Wireless Cigarette Smoke, Vaping, and Bullying Alarm Sensor

Wireless Sensor Network Based on LoRa Technology

RA02G Datasheet

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Introduction

RA02G is an indoor sensor that detects smoking, noise, and anti-tamper. New functions such as power outage detection, sensitivity adjustment, audio alert customization, and PoE splitter connection are now added. The new RA02G makes indoor monitoring easier and more flexible than you ever imagined.

Features

- Power supplied by 12V power adapter or PoE splitter
- Battery backup power (2* AAA 1.5V batteries)
- Highly accurate and stable smoking sensor
- Sensitivity adjustment for smoking and noise detection
- Upload audio alerts through Type-C cable
- IP30
- SX1262 wireless communication module
- Compatible with LoRaWANTM Class C
- Frequency hopping spread spectrum
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne

Applications

- Residential buildings, hotels, schools, hospitals, banks, office buildings, libraries, museums, meeting rooms, airports, and stations
- Toilets, elevators, and storage rooms

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Dimensions
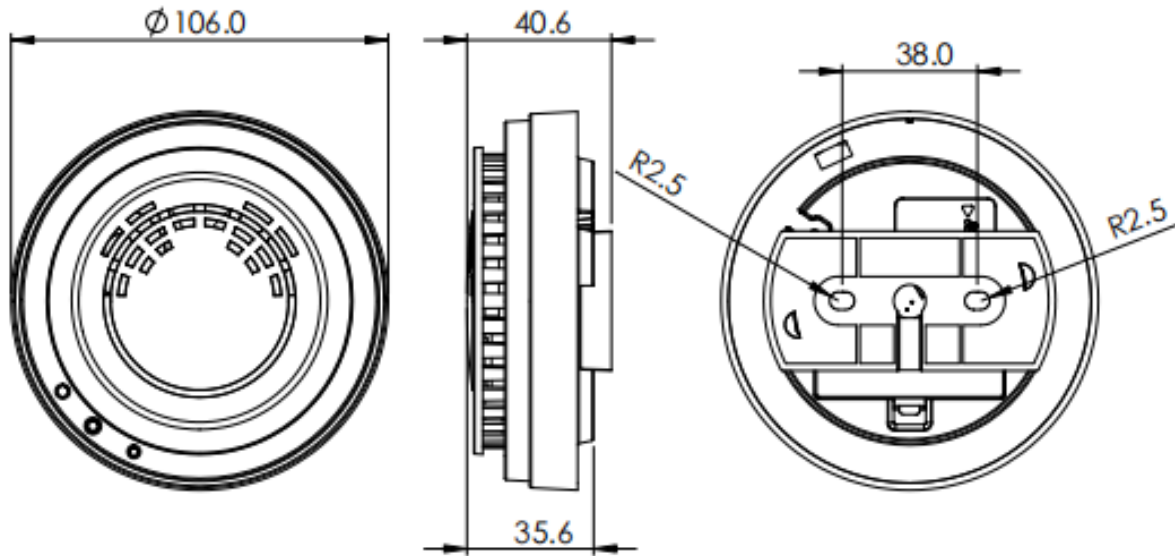
Electrical Specifications

Power Supply	Power adapter (input: 100–240VAC, 50/60HZ; output: DC 12V/1A)
Battery Backup	2* 1.5V AAA alkaline batteries
Power Consumption	Monitoring: <100mA; Sounding alarm: <200mA
Receiving Current	11mA @3.3V
Transmitting Current	120mA @3.3V

Note: The electrical specifications may vary due to the power supply voltage.

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Smoke Sensor

Operating Voltage	5VDC
Operating Current	100mA (typical value)
Comprehensive Response Time	≤10 seconds
Operating Temperature	-10 to +60°C
Storage Temperature	-40 to +80°C
Storage Humidity	0 to 99%
Communication Protocol	UART

Vibration Sensor

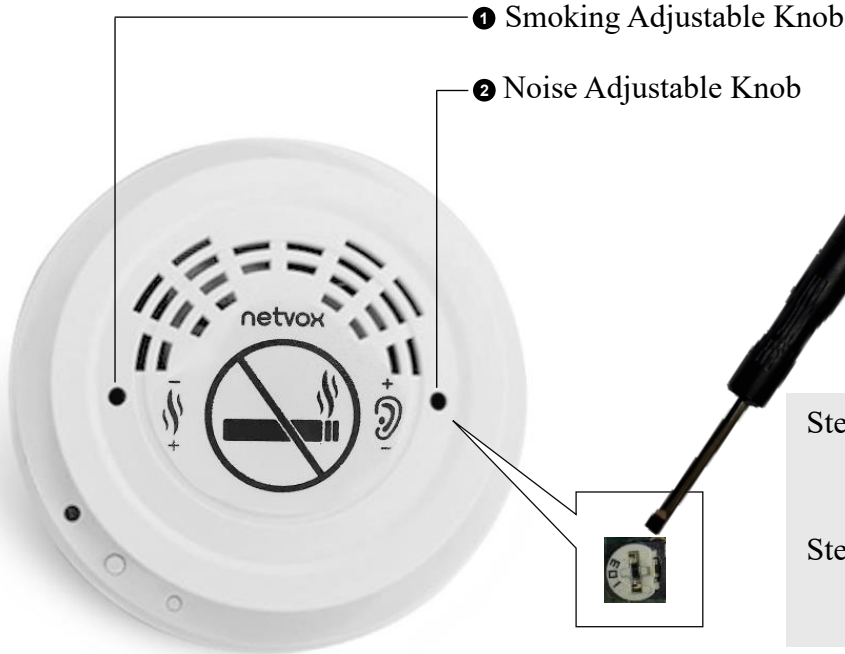| Type	Omnidirectional ball switch
Voltage	<6V
Current	2uA to 10mA
Insulation Resistance	>10MΩ
Trigger Rate	100% (amplitude > 1 mm, frequency > 20 Hz)
Trigger Frequency	>50Hz

Noise Sensor

Type	Condenser microphone
Direction	Omnidirectional
Sensitivity	-36 ± 3db
Frequency	20 to 10000Hz
Current Consumption (Max.)	0.5mA
Operating Temperature	-20 to +70 °C
Dimensions	Ø9.7 x 6.5 mm

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Sensitivity

❶ Smoking Adjustable Knob

❷ Noise Adjustable Knob

Step 1. Use a small screwdriver and poke in the hole.

Step 2. Slowly turn clockwise to lower the sensitivity.
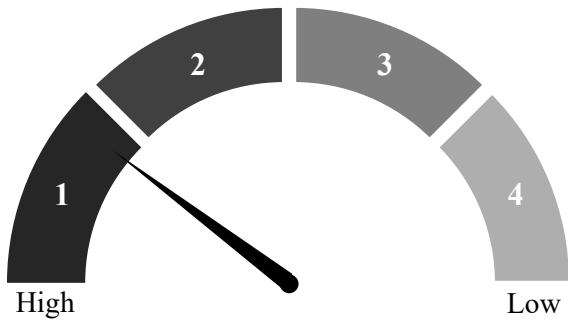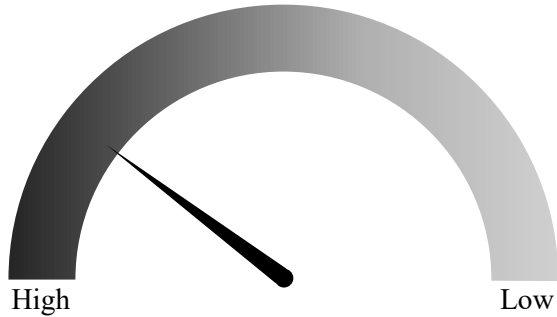
❶ Smoking Sensor

There are 4 levels of sensitivity for the smoking sensor. Each level has a 45° angle. Level 1 stands for the highest sensitivity; level 4 is the lowest. When a knob is turned clockwise, the sensitivity is decreased.

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❷ Noise Sensor

Turn clockwise to decrease the sensitivity.

High   Low

▼ Testing Report

The data is obtained when the horizontal distance between the noise and the sensor is 1 meter.

Noise Type	Testing Result (highest sensitivity)	Testing Result (lowest sensitivity)
100Hz	90 dB	109 dB
1KHz	100 dB	>110 dB
10KHz	103 dB	>110 dB
Knocking Sound	73 dB	92 dB
Music	85 dB	>110 dB

e.g. A noise of 100Hz is made 1 meter away from the sensor. When the sensitivity is set to the highest, the decibel value that it can detect is 90 dB.

Alarm Volume

The decibel of the default alarm sound is tested when the horizontal distance of RA02G and the decibel meter is 1 meter.

Alarm	dB
Smoking	53db
Noise	62db
Vibration	62db

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Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
TX Power	US915 20dbm AS923 16dbm AU915 20dbm CN470 19.15dbm EU868 16dbm KR920 14dbm IN865 20dbm
Rx Sensitivity	-136dBm (LoRa, Spreading Factor = 12, Bit Rate = 293bps) -121dBm (FSK, Frequency deviation = 5kHz, Bit Rat e=1.2kbps)
Antenna Type	Build-in antenna
Communication Range	10 km (line of sight) Note: The communication distance depends on the environment.
Data Transfer Rate	LoRa: 0.3kbps – 50kbps FSK: 1.2kbps – 300kbps Note: One modulation is required.
Modulation	LoRa / FSK
Available Frequency	EU863-870, US902-928, AU915-928, KR920-923, AS923-1, AS923-2, AS923-3, IN865-867, CN470-510 Note: Configured before shipment

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Physical Properties

Dimensions	Ø106 mm x 40.6 mm
Length of Adapter Cable	1.5m
Ambient Temperature Range	-10°C to +55°C
Ambient Humidity Range	<90%RH (no condensation)
Mounting	Screws