**Running Measurements**

1. Open C:\Users\Paios\Documents\GitHub\v1\Stability-Setup.
2. Run main\_1\_1.py.
3. The program will auto start.
4. Select either JV scan or MPPT(PnO) reading at the top.
   1. Running PnO will run and save JV scan as well.
   2. Will be stored in the same folder.
5. Hit "GO" after selecting settings.
6. Graphs will save in /data folder named after the date and time you started the program.
7. If you want to stop measurement at any point, click into the vscode terminal and ctrl-c.

**Generating Graphs**

* Open:

C:\Users\Paios\Documents\GitHub\v1\Stability-Setup\dataVisualization.dataShow\_1\_0.ipynb

* find the data file in C:\Users\Paios\Documents\GitHub\v1\Stability-Setup\data
* data is labeled:
  + [type of measurement] + [light or dark(if JV scan)] + [Date] + [time]

A screenshot of a computer

Description automatically generated with medium confidence

* Paste the entire file path of the datafile in the specific spot depending on type of measurement.
  + Will generate graph with all pixels, then 4 individual graphs per device
* Change function parameters:
  + Pixels = [1,2,3…] (show only certain pixels)
  + Devices = [0,1,2,3] (show only certain devices)
  + showDeadPixels (include dead pixels in graphs or not)
* Click run cell.

A picture containing text, font, screenshot

Description automatically generated



* Graphs will be generated in same folder where your data resides

**Downloading Code Updates**

* Open GitHub desktop
* Make sure the current repository in the upper left-hand corner says "Stability-Setup".
* Click fetch origin in the upper middle.
* Click pull origin in the same spot.
* Code will be updated.

A screenshot of a computer

Description automatically generated



**Uploading Data**

* Open GitHub desktop.
* Type commit message (can be description of measurement or just date).
* Click commit to main.

A screenshot of a computer

Description automatically generated



**Common Errors**

* "value length does not match array length", or something like that right after you hit GO:
  + This means you ctrl-c'd previously while the arduino was in the process of sending data over to the computer.
  + Solution:
    - Restart the arduino (either unplug and re-plug or hit the reset button).
    - Keep rerunning the main.py file until all of the unreadable data is cleared out.
* "COM\_\_ not found":
  + Open vs-code.
  + Open any **.ino** file.
  + Click the com port button (1st pic)
  + Replace the line in main.py (3rd pic) with whatever port the arduino uno is on (2nd pic). There is code to handle this but it only works when there is only 1 arduino plugged in and the litos uses an arduino.
  + A screen shot of a computer

    Description automatically generated with medium confidence
* If the mppt measurement shows ovf (overflow) for many values:
  + just wait a little bit for the algorithm to stabilize
  + if it doesnt stabilize within 2-3 minutes, restart the arduino