AerNos™
AerIoT™

AerIoT **Single Gas**
Data Sheet
Product Category Code: AIOT1

Overview

AerNos® AerIoT™ is a nano gas sensor product that detects gases at the parts-per-billion to parts-per-million level. It is designed to be integrated into third party IoT connected devices.

AerIoT is a standard and configurable product based on specific application requirements of integration partners. AerIoT application specific systems deliver complete processing and results for plug-and-play integration into IoT devices.

AerNos AerIoT is a sensor module that includes a microprocessor, memory, integrated algorithms, self-calibration technology and communication ports.

Configured for one or more gas sensing capability, AerIoT can be configured to detect:

- One Gas | Multi-Gas
- One Gas with Multi-Gas Activation Option

This product category data sheet is for One Gas detection and reporting of concentration; from the low ppb to ppm levels for standard use for the listed specific gases.

AerN²S™ Technology
AerNos AerIoT is based on breakthrough AerNos AerN²S Technology. AerNos AerN²S Technology represents a significant evolution in the MEMS circuitry, hybrid-nanostructures, nanoelectronics, machine learning, algorithms and nanofabrication for high volume manufacturing of its gas sensor modules. These advances, which include specific techniques and processes to manipulate hybrid nanostructures at the atomic level, increase the selectivity and sensitivity of AerNos sensors at ambient temperatures.

AerNos AerIoT nano gas sensors use doped and manipulated nanomaterials to target specific gases and its unique sensor array design allows for simultaneous detection of multiple gases to parts-per-billion (ppb) levels.

Key Features

- Detects multiple gases simultaneously
- Sensitive to parts-per-billion (ppb) levels
- Low Power
- Self-Calibrating
- Real-Time & Quick Response
- Tiny Sensor Arrays
- Complete Plug and Play Sensor Module

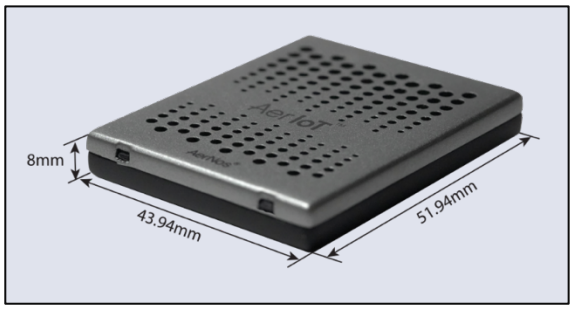
Application Usage

- Smart | Home, Building & City
- Indoor/Outdoor Air Quality
- Transportation – Indoor Cabin
- Gas & Oil Industry
- Automation & Control
- Industrial Health & Safety
- Other IoT Devices

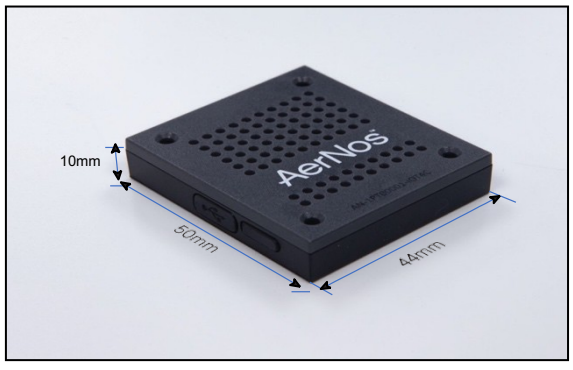
Configuration Usage

AerNos AerIoT comes in two product enclosure configurations:

- **x-SP** (*Standard Production Version*) This version is for deployment and does not include micro USB and UART communication ports. Also, the dimensions of this product are smaller allowing to be easily embedded into your product lines.



- **x-E** (*Standard Engineering Version*)
This is an engineering version and includes two additional ports (micro-USB and UART) for the purpose of testing and validation.



Performance Specifications

The following single gas configurations are provided for reference. Performance will depend on integration into your final application based on air flow and other factors. Final calibration of your AerIoT sensor results can be further calibrated based on the performance variances based on your specific product integration.

Single Gas Configurations	Detection Range	Resolution	Accuracy
Ozone (O_3)	0 ppb – 1 ppm	3 ppb	LDL: ± 30% HDL: ± 5%
Formaldehyde (CH_2O)	50 ppb – 500 ppb	10 ppb	LDL: ± 45% HDL: ± 20%
Ammonia (NH_3)	1 ppm – 20 ppm	100 ppb –1 ppm	LDL: ± 25% HDL: ± 10%
Nitrogen Dioxide (NO_2)	0 ppb - 500 ppb	5 ppb	LDL: ± 30% HDL: ± 5%
TVOCs	1 ppm – 100 ppm	100 ppb - 1 ppm	LDL: ± 10% HDL: ± 5%
Sulfur Dioxide (SO_2)	*Coming soon*		
Methane (CH_4)	*Coming soon*		
Acetone (C_3H_6O)	*Coming soon*		
Hydrogen Sulfide (H_2S)	*Coming soon*		
Ethanol (C_2H_5OH)	*Coming soon*		
Hydrogen (H_2)	*Coming soon*		
Carbon Dioxide (CO_2)	*Coming soon*		
Oxygen (O_2)	*Coming soon*		
Carbon Monoxide (CO)	*Coming soon*		

Technical Specification

Power	Min	Typical	Max
Supply Voltage	-	3.3V	-
Operating Current	5mA	25mA	45mA
Humidity	**Min**	**Typical**	**Max**
Operating Humidity	5% RH	40% RH	99% RH
Storage Humidity	0% RH	60% RH	80% RH
Temperature	**Min**	**Typical**	**Max**
Operating Temperature	5 °C	20 °C	65 °C
Storage Temperature	0 °C	20 °C	50 °C
Performance	**From Off**		**From Off**
Startup	30 Seconds		< 10 seconds
Reading Frequency	1 seconds		
Accuracy	**Variations**		
Cross-Sensitivity	Depending on surrounding environmental gases, variance between 5% up to 100%		
Temperature/Humidity	1% - 25%		
Air Flow	1% - 20%		

Electronics	Microprocessor, Memory, MEMS Sensor Array, Humidity & Temperature Sensor
Communication	Production Version: I2C Engineering Version: UART, Micro USB
Weight	Production Version: 14.6g Engineering Version: 15.2g
Dimensions	Production Version: 54 x 45 x 7 mm^3 Engineering Version: 50 x 45 x 10 mm^3
Mounting/Attachment *Engineering Version Only*	Mounting holes on four corners for attaching sensor system onto integration platforms using screw
Size of Mounting Screw *Engineering Version Only*	M2 - Part Number: 91801A530_316

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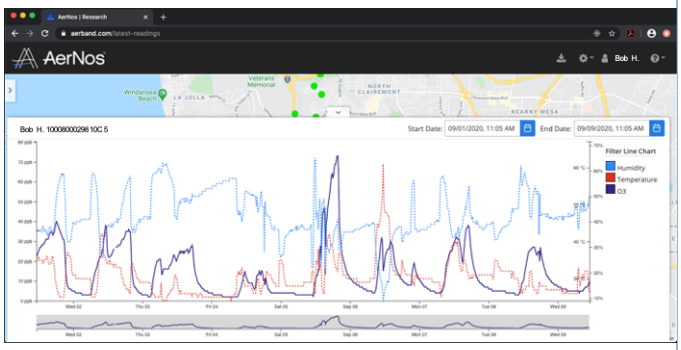
AerNos Cloud Data Platform

Unlike traditional gas sensor that are sensing elements that do not communicate to a command center, AerNos Nano Gas Sensors are "smart" sensors designed to communicate in real-time to the AerNos Cloud Data Platform via your smart devices and APIs. This feature enables third party integrators to manage all their end-user data in a consolidated or individual fashion and take real-time action to provide the best user experience. From real-time monitoring to alerts, to firmware upgrades, system administrators will easily be able to monitor and take action when necessary.

Features include:

- Real-Time Access to All Sensor Data – 24/7
- Enable Additional Gas detection capabilities based on pre-defined conditions
- Normalized data option based on AerNos sensor network from other data sources
- Detect Sensor issues and correct via pushing new firmware
- Upgrade to new capabilities by pushing out new firmware upgrades
- Sensor End of Life Alerts
- Sensor Degradation Alerts based on un-common environmental conditions
- Reporting – Ability to set automated reporting based on pre-defined filters and settings
- Application Programming Interfaces (APIs) to communicate with AerNos AerIoT and AerNos Cloud Data Platform

AerBand.Com – AerNos Cloud Data Platform



Tested & Validated

The AerNos AerIoT has been tested in our labs, manufacturing lines and the real world. Sensors get exposed to potential cross-sensitive gases at multiple temperature and humidity in the environment during use. All product accuracy testing takes into account the thousands of gases present in the environment. Although it is impossible to test cross-sensitivity across all gases in the environment, our tests are meant to ensure our sensors perform based on the Performance Specifications under standard usage as described in this datasheet.

For more detail reports related to specific gases, please contact your sales representative or visit www.AerNos.com.

Configured for Specific Use
Based on Application, Environment & Use Case

AerNos AerIoT is available to be configured for specific conditions and/or environments that are harsh or that cater to your specific end product. We take into consideration the use case and more specifically the environment that the sensor is going to deploy to minimize any noise that may result in inaccurate readings.

For example, the type of environment such as cross-sensitive gases may cause the target gas to be more or less sensitive thus increasing the accuracy variances. We can address this by further calibrating or configuring AerIoT to this specific environment in order to get a higher level of accuracy.

To learn more about our AerBand AerIoT configured for your specifications, please contact your AerNos Authorized Partner, AerNos Sales Representative.

* Information contained in this Datasheet is subject to change without notice. Sensor resolution depends on lower detection levels (LDL) or higher detection levels (HDL). Depending on use case, lower detection range variances may vary more than specifications. We strongly suggest thoroughly validating our sensor performance in your products and use case environment to review and adjust readings on your end as necessary. Product requires internet connection. Product may not function as specified in certain environmental and/or usage conditions. Sensor life depends on configuration, usage and environment and may impact dimensions for longer sensor life. Product dimensions are based on standard configurations. Warranty void when product is not used as specified. AerNos highly recommends 3rd party integrators to test, validate and calibrate AerNos AerIoT sensor performance in final product form factor and use case. Errors and omissions may be updated on future publications. Specifications herein are current as of document publication and subject to change without notice.

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