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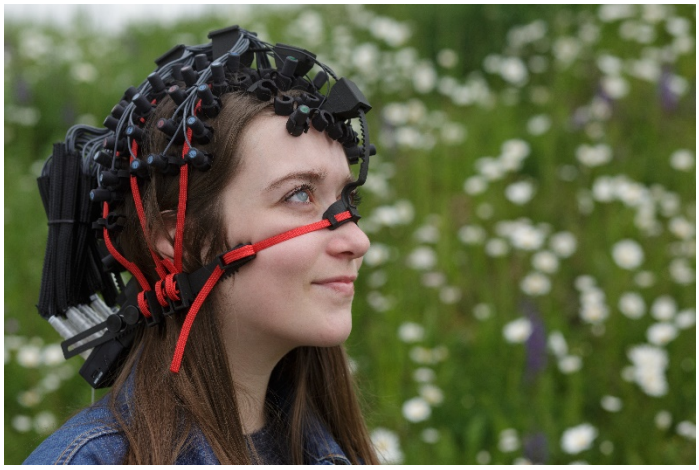
MEDELOPT FUNCTIONAL NEUROIMAGING SYSTEMS—FNIRS WITH EEG

MEDELOPT® MOBILITY
- MOBIL 8-8
- MOBIL 8-8 EEG
- MOBIL 8-16 EEG

MEDELOPT® INFINITY
- INFIN 16-16
- INFIN 16-16 EEG
- INFIN 16-32 EEG

MEDELOPT® TANDEM
- TAND 8-8
- TAND 8-16



MedelOpt® research devices provide full integration of functional nearinfrared spectography (fNIRS) and electroencephalogram (EEG) modalities in a wearable, self-contained headset. The unique design, developed by researchers for researchers, blends bimodality and flexi-modularity in an adaptable and self-contained system that supports a wide range of research possibilities.

The MedelOpt® line consists of three product categories: Mobility, Infinity, and Tandem.

All three categories support the following features:

- Continuous wave fNIRS technology
- Emitter/detector distances adjust from 20 to 55 mm—choose the distances and depth of your channels
- Emitters/detectors can be added to headset to increase channel count
- Headset adapts to a range of head sizes (no need to purchase additional headsets)
- Sampling frequencies of 128 Hz on detectors and up to 32 Hz for emitters
- Fully integrated 8 electrode EEG with 512 Hz sampling frequency

fNIRS + EEG Advantage

fNIRS technology measures changes in oxygenation and hemodynamic response while EEG signals measure electrical neural activity. While fNIRS offers a higher degree of spatial resolution than EEG, EEG provides superior temporal resolution over fNIRS. MedelOpt® combines the advantages of both signals.The simultaneous analysis of various neural and vascular components by EEG in tandem with fNIRS makes it possible to see the mechanisms involved and their interactions by a multimodal, multidimensional approach. Additionally, this simultaneous approach combines EEG's high temporal resolution with the high spatial resolution of fNIRS.

PRODUCT CATEGORIES:

MedelOpt® Mobility

MedelOpt® Mobility headsets allow high-density mapping of EEG and fNIRS signals while study participants move freely and participate in physical exercise. Mobility wireless headset units can record up to 128 channels with unlimited range through WiFi connectivity. The Mobility line includes three models, all of which are designed for applications that require the study participant to have freedom of movement. The Mobility product line includes the following models:

- MOBIL 8-8
- MOBIL 8-8 EEG
- MOBIL 8-16 EEG

MedelOpt® Infinity

MedelOpt® Infinity headsets provide whole-brain mapping with up to 512 channels recording from up to 16 emitters and 32 detectors, allowing custom advanced montages at variable depths. The Infinity line includes the following models:

- INFIN 16-16
- INFIN 16-16 EEG
- INFIN 16-32 EEG

MedelOpt® Tandem

MedelOpt® Tandem Systems provide two (2) headsets for synchronized acquisitions, hyperscanning, and social interactions. MedelOpt® Tandem's dual-headset design and high-density hyperscanning from 256 to 1024 channels make it ideal for brain synchronization studies. Tandem can be used for research applications with regions of interest from prefrontal to the cerebellum and through the parietal and lateral cortex. The Tandem line includes the following models:

- TAND 8-8 (64 theoretical channels with each headset)
- TAND 8-16 (128 theoretical channels with each headset)

SYSTEM-SPECIFIC SPEC COMPARISON

Product Category	System	Emitters/ Detectors	EEG	Wireless	Short Channel	Use Cases
Mobility	MOBIL 8-8	8/8	no	yes	1	Mobile applications demanding greater degrees of subject freedom, high-density mapping up to 128 channels
	MOBIL 8-8 EEG	8/8	yes	yes	1	
	MOBIL 8-16 EEG	8/16	yes	yes	1	
Infinity	INFIN 16-16	16/16	no	optional	≤16	In lab applications, whole brain mapping up to 512 channels and custom advanced montages with variable depths
	INFIN 16-16 EEG	16/16	yes	optional	≤16	
	INFIN 16-32 EEG	16/32	yes	optional	≤32	
Tandem	TAND 8-8	8/8 (each headset)	no	no	1 each headset	Two headsets for synchronized high-density hyper scanning, 128 to 512 channels each headset
	TAND 8-16	8/16 (each headset)	no	no	1 each headset	

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COMMON SPECS:

Electronic Box Dimensions:	22 mm x 85 mm × 48 mm
Environment:	
Operating temperature:	10–40°C (50–104° F)
Transport and storage temperature:	0–50° C (32–122° F)
Operating humidity:	0% ~ 70%, non-condensing
Transport and storage humidity:	0% ~ 90%, non-condensing
Operating altitude:	Up to 3,000 m
Power requirements	
Voltage:	5 V DC micro USB
Current consumption:	Max. 1.0A
EEG (If included)	
Sampling rate:	512 samples/sec.
Number of channels:	8 + 1 reference + 1 active ground
ADC resolution:	24 bits
Amplifier gain:	24 V/V
CMRR (Common Mode Rejection Ratio):	-110 dB min.
Input impedance:	500 MΩ || 10 nF
Input-referred noise (0.01Hz to 70Hz):	1 µVpp typ.
Full-scale input voltage:	187.5 mV
NIRS	
Sampling rate:	128 Hz ; Light Activation rate 4, 8, 16 or 32 sample/sec.
Receivers:	Silicon Photodiodes
Emitters:	LEDs dual wavelength
Wavelength:	660 & 850 nm
Cable length NIRS:	Shielded cable Length > 60 cm
Light Source:	LED IR, class: Risk group GR0 according to IEC 62471
ADC resolution:	16 bits
Transimpedance amplifier gain:	0.5 e+9 V/A
Dark offset:	1 mV typ.
Dark offset noise:	283 µVRMS
Sensitivity:	290 V/µW at λ=900 nm
Frequency response (-3dB):	130 Hz typ.
Auxiliary input	
Sampling rate:	256 samples/sec.
Number of channels:	2
Input impedance:	600 Ω
Input voltage:	0/+5 V TTL