



USER MANUAL

POCKET PARTICLE AQI 2.0

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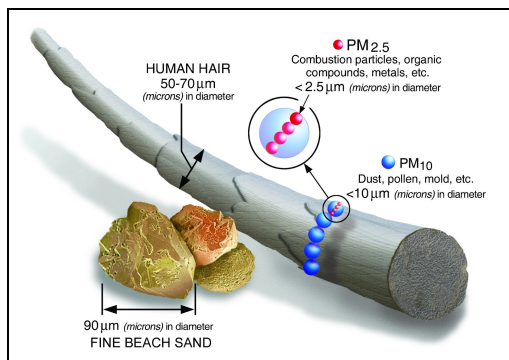
INTRODUCTION

The Science of Indoor Air Quality

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. The Particle Plus is capable of measuring three of these: PM that is 2.5 microns, PM that is 10 microns, and the total VOC. 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 PM_{2.5} particles or smaller can cross the blood barrier. The



EPA has more information on the effects of particulate pollution¹. You can see the particle size of some PM 2.5 and PM 10 pollutants here. 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/m³. PM_{2.5} 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 building has been shown to cause a wide range of health issues², 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 2-5 higher indoors than outdoors and can remain at 1000 times the

¹ <https://www.epa.gov/pmcourse/particle-pollution-exposure>

² <https://iaqscience.lbl.gov/air-summary>



outdoor concentration after certain activities, such as stripping paint³. While the levels can be controlled by increased ventilation, for example opening the windows while painting, cases where the source of the elevated VOC remains can be concerning. Furthermore, 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 infested dwellings. While most of the compounds are innocuous, there is experimental evidence that some of these compounds could be toxic⁴.

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. The chart below shows the general guidance for acute exposure for a given AQI. The recommendations for chronic

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

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/m³ for to protect sensitive individuals⁵.

There is no specific guidance on VOC levels because it can vary widely depending on the type of VOC present⁶. Specific limits can be as low as 8 ppb 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, the most important thing is 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 efforts at remediation.

³ <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality#Levels>

⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4591661/>

⁵ <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

⁶ <https://iaqscience.lbl.gov/voc-summary>



How to Operate the AQI 2.0 Sensor

- To charge the Particle Plus sensor, simply plug in the Micro-USB cord and allow it to charge for 2 or more hours. A fully charged sensor will run continuously for at least 2 hours.
- To turn on the sensor, hold the knob on the back of the sensor until the LED indicator light turns on. The light will turn blue then change to green. When the light is green, the device is ready to pair.
- To get real time readings from the sensor, you will need to pair it to the SmartENV mobile app. Please follow the directions in the next sections to set up the SmartENV app and connect to the sensor.



How to Use Particle Plus Software

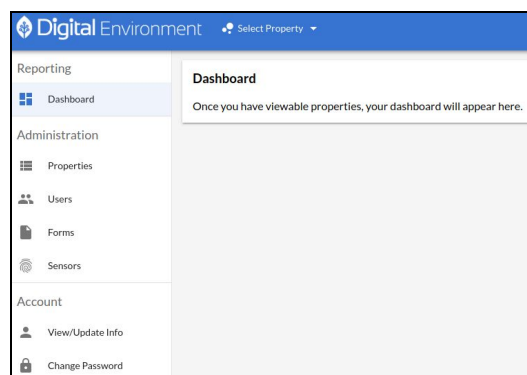
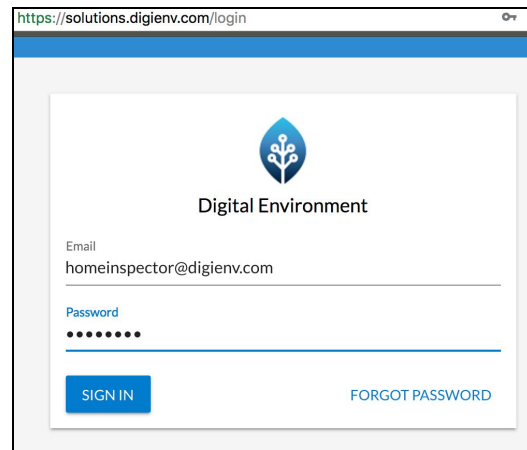
This user guide will guide you through setting up Properties for AQI inspections, operating the mobile application to collect survey data, reviewing the survey data, creating reports and much more.

Creating Properties to Manage AQI surveys

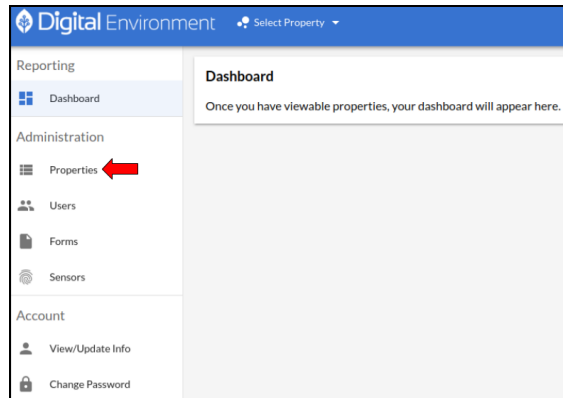
In order to capture AQI data, you will need a Property. A Property can be named anything you like and should be considered the top level of the location you want to capture data from. Under a Property you can create as many Rooms as you need and capture data separately across the Rooms to easily identify when an issue occurs in a specific space. Typically you will want to create one Property for the location and as many Rooms as needed for the Property. Once you've finished capturing data, you can generate a single report for a Property with information from any and all the Rooms within it.

Create a Property

- 1) You should have your login information provided via an email from no-reply@digienv.com. If you do not have this email, please reach out to us at support@digienv.com.
- 2) With your login information, go to <https://solutions.digienv.com> and login with your credentials.
- 3) The first thing you should see is your dashboard. No data will be populated right now because you need some Properties and Rooms.



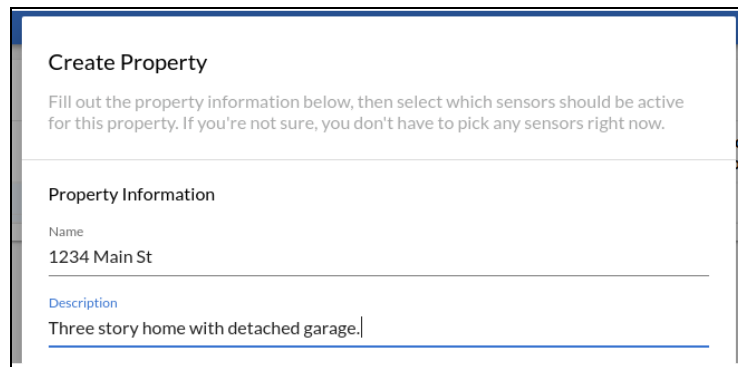
- 4) First, let's set up a Property. Select the Property icon from the left menu. Only Tenants and Admins can see this menu. If you are not able to see these menus, reach out to DigiEnv Support.



- 5) From the Property view, select the Plus button to add a new project.



- 6) In our experience, it is best to create a new Property for each site visit where you will be using the AQI sensor. This will allow you to quickly generate reports and find information to specific locations. Naming a Property is best done with the address, the client name or some other reference for your records. In this example, we are gathering data from a home on Main St., so we will name the property 1234 Main St. You could also use client names or other references.



- 7) Next, you will need to set the owner for the property survey. An owner is the user who would be expected to manage and maintain the survey. Typically this will be your account or one of your technicians. You can select the dropdown and find your email address. If you have multiple users you can select another user. Even if you are not the owner, you can still access activities under the project and make changes as needed. Additional documentation is available if you would like to use software to manage multiple employees.



- 8) The latitude and longitude fields are there to allow you to provide an exact location of the site you will be inspecting. You can provide the information if you would like or you can safely ignore these fields.

Latitude
Longitude

- 9) The last thing you need to do is set up the sensors you will need on the project. The typical sensors you will need would be Pocket Particle AQI, GPS, Images and Notes.

Note: Only check the box for the sensors you purchased.

<input checked="" type="checkbox"/>	GPS via Android/iOS
<input checked="" type="checkbox"/>	Images via Android/iOS
<input checked="" type="checkbox"/>	Notes via Android/iOS
<input checked="" type="checkbox"/>	Pocket Particle AQI 1.0, USB for Android
<input checked="" type="checkbox"/>	Pocket Particle AQI 2.0, BLE

- 10) After entering data in all the needed fields, save your project. You should see it on the project list now.

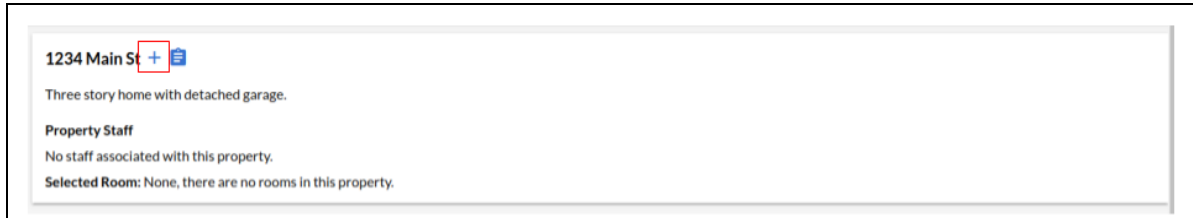
Properties +					1 records
Name	Owner	# of Rooms	Created	Last Updated	
Filter Name...					
1234 Main St	John Sanders	0	May 28, 2019 8:23 pm	May 28, 2019 8:23 pm	⚙️

- 11) Now that you have a property setup, you can see under the # of Rooms columns that have 0 Rooms created. You can create as many Rooms as you need and be as specific as you like. You can do this in advance from the web application or on-site from the mobile app.

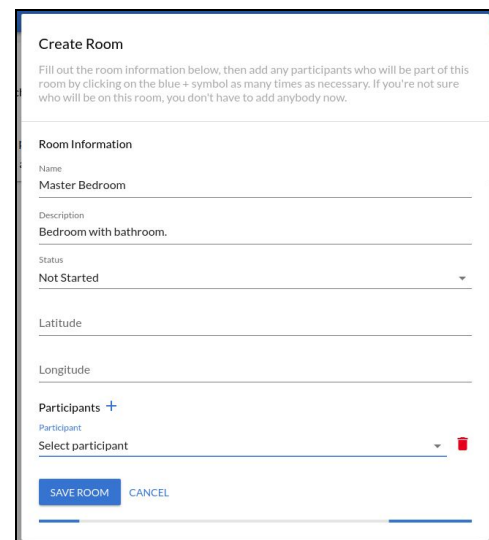
Properties +					1 records
Name	Owner	# of Rooms	Created	Last Updated	
Filter Name...					
1234 Main St	John Sanders	0	May 28, 2019 8:23 pm	May 28, 2019 8:23 pm	⚙️



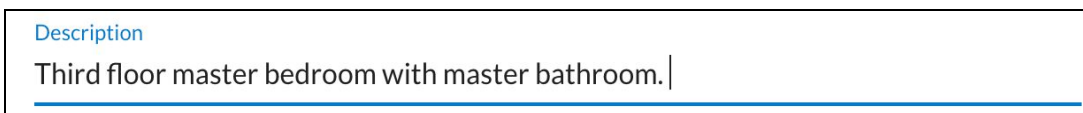
- 12) To add Rooms from the Web application, click on the row for the Property and a new table will appear below it, listing additional information for the property as well as all the Rooms. Select the Plus button next to the Property Name in the new table that is displayed to create a new Room.



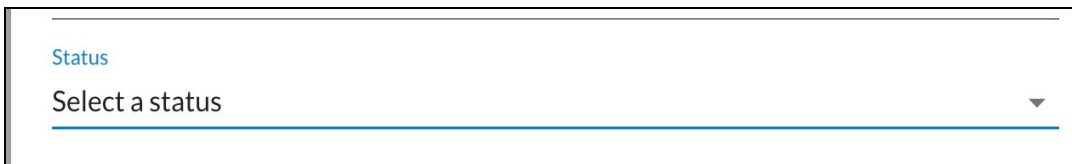
- 13) This button will bring up a new menu where you can fill in the details for a Room. Give the Room a descriptive name.



- 14) Give a description for the Room.



- 15) Each Room has a status for the survey and data collection. These could be one of four statuses: Not Started, Started, Completed and Approved. You will typically want to set a new Room to Not Started. If you open the Room in the SmartENV mobile app it will automatically update the Status to Started.





- 16) The latitude and longitude fields are there to allow you to provide an exact location of the site you will be processing. You can provide the information if you would like or you can safely ignore these fields. The SmartENV mobile application and also use the phone's GPS to add location data.




Latitude

Longitude

- 17) The last step in setting up a Room is assigning participants to the Room. Participants are people that will perform the survey. Select the Plus button and use the dropdown to select your user account or your technician. Note that a user only needs to be assigned to one Room in a Property to see all the Rooms in the Mobile App. This makes it easy for all users assigned to a Property to access any new Rooms created on the fly.

Participants + 


Participant


Select participant   

- 18) Once you have added yourself as a Participant, check the information on your Room. If everything looks correct, save the Room.


- 19) Now we see the Property tab has a new Room. Congratulations! You are now ready to move into the SmartENV mobile app and start capturing data. You can access all Rooms from within the SmartENV mobile app, regardless of status. You can create as many Rooms under a Property as you need.

■ Not Started
■ Started
■ Completed
■ Approved



Rooms in Property: 1234 Main St + 

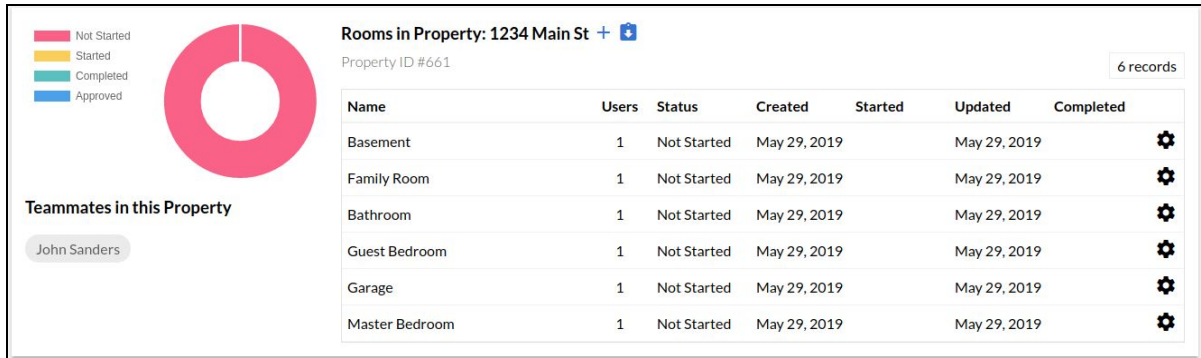
Property ID #661 1 records

Name	Users	Status	Created	Started	Updated	Completed
Master Bedroom	1	Not Started	May 29, 2019		May 29, 2019	

Teammates in this Property

John Sanders

20) Continue adding Rooms or additional Properties as needed or you can add them from the mobile app during the survey.



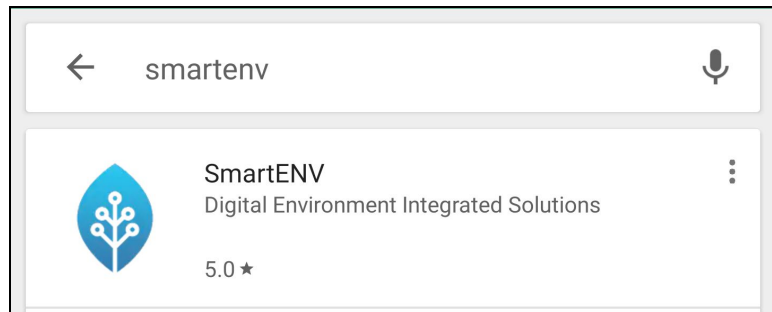
Rooms in Property: 1234 Main St +
 Property ID #661 6 records

Name	Users	Status	Created	Started	Updated	Completed
Basement	1	Not Started	May 29, 2019		May 29, 2019	
Family Room	1	Not Started	May 29, 2019		May 29, 2019	
Bathroom	1	Not Started	May 29, 2019		May 29, 2019	
Guest Bedroom	1	Not Started	May 29, 2019		May 29, 2019	
Garage	1	Not Started	May 29, 2019		May 29, 2019	
Master Bedroom	1	Not Started	May 29, 2019		May 29, 2019	

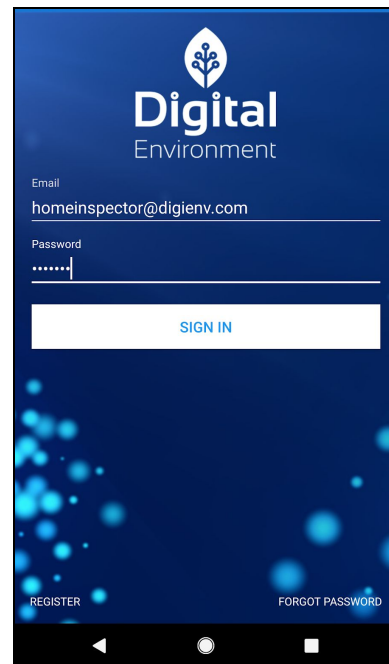
Teammates in this Property
 John Sanders

SmartENV Mobile App

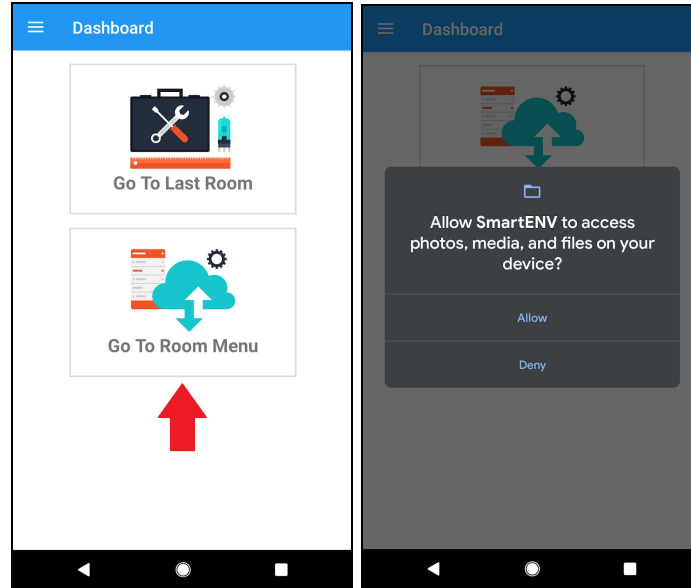
1) Download the SmartENV mobile app off the Android Play Store or Apple iStore.



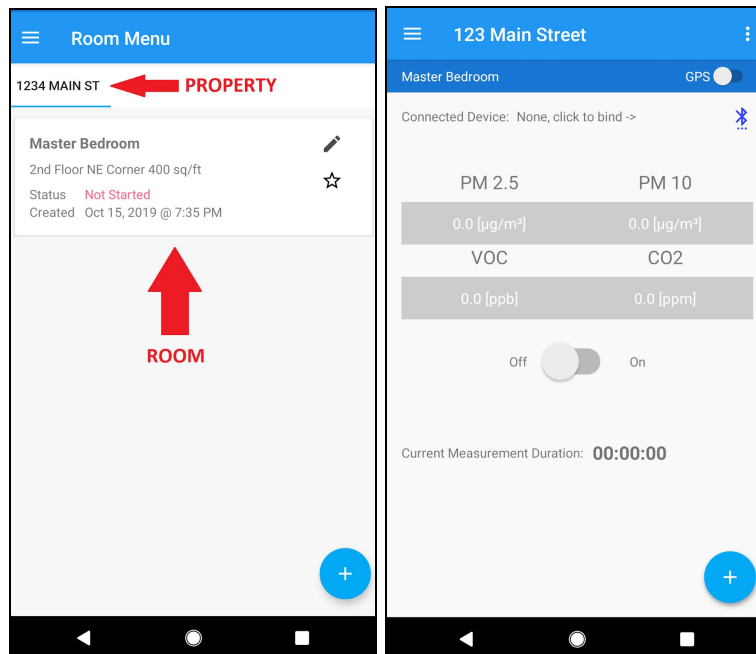
2) Login to the SmartENV mobile app using the same credentials as you used on the Solutions Web App.



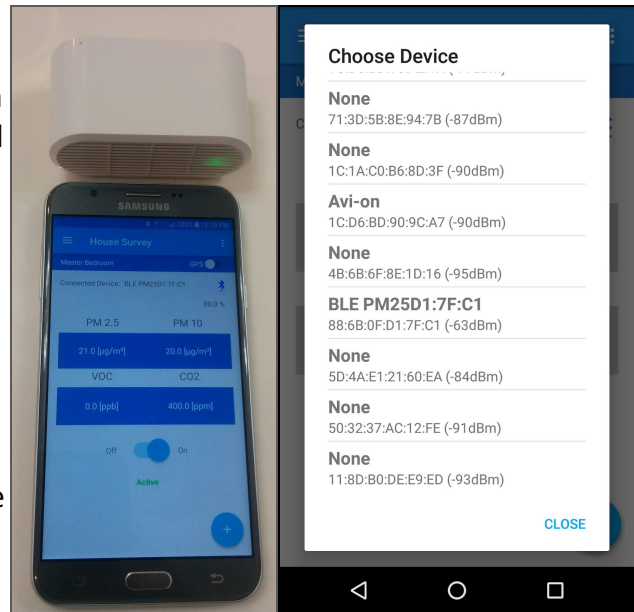
- 3) Select Goto Room List. You may be prompted to allow SmartENV to access your files. This is required to upload images and other documents from the mobile app. Select Allow to enable this functionality.



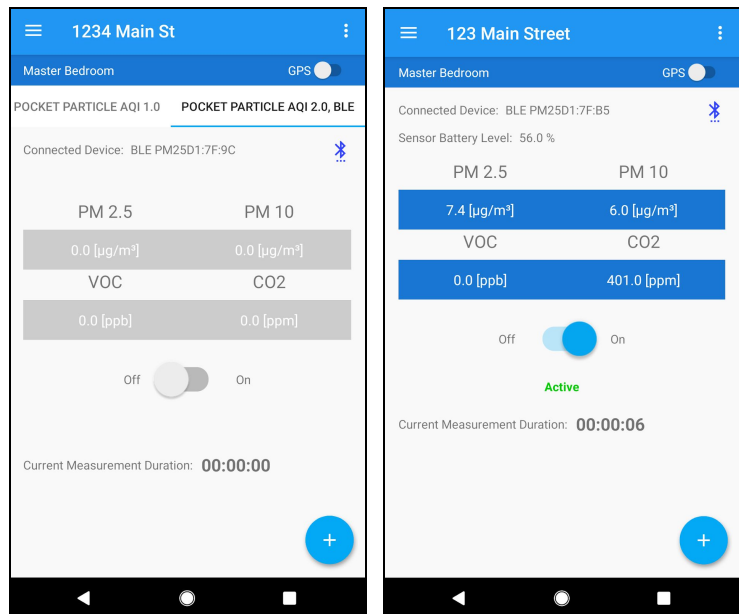
- 4) You should see the Room(s) you created earlier on the Solutions web page. Select one from the list. This will take you to the Data Collection Screen.



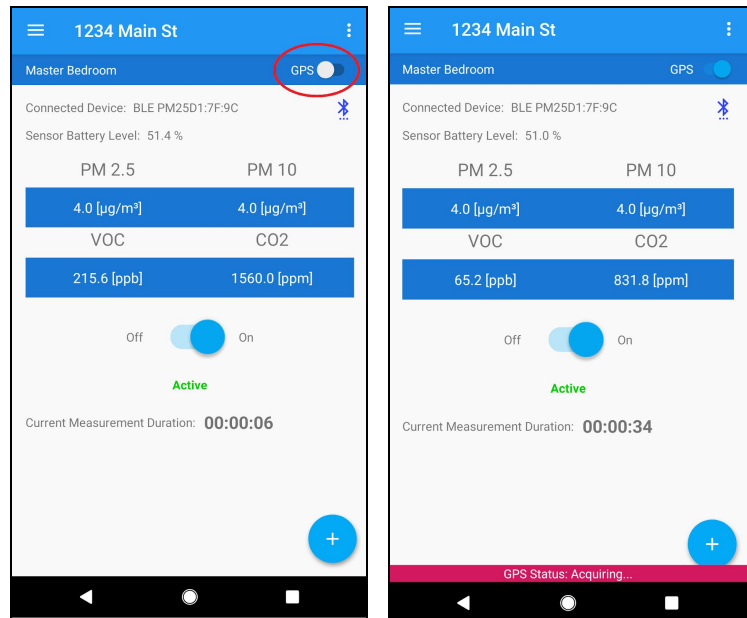
- 5) If you have not already, turn on the sensor by holding the black button on the back of the sensor. The light will turn blue then green. With Bluetooth enabled on your device, tap the Bluetooth icon on the Data Collection Screen. Note you may need to scroll to the correct Sensor if you have more than one to see the Bluetooth icon. This will display a list of available Bluetooth devices. The Pocket Particle AQI 2.0 device name will be "BLE PM25" and then an identifier unique to your device. Select the sensor. The name should now appear on the sensor measurement screen.



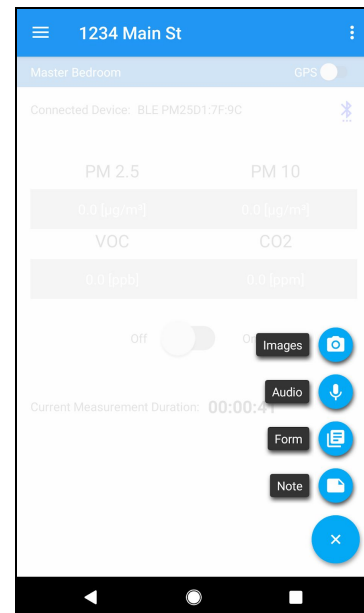
- 6) You should now see a Room page similar to this. Select the sensor On switch to start capturing AQI data. You will see the numbers change in real time.



7) You can also select the GPS button to capture GPS data along with your AQI data. If your GPS services are disabled, you will be prompted to enable them at this time. Both AQI and GPS data can be captured at the same time. You can also take photos or notes without interrupting your capture.

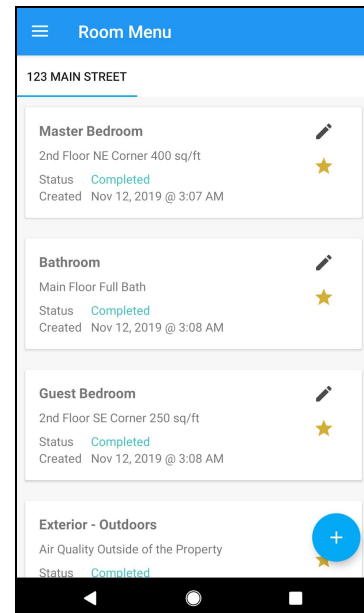


8) You can select the Plus icon in the bottom right to add Notes or Images to the Room. To upload images, you can either use your camera app to capture the picture immediately or upload from your gallery.

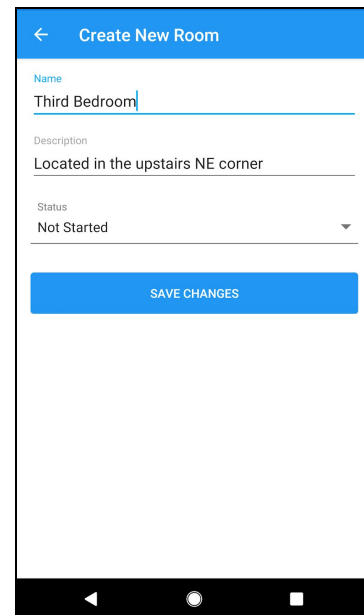


9) When you are done with a Room and plan on moving to another location or Room, turn off the Particle Plus AQI sensor and GPS and go back to the Room Selection page.

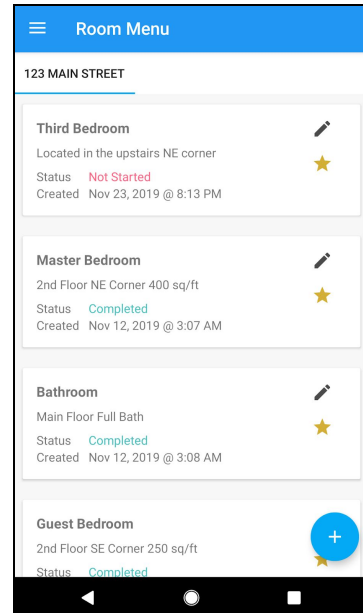
10) If you want to add another Room, select the Plus button on the Room Selection page.



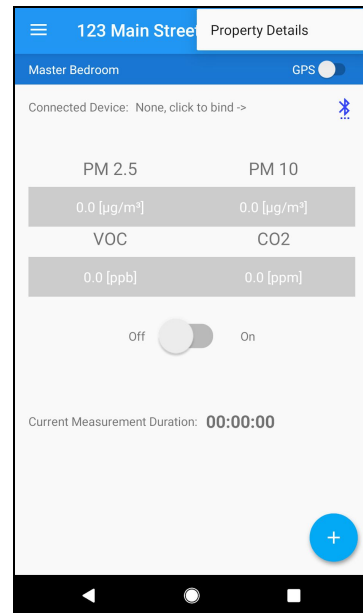
11) Provide the name, description and Status of the new Room and save it.



12) You should see the new Room on the selection list.
Select it to start surveying the Room.



13) You can also access the Property Details by
selecting the Triple dots in the top-right in the
Room survey.



Review Data

- 1) Log back into <https://solutions.digienv.com> using your credentials.
- 2) You should see your Dashboard has changed now. If you've captured GPS data, you will see a map with that information. If you have multiple Properties, you can change your Property by selecting the dropdown at the top.

Property Selection
Please select from an available property below that you would like to work on, manage, or view data for.

Available Properties

1234 Main St
Owner: John Sanders (nickmank+demo@digienv.com)
Started Rooms: 7
Last Updated Room: Master Bedroom

0.00% Complete

CLOSE

Room Name	Users	Status	Created	Started	Updated	Completed
Master Bedroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Garage	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Guest Bedroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Bathroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Family Room	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Basement	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	

- 3) You can select a Room to review by selecting it from the table on the Dashboard page. You can also use the left menu to review Rooms based on their status. If your Room is in the Started state, you will need to go to Rooms in Progress section. If you changed the Room status to Completed, you will need to go to the Completed section. For this example, all jobs are still in the Started State, so we can select Rooms in Progress.

Rooms in Property: 1234 Main St +

Property ID #661 7 records

Name	Users	Status	Created	Started	Updated	Completed
Outside	1	Started	May 30, 2019	May 30, 2019	May 30, 2019	
Master Bedroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Garage	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Guest Bedroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Bathroom	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Family Room	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	
Basement	1	Started	May 29, 2019	May 29, 2019	May 29, 2019	

Teammates in this Property

John Sanders



- 4) On the Rooms in Progress page, you can see information for a particular Room. In this picture, we see that there is no Pocket Particle or GPS data for the Room named Outside. Click the Change button to move between Rooms.

1234 Main St +


Three story home with detached garage.

Property Staff


John Sanders

Selected Room: Outside

CHANGE DELETE

 **Data Timeline**

No data found for any listed sensors.

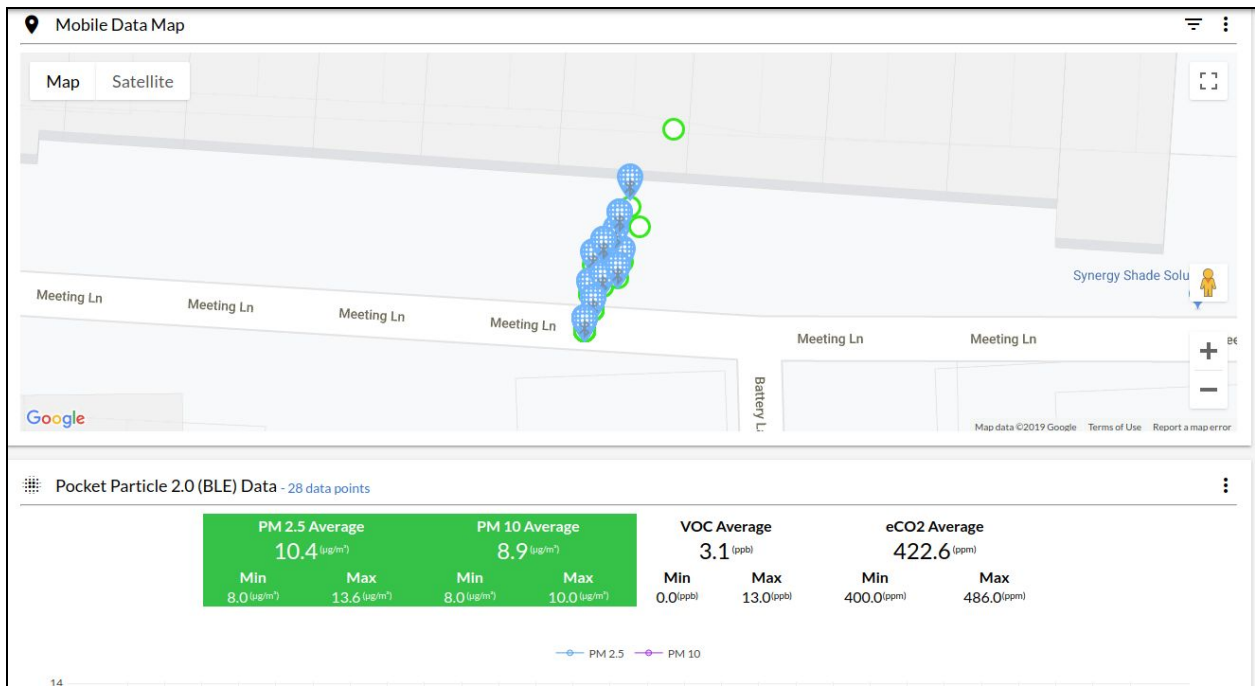
 **Mobile Data Map**

No geo data found for any listed sensors.

CHANGE DELETE

	Room	Status	Created	Started	Last Updated
SELECT	Outside	Started	May 30, 2019 10:49 AM	May 30, 2019 10:49 AM	May 30, 2019 11:52 AM
SELECT	Master Bedroom	Started	May 29, 2019 11:51 AM	May 29, 2019 1:02 PM	May 29, 2019 1:02 PM
SELECT	Garage	Started	May 29, 2019 12:02 PM	May 29, 2019 1:02 PM	May 29, 2019 1:02 PM
SELECT	Guest Bedroom	Started	May 29, 2019 12:03 PM	May 29, 2019 1:02 PM	May 29, 2019 1:02 PM
SELECT	Bathroom	Started	May 29, 2019 12:03 PM	May 29, 2019 1:01 PM	May 29, 2019 1:01 PM
SELECT	Family Room	Started	May 29, 2019 12:03 PM	May 29, 2019 1:01 PM	May 29, 2019 1:01 PM
SELECT	Basement	Started	May 29, 2019 12:04 PM	May 29, 2019 1:01 PM	May 29, 2019 1:01 PM

- 5) On for the “Master Bedroom” Room both Pocket Particle and GPS data have been captured.



- 6) You can also see any Notes and Images that were uploaded from the Mobile App on this page.


Note Data - 1 data point

outdoor smoker

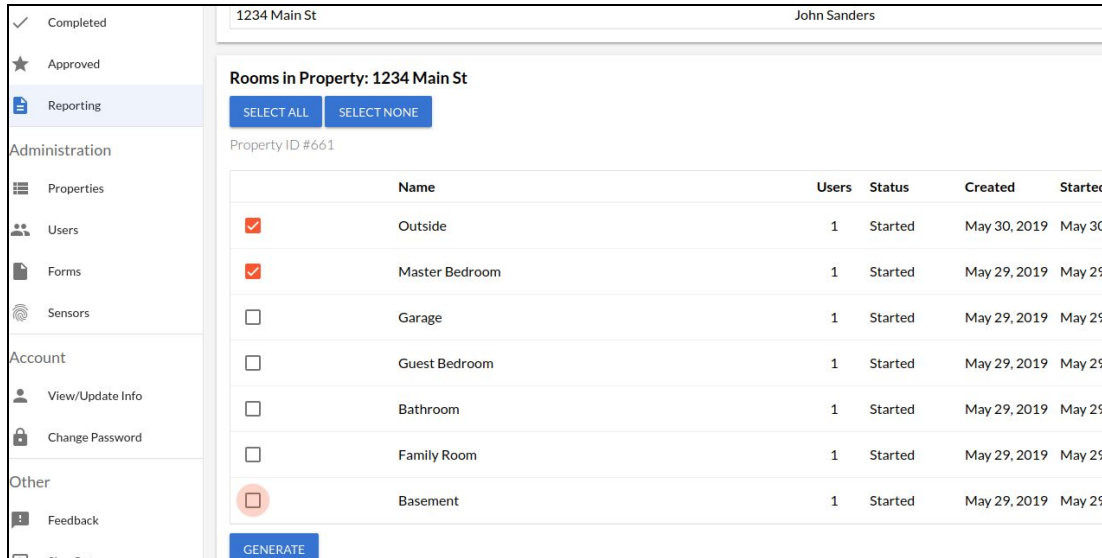
Alex Preston
 Jul 26, 2018 3:24 pm

Image Data - 1 data point


7/26/18 3:23 pm



- 7) If you would like a printable report of the Pocket Particle Plus data, you can download the report using the Reporting tab on the left side of the screen. Clicking the generate button will download a PDF report for the Property and the selected Rooms. All rooms are selected by default and minimal data will be presented for Rooms with no data.



- 8) Now with your report generated, you can share this information with your customer and determine if there are any issues that require further investigation.

Property Summary report for: 1234 Main St 

home inspection

Owner: Alex Preston (homeins@digienv.com)

Creator: Alex Preston (homeins@digienv.com)

Sensors: Forms via Android/iOS, GPS via Android/iOS, Images via Android/iOS, Notes via Android/iOS, Pocket Particle AQI 1.0, USB for Android, Pocket Particle AQI 2.0, BLE

Pocket Particle 2.0

Room	# of Meas. collected	PM2.5 Min (µg/m³)	PM2.5 Average (µg/m³)	PM2.5 Max (µg/m³)	PM10 Min (µg/m³)	PM10 Average (µg/m³)	PM10 Max (µg/m³)
Outside	11	3.0	3.7	4.0	4.0	6.5	8.0
Garage	11	3.0	3.5	4.0	3.0	4.5	5.0
Basement	17	3.0	3.1	4.0	3.0	3.5	6.0
Family Room	26	4.0	4.5	5.0	5.0	5.7	7.0
Kitchen	29	4.0	4.8	6.0	5.0	5.3	7.0
Master Bedroom	49	3.0	3.7	5.0	3.0	4.3	5.0
Guest Bedroom	36	4.0	4.6	5.0	5.0	6.0	8.0
Bathroom	23	4.0	4.4	5.0	4.0	5.2	6.0



Glossary

Solutions Web Application

The main source of managing your Properties, Rooms, Users and viewing your data. Most administrative tasks can be performed here.

Dashboard

Displays your standard information for the Property you have selected. Allows you to quickly navigate to different Rooms and manage the Property.

Reporting

Allows you to generate a Property report to be shared with customers.

Rooms in Progress/Completed/Approved

Displays detailed information of a Room based upon the Status of the Room. Here you can see GPS and AQI data as well as Notes and Images you captured on a per-Room basis.

Administration

These menus are only available to Administrator level users. These allow you to create new or manage existing Properties, Rooms and Users.

Properties

Create or edit Properties and manage the details of the Property.

Users

Create and edit Users and find additional details about Users and their assignments.

Sensors

The sensor page will show what sensors you have assigned to your account. You should not need to edit anything here. If you have questions about additional sensors, reach out to DigiEnv Support.



Account

The account section allows you to view and edit information about your account, including resetting your password.

View/Update Info

Here you can View your account name and information and update it as needed. Administrators can also upload Images for their Business that can be shown in the Report.

Change Password

If you need to update your password, you can do so here.

Other

Additional features and functions will generally be listed here.

Feedback

If you would like to provide us Feedback on any system or function, you can quickly and easily do so using the Feedback button.

Sign Out

If you need to sign out and test a new password or change users, you can do so using the Sign Out button.

SmartENV Mobile Application

The main application for collecting data using your smart device.

Login Screen

Email and Password

The email and password you setup for your user account.



Register

If you have not set up a user yet, you can use the Register button to create one. Note that if you want to create an additional user under your account, you should use the Solutions webpage. Registering a user through the SmartENV Mobile app does not associate them with your existing account.

Forgot Password

If you have forgotten your password, you can reset it using this button on the main screen of the SmartENV Mobile App.

Dashboard

You can navigate to the appropriate area from the dashboard. You will see the option to choose between your last Property or see a Property list. You can also select the left Menu from here.

Properties

If you are a TENANT or ADMIN user, you will see an additional field called Properties. You can create new Properties from this menu or edit existing ones.

Room Selection

You can navigate through the different Properties and see all the Rooms under a Property. You can also add additional Rooms from this screen as well.

Data Collection Screen

This is where you collect data from the sensors and is what you see after selecting a Room. You may see multiple sensors that you can sort through and a blue button where you can capture additional information like Images and Notes.

Contact Us

If you need to provide us feedback or have any questions about the product, you can use this screen to provide that information.



Logout

Your account information is stored by default. If you need to change users or log back in with an updated password, you can logout using this button.