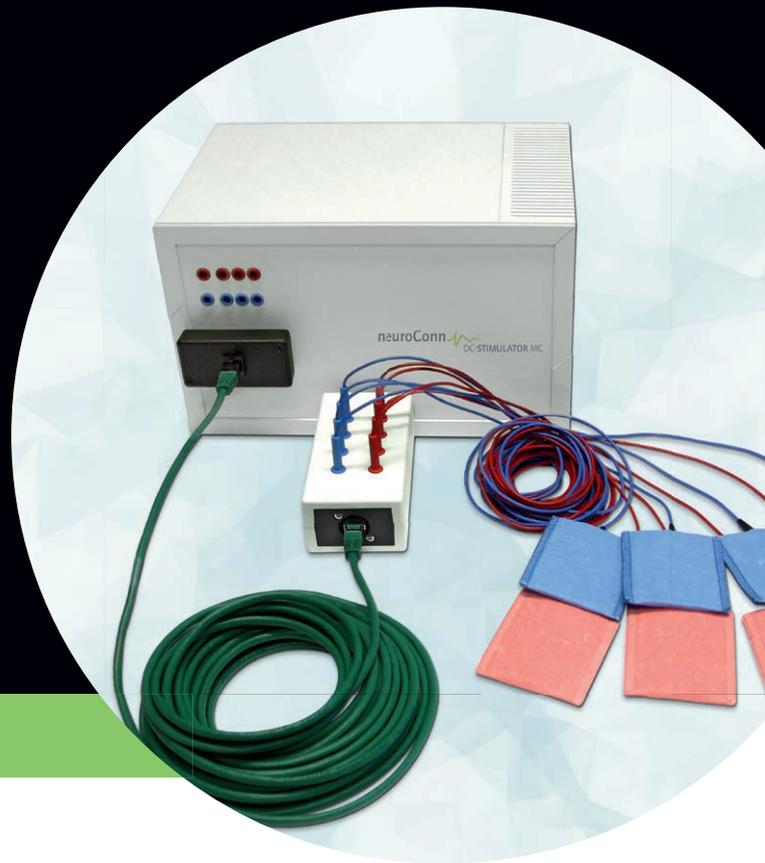


# DC-STIMULATOR MC

## Measuring and Modulating Brain Activity

for neuroscience applications



### Programmable, multi-channel direct, alternating and random noise current stimulator

The DC-STIMULATOR MC is a stimulator for use in scientific research that provides a stimulation using weak direct or alternating current (transcranial Electrical Stimulation - tES) within non-invasive interventional Neurophysiology. The electrical charge and current density applied through a constant current source are far below the threshold for releasing a stimulus. Depending on the duration, the used current, the current density, and the frequency, the stimulation has a modular effect on existing neuronal elements by either activating or inhibiting cortical activity.

The multi-channel DC-STIMULATOR MC allows computer-controlled, full-band stimulation from independent electrical sources using any desired signal type in the range of 0 - 1,000 Hz and currents of between 50-4,000  $\mu$ A with a freely adjustable phase. Furthermore, the DC-STIMULATOR MC can be used during functional magnetic resonance imaging (fMRI) and, in addition, can be combined with the NEURO PRAX<sup>®</sup> TMS/tES allowing full-band DC-EEG to be recorded during multi-channel tES.

### Areas of Application/Treatments

**Research, hospitals and surgeries:**

controlled, monitored and simultaneous tDCS/tACS/trNS stimulation or sham stimulation of patient groups, multi-channel tDCS/tACS/trNS stimulation

**Analysis and stimulation of the ROI:**

software-controlled, multi-channel stimulation of selected regions of the brain and validation of tES with the help of functional magnetic resonance imaging (fMRI)

**Analysis and stimulation:**

development and evaluation of user-specific stimulation sequences

## DC-STIMULATOR MC Features

- 4/8/12/16 programmable, micro-processor-controlled constant current sources using independent channels (16 channels\*)
- for transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), cranial electrical stimulation (CES), galvanic vestibular stimulation (GVS) and transcranial random noise stimulation (tRNS)
- 4/8 channels, capable of alternating current, bipolar stimulation possible (16 channels\*)
- medical panel pc for the use and programming of stimulation modes and stimulation sequences
- various types of stimulation can be selected and combined, continuous stimulation, cyclical switching on and off of stimulation, sinusoidal stimulation (up to 1,000 Hz)
- import of any stimulation sequences into the software to control the DC-STIMULATOR MC with customer-specific signal sequences\*
- high safety standard through multistage monitoring of the current path
- external trigger input\*

\* optional



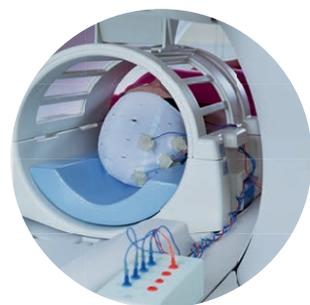
DC-STIMULATOR MC  
with medical panel PC



4/8 (optional 16) freely  
programmable channels



Adaptor box for  
4 x 4 / 8 x 8 or  
4 x 1 / 8 x 2 stimulations



DC-STIMULATOR MC in the  
MRI scanner

## DC-STIMULATOR MC Specifications

- currents and wave forms of up to  $\pm 4,000 \mu\text{A}$
- AC current adjustable up to  $8,000 \mu\text{A}$  (peak-to-peak)
- frequencies of up to 1,000 Hz selectable and phase freely adjustable
- freely selectable application duration
- 16-bit D/A conversion
- time resolution  $< 1 \text{ ms}$  (sample rate 16,000 sps)
- recording of stimulation sequences with 8,000 measurements/second
- max. 1 % relative direct current fault tolerance
- max. 0.02 % direct current fluctuation
- current variance during stimulation  $< 0.02 \%$
- voltage limit of 30 V
- power supply via external medical power supply unit
- dimensions: 420 mm x 395 mm x 170 mm (W x D x H)
- weight: 4.2 kg

\* optional

## fMRI Add-on for DC-STIMULATOR MC

- use of the DC-STIMULATOR MC in fMRI
- no interference of the fMRI images during EPI sequence

## DC-STIMULATOR MC Options

- Trigger Out to control external devices
- remote control of the DC-STIMULATOR MC\*
- generation of arbitrary wave forms
- stimulation via ROI as well as modelling of the current flow

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