

ePulse: Laser Measurement News

The true measurement of laser performance



ePulse: Laser Measurement News November 2024

Welcome to **ePulse: Laser Measurement News**, a review of new developments in laser beam measurement, beam diagnostics, and beam profiling. Each issue contains industry news, product information, and technical tips to help you solve challenging laser measurement and spectral analysis requirements. Please forward to interested colleagues or have them [subscribe](#).

Features

Addressing Key Challenges in Li-Ion Battery Production

One of the most demanding laser-based applications is the production of lithium-ion (Li-Ion) batteries, where the quality and efficiency of laser processes can significantly impact the overall performance and safety of the batteries. To ensure optimal battery performance and mitigate potential safety hazards, water usage is avoided in these processes. Several laser-based processes must be executed with high precision. Ensuring accurate power measurements, fast reading times, and protection against dust and debris are essential to maintaining the integrity of these processes. [Li-Ion Battery Production](#).



Large Mode Area Fiber Testing at ALPhANOV

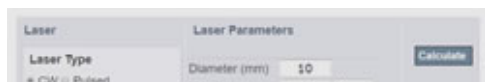
One of the main characteristics to be tested in large mode area (LMA) fibers is modal behavior. The ALPhANOV engineers needed a device that would deliver reliable and consistent measurements in order to be able to compare each fiber at the same level of quality. They needed a system that could quickly and easily measure alignment, including beam propagation ratio (M2), astigmatism, and beam shape. Enter the Ophir BeamSquared beam propagation analyzer. [ALPhANOV](#).



Applications

Laser Power Density Calculator

If you have a laser beam, you want to know its power density. It can be argued that there is no single parameter that better characterizes how a laser will perform. If you are cutting sheet metal, the power



Videos of the Month

New: Helios Pro Industrial Laser Power Meters

Designed with factory automation in mind, the Helios Pro family of laser power meters features a robust, industrial design for harsh environments as well as a range of communication interfaces that make them easy to integrate into factory networks. [Helios Pro](#).



F150(200)A-CM-16 High Damage Threshold Laser Power Sensor

If you need to measure the power of high repetition rate lasers with very short pulses (typical in many micromachining applications), with powers up to 200W – and you want a sensor that will survive the experience – the F150(200)A-CM-16 from Ophir may be exactly what you need. [F150\(200\)A-CM-16 Laser Power Sensor](#).



Ophir Premium Energy Sensors - Even for UV

Meet Ophir's high performance energy sensors for pulsed UV lasers (and not only for UV...). These sensors are the perfect solution for pulsed lasers at 193nm and 248nm. They offer absolute calibration, even in the UV, and high damage threshold, even in the UV. [High Performance Energy Sensors](#).

density will determine how fast it can cut (and the quality of the cut as well). If you are performing laser surgery, the power density will need to be within a narrow range to ensure a successful operation.

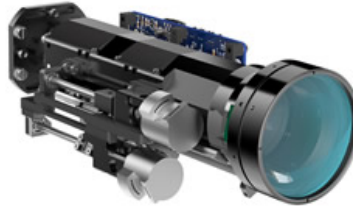
If you are testing the laser for safety purposes, the power density must be below a specific threshold where eye damage can occur. Ophir has a calculator for easily determining the power density of your laser.

[Calculating Laser Power Density.](#)



Application Note: Advances in IR Zoom Lenses for Security and Surveillance

This paper explores some of the issues faced in designing and building high-performance IR zoom lenses for detection, recognition, and identification (DRI) applications. It provides an overview of the innovative solutions developed at MKS Ophir to meet these challenges and offers a snapshot of our long range product solutions in SWIR, MWIR, and LWIR, as a way to highlight the current state-of-the-art in this technology. [IR Zoom Lenses.](#)



What's New

Helios Pro Industrial Power Meter for Optimizing Li-Ion Battery Welding

The Ophir® Helios Pro industrial power meter is a robust, compact device for measuring high-power lasers, including diode, fiber, and Nd:YAG, with power ranges from 100W to 12kW, and wavelengths from 450-550nm (blue/green) to 900-1100nm (infrared). An exceptional device, the Helios Pro industrial power meter can monitor pulse shape during measurement and compensate for the effects of slow pulse rise time; this means it delivers accurate measurements even when the laser does not have a sharp rise/fall time. In addition, a new shutter mechanism allows for mounting in any orientation while still protecting the sensor from dust and debris. A diffuser option supports power measurements of small beams in restricted spaces while close to the focal plane. [Helios Pro Industrial Power Meter.](#)



20K-W High Power Laser Sensor with Fast Response Time, High Damage Threshold, and Enhanced Safety Features

The Ophir® 20K-W High Power Laser Sensor is a compact water-cooled thermal sensor for measuring high powers from 100W to 20kW over the spectral range of 800-2000nm and 10.6µm. A deflecting cone and annular absorber allow the sensor to withstand high power densities to 10kW/cm². The sensor delivers a fast 3.5 sec response time, shortening the time required for measurement. A large



Medical Applications and Laser Beam Analysis

Measuring your medical laser ensures patients receive the best possible care. This video describes recent Ophir laser measurement solutions for medical applications. [Medical Beam Analysis.](#)



Blog Posts

Unlocking Precision: Beam Width Measurement Methods in BeamWatch

In response to market demands for precise and efficient measurement solutions, Ophir's BeamWatch family of products continues to evolve, offering cutting-edge non-contact measurement systems. Here we delve into the latest developments in laser measurement methods, from exploring measurement accuracy to providing insights on selecting the most suitable method for diverse configurations. [Beam Width Measurement.](#)

Simplifying Beam Measurement: The Auto ISO Feature in BeamSquared

BeamSquared focuses on measuring the propagation characteristics of continuous-wave (CW) and pulsed lasers. The Auto ISO measurement feature simplifies obtaining an ISO-compliant beam measurement. Here's how it works. [BeamSquared.](#)

Enhancements in the BeamWatch BW-NIR-130 and BWPLUS-45 Models

Delve into the latest advancements reshaping laser measurement technology with the introduction of the BW-NIR-130 and BWPLUS-45 models from MKS Ophir. These sophisticated instruments represent a significant evolution in precision and adaptability, meticulously engineered to meet the evolving demands of the laser industry. [BeamWatch.](#)

55mm aperture is insensitive to beam size or angle of divergence, which means greater flexibility when manipulating beams and more consistent power delivery even when the input beam changes slightly in size or direction. [20K-W Laser Sensor](#).



Relocation & Expansion of MKS Bucharest Romania Production Site

MKS has announced the relocation and expansion of our Ophir Bucharest Romania manufacturing facility to a new, cutting-edge site. As part of our continued commitment to supporting your security and defense production needs, this investment represents a significant enhancement to our capacity and capabilities in the form of expanded capacity, advanced technology, enhanced production flow, and increased flexibility. [MKS Bucharest Romania Production Site](#).



IR Optics Assembly, Support, and Services in India

MKS Instruments, Inc. announced the introduction of new assembly, support, and service capabilities for our Ophir infrared (IR) optics products in India. This expansion supports the Indian Government's 'Atmanirbhar Bharat' or 'Make in India' initiative, reinforcing MKS' commitment to the Indian national security industry. MKS will extend its local presence by integrating Ophir's IR lens assembly, support, and service capabilities into its existing Atotech facilities in Delhi. [Optics Services in India](#).



Webinars

How the Ring Core Mode is Revolutionizing Automotive Laser Welding

On-Demand

Speaker: John McCauley, Sr. Business Development Manager, MKS Ophir
Joining materials that are relatively new to automotive components is a struggle. When welding a highly reflective material, like copper, more laser light being applied to the material is needed to create these welds at the desired penetration depths. But this simple approach has led to problems of increased weld spatter and porosity. Fortunately, using a ring-core laser shape provides depth of penetration and aesthetically pleasing welds using a ring-core laser shape. [Ring Core Laser Shape](#).

Lasers in Health and Medicine

On-Demand

Speaker: Nathan Brouwer, Sr. Field Sales Engineer, MKS Ophir
Laser usage in health and medicine has grown to touch nearly every branch of medical surgery and biological science. This *BioPhotonics* session provides an overview of many of the laser applications in medical surgery centers, doctors' offices, and even at home for some biohackers. Nate discusses the laser calculations needed to estimate power density, a key metric to understand when delivering photons to human tissue. [Lasers in Health and Medicine](#).

Research News

Wafer-Scale Integration of 2D Perovskite Oxides for Motion Recognition

Ethernet Connectivity for Centauri Laser Power Meters

Ophir has expanded the connectivity options for the Centauri laser power meter by introducing Ethernet connectivity alongside the existing USB option. This enhancement is available with the latest versions of StarLab PC software and Centauri firmware, offering greater flexibility and remote access capabilities for laser measurement. [Ethernet](#).

Catalogs: Power Meters, Beam Profiling, IR Optics

The [2024 Ophir Laser Measurement Catalogs](#) include tutorials and product specifications for laser power meters and beam profiling systems.

The [2024 Ophir IR Optics Thermal Imaging Lenses Catalog](#) includes a wide range of LWIR, MWIR, and SWIR continuous zoom lenses compatible with 5 μ m, 10 μ m SXGA & 15 μ m VGA detectors, as well as 1-FOV and multiple FOV. Includes new product specs, extended range of lens DRIs, and detailed H-FOVs charts per detector.

MKS Newsletters

[TECHinnovations Newsletter](#) for the latest on vacuum, power solutions, gas delivery and analysis, plasma generation, and ozone solutions for semiconductor and advanced markets from MKS Instruments.

[Focus on Photonics Newsletter](#) for innovations in lasers, opto-mechanical components, vibration and motion control, and laser characterization from Newport Corp.

[Ophir IR Optics Newsletter](#) for the latest developments in thermal imaging optics.

Trade Shows

[SPIE Photonics West](#)
25-30 January 2025
San Francisco, CA USA

[SPIE BIOS Expo](#)
25-26 January 2025
San Francisco, CA USA

[IDEX](#)
17-21 February 2025

Two-dimensional perovskite oxides with compelling optoelectronic performance have been thriving in high-performance photodetection. However, harsh synthesis and defect chemistry severely limit their overall performance. The authors report the wafer-scale integration of highly oriented nanosheets by introducing a charge-assisted oriented assembly film-formation process. The power density of the light was measured with an Ophir NOVA II optical power meter. [Perovskite Oxides](#).

Octave-Wide Broadening of UV Dispersive Wave by Soliton-Splitting Dynamics

Efficient generation of a coherent dispersive wave with ultra-broad bandwidth has proved difficult to realize. The authors unveil a new regime of soliton dynamics in which the dispersive wave emission process strongly couples with the splitting dynamics of the driving pulse. Pulse energy was measured using the Ophir 3A-P thermal power meter. The energy measurements of the broadband UV DW pulses were achieved through the use of bandpass filters, an Ophir PD300-UV photodiode sensor, and a UV spectrometer. Near-field beam profiles were measured with an Ophir SP932 CCD camera. [Soliton Dynamics](#).

Frequently Asked Questions

Q: Why is my computer CPU at 100% when I use BeamGage?

A: CPU idle states are managed by the OS to save energy rather than run the CPU at a single maximum idle state. CPU idle state switching can adversely affect data acquisition from high bandwidth devices, such as the cameras used with BeamGage. To mitigate this, BeamGage will attempt to take the CPU out of energy saving mode and put it into "High Performance" mode to provide a better experience when making beam profiling measurements. This can cause the computer CPU to report as 100% usage. Once BeamGage is closed, it will return the CPU back to the previous energy saving mode.

Q: Do you have a Python example for use with BeamGage Professional?

A: Yes, we do have a Python example for use with BeamGage Professional. You can find it and more at our GitHub located at <https://github.com/Ophir-Spiricon/BP-Automation>.

Abu Dhabi, UAE

[LASER World of PHOTONICS China](#)

11-3 March 2025
Shanghai, China

[SPIE Defense & Commercial Sensing](#)

13-17 April 2025
Orlando, FL, USA

[AUVSI Xponential](#)

19-22 May 2025
Houston, TX USA

[DSEI Japan](#)

21-23 May 2025
Chiba, Japan

[LASER World of PHOTONICS Munich](#)

24-27 June 2025
Munich, Germany

[LASER Korea 2025](#)

2-4 July 2025
Gyeonggi-do, South Korea

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About Ophir Products

Ophir is a brand within the MKS Instruments Photonics Solutions Division. The Ophir product portfolio consists of laser and LED measurement products, including laser power and energy meters, laser beam profilers measuring femto-watt to hundred-kilowatt lasers, high-performance IR and visible optical elements, IR thermal imaging lenses and zoom lenses for defense and commercial applications, OEM and replacement high-quality optics and sub-assemblies for CO₂ and high-power fiber laser material processing applications. Ophir products enhance our customers' capabilities and productivity in the semiconductor, advanced electronics, and specialty industrial markets. For more information, visit www.ophiropt.com.

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