solution science

# Elliot Scientific

for research and industry

# 2014 Newsletters

# Company Profile

Elliot Scientific is a major supplier of Opto-Mechanic components and systems under the Elliot|Martock and Elliot Scientific brands to the Scientific, Research and Industrial communities. In addition, we supply world-class Laser, Cryogenic, Magnetic, Telecom and Datacom systems sourced from many British, North American, European and Far Eastern companies.

Elliot Scientific is uniquely positioned to assist customers by being able to:

- Supply competitive components and systems
- Source, integrate and manufacture complex systems
- Design and manufacture for Custom or OEM requirements

## Elliot|Martock

Martock Design became a wholly owned subsidiary of Elliot Scientific in 2003 following thirty years at the forefront of design, development and manufacture of high quality precision instruments and equipment. That tradition continues today as we continually strive to improve and expand the ranges of Elliot|Martock and Elliot Scientific own brand products.

These include our award winning optical tweezer systems, the lab essentials mirror mount range, fibre positioning components, waveguide manipulators, automated alignment systems, micropositioners and other class-leading products.

All of our customers - from academic institutions and government agencies through to commercial researchers and industry - are provided with the highest levels of service backed up by solid technical support from our team of experienced engineers.

## Solution Science for Research and Industry

We pride ourselves in offering Solution Science for Research and Industry. We employ the best-qualified staff and scientists to help you sift through the multitude of options available to get the equipment and systems that match your needs. That's ***Solution Science***.

## Staff

We employ PhD level physicists, scientists and mechanical design engineers to assist you with your product search or application, and to ensure that our advice is correct and balanced. Many of the team have been with us for over ten years, bringing with them a huge amount of experience for you to tap into.

## Quality

We have been BS EN ISO 9002 registered since 1993 and BS EN ISO 9001 registered since 2003. We understand the need for continual improvement in services and traceability, both in distribution and manufacture. Our commitment to this ensures our standards are the highest in our industry.

## Catalogue & Custom Manufacturing

This catalogue only gives an overview of our extensive range. If you cannot find what you are looking for here, why not phone, fax or e-mail us. Many products have been supplied that started as ideas and concepts requested by customers requiring tailored manipulation systems. With our innovative design experience, we can offer unique solutions in opto-mechanical positioning and control systems. We are here to help you find the right products to meet your requirements.


## Elliot Scientific Limited

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**January 2014**

## Ultra-compact high-performance MatchBox™ series lasers from Integrated Optics

The MatchBox™ series of CW Micro Lasers manufactured by **Integrated Optics UAB** is a new range of very compact lasers introduced by Elliot Scientific for applications in chemistry and biophotonics, in particular Raman spectroscopy and fluorescence imaging.

The MatchBox™ series includes both DPSS and diode lasers with a wide range of output wavelengths - **from 405 nm to 1342 nm** - with either free space or fibre coupled outputs.

With a small, robust and easy to integrate form factor, which is enabled by the monolithic design and semi-automated precision assembly process, the MatchBox™ series has the best power/size/price ratio in the market for research-grade lasers in its class.

- **Over 25 wavelengths**
- **Optional SLM models**
- **Ultra-low optical noise**
- **> 50 mW output powers**
- **Sealed laser head**
- **Very compact size**
- **Optional fibre coupling**
- **Prices start at < £1,000**

For pricing, availability, and technical specifications of these lasers and details of **special SERS and SEF substrates** for enhancing Raman and fluorescence spectroscopy, please **contact us**.

## Photodigm's Mercury puts big features in a small laser diode package

Mercury with 2" flex cable

Mercury mounted for testing

**Photodigm** has redefined the definition of *high power* in single frequency spectroscopic laser diodes by utilising advances in epitaxial design and wafer fabrication, allowing users to immediately notice lower threshold and higher slope efficiencies when compared to earlier generations.

To accommodate these higher powers, Photodigm has developed the Mercury package to overcome the limitations of the commonly used 1950's designed TO-3 mount. Mercury offers many advantages:

- Small volume, only 9.2 x 5.5 x 5.4 mm
- Capacity to handle up to 1 W of laser power
- Low thermal mass for rapid wavelength tuning
- Flex cable breakout of electrical connections
- Test mount for laboratory use (see photo)
- Built-in Peltier and thermistor for rapid closed-loop feedback temperature control

Laser wavelengths currently available in the Mercury package are **780 nm**, **785 nm**, and **852 nm**, with up to 280 mW of laser power in a diffraction-limited single lateral- and longitudinal-mode free-space beam. Other, lower power, wavelengths are available in the standard Photodigm package.

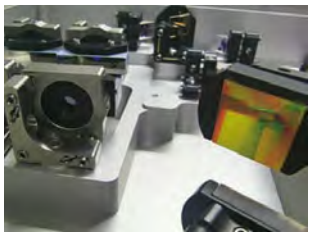
For the specifications of these or other products Photodigm offer, **contact us** now

## Next month: Photonics West

**Photonics West** is said to be the most influential conference and exhibition for biophotonics and biomedical optics, high-power laser manufacturing, optoelectronics, microfabrication, and green photonics in the world. With 1,300 exhibitors and an expected 20,000 visitors, it's going to be a busy show.

Elliot Scientific will be exhibiting in **Booth 4827**, from 4th to the 6th of February, at San Francisco's Moscone Center. If you're in the area then, come see us and say hello.

## FEMTOOPTICS™ - Ultrafast optics from FEMTOLASERS



**FEMTOLASERS** design and manufacture their own range of high performance precision optics specifically for the high-speed laser community. Products include:

**Enhanced Ag mirrors**

- Special reflectance enhancing dielectric multilayer overcoating
- High reflectance and low GDD over approximately one optical octave
- Distortion free manipulation of few cycle pulses

**Dielectric beam splitters**

- Constant splitting ratio over a large spectral bandwidth
- Minimum GDD upon both reflection and transmission
- Compatible with sub-7 fs pulses
- p-polarised and s-polarised versions

**Ultra broadband achromatic waveplates**

- Wavelength-independent performance over a large bandwidth
- Small GDD upon transmission
- High throughput

**Download the FEMTOOPTICS™ catalogue**, or **contact us** for more information.

## New EXFO catalogue available now


**EXFO** has released a new catalogue covering their entire range of products for the fibre-based telecom engineer. Equipment for network engineers and R&D/ Manufacturing is covered but, as Elliot Scientific only specialises in the latter, we have made available a special abbreviated version for **download** from our EXFO product pages. Examples of the test equipment covered include:

**IQS Series**

- Light Sources
- WDM & Tunable Laser Sources
- Variable Attenuator
- Optical Spectrum Analyser
- Standard & MEMS Optical Switches

**PSO Series**

- Optical Modulation Analyser
- Optical Sampling Oscilloscope

**Handheld & Benchtop Systems**

- Power Meters
- Variable Attenuators
- Laser & Light Sources
- OTDR

**Contact us** now for more details.

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**February 2014**

## Special prices on laser mirrors and waveplates - Only while UK stocks last

**Spectral Optics** manufactures a broad range of quality standard sized laser mirrors covering all common applications. Elliot Scientific holds a limited stock of these available for a **next working day delivery** in the UK.

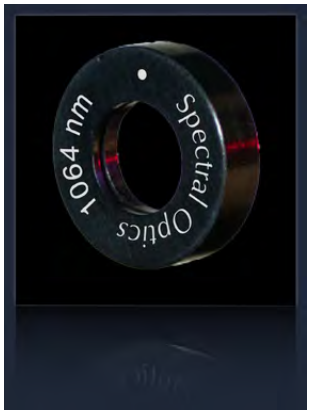
With new parts due in the Spring, we are making our existing stock available at special prices, but only while stocks last. As we go to press, the stock comprises:

### High Power Mirrors only £85

| Wavelength (nm) | Incidence | Size | Part Number |
|---|---|---|---|
| 355 | 0° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-355 |
| 355 | 45° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-355/45 |
| 532 | 0° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-532 |
| 532 | 45° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-532/45 |
| 1064 | 0° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-1064 |
| 1064 | 45° | 1" x 0.375" | MP-1.00-0.37-LM-BK7-1064/45 |

SPECTRAL OPTICS
a division of Spectral Products LLC

Half- and quarter-waveplates suitable for high power lasers at 532 nm and 1064 nm wavelengths, plus waveplates for medium power applications at 633 nm, are also on sale.




### High Power Zero-Order M-F* Bonded & Mounted only £304

| Wavelength (nm) | Type | Size | Part Number |
|---|---|---|---|
| 532 | ¼-wave | 0.5" | WVPZF-Q-0.50-V1-V1-M-532 |
| 532 | ½-wave | 0.5" | WVPZF-H-0.50-V1-V1-M-532 |
| 1064 | ¼-wave | 0.5" | WVPZF-Q-0.50-V1-V1-M-1064 |
| 1064 | ½-wave | 0.5" | WVPZF-H-0.50-V1-V1-M-1064 |

### Medium Power Zero-Order Cemented & Mounted only £221

| Wavelength | Type | Size | Part Number |
|---|---|---|---|
| 633 | ¼-wave | 0.5" | WVPZ-P-0.50-V1-V1-M-633 |
| 633 | ½-wave | 0.5" | WVPZ-H-0.50-V1-V1-M-633 |

For up to date stock availability on these, or specifications of other products that Spectral Optics offer, **contact us now**.

** M-F=Molecular Fusion™*

## Modern laser eyewear is not inconvenient or uncomfortable... Just ask Elliot Scientific

Direct and indirect exposure to laser energy will affect the eyes. Depending on the context, this can be temporary - vision disruption that lasts from a few seconds to a couple of hours - or a painful injury that becomes a lifelong permanent disability.

Elliot Scientific offers a **broad choice** of CE approved protective filters, spectacles, and googles from leading manufacturers for use with a variety laser light sources that are found in research and manufacturing.

We are also able to protect pilots and law enforcement officers from the glare of laser pointers, and we supply eyeshields - both reusable and disposable - for patient use in medical and aesthetic clinics.

To discuss the best eye protection for your application, please **contact us now** for advice.

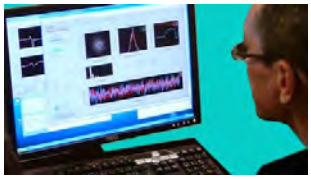
## Next month: 78th Annual Meeting of the Deutsche Physikalische Gesellschaft (German Physical Society)


Elliot Scientific will be joining our German distributor Mountain Photonics GmbH at the 78th Annual Meeting of the DPG - Deutsche Physikalische Gesellschaft - in Berlin. We will be demonstrating our Elliot|Martock range of Flexure Stages, precision miniature slides, and accessories.

The event takes place over three days, from the 18th to the 20th March at Berlin's Humboldt University. The exhibition section of the conference will also feature **mechOnics**, **Nufern** and **FEMTOLASERS Produktions**.

Location: **Humboldt-Universität zu Berlin, Unter den Linden 6, 10117 Berlin**

## Global appetite for Optical Tweezers fulfilled by Elliot Scientific



**Elliot Scientific Optical Tweezers** have proven to be a popular choice of research instrument for trapping experiments by scientists around the world.

2013 ended with our Tweezers engineering team having travelled in excess of 100,000 miles to demonstrate or install systems in far-flung places, and the 2014 diary is already starting to fill with travel dates.

Optical Tweezers are an invaluable tool for measuring and exerting forces in the microscopic world. The picoNewton forces that light can exert on minuscule particles have empowered scientists, particularly those in biomedicine, enabling them to perform important studies on single molecules, cells and colloids without inflicting damage.

Elliot Scientific offers the most comprehensive range of optical tweezers available:

- Component based “open architecture” systems
- Self-contained portable, desktop single beam workstations
- Single spot optical tweezers for integration with commercial microscopes
- Multiple spot optical tweezers under full PC control integrated with commercial microscopes
- Force Measurement accessory for single trap stiffness using a Quadrant Photodetector
- Force Measurement accessory for multi-trap stiffness & particle tracking using CPT technology

**Demonstration videos** and **application notes** can be viewed ordownloaded, but for pricing and specifications of **Elliot Scientific Optical Tweezers**, please **contact us**. Custom systems are our speciality.

## Fibre-optic temperature measurement system is immune to RF and microwave interference

Sensor immunity to electromagnetic interference and harsh environments makes the **Neoptix™ Reflex™** ideal in many manufacturing, power generation, and research applications where multi-channel temperature measurement is required.

With its 4-channel capability, the fibre optic system based on proven GaAs technology ensures several 'hot spots' can be measured simultaneously. This allows for better temperature mapping on industrial processes or scientific experiments.

Designed to meet both rugged industrial and delicate laboratory requirements, the technology is very advantageous when compared to traditional sensors. The fibre optic temperature sensors used are non-conductive and therefore inherently immune to electrical interference.

The standard Reflex™ measures over a temperature range of -80 to 250 °C with a resolution of 0.1 °C. If you have an application that requires a lower starting point, or a higher end point, then do let us know as other calibrated temperature ranges can be supplied. A choice of outputs can feed signals to recording devices or other instruments if necessary.

For more about Reflex™ or other products from **Neoptix™**, please **contact us**.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**March 2014**

## 508 TPI - Astounding new screw pitch from Kozak Micro

**508 TPI**

The world's first commercially available **508 TPI (0.05 mm pitch)** ultra-fine adjustment screw sets are now available in the UK and Ireland through Elliot Scientific.

Proprietary manufacturing on a variety of customised machine tools enables **Kozak Micro** to produce adjusters in a range of pitches that are superior to industry standards. Thread classes exceed the highest 3A-3B Unified Thread Standard (UTS) by as much as 50%.

Elliot Scientific offers 6 imperial and 4 metric thread pitch ranges of matched-set micropositioning adjustment screws and unbraked bushings that deliver the highest precision and smoothest movement by far for the most demanding of OEM applications.

**Contact us now** for more information.

## FEMTOLASERS selected for prestigious project


**FEMTOLASERS** has been awarded a significant contract to develop and build the "front-end" source to generate ultrafast, high stability, ultra-low noise pulses for the prestigous pan-European High Repetition-Rate Advanced Petawatt Laser System in the Czech Republic. The systems they will be supplying are:

- **INTEGRAL™ element™ PRO 500** ultrashort pulse seed oscillator
- **FEMTOPOWER™ compact™ PRO** first stage multipass amplifier
- **FEMTOPOWER™ V** booster amplification stage
- **FEMTOOPTICS**: temporal pulse cleaning, spectral amplitude and phase shaping

HAPLS is being assembled by Lawrence Livermore National Laboratory (LLNL) for the ELI-Beamlines facility in Prague. This new facility will deliver pulses lasting less than 30 femtoseconds at a repetition rate of 10 Hz, with peak powers greater than one Petawatt.

FEMTOLASERS was selected by LLNL and the ELI-Beamlines team as only they could fulfil the technical requirements and meet the strict timescales required for construction of the facility.

HAPLS is being designed to significantly advance the state-of-the-art for high power lasers, allowing international scientific research in areas as diverse as medical imaging, particle acceleration, biophysics, chemistry, and quantum physics.

For more about FEMTOLASERS products, **contact us** now.

## Lake Shore 8501 THz Characterisation System and New Measurement Catalogues available now

The new **Lake Shore Model 8501 THz System** is the first affordable, integrated, convenient solution specifically tailored for characterisation of research-scale electronic and magnetic materials. It enables fully automated high-resolution THz spectroscopic characterisation of electronic, magnetic, and chemical samples over a wide range of frequencies, temperatures, and magnetic fields, yielding detailed profiles of material responses.

Researchers interested in measuring spin materials can opt for an additional cryostat insert with opposite helicity THz emitter and detector to expand the instruments' capabilities.

In addition, Lake Shore have also released two new catalogues for their ***Temperature Measurement & Control*** and ***Magnetic Measurement & Control*** ranges.

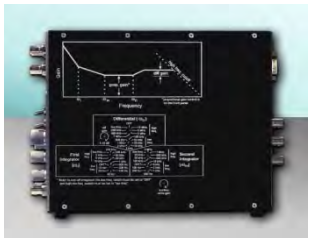
Please **contact us** for us for printed copies of the catalogues, or for more information about the THz system.

## Vescent D2-125 Reconfigurable Servo Loop Laser Controller

The D2-125 laser servo from **Vescent Photonics** is designed for low-noise servo control of lasers and other experimental systems. It incorporates a $PI^2D$ loop filter, with two-stage integral feedback, that provides tight locking to cavities and atomic/molecular transitions.

The reconfigurable $PI^2D$ Loop Parameters enable full user-control, giving servo-loop optimisation for a wide variety of systems such as: acousto and electro-optic actuators, voice coils, piezo actuators, and so on.

- Both PZT & Laser Current Feedback
- Double Integrators For Tight Locking
- Peak Lock Option
- Smooth Lockup
- Frequency Jumping and Lockup via Computer Control
- Internal Ramp Generator
- High Bandwidth (10 MHz)
- Reconfigurable $PI^2D$ Loop Parameters



Other modules from Vescent Photonics include:

- **D2-105 Laser Controller**
  - Lowest noise current source commercially available
- **D2-135 Offset Phase Lock Servo**
  - Offset Phase Locks up to 10 GHz
  - Extremely tight phase lock between the master and the slave
- **D2-100-DBR Laser Module**
  - Highly Vibration Insensitive: No Moving Parts or Piezos
  - 40 GHz Mode Hop-Free Tuning via High Bandwidth Injection Current

To learn more about how these products advance science, **contact us now**.

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## Next month: analytica 2014 in Munich, and SU2P in Glasgow

For four decades, **analytica** has been the leading international fair for state-of-the-art laboratory technology and pioneering biotechnology. No other trade fair in the world covers the range of subjects related to the laboratory in industry and science in such breadth and depth, and on such a scale.

Elliot Scientific will be demonstrating our **Optical Tweezers** system in **Booth 240**, alongside our German distributor Mountain Photonics, which can be found in **Hall A2**. We will also be showing our range of **precision mechanics**, from ultra-small slides to our world-renowned high-resolution Flexure Stages.

The event takes place from the **1st to the 4th of April at Messe Munchen**.

At the end of the month, Elliot Scientific will be at the **Fifth Annual SU2P Symposium**. This will be held on the **31st March and 1st April** at The University of Strathclyde. The Symposium features a small exhibition and includes a list of exceptional speakers from around the world who will present leading edge research on a wide range of photonics and related topics.

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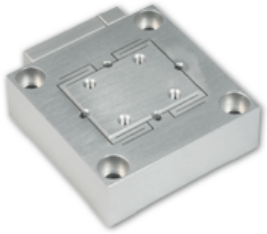
**April 2014**

## Nine New Products from Mad City Labs



**Mad City Labs** has recently introduced eight new positioning systems to their already extensive range, and launched a total internal reflection fluorescence microscopy accessory in the form of the MicroMirror TIRF.

**Nano-MET10 and Nano-MET20**
*Compact, high-speed, single axis nanopositioning systems with exceptional resonant frequency, ultra-low noise performance and picometre positioning resolution*

**Nano-MET2 and Nano-MET3**
*Ultra-low noise, high-precision, high-speed XY and XYZ nanopositioning system with picometre positioning resolution*

**Nano-HS3M**
*High-speed, compact XYZ precision nanopositioning system with < 2 pm noise on all axes and picometre positioning resolution*

**Nano-METZ**
*Compact Z-axis nanopositioning system with ultra-fast response, picometre resolution, and femtometre noise floor for demanding scanning, AFM, and metrology applications*

**MCL-MANNZ**
*Integrated inverted optical microscope micro-nanopositioning system combining micrometre driven, two axis, linear motion stage with a high resolution, Z-axis nanopositioner*

**MCL-MOTNZ**
*Ultra-stable inverted optical microscope positioning system combining stepper motor XY linear motion stage with a high resolution Z-axis nanopositioning system*

**MicroMirror TIRF - Total Internal Reflection Fluorescence Microscopy Accessory**
*An enabling technology for advanced study of complex biomolecular interactions using a proven design that offers a simple yet flexible instrument platform for single molecule research*

For the detailed specifications of these new nanopositioners, or other products from Mad City Labs, **contact us** now.

## Vescent launch new 9 GHz D2-160 Beat Note Detector


The **D2-160 high-speed detector**, from Vescent Photonics, has a full 9 GHz bandwidth for capturing beat notes between lasers of different frequencies, and covers the key wavelengths for Potassium (K: 770 nm), Rubidium (Rb: 780 & 795 nm), and Caesium (Cs: 855 nm). It can also capture fast rising edges of laser pulses for timing, triggering, and pulse synchronisation.

The D2-160 is compatible with both the Vescent D2-150 Heterodyne Module and the D2-135 Offset Phase Lock Servo. Used in combination, a true phase lock between a pair of lasers with a user-defined frequency offset can be established.

For more information about this or any other product from **Vescent Photonics**, please **contact us**.

## After Easter, we're back in Japan at OPIE 2014

OPTICS & PHOTONICS International Exhibition
OPIE '14

Elliot Scientific is demonstrating Optical Tweezers and a range of precision positioning systems – from ultra-small slides to the Elliot Gold Series XYZ Flexure Stages – in the huge **LASER EXPO Zone at OPIE'14, Yokohama**.

Organised by the Laser Society of Japan, this technology exhibition is the largest laser related tradeshow in the country, enabling researchers and industry to discover the trends in nano- and macro-laser processing, optical communications, biotechnology and nano technology.

We will be joining our Japanese distributor **Autex** in **Booth G-1.**

**The show takes place from April 23rd to 25th at the Pacifico Yokohama.**

## FEMTOOPTICS™ release Larger Aperture Achromatic Waveplates

**FEMTOLASERS** has expanded their optics range with the addition of larger aperture achromatic, air-spaced femtosecond-optimised waveplates (retardation λ/2 and λ/4). The new models have an increased free aperture of 21 mm.

- Wavelength independent performance over a large bandwidth
- Small GDD upon transmission
- High throughput

**FEMTOOPTICS™** broadband achromatic waveplates are cement free, consisting of air-separated quartz and $MgF_2$ plates. Owing to this design, the waveplates introduce minimum GDD and are also suitable for high power applications. The dispersion of each waveplate is exactly known in the range 650 nm - 950 nm and can be easily compensated for with dispersive mirrors.

Other femtosecond polarisation management optics include: Reflective phase retarders, Zero order 400 nm waveplates, and Ultra broadband thin film polarisers with outstanding bandwidth and extinction ratio. **Contact us** for more information.

## New FVA-3800 Multiport Benchtop Optical Variable Attenuator from EXFO

**EXFO** has added a new instrument to their range with the launch of a new Multiport Benchtop Optical Variable Attenuator, the **FVA-3800**. It is the ideal attenuator for BER testing and system verification in labs or demanding manufacturing environments.

The FVA-3800 is also the most compact optical variable attenuator on the market, and is capable of housing up to four attenuators per unit, making it perfect for tight spaces.

**Key Features**

- Up to four attenuators per unit
- Very fast settling time
- Polarisation-maintaining option
- Integrated power meter for accurate output power control
- Front-panel control as well as remote control via USB or Ethernet

**Applications**

- BER testing
- System loss emulation
- Coherent transmission
- Bi-directional optical sub-assembly (BOSA)

**Contact us now** for the specifications of this or details of other products EXFO offer.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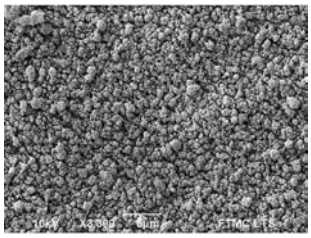
**May 2014**

## New SERS/SEF substrates significantly enhance Raman signal

The Ato ID™ ***Randa*** **Plasmonic Sensor** is designed to strengthen signals in both the visible and IR wavelength ranges for both Surface Enhanced Raman Spectroscopy (SERS) and Surface Enhanced Fluorescence (SEF).

**Features**

- Ideal for visible and IR laser wavelengths
- Significantly enhances Raman signal
- Developed for high sensitivity trace detection applications
- Coated with 99.99% silver
- Active area: 4 x 4 mm (typical)
- Overall carrier size 25 x 25 x 1 mm thick
- Compatible with use of cover slip over the active SERS area

The base substrate is soda-lime glass, which exhibits relatively weak inherent Raman scattering and so does not interfere with the sample signal. The active region comprises a pure silver coating over the proprietary nanofabricated base (patent pending).

All 'Randa' Raman substrates are vacuum sealed in a cleanroom environment for ease of handling, and the monolithic structure eliminates risk of contaminants that can arise with glued or chemically treated types.

Please **contact us** for more information.

## New DSP50 Multiphase Linear Stage from mechOnics


**mechOnics** offer an extensive range of very small (minimum footprint 15 x 15 mm) piezo-driven stepper-motor stages in single, dual and three-axis configurations. Specifications vary depending on the stage and its controller combination, but most offer low hysteresis, holding without current, superior step widths and positioning accuracy.

The newly announced DSP50 Multiphase Linear Stage brings up to 16 N blocking force over a travel range of 10 mm and an extremely uniform movement thanks to use of multiple piezo inertia drives. Movement detection is by optical sensor, enabling 1 nm precision and high repeatability at speeds of up to 1 mm/s.

Stages are available with different ranges of travel, depending on their size, and some models can be ordered for UHV and/or low temprature operation. Other systems from mechOnics include a Miniature Monomode Coupler for optical fibre, and a mirror tilting mount with up to 6° of rotational movement.

**Contact us** for details of the mechOnics range and how they can improve your application.

## Next month: Photonex Roadshows in Edinburgh and Cambridge plus CLEO:2014 in San Jose

Photonex SCOTLAND Photonics, Imaging & Light Technologies
Photonics Technology Roadshow 4th June 2014 Heriot-Watt University

CLEO:2014
Laser Science to Photonic Applications

Photonex CAMBRIDGE Photonics, Imaging & Light Technologies
Photonics Technology Roadshow 18th June 2014 Robinson College Cambridge

The **Photonex Roadshow** events start next month, beginning **June 4th in Edinburgh** at Heriot-Watt University, and then **June 18th at Robinson College, Cambridge**. The UK's top photonics technology suppliers, leading researchers, and invited speakers will come together for these very special one-day events.

In between the two Roadshows, **CLEO:2014** takes places in San Jose. From **June 10th to 12th** we will be exhibiting our wares in **Booth 2120** at the annual Conference on Lasers and Electro-Optics. Billed as the world's most prestigious technical conference in the photonics industry, CLEO has over 300 companies from around the globe showing new products and demonstrating cutting-edge innovations.

If you are attending any of these events, do drop by to say hello.

## EXFO: TKS-CAL provides in-house instrument verification, FIP-400B automates fibre inspection

**EXFO** has launched the TKS-CAL Optical Calibration Kit to provide in-house instrument verification, putting users in control of all their calibration operations.

The system enables manual calibration of power meters as well as verification of light sources, attenuators and OTDRs without causing any downtime and costly shipping. Flexible and modular, it is designed to evolve as needs change.

The **FIP-400B automated and intelligent fibre inspection solution**, has been designed by EXFO to speed up and simplify connector inspection. This intelligent test tool transforms fibre inspection into a fast and simplified one-step process providing accurate and consistent test results.

The system detects dirty and/or damaged connectors with precision, displaying a digital image of the connector with three available levels of magnification.

A wide range of adaptor tips, for both single fibre and multifibre connector inspection, make the FIP-400B ideal for use in fieldwork and the research laboratory.

For more information, please **contact us**.

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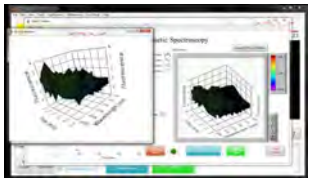
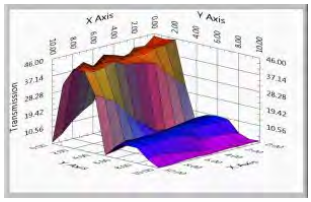
## TimePro™ Kinetic Spectroscopy and FilmPro™ Thickness Measurement introduced by CRAIC






**CRAIC Technologies** has developed software to measure time-dependent changes of microscopic samples in full UV-VIS-NIR reflectance, absorbance and emission spectra.

The new **CRAIC TimePro**™ Kinetic Spectroscopy package is designed to be used with CRAIC Technology's microspectrophotometers and their controlling Lambdafire™ software. CRAIC TimePro™ allows the user to monitor changes in the spectra over time, providing a unique and valuable tool for chemists and biological researchers.

**CRAIC FilmPro**™ is a film thickness measurement software package developed for CRAIC microspectrophotometers equipped with the Lambdafire™ software. It allows the user to rapidly measure the thickness of thin films and analyse many materials on both transparent and opaque substrates.

FilmPro™ is ideal for determining the thin film thickness on semiconductors, MEMS devices, disk drives, flat panel displays, and more. This powerful and flexible software can be used in many different fields and in everything from research to industrial settings.

Please **contact us** for more information about these products.

Elliot Scientific

Solution Science for
Research and Industry

**June 2014**

## FEMTOLASERS launch 3 new products at CLEO:EXPO 2014


Today at the **CLEO** conference and exhibition, **FEMTOLASERS** has announced three new products:

- **rainbow™2 | sub-6 fs | plug & play | CEP4**

  This new generation of ultrafast oscillators is the ultimate combination of performance and reliability, making it the ideal light source for the most demanding ultrafast applications

- **WIZZMO™ | sub-4 fs | compression & characterisation**

  The first all-in-one accurate compression and temporal characterisation system for few cycle laser pulses down to below 4 fs. The system's outstanding performance is derived from the unique integration of FEMTOLASERS MOSAIC™ OS dispersive mirror compressor and Fastlite's WIZZLER™ USP measurement system

- **FEMTOPOWER™ sub-5 fs | 0.1 TW | CEP stabilised**

  The first commercially available ultrafast laser amplifier system with CEP stabilised pulses shorter than 5 fs and offering > 0.1 TW peak power

As details of these new products have only just been announced, please **contact us** for further information to be sent to you when it is released.

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## ICE Box™: Integrated Control Electronics from Vescent Photonics

**Applications**

- Atomic Clocks
- BEC or Cold Atom Experiments
- Quantum Computing
- Cryptography Devices
- Gravity/Magnetic/Inertial Sensors

**Vescent Photonics** has introduced ICE, a compact suite of digitally controlled electronics that will precisely drive and stabilise a broad range of semiconductor lasers and associated photonics tools.

The ICE system is based on the same high-performance D2 Series electronics that have established Vescent Photonics as the leader in laser control and stabilisation. It is fully compatible with all Vescent D2 modules and can be used to drive and control a complete stabilised-laser system; overseeing frequency and temperature, offset lock DBR, DFB, or External Cavity lasers.

ICE can also control a tapered amplifier or a semiconductor optical amplifier (SOA) operating either as an amplifier or as a high-contrast non-mechanical shutter, and a liquid crystal shutter.

Each ICE control board is commanded via a USB Virtual Communication Port programmed in a language such as LabVIEW™, MATLAB™, Python, Java, *et al*. An intuitive GUI can also be used to issue commands and control the experiment or, if installed in the 'ICE Box'- a chassis that provides power and interface connections - a front-panel control is included.

For more information about this new product, or any other from **Vescent Photonics**, please **contact us**.

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## CODIXX colorPol® Xtrafine: A 25 µm thick polariser for optical communication devices

CODIXX
colorPol® polarizers

**CODIXX** has recently introduced the new colorPol® Xtrafine high performance ultra-thin polariser. With a thickness of only 25 µm, it is considerably slimmer than their previously thinnest one of 0.2 mm.

The colorPol® Xtrafine offers unique transmittance properties of greater than 88% uncoated or over 97 % with an AR layer, and contrast ratios above 1000:1 (30dB) in the NIR spectral range of 1250 to 1650 nm. This addition to the colorPol® polariser is intended for incorporation into future optical communication devices.

CODIXX developed their unique colorPol® technology of doping of sodium silicate glass with prolate silver nanoparticles in order to produce polarisers that have stability at high temperature (up to 400° C), are chemical and UV resistant, and are fully ROHS compliant.

For more details about these new polarisers or other CODIXX products, **contact us** now.

## New Model 372 AC Resistance Bridge/Temperature Controller from Lake Shore

From next month, **Lake Shore** will begin shipping their new Model 372 AC Resistance Bridge/Temperature Controller.

Designed for precise, accurate AC resistance measurements, the Model 372 has a number of improvements over the Model 370 for greater accuracy when performing temperature measurements at very low temperatures.

These improvements include the reduction of the input voltage noise figure from 33 nV/vHz down to 10 nV/vHz, the incorporation of new noise reduction features, and the reduction of the maximum DC bias current from 4 pA to 2 pA, resulting in a reduction of DC bias power to 0.4 aW (down from 1.6 aW).

The instrument's design has also been refined for ease of use. The Model 372 features a streamlined front-panel keypad interface and a customisable front display. Control, configuration, and monitoring software in also included for ease of control no matter what the application.

In addition, the back panel features Ethernet, USB, and IEEE-488.2 connectivity as well as monitor and frequency reference outputs for direct connection to external devices or equipment. (LabVIEW™ drivers are available for easy integration with external equipment and systems.)

To complement the new controller, Lake Shore are also introducing the Model 3726 scanner option designed for connecting up to 16 ultra-low temperature measurement points. With lower input noise and DC bias current, the new scanner takes full advantage of the performance improvements built into the Model 372 and offers superior performance to the previous generation.

**Contact us now** for pricing and delivery information.

**Model 372 Features**

- Superior noise rejection
- Dedicated ULT input
- Improved impedance
- Controls to below 10 mK
- 3-year warranty

**Applications**

- Optimised for dilution refrigerators
- Ultra-low impedance measurement
- Cryogenic temperature measurement and control

## Next week: The Photonex Roadshow reaches Cambridge

The Photonex Roadshow reaches **Cambridge** next week, stopping at **Robinson College on June 18th**. The UK's top photonics technology suppliers, leading researchers, and invited speakers will be coming together for this special one-day event, and we look forward to seeing you there.


Tel: +44 (0)1582 766300 | Fax: +44 (0)1582 766340 | Eml: sales@elliotscientific.com | © June 2014

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**July 2014**

## Integrated Optics add two new laser wavelengths: 445 and 488 nm


**Integrated Optics UAB** has expanded their range of MatchBox™ series CW Micro Lasers by introducing 445 nm and 488 nm models for applications in chemistry and biophotonics.

The MatchBox™ series includes both DPSS and direct diode lasers with a wide range of output wavelengths - **from 405 nm to 1342 nm** - with either free space or fibre coupled outputs.

With a small, robust and easy to integrate form factor, which is enabled by the monolithic design and semi-automated precision assembly process, the MatchBox™ series has the best power, size, and price ratio in the market, making them ideal as a research-grade laser.

- Dozens of wavelengths
- Optional SLM models
- Ultra-low optical noise
- Sealed laser head
- Very compact size
- Optional fibre coupling

For availability and technical specifications of these lasers, please **contact us**.

## The Energetiq® Next Generation LDLS™ is now available from Elliot Scientific

**Features**

- CW laser plasma
- Very high brightness
- 170 to 2100 nm
- Extra long life
- Excellent stability
- SMA fibre-coupled option - EQ-99XFC

**Energetiq** has introduced a new EQ-99X-Series of LDLS - laser-driven light sources - that benefit from ultraclean construction to give greater long-term stability and an extended operating life. In addition, the fibre-coupled EQ-99XFC LDLS features Fiber-Protection Technology™, a new technique that improves long-term deep ultraviolet output by a significant amount.

These revolutionary award-winning lamps, with focusable high brightness, broad spectral range, high stability, long life, and low cost of ownership, have set a new standard in the available illumination technologies for scientists. Typical applications are:

- HPLC & high performance spectroscopy
- Advanced imaging & microscope illumination
- Environmental analysis & monitoring
- Materials characterisation & sample testing
- Gas phase measurements
- New datasheets are already available for download:
  - **EQ-99X**
  - **EQ-99XFC**

If you have an application that requires stable and very bright illumination, please **contact us** as we have the solution.

## Need Laser Safety Eyewear? Choose NoIR LaserShields®

NoIR LaserShields®

**NoIR LaserShields®** deliver an extensive range of filters for protection against specific or combined laser wavelengths, making their eyewear particularly suitable for research, manufacturing, medical, aviation, police and security personnel.

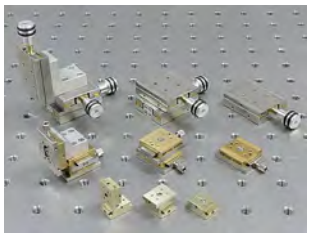
A broad choice of quality frames to suit the application and pocket are available, along with a selection of disposable products specifically for medical and aesthetic clinics.

All the NoIR products Elliot Scientific offer are **CE-Certified (EN207/208)**

NoIR has been manufacturing laser safety eyewear for multiple applications since 1996, following its creation by parent company NoIR Medical Technologies. Full details of filter groups and frame styles, as well as datasheets and CE Certificates, can be found within our **comprehensive product pages**.

If you have a requirement for laser eye protection, it is important that you **contact us** with details of the laser involved so we can advise on the best choice of filter and frame combination before ordering.

## A top (optical) table is not complete without Elliot Martock



**Elliot Martock** high-resolution (under half a micron) **precision miniature slides** have been popular with scientists and OEMs for nearly 40 years.

With a useful selection of Small, Very Small and Ultra Small models (with travels of 10, 5 and 3 mm respectively), the range satisfies many requirements for a stable and compact precision stage in both research and industry.

Our market-leading micro-positioners offer single, dual and three axis configurations with a variety of adjustment options such as simple screws to precision micrometers. A number of accessories - such as post adaptors - complement each range to further enhance their flexibility of use, and we also offer tilt and rotation mechanisms.

Our **Gold Series Flexure Stages** are our **best export**. Scientists and engineers around the globe recognise that these are the **best performing** and **best value** high-resolution XYZ positioners in the world. They feature:

- 20 nm resolution with 2 mm travel per axis
- Excellent operation and superb long term stability
- Great versatility from a petite package

These precision engineered stages are highly adaptable for use in a multitude of situations. Choose from systems preconfigured for fibre launch, such as free space light into photonic crystal fibres, or for alignment of other types of optical device. Note that we offer a number of left and/or right-handed ready-built configurations at lower cost when compared to purchasing individual parts.

Once again, these positioners come with a choice of adjustment options. Simple thumbwheels, precision micrometers, and piezo driven adjusters are available for use in any combination. An extensive range of add-ons, accessories, and attachments ensure that most applications can be satisfied. If not, contact us for a custom solution.

For more details about UK manufactured Elliot Martock products, including specifications and dimensioned drawings, please **contact us**.

## SPIE International Year of Light Photo Contest

INTERNATIONAL YEAR OF LIGHT 2015

2015 has been declared **The International Year of Light** by UNESCO to help raise global awareness of how important light-based technologies are to sustainable development and the provision of solutions to global challenges in energy, education, agriculture, and health.

Sponsored and organised by **SPIE** - the international society for optics and photonics, the **IYL 2015 Photo Contest** is open to photographers of all ages from around the world.

Up to two photos can be submitted that show light or a light-based technology as used in everyday life. Photos are not required to be scientific but they should include a scientific theme or communicate the message of the International Year of Light in some way.

Entries in the **SPIE International Year of Light photo contest** must be received by 30 September 2014, with prizes of up to $2,500 awarded in 2015.

Elliot Scientific

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**August 2014**

## Laser Servo *Lock* demonstrated in Vescent videos

*Lock robustness*


*Lock Guard™*

**Vescent Photonics** has uploaded two videos demonstrating the robustness of their D2-125 servo-loop controller in maintaining lock.

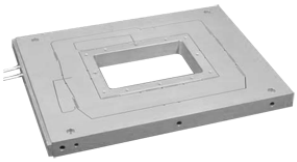

The D2-125 Laser Servo is designed for low-noise servo control of lasers and other experimental systems. The PI$^2$D loop filter, with two-stage integral feedback, provides tight locking to cavities and atomic/molecular transitions. The D2-125 provides full user-control over the loop-filter parameters, enabling servo-loop optimisation for a wide variety of systems such as: acousto and electro-optic actuators, voice coils, piezo actuators, temperature controllers, and so on.

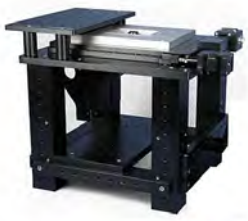
**Lock Guard™ Option**

Auto relocking is available for the D2-125 Laser Servo as an option. Lock Guard™ detects when the servo loop filter has gone out of lock and automatically recaptures it. When it detects an Unlock Point (a fast change in the servo output), it disengages the servo and holds the output at the last known valid value. Lock Guard™ then waits for a Hold Time before re-engaging the lock. If, during the Settle Time, it detects that the system is still out of lock it will try again. Lock Guard™ control parameters are all user adjustable for maximum flexibility.

If your delicate laser experiment keeps losing its lock, **contact us** for more information.

## Mad City Labs full range available for microscopists through Elliot Scientific





**Mad City Labs** (Madison City, Wisconsin) is the leading US manufacturer of flexure based nanopositioning systems capable of sub-nanometre positioning resolution.

Elliot Scientific offers their nanopositioning equipment as single or multi-axis stages, rotation/tilt stages and focus mechanisms for numerous biophysics and lifescience applications. UHV versions are also available for nanotech researchers.

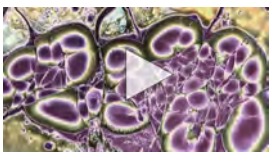
Systems from Mad City Labs combine long range motion with exceptional linearity, orthogonality, and stability with nanometre step-size and sub-nanometre resolution. These features provide innovative and practical control solutions for:

- Super resolution microscopy
- High speed confocal imaging
- AFM, NSOM and scanning probe microscopy
- Fibre positioning & high resolution optical alignment
- Single molecule spectroscopy & particle tracking
- Sub-diffraction limit microscopy, nanoscopy & lithography

The Mad City Labs range complements Elliot Scientific's portfolio of micro and nanopositioning systems, and makes us the logical choice of micropositioner supplier to the nanotech, biophysics and lifescience communities in academia and industry.

For more information about the micropositioning systems, focusing elements and other products from Mad City Labs, **download the catalogue here** or, **contact us now**.

## RMS 175th Anniversary celebrations draw to a close

Next month, the **Royal Microscopical Society** will conclude celebrating the 175th anniversary of their founding.

Way back in September 1839, the *The Microscopical Society of London* was formed by some of the leading scientists of the time to advance the science of the microscope.

This 175th year has seen special events held at both the House of Commons and mmc2014. It will conclude next week with an evening at London's Glaziers Hall on the 19th. Guest speakers will include Professor Pete Nellist, Professor Tony Wilson Hon FRMS, Professor Anne Ridley Hon FRMS, and Professor Helen Saibil Hon FRMS.

Watch a video of the reception hosted by the RMS at the start of the anniversary celebrations: ***Innovation under the Microscope***.

## Optical Tweezers on the menu at SPIE Optics + Photonics next month

Ten years ago Elliot Scientific supplied its first simple desktop instrument for single beam trapping. This **Optical Tweezers** system was such a unique product; it won a Photonics Spectra PRISM award. Since then, we have supplied numerous self-contained and microscope-based systems to researchers all around the globe.

Elliot Scientific offers the most comprehensive range of Optical Tweezers available. So, whether you seek to start with an economical *open architecture* or self-contained portable system, add capability to your existing microscope, or purchase a fully integrated multiple spot system with QPD/CPT, then we can meet your needs.

Elliot Scientific can supply an instrument that works *straight out of the box* so you can commence your work from day one. For more information, visit our **Elliot Scientific Optical Tweezers pages**, or **contact us**.

Next month at **SPIE Optics + Photonics 2014**, some of the leading users of our Optical Tweezers will be sharing their knowledge at **Optical Trapping XI**. This specialist conference takes place in San Diego from September 17th to the 21st.

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## Model 340 Option Cards still available. Once they're gone they're gone!

**Lake Shore Cryotronics** have advised us that a number of Option Cards are still available for the now discontinued Model 340 temperature controller.

The Model 340 has a single Option Card slot to take any one of the following discounted boards:

- **3462 Dual Standard Input Option Card**
  Adds two standard inputs to the Model 340 with separate A/Ds and excitation for each sensor. Onboard microprocessor allows the Model 340 to read four sensors and use any of them as a control sensor.
- **3464 Dual Thermocouple Input Option Card**
  Adds two new thermocouple inputs for temperature measurements from cryogenic levels to 1000 °C. Includes onboard microprocessor management and room temperature compensation. Curves for thermocouple types E, K, and AuFe 0.07% vs. Cr are included. Other types can be added.
- **3465 Single Capacitance Input Option Card**
  **A**dds a new capacitance input to the Model 340 to control temperature in strong magnetic fields using a Lake Shore Model CS-501 capacitance temperature sensor. Separate A/D and excitation for the sensor plus onboard microprocessor control.
- **3468 Eight Channel Input Option Card**
  Adds eight sensor inputs to the Model 340 that are divided into two groups of four. The card includes two A/D converters, one for each group of four inputs, and individual excitation for each sensor. Each input group must use the same sensor type, but the two groups can be different. The eight multiplexed inputs update at one second intervals, so the 3468 is not recommended for temperature control.


For more details on availability and pricing, please **contact us now**.

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## Next month: Come see Elliot Scientific on Stand 10 at Photon 14

**Photon 14**

**September 1st - 4th**
**Imperial College, London**
**Stand 10**


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**September 2014**

## Mad City Labs release MMP precision micropositioning stage series

**Mad City Labs** has started shipping their new **MMP Series** of precision, stepper motor driven, micropositioning stages that offer excellent repeatability.

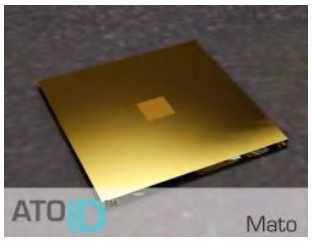
Engineered for high precision positioning in a variety of applications, these high resolution long range linear positioning units are available in one, two or three axis configurations.

The dedicated Micro-Drive™ intelligent control system, designed by Mad City Labs, delivers exceptional stability with a high native precision. Complex motion profiles can be programmed with sophisticated control parameters, such as automatic acceleration and deceleration. This makes the MMP Series the ideal choice for demanding motion control applications.

High resolution (50 nm) linear encoders for users requiring real-time feedback of the actual stage position, and wireless control, are available options.

For more information about this micropositioning system, its controller or other products from Mad City Labs, **contact us** for more information.

## New Gold SERS substrates for enhanced NIR Raman signal




The newly released **Ato ID™ *Mato* Plasmonic Sensor** offers good excitation results for Surface Enhanced Raman Spectroscopy (SERS) in both the red (600 nm plus) and NIR wavelength ranges.

- Gold (Au) coated: Ideal for red to NIR
- Significantly enhances Raman signal
- Single use, yet affordable
- Cover slip compatible
- Nanofabricated base

AIP Applied Physics Letters

**New study shows SERS advances noninvasive prostate cancer screening**

The base substrate is soda-lime glass which exhibits relatively weak inherent Raman scattering and so does not interfere with the sample signal. The active region comprises a pure gold coating over the proprietary nanofabricated base (patent pending). The monolithic structure eliminates risk of contaminants that can arise with glued or chemically treated types. All *Mato* Raman substrates are vacuum sealed in a cleanroom environment for ease of handling.

For more details on *Mato* and the silver *Randa* SERS substrates, please **contact us**.

## Lake Shore's new Model 372 AC Resistance Bridge/Temperature Controller now shipping

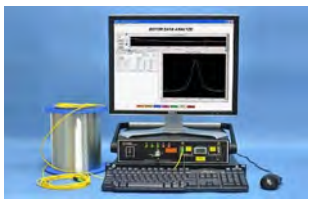
**Lake Shore** is now offering their new **Model 372** AC Resistance Bridge/Temperature Controller for experiments requiring precise and accurate AC resistance measurements. It offers a number of improvements in both design and performance for greater accuracy when making temperature measurements at very low temperatures.

The 372 has monitor and frequency reference outputs for direct connection to external devices or equipment, plus Ethernet, USB, and IEEE-488.2 connectivity.

To complement the new controller, Lake Shore have also introduced the Model 3726 scanner option designed for connecting up to 16 ultra-low temperature measurement points. With lower input noise and DC bias current, the new scanner takes full advantage of the performance improvements built into the Model 372 and offers superior performance to previous generations.

For more information about the new Model 372, **contact us now**.

## Brillouin Optical Time Domain Reflectometery added to Foresight™ DSTS by OZ Optics



**OZ Optics** has added a BOTDR (Brillouin Optical Time Domain Reflectometry) single-ended fibre measurement capability to their **Foresight™** Distributed Strain and Temperature Sensor (DSTS). Utilising Brillouin scattering in an optical fibre, the new module can sense changes in both temperature and strain along the length of a simple fibre, or the rapid detection and location of a major disturbance within a second, up to 70 km away.

- Live measurement of strain and temperature
- BOTDA and OTDR, and / or BOTDR
- Fibre configuration:
  - Loop - Up to 100 km round trip
  - Single-ended - Up to 70 km
- Multiple channel monitoring
- Real-time fault point detection
- High spatial strain and temperature resolution
- Uses standard telecom optical fibre

Foresight™ has been developed for applications in construction, energy, and security. For more information about Foresight™ and BOTDR, download the **datasheet**, or **contact us** directly.

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## Next month: Elliot Scientific is on Stand B10 at Photonex 2014

**Photonex 2014**

**October 15th - 16th**
**Ricoh Arena, Coventry**
**Stand B10**

Photonex®
The Technology of Light
INCORPORATING VISION UK IN ACTION
EXHIBITION & CONFERENCE · 15th & 16th October 2014 · Ricoh Arena Coventry


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**October 2014**

## Gamma Scientific systems and UDT Instruments now available from Elliot Scientific

Elliot Scientific is now distributing a comprehensive range of light and optical test and measurement systems from **Gamma Scientific**.

For over 50 years, Gamma Scientific (San Diego, California) has been trusted by some of the world's leading organisations to provide equipment to accurately determine the consistency, power, and colour of light.

Gamma Scientific designs and manufactures laboratory grade light measurement instruments and systems that include:

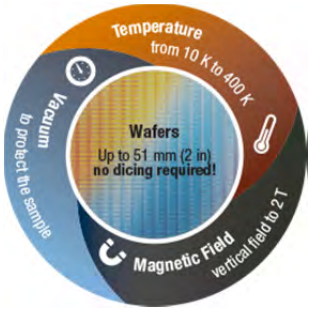
- Spectroradiometers
- Spectrometers
- Spectrophotometers
- Goniophotometers
- Reflectometers
- Thin Film Measurement Systems
- Calibration Light Sources - Filament & LED
- Integrating Spheres up to 3 metres in diameter

In addition, Elliot Scientific is also offering Optometer equipment from UDT Instruments, a division within Gamma Scientific. This portfolio includes Photometers, Radiometers, Lux meters, Luminance meters, Colourimeters, Photodetectors, and Illuminance meters for photometric and radiometric testing applications.

Gamma Scientific instruments are used in a variety of applications that cover the testing of LEDs, lamps, light fittings and luminaires, lasers and fibre-optics, night vision equipment and visual displays and, uniquely, the single sided inspection of the first surface of any transmissive element.

So, if you are in the UK or Ireland, and need to determine Lux, Lumens, Watts, Candelas or chromaticity, **contact us now**…
…or **see Gamma Scientific at Photonex next week**.

## Lake Shore meld a DC Hall System and Cryogenic Probe Station. Result: the new Model 8425




**Lake Shore** now offer non-destructive Hall measurement of wafer-scale materials in a tightly controlled cryogenic environment for advanced materials research.

The new **Model 8425** features the latest in Lake Shore Hall measurement capabilities and is ideal for a number of applied physics, electrical engineering, materials research, and product R&D applications that require characterisation of the electronic and magneto-transport properties of novel materials such as:

- III-V Semiconductors
- II-VI Semiconductors
- Elemental Semiconductors
- High-temperature Superconductors

The Model 8425 combines the capabilities of the 8400 Series Hall measurement system with the flexibility and convenience of the CRX-VF cryogenic probe station. With this fully integrated solution, users can perform Hall measurements on wafer-scale materials up to 51 mm in diameter, so there is no need to dice and solder wiring to a sample, as is commonly required in a conventional Hall system.

In addition, as the sample is under vacuum , the Model 8425 is an ideal measurement platform for materials susceptible to degradation caused by atmospheric exposure or which may require initial baking to drive out moisture.

**Specifications**

- DC fields to 2 T and resistances from 0.5 mΩ to 100 GΩ
- Variable temperature from 10 to 400 K using its CCR — no cryogen required
- Comprehensive software covers system operation, data acquisition and analysis
- Multi-carrier analysis with Quantitative Mobility Spectrum Analysis (QMSA) option

For more information, pricing, and availability, **contact us** today.

## Product Overview 2015 now available


We have launched our new brochure for the coming year: **Product Overview 2015** is a full-colour 16-page publication that reveals the extensive range of products Elliot Scientific offers from leading companies around the globe for use in a wide variety of fields and for a broad catalogue of applications.

Product Overview 2015 also covers our own designs and manufactured systems that we market under the **Elliot Scientific** and **Elliot|Martock** brands.

Printed copies of the brochure are now available, so **contact us** to have one posted to you, or simply pick one up at any conference or exhibition we are attending. Alternatively, **download a PDF** version or read **online at Issuu**.

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## Vescent Photonics add an Offset Phase Lock Servo to their *ICE Box*



**Vescent Photonics**' ICE (Integrated Control Electronics) platform, which has been designed to reduce the footprint of the laser electronics used in precision photonics tools, now includes the **ICE-CP1 Offset Phase Lock Servo**.

This, and Vescent's stand-alone D2-135, offer the ability to lock a slave laser to a master with a user-determined frequency offset of between 250 MHz and over 9.3 GHz.

Offset servos offer a true phase lock with the capture range of a frequency lock, and a key element in this is the detection of the optical beat note between the master and slave. Enter Vescent's D2-160 Beat Note Detector, a stand-alone device that accomplishes this task for a fraction of the cost of most other high-speed detectors.

The D2-160 is fibre-coupled for easy matching with Vescent's D2-150 Heterodyne Module on the upstream side, and an SMA output for either ICE or D2 control platforms on the downstream side.

**ICE** is a very versatile system in that it can be configured as a complete solution or as integratable PCBs in an OEM design. Controlled via serial commands, a GUI, or uploadable, timed events, with sub-microsecond jitter and delay. ICE offers the convenience of a digital interface coupled to the low-noise and high-speed of analog control electronics.

A single ICE Box, for example, can control four DBR lasers, temperature loops, current sources, and frequency and offset locks.

If you would like more information about these and other systems Vescent Photonics offer, please **contact us**.

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## Next week: Elliot Scientific is on Stand B10 at Photonex 2014

**Photonex 2014**

**October 15th - 16th**
**Ricoh Arena, Coventry**
**Stand B10**

Photonex® 15th & 16th October Ricoh Arena Coventry

November 2014

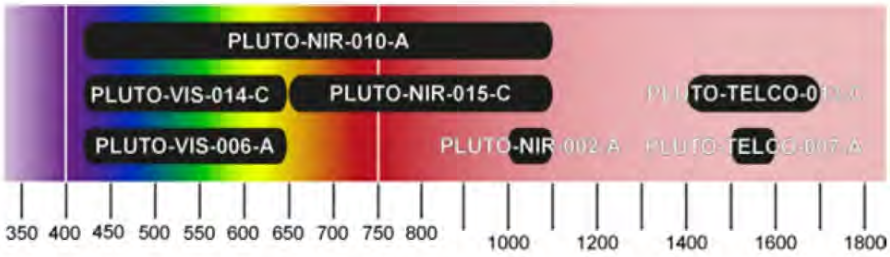
## PLUTO Spatial Light Modulators: 7 new models introduced by HOLOEYE

This past month has seen the introduction of seven new phase panels for the **PLUTO** range of Spatial Light Modulators from **HOLOEYE**. The different panel versions are optimised for use in different wavelength ranges, and all versions use fast full digital addressing which ensures high reliability and a compact driver unti.

Alongside the standard PLUTO-VIS and PLUTO-NIR there are special high retardation (-HR) models available. These show considerably higher phase retardation compared to the standard panels. The high retardation models can enable mod 4π or even mod 6π, which can be of benefit for applications such as wavefront generation.

Other applications may require a stable phase response, and this can be accomplished using the high retardation panels and driving the panels with lower voltage settings for 2π phase retardation. Response times in this instance are reduced, but phase stability is significantly enhanced.

A summary of the new models is shown in the graphic below, but **do contact us** for more detailed product information.




| Device | Wavelength Range | Fill Factor | Comment |
|---|---|---|---|
| PLUTO-VIS-014-C | 420 – 650 nm | 92 % | |
| PLUTO-VIS-006-A | 420 – 700 nm | 87 % | High Retardation Version |
| PLUTO-NIR-010-A | 420 – 1100 nm | 92 % | |
| PLUTO-NIR-015-C | 650 – 1100 nm | 92 % | High Retardation Version |
| PLUTO-NIR-002-A | 1000 – 1100 nm | 87 % | |
| PLUTO-TELCO-007-A | 1520 – 1620 nm | 87 % | |
| PLUTO-TELCO-013-C | 1400 – 1700 nm | 92 % | |

## FEMTOLASERS introduce a High Energy version of the KALEIDOSCOPE Hollow Fibre

**FEMTOLASERS** has launched the **KALEIDOSCOPE™ HE** - a new Hollow Fibre Compressor. Designed to generate and compress high energy laser pulses down to few cycle pulse durations, the KALEIDOSCOPE™ HE is the first commercially available solution.

By coherently enhancing the bandwidth of amplified laser pulses with energies of up to 5 mJ, KALEIDOSCOPE™ HE enables the generation of high quality pulses with 1.5 mJ output energies and pulse durations of under seven femtoseconds.

If paired with FEMTOLASERS' femtopower™ CEP-stabilised ultrafast amplifier systems, the KALEIDOSCOPE™ HE offers the ultimate in performance for state of the art applications such as attoscience and high harmonic generation.

For more information on this and other products from FEMTOLASERS, **contact us now**.

## Do you need Laser Frequency Stabilisation & Locking for Cold Atom Science and Engineering?

If the answer to the above question is ***yes***, then choose **Vescent Photonics** for:

### Laser & Electro-Optic Electronics

- **Power Supply, Controller, and Servos**

Vescent laser and electro-optic control electronics provide the lowest noise, highest bandwidth, and greatest flexibility of any commercially available products. From laser current drivers with a noise density of less than 100 pA/√Hz, to laser servos with full PI$^2$D loop filter reconfigurability, Vescent's unmatched performance is designed for the most demanding AMO research.

### Ultrastable Narrow Linewidth Lasers

- **Ultrastable, large mode-hop-free tuning**

Vescent narrow linewidth CW lasers are constructed with very short laser cavities and no moving parts or piezos. This unique combination provides a large mode-hop-free tuning range and immunity to vibration.

### Accessory Modules

- **Electro-optic and Optical Ancilliaries**

Vescent optical and electro-optical modules deliver rugged, vibration immune operation, and are designed to be mutually compatible. This allows the user to take advantage of Vescent's non-mechanical approach to design sophisticated AMO experiments within uniquely small footprints on optical tables.

**Contact us** for further information or visit our **Vescent pages**.

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## New molecular motion tracking mode for Nano-Cyte®

The **Nano-Cyte®** Single Molecule Imaging system, from **Mad City Labs**, now features a *tracking* mode capable of surveying a wide sample area. This new feature builds on the existing capabilities of the Nano-Cyte® fluorescence imaging system: nanometer scale stabilisation in three dimensions, image acquisition, device control, particle localisation analysis, particle position rendering and active positional control.

The tracking mode is capable of surveying a 200 micron by 200 micron area within a sample, representing 16 typical fields-of-view (FOVs), while maintaining 3-dimensional stability at the nanometer scale. Using this feature it is now possible to track the motion of particles at the nanometer level as they move through multiple FOVs for extended periods of time.

If you would like more information about this and other systems Mad City Labs offer, please **contact us**.

Elliot Scientific

Solution Science for
Research and Industry

**December 2014**

## Two new products from Micro Laser Systems

Fibre Focuser

**Micro Laser Systems** manufacture diode laser modules and optical assemblies with an emphasis on providing diffraction limited, circular beams with low wavefront error and low divergence. The California-based company has recently developed a new range of products which we are pleased to introduce to the UK and Ireland.

### Fibre Focuser

The Micro Laser Systems' Fibre Focuser generates diffraction limited micron spot sizes at long working distance via its multi-element air spaced Focusing Cell. This element screws onto the main collimator to provide a convenient and compact way to define the focused spot. This method avoids additional optic holders and alignment problems. The Fibre Focuser can be adjusted to work optimally with singlemode fibres, polarisation maintaining (PM) fibres and large mode area (LMA) fibres at any one wavelength within the limits of its AR coating.

The Fibre Focuser's optical materials have been chosen to eliminate or minimise laser-induced fluorescence, especially in the visible, and are housed in a stainless steel body to shield from the effects of temperature. Custom options, such as alternative housing materials for hazardous environments, mounting holes or slots, and special wavelength ranges, can be ordered.

### Fibre Receiver

Fibre Receiver

The FR10 Fibre Receiver has been designed to collect reasonably collimated light and inject it efficiently into a 100 µm or larger core fibre via an SMA connector. The stainless steel FR10 has been specially engineered specifically by Micro Laser Systems for this task, delivering a much larger signal than if using a reversed collimator in the same situation.

The FR10 Fibre Receiver is delivered with a factory preset focus for collimated light. However, if you are working at the lower or upper end of the spectrum, or if the light source is not as collimated as one would like, focus can be user adjusted for better coupling and optimal signal strength.

The receiver's 10 mm aperture is threaded to accept sensors or ½" inch optics such as filters. Extra items can be added via the convenience of the FL10 Cell mount, and a ring adapter for mounting to common optical mounts and optical fibre assemblies is also available.

For more about these two products, **visit our Micro Laser Systems pages** on our website, or **contact us** for more in-depth product information.

## Winter Holidays

Frost, Lajoux, Jura, France

Image credit: *Annick MONNIER* via Wikimedia Commons†

Elliot Scientific will be closed for the winter holidays from end of business on:

- **Wednesday, December 24th. 2014**

We re-open at 08:30 GMT on:

- **Monday, January 5th. 2015**

*Season's Greetings and*
*Best Wishes for the coming New Year*

## International Year of Light 2015

Image credit: Crown Copyright

United Nations Educational, Scientific and Cultural Organization · International Year of Light 2015

Next month sees the start of the **International Year of Light and Light-based Technologies**. 2015 was proclaimed an International Year by the the United Nations, recognising the importance of light-based technologies in sustaining development and providing solutions to global challenges in energy, education, agriculture and health.

INTERNATIONAL YEAR OF LIGHT 2015

Light has a vital role in our lives and plays a substantial part in science in the 21st century. It has revolutionised medicine, opened up international communications, and links the cultural, economic and political aspects of our global society.

As light is an important aspect of our business, Elliot Scientific will be supporting the **IYL 2015** initiative through our newsletter. To get us off to an early start, here's news on how the IYL ended up on the **Christmas tree outside №10 Downing Street** last week.

† Frost, Lajoux, Jura, France by Annick MONNIER (Own work) [CC-BY-SA-3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

## RoadVista: Now in the UK & Ireland

**RoadVista** is an established manufacturer of retroreflectometer equipment for compliance testing of road signs and line markings. The instruments deliver the highest performance in accuracy, reliability, and usability, and are now available in the UK and Ireland. Below is a selection of some of the systems Elliot Scientific offers:


*The **RoadVista 922D** handheld retroreflectometer is designed to measure the retroreflection (RA) of road signs and other materials. It features an annular measurement geometry simplifying the measurement process and meets BS EN 12899-1 and DIN 67520 test specifications.*


*The **RoadVista 932-3** is a handheld retroreflectometer is designed for use in the field or laboratory. It features multi-geometry point measurements for full characterisation of retroreflection (RA) and retroreflected night-time (CIE1931xy) colour of sign sheeting and high visibility clothing.*

*RoadVista's **StripeMaster 2 Touch** is a retroreflectometer designed for use in the field to measure retroreflectivity (RL) of glass beads embedded in white or yellow thermoplastic, traffic paint or temporary marking materials.*


*The **RoadVista 933** is a benchtop four axis goniometer system for testing sign sheeting and high visibility clothing. The 933 quickly measures retroreflection and the retroreflective colour of materials at multiple geometries.*

For the laboratory, RoadVista offers the Model 1000 benchtop unit for monitoring retroreflective sheeting material production, and the 940D computerised photometric range system (below left). This is the ultimate reference in photometric testing of retroreflective materials, devices and light sources, and is used by a number of government agencies and labs around the world. It is fully compliant with all ASTM, CEN, CIA and DIN standards and is the reference system used to develop those standards.

In addition, RoadVista's Laserlux CEN 30 (below right) is a vehicle mounted road retroreflectometer system measuring road markings in real time while travelling at varying traffic speeds.


**Contact us now** for more details about the RoadVista range, or call 01582 766300


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