netvox R718F Wireless Reed Switch Open/Close Detection Sensor User Manual

Contents

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Introduction

R718F is a wireless long-distance reed switch detection device which is Class A devices based on the LoRaWANTM protocol of Netvox and is compatible with the LoRaWAN protocol.

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.

Appearance

Main Features

- Adopt SX1276 LoRa wireless communication module
- 2 ER14505 battery AA SIZE (3.6V / section) parallel power supply
- Trigger the magnetic sensor, and the device can send the alarm
- The base is attached with a magnet that can be attached to a ferromagnetic material object
- Host body protection class IP65/67 (optional)
- Compatible with LoRaWANTM 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

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 of various models in different configurations.

Set up Instruction

On/Off

Power on	Insert batteries. (users may need a screwdriver to open)
Turn on	Press and hold the function key for 3 seconds till the green indicator flashes once.
Turn off (Restore to factory setting)	Press and hold the function key for 5 seconds and the green indicator flashes 20 times.
Power off	Remove Batteries.
Note:	1. Remove and insert the battery: the device is in the turn-off state by default. 2. The first 5 seconds after power on, the device is in engineering testing mode. 3.Every time, after remove and reinsert the battery, the device is in a turn-off state and need to power on again. 4. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.

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 (Not restore to the factory setting)	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	1. Suggest removing batteries if the device is not used to save power. 2. Suggest checking the device registration information on the 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 factory setting / Turn off The green indicator flashes 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: se nd a data report according to Min Interval.
The device is turn on but not join in th e network	1.Suggest removing batteries if the device is not used to save the powe r. 2. Suggest checking the device registration information on the gateway.

Low Voltage Warning

Low Voltage	3.2V

Data Report

The device will immediately send a version packet report along with an uplink packet including reed switch status and battery voltage.
The device sends data according to the default configuration before any other configuring.

Default setting:
MaxTime : Max Interval = 60 min = 3600s
MinTime : Min Interval = 60 min = 3600s (Default: Every Min Interval will detect the current voltage.)
BatteryVoltageChange: 0x01 (0.1V)

Reed switch trigger status:
When the magnet closes to the reed switch, it will report the status “0”
*The distance between the magnet and the reed switch is less than 2 cm
When the magnet removes the reed switch, it will report the status “1”
*The distance between the magnet and the reed switch is greater than 2 cm

Note:
The cycle of the device sending the data report is according to the default.
The interval between two reports must be the Mintime.

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver **http://loraresolver.netvoxcloud.com:8888/page/index** to resolve uplink data.

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

FPort 0x07

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**	**CmdID**	**Device Type**	**NetvoxPayLoadData**			
ConfigReport Req		0x01		MinTime (2 bytes Unit: s)	MaxTime (2bytes Unit : s)	BatteryChange(1byteUnit:0.1v)	Reserved (4Bytes, Fixed 0x00)

ConfigReport Rsp	R718F	0x81	0x1D	Status (0x00_success)			Reserved (8Bytes, Fixed 0x00)
ReadConfigReportReq		0x02		Reserved (9Bytes, Fixed 0x00)			
ReadConfigReportRsp		0x82		MinTime (2 bytes Unit: s)	MaxTime (2bytes Unit : s)	BatteryChange(1byteUnit: 0.1v)	Reserved (4Bytes, Fixed 0x00)

1. Configure device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v

   Downlink: 011D003C003C0100000000

   Device returns:

   811D000000000000000000 (configuration successful)

   811D010000000000000000 (configuration failed)

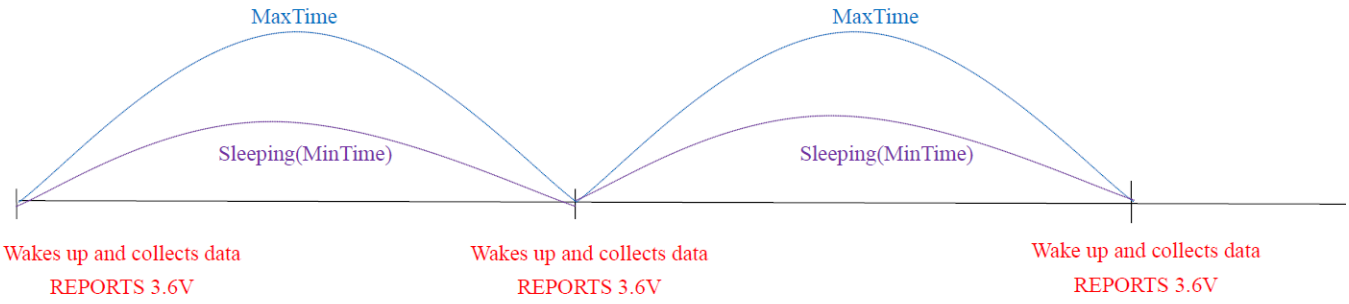
2. Read device parameters

   Downlink: 021D000000000000000000

   Device returns:

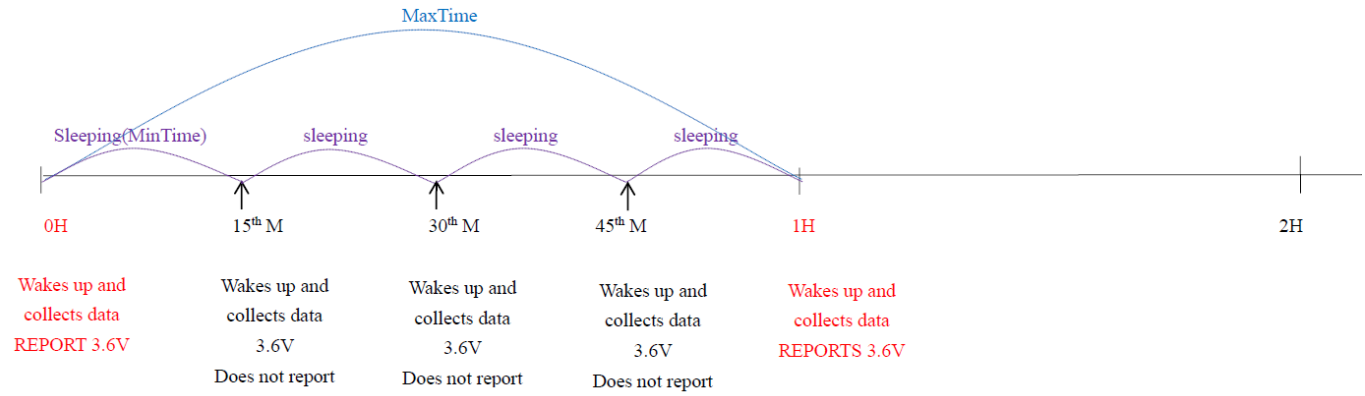
   821D003C003C0100000000 (current configuration parameters)

Example for MinTime/MaxTime logic:
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V

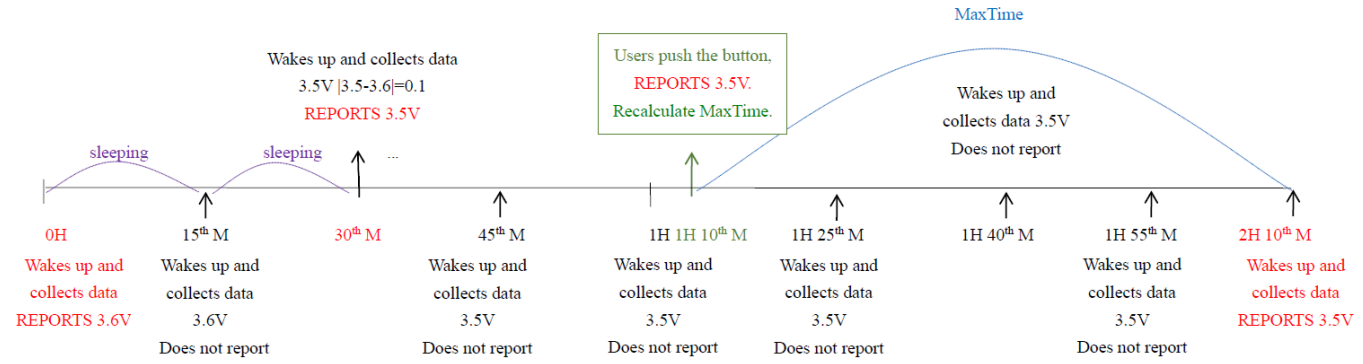


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BatteryVoltageChange value.

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



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



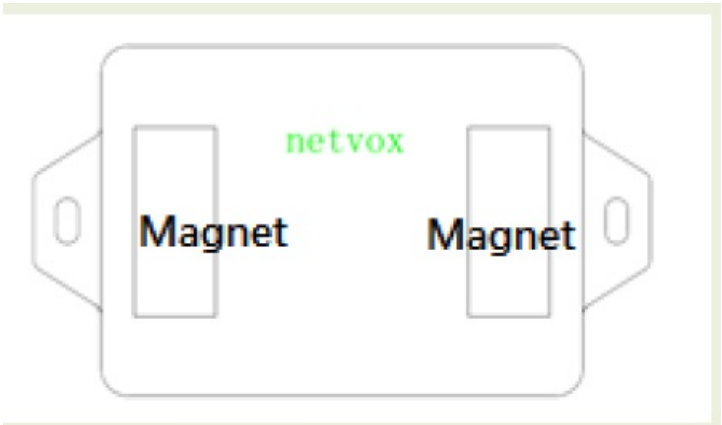
Notes :

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 variation 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.

Installation

1. R718F has a built-in magnet (as the figure below). When installed, it can be attached to the surface of an object with iron which is convenient and quick.
   To make the installation more secure, use screws (purchased separately) to secure the unit to a wall or other surface (as the figure below).
   Note: Do not install the device in a metal shielded box or in an environment with other electrical equipment around it to avoid affecting the wireless transmission of the device.



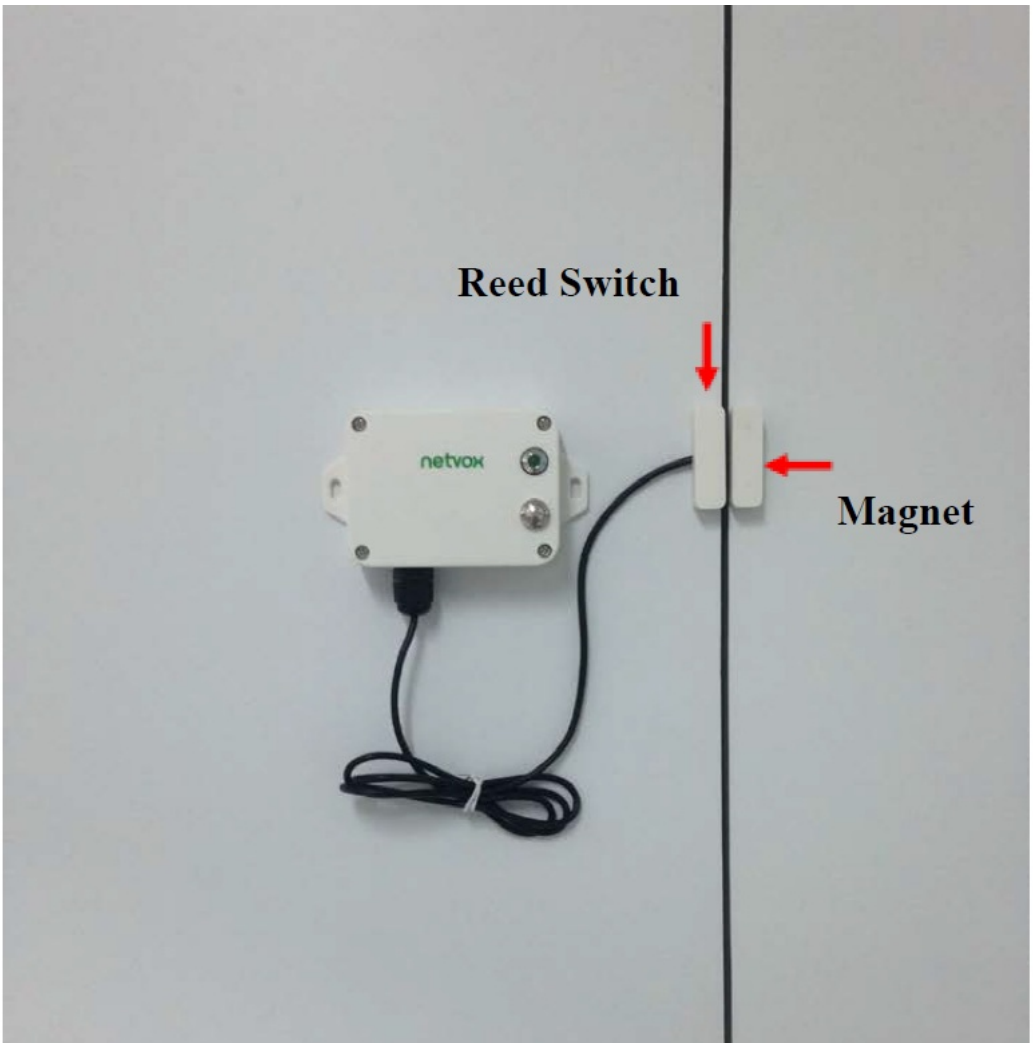
2. Tear off the 3M glue at the bottom of the reed switch probe and the magnet (as the red frame in the figure above). Then, stick the reed switch probe to the door and is parallel to the magnet (as the figure on the right).
   Note: The installation distance between the reed switch probe and the magnet should be less than 2cm.

When the door or window is opened, the reed switch probe is separated from the magnet, and the device sends an alarm message about the opening.
When the door or window is closed, the reed switch probe and the magnet get closer, and the device restores to the normal state and sends a state message about the closing.

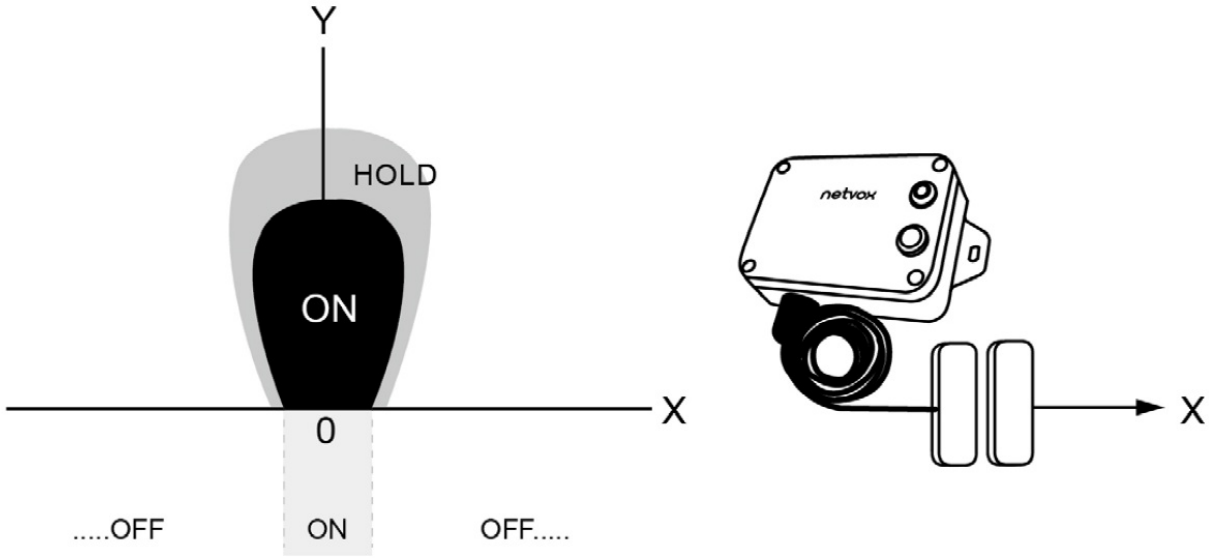
R718F is suitable below scenarios:

- Door, window
- Machine room door
- Archives
- Closet
- Refrigerators and freezers
- Cargo ship hatch
- Garage door
- Public toilet door

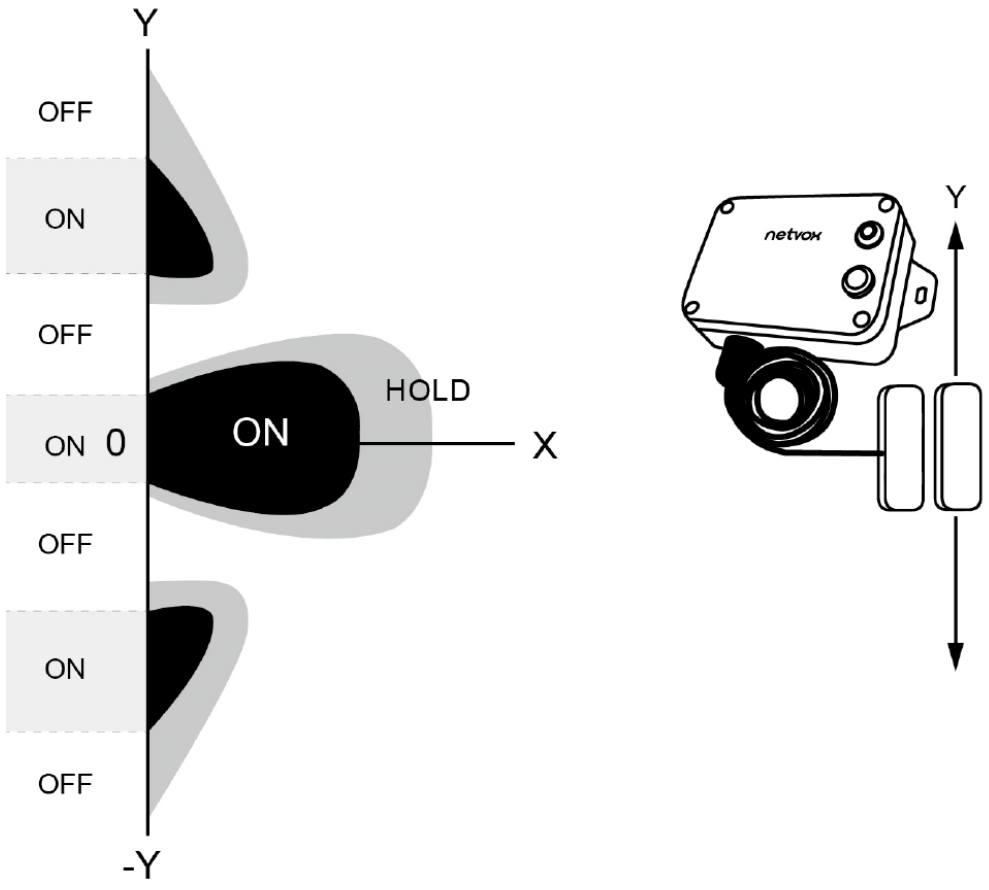
The place needs to detect the opening and closing status.



When installing the device, the magnet **must move along the X axis** relative to the sensor.



If the magnet moves along the Y axis relative to the sensor, it will cause repeated reports due to the magnetic field.



Note: Please do not disassemble the device unless it is required to replace the batteries.
Do not touch the waterproof gasket, LED indicator light, function keys when replacing the batteries. Please use suitable screwdriver to tighten the screws (if using an electric screwdriver, it is recommended to set the torque as 4kgf) to ensure the device is impermeable.

Information about Battery Passivation

Many of Netvox devices are powered by 3.6V ER14505 Li-SOCl2 (lithium-thionyl chloride) batteries that offer many advantages including low self-discharge rate and high energy density.
However, primary lithium batteries like Li-SOCl2 batteries will form a passivation layer as a reaction between the lithium anode and thionyl chloride if they are in storage for a long time or if the storage temperature is too high.

This lithium chloride layer prevents rapid self-discharge caused by continuous reaction between lithium and thionyl chloride, but battery passivation may also lead to voltage delay when the batteries are put into operation, and our devices may not work correctly in this situation.
As a result, please make sure to source batteries from reliable vendors, and the batteries should be produced within the last three months.
If encountering the situation of battery passivation, users can activate the battery to eliminate the battery hysteresis.

To determine whether a battery requires activation
Connect a new ER14505 battery to a 68ohm resistor in parallel, and check the voltage of the circuit.
If the voltage is below 3.3V, it means the battery requires activation.

How to activate the battery

- Connect a battery to a 68ohm resistor in parallel
- Keep the connection for 6~8 minutes
- The voltage of the circuit should be ≧3.3V

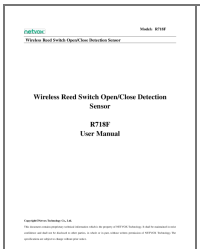
Important Maintenance Instruction

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.

Documents / Resources

	**netvox R718F Wireless Reed Switch Open/Close Detection Sensor** [pdf] User Manual R718F, Wireless Reed Switch Open Close Detection Sensor