new products

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.

Lawrence G. Rubin

Focus on magnetics and electromagnetism

Hall effect sensor

Allegro MicroSystems has introduced the A3423, a dual-channel Hall effect sensor that provides output signals to indicate speed and direction of a target; it is intended for use in applications that incorporate encoder ring-magnet targets. The device's sensitive and temperature-stable Hall elements are photo-lithographically aligned to better than 1 μm and are spaced 1.63 μm apart; these features offer excellent speed and direction information for small-geometry targets. End-of-line trimming of the Hall element switch points provides tight matching capability. The continuous-time method of offset cancellation delivers a fast startup and signal recognition and very low noise at the output. The A3423 includes low-drift amplifiers that guarantee symmetry between the switches to maintain signal quadrature. *Allegro MicroSystems Inc, 115 Northeast Cutoff, Worcester, MA 01606, http://www.allegromicro.com*

See www.pt.ims.ca/12313-131

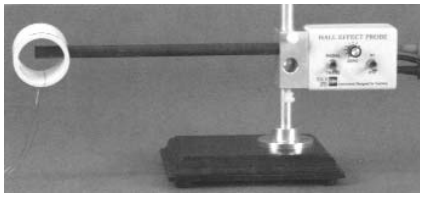
NMR spectrometer

The Avance III NanoBay from Bruker BioSpin is a highly integrated, state-of-the-art NMR spectrometer that delivers quality NMR information for pharmaceutical and industrial chemistry, food analysis, diagnostics research, and other small molecule applications. The NanoBay offers a Microsoft Windows-based intuitive-routine user interface (Linux option) and is available in combination with the company's UltraShield Plus 300- and 400-MHz magnets to allow easy siting in non-NMR laboratories, even when space is limited. The new spectrometer incorporates the recently introduced Avance III technology, which permits a high level of digital control, very pure NMR frequency generation, and extended speed and flexibility. The NanoBay incorporates Bruker's TopSpin NMR software and IconNMR automation interface. *Bruker BioSpin Corporation, 15 Fortune Drive, Billerica, MA 01821-3991, http://www.bruker-biospin.com*

See www.pt.ims.ca/12313-132

Hall effect sensor for teaching

TeachSpin is offering the HE1-A Hall effect sensor designed specifically for teaching students to understand the phenomenon of the Hall effect and its interaction with a magnetic field. With TeachSpin's Hall Effect Calibration Kit, model HECK1-A, students can calibrate an instrument, then use it to measure unknown magnetic fields,



such as in the Helmholtz coil shown in the photo. The HE1-A probe has a zero adjust that lets users cancel out the signal from the Earth's local magnetic field, a necessary procedure to allow the probe to measure fields significantly smaller than that local field. It can also be used, for example, to check the field homogeneity and field-gradient linearity produced in the coils supplied with the company's Magnetic Force and Magnetic Torque apparatus. *TeachSpin Inc, Tri-Main Center, Suite 409, 2495 Main Street, Buffalo, NY 14214-2153, http://www.teachspin.com*

See www.pt.ims.ca/12313-133

Electromagnetic simulation software

Field Precision has announced the Electromagnetics Toolkit, TK0500, a comprehensive software package for the full range of electromagnetic simulations. Applications include resonator design and EM scattering and interference. The toolkit includes WaveSim, which provides finite-element frequency-domain simulations of EM propagation and microwave devices and handles both closed and open systems with the option for material losses. The other component of the toolkit is EMP, a time-domain code that simulates EM pulses in 2D planar geometries and 3D cylindrical systems. It uses finite-element methods on conformal triangular meshes to accurately represent curved and sloped material boundaries. Version 6.0 of the two programs combines major technical advances with improved plotting and usability. *Field Precision LLC, P.O. Box 13595, Albuquerque, NM 87192, http://www.fieldp.com*

See www.pt.ims.ca/12313-134

Magnetic field sensor

The Ametes MFS-3A, distributed by GMW Associates, is a three-axis magnetic field sensor that incorporates three Sentron CSA-1V Hall effect ICs, which feature a sensitivity of 280 mV/mT, high stability, accurate calibration, and high signal output. The ICs are mounted with their sensitive axes mutually perpendicular so they can measure the three components of magnetic flux density, B_x, B_y, and B_z, over the field range of ±7.3 mT. The MFS-3A, with three linear analog outputs, V_x, V_y, and V_z, and a frequency response of DC to 100 kHz, is suitable for environmental magnetic fields. For example, the sensor enables the independent monitoring of the on/off status of large magnets with extended fringing fields. Its resolution of ±10 μT allows measurement of the 500 μT (5G) safety level applicable to magnetic resonance imagers. *GMW Associates Inc, 955 Industrial Road, San Carlos, CA 94070, http://www.gmw.com*

See www.pt.ims.ca/12313-135

VSM enhancements

Lake Shore Cryotronics has developed two new options for its 7400 series of vibrating sample magnetometers. The model 74035 single-stage variable temperature assembly enables measurements from 100 K to 900 K using liquid nitrogen and argon gas; a single-point measurement can be taken at 85 K. A hardware switch is not needed to go from high to low temperatures, and the assembly pro-

vides a rapid cooldown from 900 K to room temperature and from there to 100 K. The model 74046 MR option (see photo) performs fast and accurate resistance measurements of magnetoresistance materials as a function of both magnetic field and temperature. With that option's data acquisition, control, and analysis software, users can extract, for example, pertinent parameters for free and pinned layers of both simple and synthetic spin-valve sensors. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082, http://www.lakeshore.com*

See www.pt.ims.ca/12313-136

Hall effect rotary sensor

Duncan Electronics' model 9360 is a noncontacting rotary dual-output Hall effect sensor. It has an electrical angle of 0–359.9 ° with ±0.6% full-scale accuracy at room temperature and ±0.9% f.s. over the operating temperature range of –40 °C to +85 °C; as an option, the range can be extended to 125 °C. The 9360 incorporates a compression-molded, rotating neodymium disk magnet whose strong magnetic field makes possible high accuracy and reliability. The rugged device can withstand 10 Gs vibration (20–2000 Hz), 50 Gs shock, and a half-sine pulse of 5 ms duration. With its infinite rotation and absolute position feedback capabilities, the new sensor is ideal for high-vibration applications in heavy equipment, off-highway, marine, and industrial markets. *BEI Duncan Electronics Division, 170 Technology Drive, Irvine, CA 92618-2401, http://www.beiduncan.com*

See www.pt.ims.ca/12313-137

Handheld spectrum analyzer

Saelig Co has introduced the PSA2701T, a handheld spectrum analyzer that covers the frequency range 1 MHz to 2.7 GHz. The instrument provides sweep modes of continuous, single, peak hold and average—up to 256 sweeps—with unlimited storage for waveforms, setups, and fully annotated screens under user-defined file names. The PSA2701T offers a –96 dBm typical noise floor, –20 or 0 dBm reference level, a zero span mode with AM and FM audio demodulation, and resolution bandwidths of 15 kHz, 280 kHz, and 1 MHz; its sweep parameters can be set as "center plus span" or "start plus stop" to 1-kHz resolution. The spectrum analyzer is built around a Palm T|X handheld computer so data transfer to a PC for analysis, documentation, and printing is possible via the mini-USB connector. *Saelig Company Inc, 1160-D2 Pittsford-Victor Road, Pittsford, NY 14534, http://www.saelig.com*

See www.pt.ims.ca/12313-138

RF signal generator enhancements

Keithley Instruments is offering a series of enhancements to its model 2910 RF vector signal generator, which provides continuous tuning from 400 MHz to

2.5 GHz, software-defined radio architecture, synthesizer technology, and power-leveling circuitry. The 2910 V2.0 features additional wireless signal generation waveforms and a new power calibration table that improves measurement accuracy by compensating for RF power losses in test fixture cables. Two new modulation capability options are available; one allows users to create multiple permutations of all digital modulation signals, and the other provides a flexible solution for GPS testing that is ideal for production test environments. Another enhancement is arbitrary waveform generator memory expansion to 100 megasamples. *Keithley Instruments Inc, 28775 Aurora Road, Cleveland, OH 44139, http://www.keithley.com*

See www.pt.ims.ca/12313-139

Magnetic encoders for motors

Bodine Electric's Incodermotors are a new selection of permanent magnet and brushless DC motors and gearmotors that have encoders inside the motor housing. Encoders, which are used to measure speed and position, are common add-on components in motion control systems. Now it is possible to have a prewired and fully tested motor–encoder combination that is ready to drop into an OEM's product. The Incodermotors are protected from harsh environments, and the overall size of the encoder–motor combination is not increased. The 4.5- to 12-VDC magnetic encoders are available with one or two Hall effect sensor output signals in resolutions of 2, 4, 8, and 30 pulses per revolution. They work with digital tachometers and other electronic devices to measure speed, distance, and direction. *Bodine Electric Company, 2500 West Bradley Place, Chicago, IL 60618-4798, http://www.bodine-electric.com*

See www.pt.ims.ca/12313-140

Direct-drive rotary motion simulators

The ARMS series of direct-drive rotary motion simulators from Aerotech provides superior angular rates, accelerations, and positioning to test inertial components and systems such as MEMS, gyroscopes, avionics, and accelerometers. When coupled with the company's advanced controls, resolution can be as fine as 0.02 arcsecond, with accuracy from ±2.5 arcsecond and repeatability to ±0.5 arcsecond. The ARMS has rate resolution down to 0.002 deg-s and rate stability to 0.0001%. The simulators use the company's S-series brushless motor, whose slotless, ironless design eliminates cogging and thus produces no torque ripple. The motor and rotary encoder are directly coupled to a common shaft. Low inertia and zero backlash make the ARMS ideal for applications that require frequent directional changes. *Aerotech Inc, 101 Zeta Drive, Pittsburgh, PA 15238-2897, http://www.aerotech.com*

See www.pt.ims.ca/12313-141

New literature

The new VG Scienta catalog contains 490 pages of products and systems for UHV research. Among the many new items are electron spectrometers, cryostats, surface science and growth/deposition systems, and valves, viewports, and shutters. *VG Scienta Inc, 37A Pleasant Street, Unit 1, Newburyport, MA 01950, http://www.vgscienta.com* ■

See www.pt.ims.ca/12313-142