

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. 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.

Modular Thermal Imaging System

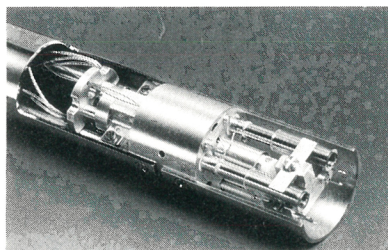
Mikron Instrument's TH3100 series of thermal imaging systems are compact units suitable for both field and fixed applications. Each system consists of a small detector fitted with a close-focus, telephoto or wide-angle lens and a control unit with a 3.5-inch display; it weighs only 7.2 kilograms. For field applications the units can be operated with a 12-volt power supply. Data is processed on a personal computer. Three detector units are available: the TH3102 is sensitive to infrared energy from 8 to 13 microns, has a resolution of 0.1 °C and operates from -50 to 200 °C; the TH3104 is sensitive to 3 to 5.3- μ m radiation, has a resolution of 0.3 °C and operates from 0 to 300 °C; and the high-temperature TH3114 is sensitive to radiation from 3 to 5.3 microns, has 0.3 °C resolution and operates from 290 to 2000°C. Options include filters for special applications and a hard disk that can store up to 5000 images. The systems are intended for research, quality control, energy efficiency studies and performance evaluation of printed circuits. *Mikron Instrument, 445 West Main Street, Wyckoff, New Jersey 07481*

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Miniature Cryogenic Scanning Tunneling Microscope

Topac Scientific Instruments has made available the Minicryo STM, a scanning tunneling microscope that operates from 1.5 to 300 kelvins. Designed by the British firm WA Technology, the unit has a special drive motor that functions at very low temperatures. The 25-millimeter-diameter microscope is fitted to the end of

a rod inside a tube, which is then inserted into the cryostat. The device's small size allows it to be used in high magnetic fields. Depending on the piezo used, the device will



scan an area up to 8 microns in diameter. It is available as an integrated system including cryostat or in a form that can be retrofitted to flow or bath cryostats. Applications include infrared and visible spectroscopy and superconductivity studies. *Topac Scientific Instruments, 99 Derby Street, Suite 303, Hingham Massachusetts 02043*

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Atomic Force Microscope Compatible for Semiconductor Fabrication

The Dimension 7000 Autowafer atomic force microscope from Digital Instruments is designed for use in semiconductor manufacturing. The unit has cassette-to-cassette wafer handling and is said to deposit fewer than ten 300-nanometer or larger particles per pass on an eight-inch wafer, making it compatible with class-1 clean room standards. The microscope is isolated from vibration and acoustic noise and has vertical and horizontal resolutions of one angstrom and one nanometer, respectively. The Dimension 7000 supports

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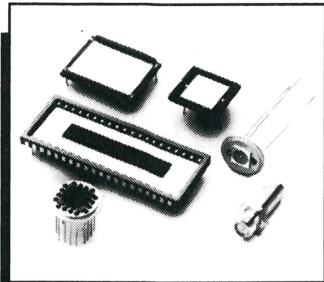
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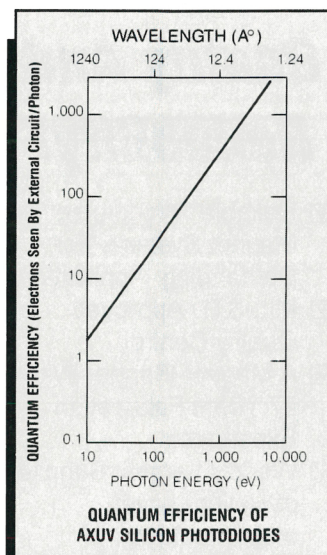
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most popular scanning probe and atomic force microscopy techniques, including electric force microscopy and the company's tapping-mode microscopy. Optional software can be used to automate scanning or facilitate pattern recognition. *Digital Instruments, 520 East Montecito Street, Santa Barbara, California 93103*

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Field-Emission-Gun-Based Environmental Scanning Electron Microscope

Electroscan's ESEM FE3030 is an environmental scanning electron microscope that combines a Model FEG-XL30 electron gun-based scanning electron microscope, manufactured by Phillips Electron Optics of The Netherlands, with a vacuum system and secondary electron detector made by Electroscan. The resulting system has a resolution of 2 nanometers, with magnifications of over 150 000× at 10 torr of gas pressure. (The presence of the gas is intended to eliminate charging on nonconductive samples.) The system is said to have good resolution with low acceleration voltages, as required for applications in semiconductor, polymer and biomedical research. *Electroscan, 66 Concord Street, Wilmington, Massachusetts 01887*

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Surface Profiler with Standard Mechanical Interface Technology

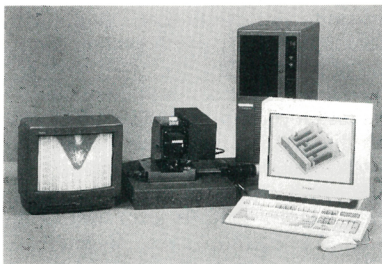
The P-30 surface profiler from Tencor Instruments combines standard mechanical interface technology with a class-1 clean-room minienvironment. The P-30 features built-in vibration isolation. The unit's advanced pattern recognition and automated substrate handler allow a full cassette of wafers to be measured without operator intervention. The measurement head exerts a force as low as 0.0005 Newtons, allowing nondestructive measurements to be made directly on product wafers, photoresists and aluminum films. The profiler measures height, roughness, waviness, radius of curvature and many other surface parameters. Control is by means of either a Windows-based graphical user interface, or an optional software package that allows remote operation and two-way communication between

the P-30 and a host computer. *Tencor Instruments, 2400 Charleston Road, Mountain View, California 94043*

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Scanning Probe Microscope for Large and Small Samples

Park Scientific Instruments's Auto-probe M5 scanning probe microscope provides 8 inches of motorized stage travel and handles samples of up to 16" × 16" × 1". The system supports most popular SPM modes and provides magnifications from 2000 to 10 000 000× with sub-angstrom resolution. Samples need not be vacuum compatible or specially coated. Closed-loop-calibration hardware for



scan control can be used to improve measurement precision. Applications include studies of polymers, biological materials and semiconductors. *Park Scientific Instruments, 1171 Borregas Avenue, Sunnyvale, California 94089*

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Scalable Image Processor with Parallel Processing

General Imaging's Megapipe scalable image processor can execute up to 30 billion operations per second in a single platform with a sustained input-output bandwidth of 4 gigabytes per second. Megapipe can run several synchronous or asynchronous applications in parallel. The processor consists of an active motherboard-backplane that connects the system's processing elements; daughter cards that serve as processing elements and connections to the outside world or host platform; and an object-oriented programming environment that supports heterogeneous multiprocessing, libraries of signal and image processing functions and visualization routines. Programming is accomplished by means of a "drag-and-drop" graphical user interface. The daughter

cards include C80 16-megabyte processing cards with look-up tables, a dual-channel acquisition card and a real-time display card. Future daughter cards will include programmable digital signal processors, bridging modules and dedicated pipeline processors. Applications include remote sensing, defense, medicine and machine vision. *General Imaging, 6 Fortune Drive, Manning Park, Billerica, Massachusetts 01821*

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Compact, Inexpensive CCD Computer Cameras

Electrim has added three new cameras to its EDC-1000 series of monochrome and color charge-coupled device cameras, which are designed to be economical alternatives to the combination of a video camera and frame-grabber board. The cameras use full-frame or frame-transfer CCD detectors and, when fitted with a lens, they can transfer image data to a computer. Each camera has an 8-bit-per-pixel gray scale, 50–70% quantum efficiency and exposure times as low as 1 millisecond.

The EDC-1000M is a medium-resolution camera (324 × 484 pixels) with an rms noise level of 60 electrons. It retails for \$550. The EDC-1000L has 753 × 484-pixel resolution, a noise level of 35 electrons, and it retails for \$800. The EDC-1000D has the same noise and resolution as that of the EDC-1000L, but also has 24-bit color image acquisition. It retails for \$900. Among the suggested applications are microscopy, astronomy, machine vision, pattern recognition, telecommunications, image databases and education. *Electrim, 356 Wall Street, Princeton, New Jersey 08540*

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Scanning Electron Microscope for Critical Dimension Measurements

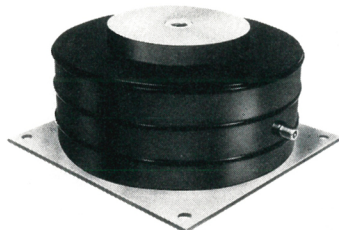
Hitachi's S-7280H scanning electron microscope is intended for studying features smaller than 20 microns in ultra-large-scale integration wafer processing. The microscope has a computer-controlled five-axis eucentric stage that allows 200-mm samples to be examined at different positions and at any rotational and tilt angle. The unit includes a

bulkhead-mountable, clean-room compatible system and a random-access, cassette-to-cassette autoloader for testing randomly selected wafers. The S-7280H super-conical objective lens permits 5-nanometer resolution of surface features at 1 kilovolt. Optional features include a cross-section holder, mask holder, 6-inch wafer holder and defect review capability, which allows low-voltage imaging of defects for archiving. *Nissei Sangyo America, 755 Ravendale Drive, Mountain View, California 94043*

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Vibration Control Systems with Pneumatic Isolation

Newport is offering three additional pneumatic isolation systems manufactured by Barry Controls: The VIP is an active electro-pneumatic system that controls the height and damping of pneumatic vibration isolation systems for high-speed coordinate-measuring machines and other sensitive apparatus. The system has a leveling accuracy of ± 5 micrometers and settles out most vibrations in less than a second. It features automatic overtravel protection, status-indicator lights and digital readouts for height and adjustments. Electro-Damp consists of four active isolators and an electronic controller.



It offers electronic servo-controlled vibration control with six degrees of freedom. The system has a resonant transmissibility of less than 1.1, resonant frequency of 0.4 hertz, peak active force output of 20 pounds per isolator (5 pounds continuous) and vibration settling time of less than 20 milliseconds. The Stabl-Levl Mount is a low-frequency, low-profile elastomeric pneumatic spring mount that protects against vibration, shock and noise. The mount has a horizontal-to-vertical stiffness ratio of 1:1 and is said to be free from frequency surge or hysteresis. *Newport, 1791 Deere Avenue, Irvine, California 92714*

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