



Newsletter

Spring's Arrival



Arbin's line of high-power systems has been growing steadily to meet and exceed customer expectations. Using PWM-MOSFET, PWM-IGBT and Linear technologies, these systems meet the stringent requirements for the battery industry as well as other related industries such as super capacitors and fuel cells.

Important features such as multiple current ranges on each channel, bipolar technology with very high control, no ripple circuits, high accuracy and control, have been maintained throughout the series of high power systems to give our users the best that the technology has to offer. Using Arbin patented heat sink design, these systems offer the best space utilization available for air-cooled systems, enabling us to fit more power per square foot of footprint than anyone else in the

industry.

The response to these systems was evident at the Advanced Automotive Battery Conference held recently in Las Vegas. The conference provided an opportunity for the attendees to meet with the Arbin representative in person, and ask questions and get clarifications. The application of the same system to test 42V lead acid batteries as well as supercapacitors drew special attention.

Arbin's bipolar technology possesses clear advantages for the testing of 42V batteries. These systems are designed to provide an integrated testing platform where the power supply, load banks, control modules and data collection units are all housed within the same system providing our users with one of the best automated testing environments. 🌱

High Power System - 42V & Beyond

Inside this issue:

- High Power System
- Arbin New US Headquarters
- Battery Holders & Cables Online Store
- Software Updates



6-channel BT2000-LNR-(0.6V-42V)-200A/50A, 8400W



Top: 1-channel EVTS-LNR-(0V-5V)-150A/50A/1A, 750W

Bottom: 1-channel EVTS-LNR-(0V-60V)-150A/50A/1A, 9kW, 16 thermistors, 16 aux voltage inputs



8-channel BT2000-PWM-MOSFET-((-1)V-100V)-25A/1A/0.1A, 2500W, 8 pressures, 16 thermocouples, 40 aux voltage inputs



3-channel BT2000-IGBT-(30V-300V)-50A, 15kW
8 thermocouples, 64 aux voltage inputs



1-channel EVTS-IGBT-(40V-200V)-200A/1A/0.01A, 40kW, 16 thermistors, 16 pressures, 16 aux voltage inputs



4-channel BT2000-PWM-MOSFET-(0V-50V)-25A/2A/0.1A, 1250W

Arbin New Headquarters

For Arbin employees at its headquarters in College Station, TX, the new year started by reporting to work at our new office building, about 10 miles south of its previous location. The new 25,000 square feet building sits on 32 acres of land. Besides the addition of a guesthouse and a man-made fishing lake, the rest of the land is open for future development of the company.

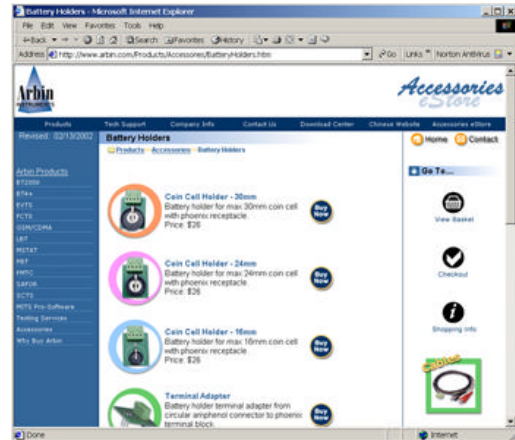
The new office houses all of the company's US operations with 17,000 square feet dedicated to production and testing. The 3-bedroom guesthouse is built to accommodate Arbin employees from branch offices who are visiting for training. Managed by

Texas A&M Fisheries Department, the 3-acre lake is for employee recreation, namely fishing, swimming and boating.

The new address is:
762 Peach Creek Cut Off Rd.
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USA
Phone: (979) 690-2751
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Web: www.arbin.com



Accessories Online!



<http://www.arbin.com/Products/Accessories/shopping.htm>

Last December Arbin added a new online ordering service for selected battery holders and cables on the company's English website. The primary focus is to establish a faster and more efficient means of doing business through a secure, real-time, web-based ordering system. The holders and cables are typically used with Arbin systems, but they can also be used with other third-party systems. Orders may be faxed in or sent through an industry-standard secure socket layer (SSL) internet connection.

Software Updates

Installing Third Party Software

Arbin recommends not to install any software not originally sent with the system. All required software is pre-loaded at the factory.

We realize that this restriction may be impractical for those who must connect with a network or transfer large data files. The reason we make this recommendation is that any software installed on the PC may alter Windows system files. These are files located in the directory "C:\winnt\system32".

Examples of programs, which are suspected to have caused problems, are:

- Utilities or programs automatically installed on the

PC when attaching to a network.

- Anti-virus software (this does not include the anti-virus software already installed when shipped).
- Other analytical instrument software or interface cards.

Usually, any problems with the Arbin Software can be remedied by replacing the changed system files with the original system files on the Backup CD for the MITS version you are running. These files are all located in a folder on the CD named "system32". This folder may be in different locations depending on the version of MITS software.

If you experience unusual behavior in the Arbin soft-

Arbin Mailed Out Events Calendar

Continuing the tradition for the 6th year, Arbin mailed out professionally printed industry events 2002 calendars to 3500 names in this industry all over the world. The calendar lists major industry events taking place in 2002 and is useful for scheduling your conferences-to-attend agenda.

Conference schedulers are encouraged to contact us for their events to be included in the calendar. Because there is a deadline for printing, early submission is important to ensure inclusion in the calendar. Email susana.t@arbin.com if you would like to include your events in the calendar or to receive a copy of the calendar.



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Advancing Fuel Cell Research... continues from Page 4

Typical Order 1: 30 l/m and 1.5 kW system
FCT/G-40/2V-50/5/0.5A-1.5kW-1ch-2GH30-2DPH30

Gas Handling (GH)

- Two Reactant Gas Handling lines: Individual mass flow control for each line: one for H₂ gas and another for Air/O₂ gas.
- Range of Gas Flow: 0.6-30 liters per minute
- Maximum Inlet Gas Pressure: 60 PSI applicable on entire inlet system

**Dew Point Humidifier (DPH)**

- Two humidifiers and their control: providing up to 100% RH, one for fuel gas; another for oxidant gas at max. 30 l/m
- Maximum gas outlet temperature: 100°C
- Humidifier bypass function: standard for each DPH
- Maximum pressure: 60 PSI

Tail Gas System

- Backpressure Range: 0-60PSI manual adjustments for each reactant gas stream
- Backpressure display: Gauge
- Backpressure bypass function: Available for each reactant gas stream, executing by computer controlled solenoid valve
- Water Knock Out drain: standard for each reactant gas stream

Electronic Load (40/2V-50/5/0.5A-1.5kW)

- Type: Linear electronic load
- Current range: 50A (high) / 5A (medium) / 0.5A (low)
- Voltage rating: 0 ~ 40V (high)
- Maximum power on each channel: 1.5 kW
- Standard digital I/O auxiliary board for valve control

Customer may add the following items to enhance functionality of the testing system:

Optional MeOH-H₂O Circulation Line

- Flow Control: Computer controlled diaphragm pump
- Range of Control: 0.13 to 1.3 liters per minute
- Cooling Capacity: 350 Watts
- Dual pump is available for accurate delivery at low flow rate

Additional Gas handling Lines

- Two more fuel gas lines and one more oxidant gas line can be added into the system. Mass flow control on each line.
- Maximum Inlet Gas Pressure: 60 PSI applicable on entire inlet system

Dual Gas handling Lines

- In each gas line, a low rate MFC can be added to form a dual gas handling line for accurate low flow rate control.

Oil-less air pump

- Deliver 30 l/m oil-less air

Auxiliaries

- Auxiliary voltage, temperature, differential pressure components and inputs
- Additional Digital I/O control for external signals or devices
- AC impedance attachment, 10 mΩ ~ 10Ω

Typical Order 2: 200 l/m and 5.0 kW system
FCT/G-100/2V-200/10/1A-5.0kW-1ch-2GH200-2DPH200

Gas Handling (GH)

- Two Reactant Gas Handling lines: Individual mass flow control for each line: one for H₂ gas and another for Air/O₂ gas.
- Range of Gas Flow: 4-200 liters per minute
- Maximum Inlet Gas Pressure: 60 PSI applicable on entire inlet system

**Dew Point Humidifier (DPH)**

- Two humidifiers and their control: providing up to 100% RH, one for fuel gas; another for oxidant gas at max. 200 l/m
- Maximum gas outlet temperature: 100°C
- Humidifier bypass function: standard for each DPH
- Maximum pressure: 60 PSI

Tail Gas System

- Backpressure Range: 0-60PSI manual adjustments for each reactant gas stream
- Backpressure display: Gauge
- Backpressure bypass function: Available for each reactant gas stream, executing by computer controlled solenoid valve
- Water Knock Out drain: standard for each reactant gas stream

Electronic Load (100/2V-200/10/1A-5.0kW)

- Type: Linear electronic load
- Current range: 200A (high) / 10A (medium) / 1A (low)
- Voltage rating: 0 ~ 100V (high)
- Maximum power on each channel: 5.0 kW
- Standard digital I/O auxiliary board for valve control

Customer may add the following items to enhance functionality of the testing system:

Additional Gas handling Lines

- Two more fuel gas lines and one more oxidant gas line can be added into the system. Mass flow control on each line.
- Maximum Inlet Gas Pressure: 60 PSI applicable on entire inlet system

Dual Gas handling Lines

- In each gas line, a low rate MFC can be added to form a dual gas handling line for accurate low flow rate control.

Oil-less air pump

- Deliver 200 l/m oil-less air

Auxiliaries

- Auxiliary voltage, temperature, differential pressure components and inputs
- Additional Digital I/O control for external signals or devices
- AC impedance attachment, 2 mΩ ~ 1Ω

Software Updates continues from Page 2

ware after third party software is installed, try copying the contents of the "System32" folder to the directory "C:\winnt\system32".

A reboot of the PC is required.

Arbin's recommendation is still to avoid installing third

party software on the PC controlling the Arbin cyclers. If other software must be installed, please contact Arbin Technical Support at 979-

690-2751 or support@arbin.com to determine if the software you wish to install has known conflicts. 🌱



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WE'RE ON THE WEB!
WWW.ARBIN.COM

A Total Solution the World Over

Advancing Fuel Cell Research with Arbin Fuel Cell Testing System

With new legislation supporting fuel cell development and budget pouring over this promising energy source, the fuel cell industry is taking even bigger steps towards the commercialization of the fuel cells. Research in this field is gaining more public acknowledgment with more conferences and publications focusing on fuel cells last year and even more this year.

Dr. John Zhang, President/Chief Engineer of Arbin, has seen the prospect of the fuel cell a few years back. After much research and testing, including recruiting specialized scientists to build fuel cell testing system, his vision was realized with the launch of Arbin fuel cell testing system last year. More than 5 custom-designed fuel cell testing systems have been manufactured and sold now, and a few more prospective orders are on the way.

Arbin fuel cell testing system is completely custom-designed according to customer specific a-

tions. Besides a complete fuel cell testing system with gas handling/control, electronic load and humidification units; customers may order the humidification unit or electronic load unit separately.

Arbin Dew Point Humidifier eliminates the need for separate condenser. It covers large range of gas flow rate, even at low flow rate with accurate humidity.

Dual voltage ranges (under development) and **multiple current ranges** are in standard design of Arbin E-Load. It offers possibility to conduct the testing on single cell or stacked fuel cell device in one system at high accuracy.

Optional dual mass flow controller, a high rate and a low rate MFC, for each gas line provides accurate rate control at high rate, as well as at low rate. Furthermore, in addition to common auxiliaries and attachments, optional **AC impedance attachment** provides true on-line measurement of cell or stack impedance from 2 mΩ up to 10 Ω at accuracy 5% of value.

The main features of Arbin fuel cell testing system are:

- E-load with programmable control of current, voltage, load and power
- High accuracy and resolution of current & voltage
- Wide range of current, voltage & power
- Up to 8 programmable mass flow control lines, either gaseous or liquid
- Proprietary dew point humidifier enables precise humidity control over wide flow rate range
- Online internal resistance measurement
- Multiple potentiostats for combinatorial electrochemistry
- Safety protection
- Testing software included

Inside this newsletter on Page 3 are specifications of two typical orders for Arbin fuel cell testing systems: one is built at 30 liters/minutes and 1.5 kW for each channel; another at 200 liters/minutes, and 5.0 kW for each channels. ♣

Arbin Factory Training 2002

Mar 4-5 & 18-19
Apr 8-9 & 22-23
May 6-7 & 20-21
Jun 3-4 & 17-18
Jul 8-9 & 22-23
Aug 5-6 & 19-20
Sep 9-10 & 23-24
Oct 7-8 & 21-22
Nov 4-5 & 18-19
Dec 2-3 & 16-17

Contact: Kevin Duff
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See Us at These Events

19th Intl Primary & Secondary Seminar on Batteries
Fort Lauderdale, FL, Mar 11-14

Batteries 2002
Paris, France, April 15-18

Knowledge Foundation Fuel Cell conference
Washington, DC, April 21-23

ECS Centennial-201st Electrochem Meeting
Philadelphia, PA, May 12-17