Advanced Neurostimulation

The Magstim range of magnetic stimulation systems provide a variety of high quality solutions for researchers and clinicians working within Neurology, Neuroscience, Psychiatry and Rehabilitation.

Magstim has substantial expertise in magnetic stimulation, and is a leader in the field, offering a wide range of magnetic stimulators and stimulating coils to suit a variety of clinical and research applications.

Non-invasive Neuromodulation

Magnetic stimulation is a non-invasive and painless method of stimulating human tissue using strong, time varying magnetic fields to induce small currents in nerve tissue. These are able to stimulate the human cortex, spinal roots and peripheral nerves.

Depending on the application a variety of output waveforms may be used to excite or inhibit nerve response. These pulses can be either monophasic or biphasic, or a combination of the two.

This brochure is intended for users of TMS equipment outside of the USA.
Monophasic Systems

Monophasic single pulse systems are favoured in neurological applications due to the accuracy of the stimulation and the low heat output.

**Magstim 200² & BiStim² - Monophasic**

Magstim produce two monophasic systems; the Magstim 200² and BiStim², which are used extensively within the fields of neurology and neurophysiology. For accurate single pulse functionality, monophasic waveform systems are favoured for:

- Neurological research
- Cortical mapping and brain research
- Functional assessment of central motor pathways
- Early diagnosis, assessment and monitoring of nervous diseases, such as Multiple Sclerosis and Motor Neurone Disease.

**Single pulse**

Magstim 200² provides users with the ability to elicit cortical evoked potentials, quickly and easily, as a routine component of clinical and research assessment techniques, including:

- Triple Stimulation Technique*
- Resting Motor Threshold
- Active Motor Threshold
- Central Conduction Time
- Motor Evoked Potential
- Input-Output Curve
- Cortical Silent Period
- Motor Mapping

**Magstim 200²** offers complete flexibility and can be interfaced with a wide range of commercially available EMG systems. The monophasic waveform provides a high degree of hemispheric accuracy, low noise and less coil heating than other pulse waveforms. The Magstim 200² is backward compatible with all Magstim stimulating coils, via the coil adaptor.

**Controlled Trains**

Magstim BiStim² offers the potential to combine two Magstim 200² units to provide fully programmable paired pulse stimulation through a single stimulating coil. The ability to change pulse intervals and to independently control the power level of each Magstim 200² allows for precise sub- and supra-threshold conditioning and test pulses. This is invaluable for the investigation of Inter-Cortical and Intra-Cortical Inhibition and Facilitation.

The inter-stimulus interval (ISI) of the two pulses is adjustable using either the integral stimulator controls, remote control coil or externally via triggering software offering complete user flexibility. Two ISI options offer maximum controllability:

- 1ms - 999ms in 1ms resolution
- 1.0ms - 99.9ms in 0.1ms resolution

BiStim² has the added advantages of being able to sum the two single pulses provided by the Magstim 200² stimulators to produce a single high power pulse equal to 113% of a single Magstim 200², as well as having the functionality to connect two individual coils for interhemispheric stimulation.

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Magstim 200²</th>
<th>Magstim BiStim²</th>
<th>Magstim Rapid²</th>
<th>Magstim Rapid² Plus¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum voltage</td>
<td>2.80kV</td>
<td>2.50kV</td>
<td>1.67kV</td>
<td>1.67kV</td>
</tr>
<tr>
<td>Maximum repetition rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(230V configuration)</td>
<td>30% 2.0s</td>
<td>30% 2.0s</td>
<td>Single PSU - 50Hz</td>
<td>100Hz</td>
</tr>
<tr>
<td></td>
<td>50% 3.0s</td>
<td>50% 3.0s</td>
<td>Single PSU - 30Hz</td>
<td>50Hz</td>
</tr>
<tr>
<td></td>
<td>100% 4.0s</td>
<td>100% 4.0s</td>
<td>Single PSU - 15Hz</td>
<td>25Hz</td>
</tr>
<tr>
<td>Minimum Inter Stimulus Interval</td>
<td>N/A</td>
<td>1.0ms</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Minimum Inter Train Interval</td>
<td>N/A</td>
<td>4.0s</td>
<td>0.5s</td>
<td>0.5s</td>
</tr>
</tbody>
</table>

* Also available as 2.80kV
Biphasic Systems

Magstim Rapid² - Biphasic

Magstim Rapid² repetitive Transcranial Magnetic Stimulation (rTMS) devices are highly effective non-invasive biphasic magnetic stimulators designed to meet the exacting needs of those involved at all levels of clinical and academic research. Highly efficient, short duration biphasic pulses makes it very well suited to bilateral cortical stimulation and is used in many different areas of research, including:

- **Cognitive Neuroscience** - in the investigation of learning, memory, speech, hearing, visual, perception and functional connection
- **Psychiatry** - to influence specific brain function within the dorsolateral prefrontal cortex
- **Neurophysiology** - used in the stimulation of the peripheral and central nerve pathways
- **Rehabilitation** - used in the promotion of muscle recovery and the relief of nerve spasticity

The Magstim Rapid² range of repetitive stimulators has been developed to maintain a consistent pulse amplitude/frequency during the delivery of stimulation trains through Single Pulse, Repetitive, Burst and Session modes of operation. Rapid² stimulators offer frequencies of up to 100Hz, with a 0.1Hz frequency resolution for the first 30Hz.

Magstim Rapid² has a unique in built two channel EMG amplifier with integral system acquisition software including latency and amplitude measurements. The dedicated touch screen user interface with internal and external memory makes storage and retrieval of results straightforward. Connecting the optional thermal printer allows for the provision of hard copies.

Rapid² can be used with other investigation tools such as fMRI, EMG, EEG, tDCS, tACS and Image-guided TMS over a broad range of protocols and is fully compatible with existing Magstim coils through customised hardware.

Magstim Rapid² Plus¹ is an innovative enhancement to the Rapid² and is the only system able to offer a significantly higher repetition rate at stimulation output of 30% and higher. This is particularly useful in applications using protocols such as Theta Burst⁴, as the Magstim Rapid² Plus¹ is capable of up to 89% output at 50Hz.

With the addition of a Plus¹ module a single PSU Rapid² can be easily upgraded to dual PSU performance, whereas the addition of the Plus¹ module to a dual PSU Rapid² make high powered protocols feasible.
An effective treatment where traditional medication has failed

As the original pioneers of TMS, Magstim are industry recognised as world leaders in diagnostic, research and therapy solutions.

rTMS (Repetitive Transcranial Magnetic Stimulation) is a treatment for patients that have not responded to pharmaceutical solutions - it is estimated that up to 40% of patients do not benefit from, or cannot tolerate, antidepressant medications – even after repeated attempts. A recent study has shown that rTMS has a 58% response rate and 37% remission rate and has shown efficacy as a well-tolerated therapeutic option¹.

Benefits of rTMS

- Treatment with rTMS has a fast onset of action with significant patient improvement²
- Treatment is provided as an outpatient procedure
- Patients can return to normal activities after treatment
- No anaesthesia or sedation required
- 20-30 treatments over 4-6 weeks
- 37.5 minute treatment time

Is rTMS right for you?
rTMS is a treatment that can be used as an adjunct with medication, or as a drug free treatment. This therapy avoids the side effects associated with antidepressant medication.

rTMS is the future for depressed patients who are proving resistant to traditional pharmaceutical solutions.

To request more information, please visit:
www.magstim.com/TMSclinical
email: TMSclinical@magstim.com or Tel: +44 (0) 1994 240798

### Magstim 200² & BiStim²

**Output Type**
- Monophasic
- Biphasic

**Maximum voltage**
- Magstim 200²: 2.80kV
- BiStim²: 2.50kV
- Rapid²: 1.67kV
- Rapid² Plus¹: 1.67kV

**Maximum repetition rates**
- Single PSU: 50Hz
- Dual PSU: 100Hz

**Minimum Inter Stimulus Interval**
- N/A

**Minimum Inter Train Interval**
- N/A

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**Magstim produce two monophasic systems; the Magstim 200² and BiStim², which are used extensively within the fields of neurology and neurophysiology.**

For accurate single pulse functionality, monophasic waveform systems are favoured for:
- **Neurological research**
- **Cortical mapping and brain research**
- **Functional assessment of central motor pathways**
- **Early diagnosis, assessment and monitoring of nervous diseases, such as Multiple Sclerosis and Motor Neurone Disease.**

**Single pulse Magstim 200²** provides users with the ability to elicit cortical evoked potentials, quickly and easily, as a routine.

**Controlled Trains**
- Magstim BiStim² offers the potential to combine two Magstim 200² units to provide fully programmable paired pulse stimulation through a single stimulating coil. The ability to change pulse intervals and to independently control the power level of each Magstim 200² allows for precise sub- and supra-threshold conditioning and test pulses. This is invaluable for the investigation of Inter-Cortical and Intra-Cortical Inhibition and Facilitation.

The inter-stimulus interval (ISI) of the two pulses is adjustable using either the integral stimulator controls, remote control coil or externally via triggering software offering complete user flexibility.

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**Component of clinical and research assessment techniques, including:**
- **Triple Stimulation Technique**
- **Resting Motor Threshold**
- **Active Motor Threshold**
- **Central Conduction Time**
- **Motor Evoked Potential**
- **Input-Output Curve**
- **Cortical Silent Period**

**Magstim 200²** offers complete flexibility and can be interfaced with a wide range of commercially available EMG systems. The monophasic waveform provides a high degree of hemispheric accuracy, low noise and less coil heating than other pulse waveforms.

**The Magstim 200² is backward compatible with all Magstim stimulating coils.**

**Two ISI options offer maximum controllability:**
- 1ms - 999ms in 1ms resolution
- 1.0ms - 99.9ms in 0.1ms resolution

**BiStim² has the added advantage of being able to sum the two single pulses provided by the Magstim 200² stimulators to produce a single high power pulse equal to 113% of a single Magstim 200².**

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Please refer to [www.magstim.com](http://www.magstim.com) for regular product updates.

*Requires coil adapter*
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**Stimulator Compatibility**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Coil</th>
<th>Description</th>
<th>Application</th>
<th>200²</th>
<th>Bistim²</th>
<th>Rapid²</th>
<th>CE Mark</th>
<th>FDA Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4102-00</td>
<td>D70² Double Coil</td>
<td>High Performance Double Coil</td>
<td>Cortical Stimulation Spinal Roots Peripheral Nerves</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>9902-00</td>
<td>110mm Double Coil</td>
<td>Cone Coil 1st generation</td>
<td>Central motor disorders Spinal injuries Urology</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>4150-00</td>
<td>Alpha 70mm Double Coil</td>
<td>Alpha Coil</td>
<td>Cortical Stimulation Spinal roots Peripheral nerves</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>3530-00</td>
<td>70mm Double Coil</td>
<td>Air Cooled Coil</td>
<td>Power intensive protocols Long duration protocols</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3910-00</td>
<td>70mm Double Coil</td>
<td>Air Film Coil</td>
<td>Psychiatry Cognitive Neuroscience Neurology Neurophysiology Rehabilitation</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3950-00</td>
<td>70mm Double Coil (Placebo)</td>
<td>Identical to the active coil (see above) other than the stimulating output. Suitable for double-blind trials</td>
<td>Cortical Stimulation Cervical nerve roots Lumbosacral nerve roots</td>
<td>☑️</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Sclerosis and Motor Neurone Disease.

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Single pulse functionality, monophasic waveform systems

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... fields of neurology and neurophysiology. For accurate
... Two ISI options offer maximum controllability:

1.0ms - 99.9ms in 0.1ms resolution

113% of a single Magstim 200².

BiStim² has the added advantage of being able to sum the

200² BiStim² Rapid² Rapid² Plus¹

Output Type Monophasic Monophasic Biphasic Biphasic

Maximum repetition rates 30% 2.0s 2.0s Single PSU - 50Hz  Dual PSU - 100Hz 100Hz

100% 4.0s 4.0s Single PSU - 15Hz  Dual PSU - 25Hz 41Hz

Minimum Inter Stimulus Interval N/A 1.0ms N/A N/A

Minimum Inter Train Interval N/A 4.0s 0.5s 0.5s

Users of Magstim Transcranial Magnetic Stimulators

in the USA please note:

Caution - Investigational Device. Federal (or United
States law) limits device to investigational use.

All standard products carry the mark, comply with the Medical Device Directive

93/42/EEC, and are manufactured under a Quality System certified to ISO 13485. 

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All specifications are subject to change. All material in this literature is produced in
good faith.

This brochure is intended for users outside the USA.