g.USBAMP

BIOSIGNAL ACQUISITION AND PROCESSING

PRODUCT HIGHLIGHTS

- 16 DC-coupled wide-range input channels per unit, 4 independent grounds, record any type of signal (EEG/ECoG/ECG/EMG/EOG/spikes/...), connect various sensors, stack units for 32/48/64 channels.
- 24-bit resolution with simultaneous sampling of all channels with up to 38.4 kHz, digital signal filtering and preprocessing, connect via USB 2.0.
- Works with passive and with active electrodes, 8 digital trigger inputs/unit, 4 digital outputs/unit, new simplified synchronization of units.
- Internal digital bandpass and notch filters, built-in calibration unit and impedance checking.
- Easy configuration and setup via the software, high-speed online data processing for SIMULINK available, recommended by BCI2000 & approved under OpenViBE
- Driver package/API available
- FDA cleared and CE certified medical product

Certified by:

g.USBamp is a high-performance and high-accuracy biosignal amplifier and acquisition/processing system. With g.USBamp, you can record activity from the brain, eyes, heart, muscles, and more - including respiration, galvanic skin response, temperature, and many other physiological and physical parameters. Due to its technical specifications and various software options, this instrument has become a widely used standard for many different fields of research, including neuropsychology, life science, medical research and biofeedback/neurofeedback/BCI research.

g.USBamp is USB enabled and supports 16 simultaneously sampled biosignal channels at 24 bit resolution. A total of 4 independent grounds guarantee there is no interference between the recorded signals. The amplifier connects easily to the USB socket on your PC/notebook and can immediately be used for data recording. You can also build a multi-channel system with more than 16 channels using multiple g.USBamp devices. A synchronization cable guarantees that all devices are sampling at exactly the same frequency.

The amplifier has an input range of ± 340 mV, which allows recording of DC signals without saturation. Digital inputs and outputs allow the recording of trigger channels together with the biosignal channels to easily pass analysis results to the outside world. A short-cut input allows you to connect the amplifier inputs quickly to the ground potential to protect the amplifier against overflows, which may occur in operating rooms with gamma knives or other environments.

TECHNICAL SPECIFICATIONS

Weight	1000 g
Size	197 × 155 × 40 mm
Color	Color of choice
Sensitivity	85.7 nV / ± 340 mV
Amplifier type	real DC coupled
16 × ADC	24 Bit (38.4 kHz internal sampling per channel)
2 × DAC	12 bit
Noise level	< 0.4 µV rms 1–30 Hz
Input channels	16 mono- / 8 bi-polar (per device, software selectable)
Input impedance	> 100 MOhm
Input connectors	standard safety connectors and system connectors
Applied part	CF
Safety class	II
Certification and Standards	FDA-cleared, CE certified medical product EN60601-1, EN60601-1-2, EN60601-2-26, EN60601-2-40, EN ISO 14971

INPUT CHANNEL PROPERTIES

g.USBamp uses wide-range DC-coupled amplifier technology in combination with 24-bit sampling. The result is an input voltage range of +/- 340 mV with a resolution of < 85,7 nV! This means that any 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 an important requisite for various artifact treatment and correction techniques. The use of digital filters avoids hardware-related variations between channels. g.tec's active electrode system can also be connected directly, as well as all of our sensors (e.g. GSR, skin temperature, blood pressure, oxygen saturation, respiration effort and airflow, pulse plethysmography, acceleration, limb movements, snoring sounds, and many more).

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Control

The high-resolution EEG system with 64 channels enables exoskeleton control with motor imagery, P300 and SSVEP based BCI systems. The system has electrodes over the most important brain regions for finding control signals (motor cortex, central areas, visual cortex) for every type of BCI. The high number of electrodes can also be used for spatial filtering of the data to further improve control quality.