netvox R718KA2 Wireless 2 Input mA Current Meter Interface 4-20mA User Manual

R718KA2 Wireless 2 Input mA Current Meter Interface 4-20mA User Manual

Contents

Introduction

R718KA2 is a 2-way current detection device for Netvox Class A type devices based on LoRaWAN open protocol. The device is suitable for detecting 4mA to 20mA current, and R718KA2 is compatible with LoRaWAN 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
- Simple operation and setting
- 2 ER14505 lithium batteries in parallel power supply (3.6V / section)
- IP Rating: IP65
- 4mA to 20mA current meter interface
- Compatible with LoRaWAN ™Class A
- The base is attached with a magnet that can be attached to a ferromagnetic material object
- 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: Activity/Thing Park, TTN, Devices/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 life time for variety models at 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 once.
Turn off (Restore to factory s etting)	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; the device is at off state by default. Turn on the device to use again. 2. On/off interval is suggested to be about 10 seconds to avoid the interferen ce of capacitor inductance and other energy storage components. 3. 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 to join. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Had joined the network (not at factory setting)	Turn on the device to search the previous network to join. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Fail to Join The Network	Suggest to check the device verification information on the gateway or consult your platform server provider.

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 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

Sleeping Mode

The device is on and in the network	Sleeping period: Min Interval. When the report change exceeds setting value or the state changes: send a data a report according to Min Interval.

Low Voltage Warning

Low Voltage	3.2V

Data Report

After power on, the device will immediately send a version packet report and an attribute packet report.
The device sends data according to the default configuration before any other configuring.
Default Setting:
Maximum time: 900s (15min)
Minimum time: 900s (15min)
Battery Change: 0x01 (0.1V)
Current Chang:0x02 (2mA)
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
3. If there is special customized shipment, the setting shall be changed according to customer requirements.
   Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver
   http://www.netvox.com.cn:8888/page/index to resolve uplink data.

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 between1~65535	Any number between1~65535	Can not be 0.	Reportper Min. Interval	Reportper Max. Interval

5.1 Example of Report DataCmd
FPort 0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	Device Type	Report Type	Netvox Payload Data

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

Device	**DeviceType**	**ReportType**	**NetvoxPayLoadData**					
R718KA2	0x44	0x01	Battery(1Byte) unit:0.1V	Current1(1Byte) unit:1mA	Current2(1Byte) unit:1mA	FineCurrent1(1Byte) unit:0.1mA	FineCurrent2 (1Byte) unit:0.1mA)	Reserved (3Bytes) fixed 0x00

Uplink:014401240E0F9298000000

Byte	**Value**	**Attribute**	**Result**	**Resolution**
1st	01	Version	1	–
2nd	44	Device Type	44	–
3rd	01	ReportType	1	–
4th	24	Battery	3.6v	24(HEX)=36(DEC),36*0.1v=3.6v
5th	0E	Current 1	14 mA	0E(HEX)=14(DEC),14*1mA=14mA-
6th	0F	Current 2	15 mA	0F(HEX)=15(DEC),15*1mA=15mA
7th	92	FineCurrent 1	14.6 mA	92(HEX)=146(DEC),146*0.1mA=14.6mA
8th	98	FineCurrent 2	15.2mA	98(HEX)=152(DEC),152*0.1mA=15.2mA
9th~11th	000000	Reserved	0	–

5.2 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**	**CmdID**	**Device Type**	**NetvoxPayLoadData**				
Config ReportReq	R718KA2	0x01	0x44	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byteUnit:0.1v)	Current Change (1byte Unit:1mA)	Reserved (3Bytes,Fixed 0x00)
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)	CurrentChange (1byte Unit:1mA)	Reserved (3Bytes,Fixed 0x00)

1. Configure the device parameter MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v, CurrentChange= 5mA

   Downlink: 0144003C003C010A000000

   Device Return:

   814400000000000000000 (configuration success)

   814401000000000000000 (configuration failure)
2. Read the device parameter

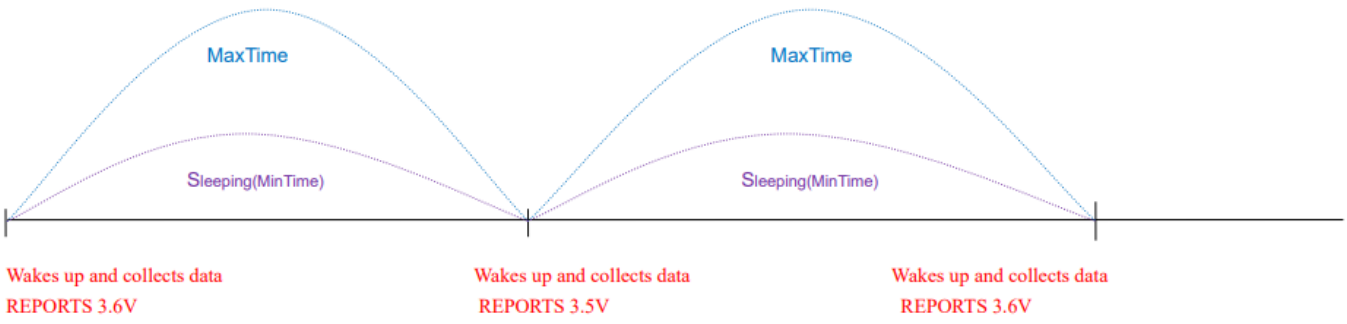
   Downlink: 024400000000000000000

   Device Return:

   8244003C003C010A000000 (device current parameter)

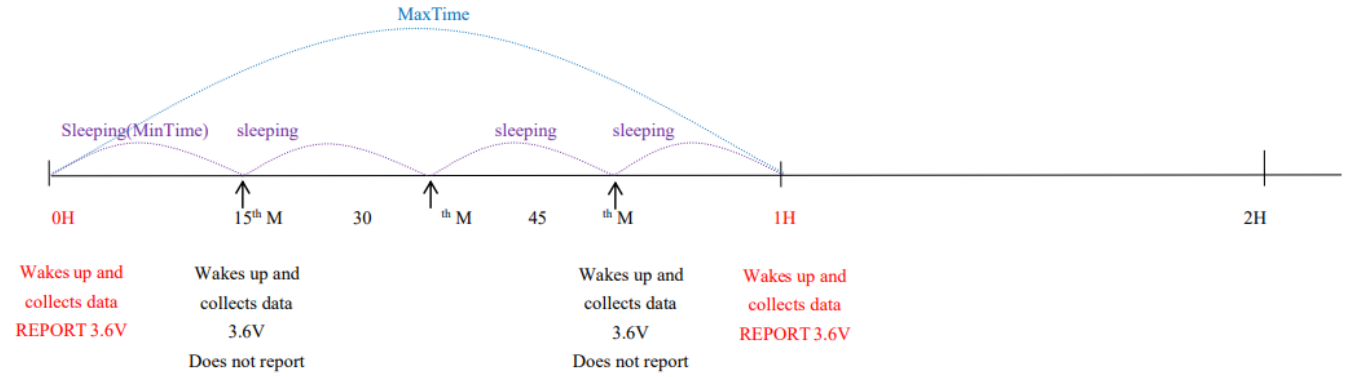
5.3 Example for MinTime/MaxTime logic

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

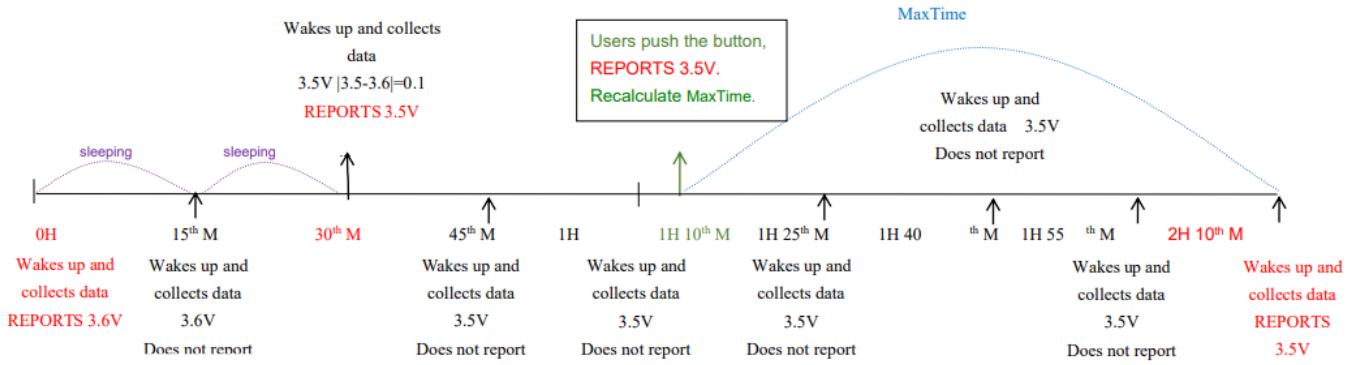


Note:

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

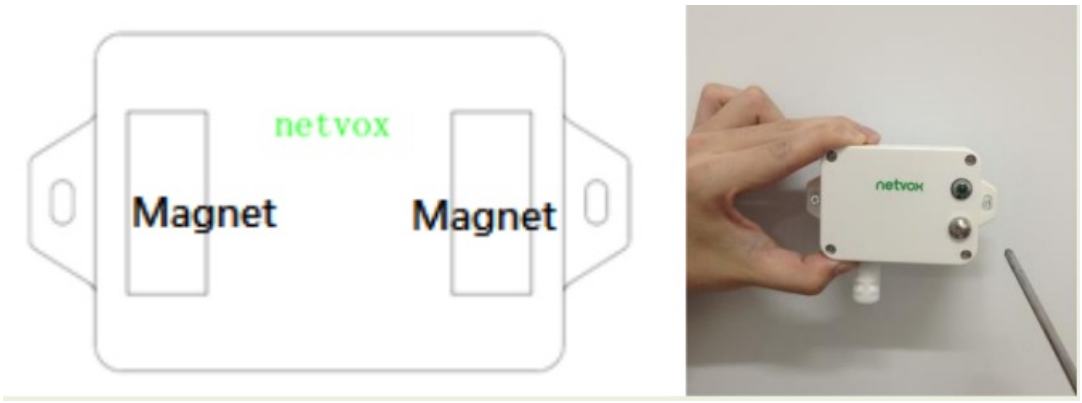


Notes:

1. The device only wakes up and performs data sampling according to MinTime Interval. When it is on sleeping mode, 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

1. Wireless Current Meter Interface (R718KA2) 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. To make the installation more secure, use screws (purchased) to secure the unit to a wall or other surface (as the figure below).
   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.

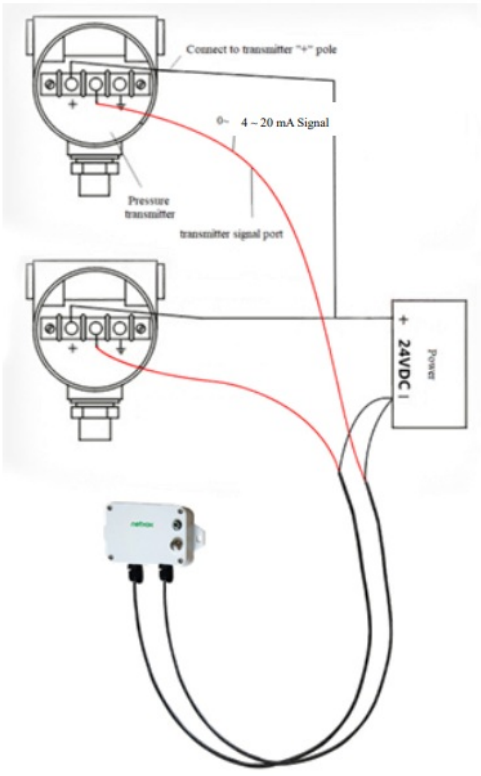


2. Connect the sampling line of the current meter interface sensor to the transmitter according to the wiring method shown in figure. There are two connection modes, 2-wire and 3-wire.
3. When the current meter interface sensor detects the current value according to the configured time or by pressing the button, it sends the data immediately.

Wireless Current Meter Interface (R718KA2)
It can also be applied to the following scenarios:

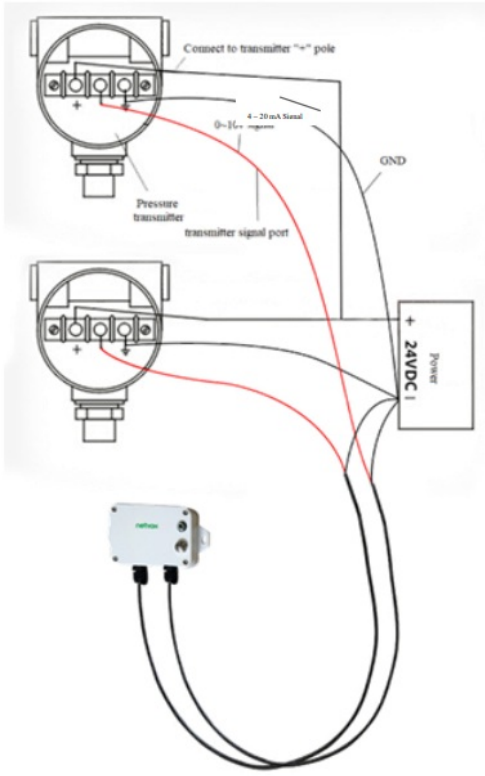
- Pressure transmitter
- Differential pressure transmitter
- Level transmitter
- Flow transmitter

  The transmitter with 4-20mA output signal



2-wire System Example Diagram

(for wiring reference)



3-wire System Example Diagram

(for wiring reference)

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:

7.1 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.

7.2 How to activate the battery
a. Connect a battery to a resistor in parallel
b. Keep the connection for 5~8 minutes
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:

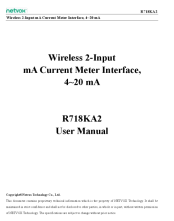
- Keep the device dry. Rain, moisture and various liquids or water may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This way can damage its detachable parts and electronic components.
- Do not 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

	netvox R718KA2 Wireless 2 Input mA Current Meter Interface 4-20mA [pdf] User Manual R718KA2 Wireless 2 Input mA Current Meter Interface 4 20mA, R718KA2, Wireless 2 Input mA Current Meter Interface 4 20mA, Current Meter Interface 4 20mA, Meter Interface 4 20mA

References

- Lora Command Resolver
- ÉÔºò¡£¡£¡£