

solid choice.

Pine Research Instrumentation offers a flexible line of portable USB potentiostats. Our WaveNow, WaveNano, and WaveNow^{XY} potentiostat/galvanostat systems break with the past, replacing traditional stationary benchtop instruments with lightweight, portable, and powerful alternatives. These systems are a solid choice for research, teaching, and industrial applications.



affordable.



At a fraction of the cost of most other comparable systems, these potentiostats give you exactly what you need without breaking your budget. Prices are so low, in fact, that you will be asking yourself why you did not buy more of them. For the perfect way to outfit your entire lab with multiple potentiostats, contact us today for a quantity discount.

flexible.



At only 200 grams and just larger than a modern smartphone, this is the ideal potentiostat for flexible uses. It connects to your laptop or desktop PC via a standard USB cable. The size and ease of interface make this system perfect for use on the bench, in a hood, secured in a glovebox, and even for remote applications with the optional battery pack.

capable.



Our potentiostats perform all the classical electroanalytical techniques, which include: voltammetric, galvanostatic, and hydrodynamic methods. Once you have collected your results, our versatile AfterMath data analysis software helps you manage your data, create graphs and prepare reports. For nearly any application, the WaveNow is a solid choice.

PINE
research

2741 Campus Walk Ave · Building 100 · Durham, NC 27705 · USA



+1 919.782.8320



@ pinewire@pineresearch.com



pineresearch.com



Software & Interface Cable (included)

Software: Pine AfterMath™
Data Organizer
Interface Type: USB 2.0
Cable: USB A / B cable



Minimum Host PC Requirements (the PC is not included)

Operating System: Windows 10, 8, 7, Vista (32 and 64 bit)
XP (32 bit)
Processor Class: Pentium IV or equivalent
Processor Speed: 1 GHz or faster
Physical Memory: 1 GB (32-bit OS),
2 GB (64-bit OS) or higher
GUI Platform: Microsoft .NET 2.0
Screen Resolution: 1024 x 768 pixels recommended

All specifications are subject to change at any time without prior notification.

WaveNow™, WaveNow^{xy}™, WaveNano™ and Aftermath™ are trademarks of Pine Research Instrumentation, Inc. (Durham, North Carolina). Windows is a registered trademark of Microsoft Corp. (Redmond, Washington).

Standard Electrochemical Methods:

Basic Methods:

Open Circuit Potential (OCP)
Bulk Electrolysis (BE)

Potentiostatic Methods:

Chronopotentiometry (CA)
Staircase Potential Step Chronoamperometry (SPSCA)
Cyclic Step Chronoamperometry (CSCA)

Galvanostatic Methods:

Chronopotentiometry (CP)
Form Chronopotentiometry (CRP)
Staircase Potentiometry (SCP)
Cyclic Step Chronopotentiometry (CSCP)

Voltammetric Methods:

Cyclic Voltammetry (CV)
Linear Sweep Voltammetry (LSV)
Staircase Voltammetry (SV)
Differential Pulse Voltammetry (DPV)
Square-Wave Voltammetry (SWV)
Normal Pulse Voltammetry (NPV)

Stripping Voltammetry

Stripping Voltammetry (ASV)
Differential Pulse Stripping Voltammetry (DPVS)
Square Wave Stripping Voltammetry (SWSV)

Rotating Methods (optional)

Rotating Disk Voltammetry (RDE)
Rotating Disk Koutecky-Levich Series (KL-RDE)
Rotating Disk Electrode (RE-RDE)
Rotating Disk Chronopotentiometry (CR-RDE)
Rotating Disk Ramp Chronopotentiometry (RCR-RDE)

Spectroelectrochemical Methods (optional)

Spectroscopy (SPSC)
Spectroelectrochemistry (SPSEC)

Corrosion Methods (optional)

Linear Polarization Resistance (LPR)
Rotating Cylinder Voltammetry (RCV)
Rotating Cylinder Electrode (RE-RCE)
Rotating Cylinder Sternberg Study (RSB-RCE)
Rotating Cylinder Polarization Resistance (LPR-RCE)
Rotating Cylinder Open Circuit Potential (OCP-RCE)
Rotating Cylinder Chronopotentiometry (CR-RCE)
Rotating Cylinder Ramp Chronopotentiometry (RCR-RCE)



Measured Current

Practical Range: 80 nA[§] to 100 mA
Ranges: ±100 mA, ±5 mA, ±200 µA, ±10 µA
Autoranging: Yes
Resolution (at each range): 3.4 µA, 170 nA,
6.8 nA, 340 pA
Accuracy: ± 0.2% setting; ±0.05% of range
ADC Input: 16 bits
Filter: 2.5 kHz (2-pole, low pass filter)
Leakage Current: 10 pA at 25°C

Applied Current (galvanostat mode)

Ranges (four ranges): ±100 mA, ±5 mA,
±200 µA, ±10 µA
Resolution (at each range): 3.1 µA, 156 nA,
6.25 nA, 313 pA
Accuracy: ± 0.2% setting; ±0.05% of range
DAC Output: 16 bits

Power Amplifier (CE control amplifier)

Compliance Voltage: > ± 12.5 V
Output Current: ±100 mA (maximum)
Speed Settings: 3
Unity Gain Bandwidth: > 20 kHz (on "fast" speed)
Rise Time: 180 V/msec (on "fast" speed)



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Output Current: ±100 mA (maximum)
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Unity Gain Bandwidth: > 20 kHz (on "fast" speed)
Rise Time: 180 V/msec (on "fast" speed)



Measured Current

Practical Range: 100 pA[§] to 1 mA
Ranges: ±1 mA, ±50 µA, ±2 µA, ±100 nA
Autoranging: Yes
Resolution (at each range): 34 nA, 1.7 nA,
68 pA, 3.4 pA
Accuracy: ± 0.2% setting; ±0.05% of range
ADC Input: 16 bits
Filter: 2.5 kHz (2-pole, low pass filter)
Leakage Current: 10 pA at 25°C

Applied Current (galvanostat mode)

Ranges (four ranges): ±1 mA, ±50 µA,
±2 µA, ±100 nA
Resolution (at each range): 31 nA, 1.56 nA,
62.5 pA, 3.13 pA
Accuracy: ± 0.2% setting; ±0.05% of range
DAC Output: 16 bits

Power Amplifier (CE control amplifier)

Compliance Voltage: > ± 12.5 V
Output Current: ±1.0 mA (maximum)
Speed Settings: 3
Unity Gain Bandwidth: > 20 kHz (on "fast" speed)
Rise Time: 180 V/msec (on "fast" speed)

[§] Lower limit of the practical range is current level where noise begins to interfere with the signal unless special precautions are taken. With proper shielding the WaveNano can routinely measure signals as low as 100 pA.

The Following Information Applies to the WaveNow™, WaveNow^{xy}™ and WaveNano™:

General

Power Required: 5.0 VDC, 2 A (low voltage DC device)
Power Adapter: 100 to 240 VAC, 300 mA, 50 to 60Hz
Field-Changeable Adapter Plugs: US, EU, UK, and Australia (included)
LED Indicators: Power, USB, and Status
Instrument Dimensions: 165 x 100 x 29 mm
Shipping Dimensions: 260x 260 x 360 mm
Instrument Weight: 200 g (7 oz)
Shipping Weight: 1.4 kg (3 lb)
Temperature Range: 10°C to 40°C
Humidity Range: 80% RH maximum, non-condensing

Control Modes and Connections

Operating Modes: potentiostat (POT), galvanostat (GAL), open circuit potential (OCP)
Cell Connections: working (K1), counter (CE), reference (REF), and working sense (K1SENSE)
Signal Ground Configuration: working electrode connects to signal ground through current range resistor; signal ground connects to USB ground
IR Compensation: No

Applied Potential (potentiostat mode)

Range: ±4.0 V; WaveNow^{xy}: ±10.0 V
Resolution: 125 µV per DAC bit
WaveNow^{xy}: 312.5 µV
Accuracy: ±0.2% of setting; ±1.0 mV
Thermal Drift: < 0.01% / °C
DAC Output: 16 bits
Scan Rate (min): 10 µV / sec; WaveNow^{xy}:
25 µV / sec
Scan Rate (max): 10 V/sec

Measured Potential

Range: ±4.0 V; WaveNow^{xy}: ±10.0 V
Resolution: 136 µV per ADC bit; WaveNow^{xy}: 340 µV
Accuracy: ± 0.2% setting; ±0.05% of range
ADC Input: 16 bits
Filter: 2.5 kHz (2-pole, low pass filter)

Electrometer (reference electrode follower)

Input Impedance: > 10¹⁴ Ω in parallel with < 20 pF
Input Current: < 2 pA leakage/bias current
CMRR: > 50 dB at 10 kHz; 80 dB at 60 Hz
Bandwidth: > 800 kHz (3 dB)

Certification

The WaveNow™, WaveNow^{xy}™, and WaveNano™ potentiostat/galvanostat systems comply with one or more EU directives and bears the CE marking.

Additional Output Signals (for rotation rate control)

Range: ±10.5 V
Resolution: 5.12 mV per DAC bit (12 bit)
Digital On/Off Signal: open drain (TTL compatible)
Output Impedance: < 10 Ω

Data Acquisition

Clock Resolution: 500 nsec (minimum time base)
Point Interval (min): 1000 µsec
Synchronization: simultaneous current & potential input
Raw Point Total: <10 million per experiment

External Ports

Cell Port: HD-15 female connector
Interface Port: USB Type-B connector
Rotator Control Port: 3-pin header connector

Accessories

Calibration Tools: HD-15 loopback cell (included)
Dummy Cell: external dummy cell (included)
Cell Cable: various designs available separately

