6 Connection of the Peristaltic Perfusion System PPS2

Perfusion In (via PH01)

Perfusion Out (from MEA)
Waste Bottle

Perfusion Solution

1. Connect the PPS2 with the power supply unit to the power outlet.
2. Connect the PPS2 with the USB cable A-B to the computer for PPS2 software control (possible via an USB hub).
3. Connect the tubes of the PPS2 to the perfusion solution, the PH01, the perfusion out and the waste bottle. Please follow the instructions on the leaflet in the tube bag. Adjust the flow rate.

USB 2.0 Port

PPS2 Rear Panel

USB 2.0 Cable A-B

Power Outlet

Power Supply Unit

7 Test of the System and Preparation for Experiment

60MEA-SG

120MEA-SG
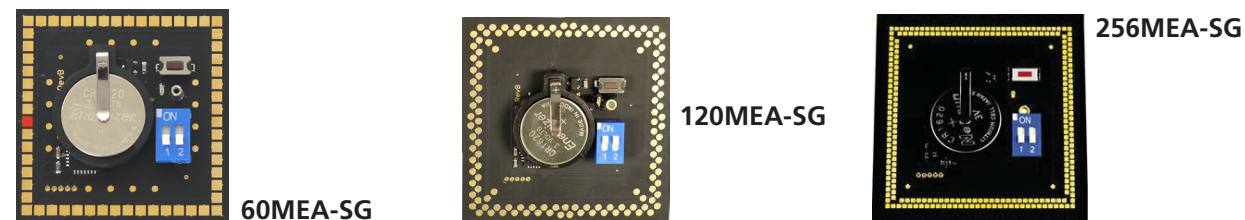
256MEA-SG

MEA Signal Generator: The 60-, 120- or 256MEA Signal Generator is used for setting up an experiment with sample data for training, controlling, and troubleshooting purposes. Please insert the signal generator (orientation: you can read the "ON" and "1   2" on the switch) and test your system with this artificial data and make yourself comfortable with the software settings before starting an experiment with biological samples.

You can find the instructions for the signal generators in its bag, on the provided USB stick (Manuals/MEA_Signal_Generator_Manual.pdf) or online at www.multichannelsystems.com/downloads/documentation.

When working with biological samples, please insert the MEAs in correct orientation.
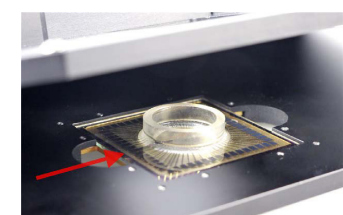
Important: MEAs are not symmetrical! Standard MEAs with one big internal reference electrode should be placed with the reference electrode to the left side in the headstage. Otherwise, the MEA layout will not match with the pin layout of the channel map in the data acquisition programs from MCS. For the orientation of special MEAs, please read the respective datasheet. You can find instructions for the handling of the MEAs on the provided USB stick (Manuals/MEA_Manual.pdf) or online. Datasheets for each MEA type are available online at www.multichannelsystems.com/products/microelectrode-arrays.

---

multichannel systems
Innovations in Electrophysiology

In Case You Experience any Problems

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

2. 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.

3. 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

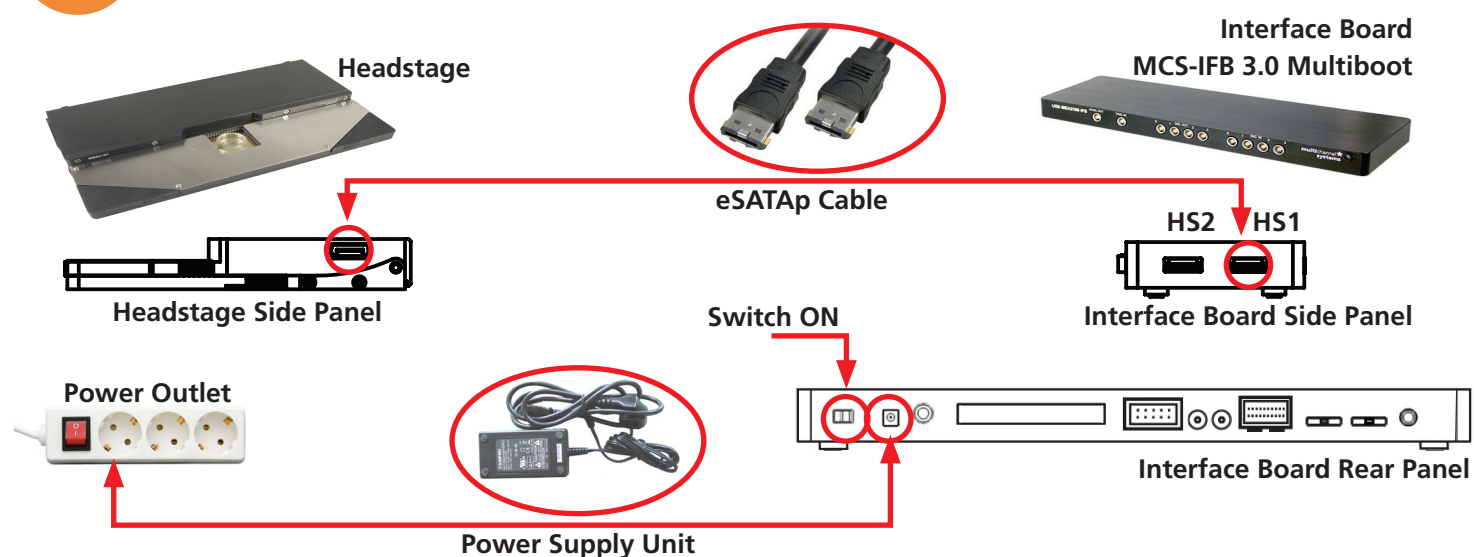
MEA2100-System: Installation Guide

- Setting up a MEA2100-System

- For more information:
  - Manuals on the provided USB stick
  - www.multichannelsystems.com/downloads/documentation

1 Connection to the Data Acquisition Computer

Interface Board MCS-IFB 3.0 Multiboot

Data Acquisition Computer

Interface Board Rear Panel

USB 1   USB 2
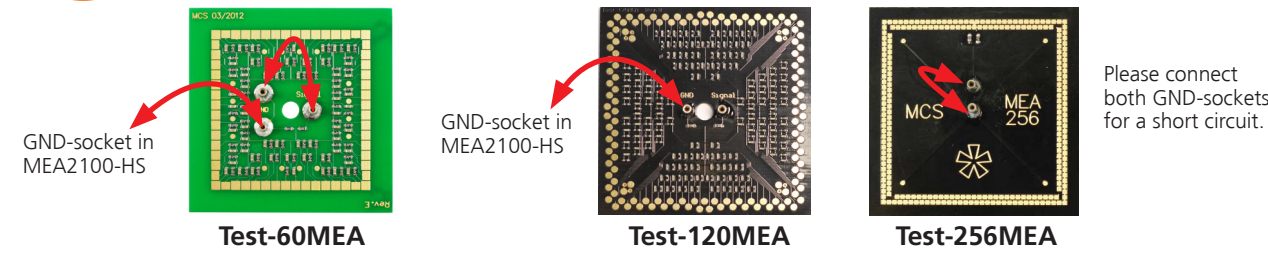
USB 3.0 Ports   **USB 3.0 Cable A-Micro B**

1. Setup and start the data acquisition computer. The data acquisition program Multi Channel Experimenter should be installed (icon on the desktop). If the icon is not on the desktop, please find the Multi Channel Experimenter on the provided USB stick (Software\Multi Channel Suite\Multi Channel Experimenter_x.x.x.exe.
2. Connect the interface board (MCS-IFB 3.0 Multiboot) with the USB super speed cable A - Micro B to an USB 3.0 micro port of the computer. Important: Please use an USB 3.0 port (blue)!
   - 2a: If only one headstage will be used, please use the connector labelled with USB 1 on the rear panel of the Interface Board.
   - 2b: In case you have two headstages, use USB 2 for the second USB connection. Do not use a hub, but connect the interface board directly to the computer!

2 Connection of the MEA2100-System Components

Headstage

Interface Board MCS-IFB 3.0 Multiboot

eSATAp Cable

HS2   HS1

Headstage Side Panel

Switch ON   **Interface Board Side Panel**

Power Outlet

Power Supply Unit   **Interface Board Rear Panel**

1. Connect the interface board to the headstage with the eSATAp cable.
   - 1a: If only one headstage is connected, please use the connector labelled with HS1.
   - 1b: For an optional second headstage, use the HS2 connector.
2. Connect the interface board 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.
3. For grounding, please connect the MCS interface board and the computer to the same power outlet.

3 Noise Test of the System Setup via Software

Test-60MEA   **Test-120MEA**   **Test-256MEA**

GND-socket in MEA2100-HS

GND-socket in MEA2100-HS

Please connect both GND-sockets for a short circuit.

Test Model Probe: The provided test model probe is used for testing the noise level of the MEA-System. It is already inserted in your headstage and the grounding cables (black, about 5 cm) are connected.
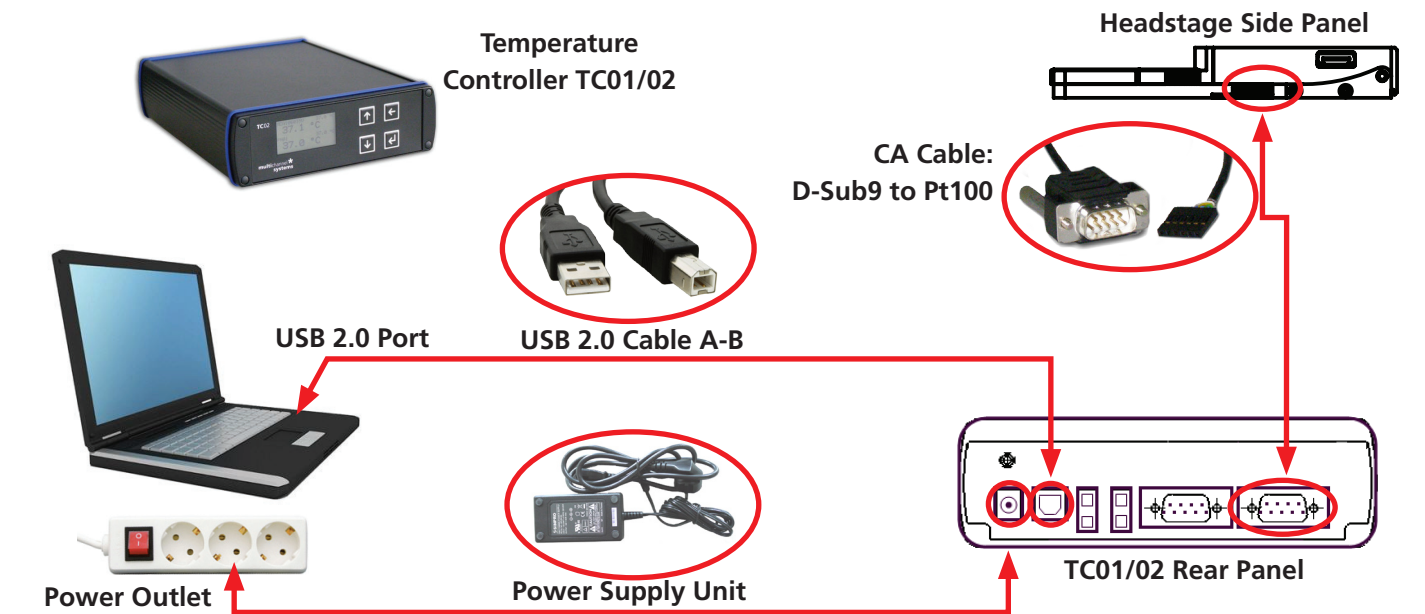
Multi Channel Suite Software

The Multi Channel Suite software consists of three independent software types, provided on the USB stick. Multi Channel Experimenter is for online recording with different devices of Multi Channel Systems MCS GmbH. Multi Channel Analyzer is for offline analysis of files generated with the Multi Channel Experimenter online tool. Multi Channel DataManager is for data export, enabling further analysis with Python, Matlab or other applications.
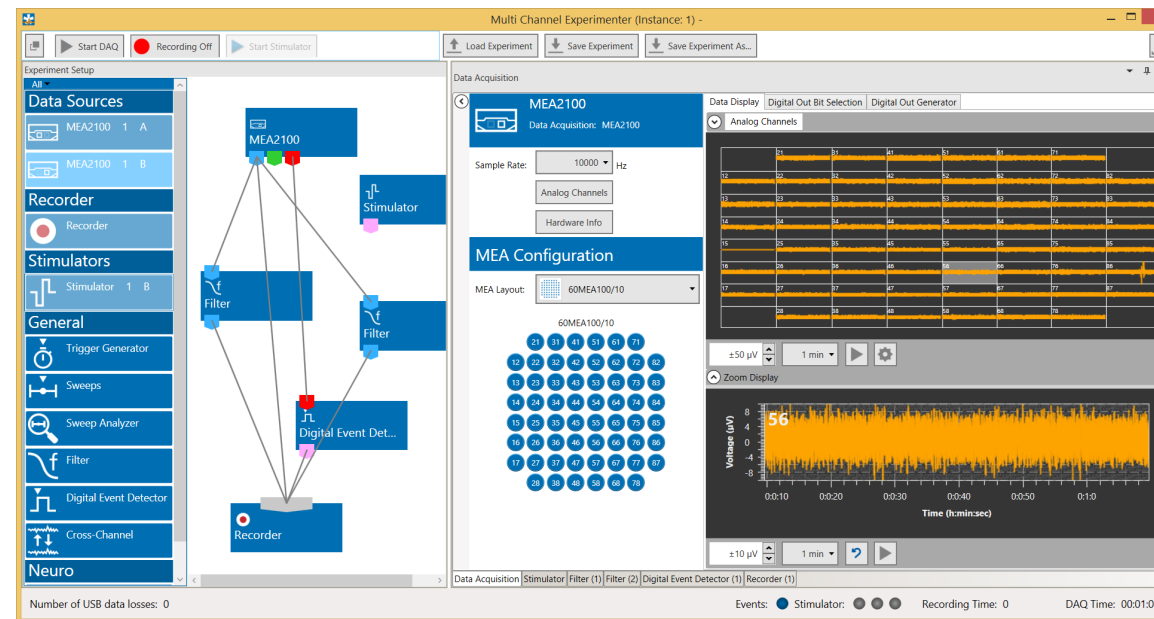
Multi Channel Experimenter Software

1. Open the Multi Channel Experimenter data acquisition software on your computer. A headstage with two MEA slots will be indicated as MEA2100 1 A and MEA2100 1 B in "Data Sources".
2. Move a data source and the instruments via drag and drop from the left to the right.
3. Connect the ports of the instruments via drag and drop. The ports are color coded: **Electrode raw data** are symbolized in blue, **analog data** in green, **digital data** in red and **feedback events** in pink ports.
4. Connect only ports with the same color. The grey port of the recorder accepts all incoming data traces.
5. Doubleclick an instrument to open the setting parameters and the data displays in overview. Zoom into a channel in the single view.
6. Press the "Start DAQ" button to start recording. The noise level should be between ±10 to 15 µV. Please read the Multi Channel Experimenter_Manual.pdf on the USB stick.
7. If you experience higher noise than that, please consult the „Troubleshooting" chapter in the manual (MEA2100-System_Manual.pdf). Make sure that the amplifier is grounded.

4 Connection of the Temperature Controller TC02 (TC01)

Temperature Controller TC01/02

Headstage Side Panel

CA Cable: D-Sub9 to Pt100

USB 2.0 Port   **USB 2.0 Cable A-B**

Power Outlet

Power Supply Unit   **TC01/02 Rear Panel**

1. Connect the temperature controller with the power supply unit to the power outlet.
2. Connect the temperature controller with the CA cable (D-Sub9 to Pt100) to the headstage. The connector is symetrical, so the orientation of the connector is irrevelant.
3. Connect the temperature controller to the USB cable A - B to an USB 2.0 port of the computer. If you have several temperature controllers, use the provided USB hub.

If you ordered a MEA2100-System **without perfusion**, you are now done with the setup and can start to use the devices. Please see #7 for testing and practicing with signal generators. If you ordered a MEA2100-System **with perfusion** (MEA2100-60/2x60/120/256-E), please continue the setup with #5.

5 Connection of the Perfusion Cannula PH01

Perfusion Cannula PH01   **CA Cable: D-Sub9 to Pt100**   **TC02 Rear Panel**

1. Connect the perfusion cannula PH01 with the CA cable (D-Sub9 to Pt100) to the temperature controller TC02. The connector is symmetrical, so the orientation of the connector is irrevelant.
2. Set the respecive channel of the temperature controller via control software or via touch screen to the device PH01. Please see the TCX manual for detailed information (USB stick: Manuals/MEA-System/TC01-02_Manual_RevG.pdf) or https://www.multichannelsystems.com/sites/multichannelsystems.com/files/documents/manuals/TC01-TC02_Manual_RevG.pdf.