How to Use the Y-Pod
Standard Operating Procedure

How to Turn On the Monitor

1) Power the monitor by plugging in the power connector plug (either running from wall power or from the battery *see Power Option Diagram on next page) to the power connector outlet. To attach the power connector:

    a. Line up the ridge in the plug with the ridge in the outlet on the pod

    b. Insert power connector plug and screw ~½ turn in the top piece of the plug

    c. Screw in the bottom piece of the plug while holding the cord to secure the connection

    Tip with ridge to align with plug

    Top piece of power connector

    Bottom piece of power connector

2) Check to make sure the pod has power available by checking light 1 (see diagram on page 3). It should be illuminated.
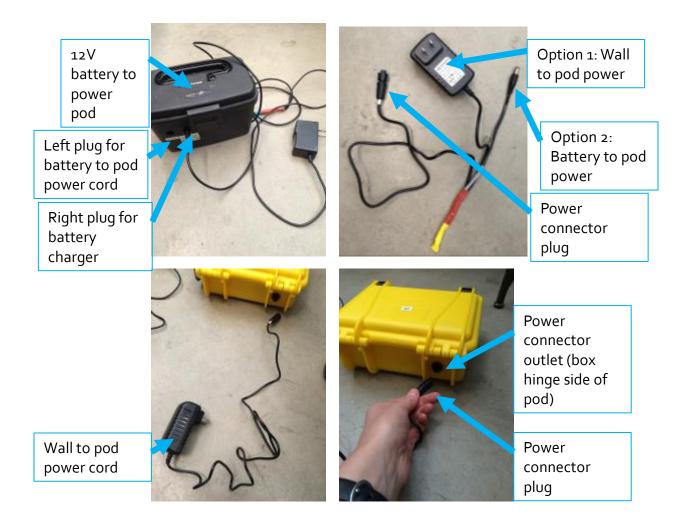
3) Power the monitor 'on' by flipping the silver power switch (see diagram on page 3).

4) Check the monitor function:

    a. Is **light 1** illuminated? *(see Pod Feature Diagram on Page 3)

    b. Are the **fans** running?

    c. Is **light 2** red all the time and is **light 3** blinking green approximately once per every 4-12 seconds? (the exact frequency will depend on the monitor's programming)

    d. If the answers to the above questions are 'yes', then the monitor is collecting data. Data collection will continue until the monitor is powered off.

    e. If the answers to the above questions are *no,* the pod is not working correctly. **ERROR CODES** – the pod is not working correctly if you see either of the following occur:

        i. *Lights 2 & 3 are both on all the time*

            1. SD card error – the pod is not recognizing the SD card.

            2. Try removing and replacing the same SD card.

            3. If that doesn't work, try inserting a new SD card.

        ii. *Light 3 not blinking*

            1. Pod is not logging and there is either no power to the board or there is another issue

2. If light 1 is off there is probably no power to the board, so try wiggling the power cord to see if the power turns on or off.
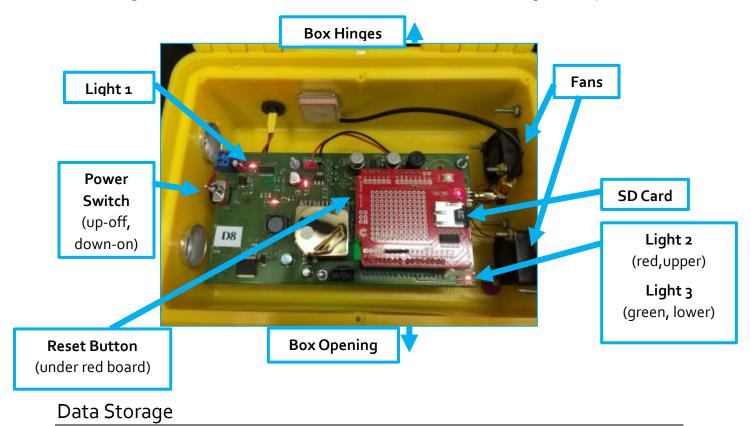3. If none of the above work click the reset button on the pod.
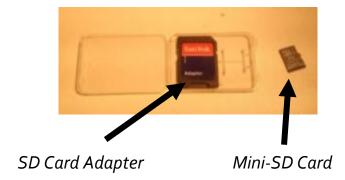
Power Option Diagram

12V battery to power pod

Left plug for battery to pod power cord

Right plug for battery charger

Option 1: Wall to pod power

Option 2: Battery to pod power

Power connector plug

Wall to pod power cord

Power connector outlet (box hinge side of pod)

Power connector plug

Pod Feature Diagram

Use the diagram below to turn on the monitor and make sure it is working correctly.

Box Hinges

Light 1

Fans

Power Switch (up-off, down-on)

SD Card

Light 2 (red, upper)
Light 3 (green, lower)

Reset Button (under red board)

Box Opening

Data Storage

SD Card Adapter   *Mini-SD Card*

While the monitor is running, data is being recorded to the mini-SD card; the device makes one file named with the date of the first day that the pod is turned on. If the pod is turned off and on on the same day, the data will continue to be recorded on the same file. If the pod is turned off and then turned on again on a different day, the data will be written to a new file named with the date of the new day it was turned on.

- *Note, the text files take up very little space, so do not worry about running out of space (we could probably fit a year's worth of continuous data on a card).
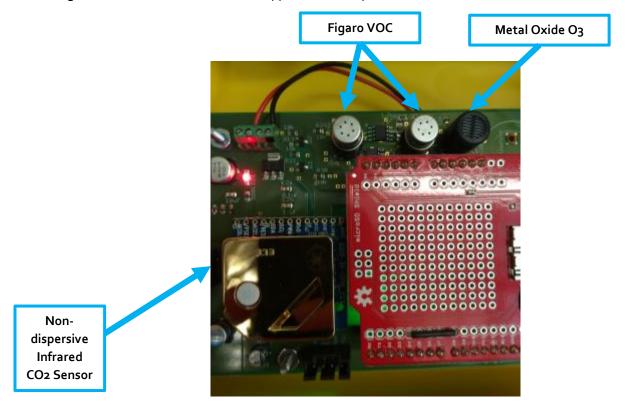
Saving/Accessing Data

- Remove mini SD card, gently push it in and when you release you should hear a click, then wiggle it out of the holder. To reinsert, gently push it in until you hear a click.
- Use the SD card adapter provided to load the data onto a computer
- The raw data is written to text files in a CSV (comma separated value format), and it is split up by day, the naming convention will tell you what data is in the file (e.g., YPODD8_2016_8_27 is data from pod D8 that started running on 8/27/2016)

Gas-Phase Species Sensors

Use the guide below to determine the type of sensor you have.

The picture above shows the locations of each sensor on the board. The Figaro VOC sensors have silver caps (not black caps). The ozone sensor has a black plastic cap, and the CO_2 sensor is a gold square. The Figaro VOC 2602 is sensitive to heavy hydrocarbons only, whereas the Figaro VOC 2600 is sensitive to both light and heavy hydrocarbons.

Sampling Frequency

The sensors are continuously running, but data is written to the SD card each time light 3 blinks green (approximately once every 2-12 seconds); therefore you likely have somewhere between 4 and 30 data points per minute. When processing the data, our group typically takes the average of the 4-30 raw data points per minute to create a "minute average" for data analysis.

If you would like to adjust the sampling frequency, the device will need to be re-programmed and you will need to contact the Air Quality group at CU Boulder for help.

Some Notes on Sampling

- Keep in mind that the sensors do not respond instantly and that they require a warm-up period to reach a baseline and adjust to ambient temperature. A good rule of thumb is to give the monitors 60 minutes to warm up before sampling.
- When sampling be sure to give the sensors time to respond to a stimuli. A good rule of thumb is to have the monitor close to the stimuli (e.g. car tailpipe) 5-10 minutes.
- Last note, keep in mind the flow dynamics of the monitor (see the diagram on the right); and make sure the monitor can effectively pull the sample into the chamber

When the monitor is sealed the fan is pulling the sample in the left side inlet vents and out the vents on the right side of the pod. The fans inside of the pod (on the right side) pull air through the pod from the inlet through the outlet.

Important Notes

- All monitors use GMT/UTC time. The time will need to be corrected for analysis (UTC-6 hrs during the summer, UTC-7 hrs during the winter to reach MST, the correct time in Colorado).
- If you choose to analyze raw data, REMEMBER that the data is in the form of raw electronic signal, or voltages. This means that only qualitative analysis of trends is possible, but quantitative data will not be accurate.