new products

Focus on test, measurement, and data acquisition

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description.

Andreas Mandelis

Signal acquisition module

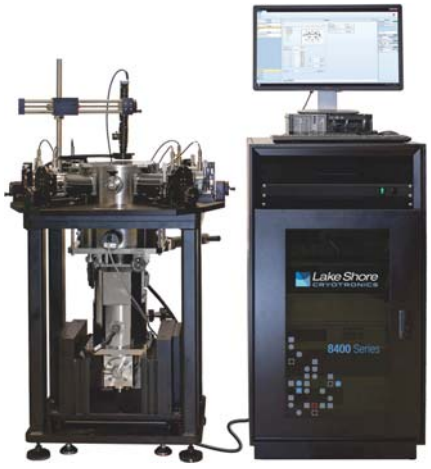
Designed for noise, vibration, and acoustic measurement, Data Translation's DT7837 high-accuracy dynamic signal acquisition module has an embedded ARM Cortex-A8 600-MHz processor. Four 24-bit, integrated electronic piezoelectric sensor input data sets can be algorithmically processed in real time using an optional 24-bit stimulus digital-to-analog generator and the results presented for analysis. The module features up to 102.4-kHz simultaneous sampling, eight digital inputs and outputs, counter timers, a tachometer, an open-source Linux computing platform, and a secure digital card interface for measurement results and raw data. A USB-host port is provided for an additional solid-state-drive hard disk, wireless LAN, or GSM communication stick. An RS-232 (3.3 V) serial interface allows for communication with a programmable logic controller. *Data Translation Inc, 100 Locke Drive, Marlboro, MA 01752-1192, http://www.datatranslation.com*

Secondary ion mass spectrometer

Hiden has introduced its Compact secondary ion mass spectrometer (SIMS) for characterization of layer structures, surface contamination, and impurities in solar cell, glass coating, and metallic thin-film applications. The machine, assisted by an oxygen primary ion beam, sensitively detects positive ions and provides isotopic sensitivity across the entire periodic table. The ion gun geometry is suitable for nanometer-depth resolution and near-surface analysis. A rotary carousel allows 10 samples to be simultaneously loaded for measurement into the dry-pumped vacuum chamber. An electron gun option is available for analysis of insulating samples. The Compact SIMS provides depth profiles, 3D and 2D images, and mass spectral data. It has a secondary neutral mass spectrometry facility that can quantify high-concentration elements such as alloys. *Hiden Analytical, 420 Europa Boulevard, Gemini Business Park, Warrington WA5 7UN, UK, http://www.hidenanalytical.com*

Hall measurements on wafers

Lake Shore Cryotronics offers its model 8425 system for nondestructive measurement of Hall mobility on wafer-scale



materials as a function of temperature and field. Featuring an integrated cryogenic probe station, the system lets users perform Hall measurements on wafers up to 51 mm in diameter and makes dicing of fabricated wafers unnecessary. Because samples are under vacuum, the platform is suitable for testing materials that are reactive to air or require initial warming to drive out moisture. Repositionable probes eliminate the need for large, fixed-wire contacts and enable multiple structures to be sampled on a wafer. The system offers DC fields to 2 T, resistances from 10 μΩ to 100 GΩ, and temperature measurement from 10 K to 400 K. It supports van der Pauw, Hall bar, and gated Hall bar measurements. Lake Shore software permits control of magnetic field, sample excitation and temperature, and automated temperature loops.

Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082, http://www.lakeshore.com

Microwave vector signal analyzer and generator

National Instruments has introduced two new instruments to expand the measurement capabilities of its PXI platform: a high-performance, 26.5-GHz microwave vector signal analyzer (VSA) it claims has the widest bandwidth of any microwave VSA available, and a fast-tuning 20-GHz continuous wave signal

generator. High-performance VSAs have a low noise floor, high linearity, and low phase noise. The company's VSA combines those attributes with up to 765 MHz of instantaneous bandwidth, so users can analyze very wide bandwidth signals in a single acquisition. Those signals include radar pulses, LTE-Advanced transmissions, and 802.11ac waveforms. The signal generator combines low phase noise and a fast tuning time of 100 μs. Applications include blocking and interferer generation, high-performance intermodulation distortion test benches, and radar testing. *National Instruments Corporation, 11500 North Mopac Expressway, Austin, TX 78759-3504, http://www.ni.com*

Thermal imaging camera

Omega's OSXL-TIM3 thermal imaging camera can measure from −20 °C to 250 °C, display the thermal images and temperatures, and save the thermal images to an 8-GB micro SD card (included with the camera) for later review. Up to 60 000 images per gigabyte can be stored. Software, which is compatible with Windows 7 and 8, transfers images to a PC for review and detailed reporting of the saved images. The compact, lightweight camera is automatic and focus free. Among the applications are solar power generation, process control, and inspection and diagnostics in factory automation. *Omega Engineering Inc, One Omega Drive, P. O. Box 4047, Stamford, CT 06907-0047, http://www.omega.com*

Universal mechanical tester

The latest generation of Bruker's universal mechanical tester, the UMT TriboLab, incorporates in a single platform the full range of performance previously offered in several UMT models. It includes increased load capacity speed, higher torques, and enhanced data accuracy and modularity. As with previous UMTs, the TriboLab's universal base can be equipped with various drive modules to allow multiple, different tribology tests to be performed. Its design emphasizes ease of use, with simpler configuration requirements, a tool-less drive exchange, easier software and scripting capabilities, and fewer training requirements. The TriboID feature automatically recognizes the attached modules and reconfigures user menus based on the hardware installed. A user-friendly graphical interface controls the new TriboScript software. *Bruker Nano Surfaces Division, Tribology and Mechanical Testing, 1717 Dell Avenue, Campbell, CA 95008, http://www.bruker.com*

Cold cathode gauge

According to MKS Instruments, its Granville-Phillips series 500 cold cathode gauge has the highest accuracy (±10%) of any available wide pressure range CC gauge; a longer lifetime than traditional CC gauges; and fast, reliable starting. Its method for determining pressure dosage over time provides for predictive maintenance. The device offers a wide measurement range from 10^{-10} torr to 10^{-2} torr and includes electronics and digital and analog interfaces. The USB interface and GP Connect software provide easy setup and diagnostics, including screens for setting up the gauge, graphing the pressure trend, and checking usage statistics. Applications include coating, semiconductor, and general vacuum R&D and analytical

and high-energy physics studies. *MKS Instruments, 2 Tech Drive, Suite 201, Andover, MA 01810, http://www.mksinst.com*

Raman spectroscopy substrates

Ocean Optics claims that its surface enhanced Raman spectroscopy (SERS) substrates are highly sensitive, stable, and reliable. They deliver precise trace-level Raman spectroscopy measurement in applications that include chemical and explosive agent detection and authentication, contaminant screening, and quality control. Using precisely controlled gold nanoparticles, the SERS substrates amplify very weak Raman signals by many orders of magnitude and yield fast, repeatable SERS measurements for the identification and quantification of SERS-active analytes. Detection at the parts-per-billion and even parts-per-trillion levels is possible. Standard substrates are formatted for microscope slides with a 5-mm-diameter active area. Customized designs are available with a choice of form factor, such as swabs and coatings, and the ability to impart specificity to particular analytes. SERS substrates work reliably with Ocean Optics Raman instruments. *Ocean Optics Inc, 830 Douglas Avenue, Dunedin, FL 34698, http://www.oceanoptics.com*

Radiometer for low-power measurements

Ophir Photonics has announced the RM9 radiometer, a sensor for measuring the power of very low level CW and quasi-CW sources. It uses a pyroelectric sensor in conjunction with an 18-Hz chopper to measure a wide range of radiation, from UV to deep-IR. According to the company, the RM9 is calibrated over the entire range of wavelengths, from 0.15 μm to 12 μm, and not just a single one like other radiometers. The sensor features a digitally synthesized lock-in amplifier that reduces external noise to a minimum, so it can measure power levels down to 100 nW and lower. The sensor output can be displayed on any standard Ophir meter or on a PC. The RM9 has an 8-mm aperture, combines very low noise levels of ~30 nW over 10 s with fast response times (3.5 s with display), and measures power levels from 100 nW to 100 mW. *Ophir-Spiricon LLC, 3050 North 300 West, North Logan, UT 84341, http://www.ophiropt.com/photonics*

Programmable DC electronic loads

B&K Precision's 8600 series of 150- to 250-W DC electronic loads can sink current up to 60 A at voltages up to 500 V. Three compact benchtop models provide transient operation speeds up to 25 kHz and built-in battery and LED test-mode functions. They are suitable for testing and evaluating DC sources such as power supplies, DC–DC converters, batteries, LED drivers, and photovoltaic arrays. The 8600 series can operate in constant current, constant voltage, constant resistance, and constant power modes. Transient, list, and automatic test functions are provided for more complex loading profiles of varying load levels, switching times, and operation modes. The high-resolution, 16-bit measurement system and bright dual-line display allow users to view both set and measured parameters simultaneously. Standard GPIB, USB, and RS-232 interfaces are included for remote control and programming. *B&K Precision Corporation, 22820 Savi Ranch Parkway, Yorba Linda, CA 92887-4610, http://www.bkprecision.com*

Optical thickness gauge

Based on optical interferometer technology, the model 157 optical thickness gauge from Bristol Instruments measures absolute thickness to an accuracy of ±0.1 μm. Measurement repeatability has been improved two and a half times over the previous version, to ±0.02 μm. Thickness information is critical in the development and production of materials such as plastic films, medical membranes, glass tubing, and ophthalmic products. According to the company, model 157 is the only optical thickness gauge that provides both reliable, high accuracy and very high repeatability. Combining the two allows the system to reduce variability in material thickness. Accuracy is guaranteed because measurements are continuously referenced to a built-in length standard recognized by NIST. *Bristol Instruments Inc, 50 Victor Heights Parkway, Victor, NY 14564-8909, http://www.bristol-inst.com* ■