

O2k-Manual: DatLab 7.4



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Updates: https://wiki.orooboros.at/index.php/MiPNet26.06_DatLab_7:_Guide

DatLab 7.4 guide

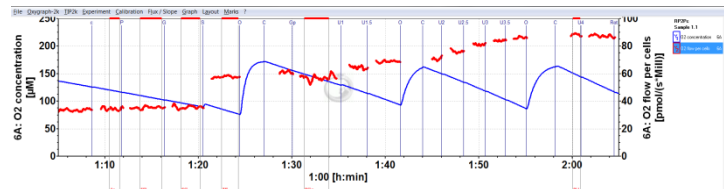
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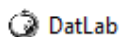
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1. General information

This guide introduces features of **DatLab 7.4** which presents an integral component for [high-resolution respirometry \(HRR\)](#). For specific applications of DatLab, see:

- » [MiPNet22.11](#) O2k-FluoRespirometer manual
- » [MiPNet06.03A](#) O2k Quality Control 1: Polarographic oxygen sensors and accuracy of calibration
- » [MiPNet14.06E](#) O2k Quality Control 2: Instrumental oxygen background correction and accuracy of oxygen flux
- » [MiPNet24.06](#) DatLab O₂ flux analysis: real-time
- » [MiPNet12.10](#) Titration-Injection microPump, TIP2k
- » [MiPNet17.05](#) O2k-Fluo LED2-Module
- » [MiPNet15.03](#) O2k-MultiSensor-ISE
- » [MiPNet15.05](#) NO-manual

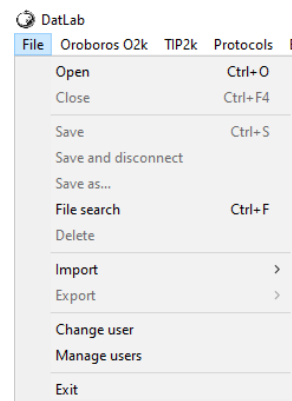
The following sections are a guide through the menu bar displayed in DatLab 7.4 software:



File Oroboros O2k TIP2k Protocols Experiment Calibration Flux / Slope Graph Layout Marks ?

2. File

- **Open** **Ctrl+O** Left mouse click **Open DLD file** to open a previously saved **DatLab Data** file. An additional DLD file can only be opened by starting a separate DatLab session.
- **Close** **Ctrl+F4** Close a DLD file. By doing so the window 'Save changes to file?' pops up offering the options to close the file after saving the changes, or to close the file without saving any modifications on the currently open file.
- **Save** **Ctrl+S** Save any changes made by overwriting the currently open file, specifically changes related to set calibrations, experimental protocol, marks, events, and layout. Such changes do not affect the raw data of the experiment. **Temporary backup files** are generated by DatLab 7.4 in the current user's temp directory, indicated by the extension 'tmp.***' in the file name. These files are retained only if the PC has failed during data analysis. During data acquisition the data are continuously saved, bypassing the need to create backup files under these conditions.
- **Save and disconnect** Stop data acquisition and disconnect from the O2k ([MiPNet22.11](#)).
- **Save as...** Save the file under a different file name and/or under a different directory.
- **File search** **Ctrl+F** displays a list of all files labelled by the experimental code in a selected directory (see **Experiment** \ **Edit** **F3**). Click on the file name to preview the protocol.
- **Delete** To delete a file containing no useful data (easily when viewing the traces). Option only available when disconnected from the O2k.
- **Import** **DatLab templates** can be imported for O2k-setups, graph layouts, mark names, TIP2k setups and marks statistics configurations.
- **Export**
 - A (B): Export DL-Protocol User (*.DLPU):** Fixed sequence of events and marks can be changed (Skipped/Added) in a SUIT protocol by the user. Text, instructions, concentrations and titration volumes of injections in a specific DL-Protocol can be edited and saved as **user-specific DL-Protocol**.
 - » [Export DL-Protocol User \(*.DLPU\)](#)
 - Data to text file (*.csv)** exports plots and events to a text file for further use in Excel and other programs compatible with .csv extension.
 - Events to text file (*.csv)** exports all information in Events to a text file (*.csv). This file may be used as a protocol, including the comments in the Events.

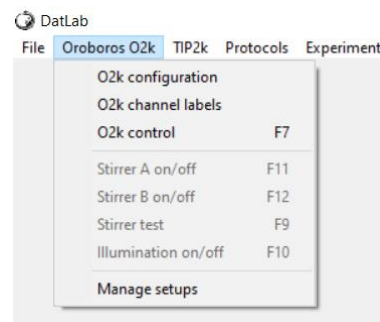


One channel to DatLab 2 analysis exports the O2 raw signal to a DatLab 2 file (*.DLR); e.g. for O2 kinetics in DatLab 2.

- **Change user:** Enter the name to alter the username.
- **Manage users:** Rename or delete users.
- **Exit:** Exit DatLab.

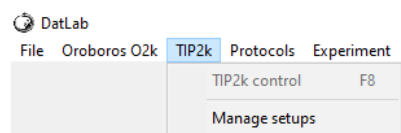
3. Oroboros O2k

- **O2k configuration:** Select or deselect channels that are not actually used and enter sensor numbers. With the O2k-FluoRespirometer (O2k-Series H), the serial numbers of the Smart Fluo-Sensors are shown automatically under [Amperometric, Amp] » [MiPNet22.11 O2k-FluoRespirometer manual](#)
- **O2k channel labels:** Change default channel labels.
- **O2k-control [F7]:** Control the O2k-operation mode. » [MiPNet22.11 O2k-FluoRespirometer manual](#)
- **Stirrer A (B) on/off [F11] ([F12]):** Stirrers in chamber A or B are switched on/off.
- **Stirrer test [F9]:** Stirrers are stopped intermittently (default: 30 s) for a stirrer test. » [MiPNet06.03 POS-Calibration SOP](#)
- **Illumination on/off [F10]:** The illumination in both chambers is switched on/off. This illumination must be distinguished from light introduced into the chambers by LEDs for the purpose of spectrophotometric and fluorometric measurements. For these, the internal illumination must be switched off.
- **Manage setups:** Setups can be renamed or deleted.



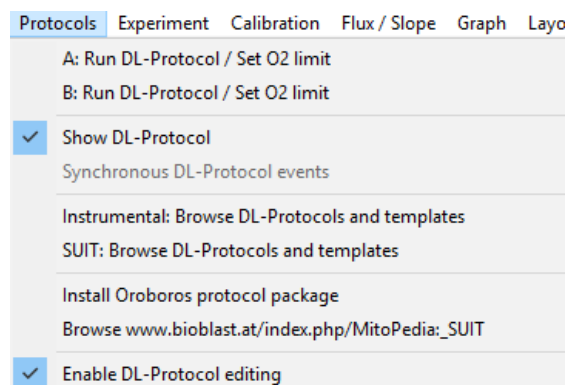
4. TIP2k

- **TIP2k control [F8]:** Control the TIP2k operation mode.
- **Manage setups:** Setups can be renamed or deleted. » [MiPNet12.10 TIP2k-Manual](#)



5. Protocols

- **A (B): Run DL-Protocol / Set O2 limit** opens a window to assign DL-Protocols to O2k-chamber A or B, or both and to set a warning for lower O2 limit. The same window pops up after connecting to the O2k.
- **Show DL-Protocol** can be checked () to hide or show the DL-Protocol window.
- **Synchronous DL-Protocol events:** This option is only available when the same DL-Protocol is selected (in 'Set DL-Protocol / O2 limit') for chamber A



and B. When checked () , the user only needs to follow one protocol sequence in chamber A or B.

- **Instrumental: Browse DL-Protocols and templates** opens a folder with the library of the Instrumental protocols provided with the DatLab 7.4.
- **SUIT: Browse DL-Protocols and templates** opens a folder with the library of the SUIT protocols provided with the DatLab 7.4.
» [Browse DL-Protocols and templates](#)
- **Browse www.bioblast.at/index.php./Mito-Pedia_SUIT:** Link to the available library of SUIT protocols and updates.
» <https://suitbrowser.oroboros.at/>
- **Enable DL-Protocol editing** can be check-marked () to enable changes in DL-Protocol.



[Clip How to find a \(DLP\)](#)

6. Experiment

- **Sample F3**: Collection of information regarding the protocol, sample or medium used. Information in this window can be edited at any time during or after the O2k run. Changes made in this window lead to instantaneous recalculation with the new parameters. Initially, the **Sample** window displays information from the last file recorded and saved while connected to the O2k.

Reset to system default: Left click to reset values to system default.

Cancel: Left click to proceed quickly with the experiment and edit any time later.

Experimental code: Up to 10 digits. The File search function Ctrl+F lists all files with identical experimental code within a selected directory.

File recorded by (*read only*) shows the user that recorded the file. While connected to the O2k, the [User code](#) can be changed by left click [Change user](#).

O2k-serial number (*read only*) automatically recorded.

Power-O2k (*read only*) as defined in [Oroboros O2k \ O2k-configuration](#).

Chamber The following entries are entered separately for the left (A) and right (B) O2k-chamber.

Protocol (*read only*) Displays the name of DL-Protocol selected.

Sample Enter information about sample used in each chamber. No sample is added in O₂ calibration experiments.

Sample type, Cohort, Sample code, Sample number, Subsample number

» [Sample - DatLab](#)

Sample concentration and amount

Unit ▼ Select a unit to express the concentration or amount of sample in the HRR assay.

Million cells - Flow: flow per object (*e.g.*, cell number)

mg - Flux: mass-specific flux (*e.g.*, mg of protein, wet weight or dry weight).

Unit - Flux: units of another marker of sample size (*e.g.*, citrate synthase activity).

» [Normalization of rate](#)

Concentration: Enter the sample concentration (*e.g.*, Million cells/mL, mg W_w /mL, mg mt-protein/mL). The corresponding amount of sample is calculated based on the O2k-chamber volume.

Amount: Alternatively, enter the sample amount (*e.g.*, biopsy W_w) if a known amount of sample is added into the chamber. The corresponding sample concentration is calculated based on the chamber volume.

Medium: Name of the incubation medium in the O2k-chamber.

Chamber volume: The default is 2 mL or 0.5 mL. It is important to define the actual effective volume of the O2k-chamber used for further calculations of oxygen flux. Calibration of O2k-chamber volume: » [MiPNet22.11 O2k-FluoRespirometer manual](#).

Data recording interval [s] (*read only*) is selected in the window **O2k control** **F7**.

Comments: For display and printing in the window **Experimental log**.

- **Experimental log** **Ctrl+F3**: The experimental log is generated automatically with information on O2k-settings and calibrations, the **Edit experiment** window, and various events. Time-dependent information can be viewed for chambers A, B, or both. A filter is selected for viewing minimum, intermittent (default), or all information. Left click **Preview** to view the protocol and **Save as PDF** file for quality control.

- **Add event** **F4**

Events: An event is a defined point in time, labeled by a name (1 to 10 characters). The event is shown by a vertical line in the graph (line style can be modified under **Graph\Options**) and the label of the event is shown at the top of the graph. The default name is the sequential number of the event. It is recommended to edit event labels with a minimum number of characters, and to explain the abbreviation in the 'Definition' box. The final concentration and titration volume can be entered into the corresponding boxes, if the event relates to the titration of a substance A short comment can be entered to describe the event in detail.

Set events **F4**: Real-time: Press **F4** to set an event quickly at the current time of the experiment (*e.g.* to indicate a manual titration into the chamber). Instrumental events are added automatically, *e.g.* when the stirrer (A or B) or illumination (both chambers) is switched on or off. The **Edit event** window pops up after setting a new event. Pressing **F4** defines the time point of the event. Full attention can then be paid to the experiment. Edit the event later.

Ctrl+Left click Insert an event at any chosen moment of the plotted record of the experiment by placing the cursor anywhere in the graph at the selected time point, press **Ctrl** and click the left mouse button **Ctrl+Left click**.

Edit event: Left click on the name of an existing event to open the **Event information** window to edit or **Delete event**.

Name: Enter an event name of 1 to 10 characters. Short names (*e.g.* O instead of Open) are recommended.

Definition: Enter an event definition.

Concentration: Enter the concentration of the chemical added.

Volume: Enter the volume added.

Comment: Further information can be entered into the text field.

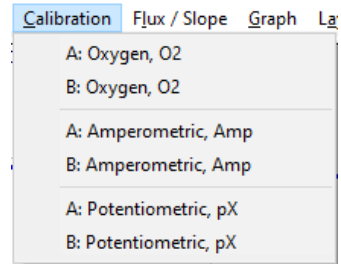
Chamber: Select O2k-chamber A, B, or both. The Event will be shown on plots for both or one selected chamber.

7. Calibration

- **Oxygen, amperometric and potentiometric channels**

Select chamber and channel to open Calibration window. See details in each link:

» [Oxygen calibration - DatLab](#)



O2 calibration

Channel: 2A: O2 POS # 2235

Channel label: O2

Signal | Details

Calibration source: Active file Calib. POS # 2235

Copy from file	Oxygen concentration cO2 [μM]	Select Mark	POS signal Recorded [V]	O2 slope neg. [pmol/(s.mL)]	Temperature [°C]	Barometric pressure pb [kPa]
Air calibration: c1	179.34	<input type="checkbox"/>	R1	1.8022	37.0000	94.40
Zero calibration: c0	0.000	<input type="checkbox"/>	R0	0.0037	0.0000	0.00

Gain, G [V/ μA] 1

O2 solubility factor of medium, FM 0.920 Medium: MRO5Cr

Caution: calibration will not update the default parameters

[MitoPedia: O2 calibration](#)

» [Amp Calibration - DatLab](#)

Amp calibration

Channel: 1B: Amp Active sensor # D-01008U

Channel label: Amp

Signal

Current calibration

Calibration source

Active file

Calib. sensor # D-01008U

Name	Signal [V]	Slope	Conc.
Fluo_0.0	0.96229	0.00100	0.00000
1_Fluo	1.17331	-0.02892	0.50000
2_Fluo	1.38823	0.03142	1.00000
3_Fluo	1.61744	0.05128	1.50000
4_Fluo	1.83279	0.02745	2.00000

Sensitivity [V/ μM] 0.4298 $R^2=0.99979$

Intercept [V] 0.9575

Calibrate

Select marks

Name	Time	Signal [V]	Slope	Conc.
Fluo_0.0	00:10:27	0.96229	0.001	0.00000
1_Fluo	00:14:15	1.17331	-0.02892	0.50000
2_Fluo	00:17:26	1.38823	0.03142	1.00000
3_Fluo	00:20:37	1.61744	0.05128	1.50000
4_Fluo	00:23:43	1.83279	0.02745	2.00000

Gain for Fluo sensor 1000 Fluo intensity 220

Copy from file Sensitivity [V/ μM] 0.4298 $R^2=0.99979$

Reset to system default Intercept [V] 0.9575

[MitoPedia: Amp calibration](#)

» [pX calibration - DatLab](#)

8. Flux/Slope

- **Oxygen, amperometric, potentiometric and proton flux channels**

Select chamber and channel to open **Slope configuration**. See details:

» [Flux/Slope - DatLab](#)

9. Graph

The active graph is selected by a left click on the graph. The active graph is highlighted and indicated by the Oroboros logo.

- **Add:** A new graph is added below the current plots. Select plots for display in the new graph, **Ctrl+F6**.
- **Delete bottom graph:** The bottom graph is deleted, which reappears with the same layout by Add.
- **Select plots Ctrl+F6:** Opens a window **Graph layout Plots** with tabs depending on active channels: Oxygen, O2; Amperometric, Amp; Potentiometric, pX; System channels.

Select graph ▼ Pull down to select one of the displayed graphs.

Tabs: **Oxygen O2**, **Amperometric Amp**, **Potentiometric pX**, **System channels**:

Left click on a channel type to select plots from this channel.

Tabs: **Oxygen O2**, **Amperometric Amp**, **Potentiometric pX**

Y1, **Y2** Select the left (Y1) or right axis (Y2) for a plot.

Use default label selects the default axis label.

Use custom label: To define a different axis label, select and enter or edit a custom label.

Channel label: Edit (for Amp and pX channels).

▼ **Color** Defines the color of the plot.

▼ **Width** Defines the line width of the plot.

▼ **Linestyle** Defines the type of line (solid, dash, dot) of the plot.

▼ **Unit** Pull down to select a different unit (for Amp and pX).

Raw signal displays the non-calibrated raw signal.

Flux per volume

Normalization

Flux control ratio

Baseline correction

Background correction » [Select plots in DatLab](#)

Load layout: Select layout category (**Standard layouts**, **Lab layouts**, **User: Name**), select **Layout type** ▼: **O2k-Core**, **O2 & Amp**, **O2 & pX**, **Other** (depending on the channel selection in **O2k-configuration**), and **Layout name** ▼.

Save layout: A layout can be saved with any layout name under the category **Lab layouts** or **User: Name**.

Tab: System channels

Block temperature: The continuously measured temperature of the copper block housing the two glass chambers [°C].

Barometric pressure: The continuously recorded absolute (local) barometric pressure [kPa].

Peltier power: For regulation of block temperature, continuously recorded [% of maximum power].

Room temp: Temperature from internal temperature sensor recording the environmental (room) temperature [°C].

Electronics humidity: Signal from internal sensor recording the electronics humidity [%].

Electronics temp: Signal from internal temperature sensor recording the electronics temperature. [°C].

- **Scaling F6:** Left click on the X-, Y₁- or Y₂-axis opens the Graph layout/ Scaling window. F6 provides flexibility to vary the display of the plots and create Graph layouts. Viewing plots in differently scaled graphs, zooming the signal and time scales, and scrolling along the axes of the graph provide maximum information on the current experiment, but do not influence the format of stored data. Different ranges for the axes change the appearance of data dramatically.

Axis	Quantity	Unit	Minimum	Maximum	Range
Y1	2A: O2 concentration	[µM]	0.000	250.000	250.000
Y2	2A: O2 flux per V	[pmol/(s*mL)]	0.000	100.000	100.000
X	Time	hh:mm:ss	00:00:00	00:30:00	00:30:00

Choose a standard layout for a reference layout of a graph.

Select graph: ▼ Pull down to select any of the defined graphs.

Minimum defines the minimum axis position (suppression) for the display of data at a constant range.

Maximum defines the maximum axis position for the display of data at a constant range.

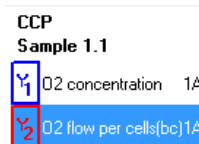
Range defines the range of the Y_1 axis (left), Y_2 axis (right) and X axis (Time). Select a predefined Graph layout type from the options in the pull-down menu. Edit the layout name of the graph by a left click on the name, and then click on **Save layout** to save the entire graph layout.

Apply to Graph 1: The scaling defined for Graph 2 is applied to Graph 1.

Navigating graph with arrow keys

Use arrow keys to scroll (data on Y -axes), pan (time on X -axis), or zoom (expansion or compression: Ctrl+arrow key), independent of the **F6** window.

Select the active plot in a graph by left clicking on the label of the plot in the figure legend on the right. The active plot is highlighted. Scrolling and setting marks apply to the active plot.



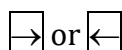
Scroll up and down the Y axis, with a shift of 50 % of the active plot.



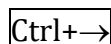
Magnify the signal (half the signal range is displayed).



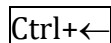
Cover a larger range on the screen for overview (twice the signal range is displayed).



Panning, shift 50 % of the time axis to the right or left. During data acquisition, switch off automatic panning to pan backwards without changing the time range.

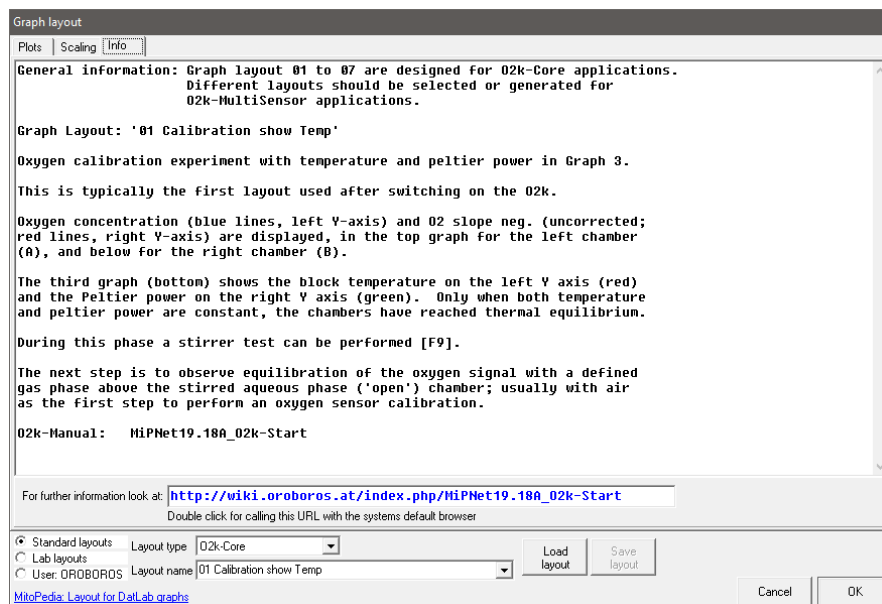


Magnify the time resolution on the screen (decreasing the time range). **Ctrl+Right** expands the data, half the original time range is displayed. The upper limit of the time range is fixed.



Cover a larger time range on the screen. **Ctrl+Left** compresses the data, twice the original time range is displayed. The reference time point is fixed on the right during zooming in and out.

- **Info**

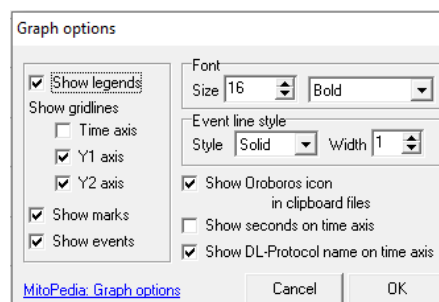


View and edit information, and load or save a graph layout (Section 9).

A quick selection of the tabs **Plots** **Ctrl+F6** and **Scaling** **F6** is possible.

- **Synchronous time axes** : Sets the time axes of all graphs at an identical range and offset, which is particularly useful while panning.
- **Autoscale time axis** autoscales the entire experimental time scale.

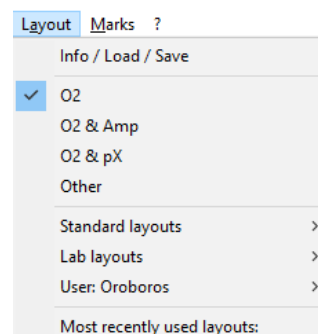
- **Autoscale Y1 (Y2) axis** autoscales the full data range.
- **Automatic pan** toggles automatic panning on/off
» [O2k status line](#)
- **Mouse control: Zoom** **Ctrl+Z**
Zoom in: Select **Mouse control: Zoom** in the menu or press **Ctrl+Z**. Left click on the graph where you want to zoom in. Place the cursor at the upper left corner of the field for zooming. Hold **Shift**, press the left mouse button **Shift+Left click** and slide the cursor to the lower righthand corner to define the field for zooming in. The text for all axes now indicates the respective range (full scale).
Zoom out: To return to the original scaling (as defined in the Graph layout), hold **Shift**, press the left mouse button, and slide the cursor anywhere to the left **Shift+Left click**.
- **Mouse control: Mark** **Ctrl+M**
 The Mark mode is active by default, or can be selected in the menu, or by **Ctrl+M**. Specific sections of the experiment can be marked on each plot. Usually, marks are set on the plot for oxygen concentration for calibration ([MiPNet06.03A](#)), whereas marks on the plot for oxygen flux are set for exporting the median or average of flux to a table.
» [Marks-DatLab](#)
- **Full screen** : The selected graph may be shown alone on the full screen , or together with the other defined graphs. Full screen is particularly useful for a single channel overview.
- **Display numerical value:** The current numerical values are displayed in the graph for the active plots on the Y₁ axis and Y₂ axis (during data acquisition only).
- **Display Power-O2k:** The Power-O2k number, set in **Oroboros O2k \ O2k configuration**, is shown in the active graph.
- **Options**
 Show legends shows the quantities plotted on each Y axis.
Show gridlines gives options to show or hide vertical and horizontal gridlines.
 Show marks optionally shows or hides marks in all graphs, without deleting the marks.
 Show events optionally shows or hides events in all graphs, without deleting the events.
Font: Change font size and style of axes labels and numbers.
Event line style can be modified.
 Show Oroboros icon in clipboard files
Yes!
 Show seconds on time axis gives an option to exclude or include the display of seconds on the labels of the time axis.
 Show DL-Protocol name on time axis gives an option to exclude or include the DL-Protocol name on the time axis.
- **Copy to clipboard:** Select the active graph. In the Graph menu, Left click **Copy to clipboard**, and select the WMF or BMP format; **Alt+G B W**. Open the target file (DatLab-Excel template, Word, PowerPoint, Paint, *etc.*), and paste the image **Ctrl+V**.



10. Layout

Graph layouts are selected from the **Layout** menu for standardized display of graphs, plots and scaling of axes.

- **Info / Load / Save:** Open this window (Section 9) to view and edit information, and load or save a graph layout.
- **Types:** Four types of layouts can be selected depending on the **O2k-configuration**:
 - ▶ **O2:** Oxygen channel only.
 - ▶ **O2 & Amp:** Oxygen and amperometric channel.
 - ▶ **O2 & pX:** Oxygen and potentiometric channel.
 - ▶ **Other**



- **Standard layouts:** In many Standard layouts, plots are shown for the chamber A in Graph 1 (top), and for chamber B in Graph 2 (below). During data acquisition, a 30-min time range is frequently used.

Q1 Calibration show Temp shows O₂ concentration and the negative slope in Graph 1 and 2, and temperature and Peltier power in Graph 3. This is the default layout used after switching on the O2k for performing oxygen calibration. Graph 1 & 2: O₂ concentration (blue lines, left Y-axis) and O₂ slope negative (uncorrected; red lines, right Y-axis) are displayed in the top graph for the left chamber (A), and below for the right chamber (B). 'O₂ slope neg.' is the negative slope of oxygen concentration, multiplied by 1000 to convert to units [pmol/mL], over time [s]. Graph 3 (bottom) shows the block temperature on the left Y axis (red) and the Peltier power on the right Y axis (green). Only when both temperature and Peltier power are constant, have the chambers reached thermal equilibrium.

» [MiPNet06.03A: O2k Quality Control 1: Polarographic oxygen sensors and accuracy of calibration](#)

O2 Calibration - Background is used for recording polarographic oxygen sensor (POS) calibration and instrumental O₂ background test. No correction is applied for instrumental O₂ background flux, J^{O_2} . 'O₂ slope neg.' is plotted on the right Y-axis with a scaling to display $\pm 10 \text{ pmol}\cdot\text{s}^{-1}\cdot\text{mL}^{-1}$ and zero in the middle of the Y2 axis. Zero slope ($\pm 1 \text{ pmol}\cdot\text{s}^{-1}\cdot\text{mL}^{-1}$) in the 'open' chamber at air calibration indicates stability of the oxygen signal.

» [MiPNet14.06: Instrumental O2 background](#)

O3 Background high O2 for recording an instrumental O₂ background test at high oxygen from 150 to 450 μM .

O4a Flux per volume displays background-corrected O₂ flux per volume, which is most relevant to evaluate experimental details, i.e. flux per volume is optimally in the range of 20 to 200-500 $\text{pmol}\cdot\text{s}^{-1}\cdot\text{mL}^{-1}$. This plot is also chosen when measurements on sample density are available only at a later stage ([MiPNet24.06](#)). Total O₂ flux is corrected for instrumental O₂ background, $J^{O_2, V}$, to obtain sample oxygen flux per chamber volume, $J_{O_2, V}(\text{sample})$:

$$J_{O_2, V}(\text{sample}) = J_{O_2, V}(\text{total}) - J^{O_2, V}$$

O4b Flux per volume overlay is similar to the layout 'O4a Flux per volume'. Graph 1 shows the background-corrected O₂ flux per volume [$\text{pmol}\cdot\text{s}^{-1}\cdot\text{mL}^{-1}$] superimposed from both chambers. Graph 2 shows O₂ concentration [μM].

05a Specific flux for plotting background-corrected O₂ flux per unit sample. The unit as a marker for the amount of sample is defined in the **F3** window. Example: Select **Unit mg** for the amount (mass) of sample added to the chamber. The mass-concentration is automatically calculated (division by chamber volume, typically 2 mL or 0.5 mL). Then mass-specific flux [$\text{pmol}\cdot\text{s}^{-1}\cdot\text{mg}^{-1}$] is displayed as volume-specific flux [$\text{pmol}\cdot\text{s}^{-1}\cdot\text{mL}^{-1}$] divided by mass-concentration [mg/mL]:

$$J_{\text{O}_2,\text{mass}} = J_{\text{O}_2,V} / \text{mass-concentration}$$

05b Specific flux overlay is similar to '05a Specific flux'. Graph 1 shows the background-corrected O₂ flux per unit of sample superimposed from both chambers. Graph 2 shows O₂ concentration [μM].

06a Specific flux high O₂ is same as '05a Specific flux' with the scaling adapted to the high O₂ concentration used for permeabilized muscle fibers (150 to 450 μM ; range 300 μM).

06b Specific flux high O₂ overlay as '06a Specific flux high O₂', but O₂ flux (graph 1) and O₂ concentration (graph 2) superimposed from both chambers.

07a Flux control ratios shows the flux control ratio (*FCR*) and the O₂ concentration for the left chamber in graph 1 and for the right chamber in graph 2. First, the reference and baseline metabolic states are marked and the marks are named (**Marks \ Specifications**). Then the marks are selected in the menu **Flux/Slope \ O₂ slope** in the Slope configuration window.

07b Flux control ratios overlay as '07a Flux control ratios', but *FCR* (graph 1) and O₂ concentration (graph 2) superimposed from both chambers.

Layouts for O2k-MultiSensor applications are explained in the specific O2k-Manuals.

- **Lab layouts:** A **Standard layout** or any other layout can be modified and saved under **Lab layouts**, which is recommended for a team using project-specific layouts.
- **User: Name:** A **Standard layout** or any other layout can be modified and saved under a specific user name, which is recommended to distinguish individual layouts from standard layouts used by a team.

11. Marks

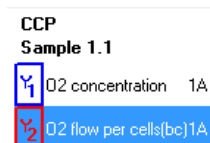
Set Marks to obtain the median, average, standard deviation, outlier index and range of the data within the mark, for calibration of the oxygen signal ([MiPNet06.03A](#)), flux analysis ([MiPNet24.06](#)), or to delete marked data points. Marks define a section (period of time) in a selected plot (column) and contain the data of the selected plot within the defined section of time. Marks are shown by a horizontal bar in the active plot. Several marks can be set on any plot, but marks cannot overlap within a plot and are separated by one or more data points which are not marked.

» [Marks-DatLab](#)

Mark In the **Graph** menu select **Mouse control: Mark**, or press **Ctrl+M**.

Left click Select the active plot in a graph by a left click on the label of the plot in the figure legend on the right. The active plot is highlighted.

Shift+Left click Set the cursor on the starting position of the mark, hold **Shift** and press the left mouse button, while moving the cursor along the X-axis.



Shift+Right click The period of a mark may be reduced or the entire mark deleted by holding **Shift** and pressing the right mouse button, while moving the cursor along the X-axis over the marked section.

Default mark names: Marks are labelled with consecutive letters by default, starting from 'a', independent of the sequence of position of the marks. When deleting a mark **Shift+Right click**, then this mark letter is missing on the mark list. Marks after 'z' receive an 'a' in front ('aa', 'ab'...).

Mark information: Left click into the top or bottom bar of the mark:

Name: Edit the mark name.

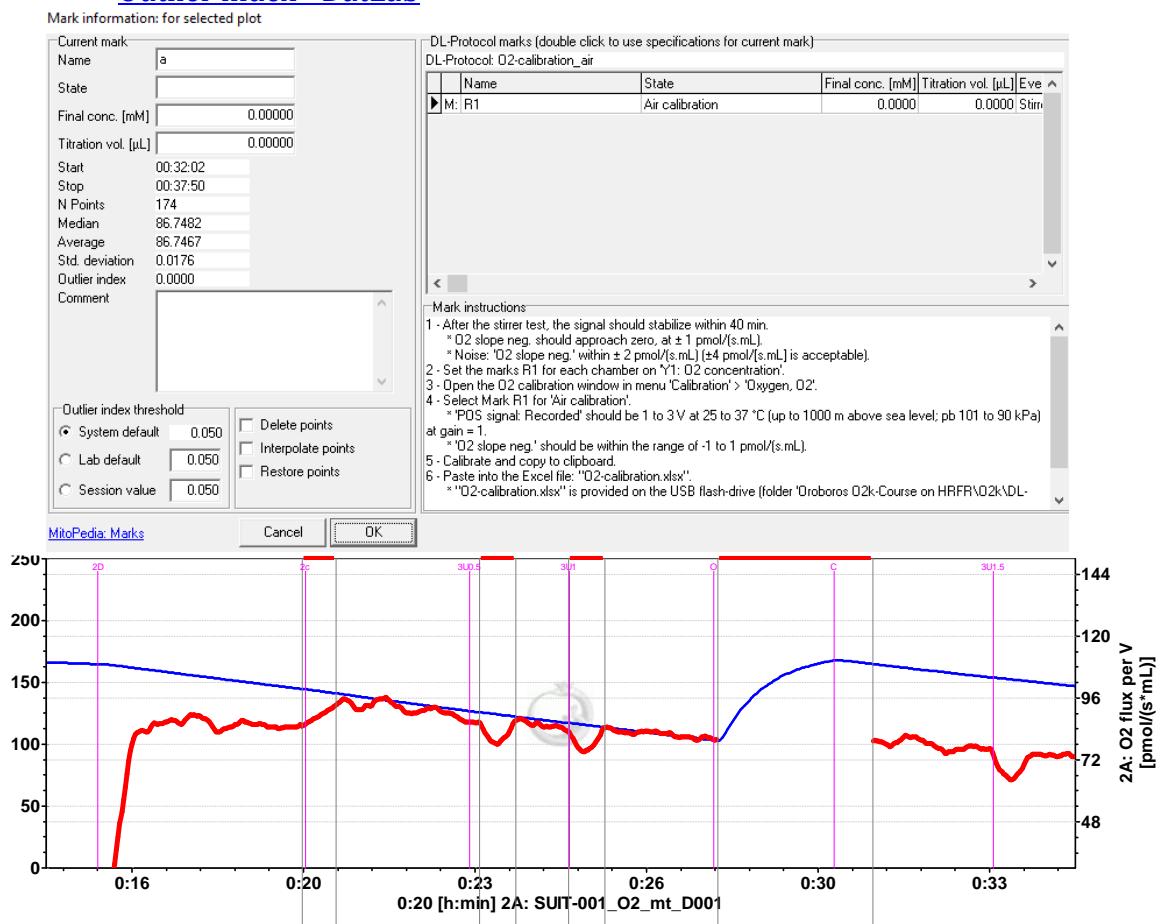
State: An explanation of the mark name, frequently giving the units of concentration.

Final conc. (mM): (*optional*) The value is used as the concentration or pX value in the Amp or pX calibration windows.

Titration vol. (μL): (*optional*) In SUIT protocols, the value is pre-filled as the volume of a titration, for calculating the dilution of sample in DatLab-Excel templates. The titration volume must be entered manually if no SUIT protocol is used.

Outlier index threshold: Set to a lab-specific or session-specific value different from the system default value.

» [Outlier index - DatLab](#)



Delete \ Interpolate points: Set marks for deleting disturbed flux during reoxygenations (Mark d), or interpolating flux disturbed due to titrations (Mark a; compare to Marks b and c without deletion or interpolation of points).
Restore points \ Recalc. flux: All data points can be restored (signal) or recalculated (flux).

- **All marks in plot** used when a non-standard protocol and non-standard Mark names have been used for data acquisition.
 - **Flux / flow + all info** contains the information saved in the Mark information window and the values of flux or flow, according to the layout selected, corrected for Instrumental background O₂ flux. In addition, exported data include information contained in the Sample window, in the O₂ calibration window and on parameters used for Instrumental background O₂ flux correction.
 - **Flux / flow** contains the information saved in the Mark information window and the values of flux or flow, according to the layout selected, corrected for Instrumental background O₂ flux.
 - **Slope uncorrected + all info** **F2** contains the information saved in the Mark information window and the values of flux or flow, according to the layout selected, but without instrumental O₂ background correction. The correction will be applied in the DatLab - Excel template. In addition, exported data include information contained in the Sample window, in the O₂ calibration window and on parameters used for Instrumental background O₂ flux correction.
- **DL-Protocol marks** used if data were recorded using a DL-protocol.
 - **Flux / flow + all info**
 - **Flux / flow**
 - **Slope uncorrected + all info** **F2**

Mark statistics

Select Show

Chamber: O2k P2
 A
 B

Plot for marks: 2A: O2 concentration [µM]
 2A: O2 slope neg [pmol/(s·mL)]

Channel: Oxygen, O2
 Amperometric_Amp
 System channels

O2k configuration: Use "Slope uncorrected + all info" only in conjunction with Oroboros DatLab-Analysis templates

Copy to clipboard options:

All marks in plot:
 Flux/flow + all info (4)
 Flux/flow
 Slope uncorrected + all info
 DL-Protocol marks:
 Flux/flow + all info
 Flux/flow
 Slope uncorrected + all info

Select:
 Median (5)
 Average
 Standard deviation
 Outlier index
 Range
 Maximum
 Minimum

Sort by:
 Time (6)
 Mark name

A: O2 slope background
 $a^1 = -2.4426 a^2 = \text{Intercept: flux at zero oxygen}$
 $b^1 = 0.0329 b^2 = \text{Slope: flux per oxygen conc.}$


2017-02-08 P2:O2_Oroboros.DLD


Median	Unit	1mL	1PM	2D	2c	3U	4G	5S	6Oct	7Rot	8Gp	9Ana	10AsTm	11Azd
State	RDx		NIPM_LL	NIPM_LP	NIPM)_c_P	NIPM)_L	NIPGM)_E	NSIPGM)_E	FNSIPGM)_E	S_E	SGp)_E	RDx	CIV)_E	RDx
Concentration		0.000000	7.000000	2.500000	10.000000	0.000000	10.000000	50.000000	0.500000	0.500000	10.000000	2.500000	2.500000	200.000000
Volume		0.000000	15.000000	10.000000	5.000000	0.000000	10.000000	100.000000	10.000000	1.000000	20.000000	1.000000	10.000000	100.000000
Start		00:10:06	00:13:52	00:17:15	00:20:40	00:24:18	00:36:57	00:43:18	00:51:22	01:01:19	01:04:31	01:12:12	01:41:46	01:43:56
Stop		00:11:24	00:15:35	00:18:51	00:21:48	00:24:58	00:38:26	00:44:39	00:52:40	01:02:53	01:05:57	01:13:40	01:42:19	01:44:32
N Points		40	52	48	34	20	45	41	40	48	43	44	17	17
2A: O2 concentration	µM	169.6914	166.6562	154.6705	137.6962	119.8141	132.7738	77.3842	82.9378	82.2137	62.6217	51.0972	48.7726	40.6420
X 2A: O2 slope neg	pmol/(s·mL)	3.5778	26.0386	88.3522	95.4084	86.0664	88.9485	220.7314	221.0296	164.7783	162.6913	1.7392	280.3617	53.7666

Mark statistics Load template Save template

MitoPedia: Mark_statistics

1. Select channels for which plots should be displayed. System channels: Select or deselect system channels (barometric pressure, block temperature etc.) to be shown in Statistics.
2. Select the O2k-chamber for which plots should be displayed in the marks statistics table.

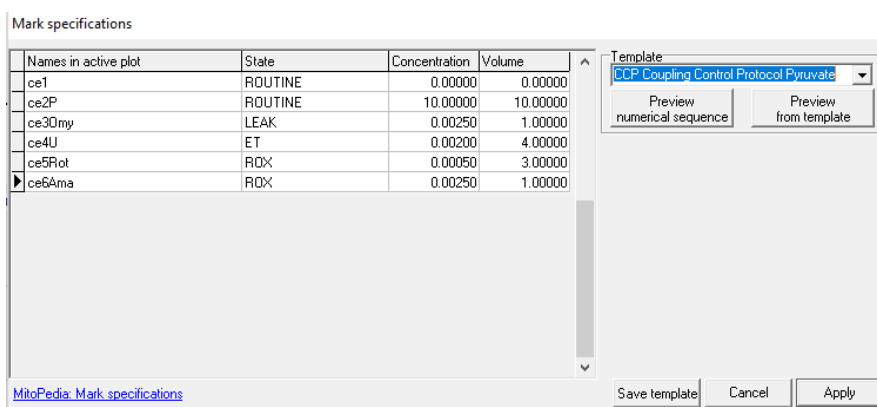
3.  click on the source plot on which the marks are set.
4. Select **All marks in plot** when a non-standard protocol and non-standard Mark names have been used for data acquisition. If data were recorded using a DL-protocol, **DL-protocol marks** can be selected along with the desired format for data display. For either selection, the previous chosen data display format can be changed again.
5. Select the statistical value calculated over the sections defined by marks. Default: Median.
6. Select the sequence of marks, sorted as a Time sequence or Mark name in alphanumerical order.
7. Values are displayed for selected plots. The source plot for marks is indicated by an "X".

 Left click to select a single data cell in the table, copy, **Ctrl+C**, and paste into a Windows™ file, **Ctrl+V**.

Copy to clipboard: Left click 'Copy to clipboard' to copy the mark statistics table into the 'O₂ analysis template DL7.4' or other programs. It is important to carefully evaluate which set of data rows is relevant.

More details on data analysis » [MiPNet24.06 Oxygen flux analysis DatLab 7.4](#).

- **Manage mark statistics templates** shows the saved **System channels** settings and allows for renaming or deleting of the configuration.
- **Specifications** is largely replaced by **SUIT DL-Protocols** and **Instrumental DL-Protocols** in [DatLab 7.4](#). Mark specifications allow the user to rename **Marks** in the active plot and save/recall the settings.



Mark specifications (name, state, concentration and volume) are shown from the active plot. Define the **Template Name ▼** and **Save template**.

Select a **Template Name ▼**, Left click on **Preview from template**, and **Apply** all marks of the plot, including the state, concentration and volume.

- **Manage mark specifications templates:** Rename or delete mark name templates in this window.
- **Copy marks from** a selected plot to the active plot.

12. Some features of Windows™

Print

The entire screen is 'printed' to clipboard.

Alt+Print

The active window is 'printed' to clipboard.

Ctrl+C

Copy to clipboard.

Ctrl+V

The contents of the clipboard is pasted into the page of a Windows™ program (Word; Excel; PowerPoint).



Related MiPNets

- » [MiPNet22.11 O2k-FluoRespirometer manual](#)
- » [MiPNet06.03A O2k-calibration](#)

13. Author contributions

Erich Gnaiger contributed to the concept of all DatLab versions, wrote the chapter, edited the final version. Cristiane Cecatto contributed to and edited this chapter. Lukas Gradl is the programmer of all DatLab versions.

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Standortagentur

