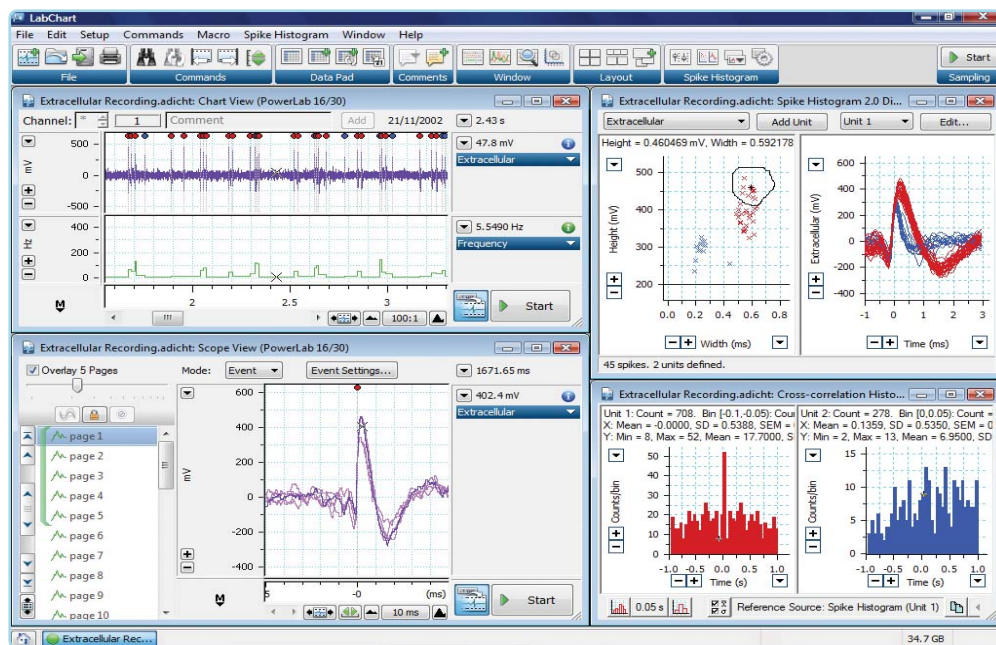


# Neuroscience Education

## PowerLab® Teaching Systems



A LabChart recording (top left) of an extracellular signal. The Scope View feature (bottom left) shows the average of 5 sweeps. The Spike Histogram Module (right top and bottom), available separately, shows spike discrimination.

Our teaching systems offer solutions for all levels of neuroscience education. At the core of the systems is the powerful and flexible PowerLab 26T data acquisition unit. With sampling rates of up to 200 kHz per channel (400 kHz aggregate), 16-bit full-scale signal resolution, digital I/O, an extensive selection of filters, built-in Bio Amp and Isolated Stimulator, the PowerLab 26T is ideal for all levels of teaching.

Complementing the PowerLab unit and related hardware kits, are two suites of software and experiments. The innovative LabTutor Teaching Suite and the powerful LabChart Teaching Suite.

## Features & Benefits

- Complete systems for neurophysiology and electrophysiology experiments
- Durable, reliable, easy-to-use data acquisition systems
- Suitable for all teaching levels
- Includes easily customized teaching materials and tools to create your own

## Quality & Safety

PowerLab systems are manufactured under the ISO 9001:2008 certified quality management system and have a three year warranty.

PowerLab systems meet the European EMC directive, which is equivalent to the FCC Class B standard in the United States.

All biopotential signal conditioners are approved to the IEC 60601-1 patient safety standard, making them safe for use with human subjects.



**LabTutor**

- Protocols, recording, analysis and reporting within a single interface
- Online access to experiments from any Internet connected computer
- Easy student/lab content management

**LabChart**

- Flexible and powerful research-grade software
- Supplied with experiments including protocols and student quizzes
- Ideal for CRAWDAD experiments

# Software to teach the way you want to

## LabTutor Teaching Suite

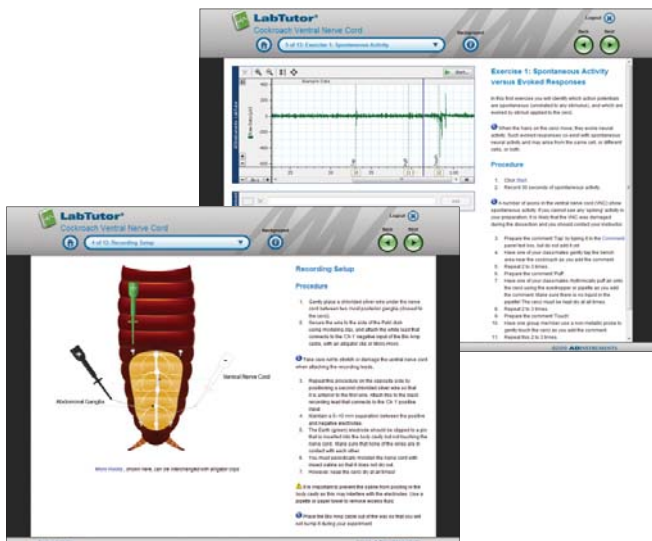
The innovative LabTutor 4 Teaching Suite is an integrated solution for life science laboratory courses. It provides great learning outcomes and delivers outstanding time and cost savings for departments and institutions. Students' interest is quickly captured through an interactive, independent discovery process that requires almost no supervision.

Educators can save time by managing course content, student lists and experiment updates on a single networked computer. Experiment customization and creation tools are included in the package.

The LabTutor Online component provides additional benefits to students and educators. By enabling off-site access from any Internet-connected computer, students can preview experiments ahead of class and complete the analysis and report sections out of the lab. This can be done individually or as a group.

## LabTutor Experiments

LabTutor experiments integrate background scientific information and experiment protocols with real-time data acquisition in a single software interface. The functions of a chart recorder, digital oscilloscope, spreadsheet, graph generator and other presentation tools are combined into one seamless laboratory experience. Students follow protocols, record data, analyze recordings, complete laboratory reports and submit their work from a single web-browser based interface. New LabTutor experiments are released regularly and are available to download from our website.



LabTutor Cockroach Ventral Nerve experiment showing instructions and recorded data pages.

## LabChart Teaching Suite

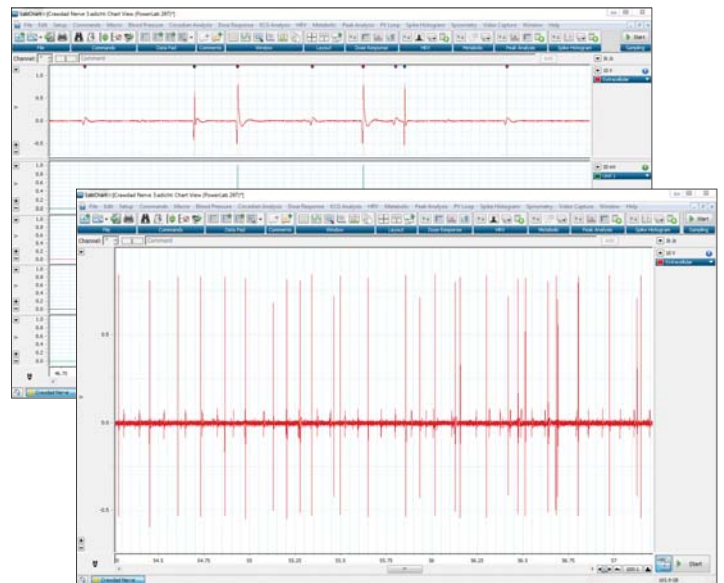
LabChart has been used in the world's best education, as well as research, institutions since 1988. LabChart turns a personal computer into a real-time, multichannel chart recorder that can acquire, display and analyze up to 32 channels of data, online or offline. The depth of LabChart's features allows the software to grow with the student's progress through a course, from introductory courses to advanced research projects.

## LabChart Experiments

LabChart experiments are available in Microsoft Word format. An experiment includes:

- **Instructor guides:** hardware and software hints, additional exercises and lab report answers
- **Student protocols:** documents containing objectives, background information and step-by-step instructions
- **Settings files:** configured LabChart software files for selected software and hardware. Students simply open files and start recording
- **Sample data files:** examples of acquired data
- **Lab reports:** laboratory reports with questions and exercises for students to complete

LabChart teaching experiments are available for human and animal physiology, biology and psychophysiology, and can be easily customized to suit individual course requirements.



LabChart Recording of

# Teaching Systems

## PTB4264 Ultimate Teaching System

This system is ideal for investigating cardiovascular signals (ECG, pulse, blood pressure), muscle responses (EMG) and breathing. PTK10 and PTK19 Kits extend the possible experiments into human spirometry and isolated nerve and tissue animal studies.



### PTB4264 Ultimate Teaching System

ML4856	PowerLab 26T Supplied with LabChart and LabTutor software
MLT1010/D	Pulse Transducer
MLT1132/D	Respiratory Belt Transducer
MLT1100/D	Sphygmomanometer
MLA92/D	Push Button Switch
MLA2540	5 Lead Shielded Bio Amp Cable
MLA2505	Shielded Lead Wires
MLA700	Reusable ECG Electrodes
MLA1010	Disposable ECG Electrodes
MLAWBT9	EEG Flat Electrodes
MLA1093	Abrasive Gel
MLA1090	Electrode Cream
MLA1095	Electrode Paste
MLAYDG	Dry Earth Strap
MLA1250	Headphones
MLT004/ST	Grip Force Transducer
MLADDF30	Stimulating Bar Electrode
MLT201	Cardio Microphone
MLA1094	Alcohol Swabs
MLAC22	BNC to DIN Smart Adapter (2)
PTK10 Human Respiratory Kit	
ML311	Spirometer Pod
MLT1000L	Respiratory Flow Head
MLA1011A	Clean Bore Tubing & Adapter
MLA145	Student Respiratory Kit (5 sets)
PTK19 Nerve and Muscle Kit II	
MLTF500/ST	Teaching Force Transducer
MLA0320	Animal Nerve Stimulating Electrode
MLA1605	Shielded Lead Wires
MLA013	Muscle Holder
MLA40	Manipulator & Stand
MLT016/B	Nerve Chamber with Cables

## PTB4265 Psychophysiology Teaching System

This system is well suited for psychophysiology experiments. It includes a GSR Amp for measuring electrodermal activity, and Thermistor Pod for skin temperature monitoring. The built-in Bio Amp and Isolated Stimulator are ideal for a range of biopotential and stimulus response experiments.



### PTB4265 Psychophysiology Teaching System

ML4856	PowerLab 26T Supplied with LabChart and LabTutor software
FE116	GSR Amp with MLT116F finger electrodes
ML309	Thermistor Pod
MLT1010/D	Pulse Transducer
MLT1132/D	Respiratory Belt Transducer
MLT422/A	Skin Temperature Probe (2 m)
MLA2540	5 Lead Shielded Bio Amp Cable
MLA2505	Shielded Lead Wires
MLADDF30	Stimulating Bar Electrode
MLA700	Reusable ECG Electrodes
MLA1010	Disposable ECG Electrodes
MLAWBT9	EEG Flat Electrodes
MLAYDG	Dry Earth Strap
MLA92/D	Push Button Switch
MLA1093	Abrasive Gel
MLA1090	Electrode Cream
MLA1095	Electrode Paste
MLA1094	Alcohol Swabs
MLAC22	BNC to DIN Smart Adapter (2)





# Hardware

## PTB266 Neurobiology Teaching System

The Neurobiology Teaching System includes the PowerLab 4/26, as well as amplifiers and headstages required for intracellular and extracellular electrophysiology recordings.



### PTB266 Neurobiology Teaching System

ML846 PowerLab 4/26

MLT016/B Nerve Chamber with Cables  
MLA285 Differential Pod Input Cables (2)  
MLA270 Stimulator Cable

AM3100 Intracellular Amplifier with headstage

AM3000H Differential Amplifier with headstage

MLA015 Alga Chamber

## Teaching Kits

**PTK12 Psychophysiology Kit** – Measures GSR and skin temperature.



**PTK17 Reflex Kit** – Used for stimulating and measuring human reflexes.



**PTK19 Nerve and Muscle Kit II** – For recording of isolated nerve and muscle activity.



## Extend the scope with these neuro amps

### AM1700 Differential AC Amplifier



The 1700 Differential AC Amplifier is ideal for research or teaching applications requiring extracellular neurophysiological recording from excitable tissue, such as nerve or muscle, and is capable of making EMG, EEG, EKG and ERG recordings.

### AM1600 Neuroprobe Amplifier



The AM1600 microelectrode amplifier is designed for the exacting requirements of intracellular neurological studies. The amplifier's advanced current injection system, adjustable to 0.1 nA resolution, allows external switching of both internal and external current sources.

### DP-311 Differential Amplifier with Active Headstage



The DP-311 is suited for EEG, EKG and extracellular recording using glass or metal microelectrodes. Extracellular action potentials are typically measured in microvolts but are usually accompanied by much larger DC electrode voltages. The DP-311 is designed to amplify these microvolt level events with as much as  $\pm 2$  Volts DC at the input.

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PowerLab systems and signal conditioners meet the European EMC directive. ADInstruments signal conditioners for human use are approved to the IEC60601-1 patient safety standard and meet the CSA C22.2 No. 601.1-M90 and UL Std. No. 2601-1 safety of medical electrical equipment standards.



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