



netvox R718DA Wireless Vibration Sensor Rolling Ball Type User Manual

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netvox R718DA Wireless Vibration Sensor Rolling Ball Type



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Introduction

R718DA is identified as a LoRaWAN ClassA device with a ball-type vibration sensor and is compatible with the LoRaWAN protocol. The main body of R718DA can be attached to the iron surface of the detected target with a built-in magnet. When the target vibrates and the ball shakes in the sensor, R718DA sends the alarm message immediately.

LoRa Wireless Technology

Lora is a wireless communication technology dedicated to long-distance and low power consumption. Compared with other communication methods, the LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. Examples, automatic meter reading., building automation equipment, wireless security systems, and 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 wireless communication module
- 2 x 3.6V ER 14505 AA lithium batteries
- Trigger the vibration sensor, the device will send trigger information
- The base is equipped with a magnet that can be attached to the magnetic substance
- I P Ratings Main part IP 65 / I P67 (Optional Sensor –I P67
- Compatible with LoRaWAN TM Class A
- Frequency hopping spread spectrum technology
- Configuration parameters can be configured through third-party software platforms
- Data can be read and alerts can be sent via SMS text and e mail Optional
- Applicable to third-party platforms: Activity / 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 various types of battery life 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 and the green indicator flash on ce.

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:	<ol style="list-style-type: none"> 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. For the first 5 second after powering on, the device will be in engineering test mode.
Network Joining	
Never joined the network	<p>Turn on the device to search the network to join. 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 to join. The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Fail to join the network (when the device is on)	<p>Suggest to check the device verification information on the gateway or consult your platform server provider.</p>
Function Key	
Press and hold for 5 seconds	<p>Restore to factory setting / Turn off</p> <p>The green indicator flashes 20 times: success The green indicator remains off : fail</p>
Press once	<p>The device is in the network: the green indicator flashes once and sends a report</p> <p>The device is not in the network: the green indicator remains off</p>
Sleeping Mode	

The device is on and in the net work	<p>Sleeping period: Min Interval.</p> <p>When the report change exceeds the 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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Data Report

- The device will immediately send a version packet report and the vibration report data
- The device sends data in the default configuration before any configuration is done.

Default setting

- **MaxTime:** Max In t erval = 60 min 36 00s
- **MinTime:** M in Interval = 60 min 36 00 s
- **Battery Voltage Change:** 0x 0 1 (0)

R718DA Trigger

- When the device senses vibration and the ball is shaken, an alarm message will be reported.
- The shaking alarm bit is "1". The static and nonshaking alarm bit is "0".

Restore Function

- There are two ways for the ball to trigger an alarm.
- One is not to report the recovery status after sending the alarm. default
- The other is to report the recovery status after the device stops vibrating for 5 seconds after sending the alarm.
- The two ways can be executed before shipment or by LoRaW A N command configuration.

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 LoRa WAN 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 follows:

Min Interval (Unit: second)	Max Interval (Unit: second)	Reportable Change	Current Change≥ Reportable Change	Current Change Reportable Change
Any number between n 1~65535	Any number between n 1~65535	Can not be 0	Report per Min Interval	Report per Max Interval

Example of Configure Cmd

- **F Port:** 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
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Config ReportReq	R718DA	0x01	0x1A	MinTime (2bytes Unit: s)	MaxTime (2bytes Unit: s)	B a t t e r y C h a n g e (1 b y t e U n i t: 0. 1 v)	Reserved (4Bytes, Fixed 0x00)
Config ReportRsp		0x81		Status (0x00_success)			Reserved (8Bytes, Fixed 0x00)
ReadConfig ReportReq		0x02		Reserved (9Bytes, Fixed 0x00)			

ReadConfig			Minime	MaxTime	B a t t e r y C h a n g e	Reserved
ReportRsp	0x82		(2bytes Unit: s)	(2bytes Unit: s)	(1 b y t e U n i t: 0. 1 v)	(4Bytes, Fixed 0x00)

Configure device parameters

- MinTime =1 min, MaxTime = 1 min, BatteryChange =0.lv
- **Downlink:** 011A003Co03CO100000000
- 003C(Hex) = 60(Dec)

Response

- 811A00000000000000000000 (Configuration success)
- 811A01000000000000000000 (Configuration failure)

Read device configuration parameters

- **Downlink:** 021A000000000000000000

Response

- 821A003CO03CO100000000 (Current configuration)

Restore configuration

Description	Device	CmdID	DeviceType	NetvoxPayLoadData	
SetRestore ReportReq	R718DA	0x03	0x1A	RestoreReportSet (1byte) 0x00_DO NOT report when sensor restore 0x01_DO report when sensor restore	Reserved (8Bytes, Fixed 0x00)
SetRestore ReportRsp		0x83		Status (0x00_success)	Reserved (8Bytes, Fixed 0x00)
GetRestore ReportReq		0x04		Reserved (9Bytes, Fixed 0x00)	
GetRestore ReportRsp		0x84		RestoreReportSet (1byte) 0x00_DO NOT report when sensor restore 0x01_DO report when sensor restores	Reserved (8Bytes, Fixed 0x00)

Do report after the sensor stops vibrating

- **Downlink:** 031A010000000000000000 (0x01_DO report when sensor restore)

Response

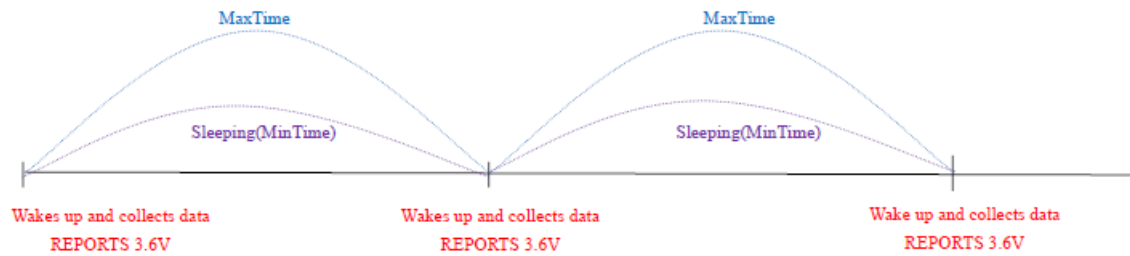
- 831A00000000000000000000 (Configuration success)
- 831A01000000000000000000 (Configuration failure)

Read restore function

- **Downlink:** 041A000000000000000000
- **Response:** 841A010000000000000000 (Current configuration) (report when sensor restore)

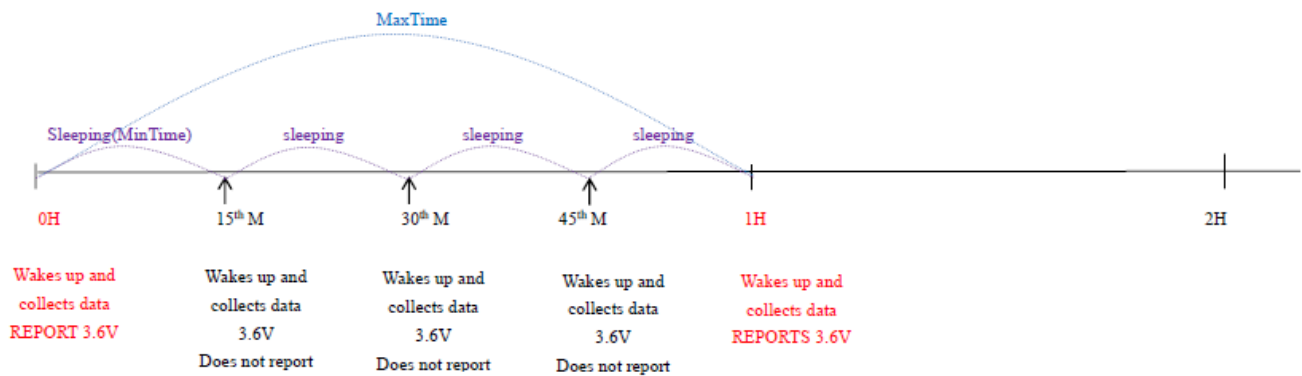
Example for MinTime/Maxime logic

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

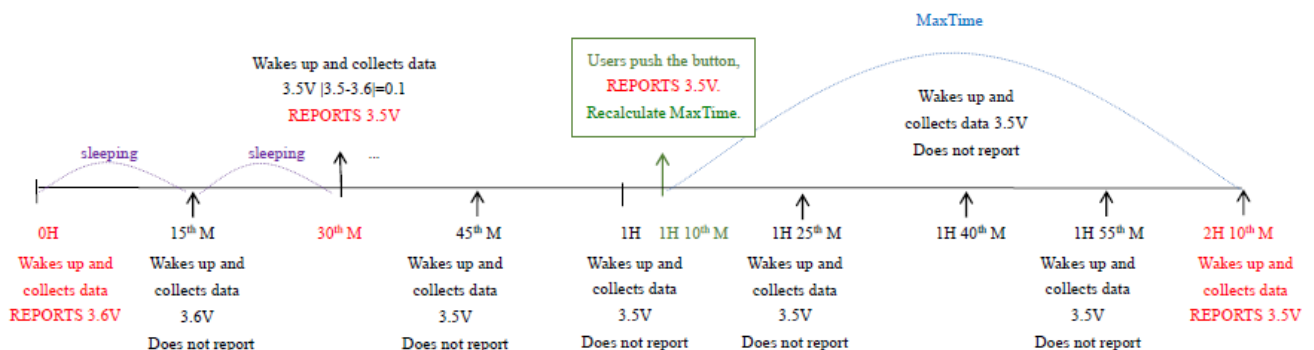


Note: MaxTime=MinTime. Data will only be reported according to Maxime (MinTime) duration regardless BatteryVoltageChange value.

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



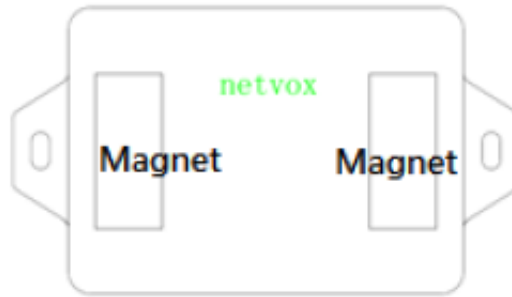
- **Example#3:** based on MinTime = 15 Minutes, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange= 0.1V.



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 the MinTime interval. If the data variation is not greater than the last data reported, the device reports according to the Maxime 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. Whenever the device sends a report, no matter the resulting of data variation, butt on pushed o r MaxTime interval, another cycle of MinTime/Maxime calculation is started.

Installation



1. The device has a built-in magnet.
2. When installed, it can be attached to the surface of an object with iron which is convenient and quick.



3. To make the installation more secure, use screws (purchased) to secure the unit to a wall or other surface.

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.

1. Fix the vibration sensor of the vibration sensor on the object that needs to be detected whether it is vibrating (here, take the mousetrap as a picture, as shown below).



2. The figure shows the vibration sensor (R718DA) applied to the scene of the mousetrap in the restaurant. It can also be applied to the following scenarios:

- Restaurant (rat)

- Shopping mall supermarket (rat)
- Engine room (rat)

1. When it is necessary to detect whether the object is vibrating or moving. When the vibration sensor detects a vibration, it immediately sends an “alarm” message. When the device reports data periodically, it restores the “normal” status and sends “normal” status information. Moreover, enable the Restores function and the normal status will be sent after the device stops for 5 seconds

Note

- The shaking alarm bit is “1”.
- The static and nonshaking alarm bit is “0”.



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 a 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 it is suggested that if the storage period is more than one month from the date of battery production, all the batteries should be activated. If encountering the situation of battery passivation, users can activate the battery to eliminate the battery hysteresis.

ER14505 Battery Passivation:

To determine whether a battery requires activation

- Connect a new ER14505 battery to a 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 resistor in parallel
- Keep the connection for 5-8 minutes
- The voltage of the circuit should be 23.3. indicating successful activation.

Brand	Load Resistance	Activation Time	Activation Current
NONE	165 Ω	5 minutes	20mA
RAMSAY	67 Ω	8 minutes	50mA
EVE	67 Ω	8 minutes	50mA
SAFT	67 Ω	8 minutes	50mA

Note: If you buy batteries from other than the above four manufacturers, then the battery activation time, activation current, and required load resistance shall be mainly subject to the announcement of each manufacturer.

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 a dusty or dirty environment. It might damage its detachable parts and electronic components.
- Do not store the device under excessive heat conditions. 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.

Documents / Resources

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References

- [🌐 Netvox Command Resolver](#)
- [🌐 Εἰς τὴν ἀρχὴν](#)