BIOPAC Systems, Inc.

MedelOpt+

WWW.BIOPAC.COM

APPLICATIONS

Cognition & Behavior

- Cognitive Neuroscience
- Language
- Auditory
- Social Interactions

Movement & Interaction

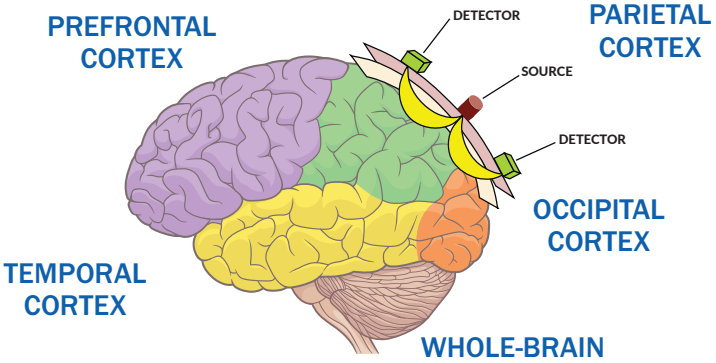
- Sports Sciences
- Mobility Studies
- Virtual Reality

Clinical / Modulation

- Epilepsy
- Deep Brain Stimulation (DBS)
- Vagal Nerve Stimulation (VNS)

Integrated Brain-Body Platform

MedelOpt+ *f*NIRS/EEG device integrates with BIOPAC's Acq*Knowledge* software and MP Systems to synchronously record *f*NIRS, EEG, ECG, EMG, EOG, EGG, EDA, respiration, airflow, expired gases (CO_2 & O_2), PPG, blood pressure, temperature, force, SpO_2, eye tracking, and accelerometry. Built-in support for visual, auditory, tactile, olfactory, and electrical stimulation, video recording, and event marking enables fully synchronized multimodal data collection—bringing brain, body, and behavior together in a single workflow.



- **Precision and synchronization:** The system features a lightweight exoskeleton headset and montage generator for accurate source—detector positioning, combined with a **shared clock and hardware triggers** to eliminate latency and drift, ensuring temporally aligned datasets for advanced analysis.
- **Workflow efficiency and scalability:** Acquisition, setup, and analysis are unified in a single Acq*Knowledge* workflow, reducing setup time and errors, with support for real-time data access and multiple file formats. Modular hardware and cloud capabilities enable reproducible, scalable studies across multiple participants and labs.

The *f*NIRS + EEG Advantage

MedelOpt+ combines 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 headset is modular and adapts to the size of the person's head as well as the study. Start with a 64-channel NIRS system and add NIRS and EEG as your study grows. The Mobility system can collect data for up to eight hours. Tandem systems allow data collection from multiple participants for hyperscanning to support a range of interests and budgets.

MedelOpt+ Breakthrough Technology for Brain Researchers

Direct Access to the Scalp

Rapid preparation/ inspection and improved coupling through hair.

Modular, Expandable Headset

Expand NIRS density on demand. Start at 8/16 and upgrade to 16/32 without changing the headset.

One Size Fits All

Adaptable from children to adults while maintaining optode contact.

Designed for rapid reconfiguration across participants without remapping.

BIOPAC solutions are used by leading universities around the world and cited in thousands of scholarly publications

Why MedelOpt+

Unified Brain-Body Platform

Synchronized Brain-Body Data

Acquire *f*NIRS, EEG, ECG, EDA, RESP, PPG, STIM, video, audio, etc., all in Acq*Knowledge* interface.

Real-Time Control & Instant Replay

View signals live and instantly review multimodal data post-acquisition.

Hardware-Level Precision Sync

Time-locked events across all channels eliminate drift and misalignment.

Integrated Stimulation Control

Run complex paradigms with visual, auditory, electrical, haptic, thermal, and olfactory, all fully managed through Acq*Knowledge*.

VR-Ready

Combine *f*NIRS, physiology, and stimulation with immersive VR environments synchronized and controlled in one platform.

Powerful, Flexible Neuroscientific Research Systems fNIRS + EEG + Physiology

MedelOpt+ VR

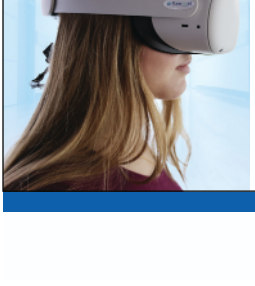
SHOWN WITH META QUEST 2

MedelOpt+ VR integrates seamlessly with BIOPAC's VR systems including head-mounted displays, motion-tracking, eye tracking, and software. Exoskeleton and native VR mounting options for leading HMDs (e.g., Meta Quest 2/3, VIVE Focus).

Combining VR with *f*NIRS and/or EEG 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 cortical regions, e.g., Motor Cortex, SMA, and DLPFC.

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

MedelOpt+ System Specifications

System Type	Part #	Sources/Detectors	EEG
MOBILITY 	MOBIL 8-8	8/8	No
	MOBIL 8-8-EEG	8/8	Yes
	MOBIL 8-16-EEG	8/16	Yes
INFINITY 	INFIN 16-16	16/16	No
	INFIN 16-16-EEG	16/16	Yes
	INFIN 16-32-EEG	16/32	Yes
TANDEM 	TAND 8-8	8/8 per headset	No
	TAND 8-16	8/16 per headset	No
	Other combinations available including EEG. Contac		
VR 	VR-8-8	8/8	No
	VR-8-8-EEG	8/8	Yes

Seenel Imaging Technology is

Specifications subject to change. MedelOpt+® is intended for rese
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BIOPAC®, BioNomadix®, and Acq*Knowledge*® are reg

Wireless	Use Cases	Expand with BIOPAC
Yes	Mobile applications requiring greater degrees of participant movement, as well as high-density mapping with up to 128 channels.	ECG & HRV
Yes		EDA
Yes		EMG
		EOG
		EGG
Optional	Whole-brain/high-density mapping up to ~512 channels; custom advanced montages with variable depths.	Pulse
Optional		Respiration
Optional		Temperature
		Cardiac Output
		Heel & Toe Strike
No	Social interaction, cooperation/ competition paradigms (two synchronized headsets).	Clench Force
No		Accelerometer
		Goniometer
		Eye Tracking
		Stimulation
Yes	Study the effects of VR on attention, memory, decision-making, and emotional response. Research applications with regions of interest from the prefrontal to the cerebellum and through the parietal and lateral cortex.	Video Synchronization
		Behavioral Data
Yes		And Many More

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s Protected by International Patent Applications

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naging SAS. Certain features are protected by international patents.
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High-Performance *f*NIRS & EEG

Ultra-Low Noise Electronics

~0.3% of sensor dynamic range; representative signal-to-noise ratio ≈ 151:1 (example signal 25,650 counts).

Stability & Linearity

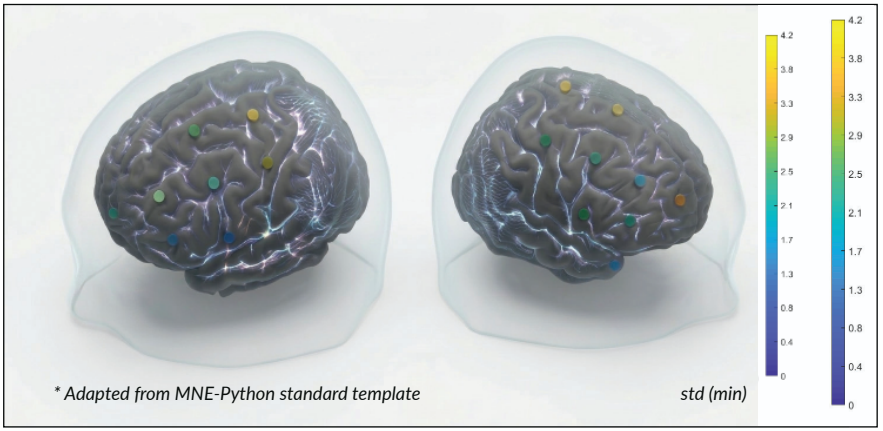
>6-hour drift-free *f*NIRS performance validated following MEDPHOT criteria.

More Light In, More Signal Out

+53% LED output (peak up to 20 mW); up to +48% detected light vs. prior generation.

EEG Integrity

Integrated shielding significantly reduces 0–10 Hz noise for cleaner delta/theta/alpha bands during multimodal or VR use.



Exceptional, Reproducible Spatial Accuracy—Only 2.9 mm Variation

~5× Better than Electrode Cap-Based Placement

Drives reproducibility across participants and sessions.

Risk-Free Configuration

Modular exoskeleton keeps *f*NIRS sources/detectors and EEG electrodes locked; swap participants without rewiring the entire cap.

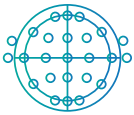
Common Technical Specifications

Brain-Body Platform

One Application with Time-locked Synchronization
for Physiology + *f*NIRS + EEG

NIRS Technology

Continuous Wave
660/850 nm



EEG

8 electrodes @ 512 Hz
fully integrated

NIRS Sampling

Sources up to 32 Hz,
Detectors 128 Hz

Channel Distances

Flexible, 8–50 mm
(variable depths)

Stability

Validated ≥6 h acquisition
(MEDPHOT-guided tests)

Short-Separation Channels

Configurable from
1 to numerous;
higher densities available

Optode Placement

±2.9 mm average
accuracy (MeMoSoft
included)

Electronics

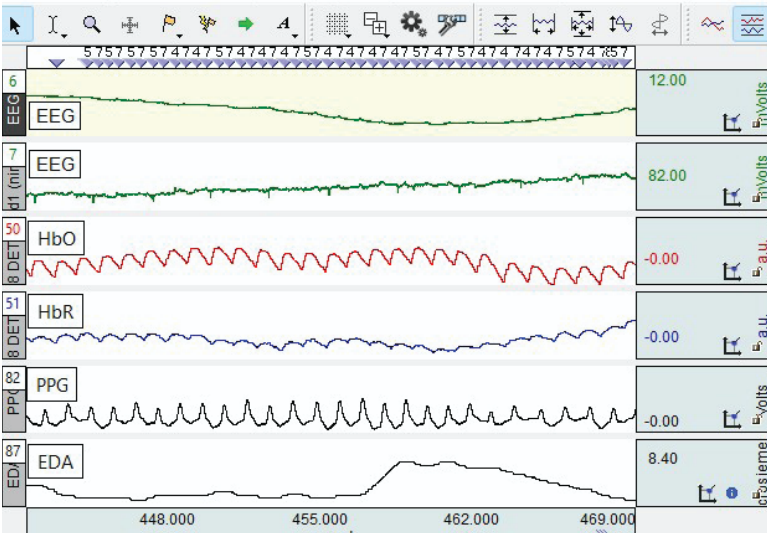
Ultra-low noise (~0.3% of full range); high linearity across intensity range

LED Peak Power

Up to 20 mW
per source

One Application, Full Insight

The only platform that unifies neurological data, physiology, and stimulation in one interface.



Seamless Integration with BIOPAC Systems

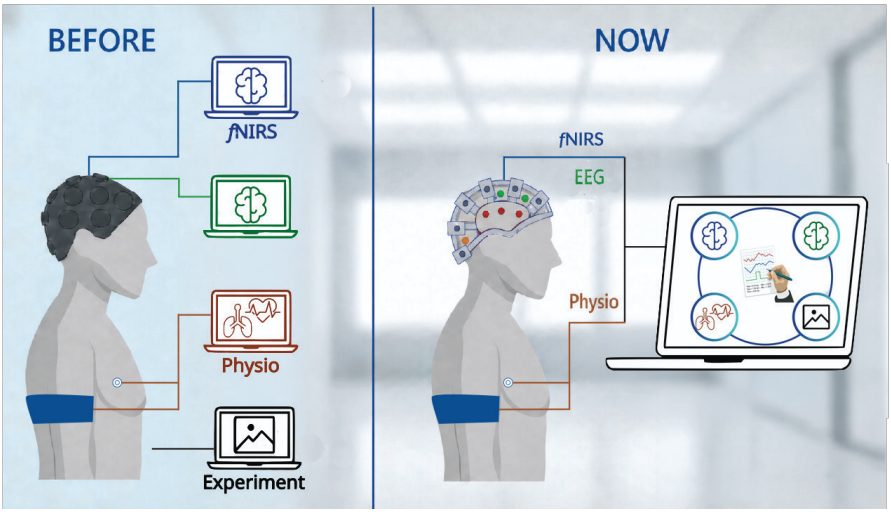
Powered by Acq*Knowledge*, MedelOpt+ integrates *f*NIRS with EEG and—when paired with the MP200—supports synchronized physiology, stimulation, eye tracking, video, and VR. The MP200 System enables acquisition of ECG/HRV, respiration, EDA, PPG, and more.

Single Software Solution—Fully Integrated with Acq*Knowledge* software and BIOPAC MP200 hardware

- Multichannel data acquisition with rich visualization
- Transformations/filters & automated analysis
- Advanced stimulation—electrical, visual, auditory, haptic, olfactory, and thermal
- Triggering & event marking—control external hardware and add event marks
- Behavioral monitoring with integrated video and audio

Systemic Physiology Augmented *f*NIRS (SPA-*f*NIRS)

Measure and model systemic drivers (respiration, heart rate/HRV, EDA, and motion) to distinguish between neural and systemic components and study brain body interactions.



Why SPA-*f*NIRS?

- Filters out non-neural signals to improve data reliability
- Reduces false positives and false negatives by regressing systemic components
- Enables new insights into embodied cognition and social interaction
- Aligns with emerging best practices in systemic physiology regression

Bottom Line

From setup to insight, MedelOpt+ delivers cleaner signals, fewer errors, and faster outcomes, enabling users to focus on discovery rather than troubleshooting.

Watch On-Demand fNIRS Training at BIOPAC.COM/WEBINARS

Inspiring People and Enabling Discovery About Life

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