

# Canāree™ Air Quality Monitor A1 / I1 / I5 / I6

## Compact and Complete Air Quality Monitoring Product Specification

### Product Summary

Canāree is a compact Air Quality Monitor (AQM) that monitors air quality in real-time. A-Series models are USB-only devices that can be IoT enabled when connected to a networked device such as Wireless Access Points or any Windows PC / Mac running SenseiAQ Software. I-Series models support Wireless-LAN (802.11n) for standalone operation and Wired Ethernet (PoE+) is provided on E-Series models. Additional gas sensors are available depending on models including Biogenic Volatile Compounds (BVOC), temperature, relative humidity, pressure, and CO<sub>2</sub>. in the Canāree i5. Please refer to the product lineup section for more details.



Figure 1 - Canāree (all models)

All Canāree models collect real-time air quality data locally and send that data to the cloud for remote monitoring and analysis. SenseiAQ™ software displays the data on a dashboard including Air-Quality-Index (AQI) scores, color-coded for EPA Standards along with vape/smoke/AQ alerts. APIs are available to support third party integrations such as Air Quality Management Systems (AQMS), Building Management Systems (BMS) and IoT Device Management.



Figure 2 - SenseiAQ User Interface (I5)

Canāree utilizes Piera’s Intelligent Particle Sensor series 7100, and Bosch BME688 (I5 models). Using data from the sensors and unique algorithms to identify different particulate sources, Canāree can classify sources of air-pollution such as smoke (tobacco, wildfire), vape, cooking, dust and noxious gas detection for indoor applications. Embedded gas sensor within Canāree is also capable of measuring the sum of VOCs/contaminants in the surrounding air, providing orthogonal information regarding the ambient air quality in addition to



particulate matter.

### Features

- Ultra-high sensitivity for detecting airborne particulates (PM0.1 – PM10), BVOC, CO<sub>2</sub>, temperature, humidity and pressure
- Fast data acquisition and sampling
- Easy plug-and-play
- Power saving and cleaning mode
- OTA firmware update capability
- Built-in VSD (Vape/Smoke Detection) module
- High accuracy and reliability
- LED air quality status indicator

### Applications

- Enterprise monitoring of indoor air quality, AQI reporting  
Ideal for Clean Rooms, Hospitals, Offices, College Campuses, Hotel/Shared living and Industrial Environments
- Smoke/vape detection with real-time alerts and notifications
- Air Quality Mitigation (Air Purifiers, HVAC Systems)

## 1. Canãree Product Lineup

| Features                                  |                      | Canãree A1 | Canãree I1 | Canãree I5 | Canãree I6 |
|---|----------------------|------------|------------|------------|------------|
| S<br>e<br>n<br>s<br>i<br>t<br>i<br>v<br>e | PM (0.1 – 10)        | o          | o          | o          | o          |
|   | BVOC                 |            |            | o          | o          |
|   | Temperature          |            |            | o          | o          |
|   | Relative Humidity    |            |            | o          | o          |
|   | Pressure             |            |            | o          | o          |
|   | CO <sub>2e</sub>     |            |            | o          |            |
| O<br>t<br>h<br>e<br>r                     | CO <sub>2</sub>      |            |            |            | o          |
|   | Vape/Smoke Detection | o          | o          | o          | o          |
|   | Wired Network        | o          | o          | o          | o          |
|   | WIFI                 |            | o          | o          | o          |
|   | Bluetooth            |            |            |            | o          |
| s   | LED indicator        | o          | o          | o          | o          |

Table 1. Canãree product lineup

## 2. Technical Specifications

### 2.1. Hardware

Piera Systems Inc. reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Please contact Piera Systems anytime to obtain the latest relevant information. We are ready to help you determine which of our solutions will best meet your needs.

| Technical Data                 |   |
|--------------------------------|---|
| USB-Serial Driver              | Silicon Labs CP2102 UART Bridge             |
| Power Consumption *            | 100mA @ 5.5v (Continuous Operation)         |
| USB Connector Type             | Type A - USB 2.0, (max 10' cable extension) |
| Physical Dimensions            | 9cm x 7cm x 2cm (3.54" x 2.76" x 0.79")     |
| Weight *                       | 50g (1.76 oz)                               |
| Software Supported             | SenseiAQ (Windows / MacOS) Application      |
| Cloud Reporting Support        | Microsoft Azure IoT Hub                     |
| MTBF (24-hour operation)       | 8 Years <sup>1</sup>                        |
| Power Saving and Cleaning Mode | Supported (through SenseiAQ)                |
| Storage Temperature Range      | -40°C to +80°C                              |

Table 2. Canãree hardware specifications

\* Will vary depending on model

## 2.2. Embedded Sensors

| Parameter                   |   | Conditions                                  | Value          | Units             |     |
|-----------------------------|---|---|----------------|-------------------|-----|
| PM                          | Particle Count (PC) accuracy <sup>1</sup>                   | -   | ±10            | %                 |     |
|                             | Particle Count (PC) resolution                              | -   | 50             | #/Liter           |     |
|                             | Particle Count (PC) limit                                   | Referenced @ 2.5um PC bin                   | 1,000,000      | #/Liter           |     |
|                             | Mass Concentration (PM) limit <sup>2</sup>                  | Referenced @ ≤2.5um particle size           | 6,000          | ug/m <sup>3</sup> |     |
|                             | Binning output range for particle counts<br>(Differential)  | PC0.1                                       |                | ≤0.1              | um  |
|                             |   | PC0.3                                       |                | 0.1 - 0.3         | um  |
|                             |   | PC0.5                                       |                | 0.3 - 0.5         | um  |
|                             |   | PC1.0                                       |                | 0.5 - 1.0         | um  |
|                             |   | PC2.5                                       |                | 1.0 - 2.5         | um  |
|                             |   | PC5.0                                       |                | 2.5 - 5.0         | um  |
|                             |   | PC10  |                | 5.0 - 10          | um  |
|                             | Binning output range for mass concentration<br>(Cumulative) | PM0.1                                       |                | ≤0.1              | um  |
|                             |   | PM0.3                                       |                | ≤0.3              | um  |
|                             |   | PM0.5                                       |                | ≤0.5              | um  |
|                             |   | PM1.0                                       |                | ≤1.0              | um  |
|                             |   | PM2.5                                       |                | ≤2.5              | um  |
|                             |   | PM5.0                                       |                | ≤5.0              | um  |
| PM10                        |   |   | ≤10            | um                |     |
| Start-up time               | Default: 5 (until stable output)                            | >2.5  | s              |                   |     |
| Count sampling time         | Default: 0.2  | ≥0.1  | s              |                   |     |
| Data output interval        | Default: 0.2  | ≥0.1  | s              |                   |     |
| Lifetime <sup>3</sup>       | 24h/day operation   | >8  | Years          |                   |     |
| Air flow rate               | Standard atmosphere   | 0.13  | CFM            |                   |     |
| Coverage area               | 3m height   | 30  | m <sup>2</sup> |                   |     |
| Operating range             |   | -10 to +60°C, 0 to 95% RH                   |                |                   |     |
| Gas                         | Unit-to-unit deviation                                      | IAQ   | ±15            | %                 |     |
|                             | Gas scanning interval                                       | -   | 10.8           | s/scan            |     |
|                             | Sensor outputs  | BVOC  | -              | -                 | ppm |
|                             |   | CO <sub>2e</sub>                            | -              | -                 | ppm |
| CO <sub>2</sub>             |   | -   | -              | ppm               |     |
| Temp<br>RH,<br>Pres<br>sure | Response time   | τ0-63%                                      | 8              | s                 |     |
|                             | Accuracy tolerance  | -   | ±3             | %                 |     |
|                             | Hysteresis  | -   | ≤1.5           | %                 |     |
|                             | RMS noise   | -   | 0.12           | Pa                |     |
|                             | Sensitivity error   | -   | ±0.25          | %                 |     |
|                             | Temperature coefficient offset                              | -   | ±1.3           | Pa/K              |     |
| Absolute accuracy           | -   | ±0.5  | °C             |                   |     |
| Operating range             |   | 300 to 1,100 hPa, -40 to 85°C, 0 to 100% RH |                |                   |     |

Table 2. Canāree particle sensor specifications

1. Deviation from reference counter (GRIMM 11D model year 2006) based on average readings over 3-minute period. The accuracy is verified after calibration using a Smoke Detector Tester Spray, SDI LLC. Contact Piera Systems for further details.
2. Mass concentration limit is estimated for PC2.5. May vary depending on size and density of particles.
3. Lifetime may vary depending on different operating conditions.

### 3. Installation

#### 3.1. Using Host Devices via USB

Single or Multiple Canāree A1 devices can be plugged into any Host Device. Host Devices include Wireless Access points, PC's, Smart TV's, iOS/Android phones. Canāree A1 has been



validated and works with HPE-Aruba Wireless Access Points (ArubaOS V8.8 or later). Piera Systems is an HPE-Aruba Solution Partner. Canāree I models can also be connected in the same manner, if desired.

### 3.2. Using Wireless LAN

Canāree I models (I1, I5, and I6) operate stand-alone IoT Devices if they are connected to power via USB, and communication can be established via WIFI to the Sensei Cloud Service. I-Series support 802.11n and WPA2 PSK Security modes with AES Encryption as well as DHCP or Static IP Addressing.

### 3.3. Configuration

Via SenseiAQ Software running on host device or remotely. Device automatically registers on Piera Systems MS Azure Cloud service and is ready for use after it is plugged into Host's USB port, or manual configuration from SenseiAQ is required for WIFI and Bluetooth.

## 4. Cloud Support

### 4.1. Microsoft Azure

Standard 1 year of SenseiAQ Cloud Monitoring included with the purchase of product

### 4.2. Other Public and Private Cloud Services

Contact Piera Systems [support@pierasystems.com](mailto:support@pierasystems.com).

## 5. Ordering Information

Please visit [www.pierasystems.com](http://www.pierasystems.com) or email to [info@pierasystems.com](mailto:info@pierasystems.com).

## 6. Important Notices

### 6.1. Warning, Personal Injury

**Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Do not use this product for applications other than its intended and authorized use. Before installing, handling, using or servicing this product, please consult the data sheet and application notes. Failure to comply with these instructions could result in death or serious injury.**

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with respect to the design or the manufacture of the product.

## **6.2. ESD Precautions**

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take customary and statutory ESD precautions when handling this product.

## **6.3. Warranty**

Piera warrants solely to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product shall be of the quality, material and workmanship defined in Piera's published specifications of the product. Within such period, if proven to be defective, Piera shall repair and/or replace the product, in Piera's discretion, free of charge to the Buyer, provided that:

- notice in writing describing the defects shall be given to Piera within 14 (fourteen) days after their appearance;
- such defects shall be found, to Piera's reasonable satisfaction, to have arisen from Piera's faulty design, material, or workmanship;
- the defective product shall be returned to Piera at the Buyer's expense; and
- the warranty period for any repaired or replaced product shall be limited to the unexpired portion of the original period.

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