

Charge Sensitive Preamplifiers

CoolFET®



Noise @ 0 pF: 670 eV FWHM (Si)
~76 electrons RMS

Noise Slope: 13 eV/pF with Low C_{iss} FET
11.5 eV/pF with high C_{iss} FET

Fast Rise Time: 2.5 ns

FEATURES

- Thermoelectrically Cooled FET
- 3 internal FETs to match detector
- Lowest Noise and Noise Slope
- AC or DC coupling to the detector
- Both Energy and Timing outputs
- Optional input protection
- Easy to use

STATE-OF-THE-ART A250



External FET

FET can be cooled

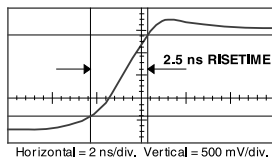
Noise: <100 e⁻ RMS (Room Temp.)

<20 e⁻ RMS (Cooled FET)

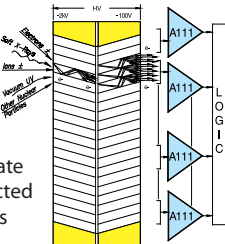
Gain-Bandwidth f_t > 1.5 GHz

Power: 19 mW typical

Slew rate: >475 V/ μ s



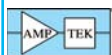
THE INDUSTRY STANDARD A111



A Microchannel Plate (MCP) Array Connected to Multiple A111s

AMPTEK - Your complete source for high performance preamplifiers and amplifiers

Visit Us Now
www.amptek.com



AMPTEK INC.

sales@amptek.com www.amptek.com

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.

Andreas Mandelis

Focus on nanoscience and nanotechnology

Ultrasonic piezo motor controller

Physik Instrumente has introduced the new two-axis C-867 piezo motor digital controller for ultrasonic high-stability piezo motor stages such as those used on the latest-generation microscopes.



The controller's major operating features are its optimization for high-stability operation with ultrasonic piezo linear motors; integrated drive electronics for ultrasonic motors; dynamic servo parameter switching for faster settling; and extensive software support, including LabVIEW. A frequency-control loop adjusts the operating frequency of the driving voltage to compensate automatically for the motor's mechanical frequency drift caused by temperature or load changes. The C-867 is designed especially for closed-loop micropositioning systems equipped with piezo linear motor drives. It can be operated from a host PC via either a USB port or an RS-232 interface. *Physik Instrumente LP, 16 Albert Street, Auburn, MA 01501, <http://www.physikinstrumente.com>*

Nanoindenter

A new nanoindentation capability, available exclusively on Agilent Technologies' nanoindenter G200 instru-

mentation platform, allows users to make substrate-independent measurements on thin films. It is suitable for evaluating the elastic modulus of hard samples on soft substrates or of soft samples on hard substrates. Assuming that the film thickness and substrate modulus are known, the technique can extract the film modulus from the measured substrate-affected modulus. Applicable to various film-substrate systems, the technique enables measurement of Young's modulus and hardness in compliance with ISO 14577 and measurement of deformation over six orders of magnitude, from nanometers to millimeters. *Agilent Technologies, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, <http://www.home.agilent.com>*

Atomic force microscope stage

Asylum Research has released the new NanoRack sample stretching stage accessory for its MFP-3D atomic force microscopes (AFMs). This high-strain, high-travel manual stretching stage provides two-axis stress control of tensile loaded samples under different loads. Automatic-load cell calibration provides integrated force measurements with MFP-3D images or other measurements and returns both stress and strain data. The maximum sample load is 80 N. Direct measurements can be made to determine the interfacial adhesive strength of nano- and microscale domains within polymer blends, especially blends generated in situ in polymerization reactors. Additional applications include measurements of forces required to induce cracking in biological and inorganic materials. The stage is compatible with various AFM imaging techniques including phase and dual AC for enhanced contrast of material properties and the MFP-3D's Ztherm option for localized thermal analysis. *Asylum Research, 6310 Hollister Avenue, Santa Barbara, CA 93117, <http://www.asylumresearch.com>*

Miniature fiber-optic spectrometers

B&W Tek's Quest series of miniature fiber-optic spectrometers now features a low thermal-drift spectrum of around 19 counts/°C in typical cases and a faster readout speed of >2.0 MHz. In ad-

dition, the series is now available with an optional RS-232 communication interface for convenient integration into larger systems. The fast readout speed of the new Quest spectrometers makes them suitable for high-speed applications such as LED binning and sorting. Quest X employs a traditional crossed Czerny–Turner spectrograph and Quest U an unfolded Czerny–Turner spectrograph that minimizes stray light in the UV region. The series is equipped with a 2048-element linear CCD array, a built-in 16-bit digitizer, and an externally synchronized trigger. B&W Tek is an ISO 9001 and ISO 13485 certified facility. *B&W Tek Inc, 19 Shea Way, Newark, DE 19713, <http://www.bwtek.com>*

Metrology for sealing-surface characterization

Bruker Corp's NPFLEX-LA is a noncontact 3D surface metrology system that provides quantitative lead-angle and surface-texture measurements for the control and reduction of fluid leakage of rotary dynamic sealing surfaces. It combines Bruker's gauge-capable, interferometry-based 3D optical profiling technology with new patent-pending metrology capabilities to quantifiably measure the shaft lead angle and texture of sealing surfaces in a single, integrated solution. Designed to perform accurate metrology independent of part warping, level, concentricity, or mounting inconsistencies, the NPFLEX-LA features a streamlined production user interface that enables rapid setup. Easily set pass/fail criteria identify and/or discard nicks, burrs, and scratches from a measured surface area on a machined shaft. The NPFLEX-LA confirms that manufacturing processes produce sealing-surface parts to required tolerances. *Bruker Corporation, 2650 East Elvira Road, Tucson, AZ 85756, <http://www.bruker.com>*

Resonant scanning probe microscope

Mad City Labs' MadPLL is an integrated instrument package that allows the user to create an economical high-resolution resonant scanning probe microscope. The "instant" closed loop atomic force microscope and near-field scanning optical microscope are suitable for research and teaching laboratories. The

package includes a digital phase-locked loop (PLL) controller, dedicated software, a sensor-amplifier board, and a resonant-probe mounting board. MadPLL has been specifically designed for tuning forks and Akiyama probes. The company's software offers automated features such as parasitic capacitance control, resonant frequency detection, and Q calculation. The integrated z-axis proportional and integral control loop is fully compatible with Mad City Labs' high-resolution closed-loop nanopositioning systems. *Mad City Labs Inc, 2524 Todd Drive, Madison, WI 53713, <http://www.madcylabs.com>*

Single-photon-counting module

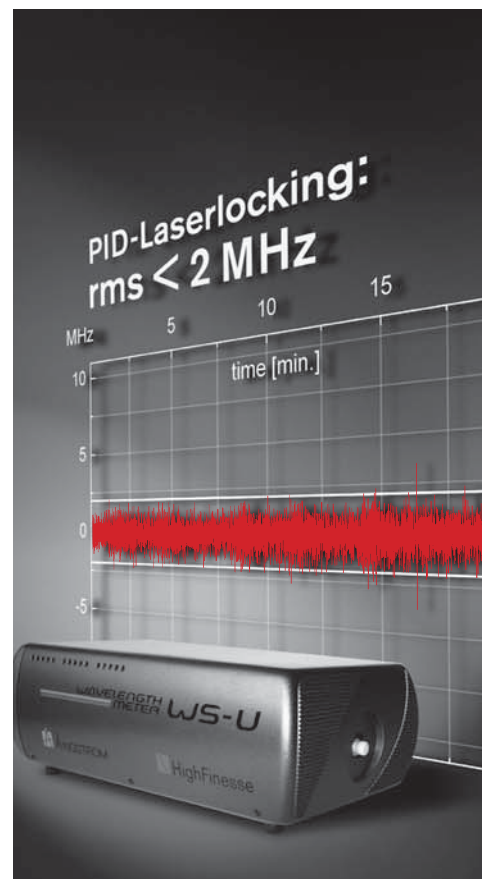
Aur a Technology has launched the new SPD_A_M2, an all-in-one dual photon-counting module. The SPD_A is a family of ultralow-noise, high-quantum-efficiency (QE), near-IR (900–1700 nm) single-photon detectors. Their Geiger-mode InGaAs avalanche photodiode and thermoelectric coolers ensure a low and stable dark count, with a performance superior to $5.0 \times 10^{-6}/\text{ns}$.



Most photomultipliers count a QE below 1% in near-IR; the QE of the SPD_A is adjustable up to 25%. The advantage of the dual single-photon-counting module SPD_A_M2 is that the two independent detectors are included in the same case and, most importantly, are paired during the manufacturing. Thus, they have similar dark count rate and QE. The SPD_A_M2 is suitable for time-correlated single-photon counting. *Aur a Technology, Incubateur d'Entreprises Innovantes de Franche-Comt , 18 rue Alain Savary, 25000 Besan on, France, <http://en.aureatechnology.net>*

Microfluidic systems temperature control

The new Hotplate Adaptor–Chip Holder H from Dolomite Microfluidics allows control over internal temperatures of microfluidic chips without



HighFinesse- ngstrom Wavelength Meters

**Accurate Like Your Research
Redefining Performance**

- Most stable and reliable
- **NEW** Pulsed & cw for 192 nm – 11 μm
- Fastest measurement: 200 Hz
- Multichannel 1 to 8 lasers



Phone: (585) 657-6663
sales@toptica-usa.com
www.toptica.com
www.highfinesse.com

The Most Direct Route to Your Destination...



-  Quality You Require
-  Inventory You Need
-  Prices That Meet Budget

 **Peace of Mind!**



VACUUM MART™
DIVISION

www.lesker.com
Kurt J. Lesker
Company

Kurt J. Lesker Company
United States
412.387.9200
800.245.1656
salesus@lesker.com

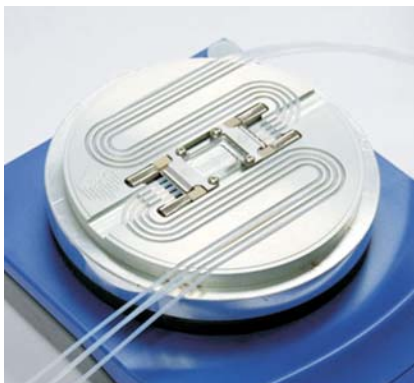
Kurt Lesker (Shanghai)
Trading Company
科特·莱思科(上海)
商贸有限公司
Asia
+86 21 50115900
saleschina@lesker.com

Kurt J. Lesker Canada Inc.
Canada
416.588.2610
800.465.2476
salescan@lesker.com

Kurt J. Lesker Company Ltd.
Europe
+44 (0) 1424 458100
saleseu@lesker.com



11-074



disruption to the fluid flow. The use of temperature-control systems is vital for many applications including nanostructure generation, controlled microreactions, and controlled-temperature droplet microfluidics (in the latter case, to prevent a solidification reaction until the droplets have left the chip). Holding a microfluidic chip securely in position, the Hotplate Adaptor enables users to pre-heat or post-heat fluids by using the integrated tube heater. Operating over a wide temperature range up to 100 °C, the adaptor has a removable lid that can be closed to keep the chip at constant temperatures and thus maintain cell viability in cell-based analytical studies. *Dolomite Microfluidics, 29 Albion Place, Charlestown, MA 02129, <http://www.dolomite-microfluidics.com>*

Natural gas imaging system

FEI has announced a solution for analyzing the production characteristics and potential of unconventional gas reservoirs. The Helios NanoLab Dual-Beam system images kerogen, porosity, and microstructures in three dimensions with nanometer-scale resolution. The data are essential to determining a reservoir's production potential, optimizing extraction procedures, and designing simulators of the nanoscale pore structure. Huge reserves of natural gas are known to exist in unconventional gas reservoirs, but producing the gas is difficult because it is trapped in poorly connected networks of pores with dimensions as small as a few nanometers. The ability to understand the structure of the networks allows geologists to make more accurate predictions of producible gas and optimize its extraction. The Helios system captures images and develops a 3D microstructural model of the pore structure, including the subvolumes and the connectivity of kerogen. *FEI, North*

America NanoPort, 5350 NE Dawson Creek Drive, Hillsboro, Oregon 97124, <http://www.fei.com>

System for genomic analysis

Fluidigm's new BioMark HD real-time polymerase chain reaction (PCR) system is designed for researchers who require the sensitivity and throughput to study gene expression down to the single-cell level. By incorporating a fast thermal cycling protocol, the BioMark HD system reduces time-to-result by doubling the throughput of the original system. According to the company, one technician can now generate more than 50 000 data points in one day. The fast thermal cycling protocol is compatible with commercially available assays and yields data equal in quality to standard cycling protocol data. The BioMark HD platform supports gene and single-cell gene expression and genotyping. Using digital array chips, the system performs common digital PCR functions such as mutation detection, copy number variation, and absolute quantitation of nucleic acid sequences. *Fluidigm, 7000 Shoreline Court, Suite 100, South San Francisco, CA 94080, <http://www.fluidigm.com>*

Subnanometer transducer positioning system

The new DIT-5200 system from Kaman Precision Products and Measuring uses differential impedance to make precision measurements of transducer position to subnanometer resolution. The noncontact differential system offers high thermal stability, high sensitivity, and high linearity. The DIT-5200 is a true differential system for common mode rejection based on high-precision, eddy-current, balanced-bridge technology. It is thermally stable at $\pm 0.03\%$ FS/°C and, at null, $\pm 0.005\%$ FS/°C. It is highly sensitive—up to 394 mV/μm—and is extremely linear, to 0.1% full range. Applications include precise alignment of fast steering mirrors, servo control position feedback, semiconductor stage positioning, angular displacement indication, x-y orbit position feedback, and stylus position. *Kaman Corporation, 3730 Sinton Road, Suite 100, Colorado Springs, CO 80907, <http://www.kamansensors.com>* ■