

Focus on sensors and detectors **FREE**

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Focus on sensors and detectors

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Andreas Mandelis

Multifunction laser sensors

Ophir Photonics, a Newport Corporation brand, has expanded its BeamTrack family by adding the 1000W-BB-34-Quad laser sensor. BeamTrack is a series of compact, multifunction thermal detectors that measure laser power, energy, beam position, and in some models beam size, in one device. The 1000W-BB-34-Quad measures laser power from 15 W to 1000 W and energy from 300 mJ to 300 J. Accurate to 0.5 mm, it can log beam position to record beam wander. BeamTrack sensors work as follows: The signal coming from the sensor is divided into four quadrants. By measuring and comparing the output from the four sections, users can determine the position of the center of the beam to a high degree of accuracy. After processing outputs from the various detectors, the user is presented with the beam position and size. *Ophir-Spiricon LLC, 3050 North 300 West, North Logan, UT 84341, <http://www.ophiropt.com>*



Wideband FTIR spectrometer

Bruker has introduced a Fourier transform infrared (FTIR) spectrometer that covers the complete mid- and far-IR/THz spectral ranges. To achieve that, the new wide-range MIR-FIR DLaTGS detector has been combined with the wide-range MIR-FIR beamsplitter recently offered for the company's Vertex 70 series of research FTIR spectrometers. The combination provides data collection from 6000 cm^{-1} to 30 cm^{-1} in one step for transmittance, reflectance, and attenuated total reflectance measurements with no need to change the beamsplitter or detector. The extension of the mid- to the far-IR spectral range

below 400 cm^{-1} is of interest for molecular vibrational analysis in inorganic and organometallic chemistry and for geological, pharmaceutical, and physics applications. *Bruker Daltonics Inc, 40 Manning Road, Manning Park, Billerica, MA 01821, <http://www.bruker.com>*

Multisensor module

According to Data Translation, its new data acquisition module DT9829 can measure many types of sensors. These include the following: thermocouples, resistance temperature detectors, and thermistors for temperature; bridge-based and strain gauge sensors for strain and load cell data, such as torque and pressure; and voltage, current, and resistive sensors for electrical parameters. A sensor simply has to be connected at an input; all selections, including any necessary for excitation, cold junction compensation, or bridge completion, are included and supported by Quick-DAQ. No other circuitry or external components are needed. Software also includes comprehensive drivers and interface tools for LabVIEW and MATLAB programmers. The eight-channel module samples at 960 Hz and uses a 24-bit sigma-delta analog-to-digital converter to eliminate aliasing. It has four isolated digital inputs and four open-collector digital outputs for notifications or control. *Data Translation Inc, 100 Locke Drive, Marlboro, MA 01752-1192, <http://www.datatranslation.com>*

Sensor for low liquid flow rates

Sensirion has designed its LS32-1500 sensor for liquid flow rates of 0–40 ml/min. A fast response time of 30 ms, good repeatability, and chemical resistance make the sensor suitable for diagnostic analyzers and other applications. Measuring a compact $18 \times 18 \times 59\text{ mm}$, the instrument can also be used in fuel cells and applications in dosage control and industrial automation monitoring. The sensor is noninvasive; the MEMS chip is located on the outer wall of a capillary and measures through the channel wall.

The wetted materials are composed of high-performance stainless steel, polytetrafluoroethylene, and polyether ether ketone to ensure biocompatibility and chemical resistance. *Sensirion AG, Laubisruetistrasse 50, 8712 Staefa, Switzerland, <http://www.sensirion.com>*

CCD cameras

Andor Technology has launched its iKon-M SY and Newton SY series of CCD cameras. The standalone, light-tight detectors offer $-100\text{ }^\circ\text{C}$ deep cooling optimized for the soft x-ray region. They are suitable for soft x-ray imaging, x-ray fluorescence, and high-energy applications that require direct detection of low-flux soft x rays between 2.5 and 20 keV with high spatial resolution and rapid readout for the iKon-M (5 MHz) and Newton platforms (2 MHz). The beryllium window, only 200 μm thick, yields an 8% increase in transmission at 3 keV over industry-standard 250- μm windows. It blocks all unwanted lower energies and visible wavelengths with minimal beam hardening. The detectors use Andor's software development kit and are fully integrated and supported in a range of third-party software that includes MATLAB, LABView, and EPICs. They can also be operated with Andor's software interface, SOLIS. *Andor Technology USA, 425 Sullivan Avenue, Suite 3, South Windsor, CT 06074, <http://www.andor.com>*

Laser power sensors

Coherent has developed a high-speed, thin-film sensor technology for laser power measurement. New PowerMax-Pro sensors have a transverse thermal flow design that enables fast, high-power measurement with high damage resistance. Users can trace the pulse shape of modulated lasers at pulse repetition frequencies up to 25 kHz.



The detectors can operate over a spectral range from 300 nm to 11 μm and incorporate a $30 \times 30\text{ mm}$ active area. In traditional thermopile detectors, heat is generated in the absorbing coating when it is struck by the laser. The heat must then move a centimeter or more through the thick aluminum or copper substrate out to the edges where the thermocouple array is located. The heat flow takes time, so thermopiles take several seconds to stabilize after the laser is turned on. In the new design, heat flows vertically through a film

that is only microns thick, so the measurement response time is below 10 μs . *Coherent Inc, 5100 Patrick Henry Drive, Santa Clara, CA 95054, <http://www.coherent.com>*

Pressure, conductivity, and temperature sensor

The TruPCT multisensor from Finesse Solutions measures process pressure, conductivity, and temperature. The in-line device consists of a disposable sensor and two smart transmitters with blades. All of its wetted materials are USP class VI compliant. The TruPCT enables three measurements in a single process insertion point, reducing the flow path connections from six to two. The pressure sensor uses a similar measuring approach to the company's upstream TruTorr headspace pressure sensor. A Pt 100 resistance detector provides an accurate temperature measurement that can be used as a process variable. The conductivity sensor uses a solid-state measurement chip. To maximize accuracy, all three measurement loops are enabled for a one-point calibration. *Finesse Solutions*

Inc, 3501 Leonard Court, Santa Clara, CA 95054, <http://www.finesse.com>

CMOS image sensor

Gpixel's GMAX3005 monochrome CMOS image sensor offers a 150-MP active pixel resolution. It can run at 10 frames per second at full frame, with higher rates achieved in row-windowing mode. The sensor's chip size is 167.6 \times 30.1 mm, including a photon-sensitive area that is 165 \times 27.5 mm. It has a 16-bit on-chip analog-to-digital converter with a 12-bit effective number of bits, and 120 low-voltage differential signaling output pairs running at 200 Mbps. The sensor consumes less than 2.5 W at full frame rate in full resolution. It sits in an ultraflat 395-pin ceramic pin grid array (CPGA) package with efficient heat dissipation. Suitable for applications that require high sensitivity, the GMAX3005 reaches a noise level of less than 4 e^- , a dynamic range of 75.4 dB, and over 70% quantum efficiency for 550-nm detection. It has a dark current as low as 10 e^- /s/pixel at 32 $^{\circ}\text{C}$, which makes long exposure possible even without active cooling. *Gpixel Inc, No. 588 Yingkou Road, Economical*

and Technological Development Zone, 130033, Changchun, China, <http://www.gpixelinc.com>

Capacitive displacement sensor

Model CPL490, a new capacitive displacement sensor in Lion Precision's Elite series modular product line, measures position or displacement with 50-pm precision or less. Relative to the noncontact sensor's measurement range, that translates to a resolution value of less than 7 ppm even at 15-kHz bandwidth. Previous models were capable of similar precision but only when high-frequency components were filtered out of the measurement signal. The CPL490 can resolve target position changes of less than 100 pm while objects are moving at 15 kHz. When bandwidth is increased to 50 kHz, a very high frequency for capacitive sensors, the precision is still less than 0.3 nm. The CPL490 has thermal stability of 0.02% of full scale/ $^{\circ}\text{C}$. *Lion Precision, 563 Shoreview Park Road, St. Paul, MN 55126, <http://www.lionprecision.com>*



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- Option for Control Unit and National Instruments PXI system
- 1 metre diameter coil available from September 2014



Mag-13 Three-Axis Magnetic Field Sensors

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- Measuring ranges from 60 μ T to 1mT
- Bandwidth up to 3kHz
- Mag-14: bandwidth to 12kHz



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- Resolution of 2x10⁻⁶ SI
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Multispectral photodiode array

Pixelteq has released its PixelSensor eight-band multispectral photodiode array with eight wavelength-selective photodiodes in a 9-mm² sensor. The compact device enables multispectral sensing at a small scale by integrating spectral filters at the sensor level, which simplifies optical designs and reduces device integration costs. The PixelSensor photodiode splits the visible spectrum into eight discrete color bands. Its standard 20-pin leadless chip carrier package can be surface- or socket-mounted. Common cathode operation provides low noise and fast response time. Using Pixelteq's micro-patterned optical filter technology, narrowband filters deliver improved sensitivity and contrast for multispectral applications from portable color monitors to industrial and scientific instruments. *Pixelteq, 8060 Bryan Dairy Road, Largo, FL 33777, <http://www.pixelteq.com>*

Continuous position sensor

Opto Diode's ODD-SXUV-DLPSD is a duo-lateral UV/extreme-UV (EUV) submicron-position resolution sensor

that provides a highly stable response after exposure to UV and/or EUV radiation. It is available in a TO-8 windowless package to minimize changes in the diode's responsivity after exposure to intense UV/EUV photons. With a 5- by 5-mm active area, the sensor is suitable for applications in advanced lithography and other positioning applications that require the use of a wavelength of less than 200 nm. The continuous position-sensing photodiode is designed for position detection of light of wavelengths from 1 to 400 nm. Its responsivity at 13 nm is typically 0.20 A/W; at 254 nm, 0.02 A/W. Dark current is 10 nA (typical) and 50 nA (maximum) under operating conditions. The sensor features reverse breakdown voltage of a minimum of 50 V and a capacitance of 40 pF (typical) to 60 pF (maximum). *Opto Diode Corporation, 750 Mitchell Road, Newbury Park, CA 91320, <http://www.optodiode.com>*

new literature

Magnetic measurement equipment catalog

The new *Magnetic Measurement and Control Catalog* includes Lake Shore's complete line of benchtop and handheld Hall effect gaussmeters; axial, transverse, tangential, and multi-axis Hall probes; fluxmeters; Helmholtz and search coils; electromagnets; and electromagnet power supplies. The catalog is organized to help users easily find a Hall probe for their specific application and selected gaussmeter. It includes reference tables listing the types of probes most commonly used in test and measurement applications and tables showing differences among more specialized types of probes. The catalog explains how Hall probe technology can be used to accurately measure magnetic fields in assembly and quality control applications, particularly by manufacturers who produce magnets, magnetic assemblies, and accessories that must hold to tight tolerances. It is available for download from the company's website. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082-8888, <http://www.lakeshore.com>*

