

# Wireless Dry Contact Interface

**R718J**

**User Manual**

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## 1. Introduction

R718J is a ClassA type external dry contact device based on LoRaWAN open protocol of Netvox. It can externally connect various switches, buttons, relays and reed switch output. It can detect the closing or disconnecting signal of dry contact and is compatible with LoRaWAN protocol.

### **LoRa wireless technology:**

LoRa is a wireless communication technology dedicated to long-distance low-power consumption. Its spread-spectrum modulation method greatly increases the communication distance compared with other communication methods, and can be widely used in long-distance low-rate IoT wireless communication fields in various occasions. Such as automatic meter reading, building automation equipment, wireless security systems, industrial monitoring and control. It has the characteristics of small size, low power consumption, long transmission distance and strong anti-interference ability.

### **LoRaWAN:**

LoRaWAN defines an end-to-end standard specification using LoRa technology to ensure interoperability between devices and gateways from different vendors.

## 2. Appearance



### 3. Product Property

- Apply SX1276 wireless communication module
- 2 ER14505 lithium batteries (3.6V / section) parallel power supply
- Dry contact detection
- The base is attached with a magnet that can be attached to a ferromagnetic material object
- Protection class IP65/IP67 (Optional)
- Compatible with LoRaWAN™ 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

## 4.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 till green indicator flashes for 20 times.
Power off	Remove Batteries.
Note:	<ol style="list-style-type: none"> <li>1. Remove and insert the battery; the device is at off state by default.</li> <li>2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.</li> <li>3. Five seconds after power on, the device will be in engineering test mode.</li> </ol>

### Network Joining

Never joined the network	<p>Turn on the device to search the network.</p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Had joined the network	<p>Turn on the device to search the previous network.</p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>

### Function Key

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

### Sleeping Mode

The device is on and in the network	<p>Sleeping period: Min Interval.</p> <p>When the reportchange exceeds setting value or the state changes: send a data report according to Min Interval.</p>
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## Low Voltage Warning

Low Voltage	3.2V
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## 5.Data Report

When the device is turned on, it will immediately send a version package.

Data will be reported once per hour by default setting.

Maximum time: 3600s

Minimum time: 3600s (Detect the current voltage value every 3600s by default setting)

Default reportchange:

Battery ---- 0x01 (0.1V)

### Dry contact detection trigger:

When the dry contact is connected, the data status bit is “1”.

When the dry contact is disconnected, the data status bit is “0”.

Note:

The device send data cycle depends on real burning configuration.

The interval between two reports must be the minimum interval.

Data report configuration and sending period are as following:

Min. Interval (Unit:second)	Max. Interval (Unit:second)	Reportable Change	Current Change $\geq$ 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 bytes

**DeviceType**– 1 byte – Device Type of Device

**NetvoxPayLoadData**– var bytes (Max=9bytes)

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData			
ConfigReport Req	R718J	0x01	0x21	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)	
ReadConfigReportReq		0x02		Reserved (9Bytes,Fixed 0x00)			
ReadConfigReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)

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

Downlink: 0121003C003C0100000000 003C(H<sub>ex</sub>) = 60(D<sub>ec</sub>)

Device returns:

812100000000000000000000 (configuration is successful)

812101000000000000000000 (configuration failed)

(2) Read device parameters

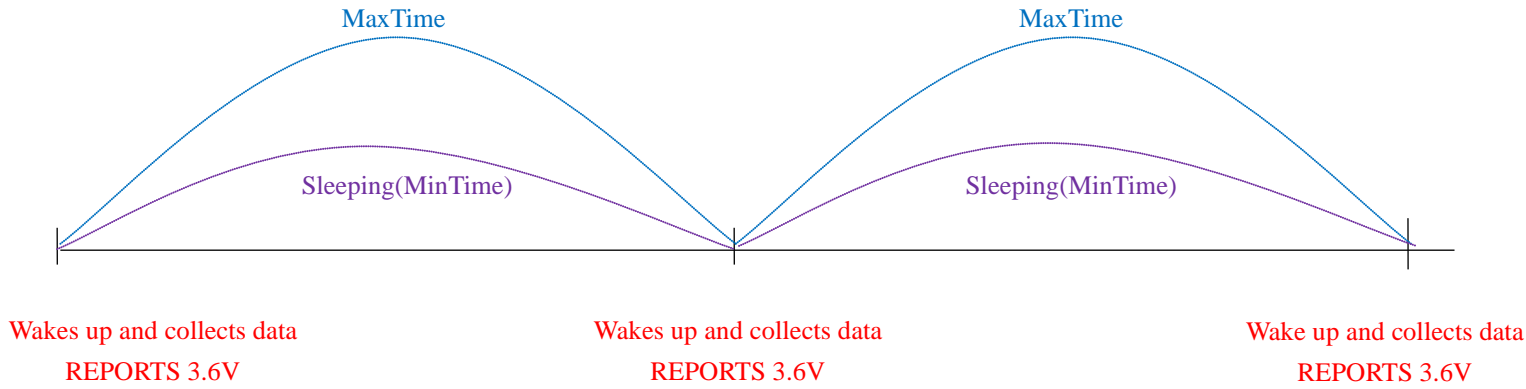
Downlink: 022100000000000000000000

Device returns:

8221003C003C0100000000 (current device parameters)

**Example for MinTime/MaxTime logic:**

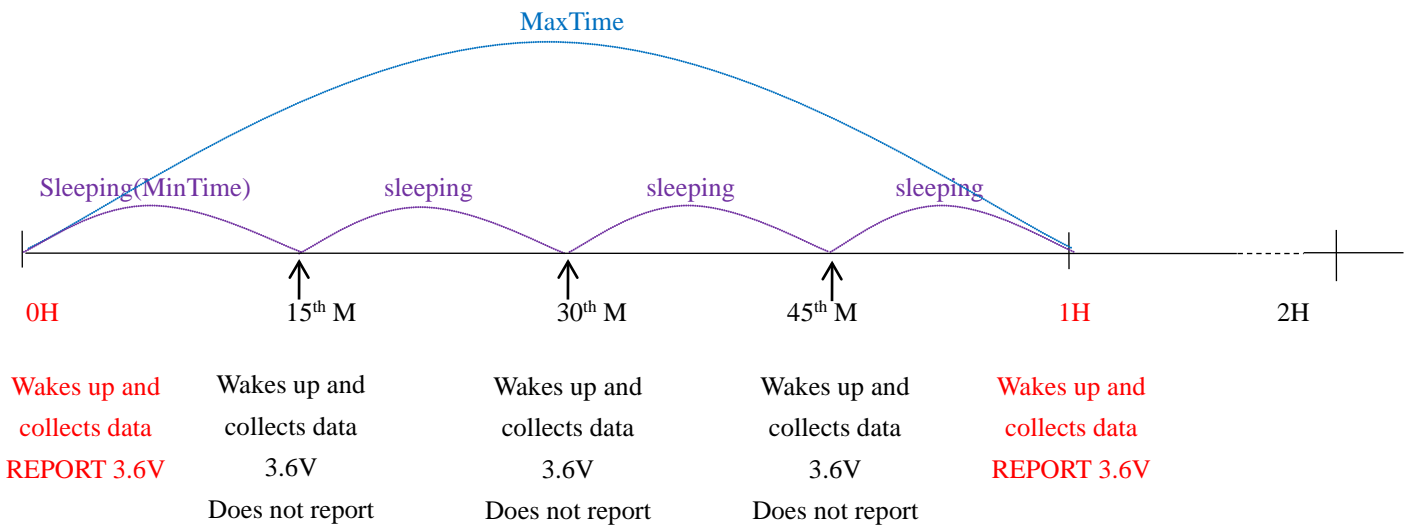
**Example#1** based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V



Note:

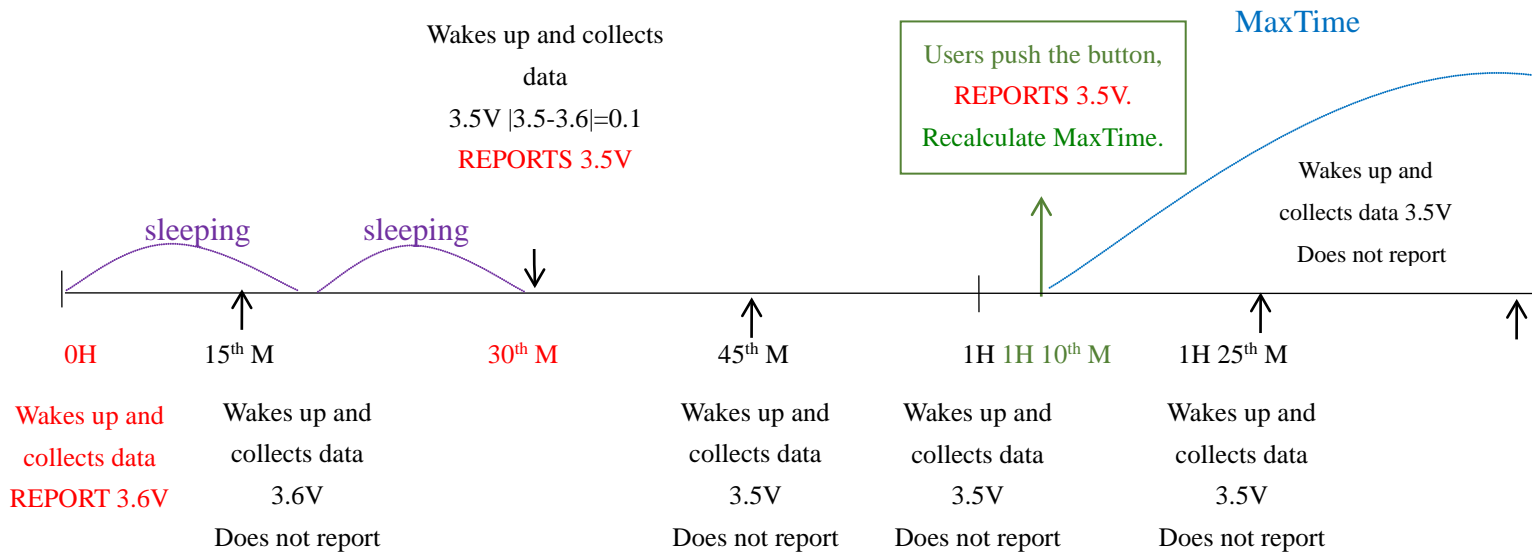
MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BtteryVoltageChange value.

**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.



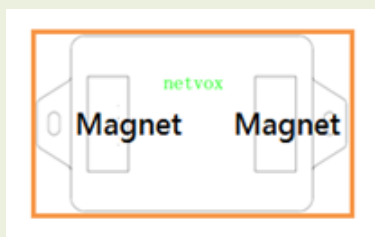
Notes:

- (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 change value 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.

## 6. Installation

1. The dry contact sensor (R718J) has a built-in magnet (as Figure 1 below), which can be attached to the surface of an iron object during installation, which is convenient and quick. In order to make the installation firmer, please use screws (purchased separately) to fix the device to the wall or other surface. (as Figure 2 below)

Note: 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. After the dry contact sensor detects the change of the dry contact state, it will report the data immediately.
3. If the battery voltage is detected that exceeds the change value during Min Time, the data will be reported immediately.
4. Whether the state of the dry contact is change, a piece of data will be reported regularly when the MaxTime comes.

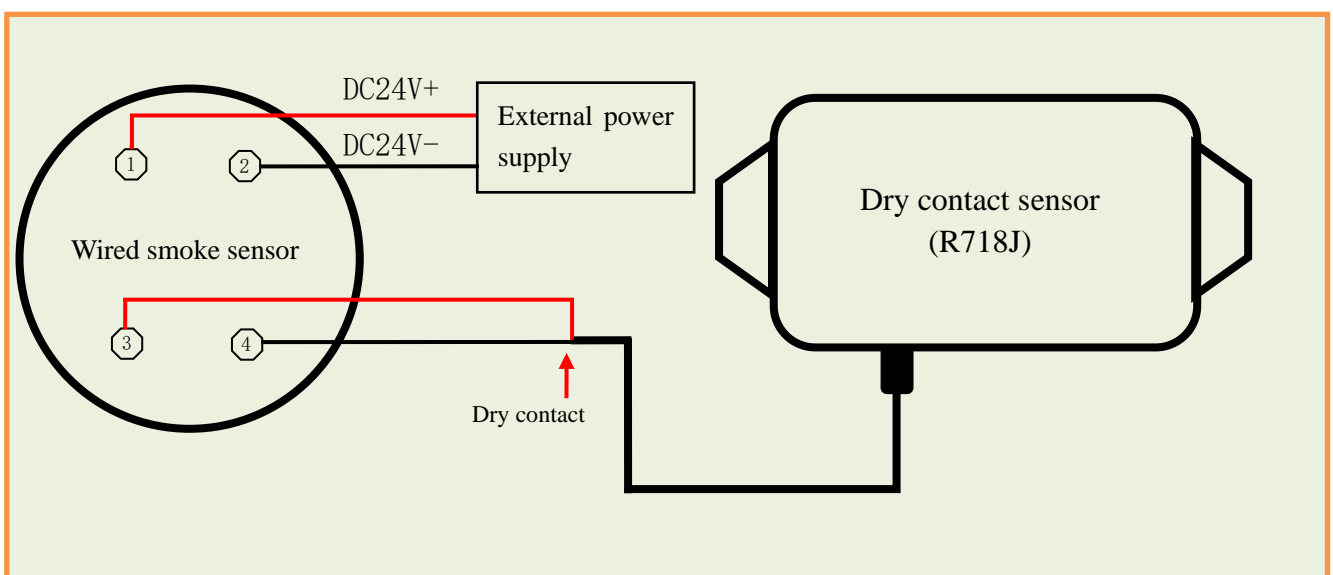
Note:

- When the dry contact is connected, the data status bit is "1".
- When the dry contact is disconnected, the data status bit is "0".

Dry contact sensor (R718J) can be used in the following scenarios:

- Various switches and buttons
- Dry contact output of sensor
- The operating status of the equipment
- State monitoring of doors and windows in home or business

The occasion is necessary to judge the state of the sensor through the dry contact signal.



A diagram that the dry contact sensor (R718J) connecting to a wired smoke sensor.

### **\*Information about Battery Passivation**

Many of Netvox devices are powered by 3.6V ER14505 Li-SOCl<sub>2</sub> (lithium-thionyl chloride) batteries that offer many advantages including low self-discharge rate and high energy density.

However, primary lithium batteries like Li-SOCl<sub>2</sub> 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**

- 1) Connect a battery to a 68ohm resistor in parallel
- 2) Keep the connection for 6~8 minutes
- 3) The voltage of the circuit should be  $\geq 3.3V$

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.

## 7. Important Maintenance Instruction

Your device is a product of 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 moisture 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 can damage its detachable parts and electronic components.
- Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in a 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. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.
- Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.

All of the above suggestions apply equally to your device, battery and accessories. If any device is not working properly.

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