

Simultaneously Recording

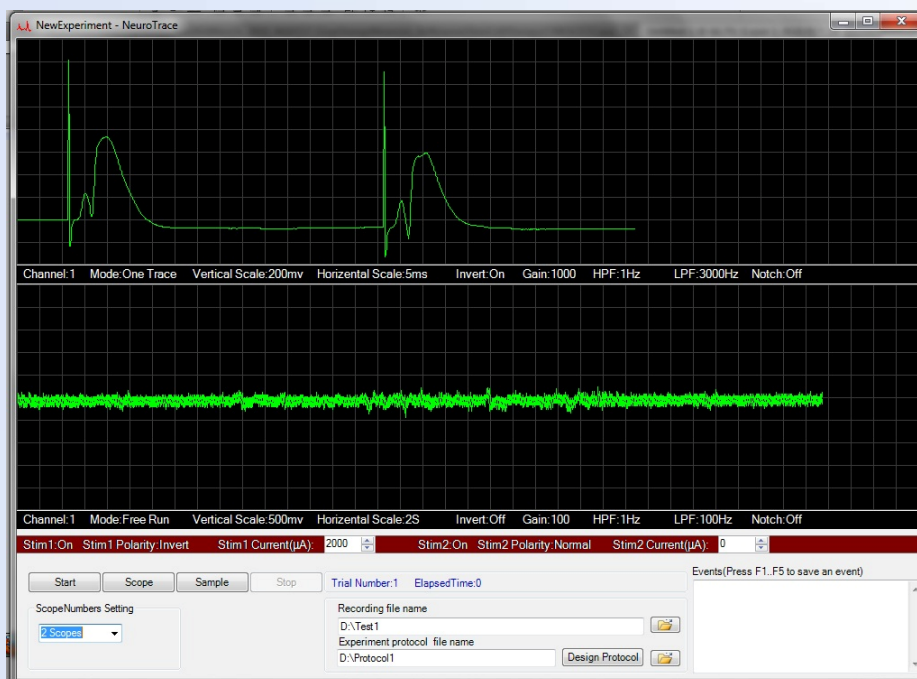
Electromodule is a General purpose data acquisition system for recording Action potential (Spikes), Field Potential, EEG signals, and signal modulation by external digital events.

Electromodule Device is combination of at least twenty-five different devices in one package

Microelectrode amplifier is a Part of the Electromodule

Design of Microelectrode amplifier is optimized for low noise, high dynamic range, and low power dissipation. The novel aspect of the amplifier is its ability to record EEG, LFP and single-unit signals simultaneously from stream of one electrode by one channel Analog to Digital Converter with 24 bit resolution, another novel aspect is noise-resistant properties of designed circuits

in following image researcher by changing of filter and gain in "NeuroTrace" software had been able to record LFP and EEG signal simultaneously by one electrode



this software have several oscilloscope .Each scope can be optimized for defferent type of recording by adjusting Gain ,High-pass filter, Low-pass filter, Horizontal and vertical scale,Inverter in the bottom table,we see the characteristic of EEG,LFP and single unit(spike) recording

	Single unit	LFP	EEG
High Pass filter	300 Hz	1 Hz	1Hz
Low Pass filter	10000 Hz	3000 Hz	100Hz
Gain	10000	1000-2000	100

Microelectrode amplifier (U3022)

Type: Differential, Isolated, Extracellular

Number of channels: Optional, 2, 4, 8

High pass filter setting: 0.1, 1, 10, 100 and 300Hz

Low pass filter setting: 1000, 3000, and 5000Hz

Notch filter setting: 50/60Hz

Gain: 10, 100, 200, 500, 1000 and 10000

Input voltage range: $\pm 5V$

Maximum analog input voltage: $\pm 5V$

Input impedance: $10^{12}\Omega$, common mode and differential

Input leakage current: 60pA (typical)

Input capacitance: 8pF

Common mode rejection ratio: 75dB @ 50/60Hz

Isolation type: Optical

Isolation voltage: 2500V

Isolation resistance: $10^{12}\Omega$

Digitizer

Coupling: DC

Analog input range: $\pm 2.5V$

ADC resolution: 24bits

Linearity error: $\pm 7.6\text{ppm}$ (maximum)

Maximum sampling rates: 50 kHz, each channel