

# Newport Spectra-Physics Newsletter

N° 27

Summer 2008

Solutions to Make, Manage and Measure Light<sup>SM</sup>



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### One Box Ultrafast Amplifier

*A unique combination of high power, robust performance and unmatched stability.*

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*Economical, high-performing isolation platform for every budget.*



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*The best just got even better.*



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## ULTRAFAST LASER UPDATE

**Mai Tai® DeepSee™****Automated Dispersion Compensation Upgrade Module**

Spectra Physics is pleased to announce the DeepSee upgrade module for select Mai Tai HP and Mai Tai BB oscillator models. This upgrade module can be installed in the field. The Mai Tai DeepSee laser sets new standards for delivering the shortest possible pulses to the sample while maximizing the fluorescence signal. The DeepSee laser provides >300 nm (690–1040 nm) in its usable tuning range with >2.3 W of average power and a pulse width of less than 100 fs – a performance level that has never before been available.

The Mai Tai family is a proven platform with almost a decade of history to its name. It boasts leading performance specifications such as shortest pulse widths, highest peak power and best beam quality. It also has the most experienced support team and the largest installed base for any laser of its type.

**Advantages of the DeepSee laser's automated dispersion compensation**

- Shortest pulses on the sample give maximum fluorescence signal
- Fully automated and synchronized with the Mai Tai laser
- Beam quality and beam pointing remain stable
- Mai Tai oscillator's wide tuning range is unaffected

Reliability is assured through the ultra-stable regenerative mode-locking technique made famous by the Spectra-Physics Tsunami® oscillator. Using this method, the DeepSee oscillator offers hands-free, dropout-free wavelength tuning, so the system is always pulsing and ready to take images. The new model also includes StabiLok® technology that provides real-time monitoring of the laser system and helps maintain beam position, average power, and wavelength – making the DeepSee laser the most reliable and versatile hands-free laser source on the market.

**WEB** See our website for more info.  
newport.com/DeepSee27

**Solstice™****One Box Ultrafast Amplifier**

*A unique combination of high power, robust performance and unmatched stability.*



The Spectra-Physics Solstice™ amplifier is an innovative, rugged laser system that delivers hands-free, cutting-edge performance and ultra stable operation. With its unique combination of high power, robust performance and unmatched stability, the Solstice one box ultrafast amplifier is an excellent choice for a wide range of applications.

Scientific researchers can take advantage of the high power (>2.5 W) to easily split the Solstice laser's beam into several, which enable multi-color pump probe experiments. For industrial customers, the high average power ensures maximum throughput in micromachining applications.

**WEB** See our website for more info.  
newport.com/Solstice27

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Continued from page 2.

### The Solstice Advantage

- One box, compact ultrafast amplifier
- Based on patented regenerative cavity design for highest performance
- More than 2.5 W of output power
- Exceptional beam quality ( $M^2 < 1.3$ )
- Capable of operating in a  $\pm 5$  °C environment
- All digital timing electronics for temperature insensitive long term stability
- Computer controlled
- Pulse width  $< 100$  fs
- Available in 1 and 5 kHz versions

### Applications

- OPA pumping
- Ultrafast multicolor pump-probe spectroscopy
- Ultrafast micromachining on a wide variety of materials
- Nonlinear optics

## Spitfire® Pro Ultrafast Amplifier

*Innovative regenerative amplifier optical design for optimum performance.*



The Spectra-Physics Spitfire® Pro is the world's most popular ultrafast amplifier system. Cutting-edge performance, high reliability, and industry-leading technical support combine to make the Spitfire Pro the ultrafast amplifier of choice in hundreds of leading research institutions.

All Spitfire Pro amplifiers feature the unique, patent protected XP regenerative cavity optical design. With a single intra-cavity Pockels cell, the new cavity significantly reduces dispersion and losses, yielding shorter pulses (shorter than 35 fs) and higher pulse energy (up to 6 mJ), while offering outstanding contrast ratio and the best beam quality available today.

**WEB** See our website for more info.  
[newport.com/Spitfirepro27](http://newport.com/Spitfirepro27)

### The Spitfire Pro Advantage

- Unique, patented regenerative cavity design for minimum intra-cavity dispersion and losses
- Up to 6 W of average power
- Pulse width as short as 35 fs
- Available in 1 kHz and 5 kHz configurations
- Superior mode quality ( $M^2 < 1.35$ )
- Excellent pulse-to-pulse energy stability
- Exceptional beam pointing stability simplifies integration into complex laboratory setups
- All digital timing for temperature insensitive long term stability
- Fully computer controlled
- Complete wavelength flexibility with SHG, THG, FHG, and OPA accessories
- Supported by industry's most knowledgeable and experienced ultrafast engineering and service teams

### Applications

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

## Need a green, red or infrared laser?

### Newport HeNe Lasers



High performance and affordability at a range of wavelengths.

Newport now offers a complete line of Helium-Neon (HeNe) lasers that combines high performance and affordability at wavelengths of 543 nm, 632.8 nm, 1.15  $\mu\text{m}$ , 1.52  $\mu\text{m}$  and 3.39  $\mu\text{m}$ .

With enhanced designs, superior optical components and optimized mirror quality, these models deliver unsurpassed operational stability over long lifetimes, making them the highest-quality HeNe lasers available. They are supported by a one-year warranty and are available "off the shelf".

#### Green HeNe Laser (543 nm)



The green HeNe laser product family offers TEM<sub>00</sub> and higher-order mode structures at 543 nm, with all models available in either linear or random polarization. The 543 nm wavelength is highly visible (near the photopic vision peak), making this wavelength ideal for alignment applications. The green HeNe laser is also well suited to many biophotonic applications. We offer lasers with power levels ranging from 0.5 mW to 2.0 mW.

#### Red HeNe Laser (633 nm)



The red HeNe laser product family offers TEM<sub>00</sub> mode at 633 nm, with all models available in either linear or random polarization. To meet every application and budgetary need, we offer a variety of power levels ranging from 0.5 mW right up to 35 mW. This product family offers some of the highest power levels available in production HeNe lasers.

#### Infrared HeNe Laser



The infrared (IR) HeNe laser product family offers TEM<sub>00</sub> mode output beam at 1.15  $\mu\text{m}$ , 1.52  $\mu\text{m}$  and 3.39  $\mu\text{m}$ . All models are available with 500:1 linear polarization.

**WEB** See our website for more info.  
[newport.com/HeNe27](http://newport.com/HeNe27)

#### R-32734 Frequency/Intensity Stable HeNe Laser

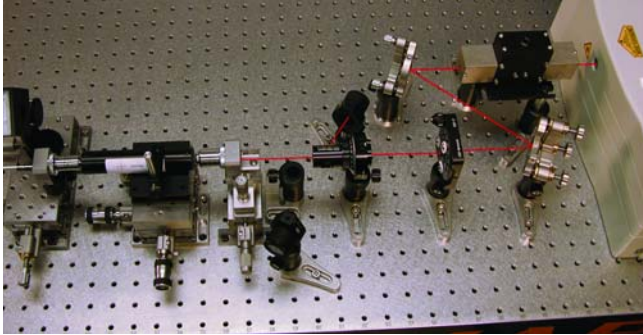


The R-32734 uses a highly refined thermal compensation technique to provide an excellent balance of high output power and stability, plus low temperature sensitivity and solid reliability.

An extremely versatile research and instrumentation tool, the R-32734 can toggle instantly via front panel control between intensity- and frequency-stable modes. In intensity-stabilized mode it will operate as an output power reference with stability of  $\leq \pm 0.2\%$  over one hour, while the frequency-stabilized mode offers frequency stability as low as  $\leq \pm 3$  MHz over an eight-hour period.

## Steering pulses with minimum dispersion

### Newport Supercontinuum Kit



The Newport Supercontinuum Kit is a complete supercontinuum-generation solution designed specifically for use with a femtosecond Ti:Sapphire laser such as the Tsunami® or Mai Tai® lasers. Created in response to feedback from researchers in the emerging field of supercontinuum generation, the kit allows laboratory experiments to be set up by assembling pre-selected, certified off-the-shelf components into a cost-effective supercontinuum solution.

The kit leverages the powerful combination of Newport's SCG-800 supercontinuum fiber module and high-stability ULTRAlign™ manual positioners. The SCG-800 is a polarization-maintaining supercontinuum device for use with 800 nm-range femtosecond lasers. It contains a highly nonlinear, polarization-maintaining photonic crystal fiber with a zero-dispersion wavelength of 750 nm. The fiber ends are sealed and mounted in quartz ferrules, and the polarization axis is

aligned to a line on the device. The nonlinear fiber is mounted in a robust aluminum housing, which is then securely mounted on the ULTRAlign translation stage. The SCG-800 features build-in beam expansion at the end facets, facilitating easy coupling and providing a high damage threshold.

The kit also includes a faraday isolator, two steering mirrors and a half-waveplate/polarizer combination for variable attenuation of the incident pump laser power. Much effort was put into eliminating optical feedback and maximizing beam stability in order to maintain alignment with the small 1.6-micron fiber core inside the SCG-800 module. Optics and mounts have been certified by our Technology and Applications Center as compatible with the Spectra-Physics Mai Tai and Tsunami Ti:Sapphire lasers.

A much more detailed explanation of this kit, including alignment procedures, recommended operating parameters and a detailed characterization of the supercontinuum generated as a function of launched pump power and wavelength can be found in Newport Application Note #28, Supercontinuum Generation in SCG-800 Photonic Crystal Fiber.



**WEB** See our website for more info.  
newport.com/Super27

## Efficient performance, flexible control

### Oriel® LED Sources

*Simple and economical LED light-generation solutions.*



Newport sets another standard in light-generation instruments with the new family of Oriel® LED sources. For applications where low power consumption and heat dissipation are critical, these sources of UV/VIS-NIR radiation offer a simple, economical and long-lived alternative to diode lasers and QTH lamp-based systems.



We offer models covering wavelengths from 385 nm to 629 nm, as well as a broadband white-light model, with power levels up to 500 mW. An interchangeable LED head is recognized by the drive, while a standard output flange offers easy coupling to light guides, microscope illumination adaptors, fibers or lens assemblies.

**WEB** See our website for more info.  
newport.com/LED27

## IDEAL FOR ULTRA-SENSITIVE ALIGNMENTS

# Agilis™ **NEW**

## Piezomotor Driven Micropositioning Devices

*Get better results by remote control.*

Newport's growing Agilis family of piezomotor driven devices allows end-users to remotely control laser or optical setups with greater precision, for better experimental results. Ultra-compact and offering great ease-of-use, the motorized Agilis components are priced extremely competitive, comparable to the prices of manual components. The Agilis series is comprised of mirror mounts, linear and rotation stages and dedicated control electronics.



## AG-M050 & AG-M100

### Piezomotor Driven Optical Mounts

- For 0.5" and 1" diameter optics
- Impressive 0.2 arc-s adjustment sensitivity
- Set-and-forget long-term stability
- Vacuum compatible versions
- **NEW** Models with integrated precision limit switch provide absolute positioning capability that enable registering and returning to a set position with better than 0.05° repeatability



## AG-PR100

### Piezomotor Driven Rotation Stage

- Continuous 360° rotation with 5  $\mu$ rad (1 arc-s) adjustment sensitivity
- Ultra-compact — ideal for space constrained setups and system integration
- Set-and-forget long-term stability



## AG-UC2

### Agilis 2-Channel Controller

- Convenient push button remote control and USB computer control for 2-axis
- Powered through USB
- ASCII commands, LabView drivers, utility software



**WEB** See our website for more info.  
newport.com/agilis27

## IDEAL FOR ULTRA-SENSITIVE ALIGNMENTS



### AG-LS25

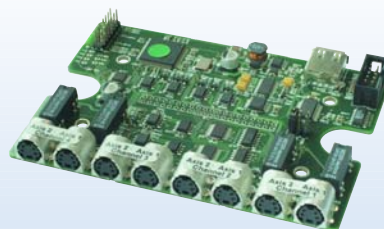
#### Piezomotor Driven Linear Stage

- 12 mm travel
- 50 nm minimum incremental motion
- Ultra-compact — ideal for space constrained setups and system integration
- Set-and-forget long-term stability
- Precision limit switch provides absolute positioning capability with 100  $\mu\text{m}$  repeatability
- **NEW** Vacuum compatible version available August 2008

### AG-UC8PC **NEW**

#### 8-Channel PC-Board Controller

- 8-axis control on a 117x85 mm board
- Simplifies integration into existing electronics
- RS232, RS485 or USB control
- Expandable to 16-, 24-, 32-, 40- or more channels



## Fluorescence Filters for Today's Research



Newport's Corion® filters bring together the perfect blend of proven OEM filter manufacturing expertise and our patented Stabilife® technology to deliver unsurpassed fluorescence filter solutions for today's researchers.

Our extensive experience in creating filter solutions for Cytometers, DNA Sequencers and other fluorescence based instrumentation is the foundation for our innovative High Performance Fluorescence Filters for microscopy applications. Available from stock for the most popular fluorophores, these filters provide extremely high transmission, steep transitions from blocking to transmission and superior image quality combined with exceptional spectral stability.

To request a brochure or more information call us, or visit:

**WEB** See our website for more info.  
[newport.com/filters27](http://newport.com/filters27)

## UPGRADE YOUR TABLE WHENEVER YOU NEED TO

# SmartTable® OTS™ Optical Table System



*Economical, high-performing isolation platform for every budget.*



Newport's new SmartTable® OTS™ optical table system (patent pending) combines the unmatched performance and value of our patented SmartTable® optical table with a new, innovative isolation platform to optimize laboratory space, organization and safety – at sizes and performance levels to suit every budget.

The new platform integrates Newport's I-1250 pneumatic isolator with a new rigid frame to create an economical isolation

platform with superior performance and unmatched accessories. The I-1250 has been used for many years by OEM customers worldwide looking for a reliable, high-performing solution with low cost of ownership.

No other optical table system offers the same combination of performance, accessories and upgradeability to meet the needs of growing labs. As system requirements and budgets change, users can easily upgrade their system in-situ to improve performance, organization and safety. For example, users can initially select a 4' x 8' x 8" ST-UT broadband-damped upgradeable table surface with a rigid leg frame (ST-UT-OTS48-8-N), opting to upgrade both the damping and isolation performance later, in the field, to the highest performance level available.

### Features & Benefits

- Field-upgradeable table and platform options
- Integrated accessories to improve use of lab space, organization and safety
- Three levels of damping and isolation performance to meet every performance and budgetary need

### Table Options (in order of increasing performance)

- ST-UT Series upgradeable optical table with broadband damping
- ST-UT2 Series upgradeable optical table with tuned mass dampers
- ST Series SmartTable optical table with IQ active damping technology

### Isolation Options (in order of increasing performance)

- Rigid frame (Option N)
- Fill-and-Forget™ adjustable pneumatic isolators (Option F)
- Auto-leveling, high-performance pneumatic isolators (Option I)

**WEB** See our website for more info.  
[newport.com/smart27](http://newport.com/smart27)

## BUILD ULTRA-STABLE STRUCTURES

# PS-Q Pedestal Cube



Endless stacking of cubes on posts.



*From left to right: PS-Q pedestal cube, PS-Q-A pedestal cube thread adaptor 8-32 and M-PS-Q pedestal cube (metric version).*

An extension of the pedestal post system, the PS-Q pedestal cube allows PS Series pedestal and extension posts to be mounted at a 90° angle, enabling the construction

of ultra-stable multi-dimensional structures.

Uniquely, the pedestal cube system facilitates alignable stacking of cubes on posts with the PS-Q-A thread adaptor (pictured). Fitted into either of the two counterbores on the cube, this adaptor allows the cube to be rotated in the same orientation as any of the cubes below it, while also providing a threaded hole on top of the cube for

### Key Features

- Endlessly stackable
- Made from solid stainless steel
- English and metric versions

further stacking of posts or other cubes. With this feature, the pedestal cube can be infinitely stacked while maintaining a common alignment – unlike other cubes.

**WEB** See our website for more info.  
[newport.com/psq27](http://newport.com/psq27)

## Great performance in high-energy laser applications

### High-Energy Nd:YAG Laser Beamsplitters

The ideal choice for applications using Nd:YAG or Nd:YLF solid-state lasers.



Our 50/50 high-energy beamsplitters for laser-line wavelengths of 1064 nm, 532 nm, 355 nm and 266 nm are designed to manage the fundamental and harmonic wavelengths of Spectra-Physics Vanguard™ and Quanta-Ray® lasers. However, with a low thermal expansion substrate and high-damage-threshold optical coating, they are also ideal for any scientific or industrial applications that use Nd:YAG or Nd:YLF solid-state lasers.

With 10–5 scratch-dig and excellent surface specifications and tolerances, the beamsplitters are specially designed to deliver excellent results in high-energy applications. They are manufactured by applying high-damage-threshold IBS coatings to UV-grade fused silica substrates, with an anti-reflection coating on the second surface to reduce back reflections.

Newport also provides high-damage-threshold mirrors, harmonic beamsplitters, thin film plate polarizers, laser-wedged windows and laser beam expanders for managing Nd:YAG and Nd:YLF laser pulses.

**WEB** See our website for more info.  
newport.com/beam27

#### Key Features

- UV-fused silica substrate
- Surface flatness of  $\lambda/10$  with 10–5 scratch-dig
- 16 different parts at four center wavelengths (266 nm, 355 nm, 532 nm and 1064 nm)
- Available in 1" and 2" diameter
- Available for both S and P polarizations
- Damage threshold of 20.0 J/cm<sup>2</sup> with 10 ns pulse at 1064 nm or 2000 MW/cm<sup>2</sup> CW

## Two new options for managing output beams

### Ultrafast Broadband & Super-Broadband Turning Mirrors

Steering pulses with minimum dispersion.



Newport's ultrafast mirrors are designed to manage the output beam of Ti:Sapphire oscillators and amplifiers. They have been successfully tested by ultrafast researchers in academic and industrial laboratories around the world.

The super-broadband mirror offers over 99.6% reflection from 680–1060 nm, covering the full

bandwidth of Spectra-Physics' Mai Tai® laser, while the broadband mirror is a more economical version that delivers more than 99% reflection from 700–930 nm for Spitfire, Solstice, and Tsunami lasers. With controlled group velocity dispersion (GVD) optical coating design, both mirrors are an excellent option for steering the 20–100 fs output pulse from a Ti:Sapphire laser with lowest possible pulse dispersion.

Newport also offers a range of other specialized ultrafast optics including chirped mirrors, beamsplitters, ultrafast concave mirrors and polarizers for managing femto-second laser pulses.

#### Key Features

- UV-fused silica substrate
- Controlled group velocity dispersion to minimize pulse broadening
- >99.6% reflection from 680–1060 nm
- Available for both S and P polarized pulses

**WEB** See our website for more info.  
newport.com/mirrors27

## VERSATILE, STATE-OF-THE-ART OPTICAL POWER METERS

# 1936-C and 2936-C

## The Best Just Got Even Better




The hugely successful 1935-C/2935-C series of power meters has set new standards in optical power and energy measurement. Now, Newport has combined the superb femtowatt-level sensitivity of the 1931-C/2931-C series and the extreme versatility of the 1935-C/2935-C series to create a revolutionary step forward in power metering.

For any measurement application, no matter how demanding, all you need is one of these new models plus a Newport detector. Both series are fully compatible with the 918D Series semiconductor-based low power, 818P Series thermopile and 818E Series pyroelectric detectors. When a different detector is needed, hot-swapping capabilities means there's no need to recycle the power.

For low-power or high-power applications, or those involving measurement of energy from continuous or pulsed light sources, the new instruments have broken the barrier of temporal measurement performance with calibrated results. They can handle repetition rates of up to 10 kHz at an unheard sampling rate of 250 kHz. This means that even reasonably high-speed dynamical phenomena can be seen, eliminating the need for an oscilloscope in many cases.

Pulse, peak-to-peak and DC source measurements can be displayed in units of W, dBm, dB, J, A, and V. Dual-channel 2936 Series meters allow for the simultaneous measurement variety of light sources operating at different power levels and wavelengths.

**WEB** See our website for more info.  
[newport.com/power27](http://newport.com/power27)

### Key Features

- One of the most advanced power meters on the market
- State-of-the-art analog board for superb sensitivity, accuracy, and speed
- Power measurement capable of 11 fW–20 kW
- Energy measurement capable of 7 mJ–20 kJ
- Measurement rep-rates up to 10 kHz
- Frequency measurement of pulses up to 250 kHz
- 5.7" graphical TFT LCD, VGA provides excellent legibility from any angle, in any light condition or when wearing colored eyewear
- USB and RS-232 computer interfaces; USB data transfer up to 8Mbps; data storage via internal memory or USB flash drive
- Color plotting, statistics and on-board data post-processing
- Analog and digital filtering
- Trigger in/out control with alarm levels
- Analog bar graph with 10x zoom
- Advanced programming toolkit – .NET and LabVIEW®
- Accelerated thermopile-based power measurements with fast prediction algorithm
- Large variety of programmable input and output controlling triggers
- Sophisticated automation capabilities in testing and laboratory applications
- True RMS measurements

# High-Power Laser Diode Bar Driver

## Models 5700-100 & 5700-150

Newport Corporation, a widely known leader in laser diode control and test instruments, introduces all new 5700 Series High Power Laser Diode Drivers, available in a 150 A - 20 V and a 100 A - 30 V configuration. Ideal for R&D, manufacturing, and quality control, the products are capable of operating in either CW (continuous wave) or pulsed mode, either locally or remotely controlled. The instrument is perfect for driving multiple high-power laser diode bars stacked in series as well as a single bar. A full LIV characterization of laser diodes is attainable via fast USB2.0 interface. Incorrect settings are prevented during the setup mode to protect the laser diode. When power is turned off, all



program settings are saved. In addition, several different setups can be saved and recalled to facilitate multiple test requirements. Complete laser diode protection is provided, including transient detection and filtering, intermittent contact protection, independent current limit and power limit settings, output off shorting circuits and a slow turn on sequence.

**WEB** See our website for more info.  
newport.com/LD27

### Key Features

- One of the highest CW output current available on the market, up to 150A
- Compliance voltage up to 30V to accommodate a diode stack
- Advanced laser diode protection schemes
- USB2.0 interface. Very simple-to-use, intuitive front panel controls

## PCD Series Photon Counting Detectors

Newport's Photon Counting Detectors provide a complete solution in a single module, which means that it is no longer necessary to be an optics or electronics expert to implement high resolution photon counting. The sensors used in these modules feature a novel quenching architecture that provides state-of-the-art timing-jitter, thereby exceeding the typical sensing performance of Photomultiplier Tubes (PMT) in all key photon counting parameters such as Photon Detection Efficiency, Dark Count, Timing-Jitter and After-Pulsing.



**WEB** See our website for more info.  
newport.com/PCD27

### Key Features

- Low Timing-Jitter (< 100ps) and low after-pulsing
- Excellent Photon Detection Efficiency at blue/red wavelengths (> 30%)
- TTL output (pulse indicates photon arrival time)
- Low operating voltages (<35V)
- Integrated TE cooler for dark count reduction
- Integrated wall mounted power supply
- Modules available in 20 or 100  $\mu\text{m}$  versions, with optional fiber coupled output
- USB Interface with integrated software environment and DLL libraries

## A TECHNICAL BREAKTHROUGH

**SPM Series****High-Gain Avalanche Photodiodes**

*APDs in silicon for the first time.*



Newport's SPM Series high-gain avalanche photodiodes (APDs) are the first solid-state alternative to the long-established photomultiplier tube (PMT). They combine the high gain (10<sup>6</sup>) and quantum efficiency of the PMT with the much-appreciated benefits of silicon – small size, low operating voltage, robustness,

reliability, insensitivity to magnetic fields, light tolerance and miniaturization. In addition, the new design offers a high signal-to-noise ratio and a very fast pulse response.

The detector, usually known as a silicon photomultiplier (SPM), consists of an array of Geiger-mode APDs, each individually coupled to integrated quench electronics. Geiger-mode APDs have extremely high internal amplification that allows single-photon sensitivity at room temperature.

The SPM Series APDs are available with an active area of 1x1 mm<sup>2</sup> or 3x3 mm<sup>2</sup>, housed in a hermetically

**Key Features**

- Compact, rugged and stable detector supplied with integrated power supply and TE cooler
- High gain: 10<sup>6</sup>
- Low bias voltages: 30V
- Fast rise time: <5 ns
- Low dark count rate: <1 MHz
- Large area: up to 9 mm<sup>2</sup>

sealed TO8 can and mounted on a two-stage Peltier cooler. During normal operation the detector is cooled to -20 °C, which reduces the dark count by an order of magnitude and offers a significant performance improvement over room-temperature operation.

**WEB** See our website for more info.  
newport.com/spm27

## THE ULTIMATE IN TIMING

**HRTM Series****High-Resolution Timing Module**

*Enables a resolution of 66 ps.*



Newport's new high-resolution timing module (HRTM) is the first portable USB high-resolution timing module on the market, offering high-end timing functions in an easy-to-use, flexible module. Its novel timing circuitry enables a timing resolution of 66 ps and is available in one, two, or four channels. The system design is optimized for use with Newport's photon-counting sensor products, but is also compatible with any other photon-counting sensor.

The HRTM offers functions including time-binning, time-tagging (micro and macro), multi-channel averager/scaler, multi-dimensional time-correlated single-photon counting (TCSPC) and auto/cross correlation. Along with a range of tools for display, statistical analysis and data export, this combination of functions in a single platform makes the HRTM the ultimate timing module.

A user-configurable memory architecture enables the capture of multiple curves in one experiment. Using the flexible interface with 16 I/O ports, these curves can be automatically mapped to memory in various configurations, allowing single-point or multi-dimensional imaging. The versatile I/O structure

**Key Features**

- Timing resolutions of 66 ps and 648 ps
- 16 user-configurable I/O inputs
- Burst timing rates up to 100 MHz
- Up to 16MB ultrafast static RAM
- Multi-dimensional data configuration
- User-configurable curves, number of time bins and time bin depth
- High-speed USB 2.0 interface to PC
- Data analysis, statistical tools and DLL libraries
- Available in one-, two- and four-channel versions

allows integration with existing external equipment such as stepper motors, microscopes and scanning arrays, allowing the HRTM to control (or be controlled by) external equipment.

**WEB** See our website for more info.  
newport.com/htrm27

## RELIABLE, ACCURATE, CONTINUOUS MEASUREMENTS

### Oriel® Solar Simulators & Solar Cell Test Equipment

Newport's Oriel® solar simulators provide the closest spectral match to solar spectra available from any artificial source. Each system is manufactured, characterized and exhaustively tested to verify beam uniformity, collimation and spectral output.

We offer 150 W to 1600 W systems with output beam sizes to 12 x12 inches. Optional air mass and dichroic filters shape the output spectra. Add an IV Test system for measuring solar cell current and voltage (IV) output.

QE Configurations for measuring solar cell efficiency are also available.

**WEB** See our website for more info.  
newport.com/solarmatch27

#### Oriel I-V Test Station



- New I-V measurement solution for photovoltaic cells
- Works with any 2" x 2" and 4" x 4" Oriel Solar Simulator
- Complete systems or modular sub-systems
- Easy-to-use LabVIEW based I-V characterization software

#### Class A Solar Simulators



- Factory certified Class A CW systems per JIS C 8912, ASTM E 927-91, and IEC 904-9
- 2" x 2" to 8" x 8" output beam sizes
- Convenient user features simplify operation
- Temperature sensors and interlocks ensure operator safety

#### 150 W Solar Simulators



- Low cost alternative for low power applications
- 1.3 inch diameter output beam
- Small arc size for efficient fiber coupling
- Optional filters let you shape the output spectrum

#### Oriel® QE/IPCE Measurement System



- 300 W Xe source
- CS260 monochromator
- Merlin™ lock-in amplifier
- Calibrated Si detector
- TRACQ™ Basic software

Efficiency (QE) and Incident Photon to Charge Carrier Efficiency (IPCE) measurement for solar cells, detectors, or any other photon-to-charge converting device. We selected the most suitable components for your measurements needs.

Worldwide contact details at: [www.newport.com/Contact-us](http://www.newport.com/Contact-us)



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