



EGI

Geodesic EEG System 500

An Intelligent EEG Platform for
Scientific Discovery & Clinical Research



Leading with Data Quality

- With a 16kHz sampling rate (4kHz effective) across up to 256 EEG channels, ensuring you capture the dynamic network activity of the brain you might otherwise miss.
- Combines high spatial resolution with high temporal resolution with up to 16 extra physiological channels.
- Battery power options for improved line noise immunity available for up to 24 hours of continuous measurement.

True integrations for better workflows enabling better science



Multimodal integration

- Supports a wide range of solutions for time locked experiments e.g. E-Prime, PsychoPy (Python), PsychToolbox (Matlab)
- Connects and synchronises with eye trackers, brain stimulation equipment including TMS, and other neuromodulation technologies
- Improved digital input or output options for synchronization with external equipment.

Real-time applications

- Designed for advanced applications like neurofeedback, brain-computer interface and closed-loop application via Lab Streaming Layer (LSL) or using the on-device computational module designed to support Artificial Intelligence (AI) and Machine Learning (ML)
- Collect data and check impedance with Lab Streaming Layer (LSL) natively and sync with other data streams



Full integration and unified interface with Magstim TMS



- Control EEG acquisition and TMS stimulation through a unified Net Station 6 interface on a single PC
- Bi-directional communication between Magstim TMS and GES 500 to minimize and mark pulse artifacts
- Design and initiate TMS protocols within the Net Station 6 user interface
- Synchronize audio / visual stimuli with TMS-EEG for time-locked stimulus induced state studies



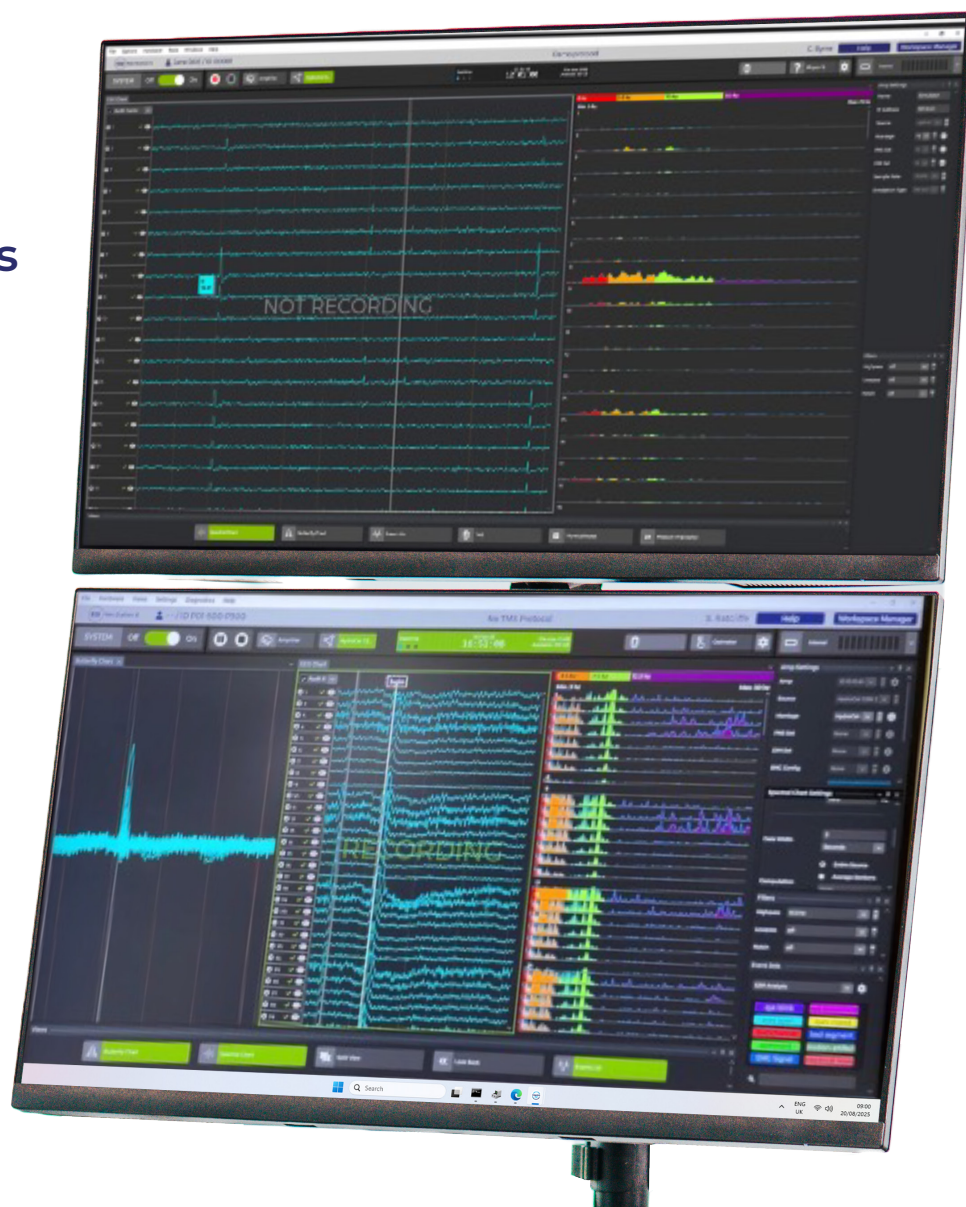
Net Station 6

Introducing the latest version of EGI's software optimized for HD-EEG acquisition and review.

- Running on a custom industrial Windows PC
- More synchronization options than ever for devices, software, and events - including TCIP/ IP, TTL, and analog triggering
- Designed to be securely online if needed

Customisable Views

- Multiple Chart Views windows to see all channels at once as well as simultaneous:
 - Butterfly - see all channels on a single line similar to MEG
 - Spectral - see the frequency content of your waveforms for each channel





I/O Ports

Port / Connection	I/O Use
BNC I/O	Send or receive TTL pulses to/from external devices for sync
Ethernet	Provides communication between the Net Amps and Net Station
USB-C	USB-C for bidirectional communication with Magstim TMS Systems
DB-9 Digital I/O	DB-9 ports to send and receive digital (TTL) signals
Fiber Optic Clock I/O	Use these ports to send and receive signals via fiber optic connection
Photocell and Audio	Quantify offsets of visual or auditory offsets of ECI events or trigger events based on visual or auditory cues

Power Options

Mains (Wall) Power	Run the system on mains power, or connect to mains as backup for battery-powered operation
Internal Battery	8 hour run time - running on battery power will minimize EMF contamination
External Battery(s)	Use with Battery Module to extend run time – daisy chain additional external batteries for up to 24 hours of run time



Physiological Data:

Feature	GES 500
Auxiliary channels supported	Up to 16 bipolar
SpO2 measurement supported	yes
Programmable gain for Physio channels	1-24
Auxiliary channel input range/dynamic range	Software-adjustable based on gain parameters





Product Packages:

Product Name	Details
Geodesic EEG System 500 Research*	• Net Amps 500 amplifier with 32, 64, 128 or 256 channels • Desktop configuration with single or dual monitors for EEG acquisition, or laptop configuration for increased portability • Net Station 6 Software on Windows PC • Internal battery • 1 year system warranty included with purchase
Geodesic Sensor Net	• Sponge-based HydroCel Nets for rapid application • Gel nets for long term recordings • TMS optimized options available • Available in sizes from neonate to adult
Sensor Net Extension Options	• Extension cable available to allow more distance between participant and amplifier • Wall / table mount arm available to hold extension cable off the ground for better positioning
TMS upgrade	• Full integration and unified interface with Magstim TMS, pulse marking and minimization of TMS-artifacts for Magstim and selected 3rd party TMS devices
Data Steaming to External Software	• Stream data using Lab Streaming Layer to synchronize with other LSL supported devices
On-Amp Computing Module	• Built-in advanced AI / ML module within amplifier for on-device computation including closed loop, BCI and TMS-EEG applications
Audiovisual Stimulus Presentation Package	• Seamless integration with audiovisual stimulus presentation systems for time locked experiments • Hardware packages available for open-source software as well as hardware/software bundles for E-Prime • Available in laptop or desktop configurations with ready-built paradigms • Integrated audio and visual timing validation testing ports built into amplifier
Physio & sensors	• Connect up to two Physio devices with 8 bipolar channels each for a total of 16 bipolar channels plus SpO2 monitoring Available sensors: • EMG/ECG sensors • Respiration belts • Thermistors and pressure transducers with cannulas to measure airflow • Body position sensor • SpO2 sensor for adults or infants connecting directly to the amplifier
Synchronized Video	• Record synchronized video even in low light conditions
Cart	• Cart for portable EEG acquisition within a building • Available with single or dual monitor configuration
Wall Mount	• Mount the amplifier, physio and batteries on solid wall



Technical specifications:

Feature	GES 500
EEG channel count	32, 64, 128 or 256
Coupling	DC
A/D resolution	24 bits
Embedded operating system	Linux
I/O connection	Fiber optic, DB-9, BNC, Ethernet, USB-C
Digital (TTL) inputs	16 bits (8 bits supported in the software)
Input impedance	$\geq 1\text{ G}\Omega$
Sensitivity (AC mode)/precision	0.044703 $\mu\text{V/bit}$
Input-Referred Noise	1 μVPP
Input range	$\pm 375\text{ mV}$
Sampling rate	16 kHz (4kHz effective sampling)
Effective bandwidth	DC to 4,000 Hz
Common mode rejection rate	$\geq 109\text{ dB}$
Isolation mode rejection rate	$\geq 120\text{ dB}$
Power consumption	18W
Power options	8 hours battery, daisy chain for 24 hours of measurement, mains power connection available

* Geodesic EEG System 500 Research is not intended for use in diagnosis or treatment of any disease or condition. It is a scientific research instrument designed for performing measurements and acquiring data for neurophysiological research.



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