

# magstim<sup>®</sup>

The Leading Provider of Advanced Neurostimulation Products



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## 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.



“ a leader in the field of magnetic stimulation ”

## Monophasic Systems

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

### Magstim 200<sup>2</sup> & BiStim<sup>2</sup> - Monophasic

Magstim produce two monophasic systems; the **Magstim200<sup>2</sup>** and **BiStim<sup>2</sup>**, 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 200<sup>2</sup>** 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<sup>v</sup>
- Resting Motor Threshold
- Active Motor Threshold
- Central Conduction Time
- Motor Evoked Potential
- Input-Output Curve
- Cortical Silent Period
- Motor Mapping

**Magstim 200<sup>2</sup>** 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 200<sup>2</sup> is backward compatible with all Magstim stimulating coils, via the coil adaptor.



### Controlled Trains

**Magstim BiStim<sup>2</sup>** offers the potential to combine two Magstim 200<sup>2</sup> 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 200<sup>2</sup> 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

**BiStim<sup>2</sup>** has the added advantages of being able to sum the two single pulses provided by the Magstim 200<sup>2</sup> stimulators to produce a single high power pulse equal to 113% of a single Magstim 200<sup>2</sup>, as well as having the functionality to connect two individual coils for interhemispheric stimulation.

	Magstim 200 <sup>2</sup>	Magstim BiStim <sup>2</sup>	Magstim Rapid <sup>2</sup>	Magstim Rapid <sup>2</sup> Plus <sup>1</sup>
Output Type	Monophasic	Monophasic Twin Pulse	Biphasic	Biphasic
Maximum voltage	2.80kV	2.50kV*	1.67kV	1.67kV
Maximum repetition rates (230V configuration)	30% 50% 100%	2.0s 3.0s 4.0s	Single PSU - 50Hz Single PSU - 30Hz Single PSU - 15Hz	Dual PSU - 100Hz Dual PSU - 50Hz Dual PSU - 25Hz
Minimum Inter Stimulus Interval	N/A	1.0ms	N/A	N/A
Minimum Inter Train Interval	N/A	4.0s	0.5s	0.5s

\* Also available as 2.80kV

## Biphasic Systems

### Magstim Rapid2 - Biphasic

**Magstim Rapid<sup>2</sup>** 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**<sup>vi</sup> - in the investigation of learning<sup>vii</sup>,<sup>viii</sup>, memory<sup>x</sup>, speech<sup>x</sup>, hearing, visual, perception and functional connection

**Psychiatry**<sup>xi</sup> - 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 Rapid<sup>2</sup>** 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. Rapid<sup>2</sup> stimulators offer frequencies of up to 100Hz, with a 0.1Hz frequency resolution for the first 30Hz.



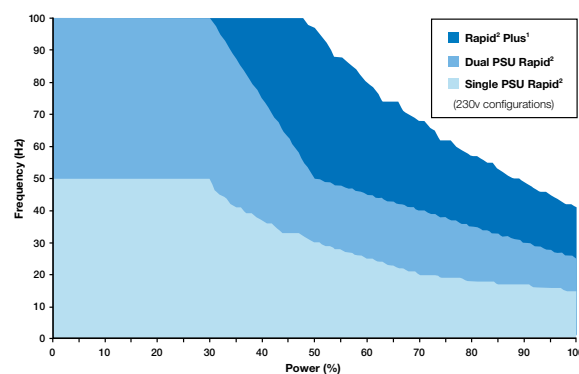
**Magstim Rapid<sup>2</sup>** is for single pulse and repetitive stimulation

**Magstim Rapid<sup>2</sup>** 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.

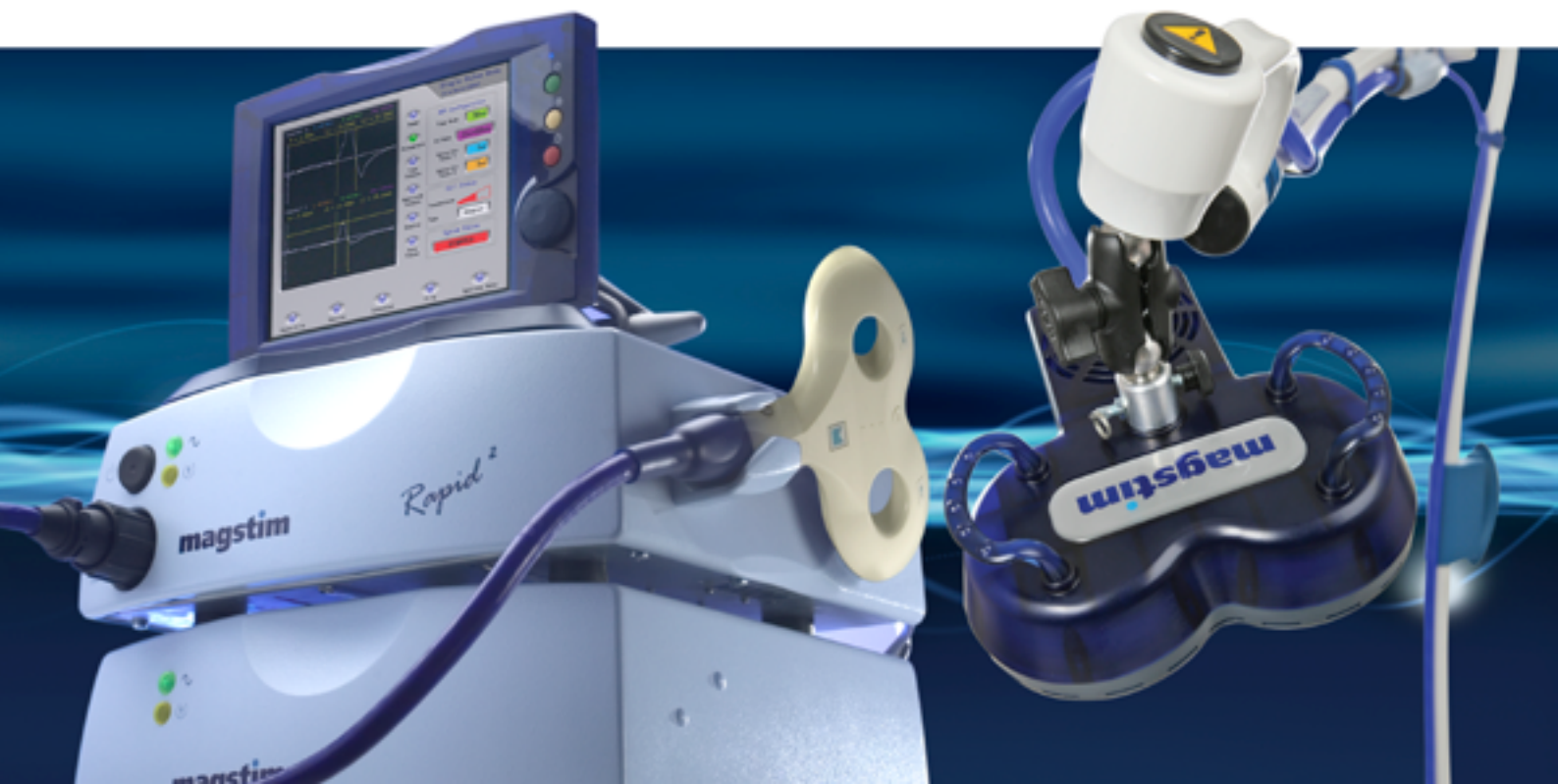
Rapid<sup>2</sup> can be used with other investigation tools such as fMRI, EMG, EEG, tDCS, tACS and Image-guided TMS over a broad range of protocols and is fully compatible with existing Magstim coils through customised hardware.

**Magstim Rapid<sup>2</sup> Plus<sup>1</sup>** is an innovative enhancement to the Rapid<sup>2</sup> 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 Burst<sup>xii</sup>, as the Magstim Rapid<sup>2</sup> Plus<sup>1</sup> is capable of up to 89% output at 50Hz.

With the addition of a Plus<sup>1</sup> module a single PSU Rapid<sup>2</sup> can be easily upgraded to dual PSU performance, whereas the addition of the Plus<sup>1</sup> module to a dual PSU Rapid<sup>2</sup> make high powered protocols feasible.



Magstim Rapid<sup>2</sup> Performance



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## TMS Clinical

### 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 option<sup>1</sup>.

#### Benefits of rTMS

- Treatment with rTMS has a fast onset of action with significant patient improvement<sup>2</sup>
- 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](http://www.magstim.com/TMSclinical)

email: [TMSclinical@magstim.com](mailto:TMSclinical@magstim.com) or Tel: +44 (0) 1994 240798

<sup>1</sup> Carpenter, L, *et al*: Transcranial Magnetic Stimulation (TMS) for major depression: a multisite, naturalistic, observational study of acute treatment outcomes in clinical practice (2012)

<sup>2</sup> Rossini, D, *et al*: Transcranial magnetic stimulation in treatment-resistant depressed patients: A double-blind, placebo-controlled trial (2005)



					Stimulator Compatibility			Regulatory	
Part No.	Coil	Description	Application	200 <sup>2</sup>	Bistim <sup>2</sup>	Rapid <sup>2</sup>	CE Mark	FDA Clearance	
	3192-00	90mm Single Coil	Standard High Power Remote Control	Cortical Stimulation Cervical nerve roots Lumbosacral nerve roots	✓	✓	✓	✓	✓
	9784-00*	90mm Single Coil	Coil High Power 1 <sup>st</sup> generation	Cortical Stimulation Cervical nerve roots Lumbosacral nerve roots	✓	✓	✓	✓	✓
	1165-00*	25mm Double Coil	Branding Iron Polyurethane 1 <sup>st</sup> generation	Facial nerve Median nerve Ulnar nerve Somatosensory evoked potentials F-Wave and reflexes	✓			✓	
	3190-00	70mm Double Coil	Remote Coil	Cortical Stimulation Spinal roots Peripheral nerves	✓	✓	✓	✓	✓
	3271-00*	70mm Double Coil	Branding Iron Polyurethane 1 <sup>st</sup> generation	Cortical Stimulation Femoral nerve Back and neck	✓	✓	✓	✓	
	3281-00*	70mm Double Coil	Flat coil Polyurethane 1 <sup>st</sup> generation	Cortical Stimulation Femoral nerve Back and neck	✓	✓	✓	✓	

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

\* Requires coil adapter

				Stimulator Compatibility			Regulatory	
Part No.	Coil	Description	Application	200 <sup>2</sup>	Bistim <sup>2</sup>	Rapid <sup>2</sup>	CE Mark	FDA Clearance
	4102-00 D70 <sup>2</sup> Double Coil	High Performance Double Coil	Cortical Stimulation Spinal Roots Peripheral Nerves	✓	✓	✓	✓	
	9902-00 * 110mm Double Coil	Cone Coil 1 <sup>st</sup> generation	Central motor disorders Spinal injuries Urology	✓	✓	✓	✓	
	4150-00 Alpha 70mm Double Coil	Alpha Coil	Cortical Stimulation Spinal roots Peripheral nerves	✓	✓	✓	✓	
	3530-00 70mm Double Coil	Air Cooled Coil	Power intensive protocols Long duration protocols			✓	✓	
	3910-00 70mm Double Coil	Air Film Coil	Psychiatry Cognitive Neuroscience Neurology Neurophysiology Rehabilitation			✓	✓	✓
	3950-00 70mm Double Coil (Placebo)	Identical to the active coil (see above) other than the stimulating output. Suitable for double-blind trials	Cortical Stimulation Cervical nerve roots Lumbosacral nerve roots			✓	✓	

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

\* Requires coil adapter

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**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 CE 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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