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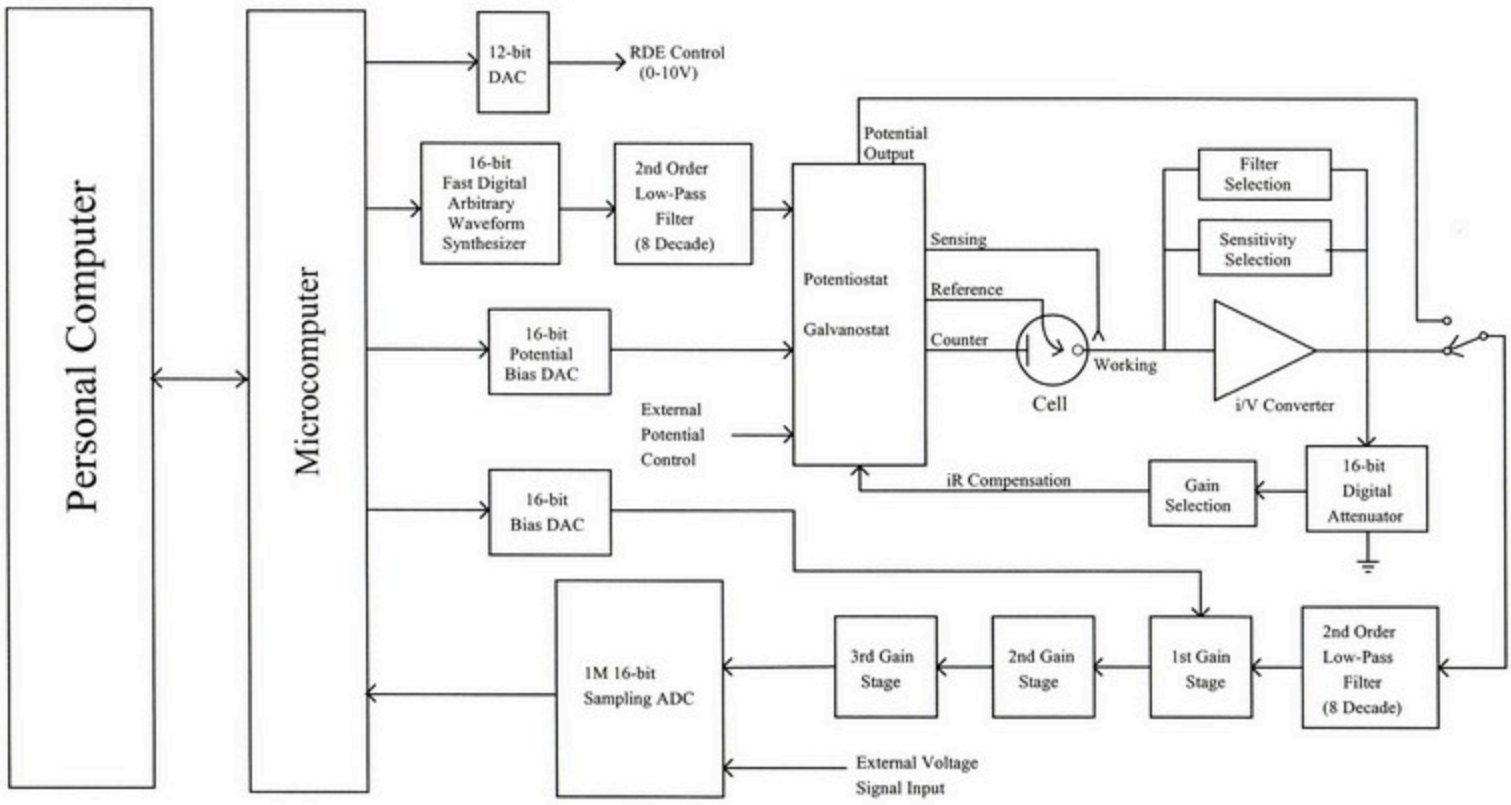
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Model 600C Series

Electrochemical Analyzer/Workstation

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The Model 600C series is designed for general purpose electrochemical measurements. The figure below shows the block diagram of the instrument. The system contains a fast digital function generator, high speed data acquisition circuitry, potentiostat, and a galvanostat (available only in select models). The potential control range is ±10 V and the current range is ±250 mA. The instrument is capable of measuring current down to tens of picoamperes. The steady state current of a 10 µm disk electrode can be readily measured without external adapters. With the CHI200 Picoamp Booster and Faraday Cage (fully automatic and compatible with the CHI600C series), currents down to 1 pA can be measured. These instruments are very fast. The function generator can update at a 5 MHz rate, and the maximum sampling rate is 1 MHz at 16-bit resolution. The instrument provides very wide dynamic range on experimental time scales. For instance, the scan rate in cyclic voltammetry can be up to 500 V/s with a 0.1 mV potential increment or 5000 V/s with a 1 mV potential increment. The potentiostat/galvanostat uses a 4-electrode configuration, allowing it to be used for liquid/liquid interface measurements and eliminating the effect of contacting resistance of connectors and relays for high current measurements. Multiple data acquisition systems allow an external input signal (such as spectroscopy signals to be recorded simultaneously with electrochemical data). The instrument will also automatically re-zero both potential and current, so that periodic re-calibration of the instrument can be avoided.



The 600C series is the upgrade to our very popular 600B series. The analog-to-digital converter has been changed from 12-bit to 16-bit. The maximum sampling rate is 1 MHz. The instrument also now utilizes FLASH memory, allowing instrument updates to be distributed by e-mail instead of the shipment of an EPROM chip.

The 600C series has a serial port (default) and a USB for data communication with the PC. You can select either serial port or USB (but not both) by changing the jumper setting on the board.

The 600C series also includes a true integrator for chronocoulometry.

A 16-bit highly stable bias circuitry is used for current or potential bias. This allows wider dynamic range in ac measurements. It can also be used for re-zero the dc current output.

The model 600C series can be upgraded to a bipotentiostat. The model 700C series will be an add-on board to the 600C series. It will therefore be identical to the 600C series when used for single channel measurements. When it is used as a bipotentiostat, the second channel can be controlled at an independent constant potential to scan or step at the same potential as the first channel, or to scan with a constant potential difference with the first channel. Additional voltammetric and amperometric techniques for the second channel are currently under development.

We provide several different models in the 600C series. The following table compares the different models. Other than what is listed, the specifications and features of these models are identical. Models 600C and 610C are basic units for mechanistic study and electrochemical analysis, respectively. They are also great for teaching purposes. Models 602C and 604C are for corrosion studies. Models 620C and 630C are comprehensive electrochemical analyzers. Models 650C and 660C are advanced electrochemical workstations.

Specifications

Potentiostat
Galvanostat (Model 660C)
Potential range: -10 to 10 V
Potentiostat rise time: < 1 us
Compliance voltage: ±12 V
3- or 4-electrode configuration
Current range: 250 mA
Reference electrode input impedance: 1×10^{12} ohm
Sensitivity scale: 1×10^{-12} - 0.1 A/V in 12 ranges
Input bias current: < 50 pA
Current measurement resolution: < 0.01 pA
Minimum potential increment in CV: 100 μV
Potential update rate: 5 MHz
Fast data acquisition: 16 bit @ 1 MHz
External signal recording channel
Automatic and manual iR compensation
Flash memory for quick software update
Serial port or USB selectable for data communication

CV and LSV scan rate: 0.000001 to 5000 V/s
Potential increment during scan: 0.1 mV @ 500 V/s
CA and CC pulse width: 0.0001 to 1000 sec
CA and CC Steps: 320
True integrator for CC
DPV and NPV pulse width: 0.0001 to 10 sec
SWV frequency: 1 to 100 kHz
ACV frequency: 1 to 10 kHz
SHACV frequency: 1 to 5 kHz
IMP frequency: 0.00001 to 100 kHz
Automatic potential and current zeroing
Potential, current low-pass filters, covering 8-decade frequency range, Automatic and manual setting
RDE rotation control voltage output: 0 - 10 V (Model 630C and up)
Cell control: purge, stir, knock
Maximum data length: 128K-4096K selectable
Dimension: 12.5”(W) × 11”(D) × 4.75”(H)
Weight: 15 Lb.

Square wave voltammogram.

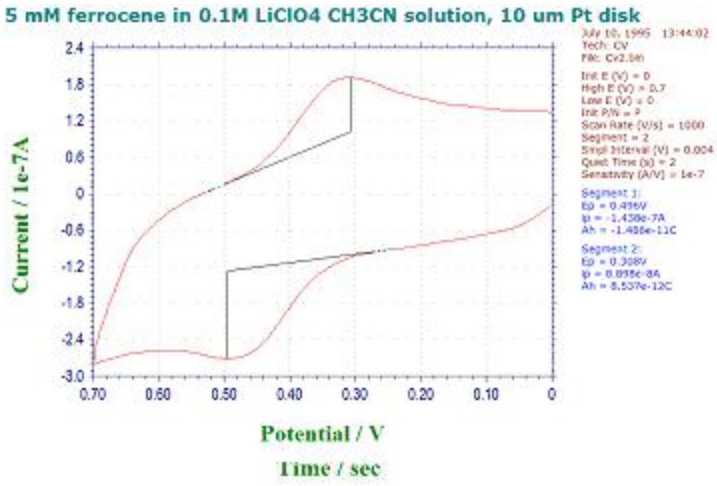
Amperometric i-t Curve.

Differences Between 600C Series Models

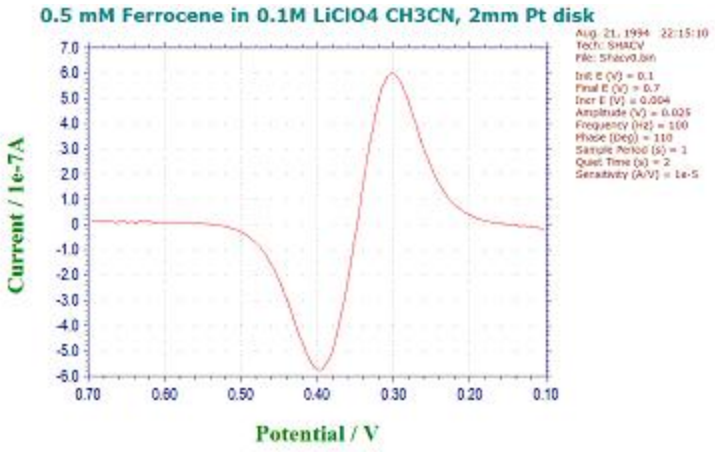
Functions	*600C*	*602C*	*604C*	*610C*	*620C*	*630C*	*650C*	*660C*
Cyclic Voltammetry (CV)	●	●	●	●	●	●	●	●
Linear Sweep Voltammetry (LSV) [&]	●	●	●	●	●	●	●	●
Staircase Voltammetry (SCV) [#,&]						●	●	●
Tafel Plot (TAFEL)		●	●			●	●	●
Chronoamperometry (CA)	●	●	●		●	●	●	●
Chronocoulometry (CC)	●	●	●		●	●	●	●
Differential Pulse Voltammetry (DPV) [#,&]				●	●	●	●	●
Normal Pulse Voltammetry (NPV) [#,&]				●	●	●	●	●
Differential Normal Pulse Voltammetry (DPNV)[#,&]								●
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)							●	●
AC Impedance (IMP)			●				●	●
Impedance - Time (IMPT)			●				●	●
Impedance - Potential (IMPE)			●				●	●
Chronopotentiometry (CP)								●
Chronopotentiometry with Current Ramp (CPCR)								●
Multi-Current Steps (ISTEP)								●
Potentiometric Stripping Analysis (PSA)								●
Open Circuit Potential - Time (OCPT)	●	●	●	●	●	●	●	●
Galvanostat								●
RDE control (0-10V output)						●	●	●
Full version of CV simulator						●	●	●
Limited version of CV simulator	●	●	●	●	●			
Impedance Simulator			●				●	●
iR Compensation	●	●	●	●	●	●	●	●
External Potential Input	●	●	●	●	●	●	●	●
Auxiliary Signal Measurement Channel	●	●	●	●	●	●	●	●

#: Corresponding polarographic mode can be performed.
&: Corresponding stripping mode can be performed.
$: Phase selective data are available.



Cyclic voltammogram at 1000V/s.



Phase selective second harmonic AC voltammogram.

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