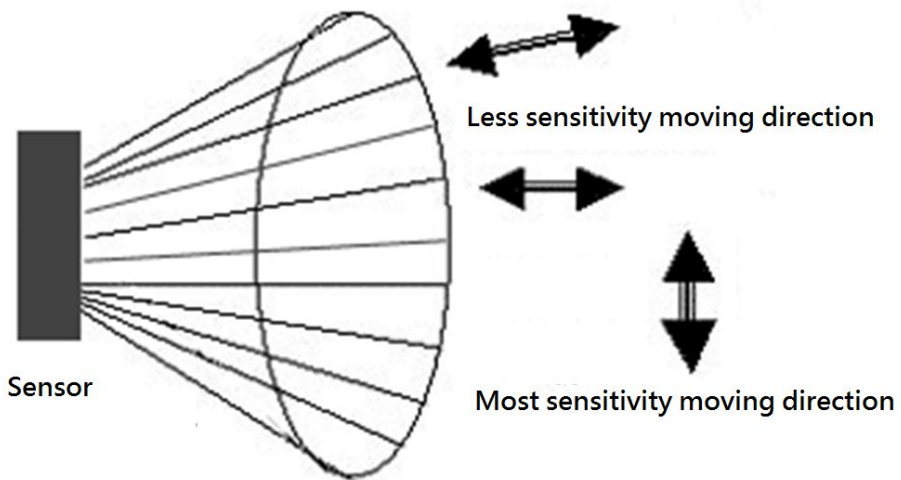
Double-sided stickers tips:

1. Clean two surfaces to stick with.

2. Tear sticker on one side; stick to the position shown product base, and smoothly press it.

3. Rip the remaining side and stick to the clean side of the wall (the direction of arrow shows up) and press firmly around 20 seconds.

Double-sided stickers

5. Setting up ZB11A

5-1. Turn On/Turn Off ZB11A

After powering on, ZB11A will enter into the turn-off mode.
To manually turn on ZB11A, press the *Binding Key* once. The two indicators will flash **once**.

- When ZB11A is first time used or after resetting → it will try to join the network.

To manually turn off ZB11A, press and hold the *Binding Key* for 15 seconds. The indicator will generate slow **green** flash.

It is recommended that having a 10-second interval between turning on and turning off ZB11A to avoid the interruption between inductors and capacitors or so.

5-2. Join the ZigBee Network

After ZB11A is turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While ZB11A is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, ZB11A 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 ZB11A. 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. Enroll in the ZigBee Security System

ZB11A is a Zone device in the ZigBee security system. Right after ZB11A join the ZigBee network, it will automatically find out a CIE (Control and Indicating Equipment) device (i.e. Netvox Z201B) and send a registration request to the CIE device to enroll in the security system. The enrollment has these 3 situations:

A. There is no CIE device or no compatible CIE device in the network → the indicator flashes **green** **twice**.
B. There is a compatible CIE device in the network, but it is failed to enroll → the indicator flashes **green** **4 times**.
C. The enrollment is completed → the indicator flashes **green** **6 times**.

NOTE: Users had better NOT enroll multiple Zone devices at the same time to prevent registration failure.

5-4. Sleeping Mode

ZB11A is designed to go to 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 → ZB11A will go to sleeping mode. It will wake up every 15 minutes to search a network to join.
C. Once ZB11A was joined to a network and by any chance the network is no longer existed or the device is out of the network → ZB11A 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 ZB11A

To manually wake up ZB11A, press the *Auxiliary Key* **once**.

- When ZB11A is in a ZigBee network → it will send out the device data, like IEEE address/Network address, and the indicator will flash **green** **5 times**.
- When ZB11A was in a ZigBee network, but by any change it is offline → it will start to rejoin the ZigBee network.

ZB11A will be activated for 2 minutes.

5-6. Battery

ZB11A 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 internal is longer than 5-minute.

5-7. Infrared Sensor Detection and Report

When infrared sensor detects a movement, ZB11A will send the report to the CIE device and go to Occupied status. The indicator will flash **red** **once**. In Occupied condition, ZB11A will detect the further movement

every 84 seconds (120 * 70%) by default. Until no additional movement is detected within the period of 120 seconds, ZB11A will go to Unoccupied condition and send the report to ZigBee network.

- After ZB11A joins the ZigBee network, the infrared sensor will not be active within 1 minute.
- Under the circumstances ZB11A is not in a ZigBee network, it will start to join a network after the ZB11A detects a movement.
- Users could change the detecting sensitivity by adjusting the Sensor Sensitivity Adjuster.
  Clockwise adjustment → Higher sensitivity
- Default Sensor Sensitivity Adjuster is as below:

Default Sensor Sensitivity Adjuster

5-8. Tamper Alarm

ZB11A features tamper alarm. When the cover is opened, ZB11A will notify the central security unit, CIE (Control and Indicating Equipment) device, to send a command to a Warning Device.

5-9. 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. After the indicator shows fast **green** flashes, release the button to complete the restore.

6. Home Automation Clusters for ZB11A

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 ZB11A.

1、End Point(s)：0x01:

2、Device ID： IAS Zone（0x0402）

3、EndPoint Cluster ID

Server side	Client side
EP ：0x01（Device ID: IAS Zone 0x0402）	
Basic(0x0000)	*None*
Power configurationr(0x0001)	
Identify(0x0003)	
Ias Zone（0x0500）	
Commissioning(0x0015)	*None*
Poll control(0x0020)	
Diagnostics Cluster(0x0B05)	

This lists the attributes of the basic information.

（1）Attributes of the Basic Information

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	*ZCLVersion*	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	M
0x0001	*ApplicationVersion*	Unsigned 8-bit integer	0x00 – 0xff	Read only	-------	O
0x0002	*StackVersion*	Unsigned 8-bit integer	0x00 – 0xff	Read only	-	O
0x0003	*HWVersion*	Unsigned 8-bit integer	0x00 – 0xff	Read only	-	O
0x0004	*ManufacturerName*	Character string	0 – 32 bytes	Read only	netvox	O
0x0005	*ModelIdentifier*	Character string	0 – 32 bytes	Read only	ZB11AE3ED	O

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