# Canāree i1 Configuration Guide
Real-Time Air Quality Monitoring Industrial IoT Device
Initial Configuration Guide – Version 1.2.2 updated 10/6/21

CANĀREE i1 OVERVIEW DIAGRAM
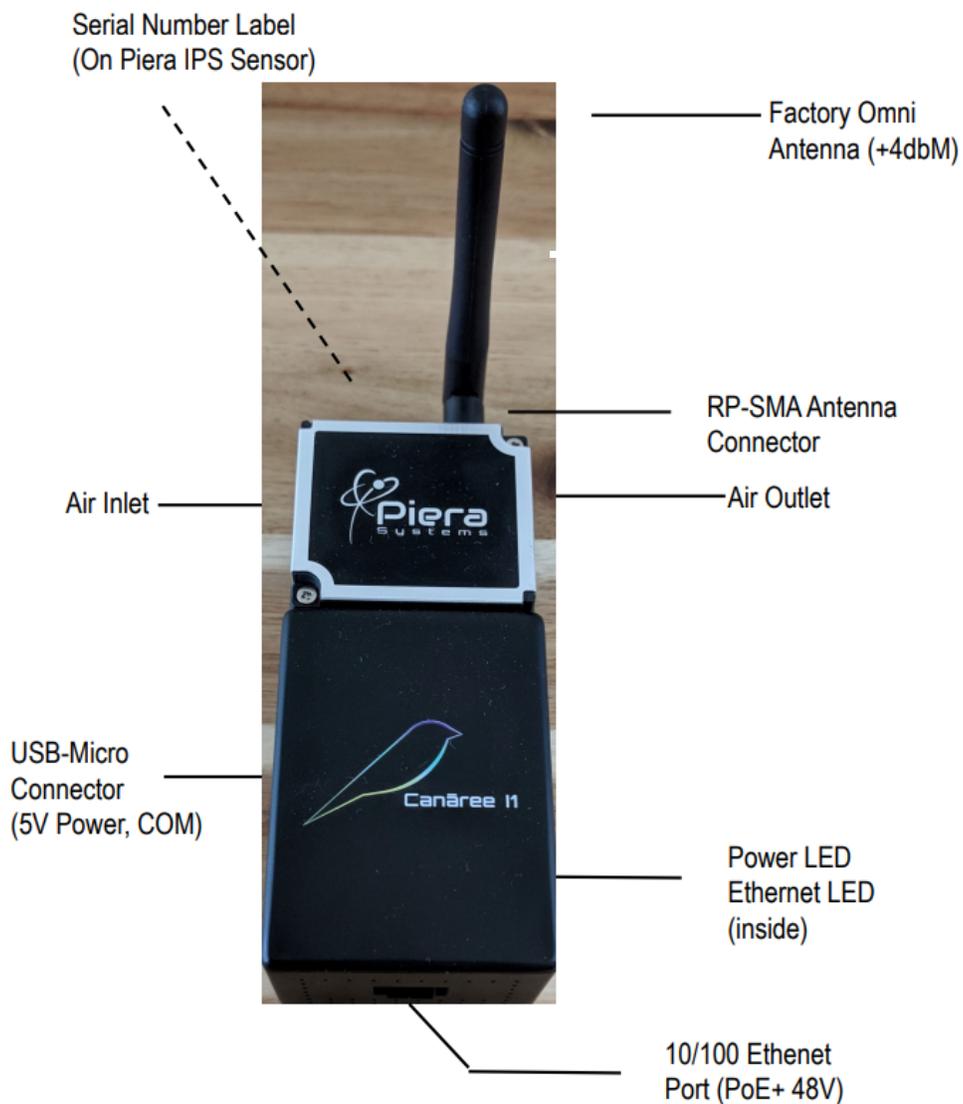
Serial Number Label
(On Piera IPS Sensor)

Factory Omni
Antenna (+4dbM)

RP-SMA Antenna
Connector

Air Inlet

Air Outlet

USB-Micro
Connector
(5V Power, COM)

Power LED
Ethernet LED
(inside)

10/100 Ethenet
Port (PoE+ 48V)

Canāree i1 Deployment Options

Canāree i1 supports a variety of deployment scenarios to IoT-Enable Piera IPS-Series Intelligent Particle Sensors in most common networking environments including:

Wired Ethernet / PoE Powered

Operating as a Class 0 PoE+ Device consuming < 2W @ 48VDC the device will receive power and internet access from an Ethernet Switch or "48V PoE Injector" using either DHCP (Default) or Static IP Addressing.

Canāree I1E Ethernet Port

48V PoE+ Switch or Injector

Wired Ethernet / USB Powered

If your Ethernet Switch does not support PoE+ for power the device can be powered via a reliable USB 5V source including standard power adapters or battery packs. The power source used should support up to 1.5Amps such as most Rapid Charger USB Adapters. Internet access is provided via the Ethernet Connection using DHCP (default) however Static IPv4 addressing is supported.

Wireless / USB Powered -

The device can be programmed for your 802.11n (2.4ghz only) Wireless network using WPA2 / PSK and will operate remotely via the included 5V USB Adapter. SenseiAQ Software is used to initially provision the Wifi network settings.

Wireless / PoE Powered -

The device can be programmed for Wifi and still receive power via the PoE Ethernet Port or injector; however the Ethernet "Link" will remain down while operating in this mode

Power Failover

The onboard circuitry supports failover between PoE+ power and USB Power automatically. PoE+ will be used when available during power-on.

Notes on External Antenna for 2.4g Wifi Specifications

Canāree i1 supports external Wifi antennas for the 2.4Ghz Band using a single stream RP-SMA connector. The factory antenna is unidirectional and operates at +4dbM. and can operate up to 400' from a Wireless AP in most circumstances. 3rd party antennas can extend range and coverage beyond this point and improve connectivity in poor Wifi coverage areas. For more information on supported antennas contact PieraSystems.com/support

Getting Started Guide

If using either Wired Ethernet deployment option, your device is immediately ready to install - The factory default settings for the device will attempt to DHCP on the Ethernet link to obtain an IP Address, DNS and Gateway IP. If successful it will phone home to the SenseiAQ Cloud Service

If using Wireless deployment mode, **the device will need to be configured to your Wireless Networks settings before bringing online.** SenseiAQ Software version 1.2.2 or greater is required to configure Wifi settings and register devices to your SenseiAQ Cloud Account. The latest version of our software is available on GitHub to Download: https://github.com/PieraSystems/SenseiAQ

## Configuration and Registration using SenseiAQ

When running SenseiAQ will begin searching for your local USB-Connected sensor until a device is connected. A notice will instruct you to download a driver if required.
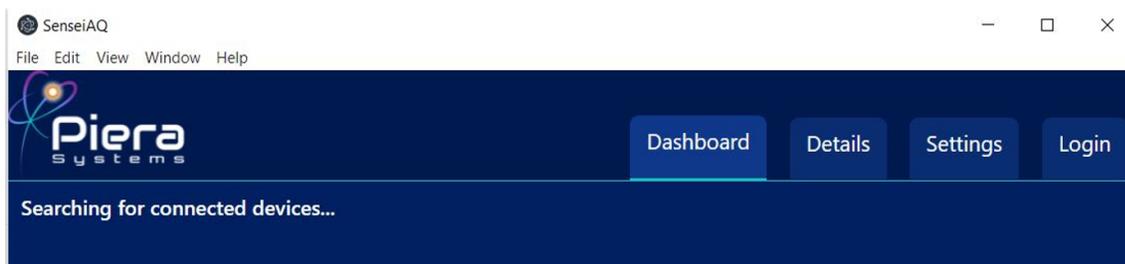
Once the Canāree I1E is connected it will appear as a local (USB) device in SenseiAQ. Here you can monitor sensor information in real-time and use all the features of the SenseiAQ App locally or configure the device for network operation. The full user guide for SenseiAQ Software is available at https://pierasystems.com/support/
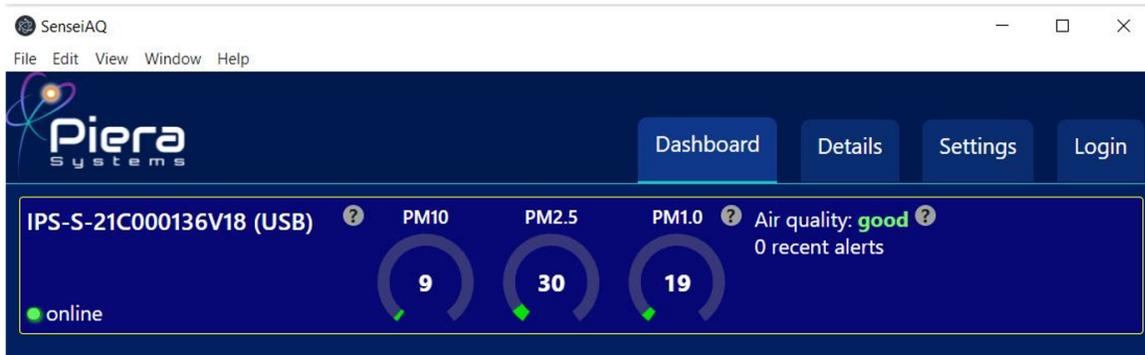
Once detected as a USB Device, navigate to the Settings tab to configure your Device (Network) settings. Selecting the Wifi option will require you to input your Wifi network name and password. Enter this information and click Save to program the device.
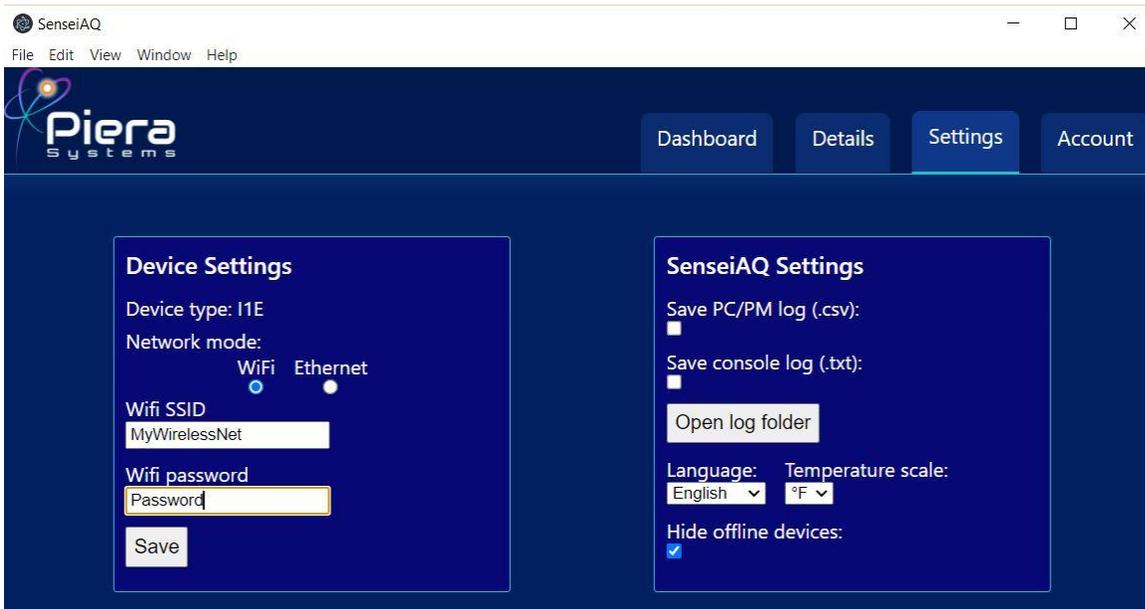

If this is a new device and you wish to register it to the SenseiAQ Cloud, click on the Login tab. If you do not already have an account, click on *Create Account*.
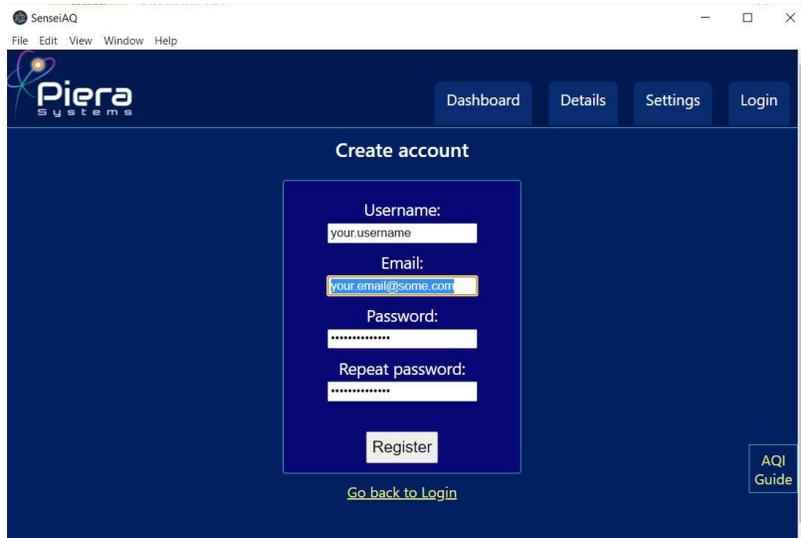
When creating an account for the first time, be sure to input a valid email address in case you later forget your password and need it reset. Note this email address will also be used to send alerts on events and software updates from Piera Systems.
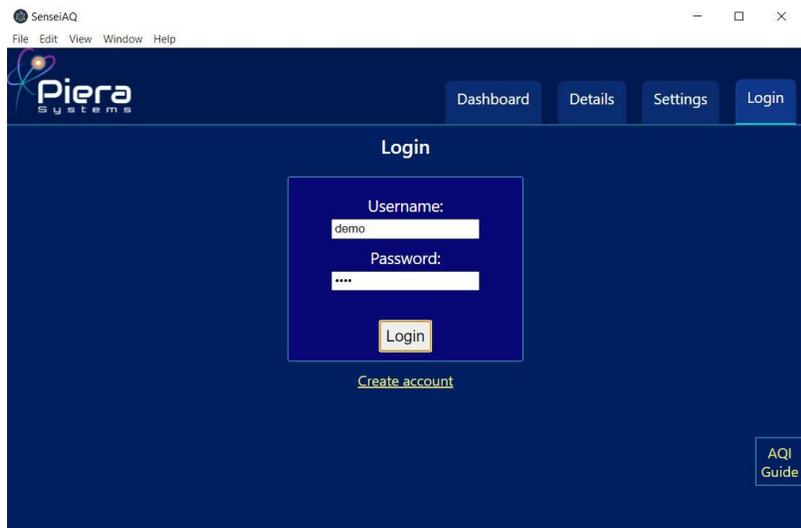
Login with your new account and you will be redirected to the Dashboard.
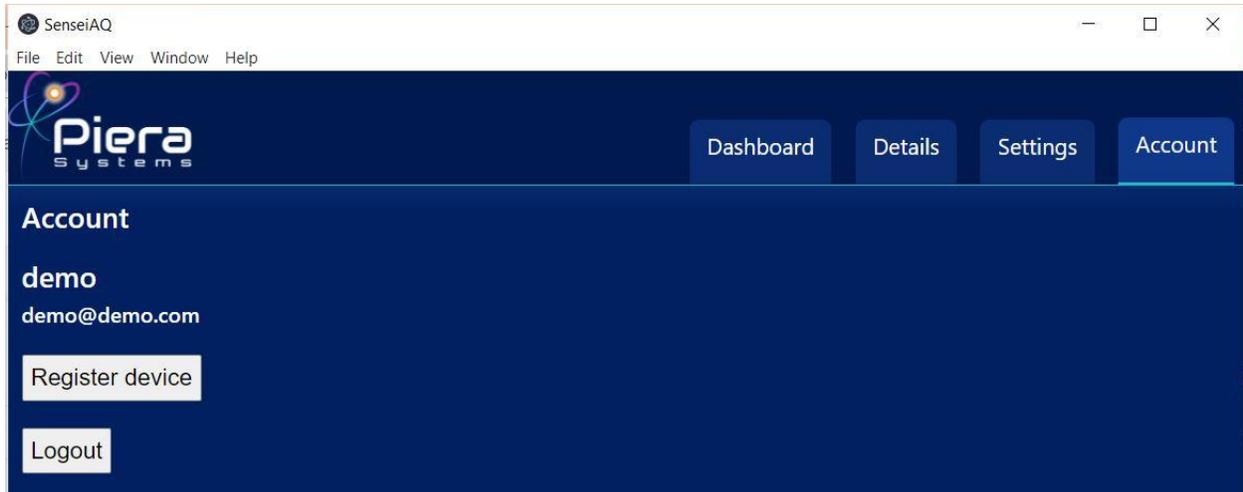
To register this (local USB) Device to your SenseiAQ Cloud account, click on "Register device" Your device can now be accessed remotely via https://sensei.pierasystems.com using this account.

Congratulations! Your Canāree is now ready to be deployed as a standalone Air Quality Monitor. You can safely disconnect the device from your PC and install it in its final location. If you wish to register or configure additional devices, connect them to SenseiAQ and follow the above process to Register additional devices.

The device can be installed horizontally on a flat surface or wall mounted vertically using the provided holes on the back of the device (Distance between center holes is 2.25 inches. This device is designed for indoor use only!

CLI Configuration using Terminal Software

Configuration of the Canāree i1 can also be done through CLI Configuration via the provided USB-Adapter cable and your favorite Terminal Emulation Software for Windows or MacOS such as PuTTY, HyperTerminal, Zterm or TerraTerm to access the device via the USB-Serial port. If you're unsure of which tool to use, we recommend PuTTY. https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

Once connected via USB to your PC/Mac, Canāree will appear as a COM Port for use with your terminal emulation software. The settings are 115200 bps / 8 / n / 1

Below is an example configuration for Wireless connectivity for you to modify and paste into your device via Terminal emulation software if you prefer not to install SenseiAQ.

```
%Wwifi=myWifiSSID,myWifiPASS
```

To Enable the Wired Ethernet port for network connectivity via DHCP and disable Wifi

```
%Wnetmode=1
```

To Disable the Wired Ethernet port for network connectivity and force Wifi Connectivity

```
%Wnetmode=0
```

  [Wait 20 seconds for the device to reboot]

```
%Wwifi=myWifiSSID,myWifiPASS
```

  [The device will reboot once again and attempt the new Wifi connection]

Other Useful CLI Commands

- `%Rnetwork`
  Show network information (Including Static IPs and Network mode)

- `%Rrssi`
  Show WiFi signal strength (Wireless Received Signal Strength Indicator (RSSI as dbM)

- `%Razure`
  Show Azure IoT Hub settings

- `%Rrelay`
  Show WebRelay settings

- `%Wreset`
  Reset device (soft power cycle)

Write Configuration Commands

- %Wnetmode=[0/1]
  Set network mode. 0 for Wireless mode, 1 for Wired Ethernet
  Example (set Wifi mode):
  %Wnetmode=0

- %Wwifi=[ssid],[pass]
  Set WiFi Network Name (SSID) and WPA2 / PSK (Pass)
  Example:
  %Wwifi=mywifi,pass123

- %Weth=[local_ip],[gateway_ip],[network_ip],[dns_ip],[dns2_ip]
  Set ethernet options.

Example:
%Weth=192.168.0.71,192.168.0.1,192.168.0.0,8.8.8.8,8.8.4.4

- %Wautoreset=[0/10]
  Set number of retries before auto-reset. Less than 5 not recommended to avoid restart loop, 0 to disable auto-reset.
  Example:
  %Wautoreset=10

- %Wrelayactive=[0/1]
  Toggle relay mode on or off.
  Example:
  %Wrelayactive=1

- %Wrelayurls=[relay_start_url],[relay_stop_url]
  Set relay start and stop URLs.
  Example:
  %Wrelayurls=http://192.168.1.2/stateFull.xml?relayState=1,http://192.168.1.2/stateFull.xml?relayState=0

- %Wlimits=[pm1.0],[pm2.5],[pm10]
  Set relay PM limits.
  Example:
  %Wlimits=35.5,35.5,155.0

WebRelay Integration Notes
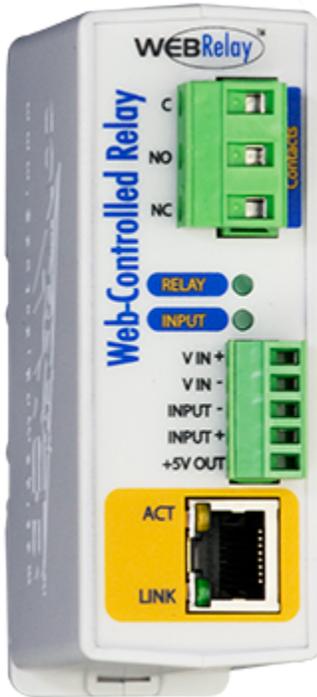
Canāree i1 Supports sending HTTP Commands to a WebRelay device via the Ethernet or Wifi network. WebRelay is an electrical relay (or electrical switch) with a built-in web server. The relay can be turned on, off, or pulsed using a web browser or Canāree i1. It has a long history of reliable operation in many applications including remote reboot, industrial control, security, and remote control and monitoring for more information visit https://www.controlbyweb.com/webrelay/

In this solution each Canāree i1 can be configured to connect to a WebRelay's URL to start or stop the relay, and this can be done automatically at specific PM Limits for PM1, 2.5 10. In this configuration the relays will be turned ON whenever the PM Thresholds are exceeded, and turned OFF only when the PM Thresholds are no longer exceeded. This can be used to control Exhaust Fans, Air Purification Systems or UV Lighting devices.

A manual Relay On/Off mode toggle is provided for testing the relay. To configure Canāree i1 for a Web-Relay you must enter the stop-start URLs before enabling Relay Mode on the device. The following commands are provided as examples when configuring WebRelay using their default values.

- *%Wrelayurls=http://192.168.1.2/stateFull.xml?relayState=1,http://192.168.1.2/stateFull.xml?relayState=0*

ON and OFF URLs to HTTP GET for your specific Web-Relay use its real IP Address.

- `%Wrelayactive=1`

Enable the Web Relay controls by setting this value to 1.

- `%Wlimits=[pm1.0],[pm2.5],[pm10]`

Set relay PM upper-limits to auto-enable relay ON URL, for example Example:
  %Wlimits=35.5,35.5,155.0

Appendix A: Canāree i1e Hardware Specifications

Software Specifications	Rating
Power Specs	PoE+ 48VDC via Ethernet Cat5 Port 5VDC @ 500Ma Max via USB Adapter Auto Power failover from PoE+ to USB Onboard Power Isolation from 48V to 5V
Ethernet Specs	10/100 Ethernet Support via Cat5 Cable PoE Class 0 Device (2.0 watts max draw) Auto MIDI / Crossover
Wireless Specs	802.11n Support on 2.4Ghz Frequency Bands Supports Channel 1,6,11,13 (no 5ghz bands) WPA2 / PSK Wifi Authentication Factory Omni Antenna @ +4dbM Support via RP-SMA connector
USB Interfaces Specs	Type Micro - USB 2.0 Max Length 10m / 32'
Physical Dimensions	113mm x 50mm x 41mm
Piera IPS Sensors Included	Piera-IPS-7100™ Series
TCP/IP Specs	DHCP Support for Wired and Wireless Static IP Support for Wired Ethernet Static DNS, NTP Servers supported
Cloud Reporting Support	Native support for Microsoft Azure IoT Hub*
API Support	Direct Serial API (CSV format) Azure IoT via REST API in JSON format
3rd Party Relay Support	Support for 3rd Party Web-Relay https://www.controlbyweb.com/webrelay/
Web-Interface Language Support	English, Spanish, French, Italian

*1 Year subscription included with purchase of device. Extended subscriptions available with maintenance contract.