



WHOLE-HEAD NEUROIMAGING

fNIRS + EEG

HIGH-DENSITY • BIMODALITY
MOBILITY • FLEXI-MODULARITY

INTEGRATES WITH VIRTUAL REALITY



WWW.BIOPAC.COM

APPLICATIONS

Cognitive Neuroscience

Sports Sciences

Virtual Reality

Motor Walking

Language

Auditory

Social Interactions

Hyperscanning

Epilepsy

Deep Brain Stimulation (DBS)

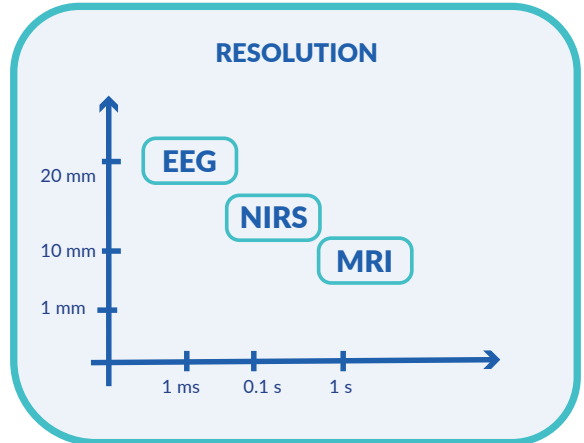
Vagal Nerve Stimulation (VNS)



The fNIRS + EEG Advantage

MedelOpt provides high-quality measurements of changes in oxy- and deoxy-hemoglobin simultaneously with electric potentials

Functional near infrared spectroscopy (fNIRS) measures changes in oxygenation and hemodynamic response while EEG signals measure electrical neuronal activity. The spatial resolution of fNIRS is superior to EEG, and the temporal resolution of EEG is superior to fNIRS. MedelOpt combines the advantages of both signals.



Researchers can now simultaneously collect neural and vascular brain activity in a flexible, adaptable headset. MedelOpt provides accurate measurements for in-vivo 2D/3D functional brain mapping.

Features



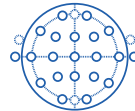
NIRS Technology

Continuous Wave



Sampling Frequency

128 Hz on detectors, up to 32 Hz for emitters



Electroencephalogram

8 electrodes with 512 Hz sampling frequency



Channel Distances

Flexible up to 55 mm



One Headset

Fits 4-year-old to adult



MedelOpt Breakthrough Technology for Brain Researchers



Direct Access to the Scalp

Unique headset design allows easy access to the scalp to move hair from under optodes without removing the headset



Modular, Expandable Headset

Flexible sensor placement, NIRS and EEG can be set up to record the whole head from the cognitive to the visual area



Crafted for Wearability

Lightweight, comfortable, and easy to adjust system allows data acquisition from stationary or mobile participants

Integrate MedelOpt with Physiological Data from BIOPAC Devices

MedelOpt fNIRS and EEG systems combine high-density NIRS with EEG in a flexible, adaptable headset. Developed by researchers for researchers, MedelOpt offers a variety of options to use in the lab, in the field, and in virtual reality.

The headsets are flexible, modular, and adapt to the size of the person and to the size of the study. Start with an 8-channel system and add channels as your study grows. Headsets can collect data for up to eight hours. MedelOpt systems can be adapted from EEG/fNIRS modality to hyperscanning to support a range of interests and budgets.



MedelOpt Virtual Reality (VR)



SHOWN WITH META QUEST 2

MedelOpt VR integrates seamlessly with a variety of VR head-mounted displays, WorldViz's PPT motion tracking systems, and Vizard software.

Combining VR with fNIRS allows researchers to measure brain activity in response to simulated environments, providing insights into how the brain processes and reacts to different stimuli. Researchers can study the effects of VR on attention, memory, decision-making, and emotional response.

Talk to a BIOPAC specialist about VR solutions for Vizard and Unity.

MedelOpt fNIRS with EEG

MedelOpt research devices provide full integration of functional near infrared spectroscopy and electroencephalogram in a single headset. The unique design blends bimodality and flexi-modularity in an adaptable and self-contained system.

Direct Access to Scalp



MEDELOPT MOBILITY

Wireless with unlimited range for mobility and high-density mapping up to 128 channels



MEDELOPT INFINITY

16 emitters and 32 detectors for whole-brain mapping up to 512 channels and custom advanced montages with variable depths

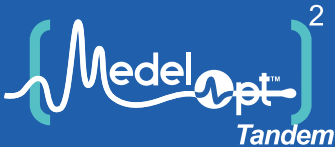


Seenel Imaging Technology

Functional Neuroimaging Systems

MedelOpt supports a wide range of research possibilities and provides access to the scalp without removing the headset. Adjust modular components for optimized fit and data collection. MedelOpt VR is fully integrated with a head-mounted VR device like Meta Quest 2 and others.

No Cap Needed



MEDELOPT TANDEM

Simultaneous acquisitions for brain synchronization with high-density hyperscanning 256 to 1024 channels with two headsets







MEDELOPT VR

Combine fNIRS, EEG, VR, and Physiology for both cognitive and physiological insights using immersive stimuli



Protected by International Patent Applications

MedelOpt System

System Type	Part #	Emitters/ Detectors	EEG
 <div>MOBILITY</div>	MOBIL 8-8	8/8	No
	MOBIL 8-8-EEG	8/8	Yes
	MOBIL 8-16-EEG	8/16	Yes
 <div>VR</div>	VR-8-8	8/8	No
	VR-8-8-EEG	8/8	Yes
 <div>INFINITY</div>	INFIN 16-16	16/16	No
	INFIN 16-16-EEG	16/16	Yes
	INFIN 16-32-EEG	16/32	Yes
 <div>TANDEM</div>	TAND 8-8	8/8 per headset	No
	TAND 8-16	8/16 per headset	No

Specifications

Wireless	Short Channel	Use Cases
Yes	Up to 8	MedelOpt Mobility is lightweight and easy to use. Researchers can study brain function in real-world settings with natural movement such as walking, running, etc.
Yes	Up to 8	
Yes	Up to 8	
Yes	Up to 8	Combining VR with MedelOpt allows researchers to measure brain activity in simulated environments, providing insights into how the brain processes and reacts to different stimuli.
Yes	Up to 8	
Optional	Up to 16	High-density whole brain mapping and custom advanced montages with variable depths. Researchers can pinpoint specific brain regions involved in a task or stimulus.
Optional	Up to 16	
Optional	Up to 16	
No	Up to 4 per headset	Two headsets synchronize acquisitions and hyperscanning to investigate the neural mechanisms underlying social interactions, empathy, cooperation, and conflict.
No	Up to 4 per headset	

Protected by International Patent Applications

Dual Task: Treadmill + Countdown

Walking (Velocity: 4 km/hour)
Counting back by 7 while walking

The inherent mobility of MedelOpt allows researchers to quantify how the brain is functionally involved in gait control during walking.

Recent studies using fNIRS, a noninvasive optics-based neuroimaging modality, shed light on the functional brain correlates of walking.

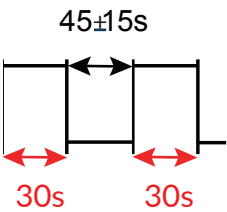


12 blocks

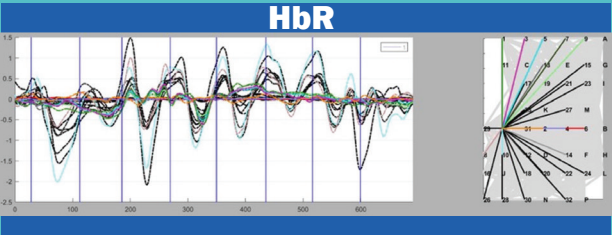
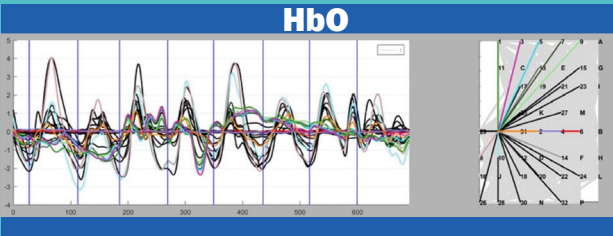
Baseline: 30 sec

Task: 30 secs

Rest: 45 + x seconds,
with x = a random number [-15,15]



*Channels from
One Source in
Motor Cortex*





MedelOpt systems are designed to support a range of settings and can be expanded as needed. Works with EIOpt software and AcqKnowledge software.

Montages

Design the best high-density montage for your studies

Distances

From 20 to 55 mm, choose channel distance and depth

Calibration

Control your calibration

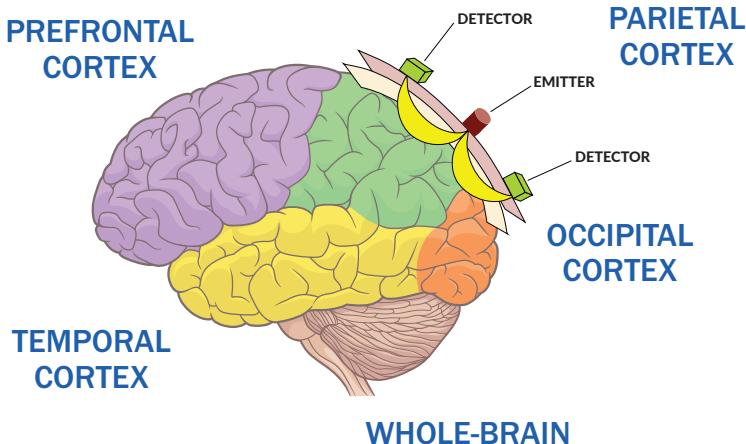
Head sizes

One headset adjusts to all sizes: 4-year-old to adult

Integrated Optodes

The optodes are integrated into the headset, making it very easy for the researcher to use

Measurement Areas



*Inspiring People and
Enabling Discovery
About Life*

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