

ePulse: Laser Measurement News

The true measurement of laser performance



ePulse: Laser Measurement News January 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

Trends in Industrial Manufacturing

By Markus Rütering, VP Sales, EMEA, MKS Photonics Solutions Division

Lasers are constantly being used in new applications and by more than traditional laser experts (physicists and technicians). That presents a challenge as laser parameters - some of which are completely different from even a few years ago - must be checked regularly and, above all, ever faster in automated systems. Dr. Gerlach, editor of *LP.PRO* magazine, interviews Markus Rütering about trends in industrial manufacturing and the future of measurement technology for lasers. They discuss networked systems, IoT, additive manufacturing, automotive applications, and more. [Industrial Manufacturing with Lasers](#).



See What's New at Photonics West 2024

Stop by MKS booth #927 at Photonics West 2024 to see what's new in laser beam profiling, power/energy measurement, and IR optics, Jan 30-Feb 1, 2024. Featured products include:

- **NEW! BeamSquared SP204S**

M² beam propagation analyzer, a compact and fully automated tool for measuring the propagation characteristics of 266

to 1100 nm CW and pulsed laser systems with increased sensitivity and resolution in the NIR region.

- **NEW! SP203P Beam Analysis Camera**, phosphor-coated CMOS sensor for measuring wavelengths from 1440-1605nm.

- **BeamWatch® Plus**, a non-contact beam profiler that measures focus shift, M², focus spot size down to 45µm, and position of high-power industrial lasers operating in the VIS and NIR range.

- **BeamWatch® 130**, a non-contact beam profiler that measures

SPIE. PHOTONICS WEST

Videos of the Month

How to Use High Power Sensors Correctly and Prevent Problems

When you use high-power laser measurement sensors, challenges can arise. Here are the tips and best practices that will help you avoid these problems. [High Power Sensors](#).



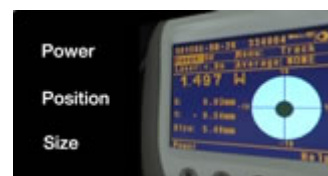
Ariel, Ultra-Compact Sensor for Measuring High Power Industrial Lasers to 8kW

Designed for applications in closed and confined spaces - such as 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. [Ariel Sensor](#).



BeamTrack Sensor Measures Power, Energy, Size and Position

Ophir's BeamTrack Sensor Series combines power and energy measurement, beam position, and beam size in single, compact devices. [BeamTrack Sensor](#).



LightIR, Low-SWaP Zoom Lenses

Designed for use in unmanned aerial vehicles, payloads, drones, and hand-held devices, the

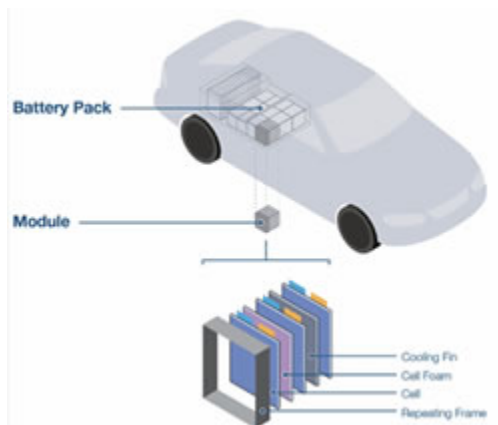
focus shift, M^2 , focus spot size down to $130\mu\text{m}$, and position of high-power industrial lasers operating in NIR range.

- **BeamPeeK Software for Field Technicians**, easy-to-use laser beam analysis for optimizing Additive Manufacturing processes.
- **StarViewer iOS App** for Ariel stand-alone sensor for measurement of high power lasers.

Audio Blog

Laser Applications in EV Car Batteries

Battery and car makers want to put as many 'battery cells' (the basic Li-ion unit that stores charge) in the car as possible, and get rid of anything else, such as metal parts that house cells in modules or the battery pack entirely (i.e. going C2V or 'cell to vehicle'). Moving away from a modular approach means that servicing or fixing the battery of an EV car is almost impossible, and therefore the reliability, safety, and structural integrity of the battery must be very high. That is where laser processes come into play. [Audio Blog](#).



Applications

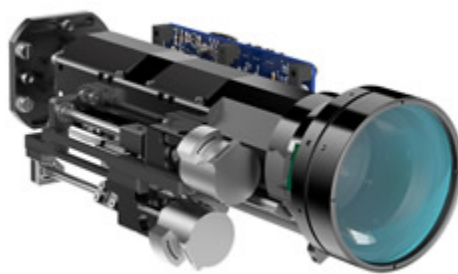
Lasers in Scientific Research

Using an accurately calibrated power meter in the object plane itself makes it possible to measure the exact amount of light applied to a specimen, regardless of the light source or optical details of the microscope. Such objective measurements can enable researchers to directly compare results of experiments performed using different optical equipment and setups in such applications as flow cytometry, DNA sequencing, and terahertz imaging. Measuring [Lasers in Scientific Research](#).



SWIR & NIR Imaging for Aerial Electro-Optical Systems (EOS)

Aerial EOS demands versatile optics capable of operating across the full range of operational wavelengths. Recent battlefield experiences are driving these systems to be much more comprehensive while requiring smaller payloads to maximize on-mission duration. From applications for high-speed and surveillance aircraft to large and small UAVs, these systems must navigate through challenging environments including poor visibility and detect, as well as decode, laser-pointers in the field. [Imaging in Aerial EOS](#).

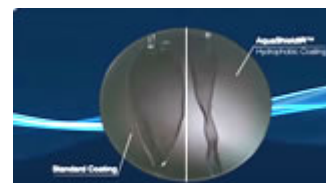


LightIR lenses are light-weight, compact, high performance MWIR & LWIR continuous zoom lenses that combine SWaP capabilities, extended detection range, rugged design, and cost-effective pricing. [LightIR Product Family](#).



AquaShieldIR™ Advanced Hydrophobic Coatings

Designed to provide long-lasting protection and enhance the capabilities of IR imaging lenses in maritime environments, AquaShieldIR™ coatings surpass the requirements set by the MIL 810 standard for durability testing in salt fog and salt solution. [AquaShieldIR Coatings](#).



Social Media: Blog

Choosing the Correct Laser Beam Characterization System for Additive Manufacturing

A key factor in the quality of a finished additive manufactured product is the condition of the laser and optical components used. To ensure proper operation, optimize the system performance, and prevent potential quality problems, the laser together with the optical system require periodical monitoring, especially in an industrial environment. Here's how. [Additive Manufacturing](#).

Using Pulsed Lasers for Quality Evaluation of Periodically Poled Nonlinear Crystals

Measuring the chemical and geometrical properties of nonlinear and periodically poled nonlinear crystals is important for ensuring their efficiency in converting laser wavelength. Research by the laser research center at Vilnius University in Lithuania suggests a new approach to this important issue. [Nonlinear Crystals](#).

Cooling Methods for High-Power Laser Measurement

Measurement of high-power lasers requires efficient heat

What's New

Ophir Photonics European Service Lab in Germany Gains ISO/IEC 17025 Accreditation

The Ophir Photonics Darmstadt, Germany Calibration Laboratory has received ISO/IEC 17025 accreditation. ISO/IEC 17025 is given to calibration laboratories that have achieved the highest standards of quality, administration, and technical operations. All of Ophir's Calibration Laboratories are now ISO/IEC 17025 accredited: Jerusalem, Israel; North Logan, Utah; Omiya-ku, Japan; and Darmstadt, Germany. [ISO/IEC 17025](#).



Webinars On-Demand

How Do You Know Your AM Laser is Performing to Spec?

Speaker: John McCauley, Sr. Business Development Manager, MKS Ophir

How can you assure your AM laser is performing as needed to produce high quality, consistent builds? In this webinar hosted by *Metforming Magazine*, John McCauley discusses the what, why, and how around the latest innovations in uncooled power meters designed for the AM workspace, and self-contained laser beam profilers that provide views of the working beam and monitor the location of the beam waist and any focal shift that may be occurring. [Additive Manufacturing](#).

Measuring Long-Wavelength Lasers

Speaker: Kevin Kirkham, Sr. Business Development Manager, MKS Ophir
Using SWIR, MIR, and FIR lasers requires knowledge of their beam quality parameters. In this webinar hosted by *Photonics Spectra*, Kevin Kirkham discusses the types of measurement tools that are available for long-wavelength sources - IR cameras, pyroelectric scanning-slit sensors, and wavelength conversion apparatus - and which are appropriate for different application types. [Long-Wavelength Lasers](#).

Research News

Imaging Recognition in Complex Environments

Although metasurfaces show great potential in information storage due to their modulation for different degrees of freedom of light, a compact and efficient detector for relevant multi-dimensional data retrieval is still a challenge, especially in complex environments. The authors demonstrate a multi-dimensional image storage and retrieval process by using a dual-color metasurface and a double-layer integrated perovskite single-pixel detector (DIP-SPD). Laser power was measured by an Ophir Vega meter and PD300-UV silicon photodiode sensor. [Metasurface Imaging](#).

Acceleration and Manipulation of Free Electronics by THz Sources

The authors demonstrate the confinement of single-cycle THz-waveform-driven electron emission to one of the two half cycles from a solid surface emitter. THz beam profiles were recorded with an Ophir Pyrocam III, pyroelectric camera. Terahertz-driven single-burst surface electron emission sources, which do not rely on field-enhancement structures, will impact the development of THz-powered sources, waveguides, acceleration devices, and more. [THz Sources](#).

control in power measurement sensors. Choosing the right heat transfer method is a critical step in configuring a reliable, accurate high-power laser meter. [Cooling Methods](#).

Catalogs: Power Meters, Beam Profiling, IR Optics

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

The [2023 Ophir IR Optics Thermal Imaging Lenses Catalog](#) includes a wide range of LWIR, SWIR, MWIR 1-FOV, Multiple FOV, and continuous zoom lenses.

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.

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

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

Trade Shows

[SPIE Photonics West](#)
January 30 – February 1, 2024
San Francisco, CA
Booth #927

[AMUG Users Group](#)
March 10-14, 2024
Chicago, IL

[Laser World of Photonics China](#)
March 20-24 2024
Shanghai, China

[OFC Conference & Exhibition](#)
March 26-28, 2024
San Diego, CA

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Blog

[The Ophir Laser Measurement Group](#)

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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