

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. For more information about a particular product, visit the website at the end of the product description.

Lawrence G. Rubin

Focus on sensors

Noncontact temperature sensor

Melexis has introduced the MLX90614 IR thermometer, which is incorporated in a silicon chip with a thin, micro-machined membrane heated by the IR radiation of a remote object. The heating is detected by on-chip thermocouples followed by a signal conditioning circuit that amplifies and digitizes the thermocouple voltage and calculates the object temperature using stored calibration parameters. The non-contact thermometer system, enclosed in a TO-can, provides an operating temperature range of -40°C to 125°C and an extended range of -70°C to 380°C and maintains a temperature resolution of 0.01°C . The MLX90614 has an accuracy of $\pm 0.5^{\circ}\text{C}$ in the object temperature range of 0°C to 50°C and $\pm 1^{\circ}\text{C}$ outside that range. Two versions of the device are available, one for 3-V supply operation, that is ideal for handheld, battery-operated instruments, and one for 5-V. Melexis USA, 41 Locke Road, Concord, NH 03301, <http://www.melexis.com>
See www.pt.ims.ca/10554-131

Micropower Hall-effect sensors

Allegro MicroSystems has announced the A139x series of new linear Hall-effect sensors that provide a voltage output directly proportional to an applied magnetic field. The new models, ideal for battery-operated applications, run from 2.5- to 3.5-V power supplies and consume only 10 mW in the active mode, with a draw of 4 mA. Current consumption can be reduced to less

than $25\text{ }\mu\text{A}$ through the addition of a user-selectable sleep mode during which the output of the devices is in a high-impedance mode (not a valid state). This feature allows multiple A139x sensors to be connected to a single A/D converter input. The four models are differentiated by their gains; the A1391, 1392, 1393, and 1395 provide 1.25 mV/G, 2.50 mV/G, 5.00 mV/G, and 10.0 mV/G, respectively. Allegro MicroSystems Inc, 115 Northeast Cutoff, Worcester, MA 01606, <http://www.allegromicro.com>
See www.pt.ims.ca/10554-132

Capacitive displacement gauges

The D-510 series of PISeca capacitive gauges from Physik Instrumente perform high-precision, noncontact measurements of geometric quantities representing displacement, separation, position, length, or other linear dimension against any kind of electrically conductive target. The new gauges feature the following: subnanometer resolution over measuring ranges down to $500\text{ }\mu\text{m}$, bandwidths to 10 kHz, high temperature stability, and linearity to 0.1%. The company uses a special guard-ring electrode to shield the sensor electrode from boundary effects.



In addition, the sensor signal conditioning electronics of the D-510 family are equipped with PI's ILS linearization circuit. PISeca capacitive sensor systems can be operated in multichannel configurations and combined with nanopositioning actuators for closed-loop control applications. Physik Instrumente LP, 16 Albert Street, Auburn, MA 01501, <http://www.pi-usa.us>
See www.pt.ims.ca/10554-133

High-temperature pH sensors

Emerson Process Management is offering the Rosemount Analytical models 3300HT and 3400HT high-temperature pH sensors that perform longer in tem-

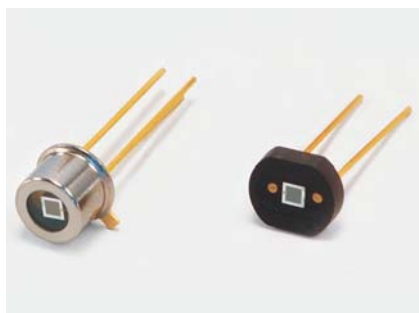
peratures up to 145°C . They feature AccuGlass pH glass formulations that resist cracking, an improved double junction reference that can be refilled if reference electrolyte is depleted, a replaceable Teflon reference junction, and a chemically resistant Ryton body contained in a titanium sensor tube. The sensors are recommended for use not only at elevated temperatures but also in harsh, dirty, and abrasive applications and those in which suspended solids are present. The 3400HT retractable design allows for the sensor to be removed from the process without process shutdown. The 3300HT insertion/submersion design allows for variable insertion depths. Emerson Process Management Power & Water Solutions, 200 Beta Drive, Pittsburgh, PA 15238, <http://www.emersonprocess.com>
See www.pt.ims.ca/10554-134

Magnetostrictive linear sensor

MTS Systems Corp has developed the R-series analog magnetostrictive position sensor based on the company's Temposonics design platform. The new sensor can simultaneously produce outputs for two independent magnet-marker positions with a dual-channel electronic design, thus enabling users to measure two parallel or relative motion axes with a single sensor. The R-series sensor can also simultaneously measure a single magnet marker's position and velocity and can be configured for factory or field to provide either the rate of motion magnitude only (speed) or the magnitude and direction (velocity). The speed range has been expanded, covering 25 mm/s to 10 m/s, with a speed sensing resolution of 0.1 mm/s. Field programming can be performed with handheld, DIN rail-mounted, or PC-based programmers. MTS Systems Corporation, Sensors Division, 3001 Sheldon Drive, Cary, NC 27513, <http://www.mtssensors.com>
See www.pt.ims.ca/10554-135

Avalanche photodiode detector

Hamamatsu Corp's S10362-11 series multipixel photon counter is an advanced Geiger-mode avalanche photodiode detector that can detect low-level light in various applications, including positron emission tomography, high-



energy physics, DNA sequencing, and fluorescence measurement. The device has an active area of $1\text{ mm} \times 1\text{ mm}$ and is available with 100, 400, or 1600 pixels. Each pixel contains a quenching circuit so that simultaneous photon events can be counted separately and with high accuracy. The S10362-11 provides a gain of approximately 1×10^6 , high photon detection efficiency, and peak sensitivity at 400 nm. The detector can be operated at low voltage (less than 100 V) and is insensitive to magnetic field effects. It is offered in TO-18 and ceramic package types. *Hamamatsu Corporation, 360 Foothill Road, Bridgewater, NJ 08807, <http://www.hamamatsu.com>*

See www.pt.ims.ca/10554-136

Digital rate sensor

Systron Donner Inertial has announced the DIGI-Q, a digital quartz rate sensor that uses the company's quartz MEMS technology. The device, with its rugged, compact package, is suited for platform stabilization, navigation systems, industrial robotics, aircraft flight control, and motion sensing. The single axis design is flexible in its mounting location and is easily adaptable to one-, two-, or three-axis configurations. The DIGI-Q provides a standard range of $\pm 1000^\circ/\text{s}$ full scale and an in-run drift of less than $3^\circ/\text{hr}$. It includes an onboard microprocessor and a digital signal processor for improved bias performance over temperature and offers improved noise, low-angle random walk, and scale factor linearity. The instrument's dual protocols (RS-232 and RS-422) increase compatibility options. *Systron Donner Inertial, 355 Lennon Lane, Walnut Creek, CA 94598-2418, <http://www.systron.com>*

See www.pt.ims.ca/10554-137

Viscosity measurement chip

RheoSense has introduced the Viscometer-on-a-Chip (VSS), a viscosity measurement instrument that can provide pre-

cise and repeatable characterization of various liquids. The VSS can eliminate the need to send viscosity measurement samples to an off-site laboratory for batch-to-batch consistency checks. The chip measures the viscosity and the temperature as the test liquid flows through a microchannel on the chip and an integrated microslit rheometer. Non-Newtonian viscosity is extracted by a rigorous Rabinowitch correction, after which the measurement data are sent for display and analysis to a microcontroller-based readout circuit. A liquid dispensing pump is supplied as part of the system. Wide shear ranges up to 10^6 L/s can be measured from 10^{-2} to about 10^4 poise. *RheoSense Inc, 2694 Bishop Drive, Suite 260, San Ramon, CA 94583, <http://www.rheosense.com>*

See www.pt.ims.ca/10554-138

Liquid flowmeter

The SLF-500 ultrasonic liquid flowmeter from Flow Technology is a clamp-on instrument that measures bidirectional flow through metal, plastic, and even lined pipes without altering the piping.



Typical applications include corrosive chemicals in the process industry and any installations where it is preferable not to have an instrument exposed to the process fluid. The operating principle of the meter involves a time-difference calculation method of ultrasonic wave propagation. The SLF-500 does not cause a pressure drop and provides fast speed of response. It can be used on lines with diameters from 1 in. to 12 in. without recalibration and will cover a wide range of flow rates. The instrument offers an accuracy of $\pm 2\%$ of reading (in the operating range of 3.3 ft/s to 33 ft/s), $\pm 0.066\text{ ft/s}$ in the range below 3.3 ft/s; the repeatability is $\pm 0.2\%$. *Flow Technology Inc, 8930 South Beck Avenue, Suite 107, Tempe, AZ 85284, <http://www.ftimeters.com>*

See www.pt.ims.ca/10554-139

NANOPOSITIONING SYSTEMS

Closed Loop
High Speed
True Parallel Motion
Picometer Precision
Piezo Motion
Custom Solutions

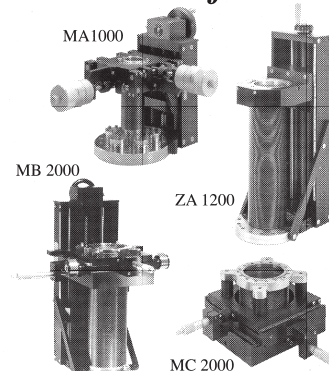
MCL

MAD CITY LABS INC.

sales@madcitylabs.com www.madcitylabs.com

See www.pt.ims.ca/10554-31

The ABCs of X-Y-Zs



PRECISION X-Y-Z MANIPULATORS

- Up to 2" (50mm) X-Y travel standard
- 1.39 - 4.0" bellows ID standard
- Bakeable to over 200°C (without removing micrometers)
- Easy access X micrometer and Z scale may be mounted on either side
- Z axis strokes from 2 - 36" standard
- A style for every application

Call 1-800-445-3688 for more information.

McAllister Technical Services

Manufacturers of surface analytical instruments and devices

West 280 Prairie Avenue
Coeur d'Alene, Idaho 83814

See www.pt.ims.ca/10554-32

Distance laser sensor

Dimetix has developed the DLS-B, a distance laser sensor that can measure absolute distances to natural and reflective targets up to 500 m with ± 1.5 mm precision. It is possible to determine positions to objects that are difficult to access or have very high surface temperatures. The measurement rate is influenced by the target. If the laser light is reflected well by the target, fast measurement rates can be achieved (up to 0.15 s in tracking mode). The DLS-B can handle moving targets in which the measured distance is the mean value between the distance at the start and end of the measuring process. The instrument incorporates a class II laser—less than 1 mW output—power normally used in classroom demonstrations, laser pointers, aiming devices, and range-finding equipment. The DLS-B can be connected to an external display via RS-232 and RS-422 interfaces. Dimetix AG, Degersheimerstrasse 14, CH-9100 Herisau, Switzerland, <http://www.dimetix.com>

See www.pt.ims.ca/10554-140

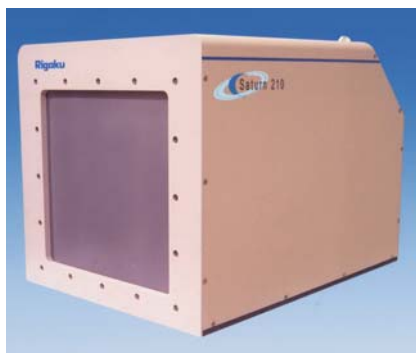
Laser scanner software

FARO Technologies has released version 4.0 of its laser scanning software family. The company's Laser Scanner LS is a portable, computerized measurement device that creates 3D, high-resolution digital photographs by scanning everything in its 360-degree path as far away as 76 m. The new software packages are used for viewing, administering, calibrating, filtering, and managing large 3D point clouds collected with the Laser Scanner LS. Version 4.0 provides such improvements as intrinsic use of an inclination sensor for faster registration, constraint-plane fit for high-accuracy plane positioning, easier export of slices, automatic filtering, and intelligent contrast adjustment to improve point-cloud visualization. The new release is also multilingual. FARO Technologies Inc, 125 Technology Park, Lake Mary, FL 32746, <http://www.faro.com>

See www.pt.ims.ca/10554-141

Synchrotron CCD detector

Rigaku has announced the Saturn 210, a large area (203 mm $\times$ 203 mm aper-



ture) CCD detector designed to have the sensitivity and speed required for accurate measurement of weaker reflections both at the synchrotron and in the home laboratory. The detector incorporates four Kodak KAF-4320E CCD chips with 2084 $\times$ 2084 pixels per CCD—a total of 4168 $\times$ 4168—with four ports per chip. The system includes closed-loop Joule-Thomson cooling and benefits from the use of front-illuminated Kodak Blue Plus indium-tin-oxide gate technology and the Camera Link high-speed serial data communications interface. The Saturn 210 provides readout speeds of 0.5 and 2.0 megapixels/s/output and a readout time of 2.4 s and 0.7 s at full resolution; the total system noise is less than $12 e^-$. Rigaku Americas Corporation, 9009 New Trails Drive, The Woodlands, TX 77381-5209, <http://www.rigaku.com>

See www.pt.ims.ca/10554-142

Temperature and humidity logger

Hart Scientific's model 1620A, called the DewK, is a paperless temperature and humidity data logger with wireless, Ethernet, and RS-232 communications. The instrument accepts inputs from up to two sensors and allows sensor hot-swapping; each sensor contains its own calibration data. An H probe reads temperature to $\pm 0.125^\circ\text{C}$ over its calibrated range of 16°C to 24°C and measures humidity to $\pm 1.5\%$ RH from 20% RH to 70% RH. An S probe reads temperature to $\pm 0.25^\circ\text{C}$ over its calibrated range of 15°C to 35°C and records humidity to $\pm 2\%$ RH from 20% RH to 70% RH. The 1620A can store up to 400 000 date- and time-stamped measurements, which can be sent to a PC in real time. An unlimited number of instruments can be simultaneously monitored by adding the company's LogWare III software. Hart Scientific Inc, 799 East Utah Valley Drive, American Fork, UT 84003-9775, <http://www.hartscientific.com>

See www.pt.ims.ca/10554-143

Particle analyzer

The FlowCAM-CX from Fluid Imaging Technologies is a color imaging particle analyzer that integrates microscopy and flow cytometry into one instrument. It collects digital color images at speeds claimed to be unattainable by traditional microscopy. Users can identify and analyze particles and cells using the 23 parameters collected for each image. The FlowCAM-CX also uses fluorescence and laser scatter for added particle sensitivity. The company's VisualSpreadsheet software enables analyzers to capture data for each image and present those data in an image-based spreadsheet. Collected data sets are then used to construct graphical representations such as particle size and shape distributions. The new analyzer is available in portable or benchtop models. Fluid Imaging Technologies, 258 Cross Point Road, Edgcomb, ME 04556, <http://www.fluidimaging.com>

See www.pt.ims.ca/10554-144

New literature

ControlSoft Inc is offering the *PID Loop Tuning Tips Pocket Guide* to assist engineers in tuning their PID loops, reducing process fluctuations and product waste, increasing product quality and consistency, and reducing field engineering time. A free copy can be ordered on the company's website. ControlSoft Inc, 5387 Avion Park Drive, Highland Heights, OH 44143, <http://www.controlsoftinc.com>

See www.pt.ims.ca/10554-145

On the Web

A new resource for capillary rheometer users is available from Malvern Instruments. A FAQs section includes details of the way a capillary rheometer works, the types of samples that can be analyzed, instructions on how to configure a system for optimum performance, and the practical applications of measured data. Malvern Instruments Inc, 10 Southville Road, Southborough, MA 01772, <http://www.malvern.com/rosand/faq>

See www.pt.ims.ca/10554-146

The objective of a new website called freeRandD.com is to help bring together talented university students and industry professionals who have common interests in research and development. Businesses can select students to work on their projects, and students can learn how to work in a business environment. <http://www.freerandd.com>

See www.pt.ims.ca/10554-147