Wireless Outdoor PM2.5/Temperature/Humidity Sensor

Wireless Outdoor PM2.5/Temperature/Humidity Sensor RA0716 Data Sheet

Wireless Sensor Network Based on LoRa Technology

LoRa Alliance Certified™

RA0716

ISO 9001 SGS UKAS QUALITY MANAGEMENT 005 LoRa Alliance Member™ zigbee alliance member

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General Description

RA0716 with temperature and humidity sensor, can detect and send the temperature and humidity data of the environment, is a wireless communication method, in line with the LoRa protocol standard. RA0716 with PM2.5 dust sensor can be used to obtain the concentration of suspended particulates in air per unit volume.

Principle of Operation

RA0716 has built-in air temperature and humidity sensor and dust sensor. The air temperature and humidity sensor SHT-30 communicates with the module through I2C, and the dust sensor communicates with the LoRa module through the UART serial port.

Example Applications

● Smart home
● Atmospheric detection
● other

Features of NETVOX Sensors

• Wireless range of 10 km [1]
• LoRaWAN™ Class A compatible
• Frequency Hopping Spread Spectrum (FHSS)
• Improved interference immunity
• Improved power management for longer battery life
• Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
• Battery Life[2]:
        Please refer to web: http://www.netvox.com.tw/electric/electric_calc.html
        At this website, users can find battery life time for varier models at different configurations.
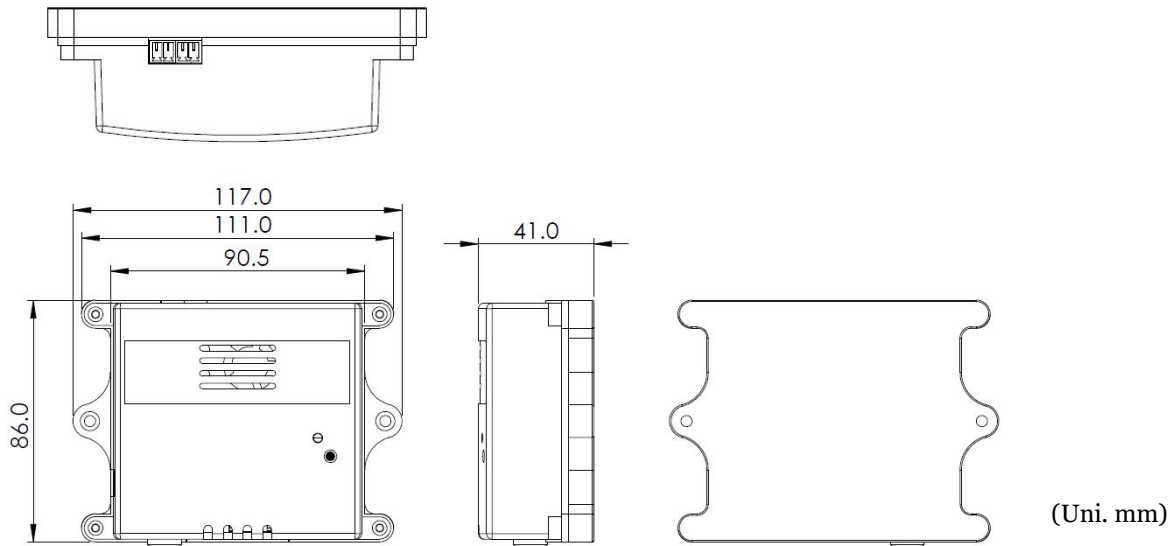• Over-the-air updates (future)
• Third-Party online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email (optional)
• Available third-party platform: Actility/ThingPark, TTN, MyDevices/Cayenne

*1. Actual range may vary depending on environment.
*2. Battery life is determined by sensor reporting frequency and other variables.

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Technical Specifications

(Uni. mm)

Electric

Power Supply Power Supply	DC Power Supply, DC12V/1A
Operating current 1	40mA (no RF signal emission)
Operating current 2	80mA (with RF signal emission)

Frequency

TX Power	19dBm±1dBm
Rx Sensitivity	-136dBm (LoRa，Spreading Factor=12，Bit Rate=293bps) -121dBm (FSK,Frequency deviation=5kHz, Bit Rate=1.2kbps)
Antenna Type	Build-in antenna
Communication Range	10 km (line-of-sight, the actual transmission distance depends on the environment)
Data Transfer Rate	0.3kbps～50kbps
Spread Technique	LoRa/FSK
Available Frequency	EU863-870，US902-928，AU915-928， KR920-923，AS923，CN470-510 Configured before shipment

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PM2.5 particle concentration sensor

Working voltage	5VDC
Operating current	100mA (typical)
Particle measurement range	0.3~1.0; 1.0~2.5um
Particle count efficiency	50%@0.3um, 98%@≥0.5um
Particle mass concentration effective range (PM2.5 standard value)	0~500 μg/m3
Particle mass concentration resolution	1ug/m3
Particle mass concentration consistency (PM2.5 standard value)	±10%@100-500ug/m3 ±10ug/m3@0-100ug/m3
Comprehensive response time	≤10s
Service life and product consistency	The average fault-free time of the PMS7003M PM2.5 particle concentration sensor are 3 years. The annual concentration is more than 50ug/m^3 for more than 50% of the year, or the concentration is over 500ug/m3 for more than 20% of the year. The consistency of the sensor will decrease, and the data may be high due to internal ash.

SHT-30 temperature and humidity sensor

Working voltage	+3.3VDC
Temperature measurement range	-20°C-55°C
Temperature measurement accuracy	+/-0.8°C
Humidity measurement range	0%RH-100%RH
Humidity measurement accuracy	+/-4%RH @25°C

Physical

Dimension	111mm*86mm*41mm
Working Temp	-20°C ～ +55°C
Storage Temp	-40°C ～ +85°C
Humidity Detecting Range	＜90%RH

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