



# Canāree™ Air Quality Monitor

## R-Series

### Industrial Grade Air Quality and Environmental Monitoring

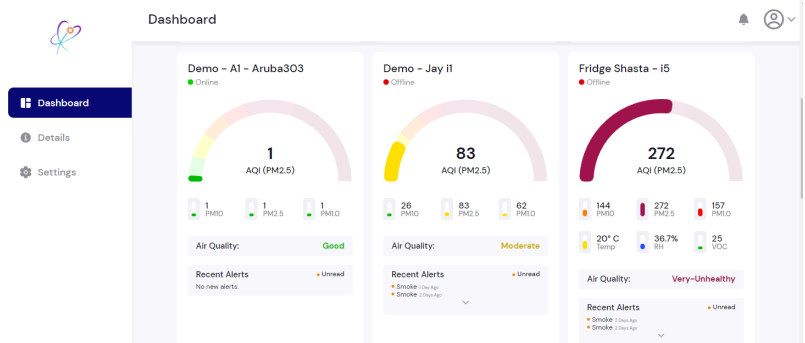
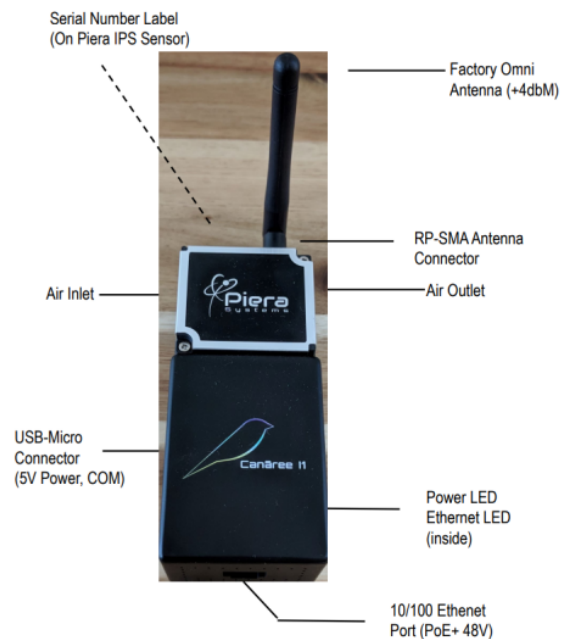
#### Product Specification

### Product Summary

Canāree R-Series is an Air Quality Monitor (AQM) expandable with Environmental Monitoring features designed specifically for the enterprise and industrial environments such as, Offices, Retail, Medical or Warehouses. It monitors air quality and environmental data in real-time and offers remote analysis in SenseiAQ Cloud or other Building Management Systems (BMS) commonly used in SmartBuildings. R-Series models support both Wireless-LAN (802.11n) or Wired Ethernet (with PoE+ support) for fully standalone operation with the ability to control external relays or interoperate with Building Management Systems (BMS) using standard HTTPs and JSON APIs. Redundant Power can be provided by using both POE+ and USB for backup power, with failover from Wired to Wireless ethernet for transport.

Additional sensors are available depending on models including: Biogenic Volatile Compounds (BVOC), temperature, relative humidity, pressure, and CO<sub>2</sub>. Please refer to the product lineup section for more details.

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



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(BMS) and IoT Device Management

Canāree utilizes Piera's Intelligent Particle Sensor series 7100, and Bosch BME688 (I5E 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.

## Deployment Options

- **Using Wired Ethernet LAN**

Canāree R-Series are designed to be powered and network connected using standard 802.11 Ethernet and optional 48V PoE+. The device consumes less than 5W of PoE power and is classified as a Type 1 PoE Device. In this default configuration the device will use DHCP for IP Addressing and phone-home to the SenseiAQ Cloud for simple out-of-the-box deployments in the enterprise. Static IP address is supported with manual configuration.

- **Using Wireless LAN**

Canāree R-Series models (I1e, I5e, and I6e) 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. R-Series ships with an external/adjustable omnidirectional antenna (+4dbi gain). Support for third-party antenna's is provided by a standard RP-SMA (For a full list of compatible antennas see our product FAQ). Full support for 802.11n and WPA2 PSK Security modes with AES Encryption as well as DHCP or Static IP Addressing in Wireless mode.

- **Using USB to another device**

Devices can be plugged into any Host Device. Host Devices include Wireless Access points, PC's, Smart TV's, iOS/Android phones. Canāree R-Series 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.

No configuration needed if using Ethernet/DHCP from the factory. Configuration supported via Wifi/Browser based provisioning or via SenseiAQ Software running on host device. Once provisioned, the device automatically registers on Piera Systems MS Azure Cloud service and is ready to begin monitoring air quality immediately.

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## 1. Canāree R-Series Product Features

	Features	Canāree R1	Canāree R5	Canāree R6
S e n s o r s	PM (0.1 – 10)	o	o	o
	BVOC		o	o
	Temperature		o	o
	Relative Humidity		o	o
	Pressure		o	o
	CO <sub>2a</sub> Estimates		o	
	CO <sub>2</sub> PPM			o
C o n n e c t i v i t y	Vape/Smoke Detection	o	o	o
	Wired Network	o	o	o
	48V PoE+ Support	o	o	o
	802.11n WIFI	o	o	o
	External Antenna via RP-SMA	o	o	o
	Dual Power Mode	o	o	o
B M S	WebRelay Support	o	o	o
	External relay trigger		o	o

Table 1. Canāree R-Series feature lineup

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## 2. Technical Specifications

### 2.1. Hardware

Technical Data	
USB-Serial Driver	CH340T USB to UART Bridge
Power Requirements	Stable 5-5.5V via USB Power Supply or standard USB Battery Backups. 48-52VDC via POE+ 802.11AF Class 1 device
Power Consumption *	160mA @ 5.5v (Continuous Operation) 200mA @ 5.5v (Startup Operation)
USB Connector Type	Micro - USB type 2.0, (max 10' cable extension)
Physical Dimensions	11cm x 5cm x 5cm (4.375" x 2.00" x 2.00")
Weight *	200g
Software Supported	SenseiAQ (Windows / MacOS) Application
Cloud Reporting Support	Microsoft Azure IoT Hub Certified
MTBF (24-hour operation)	8 Years <sup>1</sup>
Power Saving and Cleaning Mode	Automatic or Manual
Storage Temperature Range	-40°C to +80°C

Table 2. Canāree 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 (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 (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	

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		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
Temp RH, Pressure	Response time	±0-63%	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. Cloud Support

#### 3.1. Microsoft Azure

Standard 90 days of SenseiAQ Cloud Monitoring included with the purchase of product

#### 3.2. Other Public and Private Cloud Services

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

### 4. Ordering Information

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

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## 5. Important Notices

### 5.1. 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.**

If the Buyer shall purchase or use IPS for any unintended or unauthorized application, Buyer shall defend, indemnify and hold harmless Piera and its officers, employees, subsidiaries, affiliates and distributors against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if Piera shall be allegedly negligent with respect to the design or the manufacture of the product.

### 5.2. 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.

### 5.3. 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.

This warranty does not apply to any equipment which has not been installed and used within the specifications recommended by Piera for the intended and proper use of the equipment.

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