Wireless Relay Switch Control

R831D

User Manual

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1. Introduction

The R831D is a Wireless Relay Switch Control device for Netvox Class C type devices based on the LoRaWAN open protocol and is compatible with the LoRaWAN protocol.

R831D is designed to control switch devices, mainly for electrical appliances. R831D allows you to connect and control 3 buttons and 3 dry contacts. The connected buttons and dry contacts will not affect each other. It will report 3 relay status and 3 input status.

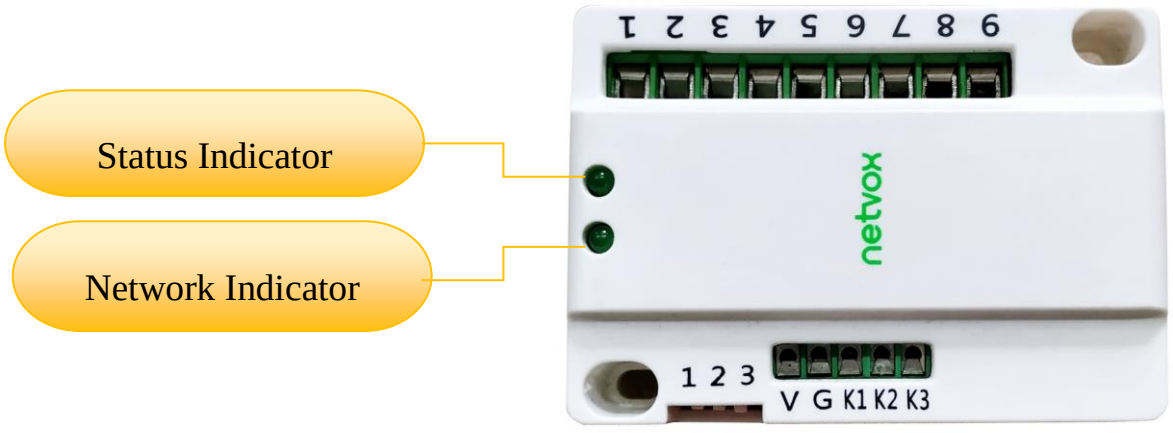
LoRa Wireless Technology:

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



DIP Switch

R831D			
DIP SW	1	2	3
on	■	■	
off			■

Port 1	N/A
Port 2	First load
Port 3	First load
Port 4	Second load
Port 5	Second load
Port 6	Third load
Port 7	Third load
Port 8	GND
Port 9	12v

1~3	DIP Switch (Change R831 series mode)
V	N/A
G	GND
K1	input 1
K2	input 2
K3	input 3

3. Main Features

- Apply SX1276 wireless communication module
- Three relays switch dry contact output
- Compatible with LoRaWAN™ Class C
- 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
- Improved power management for longer battery life

Battery Life:

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

- At this website, users can find battery life time for variety models at different configurations.

1. Actual range may vary depending on environment.

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

4. Set up Instruction

On/Off

Power on	External 12V power supply
Turn on	After plug the power, the status indicator will stay on, it means the boot is successful.
Restore to factory setting	Press and hold the function key for 5 seconds till the status indicator flashes for 20 times.
Power off	Remove power
Note:	Press and hold the function key then power on, it will enter engineering mode

Network Joining

If the device has never joined the network	Turn on the device, and it will search for the network to join. The network indicator stays on: Joins the network successfully The network indicator stays off : Fail to join the network
If the device has joined the network and it is not set to default	Turn on the device, and it will search for the previous network to join. The network indicator stays on: Joins the network successfully The network indicator stays off : Fail to join the network

Function Key

Press the function key and hold the pressing for 5 seconds	The device will be set to default and turned off The status indicator light flashes for 20 times: success The status indicator light remains off: fail
Press the function key once	The device is in the network: The status indicator light flashes once and sends a report The device is not in the network: The status indicator light remains off

5. Data Report

The device will immediately send a version packet report along with an uplink packet including 3 relay status and 3 input status.

The device sends data in the default configuration before any configuration is done.

Default setting:

MaxTime: Max Interval = 900s

MinTime: Min Interval = 2s

Note:

The device report interval will be programmed based on the default firmware which may vary.

The interval between two reports must be the minimum time.

Please refer Netvox *LoRaWAN Application Command document* and *Netvox Lora Command Resolver*

http://www.netvox.com.cn:8888/page/index to resolve uplink data.

Example of ConfigureCmd

FPort：0x07

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)

Off	R831D	0x90	0XB0	Channel(1Bytes) bit0_relay1, bit1_relay2, bit2_relay3, bit3_bit7:reserved	Reserved (8ytes,Fixed 0x00)
On		0x91		Channel(1Bytes)	Reserved

				bit0_relay1, bit1_relay2, bit2_relay3, bit3_bit7:reserved	(8ytes,Fixed 0x00)
Toggle		0x92		Channel(1Bytes) bit0_relay1, bit1_relay2, bit2_relay3, bit3_bit7:reserved	Reserved (8ytes,Fixed 0x00)
Red Current Status		0x94		Reserved (9Bytes,Fixed 0x00)	
ConfigReportReq		0x01		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Bytes,Fixed 0x00)
ConfigReportRsp		0x81		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)
ReadConfigReportReq		0x02		Reserved (9Bytes,Fixed 0x00)	
ReadConfigReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Bytes,Fixed 0x00)
SetSwitchTypeReq		0x03		SwitchType(1byte) 0x00_Toggle, 0x01_Momentary	Reserved (8Bytes,Fixed 0x00)
SetSwitchTypeRsp		0x83		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)
GetSwitchTypeReq		0x04		Reserved (9Bytes,Fixed 0x00)	
GetSwitchTypeRsp		0x84		SwitchType(1byte) 0x00_Toggle, 0x01_Momentary	Reserved (8Bytes,Fixed 0x00)

Max Time and Min Time setting

(1) Command Configuration:

MinTime = 1min、MaxTime = 1min

Downlink: 01B0003C003C0000000000

Response: 81B0000000000000000000 (Configuration success)

81B0010000000000000000 (Configuration failure)

(2) Read Configuration:

Downlink：02B0000000000000000000

Response:

82B0003C003C0000000000 (Current configuration)

Relay switch control

(3) Relay1, Relay 2, Relay3 normal open (disconnect)

Downlink：90B0070000000000000000 // bit0=relay1, bit1=relay2, bit2=relay3

(4) Relay1, Relay 2, Relay3 normal close (connect)

Downlink：91B0070000000000000000 // bit0=relay1, bit1=relay2, bit2=relay3

(5) Toggle relay normal open/close

Downlink：92B0070000000000000000 // bit0=relay1, bit1=relay2, bit2=relay3

Relay switch Type

Change relay switch type:

a. Toggle: Normal open/close type switch, ex. toggle switch

b. Momentary: Tact type switch, ex. tact switch

(6) Setting switch type is tact type switch

Downlink：03B0010000000000000000

Response：83B0000000000000000000 (Configuration success)

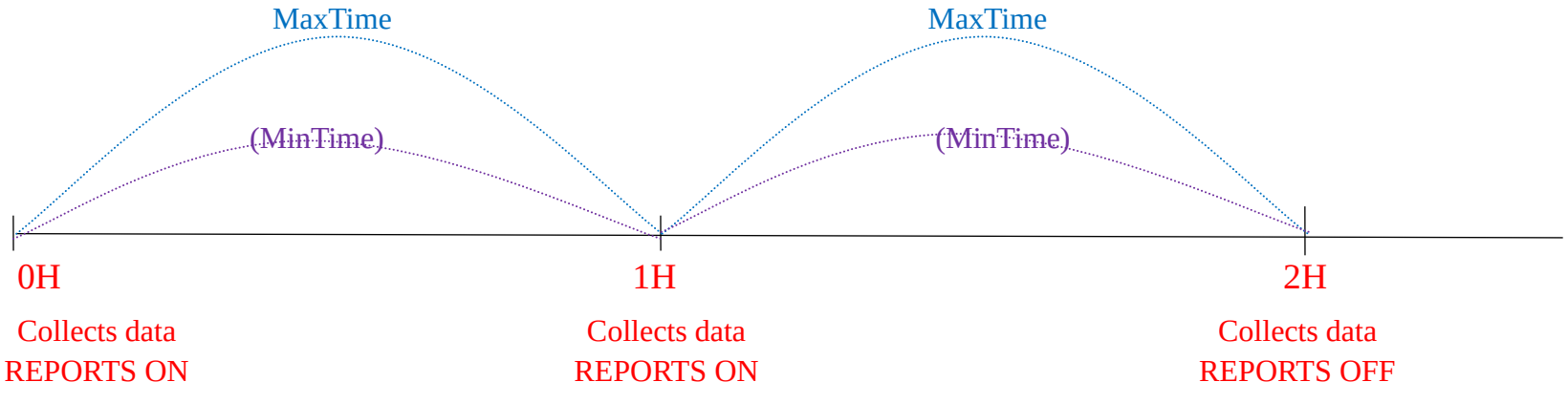
(7) Confirm switch type

Downlink：04B0000000000000000000

Response：84B0010000000000000000 (The switch type is tact type)

Example for MinTime/MaxTime logic

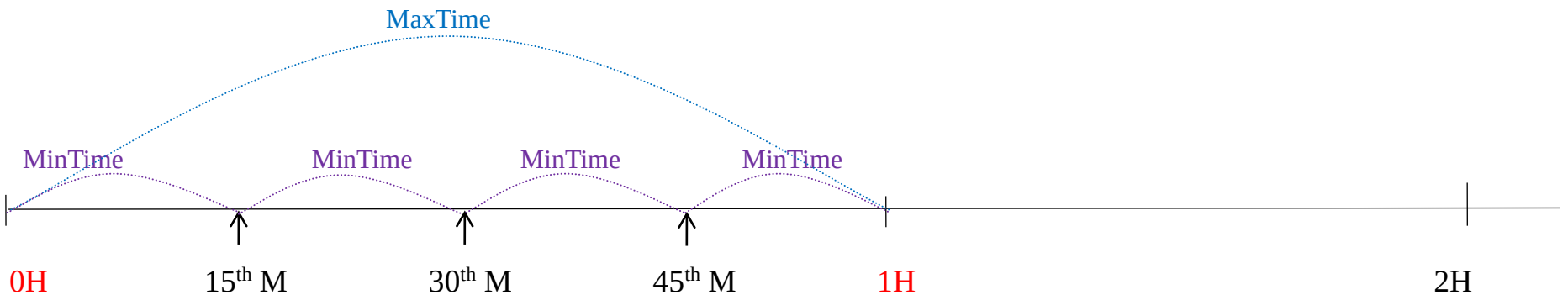
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour



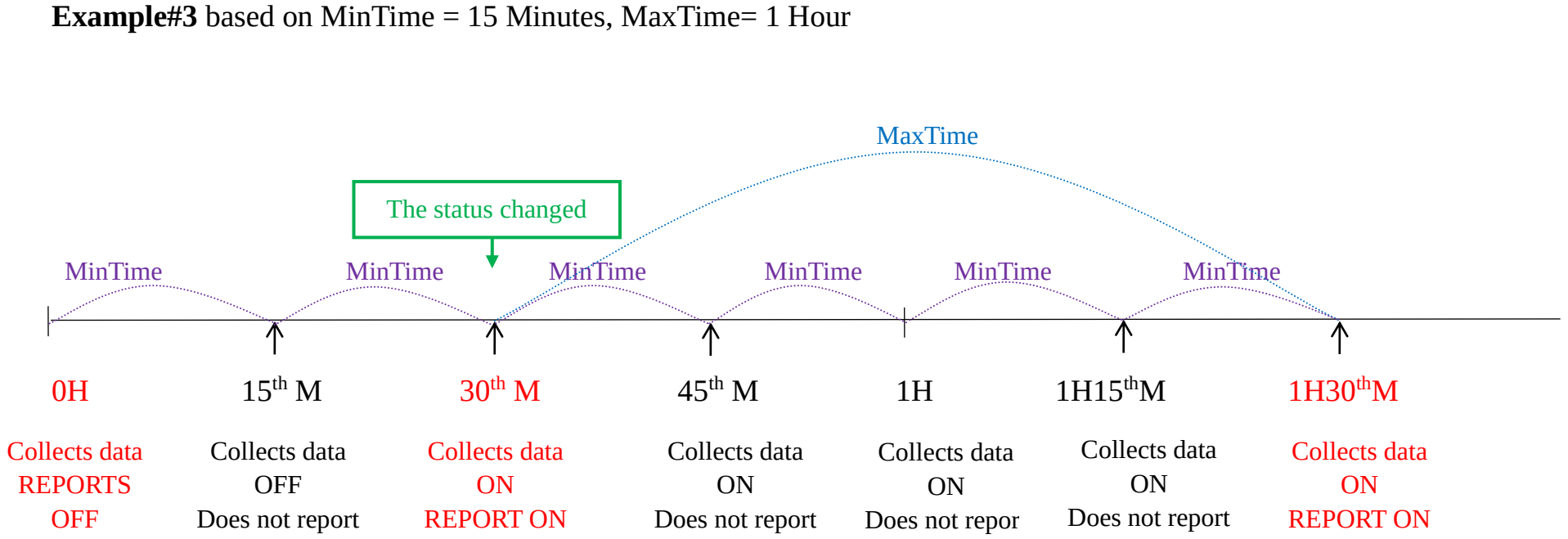
Note:

MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless ON/OFF value.

Example#2 based on MinTime = 15 Minutes, MaxTime= 1 Hour



Example#3 based on MinTime = 15 Minutes, MaxTime= 1 Hour



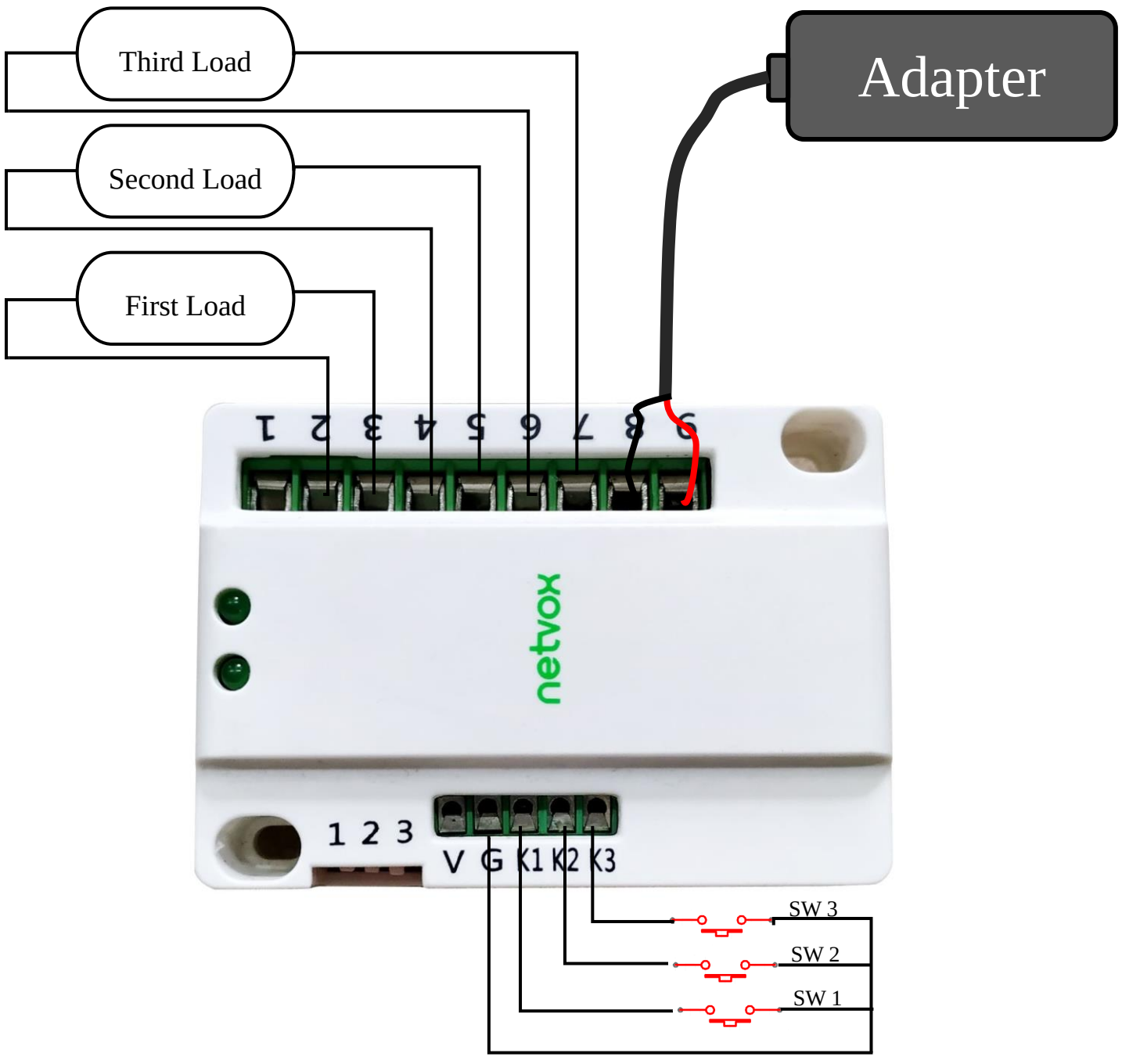
Note:

The status has changed, it will be reported at MinTime and recommend the MinTime Interval set as 2 seconds

6. Installation

This product does not have a waterproof function. After joined the network, please place it indoors.

The wiring diagram as follow below:



7. Maintenance and maintenance

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.