VAPELESS Vaping Gas Mix Sensor
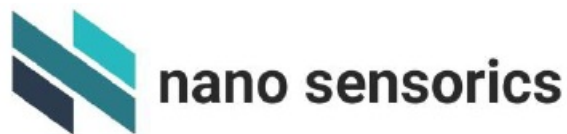
nano sensorics VAPELESS Vaping Gas Mix Sensor Instruction Manual

Contents

nano sensorics VAPELESS Vaping Gas Mix Sensor

Specifications:

- **Product Name**: VAPELESS Gas Mix Sensor
- **Model:** V3.6
- **Published Date**: 2024-03-11
- **Manufacturer:** UAB Nano sensorics
- **Address**: Pakauns g. 70, LT-47243 Kaunas
- **Website**: **www.nanosensorics.com**
- **Email**: **info@nanosensorics.com**

Product Features:

- Indoor environment measuring capabilities
- Smart buildings integration
- Suitable for Schools, universities, Government buildings, Public buildings, Banks, Industrial facilities
- Indoor Vaping detection
- LoRaWAN communication technology
- Computational AI algorithm for accurate readings
- Integrated Indoor temperature and humidity sensors
- Configuration over the air for easy setup
- Pattern recognition technology for enhanced detection
- Auto self-calibration feature

Installation Instructions:

1. Install the VAPELESS sensor in the ceiling of the bathroom or room.
2. Remove the battery-enabling belts from the sensor grill before installation.
3. Connect the sensor to a 220/230 AC power supply after installation.

4. The reset button is located in the grill gap of the sensor for maintenance purposes.

5. After installation, push the reset button to start the connection process.

Usage Instructions

The VAPELESS sensor automatically attempts to connect to the LoRaWAN network when batteries are installed or the reset button is pushed. Follow the LED indicator status for successful connection:

1. Blinking/Flashing LED for 15 seconds – Attempting to connect

2. Solid LED for 3 seconds – Successfully connected

3. Dark LED – Connected to LoRaWAN network

Calibration and Maintenance:

The VAPELESS sensor comes factory-calibrated and is maintenance-free under normal indoor conditions. The e-vape gas recognition learning algorithm ensures accurate readings. The vape index value can be adjusted via downlink if needed. The sensor requires battery replacement as the only maintenance task.

FAQ:

- Q: Can the vape index threshold be changed?

  A: Yes, the default threshold value of 120-140 can be adjusted via downlink settings.
- Q: How often should the batteries be replaced?

  A: The VAPELESS sensor is maintenance-free except for battery replacement, which should be done when needed.
- Q: What happens if the sensor is disconnected from power?

  A: If disconnected from power, the vape index value sent will be 0.

OPERATION AND INSTALLATION MANUAL

Vaping gas mix sensor – VAPELESS
V3.6 Published on 2024-03-11

General information

The VAPELESS is advanced technology gas detection indoor sensor applied for the full sensing of the Vaping gases exhaust by the electronic cigarettes together with environment temperature and humidity. VAPELESS enclosed in a room sensor box and designed to be wall mounted. VAPELESS is powered 5V DC voltage and is enclosed with 3.6 V batteries for the feeding LoRaWAN infrastructure in the sensor. The data transmitted from the sensor is based on Class A LoRaWAN® wireless network. Sensor has sophisticated "Pattern Recognition" AI technology and detects any kind of Vaping gas mix of any kind of Vaping fluids and flavors, even with mixed drugs.

The main technical characteristics and benefits of VAPELESS sensor:

- Compatible with LoRaWAN® specification 1.0.3;
- Measures Vaping gas mix Index Points.
- Uses "Pattern recognition"

- Indoor use;
- Easy to use and deploy;
- Powered by batteries + power supply for the processing power of gas mix detection and recognition.
- Data transmission up to 10 km;
- Battery life is up to 10 years depending on settings and environmental and trigger conditions;

Markings
One the backside of the senor there will be label indicating sensor name, serial number, production date and QR code.

Applications

- Indoor environment measuring
- Smart buildings
- Schools, universities
- Government buildings
- Public buildings
- Banks
- Industrial facilities

Product Features

- Indoor Vaping detection
- LoRaWAN communication
- Computational AI algorithm
- Indoor temperature sensor
- Indoor humidity sensor
- Configuration over the air
- Pattern recognition technology
- Auto self-calibration

Installation and MAINTENANCE
VAPELESS sensor must be installed in celling of bathroom/room.
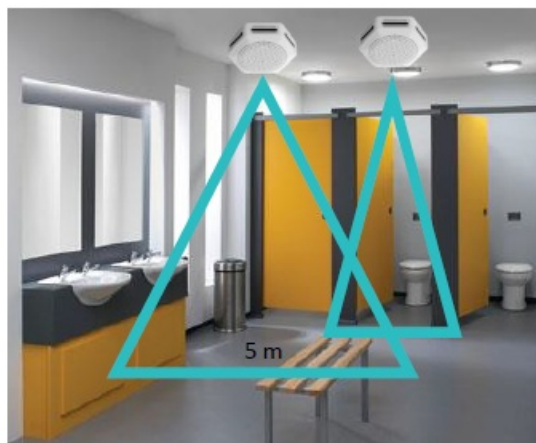
Sensor covers ~2 – 2.5 meter radius zone. Best sensor mounting height is up to 3 – 3.5 meters.

- Batteries are already inside the device, so before installation please pull out battery-enabling belts from sensor grill.
- Once the sensor installed, connect the sensor to 220/230 AC power supply.
- Reset button is placed in the grill gap of the sensor.

Push button and LED indicator description:

- Once batteries belt is removed, or reset button will be pushed in the sensor, it will automatically attempt to connect to the LoRaWAN network and the LED indicator will start to be blinking / flashing for 15 seconds.
- In case of the successful connection to the LoRaWAN network LED indicator will stay on for 3 seconds and LED indicator will stop flashing and go dark. This means sensor successfully connected to the LoRaWAN network.
- If the sensor will not connect on the initial try, it will attempt to connect to the LoRaWAN network after 10 seconds, then after 60 seconds, then after 10 minutes, then after 1 hour, then after 24 hours till successful connection to the LoRaWAN network.
- The sensor will restart by pressing the button on the sensor and it will attempt instantly to connect the LoRaWAN network.

The VAPELESS sensor has integrated a complex e-vape gas recognition learning algorithm. Vape index is measured in p.u. and it is from 0 to 500. The Vape Index value below index of 120-150 indicates the complex gas background which is normally under 120-150 index. That means no Vaping is occurring in the environment.
In the Vapeless, there is set default threshold value of the vape index which is 120-140 and can be changed via downlink.
When the e-vaping gas is detected (usually index is above 120-150) and vape index value exceeds the threshold value e.g. 120 the sensor sends data in intensive intervals in seconds: 1s, 30s, 30s, 30s, 60s, 60s, 60s*15 ,60s*30, 60s*30, 60s*60. If the threshold value is not exceeded than Vapeless sends the value one time per hour. That data sending cycle has reset of the sending intervals algorithm if still the index threshold value is exceeded after data sending intervals in a row 1, 30, 30, 30, 60, 60, when again measurement cycle starts from 1s, 30s, 30s, 30s, 60s, 60s, 60*15 ,60*30, 60*30, 60*60.
The baseline (120-140 or more of Index points) is set by the sensor installer after checking the natural background level in the room.
If the sensor is disconnected from 5 V DC power supply, then the vape index value is sent 0.
The VAPELESS sensor has to be installed reliably and with appropriate screws. The sensor must not be placed near any air vents windows, or door openings where constant fresh air flow is possible. The sensor is not suitable to be installed for outdoor locations. The sensor cannot be stored at dusty or dirty areas with excess operation and storage temperature. The sensor is not washable, paintable. The open holes of the case must not be blocked, glued with any material. 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. The VAPELESS sensor is maintenance-free except replacement of the batteries.

Calibration
Factory calibrates the VAPELESS sensor when it is produced. The VAPELESS sensor is maintenance-free in normal indoor environments due to the Nano sensorics integrated intelligent computational algorithms (AI) and holistic Automatic Baseline Correction (ABC) technology.

Regulations
UAB "Nano sensorics" is a company that develops and produce highly innovative sensors with integrated intelligent computational algorithms (AI) enabling extremely low power data transmission. Declaration of conformity Hereby, UAB „Nano sensors" declares that VAPELESS complies with the essential requirements and other relevant provisions of Directive CEM 2014/30/UE, BT 2014/35/UE, RED 2014/53/UE, CE, RoHS
This document contains proprietary technical information which is the property of UAB „Nano sensorics". All information must not to be disclosed through any means is prohibited unless expressed, written consent of

authorized representative of UAB „Nano sensorics" is obtained.

All information, including but not limited to the technical specifications are subject to change without notice. UAB „Nano sensorics" reserves all rights to change, modify, update software, firmware, and documentation without any obligation to notify any individual or entity. If any changes are made, the revised Information shall be posted on this website, manuals, and technical specifications. Please check the latest information posted herein to inform yourself of any changes. Nano sensorics and Nano sensorics. All products, UAB "Nano sensors" names, logos, trademarks are property of UAB „Nano sensorics

Sensor dimensions

H: 45 mm
W: 130 mm
L: 146 mm
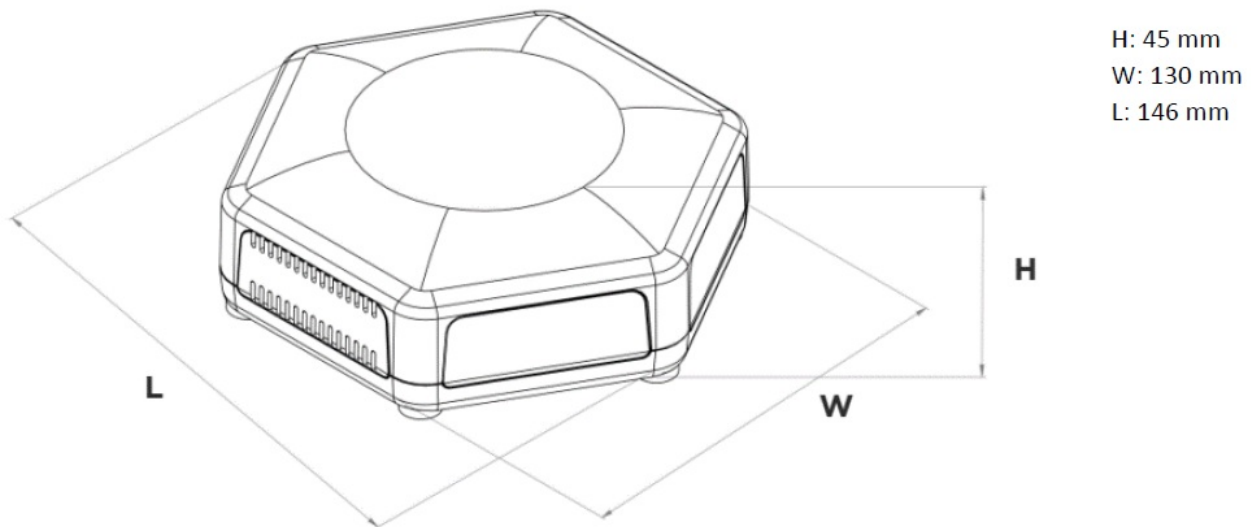
Important safety information

Read this manual before attempting to install the device. UAB „ Nano sensorics" will not accept responsibility for any damage or injury resulting from not following the instructions in this manual.

- The sensor is for indoor use;
- Do not disassemble, crush, puncture, short internal circuits;
- Remove batteries if the sensor is not used, discharged battery has to be removed from the battery sensor, in this case left batteries might leak and damage the sensor;
- Keep the battery or device dry and away from water or any liquid as it may cause a short circuit;
- Replace batteries only with the same or equivalent type recommended by the manufacturer;
- Discard used batteries according to the manufacturer's instructions;
- Do not bend, deform, shred, microwave, paint the sensors, or other hardware;
- Do not insert external material into any opening on the sensors;
- Disassembling or puncturing the battery (whether integrated or removable) can cause an explosion or fire;
- Do not dry the sensors or battery with an external heat source such as a microwave oven or hairdryer;
- Observe proper precautions when handling batteries. Batteries may leak or explode if improperly handled;
- The sensor is not applied as a metrological, commercial accounting purposes and UAB „Nano sensorics" will not be held liable for any damage which may result from inaccurate readings;
- Do not use any detergent or alcohol to clean the device;
- Clean gently with softly moisture cloth.

Waste disposal

The sensor disposed according to the Waste Electrical and Electronic Equipment Directive, (WEEE Directive) 2012/19/EU. The sensor and its individual parts has to be disposed according to local laws and regulations your product should be disposed of separately from household waste and industrial waste. When this product reaches its end of life, you have to bring the sensor, its components to the collection point designated by local authorities in order to protect the environment and to reduce waste through recycling. The battery must be disposed of separately.

Sensor technical details

Sensing characteristics	
Vaping Index	ranging from 1 to 500 Vaping Index points
Vaping repeatability	<±5 of Vaping Index points
Temperature	-10 to 70 °C
Temperature Accuracy	Max '+/-0.2°C@ 0°C 70°C Max '+/-0.3°C@ -10°C 0°C
Humidity	0 to 100 % RH (non-condensing)
Humidity Accuracy	"+/-1.8%RH @20°C, >90% "+/-3%RH @20°C
Preliminary mechanical specification	
Weight	Up to 230 g without batteries, up to 290 g with batteries
Dimensions	Up to 146 x 130 x 45 mm
Enclosure	Plastic
Storage Temperature	-40 to 70 °C
Sensor Power Supply	
Battery Type and voltage	2×3.6 V AA Lithium Battery ER14505 AA lithium batteries (3.6V2400mAh/section) And external 5 V power supply
Expected Battery Life	<10 years (Depending on configurations and environment)
Sensor logging Function	
Sampling Interval	Configurable via downlink configuration, NFC configuration is optional
Data Upload Interval	Configurable via downlink configuration, NFC configuration is optional
Radio / Wireless specification	
Wireless Technology	LoRaWAN® 1.0.3
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN Device Type	Class A End-device

Supported LoRaWAN® features	Default – OTAA , Optional – ABP, ADR, Adaptive Channel Setup
Supported LoRaWAN® regions	EU863 – 870 Optional: US902 – 928, EU863 – 870, AU915 – 928, EU433, RU864, IN865
Link Budget	137 dB (SF7) to 151 dB (SF12)
TX Power	14dBm±1dBm (Region specific)
Rx Sensitivity	132 dBm (LoRa, Spreading Factor=12, Bit Rate=293bps) -118 dBm (FSK, Frequency deviation=5kHz, Bit Rate=1.2kbps)
Communication range	10 km (line-of-sight, actual transmission distance depends on the environment)

Downlink messages

The downlink data messages must be sent via port No. 3 in the specific format. Minimal data size is 3 bytes.

Header	Payload length	Payload	
Settings ID	Settings data		
0xBA	1 byte	1 byte	0-n bytes

The downlink data messages are as follows:

Setting ID	Setting Length	Comment
0x1B	1 byte	LED control: • 0x00 – green LED OFF • 0x01 – green LED ON • 0x02 – green LED toggle for 5 s
0x1C	0 byte	Reset device

The examples of the downlink single messages:
BA021B01 – green LED ON.

- BA011C – Reset device.
- BA031D008C – last four numbers indicates the setting up threshold vaping threshold index value of the downlink where 8C (HEX is 140 DEC (HEX)

It is recommended to send downlink data messages each by each after setting actual operational validation. When downlink message is sent for the setting of the vaping threshold index value, the new index setting is deployed after time interval which is equal corresponds the data sending sequence in relation with time intervals. The forced

new vaping threshold index value setting deployment can be performed after resetting the sensor in order to shorten new vaping threshold index value deployment time duration.

In case if downlink message is sent to the sensor working on "ABP" mode, the vaping threshold index value change will take effect only after the time interval equal to the previous time interval.

The example to send the downlink message through the "Things Of The Network":

Uplink   **Downlink**

Schedule downlink

Insert Mode

◯ Replace downlink queue

⦿ Push to downlink queue (append)

FPort *

| 3 |

Payload type

⦿ Bytes   ◯ JSON

Payload

| BA 03 1D 00 8C |

The desired payload bytes of the downlink message

☐ Confirmed downlink

Schedule downlink

Documents / Resources

[nano sensorics VAPELESS Vaping Gas Mix Sensor](#) [pdf] Instruction Manual
VAPELESS Vaping Gas Mix Sensor, Vaping Gas Mix Sensor, Gas Mix Sensor, Mix Sensor, Sensor

References

- 🌐 **[Home - www.nanosensorics.com](#)**
- **[User Manual](#)**