

NEW PRODUCTS

Focus on test and measurement

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. For all new products submissions, please send to Rnanna@aip.org.

Andreas Mandelis

Multiaxis alignment systems



Physik Instrumente has introduced ultrafast automated multiaxis alignment systems for silicon photonics applications. They offer six degree-of-freedom parallel kinematics, nanoscale accuracy, and position sensing for tasks such as testing wafers and aligning fibers and optical components. The 2×6 axis F-712.HA2 and 2×3 axis F-712.MA2 systems are based on a specialized digital motion controller with embedded alignment and a precision scanning and tracking mechanism that combines piezoelectric and servo-motorized drives. They can achieve times of less than 1 s for single- and double-sided alignment tasks. Interdependencies of axes are automatically compensated for, and integrated coarse-fine solutions deliver 25 mm closed-loop motion for first light and 100 μm , high-speed, piezo-flexure-based nanoaligned motion in x , y , and z directions. Longer linear travel ranges are possible. **Physik Instrumente**, 16 Albert St, Auburn, MA 01501, www.pi-usa.us

Optical wavelength meter

The model 228A optical wavelength meter from Bristol Instruments uses optical interferometer technology to measure the absolute wavelength of CW lasers. The company has reduced the time needed for measurement; the instrument now measures absolute wavelength to the highest accuracy of ± 0.2 ppm (± 0.3 pm at 1500 nm) at a rate of 10 Hz.



That improves on the original specification of 4 Hz. Accuracy is maintained over long periods of time because the meter is continuously calibrated with a built-in, single-frequency helium-neon laser that is stabilized using a precise balanced longitudinal mode technique. The interferometer's novel design minimizes the variation between consecutive wavelength measurements and results in a repeatability that supports a confidence level of greater than or equal to 99.7%. To verify performance, every 228A system is tested with laser sources that are traceable to NIST standards. **Bristol Instruments Inc**, 50 Victor Heights Pkwy, Victor, NY 14564, www.bristol-inst.com

Portable analyzer for metals



A portable arc and spark optical emission spectrometry metals analyzer from Spectro Analytical Instruments offers many of the features of the company's mobile Spectrotest OES analyzer in a smaller, lighter unit. According to the company, its new Spectroport is as fast as a handheld x-ray fluorescence instrument, but unlike handheld XRF, it accurately analyzes elements such as carbon, sulfur, phosphorus, and aluminum at low and critical levels. A new optical system covers a wide range of elemental wavelengths and displays excellent precision, stability, and robustness without additional heating. Flexible options to maximize mobility include large and small transport trolleys and a rechargeable battery pack for cordless use. Spark Analyzer Pro software lets users quickly and easily define testing modes and sample identification fields. Predefined calibration packages and the iCAL 2.0 calibration logic system minimize standardization efforts. **Spectro Analytical Instruments Inc**, 91 McKee Dr, Mahwah, NJ 07430, www.spectro.com



High-resolution array spectroradiometers

According to Instrument Systems, its CAS 140CT-HR spectroradiometers combine high spectral resolution and short testing times. Based on the company's CAS 140CT array spectrometer, they are designed for light measurement of particularly narrowband emitters, such as laser diodes, in laboratory and production environments. All models include calibration traceable to Germany's National Metrology Institute and accessories such as integrating spheres and optical probes for irradiance. An integrated density filter wheel and dark shutter facilitate automated measurements over a broad detector signal range. The spectroradiometers can be triggered externally. They feature a back-thinned CCD detector for high measurement sensitivity and deliver resolution down to 0.2 nm. Typical measuring ranges of 80 nm, 120 nm, and 160 nm can be customized from 800 nm to 1000 nm; further spectral ranges are available on request. **Instrument Systems GmbH**, Neumarkter Str 83, D-81673 Munich, Germany, www.instrumentsystems.com

Extended bandwidth lock-in amplifier

An updated version of Stanford Research Systems' SR865 lock-in amplifier for extended frequency bandwidth applications, the SR865A, has an ultrawide frequency range of 1 mHz to 4 MHz. The built-in current amplifier offers an input range of either 1 μ A with 400 kHz of bandwidth and 130 fA/ $\sqrt{\text{Hz}}$ of noise or 10 nA with 2 kHz of bandwidth and 13 fA/ $\sqrt{\text{Hz}}$ of noise. The voltage connector has a 10 M Ω input impedance and can be AC or DC coupled. Input connector shields can be connected to the instrument through a user-selectable 10 Ω ground or 10 k Ω floating resistor. The SR865A has conventional resistor-capacitor response output time constants from 1 μ s to 30 ks with roll offs of 6, 12, 18, and 24 dB/oct. It also features advanced digital filters that can greatly reduce measurement time while increasing the signal-to-noise ratio. The input range can be explicitly set from the front panel without having to consult a confusing "dynamic reserve" equation. **Stanford Research Systems Inc**, 1290-D Reamwood Ave, Sunnyvale, CA 94089, www.thinksrs.com



Vibrating sample magnetometer

Lake Shore Cryotronics has launched the 8600 series in its electromagnet-based vibrating sample magnetometer (VSM) line for characterizing a broad range of magnet properties in materials science laboratories. The series was created with first-order reversal curve (FORC) measurement as a primary objective; Lake Shore claims that the series' high sensitivity enhances FORC analysis precision and that the VSM performs complex FORC data collection sequences faster than previous systems. The VSMs feature sensitivity of 33 nemu and measurement speed of 10 ms/pt. Their operation is simple and ergonomic. Temperature options include a cryostat, a high-temperature oven, and a single-stage variable temperature insert for automated, unattended operation over wide temperature ranges. The VSMs can be used for studying emerging low-moment magnetic materials, applying FORC analysis, and making fast, high-resolution measurements. **Lake Shore Cryotronics Inc**, 575 McCorkle Blvd, Westerville, OH 43082-8888, www.lakeshore.com



High-speed piezo mirror stages

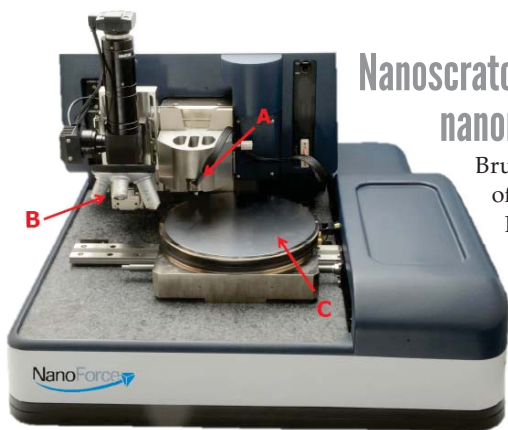
The Nano-MTA nanopositioning stages from Mad City Labs are single-axis piezoelectric mirror tip and tilt actuators. A cage mount allows for easy integration with the company's RM21 microscopes and standard optomechanical components. Horizontal and vertical scanning orientations are available. The stages deliver nanoradian resolution and are suitable for microscopy applications that involve high-precision beam steering, tracking, and scanning. Those include optical trapping, interferometry, optical disk manufacturing, and astronomy. Proprietary PicoQ position sensors provide absolute, repeatable position measurement under closed-loop control with low-noise performance. The Nano-MTA series can be used with the Nano-Drive or higher-power Nano-Drive85 controller; with the Nano-Drive85, it can provide continuous high-speed scans at 400 Hz and step response times down to 2 ms. **Mad City Labs Inc**, 2524 Todd Dr, Madison, WI 53713, www.madcitylabs.com



Accessory set for vacuum meters

Thyracont's versatile VD8 vacuum gauges measure absolute pressure in the range of 1600 to 5×10^{-4} mbar. Various accessories are available that support the gauges' full functionality for testing and maintaining vacuum and vacuum systems in research and industry. The company now offers at a low cost the most popular accessories in a compact, foam-protected case that also has room to store a vacuum gauge. The VD8ZUB set includes a USB cable for connection to a PC; a license for the company's VacuGraph Windows software to record, analyze, and transmit measurement data; and a 9 V replacement battery. A far-range power supply pack can be equipped with country-specific changeable power plugs. It enables long-term measurements independent of the battery status of the vacuum gauge. **Thyracont Vacuum Instruments GmbH**, Max-Emanuel-Str 10, 94036 Passau, Germany, www.thyracont-vacuum.com





Nanoscratch capability for nanomechanical testing

Bruker's Nano Surfaces Division now offers a nanoscale scratch option for its NanoForce nanomechanical testing system. With the nanoscratch capability, the platform can characterize the resistance of thin films and coatings to scratching, cracking, chipping, scuffing, and delamination. But the NanoForce is still able to accurately investigate the uniformity of mechanical

properties via instrumented indentation tests on nanoscale surfaces and structures over large sample areas. The company claims that since the NanoForce system is already well suited for testing the modulus and hardness of thin films and coatings with its standard dynamic testing methods, the addition of nanoscratch capabilities to characterize other important thin film mechanical properties on a single platform will make it a more useful tool for investigating the nanomechanical performance of new material systems. **Bruker Nano Surfaces Division**, 3400 E Britannia Dr, Ste 150, Tucson, AZ 85706, www.bruker.com

High-voltage oscilloscope

Built on open, modular PXI architecture, the PXIe-5164 oscilloscope from National Instruments enables researchers in physics, aerospace, semiconductor, and other fields to build test systems that require high-voltage measurements and high levels of amplitude accuracy. According to the company, the oscilloscope can measure a high-voltage signal of up to 100 V_{pp} at up to 1 GS/s with 400 MHz bandwidth. Its 14-bit analog-to-digital converter also allows users to see small signal details that would normally be hidden by instrument noise. The PXIe-5164 offers up to 34 channels to build parallel, high-channel-count systems in a compact form factor. A 3.2 GB/s streaming data rate is enabled by eight PCI Express Gen 2 bus communication lanes. The Xilinx Kintex-7 410 field-programmable gate array allows for the creation of custom internet protocol that is programmed through LabVIEW, including filtering and triggering. **National Instruments**, 11500 N Mopac Expy, Austin, TX 78759-3504, www.ni.com



Benchtop unit with digital panel meter



Omega's MDS8PT is a universal benchtop unit that houses the company's Platinum series 1/8 DIN digital panel meter. The meter's large, color-changing LED display is programmable at any set point or alarm point to meet

various application needs. It delivers accurate readings rapidly and can handle 10 common types of thermocouples, thermistors, and multiple resistance temperature detectors. It can also handle DC voltage and current ranges for several processes. The unit includes universal input with dual alarm relays, optional RS-232 and RS-485 Modbus communication, and embedded Ethernet. The MDS8PT is suitable for laboratory use, engine testing, and food processing. **Omega Engineering Inc**, 800 Connecticut Ave, Ste 5N01, Norwalk, CT 06854, www.omega.com

Three-axis Helmholtz coil



The HC16 Helmholtz coil system from Bartington

Instruments can generate stable magnetic fields in up to three axes. Its 350-mm-diameter HC16 Helmholtz coils, a PA1 power amplifier, and a CU1 control unit interface with a PXI control system or other compatible National Instruments acquisition card to govern system operation. Each pair of coils generates a homogeneous magnetic field in the x-, y-, or z-axis up to ± 1 mT from DC to 440 Hz and greater than ± 100 μ T at 5 kHz. A mounting table is provided to hold the test item inside the central homogeneous volume. The system allows for testing of small sensors at higher fields. Applications include calibration of three-axis magnetic field sensors and creation of a known magnetic environment. Classified as dual use, the product requires an export license for shipping outside of the European Union. **Bartington Instruments Ltd**, 5, 8, 10, 11, and 12 Thorney Leys Business Park, Witney, Oxfordshire OX28 4GE, UK, www.bartington.com

Thermal laser-power measurement sensor



The F50A-BB-18 thermal laser-power measurement sensor from Ophir Photonics is compact, is fan cooled, and has a wide dynamic range. Designed for continuous use at higher laser powers, it measures powers from 10 mW to 50 W and energies from 6 mJ to 50 J. A spectrally flat broadband coating is included and can be used from the far-UV to the far-IR. The highly linear sensor provides precision readings of power stability over time with no drift. It has a 17.5 mm aperture, a wavelength range of 0.19–20 μ m, a response time of 0.8 s, and low noise of 0.5 mW. It includes a cable for connection to Ophir's smart displays and PC interfaces such as StarBright, Nova II, Vega, and Juno. Each display features a smart connector interface that automatically configures and calibrates the display when plugged into one of Ophir's measurement sensors. **Ophir-Spiricon LLC**, 3050 North 300 West, North Logan, UT 84341, www.ophiropt.com

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