

NEW PRODUCTS

Focus on test, measurement, quantum metrology, and analytical equipment

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 its description. Please send all new product submissions to ptpub@aip.org.

Andreas Mandelis

Software for quantum effects control



Quantum Machines has enhanced the capabilities of its Quantum Orchestration Platform (QOP), which integrates parametric pulse programming, real-time classical processing, flow control, and ultrafast analog feedback. New features in release 2.0 improve fidelity, simplify setups, and provide greater flexibility to run advanced quantum experiments. The intuitive, open-source QUA programming language lets users run advanced quantum algorithms out of the box. QOP V2.0 offers strict timing for sequences with zero gaps, a crosstalk matrix, improved digital filters, advanced chirping, an input stream for fast data transfer

during run time, high-resolution time tagging, and shareable ports. *Quantum Machines*, Yigal Alon St 126, Tel Aviv-Yafo, Israel, www.quantum-machines.co

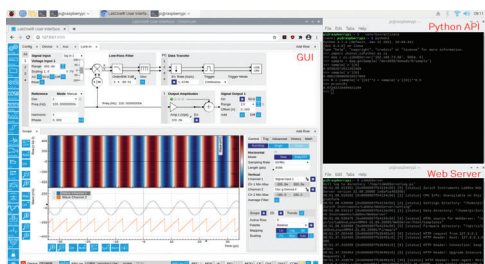
Digital pressure gauge

Omega's latest series of digital pressure gauges, DPG509, offers full-scale accuracy as high as 0.08%; 0.25% accuracy is also available. The DPG509 technology builds upon a diffused silicon piezoresistive sensor to create an efficient digital platform that maintains high accuracy, improves temperature stability, and enables compensation in both the positive and the negative pressure direction. With the data-logging option, users can log data as fast as four readings/s. Data analysis is straightforward with an included, easily accessible SD card. All options have a thermoplastic housing with an ingress-protection rating of IP65 for durability in harsh environments. The highly configurable DPG509 series can be used in a wide range of applications, including testing, hydraulics and pneumatics, pumps and compressors, fluid management, level indication, filter monitoring, and automation. *Omega Engineering Inc*, 800 Connecticut Ave, Ste 5N01, Norwalk, CT 06854, www.omega.com



Fast oscilloscope

Rohde & Schwarz has added a new series, the R&S MXO 4, to its oscilloscope portfolio. Because of an application-specific integrated circuit with a data processing rate of 200 GB/s, the R&S MXO 4 series can achieve the world's fastest real-time update rate of more than 4.5 million acquisitions per second, according to the company. A 12-bit analog-to-digital converter operates across all the instrument sample rates with an 18-bit vertical-resolution architecture. The R&S MXO 4 series also features a standard acquisition memory of 400 megapoints on all four channels and the lowest noise and largest offset range in its class: ± 5 V with a scaling of 500 μ V/div. Once only available in more costly higher-performance oscilloscopes, the digital trigger comes standard in the new series. The trigger sensitivity of 1/10 000 division enables users to isolate difficult-to-find small physical layer anomalies in the presence of large signals. The oscilloscopes in the R&S MXO 4 series are the first to perform 45 000 FFTs/s. *Rohde & Schwarz GmbH & Co KG*, Mühldorfstraße 15, 81671 Munich, Germany, www.rohde-schwarz.com



Software for scalable quantum computing

Zurich Instruments designed its LabOne Q software for experiments on advanced control electronics. The Python-based interface provides intuitive tools for specifying multichannel signals with precise timing control. LabOne Q users can program large setups in Python as a single machine and transform complex quantum circuits into simple code, which can easily be reused. Using sections, users can group pulse patterns across signal lines. To express all levels of timing consistently, the sections support looping, sweeping, and averaging structures.

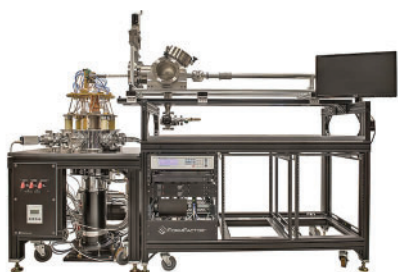
Although users have complete low-level access to the instruments, the software streamlines and automates time-consuming tasks such as generating and uploading waveforms, synchronizing pulses between multiple instruments, and optimizing instrument settings, which can help maximize computational duty cycles. Upgrading or scaling up a laboratory setup requires only a drop-in replacement in the code. *Zurich Instruments AG*, Technoparkstrasse 1, 8005 Zürich, Switzerland, www.zhinst.com

Arbitrary waveform generator

According to Keysight, its M8199B is the first arbitrary waveform generator (AWG) with a sampling rate up to 256 GS/s that offers analog bandwidth exceeding 80 GHz and up to eight synchronized channels operating simultaneously. It enables data transmission greater than 400 GB/s per lane in intensity-modulation and direct-detect formats and greater than 1.6 TB/s per carrier in coherent optical communications. The M8199B AWG is suitable for high-speed research experiments using multilevel pulse- and quadrature-amplitude and other proprietary modulation formats at symbol rates approaching 200 GBaud. Users conducting physics, chemistry, and general-purpose electronics research can generate any arbitrary waveform that can be mathematically described, including the ultrashort pulses, wideband RF pulses, and chirps needed for applications such as chemical reactions, elementary-particle excitation, and quantum effects. **Keysight Technologies Inc**, 1400 Fountaingrove Pkwy, Santa Rosa, CA 95403-1738, www.keysight.com



Quantum device testing



FormFactor has unveiled its IQ2000 die probing system that can cool devices from room temperature to a base temperature of 4 K in less than 1 h and simultaneously enable probe testing. It can expedite testing for quantum control chips, cryo-CMOS, photonic devices, niobium-based circuits, materials development, and other applications that require ultralow-temperature environments. The IQ2000 load-lock chamber and cryogenic probe head provide tool-free device exchange without opening or warming up the ultracold test environment. The high-density electrical probe interface enables high-bandwidth, parallel device contact. The IQ2000 offers options for base temperatures of less than 2 K or 4 K. It features up to 128 low-frequency signals and up to 28 high-

bandwidth (greater than 12.5 GHz) signals for parallel device testing with FormFactor's probe-card technologies. The low-vibration system provides for stable device contact and low-noise measurements. **FormFactor Inc**, 7005 Southfront Rd, Livermore, CA 94551, www.formfactor.com

Multichannel coherent microwave RF source

Rigol now offers an RF microwave generator, the DSG5000 series, for complex multichannel and system-level applications. The new signal generators are available with 2, 4, 6, or 8 independent RF channels. Designed for high-frequency signals in applications such as quantum research and radar, the DSG5000 series features high long-term phase stability between channels of $\pm 1^\circ$. At 10 GHz with a temperature variation of less than 1°C , the phase stability can be measured at less than 1° of phase deviation over 72 h. According to the company, that stability yields the highest accuracy in long-term verification applications compared with competitive solutions. The RF source can generate up to 20 GHz signals with amplitude-, frequency-, phase-, and pulse-modulation capabilities. It provides high signal purity with low phase noise measuring less than -33 dBc/Hz at 1 GHz, an offset of 10 kHz, a fast switching speed of 3 ms, and a typical amplitude accuracy of $\pm 1.1\text{ dB}$. **Rigol Technologies Inc**, 10220 SW Nimbus Ave, Ste K-7, Portland, OR 97223, www.rigolna.com



High-resolution SWIR cameras for thermography

InfraTec developed its ImageIR 8100 and ImageIR 9100 short-wave IR (SWIR) cameras to offer high measurement accuracy and very good short- and long-term stability in thermographic measurement tasks involving very high temperatures and challenging materials. For example, the cameras allow emissivity-optimized measurements of temperatures on metallic surfaces in applications between 300°C and 1700°C . They are also suitable for laser applications, additive manufacturing, and welding processes and press hardening in the metal industry. The ImageIR 8100 and ImageIR 9100 cameras are radiometrically calibrated in the VGA and SXGA image formats with 640×512 and 1280×1024 IR pixels, respectively. Both have a $5\text{ }\mu\text{m}$ pixel

pitch, which allows for a comparatively affordable, compact optical design with high imaging quality. Brilliant thermographic images with high geometric and thermal resolution can be achieved in both formats. **InfraTec Infrared LLC**, 5048 Tennyson Pkwy, Ste 250, Plano, TX 75024, www.infatec.eu

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