Digital Environment

POCKET PARTICLE AQI 2.0

USER MANUAL

INTRODUCTION:

Welcome to Digital Environment!

Thank you and congratulations on your purchase of the Digital Environment powered Pocket Particle AQI 2.0 sensor (PP2.0) for Android and iOS mobile devices. By now you would have received an email containing your username and password for the web and mobile applications. A subscription to the Digital Environment Solutions Web application is required to utilize all of the features your new sensor has to offer. The mobile device being used must have either a connection to Wi-Fi or mobile data plan along with having bluetooth enabled.

Please visit: www.solutions.digienv.com to access your user account and get started setting up your profile.

What's in the Box?

- Pocket Particle AQI 2.0 sensor with protective case
- Charging cable - USB-Micro to USB-A
- USB charger for home and vehicle
- Shockproof travel case
- User manual & Quick start guide

What does the Sensor Do?

The Pocket Particle AQI 2.0 sensor is the most accurate and sensitive mobile air quality inspection device on the market. The sensor provides live readings of particulate matter 2.5 and 10 microns (PM2.5 / PM10), equivalent carbon dioxide (eCO2) and equivalent total volatile organic compounds (eTVOC) in the air around the device. The lightweight, compact and portable sensor connects to a mobile device (iOS or Android) to provide real-time readings of the air quality in the home or on the go.

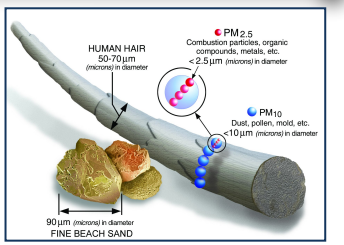
Understanding air quality is the first step towards managing respiratory health. Studies have shown the serious health risks surrounding poor air quality and mold in a home. The PP2.0 along with the mobile application can provide real-time alarming and visual sensor LED alerts to easily identify any air quality concerns. Aggregating air quality data allows users to learn, share and enhance their lives and the space around them. Managing information allows organizations to control risks and improve conditions. Home Inspectors can now take more cost effective air quality surveys as part of their entire package.

The intended use for the Pocket Particle AQI 2.0 and a subscription to the Digital Environment Data Management platform are to compile and store the air quality survey readings and provide the user with an organized report of the results to relay to their customer. All data being read by the sensor will be found in your Digital Environment account online.

THE SCIENCE:

What are Indoor Air Pollutants?

There are a number of different pollutants commonly found at varying concentrations in the air. These include Particulate Matter (PM), Volatile Organic Carbon (VOC), ozone, Carbon Monoxide (CO), and nitrogen and sulfur oxides. These pollutants are commonly found in indoor air from sources such as mold, pollen, heaters, cigarette smoke, stoves, paints, solvents, disinfecting agents, improperly stored fuel, etc. and can have a wide variety of health effects. Identifying buildings where these indoor air pollutants are concentrated is vital for maintaining good health.



Particulate matter enters the lungs and is associated with a number of diseases such as asthma and heart disease. The PM10 particles are capable of penetrating to the very deepest parts of the lungs while PM2.5 particles or smaller can cross the blood barrier. The EPA has more information on the effects of particulate pollution. The concentration of each particle size in air is measured separately and the sensor reports the value in micrograms (of each particle size) per cubic meter (of air). This unit of measure is what is used for industrial health evaluations and is abbreviated ug/m^3. PM2.5 and PM10 are most commonly produced by dust, mold, pollen, and smoke from tobacco, cooking or heating. Regardless of source, excessive particulate matter present in buildings have been shown to cause a wide range of health issues, including inducing asthma attacks, sick building syndrome, and increased incidence of respiratory infections. Total VOC represents an extremely broad range of compounds with a wide variety of health effects such as eye, nose and throat irritation, headaches, nausea, organ damage and potentially cancer depending on the VOC in question.

Furthermore, studies have found that typical levels are 2-5x higher indoors than outdoors and can remain at 1000x times the outdoor concentration after certain activities, such as stripping paint. While the levels can be controlled by increased ventilation, for example opening the windows while painting, cases where the source of the elevated VOC remain can be concerning. In modern homes ventilation is typically decreased to improve energy efficiency of the home, effectively sealing in the VOC. A more effective strategy is locating the source of the elevated VOC and taking corrective measures. Mold can produce a number of VOCs. These compounds are what produce the "musty" smell associated with mold infestation. While most of the compounds are innocuous, there is experimental evidence that some of these compounds could be toxic.

When Do Indoor Air Pollutants Become Harmful?

This is more difficult to determine as there is no concrete number denoting a problem. Pocket Particle is meant to supplement your expertise and will provide you with more information when discussing further sampling with your client. This chart below shows the general guidance for acute exposure for a given AQI.

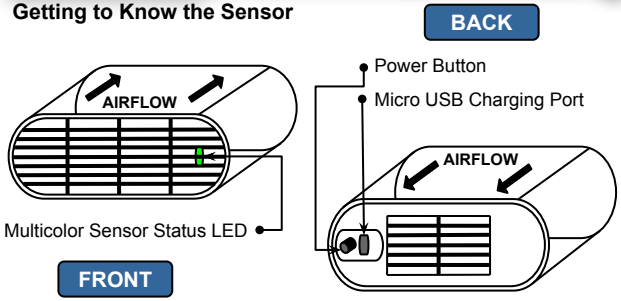
Air Quality Index - Particulate Matter	
301 – 500	Hazardous
201 – 300	Very Unhealthy
151 – 200	Unhealthy
101 – 150	Unhealthy for Sensitive Groups
51 – 100	Moderate
0 – 50	Good

The recommendations for chronic exposure to particulate matter are much lower. For instance, in The Clean Air Act the EPA recommended daily exposure limit for PM2.5 is 12 µg/m^3 to protect sensitive individuals. There is no specific guidance on VOC levels because it can vary widely depending on the type of VOC present. Specific limits can be as low as 8 ppb (parts per billion) for harmful substances, such as formaldehyde, to having no specific limit set for, innocuous substances such as fragrances. For VOC the important thing is to identify areas significantly higher than the surrounding environment where there is no easily identifiable source. VOC produced by mold could also be useful in locating a mold infestation and guide further sampling. When conducting air quality inspections, it is crucial to watch for when the sensor spikes and comparing the indoor readings to the outdoor reading. This will help you identify the source of potential problems and recommend additional sampling. It may also help to guide remediation efforts.

*Citations for The Science information can be found in the full User Manual online

THE SENSOR:

Getting to Know the Sensor



Powering ON the Sensor

- Press and hold the black power button at the back of the sensor until the status LED turns from green to blue, then release.
- While the status LED is blue the sensor is booting up, calibrating and takes roughly 10 seconds to complete.
- Once the status LED is green, this means the sensor is now currently reading the air quality around it. In most cases from powering on the status LED will be green "Good Air Quality."
- If the LED is any other color than green, this means the particulate matter in the air the sensor is currently reading is higher than the normal. Please refer to the "Air Quality Index - Particulate Matter" table.

Powering OFF the Sensor

- Hold the power button at the back of the sensor for 3 seconds. The status LED will turn off.

Charging the Sensor

- To charge the sensor it is recommended to use the supplied USB charger and cable.
- Connect the charger to a power source from either a home receptacle or vehicle port.There is a blue light that will illuminate when the charger is connected to a power source. Then connect the USB A to micro USB cable from the charger to the sensor. A faint blue light will turn on inside the sensor while charging.
- Time to fully charge the sensor battery from 0% to 100% takes approximately 1 hour and 30 minutes
- With a fully charged battery the constant usage time of the sensor is approximately 2 hours and 30 minutes.
- 20 minute charge will allow up to 30 minutes of usage.

Cleaning, Caring and Storing

Cleaning the Sensor:

- No cleaning should be required with normal use of the sensor.
- If cleaning is required, with the sensor OFF and from 15cm away, spray small short bursts of compressed air through the front and back.

Caring and Maintaining the Sensor:

- DO NOT use any cleaning solutions on the sensor.
- ALWAYS keep the sensor away from liquids and dirt.
- AVOID using in any known highly contaminated air quality environments.
- Make sure there are no obstructions covering the sensor vents on the front and back.

Storing the Sensor:

- The sensor and all accessories should be stored in the supplied protective shockproof travel case while not being used. This will help avoid any damage and prevent inaccurate readings.

HOW THE SENSOR WORKS:

A low power fan pushes air past a laser that uses a light scattering method to monitor particulate matter of 2.5 and 10 microns in size (PM2.5 and PM10). Air quality is measured every 0.1 seconds and provided in real time on the mobile application. The sensor includes an LED that indicates sensor status and particulate matter air quality ranges that correspond to the "Air Quality Index - Particulate Matter" table. The sensor does not have to be synced to the mobile app for LED air quality readings.
The Pocket Particle AQI 2.0 sensor is powered by Digital Environment Solutions Web app and SmartENV mobile app platforms. The platforms collect data from the user and sensor via bluetooth and Wifi or mobile data in order to create a complete and comprehensive air quality survey report. This report is generated in your Digital Environment account online and can be downloaded with the click of a button. The result is a bold new method to manage air quality and health and effortlessly communicate the results to the customer.

DOS & DON'TS:

DO - Power cycle the sensor for 30 seconds between each room survey.
DON'T - Run the sensor continuously for longer than 5 minutes at a time.

DO - Take a sensor survey for 2 - 3 minutes per room.
DON'T - Take a sensor survey for longer than 8 minutes per room.

DO - Hold the sensor by the left and right sides while performing surveys and stay within 10 meters of your mobile device.
DON'T - Obstructing the sensors sample airflow path and use the sensor at distances greater than 10 meters from your connected mobile device.

DO - Walk around the entire room slowly while taking the air quality survey.
DON'T - Set the sensor in one place to take the air quality survey for the entire room.

NEED MORE HELP?

Please visit www.digienv.com for more information about Digital Environment's Pocket Particle AQI 2.0 sensor and to learn about other sensors and services we have to offer.

Digital Environment has the following downloadable resources available online:

- User Manuals and Quick Start Guides
- How-to Videos
- Training Material
- Customer Handouts
- Generated Report Samples
- More Scientific Research and Data
- More Frequently Asked Questions
- More Troubleshooting Scenarios

MOBILE APPLICATION SETUP:

Downloading the Mobile App

The Pocket Particle AQI 2.0 Sensor works with both major mobile device platforms (Android and iOS). Visit your corresponding devices app store and search for **SmartENV.**

- Download and install the Mobile App

Download on the App Store | GET IT ON Google Play | SmartENV App

Running the Mobile App for the First Time

In order to utilize all of the features Digital Environment has to offer it is important to allow the SmartENV mobile app permissions on the mobile device. Once completed you are then directed to the login screen.

Log into the Mobile App

Logging into the SmartENV mobile application requires a subscription to Digital Environment Solutions Web app. When you purchased this sensor an email should have been sent to you with your login information. Use these to log into the SmartENV mobile app as well as the Solutions Web app. The login credentials for the Solutions Web app and SmartENV mobile app will be the same.

Setting up a Property and Rooms (Quick Start Guide)

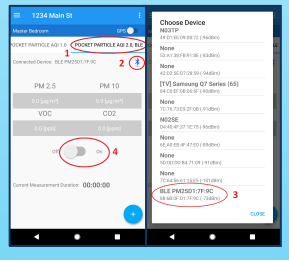
At this point you will need to refer to the included ***Quick Start Guide*** and follow the process for setting up a Property and Rooms. You will perform all your surveys here. Once this has been completed you will be able to connect the Pocket Particle AQI 2.0 Sensor to your mobile device within the app and start monitoring air quality data.

Connecting the Sensor to a Mobile Device

Turn ON the PP2.0 sensor, open the SmartENV mobile app on your device and navigate to the appropriate property and room. This is where the sensor is selected and synced via Bluetooth Low Energy (BLE) to your mobile device.

Follow the below steps:

1. Select the sensor registered to your account (if more than 1 is available)
2. Click the Bluetooth logo to open a list of available Bluetooth devices
3. Select your Pocket Particle sensor (BLE PM25XX:XX:XX)
4. Hit the ON switch on the mobile app to start recording air quality data. The sensor will warm-up for 1-2 seconds.



TROUBLESHOOTING:

ISSUE	CAUSE	SOLUTION
Sensor will not turn ON	Battery out of charge	Charge the battery by connecting to supplied cable and charger
	Potentially a defective sensor	Contact Digital Environment service to assist troubleshooting
Sensor status LED is not GREEN	Poor air quality is around the sensor	Turn the sensor off and move to an area with cleaner air quality
	Reading the current air quality	The color of the status LED corresponds to the current quality of air
During a survey the PM readings stay on 999.9 (LED = Deep Purple Color)	Hazardous air quality is still around the sensor	Move to an area with cleaner air quality
	Hazardous air quality was detected by the sensor and has stalled the readings	Turn the sensor off, wait 1 minute and turn the sensor back on again
Sensor is not pairing to my mobile device	The sensor is not paired to the mobile device through the normal device settings	The sensor is synced via Bluetooth when it's selected within the mobile application
The eCO2 and eTVOC data seems questionably high in an area	The current sensor test duration has been running too long	Shut the sensor off for 30 seconds and run the survey again between 2 - 3 minutes
	People are breathing to close around the sensor	Empty the area of people and properly ventilate the area before retesting

FAQ:

Can the sensor be used while being charged?
Yes, this will only limit the mobility of the area being surveyed.

What is the suggested effective lifespan of the sensor?
We recommend the sensor be replaced after approximately 2 years of normal consistent use and in normal environmental conditions.

What is the effective sample distance from the sensor?
The suggested maximum effective sample distance indoors for a specific area to be surveyed is approximately within 1 to 1.5 meters.

How is the AQI sensor calibrated?
The sensor is calibrated automatically every time it is powered on.

What happens if your mobile device does not have a Wi-Fi or mobile data connection?
The air quality data will only be read live on your mobile device and will NOT be stored to the Web Solutions application property that was created. This scenario is called "Offline Mode."

WARRANTY INFORMATION:

Digital Environment warrants the device for a period of One (1) YEAR from the verified original date of purchase, against any manufacturing defects, faulty materials and/or workmanship. Digital Environment will repair or replace the device at no cost to the purchaser if any defects are noticed and notified to us within the warranty period. The warranty does not cover the normal wear and tear in using the product or damage from accident, mishandling, misuse or neglect. The warranty only covers the parts that affect the device's normal function and will not cover any of the supplied accessories. Any disassembly, repair or attempts to repair the device by the user or parties unauthorized by Digital Environment will void the warranty. A reasonable evidence of purchase, to validate the purchase date, must be provided to claim the warranty. Warranty repairs and replacements are at the discretion of Digital Environment after determination of all factors for the warranty including validation of warranty period, and condition of the device and factors leading to the fault. This warranty provision is in addition to your statutory rights as a consumer and does not affect those rights in any way.

TECHNICAL SPECIFICATIONS:

Sensor		Charger	
Sensitivity (PM2.5-10):	**0.1 ug/m³**	Input (V) AC:	**110-240V 50/60Hz**
Range (PM2.5-10):	**0 - 999.9 ug/m³**	Input (V) DC:	**12-24V**
Sensitivity (eCO2/eTVOC):	**0.1 ppm & ppb**	Output(V) DC:	**5V 1A**
Range (eCO2):	**400 - 29206 ppm**	Weight:	**40 grams**
Range (eTVOC):	**0 - 32768 ppb**	Connector Type:	**USB-A**
Response Speed:	**2 seconds**		**Made in China**
Charging Connector Type:	**USB-Micro**		
Battery:	**Lithium Polymer 3.7V 400mA**		
Operating Temp Range:	**-40°C to 85°C**		
Relative Humidity Range:	**10% to 95%**		
Relative Error (PM2.5-10):	**Up to ± 15% / ± 10 ug/m³ / @ 25°C / Humidity 50%**		
Relative Error (eCO2/eTVOC):	**Up to ± 2% / @ 25°C / Humidity 50%**		

Made in Japan

Disclosure Statement:
Digital Environment will not be held responsible for any inaccurate or challenged air quality survey results obtained by the Pocket Particle AQI 2.0 Sensor.

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For more Information
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Sensor and all accessories must be disposed of carefully and according to local waste collection procedures for electronic equipment.

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