

# Measuring and Modulating Brain Activity



**neuroConn**  **NEURO PRAX<sup>®</sup> MR**

## fMRI-compatible bio- and neurofeedback system

The NEURO PRAX<sup>®</sup> TMS/tES is a DC-EEG bio- and neurofeedback system. Biofeedback is a treatment method, based on operant conditioning. In this method the patients receive feedback about their physiological states and changes in these states, which mostly cannot be perceived by the patient. Slow Cortical Potential Neurofeedback (SCP-NF) is a kind of biofeedback and therefore a method in instrument-based behavioral therapy. SCP-NF allows the patient to perceive and self-regulate their brain activity. It is probably effective in the treatment of ADHD.

NEURO PRAX<sup>®</sup> MR systems measures physiological activity such as EEG, EMG, and EP signals simultaneously and synchronously for all channels. Unique amplifier technology captures EEG activities from infraslow (0 - 0.3 Hz) to ultrafast (80 - 1,200 Hz) frequencies. The high dynamic range of our amplifiers and the integrated online correction of gradient and pulse artifacts make the NEURO PRAX<sup>®</sup> MR particularly suitable for measuring EEG, ECG, EMG, or GSR during functional Magnet Resonance Imaging (fMRI). Our full-band MR-compatible DC-EEG amplifiers are available with 8, 32 or 64 channels. They provide a wide range of optional software-based functions such as online correction of artifacts, topographical analyses, spectral and amplitude mapping, and online averaging. The NEURO PRAX<sup>®</sup> MR 8 allows to record the galvanic skin response (GSR) and the EMG.

### Areas of Application/Treatments

Neurofeedback clinic

Research in Neurology

Cognitive Neuroscience and Behavioral Science

Neurofeedback research

- | DC-EEG neuro- and biofeedback system, quantitative EEG, cognitive evoked potentials
- | fMRI and full-band DC-EEG, fMRI and EP/EMG
- | fMRI and EP, fMRI and GSR, facial EMG
- | fMRI and DC-EEG-feedback, 3D-EEG-feedback

**Moving thought**

neuroCare 

### NEURO PRAX® MR features

- 32-channel full-band DC-EEG bio- and neurofeedback system (8, 64 channels)\*
- Channel type (EEG, EMG, ECG) selectable via software
- Non-referential storage of raw data
- Online correction of gradient artifacts during fMRI by means of soft- and hardware synchronization\*\*
- Real time correction of pulse artifacts
- Suitable for polygraphy and polysomnography
- Simple and intuitive user interface
- EEG mountings and event markers freely selectable
- Patient database with medication and examination calendar, complete documentation of readings
- Topographical analyses, spectral and amplitude mapping
- Display of averaged evoked responses during fMRI-scans
- Connection to external trigger sources
- Module ACTIVE SYNC MR for high end gradient artefact correction

\* optional, \*\* hardware synchronization optional

### NEURO PRAX® MR specifications

#### full-band DC-EEG and BIOSIGNAL AMPLIFIER

- 32 full-band DC-channels (8, 64 channels)\*
- Input impedance > 10 GW
- 24-bit resolution per channel
- Selectable sampling rates of 60 to 4,000 sps
- Frequency range of 0 to 1,200 Hz @ 4,000 Hz sampling rate
- Common mode rejection rate (CMRR) > 90 dB @ 50 Hz
- Dynamic input range approx. ± 175 mV
- Input noise < 0.9 µV (RMS) @ 0 - 110 Hz at 250 sps
- Max. power consumption 1.5 W
- Continuous operation time > 8h
- Power supply via built-in rechargeable batteries
- Applied part BF
- Dimensions: 290 mm x 130 mm x 200 mm (W x D x H)
- Weight: 4.2 kg (incl. batteries)
- Data transmission via optical fiber
- Electrode input box, incl. connector cable (32, 64 channels)
- Measurement of Galvanic Skin Response (GSR) during functional MRI\*\*\*

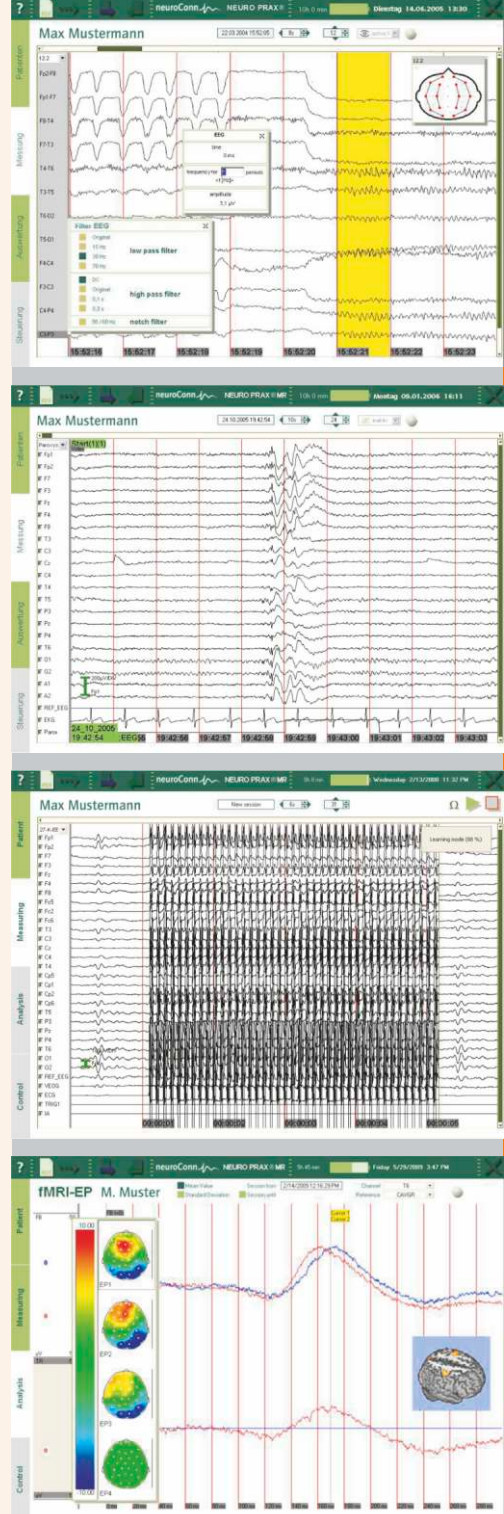
\* optional, \*\*\* only available in NEURO PRAX® MR 8

#### PANEL-PC

- Powerfull Intel® Core™ Duo processor, 2 GB RAM, min. 500 GB hard disc,
- USB 2.0, ethernet interface (LAN), min. 15" TFT color monitor, keyboard, mouse
- Operating system WINDOWS® 7 (and later)
- Operating voltage 100-240 V @ 60/50 Hz AC
- Dimensions: 420 mm x 365 mm x 170 mm (W x D x H)
- Weight: 11.6 kg (incl. stand)

### NEURO PRAX® MR options and system extensions

- Module for the online correction of artifacts
- Module for cognitive evoked potentials: CNV, CPT-OX, P300, ERN and BP (not inside MRI scanner)
- Feedback module system extension (additional monitor)
- NEURO PRAX® MR examination license from other PC
- Module for online data access via Ethernet by TCP/IP
- Export module for exporting measured data into other formats
- Module for data access within MATLAB®/Simulink®, LabVIEW®, C/C++
- Optical Trigger Module system extension for external trigger inputs
- Module for source localization of EEG and fMRI-EEG data
- Rechargeable battery pack (not inside MRI scanner)



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