

Dedicated
Near-Infrared Spectroscopy



NIRScout

High Density, Scalable Optical Neuroimaging Platform

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NIRScout System Description

The NIRScout is a user-friendly, modular, and robust functional near-infrared spectroscopy (fNIRS) platform which measures hemodynamic neuroactivation via oxy-, deoxy-, and total hemoglobin changes in the cerebral cortex.

The NIRScout platform includes a host of ready-to-implement upgrades and modules to meet the needs of a broad range of cognitive neuroscience applications.

Applications

BCI/Neurofeedback

Cognitive Disorders

Developmental Disorders

Hyperscanning (multi-subject measurements)

Movement/Balance

Infant Monitoring

Neuropathology

Neuropsychiatry

Social Interaction

Speech/Language

Stroke and Rehabilitation

Traumatic Brain Injury

Visual Impairment/Stimulation

Multi-modal Integration:

fNIRS +

EEG

fMRI

TMS

tDCS

Integrated System Solution

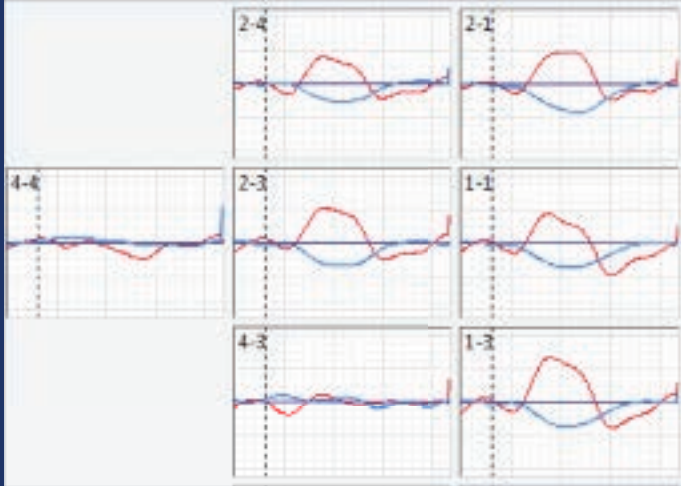
Freely-configurable probe arrays easily integrate with EEG and tDCS within a single NIRx NIRScap. Concurrent fNIRS + fMRI and fNIRS + TMS may be done with the NIRScout's low-profile fiber-optic probes.

NIRScout comes in two models: 'Standard' and 'Extended.' Either model may be upgraded by 8-source and 4-detector increments. Systems range from 8-source/4-detector configurations (32 data channels), to 128-source/64-detector tandem configurations (4096 data channels).

NIRScout can measure both topographic and tomographic NIRS data from the entire cortex, yielding 3-D depth-discriminating neuroactivation. Optical sources are available in standard LED (2 wavelengths) configuration or Laser (4 wavelengths) with the NIRScout hybrid LED/Laser source module.

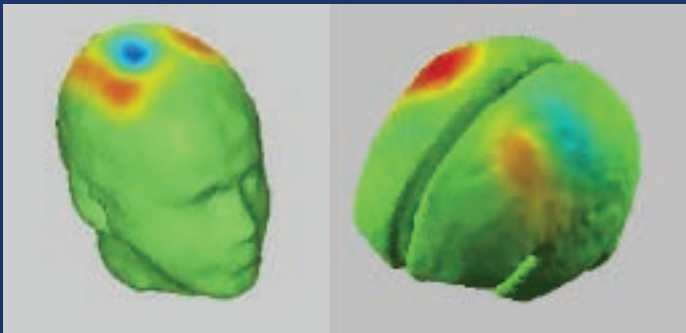


Realtime Block Averages



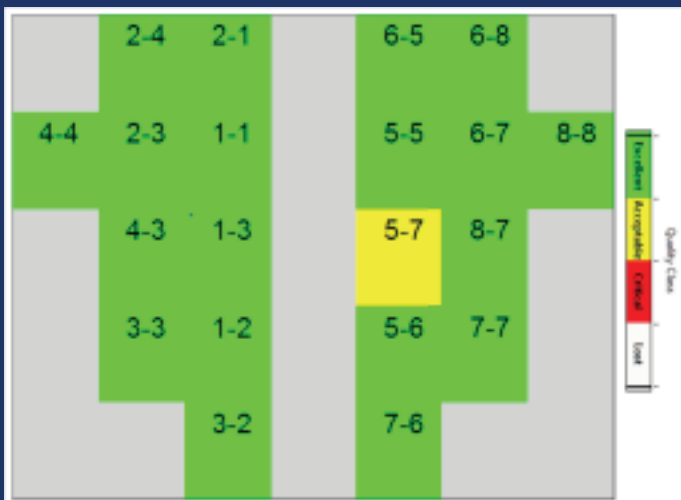
Compare events while recording

Realtime Activation Views



2D, 3D (shown) and MNI (shown)

Signal Quality-Indicator



Similar to EEG "impedance check"

NIRStar

NIRS Acquisition Software by NIRx

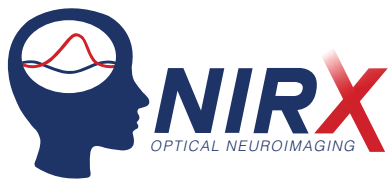
NIRScout includes the NIRStar software package, which provides a user-friendly GUI for system control including: quick automated calibration and diagnostics; signal quality checks (similar to EEG 'impedance check'); clear subject monitoring; and real-time data streams, block averages, and 2D, 3D and MNI activation displays.

NIRStar

Software Features

- Real-time multi-event block average views
- Activation shown in 2D, 3D, and MNI displays
- Includes built-in presentation software: NIRStim
- Automated hardware diagnostics
- SDK for BCI/Neurofeedback Applications
- Create and load flexible sensor configurations
- Automatic calibration and signal quality display
- Unique gain settings for each source-detector pair
- 3D optode position registration
- Programmable source-illumination pattern
- Hyperscanning: Multi-subject experiments
- Easy export to nirsLAB analysis software
- Raw data recorded; analyze in any environment





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NIRScout Technical Specifications

Maximum Sources	64 (up to 128 in tandem configuration)
Maximum Detectors	32 (up to 64 in tandem configuration)
Maximum Data Channel Streams	2048 (up to 4096 in tandem configuration)
Sampling Rate	2.5Hz - 62.5Hz (up to 100hz for NIRScoutX and NIRScoutX+)
Source Illumination Type	Hybrid Choice: LED + Laser Sources
Source Wavelengths	LED: 760nm & 850nm; Laser: 685nm, 780nm, 808nm, 830nm
Key Measurement Features	Time multiplexing and 10^9 dynamic gain state switching
Detector Dynamic Range & Sensitivity	Dynamic Range 90 dBopt; Sensitivity SiPD: <1.0 pW; APD: .05 pW;
Detection Sensor	Silicon Photodiode or Avalanche Silicon Photodiode
Trigger/Event Connection	Extended: 8-bit TTL Input and Output; Standard: 4-bit TTL Input
Maximum Functional Resolution	5mm - 30mm, depending on optode spacing
Data Acquisition Software	NIRStar (Included)
Topography Software	nirsLAB (Included)
Tomography Software	NAVI (Included)
Headgear	NIRScaps: Fully-customizable, fits all age ranges. Multi-modal (Included)
BCI/Neurofeedback	Optional Module for NIRStar
Multi-modal Compatibility	EEG, tDCS, Eye-tracking, Motion-tracking w/ module: fMRI, TMS
Included Accessories	NIRScaps, Carrying case, Strain-relief hardware, Trigger Cable, Instrument PC
Optional Accessories	Computer Cart, Active Trigger Splitter, fMRI/TMS modules, Flat and Blunt-Tipped Probes, Animal NIRs Module, BCI/Neurofeedback Module
Hyperscanning Configuration	Up to 4 separate bi-lateral 16-source/8-detector arrays for four subjects
Multi-distance/Short-distance Probe Arrays	Yes
3D Depth Discrimination?	Yes
Phase and Spectroscopic Technique	Single Phase, Continuous Wave
Temperature Range	10C to 40C (Operating), -15C to 70C (Storage)
Humidity	20% - 80% Relative Humidity Non-condensing
Power Voltage and Consumption	90 - 250 VAC (50 - 60Hz); 175W Max Consumption
Dimensions (WxHxL) and Weight	Standard: 260mm x 170mm x 330mm, 10kg Extended: 340mm x 170mm x 370mm, 16kg Extended Plus: 340mm x 270mm x 370mm, 16kg

NIRx instrument systems and software are not clinical devices and are intended for investigational device use only.