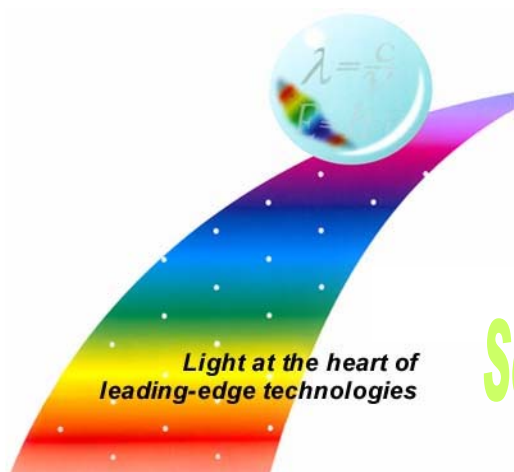


GMP INFO



Solutions for analytics and quality control

Summary:

1. **Make a Movie of Your Melting Point**
2. **Ar-laser for confocal microscopes**
3. **Nanogram balance for sub-monolayers**
4. **Photon counting applications**
5. **25 years of polarization solutions**
6. **Boost sensitivity with PEM**
7. **Optical Tweezer System**
8. **No vibrations allowed!**
9. **337 nm Nitrogen Laser**

1. Make a Movie of your Melting Point

OptiMelt provides a fast and accurate means of automatically determining the melting points and melting ranges of chemical substances. **Up to three samples can be analyzed simultaneously.** A wide observation window, with an illuminated magnification lens, allows users to observe the samples at all times. A small aluminum heating block is kept under tight computer temperature control, providing extremely linear temperature ramping. A precision Pt RTD sensor provides fast and accurate temperature readings **from room temperature to 400 °C, with 0.1 °C resolution.**

Automated Measurements

OptiMelt is specifically designed **for unattended operation.** It has a built-

In digital camera that continuously captures realtime images of the samples, and it uses digital image processing to determine results. The **melting points and melting ranges are prominently displayed on the front panel and automatically recorded into memory** for later review. OptiMelt provides a dramatic improvement over instruments that rely on

optical absorption or reflection techniques. OptiMelt's **high-resolution camera can easily detect minute changes** in the optical characteristics of the samples, eliminating the need for an operator to be present.

♦ **Completely automated operation**

♦ **Digital movie of each melt**

♦ **Conforms to Pharmacopela and GLP**

♦ PID-controlled temperature ramping

♦ Stand-alone operation and computer control (USB)

♦ Printer output



2. Ar-laser for Confocal Microscopes

The model Reliant 150 Select is the laser of choice as exciting source for RAMAN spectroscopy. The generated wavelengths are **514, 488** and (as option) **457 nm** and can be switched simply by the push of a button. Main user benefits are:

♦ **Ultra Compact** Integrated head and power supply allow for a single piece laser system.

♦ **High Power** Highest power available in air cooled lasers.

♦ **No Setup** Just plug it in and it's ready.

♦ **No Water** Completely air cooled, doesn't require water.

♦ **Lightweight** Whole systems as light as 6 Kg. (15Lbs.)

♦ **Single Phase power** All Reliant

lasers operate from standard household electricity.

♦ **Extremely Rugged** Won't go out of alignment during shipping or use, and there's no glass to break!

♦ **Zero Maintenance** Internal mirror design eliminates any need for cleaning.

♦ **Great Reliability** Hysteresis type switching power supply even withstands short circuits!



3. Nanogram Balance for Submonolayers

The QCM100 and QCM200 are accurate quartz crystal microbalance systems designed for **real-time mass and viscosity measurements** in processes occurring at or near surfaces, or within thin films.

The QCM series measure the resonant frequency and resistance of an AT-cut quartz crystal. The resonant frequency changes as a linear function of the mass of material deposited on the crystal surface. The resistance at resonance changes with the viscoelasticity of the material (film or liquid) in contact with the crystal's face.

As a gravimetric instrument, the QCM100 or QCM200 can measure mass ranging **from micrograms to fractions of a nanogram**, with detection limits **corresponding to submonolayers of atoms**. Measurement of resistance provides the opportunity to **examine the viscosity and elasticity of films and liquids** at or near the crystal surface. This makes it feasible to **observe conformational changes such as phase transitions, swelling and cross-linking, in real time**. The electronics are specifically designed to handle heavy loads (up to 5 k Ω) making

these instruments ideal for studies involving lossy films and highly viscous liquids.

- Frequency and resistance display (QCM200)
- Analog output for potentiostats
- Reads highly loaded crystals (up to 5 k Ω)
- Transformer-isolated crystal for EQCM measurements
- Simple shunt-capacitance cancellation
- No network/impedance analysis necessary



4. Photon Counting Applications

Photon counting applications have had **decisive impact on a wide range of fields**, from astronomy and metallurgy to environmental protection, health diagnostics, medical analysis and imaging, and – **perhaps most spectacularly – biomedical research**.

For example, much of the recent dramatic progress in genomics has been made possible by microarray technology, which depends on the ability to detect reactions between reagents and thousands of DNA strands dis-

tributed across a microarray slide. Scientists use fluorescence detection techniques to achieve this, and they often **detect fluorescence by counting photons**. **Photon counting has played an essential role in mapping the human genome**.

Single Photon Counting Modules (SPCMs) – A SPCM counts photons with an avalanche photodiode (APD). An APD is a solid-state, silicon-based device that converts photons into electrons in a dramatically different way than an ordinary photodiode. In

ordinary photodiodes, the photon/electron ratio is one to one. APDs, however, operate with an internal gain, which multiplies the number of electrons per photon – e.g. 1 to 100, 1 to 1000, etc. These electrons generate still more electrons, which creates an avalanche effect that is proportional to the light's intensity. The PerkinElmer SPCM uses an APD that **is able to generate a gain of 10⁸**. **Operation in this non-linear, photon-counting mode is extremely fast, allowing users to count a photon every 50 nanoseconds**.

5. 25 Years of Polarization Solutions

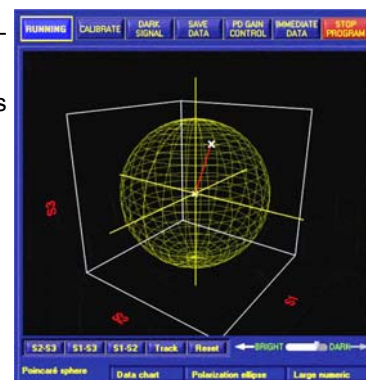
From top university labs to some of the world's most sophisticated manufacturers, Meadowlark is known and respected for producing the highest quality optical components and instrumentation for polarization measurement and control.

- Polarizers and Retarders
- Liquid Crystal Variable Retarders, Attenuators, and

Polarization Rotators

- Basic Liquid Crystal Controller
- Spatial Light Modulators and Controller.
- Polarimeters and Mounts

« *highest quality in polarization measurement and control* »



6. Boost Sensitivity with PEM

The photoelastic modulators (PEMs) are polarization modulation devices. The PEM is typically used as the key component for generating modulated polarization states of light in an integrated instrument. PEMs have several unique features such as wide spectral range, large aperture, wide acceptance angle, and high precision phase modulation. The most important reason for using the PEM is to improve the sensitivity of a measurement.

Application Example 1: PM-IRRAS

Polarization Modulation Infrared Reflection-Absorption Spectroscopy is the differential IR absorption between the s- and p-linearly polarized light for the molecules adsorbed on a metal surface. Used in IR electrochemistry and air-water interface studies.

Application Example 2: Ellipsometry

The polarization change of a light beam is measured when it is reflected by the sample. This change in polarization is then related to the sample's properties.

Those and other applications are found in:

- ♦ Analytical chemistry,
- ♦ Reflection Difference Spectroscopy
- ♦ Müller Polarimetry
- ♦ Rheology
- ♦ Radiometry
- ♦ Interferometry
- ♦ Biochemistry
- ♦ Electrochemistry
- ♦ Material and surface characterization
- ♦ Semiconductor industry



7. Optical Tweezer System

The E3100 is a fully interlocked optical tweezer system for single-beam **trapping and manipulation of micron sized particles.**

Optical tweezers have found many applications in biophysics, biology, chemistry and physics. Measuring properties of DNA, **spectroscopy of trapped particles and cell sorting** have all been undertaken. Until now optical or laser tweezers have been used in optical laboratories or on complex microscopes. We can provide this new optical tweezer to biochemistry laboratories, chemistry laboratories and the classroom with a **turnkey**

system requiring little laser knowledge.

Commercially available systems have been based around expensive research microscopes with complex motorised stages and software control. Whilst these systems work well they come at a price. Our solution can bring the same physics to biochemistry and chemistry research **at a much lower cost.** By using precision manual stages and high quality imaging optics the system can be used **to easily manipulate particles of 1 micron to sub micron accuracy.**

Dielectric spheres, biological samples and cells can all be trapped and manipulated. Both visible 685nm 40mw and 785nm 56mw are available as standard. For those applications where more power is required an external laser can be injected.

Once trapped, the **cell manipulation is carried out using conjugate beam steering optics.** Alternatively the particle can be trapped and the **whole sample moved with the precision XY stage.** **Rotation of birefringent particles can be performed with polarisation optics.**



8. No Vibrations Allowed!

As the World's Leading Designer and Manufacturer of **Standard and Custom Vibration Isolation Systems and Optical Tables**, TMC has dedicated a major part of its design and innovative efforts to the Life Sciences Industry.

♦ CleanTop™ II Steel Honeycomb **Optical Tables for laser/electro-optics** research.

♦ High Performance Vibration Isolation Lab Tables for **optical microscopes and other small,**

table-mounted instruments.

♦ Floor Platforms for **electron microscopes and other floor-mounted equipment.**

♦ Quiet Island® sub-floor platforms to **support tools in a cleanroom, raised-floor environment**

♦ TableTop™ Platforms for **optical microscopes**

♦ Stacis® Piezoelectric Active Vibration Isolation systems with

inertial feedback.

♦ A variety of active and semi-active advanced vibration isolation products specifically designed for **semiconductor lithography and metrology tools**

♦ Acoustic Enclosures and Precision Structures incorporating TMC's Proprietary Vibration and Acoustic

♦ Control Techniques.



9. NL100 . 337 nm Nitrogen Laser

The NL100 **Nitrogen Laser** is ideal for fluorescence measurements, **MALDI-TOF mass spectrometers**, and other pulsed **UV radiation experiments**. It provides 3.5 ns pulses at 337 nm (UV), with repetition rates up to 20 Hz. The pulse energy is 170 μJ , which results in a peak power of 45 kW and an average power of 3 mW.

The NL100 can be triggered internally or externally at rates up to 20 Hz. It can also provide a sync output pulse (optional) derived from the laser pulse for experiments or systems where sub-nanosecond accuracy is critical. The user also has the option of

running the laser system in command charge mode.

The NL100 uses a replaceable, sealed laser cartridge which includes the high voltage storage capacitors, switching element, and laser tube. The cartridge is warranted to maintain at least 70 % of its energy for twenty million pulses or two years, whichever occurs first.

No mirror alignment is ever necessary in the NL100, as the laser optics are mounted on the plasma tube and aligned at the factory. The NL100 also includes all safety features necessary to comply with the U.S. laser safety stan-

dards contained in 21 CFR 1040.10.

Specifications

- 337 nm wavelength
- 170 μJ pulse energy
- Internal or external triggering to 20 Hz
- Replaceable laser cartridge
- No mirror alignment necessary



NEW



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GMP : The one stop photonic shop!

Find us on the Web:

www.gmp.ch

As early as 1977, Jean-Jacques Goy was among Switzerland's early laser pioneers when he founded GMP SA, designed to be an active interface between manufacturers and users of high-tech systems and instruments. The relations he established with the world's leading manufacturers helped him obtain the exclusivity for their avant-garde systems. GMP soon ranked first in its field on the Swiss market. The Company began to supply the research laboratories of Switzerland's Federal Institutes of Technology, joined in the development of research centers operated by major industrial groups and set out to serve hospitals, clinics and doctor's practices.

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