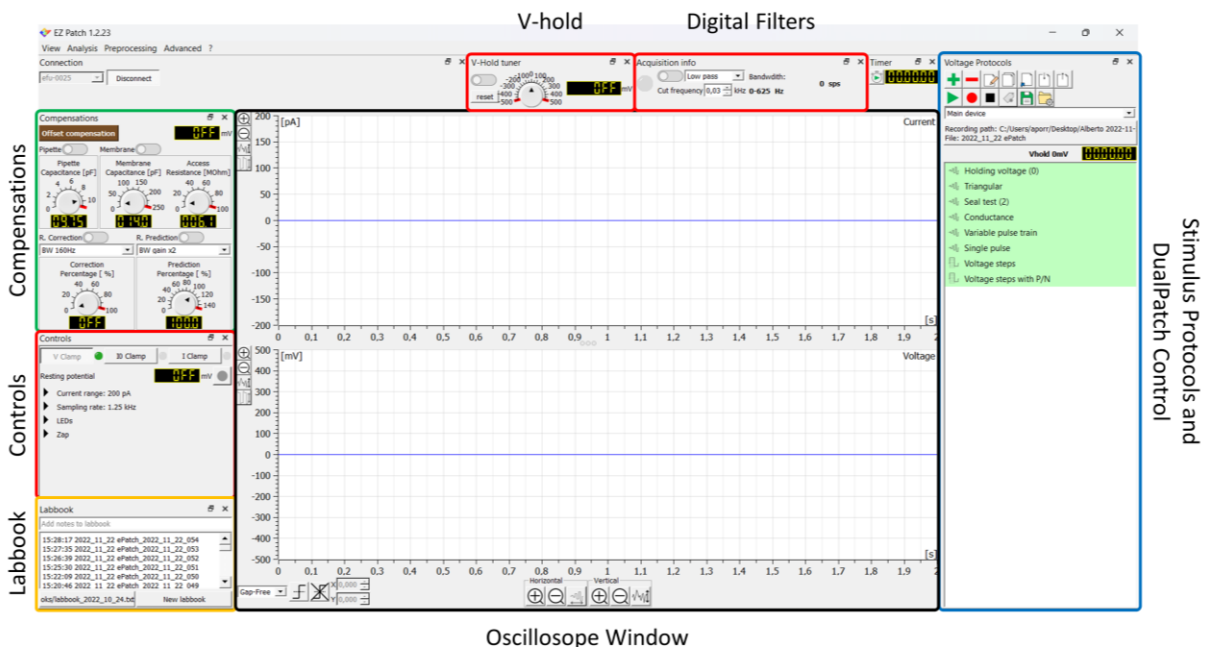


# EZ Patch quick guide

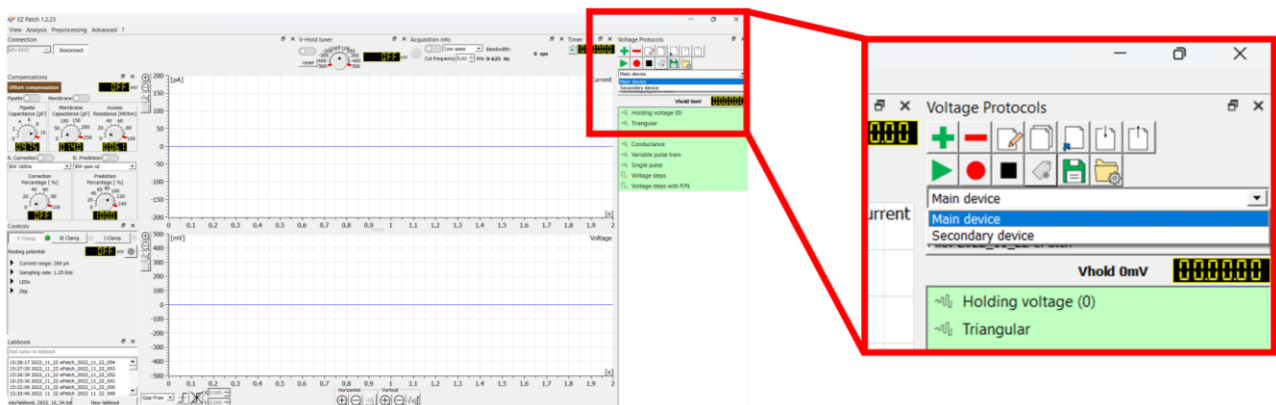
## Graphical User Interface and basic commands



The user interface is arranged in widgets that can be moved, resized and hidden. The default view can be quickly restored using the corresponding option in the menu bar (top, left of the screen). Use the list in the view menu to selectively call back the widgets that have been hidden.

## Important Note:

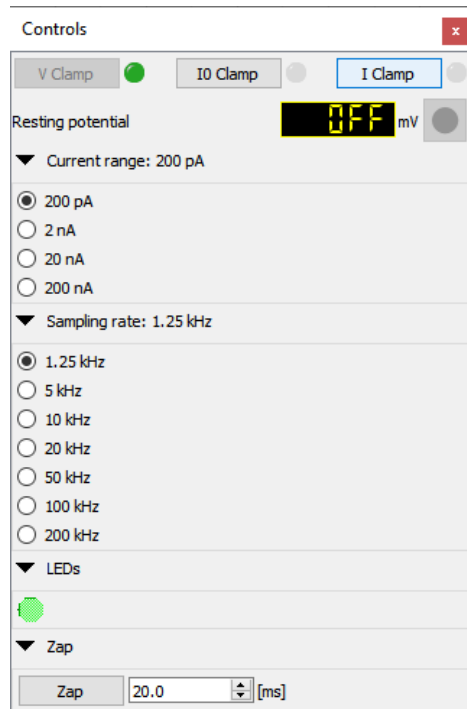
Each time the software is started, check the option selected in the drop-down menu within the Stimulus Protocols Widget (see figure below). This tool enables the dual patch-clamp modality in EZPatch software (please note that two ePatch amplifiers are needed to use this mode). If only one ePatch is used (traditional patch clamp recordings) set it as "primary device." To protect the amplifier internal circuitry from accidental current injection from external devices, this option is automatically set as "secondary device" each time the software is restarted. For further information concerning the dual patch clamp modality, please visit the related "how-to guide".



## The Controls widget

The controls widget allows to select the acquisition parameters, as well as to gain access to other ePatch controls such as the ZAP command and the LED light.

**Acquisition modes:** three operating modes are provided. Voltage clamp, true zero current mode (I0 clamp) and current clamp. The I0 Clamp mode clamps the pipette current to zero



enabling the voltage recording with no current. When I0 mode is selected, the resting potential of the impaled cell appears and updates in real time within the display located below the commands; in addition, the recording button next to the display becomes available to save the recording to disk as a .abf file.

**Current range:** Set the scaling for the current monitor output. Basing on the expected current amplitude, select the proper value in order to obtain the best signal to noise ratio 4 current range are available:

$\pm 200\text{pA}$  Gain  $2.25\text{G}\Omega$ ;

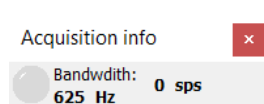
$\pm 2\text{nA}$  Gain  $225\text{M}\Omega$ ;

$\pm 20\text{nA}$  Gain  $22.5\text{M}\Omega$ ;

$\pm 200\text{nA}$  Gain  $2.25\text{M}\Omega$ .

**Acquisition bandwidth:** Select the appropriate bandwidth and sampling rate to accurately represent the analog signal of interest. Seven acquisition bandwidths in the range between 625 Hz and 100 kHz are available.

Depending on the bandwidth chosen, different sampling rate (SR) in the range between 1,25 kHz and 200 kHz are automatically selected.



The bandwidth value is always shown in real time in the acquisition info widget, together with the total number of samples expressed in sps and the LED that signals the amplifier saturation.

**Zap:** The conventional method for rupturing a membrane patch to go to whole-cell recording is to apply a pulse of suction, but sometimes this method damages the cell. The ZAP tool provides an alternative method, applying a large voltage pulse that ruptures the patch. The ZAP applies a pulse of about -1 Volt to the patch for a configurable duration.

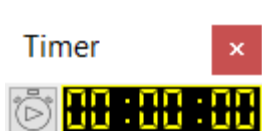
**LEDs:** use this button to either turn on or off the LED located on the back side of the amplifier. This command is useful to avoid possible interference with light-fluorescent based experiments.

## The Labbook



The Lab Book window is a text editor for typing notes and logging events that occur while EZ Patch is running. Recording events are always automatically written in the lab book, together with the related date and time. The currently used Lab Book file is automatically reloaded in each new session. Click on the “New Labbook” button to start to write on a new file (.txt file). The list of the Lab books is accessible by clicking the button named with the lab book path.

## The Timer tool



The timer tool is useful to keep track of the experiment, for example to monitor the time spent in a specific experiment mode or to keep track of the time during a treatment of the sample.

**LSB Noise:** This option is available in the “Advanced” menu. Enabling this control will digitally add a noise uniformly distributed from  $-LSB/2$  to  $+LSB/2$  to all channels (LSB stands for least significant bit). This can be useful to hide the quantization levels of the signals and emulate an analog signal. Notice that since the added noise is smaller than half LSB, if the signal is quantized again it becomes identical to signal without the LSB noise added, so the procedure is in theory completely reversible.