

# 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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Lawrence G. Rubin

## Focus on Sensors

### Capacitance-Sensing Chip

EtherTouch has developed the AD7103, a 40-pin ASIC (application-specific integrated circuit) that incorporates the company's  $e^-$  field-capacitance-sensing chip technology and is designed to sense presence or absence of motion and thus track the movement of any object or material at substantial distances. The configuration features three discrete channels with four selectable inputs. The 12 independent inputs are all at virtual ground. With 16-bit resolution, the chip provides measurement down to 4 attofarads per root Hz, and thus enables detection of very small movements and/or changes even in the presence of large background signals. In addition to its capacitive sensor, the AD7103 includes an oscillator, an A/D converter, and a serial interface. The device is adjustable in frequency, amplitude, phase, and gain. *EtherTouch*, 25 Commerce Drive, Cranford, NJ 07016, <http://www.ethertouch.com>  
Circle number 131 on Reader Service Card

### Fiberoptic Gyroscope Transceiver

Phasebridge has introduced the PB3030, a three-axis fiberoptic gyroscope (FOG) transceiver that transmits more than 1 mW of output power with greater than 20 dB of polarization extinction. The FOG transceiver provides more than 30 nm of optical spectrum and an operating temperature range between  $-40^\circ\text{C}$  and  $+85^\circ\text{C}$ . Ideal for the extreme temperature, shock, and vibration specifications required for aerospace and munitions guidance, the PB3030 will enable precision inertial guidance in applications where size and cost are important. The FOG transceiver advantageously competes with MEMS-based gyros or global positioning systems. The company offers FOG transceivers in single- and three-axis versions. *Phasebridge Inc*, 859 South

Raymond Avenue, Pasadena, CA 91105,  
<http://www.phasebridge.com>  
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### Platinum Resistance Thermometer

Hart Scientific has announced the model 5624, a 10-ohm secondary platinum resistance thermometer (PRT) that is designed to serve as a calibration standard for high-temperature resistance-temperature detectors and thermocouples. It offers an accuracy, including short-term stability and calibration uncertainty, of 55 mK over



the temperature range  $0^\circ\text{C}$ – $962^\circ\text{C}$ . After one year of use, the 5624 drifts less than 10 mK at  $0^\circ\text{C}$ . A uniquely small sensor construction creates low immersion requirements that allow the new PRT to be used as a reference standard in 6-inch dry-well calibrators and furnaces. The 5624 includes a NIST-traceable fixed-point calibration that is accredited by the NVLAP (National Voluntary Laboratory Accreditation Program). *Hart Scientific*, 799 East Utah Valley Drive, American Fork, UT 84003-9775, <http://www.hartscientific.com>

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### Magnetostrictive Position Sensor

The Temposonics C-series from MTS Systems is a linear-position sensor that incorporates the company's magnetostrictive sensor technology. The C-series sensor electronics use

### Magnetic field

### Three-Axis Testmeter



Measures  
Magnetic Field (B)

and the three components  $B_x$ ,  $B_y$  and  $B_z$ . Suitable for fringe field mapping and safety surveys. RS-232 interface.

Price: \$260 ea. USA list. Find out more at [www.gmw.com](http://www.gmw.com). Click on "Magnetic Field," then "THA17025."

[www.gmw.com](http://www.gmw.com)

**GMW**

955 Industrial Road, San Carlos, CA 94070  
650-302-3202 [sales@gmw.com](mailto:sales@gmw.com)

[www.pt.ims.ca/5989-31](http://www.pt.ims.ca/5989-31) or Circle #31

### Nanopositioning Systems



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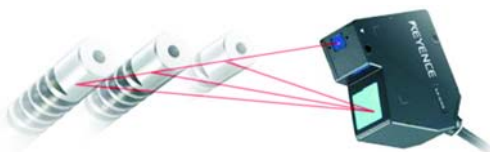
application-specific integrated circuits to perform the necessary signal sensing, control, and analysis. The resulting product fits inside a 36-mm-long by 23-mm-o.d. cylindrical package. The new sensor's modular architecture allows users to integrate the sensor into their specific product packaging. For example, although the C-series core sensor is normally powered by a standard 5-V power supply, the modular architecture can provide a second electronics board that configures the sensor to operate with 12- or 24-V power and also adds protection circuitry for EMI immunity. The C-series sensor has a 0–5 VDC or pulse-width-modulation output. *MTS Systems Corporation, 3001 Sheldon Drive, Cary, NC 27513, <http://www.mtssensors.com>*  
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## Capacitance-to-Digital Converter

Analog Devices has released the AD7745 family of chips for capacitance-to-digital conversion that combine advanced signal processing techniques with high levels of integration. The chips feature a 24-bit Sigma-Delta architecture that provides 20-attofarad resolution and a noise of 5 aF per root Hz, and they are tolerant of ground capacitance and ground leakage currents. The new chips include a temperature sensor, an integrated clock, a reference, and a multiplexer; no external components are required. The AD7745 and 7746 are two-electrode devices that provide an interface with dual-electrode capacitance sensors; the 7746 offers two capacitance channels; the AD7747 is a single-electrode chip. The chips operate at 2.7–5.25 V and 1 mA maximum current. *Analog Devices Inc, One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, <http://www.analog.com>*  
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## Laser Displacement Sensor

The Li-CCD (linearized CCD) from Keyence America offers noncontact laser distance measurement based on triangulation: The position of the re-



flected light on the Li-CCD moves as the position of the target changes. The target's displacement is measured by detecting this change. The new sensor includes the company's Ernststar lens for high accuracy and high stability, and uses an active balanced laser engine to control the laser emission time, laser power, and CCD amplification factor. Specifications include a sampling rate of 50 kHz, a linearity of  $\pm 0.03\%$  of full scale, and a resolution of  $4 \times 10^{-7}$  inch. The sensor's two-way optical system is available in a wide-spot type and in a small-spot type that is suitable for minute targets and profile measurements. *Keyence Corporation of America, 50 Tice Boulevard, Woodcliff Lake, NJ 07677, <http://www.keyence.com>*  
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## Hall-Effect Sensor

Allegro Microsystems has introduced the A3245, an omnipolar, chopper-stabilized, Hall-effect device suited for operation at 3.6–24 V. The omnipolar feature of the new digital switch allows for replacement of reed switches while eliminating the need for signal conditioning. In addition, magnet orientation is not required for simple position-sensing applications. The sensor can operate with either a north or south pole of sufficient strength turning the output on, and in the absence of a magnetic field, the output is off. The new chip includes a Hall-voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, voltage regulator, and short circuit-protected open-drain output. It is rated for operation over a temperature range of  $-40^\circ\text{C}$  to  $+150^\circ\text{C}$ . *Allegro Microsystems Inc, 115 Northeast Cutoff, Worcester, MA 01606, <http://www.allegromicro.com>*  
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## Gas Monitor

MKS Instruments has developed the Cirrus system for atmospheric-pressure on-line monitoring and analysis of gases and gas mixtures. It is ideal for use in fuel-cell gas-analysis applications including studies associated with the selection and optimization of catalysts used in fuel-cell construction. At the core of the Cirrus system is a quadrupole mass spectrometer that incorporates a closed ion source, a triple-mass filter, and a Faraday and secondary electron multiplier detector system. Use of the quadrupole analyzer enables moni-

toring of multiple gases at the same time over a dynamic range from ppb to percentage levels. A silica capillary inlet provides rapid response, while an inert chamber and automated bake-out and heating capability ensure low background contamination and prevent condensation during measurement. *MKS Instruments Inc, 90 Industrial Way, Wilmington, MA 01887-4610, <http://www.mksinst.com>*  
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## Gas Flow Calibrators

Sierra Instruments' Cal=Trak primary standard gas flow calibrators are characterized by the most basic of quantities: time and distance. The dimension-based primary accuracy is reportedly superior to pressure-based secondary methods and is backed by a rigorous uncertainty analysis. Both



models contain a nearly frictionless graphite piston that moves freely inside a borosilicate glass tube. The model SL-500 series offers an accuracy of  $\pm 0.35\%$  of mass-flow reading, while the SL-800 (the taller one in the photograph) produces  $\pm 0.15\%$ . Each model of the Cal=Trak allows three interchangeable flow cells to cover the range 5 sccm (standard cubic centimeters per minute) to 50 slpm (standard liters per minute). Flow readings are given in 1–15 s, depending on flow. *Sierra Instruments Inc, 5 Harris Court, Building L, Monterey, CA 93940, <http://www.sierrainstruments.com>*  
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## CCD Area Image Sensor

Hamamatsu has released the S9736 series of full frame transfer-CCD area

image sensors designed for low-light-level applications. The devices use a multipinned phase mode of operation to achieve a dark current of typically  $10\text{ e}^-/\text{pixels}$  per second at  $0^\circ\text{C}$  and a typical readout noise of  $4\text{ e}^-$  rms that enable a very low-light-level detection and long integration time; this results in a wide dynamic range of about 75 000. Covering a spectral response range of 400–1100 nm, the S9736 series sensors achieve a quantum efficiency of 39% at 660 nm. The new CCD area image sensors feature a  $512 \times 512$  pixel format with a pixel size of  $24\text{ }\mu\text{m} \times 24\text{ }\mu\text{m}$  and a 100% fill factor; they have an active area of  $12.288\text{ mm} \times 12.288\text{ mm}$ . The series is available in three different packages: 24-pin ceramic, 28-pin metal, or plate. All packages include a four-stage thermoelectric-cooled element. *Hamamatsu Corporation, 360 Foot-hill Road, P.O. Box 6910, Bridgewater, NJ 08007-0910, <http://www.hamamatsu.com>*

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## Surface Pressure Microphone

The Vibration Division of PCB Piezotronics has announced the addition of model 130A40, a quarter-inch pressure-type microphone, to its line of acoustic products. The distinguishing feature of this surface microphone is that it is only 6.9 mm in height. It can be laid flat on its 51-mm-o.d. rubber pad or mounted by adhesive for automotive, aeronautical, and general acoustic, sound pressure level testing. The 130A40 has a sensitivity rating of 45 mV/Pa and a 20-Hz to 15-kHz frequency range ( $-2/+5\text{ dB}$ ). The prepolarized design of the new microphone enables savings in power supplies and cables—for polarizing the transducer—and operates from the same power required for ICP accelerometers in the same test with the same signal conditioning. *PCB Piezotronics Inc, 3425 Walden Avenue, Depew, NY 14043-2495, <http://www.pcb.com>*

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## Wireless Data Logger for Education

Fourier Systems has introduced the TriLink wireless data logger, which incorporates Bluetooth technology. The data logger has a sampling resolution of 12 bits, a sampling rate up

to 20 800 samples/s, and up to 256 000 memory cells. The instrument enables simultaneous sampling of up to 8 sensors from a choice of more than 50 that cover almost the complete science curriculum throughout students' academic careers. TriLink comes with the company's curriculum packs, catering to middle and high schools across the physics, chemistry, and biology education programs. Wireless experimentation means that students are no longer tied to their PCs. Now, science laboratory computers can be positioned far away from "wet" experiments while still logging the data. *Fourier Systems Inc, 9635 Huntcliff Trace, Atlanta, GA 30350-2615, <http://www.fourier-sys.com>*

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## Light-Scattering Detector

Wyatt Technology has launched the DAWN HELEOS multiangle light-scattering detector for use in macromolecular characterization instrumentation. The new detector can incorporate both multiangle and quasi-elastic light scattering into a single unit. The DAWN HELEOS is said to be the only light-scattering detector available that can achieve a dynamic range of 126 dB, which enables the instrument to virtually never go off scale; that results in faster sample runs and a wider range of sample concentrations than before. The instrument also uses a 24-bit A/D measurement system with separate A/D converters for each detector channel. That feature provides the same high sensitivity over the entire range of scattering intensities and thus makes post-detector amplifiers unnecessary. *Wyatt Technology Corporation, 6300 Hollister Avenue, Santa Barbara, CA 93117-3253, <http://www.wyatt.com>*

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## Sampling Air Monitor

The UV Hound from Ocean Optics is a point-sampling air monitor that can simultaneously detect, quantify, and identify up to 20 toxic airborne compounds at concentrations as low as ppb. The UV Hound works by drawing in ambient air, passing it through an optical analysis chamber, analyzing it using a UV absorbance method, and then expelling it. The chamber incorporates the company's HR2000 high-resolution spectrometer that instantly resolves the fine spectral features of hazardous toxics. Microsoft Windows-based software allows for compound selection, continuous automated monitoring display, and data logging of targeted gas concentration. The system can be verified using optional gas calibration standards. *Ocean Optics Inc, 830 Douglas Avenue, Dunedin, FL 34698, <http://www.oceanoptics.com>*

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## On the Web

ControlSoft offers a free download of its expanded *PID Loop Tuning Tips Pocket Guide* that includes both open- and closed-loop tuning procedures. In addition to the original reference material on common controllers, the guide now has information on the Siemens S7 and Foxboro IA controllers. *ControlSoft Inc, 5387 Avion Park Drive, Highland Heights, OH 44143, <http://www.controlsoft.com>*

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## New Literature

The National Instruments 2005 catalog is a virtual instrumentation resource that provides views of technical documents, evaluation software, and example programs. It includes new product information, comparison charts, and key specifications. *National Instruments Corporation, 11500 North Mopac Expressway, Austin, TX 78759-3504, <http://www.ni.com>*

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Xenon Corp has published a new 26-page booklet, *Sterilization and Decontamination*, that describes pulsed UV treatments, said to be 100 000 times more intense than the Sun, to inactivate microorganisms at a DNA level, with universal lethality. *Xenon Corporation, 20 Commerce Way, Woburn, MA 01801, <http://www.xenoncorp.com>* ■

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