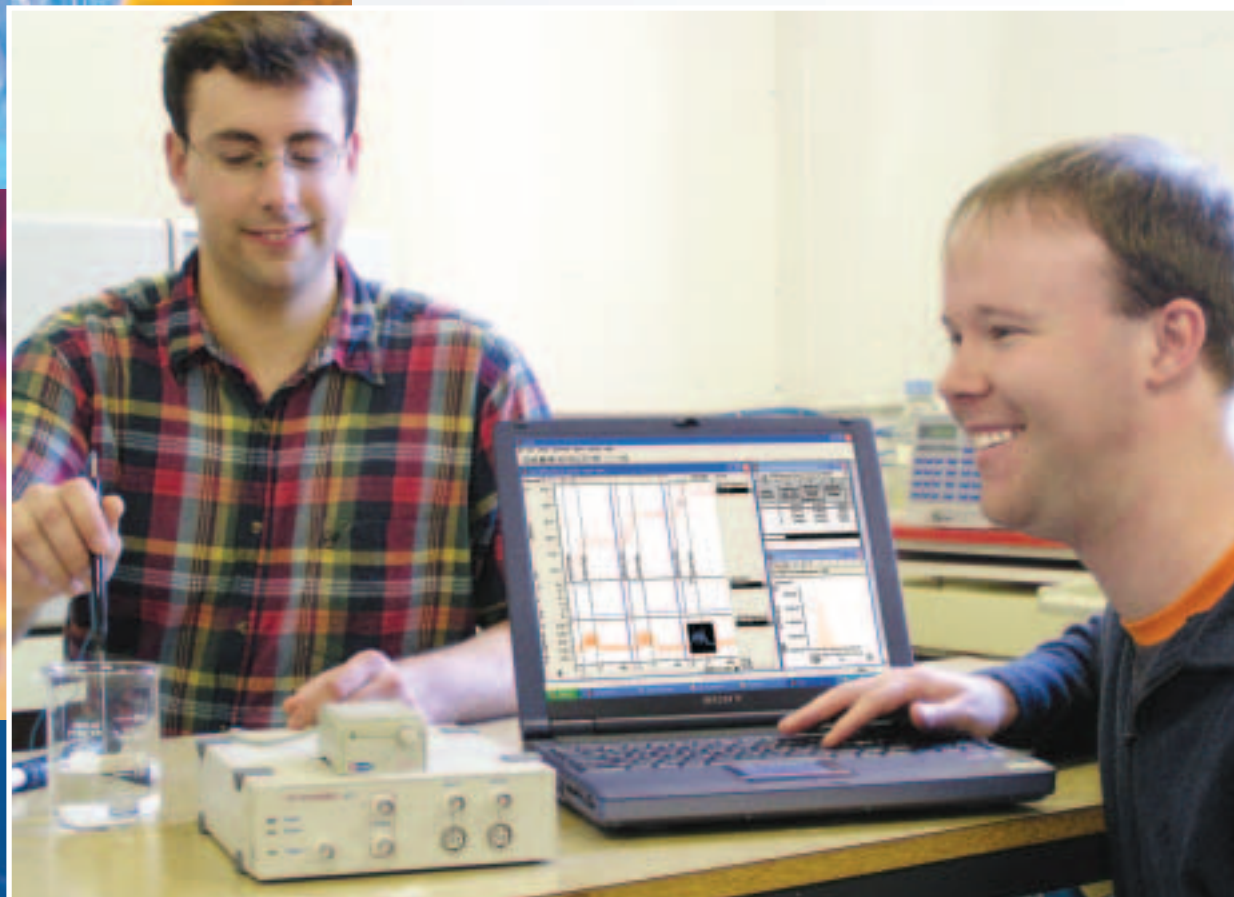
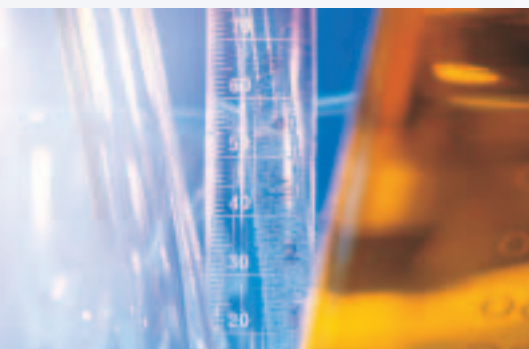


e-corder

chemistry solutions



simple to use

flexible and adaptable

cost effective

technically advanced

contact:



red box direct

Think inside the box

Tel. +353 1 440 3775

Fax. +353 1 443 0784

VIOP 3318@blueface.ie

email info@redboxdirect.com

Web www.redboxdirect.com

e-corder chemistry applications

e-corder is a high resolution, high speed computer based data recording system designed for use in the physical science laboratory.

Below are just a few of the chemistry applications e-corder has been used in.

- ▶ amperometry
- ▶ atmospheric chemistry
- ▶ biosensors
- ▶ chemiluminescence
- ▶ conductimetry
- ▶ chromatography
- ▶ differential thermal analysis
- ▶ electroanalytical chemistry
- ▶ electrophoresis
- ▶ flame emission and AAS
- ▶ flow injection analysis
- ▶ kinetics
- ▶ materials science
- ▶ microdialysis
- ▶ neurochemistry
- ▶ polarimetry
- ▶ photometry
- ▶ quartz crystal microbalance studies
- ▶ thermochemistry
- ▶ titrimetry
- ▶ voltammetry
- ▶ and many more...

How can e-corder help you record experimental and analytical data in your **chemistry research project** or **teaching application**?



The e-corder family of data recorders are available in 2, 4, 8 and 16 channel models. All are supplied with Chart and Scope data recording software.

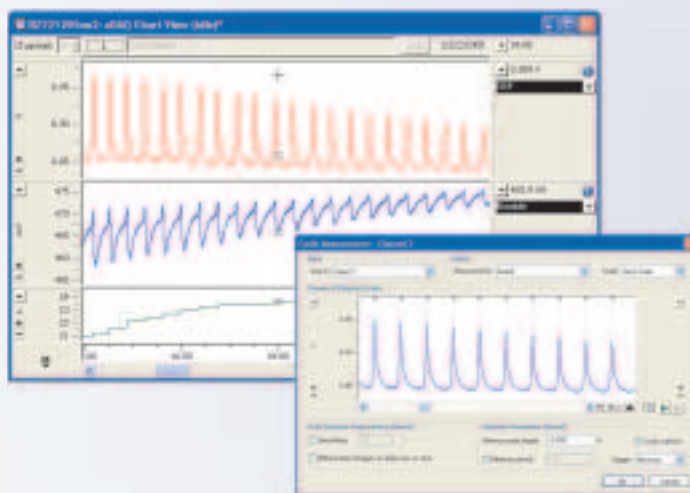


Chart recording of redox potential and bromide ion concentration oscillations during a Belousov Zhabotinsky reaction. The period of the oscillations are calculated on-line and displayed on the third channel.

See www.eDAQ.com for:

- ▶ research applications
- ▶ teaching experiments
- ▶ eDAQ citations database
- ▶ hardware and software information



eDAQ's software controlled potentiostats include the general purpose EA161 Potentiostat, high sensitivity EA162 Picostat and four channel EA168 QuadStat

Many electrochemical experiments can be performed using an e-corder with Chart, Scope or EChem software. e-corder can either be used with eDAQ's range of software controlled potentiostats, or with many other brands of potentiostat.

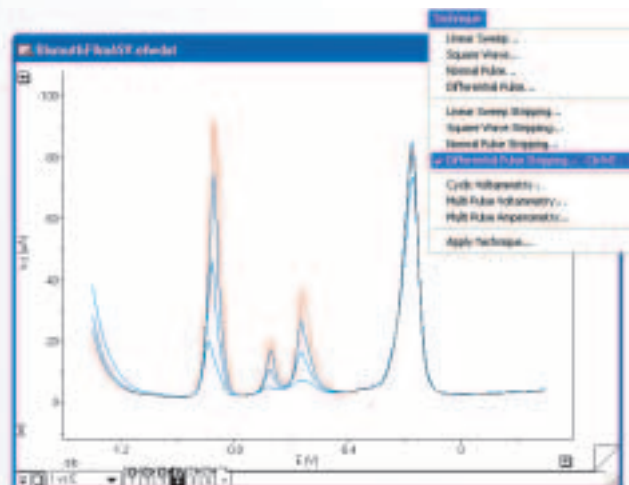
available techniques

- ▶ Staircase Linear Sweep Voltammetry *
- ▶ Normal Pulse Voltammetry *
- ▶ Differential Pulse Voltammetry *
- ▶ Square Wave Voltammetry *
- ▶ Staircase Cyclic Voltammetry *
- ▶ Differential Pulse Amperometry *
- ▶ Chronoamperometry (single or multistep) †
- ▶ Chronocoulometry (single or multistep) †
- ▶ Chronopotentiometry (single or multistep) †
- ▶ Controlled Potential Electrolysis †
- ▶ Controlled Current Electrolysis †

* using EChem software

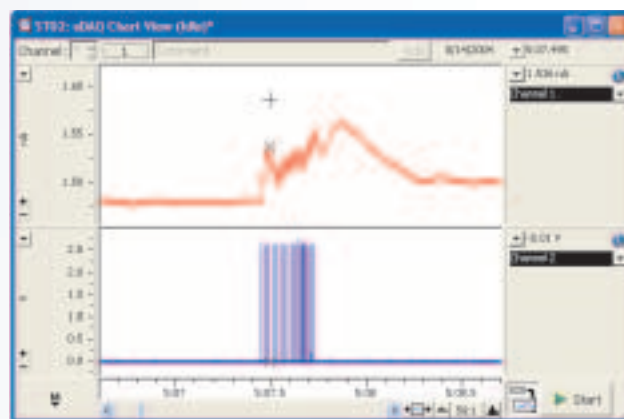
† using Chart or Scope software

EChem's voltammetric techniques are also available in stripping mode for trace element determinations.



Voltammograms shows the simultaneous determination of cadmium, tin and indium at a bismuth film electrode using anodic stripping voltammetry. Data recorded with EChem.

(Recorded by Chad Prior, Flinders University Australia)

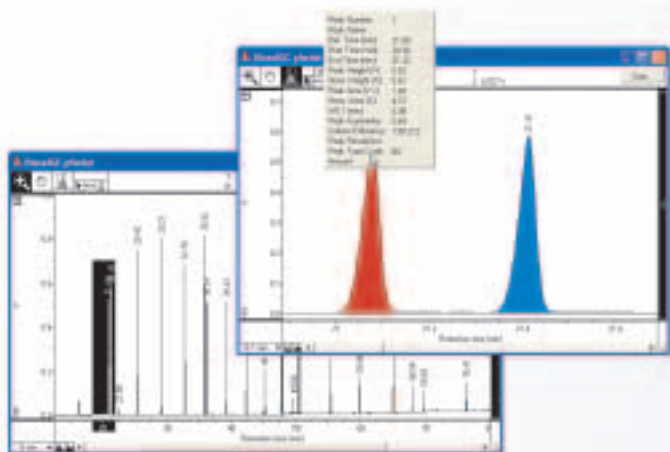


Dopamine release in the forebrain nucleus accumbens in response to electrical stimulation of the prefrontal cortex of a rats brain. Carbon fibre microelectrodes and an EA162 Picostat were used.

(Recorded by Susannah Tye, Macquarie University Australia)

chromatography

www.eDAQ.com/chromatography



Typical gas chromatogram for diesel fuel. Recorded on a PowerChrom 280 system connected to a Varian Star 3400 gas chromatograph fitted with a FID.

(Recorded by Cameron McIntyre, CSIRO Petroleum, Australia)



PowerChrom hardware unit. Supplied with PowerChrom 280 and ER282 Flow Analysis Systems

PowerChrom software runs on Windows or Macintosh computers for the collection, display and analysis of chromatography data. It can be used with either an e-corder system or a PowerChrom 280 system (www.eDAQ.com/ER280), which includes a specialized hardware unit.

Signals can be recorded from one or two chromatography detectors, with most detectors having a 'recorder' or 'integrator' output being suitable. Sophisticated digital signal processing ensures the best possible signal-to-noise ratio from your instrument.

With PowerChrom, all the information that relates to a specific chromatography experiment (peak detection and integration parameters, retention times, calibration data, sample runs, operator annotations, date and time stamping, etc.) is retained in a single PowerChrom 'Data file'. You can access any information relevant to any run in the Data file, years later if need be.

Throw away old paper recorders, integrators and DOS-based systems and upgrade to the latest generation of computing technology.



A typical PowerChrom report printout... Data document containing a Chromatogram window and a Peak Information table.

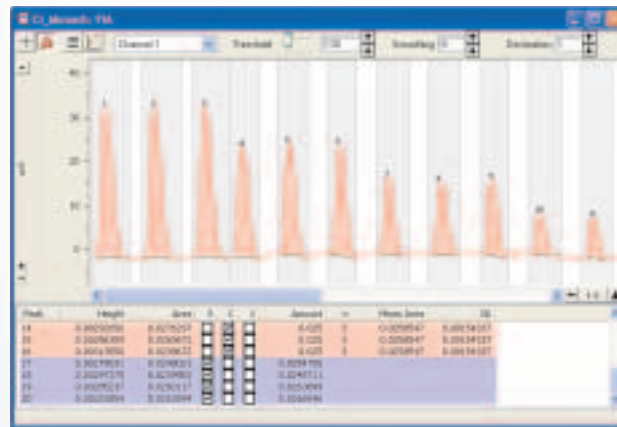
(Recorded by Anthony Harakuwe, University of Tasmania Australia)

flow injection analysis

www.eDAQ.com/FIA

The FIA Chart Extension enables Chart to detect and calibrate peaks from Flow Injection Analysis (FIA) and similar experiments. Calibration by peak area or peak height is possible and there are several curve fitting functions available. Results are printed in user configurable reports, or can be exported to other applications as a graphic or text for further analysis.

Like all Chart Extensions, the FIA Chart Extension is available FREE from www.eDAQ.com/extensions, and can be used with any **e-corder** system. The extension is also included in the economically priced ER282 Flow Analysis System (www.eDAQ.com/ER282).



The FIA Chart Extension was used to record a series of calibration peaks from a Flow Injection Analysis (FIA) system that incorporates a chloride ion selective electrode.

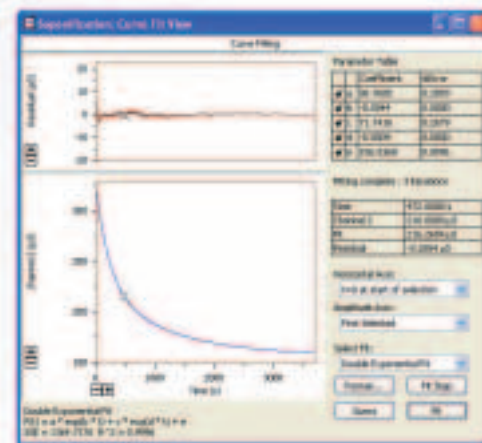
(Recorded by Ian McKelvie, Monash University Australia)

conductivity

www.eDAQ.com/conductivity

e-corder is ideal for recording changes in solution conductivity during chemical reactions. It can be interfaced with many brands of conductivity meters, along with eDAQ's fully software controlled EP307 Conductivity Pod (www.eDAQ.com/EP307).

The Conductivity Pod is suitable for use with most two-electrode conductivity cells. Charts Units Conversion feature can be used to convert the mV output to specific conductance units.



Investigating the chemical kinetics of Ethyl Acetate saponification by monitoring the change in solution conductivity. The Curve Fit Chart Extension can be used to fit various functions to collected data.



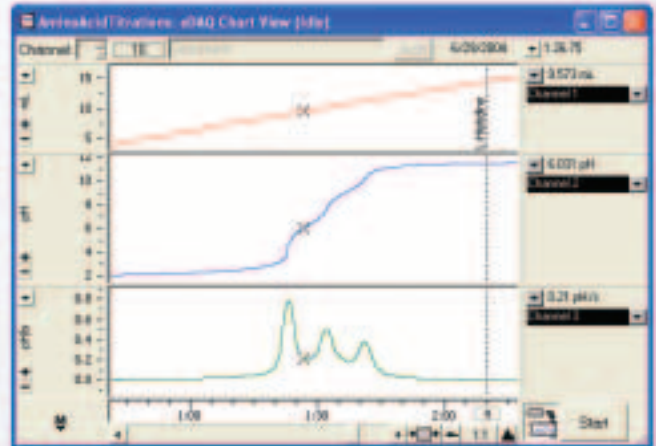
EP307 Conductivity Pod

pH & ISEs

Use **e-corder** with a pH meter to record signals from pH, ion selective and potentiometric redox (ORP) electrodes. Quickly perform single or two point calibration with Chart's pH extension. Just record the signal from one or two buffer solutions, select the pH command and enter the required values. The extension can also be used to gauge the quality of the electrode by calculating the percentage Nernstian response.

eDAQ has three software controlled pH/mV Amps:

- ▶ EP303 pH Pod (www.eDAQ.com/EP303)
- ▶ EA165 pH/mV Amp (www.eDAQ.com/EA165)
- ▶ EA168 Quad pH/mV Amp (www.eDAQ.com/EA168)

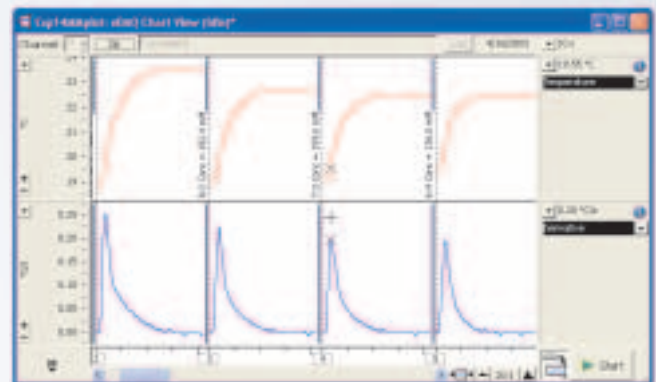


A potentiometric titration of an acidified L-Histidine solution with 0.1 M NaOH. Easily determine the pK' values of ionizing groups and relate to the structure of the amino acid.

temperature

Along with recording raw temperature, temperature changes and rates of change can be recorded with Chart and Scope. Temperatures from multiple sources can be monitored simultaneously and channel arithmetic used to perform differential thermal analysis.

The Thermocouple Chart Extension automatically calibrates the output of the EP306 Thermocouple Pod (www.eDAQ.com/EP306) to within the uncertainty limits of NIST ITS-90 rated K- and T-type thermocouples.



Monitoring temperature changes during catalase induced hydrogen peroxide decomposition. Chart's Derivative... channel function was used to display the first derivative (rate of temperature change) on the second channel.



EP306 Thermocouple Pod with ET1400
T-type Thermocouple Probe

e-corder is an ideal recording system for teaching. It can be used at all tertiary levels of chemistry and bio-chemistry experimental courses to perform both simple and advance experiments. No programming is required to develop applications, and the software is easy to use without compromising on features.

Replace expensive, single-purpose analytical instruments with an **e-corder** system.

experiments

eDAQ has developed a number of chemistry teaching experiments using equipment that can be found in the eDAQ Mega Teaching Kit (www.eDAQ.com/ER462).

Resource folders containing experimental notes and sample files are available FREE from www.eDAQ.com/teaching. Experiments include:

- ▶ *Quantitative analysis of Cu, Pb and Cd in tap water by anodic stripping voltammetry at a mercury film electrode*
- ▶ *Cyclic voltammetry of ferrocene carboxylic acid*
- ▶ *Electrochemistry of a glucose sensor*
- ▶ *Electrochemical measurement of corrosion*
- ▶ *The pH electrode calibration and the Nernst equation*
- ▶ *Determining the fluoride content of a toothpaste sample using a fluoride ion selective electrode*
- ▶ *Belousov-Zhabotinsky oscillating chemical reactions*
- ▶ *Amino Acid titrations*
- ▶ *Calibration of a 'coffee cup' calorimeter and measuring the heat of neutralization*



Components of eDAQ Mega Teaching Kit. Includes all the hardware and software to perform eDAQ's teaching experiments.



Experiment resource folders contain experimental notes with fully tested exercises. Save time developing experiments.

the e-corder advantage

Easy to learn	A short time spent with our Quick Start manual allows a user to start using e-corder . Software applications are written and supported by one team of programmers who produce consistent software features used in all e-corder applications.
Ease of use	Researchers and students find the e-corder system easy to understand because they emulate commonly used instruments such as chart recorders, oscilloscopes and X-Y recorders.
Versatility	e-corder can replace many different data recording instruments such as multipen chart recorders, digital voltmeters, XY, XYY and XT plotters, oscilloscopes, FFT analysers, histogram displays, integrators, peak detectors and analysers, electrochemistry and chromatography data systems, event controllers and signal generators.
Precision and speed	Up to 23 bits of resolution, internal calibration and auto zero provide superior precision, accuracy and dynamic range. Up to 200,000 samples per second continuous acquisition rate.
Self contained and portable	e-corder is not a data acquisition card; it is a complete recorder with software selectable input gains on each channel, selectable sampling rates, multiple channels, flexible trigger modes and a full range of analysis tools.
Power	The advanced PowerPC™ microprocessor used in e-corder provides sufficient processing power to record data at a rate of 200,000 samples per second continuously to disk via a USB-2 port. A full range of advanced calculations can also be performed on-line by the system.
Cost effective	e-corder can be used in more than one application. New software applications are continually being developed to enhance e-corder's features and applications. Use it in teaching and then in a research project.
Multiplatform	e-corders are provided with software that operates on both Windows and Macintosh.
Long life	e-corder is built to last and our support continues to provide software updates throughout the life time of your product.
Low setup charges	Standard cables will connect e-corder to specialised instruments. Because e-corder programs record experimental settings, it is easy to repeat or duplicate any experiment by simply reloading an experiment file. Macros, a method of recording all the steps taken to carry out an experiment, can be used automate many set-up and analysis tasks.

More than 30,000 systems from the **e-corder** family of products are successfully recording experimental data in scientific and engineering disciplines.



www.eDAQ.com

contact:



red box direct

Think inside the box

Tel. +353 1 440 3775

Fax. +353 1 443 0784

VIOP 3318@blueface.ie

email info@redboxdirect.com

Web www.redboxdirect.com