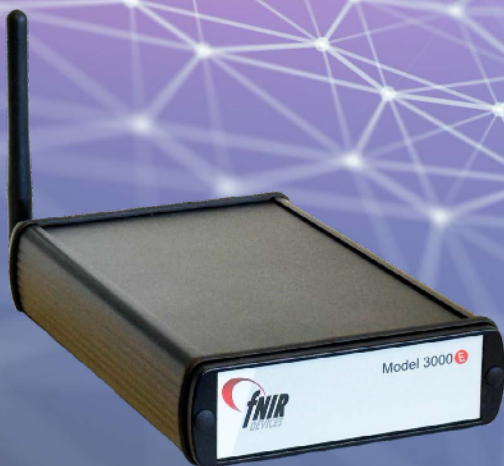


PREFRONTAL fNIRS IMAGING

AFFORDABLE COGNITIVE ASSESSMENT
CONTINUOUS WAVE fNIRS

WIRED AND WIRELESS SOLUTIONS



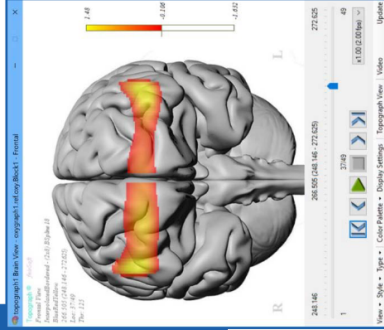
EASY SETUP • COMFORTABLE
NONINVASIVE • PORTABLE
INTEGRATES WITH BIOPAC SYSTEMS



BIOPAC.COM

APPLICATIONS

- Cognitive Neuroscience
- Brain-Computer Interface
- Emotional States
- Ergonomics
- Human Factors
- Human Performance Assessment
- Neuroergonomics
- Pediatric Pain Assessment
- Sports Science
- Stress, Emotions, and Workload
- Virtual Reality

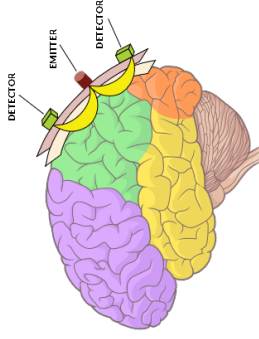


Functional Near Infrared Spectroscopy (fNIRS)

Assess Cognitive Activity in Real-Life Situations

fNIRS technology tracks hemodynamic response and neural activity of human subjects while providing researchers flexibility for study design, including working within complex lab environments and operating in nontraditional lab locations for field studies.

Subjects wear an fNIRS sensor on the forehead that detects blood oxygen levels and provides real-time values for oxygenated hemoglobin and deoxygenated hemoglobin. It provides a continuous and real-time display of the oxygen changes as the subject performs different tasks. Subjects can sit in front of a computer and take tests, perform tasks, or receive stimulation, allowing researchers to quantitatively assess brain functions such as attention, memory, planning, and problem solving.



fNIRS Optical Imaging Eliminates Many of the Drawbacks of fMRI

- Advanced signal processing algorithms
- Safe & noninvasive
- Comfortable sensors—adult, pediatric or split placement
- Record simultaneous EEG
- Affordable
- Fast & efficient setup
- Real-time display
- Portable—use in lab or field studies
- Avoid claustrophobia issues
- No special MR considerations
- Synchronize with other data or video



fNIR Devices: Complete Optical Brain Imaging Solutions

The fNIRS module measures relative change in hemoglobin levels, calculated using a modified Beer Lambert law. The powerful fNIR spectroscopy imaging tool measures NIR light absorbance in hemoglobin with and without oxygen and provides information about ongoing brain activity similar to functional MRI studies without the expense or hassle!



fNIR Spectroscopy Imaging Tools

3000 Imager

Wired and Wireless
Up to 18 optodes
20 Hz sampling frequency
*Optional Battery Pack not included

2000M Imager

Wireless and mobile system
Up to 18 optodes
10 Hz sampling frequency

*See note



Real-Time Monitoring

Track brain oxygenation changes during tasks or stimuli to quantify cognitive functions like attention, memory, and problem-solving.



Broad Applications

Ideal for studies in human performance, neurorehabilitation, pain research, and virtual reality environments.



Integrated Data

Sync fNIRS with eye tracking, pupil reflex, respiration, and electrodermal activity. Works with major stimulus and VR platforms.

Rapid Recording and Setup

Apply the sensor array and start recording within five minutes

Real-Time Monitoring of Tissue Oxygenation

Use when subjects take tests, perform tasks, view advertisements, experience ergonomic layouts, or receive stimulation

Flexible Study Design

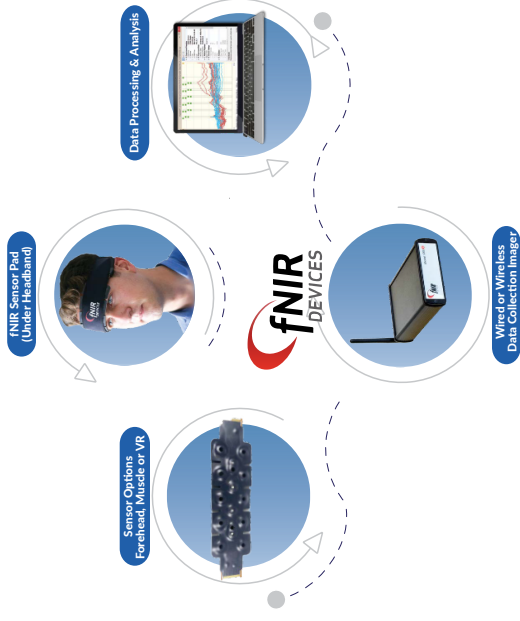
Works within complex lab environments or in the field for remote studies

Each System Includes

- Imager
- Sensor(s)
- Headband
- Cabling
- Power supply
- fNIRSoft & COBI Studio Software

Select systems include additional components such as computer or caddy.

fNIR Devices Sample System Setup



fNIR Devices Specifications

3000C Systems								
	Part	Type	Max Optodes	Sensors	Components	Cables	Sampling Frequency	Software
	FNIR104C	Tethered (USB)	18	1 x 6-channel	-	1	20 Hz	fNIRSoft Standard & COBI
	FNIR154C			1 x 18-channel	-	2		
	FNIR204C			3 x 18-channel	-	2		
	FNIR304C			3 x 18-channel	Surface Tablet + Caddy	2		
2000M Systems								
	FNIR103M	Wireless (Bluetooth 4)	18	3 x 18-channel	-	2	10 Hz	fNIRSoft Pro & COBI Studio
	FNIR203M			3 x 18-channel	1 Tablet/Notebook			
	FNIR303M			3 x 18-channel	1 Tablet/Notebook			
				2 x 5-channel				
<td>2 x 6-channel</td>	2 x 6-channel							
3000E Systems								
	FNIR104E	Tethered (USB)	6	1 x 6-channel	-	1	2 Hz	fNIRSoft Education including 4 fNIRS Lessons
Software, Upgrades, Add-on Single and Concurrent User License Options						Replacement Parts		
FNIRSOF-STD		fNIRSoft Standard Analysis Software			RXFNIR-3000-18S Shielded fNIR Sensor Pad-3000S + 18CH			
FNIRSOF-PRO		fNIRSoft Pro Analysis Software			RXFNIR-3000-18U Under-helmet Shielded fNIR Sensor Pad-3000 + 18CH			
FNIRSOF-UPD		fNIRSoft Update to Current License			RXFNIR-3000-5 fNIR Sensor Pad-3000 5CH			
FNIRSOF-S-UPD1		fNIRSoft Standard - Annual License			RXFNIR-3000-6 fNIR Sensor Pad-3000E 6CH			



Over 1,000 fNIRS Citations

Cognitive Neuroscience · Brain Computer Interface
Human Performance Assessment · Neurorehabilitation
Pediatric Pain Assessment · Neuroergonomics



Add Virtual Reality to Any fNIRS Study

fNIR Devices are compatible with a variety of HMDs.
Study the effects of VR on attention, memory,
decision-making, emotional response, and more.

Standard & Pro

fs Data Management: Import and Export Data Tools

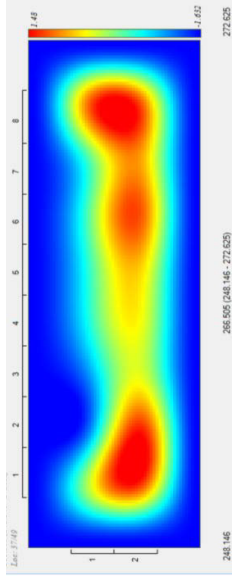
fs Scripting Engine: Built-In Command Line Interface

fs Data Management: Import and Export Data Tools

- **fs Scripting Language**
(functional and data oriented)
- **Editor with syntax highlighting and quick access tools**
- **History of commands and log operations in command pane**
- **Store procedures in script files**

fNIRSoft Pro Includes Above Features Plus

- Apply common statistical comparison and correlation
- Apply advanced modified Beer Lambert Law (MBLL) oxygen
- Apply spatial or cell-by-cell processing actions

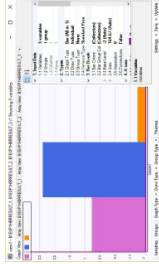


fNIRS for Education

BIOPAC's fNIRS Education System is affordable, safe (LED-based), and easy for students to use in the lab. Choose any of our four lessons listed below, including nine NIRS experiments. Give students the opportunity to observe and record well-known physiological phenomena such as the cuff occlusion task while also discovering trends in cognitive function.

F01 | The fNIRS System and Oxygenation Changes Measured on the Forearm

Students record fNIRS measurements to study changes in HbR and HbO₂ during a cuff experiment and investigate hemodynamic changes related to muscle activity.



F02 | The fNIRS System, Systemic Signals, and Artifacts

Students record fNIRS measurements from the forehead while performing various activities.

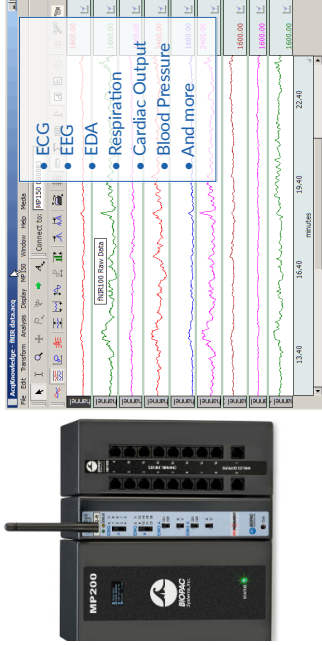
F03 | fNIRS Measurements During Verbal Fluency Tasks

Students record fNIRS measurements from the forehead while performing the verbal fluency cognitive test. Students will observe changes in HbR and HbO₂ under different conditions



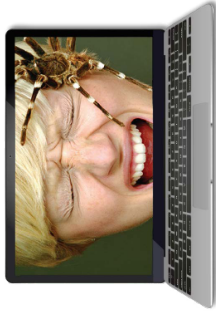
Sync with Physiological and Neurobehavioral Measures

Interface fNIRS hardware with a BIOPAC MP System and access a wide array of wired and wireless amplifiers and transducers. Synchronize both systems with additional signals and measurements.



Stimulus Presentation • Event Marking Virtual Reality • Multi-Subject Video Monitoring Eye Trackers • Observational Data

Stimulus Presentation and Eye Trackers



Virtual Reality

*Inspiring People and
Enabling Discovery
About Life*

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