



Battery Testing & Research Solutions

The BT-2X43 series consists of specially designed potentiostat/galvanostat testing stations for testing batteries and electrochemical research. 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 12 to 40 channels per chassis.

BT-2X43

MODEL	VOLTAGE	CURRENT
BT-2043	-10V to 10V	±100mA/1mA/10µA
BT-2143	-10V to 10V	±500mA/10mA/100µA

Primary Applications:

- Life cycle testing for qualification of materials
- Quality control for incoming materials
- Quality control for sampling final products
- Pilot production
- Thin film cells

- This series is targeted for large volume testing with multiple independent channels which can each function as a PST/GST with their own reference electrode
- Each channel come with three current ranges with 14 bit resolution and 0.02% accuracy
- For current less than 100mA, the system includes auto-calibration
- 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 or Microsoft Excel
- Group clamp only, no individual voltage clamp. Grouped clamp voltage can be assigned in a batch file to act as a safety limit.
- Since the analog to digital chip shares the common ground, this circuit is not designed to measure leakage current
- Not intended for use in SCTS applications
- No CCCV control type available for BT-2043 or BT-2143

Key Features

Limitations



BT-2X43

Model Number: **BT-2043**
BT-2143

Hardware Specifications

MODEL NUMBER	2043	2143
Bipolar Linear Circuit Type	Provides zero switching time between charge and discharge	
Voltage Range (max/min)	-10V to 10V	
Accuracy of Voltage Control & Reading	±4mV, 0.02% Full Scale Resolution	
Current Ranges Provided	High: 100mA ± 40µA	High: 500mA ± 200µA
0.02% Full Scale Resolution	Medium: 1mA ± 0.4µA	Medium: 10mA ± 4µA
* 0.05% accuracy for 10µA low range	Low: 10µA ± 10nA	Low: 100µA ± 40nA
Minimum V at Maximum Current	~10V @ 100mA	~10V @ 500mA
Maximum Continuous Power Output/Channel	1W	5W
Current Rise Time	100-150µS Time required for current output to get from 10%-90% of requested value	
Current and Voltage Resolution	14 Bit or 0.006%	
Voltage Clamp	Group Voltage Clamp	
Auto-Calibration	Includes internal auto-calibration for product with current between 100µA and 100mA	Includes internal auto-calibration for product with current between 100µA and 100mA. Also available for additional cost with external auto-calibration option for 1A to 10A
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 Chassis 12.5" X 25" X 10.5"	20 Channels 110V or 220V Single Phase	12 Channels 110V or 220V Single Phase
11U Chassis 15" X 30" X 25"	40 Channels 110V or 220V Single Phase	32 Channels 110V or 220V Single Phase



BT-2X43

Model Number: **BT-2043**
BT-2143

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
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 a negative scan rate to generate decreasing current ramp
Voltage Ramp	Generates a voltage ramp with a positive scan rate for increasing voltage and a negative scan rate to generate 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 & Voltage Pulse	Applies a predefined voltage or current profile to the cell or batter pack under test
Current & Power Simulation	Non standard time domain functions may be interrupted from external sources such as ASCII data streams and used as control parameters for repetitive test
Internal Resistance	This function applies a 10-pulse train with 1ms pulse width of the specified magnitude following a constant-current charge or discharge
CC-CP	Combine constant current control and constant voltage control into one stage "CC-CP"
End Conditions	Time, Voltage, Current, Capacity, Energy, ΔV , DV/dt , formula, meta-variables, and other combinations

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Model Number: **BT-2043**
BT-2143

Software Control Specifications *Continued...*

Data Logging Rate	During a standard step: 40-150 data points per second, per PC
Network Capabilities	Provide TCP/IP access for networking
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), and P (pressure).

Control Modules: Arbin provides control modules for Temperature Chamber Interface

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

