Wireless Occupancy & Temperature & Light Sensor

Wireless
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User Manual

Table of Content

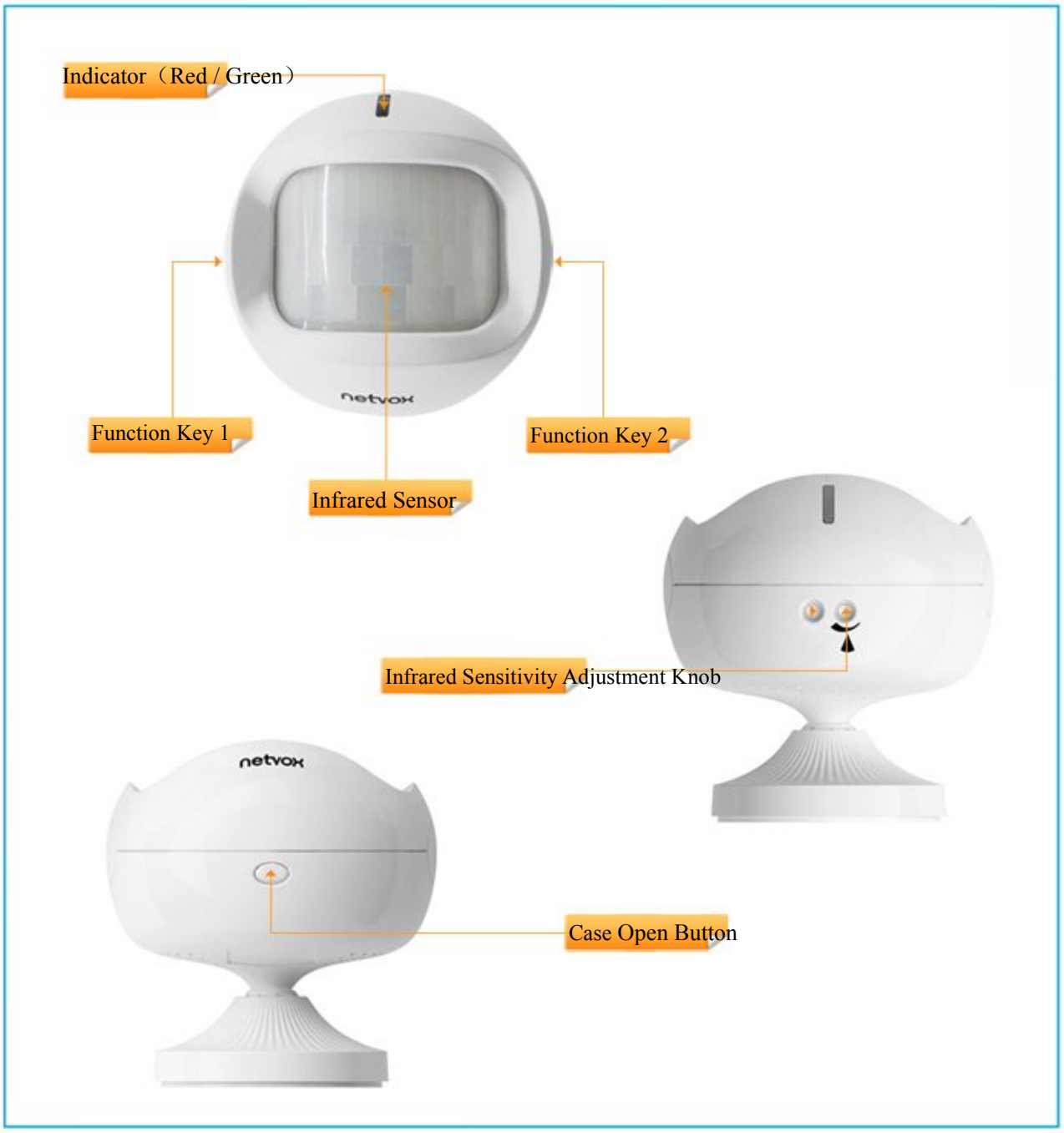
1. Introduction

RB11E is a long distance wireless infrared device based on the LoRaWAN protocol (Class A). RB11E combines infrared detection, temperature, and illumination sensors. During infrared real-time detection, if a people or other organism which is active in the monitoring area, RB11E will detect the infrared signal and report status information to the gateway. Users can execute different instructions or scenes according to the different status configuration. RB11E also supports temperature, lighting report.

LoRa Wireless Technology:
LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability and so on.

LoRaWAN:
LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

2. Appearance



3. Main Features

- Compatible with LoRaWAN
- 2 section 3.6V lithium battery powered
- Detect temperature, light illumination
- 2 sections ER14505 battery AA SIZE (3.6V / section) parallel power supply

4. Set up Instruction

4.1 Power on and Turn on / off

(1) Power on (insert batteries). Operation method: press the open shell button; then open the upper and lower covers along the gap between the upper and lower covers. After opening the case, insert two ER14505 3.6V AA batteries into the battery compartment, and then close the upper and lower covers.
(2) Turn on. If the device had never joined in any network or at factory setting mode, after powering on, the device is at off mode by default setting. Press the function key till the green and red indicator flash and release the key to turn on the device.
(3) Remove batteries (power off) when RB11E is on. Wait till 10 seconds after the capacitance discharging. Insert batteries again, because this model is a hardware switch circuit, users need to press the function key till the red and green indicators are on and then release key.
(4) Turn off: press and hold the two buttons for 5 seconds and the green indicator will continue to flash quickly. Release the button and the device will be turned off and the indicator flashes 20 times.

Note:
1. The interval between turning on/off or powering off/on is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.
2. Do not press function key and insert batteries in the same time, otherwise, it will enter engineer testing mode.

4.2 Join Into Lora Network

To join RB11E into LoRa network to communicate with LoRa gateway.
The network operation is as following:
(1) If RB11E had never joined any network or at factory setting mode, turn on the device; it will search an available LoRa network to join. The green indicator will stay on for 5 seconds to show it joins into the network, otherwise, the green indicator does not work.
(2) If RB11E had been joined into a LoRa network, remove and insert the batteries. The device will re-join the network and repeat step (1).

4.3 Function Key

(1) Press and hold function key for 5 seconds to reset to factory setting. After restoring to factory setting successfully, the green indicator will flashes quickly 20 times.
(2) Press function key to turn on the device and it will send a data report.

4.4 Data Report

When the device is powered up, it will immediately send a version package and a data report package of temperature, illumination, infrared status and voltage.
Data will be reported once every hour by default setting.
Maximum time: 3600s
Minimum time: 3600s (default current ambient temperature, illuminance value, voltage value is checked every 3600s)
Default reportchange: Battery - 0x01 (0.1V)
Temperature----0x0064 (1°C)
Illumination----0x0064 (100Lux)

Note: MinInterval is the sampling period (voltage, temperature, illuminance).
Sampling period >= MinInterval.

When infrared is triggered: The red LED will flash once after RB11E detects infrared signal, and immediately report the status of all current sensor value (voltage, temperature, illuminance).

Report configuration and data sending period.

Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Current Change≥ Reportable Change	Current Change < Reportable Change
Any number between 1~65535	Any number between 1~65535	Can not be 0	Report per Min Interval	Report per Max Interval

4.5 IR Delay Configuration

If someone or animal is moving in the monitoring area, RB11E will detect the infrared signal and the red indicator will flash once. In the mean time, it reports occupied status (at the same time, other sensor status value are also reported).

To save the power, when RB11E detects the infrared signal, it will enter IRDetectionTime period. If there is no infrared signal detected in IRDetectionTime period. It will report un-occupy.

IRDisableTime is the sampling period during IRDetectionTime (IRDisableTime are 30 seconds by default setting that PIR is off for first 70% of the period; on for rest 30% of the period).

For example, after triggered, the PIR will turn off the infrared probe for 21 (30 * 70%) seconds to save the power, living objects within this period will not be detected. PIR will re-open

detection function after 21 seconds, if it detects living objects in this period, the IR delay time will be extended for another 30 seconds till no infrared signal is detected and IRDetectionTime period is due and RB11E will then report un-occupy.

Note：IRDisableTime >=5 s, IRDetectionTime>= IRDisableTime

The infrared sensitivity adjustment knob can be manually adjusted to change the sensitivity of the infrared detection. When the clockwise rotation, the higher the infrared sensitivity, the easier it is to trigger.

5. Restore to Factory Setting

RB11E saves data including network key information, configuration information, etc. To restore to factory setting, users need to execute below operations.
1. Press and hold function key for 5 seconds till the green indicator flashes and then release; LED flashes quickly 20 times.
2. RB11E is setted to be off after restoring to factory setting. Press function key to turn on RB11E and to join a new LoRa network.

6. Sleeping Mode

RB11E is designed to enter sleeping mode for power-saving in some situations:

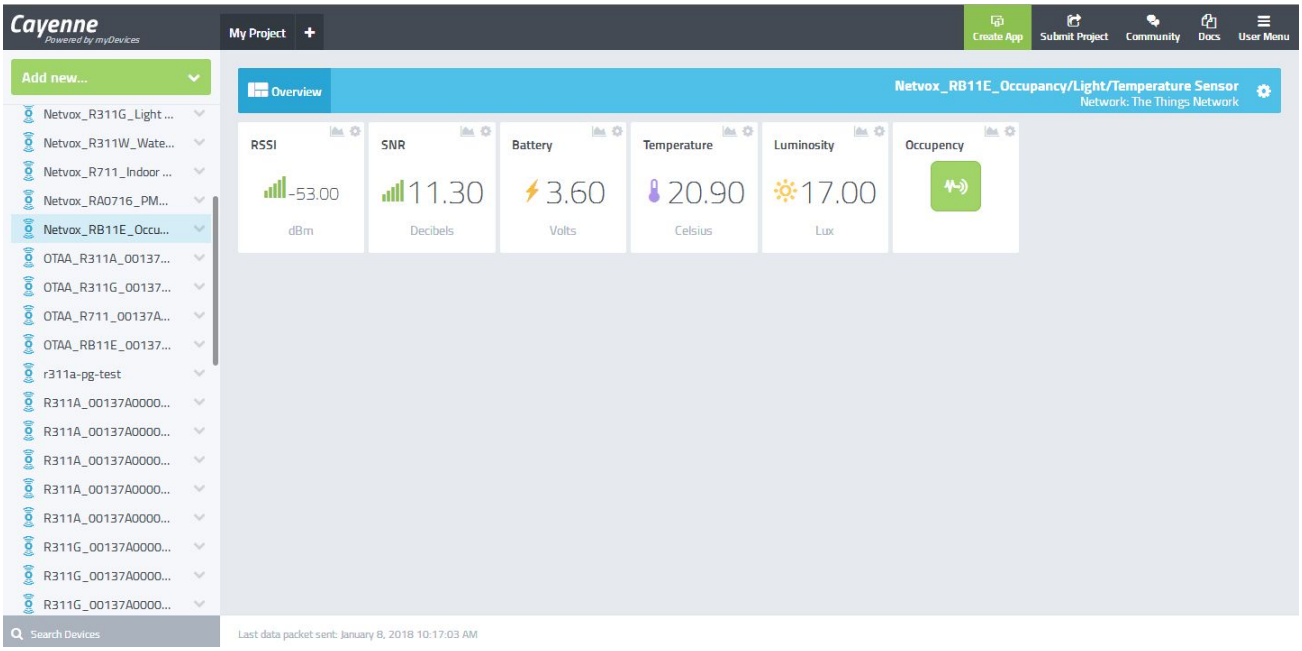
(A) While the device is in the network → the sleeping period is one hour. (During this period, if the reportchange is larger than setting value, it will wake up and send a data report).
(B) When it is not in the network → RB11E will enter sleeping mode and wake up every 15 seconds to search a network to join in the first two minutes. After two minutes, it will wake up every 15 minutes to request to join the network.

If it's at (B) status, to prevent this unwanted power consumption, we recommend that users remove the batteries to power off the device.

7. Low Voltage Alarming

The operating voltage threshold is 3.2V. If the voltage is lower than 3.2V, RB11E will send a low-power report to the Lora network.

8. MyDevices Dashboard Demonstration



9. Important Maintenance Instruction

Your device is a product of superior design and craftsmanship and should be used with care. The following suggestions will help you use the warranty service effectively.

- Keep the equipment dry. Rain, moisture, and various liquids or moisture may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This can damage its detachable parts and electronic components.
- Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in excessive cold place. Otherwise, when the temperature rises to normal temperature,

moisture will form inside, which will destroy the board.

- Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.
- Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.

All of the above suggestions apply equally to your device, battery and accessories. If any device is not working properly.

Please take it to the nearest authorized service facility for repair.

10. FCC Statement

The OEM integrator has to be aware of not to providing information to end users regarding how to install or remove this RF module in the user manual of the end product.The user manual which is provided by OEM integrators for end users must

Include the following information in a prominent location.

“ To comply with FCC RF exposure compliance requirement, the antenna user for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter .”

Label for the end product must include “Contains FCC ID :NRH-ZB-Z100B”or “A RF transmitter inside,FCC ID :NRH-ZB-Z100B”.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is 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.

FCC RF Radiation Exposure Statement:

1This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2.This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.