

## Technical specifications

TECHNOLOGY	Continuous wave Near-Infrared Spectroscopy (NIRS) using the modified Beer-Lambert law
RELATIVE MEASURES	Oxy-, deoxy-, and total hemoglobin concentration changes
ABSOLUTE MEASURES	Tissue saturation index (TSI) using spatially resolved spectroscopy (SRS)
CHANNELS	3 relative, 1 absolute (per sensor)
TEMPLATE & LOCATION	Fixed template for muscle and brain (frontal cortex)
INTER-OPTODE DISTANCE	15, 20 and 25 mm
RECEIVERS	1 photodiode
TRANSMITTERS	3 LEDs, each with 2 wavelengths, custom wavelength possible
WAVELENGTHS	Standard 760 and 850 nm
AMBIENT LIGHT CORRECTION	Proprietary algorithm to filter out ambient light
DIMENSION	Control Unit: 123 x 57 x 23 mm. Sensor: 41 x 19 x 6 mm. Wire at least 1.2m
WEIGHT	Control Unit: 120 gram. Single sensor: 34 gram.
ENVIRONMENT	Operating temperature: 10 - 40 °C
INDICATORS	On/Off, Standby/Measuring, Battery status, Sensor connected/disconnected
POWER	Up to 30 hours with fast-charging battery
SAMPLE RATE	100 Hz
DATA COLLECTION & STORAGE	Online and offline (> 250 hours)
DATA ACQUISITION & ANALYSIS SOFTWARE	OxySoft
OPERATING SYSTEM	Windows 11
EVENTS	Online, offline or PortaSync
ELECTROMAGNETIC COMPATIBILITY	No interference with TMS, EEG, EMG, ECG
HARDWARE SYNC OPTIONS	PortaSync, parallel cable, serial cable, LabStreamer
SOFTWARE SYNC OPTIONS	ASCII, LSL, DCOM (e.g. Matlab, E-prime, Presentation)
NIRS + OTHER COMPATIBILITIES	We deliver the following packages: <ul style="list-style-type: none"> <li>PortaLite MKII Control Unit + 2 mini sensors</li> <li>PortaLite MKII Control Unit + 1 mini sensor</li> <li>PortaLite MKII Control Unit + combo 1 mini / 1 regular sensor</li> <li>PortaLite MKII Control Unit only</li> <li>PortaLite MKII mini sensor only</li> </ul>

## Relevant literature for the PortaLite MKII mini

Licea, J., Khan, O. A., Singh, T., & Modlesky, C. M. (2024). Prefrontal cortex hemodynamic activity during a test of lower extremity functional muscle strength in children with cerebral palsy: A functional near-infrared spectroscopy study. *European Journal of Neuroscience*, 59(2), 298-307.

Hakimi, N., Shahbakhti, M., Horschig, J. M., Alderliesten, T., Van Bel, F., Colier, W. N., & Dudink, J. (2023). Respiratory Rate Extraction from Neonatal Near-Infrared Spectroscopy Signals. *Sensors*, 23(9), 4487.

Ranger, M., Albert, A., MacLean, K., & Holsti, L. (2021). Cerebral hemodynamic response to a therapeutic bed for procedural pain management in preterm infants in the NICU: a randomized controlled trial. *Pain Reports*, 6(1), e890.

Lai, Y., Wang, Z., Yue, G. H., & Jiang, C. (2020). Determining whether tennis benefits the updating function in young children: A functional near-infrared spectroscopy study. *Applied Sciences*, 10(1), 407.

Stöcker, F., Neidenbach, R., Fritz, C., Oberhoffer, R. M., Ewert, P., Hager, A., & Nagdyman, N. (2019). Oxygen availability in respiratory muscles during exercise in children following Fontan operation. *Frontiers in Pediatrics*, 7, 96.

Beyer, K. S., Stout, J. R., Redd, M. J., Baker, K. M., Bergstrom, H. C., Hoffman, J. R., & Fukuda, D. H. (2019). Maturity-related differences in systemic pulmonary and localized fatigue threshold among youth male athletes. *Pediatric Exercise Science*, 31(1), 99-106.

## NIRS devices



### BabyBrite

A wearable & flexible multi-channel fNIRS device for brain oxygenation measurement. The BabyBrite is specially designed to provide extra comfort to young babies.



### PortaLite

Truly lite & advanced oxygenation monitoring device that measures local tissue saturation index (TSI), as well as oxy-, deoxy- and total hemoglobin concentration changes.



### Brite

A wearable multi-channel NIRS device with enhanced flexibility for brain oxygenation measurement that measures oxy-, deoxy- and total hemoglobin concentration changes from any cortical brain areas.



### OctaMon mini

A completely wearable 8-channel fNIRS device that measures oxy-, deoxy- and total hemoglobin and is optimized for pediatric research.

# PortaLite MKII mini

Infant & toddler research in the palm of your hand



Measures local oxy-, deoxy- and total hemoglobin concentration changes and tissue saturation index (TSI)



Truly light and portable, weighing only 188 grams, including two mini sensors



Specially designed for pediatric studies and neonatal research



Up to 30 hours of power with fast charging battery

[Get a quote](#)

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## Near Infrared Spectroscopy

NIRS, the technique which the PortaLite MKII mini is based on, relies mainly on two characteristics of human tissue. The first one is the relative transparency of human tissue for light in the NIR range and secondly, on the oxygenation dependent absorbance of the hemoglobin. These characteristics make it possible to measure brain activity and muscle tissue oxygenation, when the PortaLite MKII mini is applied to the forehead and muscle respectively.

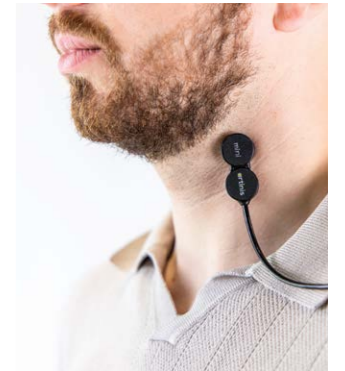
### WHAT CAN NIRS DO FOR ME?

- NIRS is used in many fields of research. NIRS enables measuring the relative changes in the concentration of oxyhemoglobin (O<sub>2</sub>Hb), deoxyhemoglobin (HHb) and total hemoglobin (tHb) in biological tissue.
- As absolute measurement, the PortaLite MKII mini measures / displays tissue saturation index (TSI) in both brain and muscle tissue.

## Applications

The flexible sensors of the PortaLite MKII mini optimally fit onto curved areas, such as a the head of infants and toddlers or small rounded muscles. It is highly portable, easy to use and provides almost no set-up time. Thanks to its light weight, possibility to perform offline measurement and battery longevity, it can just as well be used in the lab as in the field performing physical activities. Among the many application areas to choose from, the PortaLite MKII mini is particularly recommended for:

- Neonatal research
- Pediatric studies
- Clinical and Rehabilitation studies
- Functional studies
- Neuroscience studies
- Hypoxia studies, and more



# Where light meets Lite



## L

### imitless device range

The offline measurement feature enables performing measurement outside of Bluetooth range. This allows perfect data capture both in and out of the lab, such as home setting, hospital rooms, outdoor playground, and more. The data you have acquired offline can easily and directly be loaded in our software OxySoft for further analysis.

## I

### ntuitively designed for babies & toddlers

The PortaLite MKII mini, weighing only 188 g inclusive two mini sensors, ensures uninterrupted exploration for your little subjects. With quick and easy attachment, the sensors provide long-lasting comfort and a seamless experience, enhancing both the subject's playtime and the researcher's experiment.

## T

### wo sensors

The standard PortaLite MKII mini package comes with one control unit and two mini sensors. Thanks to these two separate connections, the PortaLite MKII mini offers the opportunity to use one or two sensors at the same time; and can even be combined with adult sensors to cover the widest range of measurement depth. This offers maximum flexibility in choice of application. Both sides of the brain, different muscles, or brain and muscle simultaneously - measurement possibilities are limitless!

## E

### xceptional data quality

High data quality is crucial to acquire results that can be trusted on. Thanks to shorter inter-optode distances, the mini sensors can be used to bridge the gap between short separation channels and regular channels of the adult sensors.



## PortaLite MKII mini sensor adhesive

The PortaLite MKII mini comes with a roll of medical grade adhesive. To safeguard infants and toddlers' sensitive skin, this adhesive has undergone rigorous testing for biocompatibility with skin irritation, sensitization, and cytotoxicity.

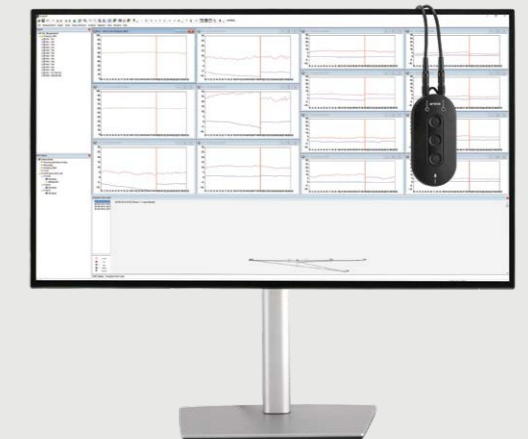
For sensitive patients for whom adhesive cannot be used, the PortaLite MKII mini sensors can be placed under a thick tight piece of clothing (i.e. a newborn beanie, a romper, etc.).

## Software

All of our devices come bundled with OxySoft, our proprietary NIRS recording and analysis software. This user-friendly software is highly customizable to individual requirements, and provides real-time calculations of oxy-, deoxy-, total hemoglobin and TSI.

With OxySoft, all data is seamlessly synchronized and stored in a single file, which can be analyzed during the recording, or afterward. OxySoft supports exporting the raw data to various formats, including to the standardized shared near-infrared file (.snirf) format, and is compatible with a wide range of third party software. Additionally, it enables for real-time streaming of data to e.g. Matlab or Python.

To ensure (f)NIRS data is always safe, even when out of Bluetooth range or during connection loss, a new Offline Recovery Tool is implemented in OxySoft to give researchers the opportunity to easily retrieve data in just a few clicks.



## What's in the box?

### PortaLite MKII mini research package

- PortaLite MKII control unit with two PortaLite MKII mini sensors
- PortaLite MKII mini starter pack
- Analysing unit with pre-installed software
- OxySoft, our proprietary data analysis software
- OxySoft license key

- Battery charger
- USB Bluetooth dongle
- Universal micro-USB cable
- User Manual & Quick start guide
- Support in setting up your research