



Supercapacitor Testing Solutions

SCTS-5

The SCTS series consists of specially designed potentiostat/galvanostat testing stations for testing supercapacitors. This product is intended to provide economical entry level testing solutions for use in quality control or R&D testing that requires significant batch samples for product qualification. The product typically ranges from 4 to 24 channels per chassis.

MODEL	VOLTAGE	CURRENT
SCTS-5-5	(-5)V to 5V	± 1A/10mA/100uA
SCTS-5-25	(-5)V to 5V	± 5A/100mA/1mA

Primary Applications:

- Battery & Capacitor Charge/Discharge Cycles
- ESR & Leakage Current Measurements
- Quality Control for incoming Materials
- Quality Control for Sampling Final Products
- Pilot Line Production
- Thin Film Cells

- The SCTS series is designed to provide fast response/rise time and low noise for precise and reliable data
- This series is targeted for large volume testing with multiple independent channels. Each Channel can function as a PST/GST with their own reference electrode.
- Advanced circuitry for research and development designed to measure leakage current and independent, low noise DAC and ADC chips.
- Each channel comes with three current ranges with a 16 bit resolution and 0.02% full scale accuracy
- Advanced software package, MITS pro (Multiple Integrated Testing System, professional version), provides flexible scheduling, user-friendly interface, distributed system control and data acquisition
- Software provides easy data analysis and plotting based in Data Watcher and Microsoft Excel, Macro Command provides automatic statistical data for ESR, leakage current, capacitance, power and energy result.
- Group based voltage clamp provides an additional safety limit that keeps all channels operating within specified limits defined by the user. The system provides a Low Voltage Clamp Value and High Voltage Clamp Value.

Key Features



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SCTS-5-25

Hardware Specifications

MODEL NUMBER	SCTS-5-5	SCTS-5-25
Bipolar Linear Circuit Type	Provides zero switching time between charge and discharge Circuit Board: LPLAB	
Voltage Range (max/min)	-5V to 5V	
Accuracy of Voltage Control & Reading	±2mV, 0.02% Full Scale Resolution	
Current Ranges Provided	High: 1A ± 400uA	High: 5A ± 2mA
0.02% Full Scale Resolution	Medium: 10mA ± 4uA	Medium: 100mA ± 40uA
	Low: 100uA ± 40nA	Low: 1mA ± 400nA
Minimum V at Maximum Current	-5V @ 1A	-5V @ 5A
Maximum Continuous Power Output/Channel	5W	25W
Current Rise Time	50-100µS Time required for current output to get from 10%-90% of requested value	
Current and Voltage Resolution	16 Bit or 0.0015% FSR	
Voltage Clamp	Group Voltage Clamp	
Connection for Batteries	Standard 6 ft. cables with alligator clips Arbin can also provide different battery holder options to allow easy engagement of the device to the test station	
Connection to Computer	TCP/IP	
Ventilation Method	Air cooled, front-to-rear airflow	
Room Operating Temperature	10 to 35 degrees C	
Computer Specifications	PC with 22" flat-screen monitor is included, preloaded with our MITS Pro testing software	

CHASSIS SIZE OPTIONS	CHANNEL NUMBER OPTIONS	
5U: 12.5" X 25" X 10.5"	8	4
11U: 15" X 30" X 25"	20	16

Arbin can provide input power options of 110V or 220V Single Phase AC Power. Options with additional channels are also available. All options have the ability to add up to two to four auxiliary boards for measuring temperature, secondary voltage, or other auxiliary boards provided by Arbin.



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MIT S Pro 4.0 Software Control Specifications

Current (A)	Outputs constant current to the cell or battery at the value specified Positive current refers to charge and negative current refers to discharge
Voltage (V)	Outputs constant voltage to the cell or battery at the value specified
C-Rate	C-Rate is a method for indicating the discharge as well as the charge current of a battery. It can be expressed as $I=M*C$ where I=current A; C=battery capacity; M is the C-rate value.
Rest	The battery is disconnected from the charge/discharge circuit but remains connected to the voltage measurement circuit to enable open-circuit voltage measurement
Power (W)	Outputs constant power to the cell of battery at the value specified. This is accomplished by iteratively measuring the battery voltage and calculating the current necessary according to Ohm's law in order to achieve the power level set by the user. Each time the channel is sampled, the calculation is performed allowing the current to quickly stabilize at the desired power level and maintain this power level as the voltage changes.
Load (Ohm)	Applies a constant resistance load to the battery at the value specified. A positive value for load will result in a positive current and a negative value for load will result in a negative current
CC-CP	Combine constant current control and constant voltage control into one step "CC-CP"
Set Variable (s)	Change test related variables including channel capacity, energy and all test counter variables.
Current Ramp	Generates a current ramp with a positive scan rate for increasing current, and negative scan rate generates decreasing current ramp.
Voltage Ramp	Generates a voltage ramp with a positive scan rate for increasing voltage, and negative scan rate generates decreasing voltage ramp.
Current Staircase	Generates a current staircase with increasing current, and negative decreasing current staircase with adjustable step amplitude.
Voltage Staircase	Generates a voltage staircase with increasing voltage, and negative decreasing voltage staircase with adjustable step amplitude.
Current and Voltage Pulse	Applies a predefined voltage or current profile to the cell or battery pack under test.
Current and Power Simulation	Non-standard time-domain functions may be inputted from external sources such as ASCII data streams and used as control parameters for repetitive tests
DC Internal Resistance	This function applies a 10-pulse train with 1ms pulse width of the specified magnitude following a constant-current charge or discharge step
End Conditions	Time, Voltage, Current, Capacity, Energy, ΔV , DV/dt , formula, meta-variables, and other combinations
Data Logging Rate	During a standard step: 40-150 data points per second, per PC
Network Capabilities	Provide TCP/IP access for networking

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Software Control Specifications *Continued...*

Data Result File	Imported into Microsoft Excel; Arbin's Excel Data Pro macro included for easy data manipulation
Data File Content	Channel data; test time, step time, voltage, current, capacity, energy, first/second derivative of I or V, auxiliary input data (optional). Statistical data: cycle #, cycle capacity/energy, max voltage, etc.

Auxiliary Options & Accessories

Arbin Instruments provides a wide variety of auxiliary modules for expanding the capability of the main I, V control circuitry. Each module plugs securely to the bus board. These auxiliary modules are classified as input, input/output, and control modules.

- Input Modules:** Auxiliary inputs can be used to record desired data as well as to terminate or regulate charge and discharge processes based upon measured conditions. Selectable inputs are of V (voltage), T (temperature), P (pressure) and pH.
- Input / Output Modules:** Digital I/O is an integrated peripheral on/off control. The output commonly is used to control valves and switches. The input allows an external control signal to control testing procedure.
- Control Modules:** Arbin provides control modules for Auto-Calibration, Smart Battery Testing, External Charger, Temperature Chamber Interface and AC Impedance Measurement.

For more information please visit: www.arbin.com/products/accessories/auxiliaries.htm

Several safety provisions are provided in every Arbin system. There are three levels of fusing provided inside the system for further protection at the channel, board, and power supply levels. The software also has several safety functions with which the user can avoid over charging the cells, over discharging, overheating, etc.

Smart UPS: This option uses a very small Smart UPS to back up power to the computer only. This allows the user to enable auto resume options to all of specific channels after a stop due to power interruption. Provision is provided for the user to intervene if they so desire before the channels resume. This is an essential component for any user with an unreliable power source unless you have the whole facility on backup power.

Safety & UPS Features

