P-SDTR Sensor GUI v1

User Guide

Installation

Download:
- Download the files directly or clone the repo from here

Python requirements:
- Install Python 3.9 (https://www.python.org/downloads/release/python-399/)
- Run `pip install -r requirements.txt` inside the project folder

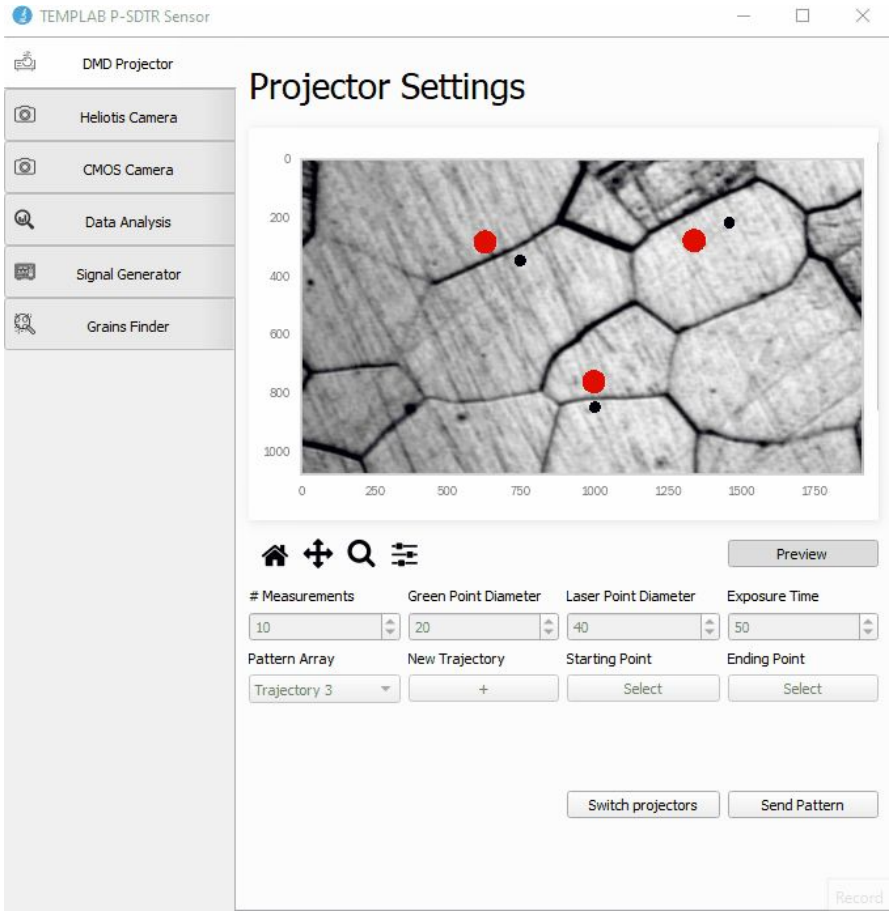
Projector driver:
- Download Zadig from here
- Connect the projector
- Go to 'Options' -> 'List All Devices'
- Look for 'DLCP900 (Interface 0)
- Replace WinUSB driver with libusb-win32 driver
- *NOTE: TI GUI will stop working once you replace the driver. If you want to restore the WinUSB driver, go to Device Manager, search for the libusb-win32 driver, uninstall and check 'Delete the driver software for this device'*

Helicam SDK:
- Download and install the SDK from here

CMOS Camera driver:
- Download native driver from here

Features

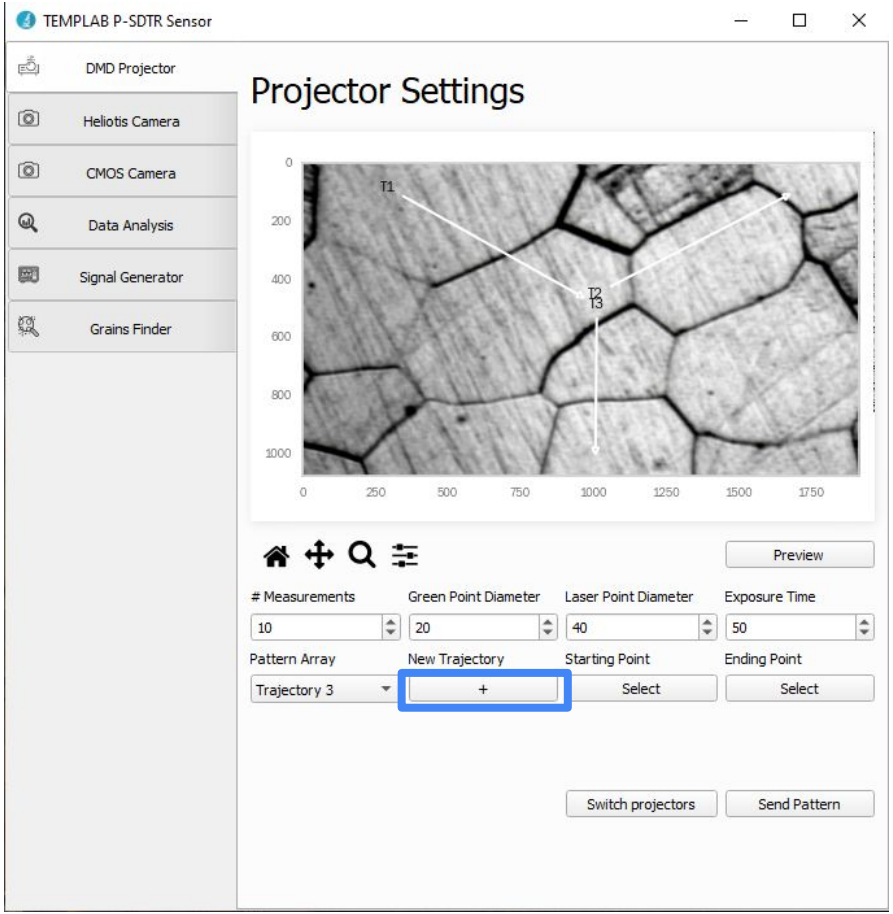
- RGB and laser projectors
- Heliotis Camera
- CMOS Camera
- Data Analysis
- Signal Generator
- Grains Finder (work in progress)



RGB and Laser Projectors

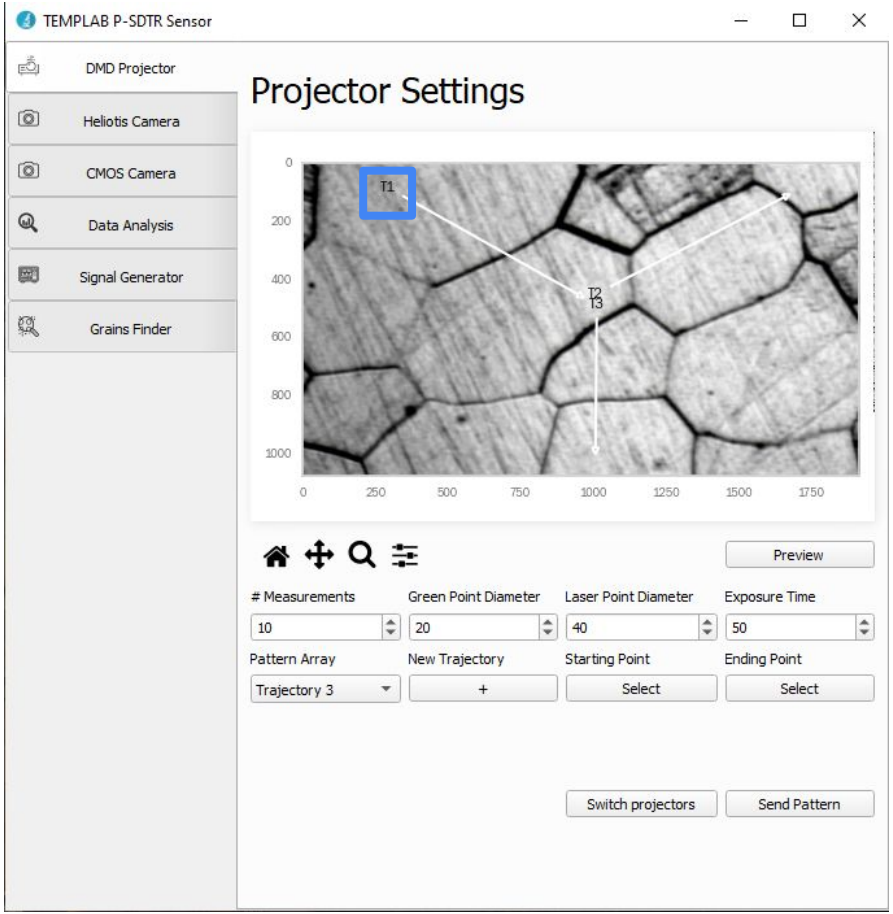
The user configures a set of trajectories to be projected on the sample.

For each trajectory, the RGB projector will display a sequence of equally spaced points all across, and the laser projector will display a stationary point at the middle.



RGB and Laser Projectors

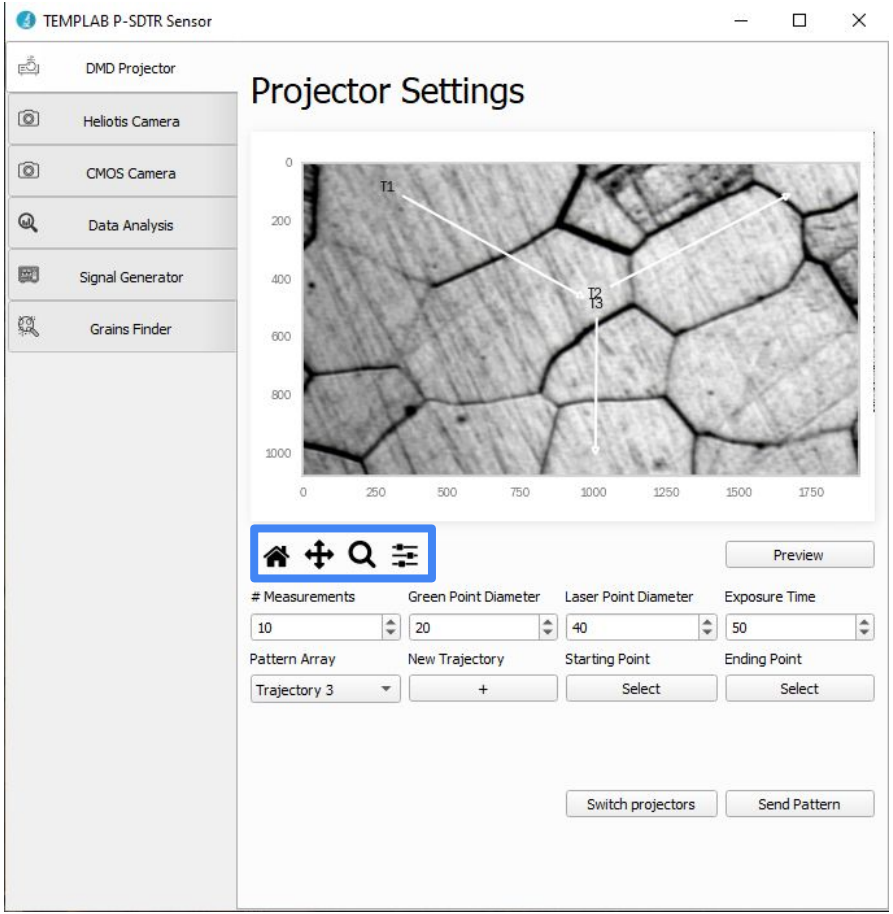
Add a new trajectory with the “+” button.



RGB and Laser Projectors

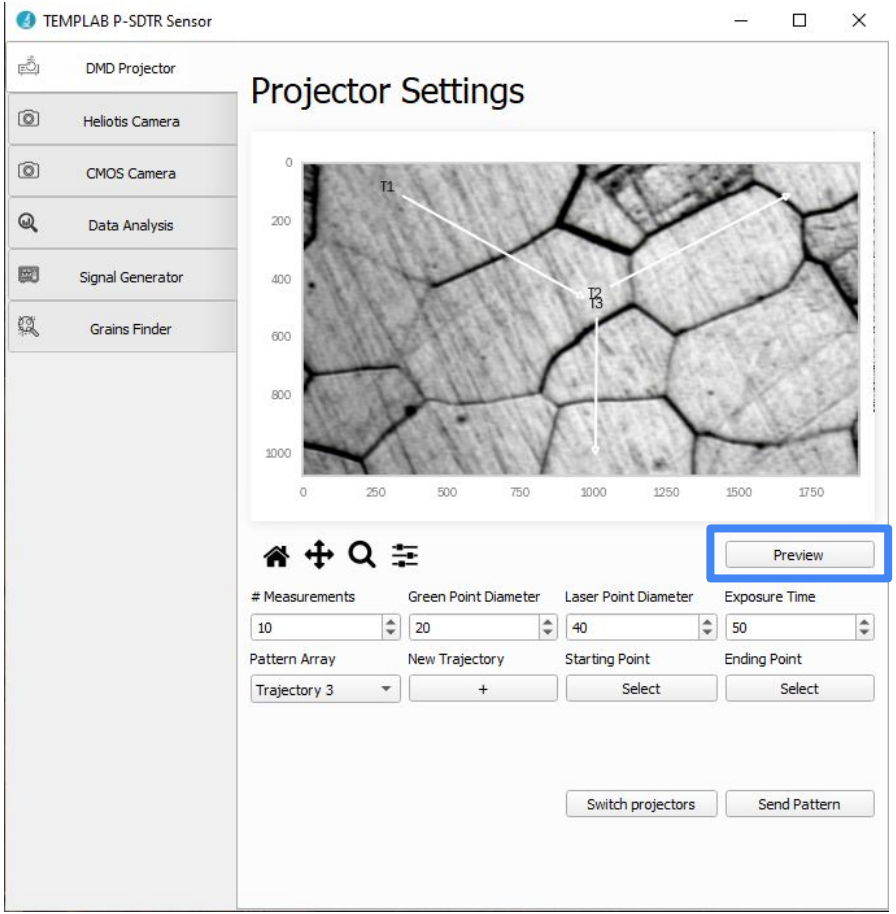
Select the starting and ending points on the plot.

To edit these later for any trajectory, use the “Pattern Array” dropdown and the “Select” buttons.



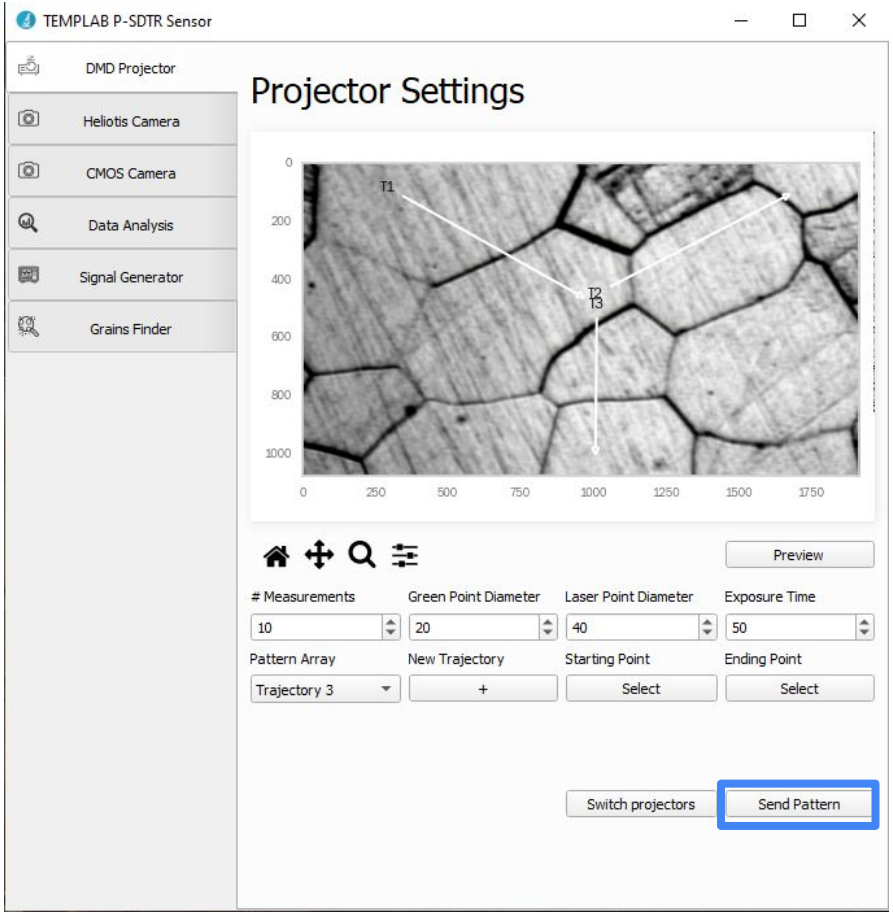
RGB and Laser Projectors

To interact with the plot (zoom, pan, etc), use the navigation bar.



RGB and Laser Projectors

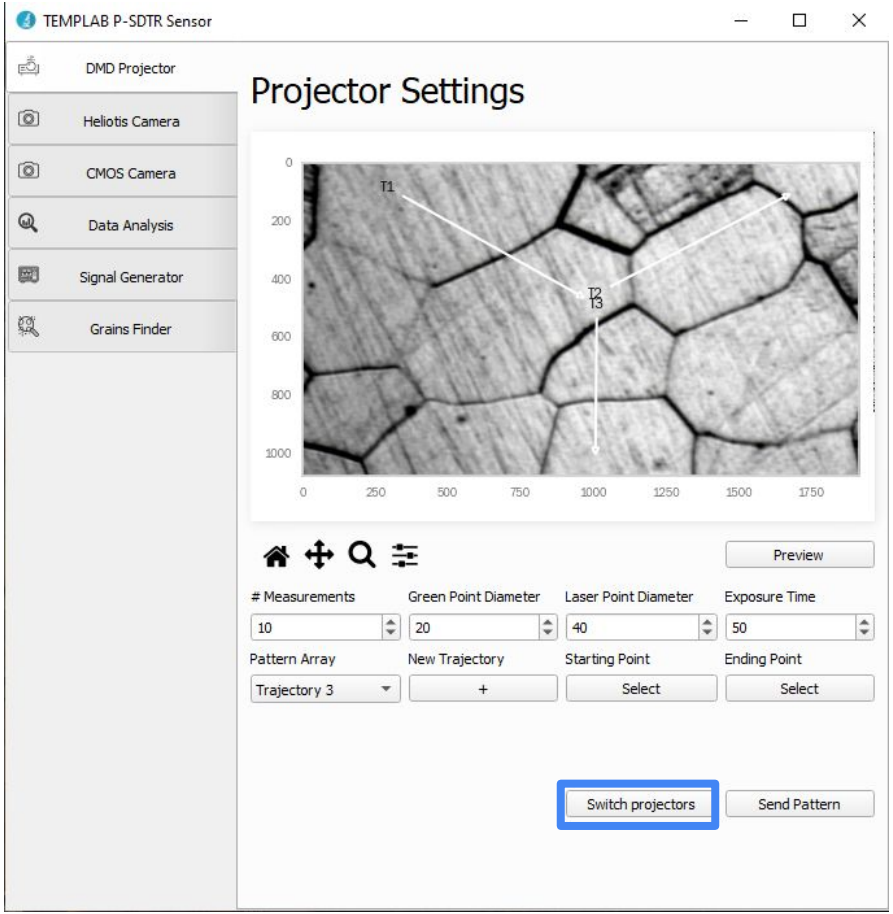
Click “Preview” to double-check.



RGB and Laser Projectors

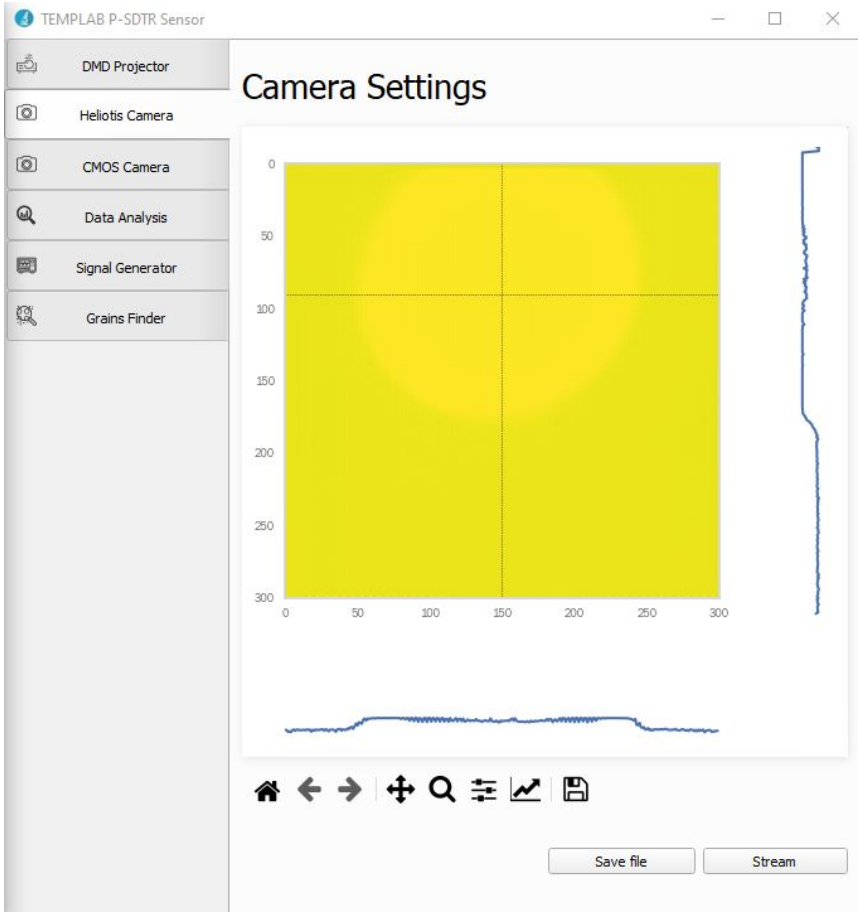
With the devices connected, click “Send Pattern” to set up the sequence in the projectors.

If the projectors are not connected or recognized by the device, a message will appear on the Python terminal.



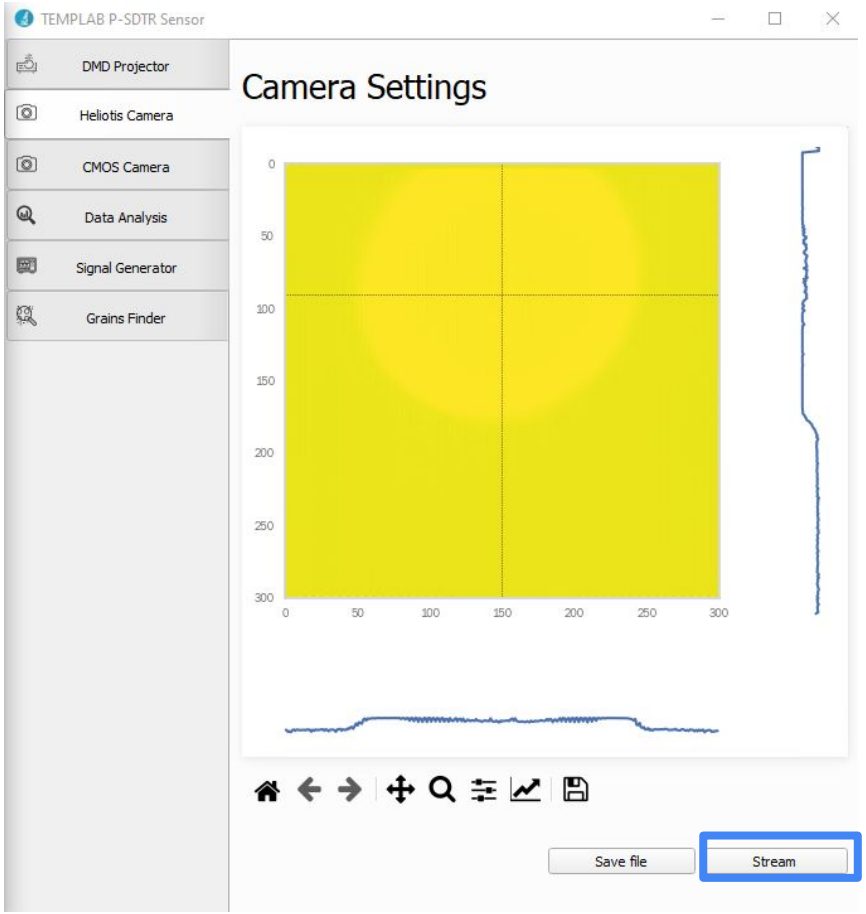
RGB and Laser Projectors

If the order of the projectors is incorrect (laser projector showing the rgb pattern and vice versa), click on “Switch projectors” and send the pattern again.



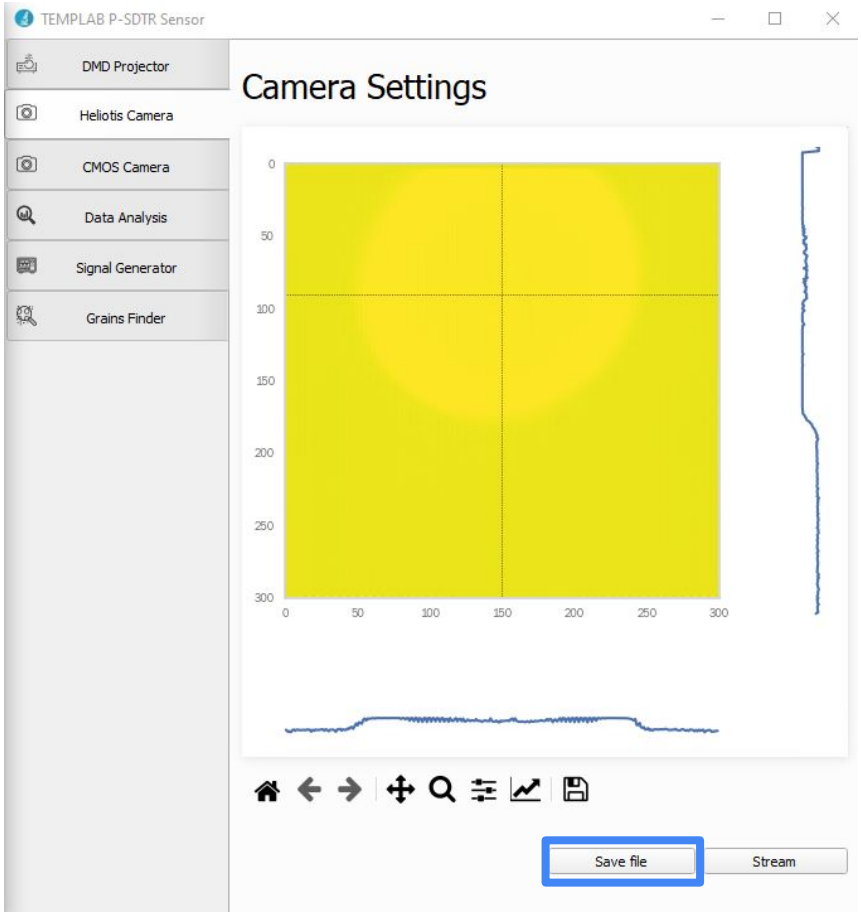
Heliotis Camera

The user connects the Heliotis Lock In Camera, visualizes the measurements (amplitude or phase), and has the option to save the data in a numpy array (.npy file).



Heliotis Camera

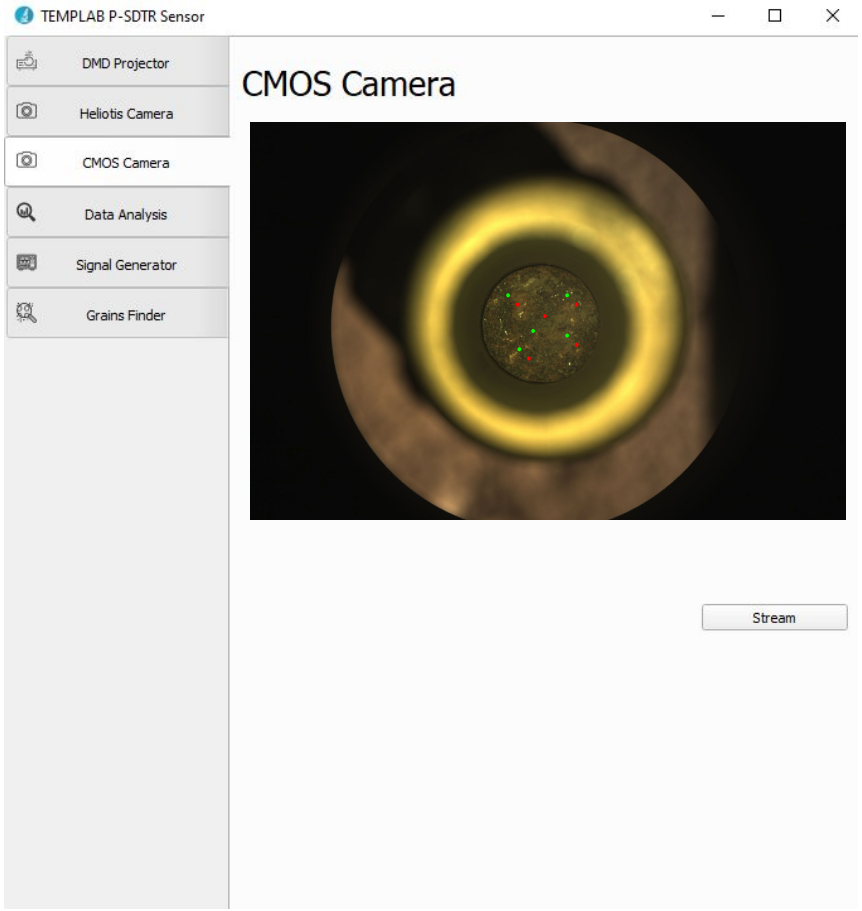
To start gathering data, press the “Stream” button.



Heliotis Camera

To save the data, press the “Save file” button.

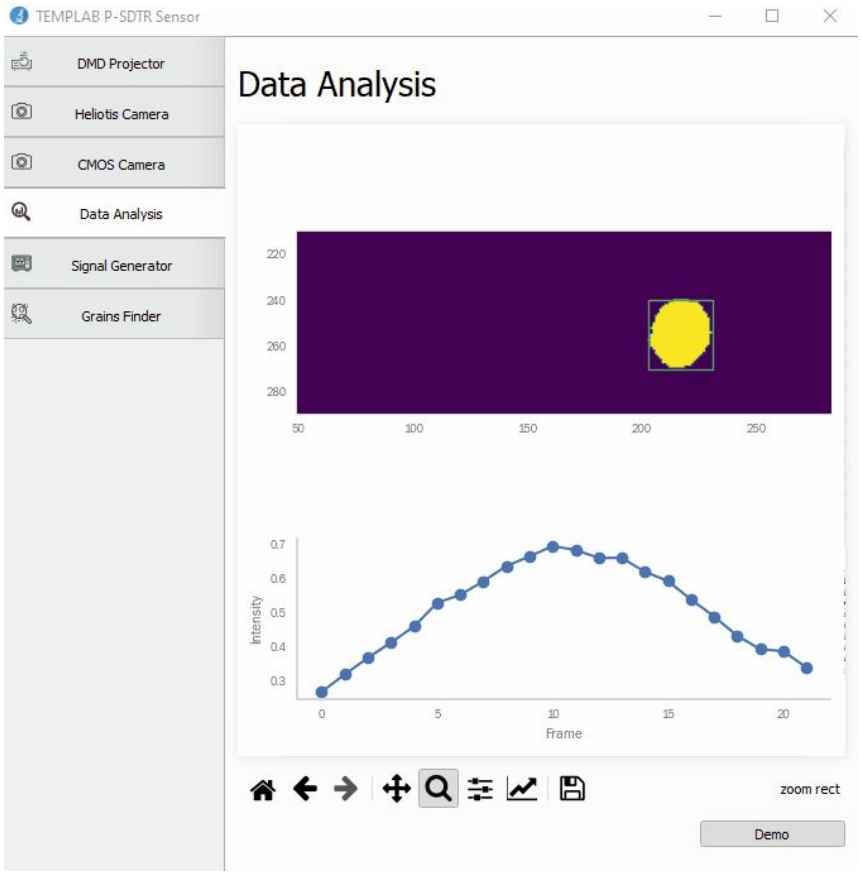
A .npy file will be created on the helicam\logs folder.



CMOS Camera

The user connects the CMOS Camera, and visualizes the sample.

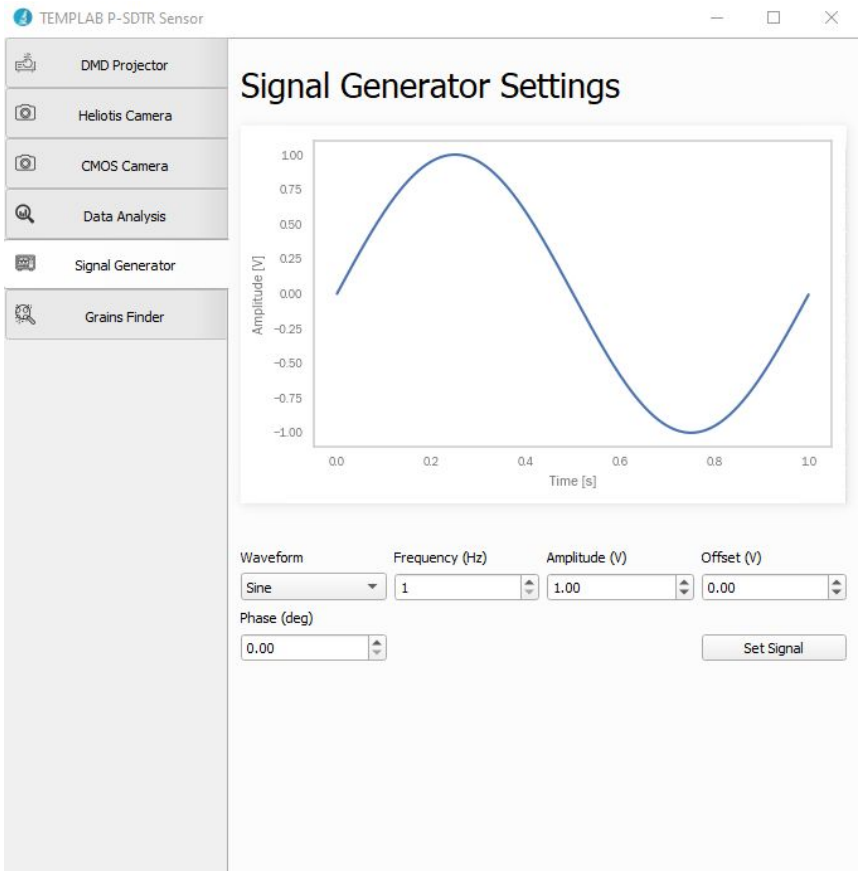
Will be mainly used for alignment purposes.



Data Analysis

The user imports a .npy file with a set of consecutives captures of a measurement trajectory from the Lock In Camera.

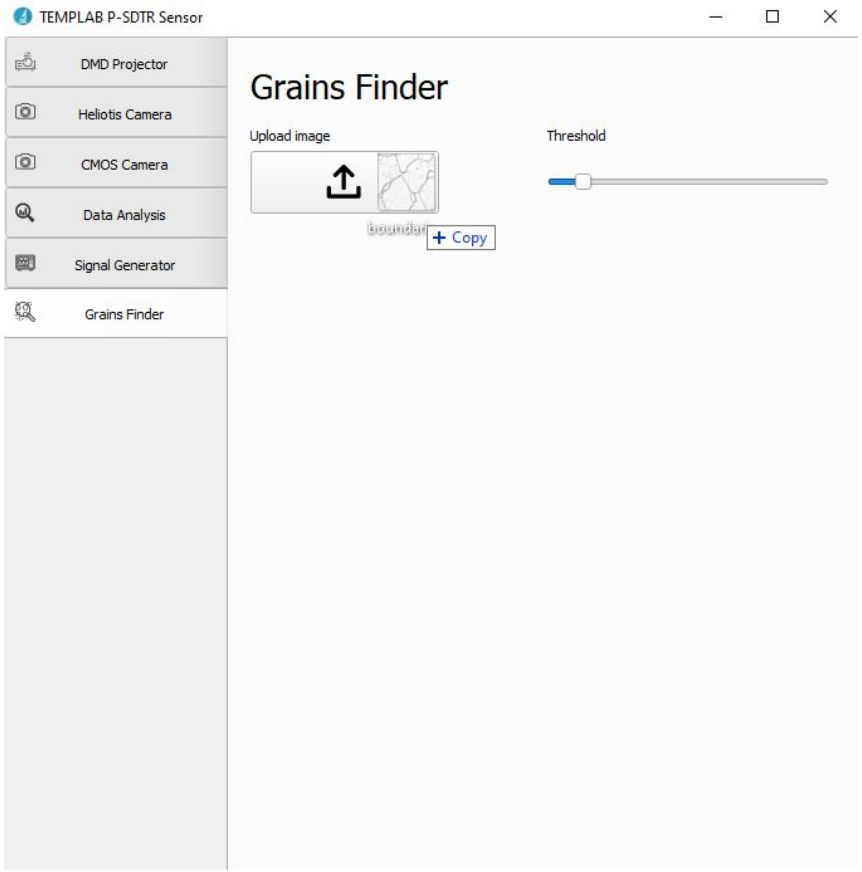
The algorithm analyses the phase lag and displays the phase profile.



Signal Generator

The user connects the signal generator for the laser beam, and sets the configuration:

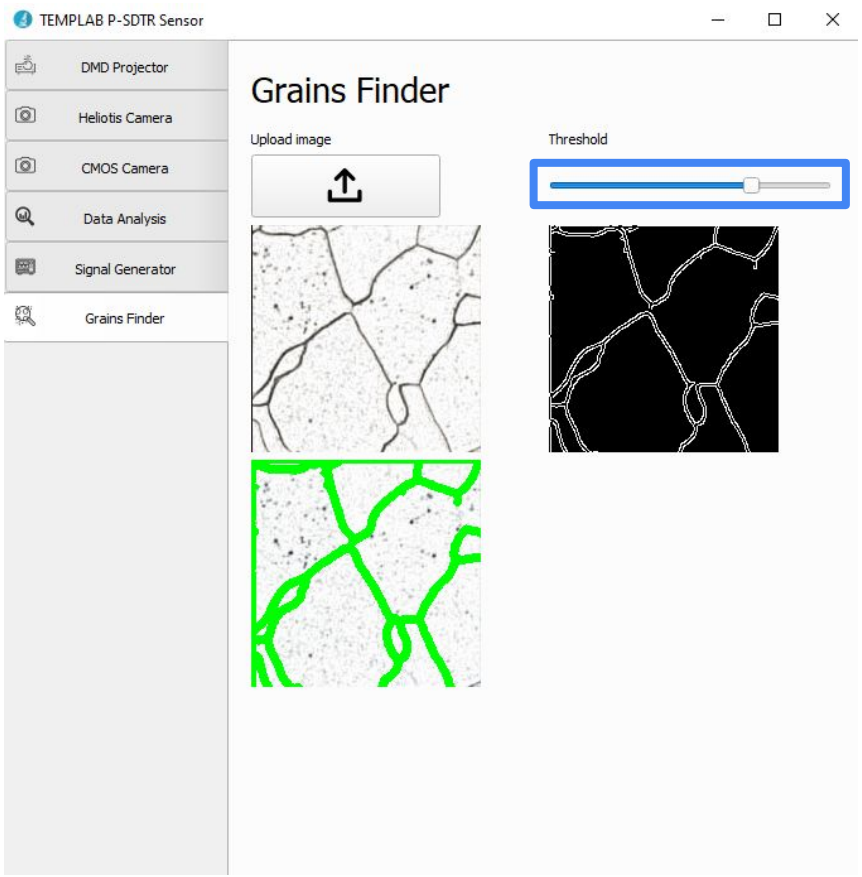
- Frequency
- Amplitude
- Offset
- Phase



Grains Finder

(work in progress)

The user uploads a SEM image by drag and drop.



Grains Finder

(work in progress)

The algorithm will find the grain boundaries and highlight them in green.

Use the slider to change the threshold.