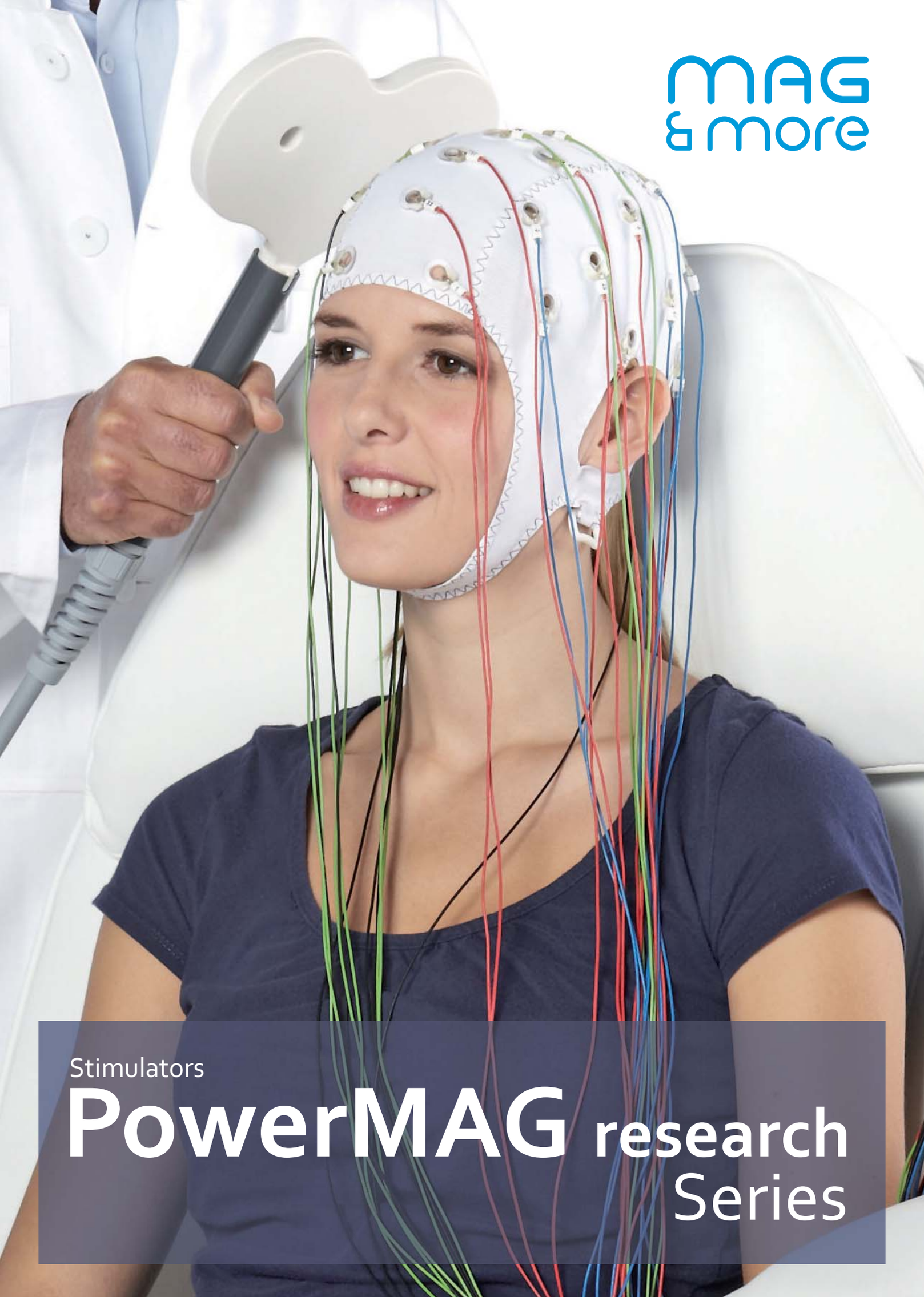


MAG & more

Stimulators

# PowerMAG research Series

*A Brief Overview of MAG & More GmbH*
*Our Philosophy on Creating Innovative, High Quality Solutions*

MAG & More has been involved in the field of magnetic neurostimulation for more than 15 years. We have fundamentally taken part in the development of strong and reliable stimulators as well as in the design of new stimulation coils. This experience has given us comprehensive knowledge to answer the needs of our customers in the field of magnetic stimulation.

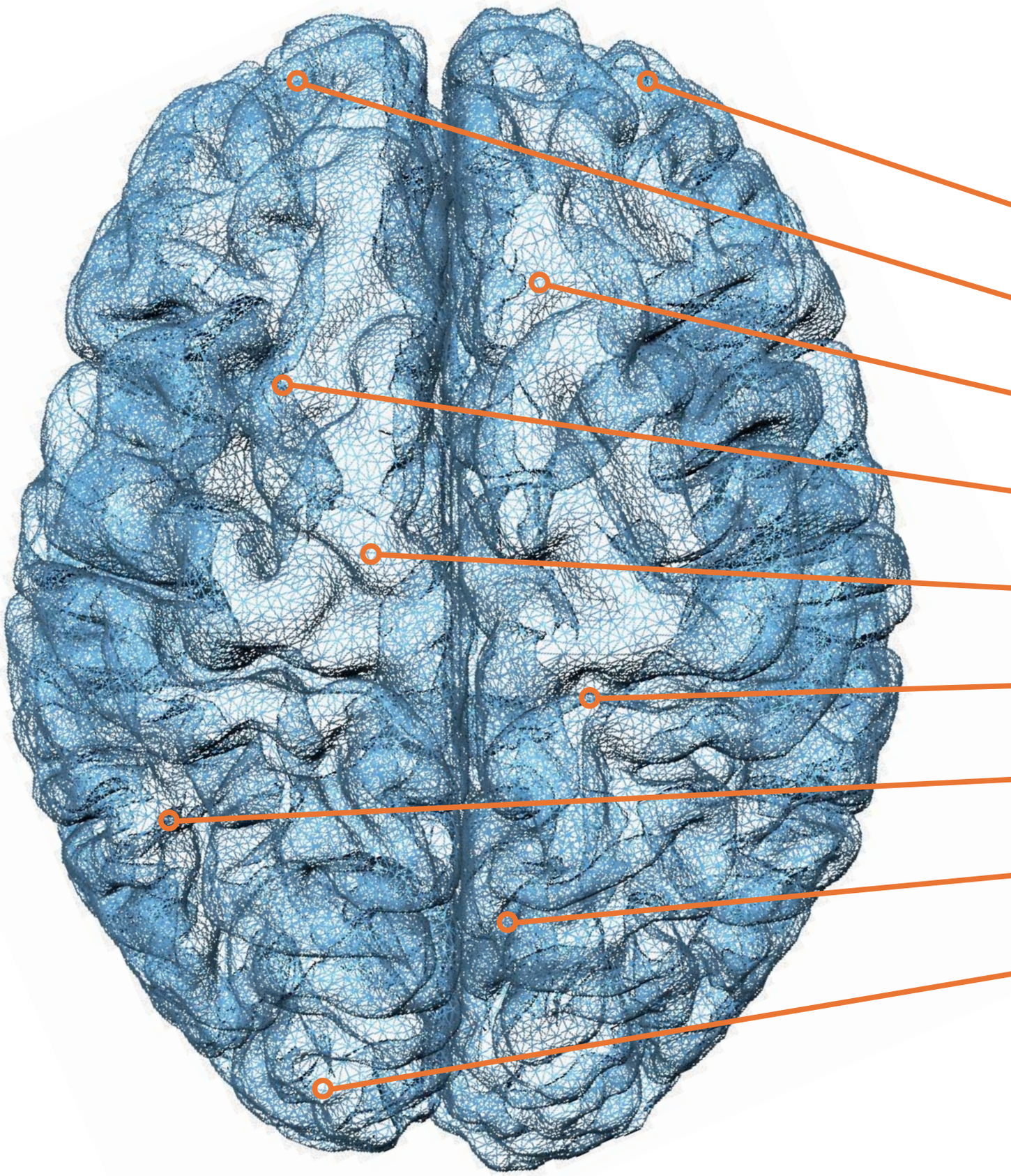
Our focus lies on creating innovative products which fulfil the highest quality standards. We are truly commited to guarantee the satisfaction of our costumers with the quality, functionality and technology of our products and hence we provide our customers with service packages that offer the right solution for their individual requirements.

Behind these innovative products, highly experienced and motivated people are working with a great team spirit to fulfill the needs of our international customers. Our offices and the manufacturing site are located in Bavaria, Germany. It is here that we continually develop modern concepts for stimulation devices, coils and other technologies that meet the newest demand in neurological research.

## *Products „Made in Germany"*

MAG & more

# Content



# CONTENT


## PowerMAG research 100

The PowerMAG research 100 was specially developed for the high-end research user. Powerful high-frequency TMS (including **Theta Burst Stimulation**) as well as highly precise single pulse TMS are available in one standalone device.

## PowerMAG research 30

As is the case with all PowerMAG stimulators, our PowerMAG research 30 makes no compromises on the **maximal intensity** (100% output) in the frequency range of up to 30 Hz

## PowerMAG research ppTMS

The PowerMAG ppTMS is a stand-alone rTMS device which can emit various **ppTMS protocols and therapeutic rTMS protocols within one machine** by actively recharging between conditioning (S1) and test pulses (S2).

## PowerMAG research MR

A TMS stimulator built by implementing innovative hardware solutions which allow the stimulator to be used in an **MR environment**.

## PowerMAG multifocal

Our pre-configured PowerMAG multifocal system solution allows the user to investigate the **interhemispheric connectivity**.

## PowerMAG research navigated

The combination of high-performance stimulator, state-of-the-art coils and various advanced equipment like **3D-TMS-neuronavigation** systems enables a versatile usage of PowerMAG research systems.

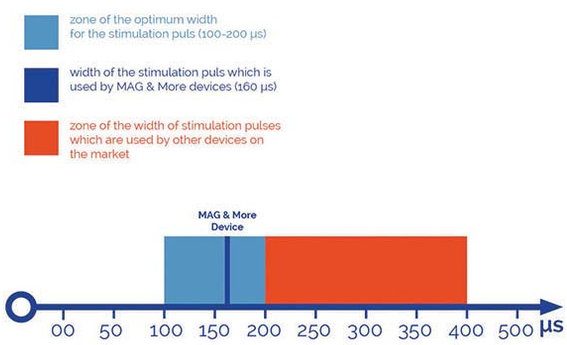

| | PowerMAG Research 30 | PowerMAG Research 100 | PowerMAG Research ppTMS | PowerMAG Research MR | PowerMAG multifocal | PowerMAG Research navigated |
|---|---|---|---|---|---|---|
| Diagnosic Pulse | X | X | X | X | X | X |
| Repetitive Stimulation | X | X | X | X | X | X |
| Train Protocols | X | X | X | X | X | X |
| Ramp Stimulation | X | X | X | X | X | X |
| Theta Burst Stimulation | | X | X | X | X | X |
| ppTMS Stimulation | | | X | | | |
| Front Panel Mode | X | X | X | X | X | X |
| Software Mode | X | X | X/O | X | X | X |
| Matlab/Presentation / E-Lab/... /Mode | X | X | X | X | X | X |
| Online EEG | X | X | X | X | X | X |
| Additional electromagnetic shielding | X | X | X | X | X | X |
| Half Wave | X | X | | | X | X |
| Full Wave | X | X | X | X | X | X |
| Positive Polarity | X | X | X | X | X | X |
| Negative Polarity | X | X | X | X | X | X |
| max. Frequency | 30Hz | 100Hz | 100Hz | 100Hz | 100Hz | 100Hz |
| max. TBS Intensity | n.a. | 70% | 70% | 70% | 70% | 70% |
| | | | | | | |
| | | | | | | |
| **Extendable with** | | | | | | |
| EEG | Online | Online | Online | Online | Online | Online |
| IR-Neuronavigations-system | X | X | X | X | X | X |
| MEP-Option | X | X | X | X | X | X |
| Multisite TMS | X | X | X | X | X | X |

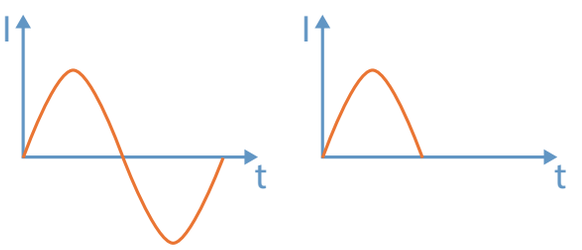

## The PowerMAG research series

The PowerMAG Research series is designed for the specific needs of your TMS research. Its novel interfacing technology creates a whole new experience in combining TMS with other methods, such as EEG, EMG and MRI. The revolutionary hardware solutions implemented in the PowerMAG Research eliminates almost every induced noise and artifact. TMS's major contribution to neuroscience research is the fact that it can demonstrate causality and induces inhibition or facilitation. Moreover, the excellent temporal resolution of TMS can be investigated by using EEG recording and its spatial resolution can be shown by using MRI.

## General Features of PowerMAG research series

- Full power output (100% intensity) up to 30Hz will all stimulators
- No decreasing of pulse power during stimulation
- Full external controllability with analogue, digital and trigger interface
- Free setting of every single pulse (shape, orientation, intensity)
- High speed sync out interface for phase synchronization with EEG amplifiers (not available in US)
- Continuous EEGs to be recorded without any power line noise or recharging artifacts
- Prepared for use with PowerMAG View! 3D Neuronavigation System
- Usable with all MAG & More coils


## Power Dosage

The precision regulation of the PowerMAG power electronics permits the reproducible and exact dosage of pulses with 0.5% accuracy.

## Pulse Width

The optimum duration of the stimulus is between 100 and 160 µs (due to the depolarisation of myelinated axons according to Lapicque's law of stimulus).
PowerMAG stimulators are optimized in terms of pulse duration. For example, the pulse length of the half-wave is only 80µs, and that of the full wave is only 160µs.
The short pulse length permits nerve stimulion using 20-40% less energy.

## Pulse Form

A decisive factor is to optimize the current/time characteristic of the magnetic pulse. During monophasic pulses, all the stored energy is released during the stimulation pulse. The biphasic pulses work with energy restoration: about 80% of the pulse energy is returned to the energy source

## Pulse Height

All pulses are always applied with the set intensity (no decrease of intensity during stimulation), no matter if single pulses are applied or pulse trains.

# PowerMAG Research 100

## Your Ultimate TMS research Tool

The PowerMAG 100 research was specially developed for the high-end research user. Powerful high-frequency TMS (including Theta Burst Stimulation) as well as high-precise single pulse and paired pulse protocols are available in one standalone device. Furthermore, all technical features of the PowerMAG 30 research are included.

## Features

- no decrease of pulse intensity during stimulation
- 100% Intensity up to 30 Hz
- 80% Intensity from 30Hz to 50Hz
- 70% Intensity from 50Hz to 100Hz
- Theta-Burst-Stimulation
- High-speed sync out interface for online TMS & EEG (not available in the US)
- Full external controllability
- Half wave and full wave available
- Current coil direction invertible on the equipment

| Technical specifications | PowerMAG Research 100 |
|---|---|
| Maximal frequency | 100 Hz |
| Minimal frequency | 0.1 Hz |
| Frequency controllability gradation | 0.1 Hz |
| Maximal frequency at 100% intensity | 30 Hz |
| Maximal Intensity | 100 % (30 Hz), 80% (50 Hz), 70% (100 Hz) |
| | |
| **Stimulation parameters** | |
| Magnetic induction | up to 4 tesla (depending on coil) |
| Maximum pulse power | 160 Joule |
| Pulse shapes | Half & full sine-wave |
| Current direction in the coil | Invertible on the equipment |
| Rise time of the stimulation pulse | 40µs/80 µs |
| Pulse duration | 160 µs |
| | |
| **Input/Output interface** | |
| Trigger input | BNC-connector (TTL pulse, active high) |
| Trigger output | BNC-connector (TTL pulse, active high) |
| External interface | 8 pole DIN connector<br>(Single pulse, repetitive mode, TBS, ramp, custom stimulation protocols possible) |
| Synchronisation | BNC-connector<br>(This feature is not available in the US because of a possible patent infringement) |
| | |
| **"Made in Germany" quality** | |
| Number of discharges at 100% intensity | 2.000.000 |
| Electrical safety | Protection class 1, Type BF |
| Hardware classification to MDD 93/42/EEC | class IIa |
| Hardware certification | CE 0494 |
| | |
| **Operating Parameters** | |
| Power supply voltage | 220/230 V~, 50 Hz |
| Power consumption | 50 VA in standby mode,<br>800 VA nominal rating, 2000 VA |
| Operating temperature | 0 °C to +40 °C |
| Dimensions | 490 x 260 x 600 mm<br>(width, height, depth) |
| Weight | 38 kg |

## Push the Boundaries of your TMS Research

The PowerMAG 30 research is a TMS stimulator built using innovative hardware solutions which allow continuous EEGs to be recorded without any power line noise or recharging artifacts. Like every PowerMAG stimulator, PowerMAG 30 research makes no compromises on the maximal intensity (100% output) in the frequency range of up to 30 Hz.

## Features

- no decrease of pulse intensity during stimulation
- 100% Intensity up to 30 Hz
- High-speed sync out interface for online TMS & EEG (not available in the US)
- Full external controllability
- Half wave and full wave available
- Current direction in the coil invertible by button

| Technical specifications | PowerMAG Research 30 |
|---|---|
| Maximal frequency | 30 Hz |
| Minimal frequency | 0.1 Hz |
| Frequency controllability gradation | 0.1 Hz |
| Maximal frequency at 100% intensity | 30 Hz |
| Maximal Intensity | 100 % (full frequency range) |
| | |
| **Stimulation parameters** | |
| Magnetic induction | up to 4 tesla (depending on coil) |
| Maximum pulse power | 160 Joule |
| Pulse shapes | Half & full sine-wave |
| Current direction in the coil | Invertible on the equipment |
| Rise time of the stimulation pulse | 40 µs/80 µs |
| Pulse duration | 160 µs |
| | |
| **Input/Output interface** | |
| Trigger input | BNC-connector (TTL pulse, active high) |
| Trigger output | BNC-connector (TTL pulse, active high) |
| External interface | 8 pole DIN connector<br>(Single pulse, repetitive mode, TBS, ramp, custom stimulation protocols possible) |
| Synchronisation | BNC-connector<br>(This feature is not available in the US because of a possible patent infringement) |
| | |
| **"Made in Germany" quality** | |
| Number of discharges at 100% intensity | 2.000.000 |
| Electrical safety | Protection class 1, Type BF |
| Hardware classification to MDD 93/42/EEC | class IIa |
| Hardware certification | CE 0494 |
| | |
| **Operating Parameters** | |
| Power supply voltage | 220/230 V~, 50 Hz |
| Power consumption | 50 VA in standby mode,<br>800 VA nominal rating, 2000 VA |
| Operating temperature | 0 °C to +40 °C |
| Dimensions | 490 x 260 x 600 mm<br>(width, height, depth) |
| Weight | 38 kg |

## Paired Pulse with PowerMAG ppTMS
## All-in-One-Solution

In general ppTMS protocols usually require two stimulators connected to one coil. The PowerMAG ppTMS is a stand-alone rTMS device which can emit **various ppTMS protocols and therapeutic rTMS protocols** within one machine by actively recharging between conditioning (S1) and test pulse (S2).

## Features

- no second device or „option" needed thanks to MAG & More´s ppTMS technology
- Powerful rTMS and ppTMS with biphasic pulses in one device
- Pulse pairs (ISI as low as 1 ms) at high intensities (sub-/suprathreshold)
- Adjustable pulse pairs in 0,1 ms steps (ISI)
- Adjustable intensity of conditioning (S1) and test pulse (S2)
- no decrease of pulse intensity during stimulation
- 100% Intensity up to 30 Hz
- 80% Intensity from 30Hz to 50Hz
- 70% Intensity from 50Hz to 100Hz
- Theta-Burst-Stimulation
- High-speed sync out interface for online TMS & EEG (not available in the US)
- Current direction in the coil invertible by button

| Technical specifications | PowerMAG Research ppTMS |
|---|---|
| Maximal frequency | 100 Hz |
| Minimal frequency | 0,1 Hz |
| Minimal ISI | 1 ms |
| ISI minimal change value | 0.1 ms |
| Frequency minnimal change value | 0.1 Hz |
| Maximal frequency at 100% intensity | 30 Hz |
| Maximal Intensity | 100 % (30 Hz), 80% (50 Hz), 70% (100 Hz) |
| | |
| **Stimulation parameters** | |
| Magnetic induction | up to 4 tesla (depending on coil) |
| Maximum pulse power | 160 Joule |
| Pulse shapes | Half & full sine-wave |
| Current direction in the coil | Invertible on the equipment |
| Rise time of the stimulation pulse | 40 µs/80µs |
| Pulse duration | 160 µs |
| | |
| **Input/Output interface** | |
| Trigger input | BNC-connector (TTL pulse, active high) |
| Trigger output | BNC-connector (TTL pulse, active high) |
| External interface | 8 pole DIN connector<br>(Single pulse, repetitive mode, TBS, ramp, custom stimulation protocols possible) |
| Synchronisation | BNC-connector<br>(This feature is not available in the US because of a possible patent infringement) |
| | |
| **"Made in Germany" quality** | |
| Number of discharges at 100% intensity | 2.000.000 |
| Electrical safety | Protection class 1, Type BF |
| Hardware classification to MDD 93/42/EEC | class IIa |
| Hardware certification | CE 0494 |
| | |
| **Operating Parameters** | |
| Power supply voltage | 220/230 V~, 50 Hz |
| Power consumption | 50 VA in standby mode,<br>800 VA nominal rating, 2000 VA |
| Operating temperature | 0 °C to +40 °C |
| Dimensions | 490 x 260 x 600 mm<br>(width, height, depth) |
| Weight | 38 kg |

## STIMULATION IN MR-ENVIRONMENT WITH POWERMAG MR

Using innovative hardware solutions enables this TMS system to be used safely and easily in a MR-environment.

### Features

- advanced safety system for use in MR environment
- Powerful rTMS and ppTMS with bi-phasic pulses in one device
- Pulse pairs (ISI as low as 1 ms) at high intensities (sub-/suprathreshold)
- In 0,1 ms steps adjustable pulse pairs (ISI)
- Adjustable intensity of conditioning (S1) and test pulse (S2)
- no degrease of pulse intensity during stimulation
- 100% Intensity up to 30 Hz
- 80% Intensity from 30Hz to 50Hz
- 70% Intensity from 50Hz to 100Hz
- Theta-Burst-Stimulation
- High-speed sync out interface for online TMS & EEG (not available in the US)
- Current direction in the coil invertible on the equipment

| Technical specifications | PowerMAG Research MR |
|---|---|
| Maximal frequency | 100 Hz |
| Minimal frequency | 0,1 Hz |
| Minimal ISI | 1 ms |
| ISI minimal change value | 0.1 ms |
| Frequency minnimal change value | 0.1 Hz |
| Maximal frequency at 100% intensity | 30 Hz |
| Maximal Intensity | 100 % (30 Hz), 80% (50 Hz), 70% (100 Hz) |
| | |
| **Stimulation parameters** | |
| Magnetic induction | up to 4 tesla (depending on coil) |
| Maximum pulse power | 160 Joule |
| Pulse shapes | Full sine-wave |
| Current direction in the coil | Invertible on the equipment |
| Rise time of the stimulation pulse | 40 µs/80µs |
| Pulse duration | 160 µs |
| | |
| **Input/Output interface** | |
| Trigger input | BNC-connector (TTL pulse, active high) |
| Trigger output | BNC-connector (TTL pulse, active high) |
| External interface | 8 pole DIN connector<br>(Single pulse, repetitive mode, TBS, ramp, custom stimulation protocols possible) |
| Synchronisation | BNC-connector<br>(This feature is not available in the US because of a possible patent infringement) |
| Safety channel | pneumatic |
| | |
| **"Made in Germany" quality** | |
| Number of discharges at 100% intensity | 2.000.000 |
| Electrical safety | Protection class 1, Type BF |
| Hardware certification | CE |
| | |
| **Operating Parameters** | |
| Power supply voltage | 220/230 V~, 50 Hz |
| Power consumption | 50 VA in standby mode,<br>800 VA nominal rating, 2000 VA |
| Operating temperature | 0 °C to +40 °C |
| Dimensions | 490 x 260 x 600 mm<br>(width, height, depth) |
| Weight | 38 kg |

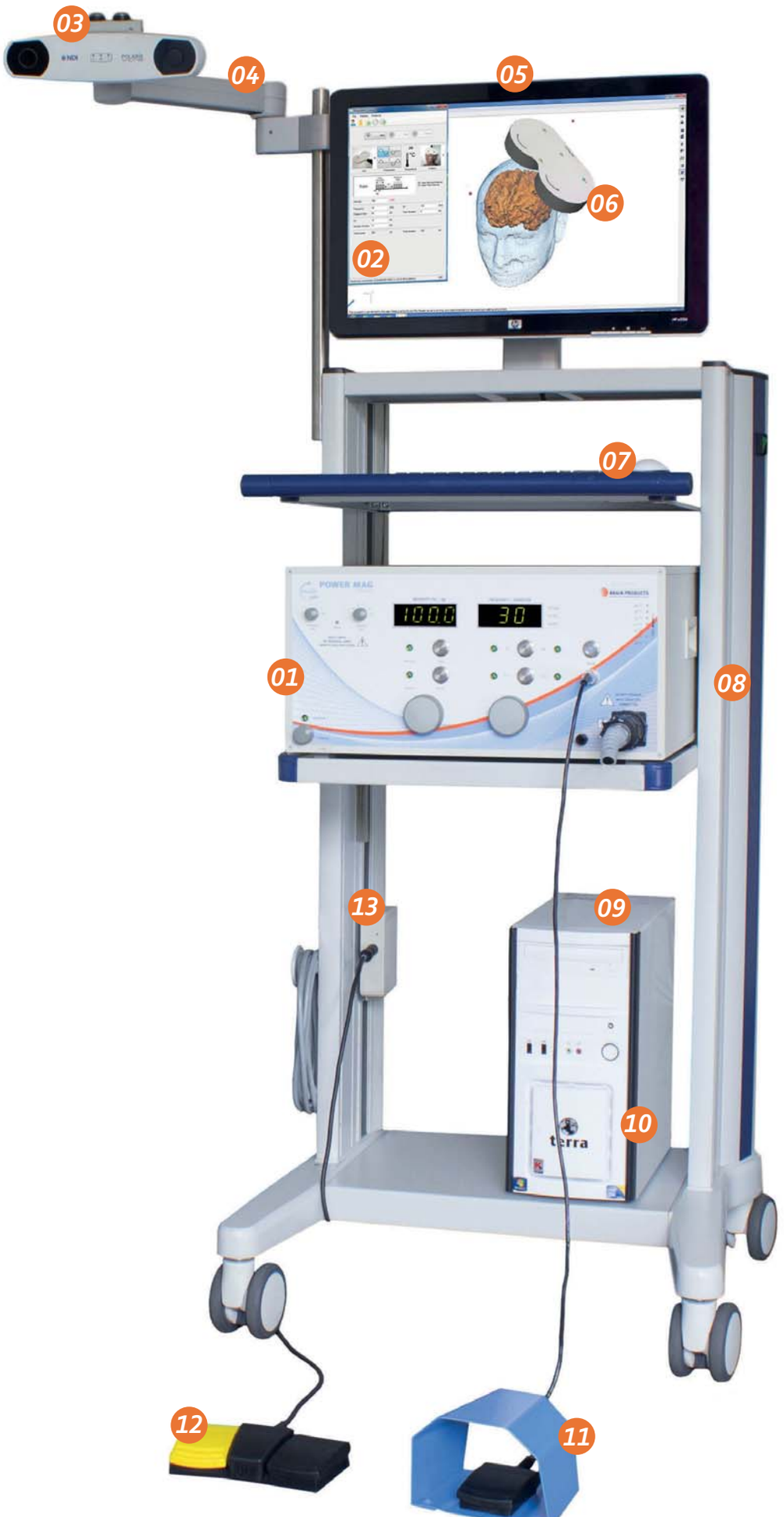
## More than only Interhemispheric Stimulation with PowerMAG multifocal

Investigate the interhemispheric connectivity with our pre-configured PowerMAG multifocal system solution. Optionally available with the PowerMAG View! 3D Neuronavigation System for simultaneous tracking of all 4 coils.For the first time our extremely high focal mini coil, the PMD25-decentral, allows for stimulation of 2 independent stimulation points which can be only 3-4cm apart

## Features

- Up to 4x research stimulators in a package
- All stimulators allow online TMS-EEG application
- PowerMAGppTMS for paired pulse protocols or 100Hz rTMS
- PowerMAG research 100 for Theta Burst Protocols
- PowerMAG research 300 for high power rTMS up to 30Hz
- Up to 4x mini coil PMD25-decentral for cortical stimulation
- Up to 4x double coil PMD70 for cortical stimulation
- External independent control of up to 4 stimulation devices via open programming interface

## *PowerMAG Research navigated*



## PowerMAG research navigated

The combination of high-performance stimulator, state-of-the-art coils and various advanced equipment like 3D-TMS-Neuronavigation systems enables a versatile usage of PowerMAG systems. Additionally, their simple and intuitive design ensure a user-friendly environment while using the stimulators.
Pre-defined for a broad range of applications PowerMAG research navigated solution enables researchers to quickly and effectively start with their studies.

## Highlights

- Mobile stimulation and navigation on a trolley
- PowerMAG 100 research for online TMS-EEG applications
- PowerMAG View! 3D Neuronavigation System with an intuitive wizard making handling navigation related data easy and simple
- Double coil for cortical stimulation
- Cooled double coil verum
- Cooled double coil sham for blind studies
- Round coil for peripheral stimulation
- Mini coil for very focal stimulation
- External independent control of up to 4 stimulation devices via open programming interface

01 POWERMAG RESEARCH 100
02 POWERMAG CONTROL SOFTWARE
03 INFRARED CAMERA
04 FLEXIBLE ARTICULATED ARM
05 MEDICAL MONITOR 22"
06 POWERMAG VIEW! 3D NEURONAVIGATION
07 CONSOLE AND MOUSE
08 TROLLEY
09 MEDICAL PC
10 PC-INTERFACE
11 FOOT SWITCH
12 PEDAL FOR THE NEURONAVIGATION
13 FOOT SWITCH READER

## Online TMS-EEG

An application is called an online TMS-EEG method when EEG potentials are examined while the cortex is being stimulated. This allows for the observation of both short and long-term stimulation effects.
In order to insure that the EEG recordings are not irrevocably disturbed by the stimulations both the TMS and EEG systems require special equipment.
Online TMS-EEG methods can be performed with stimulators of the PowerMAG research series due to their high technical specifications.

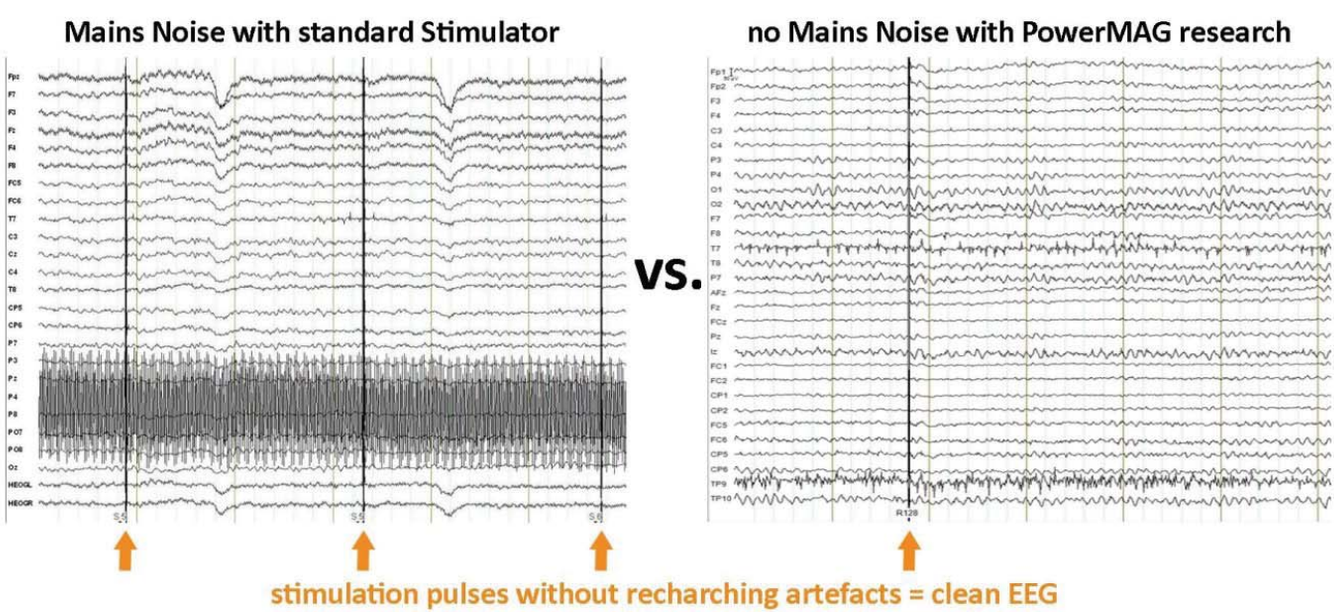
## Main Features of thePowerMAG research Stimulators

**TMS Stimulation Artifact:** Noise free EEG after 5ms allows recording without the loss of clinical information.

**Coil Recharge Artifact:** Coil recharging has no influence on the EEG data.

**Synchronization:** Synchronization of TMS an EEG via a high-frequenzcy interface allows stimulation artifact correction, evaluation of EEG responses and analysis of the average response. (This feature is not available in the US)

**Mains Noise:** No interference of mains noise in the EEG electrodes thanks to a special hardware concept. Hence an EEG distorting notch filter becomes obsolete.



**TMS relevant influences which have been eradicated/minimized by optimizing the following TMS-EEG system concepts:**

**Criteria: Electromagnetic induction of currents in electrodes during stimulation**
Solution: Due to the highly developed coil technologies **extremely focal stimulation** pulses with very **small secondary maxima** can be emitted. Additionally only a very small amount of pulse energy is needed to evoke fast nerve stimulations due to the high pulse efficiency and the short pulse length.

**Criteria: Electromagnetic induction of currents into the electrodes during coil recharging**
Solution: Having optimized the device concept – or the loading concept, to be exact – it is possible to recharge the device directly after pulsing **without disturbing the EEG signal.** This is pivotal towards receiving a clean EEG signal while recording so that in turn misinterpretations can be avoided (as the recharging artefact resembles a physiological response).

**Criteria: Electrical disturbance due to leakage current**
Solution: Extremely high standards in the design and production allow for a significant **reduction of leakage currents**. The quality seal "Made in Germany" as well as longstanding expertise in the development and production of medical products also play an important role.

**Criteria: SEP´s due to coil movement**
Solution: The design and housing concept of MAG & More coils allow for the production of very ergonomic and **light coils**. This strongly influences the formation of artifacts.

**Criteria: AEP´s due to the „coil-click"**
Solution: Modern manufacturing processes allow us to make **very quiet coils** which sport acoustically optimized inner workings.

## Multisite TMS

HIGHLIGHTS:

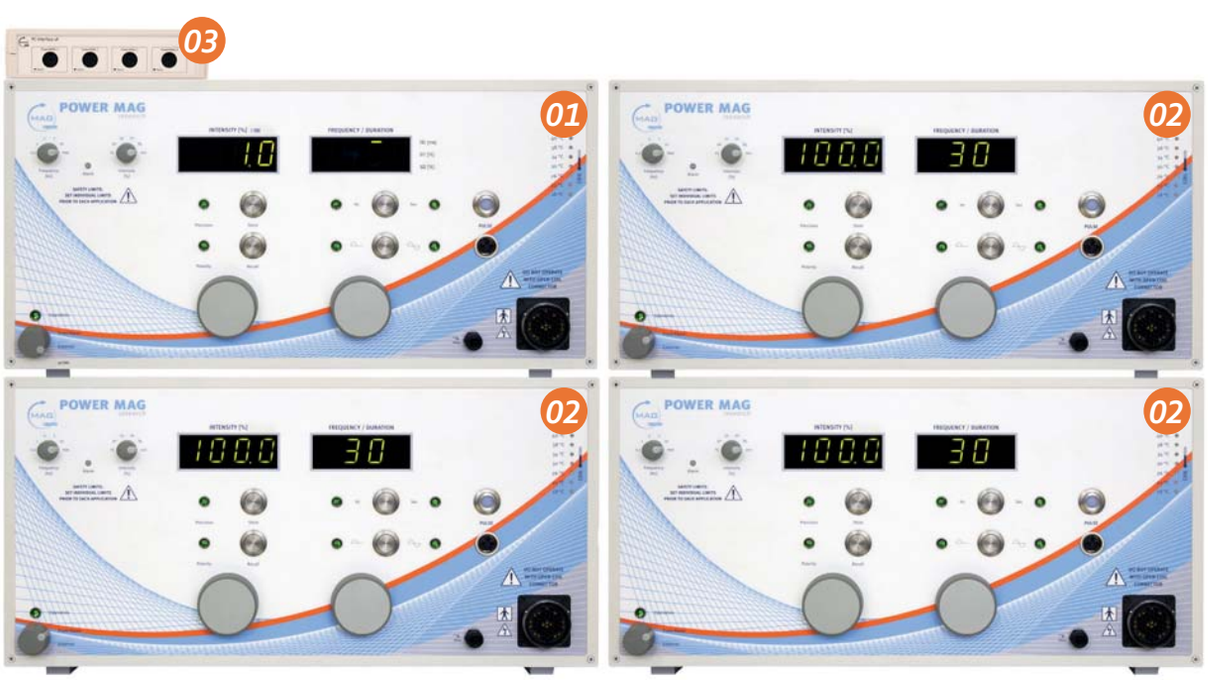
Open programming interface for external independent control of up to 4 stimulation devices
Perfectly tuned TMS system for independent stimulation of:

- Single pulse
- Paired pulse
- rTMS
- Trains
- Theta-Burst-Stimulation

Setup freely configurable:

- PowerMAG research 30
- PowerMAG research 100
- PowerMAG research ppTMS
- all MAG & More coils

Prepared for online TMS-EEG
Prepared for 3D-Neuronavigation




## Multisite TMS

MultisiteTMS describes the use of multiple independently controlled stimulation coils within an examination. Every single coil can be independently controlled with individual settings regarding time, frequency, intensity and interval. Therefore the operator can e.g. stimulate multiple locations with or without time delay between the stimulation pulses. Even suppressing one stimulation side while activating the other stimulation side is possible with multisiteTMS.

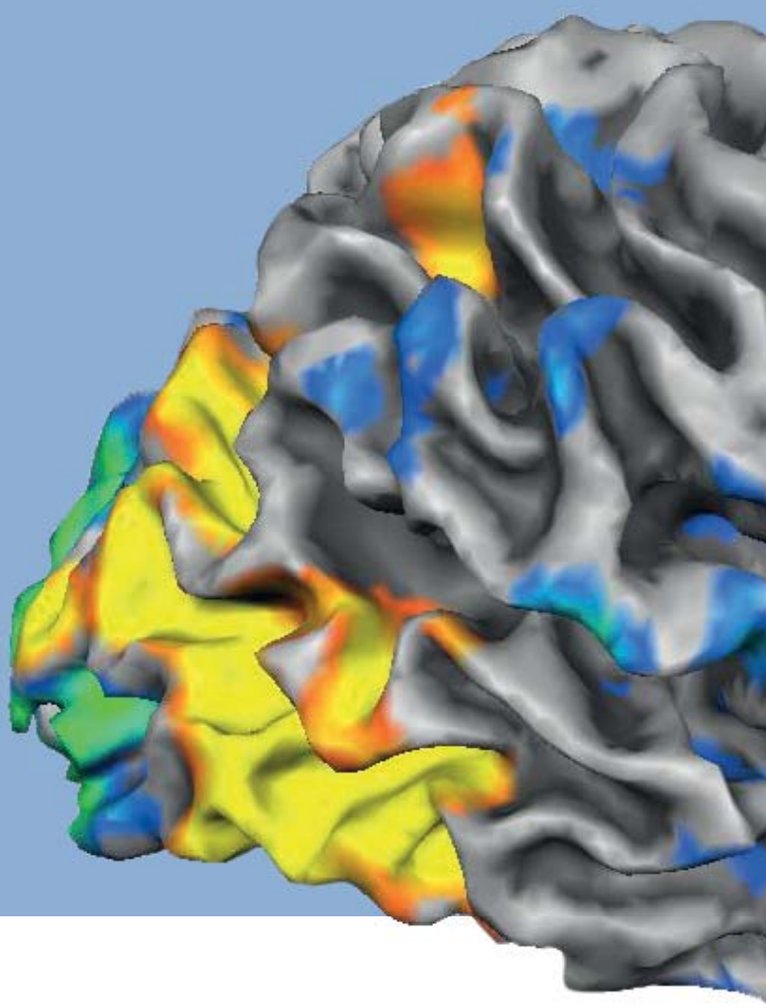
Major factors concerning the coils used in multi channel TMS are their size, the focality as well as having the possibility of getting the focus points close together - e.g. using decentralized coils.

In combination with MAG & More´s 3D-Neuronavigation the stimulation target of every single coil can be controlled absolutely accurately.

Paired with the TMS coil interface, up to four PowerMAG Systems can be controlled simultaneously and independently. Thus, up to four regions of the brain are stimulated within the network.
The corresponding USB device driver provides an open API that can be used for designing complex stimulation programs.

01 *1x POWERMAG ppTMS*
02 *3x POWERMAG RESEARCH 30*
03 *PC-INTERFACE X4*

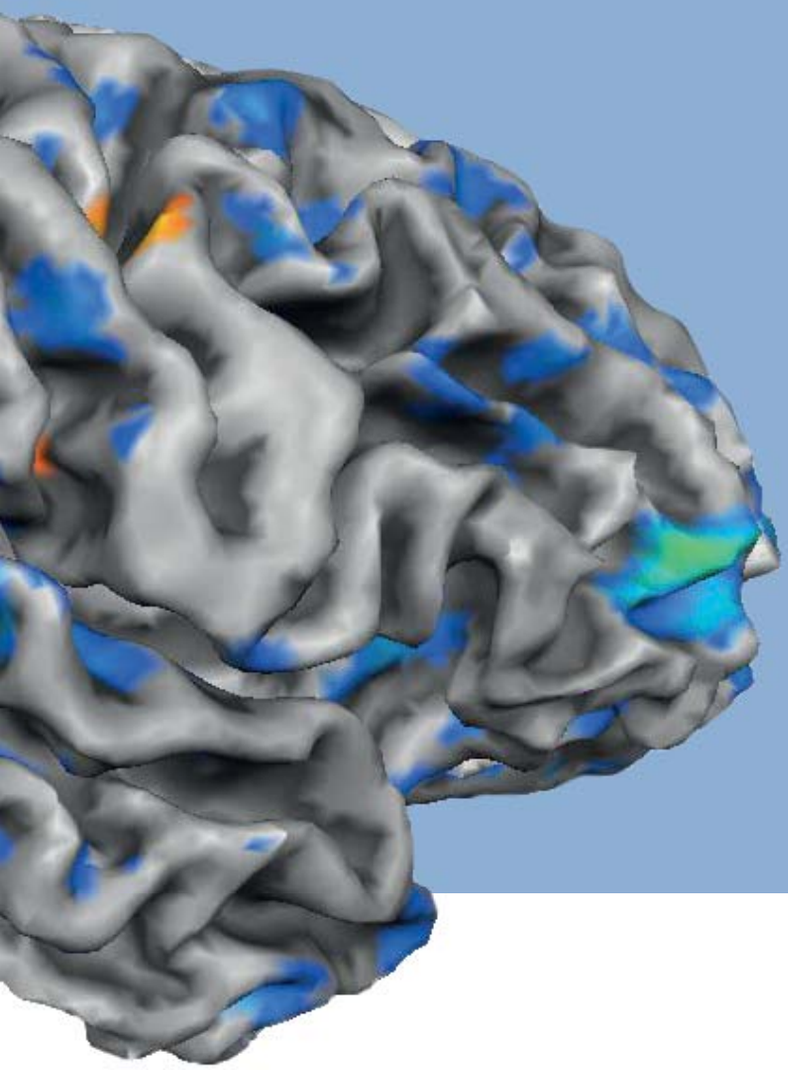
## CONTROLLED ACTIVATION BY TMS



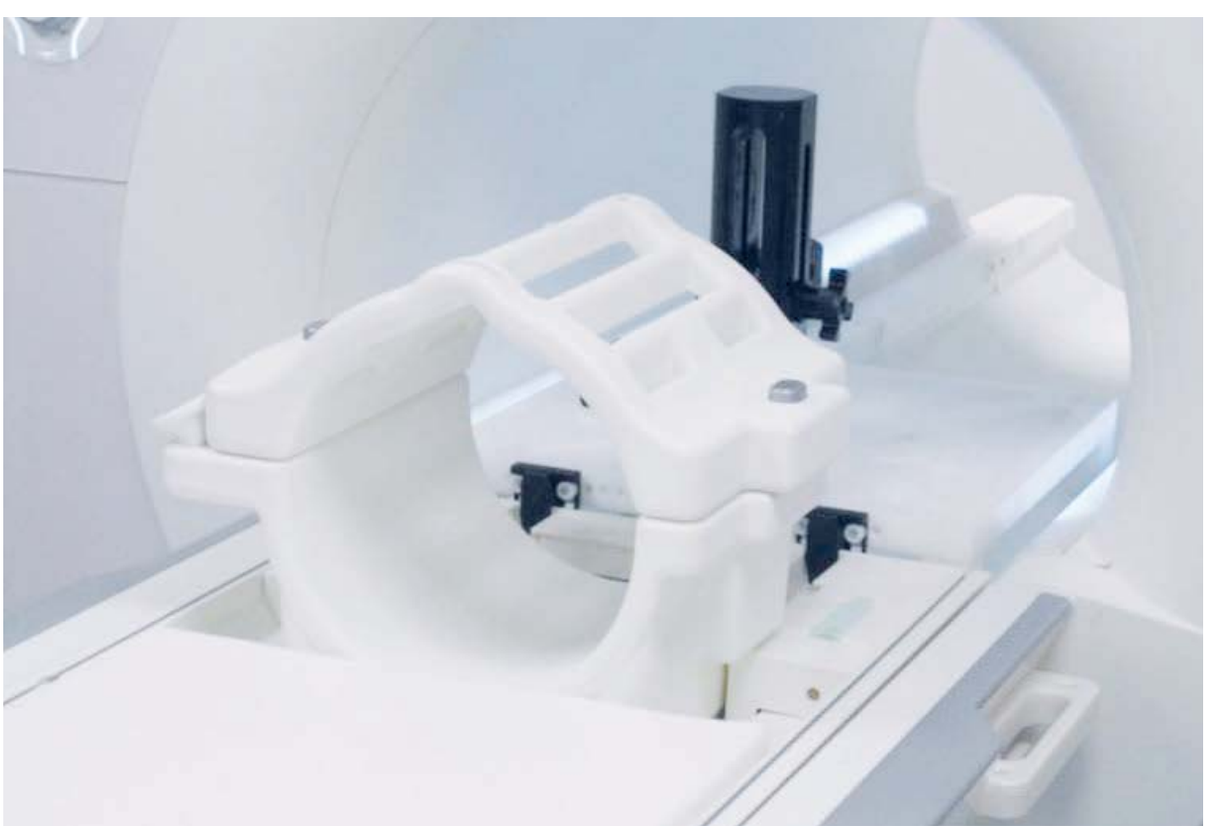
### MR Coil with Holder and Tools

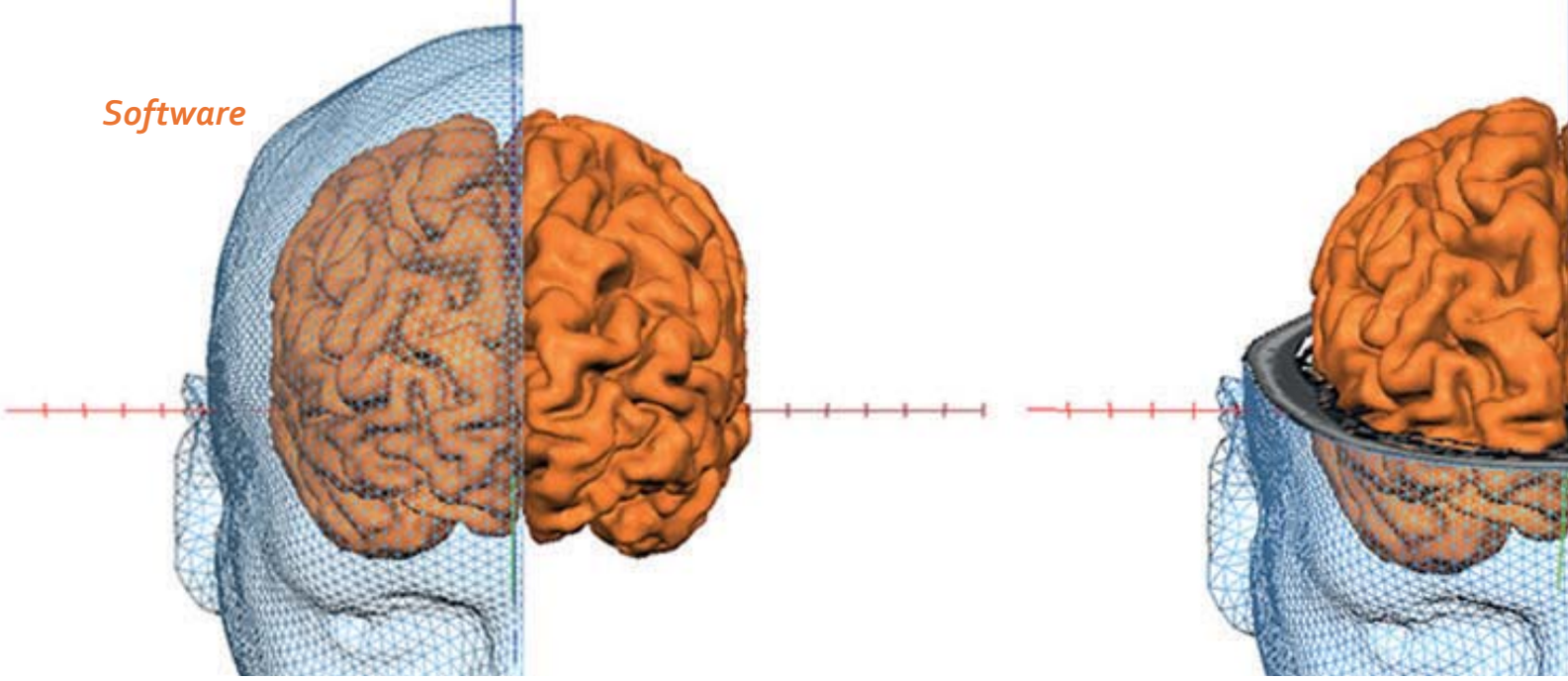
Combining TMS with MRI is technically challenging, as both methods work using very strong magnetic fields. Therefore this combination requires several adjustments in order to make it work. One of the requirement is to eliminate the use of ferrous metals.

MAG & More offers a tailor-made MR coil and coil holder within its tool set.
By removing the ferrous metals used in the normal stimulation coil, this MR-compatible coil minimizes the artifacts in MR images. In addition, the MR coil is also equipped with an RF filter which reduces the RF noise induced by the antenna effect of the coil.
The coil holder and its tool set are made from a robust plastic material, thus enabling this TMS system to be used safely and easily in a MR-environment.



## LOCAL CIRCUIT RESPONSE WITH EEG/fMRI





## PowerMAG Control

PowerMAG Control software facilitates a quick and clear treatment setup.
In addition to ready-made standard protocols for the depression or tinnitus treatment, custom protocols can be set up very easily using the intuitive user interface. Please note that the software is not a medical product.

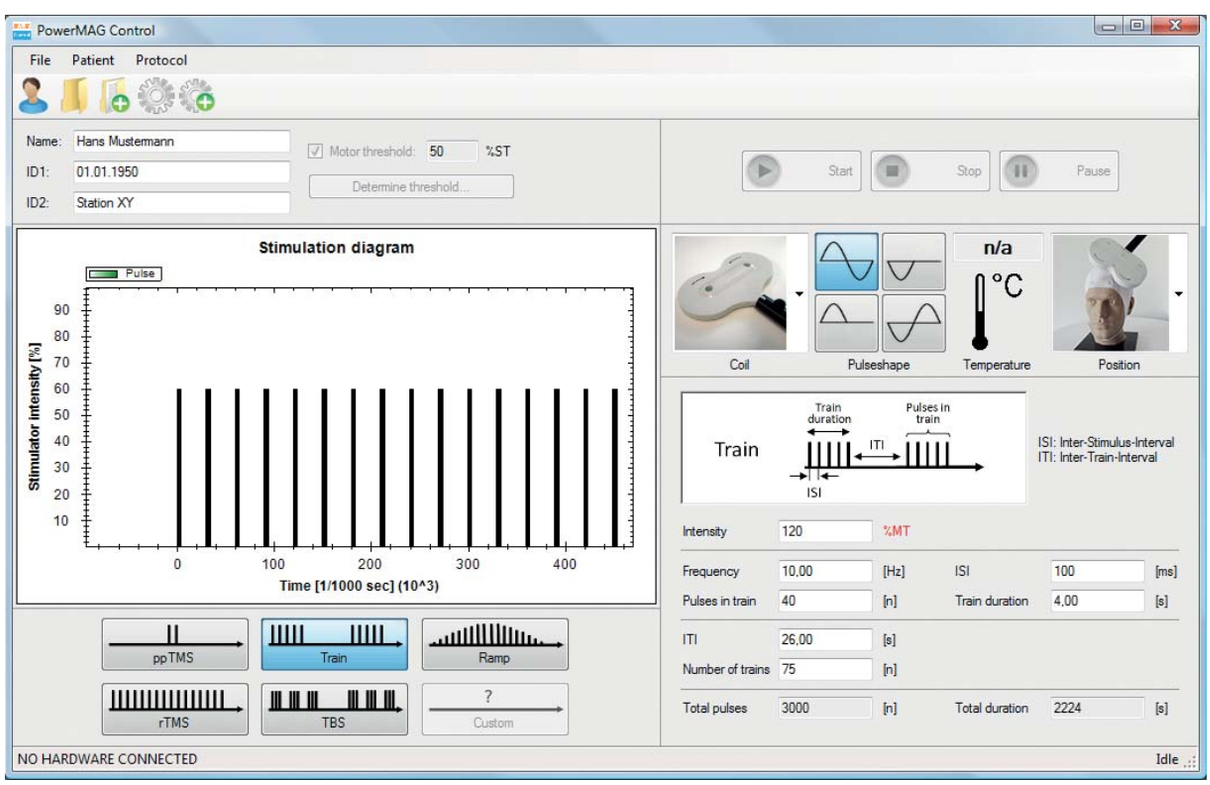
In this software, the following parameters are displayed and can be controlled, among others:

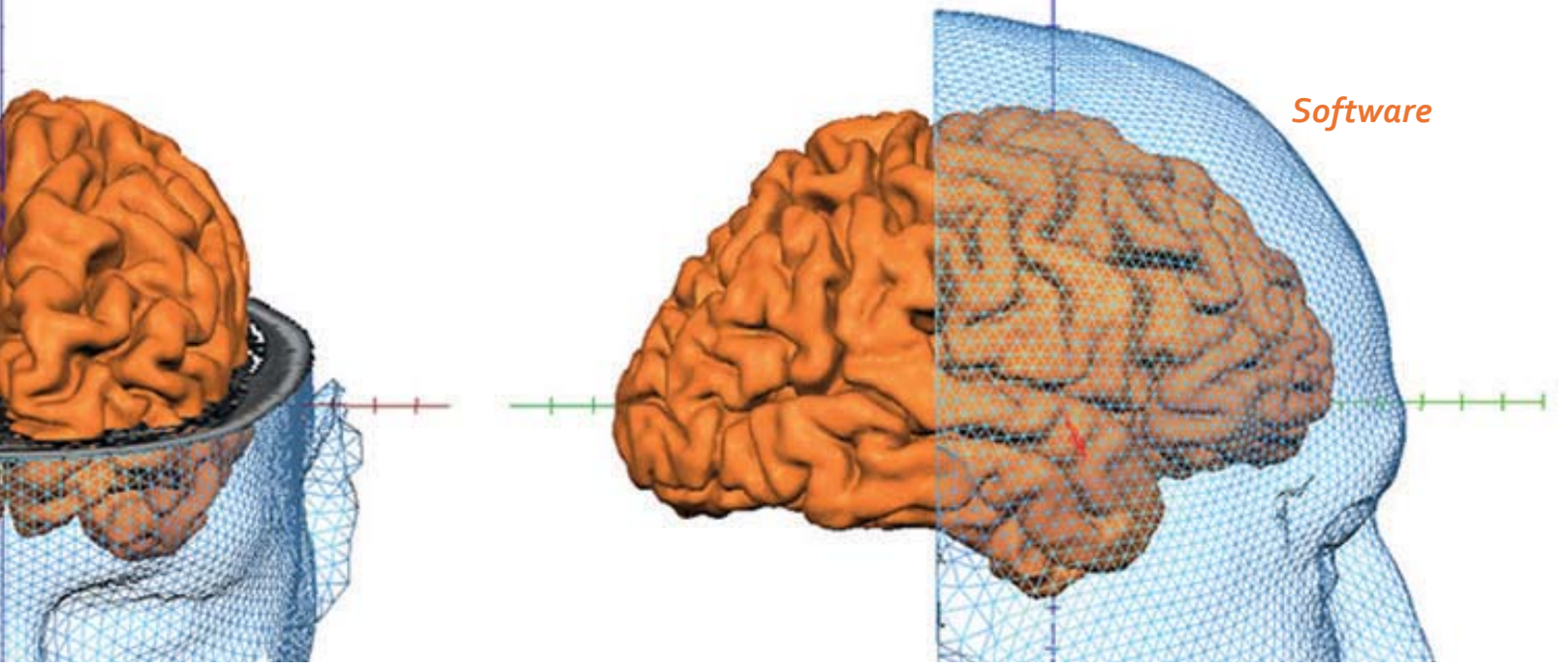
### Display:

- Threshold value
- Treatment progress
- Type of coil
- Coil temperature
- Percentage of the individual motor threshold

### Control:

- Pulse intensity
- Frequency or duration of pulse
- Pulse shape
- Pulse polarity
- Pulse sequenceshold



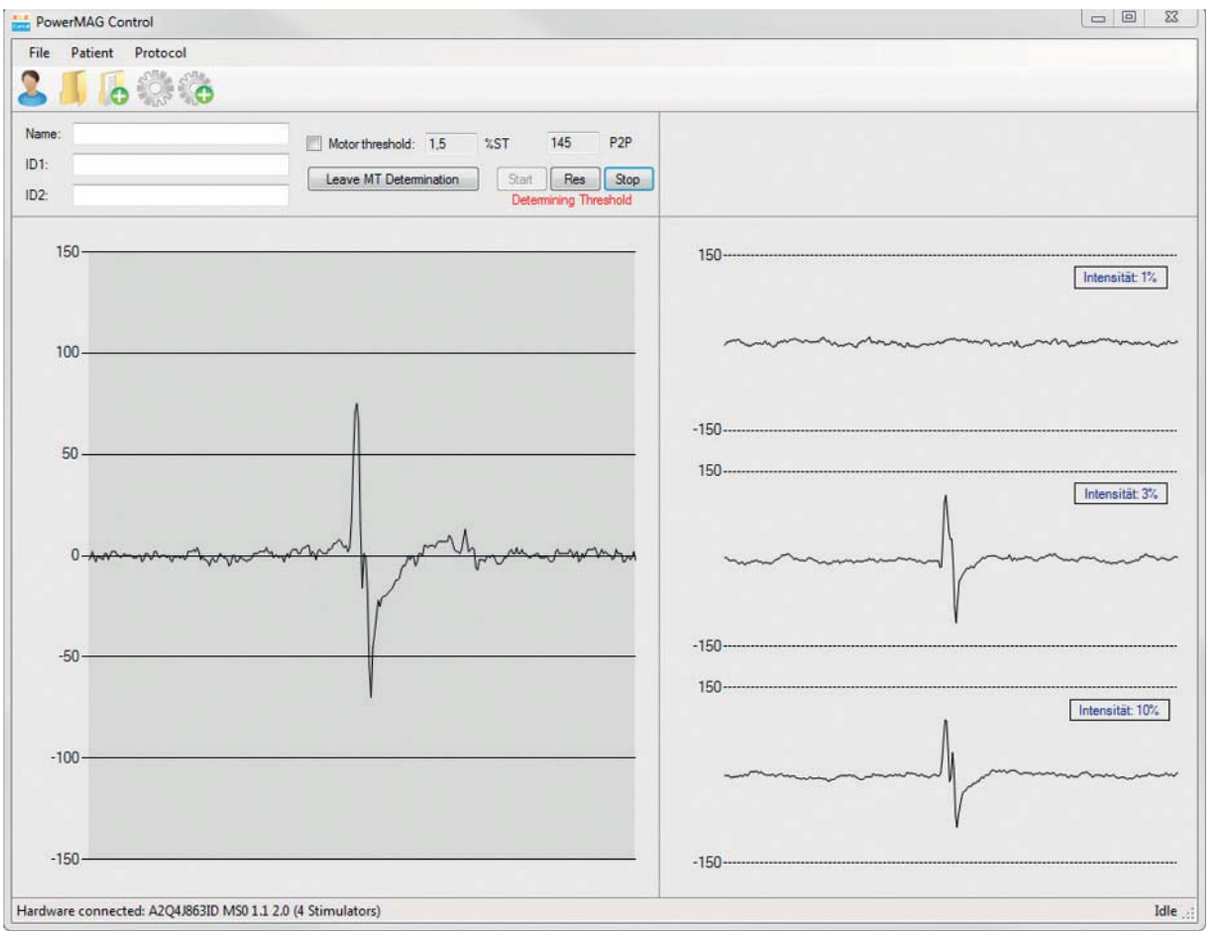


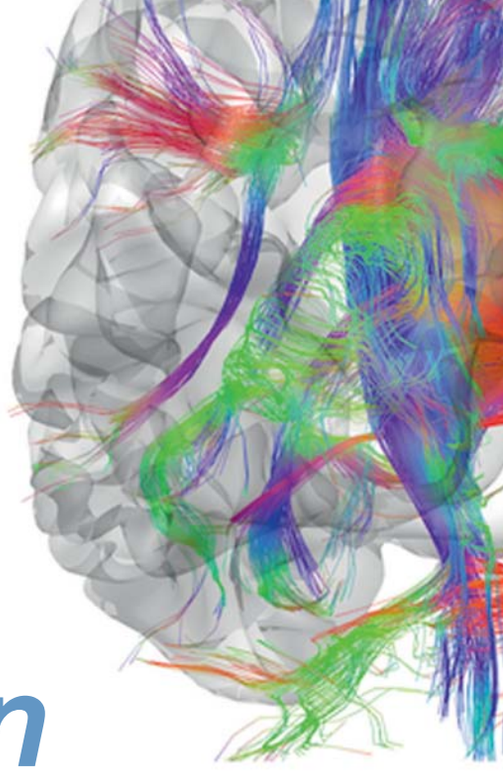
## Automatic motor threshold determination

### Software for wireless MEP option

Fully automated, closed loop solution for motor threshold determination
(no user interaction necessary)
With jittered, safe ISI (>3s, no rTMS)

- Determines motor threshold swiftly and with great precision
- Uses the maximum likelihood strategy (an adaptive PEST method)
- Includes EMG plot of last pulse and waterfall plots of previous three pulses

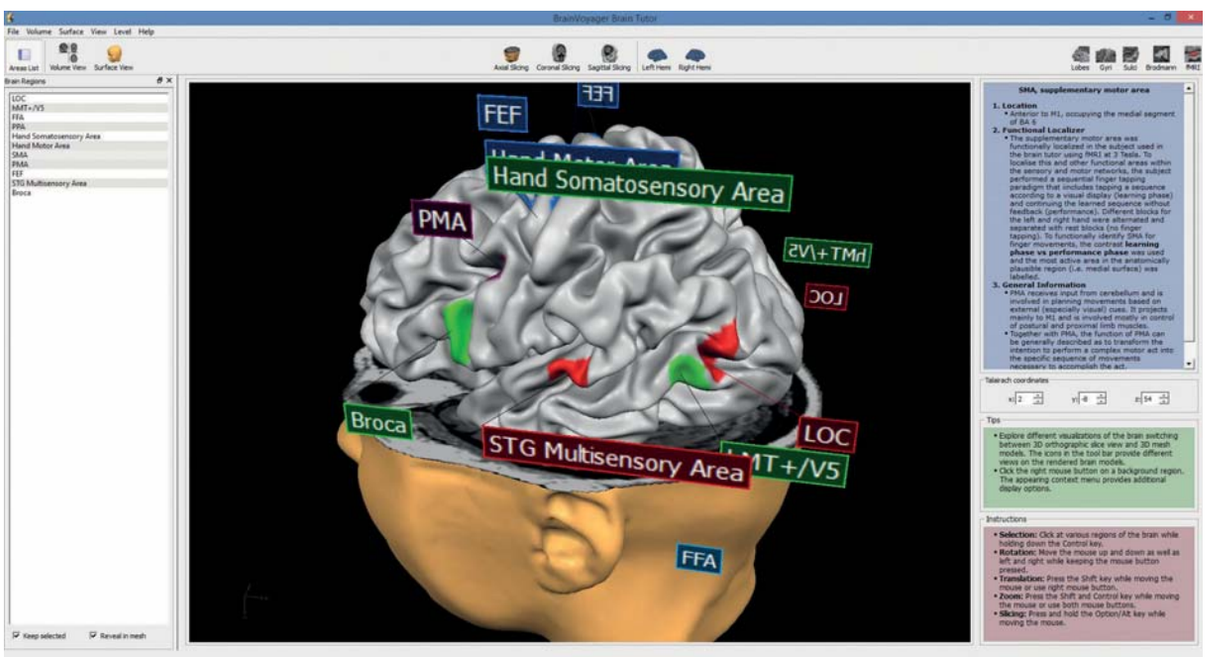


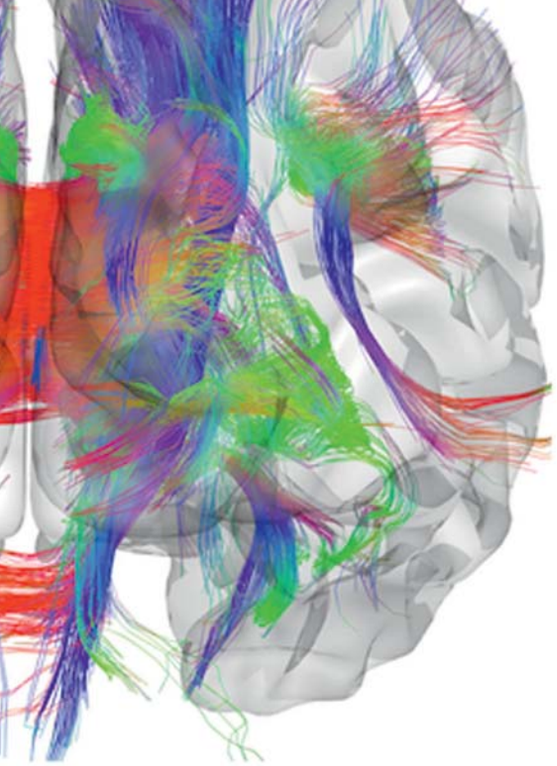


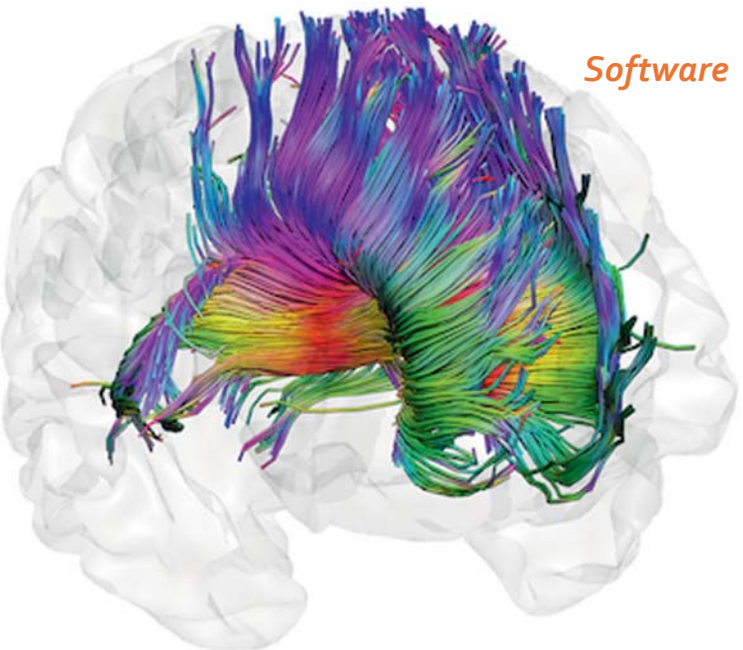
# Brain Innovation meets MAG & More

## Brain Tutor

Brain Tutor is a free award-winning educational program of Brain Innovation B.V. (www.brainvoyager.com)that teaches knowledge about the human brain in an easy way. The program lets you interactively explore high-quality 3D head and brain models, which can be rotated, moved, zoomed and morphed in real-time. The head and brain models have been computed with BrainVoyager QX  using data from magnetic resonance imaging (MRI) scans. Besides having fun with the rotatable 3D models, the program contains information about lobes, gyri, sulci, Brodmann and functional areas of the cerebral cortex. These different brain atlases may be explored simply by clicking a location in the brain or by selecting a region by its name from a list.

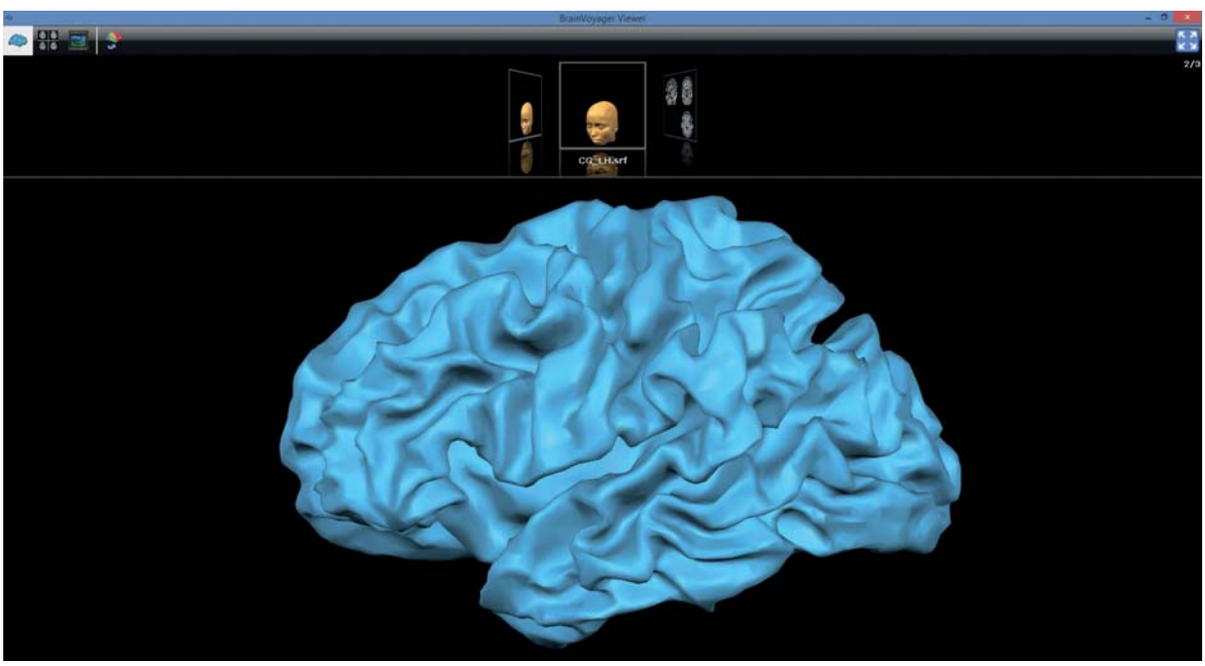






## Brain Viewer

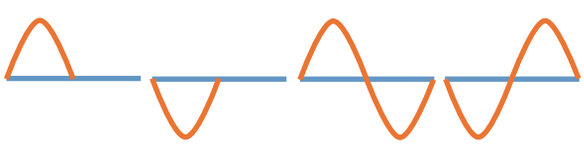
Brain Viewer allows you to browse and inspect essential PowerMAG View! data files.
In addition, the program supports viewing the header and content of DICOM files.
The Viewer also supports standard image files (JPEG, GIF, PNG, TIFF, BMP) allowing to inspection of snapshots, figures or photos. The program offers an elegant user interface with fluid navigation abilities inspired by Apple's "Cover Flow" and the iPhone interface. The program can be downloaded and distributed freely. It was developed with the following scenarios in mind: fMRI subjects. With a minimal effort one can prepare a folder with selected data of a subject (VMRs, SRFs, Maps, snapshot images), which will allow participants of fMRI measurements to browse their brain data and to show it to their family and friends. Sharing data. The Viewer can be used to pass relevant data to colleagues who do not own a PowerMAG View! license. This will allow them to view and explore your analyzed data files. Reviewing previously analyzed data. The Viewer is also useful for BrainInnovation´s BrainVoyager users because it provides a fast and elegant way to reviewing previously analyzed data.



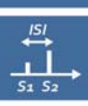
## Protocols

The stimulators in the PowerMAG series supply all necessary equipment for use in diagnosis, therapy or research. Naturally in order to meet any specific requirements a wide variety of stimulation protocols are supported. Our equipment design makes it possible for you to use not only standard protocols but also to define your own.

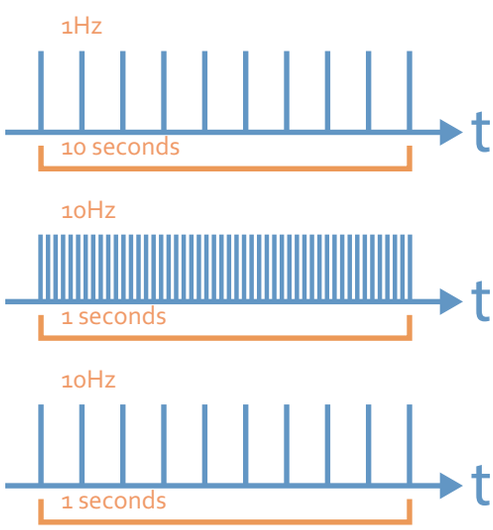
## Single Pulse



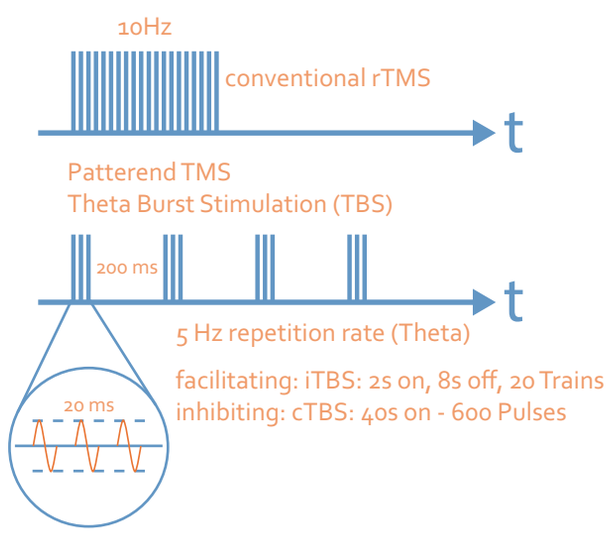
## ppTMS

| Protocol | ISI [ms] | Intensity S1 | Intensity S2 | |
|---|---|---|---|---|
| ICF | 10-15 | 80% RMT | peak to peak |  |
| LICF | 10-30 | 120-150% RMT | 120-150% RMT |  |
| LICI | 50-200 | 120-150% RMT | 120-150% RMT |  |
| SICF | 1,3(1,1-1,5) | MEP (1mV) | 90% RMT |  |
| SICI | 3(1-5) | ≤90% AMT | MEP (1mV) |  |

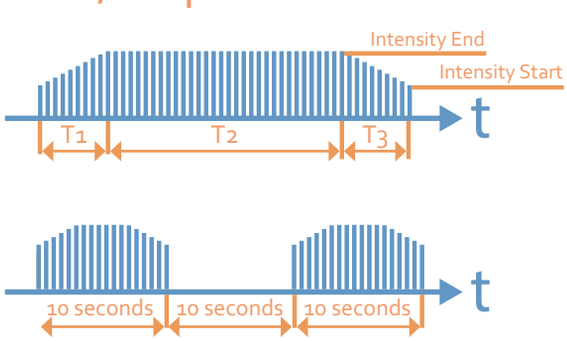
## rTMS-Pulses



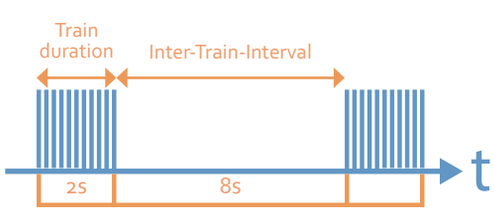

## Theta-Burst-protocols

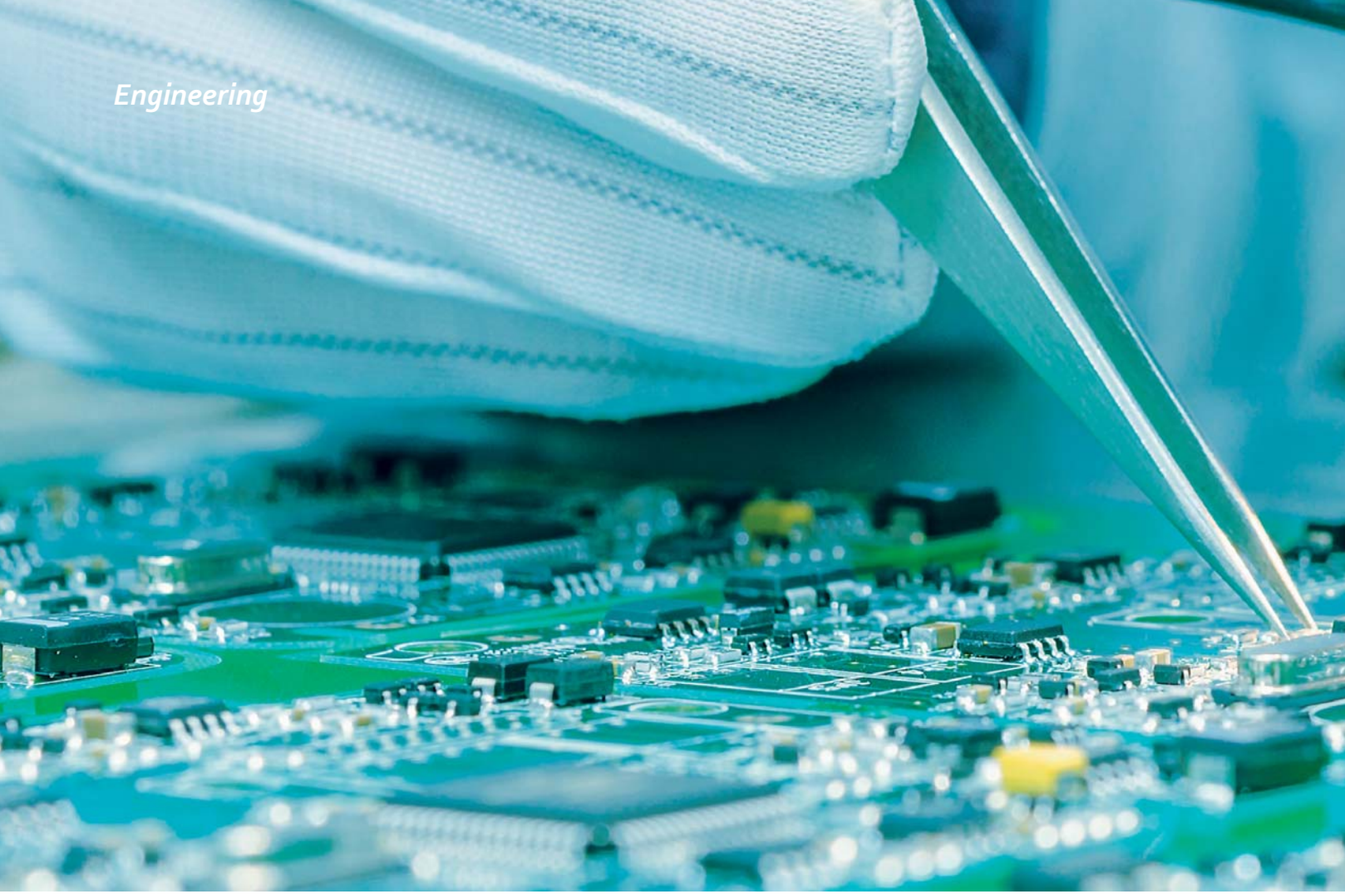



## rPMS/Ramps




## Trains





## Engineering

MAG & More also offers other custom-made stimulation coils for specific customer demands. For every proposed specification, we provide professional design and development, from computer modeling up to optimization. For example, a customized incontinence coil with maximized comfort and computer modeling for optimized stimulation results was developed to be used in clinics.

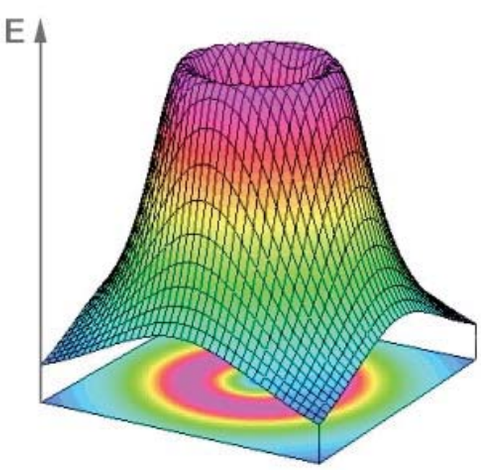
### Engineered Coils and Adapted Stimulators

With a long history in designing and developing high-end solutions, MAG & More is prepared to meet the needs of our customer requirements. Our team has the knowledge and experience to provide advanced solutions for rTMS applications for whatever your goal of stimulation is.

Thanks to our technical background combined with the experience of many years of research activities MAG & More is proud to offer 100% customer focused solutions: from single units to volume production.

By offering customized coil and stimulator solutions MAG & More fills the gap between innovative ideas and sustainable serial solutions.

Incontinence coil




Simulation of the incontinence coil

# Coils

## PMR110: Round coil

This stimulation coil has the largest stimulation area within all coils. It also has a high penetration depth. The coil is perfect for cortical, spinal and peripheral applications.


| Characteristics | |
|---|---|
| pulse length | 170 µs |
| max. field strength | 2,2 T |
| no. of windings | 13 |
| windings diameter | 110 |
| weight | 1,1 kg |
| cable length | 2 m |
| integrated navigation points | 4 (opt.) |
| performance* | 1800 |
| part no. | 510522 |

## PMD70: Double coil

Outstanding precision with a sharp field distribution is the main characteristic of this coil. It is very suitable for the selective stimulation of individual areas as well as cortical and spinal applications.

| Characteristics | |
|---|---|
| pulse length | 160 µs |
| max. field strength | 2,0 T |
| no. of windings | 2 x 10 |
| windings diameter | 2 x 70 |
| weight | 1,3 kg |
| cable length | 2 m |
| integrated navigation points | 4 |
| performance* | 800 |
| part no. | 510519 |

## PMD70-pCool: Cooled double coil

By using an innovative cooling technology, the pCool stimulation coils have an extremely high thermal storage capacity. The coil was specially developed for the high-performance PowerMAG stimulator, enabling it to deliver an increased number of possible stimulation pulses. Therefore it is ideal for depression treatment and other time consuming and high energetic protocols.

## PMD70-pCool-SHAM: Cooled double coil SHAM

The PMD70-pCool-Sham coil is designed to execute blind and double-blind study. This coil emits minimal magnetic field strengths with which only the nearest area (such as scalp) is stimulated, produces the twitching sensation without influencing neural activity. Moreover, the coil generates identical sounds as would active TMS coils and has a similar weight. By inducing the same sensation as other active coils, this sham coil is the ultimate tool for investigating the placebo effect of TMS.

| Characteristics | |
|---|---|
| pulse length | 160 µs |
| max. field strength | 2,0 T |
| no. of windings | 2 x 10 |
| windings diameter | 2 x 70 |
| weight | 1,4 kg |
| cable length | 2 m |
| integrated navigation points | 4 |
| performance* | 4000 |
| part no. (verum) | 510565 |
| part no. (sham) | 510551 |

* number of pulses (20 °C, 75 %, 1HZ)

## Double Coil PMD25-decentral

This coil generates the most focal stimulation with decentralized focus. It is therefore very practical when using the coil for paired coil applications, i.e. where two or more independent stimulation sites with close proximity are to be stimulated simultaneously.

| Characteristics | |
|---|---|
| pulse length | 160 µs |
| max. field strength | 4,0 T |
| no. of windings | 2 x 8 |
| windings diameter | 2 x 25 |
| weight | 1,1 kg |
| cable length | 2 m |
| integrated navigation points | 4 opt. |
| performance* | 100 |
| part no. | 510523 |

## Double Coil PMD45-EEG

This very focal coil is designed in a more compact geometry. The coil is an excellent choice for combining TMS with EEG simultaneously, for example in sleep research.

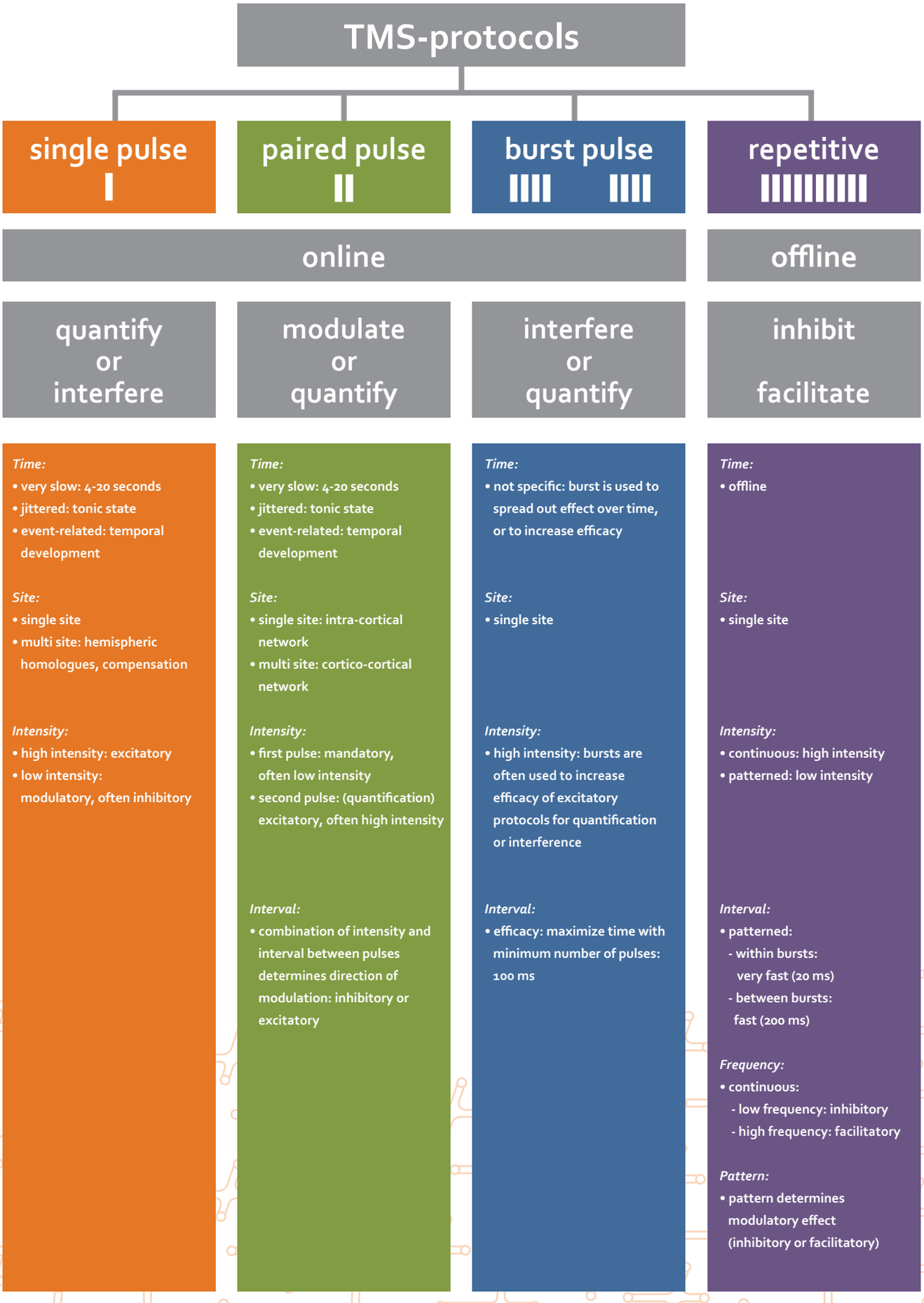
| Characteristics | |
|---|---|
| pulse length | 160 µs |
| max. field strength | 2,5T |
| no. of windings | 2 x 12 |
| windings diameter | 2 x 45 |
| weight | 1,1 kg |
| cable length | 2 m |
| integrated navigation points | 4 opt. |
| performance* | 370 |
| part no. | 510533 |

## Double Coil PMD70-View!

Exclusively designed for PowerMAG View! neuronavigation system, four navigation points in different locations are engraved in the coil housing. This enables the coils spatial adjustment to easily be performed.

| Characteristics | |
|---|---|
| pulse length | 160 µs |
| max. field strength | 2,0 T |
| no. of windings | 2 x 10 |
| windings diameter | 2 x 70 |
| weight | 1,3 kg |
| cable length | 2 m |
| integrated navigation points | 4 |
| performance* | 800 |
| part no. | 510520 |

|  PMD45-EEG |  PMD70-View! |  PMD25-decentral |  PMD70-pCool |  PMD70 |  PMR110 | coil name |
|---|---|---|---|---|---|---|
| double coil | double coil | double coil | double coil | double coil | round coil | coil type |
| 160 µs | 160 µs | 160 µs | 160 µs | 160 µs | 170 µs | pulse length |
| 2,5 T | 2,0 T | 4,0 T | 2,0 T | 2,0 T | 2,2 T | max. field strength |
| 2 x 12 | 2 x 10 | 2 x 8 | 2 x 10 | 2 x 10 | 13 | no. of windings |
| 2 x 45 mm | 2 x 70 mm | 2x 25 mm | 2 x 70 mm | 2 x 70 mm | 110 mm | windings diameter |
| 1,1 kg | 1,3 kg | 1,1 kg | 1,4 kg | 1,3 kg | 1,1 kg | weight |
| 4 opt. | 4 | 4 opt. | 4 opt. | 4 opt. | 4 opt. | integrated navigation points |
| 370 | 800 | 100 | 4000 | 800 | 1800 | performance |
| 510533 | 510520 | 510523 | 510565 | 510519 | 510522. | part no. |




* The diagram of approaches and TMS protocols are courtesy of Til Ole Bergmann and Lennart Verhagen, 2013

## Service

The satisfaction and support of our customers is of great importance to us. Our support will ensure that you can make the best use of your MAG & More products over its entire lifespan. We guarantee that we can be on-site quickly should you need us.

Because we stand for the quality of our products, a 24 month warranty is standard with, for example, our rTMS stimulators.
MAG & More's various service packages are designed to provide our customers with the right solution for their specific requirements. The conclusion of a maintenance contract provides you with the assurance that any legal requirements will always be fulfilled.
Based on the type of maintenance contract, your medical product's durability and value is also maintained. Down times are reduced and economic performance improved. Premium customers are also provided a 72h replacement service incl. a replacement device at no charge. When you buy a MAG & More PowerMAG device, you benefit from the many attractive services of MAG & More and its partners.

Please contact us if you have questions about the services MAG & More GmbH can provide you: info@magandmore.com

## Technical Support

The device installation and introduction is carried out by trained specialists and should ensures the proper handover and smooth operation of the device. In addition to technical installation and commissioning, the introduction also covers the following: Safety instructions and warnings, contraindications, side-affects, device functions, practical demonstrations and technical data.

## User training

We offer customised training programmes for our customers, in order for them to be able to get the best from our products and to design the everyday investigation and therapy as simply and efficiently as possible. In order to minimise your costs as far as possible, we would also be delighted to carry out the training at your site. The content of the training stretches from the stimulation process, positioning strategies through to the acceptance of the safety-related checking.

## Financing

Alongside the classical purchase we are also prepared to offer you attractive options towards leasing or hire-purchasing our devices. Our finance partner will be happy to put together an offer tailored to your requirements. Aside from the liquidity advantage, these options also supply you with planning security and flexibility. Just get in touch with us!

MAG & more

Your specialist for magnetic neurostimulation
and 3D navigation

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