CS300 potentiostat / galvanostat is a comprehensive research platform for corrosion,

batteries, electrochemical analysis, sensor, life science and environmental chemistry etc. Model CS300 includes all the voltammetric methods and some other techniques but doesn't include EIS. It's especially suitable for electro-analysis areas such as heavy metal ions concentration inspection.

Applications

● Reaction mechanism of Electrosynthesis, electrodeposition, anodic oxidation, etc.

● Electrochemical analysis and sensor;

● New energy materials (Li-ion battery, solar cell, fuel cell, supercapacitors), advanced functional materials, photoelectronic materials;

● Corrosion study of metals in water, concrete and soil, etc;

● Fast evaluation of corrosion inhibitor, water stabilizer, coating and cathodic protection efficiency.

Standard supply list for each set

Instrument host CS300 x1
CS studio software x1
Power cable x1
USB cable x1
Cell cable x2
Dummy cell(1kΩ||100μF) x1
Manual x1

Service: (**all the service is free)

1. Warranty period: 5 years

2. Provide installation guidance and manual, software installation video.

3. Lifetime free software upgrading and technical service

4. Provide repair service for free

Specifications

Specifications

Support 2-, 3- or 4-electrode system	Potential and current range: Automatic
Potential control range: ±10V	Current control range: ±2A
Potential control accuracy: 0.1%×full range±1mV	Current control accuracy: 0.1%×full range
Potential resolution: 10µV (>100Hz),3µV (<10Hz)	Current sensitivity:1pA
Rise time: <1µS (<10mA), <10µS (<2A)	Reference electrode input impedance:$10^{12}\Omega$||20 pF
Current range: 2nA~2A, 10 ranges	Compliance voltage: ±21V
Maximum current output: 2A	CV and LSV scan rate: 0.001mV~10,000V/s
CA and CC pulse width: 0.0001~65,000s	Current increment during scan: 1mA@1A/ms
Potential increment during scan: 0.076mV@1V/ms	SWV frequency: 0.001~100 kHz
DPV and NPV pulse width: 0.0001~1000s	AD data acquisition:16bit@1 MHz,20bit@1 kHz
DA Resolution:16bit, setup time:1µs	Minimum potential increment in CV: 0.075mV
Low-pass filters: covering 8-decade	Operating System: Windows 2000/NT/XP/7/8/10
Interface: USB 2.0	Weight / Measurements: 6.5kg, 36.5 x 30.5 x16 cm

Techniques / Software- CS300

Stable polarization
- Open Circuit Potential (OCP)
- Potentiostatic (I-T curve)
- Galvanostatic
- Potentiodynamic (Tafel plot)
- Galvanodynamic (DGP)
- Sweep-Step Functions (SSF)

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)

Stripping Voltammetry

- Potentiostatic Stripping
- Linear Stripping
- Staircase Stripping
- Square Wave Stripping
- Differential Pulse Voltammetry Stripping
- Normal Pulse Voltammetry Stripping
- Differential Normal Pulse Voltammetry Stripping

Corrosion Measurements

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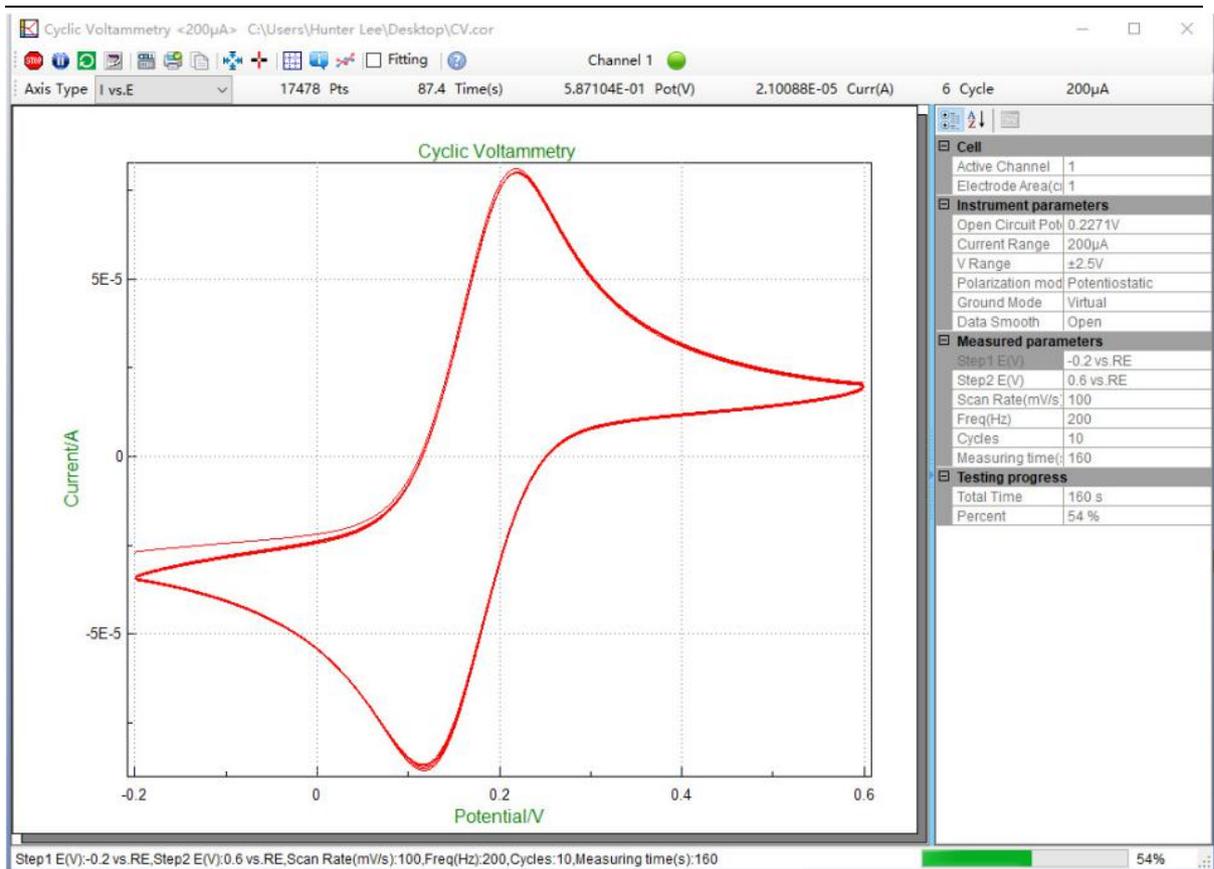- Zero resistance Ammeter (ZRA)

Battery test

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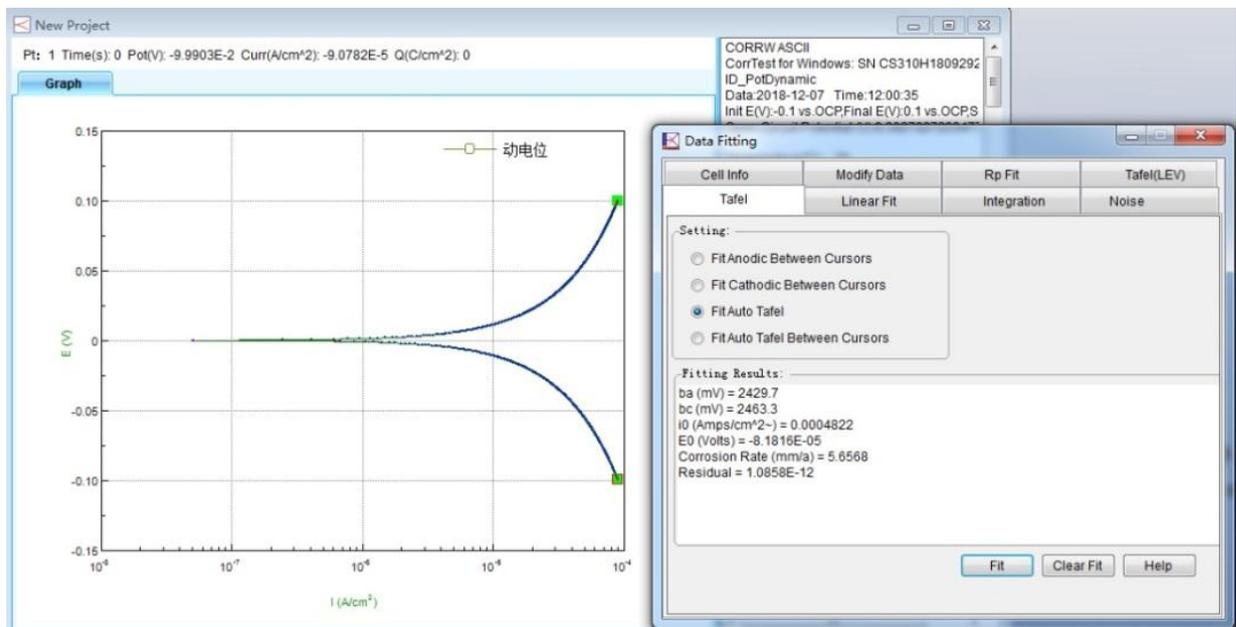- Galvanostatic Intermittent Titration Technique

Extensions

- Data Logger
- Electrochemical Stripping/ Deposition
- Bulk Eletrolysis with Coulometry (BE)
- Rs Measurement

Software Features

CS studio software provides users a versatile smoothing/differential/ integration kit, which can complete the calculation of peak height, peak area and peak potential of CV curves.

Cyclic Voltammetry <200µA> C:\Users\Hunter Lee\Desktop\CV.cor

| Axis Type | I vs.E | 17478 Pts | 87.4 Time(s) | 5.87104E-01 Pot(V) | 2.10088E-05 Curr(A) | 6 Cycle | 200µA |

Cyclic Voltammetry

Cell
| Active Channel | 1 |
| Electrode Area(c | 1 |

Instrument parameters
Open Circuit Pot	0.2271V
Current Range	200µA
V Range	±2.5V
Polarization mod	Potentiostatic
Ground Mode	Virtual
Data Smooth	Open

Measured parameters
Step1 E(V)	-0.2 vs.RE
Step2 E(V)	0.6 vs.RE
Scan Rate(mV/s	100
Freq(Hz)	200
Cycles	10
Measuring time(	160

Testing progress
| Total Time | 160.s |
| Percent | 54 % |

Step1 E(V):-0.2 vs.RE,Step2 E(V):0.6 vs.RE,Scan Rate(mV/s):100,Freq(Hz):200,Cycles:10,Measuring time(s):160   54%

CS studio also provides powerful non-linear fitting on Butler-Volmer equation of polarization curve. It can calculate Tafel slope, corrosion current density, limitation current, polarization resistance, corrosion rate. It can also calculate the power spectrum density, noise resistance and noise spectrum resistance based on the electrochemical noise measurements.

New Project

Pt: 1 Time(s): 0 Pot(V): -9.9903E-2 Curr(A/cm^2): -9.0782E-5 Q(C/cm^2): 0

Graph

动电位

CORRW ASCII
CorrTest for Windows: SN CS310H1809292
ID_PotDynamic
Data:2018-12-07 Time:12:00:35
Init E(V):-0.1 vs.OCP,Final E(V):0.1 vs.OCP,S

Data Fitting

| Cell Info | Modify Data | Rp Fit | Tafel(LEV) |
| Tafel | Linear Fit | Integration | Noise |

Setting:
- ○ Fit Anodic Between Cursors
- ○ Fit Cathodic Between Cursors
- ● Fit Auto Tafel
- ○ Fit Auto Tafel Between Cursors

Fitting Results:
ba (mV) = 2429.7
bc (mV) = 2463.3
i0 (Amps/cm^2~) = 0.0004822
E0 (Volts) = -8.1816E-05
Corrosion Rate (mm/a) = 5.6568
Residual = 1.0858E-12

Fit   Clear Fit   Help

CS Studio software can achieve real time saving of the measuring data. The data can be automatically saved even in case of sudden power off.

CS studio kit has a built-in versatile timing policy for combined measurements, which can facilitate the automation of experiments and save time.

Battery analysis: charge & discharge efficiency, capacity, specific capacitance, charge &

discharge energy.
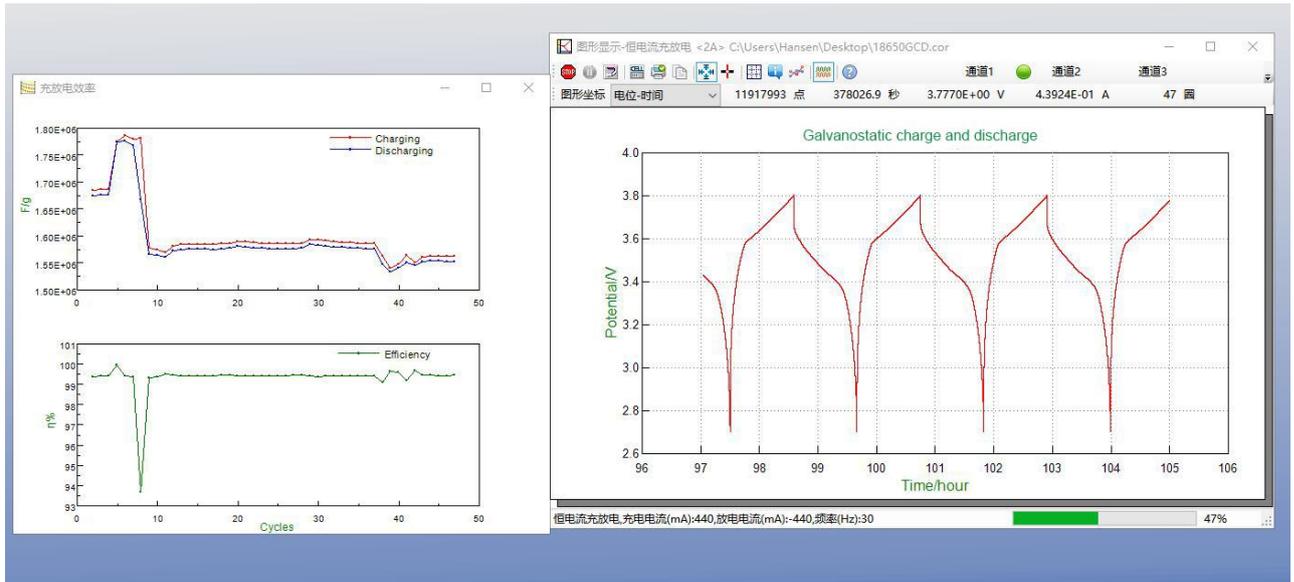
# Technical advantages

1. Polarization curve

Tafel plot can be obtained. The user can set the anodic reversal current (passivation film breakdown current) of the cyclic polarization curve to obtain material's pitting potential and protection potential and evaluate the its susceptibility to intergranular corrosion. The software uses non-linear fitting to analyze polarization curve, and can make fast evaluation of material's anti-corrosion ability and inhibitors.
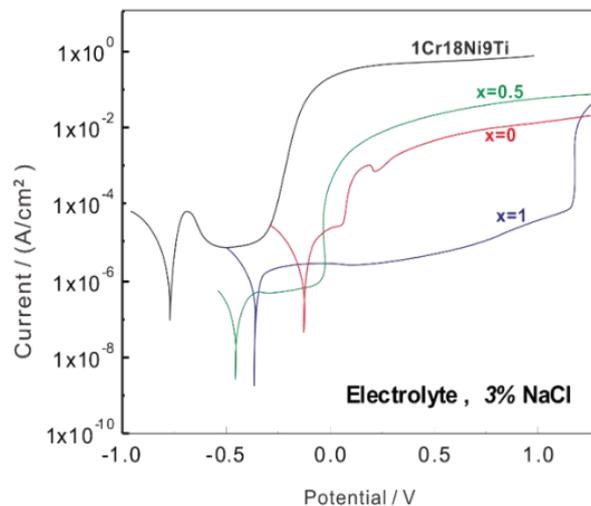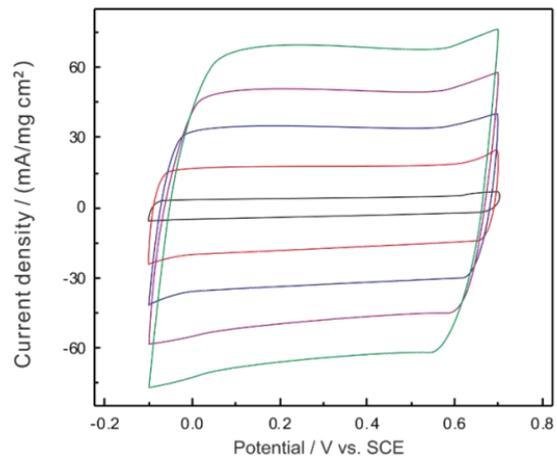

Polarization curve of Ti-based amorphous alloy & stainless steel in 3%NaCl solution

2. Voltammetry

Linear Sweep Voltammetry(LSV), Cyclic Voltammetry(CV), SCV, SWV, DPV, NPV,ACV, Stripping voltammetry etc. It integrates calculation of peak area, peak current and standard curve analysis.
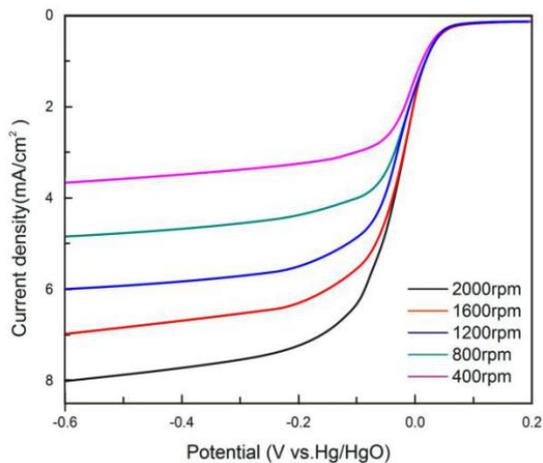
LSV: mesoporous carbon material in 0.1M KOH

CV of PPy supercapacitor in 0.5 mol/L H_2SO_4
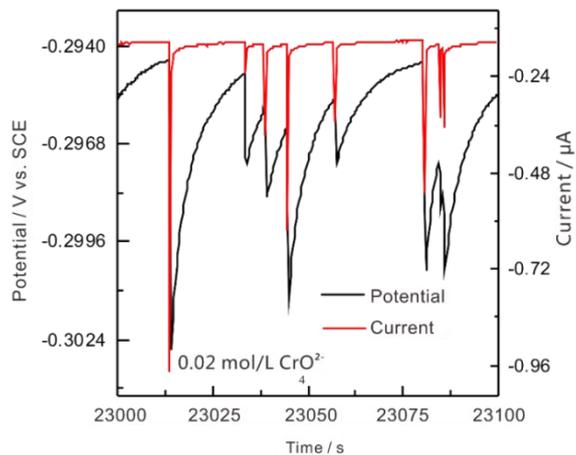
Electrochemical Noise

With high-resistance follower and zero-resistance ammeter, it measures the natural potential / current fluctuations in corrosion system. It can be used to study pitting corrosion, galvanic corrosion, crevice corrosion, and stress corrosion cracking etc. Based on calculation of noise resistance and pitting index, it can complete localized corrosion monitoring.

3. Full floating measurement

Full-floating mode be used for autoclave electrochemical measurements, on-line corrosion monitoring of metallic components under the ground (rebar in concrete, etc.)

Electrochemical noise of low-carbon steel in 0.05mol/L Cl^-+0.1mol/L $NaHCO_3$

4. User-defined methods

We are able to provide API functions and development examples, which facilitates some users' requirements for secondary development and self-defined measurements.