kernel

Flow System Specification

Time Domain fNIRS

Time-Resolved measurements reduce susceptibility to ambient light and motion artifacts while also improving depth sensitivity. We use advanced technology buillt around custom time-domain sensors and compact pulsed laser drivers.

Detector Sampling Rate

200 Hz sampling rate allows for better measurement and compensation of physiology.

Modular Optodes

Our modular system allows for purchasing a starting system with minimum of 12 modules and expanding as needed for your research objectives.

Output File Formats

SNIRF, NIfTI

Standard formats allow you to import the data into custom and third party tools.

Output Metrics

Cloud-based Time Domain Tools for Standard Outputs

- Oxy / Deoxy / Total Hb per Channel
- 1st and 2nd Moments per Channel
- Absolute Bulk Tissue Oxygenation per Channel
- Relative Oxy / Deoxy / Total Hb volumetric reconstruction per voxel

Our comprehensive set of well documented analysis methods ensure you are up and running quickly with accurate and valid results.

52	312	500+
Sources	**Detectors**	**Channels**

Source-detector pairs can span modules allowing ultra high channel counts.

690nm / 850nm

Dual wavelength laser diodes

Automated laser power adjustment for easily adapting to user hair and skin color.

Up to 20 systems

Hyperscanning

Flow systems can be synchronized together and to other peripherals using our provided peripheral sync device.

>80dB

Dynamic Range

Enables resolution of brain hemodynamics even for short channels.

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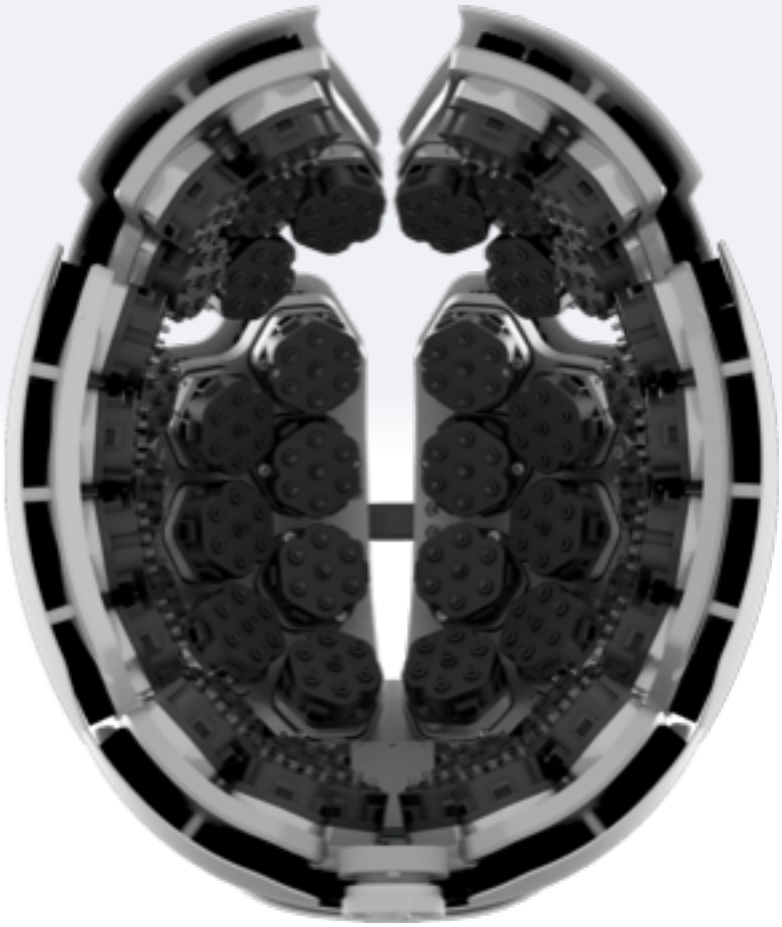

Headset

Weight

2.2 kg for all 52 modules and the headset

Wearable system that is easy to use.

Headgear

Minimum head size defined by:
52.5 cm Circumference
31 cm Bitragion Coronal Arc

Repeatable and precise positioning of headgear is achieved using rigid plates and fixed spacers.

Inertial Measurement Units

Five 9-axis IMUs

We capture 6 axes of accelerometer and gyroscope data at 200 Hz with an additional 3 axes of magnetometer data at 50 Hz. Motion capture at the same rate as our optical data allows for precise motion correction.

Laser Classification

Class 2 FLPPS 21CFR1040.10

Our lasers are safer than most cat toys.

EEG

Dry Active EEG Electrodes

6 + Ground & Reference

Provides good SNR without using electrolyte.

1 kHz EEG Sampling Rate

Allows for millisecond accuracy of data and triggers.

Connectivity

Data Storage

~80 GB/hour of recording

A full day of recordings can be stored on a typical PC before uploading to Kernel Cloud.

Power and Data

Data is transmitted over USB 2.0 and power is supplied over the same USB-C cable using the USB-PD Standard.

Cable

Up to 10’ USB-C (provided)

10’ cable allows for easy setup in varied experimental settings.

Power Consumption

75 W max

Lower power consumption allows for power supply over USB-C.