Oxy-10 Mini Protocol for Thermal Performance Curve Experiments

Author: Hannah Aichelman (hannahaichelman@gmail.com)

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Instrument: Oxy-10 mini (10 chamber from PreSens)

Software Version: OXY10v3\_33

Instrument Set-Up

1. Set up the Oxy-10 mini instrument by placing the fiber optic cables into channel ports and hand tightening (they are labeled with the port number, which corresponds to the chamber number). Gently slide the cables into the corresponding chamber holder so the fiber end meets the side of the chamber where the oxygen-sensitive spot has been glued.
2. Plug Oxy in to wall outlet and switch on.
3. Plug USB into ComPort 3 (left side of notebook).
4. Open Oxy software and, when prompted, choose correct ComPort from drop-down menu and click ‘ok’.

Instrument Calibration

1. On the ‘Calibration’ tab, click to ‘ALL CHANNELS’ at the top of the screen and enter the calibration information for the specific batch of oxygen-sensitive spots you are using. This information comes in the Final Inspection Protocol for the spots.
   1. Note: We spent a long time talking with folks at PreSens about the instrument calibration. Please see the ‘PreSens\_Oxy10Mini\_Appendix.pdf’ file included in this GitHub repository (Protocols folder) or get in touch with me if you are interested in getting more info.

Making Measurements

1. On the ‘Measurement’ tab of the software, set ‘SAMPLING RATE’ = 15 sec, set ‘CHANNEL TEMPERATURE’ to the temperature of your measurement, and set ‘OXYGEN UNIT’ to mg/L.
2. On the bottom of the ‘Measurement’ tab, click through each of the channel tabs (i.e., Channel 1, Channel 2, etc.) to check that the ‘Amplitude’ bar is in the green. This means that the fiber is flush with, and can essentially ‘see’, the oxygen sensitive spot.
3. Once the channel settings are appropriately set, click the tab under ‘SINGLE CHANNEL’ for all of the channels you want active. If using all chambers, click ‘ALL CHANNELS’ underneath the ‘SINGLE CHANNEL’ column.
4. On the ‘Logging’ tab, enter an appropriate description (e.g., coral ID) in each chamber description.
5. Click ‘LOG ALL ACTIVE CHANNELS’ on the ‘Logging’ tab when ready to begin a measurement. You will be prompted to save the log files at this time, create an appropriate file name (i.e., Date\_Temp\_P/R) and save.
6. Un-click ‘LOG ALL ACTIVE CHANNELS’ when you are ready to stop the measurement.
7. Back on the ‘Measurement’ tab, un-activate all channels, change ‘CHANNEL TEMPERATURE’, and re-activate channels as necessary when changing temperatures throughout the ramp experiment.
8. You can monitor change in O2 in each chamber during a measurement on the ‘All channels’ tab once you activate the channels.

Notes Specific to TPC Experiments Published Here

1. I made separate measurements for photosynthesis and respiration at each temperature in these experiments, each 20 minutes long. For example, after measuring respiration for 20 minutes, I would stop logging, update the file descriptions on the ‘Logging’ tab, and then begin a new log when I was ready to start measuring photosynthesis. Following the photosynthesis measurement, I would stop logging again, change the temperature on the ‘Measurement’ tab to the next temperature of the ramp, and start the process over again.