Arbin Instruments



BT-HSP

SERIES OPTIONS:

BT-HSP 1/4

BT-HSP 1/8

High Speed Pulse Battery Testing Solutions

The BT-HSP (High Speed Pulse Testing System) is designed to perform submillisecond pulses on batteries or supercapacitors, which are common in wireless or telecommunication applications.

Arbin's pulse capability covers a broad range of sub-millisecond communication profiles, which can handle multi-stage pulses as fast as 100 microseconds per stage and up to 10 stages per pulse. The pulses have a maximum length of 2700 seconds.

Each channel of the system functions as an independent potentiostat/galvanostat. Commonly used charge/discharge functions such as ramps, staircases and constant current, voltage, power, and load functions may be used on all channels at the same time. Different pulse profiles may also be performed across groups of four or eight channels depending on the configuration.

The circuit is a bipolar design that affords tremendous flexibility by ensuring crosszero linearity and negligible current switching time. All these capabilities are further enhanced by our MITS Pro Software, which according to customer feedback is a step above all other software in the industry.

- Testing of cellular phones and other smart communication devices
- Cover various standard pulse-testing applications such as GSM, CDMA, iDEN, GPRS, etc.
- Other custom user-defined pulse profiles with 2-10 stages
- Simultaneous pulse generation and data logging
- Multiple, independent channels
- Three current ranges per channel
- Channels can be operated in parallel for increased current-handling capacity
- Rise times as fast as 50µS
- Windows 7 based software
- Many input auxiliaries available such as temperature and voltage
- Voltage clamp to protect from over or under charge and discharge



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Key Features

Hardware Specifications

SERIES	BT-HSP 1/4	BT-HSP 1/8
Number of Micro Controllers	Four main channels shared by one MC	Eight main channels Shared by one MC
Chassis Size	20.5U Chassis	
Number of Channels per PC	24	32
Voltage Range (min∕max)	O to 5V	
Accuracy of Voltage Control & Reading	±2mV 0.02% Full Scale Accuracy	
Minimum V at Maximum Current	OV @	D 5A
Voltage Measurements Input Impedance	~10	GΩ
Current Ranges Provided	High:	5A ± 2mA
0.02% Full Scale Accuracy	Low:	100mA ± 400nA
Maximum Continuous Power Output per Channel	25W	
Current Rise Time ¹	50µS	50µS
Bipolar Circuit Board Type ²	LPLAB-Arm7	
Current and Voltage Resolution	16 Bit	
Voltage Clamp	Group-Based Voltage Clamp	
AC Power Supply	110 VAC with 30	A circuit breaker
Connection for Batteries	Arbin manufactured cables with alligator clips or other types of connectors upon customer request. Arbin also provides battery holder system on the side of the chassis to provide easy engagement system to the battery tester.	
Connection for Computer	TCP/IP	
Ventilation method	Air-cooled, front-to-rear airflow	
Room Operating Temperature	10 to 35 degrees C	

¹Time required for current output to get from 10% to 90% of requested value.

² Provides zero switching time between charge and discharge.

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Hardware Specifications

SERIES	BT-HSP 1/4	BT-HSP 1/8
Power Plug Type	Hubble Plug	
Location of Circuit Breaker	At the back of the chassis	
Labeling requirements	Power input label	
	Label with PN and serial number o	n the front of chassis
	Label each channel on the front pa	nel
Stage 2 Stage 3 Stage 1 Stage 3 Stage 1 Total pulse length t ≤ T second		
SERIES	BT-HSP 1/4	BT-HSP 1/8
PULSE CHARACTERISTICS		
Pulse Independency	One pulse profile per group of	One pulse profile per group of
	four channels	eight channels
Maximum Total Pulse Stages (n) ³	10	
Minimum Pulse Stage Width	100 microsecond	100 microsecond
Minimum Pulse Point Interval	50 microsecond	50 microsecond
Maximum Total Pulse Length	2700 seconds	
Control Type	Current	
REPEATED PULSE DATA LOGGING CHARACTERISTICS		
Maximum # of Points Logged per Stage	2	
Minimum Interval Between Pulses with Data Logged	1 second	
Data Sampling	There will be two samplings, at the	beginning and end of each stage.

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Burst Pulse Mode

Burst mode operation allows user to log data at a very high rate for a maximum time of 500 milliseconds. Up to 300 points per pulse can be logged across a maximum of 10 stages per single pulse. This application can be useful in instances where fast data logging is required to catch voltage and/or current data during a transition. By capturing more data, the pulse profile can be more accurately defined, especially during the charge/discharge transition period (see software screen below). This helps to identify transition in the charge/discharge process of the objects being tested. The BT-HSP 1/4 will run burst pulse data logging sequentially for each of the four channels controlled per microcontroller.





Hardware Specifications

SERIES	BT-HSP 1/4	BT-HSP 1/8	
SINGLE PULSE BURST DATA LOGGING CHARACTERISTICS			
Data Logging Independency	Only one channel can perform this fu	nction at one time per shared	
	microcontroller while other channels	s perform non-pulse control.	
Maximum Pulse Length	1S	500mS	
Maximum # Points Logged per Pulse ⁴	300	300	
Minimum Logging Interval Range	100µS to 1mS	100µS to 1mS	
	50µS increments	50µS increments	
Interval Between Pulses	10 second	60 seconds	

⁴ Software will always log first and last data points.

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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 common 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.
Load [†] (Ohm)	Applies a constant resistance load to the battery at the value specified. The load control type will always produce a negative current.
Set Variables [†]	Change test related variables including channel capacity, energy, and all test counter variables
Current Ramp [⁺] Voltage Ramp	Generates a current/voltage ramp with a positive scan rate for increasing current/voltage, and negative scan rate generates decreasing current/voltage ramp.
Current Staircase [⁺] Voltage Staircase	Generates a current/voltage staircase with increasing current/voltage, and negative decreasing current/voltage staircase with adjustable step amplitude.
Current Pulse	Applies a predefined current profile to the cell or battery pack under test.
Current & 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.
Formula⁺	Equips the user to control and limit schedule steps according to dynamic mathematical equations in addition to constants or instantaneous channel data
Channel Paralleling	Channels may be operated in parallel for increased current-handling capabilities. NOTE: Control types marked with (†) are available in parallel mode.
End Conditions	Time, Voltage, Current, Capacity, Energy, ΔV , DV/dt, formula, meta-variables, and other combinations
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, Maximum voltage, etc.

Control types marked with (+) are available in parallel mode

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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).
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 external control signal to control testing procedure.
Control Modules:	Arbin provides control modules for auto-calibration, Smart Bat- tery Testing, External Charger, Temperature Chamber interface and AC impedance measurement.

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

*Auxiliaries are provided in a separate chassis, controlled by the same PC as the test station.

Several safety provisions are provided in every Arbin system. There are multiple 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.

Safety & UPS Features

brief power interruption. There is provision for the user to intervene if desired before the channels resume. This is an essential component for any user with an unreliable power source unless the entire facility is on backup power.

This option uses a small Smart UPS to back up power to the computer only.

This allows the system to automatically resume tests after a stop due to



Smart UPS:

(optional)

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