A summary of new products and services for materials research...

Resistivity Meters: Advanced equations using a four-point probe technique have been incorporated into the MPC Loresta line of resistivity meters sold and serviced by Optical Associates. Users can get accurate values for both surface and volume resistivity for a wide range of materials, including semiconductors. The successfully expanded equations calculate the resistivity correction factor, allowing users to separate the materials' inherent resistivity from dimensional factors affecting resistivity so that resistivity distribution across a material can be easily measured and mapped. Resistivity measurements can be made on thin films, very small samples, specialty materials such as graphite or ceramics, and large samples.
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Controller for Up to Four Valves: Tylan General's AC-14 valve controller for use with the AC-4 AdapTorr adaptive pressure controller drives up to four valves from one controller. This new option eliminates the need and expense of multiple controllers on large vacuum systems that use two to four valves. Because only one controller is used, the AC-14 solves the problem of two or more controllers competing on a system and gives an analog read-out of the valve position for each valve. "Adaptive" pressure control using the AdapTorr controller continuously and automatically readjusts its control characteristics. The adaptive controller solves classic problems such as overshoot, continuous oscillation, and sluggish response.
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CO_2 Laser: SYNRAD's POLY-LASE™ Series 22 is based on closely spaced array technology within a single optical cavity and outputs a full 12 watts of power. The rf-excited, water-cooled head is 7.5 in. long and weighs only 9 oz. POLY-LASE™ is ideal for applications requiring mechanical movement of the laser source or design of hand-held devices.
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Non-Contacting Strain Measurements: Instron's Non-Contacting Video Extensometer avoids specimen and extensometer damage and accommodates high-temperature applications for low modulus polymers, films, high-temperature plastics, elastomers, and specimens that are susceptible to damage by physical contact. The instrument performs strain measurements with a resolution of 10 microns with 0.5% accuracy and has a selectable field of view ranging from 50 to 500 mm. A variable field of view accommodates different materials, including high-travel and high-resolution applications. The extensometer works in ambient lighting and is unaffected by surrounding reflected lighting. Automatic intensity control optimizes the image for the best measuring contrast, and a display allows for easy monitoring setup and aiming. The instrument also works in temperature chambers where high- and low-temperature tests can be safely monitored through the extensometer's cabinet window.
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Plasma Sources: ES-RF plasma sources from Prototech Research can obtain plasma densities of 10^{12} with no dc magnetic field in the plasma volume. The unique coupling limits the plasma volume to the plasma chamber. The power-coupling concepts produce very little dc or rf voltage on the plasma, making the plasma density and bias energy independent variables. Various models can operate from $10e^{-4}$ to 50 torr and couple powers from 50 watts to 25 kilowatts into the plasma. The units are available in diameters from 2 to 14 in., and plasma chambers are compatible with most gases. Applications include MBE sources of ion, metastable or atomic species, as well as RIE etching, stripping, precleaning, and PECVD processes.
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Portable High-Resolution Infrared Camera: Amber Engineering's RADIANCE I may be used in a wide range of applications including surveillance, predicted maintenance, process control, and materials evaluation. The camera's 256 x 256 indium antimonide staring focal plane array provides sensitivity from 1 to 5.5 μm, and images are acquired at 60 frames per second. The compact RADIANCE I weighs less than five pounds, and its rugged design allows convenient operation in the field and in industrial environments. The camera features a self-contained, Sterling closed-cycle cooler and operates from any standard 12-volt power supply. It is simple to use; power, calibration, contrast, and brightness are the only operator controls. An optional internal calibration system is also available for automatic normalization of the detectors. Images can be output in formats such as RS-170, RGB, PAL, and NTSC. Lenses range from 25 to 200 mm, and a built-in viewfinder and motor-driven focus lens are optional. The RADIANCE I includes extensive support for direct computer or DSP interface.
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Materials Characterization Services: Charles Evans & Associates' full-service analytical laboratory offers high-resolution field emission SEM and TEM imaging of specific device structures in cross section. Other capabilities include determination of impurities in bulk samples at trace levels, and determination of impurities or intentional dopants in thin films and semiconductors. Lateral imaging for determination of impurity distributions, measurement of thin film thicknesses and compositions, and identification of surface impurities are also available, as well as corrosion identification and characterization of powders, particles, and catalysts.
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Micron-Sized Spherical Silica Powders: High-purity spherical silica powders from GELTECH are particle size standards for scientific and industrial laboratories for calibrating and standardizing particle measurement systems. The powders, also useful in quality control programs for the biomedical and materials sciences fields, are highly uniform, pure amorphous silica made via a proprietary sol-gel process. They are available in diameters of 0.5, 1.0, and 1.5 microns at densities of 1.7 and 2.2 g/cc with narrow diameter distribution. Refractive index at 589.6 nm is 1.39 for 1.7 g/cc standards and 1.46 for 2.2 g/cc standards. They are packaged dry and sold in one-gram and five-gram units. These standards have excellent chemical and thermal stability and can be used in organic solvents and aqueous solutions over a broad range of pH. Other applications include light diffusers and spacers for flat panel displays, including LCDs.
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Mini Rotary Linear Vacuum Feedthrough: Compact design of Huntington Laboratories' VF-187 mini rotary linear feedthrough makes it applicable for numerous vacuum systems in which space is at a premium. Originally developed for use in scanning tunneling microscopes, the device provides high torque in a small UHV-compatible envelope. It delivers a torque of 175 ounce-inches in a housing measuring 4.83 in. retracted and 5.83 in. at full linear extension. It also provides 1 deg vernier resolution and 0.001 in. linear resolution. The VF-187 allows axial forces of up to 25 lb and side loads of up to 10 lb. It is constructed of Type 304 stainless steel with a standard 1.33 in. Vac-U-Flat flange mounting. An optional 2.75 in. mounting is also available.
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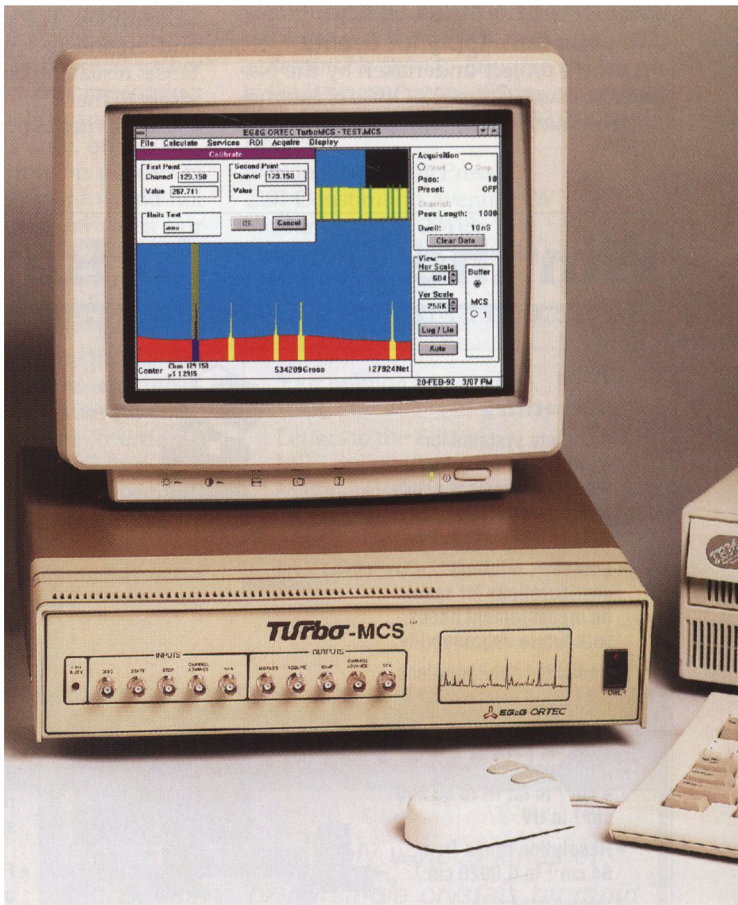
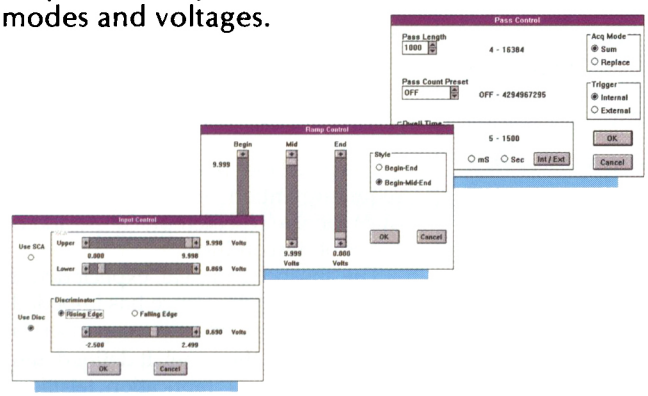
Multichannel Scaling at Warp Speed

Turbo-MCS™ transforms your PC into the world's fastest multichannel scaler, voraciously acquiring data at 150 MHz. You are in total command with powerful on-screen displays and control panels . . . all at the squeak of a mouse.



Incredibly, **Turbo-MCS** offers channel dwell times as short as 5 ns, with **no** deadtime between channels, **no** lost counts, and **no** double counting when advancing from channel to channel. **Turbo-MCS** is more than a match for the toughest multichannel-scaling applications. Its premier performance also offers a powerful solution for multiple-stop time-of-flight measurements.

Turbo-MCS offers outstanding flexibility . . . let the experiment trigger the scan, or ask **Turbo-MCS** to trigger your experiment. Select discriminator thresholds from −2.5 V to +2.5 V to count pulses of either polarity, or choose a narrow band of pulse amplitudes via the single-channel analyzer. Pick a scan length from 4 to 16,384 channels and a channel dwell time from 5 ns to 65,535 s. You can also opt for a ramp output with adjustable modes and voltages.



Applications Include:

- Time-of-Flight Ion Mass Spectrometry
- Time-Correlated Single-Photon Counting
- Laser-Induced Chemical Reactions
- Fluorescence Lifetime Measurements
- Mössbauer Experiments
- Neutron Time of Flight
- Scanning X-ray Diffractometers
- Cross-Correlation Measurements

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