Handheld potentiostat model CS100ME with EIS

(Note: The model **CS100ME** is carved on the back panel)

The CS100ME handheld potentiostat supports full electrochemical methods, including potentiostatic/galvanostatic polarization curve, Cyclic voltammetry analysis, impedance(EIS), and galvanic current measurement. etc. It has built-in chargeable li-ion battery and Bluetooth communication. The device supports laptop/computer software or mobile APP. It can be used for electrochemical tests in field or special non-electricity environment. CS100ME can be a convenient handheld tool for researchers of energy& materials, environment protection, biosensor, foods &drugs, corrosion protection etc. Maximum current is ±100mA

The voltage control range is ±10V, compliance voltage is ±10V, the maximum current output is ±100mA, and the minimum current resolution can reach 1pA. The EIS frequency range is 10μHz~1MHz.

Features

- Small & light, handheld and convenient
- Easy to install and use
- High accuracy, current resolution can reach to 1pA, and measurement accuracy is 0.1% of the range.
-during outdoor test, a laptop's USB port can be used for both charging and communicating
- The circuit adopts floating design. Electrochemical parameters of the grounded system can be measured without an isolation transformer.

Thanks to its small size with comprehensive electrochemical functions, it's typically used for:

- Battery materials' performance test in a glove box
- Ultra-low detection limit of heavy metal ions for water quality test in environmental protection field
- Low current detection in biosensor thanks to high current accuracy
- Effective ingredients detection in food and drug industry
- Outdoor bridge corrosion and soil corrosion measurements

Note: maximum current during experiment doesn't exceed ±100mA then the handheld potentiostat can be used. If exceeds ±100mA an ordinary size potentiostat with maximum current ±2A should be considered.

Specifications

Size / weight:15 x 9 x 3 (cm), 500g
Communication: USB / Bluetooth
Power supply: USB / built-in Li-ion battery 10AH@3.7V
Support 2-, 3-or 4-electrode system
Maximum current: ± **100mA**
Potential control range: ±10V
EIS frequency range: **10μHz ~ 1MHz**
Compliance voltage: ±10V
Current range: 200pA~200mA, 10 ranges
Potential range:±200mV ±2V, ±5V, ±10V
Potential accuracy: 0.1%× full range
Minimum potential resolution: 1μV
Current accuracy: 0.1%× full range
Minimum current resolution: 1pA
Reference electrode input impedance: $10^{13}\Omega||8pF$
AC amplitude: 0~±2.5V
Signal response bandwidth: 1MHz
Max. acquisition rate: 150,000 data points/s
CV and LSV scan rate: 0.001mV~ 10V/s

Electrochemical techniques - CS100ME

Stable polarization

- Open Circuit Potential (OCP)
- Potentiostatic (I-T curve)
- Galvanostatic
- Potentiodynamic (Tafel plot)
- Galvanodynamic (DGP)

Transient Polarization

- Multi Potential Steps
- Multi Current Steps
- Potential Stair-Step (VSTEP)
- Galvanic Stair-Step (ISTEP)

Chrono Method

- Chronopotentiometry (CP)
- Chronoamperametry (CA)
- Chronocaulometry (CC)

Voltammetry

- Linear Sweep Voltammetry (LSV)
- Cylic Voltammetry (CV)
- Staircase Voltammetry (SCV) #
- Square Wave Voltammetry (SWV) #

- Differential Pulse Voltammetry (DPV) #
- Normal Pulse Voltammetry (NPV)#
- Differential Normal Pulse Voltammetry (DNPV) #
- AC Voltammetry (ACV)
- 2nd harmonic AC Voltammetry (SHACV)
- Fourier Transform AC Voltammetry (FTACV)

there is correspinding Stripping Voltammetry

Electrochemical Impedance Spectroscopy (EIS)

- Potentiostatic EIS (Nyquist, Bode)
- Galvanostatic EIS
- Potentiostatic EIS (Optional freq.)
- Galvanostatic EIS(Optional freq.)
- Mott-Schottky
- Potentiostatic EIS vs. Time (Single freq.)
- Galvanostatic EIS vs. Time (Single freq.)

Corrosion Measurements

- Potentiodynamic (Tafel plot)
- Cyclic polarization curve (CPP)
- Linear polarization curve (LPR)
- Electrochemical Potentiokinetic Reactivation (EPR)
- Electrochemical Noise (EN)
- Zero resistance Ammeter (ZRA)

Battery test

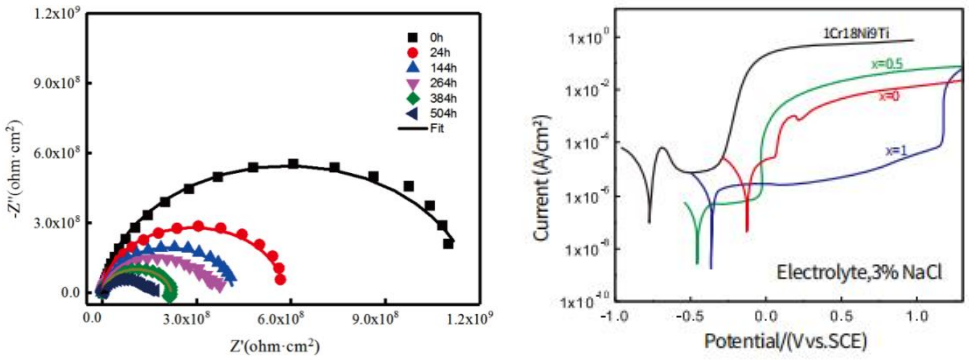
- Battery Charge and Discharge
- Galvanostatic Charge and Discharge (GCD)
- Potentiostatic Charging and Discharging(PCD)
- Potentiostatic Intermittent Titration Technique(PITT)
- Galvanostatic Intermittent Titration Technique(GITT)

Applications

Corrosion Electrochemistry

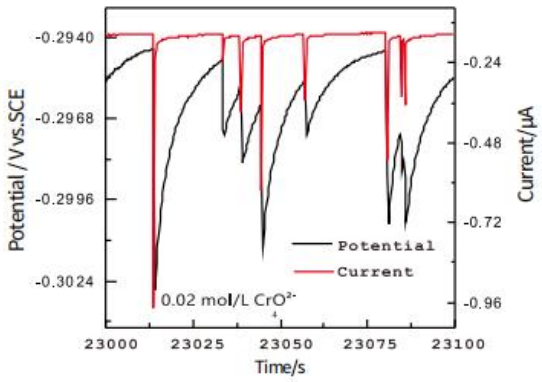
CS potentiostats /galvanostats support a variety of electrochemical techniques for corrosion, such as OCP recorder, potentiodynamic, EIS, cyclic polarization (CPP), LPR, hydrogen diffusion test, zero resistance ammeter (ZRA), electrochemical noise (ECN), etc.

Due to their high input impedance($10^{13}\Omega$), they are especially suitable for EIS measurement of high-impedance systems like coating, concrete, and pure water.



High-impedance coating ageing test in salt spray tests

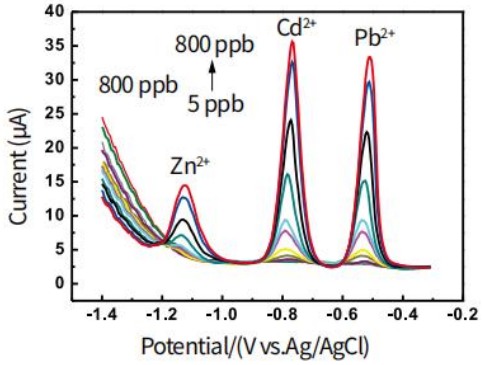
Polarization curves of Ti-alloy& stainless steel in 3%NaCl solution



ECN of low-carbon steel in 0.05mol/L Cl+0.1mol/L $NaHCO_3$

Analytical Electrochemistry

CS potentiostats include comprehensive voltammetric methods such as NPV, DPV, DNPV, SWV, and ACV, which make them ideal for quantitative analysis of trace elements via the intrinsic Voltammetry stripping techniques.



Stripping voltammetric curves in the solution dissolved with Pb^{2+}, Cd^{2+}, and Zn^{2+} ions

Electrochemical Sensor

Thanks to the high current sensitivity(1pA) and voltage resolution(1 μV), the CS potentiostat can be used for the R&D of biosensors and electrochemical sensors.

Standard supply for 1 set CS100ME

CS100ME handheld potentiostat*1

CS Studio software

Type-C USB cable *1, Power adapter *1, Electrode cable*2

Dummy cell*1, Manual *1