

Cognionics HD-72

High-Density Dry EEG Headset



- ▶ **Rapid and Easy Setup with Up to 72 Channels**
- ▶ **Comfortable - Lightweight and Wearable**
- ▶ **Designed for Mobility and High Data Quality**
- ▶ **Open Software, Raw Data Access**

 **Cognionics**

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Integrated Accessories and Software

The HD-72 is designed to work with a family of accessories to form a versatile, full-featured and flexible recording system for any experiment. Cognionics companion products include:



Wireless Trigger Module

- Eliminates the latency and jitter inherent in wireless communications
- Sub millisecond precision
- Standard DB-9, DB-25 and USB inputs
- Compatible with *E-Prime*, *Presentation* and most stimulus packages



Extension Module

- 8 analog inputs for *ECG*, *EMG*, *GSR*, *Respiration* and other physiological sensors
- Standard 5-pin powered Binder connector
- Light weight and wearable on arm/belt
- Custom inputs upon request

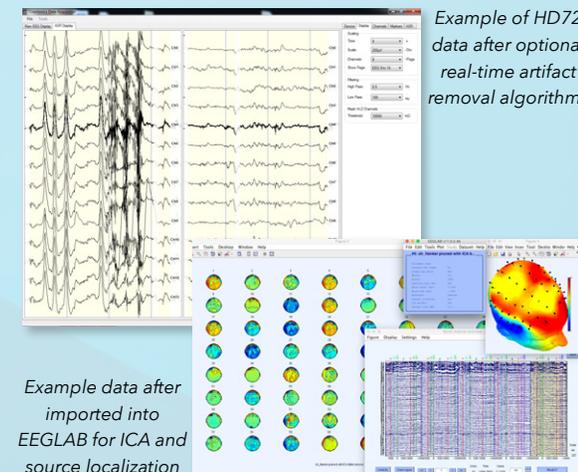


Dry ECG/EMG Belt

- Diagnostic grade signal
- For ambulatory use with dry electrodes
- Adjustable belt, slideable sensor mounts
- Use as extension from EEG system
- Or use with separate stand-alone wireless electronics

Software and 3rd Party Support

- Cognionics Acquisition includes graphical impedance check, viewing and storage of raw data
- Raw unfiltered data spec and custom development tools
- Optional real-time artifact removal (via UCSD ASR)
- Built-in support for live data streaming
- Supported integration with: *EEGLAB/BCILAB*, *MATLAB*, *OpenVibe*, *Brain Vision Analyzer* and more



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Solutions for neurophysiological research

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The Cognionics HD-72 is a complete EEG platform designed to acquire high resolution recordings using our patented and patent-pending Flex and Drypad electrodes.

The headset system allows users to easily setup a recording, without scalp prep, cleanup or even technician assistance. With the HD-72, it is possible to conduct advanced experiments and research in real-world situations that are simply impossible with conventional, wired gel systems.



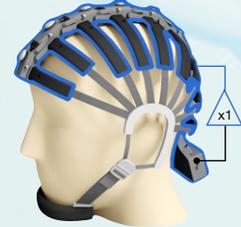
Advanced Design for Low-Noise Acquisition

The HD-72 is a tightly integrated and optimized suite of sensors, electronics and mechanics to maximize signal quality even in tough, noisy environments outside the laboratory. Key technologies include:



Dry Electrodes

The Cognionics Flex and Drypad sensors utilize custom mechanical designs and materials to effectively couple with dry scalp. For through-hair use, the Flex electrode incorporates soft legs to push aside hair while avoiding the need for hard metal pins. On bare skin, the Drypad electrode offers a cushioned, ionically conductive electro-chemical interface.



Active Shielding and Noise Cancellation

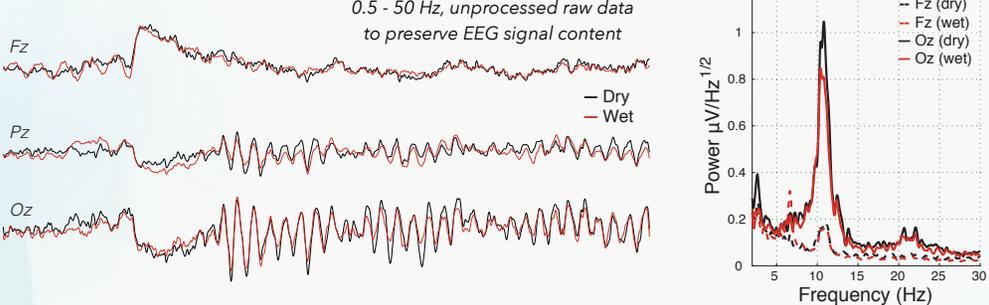
The HD-72 is fully shielded with a built-in faraday cage, spanning the entire headset, to minimize electromagnetic noise pickup. The ability to reject external interference, combined with the head-mounted amplifier module allows the system to effectively operate with high contact impedance electrodes without skin-prep.



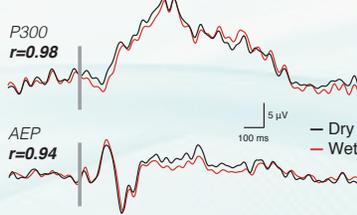
Miniature, High-resolution Amplifiers and Digitizers

Our wireless electronics utilize the latest in integrated circuit technology to provide the same performance and features and quality as older wired amplifiers in a tiny, battery-powered form-factor.

Below is an exemplary data sample from the Flex dry electrodes, taken through hair on multiple areas of the scalp, compared with nearby Ag/AgCl gel sensors. Although 100% matching is not possible due to the spatial displacement between sensors, both the raw EEG waveform and spectra show high degree of agreement. In addition, the background noise floors, both in time and frequency are similar between both sensors confirming the high SNR of the dry electrodes.



Evoked potential tests also demonstrate the dry electrode's research-grade signal fidelity. Both P300 and auditory evoked potentials correlate closely with the signal measured from the Ag/AgCl gel sensors on a wired system. Precision event marking of stimulus onset was conducted using our wireless trigger module (see reverse).



Specifications

Our wireless EEG headset systems offer comparable features and performance to traditional wired systems that are many times larger.

EEG Channels	16, 24, 32 and 64 plus reference and ground, customizable configurations
Extension Channels	8 analog inputs with add-on module for ECG/EMG/Respiration/GSR/etc.
Impedance Check	Continuous, real-time monitoring of all channels simultaneous with EEG
A/D Resolution	24-bit simultaneous sampling analog-to-digital converters
Sampling Rate	500 samples/sec at 64 channels, 1,000 samples/sec at 32 channels and below
Bandwidth	DC - 130 (at 500 samples/sec), DC - 260 Hz (at 1,000 samples/sec)
Storage	Removable microSD/HC card for computer-free mobile recording
Triggering	Wireless, <1 ms jitter/latency, no need for software correction
Power	Removable NB-6L Lithium-Ion (4 hours wireless, 8 hours microSD)