netvox R831C Wireless Multifunctional Control Box User Manual

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Control Box
R831C
User Manual

Contents

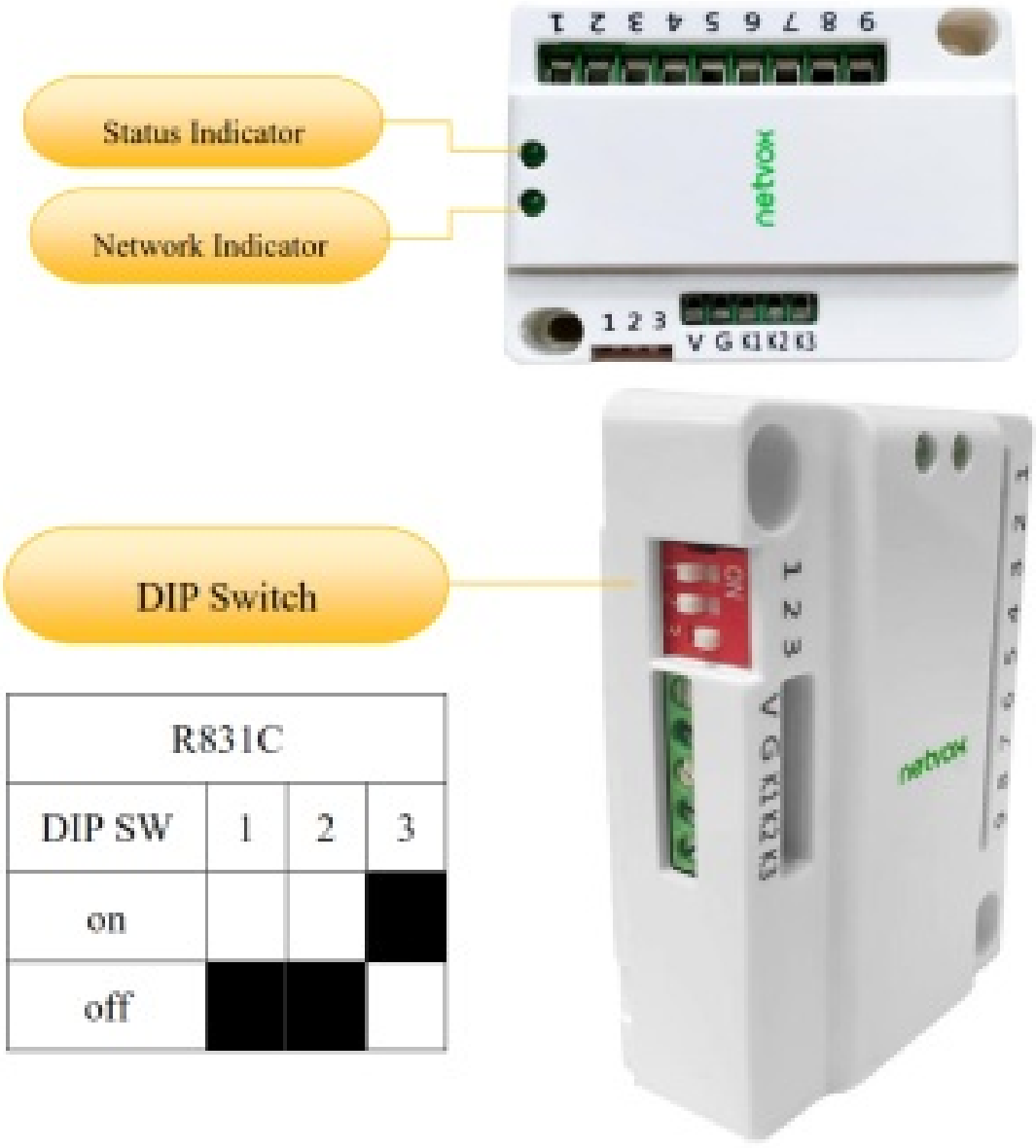
Introduction

R831C is a high-reliability switch control device that is a Class C device of netvox based on the LoRaWAN open protocol. The device is compatible with the LoRaWAN protocol. R831C is a device used to control the switch and is mainly used for the switch control of electrical appliances.
R831C can be connected with three-way buttons or the dry contact input signal. The three-way buttons can control the three switches separately. The external button or dry contact input directly controls the relay. In other words, the relay can be controlled by the external button.

LoRa Wireless Technology:

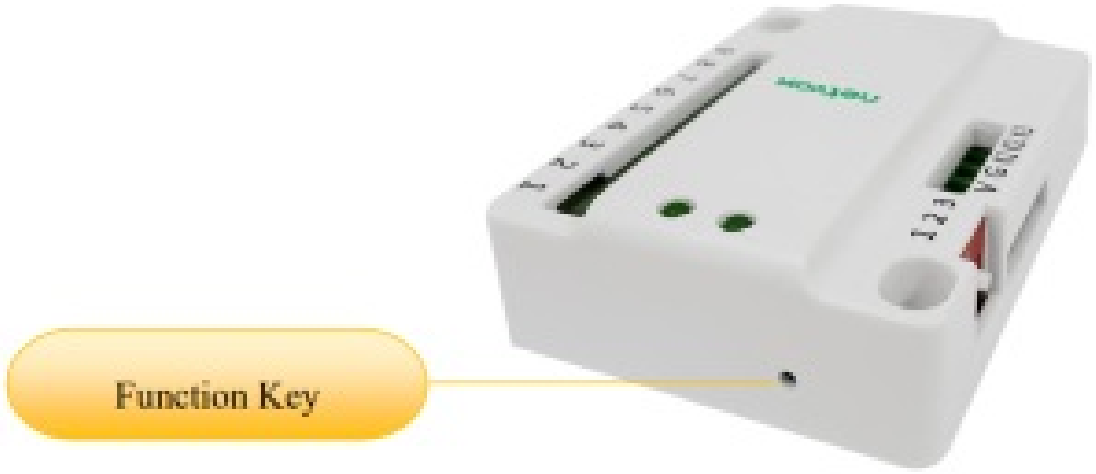
Lora is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extends the communication distance. It can be widely used in any use case that requires long-distance 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.

Appearance



R831C			
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
V	(Change R831 series mode)
G	N/A
K1	GND
K2	input 1
K3	input 2

Main Features

- Apply SX1276 wireless communication module
- Three relays switch dry contact output
- Compatible with LoRaWAN TM 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 tex 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

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

1. Actual range may vary depending on the environment.
2. Battery life is determined by sensor reporting frequency and other variables.

Set up Instruction

On/Off

Pox\ er On	External 12V power supply
Turn On	After plugging 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 20 times.
Power Off	Remove power
Note:	Press and hold the function key then power on, it will enter engineering mode

Network Joining

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
Had Joined The Network (Not Restore To Factory Setting)	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
Fail To Join The Network	Suggest checking the device registration information on the gateway or consulting your platform service provider if the device fails 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 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

Data Report

The device will immediately send a version packet and a report packet with the status of the three relay switches
The device sends data in the default configuration before any configuration is done.
Default setting:
Maxime: Max Interval = 900s
Minime: Min Interval = 2s (The current power state will be checked every Min Interval by default.)
Note:
The report interval of the device will be programmed based on the default firmware which may vary.
The interval between two reports must be the MinTime.
If there are specially customized shipments, the setting will be changed according to the customer's requirements.
Please refer to 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)
	Camden	DeviceType	NetvoxPayLoadData

Camden– 1 byte
DeviceType– 1 byte – Device Type of Device
NetvoxPayLoadData– var bytes (Max=9bytes)

Off	**R831C**	**0x90**	**OxAD**	**Channel(bytes)** **bitOrelayl,** **bitl Jelay2,** **bit2 Jelay3,** **bit3_bit7:reserved**	**Reserved** (8ytes, **Fixed Ox00)**
On		**0x91**		**Channel(bytes)**	**Reserved**

			bitO_relayl. bit 1 _relay2. bit2_relay3.bitl_bil7:reserved			**(flrcs. Fixed 0800)**
To$_n$le		**0x92**	**Channel° Bytes/ bitO_relayl. bit 1 _relay2. bit2_relay3. bitl_bil7:reserved**			**Reserved 18ytes. Fixed Ox 00)**
Read Current Statu,			**Reserved 198)ies. Fixed 08001**			
ConfigRepertRry		**owl**	**MinTtme (=b)tes Unit: s)**	**Maxlime (=b)tes Unit: s)**		**Reserved 13R)ies. Fixed Ox001**
ConligReportRsp		**0x81**	**Stains (0x30 success)**			**Reserved 18Rytes. Fixed 0000)**
ReadConfieRcportRey		**0x02**	**Reserved 198)ies. Fixed OA())**			
ReadContitzlicixnR,p		**uo2**	**MinTtme (=bytes Unit: s)**	**Maxlime (=bytes Unit: s)**		**Reserved 13R)ies. Fixed Ox001**
SedwitchTypeReq		**0‘03**	**SwitehType 1 Wool Ox00_Toggle0x01 Momentary**			**Reserved Mires.** Fixed **Ox 00)**
SetSwitchTypeRsr		**0x83**	**Status (0000 success)**			**Reserved (8Bytes. Fixed Ox00)**
GetSwitchT)Teltc.1		**0x04**	**Reserved 19Bytes. Fixed 0401**			
GaSwitchTypeRsp		**0x84**	**Switdaype11 byte/ Ox0O_Teggle. Ox01_Momeetary**			***Reserved* °Myles. Fixed Ox00)**

Max Time and Min Time setting
(1) Command Configuration:
MinTime = 1min MaxTime = 1min
Downlink: 01AD003C003C0000000000
Response: 81AD000000000000000000 (Configuration success)
81AD010000000000000000 (Configuration failure)

(2) Read Configuration:
Downlink 02AD000000000000000000
Response:
82AD003C003C0000000000 (Current configuration)

Relay switch control

(3) Relay1, Relay 2, Relay3 normal open (disconnect)
Downlink 90AD070000000000000000 // 00000111(Bin)=7(Hex) bit0=relay1, bit1=relay2, bit2=relay3
(4) Relay1, Relay 2, Relay3 normal close (connect)
Downlink 91AD070000000000000000
(5) Toggle relay normal open/close
Downlink 92AD070000000000000000
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 03AD010000000000000000
Response 83AD000000000000000000 (Configuration success)
(7) Confirm switch type
Downlink 04AD000000000000000000
Response 84AD010000000000000000 (The switch type is tact type)

Data report configuration and sending period are as follows

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

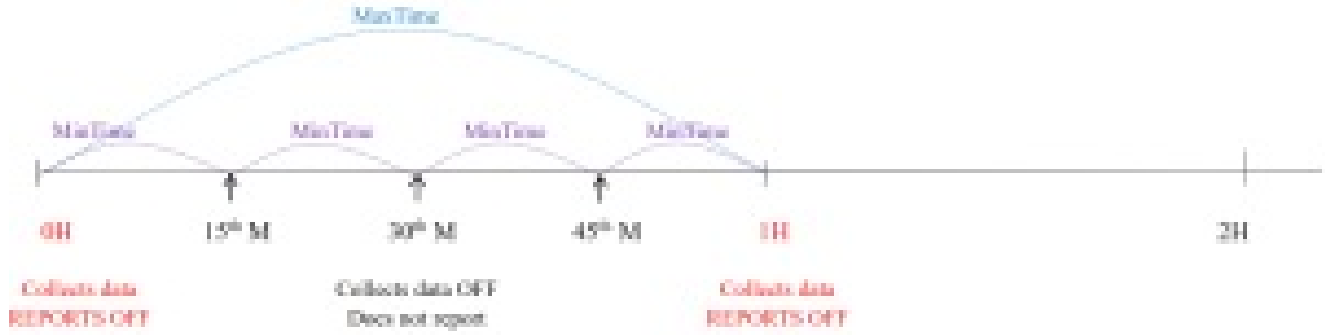
Example for MinTime/Maxime logic

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

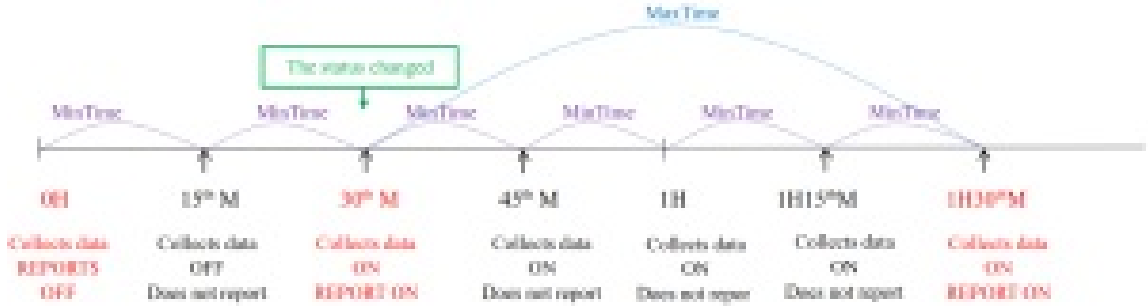
Note:

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

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



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



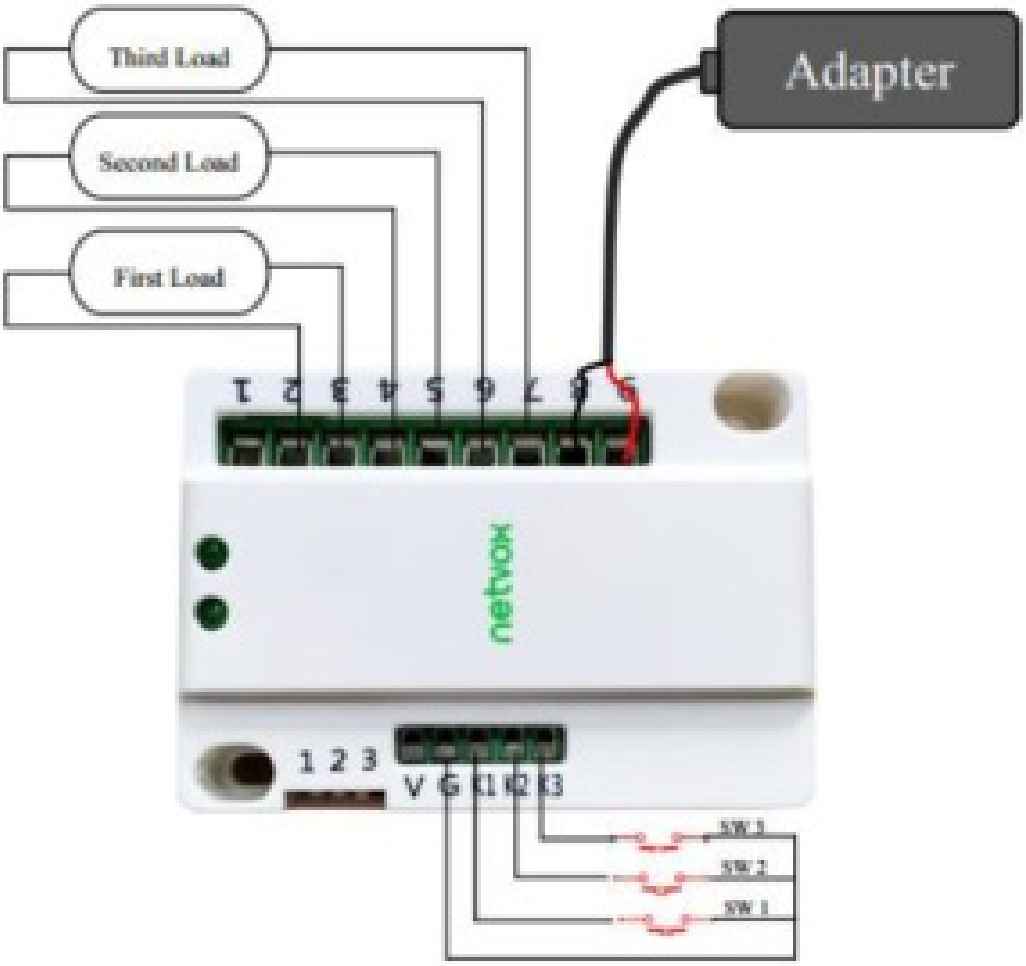
Note:
The status has changed, it will be reported at MinTime and recommend the MinTime Interval set as 2 seconds

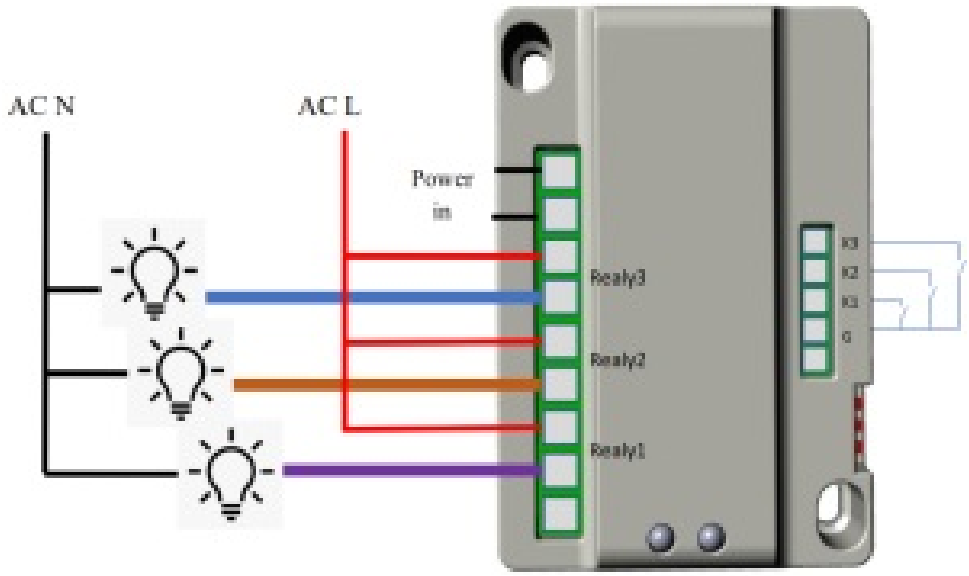
Application

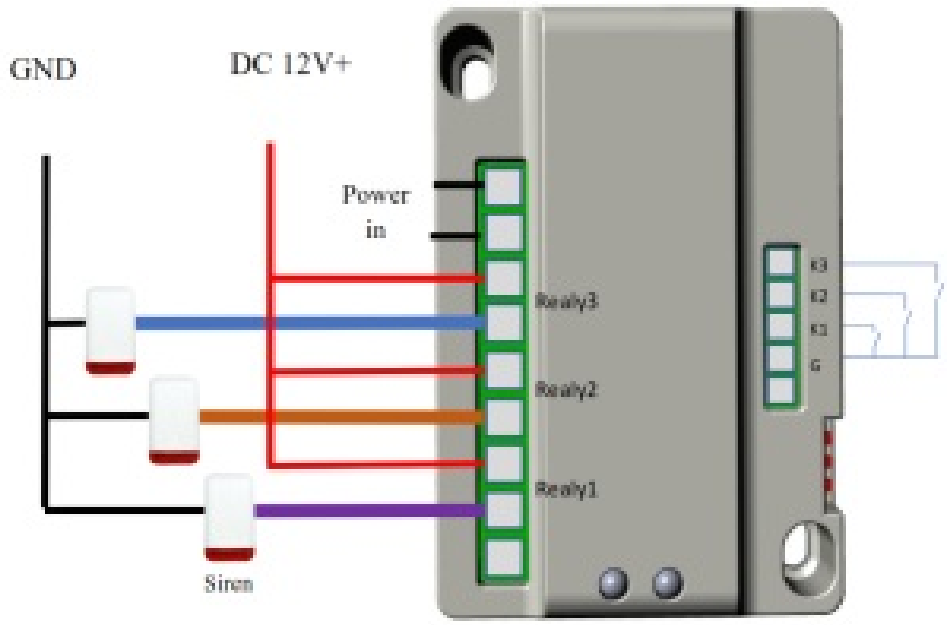
Users can connect 3 independent buttons to the input separately, and up to 3 devices to be controlled to be connected to the output. The device can be controlled either manually or via remote command.

Installation

This product does not have a waterproof function. After joining the network, please place it indoors. The wiring diagram is as follows below:


Third Load
Second Load
First Load
Adapter
1 2 3 4 5 6 7 8 9
1 2 3
V G K1 K2 K3
SW 3
SW 2
SW 1


AC N
AC L
Power
in
Realy3
Realy2
Realy1
K3
K2
K1
G



Instructions on switching the operating mode (If users do not strictly follow the manual connection, it may damage the product.)
R831 has four operating modes corresponding to the three keys of the DIP switch.
Toggle the switch and power on again to switch the corresponding state.
(If the DIP switch is not correctly toggled, the network lights and status lights will flash alternately, users need to dial the power down and power on again.)
(1) R831A – strong electric motor mode: Toggle the DIP switch 1
This mode has two relays involved in the operation which are combined for on / off / stop.
(2) R831Blight current motor mode: Toggle the DIP switch 2
This model has three relays involved in the operation which are respectively for on /off / stop.
(3) R831C – relay mode: Toggle the DIP switch 3
In this mode, the external dry contact can directly control the on / off of the local relay.
(4) R831D – relay mode: Toggle the DIP switches 1 and 2
In this mode, the external dry contact does not directly control the on/off of the local relay but reports the dry contact status and relay status.

Important Maintenance Instruction

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

- 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 an 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 an excessively 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 repair.

Documents / Resources

	**netvox R831C Wireless Multifunctional Control Box** [pdf] User Manual R831C, Wireless Multifunctional Control Box