Complete solutions for life science research

ADInstruments research systems offer flexible, all-in-one solutions for your research, including PowerLab for data acquisition and LabChart software for comprehensive data analysis. Whatever signals you want to measure, an ADInstruments system can be customized to record, display and analyze your experimental data with ease and accuracy.

Fast tracking research

Designed for life sciences, LabChart will help you streamline your analysis with specialist modules such as ECG Analysis, Blood Pressure, Dose Response, Spike Histogram, Peak Analysis and Video Capture that bring all the calculations you need into one place.

Create your complete solution

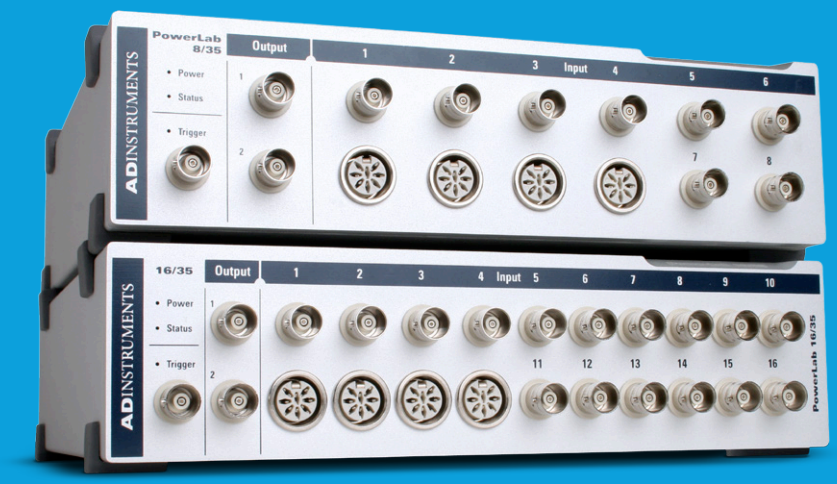
Tailor a complete solution for your research application. Our dedicated team can help you choose from a range of signal conditioners and application-specific instruments, transducers and accessories.

Take advantage of global support

When your research takes you places, we are there to help. Our global network of offices and distributors covers more than 80 countries, offering specialist support, technical advice and a range of workshops and training courses.

Applications

- Cardiovascular pressures
- Ventricular pressure-volume
- Blood flow and cardiac output
- Isolated tissue and dose response
- Isolated perfused organs
- ECG and HRV
- Intracellular recording
- Extracellular recording
- Evoked potentials
- Respiration and exercise physiology



PowerLab

Precision data acquisition hardware

PowerLab is the original high-performance digital data acquisition device, cited in more than 20,000 research papers in peer-reviewed journals. PowerLab systems for research provide the full utility of a multi-channel, real-time chart recorder, polygraph, XY plotter, digital voltmeter and storage oscilloscope with the benefits of easy data handling, high resolution, and variable sampling speeds.

PowerLab data acquisition units provide:

- 16 Bit resolution on all gain ranges
- Variable sampling and online computation speeds of up to 200 000 s/s per channel (400 kHz aggregate across all channels or 2x 200 kHz on two channels)
- Fast processor for real-time data acquisition without data loss
- Integrated pod ports for wider amplifier and transducer choice
- Digital inputs and outputs for external instrument control and triggering
- AC/DC coupled inputs
- Independent stimulator outputs
- High-pass, low-pass and anti-aliasing filters
- Available in 4, 8 or 16 channels
- Supplied with LabChart software

PowerLab is simple to set up, connecting directly to Windows and Macintosh computers via USB port, and is automatically detected by LabChart.

Signal conditioners and instruments

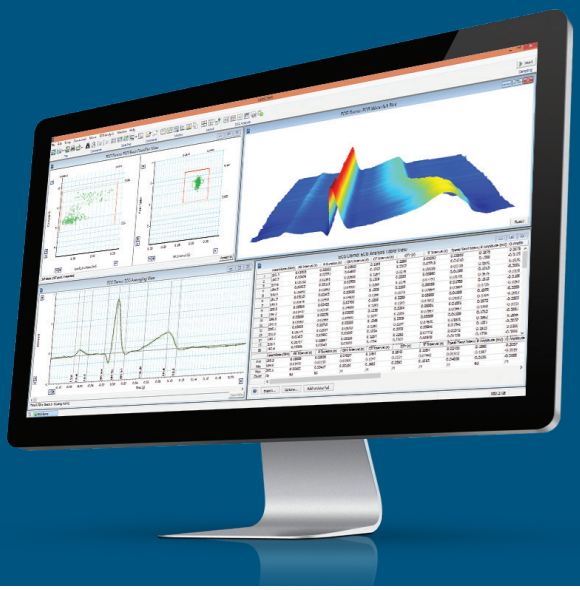
ADInstruments manufactures a wide range of software controlled preamplifiers that are automatically identified and configured by PowerLab. All settings are automatically stored with data files for easy repeating of experiments.

Transducers and accessories

We offer an extensive selection of instruments, transducers and accessories made by ADInstruments and world-leading brands. Products are fully compatible with PowerLab recorders and signal conditioners.

LabChart

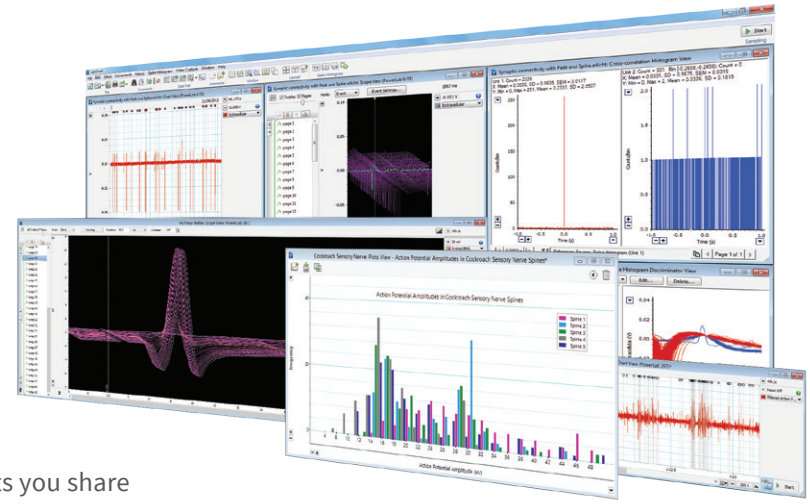
World-leading analysis software



With LabChart analysis software, you can record and display your data in real time, performing online calculations at high sampling rates, giving you full control of your research. Record up to 32 channels of raw data and choose from LabChart's range of sophisticated Add-Ons that are purpose-built for signals specific to life science, including cardiovascular, respiratory, blood pressure, neuronal and dose response data. LabChart is simple to use and suitable for a broad range of signal types.

Use LabChart to:

- Record from multiple PowerLabs and devices
- Preview and optimize recording
- Import and export data easily
- Annotate data with comments
- Convert raw data into useful units
- Automate recording and analysis tasks
- Change recording settings in seconds
- Recall data and experimental settings
- Generate customized stimulus outputs
- Speed up analysis with LabChart Modules



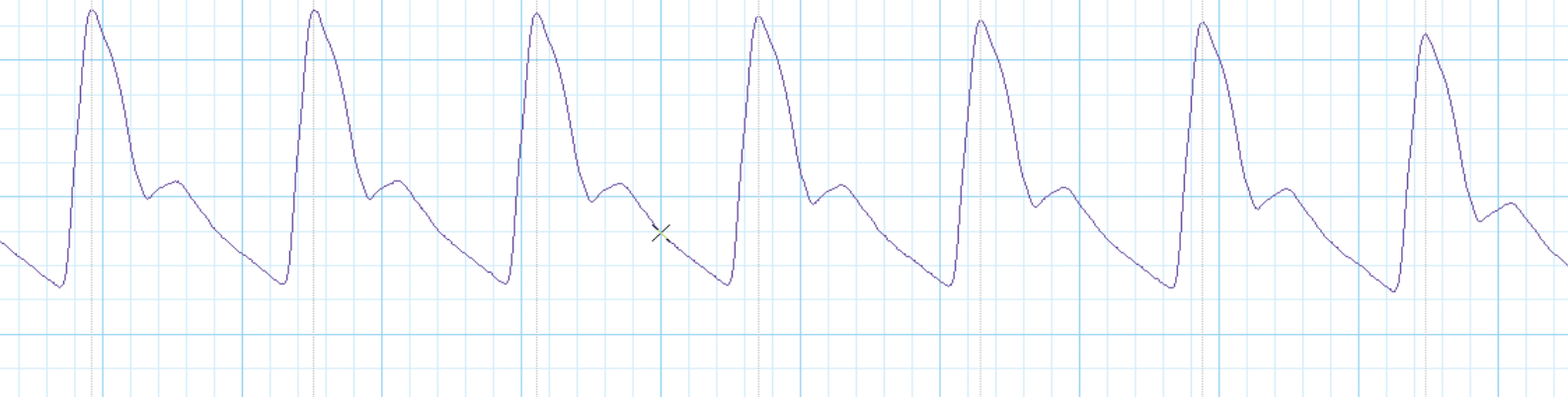
LabChart Reader is downloadable software that lets you share your LabChart data files with colleagues, publishers and students. It enables anyone to open and view LabChart files and includes a number of LabChart analysis and display features.

Specialized analysis with Add-On modules

Get the full suite of modules with LabChart Pro (some modules are not available on Mac). Range includes:

Dose Response	Generates dose response curves, EC50 values and additional parameters
Metabolic	Provides real-time measurements of parameters such as V_{CO_2}, V_{O_2}, V_E and RER
Blood Pressure	Automatically detects, analyzes and reports parameters from arterial or ventricular pressure recordings
Spike Histogram	Detects, discriminates and analyzes extracellular spike activity generating a range of plots and statistics
ECG Analysis	Detects and reports the onset, amplitude and interval times of PQRST from human and animal ECG signals
Cardiac Output	Calculates cardiac output from a LabChart recording of a thermodilution curve measured in animals
Heart Rate Variability	Displays and analyzes variation in the interval between heartbeats in human and animal ECG
Video Capture	Allows the synchronized recording and playback of a QuickTime movie and LabChart data file
Peak Analysis	Automatic detection and analysis of multiple, but not overlapping, signal waveforms from recording
DMT Normalization	Calculates and standardizes optimal vessel pretension conditions using the wire myograph
PV Loop	Analyzes left ventricular pressure and volume data, calculates loop area and a wide range of hemodynamic parameters

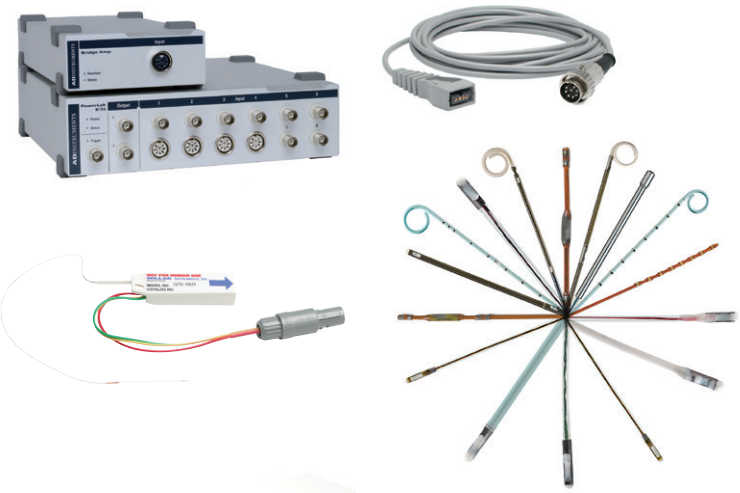
Research applications



Cardiovascular pressure

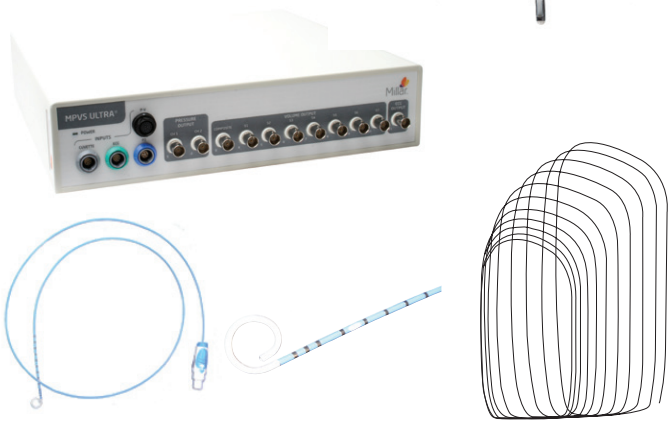
Mikro-Tip BP Foundation System

Provides the essential tools for measuring blood pressure in small and large animals. Includes the low-drift, high impedance input Bridge Amp, compatible with high-fidelity Mikro-Tip® BP catheters for research, available exclusively from ADInstruments. The catheters operate seamlessly with LabChart's Blood Pressure Module to determine systolic and diastolic pressures, dichrotic notch, dP/dt and more.



Mikro-Tip pressure-volume

Simultaneously measure pressure and volume in large and small animals with the MPVS Ultra Foundation System and Millar Mikro-Tip® PV catheters (selected separately). Supplied with LabChart's PV Loop Module for automated calculation of systolic and diastolic pressures, stroke volume, CO and more. Single and multi-segment Mikro-Tip PV catheters suitable for use in animals 16g and larger are supplied in a range of sensor sizes and electrode configurations. Also suitable for use in the digestive and reproductive systems (i.e. bladder, uterus).

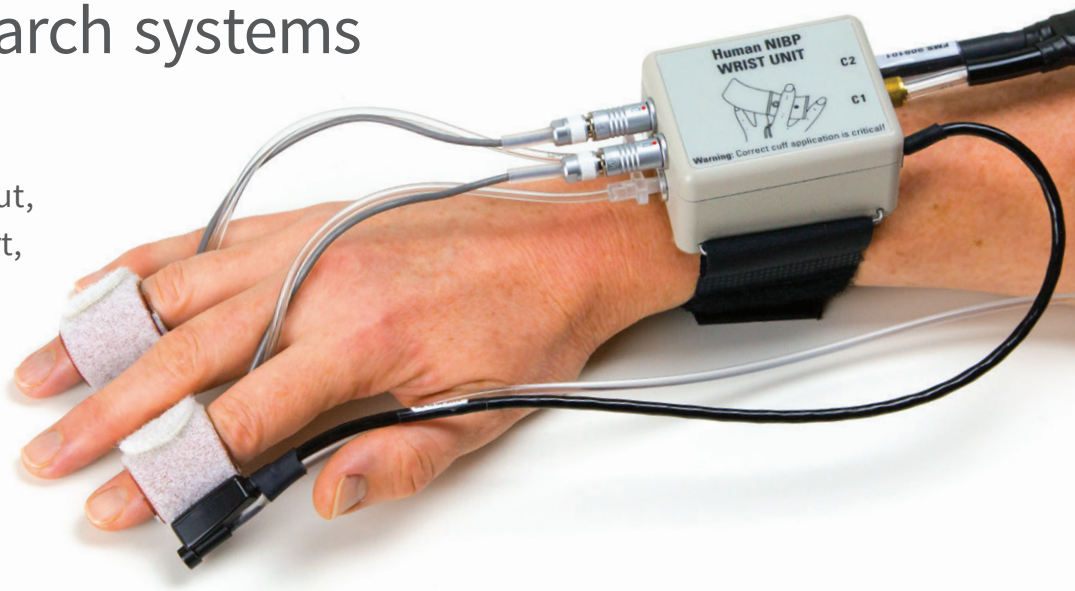


Fluid-filled blood pressure transducers

Determine arterial and venous blood pressure using the range of fluid-filled polyethylene, pressure transducers for use with small and large animals. The transducers are ideal for use with ADInstruments Bridge Amps or the electrically isolated BP Amp that provides BP readings in mmHg. The BP Amp is suitable for use with human subjects.

Complete research systems

Get a complete solution for applications including NIBP, blood flow and cardiac output, isolated tissue, isolated heart, biopotentials, electrophysiology, microneurography, psychophysiology and many more.



Non-invasive blood pressure (NIBP)

Human NIBP System

Monitor trends in blood pressure continuously and non-invasively in humans. Finger cuff switching allows long sampling periods with minimal discomfort to subjects. Provides a reconstructed arterial pulse waveform based on a finger cuff measurement. Cuffs available in a variety of sizes. Based on FMS technology.

Animal NIBP System

Detects intermittent pressure/pulse for calculation of systolic pressure in mice and rats. Interchangeable automated tail and cuff transducers are supplied.

Blood flow and cardiac output

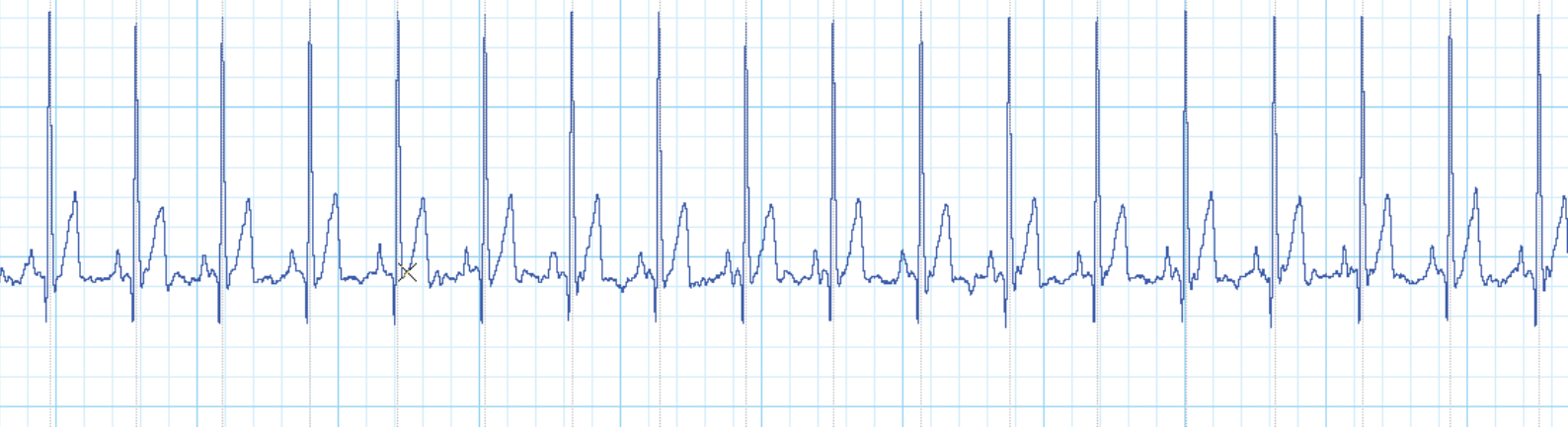
Invasive measurements

Measure arterial or venous flow with Transonic Flow Systems and Transonic Flowprobes (available separately). With minimal signal drift and attenuation, flowprobes are appropriate for acute and chronic studies. A range of sizes suitable for mice and larger animals are available, as well as inline/clamp-on sensors for tubing applications.

Blood perfusion

Continuously monitor blood and perfusion of microvascular beds and rapidly calculate Cardiac Output (mL/min) with Laser Doppler Flowmetry (LDF) probes and the BloodFlow Meter (second analog output correcting for BSC). Suitable for monitoring circulation during surgery and drug or cardiovascular studies, LDF probes for skin, muscle and organs are available.

Research applications



Biopotentials

Electrically isolated Bio Amps are optimized for recording human and animal ECG, EMG, EEG, ERG, EOG, visual evoked cortical response and more. Perform powerful time and frequency domain analysis using LabChart's Cyclic Measurements and Spectrum View.

Multi-Channel Bio Amps

8 or 16 channel bio amps can be used with both chest and resuable electrodes for differential EEG or multiple biopotential measurement in a single subject. Also compatible with EEG caps (available separately).

Animal Bio Amp

Low-noise, high-gain differential Bio Amp supplied with micro-hook electrodes. Compatible needle or spring clip electrodes are available separately.

ECG Switch Box

For mechanical selection of standard lead configurations (10 standard lead wires). Ideal for vector cardiography as a low cost option for those with only a single or dual bio to get a full 12 lead ECG. The ECG Switch Box gives direct measurement of leads I, II, III, aVF, aVL, aVR and V1 to V6.

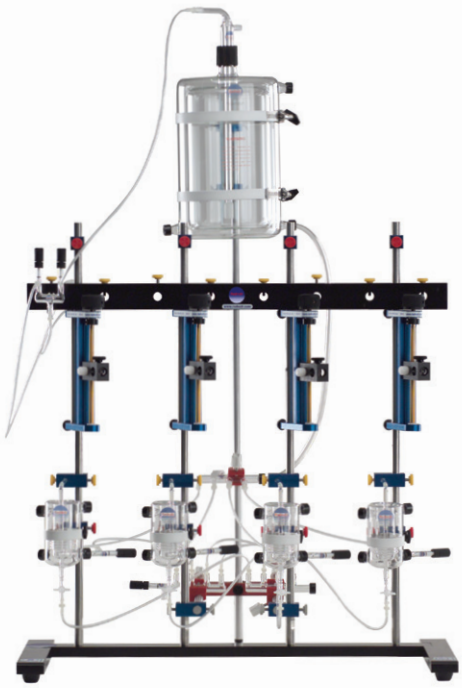
Isolated perfused hearts

Working heart (Radnoti)

Measure hemodynamic parameters in small animal hearts with the Radnoti working heart system. Capped and water-jacketed to ensure constant perfusate temperature, with ports for insertion of cannulae and commonly-used pacing and ECG electrodes. With additional instruments you can measure atrial volume and cardiac output, left-ventricular pressure, pH, temperature, surface ECG and more.

Langendorff heart (Radnoti and PanLab) *(right)*

Monitor cardiac function including left ventricular developed pressure, HR and more. Easily switch between constant-pressure and constant-flow modes with the convenient pump controller (included with system).



Isolated tissue

Traditional organ baths (Radnoti) *(left)*

Radnoti modular organ bath systems allow easy substitution of parts, enabling an extensive choice of tissue types and chamber sizes (5 to 300 mL).
The water-jacketed glassware and tubing with heating coils in the organ/tissue baths ensure constant temperature maintenance throughout the system for accurate study of muscle contraction, dose responses and more (LabChart Modules supplied).

Research applications

Isolated tissue

All-in-one compact organ baths (PanLab)

Systems available in 4, 8 and 16 chambers ideal for striated, smooth and cardiac muscle studies. Featuring electrovalves for automated filling and emptying of tissue chambers, a constant system temperature is ensured by enclosure of tissue vessels, reservoir coils and tubing in a single temperature-controlled water chamber. Systems are provided with isometric transducers, however isotonic transducers and stimulating electrodes are also available.

Isotonic force transducers

Myographs

Ideal for *in vitro* studies of muscle function, these systems feature DMT Wire Myographs. Investigate small tubular tissues as small as 60µm in diameter, or larger muscle strip preparations. They are Supplied with the DMT Normalization Module for speedy experimental set-up, and the Dose Response Module for pharmacological assessment of muscle contraction, enzyme activity and more. Single, dual and four chamber systems are available, as well as a confocal system for use with laser confocal scanning microscopy (LSCM).

Wireless data recording

Electromyography (EMG)

Record true freedom of movement using systems with Parallel-Bar and Motion Artifact Suppression technologies from Delsys Inc.

Small and lightweight EMG sensors have built-in triaxial accelerometers with a selectable range of g-forces. Up to 16 sensors can simultaneously transmit the recorded signals to a single receiver. Variations of the EMG sensors such as mini EMG and Snap-Lead are also available.

Other wireless sensors include the EKG sensor for ECG measurements and the 4 contact force sensitive resistive sensor (FSR) for relative force or pressure distribution measurements and timing from body-contact surfaces.

Powerful features in LabChart provide flexible data display with easy calculations including root mean square (RMS), power spectral density (PSD), and integration.

Neural recording

ADInstruments and Triangle BioSystems Inc. (TBSI) provide a way to fast track behavioral-electrophysiological research with industry-leading systems for wireless acquisition of neural data. Systems record field potentials or individual neural spikes from small animals (ideal for rodents) using implanted metal electrodes.

Neural signals are transmitted by small lightweight headstages that are available with options such as LED for video tracking in maze studies or external batteries for extended recording time.

Research applications

Electrophysiology

Ready-to-use neurophysiology research systems, featuring Warner Instruments' equipment, are ideal for *in vitro* and *in vivo* applications.

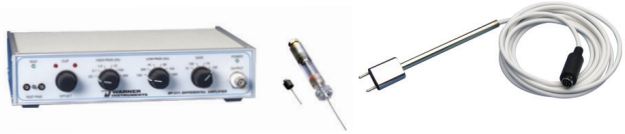
The Extracellular Recording System provides a versatile, low noise differential amplifier. The Intracellular Recording System provides simultaneous current injection stimulation and recording using a single microelectrode.

Systems are available for two-electrode, whole-cell voltage clamping of large cells and cell structures.

Investigate tissue transepithelial voltage, short circuit current, and membrane resistance using epithelial Single and dual channel Voltage Clamp Systems.

Ussing chambers are available separately, with inserts to suit your research needs that can be easily changed between experiments.

Patch clamp amplifiers offer a range of resistive-feedback headstages for currents ± 1, 10 and 100 nA in whole cells or single ion channels.



Microneurography

The Neuro Amp Ex is a low-noise, high-gain differential amplifier purpose-built for amplification of extracellular single cell/tissue potentials and single nerve fiber potentials (split-nerve preparation or human microneurography). Electrically isolated for human connection it is supplied with a headstage and microelectrode adapters.

Spirometry and exercise physiology

The Exercise Physiology System incorporates a variety of specialized instruments, transducers and accessories safe for human connection during exercise and at rest.

Hardware includes Spirometer, Respiratory Flow Heads, Gas Analyzer, Gas Mixing Chamber, Thermistor Pod, temperature sensor and single-channel bioamplifier.

Monitor and calculate human cardiorespiratory and metabolic parameters such as RR, volume and flow rates, V_{CO_2}, V_{O_2}, V_E, RER, intrathoracic pressure and lung sounds with the BP, HRV, Metabolic and ECG Analysis modules supplied.

Psychophysiology

Measure evoked responses to visual and auditory stimuli (VEP, ERP etc.) with a complete system that incorporates SuperLab® Software, StimTracker® and accessories such as the Response Pad and Smart Voice Key (one computer is required for stimulus presentation and another for data acquisition).

Skin conductance/temperature, respiratory, cardiac, and neurophysiological responses, as well as analyze reaction time and reflexes can also be recorded using optional transducers.

The ADInstruments advantage

INDUSTRY LEADERS

PowerLab is the original, high performance digital data acquisition hardware, used in all of the Top 100 institutions for life science and cited by more than 20,000 research papers in peer-reviewed journals.

ENVIRONMENTALLY FRIENDLY

Strict manufacturing processes, RoHS compliant parts, lead-free soldering, and use of recycled and recyclable materials ensures we meet our environmental responsibilities.

QUALITY AND RELIABILITY

ADInstruments products are certified to meet the strictest international safety standards for human and animal use, including the CE mark. Hardware is manufactured under a system certified to comply with ISO 9001:2008.

DATA INTEGRITY

PowerLab data acquisition systems are tested and calibrated to deliver precision data of the highest quality.

PROVEN TRACK RECORD

With 30 years of design and manufacturing experience, we have installed more than 45,000 PowerLab data acquisition systems worldwide.

INTUITIVE USE

Our software is mastered quickly and provides comprehensive recording, display and analysis features.

POWER AND FLEXIBILITY

Whether animal or human, organ, tissue or cell, in vivo, in vitro or ex vivo, our systems are adaptable to a variety of life science applications.

EXCELLENCE IN CUSTOMER TRAINING & SUPPORT

Our in-house scientists, educators, programmers and biomedical engineers understand your research needs. With representatives in more than 80 countries, we provide a truly global support network.

EXCLUSIVE DISTRIBUTION

We offer an exclusive range of ADInstruments and other brand products including gold-standard Millar cardiovascular products for research.

GLP & 21 CFR PART 11 COMPLIANCE

Our GLP software provides a data acquisition solution for GLP and 21 CFR Part 11 compliant environments. They provide a non-editable audit trail of all file operations, and a centralized user and signature authorization system that verifies user validity.

For more information contact a sales representative at: info@adinstruments.com

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