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new products

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Andreas Mandelis

Focus on bioinstrumentation and biotechnologies

Miniature fiber-coupled spectrometer

B&W Tek's new thermoelectric cooled, miniature, fiber-coupled spectrometer, the Glacier X, is equipped with a 2048-element linear CCD array, a built-in 16-bit digitizer, and a high-speed USB 2.0 interface. Compared with noncooled CCD spectrometers, the Glacier X offers higher dynamic range, significantly reduced dark counts, and superior baseline stability, making it suitable for low-light-level detection and long-term monitoring applications. Wavelength configurations are available from 200 to 1050 nm with resolutions between 0.6 and 4.0 nm. Flexible custom configurations and application support using a combination of cooling and regulation are also available for OEM customers. The thermoelectric cooling allows for weak signals such as fluorescence and Raman to be integrated over time to produce an excellent signal-to-noise ratio. B&W Tek Inc, 19 Shea Way, Newark, DE 19713, <http://www.bwtek.com>

Lasers at three new wavelengths

Coherent has expanded its Cube family of continuous-wave visible diode laser modules with three new wavelengths: 488 nm, with 50 mW of power; 685 nm, with 40 mW of power; and 730 nm, with 30 mW of power. The compact Cube laser heads measure $3.9 \times 1.6 \times 1.6$ in³. The new models deliver true circular output, excellent M² (~ 1.2), and low beam divergence. The Cube's fast—up to 150 MHz—direct modulation capa-

bility often eliminates the need for an external modulator. The Cube 488 can replace ion lasers and higher-cost solid-state lasers in fluorescence-based life sciences applications. Intended for use in confocal microscopy and flow cytometry applications, the 730-nm wavelength enables efficient excitation of new, long-wavelength fluorophores. The long-wavelength 685-nm and 730-nm models minimize crosstalk with ambient lighting and are suitable for machine vision applications. Coherent Inc, 5100 Patrick Henry Drive, Santa Clara, CA 95054, <http://www.coherent.com>

Multilaser engine

Toptica Photonics has introduced the iChrome MLE, a multicolor, multilaser engine for demanding biophotonics applications. Up to four different lasers covering wavelengths from 405 to 660 nm can be selected. Users can choose from several single-mode fiber delivery wavelengths: 405 nm, with 50 mW of power; 445 nm, with 25 mW of power; 488 nm, with 30 mW of power; 532 nm, with 30 mW of power; 561 nm, with 30 mW of power; and 640 nm, with 50 mW of power. Two systems are available: the iChrome MLE-S ($201 \times 250 \times 110$ mm³), an all-diode system with up to four diode lasers, and the iChrome MLE-L ($295 \times 250 \times 110$ mm³), which includes up to three diode lasers and a diode-pumped solid-state laser. The individual lasers are efficiently combined in a single box to yield high power levels delivered as a free beam or through coupling to a polarization-maintaining fiber. Toptica's constant optical output level technology automatically aligns the multilaser system with the push of a button, eliminating the need for manual readjustments. Toptica Photonics Inc, 1286 Blossom Drive, Victor, NY 14564, <http://www.toptica.com>

Piezomechanisms catalog

Physik Instrumente, a manufacturer of piezoceramic actuators and precision motion-control equipment for semiconductor, biomedical, and nanotechnology applications, has released a new 400-page catalog, *Piezo Mechanisms*. It presents the company's complete spectrum of piezomechanic components and motion systems, from simple, direct actuators to long-



travel ceramic linear motors and complex multi-axis, flexure-guided nanopositioning stages. The catalog includes the latest digital control electronics and a tutorial on piezodesign for positioning applications. It can be downloaded at http://www.piezo.ws/pdf/Piezo_Mechanism_Cat10.pdf. *Physik Instrumente LP, 16 Albert Street, Auburn, MA 01501, <http://www.physikinstrumente.com>*

OEM laser systems

Modulight has launched a set of single-emitter-based OEM laser systems for medical and industrial applications. The subsystems produce up to 1.5 W of optical power and cover most of the conventional wavelengths between 635 and 1550 nm. The standard configuration is based on the Modulight Butterfly module lineup options and includes an integrated laser driver, a controller, a cooling mechanism, and an external modulation interface. Among the customizable options are wavelength, power, and output specifications; control interface; form factor; and various operating parameters. The following wavelengths and maximum powers are currently offered with standard configurations: 635 nm, 500 mW; 650/665 nm, 750 mW; 808 nm, 1.5 W; 940/980 nm, 1.5 W; and 1470/1550 nm, 500 mW. The OEM systems have been designed to simplify both mechanical and electrical integration. *Modulight USA Inc, 2033 Gateway Place, Suite 500, San Jose, CA 95110, <http://www.modulight.com>*

LED fiber-optic illuminator

PerkinElmer has made available an environmentally friendly LED fiber-optic illuminator module for integration by OEMs into endoscopy, surgical microscopy, and headlight applications. The OTFI-0250 offers bright, highly uniform illumination for surgical environments, allowing images to be seen more clearly and leading to earlier and better detection and diagnosis. The solid-state LED module produces virtually no UV or IR emissions. The company states that its integrated state-of-the-art thermal management contributes to high-intensity light output and long life, and it will last up to 50 times longer than conventional high-intensity-discharge lamps. The OTFI-0250 also has precision optics and electromagnetic interference shielding. *PerkinElmer Inc, 940 Winter Street, Waltham, MA 02451, <http://www.perkinelmer.com>*

Software for flame photometers

Sherwood Scientific's models 420 and 425 flame photometers now come with 420 BlueNotes software, which enables the instruments to perform sample analyses outside the linear response range and facilitates measurement of all elements simultaneously. According to the company, the 420 BlueNotes package it supplies free of charge with all newly built 420 and 425 instruments greatly increases the utility of the dual-channel flame photometers. The linear response of the standalone devices extends to multipoint calibration and enables analysis of a much wider range of sample concentrations. Another major change is that all elements—sodium, potassium, and lithium for both models and calcium for model 425—can be measured at the same time rather than only two at once. If required, the operator will be able to measure all elements simultaneously via the host computer's onscreen, real-time display. The software allows the operator to choose K or Li as an internal standard reference element. *Sherwood Scientific Ltd, 1 The Paddocks, Cherry Hinton Road, Cambridge, CB1 8DH, UK, <http://www.sherwood-scientific.com>*

Scientific CMOS camera

According to Andor Technology, its Neo scientific CMOS camera offers ultralow noise, fast frame rates, wide dynamic range, high resolution, and a large field of view, overcoming the performance tradeoffs associated with traditional scientific CCD detectors. Neo achieves $1 e^-$ read noise while reading out 5.5 Mpixels at 30 frames/s. While maintaining $1.4 e^-$ noise, the camera can be pushed to 100 full frames/s and even faster with regions of interest. Neo's dual amplifier architecture achieves a wide dynamic range of 30 000:1 with 16-bit digitization available at all frame rates and a relatively small 6.5-mm pixel size suitable for fluorescence microscopy techniques. Neo has advanced field-programmable gate array intelligence for improved image quality and quantitative stability and a 4-GB on-head image memory to facilitate faster frame-rate performance. *Andor Technology plc, 425 Sullivan Avenue, Suite 3, South Windsor, CT 06074, <http://www.andor.com>*

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Nonmagnetic RF components

Florida RF Labs has expanded its HybriX signal distribution line with non-magnetic hybrid couplers for the MRI biomedical industry. The devices, provided in a small-sized, surface-mount package for dense coil designs, are available for standard MRI applications at 1.5 T, 3 T, and 7 T. The company claims they offer excellent repeatability, reduced size over lumped element versions, and improved system reliability and do not require costly tuning. They can provide an amplitude balance of less than ± 0.1 dB for consistent performance and are available for both transmit and receive circuits. The transmit-style couplers offer options for quick select on test tuning, while the receive-style ones have significant size reduction. Nonmagnetic crossovers also eliminate the need for RF coaxial cables and multilayer boards in MRI systems, reducing complexity and cost while improving reliability. *EMC Technology and Florida RF Labs, 8851 Southwest Old Kansas Avenue, Stuart, FL 34997, <http://www.emc-rflabs.com>*

Microscopic-feature colorimeter

The new 308 PV microscope colorimeter from Craic Technologies is a spectrophotometer that can nondestructively analyze the color of many types of microscopic samples. A microcolorimetry tool for any laboratory or manufacturing facility, it can measure



the color of microscopic sample areas by transmission and incident illumination and determine the color from fluorescence and other types of emissions. The 308 PV system integrates Craic's Lightblades spectrophotometer, which is specifically for microscale analysis, with optical interface hardware and software claimed to be powerful yet easy-to-use. According to the company, the new instrument achieves higher levels of sensitivity and stability and high resolution imaging through permanently calibrated variable apertures, thereby allowing the rapid acquisition of high-quality spectra from microscopic samples. *Craic Technologies Inc, 948 North Amelia Avenue, San Dimas, CA 91773, <http://www.microspectra.com>*

Three-dimensional bioreactor

The InBreath Whole Organ bioreactor from Harvard Apparatus is a rotating 3D device designed for cell seeding and culturing on both surfaces of a tubular matrix. The 3D reactor system is suitable for the esophagus, trachea, intestines, blood vessels, and virtually any hollow organ. An autoclavable polymer-based culture chamber houses the scaffold and culture medium for the duration of the organ-generation procedure. An organ scaffold is mounted to the corresponding scaffold holder of the appropriate diameter. Each holder features a reduced diameter central portion that exposes the luminal surface of the matrix for cell seeding and



culturing. The cell and scaffold construct is rotated on the holder by a brushless, 0- to 5-rpm adjustable DC motor that is completely separated from the culture compartment. An external control unit regulates and monitors rotation. *Harvard Apparatus, 84 October Hill Road, Holliston, MA 01746, <http://www.harvardapparatus.com>*

Chilling and heating incubators

Torrey Pines Scientific has made available a new range of programmable chilling and heating benchtop incubators with temperature ramping for use in biotechnology, biochemistry, general chemistry, and other laboratories. Typical applications include protein crystal growth, enzyme reactions and deactivations, and DNA libraries. The Echotherm models IN35 and IN45 are Peltier-based units with no compressors or chlorofluorocarbons. Their volumes are 27.5 and 55 liters, respectively, and their temperature range is from 4.0° to 70.0° C with control to 0.1° C, even at room temperature. The fully programmable controls can store three routines in memory; each routine is capable of 10 steps. Units have an RS232 interface for data collection and a 99-day timer readable to 1 s. They are available in 100, 115, and 230 V_{ac} and in 50- and 60-Hz

models. *Torrey Pines Scientific Inc*, 2713 Loker Avenue West, Carlsbad, CA 92010, <http://www.torrey-pinescientific.com>

Touchscreen syringe pump

The new Legato 100 series syringe pump from KD Scientific features a touchscreen interface and a wide flow-rate range from 1.28 $\mu\text{l}/\text{min}$ to 88.28 ml/min . Syringes from 0.5 μl to 60 ml of any type—including stainless steel, plastic, and glass—can be used in the unit. The syringes are held securely in place by KD Scientific's new clamping mechanism. The Legato 100 has an accuracy of $\pm 0.5\%$ and a reproducibility of $\pm 0.05\%$. To ensure proper operation during experiments, the large color display allows users to see all the operating parameters of the pump—syringe size, flow rates, the volume delivered, and the elapsed time. The Legato 100 can be used in flow cytometry, electrospinning, microfluidics, and other applications. *KD Scientific Inc*, 84 October Hill Road, Holliston, MA 01746, <http://www.kdscientific.com>

Minicentrifuge for microsamples

Scie-Plas has introduced a new minicentrifuge, a compact unit designed to meet a wide range of research applications. It has three rotors: a six-place, 1.5- ml rotor; a PCR strip rotor; and a 1×3 in² slide rotor. Two adapters are included for 0.5–0.65 ml and 0.4 ml . At 6000 $\text{rpm}/2000$ g, the Scie-Plas minicentrifuge can be used for quickly spinning down samples, filtering microgels, and centrifuging micro-volumes. The unit is cold-room compatible for samples that require low temperatures. Fast acceleration and braking make it suitable for



quick spins. The minicentrifuge has a small 6×6 in² footprint and a safety interlock that automatically shuts the unit off when the lid is opened. It is CE marked, indicating European Union certification. *Scie-Plas Ltd*, 22 Cambridge

Science Park, Milton Road, Cambridge, CB4 0FJ, UK, <http://www.scie-plas.co.uk>

Humidity test chamber

Sheldon Manufacturing has released the HC6 environmental humidity chamber for biotechnology testing applications. The HC6 floor model incorporates an air-jacket design that evenly disperses air within the walls to maintain uniformity and ensure proper insulation. It offers a wide temperature and humidity range and is designed to replicate natural conditions in order to determine the potential limitations a sample would experience when exposed to various temperature and moisture fluctuations. The HC6 is suitable for running the 80°C and 80% humidity test. Its other features include microprocessor-based proportional-integral-derivative controllers, a steam generator that adds heat while humidifying, a dual display of temperature and humidity that allows instant access to set point and operating conditions, and a digital countdown timer that displays the time remaining in a test procedure. *Sheldon Manufacturing Inc*, 300 North 26th Avenue, P. O. Box 627, Cornelius, OR 97113, <http://www.shellab.com>

Temperature sensor

In response to the need for a high-accuracy, high-stability temperature sensor in science and industry, Heraeus Sensor Technology has developed the KX series of platinum temperature sensors. Supplied in ceramic wire-wound construction, the palladium-gold alloy lead wires ensure excellent ohmic contact to extension leads via welding or brazing. According to the company, key features of the sensor include interchangeability; high accuracy; high stability resulting in a 0.025-W maximum ice-point resistance shift after 10 consecutive cycles from -196°C to $+400^\circ\text{C}$; high vibration resistance, specifically a ± 0.005 -W maximum shift after 30 min of 14-g peak vibration; and low hysteresis of ± 0.015 W maximum when tested as per the International Electrotechnical Commission Standard IEC 60751. The sensor can be used for laboratory and high-precision-process temperature measurements and other high-accuracy, high-reliability thermophysical applications. *Heraeus Sensor Technology USA*, 1901 Route 130, Second Floor, Unit A, North Brunswick, NJ 08902, <http://heraeus-sensor-technology.com>

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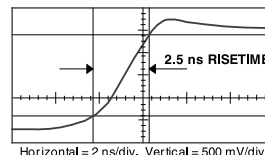
Noise: <100 e⁻ RMS (Room Temp.)

<20 e⁻ RMS (Cooled FET)

Gain-Bandwidth $f_t > 1.5$ GHz

Power: 19 mW typical

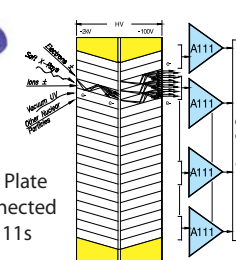
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