Discover the power of a true 32-bit Windows program with the PowerPULSE Electroanalytical Software module for our electrochemistry PowerSuite software platform. Take advantage of all the new features including powerful wizards, new graphics data presentation formats and easy-to-use import/export tools for both graphs and data.
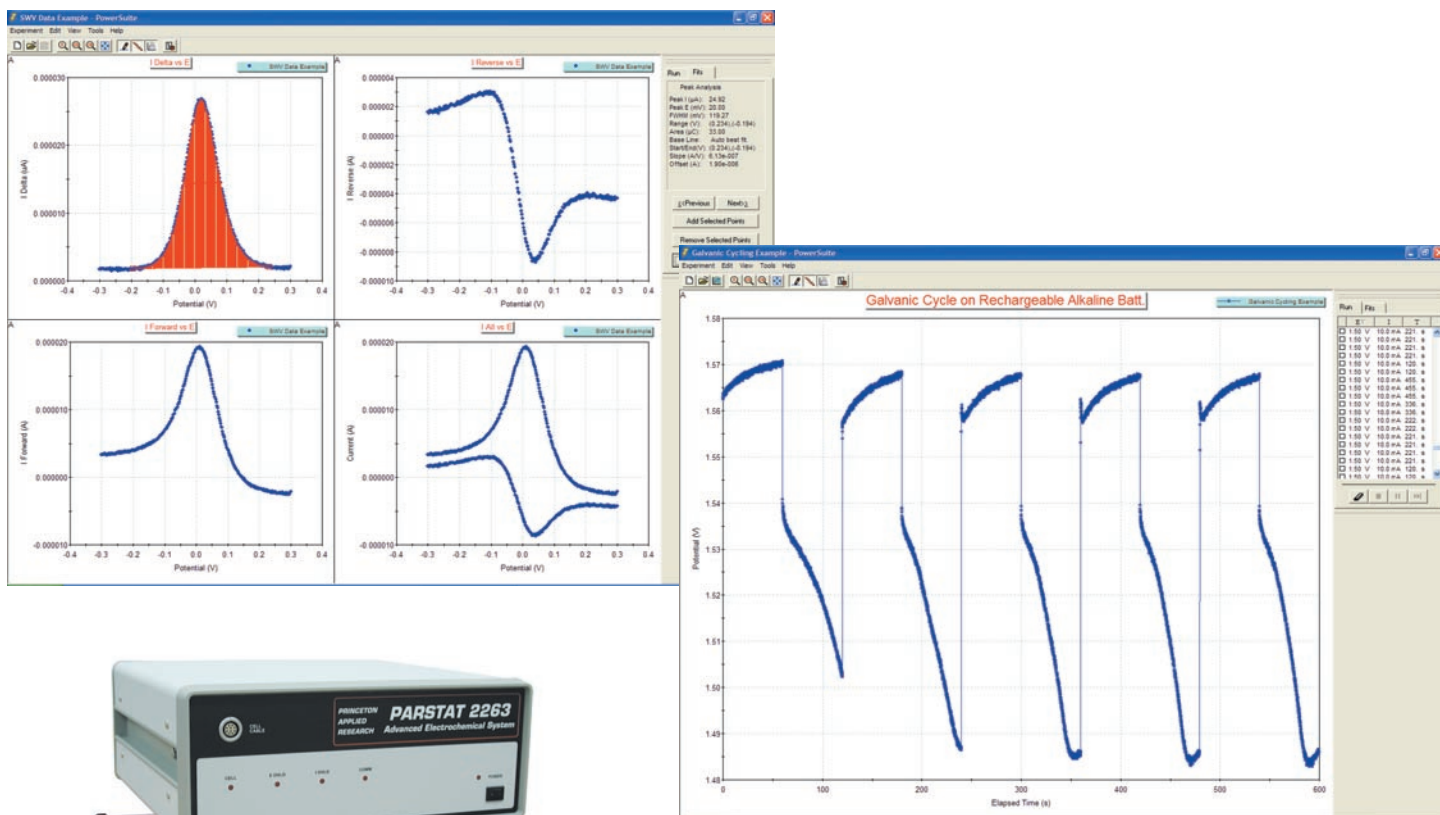
Power and Flexibility

- Standard pulse techniques (Squarewave Voltammetry, Differential Pulse Voltammetry, Normal and Reverse Normal Pulse Voltammetry) for electroanalytical experiments.

- Improved programming flexibility to perform Cyclic Squarewave Voltammetry, Cyclic Differential Pulse Voltammetry, and Anodic Stripping Voltammetry.

- Recurrent (Cycling) Potential or Galvanic Pulse techniques for battery cycling with potential, current, and charge limitation settings.

- Perform Multi-Step Chronoamperometry or Chronopotentiometry experiments with up to four different pulse amplitudes and the ability to cycle over many iterations.

- Powerful graphics with plotting and analysis tools to easily extract information from the data.

- Easy importation of M250/270 data files.

PowerPULSE begins a whole new chapter in our long tradition of providing electroanalytical software to the research electrochemistry community.

PowerPULSE joins the popular Electrochemistry PowerSuite family of software modules for electrochemical research using Princeton Applied Research potentiostats/galvanostats. PowerPULSE includes pulse techniques that are most commonly used in electroanalytical chemistry (shown in the box on the right).

The analytical techniques, Square Wave Voltammetry and Differential Pulse Voltammetry, are complemented with data analysis tools such as Peak Analysis, providing valuable information on peak height and peak area. Also available for research or teaching applications are the large amplitude pulse techniques, Normal Pulse Voltammetry and Reverse Normal Pulse Voltammetry.
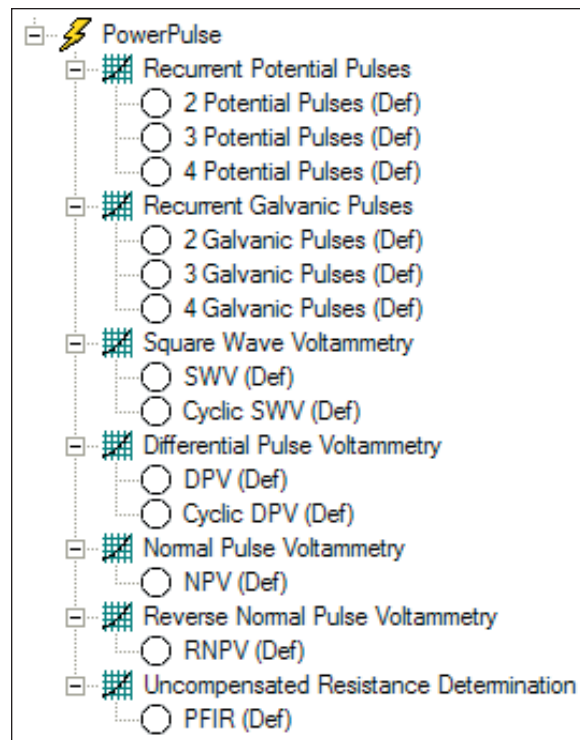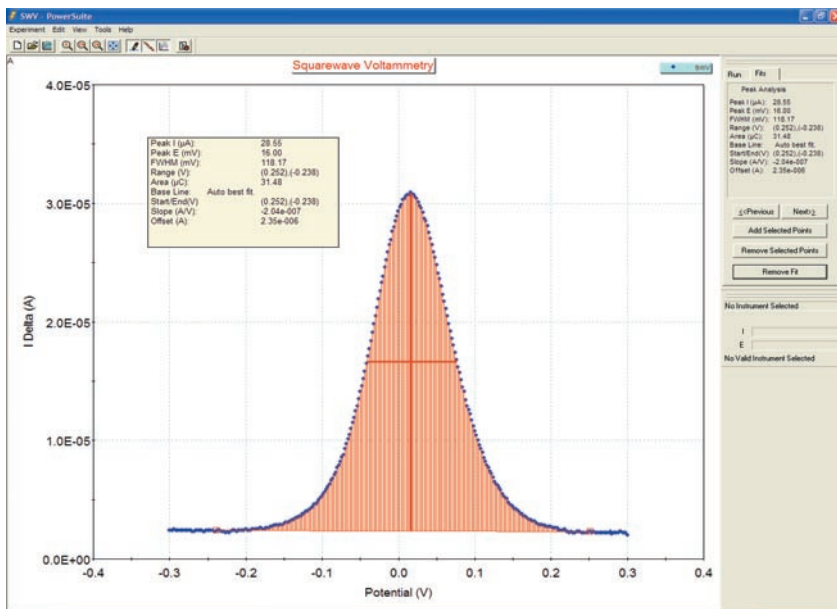
Two multi-step techniques have been added, the Recurrent Potential Pulse (RPP) and Recurrent Galvanic Pulse (RGP) techniques. Designed primarily for potentiostatic and galvanostatic cycling (ie., charge/discharge experiments on batteries), these techniques can also be be used for chronoamperometry or chronopotentiometry experiments where up to four different amplitudes and durations can be selected for a single experiment. These may be repeated, or "cycled", for many iterations providing extreme versatility and flexibility!

For those experiments where solution resistance can cause a bias in the data, a Positive Feedback IR (PFIR) compensation feature is available. PowerPULSE includes an Uncompensated Resistance Determination technique to estimate the solution resistance between the working and reference electrodes, and determines the level of compensation achievable with the PFIR Compensation method. Once determined, this resistance value is entered in the Expert Options section of the individual pulse techniques and compensation occurs automatically during the experiment.

The addition of pulse techniques into the PowerSuite software platform allows the user to utilize the powerful Autoexecute Batch Processing feature. Now users can implement an easy to use "drag and drop" feature to sequence any of the pulse techniques with any other electrochemical technique available in PowerSuite. Use the autoexecute feature in PowerPULSE to perform different pulse experiments or techniques in a sequence, run multiple cycles of a particular technique with time delays between each cycle, or combine techniques of different modules, such as EIS (impedance) experiments in PowerSINE with RGP experiments in PowerPULSE. With PowerPULSE, you have the power!
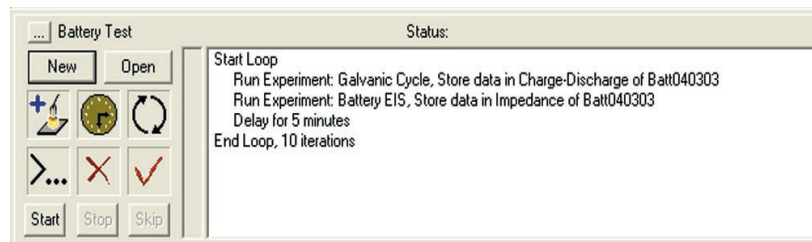

PowerPULSE is compatible with data acquired from M250/270 Research Electrochemistry software. Simply import the M250/270 data file and it quickly and easily converts to the PowerSuite data structure so that it is available for display, analysis, and comparison as if it were acquired in PowerPULSE.

PowerSuite, our 32-bit Windows 95/98/NT/2000/XP application software, provides a simple, flexible and extremely powerful software interface to perform corrosion techniques with Princeton Applied Research Instrumentation.

PowerSuite's unique data storage format using a Microsoft® Access database makes a number of other powerful features available to PowerSuite. They include making changes to some experimental parameters on the fly, performing fits on data as it's being collected, searching data files based on comments added by the user, and exporting data and plots to other programs such as Excel or PowerPoint.
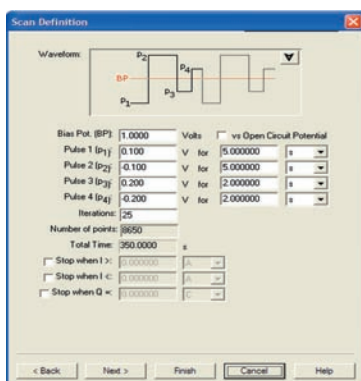

For new users, the "New Experiment Wizard" guides you through a step by step process to configure all aspects of the experiment. Once you have a setup that is to be repeated over several experiments, it can be "Saved as a Template…" , recalled, and executed without having to re-enter information with each use.

PowerSuite's dominant feature is the graphical capabilities that provide tremendous flexibility with data presentation. Up to four plots can be viewed simultaneously on the screen without opening a separate viewing program. Several default plots are available, and the user has the ability to modify each or create and save their own custom graphs according to their criteria. A wide variety of parameters are available for plotting, as well as the ability to add a second Y-axis or view the plot in 3-D. The user can select the data symbols/lines desired, and change the color of any plot.

Additional graphical features allow for the data on any axis to be mathematically changed (by choosing either +, –, /, or * of the axis values) using the Data Factors feature. This feature can be used to change a reading in amps to microamps for data comparison purposes, or it can be used to convert a potential reading acquired from an ancillary component (such as a temperature probe) through the Auxiliary Input into its proper values (such as °C).
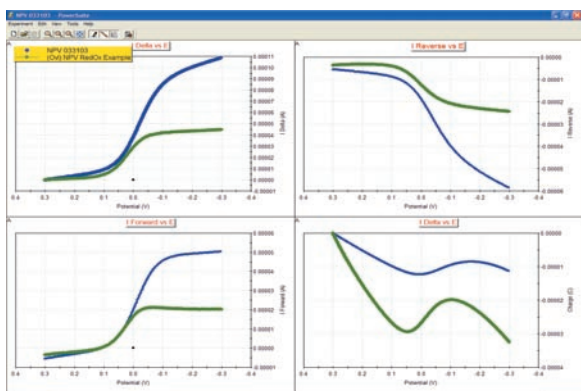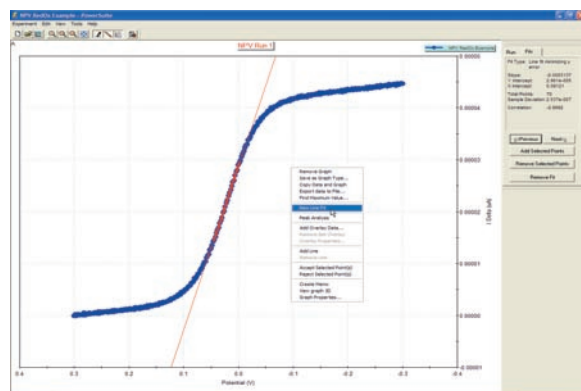
Overlaid data from prior experiments can appear on up to four different graphs simultaneously. You can even place the overlay data on the plots prior to acquiring the data, which allows the user to compare the two data sets as the experiment progresses! The graphical properties of the overlaid data can also be modified in terms of color or plot style. Any overlaid data can be selected to become the "active" data file, at which point the current "active" file becomes an overlay, and full data analysis can be performed on what was an overlay! A number of graphical and analytical features are available by right-clicking on any graph and selecting from a full complement of options.

The "Hover" window feature in PowerSuite provides you with a unique information window for any data point, even during the acquisition. Just position the cursor near a data point and the Hover box will appear, providing detailed information on that data point determined by the type of plot being examined.

The Experiment Bar provides a live interface to the experiment. The control buttons on the Experiment Bar's Run tab allow the user to start, stop, or pause an experiment. The Fits tab on the Experiment Bar provides the information on Line Fits, Peak Analysis, etc., depending on the data being analyzed. An Instrument Toolbar provides information on the ID of the instrument being controlled, the cell on/off status, current scale, as well as the current and potential measurements.

The Autoexecute Bar gives you even more automated control over PowerSuite. Experimental templates can be entered into control windows for execution, along with time delays, loops, and even user prompts. Any template can be added to an Autoexecute sequence, allowing a user to run, for example, both DC and AC corrosion techniques in the same sequence! An Autoexecute can be created and saved for repeated use to allow the user to work while away from the instrument, increasing productivity and throughput.

Specifications

Hardware Supported
GPIB Instruments: 273A, 263A, 6310A, BES, 283, VersaStat II
USB Instruments: PARSTAT Series (ie., PARSTAT 2263)

Electroanalytical Techniques
Square Wave Voltammetry (SWV)*
Differential Pulse Voltammetry (DPV)*
Normal Pulse Voltammetry (NPV)*
Reverse Normal Pulse Voltammetry (RNPV)*
Recurrent Potential Pulses (RPP)
Recurrent Galvanic Pulses (RGP)
Uncompensated Resistance Determination
*These techniques may also be performed as stripping voltammetry with the application of a deposition potential.

Working Electrodes Supported
Model 303A Static Mercury Drop Electrode (HMDE mode only) with 507 interface
Model 616/636 Rotating Electrodes
Solid Electrodes (see online catalog for electrodes and cell selection)

Recommended Computer Specifications
Pentium Processor (1GHz or greater)
64MB RAM
50MB available HDD space
CD-ROM drive
Microsoft Windows 95/98/2000/NT/XP

Interface Card (GPIB Instruments only)
National Instruments PCI-GPIB (PC)
National Instruments PCMCIA-GPIB (Laptop)

	RPP	RGP	SWV	DPV	NPV	RNPV
Applied Potential	±8 V	N/A	±8 V	±8 V	±8 V	±8 V
Max. Applied Current	N/A	Instrument Specific	N/A	N/A	N/A	N/A
Pulse Height	±2 V	±2 V	±2 V	±2 V	±2 V	±2 V
Pulse Width	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**
Step Height	N/A	N/A	1–20 mV	1–20 mV	1–20 mV	1–20 mV
Maximum Scan Rate	N/A	N/A	2500 mV/s* 100 V/s**	4000 mV/s* 100 V/s**	4000 mV/s* 100 V/s**	4000 mV/s* 100 V/s**
Maximum Number Points	10k	10k	3k	6k	6k	6k
Minimum Time per Point	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**	4 ms* 100 µs**

*GPIB Instruments
**USB (PARSTAT) Instruments