Your reference in
**Stereotactic and Functional Neurosurgery**

Functional Neurosurgery Suite
About Alpha Omega

In 1993, Alpha Omega was established as a small engineering firm in Nazareth, Israel, by Imad Younis. From those humble beginnings, our organization has grown into a truly global company, offering a plethora of pioneering products for our clients, along with consistent innovation and uncompromising quality and service. We have done this with the help and close collaboration of world renowned experts and leading research institutions. Almost two decades later, our organization continues to lead the industry with the same mission and determination in mind - improving the quality of patient care in the field of functional neurosurgery, while helping advance neuroscience research.

Today, Alpha Omega has an extensive and established customer base worldwide, and our products can be found in the most advanced hospitals, universities, and research institutions across the globe. Our equipment has been repeatedly tested and used in hundreds of operating rooms and research labs by leading doctors and scientists.

Alpha Omega prides itself not only on innovative technology, but also an extraordinary level of service and personal attention that we dedicate to each and every one of our clients. Our professional sales and support team, located in the United States, Germany, and Israel, along with a select group of international partners, cover the world to offer our clients a helping hand and expert advice whenever and wherever there is a need.

Above: Alpha Omega’s North American office is headquartered in Atlanta.
A Letter from the CEO

The brain is the most complex and mysterious human organ. Remarkable doctors and scientists around the world are consistently pioneering new research and methods to understand more about the brain, how it functions, and how to help treat different neurological disorders that affect countless individuals. As the years advance, more and more is being discovered, and slowly but surely both the scientific and medical communities are finding treatments that help prolong and significantly improve the quality of life for patients. Alpha Omega has a mission to contribute to this progress.

Since our inception, Alpha Omega has played an important role in fostering innovation and development in two main areas - neuroscience research and functional neurosurgery.

Imad Younis
CEO, Alpha Omega

Over the last two decades we have pioneered leading edge technology in both fields, receiving international recognition from global experts in each respective area. Today, our equipment can be found in hundreds of hospitals and research institutions, covering 6 continents.

Our FDA and CE approved functional neurosurgery product line, is focused on providing doctors and surgeons state-of-the-art tools for stereotactic and Deep Brain Stimulation (DBS) procedures. Our equipment guides our clients day after day with utmost precision and reliability in the operating room. After all, other people’s lives are literally in their hands, and we can’t afford to fail them.

Undoubtedly, Alpha Omega’s success is based on the unique and personal relationship we have with our customers. This two-way collaboration allows us to constantly launch new products and versions which are uniquely tailored to our clients’ evolving needs. I therefore, encourage you to carefully examine our products to understand exactly how they can apply to your particular demands. We are here to serve you, and are glad to welcome you into the Alpha Omega family of satisfied clients!

Emad Eskandar, MD
Boston MA.

Alpha Omega is the world’s best company for producing technologically sophisticated, versatile, and highly usable physiological recording equipment. The devices are highly robust and functional. In the clinical setting, this translates into excellent and reliable recordings which result in optimal localization and maximum benefit for the patient. The company is instantly responsive and willing to modify their products to suit the needs of each individual user. They are without question the best in the field.

Emad Eskandar, MD
Boston MA.

Deep Brain Stimulation (DBS) is a surgical treatment involving the implantation of a medical device, which sends electrical impulses to specific parts of the brain. DBS in selected regions of the brain has provided remarkable therapeutic benefits for otherwise treatment-resistant movement and psychiatric disorders such as Parkinson’s disease, Dystonia, Essential Tremor, OCD, and others.

Due to their effectiveness, DBS procedures have gained enormous popularity in the last years with top hospitals and practitioners worldwide, offering qualified patients the possibility to undergo this life-changing procedure. Yet despite all its benefits, DBS surgery does have its risks. Accurate and proper positioning of the electrode implants is absolutely fundamental for the procedure to be successful – for the maximum benefit of the patient and least possible side effects.

Alpha Omega’s advanced microelectrode recording (MER) technology and microdrives allow doctors and surgeons to perform DBS surgery (as well as other techniques such as pallidotomy or thalamotomy) with maximum safety and accuracy. Precision is indispensable in this procedure, in order to assure the medical professional that the correct target has been found. Alpha Omega’s full suite of neurosurgery products provide our doctors with the peace of mind that only the most advanced technology and years of experience can provide.

Why MER?

Verify your planning with the most advanced confirmation method available

✓ Real-time assessment of electrophysiological activity confirms the structural location
✓ Improved visualization of the procedure
✓ Facilitate target confirmation
✓ Effective back-up for inaccuracies that may occur during planning stage
✓ Accurate way to obtain feedback during the operation
✓ Improve results and decrease possible patient side effects
✓ Effective stimulation testing, allows practitioner to gain a wide therapeutic window for easier implant programming after the procedure

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EMERSON ORTHOPEDIC}
I have used Alpha Omega equipment for 7 years, after having used equipment from a number of other vendors in the past. I have found the Alpha Omega equipment to be the most reliable, with by far the best noise reduction hardware and software available, as well as easy-to-use and powerful data analysis tools. Furthermore, the company’s support staff is without peer.

Alon Y. Mogilner, MD, PhD, NYU Langone Medical Center

NeuroNav Si™

portable MER solution for maximum flexibility

NeuroNav Si™ is a state-of-the-art MER system used clinically in the localization of surgical targets for the implantation of Deep Brain Stimulators (DBS) or ablation of target structures, in the treatment of neurological and psychiatric diseases. The NeuroNav Si allows for safe and accurate introduction of electrodes into the brain, while recording neural activity, stimulating neural tissue, and guiding the user to the optimal target.

The NeuroNav Si™ is capable of recording up to 5 channels of spikes and 5 channels of local field potentials. With integrated micro and macro stimulation, the surgeon can switch back and forth instantly from recording to stimulation, in order to achieve maximum accuracy during the DBS procedure.

The unit is completely portable for easy maneuverability. Its compact size, affordable price, and ease of use, make it ideal for community hospitals and low volume centers. Easy set-up and simplified operations allow the operator to proceed with the operation within a matter of minutes and without complications.

The NeuroNav Si™ is ideal for:

- Hospitals and specialists who require portability to easily move the system from one location to another
- Intra-Operative Monitoring service providers
- Clinical hospitals launching a new DBS program or upgrading their existing equipment
- Low volume centers with minimal staff searching for a more affordable unit
- Fee per use and rental plans available for easy financing

User-friendly remote control

Highlights

- Multi-channel recording capabilities. A total of up to 10 recording channels - 5 for spike activity measured from electrode micro tip and up to 5 for local field potentials “LFPs” measured at the macro tip
- Wide stimulation range of 1 μA to 10 mA
- Switch seamlessly from recording to stimulation with the switch of a button
- Gradual increase and decrease of stimulation current during stimulation of sensitive areas for added safety
- Current feedback system ensures accurate delivery of stimulation current
- User-friendly, handheld remote control to direct all system functions from a simple key pad, allows the user to control the operation from the inside or outside the sterile field
- Selection of front-end modules accommodates both manual or electronic drive configurations
- Easy set-up, with pre-assembled electronic microdrive
- Quiet electronic microdrive that allows recording while moving
- Pre-set ‘step size’ option to maximize precision of the microdrive and improve safety
- Clear on-screen trajectory view, builds automatically as the electrode advances in the brain, very useful to identify entry and exit of each nucleus
- Electrode depth and distance from target are both clearly displayed on screen, with easy reference to macro and micro tip locations
- Proprietary on-line Pattern Recognition Algorithm for optimal localization of STN
- Speakers for effective audio verification
- System can measure the impedance of all electrodes to ensure recording integrity

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Alon Y. Mogilner, MD, PhD, NYU Langone Medical Center
Neuro Omega

The new leader in microelectrode recording and the latest innovation in neuroscience technology

The Neuro Omega is a technological breakthrough that fulfills the Neurosurgeons and Neurophysiologist needs to integrate different electrophysiological signals in one system and delivers exceptional stimulation capabilities. The Neuro Omega allows university hospitals and all other institutions using MER total experimental control while maintaining Alpha Omega’s highest performance, quality and clinical efficacy.

Key Benefits

- Reduces MER procedure time by up to 50%
- A single user can conduct the entire procedure using the remote control unit
- Few pieces and no clutter: Less than 5 minutes to set-up and start recording
- Streamlined operation with only one cable going out of the sterile field, minimizing the risk of contamination
- Superior signal clarity due to connection of the electrodes to the system amplifiers
- Stimulation function is enabled by our specially designed drive, making only a single device necessary for performing the entire procedure
- XY stage and 5-hole Bengun allow electrode repositioning without adjusting the stereotactic frame
- Seamless and quiet operation ensures a smooth and effective operation
- Affordable cost and quick ROI
- Advanced design with easy maneuverability

Neuro Omega Innovation

- Provide MER clinical gold-standard
- Gateway to other motion disorder treatments
- Ability to integrate all electrophysiological signals in one system
- Implemented closed-loop experimental paradigms
- Control advanced stimulation capabilities
- Minimize impact of MER system on O.R. time and space
- Unique dual screen user interface display

Don’t sacrifice science for clinical efficiency…

Explore the frontiers of MER Neurosurgery

“I have worked with and used Alpha Omega equipment since 2001. I have also used most every other microelectrode recording system available and have found that in a large 1600+ bed facility the Alpha Omega system is second to none. The equipment is highly robust and functionally easy to use and interpret with respect to both hardware and software components. The recordings are consistently reliable and results in optimal localization and maximum benefit for every patient in my busy practice. The service and support I receive from the company is superb and they constantly strive to make the system better with each upgrade taking into consideration our specific needs and recommendations. With no doubt I feel they are the leaders in the field.”

B.V. Gallo, M.D., University of Miami, School of Medicine
**Highlights**

- Reduce set up complexity with 1 cable crossing the sterile field for MER positioning, recording and stimulation
- Informative trajectory view with pattern recognition for increased neural activity
- 10 channels built into the microdrive for recording and stimulation with Micro and Macro spike and LFP recordings
- Configurable with up to 122 channels integrated all in one system: Micro and Macro electrodes, LFP, EEG, EMG, EOG
- Unparalleled stimulation capabilities for multiple simultaneous stimulation paradigms
- Complete stimulation control on the basic stimulation parameters and the ability to create unique waveforms
- One click impedance check for all channels
- Unique design promotes OR productivity
- Flexible stimulation current ranges for microelectrode test stimulations, peripheral nerve stimulation and other stimulation research requirements
- Integrated analog and digital inputs and outputs
- Online data streaming to MATLAB and C++ to access, process and incorporate in custom algorithms
- Closed loop stimulation control through data streaming or scripting
- Online statistics including firing rate, raster graphs and event related potentials

**Key benefits**

- Easy user interface
- Compatible with all standard stereotactic frames
- 16 channel add on modules for connecting: EEG recording, EMG recording and peripheral nerve stimulation, ECOG recording and stimulation

**User Interface**

Efficient and easy to use
NeuroNav Drive™
precision microdrive for a wide variety of applications

The NeuroNav Drive™ is a small, light-weight, pre-assembled microdrive developed by Alpha Omega. This innovative drive features a virtually noise-free motor allowing the surgeon to record and stimulate as the electrodes are advanced in the brain. The electrodes can be easily repositioned with the X-Y stage and 5-hole Bengun, without the tedious need to adjust the frame as required in other systems. Once the target is reached, the DBS electrode is implanted through the same guide tube used for recording without retracting it from the brain. The NeuroNav Drive™ is compatible with any frame or microelectrode recording system, making it ideal for use in a variety of settings and applications.

Highlights

- LCD display shows depth and distance to target
- Precision movement allowing one step to control movement direction and speed
- Small and light weight, reduces torque on the frame
- Motor is virtually noise-free, enabling the surgeon to safely record as the electrodes are advanced
- X-Y stage and 5-Hole Bengun allows for repositioning without the need to adjust the stereotactic coordinates as required by other systems
- Compatible with frame-based or frameless procedures
- Two drives can be combined for a dual platform

Superior safety features

- Maximum forward step of 1 mm
- Manual Override: if necessary, the drive can be controlled using the manual knob while movement will continue to be tracked by software
- Dual-Feedback System: the drive’s internal software monitors both encoder and potentiometer and notifies user if a mismatch occurs
- Design allows you to implant the DBS from the same guide tube used for recording without backing up the microdrive
Maximum safety, superior results

Accessories

large selection of electrodes and other peripherals for daily use

Alpha Omega manufactures a large selection of electrodes and other peripherals of the highest quality. Our electrodes and cannulae come in standard sizes and materials, and can also be special ordered and designed according the specific needs of our clients.

Microelectrodes
- Variety of microelectrodes in different materials
- Shielded / non-shielded
- Customized dimensions according to customer demands
- Applicable to any drive
- Superior recording quality, impedance stability

Cannulae
- Customized dimensions according to customer demands
- Tapered / standard
- Applicable to any drive

Pre-Sterilized Accessories
- Microelectrodes
- Cannulae
- Input Cables

Benefits
- Increase case efficiency by eliminating sterilization procedure
- Avoid electrode tip damage during processing
- Safer handling of the microelectrodes