

# **Wireless RS485 Adapter**

## **R718PC User Manual**

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# 1. Introduction

R718PC is a Class C type device based on the LoRaWAN open protocol of Netvox and is compatible with the LoRaWAN protocol. R718PC supports serial port transparent transmission. It can send the read commands to other sensors supporting RS-485 protocol according to the configured period, and the information returned by the other sensors will be directly reported to the gateway. It supports up to 128 bytes of data (depending on the current communication rate).The serial port transparent transmission only supports RS-485 protocol.

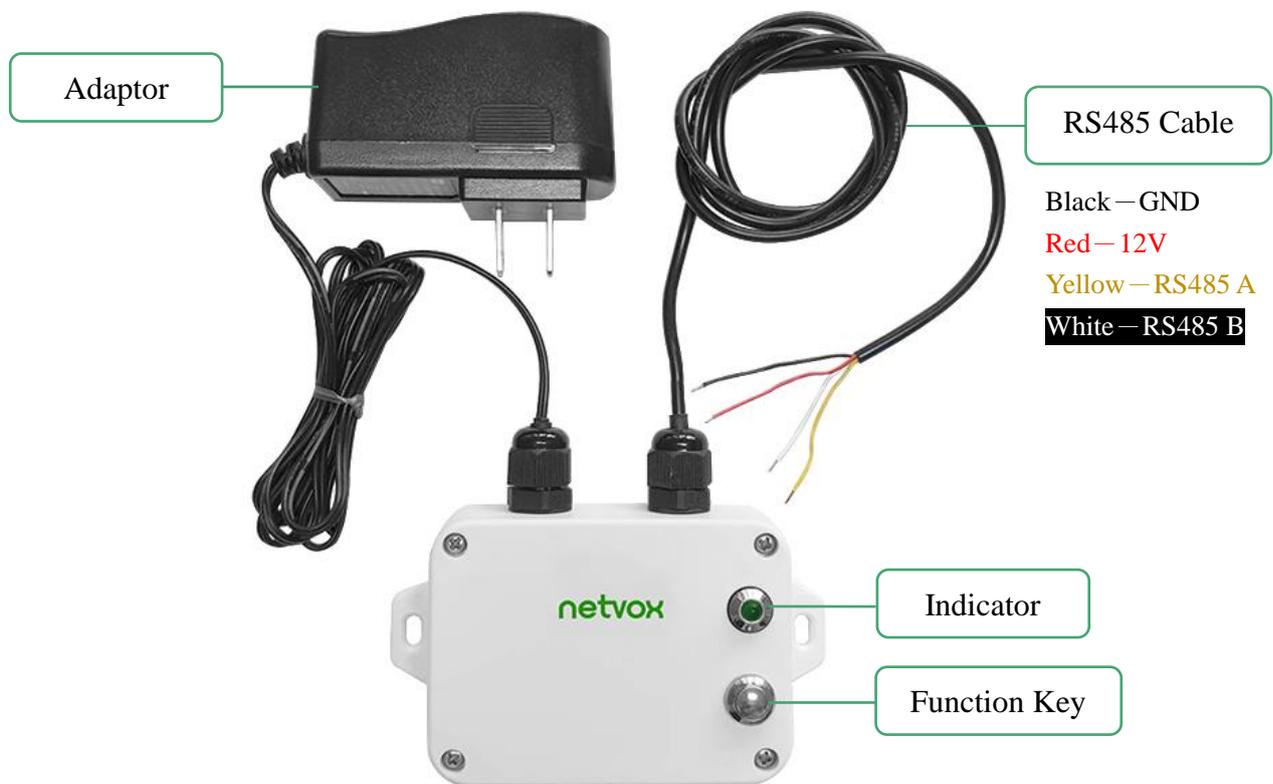
## **LoRa Wireless Technology**

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



## 3. Features

- Compatible with LoRaWAN
- DC 12V adapter power supply
- Simple operation and setting
- RS485 transparent transmission

## 4. Set Up Instructions

### On/Off

Power On	DC 12V adaptor power supply
Turn On	DC12V adaptor power supply, the green indicator flashing once means turn on successfully.
Reset to Factory Setting	Press and hold the function key for 5 seconds till green indicator flashes 20 times.
Power Off	Remove power
Note	<ol style="list-style-type: none"> <li>1. In the first 5 seconds after power on, the device will be in engineering test mode.</li> <li>2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.</li> </ol>

### Network Joining

Never joined the network	<p><u>Turn on the device to search the network.</u></p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Had joined the network (Not reset to factory setting)	<p><u>Turn on the device to search the previous network.</u></p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Fail to join the network	Please check the device verification information on the gateway or consult your platform server provider.

### Function Key

Press and hold for 5 seconds	<p><u>Restore to factory setting / Turn off</u></p> <p>The green indicator flashes for 20 times: success</p> <p>The green indicator remains off: fail</p>
Press once	<p>The device is in the network: Send recently received data (SensorRawCmdIndication), 87(CmdID)+ReceiveData</p> <p>The device is not in the network: the green indicator remains off</p>

## Baud Rate Configuration

Baud Rate Default Value	9600
Configuration Method	Deliver instructions through LORANWAN
Baud Rate Option	<b>00</b> Baudrate = 115200; <b>01</b> Baudrate = 57600; <b>02</b> Baudrate = 38400; <b>03</b> Baudrate = 28800; <b>04</b> Baudrate = 19200; <b>05</b> Baudrate = 9600; <b>06</b> Baudrate = 4800; <b>07</b> Baudrate = 2400

## 5. Data Report

The device will send a version package Report immediately after powered on.

The device has no operation before any configuration is done.

The device sends instructions through LORAWAN to configure the data that needs to be sent through RS485, and it reports the data that RS485 receives to the gateway at the same time.

The device sends instructions through LORAWAN to configure the time to periodically send the data.

When RS485 interface of R718PC receives the serial port data from the RS485 device that it is connected to, it will actively report the received data to the gateway in the format of 87+ReceiveData or 0x8E+MatchReturnRawCmd.

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver <http://cmddoc.netvoxcloud.com/cmddoc> 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 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)

#### Tips

##### 1. Battery Voltage:

If the battery is equal to 0x00, it means that the device is powered by a DC power supply.

##### 2. Version Packet:

When Report Type=0x00 is the version packet, such as 0172000B04202307100000, the firmware version is 2023.07.10.

##### 3. Data Packet:

When Report Type=0x01 is the data packet.

## 5.2 Period Configuration

Fport:0x0A

Description	Device	CmdID	Netvox PayLoad Data
SetPollSensorPeriodReq	R718PC	0x03	Period (2Byte, Unit: 1s)
SetPollSensorPeriodRsp		0x83	Status (0x00_success)
GetPollSensorPeriodReq		0x04	
GetPollSensorPeriodRsp		0x84	Period (2Byte, Unit: 1s)

\* Period=0, disable polling

(1) Configure Period as 30 seconds (0x001E)

Downlink: 03001E

Response: 8300 (configuration succeed)

8301 (configuration fail)

(2) Read parameter

Downlink: 04

Response: 84001E (current device parameters)

### 5.3 RawCmd Configuration

Fport:0x0A

Description	Device	CmdID	NetvoxPayLoadData
SetPollSensorRawCmdReq	R718PC	0x05	SensorRawCmd (Var bytes, according sensor datasheet)
SetPollSensorRawCmdRsp		0x85	Status (0x00_success)
GetPollSensorRawCmdReq		0x06	
GetPollSensorRawCmdRsp		0x86	SensorRawCmd (Var bytes, according sensor datasheet)

#### Configure SensorRawCmd

Note: The actual commands should be set based on the protocol of the sensor. The below format are for reference only.

Address Code	Function Code	Start Address	Data Length	CRC_L	CRC_H
0x01	0x03	0x00, 0x00	0x00, 0x03	0x05	0xCB

(1) Configuring the device SensorRawCmd

Downlink: 0501030000000305CB

Response: 8500 (configuration succeed)

8501 (configuration fail)

(2) Read the device SensorRawCmd

Downlink: 06

Device return: 8601030000000305CB (device current SensorRawCmd)

## 5.4 BaudRate Configuration

Fport:0x0A

Description	Device	CmdID	NetvoxPayLoadData
SetBaudRateReq	R718PC	0x08	BaudRateType (1Byte) 00—115200 bps, 01—57600 bps, 02—38400 bps, 03—28800 bps, 04—19200 bps, 05—9600 bps, 06—4800 bps, 07—2400 bps
SetBaudRateRsp		0x88	Status (0x00_success)
GetBaudRateReq		0x09	
GetBaudRateRsp		0x89	BaudRateType (1Byte) 00—115200 bps, 01—57600 bps, 02—38400 bps, 03—28800 bps, 04—19200 bps, 05—9600 bps, 06—4800 bps, 07—2400 bps

(1) Configuring Baud Rate as 115200

Downlink: 0800

Response: 8800 (configuration succeed)

8801 (configuration fail)

(2) Read the device Baud Rate parameter

Downlink: 09

Response: 8900 (device current parameter)

## 5.5 RS485 FilterTime Configuration

Fport:0x0A

Description	Device	CmdID	NetvoxPayLoadData
SetFilterTimeReq	R718PC	0x0A	FilterTime (2Bytes, Unit:1s)
SetFilterTimeRsp		0x8A	Status (0x00_success)
GetFilterTimeReq		0x0B	
GetFilterTimeRsp		0x8B	FilterTime (2Bytes, Unit:1s)

(1) Configure RS485 FilterTime as 30 seconds (0x001E)

Downlink: 0A001E

Response: 8A00 (configuration succeed)

8A01 (configuration fail)

(2) Read FilterTime

Downlink: 0B

Response: 8B001E (device current parameter)

## 5.6 RS485 MatchReturnRawCmd Configuration

Fport:0x0A

Description	Device	CmdID	NetvoxPayLoadData		
SetMatchReturnRawCmdReq	R718PC	0x0C	MatchReturnCmd Len (1byte)	MatchReturnStartIndex ndex (1byte)	MatchReturnEndIndex (1byte)
SetMatchReturnRawCmdRsp		0x8C	Status (0x00_success)		
GetMatchReturnRawCmdReq		0x0D			
GetMatchReturnRawCmdRsp		0x8D	MatchReturnCmd Len (1byte)	MatchReturnStartIndex ndex (1byte)	MatchReturnEndIndex (1byte)

Filter and send the 2<sup>nd</sup> and 3<sup>rd</sup> bytes of the original 10-byte command.

When the device receives 10 bytes of RS485 commands, LoRaWan will send the downlink of 0x8E + 2<sup>nd</sup> and 3<sup>rd</sup> bytes. The original commands would not be send as the downlink of 0x87 + original command.

(1) Downlink: 0C0A0102

Response: 8C00 (configuration succeed)

8C01 (configuration fail)

(2) Read GetMatchReturnRawCmdReq

Downlink: 0D

Response: 8D0A0102 (device current parameter)

## 5.7 StopBitParity Configuration

Fport:0x0A

Description	Device	CmdID	NetvoxPayLoadData	
SetStopBitParityReq	R718PC	0x90	Parity (1byte, 0x00_None, 0x01_EVEN, 0x02_ODD)	Stopbits (1Byte, 0x00_1, 0x01_1.5, 0x02_2)
SetStopBitParityRsp		0x91	Status (0x00_success)	
GetStopBitParityReq		0x92		
GetStopBitParityRsp		0x93	Parity (1byte, 0x00_None, 0x01_EVEN, 0x02_ODD)	Stopbits (1Byte, 0x00_1, 0x01_1.5, 0x02_2)

(1) Configure Stopbits as 2 (0x02)

Downlink: 900102

Response: 9100 (configuration succeed)

9101 (configuration fail)

(2) Read Stopbits

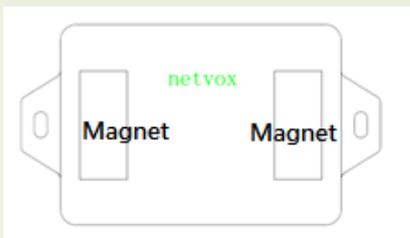
Downlink: 92

Response: 930102

## 6. Installation

1. Wireless RS485 Adapter (R718PC) has the built-in magnet. When installation, it can be attached to the surface of an object with iron conveniently and quickly. In order to make the device installation more secure, use screws (purchased) to fix the device to the 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. The colors of wiring of RS485 serial device are as follows:

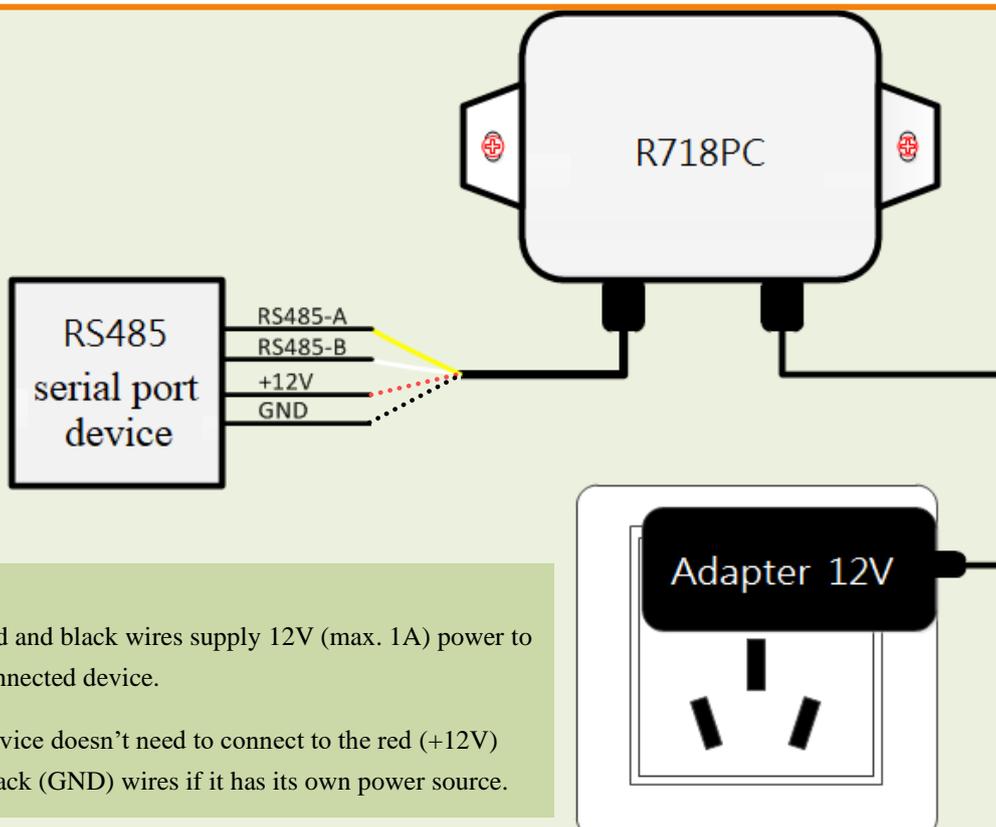
Yellow: RS485-A  
White: RS485-B  
Red: +12V  
Black: GND

3. Wireless RS485 Adapter (R718PC) supports serial port transparent transmission. It can send commands to or read data of the other connected RS485 device according to the configured period. The read information will be directly reported to the gateway.

Wireless RS485 Adapter (R718PC) can be applied to the device with RS485 serial port.

For example:

- Central air conditioning
- Floor heating
- Projector
- RS485 serial port sensor



Note:

- (1) The red and black wires supply 12V (max. 1A) power to the connected device.
- (2) The device doesn't need to connect to the red (+12V) and black (GND) wires if it has its own power source.

## 7. Maintenance Instructions

Kindly pay attention to the following 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 excessively hot 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.