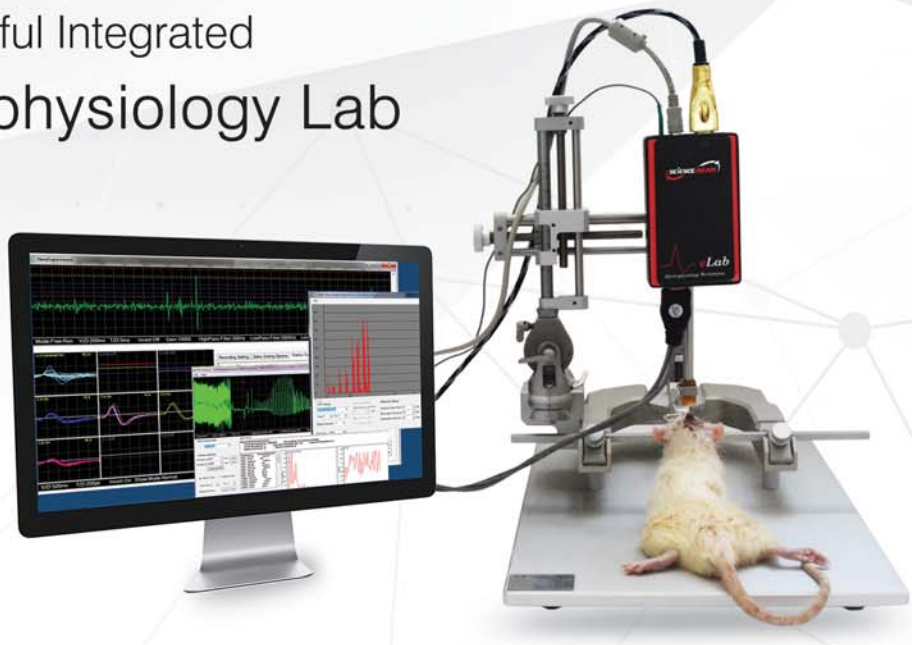
eLab/eLab+

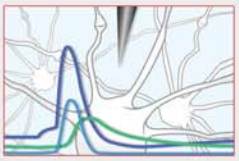
The Powerful Integrated
Electrophysiology Lab



The integration of the eLab system with eProbe software is designed to record different classes of extracellular electrophysiological signals. Various devices and tools such as data acquisition, microelectrode amplifiers, ADC, stimulators, pulse generators, and window discriminators are integrated into one eLab system.

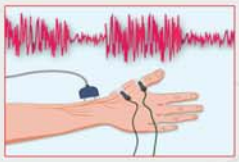
eLab enables you with a simple process for your electrophysiological research. eLab/eLab+ comprises an innovative bio amplifier that is adequate to record all range signals through a 24-bit A/D converter with capabilities of 10K or 50K samples per second. eLab+ offers both auditory and visual monitoring features.

Using eLab allows you to implement the most neural and cardiovascular researches and easily apply each of the extracellular electrophysiological techniques such as; single-unit, multi-unit, LFP (local field potential), LTP, NCV, VEP, and EXG(EEG/ECG/ECoG/EMG), as well as invasive and non-invasive blood pressure measurement.



Multi-Unit (spike)

eLab delivers the most precise recordings of extracellular action potentials, from the brain or spinal cord. eProbe software provides you with a variety of tools for monitoring, discriminating, and clustering spikes, and data analysis (PSTH/ISI). eLab has an incredible auditory tool that detects the sound of firing of every single neuron.

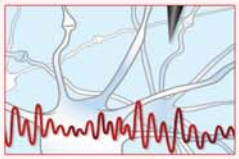


Nerve Conduction Studies (NCS/NCV)

eLab equips you with an explicit setup for nerve conduction studies. It comes with an accurate simulator and an adjustable protocol manager in eprobe software. You can accurately investigate the invasive nerve conduction parameters.

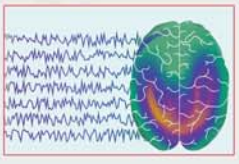
EEG/EMG/EOG/ECoG

eLab uses eProbe to easily configure a precise measuring of Electroencephalography (EEG), EMG, and Electromyography (EMG)- and ECoG signals.
eProbe software also provides multiple panels such as FFT monitoring and multi-channel EEG/ECoG signal analyzer in both time and frequency domain.



Local Field Potential (LFP)

eLab delivers exceptional precision in recording and exploring local field potentials (LFP) generated by the collective activity of many cells, in both In vivo and in vitro models. It also allows you to monitor and analyze LFP and LTP data



Electrical kindling - and ECoG

ITo study brain network structure and explore the development causes of seizures and epilepsy, one needs to make an electrical kindling module by using a repeated pulse generator and electrical stimulators with the integration of an EEG signal recorder and analyzer. eLab consists of both a constant current microstimulator and a bio-amplifier.

Electrocardiography (ECG)

eLab provides you with powerful tools for recording electrical heart activities (ECG/EKG) and cardiovascular in both invasive and non-invasive situations. eProbe is capable of monitoring, analyzing, synthesizing, and evaluating high-resolution recorded signals.

eLab/eLab+

Fantastic Electrophysiology Workstation
Single-unit, LFP, LTP, NCV, VEP, and EXG (EEG/ECG/ECoG)

- Real-time data processing
- Precise data recording
- 24 bits data resolution
- Fully-integrated in eProbe software for data recording and analysis
- Empowered with Various tools for different classes of extracellular research
- Suitable for invasive, non-invasive research in both Vivo and Vitro models
- Well-matched with ePulse as an isolated electrical and mechanical stimulator
- Lightweight, portable, and easy to use

Data Acquisition

FIFO memory	64 KB
Processor	32 bit ,168 MHz
Data transfer	USB

Amplifier

Amplifier type	Differential, Isolated
Number of channels	2/4/8/16/32
Gain	50
Input voltage range	±2.5 V
Maximum analog input	±2.5 V
Input impedance	10^{12} Ω, common
Input leakage current	60 pA (typical)
Input capacitance	8 pF
Common mode rejection	75 dB @ 50/60 Hz
Isolation type	Optical
Isolation voltage	2500 V
Isolation resistance	10^{12} Ω
Low cut filter	1 Hz
High cut filter	10 KHz

Pulse Generator

Experiment protocols	Single/multi trial and protocols
Stimulation timing Patterns	4
Pulse pattern parameters	Delay, duration, cycle, numbers
Timing pattern resolution	20 μs
Mixers	Internal stimulators, Digital outs
Mechanical stimulator	2 ch's digital outputs
Mixer inputs	4 patterns pluse 2 digital inputs

Analog to Digital Converter

Number of channels	2/4/8/6/32
ADC resolution	24 bit
Linearity error	±7.6 ppm
Sample rate (eLab / eLab+)	10 K/ 50 K per second
Analog input range	±2.5 v
Interface	Serial
Isolation type	Optical
Isolation voltage:	2500 V
Isolation resistance:	10^{12} Ω

Electrical Stimulator

Mode	Constant current
Uni-polar, isolated	Yes
Number of channels	2
Current range (optional)	0 to 4mA, 0 to 20mA
Current resolution	1 μA or 5 μA (optional)
Output waveform	DC or current pulse
Current control	Using a 12 bit DAC
Current amplitude error	3 LSB (maximum)
Polarity inversion	Yes, by software
Output switch	Yes, by software
Output voltage compliance	150 V
Current rise/fall time	5 μs, typical
Isolation type	Optical
Isolation voltage	2500 V
Isolation resistance	10^{12} Ω