



ePatch

Elements patch clamp Miniaturized Amplifier

CONTROL SOFTWARE INTERFACE GUIDE

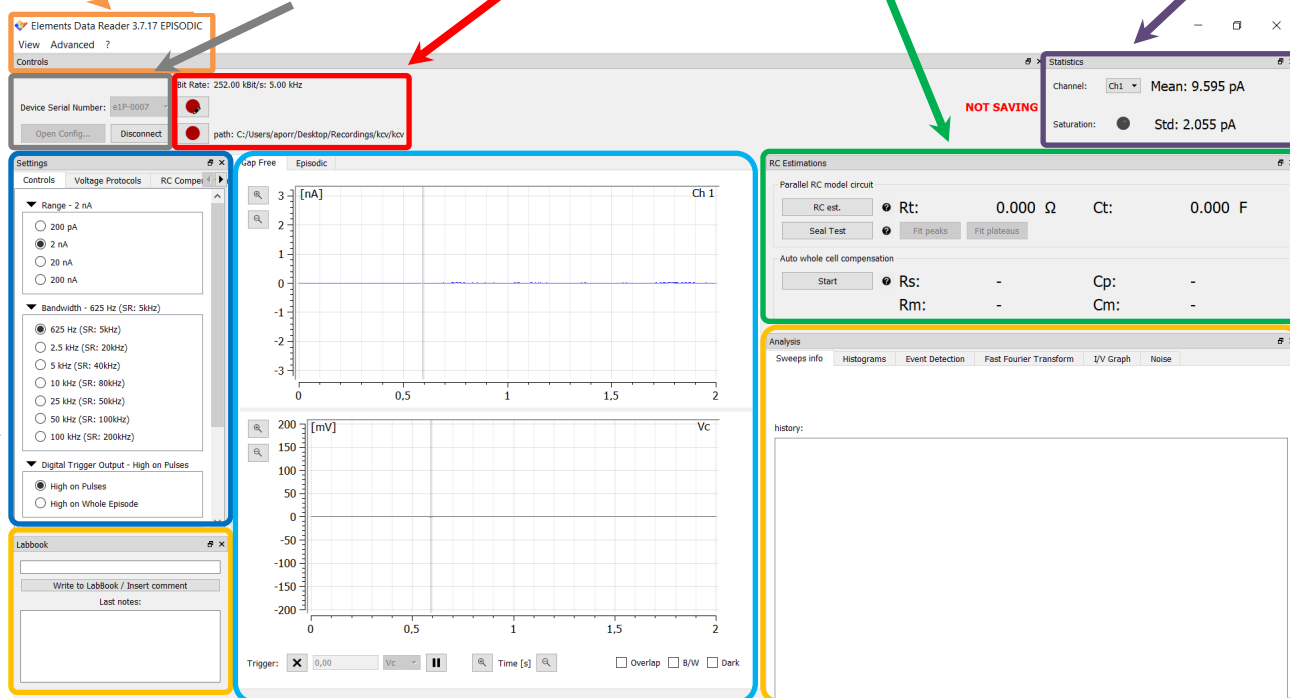
Software menu

Device information & connection

Data acquisition & saving

RC Estimations, seal testing & Automatic whole cell parameters estimation and compensation

Current Statistics section



Acquisition, protocols & Compensation settings

Insert comment tag on file data or write notes in the labBook

Input current and control Voltage real-time data visualization

Online Analysis section

The layout of the widgets described in the figure above can be customized by clicking on the name of the widget and dragging it to the new desired position.

Gap free & episodic data visualization

Data can be visualized in gap-free or episodic modalities by selecting the proper tab of the central window. The current trace and the applied voltage are shown in the top and bottom panel respectively.



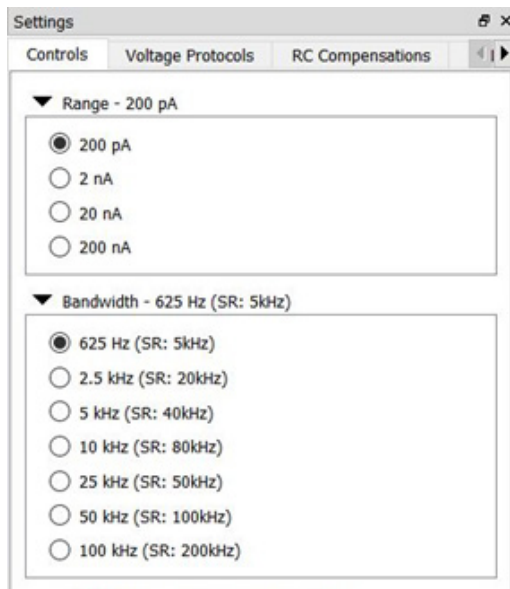
In the gap free mode, data can be triggered using the “Trigger” button and setting the displayed value as threshold. Checking the “Overlap” checkbox the data signals (input currents and Vc) are overlapped in the main window.

The axis scale can be adjusted either by clicking on the magnifying glasses icons or using the dedicated zoom shortcuts described in the “?—>shortcuts” menu. Alternatively, left click and drag the mouse to enlarge a desired area within the signals panels and right click the mouse inside them to quickly halve the scales.

Basic settings overview

The Controls tab of the “setting” widget allows the user to select the acquisition parameters, as well as to control other ePatch features such as the offset compensation, the ZAP and the digital trigger output.

Acquisition parameters selection



Current range: Select the proper current range basing on the expected current amplitude. Four current range are available:

- $\pm 200\text{pA}$ Gain $2.25\text{G}\Omega$
- $\pm 2\text{nA}$ Gain $225\text{M}\Omega$
- $\pm 20\text{nA}$ Gain $22.5\text{M}\Omega$
- $\pm 200\text{nA}$ Gain $2.25\text{M}\Omega$

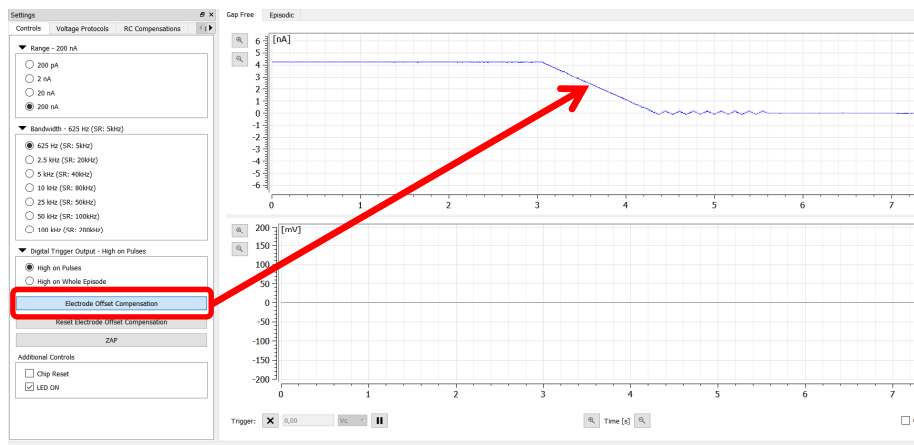
Acquisition bandwidth: Select the desired sampling rate basing on the application requirement. Seven acquisition bandwidths, ranging between 625 Hz and 100 kHz, are available. ePatch automatically sets the sampling rate (SR) (in the range between 5 kHz and 200 kHz) by selecting the specific built-in digital filter.

Electrode Offset Compensation

After connecting the amplifier, the input channel could have an offset due to the electrodes in solution.

Once the electrodes are in the buffer and a conductive path is present, click on the “Electrode offset compensation” button. This will automatically set a proper voltage (in the range of $\pm 500\text{mV}$) to adjust the baseline to

the zero-current value. When the baseline reaches the zero-value disable the “electrode offset compensation” by clicking again on the button.



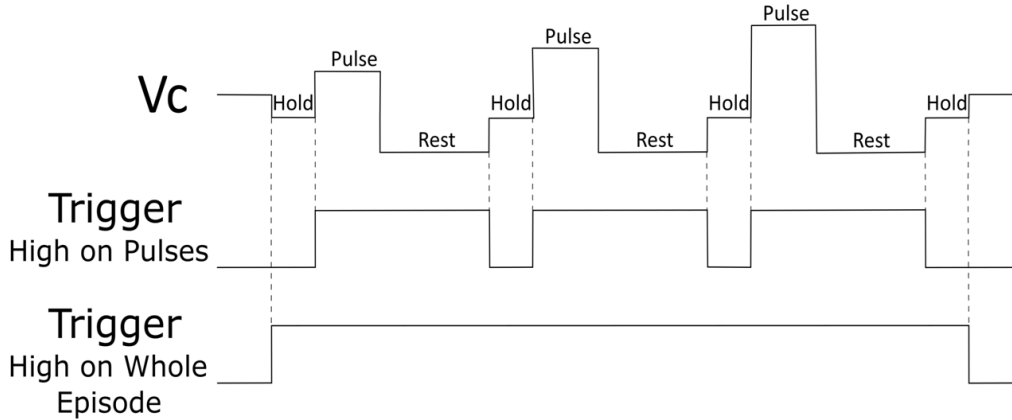
Digital Trigger Output

ePatch can be interfaced with other lab instruments by using the Digital Trigger Output function

▼ Digital Trigger Output - High on Pulses

High on Pulses ← e.g.: digital output is high on the steps of protocol 4 or 5

High on Whole Episode ← e.g.: digital output is high during the whole application of protocol 4 or 5



ZAP

To go from the cell attached to the whole cell mode, the most used method consists in applying a gentle suction by using either a syringe or the mouth in order to rupture the membrane patch under the pipette. “Zap” is an alternative way to disrupt the patch to go in whole cell configuration: clicking on the “Zap” button, a single square wave pulse of -1.65 V amplitude for 100 ms is applied to

disrupt the membrane under the pipette without losing the seal.

Electrode Offset Compensation

Reset Electrode Offset Compensation

ZAP

Additional Controls

The “Chip Reset” checkbox resets the chip and keeps the device in reset mode . Use it when the amplifier does not respond to the software commands.

The “LED ON” checkbox allows to switch on or off the LED located on the back side of the amplifier; if unchecked, the led switches off without precluding the proper working of the device. This command is useful to avoid possible interferences with light-fluorescence based experiments.

Additional Controls

Chip Reset

LED ON

LabBook and Comment Tag

Allow entry of a digital time marker with a written comment to be stored with the experimental trace.

Shortcuts list

The full list of shortcuts can be found in the "? --> Shortcuts" menu available in the upper left corner of the interface.

