g.HIAMP
MULTICHANNEL AMPLIFIER

PRODUCT HIGHLIGHTS

- Fully integrated into g.tec software components for real-time analysis
- Supports active and passive EEG electrodes and ECoG grids
- 80-256 DC coupled wide-range input channels, able to record any type of signal (EEG, ECoG, EMG, EOG/spikes, connected various sensors)
- 256 channels perfectly synchronized with 24 bit resolution
- Integrated impedance measurement for active and passive electrodes
- TMS compatible
- Easy configuration and setup via high-speed online data processing for SIMULINK
- Driver package/API available
- FDA cleared and CE certified medical product

g.HIamp is a 256 channel biosignal amplifier for invasive and non-invasive measurements of brain functions that is FDA cleared and CE approved. The amplifier has 256 ADC converters with 24 bit resolution, providing excellent signal resolution and a wide input sensitivity to measure EEG, ECoG, ECG, EMG, and EOG without any saturation. External sensors can also be connected. All channels are DC coupled. Internally, signal processing is performed with the fastest floating-point DSP and a sophisticated real-time kernel. The amplifier relies on a very high oversampling to reduce the noise as much as possible by averaging samples.

256 channels can be analyzed in real-time with the g.tec Highspeed Processing for Simulink toolbox. This provides faster and more accurate control of BCI systems that use Common Spatial Patterns (CSP). g.HIamp is equipped with 16 digital trigger channels and a HOLD input for artifact suppression (e.g. during electrical or magnetic stimulation).

g.HIamp provides 80, 144 or 256 channels per unit and can be used with passive or active electrodes. The difference between these options is just the electrode connector box (headbox). Each block of 64 channels is connected via a multi-pole medical safety connector to the electrode interface box. For ECoG grids and strips, special interface connectors are available.

TECHNICAL SPECIFICATIONS

Size	197 (L) × 197 (W) × 90 (H) mm
Weight	1,875 g
Interface	USB
Digital inputs	2 × 8 digital trigger inputs, 1 × HOLD input (for artifact suppression)
Supply	5 V DC, medical mains power supply
Sensitivity	85.7 nV / ±340 mV
Noise level	<0.5 µV rms 1–30 Hz
Amplifier type	real DC coupled
256 × ADC	24 bit (38.4 kHz internal sampling per channel)
DAC	calibration signal
Input channels	256 mono-polar / 128 bi-polar (per device, software selectable)
Input impedance	>100 MOhm
Input connectors	standard safety connectors for passive electrodes, 2-pin connectors for active electrodes
Applied part	CF
Safety class	II
Certification and Standards	FDA cleared and CE certified medical product EN60601-1, EN60601-1-2, EN60601-2-26, EN60601-2-40, EN ISO 14971

INPUT CHANNEL PROPERTIES

g.HIamp uses wide-range DC-coupled amplifier technology in combination with 24-bit sampling. The result is an input voltage of ±340 mV with a resolution of 85.7 nV! This means that every electrophysiological signal can be recorded directly, without additional hardware. Neither high electrode offset voltage nor large artifacts resulting from electrical or magnetic stimulation will saturate the amplifier inputs. This feature is important for various artifact treatment and correction algorithms. The use of digital filters avoids hardware related variations between channels.

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