

Quick guide to impedance measurements with the Locsense Artemis®



This guide provides a compact overview of the basics steps to be taken when performing impedance spectroscopy measurements with the Locsense Artemis. The Artemis is connected to the SmartSense® via the included d-sub cable.

1. Prepare the cell culture plate

Prepare the transwell plate with cells and cell culture media. Make sure to include one “blank”. A blank measurement is performed on an empty insert with identical membrane properties and treatment as the inserts that contain cells. In addition, the blank contains the same volume of cell culture media. The sole difference between the blank and the rest of the wells is that the cells are absent.

2. Insert the transwell plate with inserts inside the Smart-Sense place-holder

When inserting the transwell plate inside the holder, make sure that the inserts are aligned such that the electrodes can pass through the space that is present at the sides of the inserts. The next step is to put the SmartSense lid on top of the place-holder.

3. Prepare a configuration file

Start the Artemis software. Upon a new series of measurements, create a new configuration file, and enter the following fields: transwell type, cell type, well name and other relevant parameters. Select which wells to include in the measurements by clicking on the wells.

4. Select frequency

The last step is to either: select “sample once”, to perform a single impedance spectroscopy measurement for all selected wells, or setup a longer experiment with a fixed time-span and time-interval. An E.g. measure 24 hours with intervals of 1 hour. The recommended frequency settings are from 10 Hz – 100 kHz with a minimum of 20 points, logarithmically spaced.

5. Overview of the results

The impedance spectra can be accessed from the logbook after completing the measurements. Via the data export function, the files can be exported to csv format.

Do's when performing impedance spectroscopy measurements

- ✓ Include one blank insert
- ✓ Keep the temperature constant by placing the cells inside the incubator
- ✓ Or make sure to keep the same routine, e.g. measure at room temperature
- ✓ Ensure that both electrodes are submerged in the solution
- ✓ It is preferred to include multiple time-points, e.g., every 0.5 – 1 day while cells are in culture.

Dont's when performing impedance spectroscopy measurements

- Do not add water to the wells, this influences the conductivity of the surrounding media
- Do not touch the transwell plate while measuring