netvox R718AD Wireless Temperature Sensor User Manual

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Introduction

R718AD, mainly used to detect the temperature. It collects data over LoRa network and sends it to devices to be shown, fully compatible with LoRa protocol.

LoRa Wireless Technology:
LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extend the communication distance. It can be widely used in any use case that requires long-distance and low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. It has features like small size, low power consumption, long transmission distance, strong 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

- Compatible with LoRaWAN
- 2 ER14505 lithium batteries (3.6V / section) parallel power supply
- Temperature of gas / solid / liquid detection
- Simple operation and setting
- Protection class IP65
- 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 onc e.
Turn off (Restore to factory s etting)	Press and hold the function key for 5 seconds till green indicator flashes for 20 ti mes.
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 the 1st– 5th second after power on, the device will be in engineering test m ode.
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 remain s off: fail
Had joined the network	Turn on the device to search the previous network. 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 o ff: 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 n etwork	Sleeping period: Min Interval. When the reportchange exceeds setting value or the state changes: send a data report according to Min Interval.

Low Voltage Warning

Low Voltage	3.2V

Data Report

The device will immediately send a version package report and a report data with temperature and voltage values after the device is powered on. The device sends data in the default configuration before any configuration is done.

Default setting

- Max Interval =15 min
- Min Interval =15 min (by default, the current voltage value is detected every Min Interval) Battery Change = 0x01 (0.1V)
- Temperature Change = 0x0064 (1 ℃)

Note:

1. The data transmission cycle of the device is subject to the real programming configuration before shipment.

2. The interval between two reports must be the minimum time(if there is special custom shipment, the setting will be changed according to customer requirements)

The data reported by the device can be decoded with the Netvox LoraWAN Application Command document and **http://loraresolver.netvoxcloud.com:8888/page/index**

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	Cmd ID	Device Type	NetvoxPayLoadData				
ConfigReportReq	R718AD	0x01	0x9C	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Temperature Change (2 byte Unit:0.01°C)	Reserved (2Bytes,Fixed 0x00)
ConfigReportRsp		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)	Temperature Change (2byte Unit:0.01°C)	Reserved (2Bytes,Fixed 0x00)

1. Configuration MinTime = 1min MaxTime = 1min BatteryChange = 0.1v TemperatureChange = 1°C
    1. **Downlink** 019C003C003C0100640000

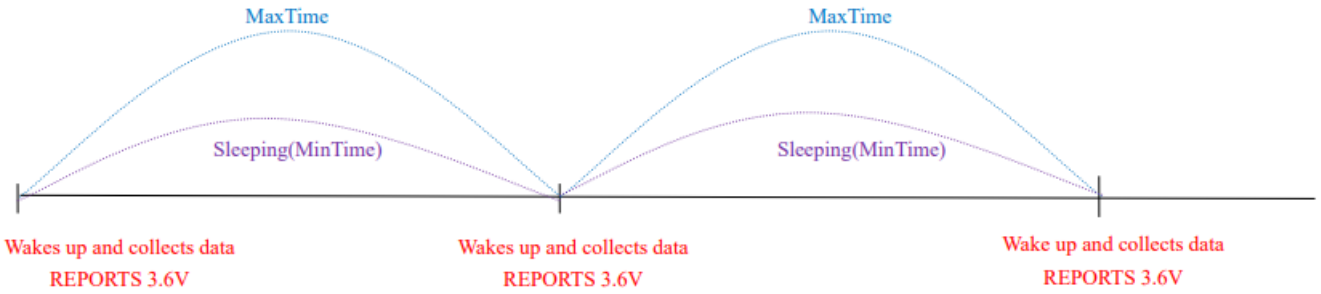
       Response 819C000000000000000000 Configuration success

       819C010000000000000000 Configuration failure
2. **Read Configuration:**

   Downlink 029C000000000000000000

   Response 829C003C003C0100640000 Current configuration setting

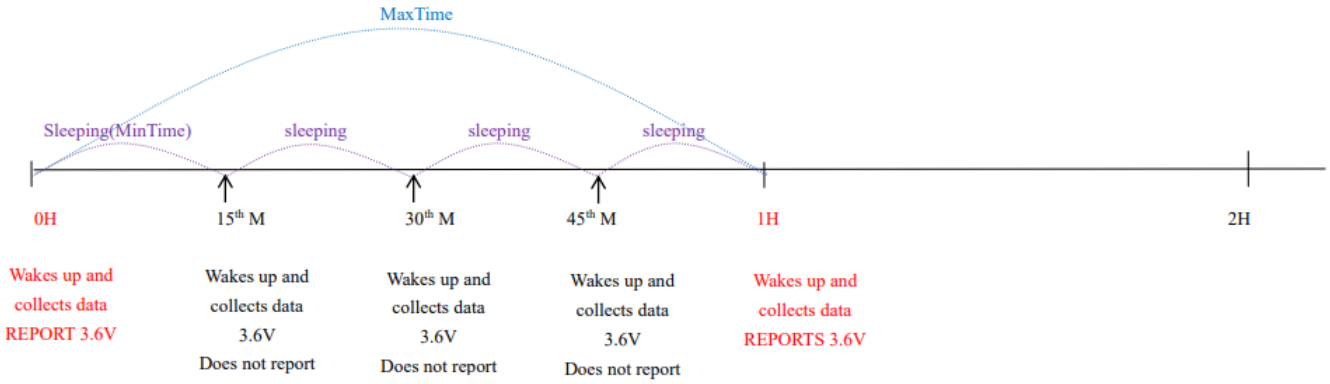
Example for MinTime/MaxTime logic:
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V



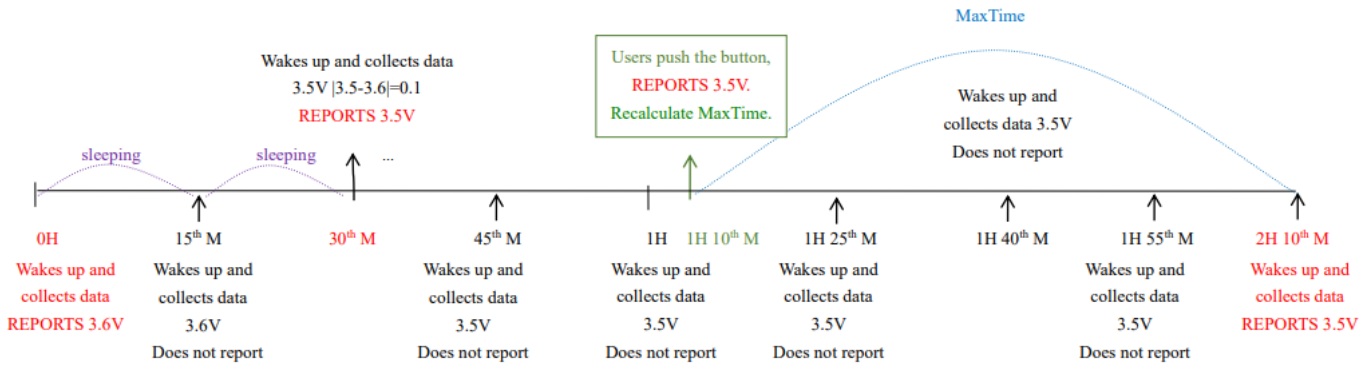
- W akes up and collects data REPORTS 3.6V
- Wakes up and collects data REPORTS 3.6V
- Wake up and collects data REPORTS 3.6V

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

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

This product comes with waterproof function. When using it, the back of it can be adsorbed on the iron surface, or the two ends can be fixed to the wall with screws. Note: To install the battery, use a screwdriver or similar tool to assist in opening the battery cover.

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 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

1. a. Connect a battery to a resistor in parallel
2. b. Keep the connection for 5~8 minutes
3. c. The voltage of the circuit should be ≧3.3, indicating successful activation.

Brand	Load Resistance	Activation Time	Activation Current
NHTONE	165 Ω	5 minutes	20mA
RAMWAY	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 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.

Documents / Resources

	netvox R718AD Wireless Temperature Sensor [pdf] User Manual R718AD Wireless Temperature Sensor, R718AD, Wireless Temperature Sensor, Temperature Sensor, Sensor

References

- Netvox Command Resolver
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