Wireless Dry Contact Sensor

R313CA
User Manual

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1. Introduction

The R313CA is a dry contact detection device for Netvox ClassA type devices based on the LoRaWAN open protocol and is compatible with LoRaWAN protocol. When any dry contact of R313CA detects a change, R313CA will send a message to the gateway.

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 and 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

Fig. R313CA appearance

3. Main Features

- 2 x 3V CR2450 button batteries

- Compatible with LoRaWAN

- Adopt SX1276 wireless communication module

- Dry contact detection

- Frequency hopping spread spectrum technology

- Configuring parameters and reading data via the third-party software platforms, and set alarms via SMS text and email (optional)

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

Note: Battery life is determined by sensor reporting frequency and other variables.

Please refer to web: http://www.netvox.com.tw/electric/electric_calc.html

In this website, users can find battery lifetime for various models at different configurations.

4.Set up Instruction

On/Off

Power on	Insert batteries (users need a flat blade screwdriver to open)
Turn on	The device (unjoin the network) is power off according to default when the battery is installed. Currently, press any button of the device shortly. After release, the red and green indicators will flash one time simultaneously that means the device turns on successfully.
Turn off (Restore to original setting)	Press simultaneously and hold two function keys for 5 seconds, and then the green indicator will flash continuously. After release function keys, the green indicator flashes 20 times and the device will turn off automatically.
Power off	Remove Batteries
Note:	1. Remove and reinsert the battery: according to the default, the device is in a turn off state. 2. After 5 seconds of powering on, the device is in engineering testing mode. 3. In the turn-on state, the interval of remove and reinsert the battery is suggested to be about 10 seconds. After reinserted the battery, the device is in the turn-on state according to the default. (If the device has been turned on, it does not need to press the button to enter the turn-on state.) The red and green indicators will flash one time simultaneously.

Network Joining

Never join the network	Turn on the device to search the network to join. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Had joined the network (Not in the original setting)	Turn on the device to search the previous network to join. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Fail to join the network	Suggest checking device verification on gateway or consulting your platform server provider if the device fails to join the network.

Function Key

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

Sleeping Mode

The device is turn on and join in the network	Sleeping period: Min Interval. When the reportchange exceeds the default or the state of the device changes: send a data report according to Min Interval.

Low Voltage Warning

Low Voltage	2.4V

*Suggest removing batteries if the device is not used to save power.

5. Data Report

After power on, the device will immediately send a version packet report and a data report including temperature, humidity, and voltage.

The device sends data according to the default configuration before any other configuring.

Report MaxTime：Max Interval ----3600s

Report MinTime：Min Interval ----3600s (Default: Every Min Interval will detect the state of the dry contact one time)

Default reportchange: BatteryVoltageChange ---- 0x01(0.1V)

Note:

1. The cycle of the device sending the data report is according to the default.

2. The interval between two reports must be the MinTime.

Triggering the dry contact:

When the dry contact detects the state changing, the report will be sent immediately.

Open:1 Close: 0

The device reported data parsing please refer to Netvox LoraWAN Application Command document and Netvox Lora Command Resolver 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 bytes

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max=9bytes)

Description	Device	CmdID	Device Type	NetvoxPayLoadData			
ConfigReport Req	R313CA	0x01	0x4C	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)
ConfigReport Rsp		0x81		Status (0x00_success)		Reserved (8Bytes, Fixed 0x00)	
ReadConfigR eportReq		0x02		Reserved (9Bytes, Fixed 0x00)			
ReadConfigR eportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)

(1) Configure R313CA device parameter MinTime = 1min、MaxTime = 1min、BatteryChange = 0.1v

Downlink：014C003C003C0100000000

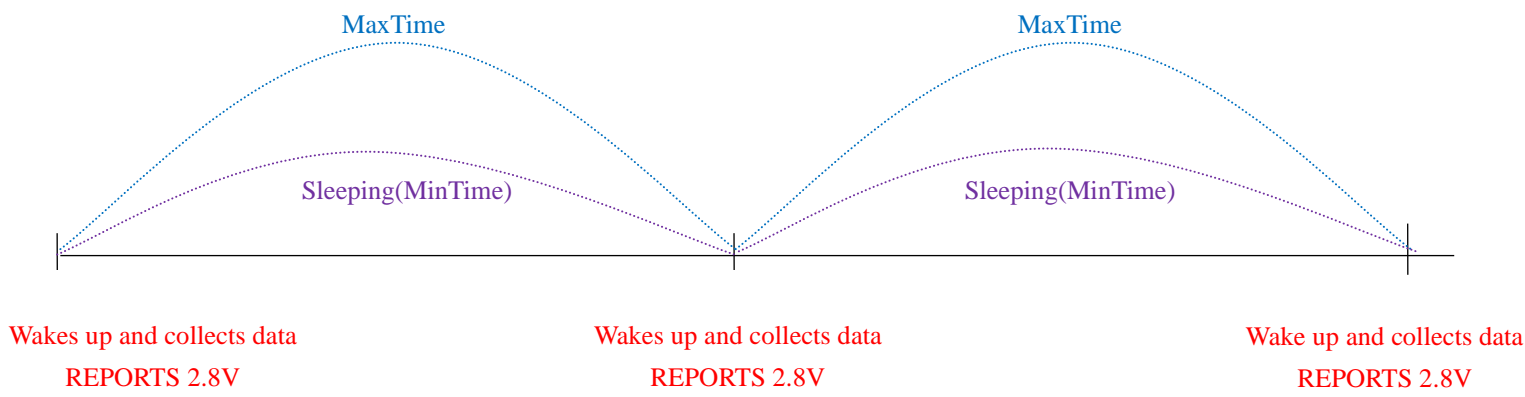Device return：

814C000000000000000000 (configuration success)

814C010000000000000000 (configuration failure)

(2) Read R313CA device parameter
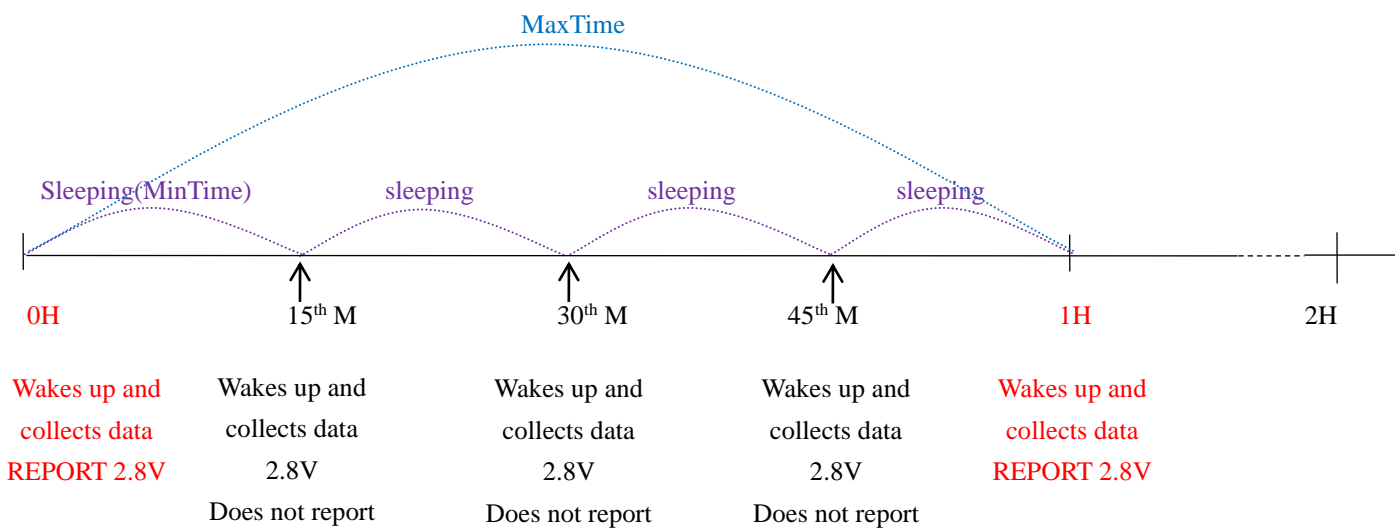
Downlink：024C000000000000000000

Device return：824C003C003C0100000000 (device current parameter)

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
REPORTS 2.8V

Wakes up and collects data
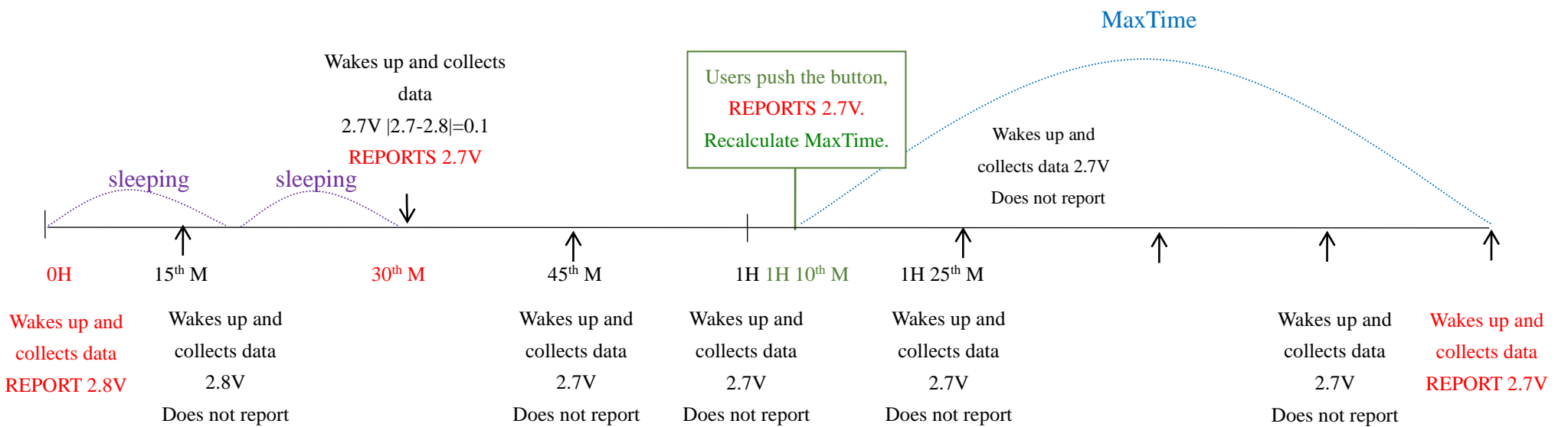REPORTS 2.8V

Wake up and collects data
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 REPORT 2.8V

Wakes up and collects data 2.8V Does not report

Wakes up and collects data 2.8V Does not report

Wakes up and collects data 2.8V Does not report

Wakes up and collects data REPORT 2.8V

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

MaxTime

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.

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

Wakes up and collects data 2.7V Does not report

Wakes up and collects data REPORT 2.7V

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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 collected data is compared with the last reported data. If the variation of the data is greater than the value of ReportableChange, the device will report according to MinTime interval. If the data variation is not greater than the last reported data, the device will report according to MaxTime interval.

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

(4) When the device sends a report, no matter the data changes, button is pushed or MaxTime interval comes, another cycle of MinTime / MaxTime calculation starts.

6. Installation

1. Remove the 3M release paper on the back of the device and attach the device to the smooth wall (please do not stick it to the rough wall to avoid falling off after a longtime usage).

Note:

● Wipe the wall surface before installation to avoid dust on the wall surface that affect the effect of the paste.

● 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.

2.When the device detects the state of dry contact changing, the data report will be sent immediately.

3.If detect the battery voltage exceeding the value of the variation at MinTime, the report will be sent immediately.

4.No matter the state of the dry contact changes, the data report must be sent at MaxTime.

Note:

● When the dry contact is close, the state of the data is "0". When the dry contact is open, the state of that is "1".

The dry contact sensor (R313CA) can be applied to the following scenes:

● Various switches and buttons

● The output of the dry contact of the sensor

● The operating state of the device

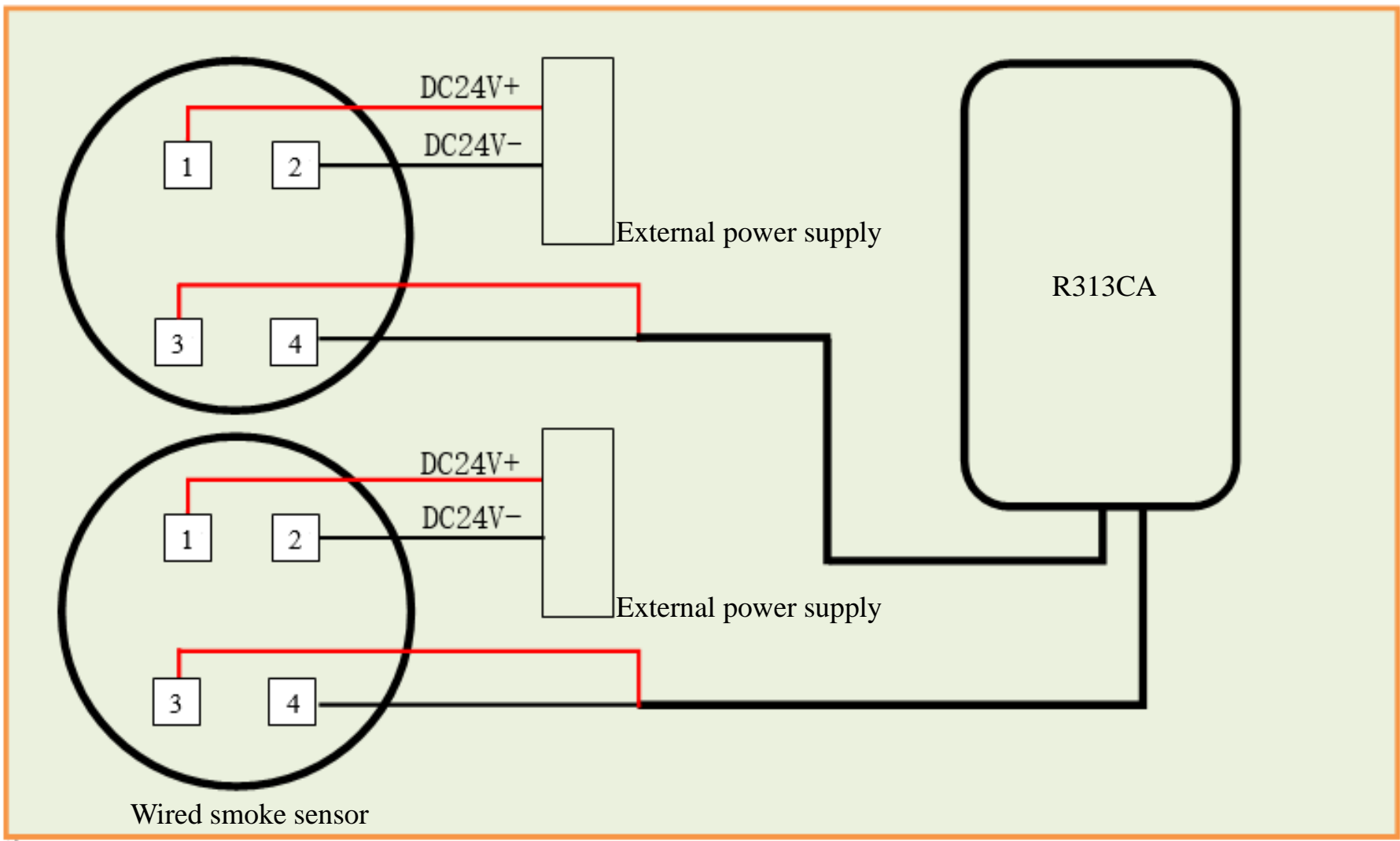● Monitoring the condition of doors and windows in home or in business

Fig. Diagram of connecting with the wired smoke sensor

7. Important Maintenance Instruction

The device is a product with 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 water 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 way can damage its detachable parts and electronic components.
- Do not store in excessive heat place. 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. Treating equipment roughly can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents, or strong detergents.
- Do not paint the device. Smudges can make debris block detachable parts up and affect normal operation.
- Do not throw the battery into the fire to prevent the battery from exploding. Damaged batteries may also explode.

All the above suggestions apply equally to your device, batteries, and accessories.

If any device is not operating properly.

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