Using the Purple Air sensor in your home

There are three aspects of the sensor this document will cover: setting it up, using it and understanding the readings.

Setting up the sensor

Set up what?

Here's a picture of the parts.

- The white rounded cylinder on the left is the instrument, then it and
- the power cord are on the instruction sheet. Some of the sheet's instructions have been done by library staff so you should follow the simpler instructions here.
- Note the holed tabs on the power supply if you need to hang it up. Likewise on the steel strap.

Please note that the instrument is made to take the weather but can not survive getting water inside. Mount it with the round part at the top. They have survived BC winters outside but only upright.

You'll need to connect the sensor to A/C power and wifi.

- The 10 metre power cord contains an inline 5 volt adapter.
- Plug the power cable in to the sensor using the micro USB plug at the end of the cable closest to the power adapter.
- The matching socket is inside the white housing. You'll be able to tell if the connection is working when you plug in to the power outlet.
- Plug the other end, with two prongs, to a wall socket. There's no power switch, the instrument starts up as soon as it is plugged in. A few seconds after power is available you can look up inside the white shell and expect to see a red glow. This is normal and says you're good to go.

Now connect to wifi.

When the instrument is powered up it looks for the wifi network it used last. Assuming you have a different SSID (network name), usually the case, you'll need to put in your details.

- To do this use your wifi device, e.g. a phone or laptop, and look for a new wifi access point called Air_Monitor_2a4f. Click to connect to this network.
- When you have a connection, start a web browser - Safari or Explorer or Edge or Firefox or whatever you normally use.
- In the browser's address box type this number: **192.168.4.1** then push enter. You'll get a web page showing current pollution level measurements. At the top left of this page is a link called **status** – that is the page you are now seeing.
- Right beside it is another link called **Wifi Settings**, point to this and click to get a new page. Here's a sample like what you'll then see:

On this new page is a list of names of all the wifi networks the instrument can see.

- Look for yours and tick the little circle to its left to select it.
- Then scroll to the bottom of the page and **enter the wifi password in the box** then
- **push save**. The unit will now save the connection information and restart.

The wifi connection is now set up. At this point there is no more wifi access from your device to the instrument. You will need to reconnect your laptop to your home network.

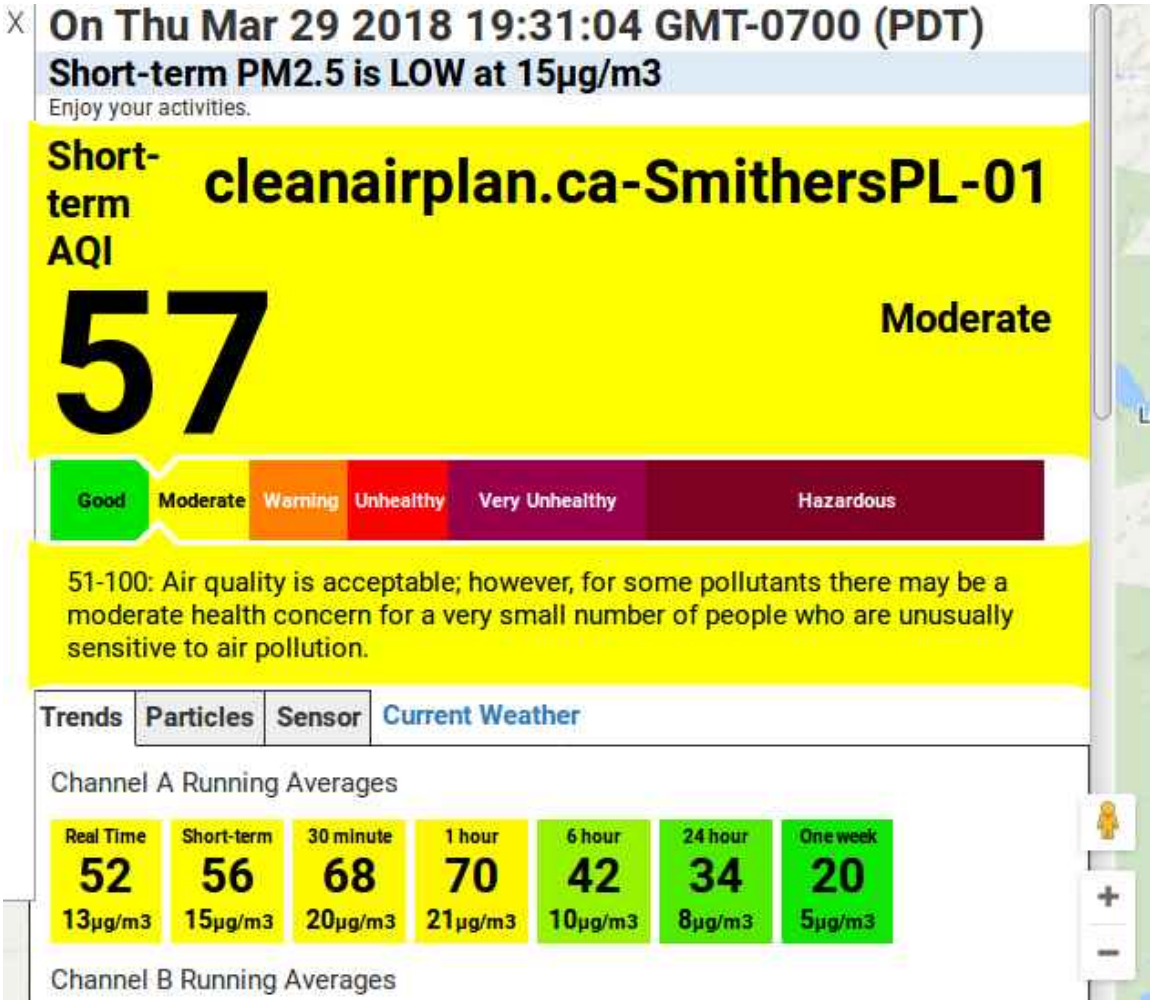
You can now go on to the internet to see readings from your instrument. Do this by going to this url: https://www.purpleair.com/map?&zoom=17&selected=416064|416066&lat=54.778358720766384&lng=-127.17549974441528&clustersize=33&orderby=L&latr=0.0031928835314047888&lngr=0.013432502746582031
You'll see the little house icon on the Smithers map, click on it to see the readings. The location on the map will always show the library - your location is not known, displayed or recorded.

Here's a screenshot:

On some maps you will see round icons. These too are Purple Air monitors, but they're in a fixed outside location. Round icon=outside readings, house icon=inside readings.

Next up is how to use the unit.

Having got readings going to the map you can now see your household PM2.5 levels on the map in real time or averaged over various time periods. Overleaf is a sample pop-up box displayed on the right of the screen after clicking on the library's house icon.



You can access the cleanairplan.ca sites by a link at https://new.cleanairplan.ca on the right hand sidebar with link text, "our air monitor communities." You'll then get a custom Google map of our area. If you point your mouse to the *map* label in the bottom left you can then see a little dropdown tickbox and toggle terrain on. This can help with visualization. You can zoom in or out as you like, the link on page 3 above will lead to Smithers.

Each of these sites contains some background information and a link to the purple air map for that community. That map has a marker on it that displays basic information about real time values. The menu box with the plus sign on the top left of the map allows toggling and selecting how the summary data is presented, so F *vs* C temperatures, Imperial *vs* Metric and mass *vs* AQI. In Canada it makes sense to use Celsius, metric and mass. Suit yourself, the settings will persist on your device.

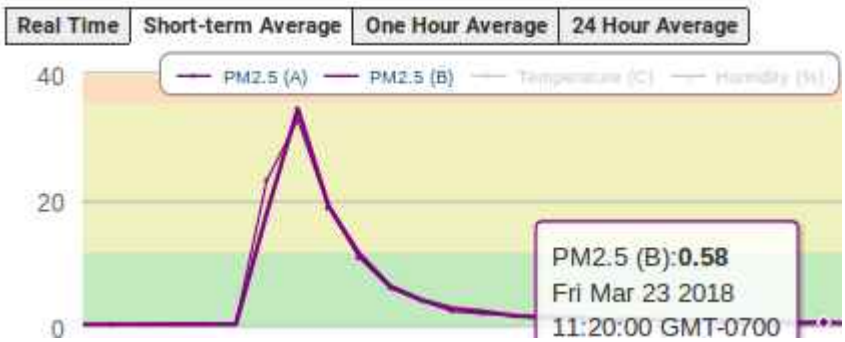
If you click on the marker you'll get a pop-up box like the one above with scads of information. It's a lot of work to see what all is there; it's easy to see new stuff from time to time as you get used to reading and clicking around.

In every coloured box is a big number - the short term AQI - and a small number, the mass concentration, those showing numbers like 5µg/m^3.What are most comparable to other ambient measurements are the 1-hour mass concentration reading and the 24-hour reading. There are two rows of coloured boxes – one for each of the sensors in that monitor, and you'll see slightly different readings in each row. The purple air site calls these channels sometimes. Generally they don't differ much. At the bottom of the popup box is a graph of readings from both sensors displayed x-y fashion with a coefficient called R^2, a correlation value, values closer to 1 indicate better agreement.

The AQI value displayed is problematic. The Air Quality Index is a national standard in both the US and in Canada but they are not the same. The purple air project is based in the US so it's natural that the US EPA standard would be used. But it isn't. Instead the short-term reading (over a 10 minute period) is used as if it were the arithmetic base measurement in the AQI calculation. But the EPA's AQI definition is based on a 24 hour measurement. So if you looked at a sequence of purple air AQI measurements and a sequence of EPA AQI figures, you'd be looking at different numbers. I think this is not accidental, the project sponsors include medical people who want to call attention to short term spikes in pollutants and this is how they've chosen to proceed. So *caveat emptor* – let the viewer beware.

In your home you will likely be well aware of observed levels and will be in a good position to understand the sources of particles and eliminate or mitigate them. It might be useful to read the Hazeltons site page here: http://hazelton.cleanairplan.ca/what-does-it-mean/ for more discussion on this.

A home diary is likely to be useful in keeping track of your activities as they affect your home air particles level. Try frying up some pancakes, or sausages – that should give the particle counters something to do. Or put more wood in your stove, another exciting episode in heart and lung health. If you do try frying food, turn on the range hood fan and you can expect lower levels and a quicker subsidence, here's a screenshot from a recent sausage frying:



This isn't, however, meant to be a medical advice column, so perhaps explore the subject in more depth at your public library.

Use purplehelp@cleanairplan.ca for support questions.