Model 800D Series Electrochemical Detector

The Model 800D series is designed for electrochemical detection; it can be used for monitoring the current passing through a flow cell in liquid chromatography/electrochemistry or in-flow injection analysis, as well as other electroanalytical applications. The system contains a digital function generator, a data acquisition system, and a potentiostat / bipotentiostat / galvanostat. The potential control range is ±10 V, the current range is ±10 mA, and the maximum sampling rate is 1 MHz at 16-bit resolution. The instrument is capable of measuring current down to picoamperes. This series is designed for analytical use that requires high sensitivity and low noise levels, and its circuitry has very low electrical noise. The instrument allows an external input signal (such as spectroscopic) to be recorded simultaneously with electrochemical measurements. When used for amperometric detection, three decades of current scales are plotted during the experiment to display signals of various magnitudes clearly. Compared with analog instruments, this instrument is much easier to use and also includes standard digital data storage and analysis capabilities, without the need for recorder or baseline adjustments. It also provides a much larger current dynamic range, so that separate runs for large and weak signals can be avoided.

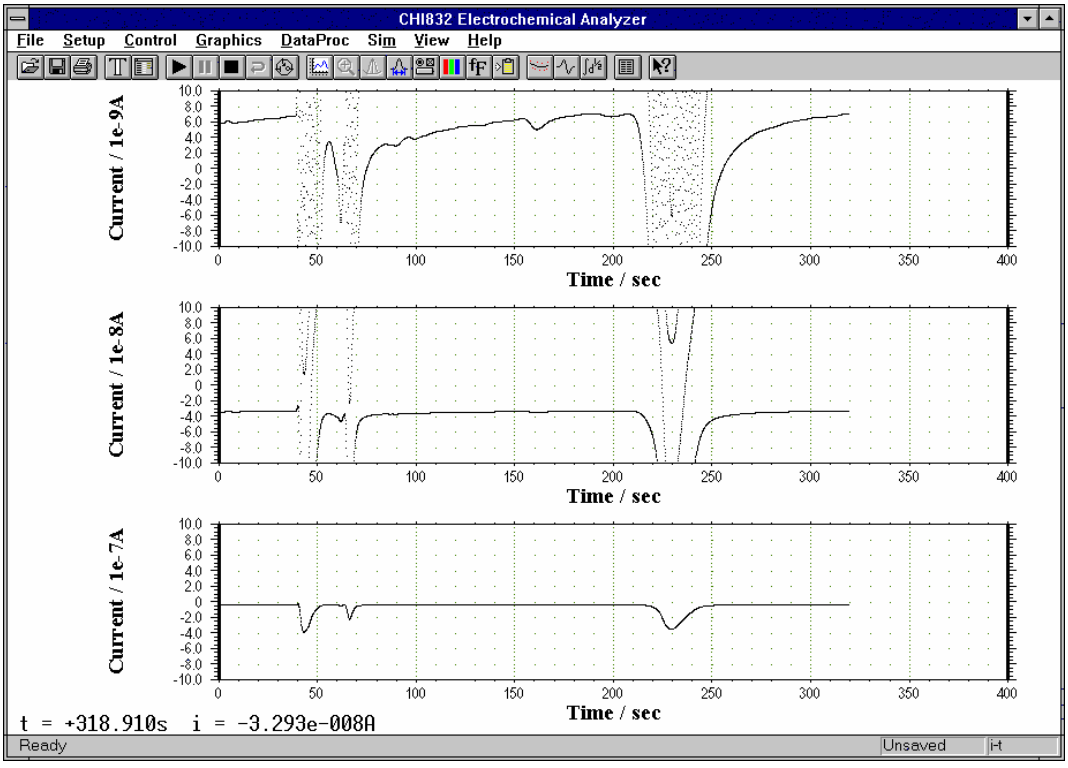
The Model 8×0D performs single channel measurements, while the Model 8×2D contains a bipotentiostat for dual-channel measurements, such as rotating ring-disk electrode applications. Dual channel measurements are available for CV, LSV, CA, DPV, NPV, SWV, and amperometric i-t techniques. The 2nd channel can be controlled at an independent constant potential, to scan or step at the same potential as the first channel, or to CV scan at a constant potential difference with the first channel.

The model 800D series is an upgrade to our model 800/800A/800B/800C series. The instrument utilizes flash memory, allowing instrument updates to be distributed electronically instead of the inconvenient shipment and installation of an EPROM chip.

The 800D series has a USB port (default) and a serial port for data communication with the PC. You can select either USB or serial port (but not both) by changing the switch setting on the rear panel of the instrument.

The 800D series also has a true integrator for chronocoulometry.

Several different models are available in the 800D series. The following table compares the different models. Other than what is listed, the specifications and features of these models are identical. Models 800D/802D and 810D/812D are mainly for flow cell detection. Models 820D/822D are intended for voltammetry applications and cannot be used for flow cell detection. Models 830D/832D are comprehensive electrochemical analyzers that can be used for electrochemical detection, voltammetry, and other applications. Models 840D/842D and 850D/852D are more advanced models with a galvanostat. Models 850D/852D also include AC voltammetry capabilities.



Real time data display for flow cell detection.

Specifications

Potentiostat / Biptentiostat:

- Zero resistance ammeter
- 2, 3, or 4-electrode configuration
- Floating (isolated from earth) or earth ground
- Maximum potential: ±10 V for both channels
- Maximum current: ±10 mA
- Compliance Voltage: ±13 V
- Potentiostat rise time: < 2 µs
- Applied potential ranges: ±3.276 V, ±6.553 V, ±10 V
- Applied potential resolution: 0.0015% of potential range
- Applied potential accuracy: ±1 mV, ±0.01% of scale
- Applied potential noise: < 10 µV rms
- Measured current range: ±10 pA to ±0.001 A in 10 ranges
- Current resolution: 0.0015% of current range, minimum 0.3 fA
- Current measurement accuracy: 0.2% if >= 1e-6 A/V, 1% otherwise
- Input bias current: < 10 pA

Galvanostat:

- Galvanostat applied current range: 3 nA – 10 mA
- Applied current resolution: 0.03% of applied current range

Electrometer:

- Reference electrode input impedance: 1e12 ohm
- Reference electrode input bias current: <= 10 pA @ 25°C

Waveform Generation and Data Acquisition:

- Fast waveform update: 1 MHz @ 16-bit
- Fast data acquisition: 16-bit ADC, 1,000,000 samples/sec
- External signal recording channel

Experimental Parameters:

- CV and LSV scan rate: 0.000001 to 5000 V/s
- CA and CC pulse width: 0.0001 to 1000 sec
- CA minimum sample interval: 1 µs
- CC minimum sample interval: 1 µs
- True integrator for CC
- DPV and NPV pulse width: 0.001 to 10 sec
- SWV frequency: 1 to 100 kHz
- i-t sample interval: minimum 1 µs
- ACV frequency: 0.1 to 10 kHz
- SHACV frequency: 0.1 to 5 kHz

Other Features:

- Automatic and manual iR compensation
- External potential input
- Potential and current analog output
- Programmable potential filter
- Programmable signal filter
- RDE control output (Model 840D and up): 0-10V (corresponding to 0-10000 rpm), 16-bit, 0.003% accuracy
- Flash memory for quick software update
- Serial port or USB port selectable for data communication
- Cell control: purge, stir, knock
- Maximum data length: 256K-16384K selectable
- CV simulation and fitting program, user defined mechanisms
- Dimension: 14.25"(W) × 9.25"(D) × 4.75"(H)
- Weight: 12 lb.

Differences of 800D Series Models

Functions	*800D/802D*	*810D/812D*	*820D/822D*	*830D/832D*	*840D/842D*	*850D/852D*
Cyclic Voltammetry (CV)*	●	●	●	●	●	●
Linear Sweep Voltammetry (LSV) [&,*]	●	●	●	●	●	●
Staircase Voltammetry (SCV) [#,&,*]						●
Tafel Plot (TAFEL)						●
Chronoamperometry (CA)*				●	●	●
Chronocoulometry (CC)				●	●	●
Differential Pulse Voltammetry (DPV) [#,&,*]			●	●	●	●
Normal Pulse Voltammetry (NPV) [#,&,*]			●	●	●	●
Differential Normal Pulse Voltammetry (DNPV)[#,&]						●
Square Wave Voltammetry (SWV) [&,*]			●	●	●	●
AC Voltammetry (ACV) [#,&,$]						●
2nd Harmonic AC Voltammetry (SHACV) [#,&,$]						●
Amperometric i-t Curve (i-t)*	●	●		●	●	●
Differential Pulse Amperometry (DPA)		●		●	●	●
Double Differential Pulse Amperometry (DDPA)		●		●	●	●
Triple Pulse Amperometry (TPA)		●		●	●	●
Integrated Pulse Amperometric Detection (IPAD)						●
Bulk Electrolysis with Coulometry (BE)			●	●	●	●
Hydrodynamic Modulation Voltammetry (HMV)						●
Sweep-Step Functions (SSF)					●	●
Multi-Potential Steps (STEP)					●	●
Chronopotentiometry (CP)					●	●
Chronopotentiometry with Current Ramp (CPCR)					●	●
Multi-Current Steps (ISTEP)					●	●
Potentiometric Stripping Analysis (PSA)				●	●	●
Electrochemical Noise Measurement (ECN)						●
Open Circuit Potential - Time	●	●	●	●	●	●
Galvanostat					●	●
RDE control (0-10V output)					●	●
Full version of CV simulator				●	●	●
Limited version of CV simulator	●	●	●			
iR Compensation	●	●	●	●	●	●
External Potential Input	●	●	●	●	●	●
Auxiliary Signal Measurement Channel	●	●	●	●	●	●

#: Corresponding polarographic mode can be performed.
&: Corresponding stripping mode can be performed.
#: Second channel (bipotentiostat) mode can be performed.