
# netvox R718Y Wireless Differential Pressure and Temperature Sensor User Manual



**Model R718Y**
**Wireless Differential Pressure and Temperature sensor**
**R718Y**
**User Manual**

Contents



## R718Y Wireless Differential Pressure and Temperature Sensor



## Introduction

R718Y is the Class A device based on the LoRaWAN™ protocol of Netvox. The device detects the pressure difference and the temperature. It is compatible with the LoRaWAN protocol.

**LoRa Wireless Technology:**

Lora is a wireless communication technology dedicated to long distances 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, are 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

- Apply SX1276 wireless communication module
- 2 ER14505 batteries AA size (3.6V / section) in parallel
- Differential pressure sensor
- Protection class IP40
- The base is attached with a magnet that can be attached to a ferrous object
- Compatible with LoRaWAN™ Class A
- Frequency-hopping spread spectrum technology
- Configuration parameters can be configured through third-party software platforms, data can be read and alarms can be set via SMS text and email (optional)
- Available third-party platform: Actility / ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life

**Battery Life:**

- Please refer to the web: **http://www.netvox.com.tw/electric/electric_calc.html**
- On this website, users can find battery lifetime for a variety of 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** | |
|---|---|
| Power on | Insert batteries. (The 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 at off state by default.<br>2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.<br>3. The first 5 seconds 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.<br>The green indicator stays on for 5 seconds: success The green indicator remains off: fail |
| Had joined the network | Turn on the device to search the previous network. The green indicator stays on for 5 seconds: success<br>The green indicator remains off: fail |

| | |
|---|---|
| **Function Key** | |
| Press and hold for 5 seconds | Restore to factory setting / Turn off<br>The green indicator flashes 20 times: success The green indicator remains off: f ail |
| Press once | The device is in the network: green indicator flashes once and sends a report<br>The device is not in the network: the green indicator remains off |
| **Sleeping Mode** | |
| The device is on and in the n etwork | Sleeping period: Min Interval.<br>When the report change exceeds the setting value or the state changes: send a data report according to Min Interval. |

When the device is powered on, it will immediately send a version package Report and the report data with the device battery voltage, the differential pressure, and the temperature.
The device sends data in the default configuration before any configuration is done.
**Default setting:**
Maxime: Max Interval = 15 min = 900s
MinTime: Max Interval = 15 min = 900s
BatteryChange = 0x01 (Unit: 0.1v)
Different Pressure Change = 0x0A (1 Pa) (Unit: 0.1Pa)
Temperature Change = 0x0A (1°C) (Unit: 0.1°C)
**Measurement Range:**
Different pressure Measuring Range: -500 to 500 Pa
Temperature Measuring Range: -20°C to 50°C
**Pressure Difference And Temperature Detection:**
When the function key is pressed, the device immediately sends a report with the current voltage value, differential pressure value, and temperature value. Or when the configured time is up, it will also detect and send the report with Battery, Different Pressure, and Temperature.
**Note:** Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver **http://loraresolver.netvoxcloud.com:8888/page/index** to resolve uplink data
**5.1 Example of ReportDataCmd**
**FPort 0x06**

| | | | | |
|---|---|---|---|---|
| Bytes | 1 | 1 | 1 | Var(Fix=8 Bytes) |
| | Version | DeviceType | ReportType | NetvoxPayLoadData |

**Version**– 1 byte –0x01——the Version of NetvoxLoRaWAN Application Command Version
**DeviceType**– 1 byte – Device Type of Device
The device type is listed in Netvox LoRaWAN Application Devicetype doc
**ReportType** – 1 byte –the presentation of the NetvoxPayLoadData according to the device type
**NetvoxPayLoadData**– Fixed bytes (Fixed =8bytes)

| **Device** | **Camden** | **Device Type** | **NetvoxPayLoadData** | | | |
|---|---|---|---|---|---|---|
| R718Y | 0xAC | 0x01 | Battery (1byte, Unit: 0.1v) | Different Pressure (Signed2Bytes, Unit: 0.1Pa) | Temperature (Signed2Bytes,Unit: 0.1°C) | Reserved (3Bytes, Fixed 0x00) |

Uplink: 01AC0124001E0116000000 1st byte (01): Version
2nd byte(AC): DeviceType 0xAC R718Y
3rd byte (01): ReportType
4th byte (24): Battery, 24 Hex=36 Dec 36*0.1v=3.6v
5th byte (001E): Different Pressure, 1E Hex =30 Dec 30*0.1Pa=3 Pa
7th byte (0116): Temperature, 116 Hex =278 Dec 278*0.1°C=27.8°C
9th ~11 bytes (000000): Reserved
**5.2 Example of ConfigureCmd**
**FPort 0x07**

| Bytes | 1 | 1 | Var(Fix =9 Bytes) |
|---|---|---|---|
| | CmdID | DeviceType | NetvoxPayLoadData |

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

| **Description** | **Device** | **Camden** | **Device Type** | **NetvoxPayLoadData** |
|---|---|---|---|---|

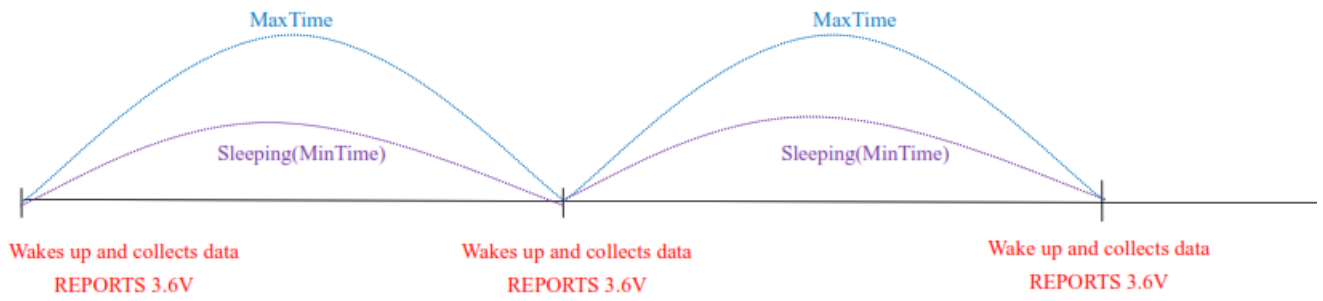
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Config ReportReq | | 0x01 | | Minime (2bytes, Unit: s) | Maxime (2bytes, Unit: s) | BatteryChange (1byte, Unit: 0.1v) | DifferentPressure Change (2bytes Unit:0.1Pa) | TemperatureChange (2byte Unit: 0.1°C) |
| Config reporters | | 0x81 | | Status (0x00_success) | | | Reserved (8Bytes, Fixed 0x00) | |
| ReadConfig ReportReq | | 0x02 | | Reserved (9Bytes,Fixed 0x00) | | | | |
| | R718Y | | 0xAC | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ReadConfig ReportRsp | | 0x82 | | Minime (2bytes, Unit: s) | Maxime (2bytes, Unit: s) | BatteryChange (1byte, Unit: 0.1v) | DifferentPressure Change (2bytes, Unit: 0.1Pa) | TemperatureChange (2byte Unit: 0.1°C) |

(1) Configure device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v, DifferentPressureChange=10Pa, TemperatureChange = 10°C
**Downlink:** 01AC003C003C0100640064 003C(Hex) = 60(Dec)
**Device returns:** 81AC000000000000000000 (configuration successful)
81AC010000000000000000 (configuration failed)
(2) Read device parameters
**Downlink:** 02AC000000000000000000
**Device returns:** 82AC003C003C0100640064 (current device parameters)

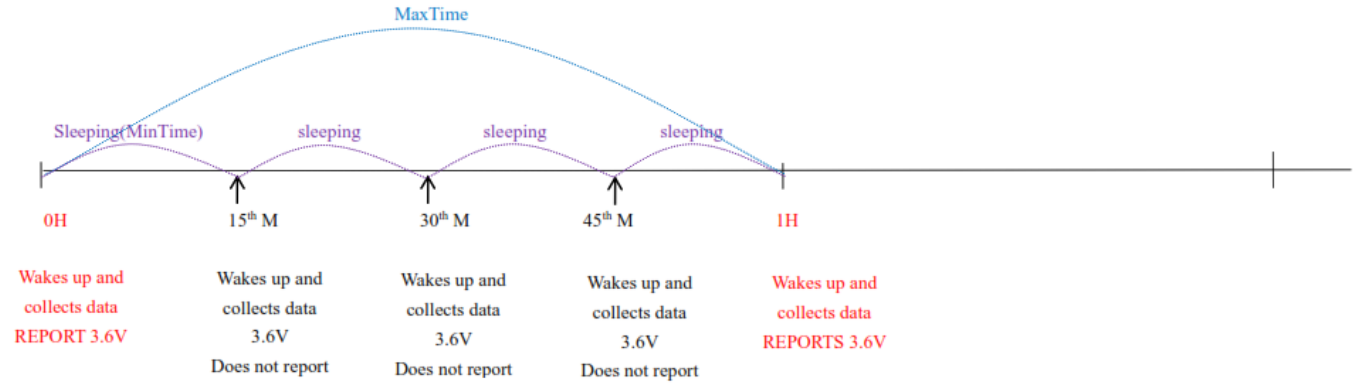
**5.3 Example for MinTime/Maxime logic**

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

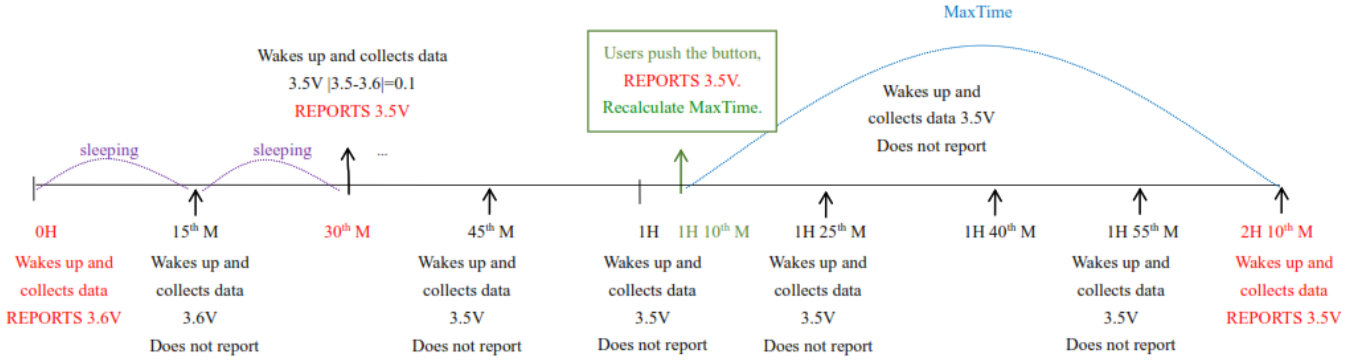



**Note:** MaxTime=MinTime. Data will only be reported according to Max Time (MinTime) duration regardless BatteryVoltageChange value.

**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 Min Time interval. If the data variation is not greater than the last data reported, the device reports according to the Max Time 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 result of data variation, button pushed, or Max Time interval, another cycle of MinTime/Max Time calculation is started.

## 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
the 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 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.

**6.1 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.
**6.2 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

## 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 temperatures 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 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.

## FCC Statement:

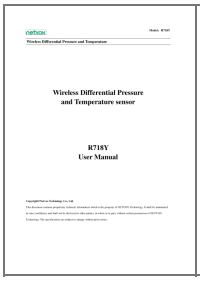
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions **:** (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment. This equipment complies with FCC radiation exposure limits set

forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## Documents / Resources

| | |
|---|---|
|  | netvox R718Y Wireless Differential Pressure and Temperature Sensor [pdf] User Manual LR-R718Y, LRR718Y, NRH-LR-R718Y, NRHLRR718Y, R718Y Wireless Differential Pressure and Temperature Sensor, Wireless Differential Pressure and Temperature Sensor |



## References

- Netvox Command Resolver
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