



Tech Note

DHS-300 Differential Head Stage Amplifier

Overview

The DHS-300 is a high common mode rejection (CMR), low noise differential amplifier designed for use with an iWorx 214 data recorder or an ETH-256 amplifier. The DHS-300 can be placed close to the preparation, eliminating long lengths of wire between the electrodes and the amplifier. These wires would act as a pick-up antenna for line current frequencies and other sources of electrical noise in the vicinity of the preparation.

The DHS-300 can be used with a variety of recording electrodes of different materials and different shapes like suction, coil, loop, pin, and rod electrodes. These electrodes connect to the inputs of the head stage through gold-plated pins supplied with the head stage. The ground electrode or its lead wire connects to the amplifier circuit through the ground lead with the alligator clip (Figure 1).

Because of its high rejection of common mode noise, this head stage is the best solution for the extracellular recording of biopotentials in experimental setups where it not possible for electronic noise to be reduced by a typical amplifier, Faraday cages, or shielding. Recording biopotentials from organs and tissues, located in situ, is an example of the type of experiment that would improve with the use of a DHS-300.



Figure 1: iWorx DHS-300 Differential Head Stage Amplifier

Equipment Setup

1. Plug the DIN8 connector of the DHS-300 (Figure) into one of the DIN inputs of an iWorx data acquisition unit or amplifier (Figure 2).
2. Attach the recording and ground electrodes to the inputs of the DHS-300: positive (+) electrode to the red input socket; negative (-) electrodes to the black input socket; and, the ground electrode to the black alligator clip and lead wire coming from the back of the head stage.

Start the Software

When using an iWorx data recording unit with DIN inputs (104, 114, 204, 214), or an iWorx amplifier used with an iWorx 118:

1. Click the Windows Start menu, move the cursor to Programs and then to the iWorx folder and select LabScribe; or click on the LabScribe icon on the Desktop.
2. When the program opens, select Preferences from the Edit menu.
3. Select the Channel preferences dialogue window. Name the channel to which the DHS-300 or the amplifier supporting the DHS-300 is connected. Set the Mode and Function for this channel to Record and Raw Data, respectively. Also, set the sampling rate and display time. Click OK.
4. If you plan to use these settings again, click on the Settings menu and select the Edit Group to add this setting file to your group of settings.

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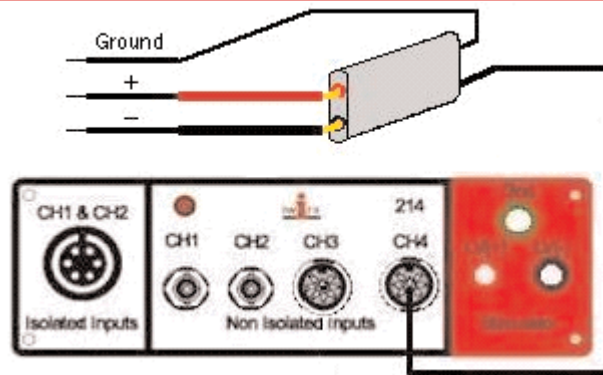


Figure 2: DHS-300 connected to iWorx 214 for recording on Channel 4.

Experiments

Experiments using the DHS-300 Differential Amplifier can be downloaded by clicking on the following links:

[Print-disabled Compound Action Potential experiment \(PDF file\).](#)

User Area (password protected)

[High resolution press optimized or low resolution screen optimized Compound Action Potential experiment \(PDF file\).](#)

Specifications

Input Impedance:	>10 GOhm
CMR:	100dB @ 60 Hz
Noise (input shorted at 1x gain):	<2uV p-p, DC-100 Hz <10uV p-p, DC-1KHz
Gain at Head Stage Output:	x10
Input Mode:	Differential
Output Mode:	Single ended