

new products

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Lawrence G. Rubin

Focus on Sensors

Digital pyrodetector

PerkinElmer has announced the DigiPyro, PYD 1998, a digital pyroelectric IR sensor for home and industrial motion-detection applications. The device combines a ceramic dual-element configuration with an integrated 14-bit A/D converter, an internal clock, and a control unit. The company's move from analog to digital technology has enabled the PYD 1998 to offer several advantages, including space savings from fewer components and significantly improved electromagnetic interference immunity. In addition, the power supply rejection ratio is increased by about 30 dB. The detector has a field of view of about 120°, typical responsivity of almost 4 kV/W, maximum noise of 50 μ V peak-to-peak, and automatic out-of-range correction. Its fast response time allows easy bandpass management. *PerkinElmer Optoelectronics Inc, 44370 Christy Street, Fremont, CA 94538-3180, <http://www.perkinelmer.com>*
See www.pt.ims.ca/7377-131

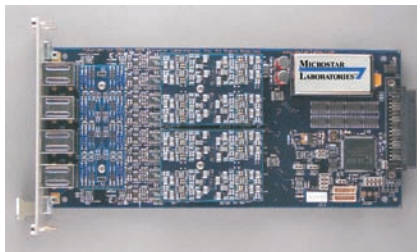
MEMS microphone

Akustica has introduced the AKU2000, a complementary metal-oxide-semiconductor MEMS single-chip microphone. The surface-mountable digital-output microphone integrates an acoustic transducer, analog-output amplifier, and fourth-order sigma-delta modulator. It provides a pulse-density-modulated single-bit digital output stream that is insensitive to RF and electromagnetic interference. This allows the AKU2000 to be placed in the optimal acoustic location in the device without regard for shielded cabling or complex signal routing. The new chip is ideal for

use in microphone-array applications in which multiple microphones will be used together to perform noise cancellation or beam forming. Suitable for portable applications, the AKU2000 supports an input clock frequency of 1–4 MHz and operates from 2.8 to 3.6 V at less than 750 μ A. *Akustica Inc, 2835 East Carson Street, Suite 301, Pittsburgh, PA 15203, <http://www.akustica.com>*
See www.pt.ims.ca/7377-132

Signal-conditioning boards

Two new expansion boards, MSXB 066 and MSXB 067, from Microstar Laboratories offer analog signal conditioning for strain gauges, load cells, resistance temperature detectors, and other resistive sensors. The boards provide a flexible interface for quarter-bridge, half-bridge, and full-bridge sensors and support eight sensors per board,



force/sense feedback, and sense voltage measurement. Each board has eight differential inputs, simultaneous sampling, selectable gains, and selectable differential voltage excitation. The MSXB 067 includes a fourth-order antialias filter for each channel, with a choice of cutoff frequencies. Applications that require accurate interchannel phase measurements can benefit from the capability of the new boards to eliminate the phase error that sequential sampling introduces. *Microstar Laboratories Inc, 2265 116th Avenue NE, Bellevue, WA 98004, <http://www.mstarlabs.com>*
See www.pt.ims.ca/7377-133

IR temperature sensor

Exergen Corp has combined its microIRt/c IR noncontact temperature sensor with the SmartIRt/c microprocessor platform to enable precision in small places without problems from leakage current or cold-junction compensation. The Smart processor continuously monitors and adjusts the complete measuring system. While performing the complex algorithms that determine the output, it also calibrates itself every second, elimi-

nating drift or sudden changes. It is programmed to automatically shift expected emissivity by 3% for every 100 °C increase in target temperature, and thus improve accuracy. The new Smart-microIRt/c has four sensor heads to choose from, with different fields of view. Four temperature ranges are available: 0–500 °C, 0–250 °C, 0–100 °C, and –30 to 70 °C. *Exergen Corporation, Industrial Division, 400 Pleasant Street, Watertown, MA 02472, <http://www.exergen.com>*
See www.pt.ims.ca/7377-134

Wireless sensor system

Moteiv Corp's Tmote Invent is a wireless sensor system designed for industrial applications such as building monitoring and security control. The package's hardware component includes the company's FCC-certified Tmote Sky sensing module for communication and computation, with an integrated suite of sensors for light, temperature, vibration (two-axis accelerometer), and sound (microphone). It also has a rechargeable battery that charges through any standard USB port, a speaker for auditory feedback, a headphone jack for discrete applications, and LEDs for visual feedback. The system's software component is Moteiv's Boomerang open-source TinyOS operating system that features reliable mesh networking and extensive sensing libraries and can operate with any existing TinyOS installation. *Moteiv Corporation, 55 Hawthorne Street, Suite 550, San Francisco, CA 94105, <http://www.moteiv.com>*
See www.pt.ims.ca/7377-135

Flat-panel x-ray sensor

Hamamatsu Corp has developed the C10013SK, a new flat-panel x-ray sensor that offers superior image quality for nondestructive inspection of microelectronic components and other applications and is compatible with energy ranges from 20 to 150 kVp. The



C100135K features an active pixel sensor with an area of $52.8 \text{ mm} \times 52.8 \text{ mm}$, with each pixel measuring $50 \text{ } \mu\text{m} \times 50 \text{ } \mu\text{m}$. The sensor captures 1-megapixel images at a resolution of eight line pairs per mm and exhibits a readout noise of 80 electrons, said to be a significantly lower level than that of most digital x-ray sensors. The device consists of a sensor board and a control board. Each pixel has a low-noise amplifier; the video signal is sent to the output through a correlated double sampling circuit. The control board converts the analog video signal into a 12-bit digital signal. *Hamamatsu Corporation, 360 Foothill Road, P.O. Box 6910, Bridgewater, NJ 08807-0910, <http://www.hamamatsu.com>*

See www.pt.ims.ca/7377-136

Digital signal conditioner

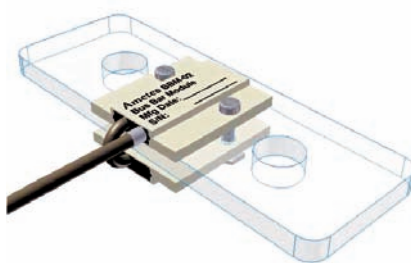
Electro Standards Laboratories has announced the model 4336 CellMite Quad AC/DC four-channel digital signal conditioner with 24-bit internal resolution. It connects directly to two AC LVDT (linear variable-differential transformer) transducers and two DC strain-gauge force transducers and provides digital data input into the serial port of a standard PC and 16-bit analog outputs. The 4336 generates precision AC sine wave excitation voltages to power the LVDTs and DC excitation voltages to power the strain-gauge force bridges. The unit independently compensates each channel's transducer nonlinearities using its integrated six-point calibration capability. Optional CellView multi-unit graphical user interface software is available. *Electro Standards Laboratories Inc, 36 Western Industrial Drive,*

Cranston, RI 02921-3403, <http://www.electrostandards.com>

See www.pt.ims.ca/7377-137

Module for current sensing

The Ametes Bus Bar Module (BBM) from GMW Associates is an ohmically isolated current sensor for DC and low-frequency currents in bus bars; it offers measurement from about 100 to 5000 A. The BBM uses two high-sensitivity Hall-effect integrated circuits to sense the magnetic field symmetrically on opposite sides of the bus bar. This enables effective cancellation of external magnetic fields without magnetic cores or



shielding, which can give rise to magnetic hysteresis and nonlinearity effects. Offset and sensitivity are factory calibrated to a fixed magnetic sensitivity. The key features of the BBM include voltage isolation, small size, and immediate recovery from high overload currents without damage. Three versions of the BBM are configured to accommodate various widths and thicknesses of bus bars. *GMW Associates, 955 Industrial Road, San Carlos, CA 94070, <http://www.gmw.com>*

See www.pt.ims.ca/7377-138

Accelerometer calibration systems

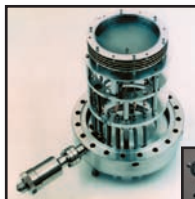
Kistler Instrument has introduced two accelerometer calibration systems. The model 8804 laboratory vibration-calibration system is used as a working standard for back-to-back calibration of accelerometers. The model 8002 is chiefly used as a primary laboratory standard to maintain NIST traceability of a working calibration standard such as the 8804. Both systems incorporate the company's 5022 frequency-compensated charge amplifier; they exhibit high stability and repeatability from 10 Hz to 10 kHz over a wide amplitude range. They are calibrated for a sensitivity of 10 mV/g (g = standard acceleration of gravity) that is adjustable to a tolerance of $\pm 0.1\%$. The system bandwidth is also adjustable to partially correct the resonant peak of the accelerometer and thus secure more usable bandwidth. *Kistler Instrument Corp, 75 John Glenn Drive, Amherst, NY 14228-2171, <http://www.kistler.com>*

See www.pt.ims.ca/7377-139

FBG sensor arrays

QPS Photonics is offering large sensor arrays that incorporate fiber Bragg grating (FBG) technology. Each array can have up to 100 FBGs, with a total length of fiber stretching up to a distance of 20 km. Through a front-end switch matrix, 16 of the fiber arrays can be connected to form a star network with a total of 1600 sensors. The networks can be interrogated using time division

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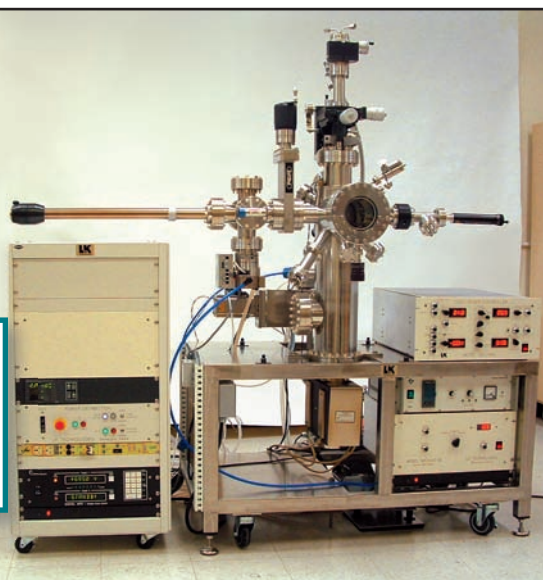


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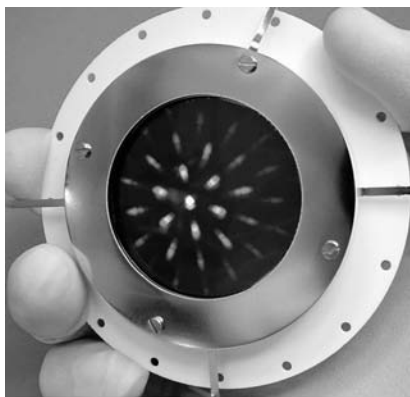
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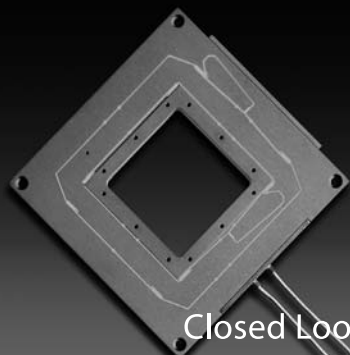


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multiplexing (TDM), a mechanism well suited for ultralarge sensor network architecture. The FBG sensor array can also serve medium-size wavelength division multiplexer networks. The company is developing array-packaging technologies that should lead to attachable strain sensors, temperature and relative humidity sensors, and sensors for bending and distortion measurements. *QPS Photonics Inc, 217 St. Louis Avenue, Pointe Claire, Quebec, Canada H9R 5L7, <http://www.qpscom.com>*
See www.pt.ims.ca/7377-140

Flow meters

Hedland Flow Meters' new HTTP series portable ultrasonic transit-time flow meters clamp onto the outside of a pipe—pipe sizes can be accommodated from 1/2 in. and higher—and do not contact the internal liquid. The meter provides instantaneous rate and accumulated flows for efficient fluid measurement. The HTTP includes bidirectional flow capability to measure forward total, reverse total, and net total. The user communicates with the flow meter via a PC serial communications port and IR serial adapter, for the convenience of no interconnection wires; a 4- to 20-mA analog output is also offered. The company's UltraLink Microsoft Windows software is included for configuration, calibration, and troubleshooting. *Hedland Flow Meters, Division of Racine Federated Inc, 8635 Washington Avenue, Racine, WI 53406, <http://www.hedland.com>*

See www.pt.ims.ca/7377-141

Deformable mirror

Boston Micromachines Corp has introduced the Mini-DM, a high-resolution, MEMS deformable mirror that is ideal for adaptive optics. It is used to improve resolution in microscopes, telescopes, and ophthalmic instruments. The MEMS mirror is an advanced wavefront control device that consists of a mirror membrane supported by an underlying actuator array. Each actuator can be individually deflected electrostatically to produce the desired pattern of deformation without hysteresis. The active mirror area of the Mini-DM is deformed by 32 actuators and can reach frame rates of up to 1000 Hz. The mirror is available in segmented- or continuous-deformable versions and with an actuator stroke of 1.5, 2.5, or 3.5 μm . *Boston Micromachines Corporation, 108 Water Street, Suite 2L, Watertown, MA 02472, <http://www.bostonmicromachines.com>*
See www.pt.ims.ca/7377-142

Electropneumatic transducer

The 211 series electropneumatic transducers from Omega Engineering decrease a supply pressure, converting it to regulated output pressure in direct proportion to an electrical signal. The transducer accepts a wide range of supply pressures, from 0.2 bar (3 psig) above the maximum output to 6.9 bar (100 psig). An integral pneumatic volume booster provides high flow capacity—up to 12 scfm. Factory calibrated for direct-acting operation, the 211 series transducers are field reversible. If used in reverse acting mode, they require recalibration after the polarity of the signal leads is reversed. The IP211 units are current controlled (4–20 mA); the EP211 units are voltage controlled (1–5 VDC). All models can be pipe, panel, or bracket mounted. *Omega Engineering Inc, One Omega Drive, P.O. Box 4047, Stamford, CT 06907-0047, <http://www.omega.com>*

See www.pt.ims.ca/7377-143

Testing of laser systems

CeTaQ Americas has developed machine capability analysis (MCA) testing for lasers in medical and biomedical device manufacturing. In the testing, the system measures the width of a laser cut and the beam size and consistency, then compares the actual result with the programmed pattern and process settings. The test method is applicable to all types of lasers including UV, both excimer and diode-pumped solid-state. In laser processing, the laser head is typically stationary and the product is moved under the beam via high-precision air-bearing stages. MCA testing verifies the x-y accuracy of those stages and of the motion-control system, which is critical to such processing. The evaluation methodology incorporates special vision algorithms and highly accurate glass plates and components. *CeTaQ Americas, 27 Executive Drive, Hudson, NH 03051, <http://www.cetaq-americas.com>*

See www.pt.ims.ca/7377-144

Correction

May 2006, page 65—The Triad Systems Engineering ILS-7000 series of fiber-coupled laser diode systems from RPMC Lasers features optical output powers ranging from 1 W up to 100 W, with 20 W from a 100- μm -core fiber at 915 nm and 975 nm.