

NEWSLETTER



Dear reader,

Welcome to the neuroConn newsletter. From now on we will inform you on a regular basis about our work, our devices, the latest progress in development as well as forthcoming events. We hope for your interest and look forward to your feedback and comments.

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Latest news

New DC-STIMULATOR PLUS available by March 2012

Ilmenau, January 2012: The new generation of our successful DC-STIMULATOR PLUS with highly improved signal quality will be available by the end of March 2012. In addition to extended standard functions, such as the simple selection of the system language (German or English), the permanent impedance check and the acoustic error signal, there will be a number of new soft- and hardware features that will open up new fields of application:

The option SIGNAL OUT is totally unique: In combination with a new neuroConn Software and the NEURO PRAX[®] EEG amplifiers it allows the EEG derivation during the tDCS and tACS, since stimulation-induced noise is being filtered out of the EEG signal online and in real time.

With the new option REMOTE the physician can trigger the DC-STIMULATOR PLUS via an external voltage generator with arbitrary signal forms.

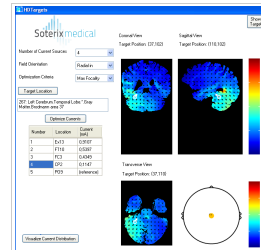
The current Patient Mode is replaced by the SCHEDULE mode with time control allowing the physician to set up and control an exact treatment schedule.

The new DC-STIMULATOR PLUS will replace the current version. Despite the various new features the basic price will not be affected.

Targeted transcranial HD-Stimulation

Present clinical paradigms using two relatively large electrodes to inject current through the head result in electric fields that are broadly distributed over large regions of the brain. The cooperation of neuroConn and US-based

[Soterix Medical](#) has now developed a new solution based on our DC-STIMULATOR MC and the Soterix Software HDTargets[™] which allows the targeted, optimised high-definition (HD) stimulation. Several small electrodes are being used and the applied currents are



systematically optimized to achieve efficient, targeted stimulation while ensuring the patients safety. This new product aims at the extension of current research areas to improve the protocols for the clinical research on tDCS in the treatment of depression,

stroke, tinnitus or pain. Several European universities have already acquired the new system. We expect the first scientific results to be available in 2012. [\[more\]](#).

In addition, a MATLAB/.NET-library is now available for the DC-STIMULATOR MC to control the stimulator comfortably via MATLAB or .NET Framework.

Societal impact of pain – EFIC Congress 2011

Hamburg, Germany, September 2011: „Societal Impact of Pain“ - this was the motto of the 7th EFIC Congress in Hamburg. 20 percent of the Europeans suffer from chronic pain – these are more than 100 million people within the EU. Many of them cannot be sufficiently treated in spite of all the progress and modern pain medicine. In addition to the suffering and the disability the patients have to endure, migraine causes annual medical costs of 27 billion EUR in Europe. Studies presented at the European EFIC Congress in Hamburg in front of 4,000 participants prognosticate the availability of new medicine with less safety concerns within the next 2 years. In addition, scientists expect progress in pain reduction from innovative methods of neuromodulation which are able to extenuate migraine and cluster headache without any side effects. „There are currently being at least four methods developed which might have great potential for the therapy of Migraine and Cluster Headache“, explained Prof. Schoenen (Luetlich, Germany). Transcranial magnetic stimulation and transcranial direct current stimulation are two of them.

tDCS shows promising results in latest psychiatric and neurological research

Recent scientific studies at the [Ludwig-Maximilians-University](#) in Munich, Germany and the [University of New South Wales \(UNSW\)](#), Australia, allow insights in the efficacy of transcranial direct current stimulation (tDCS) in the **treatment of therapy-resistant depression**. Research findings in both studies imply a positive effect of tDCS on the emotions of the participants with active stimulation of 20 min. a day. Compared to the group with sham stimulation these participants rated their subjective mood higher than before the treatment. The researchers at both universities recommend further studies to develop tDCS into an efficacious treatment of therapy-resistant depression.

After first positive results in the therapy of post-stroke symptoms, such as paresis, aphasia or strong memory decline, newer research on tDCS shows first success in the improvement of **motor abilities**. [Japanese scientists](#) applied tDCS during functional training or strength training of the lower limbs and found out that the anodal stimulation can transiently increase the



maximal knee extensor force. An American research work done by [James W. Stinear and colleagues](#) describes for the first time how direct current stimulation can enhance the voluntary control of the paretic ankle. These findings might be beneficial for post-stroke rehabilitation.

FOCUS TOPIC

THERA PRAX[®]: Neurofeedback for ADHD

Ilmenau, January 2012: Clinical research of the past years have provided clear evidence of the efficacy of neurofeedback in the treatment of children with ADHD. Two randomised, controlled studies ([Ute Strehl et al., 2006](#) and [Holger Gevensleben, et al., 2009](#)) proved neurofeedback training efficacious and specific for ADHD. The subsequent Meta analysis of 15 studies published at that point in time ([Martijn Arns & Ute Strehl, 2009](#)) found large effect sizes for neurofeedback on impulsiveness and inattention, comparable to the effect size of the pharmaceutical substance Methylphenidate used in several ADHD medications ([Martijn Arns, 2010](#)) and medium effect sizes for hyperactivity. Only here the medication proved more efficacious. Two follow-up studies were able to provide evidence that – in contrast to the medication - the positive effects of neurofeedback do not wear off even months or years after finishing neurofeedback training ([Cihan Gani et al., 2008](#) and [Holger Gevensleben et al., 2009](#)).

The research group of Holger Gevensleben, psychologist in Goettingen, Germany, has only recently been awarded the [ECAP-ADHD-Paper of the Year Award 2011](#) declaring the follow-up study mentioned above the best publication on ADHD of 2010. The research prize, awarded by the journal European Child & Adolescent Psychiatry (ECAP) is sponsored by Shire Germany, which underlines the interest the pharmaceutical industry has developed in neurofeedback and the growing acceptance as a supplementary therapy.

Various leading international associations for child and adolescent psychology in [Germany](#), [the UK](#), [Europe](#), [the USA](#) and [Australia](#) mention neurofeedback in their guidelines for ADHD and recommend further research into the method. On the other hand the American Academy of Pediatrics recently extended the age for ADHD diagnosis and medicinal treatment to [children of only four years of age](#).

In Germany a currently ongoing multi-centre study conducted by Prof. Martin Holtmann (Hamm, Germany) examines the specific efficacy of neurofeedback for ADHD in a prospective, randomised, controlled design using our THERA PRAX[®]. By the end of 2012 a total of 144 patients at five centres are to be included. Half of them were already included at the end of 2010. The German Research Foundation (DFG) supports the study with 1.4 million €.

THERA PRAX[®]: preferential device for studies and therapy of ADHD

The THERA PRAX[®] can perform Neurofeedback of the slow cortical potentials and of the EEG bands as well as biofeedback (option). Today it is assumed that SCP training in ADHD patients results in prolonged effects

and that the determination of the CNV (contingent negative variation) makes the success of the treatment predictable. For SCP training it is essential to eliminate eye movement artefacts from the signals. This is **only possible** with the THERA PRAX[®].

Over 15 years of close cooperation between Prof. Niels Birbaumer, University of Tuebingen, Germany, who originally developed the SCP training, and neuroConn, result in state-of-the-art devices for neurofeedback that incorporate the latest clinical research findings and progress.

The standardized protocols for EEG band and SCP training in ADHD and other indications, that are delivered with the system, are clinically evaluated and were developed in the studies mentioned above.

More than 70 pediatric, psychological and ergotherapeutical practices Europe are conducting neurofeedback training with the THERA PRAX[®] and have been able to help many children and adolescents with ADHD to reduce or even to go off the medication.

neuroConn – forthcoming international exhibitions

March 15 – 17, 2012: [DGKN 2012](#), 56th Scientific Annual Meeting of German Society for Clinical Neurophysiology and Functional Imaging, Cologne, Germany, [\[more\]](#)

March 31 – April 3, 2012: [CNS 2012](#), 19th Annual Cognitive Neuroscience Meeting, Chicago, USA [\[more\]](#)

April 21 – 28, 2012: [AAN 2012](#), 64th Annual Meeting of the American Academy of Neurology, New Orleans, USA [\[more\]](#)

May 5 – 9, 2012: [APA 2012](#), 165th Annual Meeting of the American Psychiatric Association, Philadelphia, PA, USA [\[more\]](#)

May 5 – 11, 2012: [ISMRM 2012](#), 20th Annual Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia [\[more\]](#)

May 9 – 12, 2012: [ESCAN 2012](#) 1st Conference of the European Society for Cognitive and Affective Neuroscience, Marseille, France [\[more\]](#)

May 16 – 19, 2012: [WCNR 2012](#), 7th World Congress for NeuroRehabilitation, Melbourne, Australia [\[more\]](#)

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