# SEC1106 Series Electrochemical Workstation

*0.1 to 3 MHz*

*CV, LSV, SCV, TAFE1, CA, CC, DPV, NPV, DNPV, SWV, IT, DPA, DDPA, TPA, STEP, IMP*

## Features

- *0.1 Hz to 3MHz frequency range*
- *Maximum ±300mA current*
- *Maximum output ±10V voltage*
- *Measurement accuracy <0.5%*
- *Compatible with 2, 3, and 4 electrode structures*
- *Multi-channel 16-bit high-precision ADC simultaneous sampling*
- *Support potentiostat, cyclic voltammetry, AC impedance method*

## Overview

SEC1106 series electrochemical workstation is a new generation launched by Saluki which is providing an accurate measurement platform for researchers involved in life sciences, physical electrochemistry, environmental protection, batteries, materials, and other fields.

SEC1106 series adopts a potentiostat with full digital feedback. The EIS operating frequency is up to 3MHz, and the basic measurement error is within 0.1% (in the impedance range greater than 100kΩ, the test error is less than 1%). Three independent acquisition links, combined with adaptive filtering and amplification technology, adopt 16-bit, 10MSPS high-performance ADC, so that the measurement results have the ultra-high sensitivity and accuracy. (One of the acquisition links is an auxiliary channel for users to collect external data, such as detecting the voltage of the electrolytic cell, etc.).

## Current Range

The maximum continuous working current of SEC1106 is ±300mA, and the peak current is ±420 mA, which can meet most chemical applications. At the same time, the current range of the instrument adopts metal foil with high precision and ultra-low temperature drift (±2ppm, typical value) spanning multiple orders of magnitude, so as to ensure the accuracy and sensitivity of the instrument in a wide current range.

No.367, Fuxing N. Rd.,105 Taipei,Taiwan Tel: +886.909 602 109
sales@salukitec.com www.salukitec.com

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(Down to several fA level current measurement).

## Cell Pressure and Applied Potential

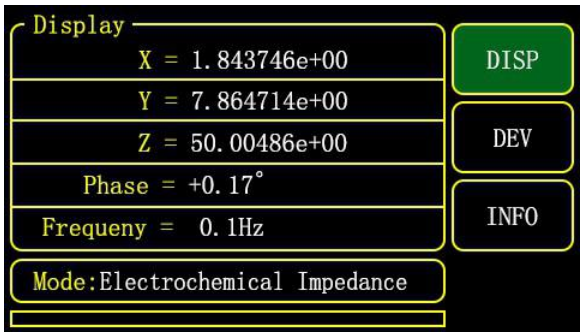
SEC1106 has a maximum tank voltage of 10V and an applied potential of 10V, and a multi-level digital attenuator is used inside the applied potential function to ensure the best instrument performance within the range of each applied potential.

## Potentiometer

SEC1106 potentiometer has the characteristics of wide frequency band and extremely high input impedance (TΩ level input resistance, sub-pF level input capacitance). When using a high impedance reference electrode, the extremely low input capacitance helps to ensure the stability of the measurement system. At the same time, the extremely high input impedance ensures that the theoretical maximum measurable impedance of SEC1106 reaches TΩ level (when measuring some paint characteristics, the impedance of the paint can reach the gigaohm level, so a very high input impedance is required). In addition, SEC1106 has an extremely small input current (<10pA), which greatly reduces the current flowing through the reference electrode, making the reference electrode not easy to polarize and ensuring its constant potential.

## Display

SEC1106 selects a 4.3-inch 480×272 resolution true color touch screen as the main display screen of the instrument. The data that can be detected by this SEC1106 electrochemical workstation, such as the X value, Y value, Z value of the signal, etc.




## Potentiostatic Module

The function of the potentiostat is to make the electrode potential controllable, and the potential is not affected by the electrode reaction, but changes according to preset requirements. The basic function of a potentiostat is to control the potential of an electrode while simultaneously measuring the polarization current flowing through the electrode. By measuring the change trend of the current with the potential and the relationship between the two, the process of the electrode reaction under the current experimental conditions can be judged, and the kinetic or thermodynamic parameters of the sample to be tested can be obtained.

## Signal Conditioning Circuit

The circuit function of this part is mainly to improve the signal quality by amplifying the current and voltage signals output by the potentiostat, filtering out out-of-band noise, and making full use of the dynamic range of the analog-to-digital converter to improve the data processing algorithm.

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The accuracy of the impedance results obtained by the module.

## Signal Interface

SEC1106 series includes a ground port and 4 BNC electrode connectors and is compatible with 2, 3, and 4 electrode architectures. The electrode connector is used with 4 electrode lines, and the voltage exceeding 10V cannot be connected to it, otherwise it will easily cause damage to the instrument.

## Auxiliary Interface

SEC1106 series has additional auxiliary input and output functions, such as Sig_Gen_Monitor, which can measure voltages below 20V and output arbitrary waveforms. E_monitor and I_monitor can observe the voltage and current information of the object to be measured. Auxiliary interface also includes AUX_IN, RDE and Ext_Sig_In.

## Remote Operation

SEC1106 series is equipped with USB2.0 interface and network interface to connect with the host computer, so that users can choose the best connection method. By default, both the software and the instrument are in USB connection mode. If you need to select the network interface, you can select the Ethernet mode in the software and the instrument, and connect to the server through the Ethernet for data transmission according to the TCP/IP protocol. SEC1106 is equipped with a complete software, which can complete complex experimental projects and achieve the needs of experimental purposes.

## Technical Specifications

### ➢ System Parameter

| | |
|---|---|
| Max. Current | ±300mA continuous<br>±420mA peak |
| Output Voltage | Maximum ±10V |
| Cell Connections | 2, 3, 4 structure |
| Signal Acquisition | 3 independent acquisition links. Using adaptive filtering, amplification technology; adopting 16-bit, 10MSPS sampling rate ADC |
| CA Gain Bandwidth | 22MHz |
| Rising Time | 200V/μs |
| Electrometer Bandwidth | 10.5MHz (-3dB point) |
| Slot Pressure | ±10V, need to load 1.2k |
| Current Axis Bandwidth | 500R – 10MHz<br>5kR – 1.5MHz<br>50kR – 0.15MHz |

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### ➢ Voltage Measurement

| | |
|---|---|
| Voltage Range | ±0.02V, ±0.05V, ±0.09, ±0.023V, ±0.046V, ±2.28V, ±4.55V, ±10V |
| Resolution | 0.0015% of measuring range |

### ➢ Current Measurement

| | |
|---|---|
| Current Range | ±228pA to ±300mArms |
| Resolution | 0.0015% of measuring range, minimum 6.94fA |

### ➢ AC Impedance Method

| | |
|---|---|
| Frequency Range | 0.1Hz - 3MHz |
| Amplitude | 5mVrms to 1Vrms |
| Accuracy | 1% |

### ➢ Potentiostat

| | |
|---|---|
| Bandwidth | ≥3MHz |
| Applied Voltage Gear | ±10 mV, ±100 mV |

### ➢ Cyclic Voltammetry

| | |
|---|---|
| Initial Potential | -10V to +10V |
| High Potential | -10V to +10V |
| Low Potential | -10V to +10V |
| Scan Rate | 0.001V/s to 10000V/s |
| Sampling Interval | 0.001V to 0.064V |

### ➢ Auxliary Function Parameters

| | |
|---|---|
| DC Paranoia Compensation | -10V to +10V |
| DC Bias | -10V to +10V |
| RDE Driver Function | -10V to +10V, 300mArms continuous |

## Ordering Information

**SEC1106A**

- Bandwidth: 3MHz
- Functions: CV, LSV, SCV, TAFE1, CA, CC, DPV, NPV, DNPV, SWV, IT, DPA, DDPA, TPA, STEP, IMP

**SEC1106B**

- Bandwidth: 1MHz
- Functions: CV, LSV, SCV, TAFE1, CA, CC, DPV, NPV, DNPV, SWV, IT, DPA, DDPA, TPA, STEP, IMP

(* At the same time, SEC1106 provides a customizable waveform output function to further meet the needs of users for special experiments.)

***Note:*** *Information will conduct the necessary updates, the contents of this document are subject to change without notice.*

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