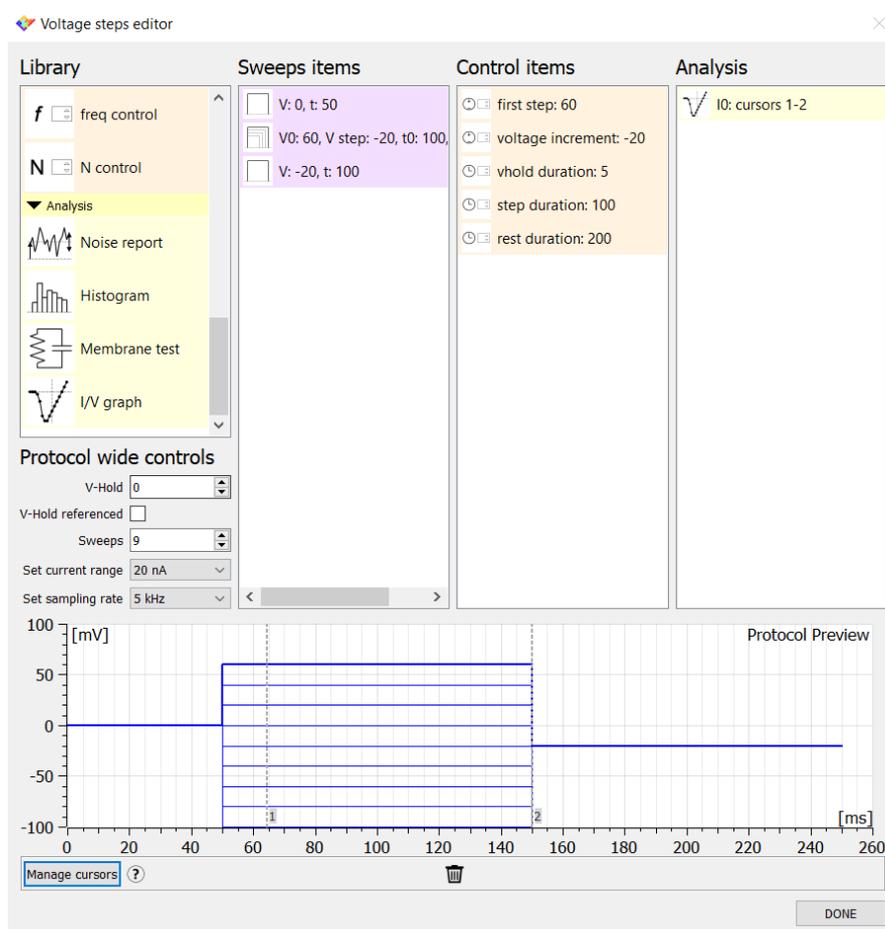


EZ Patch quick guide

On-line analyses and digital output



This short guide illustrates how to use the on-line analysis tools of EZ Patch software and the digital output.

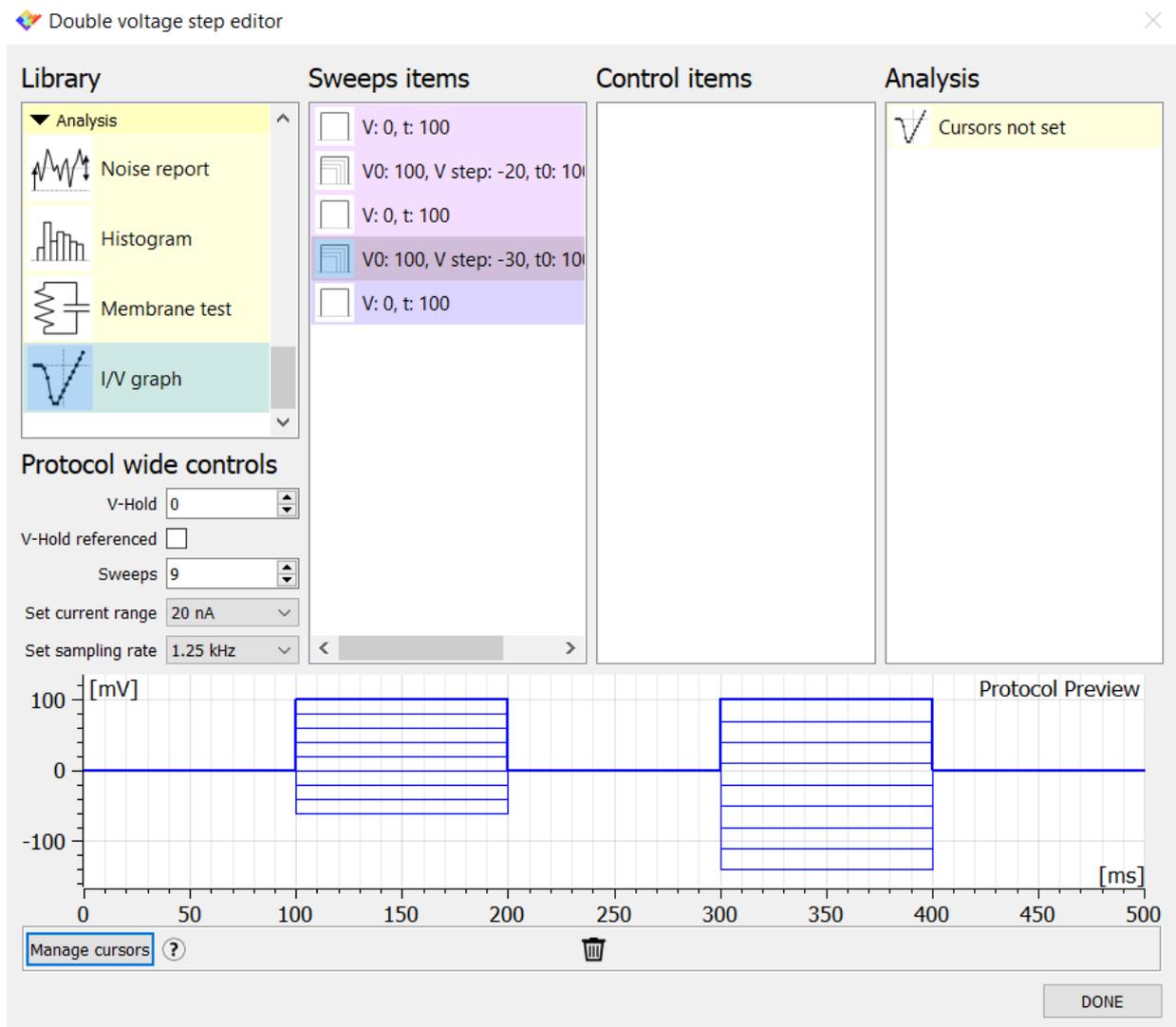
The analysis tools allow you to immediately calculate and display data based on the acquired traces, thus giving you a fast overview of your results. The on-line analyses are configured in the protocol editor. If you would like to use a real time analysis that is not currently available in EZ Patch software, please contact the Elements customer support (support@elements-ic.com) to suggest the development of a new analysis.

Set up an automated I-V plot analysis

As an example, we will design an automated I-V plot analysis of two consecutive series of voltage step protocol.

Let's start creating a new episodic voltage step protocol consisting of two set of steps preceded and followed by constant voltage values (see the waveform preview in the image below; for more details see the "protocol editor" guide).

Scroll the list of the library in the protocol editor and find the **analysis tools**. Drag the I-V analysis item in the analysis box.



Double voltage step editor

Library

- Analysis
 - Noise report
 - Histogram
 - Membrane test
 - I/V graph

Protocol wide controls

V-Hold: 0

V-Hold referenced:

Sweeps: 9

Set current range: 20 nA

Set sampling rate: 1.25 kHz

Sweeps items

- V: 0, t: 100
- V0: 100, V step: -20, t0: 100
- V: 0, t: 100
- V0: 100, V step: -30, t0: 100
- V: 0, t: 100

Control items

Analysis

Cursors not set

Protocol Preview

[mV]

[ms]

Manage cursors ?

DONE

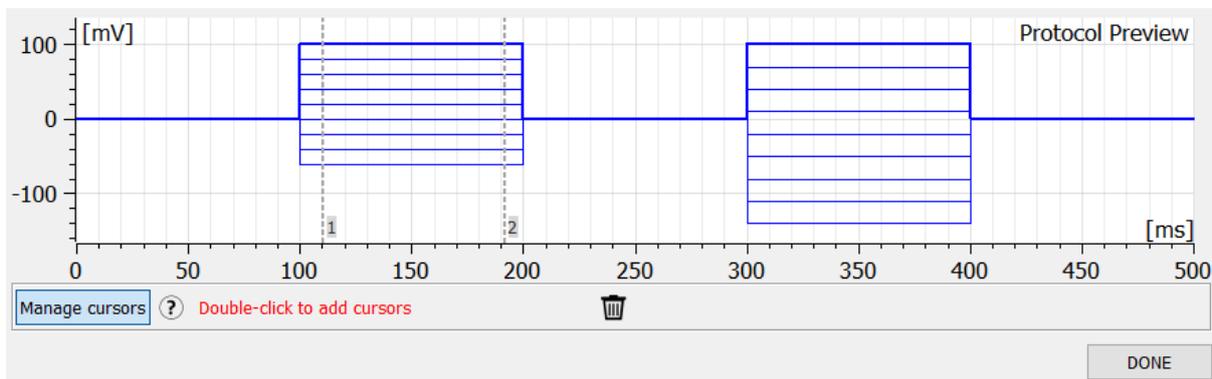
Using the waveform preview, insert the cursors to define the portion of the waveform where the analysis must be performed.

Let's start designing a I-V plot analysis of the first series of steps.

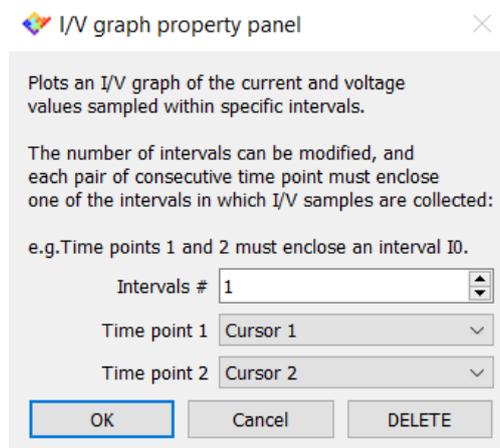
Click on "**manage cursors**" button and double click on the waveform to bring up the cursors.

Use the left button of the mouse to arrange them in the desired point.

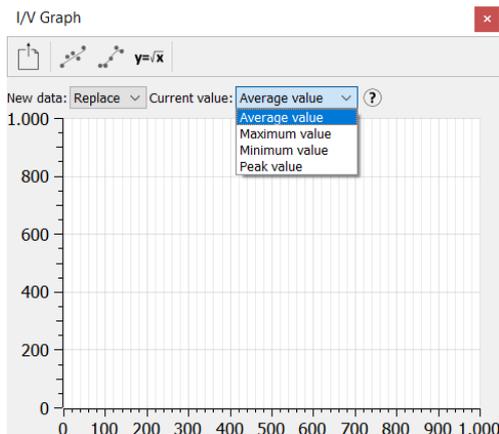
Alternatively, right click with the mouse to open the **cursor properties** panel. Here you can accurately modify the location of the cursors within the waveform and define the repetitions and the sweeps that must be included in the analysis. If you need to delete a cursor, just drag it into the trash.



Conclude the setup of the analysis assigning the newly designed cursor to the I-V item: double click on the I-V item in the analysis box to open the **properties panel** and assign the new cursors to the time point 1 and 2, as shown in the figure below.



Close the protocol editor and call the I-V graph analysis widget clicking on "View" (top left of the screen) and then on I-V graph. Choose how to plot the current signal by selecting average, maximum, minimum, or peak value. A short description of these options is shown positioning the cursor on the help ("?") button next to the dropdown menu.

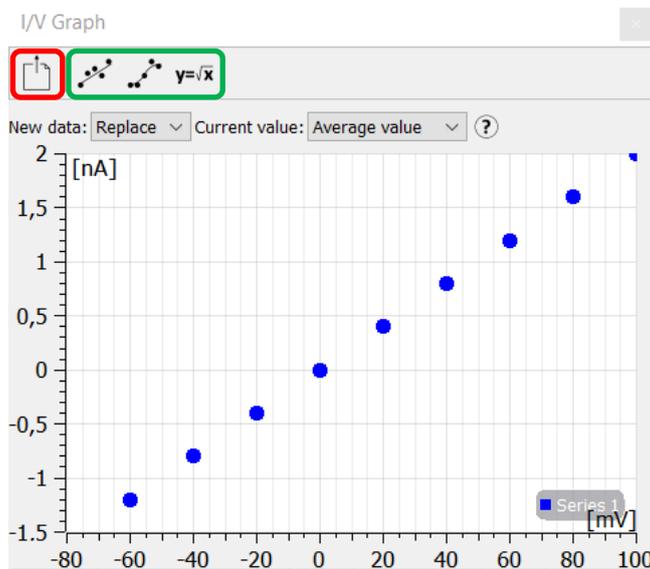


Run the protocol. The software reads the data collected in the region included between the two cursors and automatically displays the selected value in the graph.

Use the “new data” drop-down menu to **overlap the plots**, or to replace the earlier ones. When the overlap mode is selected, the legend updates to keep track of the plots. When the protocol is run in “record” mode the legend assigns the filename to the plot. Place the mouse cursor over the fitting buttons to read the fitting types.

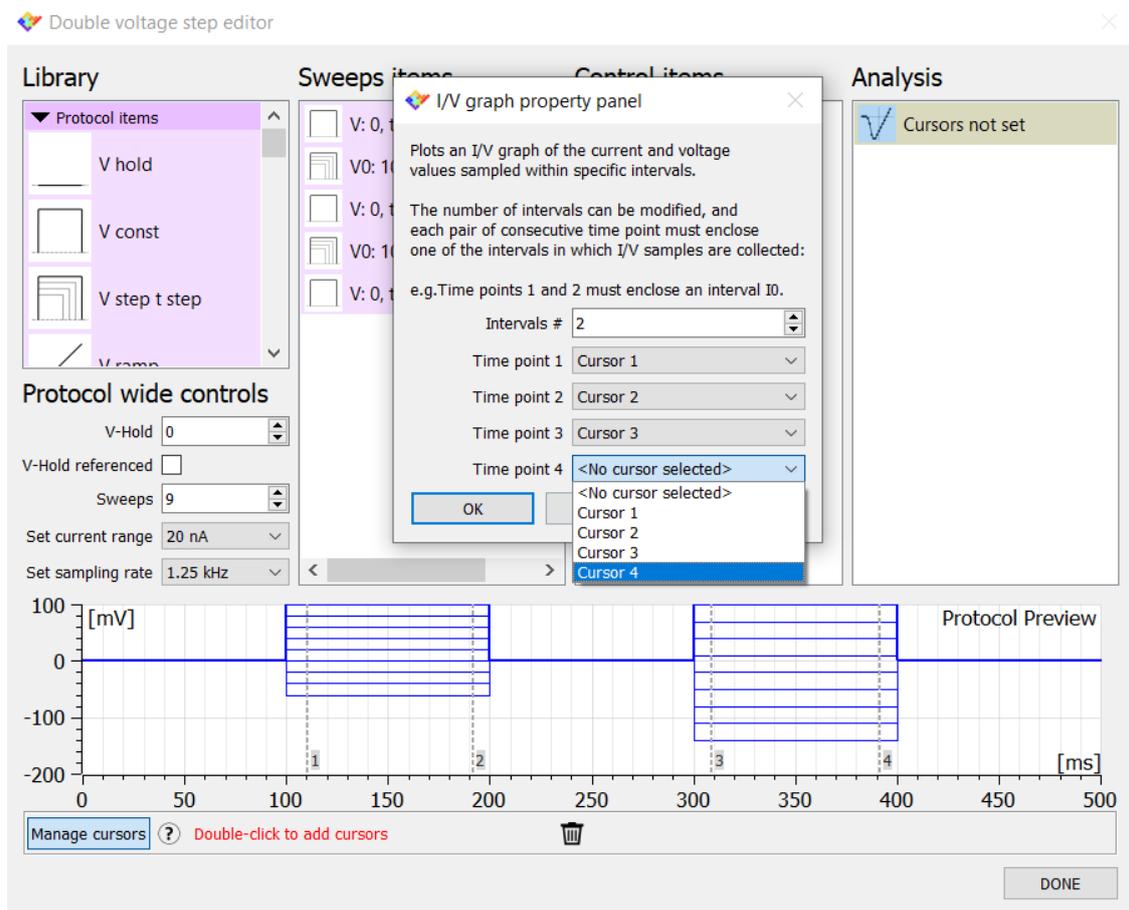
Plotted data can be exported as a .CSV file using the **export command**.

EZ Patch provides a selection of pre-defined **fitting functions** that can be applied on the last plotted data. The fitting results are automatically written in the lab-book.



- Export data
- Fitting tools

Using the same approach add another I-V plot analysis within the same waveform: open the protocol editor and add two new cursors. Open the I-V graph property panel, add a **new interval**, and assign the newly positioned cursors as shown previously.



The I-V plots of the two voltage step series will be now displayed in the same graph.

All the other analysis tools (including those dedicated to the current-clamp mode) available in EZ Patch software can be set up using the same cursor-based procedure.

Some brief instructions that help you to set up the analysis are available in the properties panel of each analysis tool. Alternatively, contact our support at support@elements-ic.com