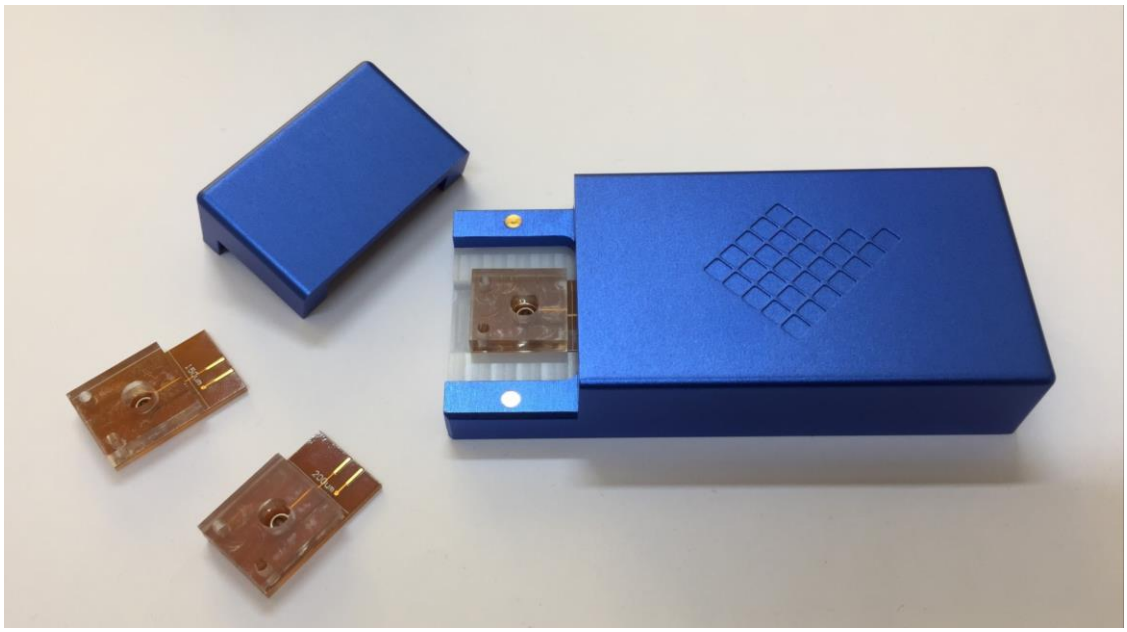
How to get started with lipid bilayer experiments

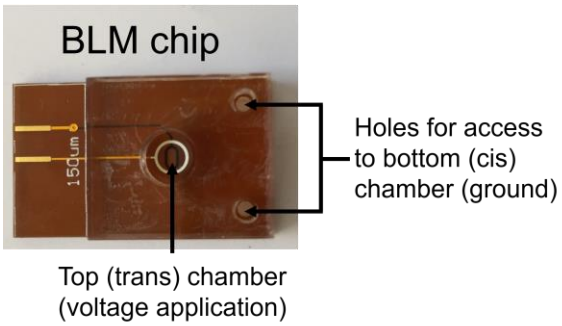


This Quick Guide shows how to perform lipid bilayer experiments using the BLM chip in combination with the Nanopre Reader (eNPR).

BLM chips are available with three different sized holes (100 µm, 150 µm & 200 µm). The table below indicates the typical BLM capacitance.

100 µm:	20-40 pF
150 µm:	35-90 pF
200 µm:	45-140 pF

Step-by-step guide:



Step 1

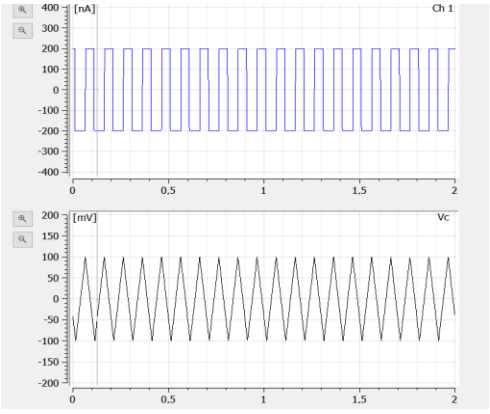
Chlorinate the Ag electrodes on the BLM chip for 10 minutes by adding 60 µl of bleach to the top (trans) chamber and 50 µl of bleach to the bottom (cis) chamber through one of the two holes. Afterwards, rinse with ddH_2O.

Step 2

Slowly fill the BLM chip with buffer solution (i.e. 1M KCl) by adding 60 µl to the top (trans) chamber and 50 µl to the bottom (cis) chamber through one of the two holes. Insert the chip into the reader. During the first few usages it is recommended to fill the BLM chip before inserting it into the device to avoid any possible buffer leakages that would harm the electronics.

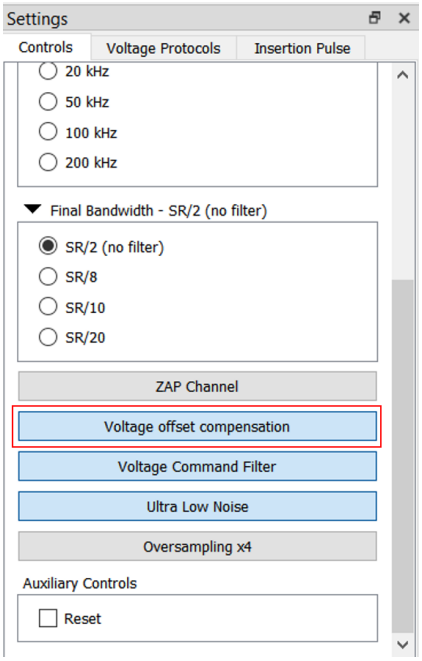
Step 3

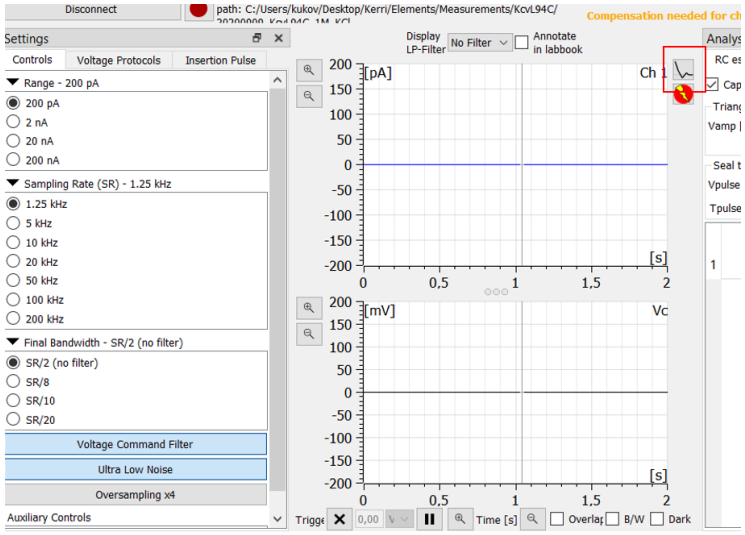
Apply the triangular wave input signal (protocol 1) and check the proper filling of the hole. A full scale square wave (due to amplifier saturation) should be seen:



Step 4

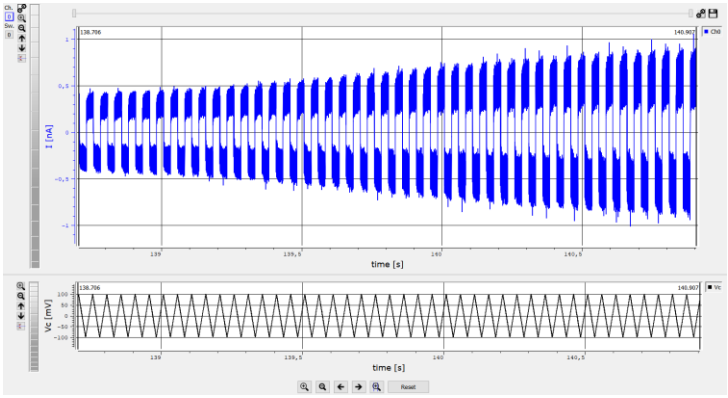
Compensate electrode offsets by clicking on the “Voltage offset compensation” button. Depending on the EDR version this button can either be found in the settings panel, or as a miniature Version next to the oscilloscope.





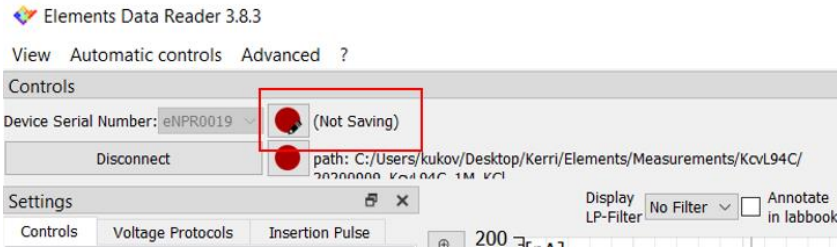
Step 5

Start painting with your desired lipids to form a BLM. An increasing square wave current signal should be seen. If a BLM can’t be formed, please try with the bubble method explained in the product website page video.



Step 6

Add the protein to the top (trans) chamber and apply the desired input signal (see the different voltage protocols in the EDR 3 manual). After successful reconstitution of a channel into the BLM, start recording the respective protocol.



Step 7

When finished, rinse both chambers first with ddH_2O, then with Ethanol or Isopropanole, and then again with ddH_2O (60 µl for top (trans) chamber, 50 µl for bottom (cis) chamber, respectively). Compressed air is best suited to completely dry the chambers.

Important additional information

- Usage of the eNPR over a long period of time can lead to an increase in temperature within the BLM chips (~30-31 °C). Please keep in mind that this might influence the channel activity. If this should be the case, additional cooling of the device is recommended.

- To improve the BLM quality while painting, the square wave current signal should increase. Should no signal improvement be seen, additional optical support can be used (binoscope/microscope) to check for possible air bubbles.

- The lid should be applied gently to the device to avoid breakage of the BLM.

For a more accurate guide on BLM experiments and tips, please contact with us.

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