

New Products

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New Products

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In order to supplement manufacturers' information, this Department will welcome the submission by our readers of brief communications reporting measurements on the physical properties of materials which supersede earlier data or suggest new research applications.

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NEW INSTRUMENTS AND COMPONENTS

Automatic two-channel temperature controller

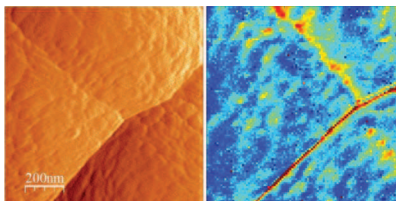
Warner Instruments, a Harvard Apparatus company, has introduced the CL-200 dual channel bipolar temperature controller for automatic control of two Peltier devices. Accurately maintaining temperatures between -6 and 65 °C with a single control, this model features a switch that allows the user to select which thermistor is used for feedback control. Built-in protection for Peltier devices prevents overheating or freezing and a low-noise power source makes the CL-200 suitable for sensitive electrophysiology applications. Designed to control any of the company's Peltier-driven temperature control devices, the CL-200 supplies 75 W of power to each channel.—Warner Instruments, 1125 Dixwell Avenue, Hamden, Connecticut 06514. (800-599-4203 or 203-776-0664) www.warnerinstruments.com



Electrochemical strain imaging microscopy

Asylum Research and Oak Ridge National Laboratory have developed a new electrochemical strain microscopy (ESM) imaging technique for Asylum's Cypher and MFP-3D atomic force microscopes. ESM is a scanning probe microscopy technique capable of probing electrochemical reactivity and ionic flows in solids on the sub-ten-nanometer level. It is the first technique that measures ionic currents directly, providing a new tool for mapping electrochemical phenomena on the nanoscale. According to the company, the ability to probe electrochemical processes and ionic transport in solids will be of use in energy generation and storage applications ranging from batteries to fuel cells. This potential arises from two improvements over other technologies: the resolution to probe nanometer-scale volumes, and the inherent

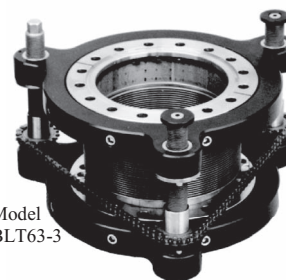
ability to decouple ionic from electronic currents. Imaging capability is extended to a broad range of spectroscopy techniques reminiscent of conventional electrochemical tools. Progress in energy storage and conversion will be facilitated by the ability to study batteries and fuel cells at the level of several nanometers. ESM provides functional imaging of electrochemical phenomena in volumes from 10^6 to 10^9 times smaller than conventional current-based electrochemical techniques. The new technique facilitates the understanding of energy technology and ionic devices on the level of individual grains and defects, thus bridging macroscopic functionalities and atomistic mechanisms. This in turn will lead to improved energy storage solutions: batteries with extremely high energy densities and long lifetimes and fuel cells with very high energy densities and efficiencies.—Asylum Research, 6310 Hollister Avenue, Santa Barbara, California 93117. (805-696-6466, ext. 224/227) www.AsylumResearch.com



High power semiconductor test instrument





Designed for characterizing high power electronics, the model 2651A is the latest addition to Keithley Instruments' series 2600A system SourceMeter family. It provides a wide current range for various research and development, reliability, and production test applications such as testing high brightness light-emitting diodes (HBLEDs), dc-dc converters, and batteries. The model 2651A offers a flexible, four-quadrant voltage and current source/load coupled with precision voltage and current meters. It combines the functionality of multiple instruments in a single full-rack enclosure: semiconductor characterization instrument, precision power supply, true current source, digital multimeter, arbitrary waveform generator, voltage or current pulse generator, electronic load, and trigger controller. It is expandable into a multichannel, tightly synchronized system via Keithley's

Bellows-Sealed Linear Translator (BLT)



Model
BLT63-3

Operating Instructions:

1.  
2.  
3. Repeat if necessary.

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TSP-Link technology. (TSP denotes test script processor.) The model 2651A can source or sink up to 2000 W of pulsed power (± 40 V@ ± 50 A) or 200 W of dc power (± 10 V@ ± 20 A, ± 20 V@ ± 10 A, ± 40 V@ ± 5 A). It can also make precise measurements of signals as low as 1 pA and 100 μ V at speeds up to 1 μ s/reading. The model 2651A provides a choice of digitizing or integrating measurement modes for precise characterization of both transient and steady-state behavior. Two independent analog-to-digital (A/D) converters define each mode—one for current and the other for voltage. They run simultaneously for accurate source readback without sacrificing test throughput. The digitizing measurement mode's 18-bit A/D converters allow the capture of 10^6 readings/s for continuous 1 μ s/point sampling time, making this mode an appropriate choice for waveform capture and measuring transient characteristics with high precision. Based on 22-bit A/D converters, the integrating measurement mode optimizes the operation of the instrument for applications that demand very high measurement accuracy and resolution, such as measurements of the very low currents and voltages common in next-generation devices. Connecting two model 2651A units in parallel via TSP-Link expands the system's current range from 50 to 100 A. The voltage range can be expanded from 40 to 80 V when two units are connected in series. The embedded TSP simplifies testing by allowing users to address multiple units as a single instrument so that they act in concert. The built-in trigger controller in the model 2651A can synchronize the operation of all linked channels to within 500 ns. The unit is suitable for various high current, high power test applications, including power semiconductor, HBLEED, and optical device characterization and testing; characterization of gallium nitride, silicon carbide, and other compound materials and devices; semiconductor junction temperature characterization; reliability testing; high speed, high precision digitization; and electromigration studies. To minimize device self-heating during tests, the model 2651A offers high speed pulsing capabilities that allow users to source and measure pulses with high accuracy. Pulse widths from 100 μ s to dc and duty cycles from 1%–100% are programmable. Embedded in the instrument is TSP Express, Keithley's LXI-based current-voltage test software utility. It simplifies connecting instruments to allow higher pulsing levels and delivers device data in three steps: connect, configure, and collect. Results can be viewed in either graphical or tabular format and exported to a .csv file for use with spreadsheet applications. Two other software tools for creating test sequences are also provided: Test Script Builder supports creating, modifying, debugging, running, and managing TSP scripts and an interchangeable virtual instrument-based LabVIEW driver simplifies integrating the model 2651A into LabVIEW test sequences.—*Keithley Instruments, Inc.*, 28775 Aurora Road, Cleveland, Ohio 44139-1891. (800-688-9951 or 440-248-0400) www.keithley.com



NEW DETECTORS, MEASUREMENTS, AND MATERIALS

Displacement measuring system

Kaman Precision Products offers its new KDM-8206 measuring system in a 19-in. modularized rack format. The user can add channels to the system by installing modular personal computer (PC) backplane boards into empty rack or benchtop enclosure slots. Designed for making high-precision multichannel displacement, run-out, and position measurements, the KDM-8206 is suitable for high-sensor-count test and development applications in industrial, laboratory, and production facilities. The fundamental component of this noncontact measuring system is the 3U-by-7T Eurocard measuring module that features auto-synchronization of multiple channels. The KDM-8206 module contains the inductive bridge and signal conditioning circuits that produce the measurement output, a linear voltage proportional to the physical displacement of the target relative to the sensor. With both coarse and fine calibration controls, the system achieves resolution to 10 μ m, or better, or 0.01% of full scale. In addition, the KDM-8206 features nonlinearity of <1% of full scale and frequency response of 50 KHz standard, with up to 120 KHz optional. Output signals are single-ended voltage, differential voltage, or 4–20 mA current. The KDM-8206 sensors measure ferrous and non-ferrous targets. Kaman offers 21 standard sensors that operate from -67 to 220° F and ten sensors that operate from cryogenic to 400° F. The inductive eddy current technology on which these sensors are built is unaffected by environmental contaminants such as water vapor, oil, and particulates. Users may select among three types of enclosures for the KDM-8206 measuring channel: 12-channel full rack, 9-channel mid-rack, and 6-channel half-rack. All Kaman-supplied racks feature a 110/220 V_{ac}, 50/60 Hz input power supply, Bayonet Neill-Concelman (BNC) coaxial output connectors for measuring channel voltage outputs, two-position terminal blocks for measuring channel current outputs, and twin BNC connectors for sensor inputs. Meters, rack-to-rack synchronization, and true differential output are optional. The KDM-8206 is CE-marked (denoting conformance with the essential requirements of the European Community) and Restriction of Hazardous Substances-compliant.—*Kaman Precision Products, Old Windsor Road, P.O. Box 2, Bloomfield, Connecticut 36582*. (860-242-4461) www.kamansensors.com



Intensified CCD cameras

Andor Technology has launched the new iStar range of scientific-grade intensified charge-coupled devices. According to the company, the iStar incorporates the best from CCD sensor and gated image intensifier technologies to achieve a combination of rapid acquisition rates and ultra-high sensitivity, down to single photon, improving rapid, nanosecond time-resolved imaging and spectroscopy. Reliable detection performance is attained through high quantum-efficiency image intensifiers, thermoelectric cooling to -40° C, 500-kHz photocathode gating rates, and enhanced intensifier electron beam imaging noise reduction. Low jitter, low insertion delay gating electronics, and nanosecond-scale optical gating provide timing accuracy down to few tens of picoseconds, allowing precise synchronization of complex experiments through iStar's comprehensive range of input/output triggering options.—*Andor Technology plc.*, 425 Sullivan Avenue, Suite #3, South Windsor, Connecticut 06074. (860-290-9211) www.andor.com

Temperature controller

According to Lake Shore Cryotronics, its new model 335 temperature controller offers user-configurable and time-saving features and advanced functions until now only found in high performance temperature controllers. The economical, half-rack-sized model 335 is the first two-channel temperature controller available with user-configurable heater outputs delivering a total of 75 W of low noise heater power. Supporting diodes, resistance temperature detectors, and thermocouples, the model 335 includes hardware and software features that allow the user to easily control experiments and automate processes. Output one functions as a current output, while output two can be configured in current or voltage mode. With output two in voltage mode, it functions as a ± 10 V analog output and still provides 1 W of heater power and full closed loop proportional-integral-derivative (PID) control. PID control parameters can be calculated automatically with improved autotuning, and alarms and relays help automate secondary control functions. The controller's zone tuning feature allows the user to measure and control temperatures seamlessly from 300 mK to over 1500 K. This feature automatically switches temperature sensor inputs when the temperature range goes beyond the useable range of a given sensor, eliminating concern about temperature sensor over or under errors and measurement continuity issues. The intuitive front panel layout and keypad logic, bright vacuum fluorescent display, and light-emitting diode indicators enhance the user-friendly interface of the model 335. Four display modes accommodate different instrument configurations and user preferences. The ability to custom-label sensor inputs eliminates guesswork in remembering or determining the location to which a sensor input is associated, and the need for sticky notes and handwritten labels. Combined with USB and IEEE-488 interfaces and intuitive menu structure and logic, these features contribute to efficiency and

ease of use. Replacing the models 331 and 332 temperature controllers, the model 335 offers software emulation modes for drop-in compatibility. The commands users are accustomed to sending to the models 331 and 332 are interpreted directly or translated to the most appropriate model 335 setting.—*Lake Shore Cryotronics, Inc.*, 575 McCorkle Boulevard, Westerville, Ohio 43082. (614-891-2244) www.lakeshore.com



Rotational viscometer

The Black Pearl viscometer from ATS RheoSystems is a high-performance rotational viscometer capable of both steady shear and yield stress testing in a rugged, compact footprint. Routine viscosity measurements of materials are important in industrial processes such as mixing and pumping, spraying and coating, extrusion, laydown, and leveling. Typically, a rotational rheometer is employed to measure the flow characteristics of most non-Newtonian systems; however, these instruments can be complicated and relatively costly to purchase and maintain and can require an operator with an advanced degree. A simple-to-operate, rotational viscometer can provide a similar flow curve profile of these non-Newtonian materials if designed and produced to be application-specific, incorporating a self-contained temperature control system and interfaced with a user-friendly Windows-based software package. The Black Pearl viscometer is suitable for investigating the mixing, stirring, and pumping behavior of coatings, emulsions, and dispersions, as well as for performing conventional flow and viscosity profile experiments. The design incorporates a Peltier temperature control system that allows isothermal, step, and/or ramp temperature profiles. The DIN standard (DIN denotes *Deutsches Institut für Normung*) sample measuring systems of cone and plate, parallel plate, and bob and cup, coupled with a wide shear rate and torque range, provide a measurable viscosity range from 1 to 10^8 cP. This is accomplished by using the DIN measuring system over the specified torque and/or angular velocity ranges of the viscometer and then combining the results. The performance specifications of the viscometer enable the testing of a wide range of materials, including paints, coatings, inks, surfactants, polymer solutions, foods, pharmaceuticals, cosmetics, biochemicals, asphalt, molten polymers, adhesives, sealants, and petrochemicals. The Black Pearl has been designed to perform both routine rheological tests such as single point viscosity checks for quality control and complex rheological evaluation for research and development. The unit comes standard with built-in Peltier temperature control for all measuring systems; cone and plate, parallel plate, and concentric cylinder measuring systems are included and employ “Quick Capture”

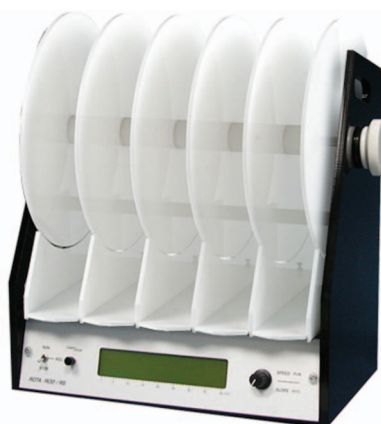
mounting technology. According to the company, the user-adjustable gapping mechanism is highly accurate. The Black Pearl has an angular velocity range from 0.01 to 200 rad/s, a torque range from 0.005 to 20 mNm, and a temperature range from -10 to 120°C .—*ATS RheoSystems*, 231 Crosswicks Road, Bordentown, New Jersey 08505. (609-298-2522) www.atrheosystems.com



BIOINSTRUMENTATION AND BIOTECHNOLOGIES

Rota rods

Coulbourn Instruments has made available a new line of high performance rota rods suitable for motor coordination and muscle fatigue studies in rodents. The new units feature a high performance motor for smooth operation and reduced stress to subjects, and individual lane timers and mechanical detection of fall for ease of use. Constant speed or acceleration mode capabilities contribute to flexibility for experimental protocols. The four-lane interchangeable drum unit allows the line to be adapted for use with multiple species. According to the company, the line requires



minimal maintenance and is easy to clean; data acquisition is simple with the included software that displays drum rotation speed and latency to fall for each lane of the unit. Units can be run at constant or acceleration modes for a wide range of applications. For optimal flexibility, Coulbourn also offers a unit with interchangeable drums to accommodate both mice and rats with one single base platform.—*Coulbourn Instruments*, 5583 Roosevelt Street, Whitehall, Pennsylvania 18052. (610-395-3771) www.coulbourn.com

Programmable shaking chilling/heating dry bath

Torrey Pines Scientific has announced its new EchoTherm model SC25XT variable speed shaking dry bath for use with biological and other samples. Fully programmable, the SC25XT features a five-program memory and a temperature range from -20 to 100°C . It has a variable speed orbital shaker for mixing samples while controlling sample temperature to 1°C . A 30-day countdown timer with alarm and auto-off, data logger, and an RS232 input/output port for data logging or controlling the units from a computer are included. The SC25XT uses accessory sample blocks available for 0.2, 0.5, 1.5, 15, and 50 ml centrifuge tubes. Also available are 2 ml vials, 20 ml scintillation polymerase chain reaction tubes and plates, 96- and 384-well assay plates of all shapes, deep-well assay plates, and other blocks for various sizes of test tubes. The unit is Peltier-driven for chilling and heating. According to the company, this unit is a suitable tool for molecular biology and can be used to run temperature/time profiles, unattended restriction digestions or ligations, and automatic enzyme reactions and deactivations. It can store oocytes at 17°C and DNA libraries at the workstation. The SC25XT comes with instructions and a universal benchtop power supply for use anywhere in the world. It is UL-, CSA-, and CE-compliant.—*Torrey Pines Scientific, Inc.*, 2713 Loker Avenue West, Carlsbad, California 92010. (866-573-9104 or 760-930-9400) www.torreypinesscientific.com



NEW LITERATURE AND SOFTWARE

Universal input data logger

CAS DataLoggers has partnered with Novus Automation to offer the new FieldLogger RTU eight-channel universal input data logger. The FieldLogger is a microprocessor-based data acquisition and recorder that can handle any analog input, operating either as a remote terminal unit (RTU) linked



to a PC for online recording and supervision or as a standalone data logger with real-time clock and graph capabilities. The new, economical logger functions as a Modbus RTU input device as part of a supervisory control and data acquisition system to transmit channel data using Modbus protocol. This new datalogger is DIN rail compatible with a 35-mm rail mounting in an acrylonitrile butadiene styrene enclosure. It features eight universal channels accepting different input sensors simultaneously, with an option to be expanded to accommo-

date more channels. Configuration—retained on the logger in non-volatile memory—and data retrieval are achieved using a PC and the included configuration utility software. The Novus FieldLogger also features an RS485 interface which allows communication up to 1.6 miles (1 km). For users without an RS485 port on their PC, Novus manufactures a USB-RS485/RS422 converter, transforming an ordinary USB port into a fully functional RS485 interface. The FieldLogger datalogger's eight universal analog inputs support several thermocouple types as well as Pt100, mA, mV, and higher voltages by applying external resistor dividers. In addition, the FieldLogger has one digital input for remote start/stop and two alarm relay channels that can be activated when any channel enters a programmed alarm condition; these relays can also be used as digital outputs. The logger provides internal cold junction compensation for thermocouples, enabling high-accuracy measurements. Recording at a working temperature of 32–130 °F (0–55 °C), the new datalogger also features an internal resolution of 20 000 counts and linearity of better than 0.05% of full scale. It can scan eight channels in 0.5 s. Field-

Chart configuration utility software is included free of charge and is downloadable from the company website. FieldChart is a Windows-compatible software that performs the communication and data treatment for the FieldLogger recorder and Novus controllers with RS485. This intuitive system requires no previous user training. The main module collects data to the PC, displays the data in both digital and graphic formats in batches or in real time, and provides trend and historical views. It can zoom in and out, superimpose or link graphs in one screen, print graphs or lists, and export to spreadsheets or word processors. The practical configurator module performs the setup of the FieldLogger parameters and allows users to check general status. In addition to its standard use as a Modbus RTU for online reading and recording (history), the FieldChart software also reads and records a graph for a 10-min period. Users needing more in-depth data analysis can upgrade to the full FieldChart analysis software to allow the FieldLogger to form a complete data acquisition system.—*CAS Data Loggers, 12628 Chillicothe Road, Unit J, Chesterland, Ohio 44026. (800-956-4437) www.DataLoggerInc.com*