netvox R718IA2 Wireless 2-Input 0-5V ADC Sampling Interface User Manual

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Introduction

R718IA2 is a voltage detection device that is a Class A device based on the LoRaWAN open protocol and is compatible with the LoRaWAN protocol. R718IA2 will check the voltage of device regularly according to the configured time, and the ADC sampling voltage range is 0-5V.

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, and 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 Feature

- Adopt SX1276 wireless communication module
- 2 sections of ER14505 battery in parallel (AA SIZE 3.6V / section)
- 2-input voltage detection
- 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
- Frequency-hopping spread spectrum
- Configuring parameters and reading data via third-party software platforms, and set alarms via SMS text and email (optional)
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life

Battery Life

- Please refer to web: http://www.netvox.com.tw/electric/electric_calc.html
- At this website, users can find battery lifetime for various models at different configurations
    1. The 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 (user may need a screwdriver to open)
Turn on	Press and hold the function key for 3 seconds till the green indicator flashes on ce
Turn off (Restore to factory set ting)	Press and hold the function key for 5 seconds till green indicator flashes 20 tim es
Power off	Remove Batteries
Note	1. Remove and insert the battery, and the device is in turn-off state by default 2. On/off interval is suggested to be about 10 seconds to avoid the interfere nce of capacitor inductance and other energy storage components 3. In the first 5 seconds after power on, the device is in engineering test mode
Network Joining	
Never join the network	Turn on the device to search the network. The green indicator stays on for 5 seconds: success The green indicator remai ns off: fail
Had joined the network (Not restore to the factory setti ng)	Turn on the device to search the previous network. The green indicator stays o n for 5 seconds: success The green indicator remains off: fail
Fail to Join the Network	1. Suggest to remove batteries if the device is not used to save power. 2. Suggest to check the device verification information on the gateway or cons ult your platform server provider.
Function Key	
Press and hold for 5 seconds	Restore to factory setting / Turn off The green indicator flashes 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

The device is on and in the network	Sleeping period: Min Interval When the reportchange exceeds setting value or the state changes, the device send a data report according to Min Interval.
The device is on but not in the network	1. Suggest to remove batteries if the device is not used 2. Suggest to check device verification on gateway

Low Voltage Warning

Low Voltage Warning	Low Voltage Warning

Data Report

The device will immediately send a version packet report and a data report including voltage. The device sends data according to the default configuration before any other configuration.

Default Setting

- MaxTime: Max Interval = 60 min =3600s
- MinTime: Max Interval = 60min = 3600s
- Reportchange: BatteryVoltageChange = 0x01 (0.1v)

Note

1. The cycle of the device sending the data report is according to the default.
2. The interval between two reports must be the MinTime.

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver K**http://www.netvox.com.cn: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 1~65535	Any number between 1~65535	Can not be 0	Report per Min Interval	Report per Max Interval

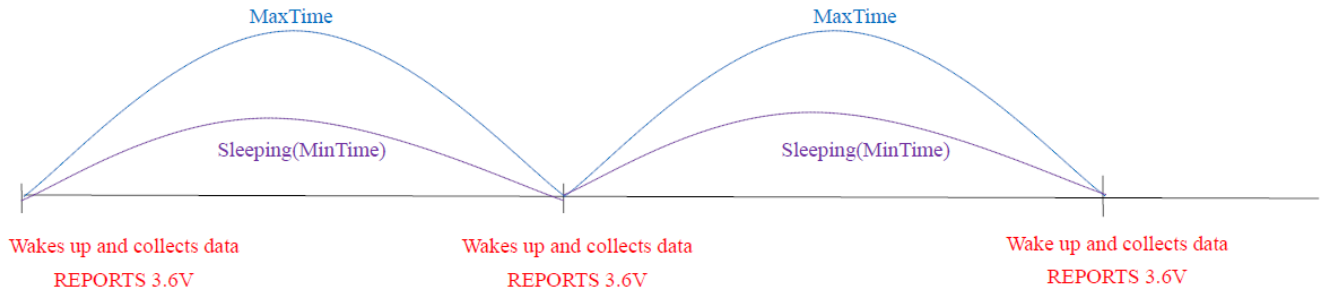
Example of ConfigureCmd

Description	Device	Cmd ID	DeviceType	NetvoxPayLoadData			
Config ReportReq	R718IA2	0x01	0x41	MinTime (2bytes Unit: s)	MaxTime (2bytes Unit: s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes, Fixed0x00)
Config ReportRsp		0x81		Status (0x00_success)	Reserved (8Bytes, Fixed 0x00)		
ReadConfig ReportReq		0x02		Reserved (9Bytes, Fixed 0x00)			
ReadConfig ReportRsp		0x82		MinTime (2bytes Unit: s)	MaxTime (2bytes Unit: s)	BatteryChange (1byte Unit: 0.1v)	Reserved (4Bytes, Fixed 0x00)

Configure R718IA2 device parameter MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v Downlink: 0141003C003C0100000000
Device Return:

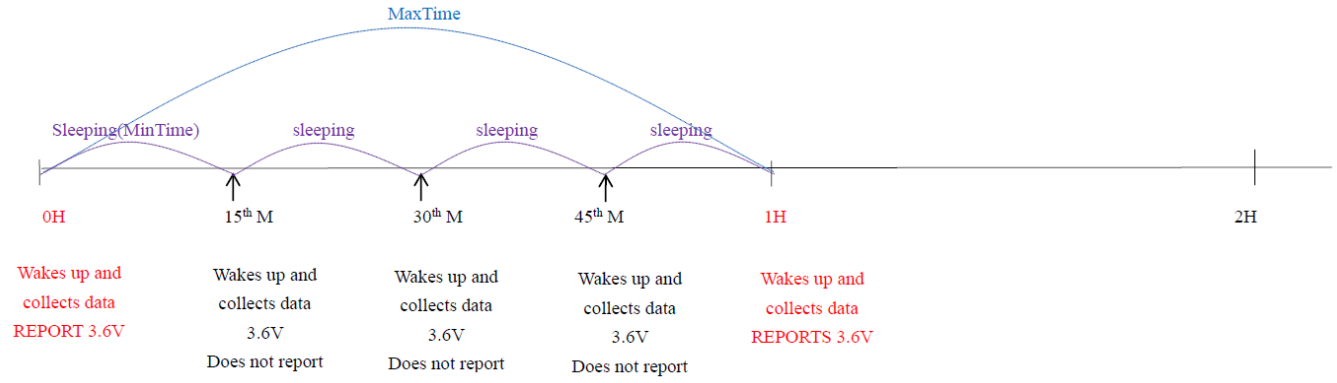
- 814100000000000000000 (configuration success)
- 814101000000000000000 (configuration failure) Read R718IA2 device parameter Downlink:
- 024100000000000000000 Device Return:
- 8241003C003C0100000000 (device current parameter)

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

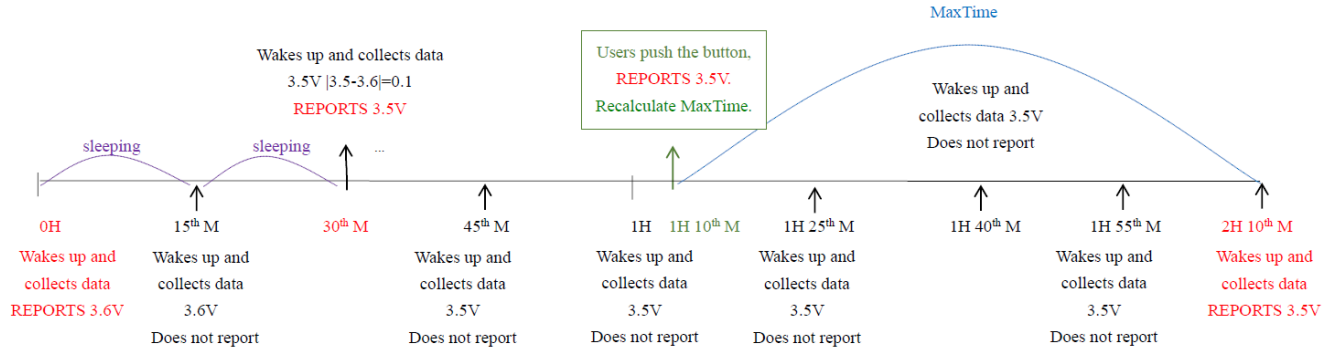


Note:
MaxTime=MinTime. Data will only be report according to Maxime (MinTime) duration regardless BatteryVoltageChange value.

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.



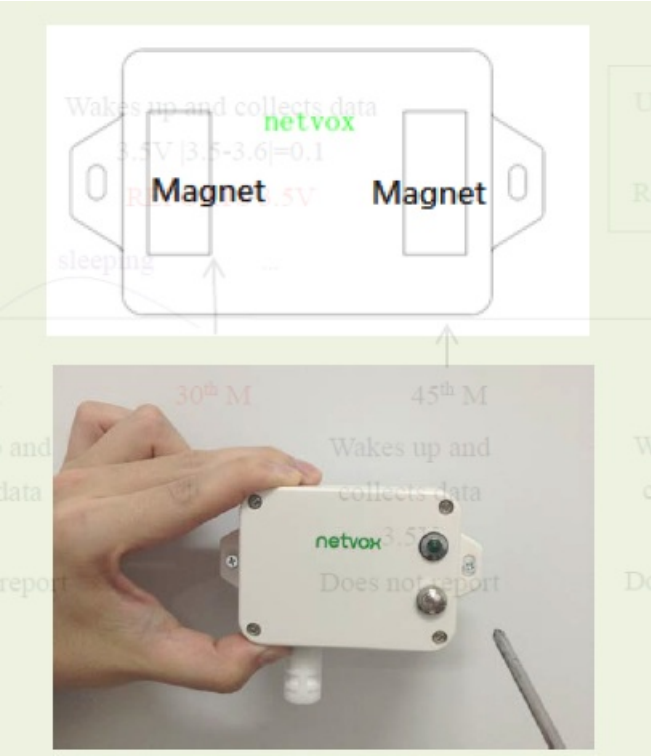
Notes

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 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 Maxime

interval, another cycle of MinTime/Maxime calculation is started.

Installation

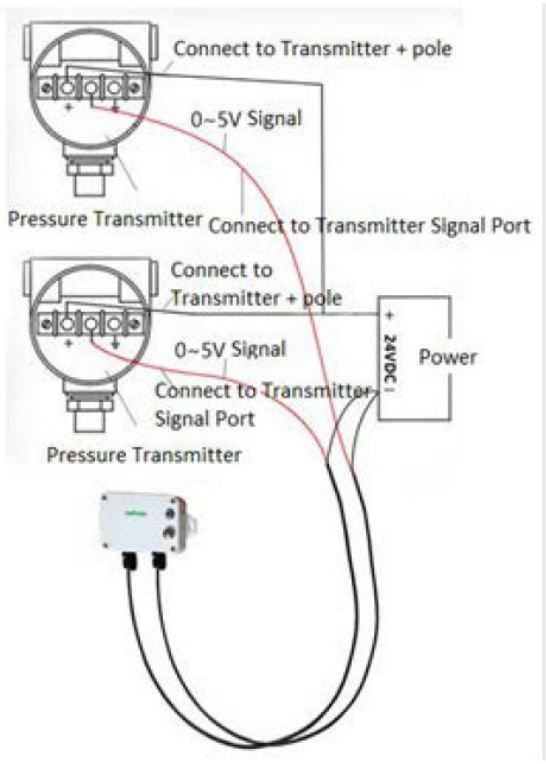
1. Wireless ADC Sampling Interface (R718IA2) has the built-in magnet (as the figure below). When installed, it can be attached to the surface of an object with iron which is convenient and quick. T To make the installation more secure, use screws (purchased) to se cure the unit to a wall or other surface (as the figure below). 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.

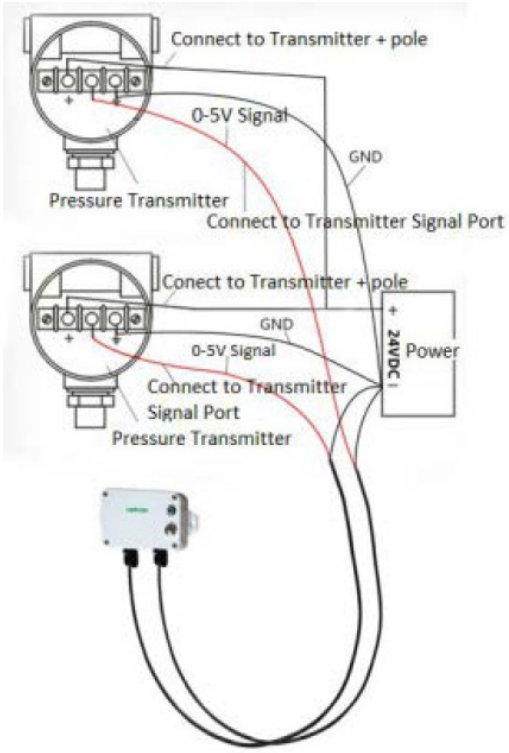


2. Connect the sampling line of the ADC sampling interface sensor to the transmitter according to the wiring method shown in the figure. There are two connection modes, 2-wire and 3-wire.
3. When the ADC sampling interface sensor detects the current-voltage according to the configured time or by pressing the button, it sends the data immediate wireless Sampling Interface (R718IA2) It can also be applied to the following scenarios:

- Pressure transmitter
- Differential pressure transmitter
- Level transmitter

The transmitter with 0-5V output signal





Note
Please do not disassemble the device unless it is required to replace the batteries. Do not touch the waterproof gasket, LED indicator light, or function keys when replacing the batteries. Please use a 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.

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 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 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

- Connect a battery to a 68ohm resistor in parallel
- Keep the connection for 6~8 minutes
- 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:

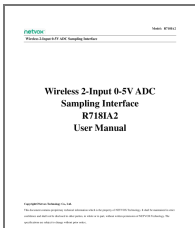
- Keep the equipment dry. Rain, moisture and various liquids or water may contain minerals that can corrode

electronic circuits. In case the device is wet, please dry it completely.

- Do not use or store in dusty or dirty areas. This way can damage its detachable parts and electronic components.
- Do not store in excessive heat place. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in excessive 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. Treating equipment roughly can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not paint the device. Smudges can make debris block detachable parts up and affect normal operation.
- Do not throw the battery into the fire to prevent the battery from exploding. Damaged batteries may also explode.

All the above suggestions apply equally to your device, batteries and accessories. If any device is not operating properly. Please take it to the nearest authorized service facility for repairing.

Documents / Resources

 Wireless 2-Input 0-5V ADC Sampling Interface R718IA2 User Manual	netvox R718IA2 Wireless 2-Input 0-5V ADC Sampling Interface [pdf] User Manual R718IA2, Wireless 2-Input 0-5V ADC Sampling Interface

References

- Lora Command Resolver
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