

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

Magnetic gradiometers

NVE Corp is offering the AB and ABH series of magnetic gradiometers that use arrays of giant magnetoresistance sensors to detect field gradients. Two pairs of unshielded GMR elements in a Wheatstone bridge provide directional sensing of small gradients in low and high magnetic fields. The gradiometers' low sensitivity to external sources of uniform fields, due to their ability to detect only magnetic gradients, enables them to successfully work in high magnetic noise environments such as near electric motors and current-carrying wires. The devices feature a DC to greater than 1-MHz frequency response and a wide linear range of operation: 10–175 G for the AB series, 5–40 G for the ABH sensors. The saturation field for the AB sensors is 250 G; for the extremely sensitive ABH series, 70 G. Because the GMR sensors are pure ratio-metric devices, they will operate at very low supply voltages. *NVE Corporation, 11409 Valley View Road, Eden Prairie, MN 55344, <http://www.nve.com>*

Motion control technology

Intelligent Motion Systems has developed the MDrive AccuStep 23; the motion control technology, when applied to step motors, prevents the loss of synchronization due to transient or continued overload, extreme acceleration or deceleration, or excessive slew speed. It accomplishes that by continually monitoring at submicrosecond intervals the relationship between the rotor and sta-

tor. The step-torque-speed versions have three operating modes: microstepping step and direction for point-to-point positioning, torque control to maintain constant motor torque, and speed control to deliver accurate velocity control. The motion control models combine AccuStep with a programmable motion controller, 1.8° brushless step motor, microstepping driver, and internal encoder. Products are available in four rotary motor lengths. *Intelligent Motion Systems Inc, 370 North Main Street, P. O. Box 457, Marlborough, CT 06447, <http://www.imshome.com>*

Hall mobility tester

Leighton Electronics has announced its LEI 1605 mobility tester for semiconductor and solar manufacturing processes. Through a contactless means, it manually measures electron mobility on various substrates and materials; by allowing users to make a measurement after each epitaxial layer deposition, the 1605 enhances their ability to monitor specific stages of process control. The tester replaces the destructive van der Pauw Hall and parallel-lepipiped or bridge-type methods used to achieve electron mobility, carrier density, carrier concentration, and sheet resistance measures. Such testing methods do not allow substrates to be recycled; the 1605 enables the repeated reuse of wafers and cuts down on waste. With optional upgrades, the



1605 will measure electron mobility in the range of about 300–20 000 cm²/vs and sheet resistance from about 100 Ω–3 kΩ/square; it also possesses mapping capability. *Leighton Electronics Inc, P. O. Box 328, Leighton, PA 18235-0328, <http://www.leighton.com>*

Hall effect current sensor

The ACS758 from Allegro MicroSystems is a thermally enhanced, Hall effect-based linear current sensor for AC and DC current measurement in the 50- to 200-A range. The device consists of a precision, low-offset Hall sensor circuit with a copper conduction path located near the Hall sensor die. The resistance of the copper conductor is 100 μΩ, which enables low power loss;

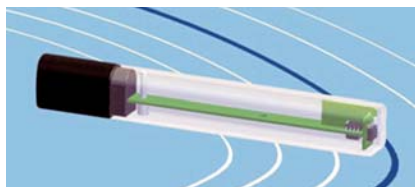
the conductor's thickness allows survival of the device at high overcurrent conditions. The terminals of the conduction path are electrically isolated from the sensor leads. An integrated shield reduces capacitive coupling from current to die due to high dV/dt signals and provides low output ripple and low offset drift in high-side, high-voltage applications. A low-offset, chopper-stabilized amplifier delivers a precise, proportional device output voltage with a 3- μ s output rise time in response to a step-input current. *Allegro MicroSystems Inc, 115 Northeast Cutoff, Worcester, MA 01606, <http://www.allegromicro.com>*

Microwave network analyzers

Agilent Technologies has introduced the PNA-X network analyzers with 13.5-, 43.5-, and 50-GHz models. The instruments' integrated measurements, versatile hardware, and reconfigurable measurement paths address the market's challenges to decrease test system costs and test complexity and increase throughput gains and accuracy. The PNA-X offers a single contact solution for on-wafer tests, which improves quality by eliminating multiple probe contacts. The 13.5-GHz model supports lower frequency devices used in wireless technology; the 43.5- and 50-GHz versions are ideal for higher frequency applications such as radar and satellite communications. The analyzers incorporate two internal pulse modulators and generators, signal-routing switches, and two high-performance signal sources that offer high power, low harmonics, and a wide power-sweep range. *Agilent Technologies Inc, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, <http://www.agilent.com>*

Low magnetic field Hall magnetometer

Metrolab's THM1176-LF is a three-axis Hall magnetometer capable of measuring fields in the range of ± 7 mT with a resolution of ± 2 μ T, a sensitivity that can be improved by averaging. The instrument can measure the fringe field of magnets in public areas, such as MRI scanners, train motors, and industrial magnets. The LF probe differs from that used in the company's original THM1176 magnetometer. Instead of



one integrated circuit, the LF consists of three sensor chips, one per axis, that are mounted in an active volume of $6 \times 3.4 \times 3$ mm. The new sensor contains a microscopic piece of soft iron that acts as a flux concentrator. Because the hysteresis curve of the concentrator affects the instrument accuracy, it was necessary to account for the resulting effects and correct for them. A fluxmeter, an AC field, and new software are used to calibrate the device. *Metrolab, distributed by GMW Associates Inc, 955 Industrial Road, San Carlos, CA 94070, <http://www.gmw.com>*

Hall effect switch

Melexis is offering the MLX90248 Hall effect switch, a device that uses enhanced CMOS technology to produce a noncontact magnetic switch with microwatt power consumption. The Hall effect-based technology offers an alternative to the use of reed switches in magnetic switching by providing bounce-free, contactless, solid-state devices. The new switch possesses increased protection against electrostatic discharge up to 8 kV and requires only a 1.5-V operating voltage. Suitable for existing 3-V operation, it can now address the growing number of 1.8-V applications while consuming less than 5 μ W power. The MLX90248 uses advanced techniques that allow the stable and repetitive detection of magnetic fields below about 60 G. Thus small and inexpensive magnets are sufficient to trigger the IC. The device features Omnipolar switching to ensure that the IC can detect both north and south magnetic poles. *Melexis USA, 41 Locke Road, Concord, NH 03301, <http://www.melexis.com>*

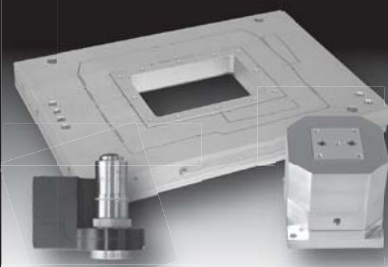
Power supplies for inductive loads

Kepeco has developed 200- and 400-W bipolar operational power supplies optimized for inductive loads. The modified BOP units are designed to operate stably in current or current-limit mode for loads up to 1 H. They are also stable with any R-L series load combination. With that option, the BOP is suitable for applications that include testing motors and magnetic components, driving

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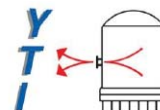
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CRT coils and cryogenic loads, and powering correcting magnets for medical imaging and particle accelerators. In current mode, the BOP bandwidth is modestly reduced when operating with a resistive load, and depending on the specific model, the rise and fall time of the supply is somewhat increased. Users can reduce the bandwidth in current mode by installing a component on the rear programming connector. All specifications of the BOP units in voltage mode are unchanged from the standard model. *Kepeco Inc, 131-38 Sanford Avenue, Flushing, NY 11355, <http://www.kepecopower.com>*

Finite-element simulation software

Tera Analysis has released the new service pack 1 for version 5.6 of the finite-element simulation software QuickField for electromagnetics, heat transfer, and stress analysis. The main changes are aimed at further improving the user interface and enhancing visualization of analysis results. Animated views and time plots of integrals are included for transient field distribution; users can view an animated process with phase/time increments. The QuickField postprocessor now displays the momentary, effective, and maximum values of time-harmonic parameters. Users can interrupt the analysis of transient problems to observe intermittent results. Analysis of time-dependent integral parameters is often required for transient problem simulation; the improved package will display any integral values as time plots and tables. *Tera Analysis Ltd, Knasterhovvej 21, DK-5700, Svendborg, Denmark, <http://www.quickfield.com>*

Parallel shaft gear motors

Bison Gear & Engineering Corp has added a new parallel shaft AC gearmotor to its expanding line of single-phase, Von Weise drop-in replacement gearmotors. The VWDIR104 AC models are available in 1/10 or 1/15 horsepower, 115/230 V, and 50/60-Hz permanent split capacitor electric motors. The integral gear reducers feature hardened steel helical and spur gearing with ratios ranging from 108:1 to 266:1. Corresponding output speeds are from 15 to 6 rpm with continuous torque ratings from 38.4 to 56.5 Nm. The motors are designed for commercial, industrial,



and agricultural applications such as in food service, office, medical, and conveying equipment. UL and CSA recognition are standard, and CE recognition can be provided for OEMs. The company's VWDIR line has expanded to 79 standard models of parallel shaft, right angle, and offset parallel shaft designs. *Bison Gear & Engineering Corp, 3850 Ohio Avenue, St. Charles, IL 60174, <http://www.bisongear.com>*

Linear Hall encoder

Austriamicrosystems claims its AS5311 is the first integrated linear Hall encoder to offer submicrometer resolution. The device is ideal for position feedback of microactuators and an alternative to incremental optical encoders in harsh environments. For linear motion sensing, a multipole magnetic strip is used; for rotary motion sensing, the magnetic strip is replaced by a multipole magnetic ring. The encoder has an incremental output with a resolution of 10 bits per pole pair and a traveling speed up to 650 mm/s. Used with a 2-mm pole pair strip, the AS5311 provides a 1.95- μ m resolution at its incremental output and a 488-nm resolution at its serial output. To allow early detection of mechanical systems failures, the encoder chip incorporates a diagnostic feature that constantly monitors the magnet placement above it. *austriamicrosystems USA Inc, 8601 Six Forks Road, Suite 400, Raleigh, NC 27615, <http://www.austriamicrosystems.com>*

New literature

AR RF/Microwave Instrumentation has published a third edition of its *Orange Book of Knowledge*. The resource tool represents the cumulative knowledge of all AR companies and includes new application notes such as a reference guide for coaxial connectors and cables. *AR RF/Microwave Instrumentation, 160 School House Road, Souderton, PA 18964-9990, <http://www.ar-worldwide.com>* ■