

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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

LAWRENCE G. RUBIN

FOCUS ON TEST AND MEASUREMENT

Lock-in Amplifier

PerkinElmer's model 7225 is a dual-phase DSP (digital signal processing) lock-in amplifier with a reference frequency (f) range of 0.001 Hz to 120 kHz. The instrument features an FET or bipolar transistor voltage-mode input with a full-scale sensitivity of 2 nV and a current-mode input with low-noise or wide-bandwidth options. Output filter time constants range from 10 μ s to 100 ks and harmonic measurements can be made up to 32 f. The internal oscillator is quartz-crystal stabilized and, because it is synchronous, allows input offset removal through cancellation. The 7225 can be used as a computer-controlled transient recorder, enabling the capture of a waveform of a signal at up to 40 kilosamples/s. Two 2-line, 16-character LCD displays provide digital indication of measured signals; external control of the unit is via either the RS-232 or GPIB interfaces. *PerkinElmer Instruments (Signal Recovery), 801 South Illinois Avenue, Oak Ridge, Tennessee 37831-0895*

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Multifrequency Capacitance Bridge

The AH 2700A multifrequency capacitance/loss bridge from Andeen-Hagerling is a successor to the company's AH 2500A 1-kHz bridge. It continues to feature automatic balancing, ranging, and internal calibration, and uses the same ratio-transformer and fused-silica reference capacitors. The new model operates at 27 discrete frequencies, ranging from 50 Hz to 20 kHz, providing 10 measurement frequencies per decade. As examples of performance, specifications for the measurements of a 100-pF capacitor at three selected frequencies include a capacitance resolution of 1.50 ppm at 100 Hz, 0.15 ppm at 1 kHz, and 0.50

ppm at 10 kHz; a capacitance accuracy of 15 ppm, 5 ppm, and 15 ppm, respectively; and a loss resolution (dissipation factor $\tan\delta$) of 1.00, 0.15, and 1.00×10^{-6} , respectively. The AH 2700A has fast analog outputs for capacitance and loss. *Andeen-Hagerling Inc, 31200 Bainbridge Road, Cleveland, Ohio 44139-2231*

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Low-Power AC Resistance Bridge

Lake Shore Cryotronics has introduced the model 370 AC resistance bridge, designed to accurately measure, display, and control the temperature of cryogenic systems cooled to between 1 K and 20 mK (and lower). The bridge uses a 13.7-Hz sinusoidal, unique matched-impedance current

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source as one of its defenses against common-mode noise. Other features to minimize and control noise include an active common-mode rejection circuit, driven guards for high-resistance sensors, and optical isolation of analog from digital functions. The current source has 20 full-scale current ranges down to 3 pA, a level for which the excitation power into, for example, a 100-k Ω resistor would be an attowatt. The bridge has full-scale resistance measurement ranges from 200 m Ω to 6 M Ω , voltage ranges from 1 μ V to 316 mV, and offers 16 input channels and two analog voltage outputs. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, Ohio 43082-8888*

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Short-Range Position Sensor

OPTRA has announced the NanoGage Model 100 short-range position sensor. The device is an electro-optic sensor with performance reportedly equivalent to a precise capacitance gauge but with a 3-mm standoff, a large bandwidth, and little sensitivity to EMI. The fundamental principle of NanoGage is the accurate triangulation of a reflected laser spot (approximately 100 μm diameter) across a photoelectric detector. The optical sensor works with reflective surfaces such as glass or metal, requiring a minimum 4% surface reflectance for a specular target. The Model 100 has a linear measurement range of 100 μm and a signal capture range of $\pm 400 \mu\text{m}$, with a resolution of 15 nm rms at 100 kHz. The aluminum body of the sensor is about 1.25 cm in diameter and 5.6 cm long. *OPTRA Inc., 461 Boston Street, Topsfield, Massachusetts 01983-1290*

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Arbitrary Waveform Generator

The Racal Instruments Model 3153 arbitrary waveform generator (AWG) module incorporates three AWGs into one C-size VXI bus slot. One of the channels has 100 megasamples per second (MS/s), the other two, 50 MS/s; the three can run independently or synchronously. Each channel delivers eight standard and arbitrary waveforms with 12 bits of amplitude resolution and 9 bits of frequency resolution, all with low phase noise. Output filters ensure the 3153's ability to simulate modulation waveforms. The deep memory of the modules minimizes test time; channel 1 includes 512 kilopoints of memory (up to 2 megapoints as an option), while channels 2 and 3 include 1 megapoint each (up to an optional 8 megapoints). The AWGs provide fast access to segment memory, sequence memory, synchronization bit, breakpoint, and trigger-start offset memory. *Racal Instruments Inc., 4 Goodyear Street, Irvine, California 92618-2002*

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Digital Delay Generator

Quantum Composers has announced the 9500 series digital delay generators, available in 2-, 4-, or 8-channel

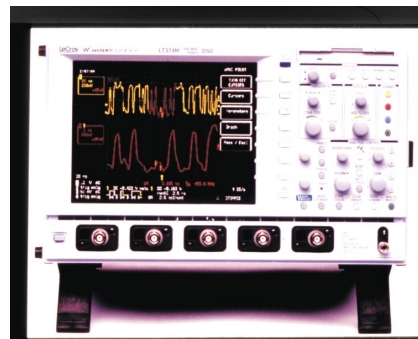
configurations. Each channel has a delay resolution of 20 ns with a 500-ps jitter; the delay and pulse width for each channel are independent. The instruments use an LCD to display menu selections that include choice of delay and pulse width, output amplitude (up to 15 V), and operating modes such as continuous, burst, and single shot with external trigger or gate.

Nonvolatile memory is used for storing up to 15 configurations to eliminate a continuous setup process. Any or all channels can be gated and include divide-by-N functions. Remote control is enabled with a standard RS-232 or an optional IEEE-488 interface. *Quantum Composers, P.O. Box 4248, Bozeman, Montana 59772*

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Digital Oscilloscopes

LeCroy has introduced the Wave-runner-2 series of digital oscilloscopes (DSOs). The model LT264 is a four-channel, 350-MHz DSO with 1 gigasample per second (GS/s) sampling rate and 100 kilopoints of acquisition memory per channel; the LT262 is a two-channel version with an option of 1 megapoint per channel. For higher speed, there is the LT374 (four-channel) 500-MHz DSO that offers 2 GS/s on each channel, and the two-channel version (LT372) with longer memory options of up to 4 megapoints per channel. The Wave-

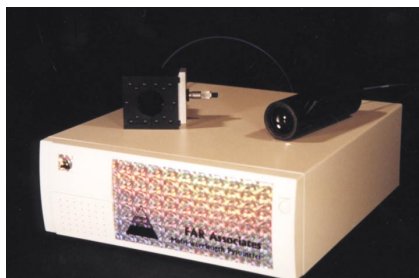


runner-2 series incorporates a new Quick Zoom feature that aids in quickly scanning through long waveforms, and a new WavePilot button that provides direct access to the new measurement dashboard, graphs, cursors, and analysis packages, and an optional advanced-trigger package. The new DSOs also feature an enhanced analog persistence mode. *LeCroy Corp., 700 Chestnut Ridge Road, Chestnut Ridge, New York 10977-6499*

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Multiwavelength Pyrometer

The FMP2 multiwavelength pyrometer from FAR Associates has a range of 800–2500°C, with resolution to 0.1°C and a typical accuracy to with-



in 5°C. Emissivity is determined with no operator input, even when the target's surface characteristics change with temperature or processing, and the pyrometer automatically compensates for any non-grayness exhibited. The display provides temperature, accuracy achieved, and emissivity; the target's thermal spectra and environmental absorption/emission spectra are also available. The FMP2 is a fiberoptic-based instrument using a wavelength range of 500–1000 nm, has a large selection of input optics, and can accommodate custom optics for applications such as measurements within pressure vessels. The pyrometer has analog control outputs; temperature limits are selectable in software. *FAR Associates, 1532 Newport Drive, Macedonia, Ohio 44056*

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Oscilloscope Card for the PCI Bus

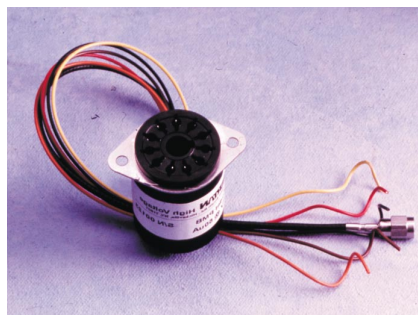
Gage Applied's Compuscope 14100 is a single-slot PCI bus card that performs 14-bit A/D conversions at sample rates up to 100 megasamples per second (MS/s) in one-channel mode and 50 MS/s in dual-channel simultaneous mode. The card features 50-MHz bandwidth with more than 70-dB dynamic range and 63-dB signal-to-noise ratio. The 14100 is available with memory depths up to 1 gigabyte. The data stored in that memory can be transferred directly (no interface bus required) to the PC memory for post-processing, display, or storage to hard disk. A new mixed-mode, digitally-programmable, variable-gain input circuit is said to accommodate the requirements of low noise, low distortion, high dynamic range, and high bandwidth. Multicard 14100 systems allow up to

16 simultaneous channels at 50 MS/s and 8 channels at 100 MS/s. *Gage Applied Inc, 2000 32nd Avenue, Lachine, Quebec, Canada H8T 3H7*

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Photomultiplier Tube Power Supply

Bertan High Voltage has announced the PMB compact photomultiplier tube (PMT) high-voltage power supply. The miniature package (35 mm × 53 mm) is integrated with an 11-pin PMT socket that includes a 10-stage resistive divider. The PMB has a 1-kV output; at its 50-μA full-load output, the ripple is 10 mV peak-to-



peak. *Bertan High Voltage Corp, 121 New South Road, Hicksville, New York 11801*

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Nonarbitrary Waveform Synthesizer

Analogic has introduced the AN2050A-NARB nonarbitrary waveform synthesizer, which reportedly provides realistic pulse shapes, noise, and the true magnetic effects of the head and media components in the hard-disk-drive industry. The instrument incorporates an 8-bit D/A converter followed by a 12-bit variable-gain stage. Its sampling clock operates at 2.4 GHz, producing an 800 Mbit/s waveform with 3×oversampling or 1 Gbit/s at 2×oversampling. The AN2500A-NARB's high bandwidth—850 MHz—is said to maintain minimum distortion of the signal at high data rates. With that speed, inputs can yield effects in the channel around Monte Carlo distributions, rather than a single waveform. A full drag-and-drop graphical user interface allows for importing waveforms, pulse shapes, and patterns. *Analogic Corp, 8 Centennial Drive, Peabody, Massachusetts 01960* ■

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APS Show—Booth # 314

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APS Show—Booth # 222

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