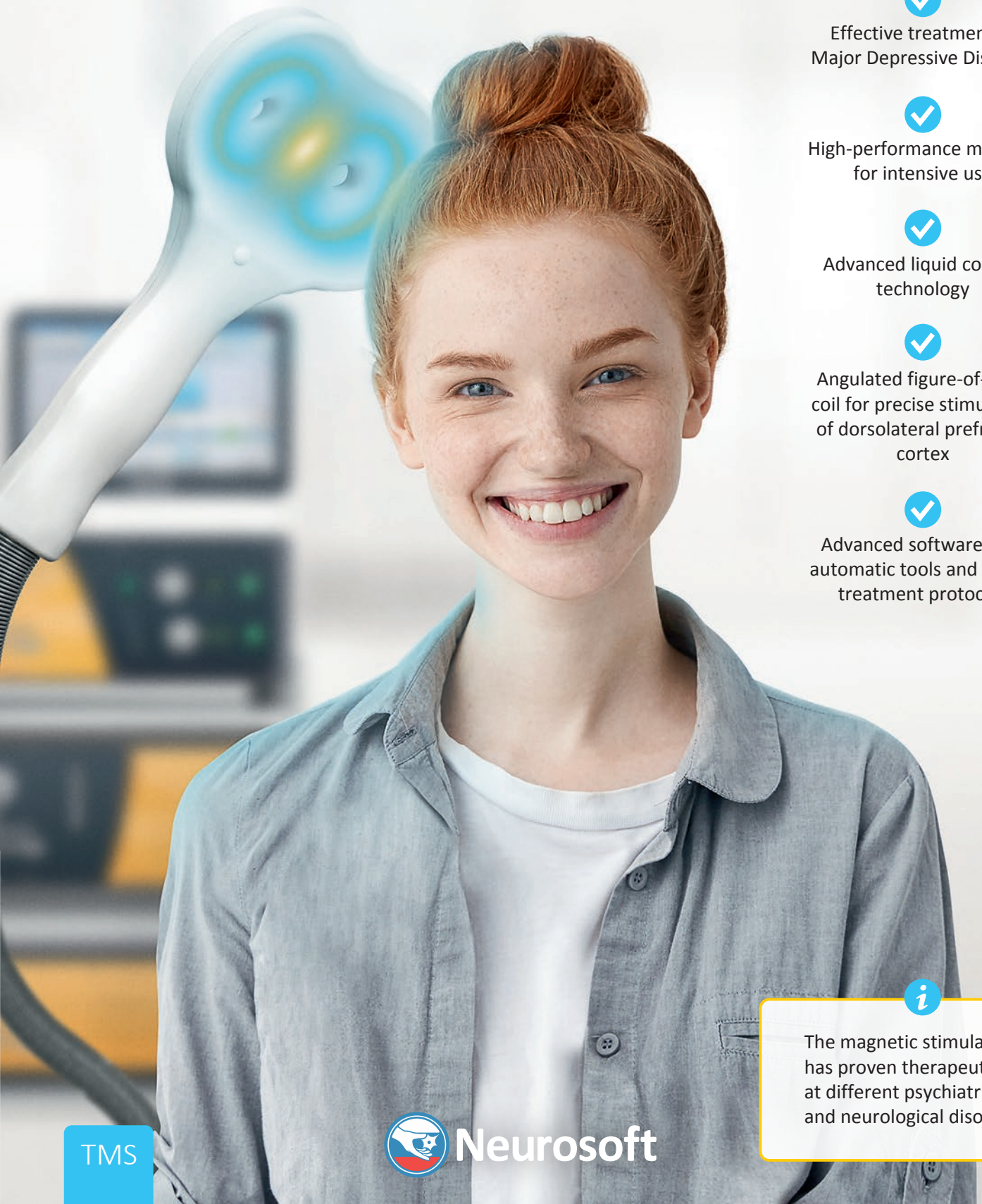
NEURO-MS/D

Transcranial Magnetic Stimulator for Major Depressive Disorder Treatment



- Effective treatment of Major Depressive Disorder
- High-performance machine for intensive use
- Advanced liquid cooling technology
- Angulated figure-of-eight coil for precise stimulation of dorsolateral prefrontal cortex
- Advanced software with automatic tools and preset treatment protocols

The magnetic stimulation has proven therapeutic effect at different psychiatric and neurological disorders

TMS

Neurosoft

NEURO-MS/D — YOUR RELIABLE SOLUTION FOR DAY-TO-DAY TMS THERAPY

WHAT IS TMS?

The alternating magnetic field of TMS machine easily penetrates through clothes, skin, scalp, meninx and bones. As soon as it reaches the central and peripheral nervous systems referred to as conductive tissues, such field generates the alternating electric field. It in turn evokes the electrical current activating the neurons as during the electrical stimulation. However, it causes no pain and requires no extra patient preparation.

Such impact allows performing a wide range of diagnostic and therapeutic procedures. The repetitive transcranial magnetic stimulation performed for a long time (about 10–40 minutes) can modulate the cortex excitability.

For example, the excitability can be increased with high-frequency stimulation or decreased with low-frequency stimulation. The magnetic stimulation has proven therapeutic effect at different psychiatric and neurological disorders. The main indication, where most of TMS machines are used now in daily practice, is MDD (Major Depressive Disorder).

TMS IN DEPRESSION TREATMENT

Nowadays, both pharmacological and non-pharmacological options are used to treat the depression. Most often a patient is offered either pharmacological or the combined treatment consisting of antidepressant medication and psychotherapy, which really works, but, unfortunately, not for everyone.

If the patient does not respond to medication or can not tolerate the side effects of medication, rTMS therapy becomes an alternative. Magnetic stimulators can perform stimulation of dorsal prefrontal cortex (DLPFC). It impacts the mood stabilizers, thus, the long-lasting therapeutic effect, non-invasive, with no pain and minimum contraindications is achieved. According to the results of the clinical trials, the number of responders to rTMS therapy in antidepressant treatment-resistant patients is about 50%. At that, depending on the depression type the remission is reached in every second* patient.

WHY NEUROSOFT?

The Neuro-MS/D configurations are not only highly effective but also thoughtfully-designed. Neurosoft magnetic stimulators are the obvious choice of TMS specialists all over the world. The choice of those, who values reliability, safety and time.

* Carpenter L et al. Transcranial magnetic stimulation (TMS) for major depression: a multisite, naturalistic, observational study of acute treatment outcomes in clinical practice. Depression and Anxiety 2012; 29: 587-596.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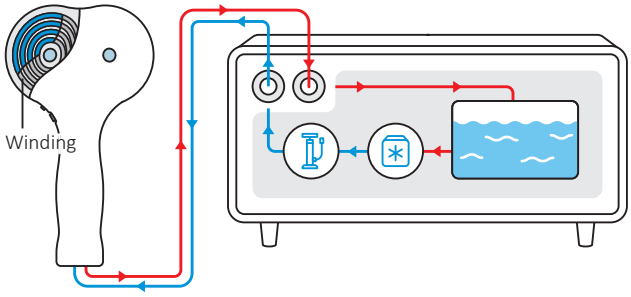
NEURO-MS/D. THE CHOICE IS CLEAR

1 INTUITIVE CONTROLS

The main unit controls the whole system. The indicators showing the stimulator parameters, buttons and knobs are located on the front panel. Besides, the stimulator can be controlled by the Neuro-MS.NET software. To ensure it, just connect the main unit to computer via USB cable.

2 LIQUID COOLING SYSTEM

The cooling system is designed to avoid the coil overheating during long-term rTMS sessions. The advanced method of active coil component cooling is implemented in Neurosoft magnetic stimulators. The cooling liquid does not fill the whole coil, is runs inside the winding. This liquid does not increase the weight of coil and neutralizes the heat on-site.

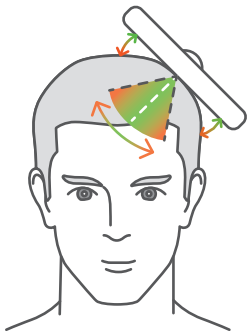


3 HIGH-FREQUENCY STIMULATION

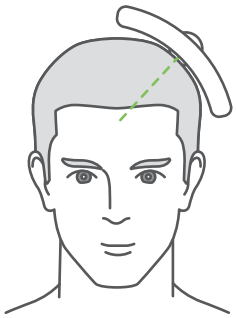
The main unit of magnetic stimulator is capable to deliver pulses at up to 30 Hz frequency. At that the maximum intensity is achieved at up to 5–7 Hz frequency. The extra power supply unit makes it possible to increase the maximum frequency up to 100 Hz and obtain the maximum intensity at up to 20–25 Hz frequency. With this extra power supply unit the theta-burst stimulation (TBS) is performed. TBS allows achieving effect much faster in comparison with conventional rTMS.

4 COOLED ANGULATED FIGURE-OF-EIGHT COIL

The accurate focused stimulation of dorsal prefrontal cortex is ensured with angulated figure-of-eight coil. The anatomic coil shape that is congruent to head shape allows achieving the precision in positioning TMS coil and avoiding coil dislocation from stimulation point.



If flat coil is used, even slight coil motion regarding patient's head can dislocate the stimulation point for up to several centimeters!



If angulated figure-of-eight coil is used, the congruence of the head and coil coincide, so that the coil motions are almost impossible.

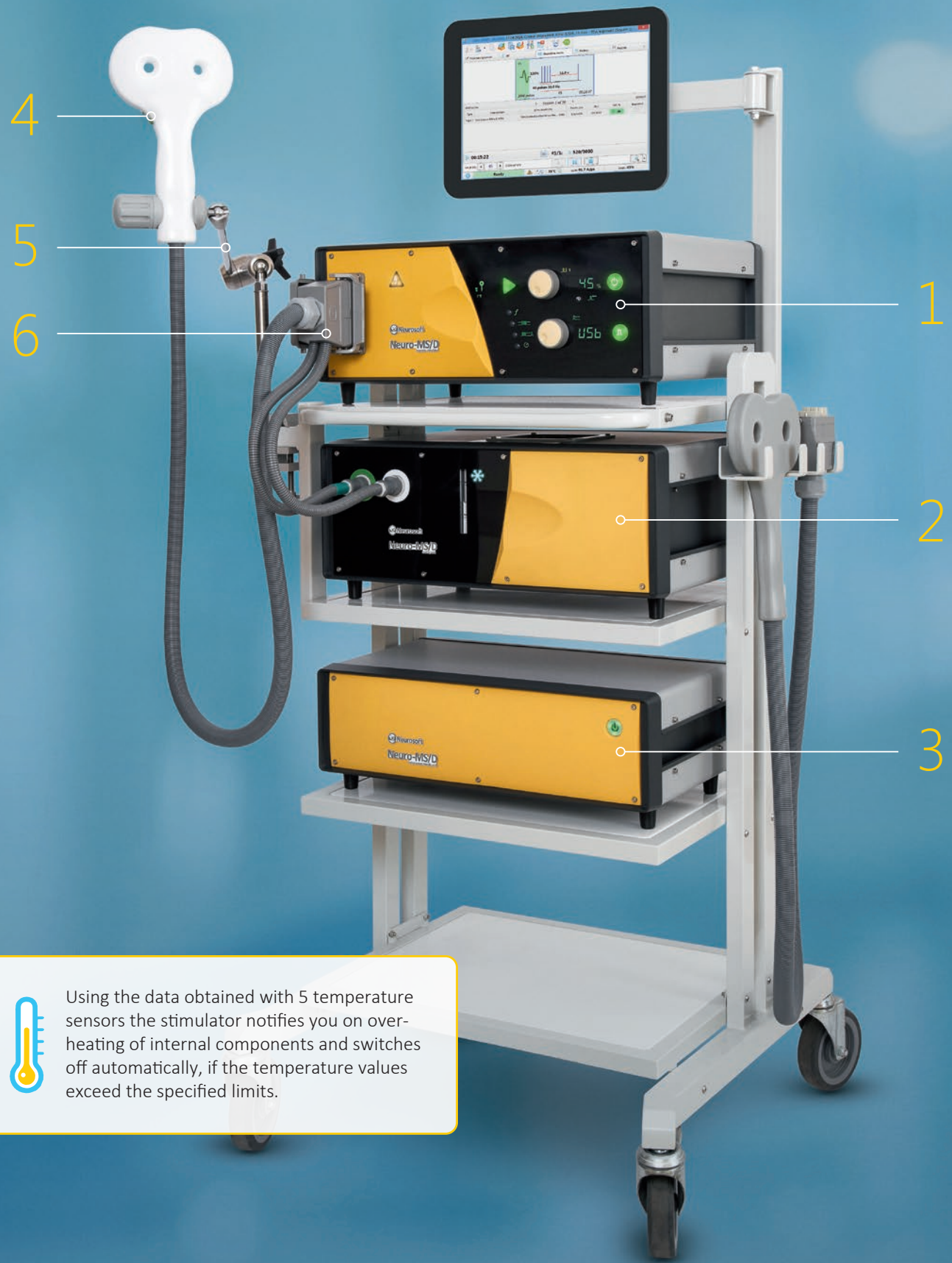
5 FLEXIBLE ARM FOR COIL POSITIONING

During the whole treatment session it is very important to keep the coil in one and the same position relative to patient's head. Any coil motion can impact negatively the therapy efficiency. To ensure reliable and accurate coil placement above the target area, we designed the special flexible arm for coil positioning. With such arm it is easy and fast to fix the coil.

6 RELIABLE COIL CONNECTOR

The special industrial connector produced from high-strength materials ensures the safe coil attachment to the main unit and longstanding functioning without pin burning which is common for other connectors.

EFFECTIVE TREATMENT
ENHANCED SAFETY
EASE OF USE



Using the data obtained with 5 temperature sensors the stimulator notifies you on over-heating of internal components and switches off automatically, if the temperature values exceed the specified limits.

FOR THOSE WHO VALUE THEIR TIME

Generally, the determination of treatment spot and rTMS session itself take up to one hour. 20% of this time or even more can be cut if the workflow steps are properly arranged. Using the experience based on knowledge and observations regarding the faced problems and feedback obtained from TMS experts, we offer the right solution to ensure the streamlined workflow. With Neuro-MS/D you can treat much more patients per day!

I. DETERMINATION OF TREATMENT SPOT (MAPPING)

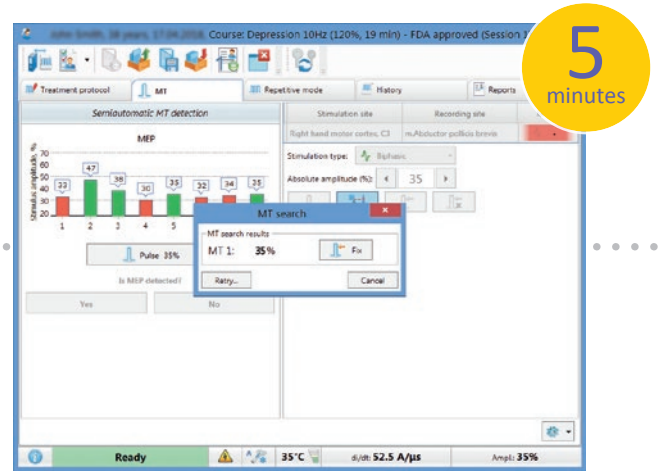
STEP 1. Seat a patient in the chair, adjust the leg support, neck rest and arm rest to ensure stable patient's position and comfort. Put the individual textile cap on a patient with patient's name written prior to it.

STEP 2. Determine the HOT SPOT. Draw the line with marker pen along the coil edge for the next steps.

II. rTMS SESSION

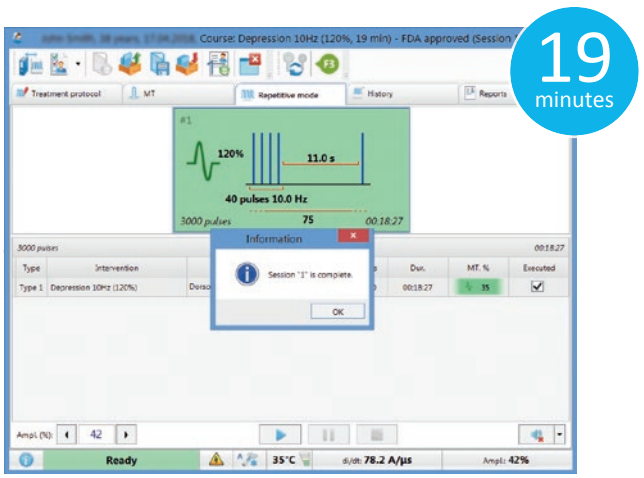
STEP 1. Seat a patient in the chair, adjust the leg support, neck rest and arm rest to ensure stable patient's position and comfort. Put the individual textile cap on a patient with treatment spot marked on it.

STEP 2. Position the coil over the target treatment spot using the adjustable arm.



STEP 3. Determine the motor threshold (MT). You can use either automatic or semi-automatic mode if EMG machine is available. The software automatically adjusts the pulse amplitude depending on the presence of the response on the previous stimulus.

STEP 4. Find the target treatment spot using the coil positioning tool.



STEP 3. Start 19-minute shortened depression treatment protocol.

NEURO-MS.NET

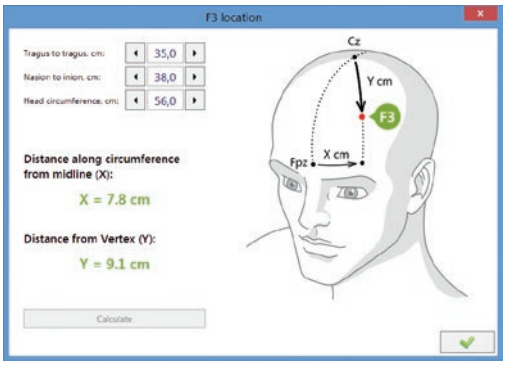
When you purchase Neuro-MS/D magnetic stimulator, you get the advanced software with the set of predefined protocols implemented in accordance with IFCN* recommendations. These protocols can be used to treat psychiatric and neurological diseases. The well-laid-out software features streamline TMS workflow and save considerably the time.

F3 LOCATOR

The FDA approved protocol provides stimulation of the left DLPFC, which corresponds to the F3 point in the 10–20 system. It is not an easy task to find it as it requires lots of measurements and calculations. Our software has implemented algorithm to locate F3 using 3 measurements:

a) tragus-to-tragus distance,
b) nasion to inion distance,
c) head circumference.

Just enter the measurements and the software shall calculate precisely the target point.

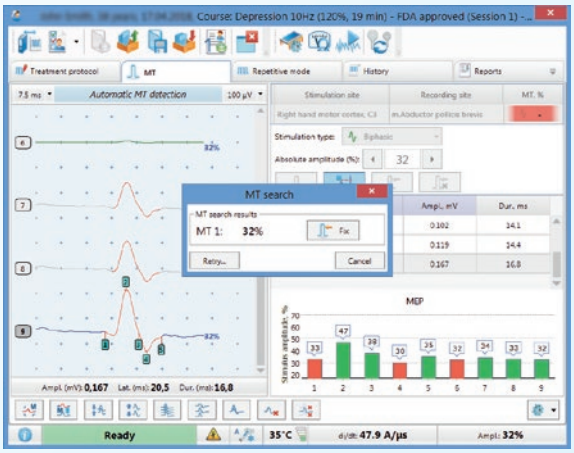


AUTOMATIC AND SEMI-AUTOMATIC MT DETERMINATION

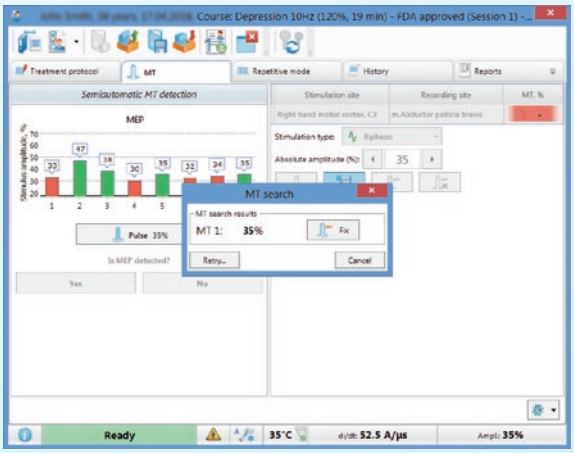
The motor threshold can be defined using 2 ways: in automatic or semi-automatic mode. In the first case we shall use EMG machine to ensure the MEP acquisition. In the second case we can use either touchscreen, or patient button, or footswitch to confirm the response presence by muscle twitch.

In automatic MT determination mode the software automatically delivers the single pulses and simultaneously analyzes the responses obtained from EMG machine. Based on the obtained data the software automatically increases or decreases the stimulus amplitude to approximate to MT as close as possible.

In the semi-automatic mode the software can deliver the pulses automatically or manually. The trained personnel observes the muscle twitch and informs the software on the response presence after stimulus delivery. Based on this data the software automatically increases or decreases the pulse amplitude and finally determines the MT.



Automatic MT determination



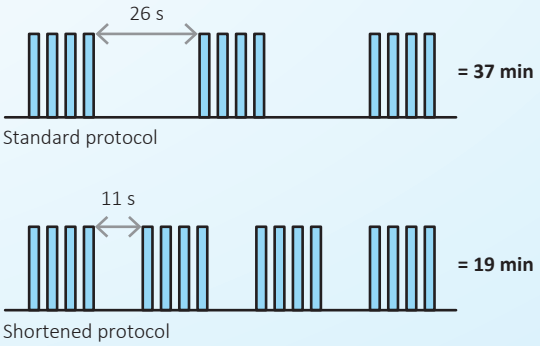
Semi-automatic MT determination

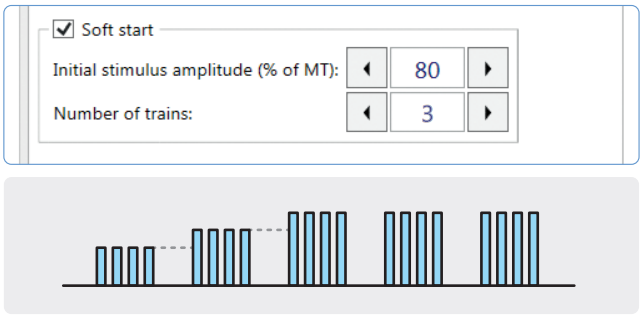
* Lefaucheur J-P et al. Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS). Clin Neurophysiol (2014).
Depending on local regulations in different countries some protocols can be disabled.

19-MINUTE PROTOCOL

The conventional depression treatment protocol lasts for about 37 minutes. This is a total of 75 trains of 4-second duration with 26-second inter-train interval (ITI). However, such ITI does not affect the treatment and can be shortened with no impact on treatment efficiency and safety.

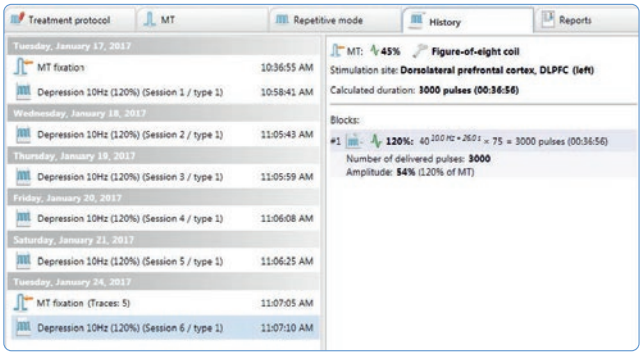
With Neuro-MS.NET software it is possible to perform 19-minute shortened depression treatment protocol. This is a total of 75 trains of 4-second duration with 11-second inter-train interval. This protocol saves the time and allows performing more treatment sessions per day.





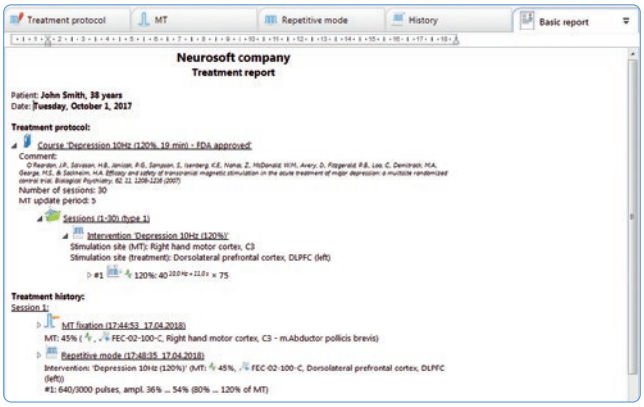
SOFT START MODE

To treat the depression, the left DLPFC is stimulated at 120% MT. Such intensity can induce involuntary head movements. To avoid such patient's response and prepare a patient properly to the procedure, you can use Soft Start Mode implemented in the software. It allows you to start stimulation at lower intensity and gradually increase it automatically up to the required value.



TREATMENT HISTORY

The treatment history keeps the data obtained during MT determination (including traces), data on performed treatment sessions and the actual number of stimuli delivered during each session.



REPORT

Upon the treatment course completion you can generate the treatment report. It contains the full information on the treatment protocol (stimulation type and treatment protocol parameters, etc.) and treatment history (mapping and treatment session data). The automatically generated report can be enlarged with your observations and comments upon patient's state and other information.

SOUND NOTIFICATION ON STIMULATION START

During the treatment session the stimulation is run 75 times. After the next inter-train pause the so called unexpectedness effect can be induced, and the patient can move involuntary the head that can result in coil dislocation. To avoid it, the special soft sound notification is played back to prepare the patient to the next stimulus delivery.

REMINDING ON MT REDETERMINATION

To ensure the appropriate depression treatment, regular MT redermination is needed, as it may change with time. The schedule of MT determination is specified in the software, and it shall remind you of it.

WHEN ACCURACY IS IMPORTANT

PATIENT CAP

The use of individual patient cap to mark the points saves your time usually spent for coil positioning during each next session.

COIL POSITIONING TOOL

To achieve the maximum treatment efficiency it is required to determine the stimulation spot precisely. The specially designed coil positioning tool allows you to find this spot quickly and position the coil over this area accurately. This spot is marked on the patient cap. It is very convenient as you will not have to determine it again.

TMS CHAIR *COMFORT*

The chair specially designed for long-term treatment sessions allows a patient to relax and seat comfortably due to multiple independent adjustments of backrest and leg rest. Besides, the small neck rest and low back rest make it easier to position the coil over the target spot.

FLEXIBLE ARM FOR COIL POSITIONING

The flexible arm ensures flexible positioning of the coil. The arm has three joints and can be rotated in any direction. It can be secured and released with just one wing-screw that enables single-handed adjustment and operation.

COOLED COILS

The high-frequency repetitive stimulation is used to perform treatment sessions. The delivery of a large number of pulses can lead to coil overheating, that is why we designed the cooled coil series. Due to breakthrough cooling system you can forget of overheating and the variety of coil shapes shall enable you to achieve the positive outcomes in each individual case.

ANGULATED FIGURE-OF-EIGHT COIL
The coil for deep focused stimulation

FLAT FIGURE-OF-EIGHT COIL
The conventional rTMS coil

DOUBLE CONE COIL
The coil for deeper brain area stimulation

NAVIGATION SYSTEM

Most clinicians rely on anatomical landmarks to detect the stimulation area. Such stimulation, sometimes, is not enough accurate because of individual anatomical peculiarities of subjects. Recently, there was developed a new technique that allows importing MRI data of a particular subject to computer before the stimulation session and perform MRI-guided stimulation using the 3D target markers on patient's brain rendering. Neuro-MS/D stimulators can be used together with navigation systems.

PRODUCT LINE OF MAGNETIC STIMULATORS

	 Neuro-MS/D advanced therapeutic	 Neuro-MS/D therapeutic	 Neuro-MS/D diagnostic	 Neuro-MS mono-phasic for paired pulse stimulation	 Neuro-MS mono-phasic for single pulse stimulation
Diagnostic TMS: MEP, CSP, CMCT, MT	+	+	+	+	+
Advanced diagnostic TMS: paired stimulation, SICI, LICI, ICF (GABAergic mechanisms)				+	
Therapeutic rTMS	+	+			
Advanced therapeutic rTMS up to 100 Hz, TBS	+				

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