netvox ™

Wireless 2-Gang Door/Window Sensor

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R311CC

User Manual

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1. Introduction

R311CC is equipped with two external reed switches, which can be used for door and window switch state detection.

LoRa Wireless Technology:

LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extend the communication distance. It can be widely used in any use case that requires long-distance and low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. It has features like small size, low power consumption, long transmission distance, strong 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
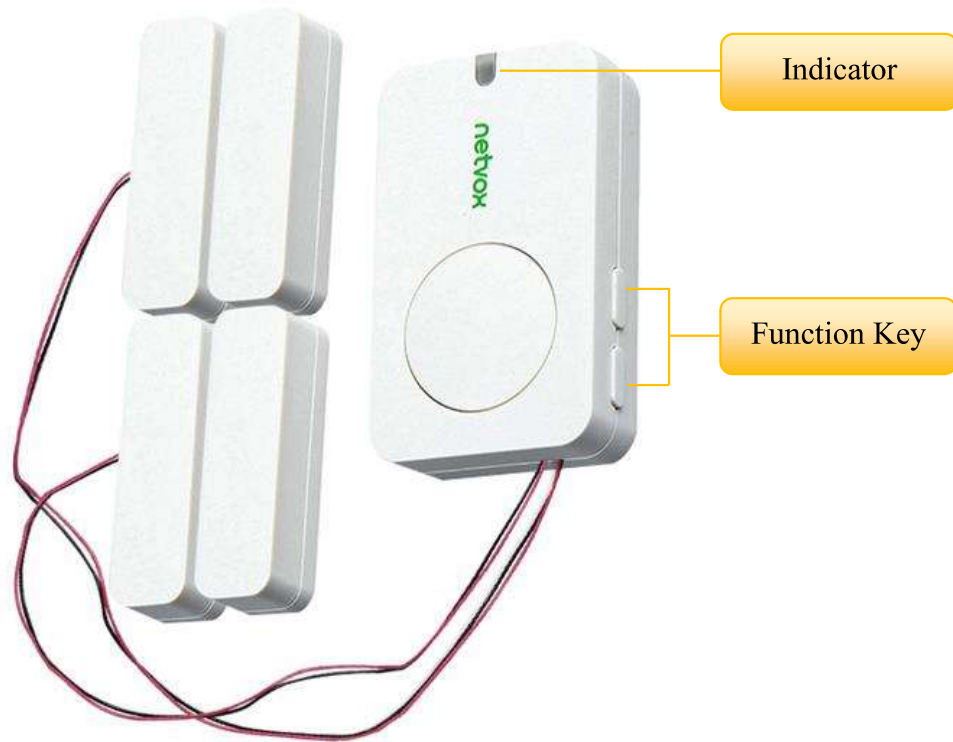
3. Main Features

• Compatible with LoRaWAN

• 2 sections of 3V CR2450 button batteries

• 2-gang Reed switch status detection

• Compatible with LoRaWAN^{TM} Class A

• Frequency hopping spread spectrum

• Configuration parameters can be configured via a third-party software platform, data can be read
   and alerts can be set via SMS text and email (optional)

• Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne

• Low power consumption and long battery life

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

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.

Low Voltage Warning

Low Voltage	2.4V

5. Data Report

The device will immediately send a version packet report along with an uplink packet including reed switch status and battery voltage.

Data will be reported by default setting before any configuration.

Default setting:

    Maximum time: 3600s

    Minimum time: 3600s (Detect the current voltage value every 3600s by default setting)

    Battery Change :0x01 (0.1V)

R311CC status:

    When the R311CC status changes, it will send a 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/cmddoc

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 of ConfigureCmd

Bytes	1	1	Var (Fix =9 Bytes)
	CmdID	DeviceType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max=9bytes)

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData			
Config ReportReq	R311CC	0x01	0x6C	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Battery Change (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)
Config ReportRsp		0x81		Status (0x00_success)		Reserved (8Bytes,Fixed 0x00)	
ReadConfig ReportReq		0x02		Reserved (9Bytes,Fixed 0x00)			
ReadConfig ReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Battery Change (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)

(1) Command Configuration:

MinTime = 1min、MaxTime = 1min、BatteryChange = 0.1v

Downlink：016C003C003C0100000000   003C$(H_{ex)}$ = 60$(D_{ec)}$

Response：

816C000000000000000000 (Configuration success)

816C010000000000000000 (Configuration failure)
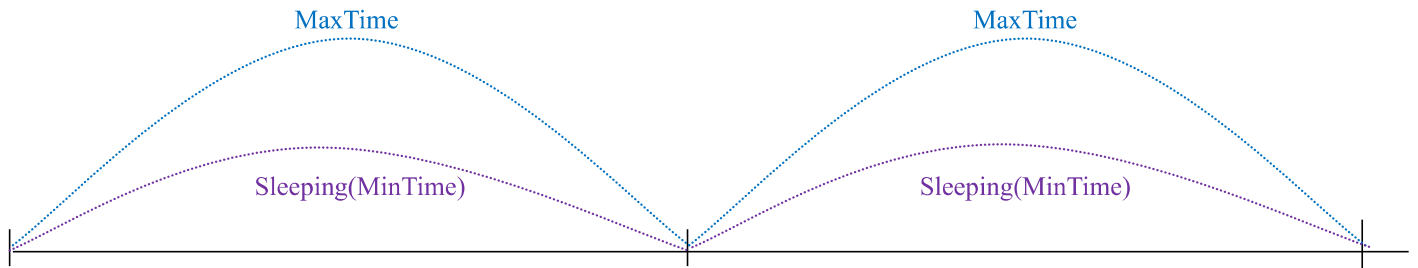
(2) Read Configuration:

Downlink：026C000000000000000000

Response：826C003C003C0100000000（Current configuration）

Example for MinTime/MaxTime logic

Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change

   i.e.BatteryVoltageChange=0.1V

MaxTime   MaxTime

Sleeping(MinTime)   Sleeping(MinTime)

Wakes up and collects data   Wakes up and collects data   Wake up and collects data
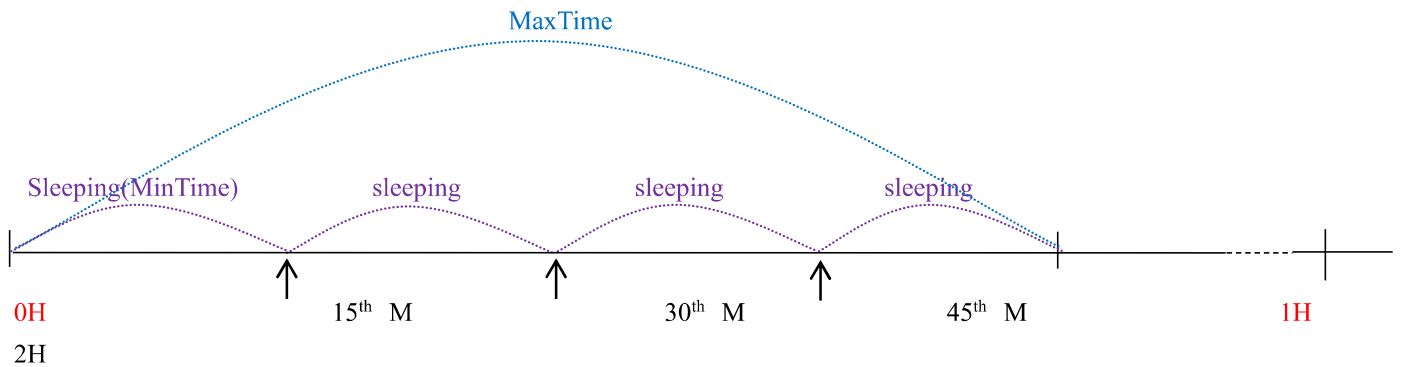REPORTS 2.8V   REPORTS 2.8V   REPORTS 2.8V

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.

MaxTime

Sleeping(MinTime)   sleeping   sleeping   sleeping

0H   15th M   30th M   45th M   1H
2H

Wakes up and collects data	Wakes up and collects data	Wakes up and collects data	Wakes up and collects data	Wakes up and collects data
REPORT 2.8V	2.8V	2.8V	2.8V	REPORT 2.8V
	Does not report	Does not report	Does not report	

Example#3 based on MinTime = 15 Minutes, MaxTime= 1 Hour, Reportable Change
i.e. BatteryVoltageChange= 0.1V.

Wakes up and collects data
2.7V |2.7-2.8|=0.1
REPORTS 2.7V

Users push the button,
REPORTS 2.7V.
Recalculate MaxTime.

MaxTime

Wakes up and collects data 2.7V
Does not report

sleeping   sleeping

0H   15th M   30th M   45th M   1H   1H 10th M   1H 25th M

Wakes up and collects data
REPORT 2.8V

Wakes up and collects data
2.8V
Does not report
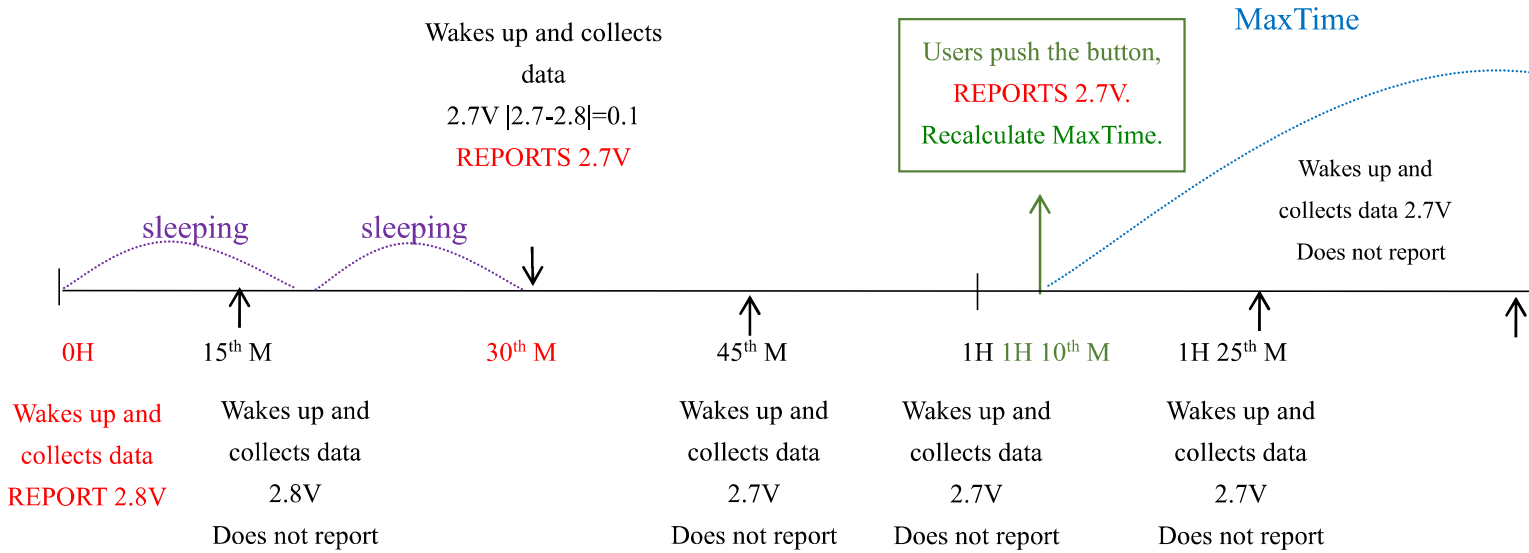
Wakes up and collects data
2.7V
Does not report

Wakes up and collects data
2.7V
Does not report

Wakes up and collects data
2.7V
Does not report

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) Dust in the installation position of the equipment needs to be wiped clean and then affixed to the equipment.

(3) The battery installation method is shown in the figure below (battery with "+" facing outward).
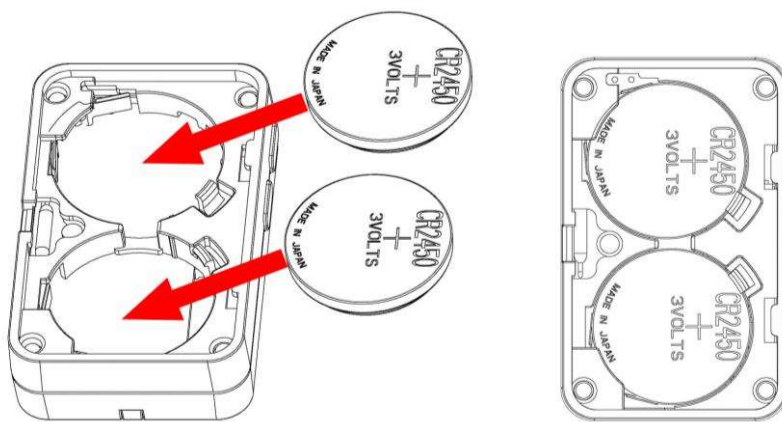
Note: To install the battery, use a screwdriver or similar tool to assist in opening the battery cover.

7. **Important Maintenance Instruction**

Kindly pay attention to the following in order to achieve the best maintenance of the product:

- Keep the device dry. Rain, moisture, or any liquid, might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.
- Do not use or store the device in dusty or dirty environment. It might damage its detachable parts and electronic components.
- Do not store the device under excessive heat condition. High temperature can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store the device in places that are too cold. 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 clean the device with strong chemicals, detergents or strong detergents.
- Do not apply the device with paint. Smudges might block in the device and affect the operation.
- Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery and accessories. If any device is not working properly, please take it to the nearest authorized service facility for repair.