

MEA2100-Beta-Screen-System

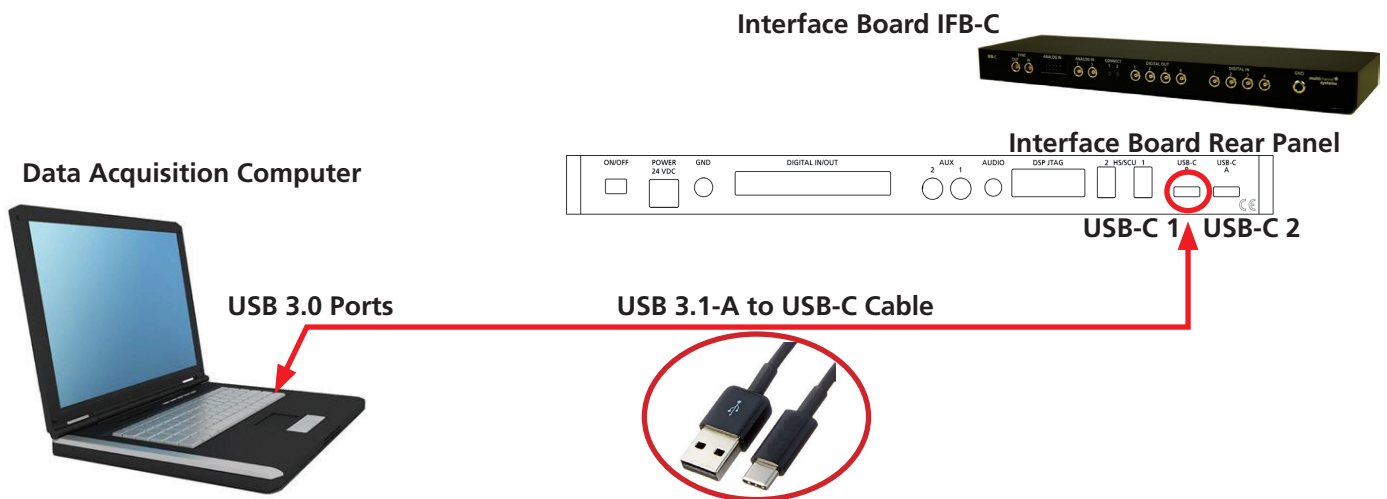
Installation Guide for MEA2100-Beta-Screen-System



- *Setting up a MEA2100-Beta-Screen-System*
- *In vitro* MEA-System for diabetes research with beta cells in intact islets of Langerhans
- *Manuals on the provided USB stick and on the web site: <https://www.multichannelsystems.com/products/MEA2100-beta-screen-system>*
- *Application Note on the web site: <https://www.multichannelsystems.com/applications/pancreatic-islet-cells-diabetes>*



1. Connection to the Data Acquisition Computer



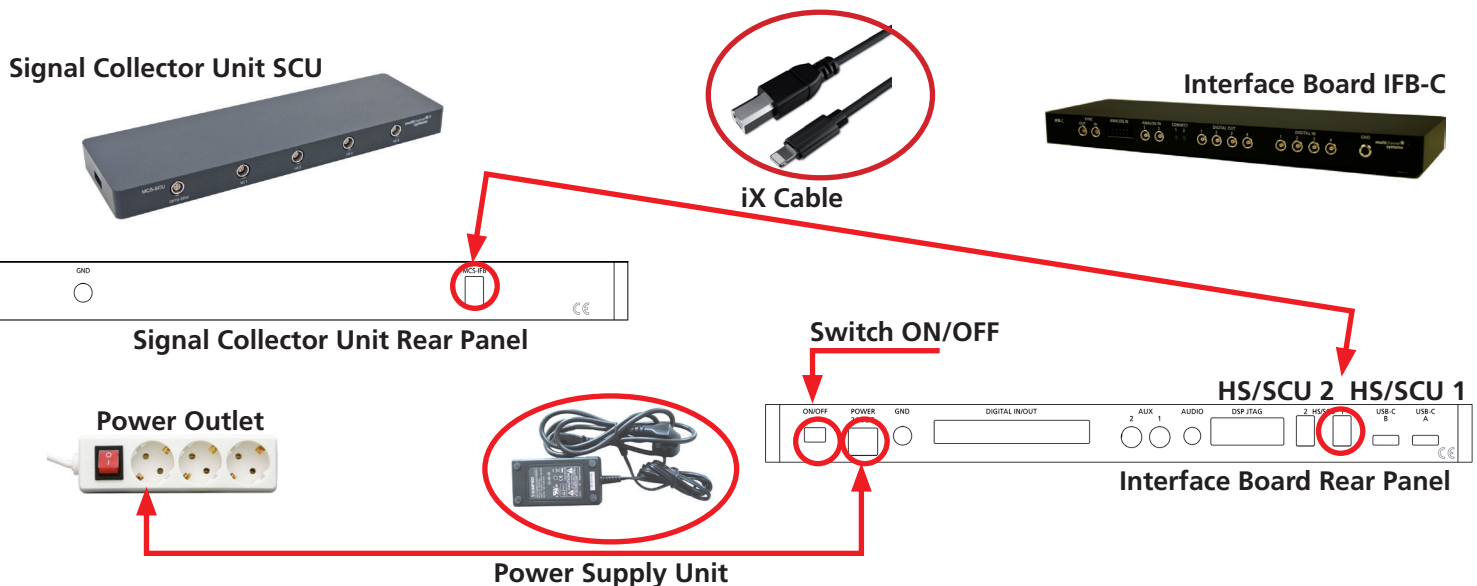
Setup and start the data acquisition computer. The two software solutions Beta-Screen Experiment-er (for DAQ) and Beta-Screen Analyser (for offline analyses) should be installed (icon on the desk-top). If the icon is not on the desktop, please find the data acquisition and analysing software on the provided USB stick.

Connect the interface board (IFB-C) with an USB cable type C to the USB 3.0 port of the computer. Important: Please use an USB 3.0 port (blue)!

- If only one headstage will be used, please use the connector labelled with USB-C 1 on the rear panel of the interface board IFB-C.
- In case you have two headstages, use USB-C 2 for the second USB connection.

Do not use a hub, but connect the interface board directly to the computer!

2. Connection between SCU and IFB-C

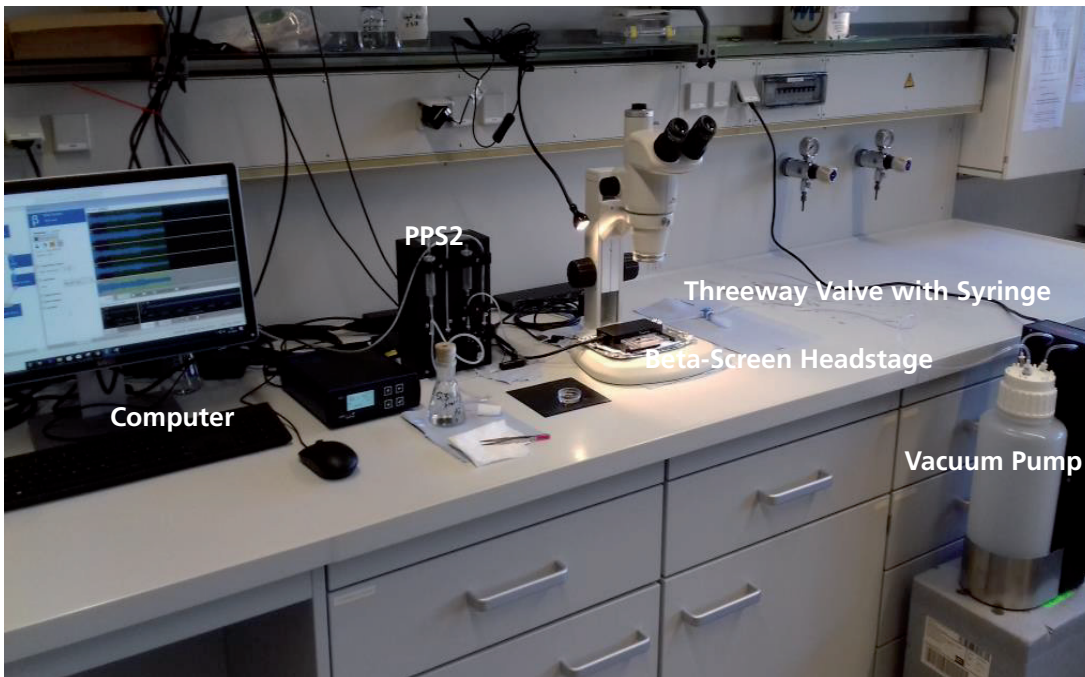


Connect the interface board IFB-C to the Signal Collector Unit SCU via iX cable.

- If only one SCU is connected, please use the connector labelled with HS/SCU 1.
- For an optional second SCU, use the HS/SCU 2 connector.

Connect the interface board IFB-C with the power supply cable to the power outlet. Switch on the interface board (I/O on the rear panel). If it comes up, follow the upcoming hardware installation guide. For grounding, please connect the IFB-C interface board and the computer to the same power outlet.

6. Setup of the complete Beta-Screen-System

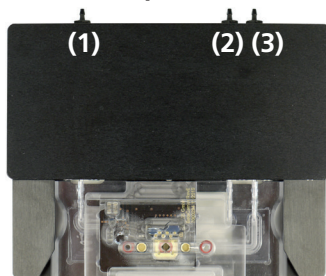


Example of a Beta-Screen-System setup with all components needed for proper recordings. As shown above no specific antivibration table is needed for the recordings but could be used if available to avoid noise sources.

7. Connection of the Perfusion for Negative Pressure on the Headstage

(1) Inflow of the Perfusion via PPS2 Pump

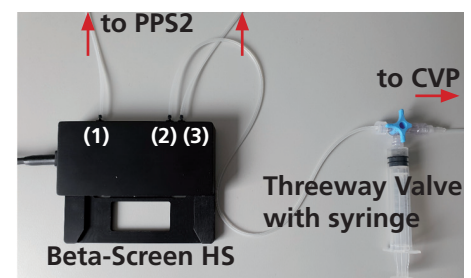
(2) Negative Pressure via CVP for the Positioning of the Islets



(3) Outflow (Suction) of the Perfusion via PPS2 Pump

Connect the tubes of the inflow and the outflow of the PPS2 perfusion pump to the inflow (1) and outflow (3) connector of the headstage. Connect the tube of the CVP vacuum pump to the connector for the negative pressure (2). Please place a threeway valve inbetween to be able to open, close and to fill the tube independent from the CVP.

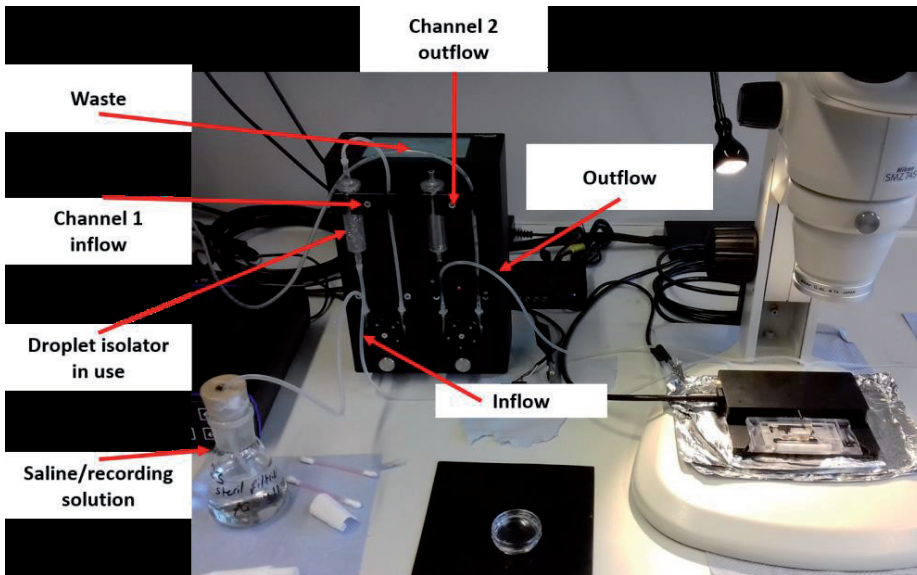
(2) Connection to the CVP via Threeway Valve with Syringe



Connect the interface board IFB-C with the power supply cable to the power outlet. Switch on the interface board (I/O on the rear panel). If it comes up, follow the upcoming hardware installation guide.

For grounding, please connect the IFB-C interface board and the computer to the same power outlet.

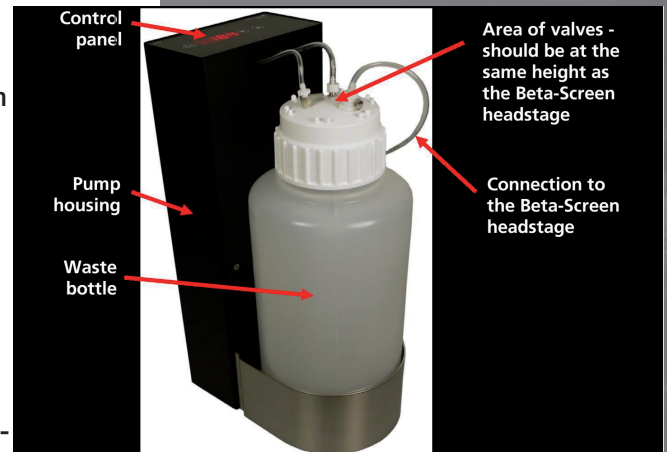
8. Setup of the Perfusion Pump PPS2



- 1) Connect the reservoir with fresh extracellular solution (recording solution) to channel 1 of the PPS2 and insert a droplet isolator between pump wheel and inlet tube of the Beta-Screen headstage. Leaving out the droplet isolator could result in line hum and additionally, to periodically appearing noise picked up from the pump electronics.
- 2) Connect the outlet tube from the head stage directly to channel 2 of the PPS2. Do not use a droplet isolator here! It would lead to slow build-up of negative pressure and sudden release by one strong slurp, causing a strong electric artifact on the measurement. Due to chamber design and the Silver/Silver Chloride electrode in the chamber, line hum imposed on the saline-filled tube will not reach the electrodes.

9. Setup of the Constant Vacuum Pump CVP

- 1) Connect the suction port tube from the headstage to the CVP on the other side. Please place a threeway valve inbetween to be able to open and close the tube independent from the CVP. The usage of the threeway valve enables also to fill the tube with saline.
- 2) Fill the complete tubing and the fluidic block of the Beta-Screen headstage completely with saline. To fill the tubes please use a syringe, for example with 10 ml volume.
- 3) Please make sure that the area of the valves where the tubes reach the pump (see figure below) reaches approximately the same height of the Beta-Screen headstage! This is very important to improve the stability of the suction properties. Moreover, please try to keep the tubes as short as possible.
- 4) Usually the range of the mbar values are inbetween 10 and ~ 40. The value can vary depending on the setup and tube length.



IN CASE YOU HAVE PROBLEMS

Consult the manuals provided on the included USB stick or online: www.multichannelsystems.com/downloads/documentation.

If you do not find help in the manuals, please do not hesitate to contact our support team via:

- Email: support@multichannelsystems.com
- Our support form at

<http://www.multichannelsystems.com/service/support>.

In order to keep your software up-to-date and stay tuned to all MCS news, please subscribe to our newsletter via our web site ("Subscribe Newsletter").

We hope that your setup was successful and you can now start your experiments.

We wish you great progress with your research and are happy to help you with any further questions!

Your MCS team



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