netvox™

Wireless Three-phase Current Detection Sensor

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R718N3

User Manual

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1. Introduction

The R718N3 is a three-phase current sensing device for Netvox Class A type devices based on the LoRaWAN open protocol and is compatible with the LoRaWAN protocol.

(1) Check the AC three-phase current according to reporting time configuration.

(2) Press the key to detect the current three-phase current, and report a command of three-phase current value report.

(3) The R718N3 is available in a variety of sub-models as below.

R718N3 Wireless 3-Phase Current Meter with 3 x 50A Solid-core CT
R718N37 Wireless 3-Phase Current Meter with 3 x 75A Split-core CT
R718N315 Wireless 3-Phase Current Meter with 3 x 150A Split-core CT
R718N325 Wireless 3-Phase Current Meter with 3 x 250A Split-core CT
R718N363 Wireless 3-Phase Current Meter with 3 x 630A Split-core CT

LoRa Wireless Technology:

LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, 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.

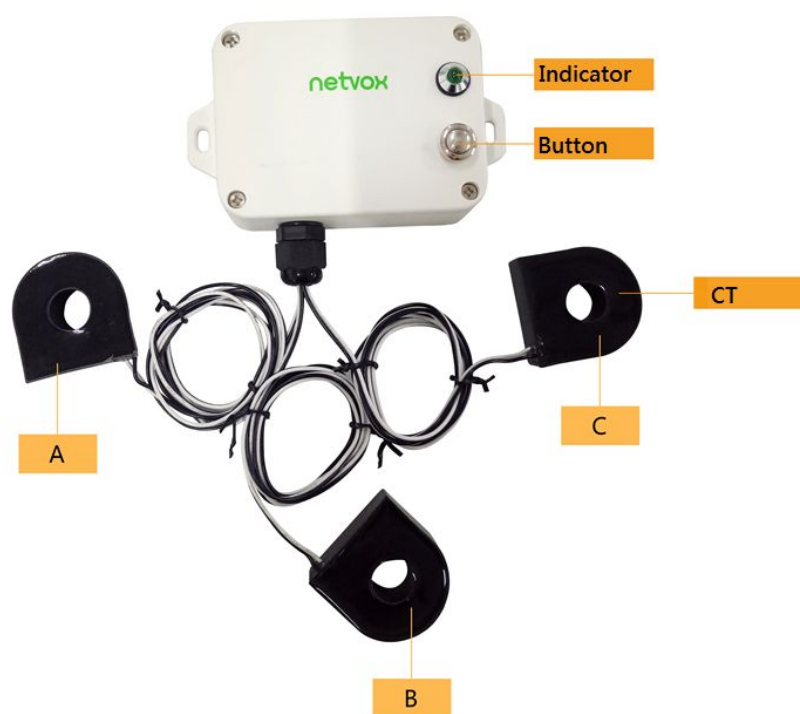## 2. Appearance

Fig.1   R718N3 (Solid-core CT) Appearance

Fig.2   R718N37 (Split-core CT) Appearance

3. Main Features

- Compatible with LoRaWAN protocol.
- Powered by 2 x ER14505 3.6V Lithium battery
- Easy set up and installation
- Detect three phase current value

4.Set up Instruction

On/Off

Power on	Insert batteries. (users may need a flat blade 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 till green indicator flashes for 20 times.
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 1st -5th second 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. 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 The green indicator remains off: fail

Fail to join the network
(when the device is on)
	First two mins: wake up every 15 seconds to send request.
	After two mins: enter sleeping mode and wake up every 15 minutes to send request.
	Note: Suggest to remove batteries if the device is not used to save power.
	     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 reportchange exceeds setting value or the state changes: send a data report according to Min Interval.
The device is on but not in the network	First two mins: wake up every 15 seconds to send request. After two mins: enter sleeping mode and wake up every 15 minutes to send request. Note: Suggest to remove batteries if the device is not used. Suggest to check device verification on gateway.

Low Voltage Warning

Low Voltage	3.2V

5. Data Report

When the device is turned on, it will immediately send a version package and a cluster report which includes battery voltage and three-phase current values.
Data will be reported once per hour by default setting.
Maximum time: 3600 seconds
Minimum time: 3600 seconds (the device will check the current voltage value per Min. interval)
Default reportchange:
batteryvoltagechange ---- 0x01(0.1V)

Note:
Max Interval = 60min, Min Interval = 60min by default (this can be configured according to the customer's inquiry)
Data sending cycle is programmed by real configuration before shipment.
The interval between two reports must be Min. Interval.

Three-phase current detection:
When the button is pressed, a report is sent immediately to return the current three-phase current value.
Or it detects and returns current information when the configuration time is due.

The reported data is decoded by the Netvox LoRaWAN Application Command document and http://www.netvox.com.cn: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 30~65535	Any number between Min.~65535	Can not be 0.	Report per Min. Interval	Report per Max. Interval

Report configuration command example:

ConfigReportReq	R718N3	0x01	0x4A	MinTime(2bytes Unit:s)	MaxTime(2bytes Unit:s)	BatteryChange(1byte Unit:0.1v)	Reserved (4Bytes,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)	Reserved (4Bytes,Fixed 0x00)

Configure device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v

    Downlink: 014A003C003C0100000000

    The device returns:

        814A000000000000000000 (Configuration succeeded)

        814A010000000000000000 (Configuration failed)

Read device configuration parameters

Downlink: 024A000000000000000000

The device returns:

824A003C003C0100000000 (current device configuration parameters)

Current report payload example:

R718N3	0x4A	0x01	Battery(1 Byte, unit:0.1V)	Current1(2Bytes,Unit:1ma)	Current2(2Bytes,Unit:1ma)	Current3(2Bytes,Unit:1ma)	Mulitplier1(1Byte),the real current1 should convert with Current* Mulitplier
		0x02	Battery(1 Byte, unit:0.1V)	Mulitplier2(1Byte), the real current2 should convert with Current* Mulitplier	Mulitplier3(1Byte),the real current3 should convert with Current* Mulitplier	Reserved(5Bytes,fixed 0x00)	

Current data #1: 014A012400000000000001

Current data #2: 014A022401010000000000

Current1 = Current1 * Mulitplier1

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 BtteryVoltageChange value.

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

6. 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. When installing the current transformer, separate the fire and neutral wires of the three-phase electric power, and take out the fire wire through current transformer and start the measurement according to the wiring below:
(Current direction, K-->L)

Solid Core CT   Split Core CT
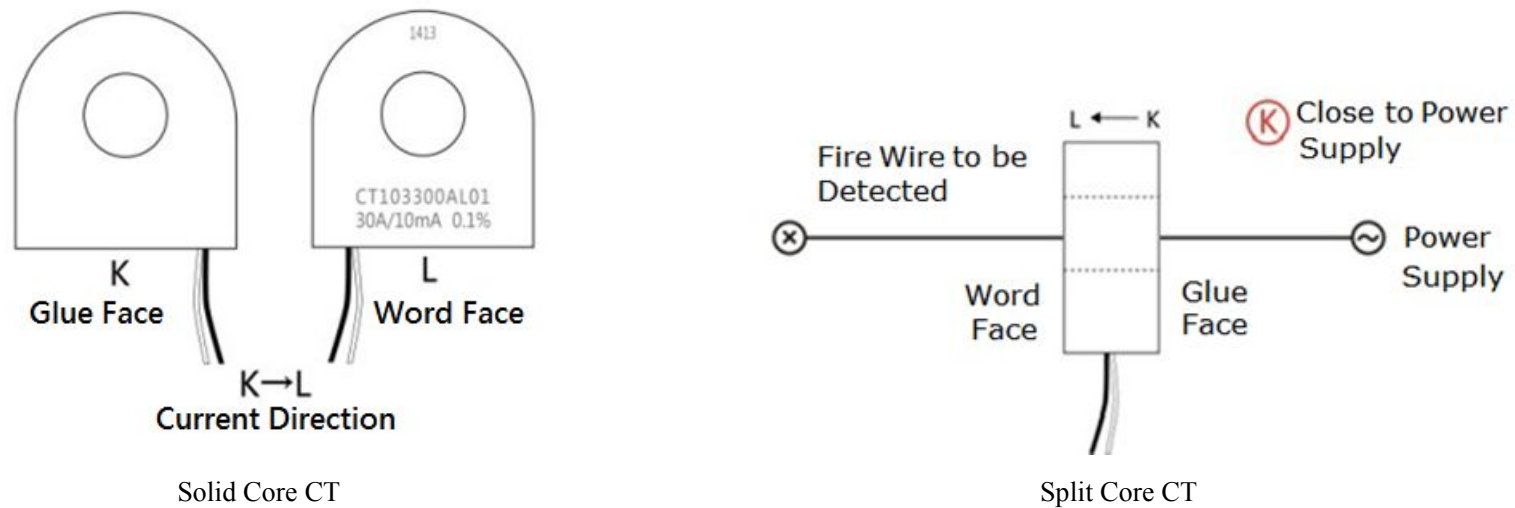
7. Important Maintenance Instruction

Your device is a product of superior design and craftsmanship and should be used with care. The following suggestions will help you use the warranty service effectively.
• Keep the equipment dry. Rain, moisture, and various liquids or moisture 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 can damage its detachable parts and electronic components.
• Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
• Do not store in a 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. Rough handling of equipment can destroy internal circuit boards and delicate structures.
• Do not wash with strong chemicals, detergents or strong detergents.
• Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.
• Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.
All of the above suggestions apply equally to your device, battery and accessories. If any device is not working properly.
Please take it to the nearest authorized service facility for repair.