GTEN 200 can be purchased as a new system, or as an easy upgrade from the GES 400

Product packages

Product name	Details
GTEN 200 Research Neuromodulation System — 32, 64, 128, or 256 channel	• GTEN 200 amplifier with HCGS Nets • GTEN targeting and planning software module • GTEN control software module • Hospital grade isolation transformer • iMac computer • Net Station software license and HASP • Articulated Arm and mounting brackets • Net Support Kit
Geodesic Sensor Net	Sponge-based HydroCel Geodesic Sensor Nets for rapid application, or gel-based for long term recordings
Options	
GeoSource 3 software	Electrical source imaging software with atlas models, or individualized head models
Geodesic Photogrammetry System	For 3D sensor registration
GeoScan Sensor Digitization Device	For 3D sensor registration

HD EEG: High Density EEG
tDCS: Transcranial direct-current stimulation
tACS: Transcranial alternating current Stimulation
tPCS: Transcranial pulsed current stimulation
tRNS: transcranial random noise stimulation
LORETA: Low-resolution electromagnetic tomography
sLORETA: Standardized low-resolution electromagnetic tomography
LAURA: Local autoregressive average

***Geodesic Transcranial Electrical Neuromodulation 200 (GTEN 200) System 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. Philips makes no representation of the suitability of the instrument for any particular research study.**

1. Luu P, Essaki Arumugam EM, Anderson E, Gunn A, Rech D, Turovets S and Tucker DM (2016) Slow-Frequency Pulsed Transcranial Electrical Stimulation for Modulation of Cortical Plasticity Based on Reciprocity Targeting with Precision Electrical Head Modeling. Front. Hum. Neurosci. 10:377. doi: 10.3389/fnhum.2016.00377

Magstim EGI
78C Centennial Loop
Eugene, Oregon 97401
Phone: +1 541 687 7962
Fax: +1 541 687 7963
www.egi.com

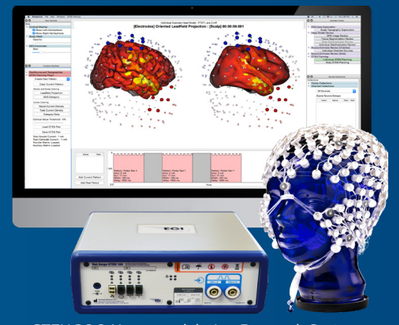
Next generation **integrated HD EEG + Neuromodulation**

Geodesic Transcranial Electrical Neuromodulation 200 (GTEN 200)*

Record HD EEG and deliver current simultaneously -using the same Geodesic Sensor Net

A single integrated platform featuring:

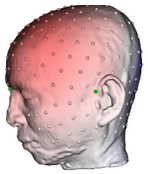
- Options for 32, 64, 128, or 256 channel sensor nets allowing any electrodes to serve as anodes, cathodes or recording electrodes
- Up to 2 mA current intensity for custom HD tDCS, tACS, tPCS, and tRNS protocols
- Individualized head modeling and a library of age-matched atlases
- Source localization tools (LORETA, sLORETA, LAURA)
- Software Developer's Kit (SDK) included complimentary



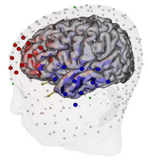
GTEN 200 Neuromodulation Research System

Robust planning tools to optimize for each individual

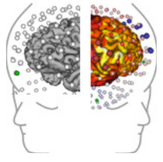
Create an MR-based individualized head model or select an age-matched atlas
– Account for intersubject differences from the start



Design your custom stimulation protocols in one of three ways:
– Manually select electrodes and current level
– Choose a region of interest within the brain to target
– Use EEG-based source localization to guide the stimulation paradigm



Localize with confidence
- High density, whole head electrode coverage and finite difference method head models allow for highly accurate source localization



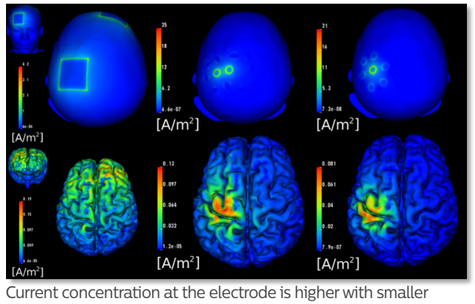
Apply the reciprocity theorem to align stimulation with physiology
- A cortical source's scalp voltage projection is the same as the scalp stimulation required to stimulate/modulate that cortical source[1]

Maximize flexibility with a larger array of montages

Localize targeting by selecting, combining custom stimulation arrays
- Up to 256 channels of EEG, of which 190 channels can be used for stimulation, with spatial selectivity to stimulate multiple anodal/cathodal pairs at a given time (minimum of 10 pairs needed to achieve maximum current)

Achieve greater focality with smaller stimulation sensors
- 1cm^2 enables 0.2mA/cm^2 current density in patch electrodes

Measure the targets and effects with HD EEG
- Use EEG-based source localization to guide the stimulation paradigm and seamlessly record EEG while stimulating



Current concentration at the electrode is higher with smaller electrodes and has been shown to achieve more focal stimulation

Close the loop and change protocols in real-time driven by physiology
- Use the Software Developers' Kit (SDK) and other open-source platforms to develop and perform closed-loop neuromodulation

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