

## Electrochemical Analytical System

**Manufacturer:** Solartron

### Model:

1. 1470E Eight Channel Potentiostat/ Galvanostat
2. 1455A Four Channel Parallel Impedance Test Station

### Descriptions:

The Solartron CellTest System is a multi-channel test system designed for the complete DC and impedance characterization of a wide range of energy storage devices such as batteries, fuel cells and super-capacitors. The speed, range and resolution of the CellTest system also make it suited to other research applications including the analysis of sensors, coatings, corrosion and general electrochemical applications.

### Features:

The CellTest system consists of one or more 1470E multi-channel potentiostats and multiple 145x series frequency response analyzers (FRAs) connected to a computer providing simultaneous DC and impedance tests on multiple cells. Each 1470E unit provides eight fully independent potentiostats, allowing up to eight separate cells to be tested simultaneously. Each channel is completely independent allowing the same or quite different experiments to be run on each cell.

The CellTest system provides a wide range of experimental techniques, including charge / discharge, potentiostatic, potentiodynamic, galvanostatic, galvanodynamic, fast cyclic voltammetry, open circuit, fast pulse and step techniques, ohmic-drop analysis and impedance.

**Simultaneous impedance** tests can be run on multiple cells by connecting Solartron 145x series frequency response analyzer (FRA) modules to the 1470E. These FRAs can operate in single sine correlation or multi-sine / Fast Fourier Transform (FFT) analysis mode, providing the ultimate in speed, precision and accuracy. The 1455 FRA provides high performance impedance measurements over the frequency range 10 $\mu$ Hz to 1MHz, while the 1451 FRA operates from 10 $\mu$ Hz to 100kHz. Temperature controlled ovens and furnaces can be added to the system and automatically controlled from the PC over a serial communications link, providing the facility to test cells at different temperatures (for example for testing solid oxide fuel cells at up to 1000°C).

## Specifications:

PC Communication	Ethernet 10BaseT or IEEE488 (GPIB). Refer to back page for details
Number of Channels	8 independent floating channels per unit
<b>Counter Electrode (CE)</b>	
Maximum voltage / current	+10V / -3V, ±4A
Maximum power per channel	40W
Selectable bandwidth	10, 100, 1k, 10k, 100k, 1MHz
<b>Voltage measurement input (RE1, RE2)</b>	
Connections	Driven shields for wide bandwidth
Maximum voltage	+10V / -3V
Voltage ranges	Auto-range or manually selected 10v, 1V, 100mV
Accuracy	±0.1% of range
Voltage resolution	3µV
ADC	16 bit 10,000 samples / sec
Input impedance	>10Gohm
<b>Current Measurement input (WE)</b>	
Maximum current per channel	+4/-4A
Current ranges	Auto-range or manually selected 5A 500mA, 50mA, 5mA, 500µA, 50µA
Accuracy	±0.1% of range
Current resolution	1.5nA
ADC	16 bit 10,000 samples / sec
<b>Experiment</b>	
Maximum steps/experiment	100
Step types:	
voltage, current	constant, ramp, pulse (includes high speed GSM), cyclic voltammetry
power, resistance	constant level (discharge only)
other	rest (open circuit), loop
impedance	requires one or more frequency response analyzers
Step termination limits	voltage, current, power, resistance and charge. temperature (requires option 14703A)
Time to switch test type	100µsec
Minimum sample rate	1 sample / 100 seconds
Maximum sample rate	10,000 samples / second
Measurement modes	Fixed sample rate or measure on change
Shutdown safety limits	voltage, current temperature (requires option 14703A)
Temperature control	Eurtherm 2000 Series controllers
<b>Temperature Range</b>	
Operating	5° to 40°C (41° to 104°F)
Specified accuracy	10° to 30°C
Storage	-25° to 70°C (-13° to 158°F)

