NIRx
ENLIGHTENING INNOVATION

NIRx Medical Technologies, LLC

Enhancing
New Dimensions in Neuroimaging

NIRSport

nirx.net

NIRSport System Description

The NIRSport is a light-weight, freely configurable, multi-channel fNIRS imaging system that combines LED illumination with active detection technology for a truly wearable brain imaging solution. These novel product features allow for a wide field of innovative applications where portability, wearability, and a small footprint are essential. This system allows for noninvasive realtime ıemoglobin measurements of the cerebral cortex.

Wearable System Solution

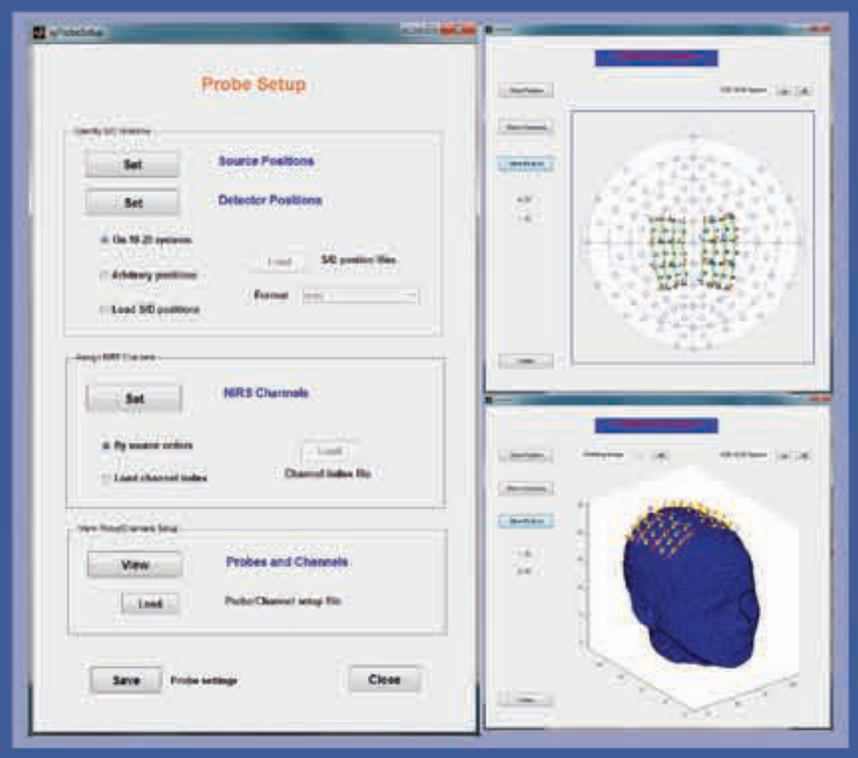
"The NIRSport offers 8 sources and 8 detectors (16 sources / 16 detectors in tandem mode) with a diverse array of available headgear and optical probes. Turn-key solutions are available for standard topography, neonatal/infant imaging, as well as multimodal acquisition with EEG, MRI, TMS, tDCS, and Eyetracking. NIRx offers both standardized probe positioning and custom-configurable setups.

This system has several digital input/output options for precise event marker triggering. A real-time data streaming option is available for BCI/neurofeedback applications. The NIRSport employs an open data format that is compatiblewith a variety of open-source analysis solutions as well as NIRx's proprietary NAVI software."

Applications

- Autism
- Brain Computer Interface
- Hyperscanning (Multi-subject Studies)
- Infant Monitoring
- Intra Operative Monitoring
- Language
- Learning and Attention
- Motor Tasks
- Neonatal-Infant Monitoring
- Psychiatric Disorders
- Speech Recognition
- Stroke and Rehabilitation
- Traumatic Brain Injury
- Wearable Studies

Probe Setup



Data Event Finder

Examples for various Advanced Plot styles during Scan

NIRStar Software Description

The NIRStar software package provides a user friendly Graphical User Intefrace for system control (calibration and probe setup), patient monitoring, real-time cortical 2d and 3d display capabilities, and a module for hyper-scanning.

NIRStar Instrument Software features:

Scalable sensor configuration

Real time event recording-display

Programmable illumination configuration

Online system performance checks

Time averaged event update display

Anatomically configurable optode arrangements: graphical 3-d digitizer

Real-time 2d, scalp, and cortical mapping with hyper-scanning capability of oxygenated, deoxygenated, and total hemoglobin

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Hardware

NIRSport Dimensions	105 mm x 170 mm x 40 mm
Net weight	660 g
Illumination type	LED
Number of Illumination Sources	8 (16 in tandem mode)
Detection Type	Active detection sensor (no optical fibers)
Number of Detectors	8 (16 in tandem mode)
Number of Channels	Up to 64 (up to 128 tandem mode)
System scan rate	2.5Hz to 62.5Hz
Dual Wavelength	760nm, 850nm (available up to 4 wavelengths upon request)
Dynamic range	60 dBopt
Sensor type	Si Photodiode
Sensitivity	< 1 pW
Host connection	USB 2.0 or 3.0 + USB 2.0 or 3.0 power via Host PC
Experiment timing	TTL/CMOS (8 In/ 8 Out max.)
E-Prime compatible	255 Input-Output Conditions
Supply voltage	15 - 21 VDC
Power consumption	39 VA max
Phase type	Single Phase
Mode of operation	Continuous Wave
Temperature range	10 to 40 degrees C (operating), -15 to 70 degrees C (storage and transport).
Humidity	Humidity 20 - 80% relative humidity non-condensing.
Standard measuring cap	128 optode positions
Static phantom	For system calibration
Standard accessories	System carrying case, system base-plate, NIRSport backpack for wearable studies, Adapter cable to connect parallel-cable (25-pin) to 10-pin IDC trigger input
PC Requirements	Dell Latitude E6430 with 3rd gen core i3 processor, 4 GB, 320 GB hdd, USB 2, Win 7 32-bit or equivalent configuration

Select System Features

2d topography • Measurement type: Change in oxy-hemoglobin, deoxy-hemoglobin and total hemoglobin concentrations • Light-weight, wearable system • Powered via laptop or tablet PC • LED Illumination: Greater temporal stability than laser source • Digital Detection, Digital Trigger I/O • Flexible imaging arrays supports multi-distance measurements • Multi-modal capability with: TMS, tDCS, MRI, EEG, Eyetracking • Real-time display, Real time data-streaming • Equipped with NAVI 2d-3d data analysis software from NIRx • Data exportable in ASCII format: compatible with other analysis software • Tandem capability: 2 separate systems synchronized to operate simultaneously • Highest dynamic range commercially available

Options

Software Developmet Kit

Custom configurable optical fibers

Custom LED-Optical fiber coupling solution

Integrated NIRS-EEG Head Gear

Custom configured headgear arrays

For real time data spooling

Available up to 10 meters

For multimodal studies: fNIRS-TMS, fNIRS-MRI

With most commercial EEG systems

Patches, Prefrontal, Whole head

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