Window/Door Sensor

User Manual

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1. Introduction

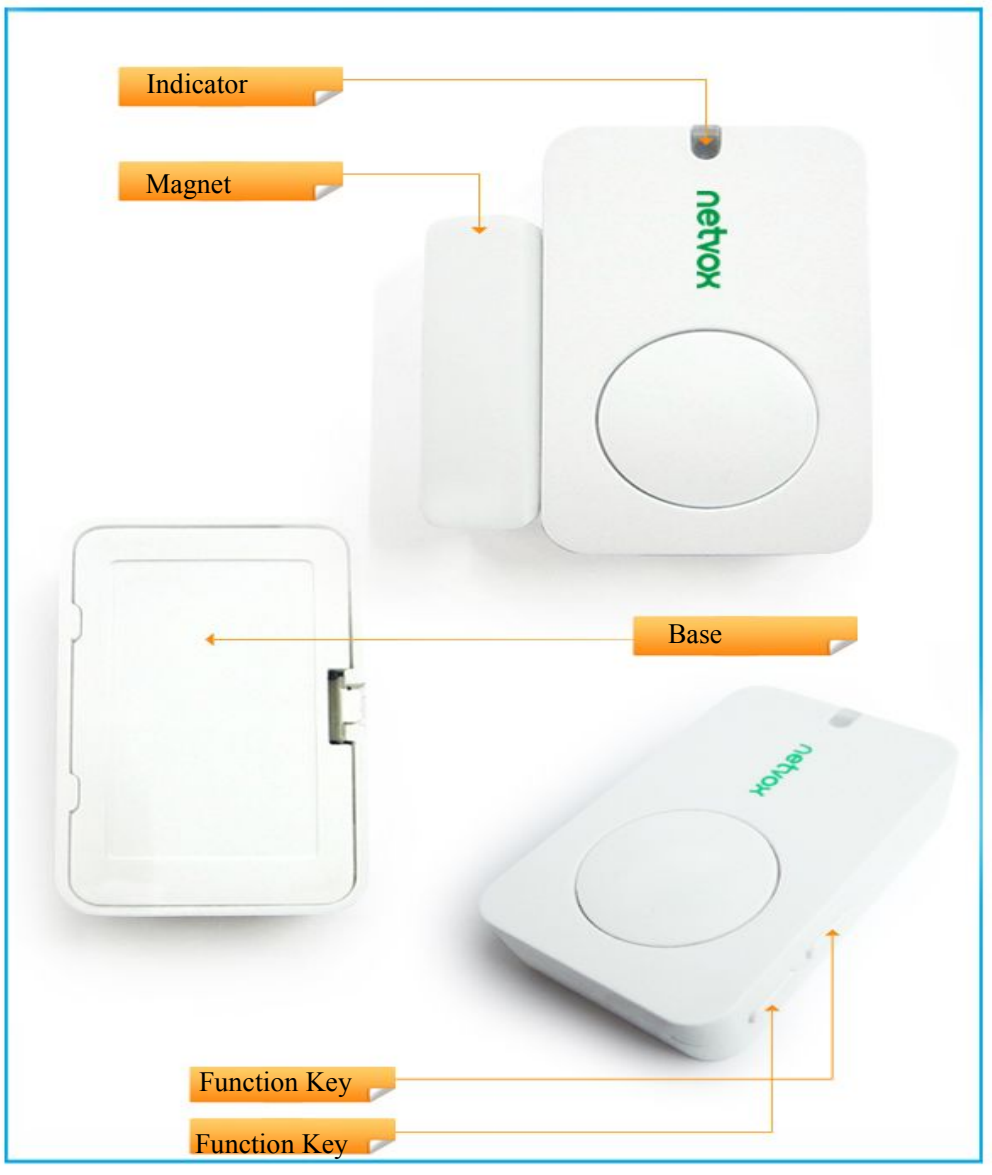
R311A is a long-distance window/door sensor based on the LoRaWAN open protocol (Class A).

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.

This device has been certified by the LoRa Alliance and is allowed to use the following logo on the product:

2. Appearance



3. Main Features

- Compatible with LoRaWAN
- 2 sections of 3V CR2450 button battery power supply
- Detectable voltage and door/window status
- Simple operation and setting
- Protection level IP30
- Compatible with LoRaWANTM Class A
- Frequency hopping spread spectrum technology
- Configuration parameters can be configured through third-party software platforms, data can be read and alarms can be set via SMS text and email (optional)
- Available third-party platform: Actility / ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life

- Note*:

Battery life is determined by the sensor reporting frequency and other variables, please refer to http://www.netvox.com.tw/electric/electric_calc.html
On this website, users can find battery life time for varied models at different configurations.

4.Set up Instruction

On/Off

Power on	Insert batteries. (users may need a flat blade screwdriver to open); insert two sections of 3V CR2450 button batteries and close the battery cover.)
Turn on	Press any function key till green and red indicator flashes once.
Turn off (Restore to factory setting)	Press and hold the function key for 5 seconds till green indicator flashes for 20 times.
Power off	Remove Batteries.
Note:	1. Remove and insert the battery; the device memorizes previous on/off state by default. 2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components. 3. Press any function key and insert batteries at the same time; it will enter engineer testing mode.

Network Joining

Never joined the network	Turn on the device to search the network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Had joined the network	Turn on the device to search the previous network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Fail to join the network (when the device is on)	First two mins:wake up every 15 seconds to send request. After two mins: enter sleeping mode and wake up every 15 minutes to send request. Note: Suggest to remove batteries if the device is not used to save power. Suggest to check device verification on gateway.

Function Key

Press and hold for 5 seconds	Restore to factory setting / Turn off The green indicator flashes for 20 times: success The green indicator remains off: fail
Press once	The device is in the network: green indicator flashes once and sends a report The device is not in the network: green indicator remains off

Sleeping Mode

The device is on and in the network	Sleeping period: Min Interval. When the reportchange exceeds setting value or the state changes: send a data report according to Min Interval.
The device is on but not in the network	First two mins: wake up every 15 seconds to send request. After two mins: enter sleeping mode and wake up every 15 minutes to send request. Note: Suggest to remove batteries if the device is not used. Suggest to check device verification on gateway.

Low Voltage Warning

Low Voltage	2.4V

5. Data Report

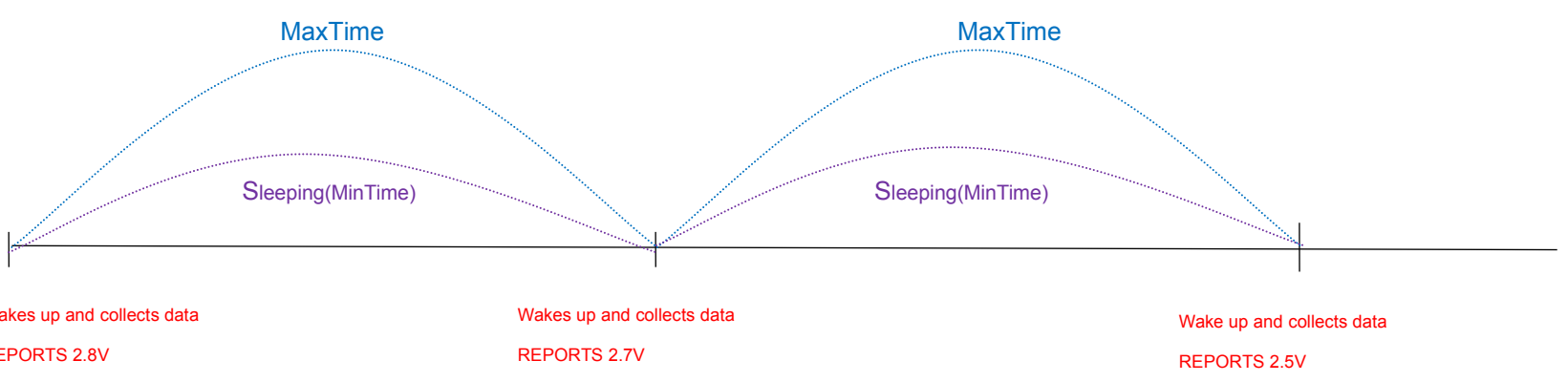
When the device is turned on, it will immediately send a version package.
Data will be reported by default setting before any configuration.
Maximum time: 3600s
Minimum time: 3600s (Detect the current voltage value every 3600s by default setting)
Default reportchange:
Battery ---- 0x01 (0.1V)
R311A sensor is triggered:
When the R311A status changes, it will send warning report.
Window/Door sensor open:1
Window/Door sensor close:0

The reported data is decoded by the Netvox LoRaWAN Application Command document and http://www.netvox.com.cn:8888/page/index

Data report configuration and sending period are as following:

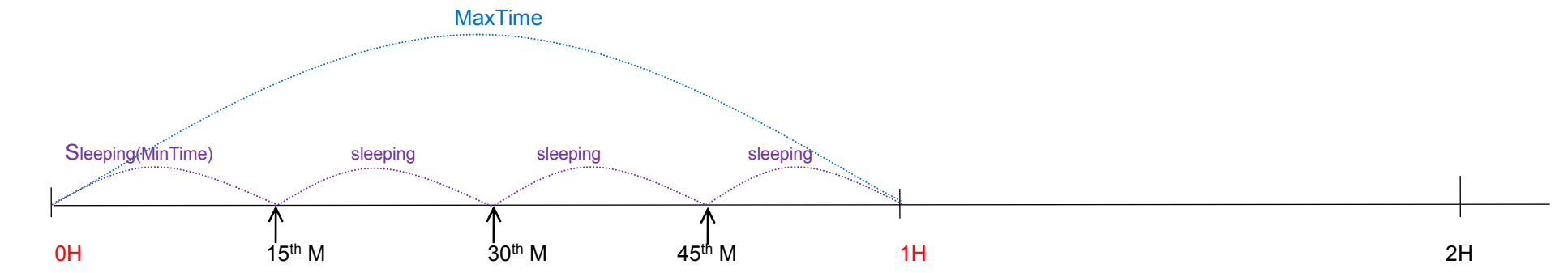
Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Current Change≥ Reportable Change	Current Change < Reportable Change
Any number between 1~65535	Any number between 1~65535	Can not be 0.	Report per Min Interval	Report per Max Interval

Example#1 **based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V**

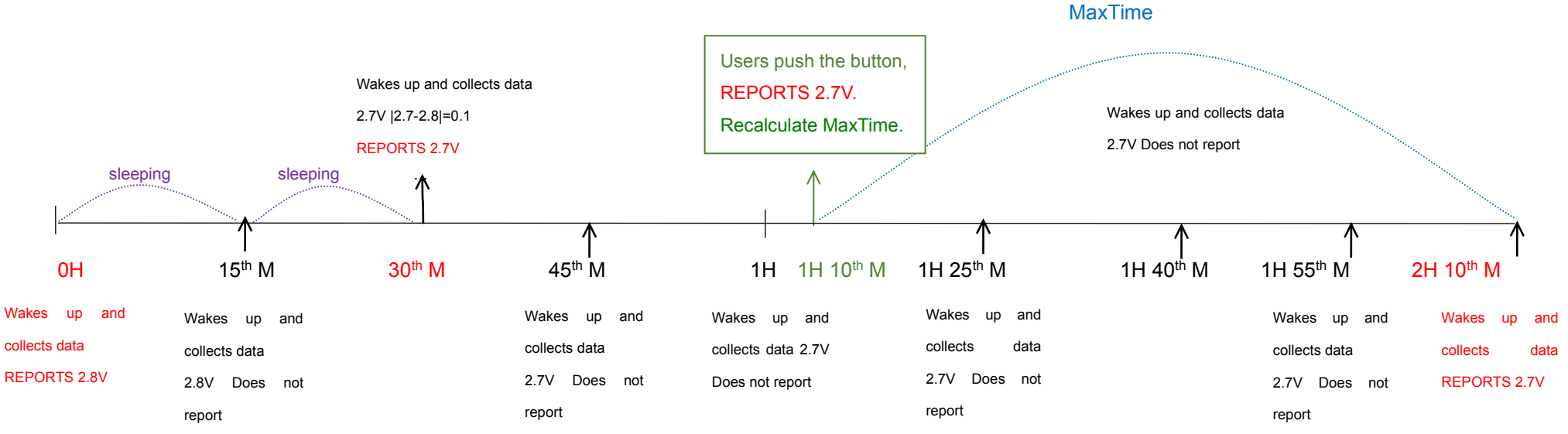


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BtteryVoltageChange value.

Example#2 **based on MinTime = 15 Minutes, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange= 0.1V.**



3 **I** **me = 15** **ıe= 1 H** **Chanç** **oltageChange= 0.1V.**



Notes:

1) The device only wakes up and performs data sampling according to MinTime Interval. When it is sleeping, it does not collect data.

2) The data collected is compared with the last data reported. If the data change value is greater than the ReportableChange value, the device reports according to MinTime interval. If the data variation is not greater than the last data reported, the device reports according to MaxTime interval.

3) We do not recommend to set the MinTime Interval value too low. If the MinTime Interval is too low, the device wakes up frequently and the battery will be drained soon.

4) Whenever the device sends a report, no matter resulting from data variation, button pushed or MaxTime interval, another cycle of MinTime / MaxTime calculation is started.

6. Installation

(1) This product does not have a waterproof function. After the screening is completed, please place it indoors.

(2) The door magnetic magnet part and the body part are installed on both sides of the door joint or the window joint, and the distance between the two needs to be less than 2cm; the dust in the installation position of the equipment needs to be wiped clean and then affixed to the equipment.

- Remove the 3M glue on the back of the magnet body and attach the body to the door frame (please do not stick it on the rough door to avoid falling off after using the device for a long time).

Note:

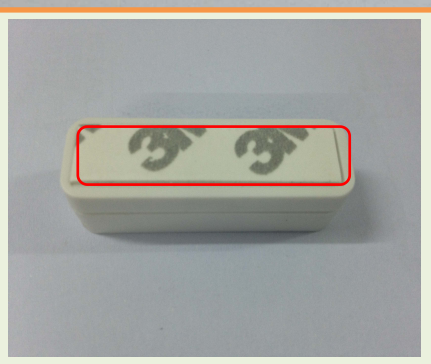
- Wipe the door clean before installation to avoid dust on the door and affect the adhesion of the device.
- Do not install the device in a metal shielded box or other electrical equipment around it to avoid affecting the wireless transmission of the device.

This figure shows the scene where the door magnetic sensor (R311A) is applied to the door (opening and closing).

It can also be applied to the following scenarios:

- Door, window
- drawer
- Machine room door
- Archive room
- Closet
- Refrigerator and freezer
- Cargo ship door
- Garage Door

Places which are necessary to detect the opening and closing state



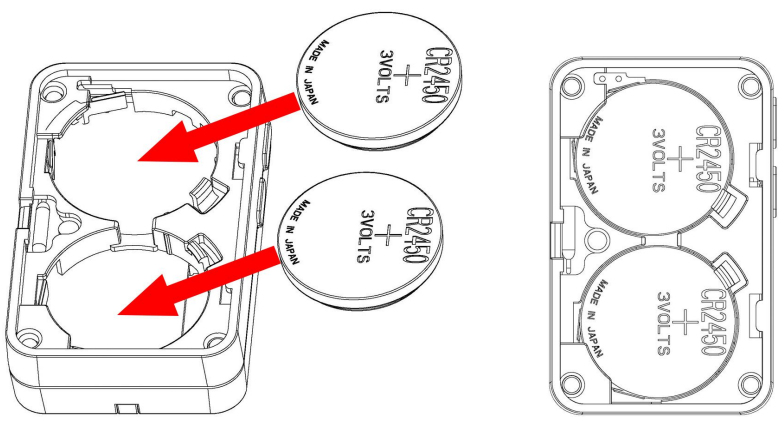
2. Tear off the 3M glue at the bottom of the magnet part of the door magnet (the red circle part in the figure above) and stick it to the door in parallel with the door magnet body. As shown in the enlarged view on the right:

Note: The installation distance between the magnet body and the magnet should be less than 2cm.

When the door is opened, the magnetic body of the door is separated from the magnet, and the magnetic device sends an "alarm" message.

When the door is closed, the magnetic body of the door is merged with the magnet, the device returns to the "normal" state, and the status information of the off is sent.

(3) The battery installation method is shown in the figure below (battery with "+" facing outward).



Note: To install the battery, use a screwdriver or similar tool to assist in opening the battery cover.

7. 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.

8. 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.