DatLab 8.0: Cyclic voltammetry manual

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DatLab 8.0: CV

Overview

Integration of Q-redox monitoring in the NextGen-O2k extends the analytical and diagnostic power of high-resolution respirometry. The DatLab 8.0: CV-Module is the next step in high-resolution respirometry (HRR) incorporating user-friendly features for cyclic voltammetry (CV) as a part of the Q-Module. CV is a type of electrochemical measurement, applied as a quality control step to determine the redox potential of coenzyme Q2. In voltammetry, information about the analyte is obtained by measuring the current as the electric potential varies. In CV the electric potential ramps linearly versus time in cyclical phases and is measured between the glassy carbon (GC) and the Ag/AgCl electrode while the current is detected between the GC and the platinum electrode. The detected current is plotted versus the applied voltage (GC's potential) to give the typical cyclic voltammogram trace.

1.   Start DatLab 8.0 for cyclic voltammetry

1.1. Install the software: unzip the DatLab 8.0 CV folder.
1.2. Click on main.exe to launch the software.
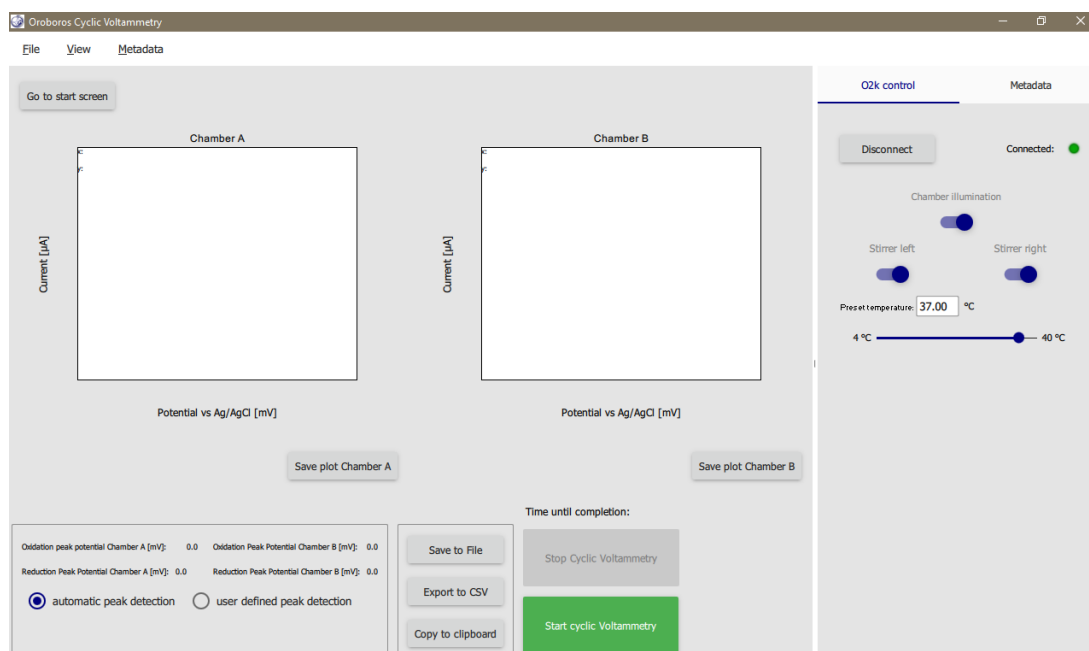
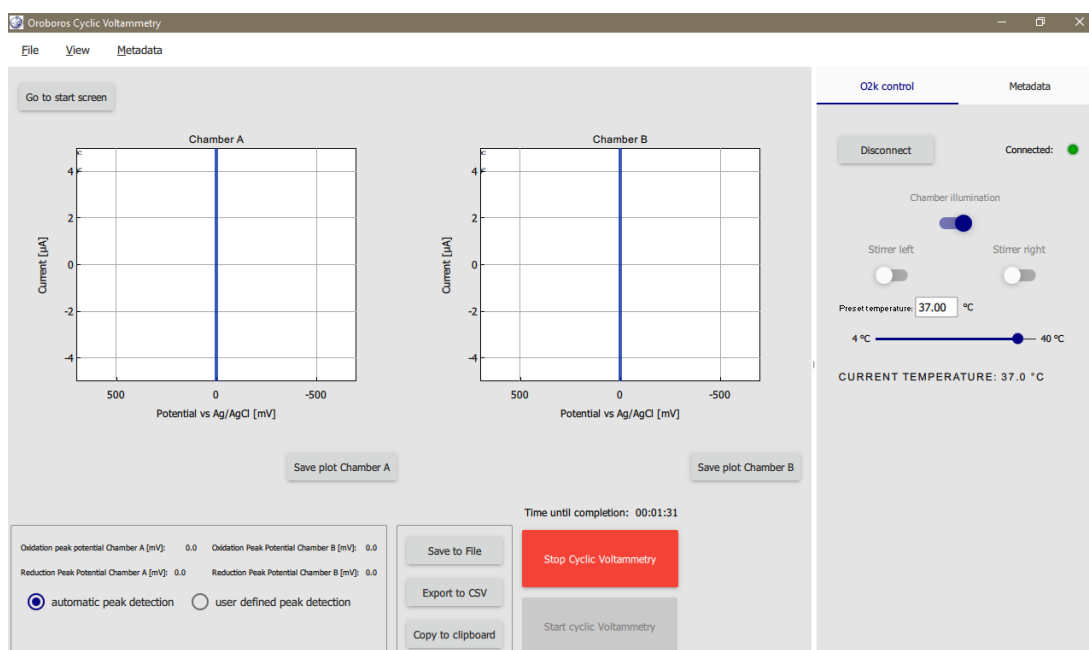1.3   In the starting window of DatLab 8.0 click on Connect to O2k.

1.4   Set the desired temperature in the side menu.

1.5   Click on Cyclic Voltammetry at the bottom to open the module for cyclic voltammetry.

1.6   Click on Start cyclic Voltammetry to start the measurement.

The cyclic voltammetry will automatically stop after finishing five cycles. Afterwards you have the option to Save to File (.dld8) and to Export to CSV (.csv). To copy the oxidation and reduction peak potential values, click on Copy to clipboard. The figures can be exported separately by clicking on Save plot Chamber A or B, and copied into a .doc or .ppt file.

The software is able to automatically detect the oxidation and reduction peak potentials for both chambers, if the automatic peak detection is selected. By clicking on the user

defined peak detection, you are able to select the peak by left clicking the mouse in the plot. The value obtained for the oxidation peak potential value (mV) will be used to measure the Q redox ratio with DatLab 7.4 (type it in O2k control/Potentiometric/Offset voltage [mV]). In DatLab 7.4, select 100 as Gain for Q sensor and check Q ena. Click on Send to O2k to start the measurement.

⚠️ **Important** Before you close DatLab 8.0, switch on the stirring in the chambers again in the side menu.

⚠️ **Important** If you start your measurement in DatLab 7.4, do not forget to change the Data recording interval in the O2k control window in the System tab to 2.0 sec.

Acknowledgements

Author contributions
Komlodi T, Iglesias-Gonzalez J and Gnaiger E were responsible for the project and instrumental development. Haider M developed the software. Komlodi T and Cardoso LHD performed the experiments. Komlodi T, Cardoso LHD, Iglesias-Gonzalez J and Tindle-Solomon L prepared the MiPNet.