netvox R718LB Wireless Hall Type Open/Close Detection Sensor User Manual

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1. Introduction

The R718LB is a long-range (communication distance) Wireless Hall Type Open/Close Detection Sensor for Netvox Class A type devices based on the LoRaWAN open protocol 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.

2. Appearance

3. Main Features

- Compatible with LoRaWAN
- 2 ER14505 lithium batteries (3.6V / cell) in parallel
- Hall sensor detection
- Simple operation and setting
- The base is attached with a magnet that can be attached to a ferromagnetic material object
- Protection level: IP65 / IP67 (optional)
- Compatible with LoRaWANTM Class A
- Using frequency hopping spread spectrum technology
- Configurable parameters via third-party software platform, reading data and setting alarms via SMS text and email (optional)
- Available for 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	Insert batteries. (users may need a flat blade screwdriver to open)
Turn on	Press and hold the function key for 5 seconds till the green 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 is at 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. At 1st -5th second after power on, the device will be in engineering test mode.

Network Joining

Never joined 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 at factory 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

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 report/change exceeds setting value or the state changes: send a data report according to Min Interval.

Low Voltage Warning

Low Voltage	3.2V

5. Data Report

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

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

Default setting:

- **MaxTime:** Max Interval = 60 min = 3600s
- **MinTime:** Min Interval = 60 min = 3600s
- **BatteryChange:** 0x01 (0.1V)

Hall sensor status:
When the magnet closes to the Hall sensor, it will report the status “0”
*The distance between the magnet and the Hall sensor is less than 3cm
When the magnet removes the Hall sensor, it will report the status “1”
*The distance between the magnet and the Hall sensor is greater than 3 cm

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.

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 Report configuration

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[0]	Device Type	Valve/PayLoadData			
Config Report Req		0x01		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Battery Change (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)
Config Report Rsp		0x81		Status (0x00_success)		Reserved (8Bytes,Fixed 0x00)	
ReadConfig Report Req		0x02		Reserved (8Bytes, Fixed 0x00)			
ReadConfig Report Rsp		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 0125003C003C0100000000 003C(Hex) = 60(Dec)
Response
8125000000000000000000 Configuration success
8125010000000000000000 Configuration failure

(2) Read Configuration:

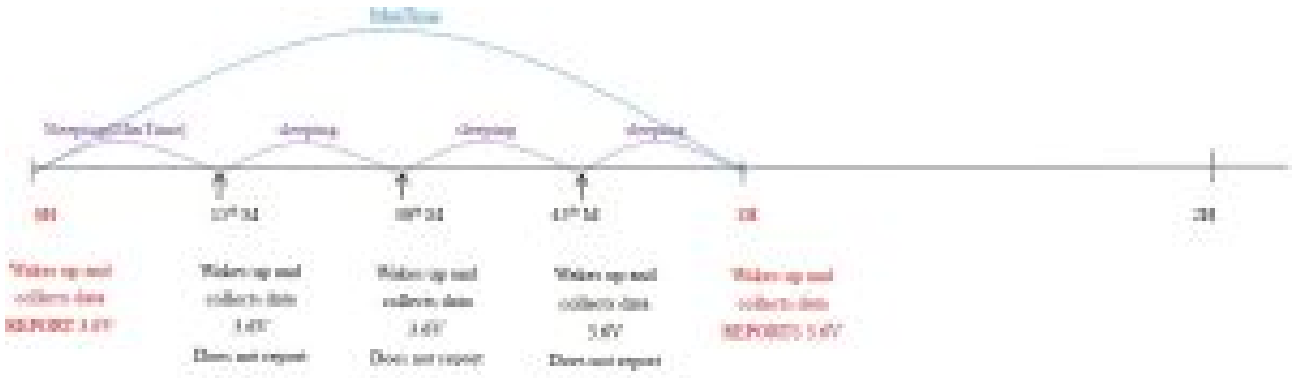
Downlink 0225000000000000000000
Response
8225003C003C0100000000 Current configuration

Example for MinTime/MaxTime logic:

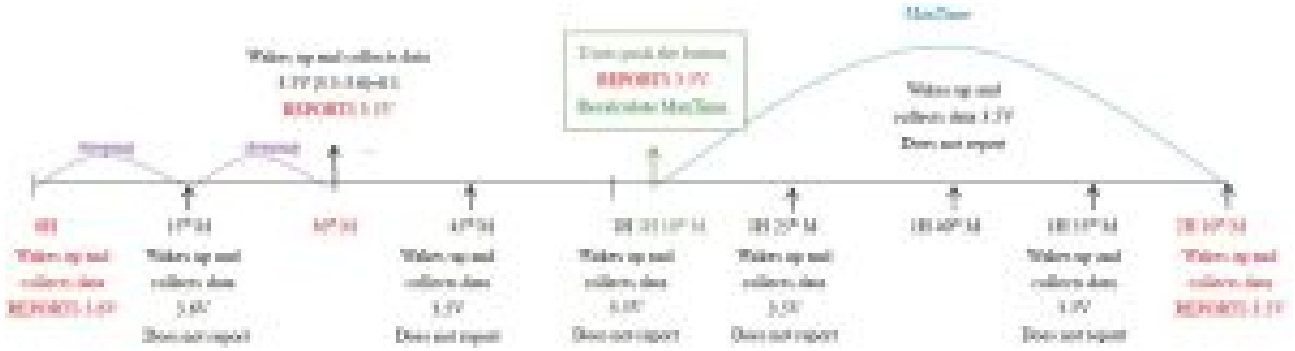
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V

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 reported data. 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 reported data, the device reports 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 wakes up frequently and the battery will be drained soon.
4. When the device sends a report, no matter resulting from data variation, such as button pushed or MaxTime interval, another cycle of MinTime/MaxTime calculation is started.

6. Installation

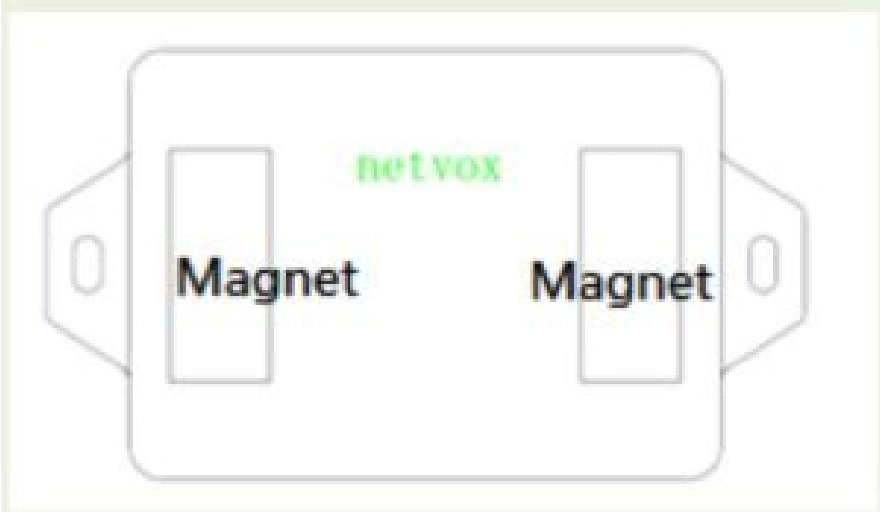
This device has a waterproof function. When the device is used, the back of it can be attached to the iron surface, or two ends of it can be secured on the wall by screws.
When the magnet is close to or far away, the sensor will be triggered to send a report.
The gap between the Hall sensor and the magnet should be less than 3cm during installation.
When the installation clearance is greater than 3cm, the device will not be able to trigger the signal.

1. The Wireless Hall Type Open/Close Detection Sensor (R718LB) has a built-in magnet (see Figure 1 below).
   It can be attached to the surface with iron material during installation.
   To make the installation more secure, please use screws (purchased separately) to fix the device on the wall or

other objects (see Figure 2 below).

Comment

Do not install the device in a metal shielded box or in an environment surrounded by other electrical equipment to avoid affecting the wireless transmission of the device.



2. Tear off 3M release paper of Hall sensor and the magnet then attach to the door or window in parallel.

   Note: The mounting distance between the Hall sensor and the magnet should be less than 3cm.

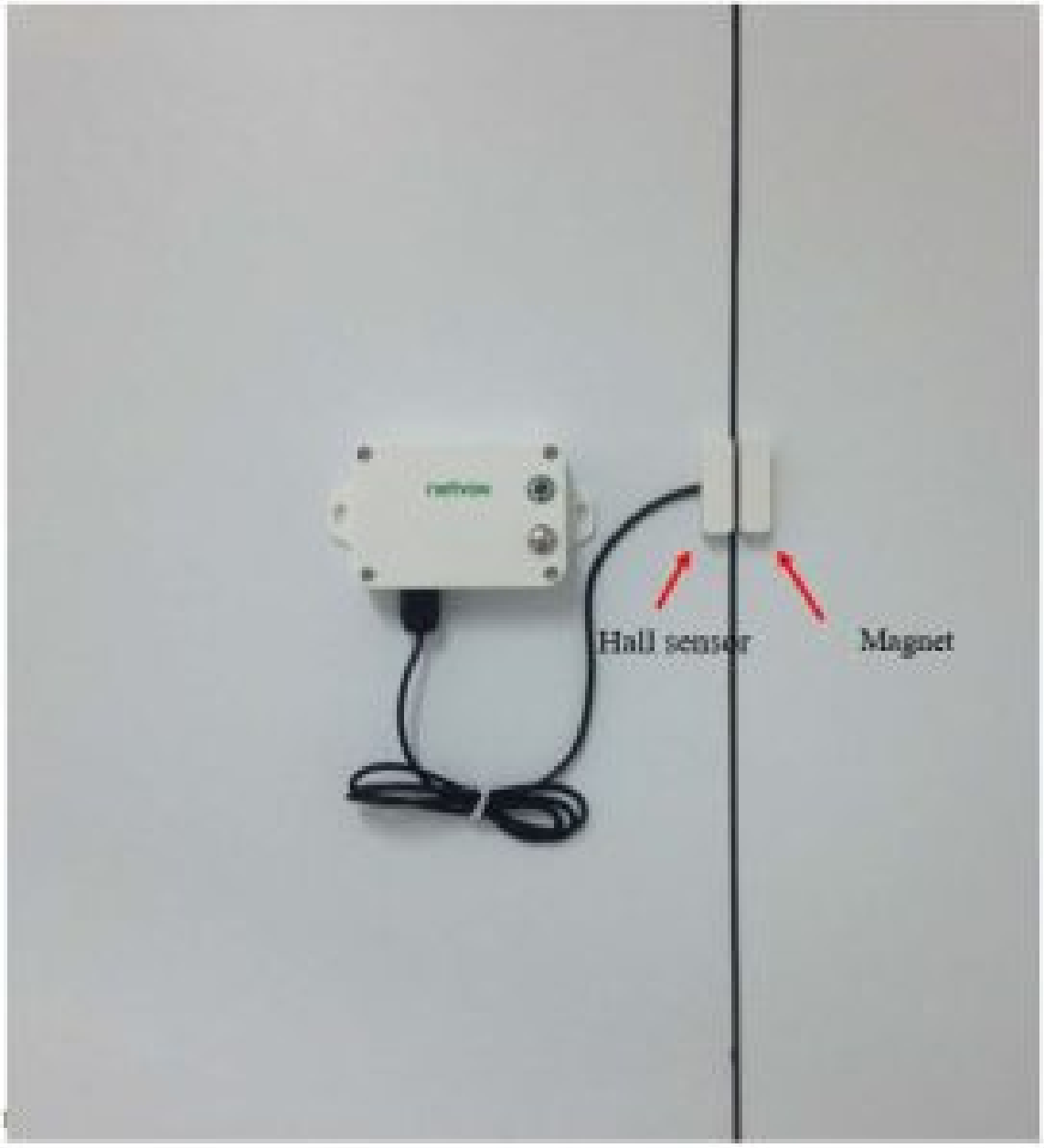
3. When the door or window is opened, the Hall sensor is separated from the magnet, and the Hall sensor sends status “1”.

   When the door or window is closed, the Hall sensor is close to the magnet, and the Hall sensor device sends status “0”.

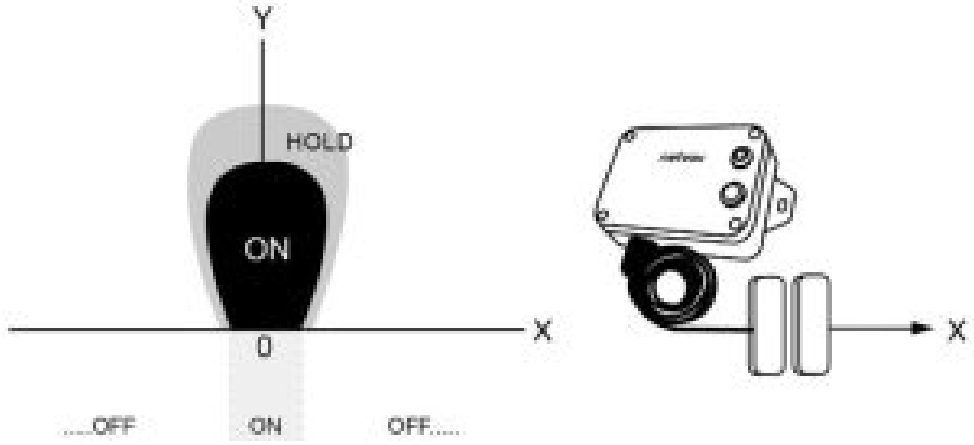
The Wireless Hall Type Open/Close Detection Sensor (R718LB) can be used in the following scenarios:

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

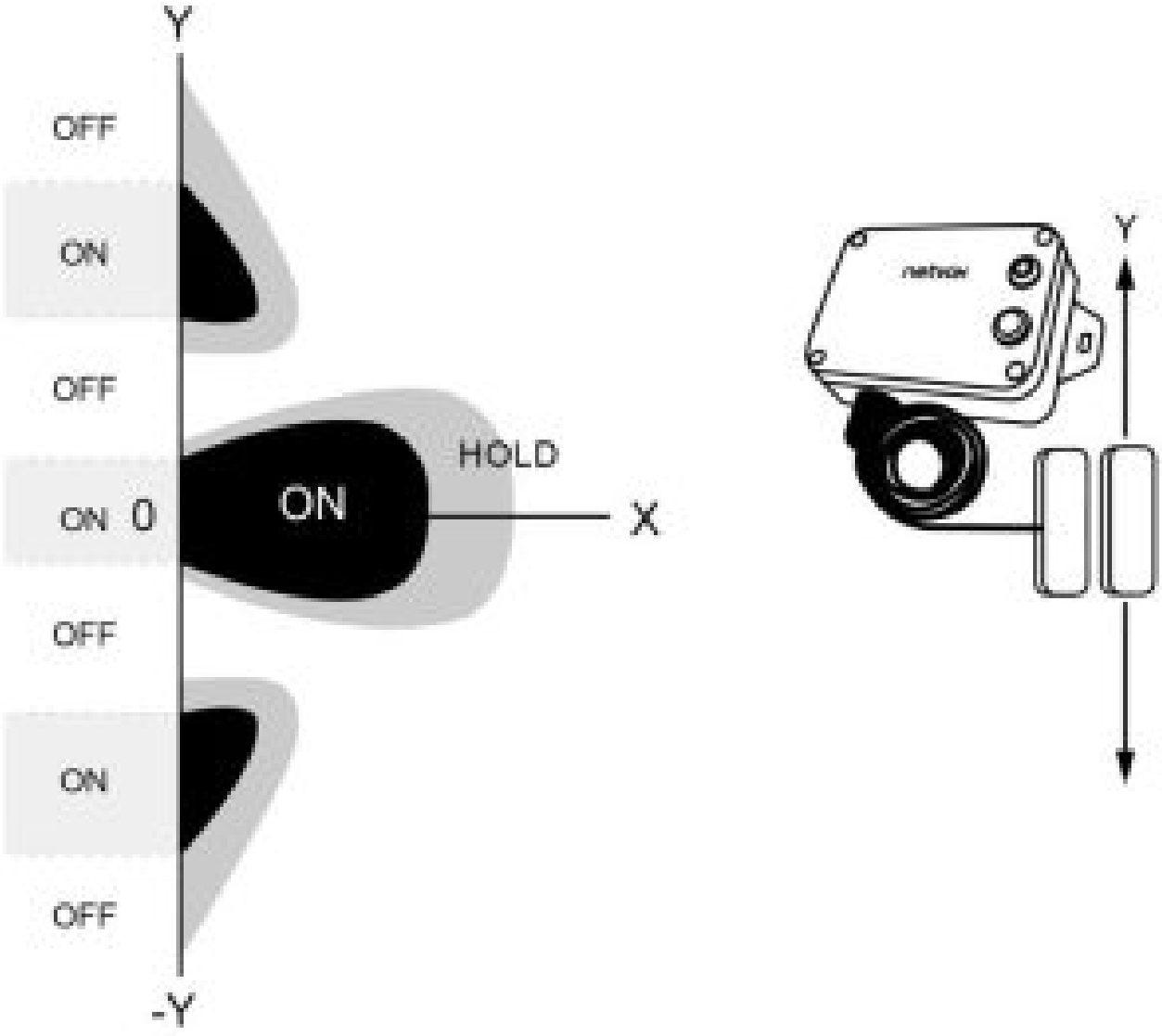
Where you need to detect the opening and closing status.



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.



Tips for installing the double-sided stickers

1. Clean the surface of the object you plan to use the sticker with.
2. Tear off the other side of the sticker and put the sticker to a clean surface of the wall. Then, press the sticker firmly around 20 seconds.

Note:

1. The white release paper side is for the wall.
2. Make sure there is no dust on the surface of the wall: wipe the dust and dirt off the wall.
3. Make sure the wall is not wet: it is recommended using a dryer to dry the wall before putting the sticker.
4. 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 Phillips screwdriver to tighten the screws (if using an electric screwdriver, it is recommended setting the torque as 4kgf) to ensure the device is impermeable.

7. 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.

7.1 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.

7.2 How to activate the battery
a. Connect a battery to a 68ohm resistor in parallel
b. Keep the connection for 6~8 minutes
c. The voltage of the circuit should be ≧3.3V

8. 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.

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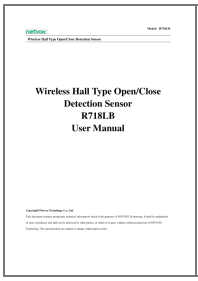 Wireless Hall Type Open/Close Detection Sensor R718LB User Manual	netvox R718LB Wireless Hall Type Open/Close Detection Sensor [pdf] User Manual R718LB, Wireless Hall Type Open Close Detection Sensor