NeuroNexus

neuronexus.com

XDAQ AIO

Updated Gen2 Design

Optimized Hardware, Firmware, API

Fast, Low Latency Interface

Better Signal, All Electrically Isolated Ports

Powerful, Yet Portable

Neuropixels Out-of-box

State-of-the Art Neuropixels Support - Seamlessly integrated support for both Neuropixels 1.0 and 2.0, enabling high-density recordings of up to 3,072 channels per unit.

High-Channel Passive Probe Compatability - Capture EEG, ECoG, LFP, and action potentials through a wide range of silicon probes or microwires - supporting up to 256 channels per cable and 1,024 channels per box.

Built-in Electrical Stimulation - Delivers up to 64 channels per cable and 128 channels per unit - fully integrated for streamlined, high-fidelity neural stimulation

Integrated Optogenetics - Built-in 4-channel high-power driver for precise, reliable optical stimulation - no external hardware required.

Robust I/O, HARP-Compatible, and Scalable - Each XDAQ features 32 digital I/O pairs and 8 ADC/DAC pairs. HARP-compatible as a master, it integrates with existing HARP systems and links effortlessly with other XDAQ.

Guaranteed Synchronized Behavior Video Capture - AIO's onboard video engine precisely aligns neural and video data by embedding neural timestamps into video frame metadata. Supports multiple high-speed cameras (>120 FPS) for multi-angle monitoring or standard cameras for multi-animal monitoring.

EIB & Adapter

Off-the-shelf adapters for seamless integration with popular open-source platforms and commercial probes.

Validation Tool

A suite of tools including brainwave-compliant signal generators, stimulation pulse validators, and impedance test loads to verify system integrity and ensure experimental reproducibility.

Commutator

Low-noise, cost-effective, and stress-tested motorized commutators compatible with both Neuropixels and Intan ecosystems.
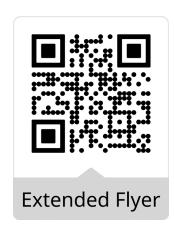
A non-motorized version is also available for the Intan platform.

Cable

Optimized, cost-effective cabling solutions designed to reduce the long-term cost of in vivo experiments across Neuropixels and conventional probe technologies.

IO and Headstage Expansion

Modular expansion options to increase digital I/O channels, support additional independent headstages (for large scale electrophysiology monitoring), or enable multiple XDAQ systems to operate in synchronized tandem.

New: HARP Adapter now available

MEA Interface

Cost-effective MEA accessory suite featuring a moisture-resistant design and microscopy access window for seamless XDAQ integration. The customizable headstage supports both stimulation and recording, and is compatible with a variety of MEA configurations.

For more details, you can scan this code to view the extended flyer:

Extended Flyer

Fullspec Passive Probe Recording (XR Mode)

Capture EEG, ECoG, LFP, and action potentials using a wide range of silicon probes or microwires.

Recording capability (when paired with XR(RHD) Headstages:

16-bit, 30kS/s/ch

±5 mV   input range
2.4 µVrms   input-referred noise
15   µV   min detectable signal

On-chip DSP high pass filter
100-20 kHz (upper cut off filter)
0.1-500 Hz (lower cut off filter

in-situ impedance measurement

Fullspec Passive Probe Recording (XR Mode)

Deliver constant-current stimulation and record from the same amplifiers. XDAQ ONE and AIO systems enable switchable VStim compliance levels, providing up to 40% additional peak current.

Stimulation Capability (when paired with XSR(RHS) Headstages:

Switchable rec/stim amplifier
Constant current driver
     10nA-2.55 mA
     14V compliance

Flexible stimuli, 33 µs step

     Biphasic
     Triphasic
     Burst

Specifications	XR Mode	XSR Mode	NP Mode	
Neural Acquisition			*NP 1.0*	*NP 2.0*
Channel Count	1024ch	128ch	1536ch	3072ch
Sampling Rate	1-30kHz		AP: 30 kHz LFP: 2.5kHz	30kHz
A/D Resolution	16-bit		10-bit	12-bit
Input Range	±5 mV		±5 mV	10 mV(ppk)
Input-referred Noise (RMS)	2.4 µV typical		AP: 5.9 µV typical LFP: 9.2 µV typical	AP: 6.8 µV typical LFP: 5 µV typical
Hardware Filter	Upper cutoff: 100 - 20 kHz Lower cutoff: 0.1 - 500 Hz		AP: 0.3-10 kHz LFP: 0.5-500 Hz	0.5-10 kHz

Electrical Stimulation	XSR Mode	NP Mode
Channel Count	128 ch	
Stim Magnitude, Type	10n to 2.55mA, constant current	
Stim Pulse	Biphasic, Triphasic, Burst	Biphasic, Triphasic
Stim time resolution	33 µs	
Compliance	±7V, -4 to +10V, -10 to +4V	

Synchonized GPIO

Digital In (2.2 - 5.5V Logic High)	8ch onboard | 32ch expandable
Digital Out (BNC 3.3, 5V configurable) (DB25: 3.3V)	8ch onboard | 32ch expandable
ADC (16bit, ± 10 V)	2ch onboard | 8ch expandable
DAC (16bit, ± 10 V)	2ch onboard | 8ch expandable

Connector and Port

	XSR Mode	NP Mode
Headstage port (electrically isolated)	4X HDMI Type A	4X USB-C
Peripheral & System		
GPIO	8x BNC Connectors, 1X D-Sub25 Connector	
Video System	4X USB Type A, UVC camera	
Optogenetics LED Driver	1X D-Sub9 Connector	
Audio Monitoring	1X 3.5mm Jack	
IO Expansion	2X HDMI Type D	
Communication	2X Thunderbolt 3 (USB-C Connector)	
Power	1X DC Jack(2.5mm, 5525) 20V 10A	
Ground Terminals	1X Chasis GND, 1X Digital GND	

Dimension (mm)	227x190x94
Weight (g)	3045

Software	XR Mode	XSR Mode	NP Mode
	Radiens, OpenEphys XDAQ™ plugin, XDAQ-RHX	Radiens, XDAQ-RHX	OpenEphys XDAQ™ Neuropixels plugin