# Reference 500+

Potentiostat/Galvanostat/ZRA

- + Fast CV
- + EIS To 5 Mhz
- **→** Ultra Low Current
- + Floating Operation
- **+** Low Noise





## Reference 600+

Potentiostat/Galvanostat/ZRA

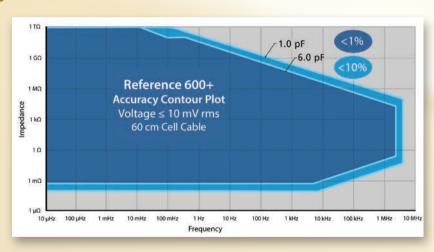


The Reference 600+ has been designed to bring you maximum performance for demanding applications. It is ideally suited for:

- + Corrosion Measurement
- + Paints & Coatings
- + Bioelectrochemistry & Sensor Development
- Physical & Analytical Electrochemistry
- + Energy Devices

#### + High Performance EIS

EIS from 10 µHz to 5 MHz. Our specially designed cables reduce mutual inductance increasing the low impedance bandwidth. Techniques include single sine Potentiostatic, Galvanostatic, and Hybrid EIS. Also included are multi-sine techniques for Potentiostatic and Galvanostatic. Our unique power-leveling algorithm improves signal-to-noise ratios and reduces acquisition time.

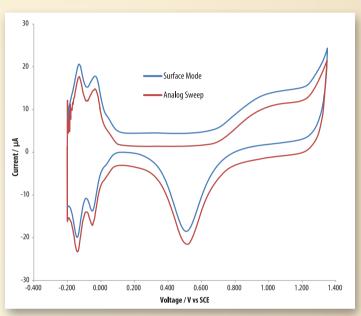


#### **+** Ultra-Low Noise

The Reference 600+ enjoys an intrinsic noise level of  $<2~\mu V$  rms, thanks to a well-designed electronic layout, components selected to balance speed and noise, and intelligent analog filtering and shielding. The instrument can oversample the signals, then average to smooth a slowly changing, but noisy, signal.

### + Digital Signal Processing

All Gamry potentiostats employ digital signal processing (DSP) technology, allowing for oversampling and averaging in order to improve signal-to-noise ratios and provide accurate capacitance measurements. Our instruments have three sampling modes – Fast, Noise Reject, and Surface. Fast corresponds to sampling at the end of each step. Noise reject oversamples and averages during the last 20% of a step. Surface mode oversamples and averages during the entire step thereby ensuring no lost charge for an accurate capacitance measurement.



Comparison of Surface Mode vs Analog Sweep. Pt WE in 1 M H2SO4. Surface mode current offset 3 µA for easy comparison.

### ♣ Floating Operation

Gamry provides the highest electrical isolation allowing for measurements on grounded cells and electrodes. Electrical isolation also allows for coupling to other instruments such as TEMs and SECMs.

### + Small Footprint

Only 9x19x27 (WxHxD) cm and 3 kg.

### + Current Interrupt & Positive Feedback iR Compensation

The Reference 600+ has both current interrupt and positive feedback modes of iR Compensation.

### → Optional Inputs & Outputs

The Reference 600+ gives you several input and output options. An additional voltage can be read via a BNC input. An external signal can be fed into the control amplifier, allowing you to input external signals right into your cell. A 15-pin connector is provided to allow for digital inputs and outputs for TTL level triggering of or with external devices. This connector also provides a voltage out, allowing control of external devices such as a rotating electrode setup.

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#### **SPECIFICATIONS**

**Potentiostat** Yes Yes **Galvanostat** Zero Resistance Ammeter Yes

2, 3, 4, 5, or 6 (includes Aux channel) **Cell Connections** 

Isolated from earth Yes

**SYSTEM** 

± 600 mA Max. Current

**Current Ranges** 11 (60 pA-600 mA), 13 with 10X and 100X gain

± 11 V Max. Applied Potential < 250 ns **Rise Time** 

< 2 µV rms (typical) **Noise and Ripple** 

3.333 µs Min. Time Base Min. Potential Step 12.5 μV

**EIS MEASUREMENT** 

**Frequency Range**  $10 \mu Hz - 5 MHz$ 

**Impedance Accuracy** See accuracy contour map

Max AC Amplitude 3 V max 600 mA max

**CONTROL AMP** 

 $> \pm 22 V$ **Compliance Voltage Output Current**  $> \pm 600 \text{ mA}$ 

**Speed Settings** 

**ELECTROMETER** 

> 10<sup>14</sup>  $\Omega$ **Input Impedance Input Current** < 10 pA > 15 MHz

Bandwidth (-3dB) (typical)

Common Mode Rejection Ratio (CMRR) > 65 dB (1 MHz)

