



## Brands That Have Built an Industry

ILX Lightwave

New Focus

OPHIR

ORIEL  
INSTRUMENTS

Richardson Gratings

Spectra-Physics

Spiricon

Newsletter N° 36 – June 2012

ILX Lightwave

### LDX-3232

High Compliance Laser  
Diode Driver ▶ page 2



New Focus

### Vortex™ Plus 6800

Precision Tunable Lasers ▶ page 4

*Newport introduces its first ever blue tunable laser.*

Newport

### 819C/819D Series

Integrating Sphere Line  
Extension ▶ page 10



Spectra-Physics

### Spitfire® Ace™ Power Amplifier

▶ page 12

**Newport Family of Brands**  
The World's Premier Source of  
Photonics Technology ▶ page 14



ILX Lightwave

- LDM-4872 Quantum Cascade Laser Mount.....2
- LDT-5900C Series Precision Temperature  
Controllers.....3
- LDX-3620B Ultra Low Noise Current Source.....3

New Focus

- GuideStar™ II Laser Beam Steering Correction  
System.....4
- 8821 Clear Edge Picomotor Mount.....5

Newport

- XPS-GCODE XPS Optimized G-Code Conversion  
Software .....5
- Innovative Metrology Setup for Controlling  
Vibrations of Rotating Machinery Parts .....6
- Newport's Photon Tamers at Work: GTS High  
Precision Linear Stage Scans Ultrafast THz Pulse...7
- ERS Series Optical Table Earthquake Restraints....8
- M-TDM-L Fully-Adjustable Tablet Computer Mount  
System.....8
- FR-CV-75 Compact ND Filter Rotator .....9
- BSD Multifunction Periscope Beam Steerers .....9
- 818-ST2 Wand Style UV/Si Calibrated Photodiode  
Sensors.....10

Spectra-Physics

- Millennia® eV™ High Power CW DPSS Lasers.....11
- What's in the Box? .....11
- Inspire™ IR Automated Ultrafast OPO.....13
- alphaScan™ Integrated Laser-OPO .....13

Literature Request .....16  
Events.....16



## LDX-3232

### High Compliance Laser Diode Driver

*Ideal for controlling quantum cascade laser diodes.*



Newport's ILX Lightwave LDX-3232 High Compliance Laser Diode Driver is the industry's only laser diode driver specifically developed for controlling high compliance voltage devices such as quantum cascade laser diodes. Careful attention to design allows these drivers to deliver up to 4 A of low noise current at up to 15 V with a stability of better than 20 ppm. This performance is critical for development of room temperature quantum cascade lasers and spectroscopic applications using quantum cascade lasers. The LDX-3232 includes multiple levels of laser protection to safe guard expensive quantum cascade lasers during operation. Protection features include: slow start circuit, floating output, AC transient suppression, independent current limits, and intermittent contact protection.

#### Key Features

- High stability, low noise 4 A driver with up to 15 V compliance
- Designed specifically for quantum cascade lasers
- Laser current modulation to 250 kHz
- Precision 4-wire forward voltage measurement
- Laser diode protection including adjustable compliance voltage, independent current limits, and intermittent contact protection
- Over temperature input shuts off current source output
- GPIO/IEEE-488 interface and trigger output

**WEB** See our website for more info.  
[www.newport.com/LDX-3232](http://www.newport.com/LDX-3232)

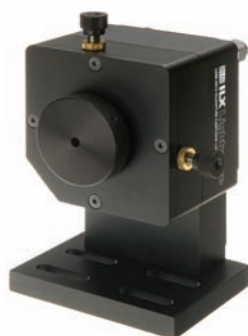
In addition to precision current control, the LDX-3232 is loaded with standard features such as dual current ranges, constant power control, fine/coarse setpoint control, laser current and voltage measurement, photodiode current display modes, forward voltage adjustment and measurement, and an external modulation input.



## LDM-4872

### Quantum Cascade Laser Mount

*Suitable in vacuum or nitrogen purged environment.*



Newport's ILX Lightwave LDM-4872 Quantum Cascade Laser Mount provides convenient mounting for quantum cascade laser diodes in a vacuum or nitrogen purged environment. The 4872 is offered with standard mounting plates for C-Mount (C-Block), Alpes COC, and customer

proprietary QCL packages. A wide temperature control range is accomplished by an integrated thermoelectric module and a high performance water-cooled cold plate which provides for an active control range of -30 °C to 30 °C with heat loads up to 10 W.

Fixture design and precision machining result in low, repeatable thermal resistance between the QCL and

#### Key Features

- Supports C-Block, COC, and customer proprietary QCL packages
- Active temperature control from -30 °C to 30 °C
- Compatible with the LDX-3232 CW QCL Driver
- Ports for vacuum evacuation or nitrogen purge
- Optional XYZ stage with multiple ZnSe lens options

**WEB** See our website for more info.  
[www.newport.com/LDM-4872](http://www.newport.com/LDM-4872)

LDM-4872 minimizing the temperature difference between the laser and the fixture.

The LDM-4872 mount is compatible with ILX Lightwave current sources and temperature controllers through interconnect cabling for quick setup. Optical table mounting is made possible through ANSI and metric spaced mounting holes on the base of the mount

ILX Lightwave

## LDT-5900C Series

### Precision Temperature Controllers

*Ideal for laser diode and component test.*

**NEW**

#### Key Features

32 W and 60 W temperature control with  $<\pm 0.003$  °C temperature stability

Compatible with thermistor, RTD and IC temperature sensors

Fully programmable PID control loop with preset values and auto-tune

Independent heating and cooling current limits

USB and GPIB computer interfaces

LabVIEW® instrument driver

Newport's ILX Lightwave LDT-5910C and LDT-5940C Thermoelectric Temperature Controllers combine precision temperature control with an intuitive instrument front panel for fast, accurate temperature control of laser diodes and other optoelectronic components.

The LDT-5910C and LDT-5940C easily control the temperature of your laser diode in one of three modes: (1) Constant Temperature, (2) Constant Sensor or (3) Constant Current. Temperature stability of  $<+0.003$  °C ensures device performance and highly reliable test measurements. With  $<+0.003$  °C

stability, the controllers are ideal for R&D applications, eliminating mode hopping and significantly reducing noise due to temperature fluctuations. The LDT-5910C and LDT-5940C include IEEE 488.1 GPIB and USB 2.0 computer interfaces for easy integration into any R&D or manufacturing application.

**WEB** See our website for more info.  
[www.newport.com/LDT-5900C](http://www.newport.com/LDT-5900C)

ILX Lightwave

## LDX-3620B

### Ultra Low Noise Current Source

*Industry leading noise performance for spectroscopic applications.*

**NEW**

#### Key Features

Battery operated dual range 200 mA/500 mA current source

$<100$  nA rms noise in battery mode

Better than 10 ppm stability over one hour

Constant current and constant power operating modes

Laser diode protection and error detection circuits protect laser diodes in all operating modes

Long life batteries allow operation up to 16 hours without charging

Battery charge mode with front panel charge level indicator

Newport's ILX Lightwave LDX-3620B is a battery-powered, ultra low noise current source, optimized for narrow linewidth or stable wavelength laser diode applications. This all new instrument provides a precision current output with  $<100$  nA rms noise and  $<10$  ppm stability. The current source can be operated in one of two output ranges in constant current or constant power operating modes. Two AC or DC coupled modulation inputs, fine and coarse, control the current source for precision laser diode wavelength or linewidth tuning with a bandwidth up to 1 MHz.

All of ILX Lightwave's proven laser diode protection features are designed into each model, which include adjustable current

limits, a floating output, shorting relays, slow turn-on circuits, and transient protection during power up and laser operation. Error indicators help resolve set up problems quickly such as open circuit and power limits.

**WEB** See our website for more info.  
[www.newport.com/LDX-3620B](http://www.newport.com/LDX-3620B)



## **New Focus** | **Vortex™ Plus 6800**

### Precision Tunable Lasers

*Newport introduces its first ever blue tunable laser.*



**NEW**

Newport's New Focus Laser team is pleased to introduce its first ever blue tunable laser. The all new Vortex Plus Precision Series Single Mode Finely-Tuned Laser is the latest addition to our New Focus range of precision tunable lasers. The Vortex Plus provides higher power than ever, combined with the same stability, mode-hop-free tuning range, and narrow linewidth as the Vortex II. In addition, the Vortex Plus includes an SMA port for direct to diode high speed current modulation. When ordering, please specify the exact center wavelength (to 10 pm) in vacuum. Part number includes complete laser system and the TLB-6700-LN Laser Controller. Heads and controllers can also be sold separately.

The TLB-6700-LN Controller has low-noise analog circuits to precisely set critical operating parameters, such as diode temperature and current. We've increased the current to allow higher power from our lasers yet reduced the noise even

#### The Vortex Plus Advantage

True continuous wave mode-hop-free operation  
Higher Power and Narrower Linewidth  
100 MHz current modulation  
Operates with new TLB-6700-LN low noise controller

#### The TLB-6700-LN Advantage

Lower noise  
Automatic laser head recognition  
Controller automatically sets temperature and current

further for sharper linewidths and better results. This controller automatically recognizes the laser head and sets the optimum temperature and maximum current limit, providing effortless setup for top performance. Digital control facilitates remote operation and computer interfacing.

The TLB-6700-LN Controller operates in both manual and remotely programmed modes via its USB interface

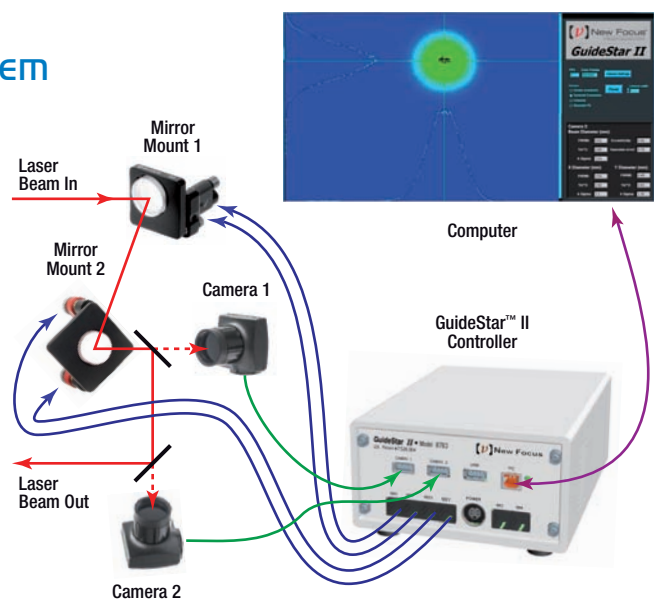


**WEB** See our website for more info.  
[www.newport.com/TLB-6800](http://www.newport.com/TLB-6800)

## **New Focus** | **GuideStar™ II**

### Laser Beam Steering Correction System

Designed for accuracy, reliability, and ease-of-use, the New Focus GuideStar™ II System is the answer to laser beam drift correction for the most demanding laser applications. The system provides high-reliability high-precision compensation of laser pointing and position drift. Two independent New Focus™ Picomotor™ actuated motorized mirror mounts provide both manual and active 4-axis control with excellent passive stability. Two miniature position-sensing cameras provide continuous tracking of both laser beam positions and laser beam profiles. The position data is fed back to the mirror motion using our patented control algorithm, the only technique that completely corrects the laser beam alignment in both X and Y and near and farfield. The system is anchored by the small GuideStar™ II Controller and controlled through your own computer with a host of user-friendly and convenient features. Full beam profiles and position and shape data are available live or can be tracked, stored and analyzed.



**WEB** See our website for more info.  
[www.newport.com/8783](http://www.newport.com/8783)

## **[v] New Focus | 8821**

### **Clear Edge Picomotor Mount**

*Offers precision and stability with the greater beam access of a clear edge mirror mount.*



New Focus™ has introduced the Clear Edge Picomotor Mount 8821. The new mirror mount features two Picomotor actuators for added precision and stability, with a clear edge mirror mount for greater beam access in a single, compact, and cost-effective package. Sapphire seats and optimized springs deliver smooth, reliable operation while maintaining a high level of thermal and mechanical stability.

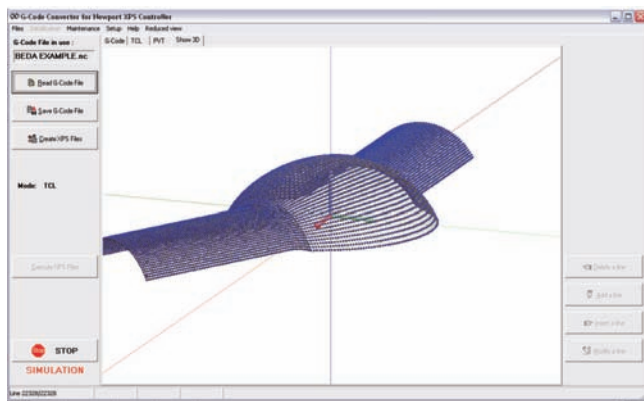
The kinematic 8821 mount accommodates 1-inch (25.4 mm) optics ranging in thickness from 6 mm to 10 mm. The new mount's Picomotor features integrated knobs for quick, manual adjustment of all axes. It is fully compatible with New Focus' 8702 Picomotor Drive Module and the iPico™ Series as well as the company's recently-introduced GuideStar™ II Laser Beam Steering Correction System. For added convenience, a left-handed mirror mount 8821L is also available, both in black anodized aluminum.

**WEB** See our website for more info.  
[www.newport.com/8821](http://www.newport.com/8821)

M  
O  
T  
I  
O  
N  
  
C  
O  
N  
T  
R  
O  
L

## **Newport | XPS-GCODE**

### **XPS Optimized G-Code Conversion Software**



#### **Key Features**

- Read, convert and edit G-code and execute in the XPS controller
- Optimized conversion process utilizes advanced features of XPS
- 3D display with real-time active tool indicator
- Multiple Digital and Analog I/O for real-time process control
- Simple and intuitive interface

Newport has released XPS-GCODE, a software that enables your XPS Universal Motion Controller to become a powerful laser machining center that can read and convert G-codes, display the tool path and execute trajectory routines with the power and precision of Newport Motion Control. The conversion process utilizes the advanced features of the XPS to generate smooth motion routines along optimized trajectories with controlled velocity. The laser is activated and additional control is available via Digital and Analog I/Os of the XPS. In addition to laser machining, XPS-GCODE is capable of handling a wide array of high precision machining processes. G-Codes are converted to native (TCL and PVT) format of the XPS, stored locally and are easily accessed via the user GUI. File conversion and transfer to the XPS for execution is all automated with

several different execution options. The part to be fabricated can be viewed in the 3D display window and can be manipulated (rotate, pan, zoom) for close inspection.

Download the software to run it in simulation mode or purchase the software to access the execution features (license key required). Newport also offer an extensive collection of stages suitable for addressing a wide array of applications for high-precision industrial and advanced laser write, or prototype fabrication. For additional information on running XPS-GCODE, please refer to the XPS-GCODE User Guide.

**WEB** See our website for more info.  
[www.newport.com/XPS-GCODE](http://www.newport.com/XPS-GCODE)



## Innovative Metrology Setup

### for Controlling Vibrations of Rotating Machinery Parts

**Newport Hexapod Motion Device Provides More Accuracy for determining the in-plane and the out-of-plane vibrations and deflections of rotating objects.**



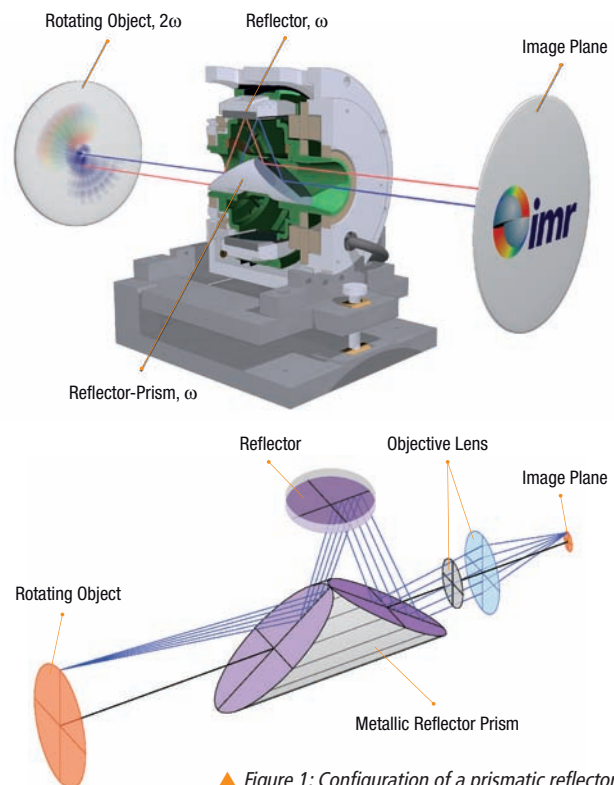
A team of scientists at the Universitat Hannover in Germany developed a method for determining the in-plane and the out-of-plane vibrations and deflections of rotating objects. The system consists of an opto-mechanical image derotator, which is combined with a high speed camera and a scanning Laser-Doppler-Vibrometer (LDV). The image derotator is used to measure deflection and vibration in a coordinate system fixed to the rotating object. Newport saw an opportunity to add value to this system in enabling the systems with 6-axis motion control capability and high precision positioning. Hence the derotator was combined the Newport's HXP1000 hexapod. The combined solution is an interesting metrology setup for controlling rotating machinery parts such as roller bearings or turbine engines in different industrial applications.

Newport's HXP1000 6-axis Hexapod is a parallel kinematic motion device that provides six degrees of freedom. In addition, the HXP1000 enables more than five times higher rigidity and twice the load capacity of comparable products on the market. Competitively priced and easy to use, the HXP1000 is able to utilize the potential of the new derotator and effect heightened and more accurate measuring capacities. Its high stiffness feature can provide a high accuracy in precision positioning of the derotator.

#### Working Principle of the Derotator

The main component of the derotator is a metallic reflector prism. As the prism is rotated, the image passing through will rotate at twice the angular rate of the prism (figure 1). The prism is used to eliminate the optical path through the glass. To receive an optimal derotated image, the optical axis of the prism, the rotary axes of its drive and the object must be identical and also the prism must rotate with half of the rotational frequency of the rotating object. The reflector prism

is located at the center of a hollow-shafted torque motor. The speed of the motor is controlled by a cascade control implemented in Matlab xPC Target such that the rotational speed of the derotator and the object amount to a ratio of 2:1. Figure 1 shows the optical principle of the derotator.



▲ Figure 1: Configuration of a prismatic reflector.

As Hans Dabeeing of Newport explains: «Rotating machinery parts are present in a large number of industrial applications. Using the derotator, which has been rigorously tested and developed by the researchers in Hannover, allows us to devise a unique metrology solution that combines the opto-mechanical image derotator, high speed camera and scanning Laser-Doppler-Vibrometer (LDV) and the Newport HPX1000 hexapod.»



The new HXP1000 offers high load capacity and high stiffness, in addition to a compact design that still provides 6 axis of positioning and is the latest offering from the Newport portfolio of high precision machinery. «We are continuously supporting new product

development, with Newport supplying numerous solutions for various research purposes,» continues Mr Dabeeing. «We are confident that the new HXP1000 will improve industry practice in the accurate measurement of machinery components.»





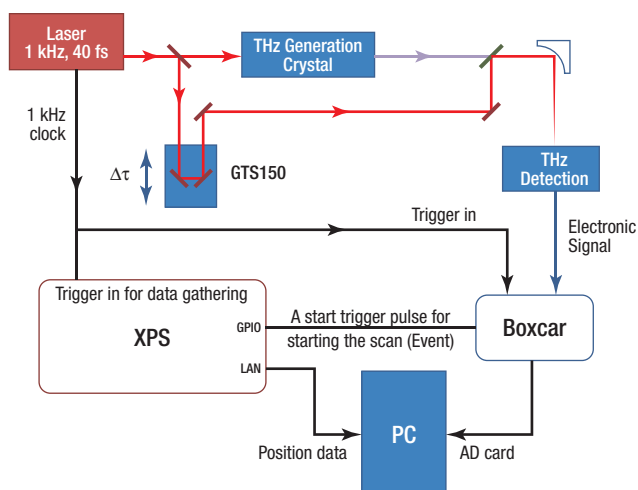
## Newport's Photon Tamers at Work:

### GTS High Precision Linear Stage Scans Ultrafast THz Pulse

The Terahertz (THz) region of the electromagnetic spectrum offers researchers an opportunity to probe materials in new and exciting ways. Using Terahertz Time Domain Spectroscopy (THz-TDS), the unique responses of materials to Terahertz radiation not only provides a method for material characterization but also an opportunity to better understand behaviors of complex phenomena such as ferromagnetism.

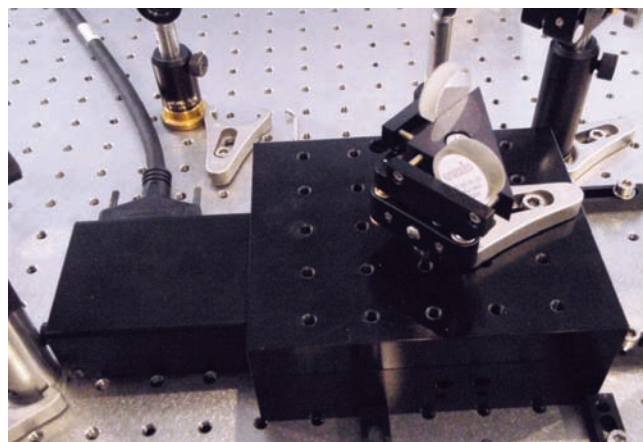
A Newport customer at the Fritz Haber Institute in Berlin, Germany is exploring the physical processes and phenomena at the Terahertz (THz) frequency region more deeply. The customer's research is focused on efficient generation of THz radiation by means of femtosecond laser pulses and the manipulation of these pulses in photonic structures such as waveguides.

A THz pulse can be generated by Electro-optic Rectification (EOR). This is done in an electro-optic medium via difference-frequency mixing of various Fourier components of the driving optical spectrum. The same THz field can be detected using an electro-optic crystal, ZnTe. To characterize the generation of ultra short THz pulses, a scanning system is applied as shown in figure 1.



▲ Figure 1: Schematic of a THz scanning system (Courtesy of Fritz Haber Institute, Berlin, Germany).

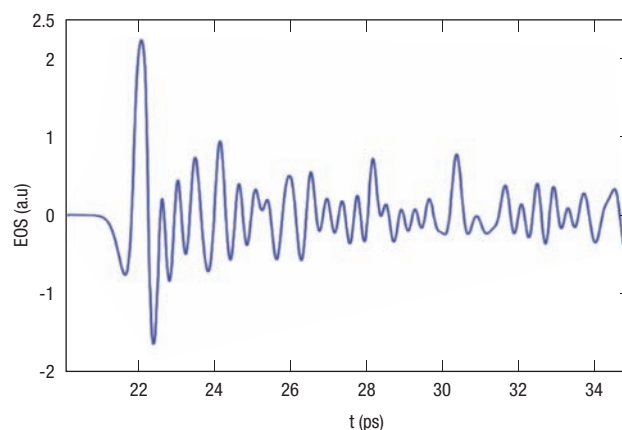
In the setup, a THz pulse is generated using difference frequency mixing in ZnTe from a femtosecond laser pulse (40 fs width, running at 1 kHz repetition rate). An optical delay line technique is used to detect the THz pulse, using another femtosecond pulse delayed in time. A customized Newport GTS70 High Precision Linear Stage is used in the delay line setup (figure 2), offering superior Minimum Incremental Motion (MIM) of 0.1  $\mu\text{m}$  and outstanding bi-directional repeatability of 0.2  $\mu\text{m}$ . The GTS70 has been modified with a wider top plate and added holes to provide a flexible mounting for various opto-mechanical components.



▲ Figure 2: Custom GTS70 high precision linear stage in the THz scanning system.

The THz pulse is scanned continuously in time with the GTS stage and an XPS Universal Motion Controller is used to gather position data with each pulse. Each laser pulse is synchronized with the position of the stage while in motion. This is achieved using the XPS controller as shown in figure 1. A 1 kHz electronic clock signal from the THz detection system is used to trigger the scanning event through the Boxcar device (a sampling instrument with trigger inputs and outputs for input signals integration and processing) sending a single start trigger pulse to the XPS.

As the stage is moving continuously in a forward direction, the data and the stage position information are gathered on a PC. Once the forward motion is complete, another start trigger pulse is sent to the GPIO (General Purpose Inputs and Outputs) of the XPS, starting a reverse motion. With the extensive I/O functionalities and high speed data acquisition of 10 kHz, the XPS controller is an ideal platform for data collection. The XPS also ensures that stage motion is precisely synchronized, allowing user to verify the plot of the THz signal versus the time delay from the PC, as shown in figure 3.



▲ Figure 3: THz signal versus time delay measurement (Courtesy of Fritz Haber Institute, Berlin, Germany).



## ERS Series

### Optical Table Earthquake Restraints



#### Key Features

- 2009 International Building Code (IBC) and 2010 California Building Code (CBC)
- Does not affect optical table performance
- Set of four earthquake restraints can withstand 3636 kg
- Available in several standard heights: 406, 495, 559, 597 or 711 mm; custom heights and configurations available

Newport has introduced an Earthquake Restraint System, Model ERS2010, designed to restrict the motion of pneumatically-isolated optical table tops during seismic activity. A minimum of three restraints is required to prevent possible tipping of a table during or after an earthquake and, once installed, the system does not affect optical table performance.

Each restraint is rated for seismic forces generated by a maximum of 907 kg of combined table and payload weight. A set of four restraints can withstand a maximum of 3632 kg. Available in several standard heights, including 406, 495, 559, 597 or 711 mm; custom heights and configurations are also available.

Each ERS2010 earthquake restraint is designed to be secured into a concrete floor at least 6-in. thick using eight Hilti anchor bolts. Seismic loads are distributed into the optical table bottom skin by eight socket head cap screws. The necessary hardware (not included with the restraints) is also available from Newport and can be ordered separately.

**WEB** See our website for more info.  
[www.newport.com/ERS](http://www.newport.com/ERS)



## M-TDM-L

### Fully-Adjustable Tablet Computer Mount System



Newport has introduced the fully-adjustable tablet computer mount system for iPads, TouchPads, Android tablets, such as the Galaxy Tab, and more. The new M-TDM-L is ideal for mounting tablet computers measuring from 216 to 272 mm (height), less than 196 mm (width), and under 14 mm (thickness). Highly versatile, the new mount will also hold tablet computers with protective case covers.

The tray design is spring-loaded, allowing safe and secure holding while permitting access to the tablet computers' charging, audio, and camera features. The M6 threaded mount easily installs to any optical table or breadboard and the ball-and-socket arm permits positioning in any orientation, portrait or landscape.

While mounted, the tablet can be charged and/or synced; it can also be used for recording video, taking photos, or for remote observation via Skype or FaceTime

**WEB** See our website for more info.  
[www.newport.com/TDM-L](http://www.newport.com/TDM-L)





## FR-CV-75

### Compact ND Filter Rotator



The FR-CV-75 provides rotational adjustment for any of Newport's Circular Linear Variable ND Filters having a  $\varnothing$  7.5 mm inner diameter. The slim design minimizes blockage of the filter's clear aperture and, with its clamping thumbscrew design, it can accommodate filter thicknesses from 2 to 13 mm. This mount is unique in that it has both English (8-32) and metric (M4) post mounting threads clearly marked on its base. To prevent inadvertent rotation after adjustment, the FR-CV-75 incorporates a side-located locking screw.

**WEB** See our website for more info.  
[www.newport.com/FR-CV-75](http://www.newport.com/FR-CV-75)



## BSD

### Multifunction Periscope Beam Steerers

Periscope Beam Steerers are multifunction optical tools that let you easily change your laser beam's optical axis height, steer its direction and even change polarization. Several versions are available including highly stable rail-based periscopes, versatile pedestal periscopes, and low-cost fixed types.



The BSD-2R Rail Periscope has Suprema-series stainless steel kinematic mounts for excellent stability and adjustability, a robust stainless steel rail-post which prevents inadvertent rotation during beam height adjustment, captive 45-degree mirror holders which will not fall out while being rotated, and a powerful magnetic pedestal base with 5.4 kg of holding force for safe placement prior to clamp down with an included fork. The separate components of the BSD-2R can also be purchased separately allowing customized periscope assemblies.



The BSD-F provides basic vertical height adjustment and 360 degrees of steering for optical beams. It features captive 25.4 mm mirror holders that will not fall out during manual rotational adjustment, a magnetic pedestal base for safe handling, and height adjustment without tools all in a simple, low-cost design. Mirrors are sold separately.

**WEB** See our website for more info.  
[www.newport.com/BSD](http://www.newport.com/BSD)



## 818-ST2

### Wand Style UV/Si Calibrated Photodiode Sensors

*Redesigned with a sturdy metal housing.*



The detector specifications of the new aluminum cased 818-ST2 Series are identical to those of the 818-ST Series. Incorporating a large 10 mm X 10 mm Si photodiode, these slim detectors are ideal for measurements in tight locations with busy setups. It provides a built-in calibrated OD3 attenuator at the flick of a switch. The UV detector is packaged in clear anodized aluminum housing to avoid burning (resulting in potential damages on optics in the setup), especially in the UV wavelength range. The calibration module is detachable from

#### Key Features

- Better calibration uncertainties than competition
- Highly protective and rugged aluminum housing
- Power levels from pW to 2 W with sliding OD3 filter
- Wavelengths from 200 to 1,100 nm (818-ST2-UV model)
- Detachable DB15 calibration module
- Ergonomic design
- Lowered price for UV models

the BNC connector, allowing interfacing with Newport meters, an oscilloscope, or a current meter as well.

**WEB** See our website for more info.  
[www.newport.com/818-ST2](http://www.newport.com/818-ST2)



## 819C/819D Series

### Integrating Sphere Line Extension

*Now available are UV (down to 200 nm) integrating sphere detector models and high power silicon based sphere detectors that can handle up to 5 watts of optical power.*



#### Key Features

- Calibrated to NIST standards
- 2", 3.3" and 5.3" sphere size available
- Si or InGaAs detectors used
- Measurements insensitive to exact detector positioning
- Signal attenuation, advantageous in measurement of high-power beams

Newport's calibrated integrating sphere detectors consist of the 819C and 819D series integrating spheres, configured to measure diverging or collimated light sources, respectively, and either a Si, UV-enhanced or an InGaAs sensor. The integrating sphere is an ideal tool for measuring high power or diverging light sources using a photodiode. The available sphere sizes are between 2" and 5.3" sphere sizes.

The spheres with a silicon detector are suitable for the measurements ranging from 400 to 1100 nm, while the models with an InGaAs detector are suitable for approximately 800–

1650 nm range. The UV version is optimized for wavelengths between 250 and 400 nm, but it is calibrated up to 1100 nm. All the spheres come with an SMA fiber optic connector on the North pole as a standard feature, allowing a small amount of light pickoff for wavelength measurement or any further analysis without affecting the overall system calibration

**WEB** See our website for more info.  
[www.newport.com/819C-819D](http://www.newport.com/819C-819D)


**Millennia® eV™**

## High Power CW DPSS Lasers



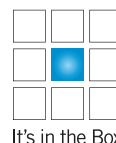
The new Millennia® eV™ from Spectra-Physics is the next generation Millennia, extending the highly successful product family of CW DPSS green lasers to unprecedented power levels. Millennia eV delivers up to 25 W of CW power at 532 nm, ultra low optical noise, TEM<sub>00</sub> beam quality and best-in-class power stability

The new platform is based on Spectra-Physics' It's in the Box™ design, where the laser optical cavity, diode and control electronics are all integrated in a single, compact package, eliminating the need for an external power supply.

Millennia eV benefits from Spectra-Physics extensive experience in the design of rugged industrial lasers. Millennia eV lasers utilize long life, highly reliable laser diodes. The optical resonator features ultra-stable EternAlign™ optical mount technology for stable alignment over the lifetime of the laser. The result is a highly reliable laser, ensuring dependable, easy turn key operation.

### The Millennia eV Advantage

Industry leading 25 W average power  
Integrated laser head and power supply  
Best-in-class power stability and beam quality  
Low optical noise  
High reliability for turn key operation



It's in the Box™

#### Scientific Applications

Pumping CW and mode-locked Ti:Sapphire lasers  
Pumping solid state and dye lasers  
Spectroscopy

#### Industrial Applications

Laser doping of solar cells  
Materials processing

With its industry leading 25 W average power and high reliability, Millennia eV is the next generation laser of choice for demanding scientific applications such as the pumping of high power ultrafast and CW Ti:Sapphire lasers and high power, high throughput industrial applications

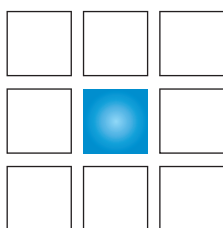
**WEB** See our website for more info.  
[www.newport.com/Millennia-eV](http://www.newport.com/Millennia-eV)

L  
A  
S  
E  
R



## What's in the Box?

### Everything



It's in the Box™

#### Lasers That Have It All

Simple Integration  
Just plug it in and start working. It's that simple.  
Flexible System Design  
Stationary or gantry. No separate power supply box.  
Compact Footprint  
Reduced system size.  
Robust and Reliable  
24/7 operation. Low Cost of Ownership.



Spectra-Physics | **Spitfire® Ace™**

## Power Amplifier



The new Spitfire Ace Power Amplifier features industry leading stability with more than twice the output power of the regenerative amplifier only Spitfire Ace, delivering more than 12 W output power at 5/10 kHz and more than 10 W at 1 kHz repetition rate. Based on the highly successful Spitfire Ace, the new amplifier sets the standard for long term performance, low noise and day-to-day reproducibility. With the patented XP cavity, the beam quality is excellent, providing  $M^2 < 1.45$  even at the highest energy configuration. The Spitfire Ace Power Amplifier is ideal for applications such as multicolor pump-probe spectroscopy, coherent control, nonlinear optics, time-resolved spectroscopy, and more.

The Spitfire Ace performs optimally when seeded using the revolutionary Mai Tai® SP oscillator. This laser is a truly hands-free system, eliminating the need for re-alignment, cleaning or adjustments of any kind. The Mai Tai SP performance specifications are guaranteed over an impressive 20 °C temperature range.

### The Spitfire Ace Power Amplifier Advantage

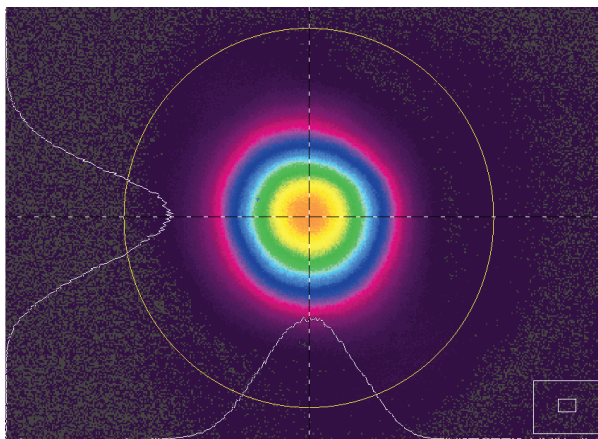
- Revolutionary XPert™ technology
- More than 12 W of output power
- Superior mode quality ( $M^2 < 1.45$ )
- Digital synchronization electronics
- Designed and supported by the most knowledgeable ultrafast engineering and service teams

#### Applications

- Multicolor pump-probe spectroscopy
- Coherent control
- Nonlinear optics
- Time resolved spectroscopy
- Four wave mixing spectroscopy
- Material processing
- Optical parametric amplification

The Spitfire Ace amplifier system is pumped using the field-proven Empower® Q-switched DPSS laser. The regenerative amplifier can be pumped using the Empower 30 or Empower 45 versions to produce >4.0 W and >5.0 W, respectively. For highest power, the Spitfire Ace Power Amplifier system is pumped using an additional Empower laser. The combination can deliver more than 90 W of average power. Equipped with proprietary noise reducing technology, the Empower 45 is the quietest amplifier pump laser on the market.

### Spitfire Ace Power Amplifier Beam Profile



**WEB**

See our website for more info.  
[www.newport.com/Spitfire-Ace](http://www.newport.com/Spitfire-Ace)

## Spectra-Physics | Inspire™ IR

### Automated Ultrafast OPO



The new Spectra-Physics® Inspire™ IR OPO delivers a wide, gap-free tuning range from 1000 nm to 1580 nm. Pumped with the Mai Tai® HP ultrafast Ti:Sapphire laser, the system also provides exceptionally high power and short pulses

across the full range. The Inspire IR OPO features user-friendly, computer-controlled tuning in a sealed hands-free package. The system's robust design ensures high stability and insensitivity to ambient temperature change.

#### The Inspire IR OPO offers

- Two output ports available: signal output (1000–1580 nm with >600 mW at 1300 nm) and fundamental output (690–1040 nm with >1 W)
- Synchronized output from two output ports—ideal for applications requiring more than one wavelength such as CARS
- Fully-automated hands-free wavelength tuning complete with automated cavity alignment to maintain optimal power and pulse durations

#### The Inspire IR Advantage

Wide, gap-free tuning from 1000 nm to 1580 nm  
 Accepts a wide range of pump wavelengths  
 Highest output power in the near IR  
 Fully-automated, computer-controlled tuning  
 Synchronized output of near IR (pump) and IR (signal) wavelengths

#### Applications

Coherent anti-stokes raman spectroscopy (CARS)  
 Multiphoton excitation (MPE) microscopy  
 Time-resolved spectroscopy  
 Vibrational overtone spectroscopy  
 Semiconductor research and spectroscopy  
 Multiple wavelength pump-probe experiments  
 Fiber optics and optical communications

Wide, gap-free wavelength coverage makes the Inspire IR OPO the next-generation OPO for developing cutting-edge imaging and spectroscopy applications

**WEB** See our website for more info.  
[www.newport.com/Inspire-IR](http://www.newport.com/Inspire-IR)

L  
A  
S  
E  
R

## Spectra-Physics | alphaScan™

### Integrated Laser-OPO



The Spectra-Physics® alphaScan™ system is an integrated optical parametric oscillator (OPO) and Nd:YAG pump laser specifically designed to deliver high

energies in the near IR region. This system is well suited for biological applications such as photoacoustic imaging and other applications requiring high energies in the hemoglobin absorption regions.

With a rapid scan option, the system is capable of tuning up to 100 nm between alternating pulses. This allows for rapidly making differential measurements or simultaneous detection of markers.

The alphaScan system is based on the Spectra-Physics Scan Series OPOs and Quanta-Ray® INDI Nd:YAG laser. Broadband (BB), high energy double pumped (BB-HE), and midband (MB) models are available. The alphaScan contains an internal filter to separate the signal from the idler wave. The system is

#### The alphaScan Advantage

Compact integrated OPO and Nd:YAG pump laser  
 High energies for hemoglobin absorption wavelengths  
 Rapid scan option for differential measurements  
 Both broadband and midband options available  
 ScanMaster software for intuitive GUI interface  
 Low pump fluences for rugged OPO performance  
 P-coated crystals for longer BBO lifetimes

#### Applications

Photoacoustic imaging  
 Photoacoustic tomography  
 Medical and biological processes  
 Remote sensing  
 Vibrational spectroscopy

software controlled and fully automated for simple operation through the use of a motorization option controlled by ScanMaster software

**WEB** See our website for more info.  
[www.newport.com/alphaScan](http://www.newport.com/alphaScan)

# *Individually, each company has a str Together we extend the spectrum*

*Individually, each company has a history of leadership. Together as Newport's family of brands, we provide an unsurpassed level of expertise and technology integration to deliver the products and services used by research, development and industrial manufacturing to help shape the future of the world in which we live.*



**Photonics Research Solutions**  
43 years



Newport was founded in 1969 to meet the specific needs of an emerging new laser industry and soon became the leader in vibration control solutions. As the photonics industry developed, Newport continued to advance its product portfolio, offering opto-mechanical components, optics, photonics instrumentation and precision motion control. Today, Newport Corporation has grown to include a family of the industry's well respected brands working together towards one goal – to satisfy the needs of the photonics community.



**Photonic Test and Measurement**  
26 years



Founded in 1986, ILX Lightwave introduced the industry's first precision laser diode current source. The company quickly became a market and technology leader providing high performance test and measurement solutions for laser diodes and other photonic components. Today, ILX Lightwave products include laser diode current sources, thermoelectric temperature controllers, laser diode controllers, laser diode mounting fixtures, optical power and wavelength meters, precision fiber optic sources, and laser diode burn-in and reliability test systems.



**Simply Better™ Photonics**  
22 years



New Focus was established 22 years ago with the mission to provide "Simply Better Photonic Tools™" and became known for a wide range of innovative photonics products. Today, New Focus is still a leader in developing, manufacturing and delivering superior, high-performance opto-electronics including high-speed detectors and modulators, high-resolution mechanical actuators and widely tunable diode lasers.



# ong history of leadership. of photonics solutions.



## Optics & Photonics Solutions 36 years



Established in 1976, Ophir Optronics has become a global leader in precision IR optics, laser measurement instrumentation and 3D non-contact measurement equipment. Renowned for quality and reliability, the company develops, manufactures and markets its innovative products based on the most advanced technologies. The Optics Group designs and produces a full range of high performance opto-mechanical infrared lens assemblies and components for the defense, security and commercial markets, including the automotive safety market. Ophir's Photonics Group is the world's largest supplier of a complete line of laser instrumentation, including laser power and energy meters and laser beam profilers. Fully focused on laser measurement, the Group's modular and customized solutions serve industrial, medical and research markets throughout the world.



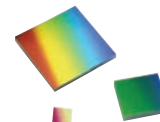
## Light Sources & Detection Systems 47 years



Oriel has 47 years of proven experience as an innovative supplier of products for the making and measuring of light. The Oriel brand features instruments, such as monochromators, spectrographs and light sources covering a broad range from UV to IR, pulsed or continuous, and low to high power. Today, Oriel continues its innovative approach with products like its family of solar simulators and test systems making it a leader in Photovoltaics and Life and Health Science.



## Diffraction Gratings 65 years



Founded in 1947, Newport's Richardson Gratings is a world leader in the design and manufacture of diffraction gratings for spectroscopic, telecommunications and laser applications, as well as for research and education. Since inception their focus has been on two key competencies: the generation of master gratings, both by mechanical ruling and by holographic recording, and secondly the replication of optically equivalent copies of those master gratings for cost-effective solutions for large volume applications.



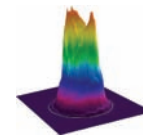
## Lasers for Industry & Science 51 years



Spectra-Physics was established as the first commercial laser company and has been the catalyst to today's laser industry. Spectra-Physics has introduced many firsts that have gone on to become industry standards: the first commercial cw, ultrafast Ti:Sapphire and Q-switched Nd:Vanadate DPSS lasers. Today, Spectra-Physics is a recognized market leader in delivering high performance, high quality lasers worldwide. With its broad portfolio of innovative products and technologies and responsive global support organization, Spectra-Physics is the partner of choice for the most demanding industrial and scientific laser applications.



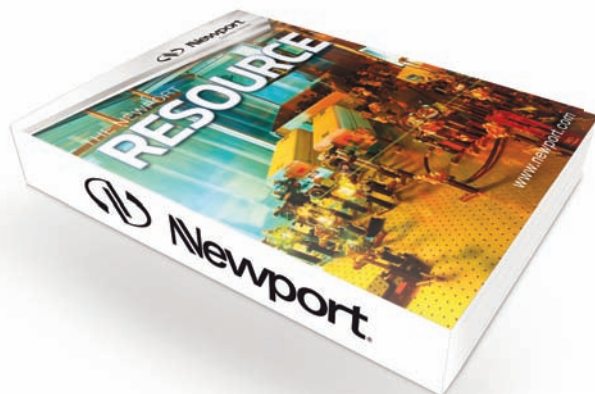
## Laser Beam Measurement 34 years



Spiricon provides a complete line of instrumentation including power and energy meters, beam profilers, spectrum analyzers, and goniometric radiometers. Spiricon is dedicated to continuous innovation in laser measurement and holds a number of patents, including Ultracal™, the baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy.

## Literature Request

Newport Resource is designed as a learning resource and product guide for optoelectronics engineers, universities, and photonics researchers. It features 1,632 pages and highlights 2,440 new products. In addition, there are over 202 pages of technical and application notes, plus instructive reference information, e.g. definitions and characteristics for tunable diode lasers, manual positioning, picomotors, optical measurement devices, optics, and more.



**WEB** To order a free copy of the catalog.  
[www.newport.com/NewportResource](http://www.newport.com/NewportResource)

### Meet Us at the Following Events

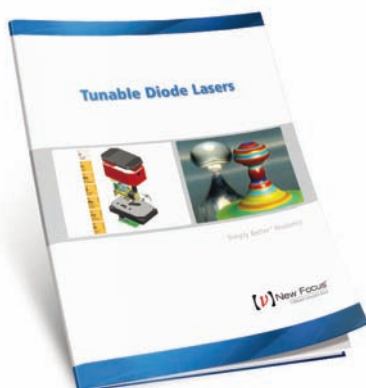


**CYTO 2012**  
 XXVII Congress  
 of the International Society  
 for Advancement of Cytometry  
 Congress Center Leipzig  
 Booth #213  
 June 23-27  
 Leipzig, Germany



**UP 2012**  
 XVIII International Conference  
 on Ultrafast Phenomena  
 July 8-13  
 Lausanne, Switzerland

### Introducing New Tunable Lasers and Amplifier by New Focus



**WEB** See our website for more info.  
[www.newport.com/TDL](http://www.newport.com/TDL)

### Photo-Biological Testing with UV Solar Simulators



**WEB** See our website for more info.  
[www.newport.com/AppNote48](http://www.newport.com/AppNote48)

### Watch Newport Corporation's Channel on YouTube



**WEB** See our website for more info.  
[www.newport.com/YouTube](http://www.newport.com/YouTube)

*The World's Premier Source of Photonics Technology.*

### Newport Family of Brands:

**ILX** Lightwave

**New Focus**

**OPHIR**

**DRIEL**  
INSTRUMENTS

**Richardson Gratings**

**Spectra-Physics**

**Spiricon**  
OPHIR Photonics

**Newport**  
Experience | Solutions

Newport Corporation, Global Headquarters  
 1791 Deere Avenue, Irvine, CA 92606, USA

PHONE: 1-800-222-6440 1-949-863-3144 FAX: 1-949-253-1680 EMAIL: [sales@newport.com](mailto:sales@newport.com)  
 Complete listings for all global office locations are available online at [www.newport.com/contact](http://www.newport.com/contact)

[www.newport.com](http://www.newport.com)

	PHONE
Belgium	+32-(0)0800-11 257
China	+86-10-6267-0065
France	+33-(0)1-60-91-68-68
Japan	+81-3-3794-5511
Taiwan	+886 -(0)2-2508-4977

	EMAIL
Belgium	<a href="mailto:belgium@newport.com">belgium@newport.com</a>
China	<a href="mailto:china@newport.com">china@newport.com</a>
France	<a href="mailto:france@newport.com">france@newport.com</a>
Japan	<a href="mailto:spectra-physics@splasers.co.jp">spectra-physics@splasers.co.jp</a>
Taiwan	<a href="mailto:sales@newport.com.tw">sales@newport.com.tw</a>

	PHONE
Irvine, CA, USA	+1-800-222-6440
Netherlands	+31-(0)30 6592111
United Kingdom	+44-1235-432-710
Germany / Austria / Switzerland	+49-(0)6151-708-0

	EMAIL
Irvine, CA, USA	<a href="mailto:sales@newport.com">sales@newport.com</a>
Netherlands	<a href="mailto:netherlands@newport.com">netherlands@newport.com</a>
United Kingdom	<a href="mailto:uk@newport.com">uk@newport.com</a>
Germany / Austria / Switzerland	<a href="mailto:germany@newport.com">germany@newport.com</a>