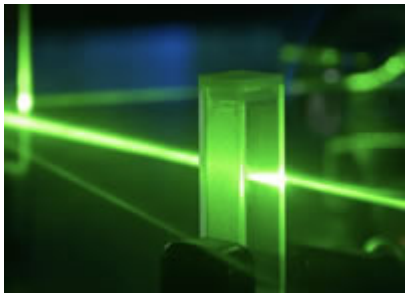
ePulse: Laser Measurement News
September 2024

Welcome to **ePulse: Laser Measurement News**, a review of new developments in laser beam measurements, 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

Advancing Laser Technology: Ophir on the Importance of Measuring M^2

Interview with Reuven Silverman, General Manager, Instruments Group, MKS Ophir



In a new feature, AZoOptics interviews Reuven Silverman to discuss Ophir's contributions to advanced laser measurement technology. The focus is on the significance of M^2 measurements in laser technology and how they impact the performance of lasers in various applications. Reuven discusses the technical problems in achieving accurate M^2 measurements and how new technological advances overcome these challenges. Advancing Laser Technology.

Laser's Role in World's First Remote Corneal Surgery

In March 2024, iVis Technologies confirmed the first successful corneal refractive surgery procedure between two distant locations. San Carlo Hospital di Nancy, Rome, connected La Nuvola Congress Center to the hospital via 5G during the national AICCER congress (Italian Association of Cataract and Refractive Surgery. The surgery was made possible by iVIs 4D Suite™ platform and, we are proud to announce that MKS technology is an integral part of this revolutionary solution. Two Ophir laser measurement sensors were adapted to accurately measure the laser energy before and during the remotely controlled surgical procedure. Remote Corneal Surgery.

Applications

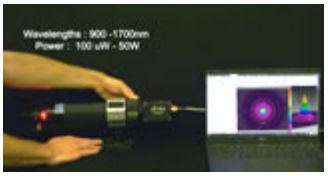
Sensor Fusion Enables Comprehensive Analysis of Laser Processing in Additive Manufacturing

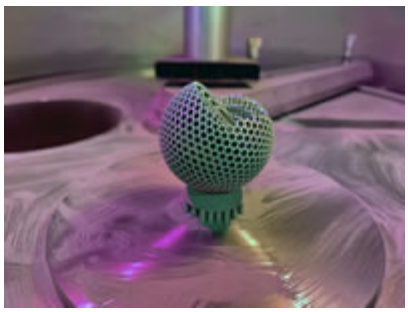
Videos of the Month

Juno-RS: New RS232-Based Virtual Meter
If you need to connect your laser power or energy sensors to an automation system - or to a PC - using RS232 communication, the new Juno-RS Virtual Meter from Ophir may be just the solution for you. Juno-RS.

Measuring LED Irradiance and Dosage
Does your application involve irradiating a target surface with an LED? UV curing of adhesives is one example of such an application. Ophir's new PD300RM sensor family measures irradiance and dosage for UV and Visible LEDs. LED Irradiance and Dosage.

Wide Beam Imager (WB-I)
The Ophir WB-I SWIR is a Wide Beam Imager accessory designated for SWIR 900-1700nm, especially popular for the 1550nm wavelength. It's a compact system for measuring the size and power distribution of large and divergent beams of VCSELs, LEDs, and large lasers. It allows you to analyze beams that are too large or divergent for a standard beam profiler. Wide Beam Imager.





In the fast-evolving world of additive manufacturing (AM), where precision and consistency are crucial, the role of laser power and beam profiling cannot be overstated. As industries increasingly turn to techniques like laser powder bed fusion (LPBF) for intricate builds, the need for precise energy delivery to transform metal powders becomes crucial. However, ensuring optimal outcomes demands more than just delivering laser energy - it requires meticulous monitoring and control of power density distribution and beam characteristics. Here's how. Additive Manufacturing.

What's New

Centauri Touchscreen Meters, Now with Ethernet

The Centauri high-end touchscreen power meters feature a large 7-inch full-color display, dual-channel option, and sampling rates up to 25kHz for Pyro sensors. Advanced math functions, graphing capabilities, sophisticated logging, and a wide selection of connectivity interfaces, including the newly added Ethernet, ensure ultimate precision and ease of use. Centauri.

Laser Power Meter for Tight Spaces

Need to measure high power lasers in confined, humid, or dusty environments? Ophir® Ariel is an ultra-compact laser power meter for measuring high power industrial lasers up to 8KW. For use in additive manufacturing, metal cutting, and welding, the Ariel power meter is a robust, battery-powered device that requires no water or fan cooling and is small enough to fit in the palm of your hand. A new diffuser enables the meter to be used safely with tighter beams that have higher power densities and can be stacked with the protective window. Ariel Industrial Power Meter.

Webinars

Lasers in Health and Medicine
Date: October 15, 2024
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. BioPhotonics.

Pyroelectric Detectors, Insight to Energy
Date: November 13, 2024
Speaker: Kevin Kirkham, Sr. Principal Sales Engineer, MKS Ophir
Pyroelectric detectors are critical in advancing various technologies by providing quantitative insights into the energy within a system. This *Photonics Spectra Sensors & Detectors Summit* session explores the

IR Long Range Zoom Lenses for Security, Surveillance & C-UAS
Explore Ophir's comprehensive catalog of long-range IR zoom lenses designed for commercial and defense applications, including observation and C-UAS systems. Ophir LWIR, MWIR, and SWIR lenses offer unrivaled performance, featuring accurate thru-zoom boresight, continuous zoom with fixed F# throughout the range, maintained focus throughout zoom, rugged design, and more. Ophir IR Long Range Zoom Lenses.

Blog Posts

Wireless Industrial Laser Power Measurements
Discover how the Ariel Power Meter revolutionizes high-power industrial laser applications with its compact, wireless design, enabling seamless remote monitoring and enhanced safety in even the most challenging environments. Ophir Ariel.

The Power of Photodiode Sensors
Photodiode sensors are semiconductor devices that produce a current proportional to light intensity. These sensors have a high degree of linearity over a large range of light power levels - from fractions of a nanowatt to about 2 milliwatts. Let’s take a look at how they work. Photodiode Sensors.

How to Choose a Beam Profiler
Selecting the right beam profiler is crucial for optimizing laser performance and ensuring accurate measurements. You have lots of choices - CCD and CMOS cameras, scanning slit sensors, pyroelectric cameras, and knife edge sensors, just to name a few. Here are 5 questions you need to ask yourself when searching for a beam profiler. Beam Profilers.

Harnessing Heat: Pyroelectric Technology
Ophir's core pyroelectric technology begins with its specially designed sensor array, which has proven to be the most rugged, stable, and precise IR detector array available. It's

technology, history, and diverse applications of pyroelectric detectors, focusing on their significance in the laser industry. They are instrumental in enhancing the efficiency of solar cells, harvesting energy from low-temperature sources, and sensing IR light. Pyroelectric Detectors.

Understanding Laser Measurement Accuracy
On-Demand
Speaker: Mark Slutzki, Product Manager, MKS Ophir
If you're using a laser in your process or research, you already know how important it is to monitor what your laser is doing – so you regularly measure it. You even check the power meter's datasheet to see how accurate those measurements are. But at that point, many people get stuck. We get lots of questions from customers trying to understand our accuracy specifications and the meaning of the various parts of our C.O.C. (Certificate of Calibration). In this webinar, we'll walk through all these in detail. Laser Measurement Accuracy.

Solid-State Light Sources: Understanding the Performance of VCSELs, Laser Diodes, and LEDs
On-Demand
Speaker: Kevin Kirkham, Sr. Principal Sales Engineer, MKS Ophir
VCSELS, Laser Diodes, LEDs, and other solid-state light sources have become mainstays in our lives. Parameters critical to their performance include spectrum, divergence, mode, intensity, and more. Carefully constructed testing confirms the performance of good devices and allows for underperforming devices to be identified and eliminated. In this session, we will discuss these key parameters and the types of measurement tools that can assure their performance before they are packaged or additional investments are made. Solid-State Sources.

SWIR and NIR Disruptive Zoom Lens for Challenging Environments: Air, Land, and Maritime
On-Demand
Speaker: Peter Kunert, Ph.D., Manager of Sales Europe, MKS Ophir IR products
Here's an inside look at the advantages of SWIR lenses and their pivotal role in air, land, and maritime imaging, offering unparalleled visibility even in challenging conditions, such as haze, smoke, and fog. Incorporating SWIR and NIR into electro-optical (EO) systems significantly enhances image clarity and performance. SWIR lenses excel in long-range daytime observation, effective glass transmission, and precise laser spot detection for designators, making them an ideal solution for defense and homeland security applications. This presentation shares how SWIR technology can transform an EO system and improve operational efficiency. SWIR & NIR Technology and Zoom Lens.

Reflective Optics for Multispectral EO Systems
On-Demand
Speakers: JJ Conboy, Sales Territory Manager, North America, MKS Ophir IR products, and Emiliano Ioffe, IR Components Engineering Department Manager, MKS Ophir Optics
Explore the fundamentals of multispectral systems with a focus on how combining various imaging bands can enhance performance without increasing size and weight. We delve into applications related to aerial EO multispectral imaging systems, highlighting their practical uses. Additionally, the session covers the design for manufacturing, addressing the manufacturing process, raw material considerations, geometrical design, and the importance of maintaining a controlled environment. Finally, we examine the capabilities of large aluminum mirrors in multispectral telescopes, emphasizing case studies and performance metrics. Reflective Optics for Multispectral EO Systems.

these sensors that are embedded in Ophir's Pyrocam line of cameras. Here's what you need to know about when and where can you use Pyrocam's technology? Pyroelectric Technology.

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 5µm, 10µm SXGA & 15µm 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

ISUILS 2024 (International Ultrafast Intense Laser Science)
29 Sept – 4 Oct 2024
Seogwipo, Jeju, Korea

The Battery Show North America
7-10 Oct 2024
Detroit, MI, USA

FABTECH Orlando
15-17 Oct 2024
Orlando, FL, USA

Photonix International Laser & Photonics Expo
29-31 Oct 2024
Tokyo, Japan

AVS 70th International Symposium & Exhibition

Research News

Light Regulated Soliton Dynamics in Liquid Crystals
Electrically powered solitons are particle-like field configurations in out-of-equilibrium nematics. The authors present a reconfigurable optoelectronic approach capable of regulating the entire lifecycle of solitons by utilizing multi-strategy digital light projection to construct delicate patterning of virtual electrode. The optical power densities of the light patterns were measured using an Ophir Nova power meter connected to an Ophir PD300-UV probe. Soliton Dynamics.

Thermal Disorder Prevents Suppression of Ultra-Fast Photochemistry
Strong coupling between molecules and confined light modes of optical cavities to form polaritons can alter photochemistry. The authors combine simulations and experiments to show that for an ultra-fast photochemical reaction such thermal disorder prevents the modification of the potential energy surface and that suppression is due to radiative decay of the lossy cavity modes. The collected emission intensity was normalized by the sum of the energies of all excitation pulses, which were recorded pulse by pulse with an Ophir PD10-C sensor. Ultra-Fast Photochemistry.

Frequently Asked Questions

Q: I have found some old Ophir/Spiricon/Photon equipment in my lab. Can I get help getting it working again?
A: Yes, we will do what we can to assist you. Please contact our Product Support Department at service.ophir.usa@mksinst.com or by phone at 1-800-383-0814.

Q: When I run BeamGage with my beam profiling camera, it is prompting for a license key. Where can I find it?
A: Ophir-Spiricon beam profiling cameras can be licensed for individual software operation. Older beam profiling cameras may not be licensed for BeamGage. If you provide us with the serial number of the camera we can confirm its licensing. Upgrades to BeamGage software can be purchased. We do recommend that old, discontinued camera models that can no longer be repaired be replaced with current models that are fully supported.

3-8 Nov 2024
Tampa, FL, USA

ICALEO 2024
4-7 Nov 2024
Hollywood, CA, USA

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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 CO_2 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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