

# **PM2.5/Temperature/Humidity Sensor**

## **User Manual**

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## 1. Introduction

Netvox RA0716, mainly used to detect the temperature and humidity of the indoor air, the communication method meets LoRa protocol standard. RA0716 carrying PM2.5 sensor, can be used to obtain the suspended particulates concentration per unit volume in the air.

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 RA0716 Appearance

## 3. Main Features

- Compatible with LoRaWAN
- DC12V power supply
- Report temperature/humidity/PM2.5
- Easy set up and installation

## 4. Set up Instruction

### 4.1 Power on and Join Into Lora Network

- (1) Power on and the device will automatically search the network to join.
- (2) If the device had never joined in any network or at factory setting mode, after powering on, the indicator is on for 5 seconds to show that it joins in the network.
- (3) If the device had joined in the network and not at factory setting mode, after powering on, the indicator is on for 5 seconds to show that it's in the network.

## 4.2 Function Key

- (1) Press function key and the LED flashes 5 times slowly. The device will send report to gateway.
- (2) Press and hold function key for 5 seconds to restore to factory setting. After restoring to factory setting successfully, the green indicator flashes quickly 20 times.

## 4.3 Activate Device

Press function key to activate the device. If it is in the network, the LED flashes 5 times slowly.

## 4.4 Data Report

When the device is turned on, it will immediately send a version package and the frequency of sending version package is 24hr per time. 10 seconds after powering on, RA0716 will send a data report of temperature/humidity/PM2.5.

The default report configuration:

```
ReportMaxTime: 180s;  
ReportMinTime: 30s;  
ReportChange: 0;
```

RA047A sends the report package according to the period of ReportMaxTime. ReportMinTime is the interval between each report package (because there are multiple types of data to be sent, we use ReportMinTime to separate each data.)

Note:  $\text{ReportMaxTime} > (5 * \text{ReportMinTime} + 10)$  Unit: second

The RA0716 device also supports Cayenne's TxPeriod cycle configuration instructions. RA0716 can also be reported in terms of the value of the cycle time TxPeriod; whether the specific time reporting period is ReportMaxTime or TxPeriod, depending on the cycle time of last configuration;

## 5. Restore to Factory Setting

RA0716 saves data (the function is activated by default, users can also turn it off via ResumeNetOnOff instruction, and it can be achieved. Re-write and power on device each time; it will re-join the network) including network key information, configuration information, etc. To restore to factory setting, users need to execute below operations.

1. Press and hold function key for 5 seconds till the LED indicator flashes and then release; LED flashes quickly for 20 times.
2. Restart RA0716 to join a new LoRa network.

Note: restore to factory settings: ACK is off by default; ADR default is on by default.

## 6. Important Maintenance Instruction

- This device is NOT truly waterproof/ resistant and is for indoor use.
- Please keep the device in a dry place. Precipitation, humidity, and all types of liquids or moisture can contain minerals that corrode electronic circuits. In cases of accidental liquid spills to a device, please leave the device dry properly before storing or using.
- Do not use or store the device in dusty or dirty areas.
- Do not use or store the device in extremely hot temperatures. High temperatures may damage the device or battery.
- Do not use or store the device in extremely cold temperatures. When the device warms to its normal temperature, moisture can form inside the device and damage the device or battery.
- Do not drop, knock, or shake the device. Rough handling would break it.
- Do not use strong chemicals or washing to clean the device.
- Do not paint the device. Paint would cause improper operation.

Handle your device, battery, and accessories with care. The suggestions above help you keep your device operational. For damaged device, please contact the authorized service center in your area.