

# ePulse: Laser Measurement News

The true measurement of laser performance



## ePulse: Laser Measurement News March 2023

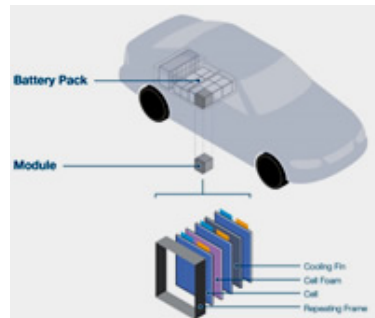
Welcome to **ePulse: Laser Measurement News**, a review of new developments in laser beam measurements, beam diagnostics, and beam profiling. Each issue contains industry news, product information, and technical tips to help you solve challenging laser measurement and spectral analysis requirements.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

### Features

#### Laser Applications in EV Car Batteries

By Efi Rotem, R&D and Engineering Director

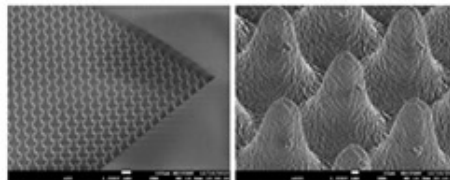
One of the most important parameters for a battery pack is the charge capacity per weight in kWh/kg. That means car manufacturers are moving away from heavy, modular packaging. As a result, lasers now play a key role in cutting, cleaning, and welding at the cell level and in welding battery pack frames and power harnesses. [Lasers in EV Batteries](#).



#### Surface Micro Structuring Using Ultrashort Laser Pulses

By Efi Rotem, R&D and Engineering Director

Surface micro structuring using ultra short pulse (USP) lasers is a unique technology with many applications such as thin film ablation, creating antireflective and optically absorptive surfaces, super hydrophobic or hydrophilic surfaces with anti-bacterial properties, and surface texturing for improved bonding strength. Several different processes such as thermal ablation, optical interference, and surface hydrodynamic effects come into play in micro structuring. The onset of each process and the resulting effect greatly depend on the material and the laser beam properties. [Surface Micro Structuring](#).



### Applications

#### Audio Blog: Lasers as Measurement Tools

Lasers have become dominant players in the measurement field. Laser-assisted measurements are measurements of physical quantities enabled or improved by the use of lasers. There are various technologies relying on lasers, each harnessing one or more laser properties. In this podcast, we will introduce you to this field and discuss examples, including measuring distances, interferometric



### Videos of the Month

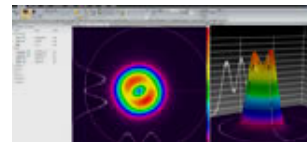
#### Power Sensor Buzzing?

Ever hear an audible "buzz" tone coming from your laser power sensor while measuring? Sounds strange, but it's actually real (under certain specific conditions). Learn about this somewhat surprising effect. [Power Sensor Buzzing](#).



#### Introducing the WB-I Wide Beam Imager

The Ophir Wide Beam Imager accessory is a compact, calibrated optical system for measuring the size and power distribution of large and divergent beams of VCSELs, LEDs, edge emitting lasers, and fiber lasers. It lets you analyze beams that are too large or too divergent for a conventional beam profiler alone. [Wide Beam Imager](#).



#### Product Overview: Helios Plus Industrial Laser Power Meter Family

Designed with factory automation in mind, the Ophir Helios Plus family has a robust, industrial design for harsh environments, and the range of communication interfaces that makes them easy to integrate into factory networks. [Helios Plus](#).



### Social Media: Blog

#### Case Study: How Applied Materials Monitor Wafer Inspection Components

As semiconductor wafer

measurements, spectroscopy, microscopy, and atomic clocks. [Laser-assisted Measurements](#).

### IR Thermal Imaging Lenses for Counter Drone Platforms

Ophir's long-range IR continuous zoom lenses are designed for C-UAS platforms by providing optical reach that takes advantage of early radar detection. A precision zoom lens allows the operator to scan the area in wide field of view to note terrain or other interference as well as to view multiple drones operating in a swarm. Use of NFOV allows the operator to further identify the threat without loss of track or focus. Automated zoom interfaces allow C-UAS to clearly show the target. This allows either operators or advanced artificial intelligence (AI) interfaces to determine the threat category of the target. [Counter Drone Platforms](#).



## Webinars

### Navigating Precision Optics: A Guide to Optics and Coating Innovations

*Speaker: Emiliano Ioffe, Process Development and Engineering Manager, Ophir Optics*

*March 16, 2023, 12:00pm EDT*

Choosing the best optical coatings for a specific application can be a daunting task. This webinar, hosted by *Tech Briefs* magazine, highlights new advances and techniques in optics and coating technology and addresses the key considerations engineers need to make informed design decisions for scientific, medical, maritime, and space applications. [Optics and Coating Innovations](#).

### Different Laser Measurement Techniques for Different Operational Environments

*Speaker: John McCauley, Sr. Business Development Manager, MKS Ophir*  
*April 12, 2023, 2:00pm EDT*

Whether you're working with lower-power lasers for mapping free-space objects or higher-power lasers for welding metal, measuring and analyzing key laser performance characteristics are vital to the long-term success of the laser, the process, and the output. But it's difficult to sort through the vast array of measurement products to find the one best for you. In this webinar hosted by *Laser Focus World*, we'll discuss different laser measurements, when and how often they need to be measured, and which characteristics are important in different operational environments. [Different Laser Measurement Techniques](#).

## What's New

### The 2023 MKS Ophir Catalogs Are Here!

The new 2023 catalogs are here. Inside you'll find details on our comprehensive range of laser power and energy sensors, meters, and laser beam profiling systems. You'll also find specs and application notes on the newest Ophir products:

- BeamPeek® Integrated Beam Analysis and Power Measurement System for Additive Manufacturing.
- SP504S Beam Profiling Camera for measuring large and divergent beams.
- 30(150)A-SV-17 and F150(200)A-CM-16 Sensor for measurement of pulsed lasers in semiconductor, PCB, and OLED manufacturing.
- IPM-10KW Modular Industrial Laser Power Meter for dusty, dirty



inspection systems move to measure smaller sized features, they need smaller wavelength lasers (deeper into UV territory). UV lasers are not always the easiest to monitor, though, as many sensors do not detect those wavelengths, and they are prone to cause sensor damage. Here's how Applied Materials addressed the issues. [Applied Materials](#).

### Lasers in Medical Applications: Improving Medical Procedures and Quality of Life

Lasers have been incorporated across different medical fields. Here we look at examples of the use of lasers in medical procedures and how laser-enabled technologies are changing patients' lives. [Lasers in Medical Applications](#).

### I'm Not Required to Calibrate My Equipment Based on ISO or FDA Requirements, So Why Should I?

At its core, calibration is about ensuring that your equipment is working properly and in the way it was intended. Returning your equipment for periodic calibration allows for evaluation for damage, upgrades to your firmware, as well as sensor-to-sensor comparison to our NIST-traceable masters. [Calibration](#).

### How Often Should Output Power on High-Powered Production Lasers Be Checked?

Laser processes require a number of variables to be measured and monitored apart from the laser, such as those related to materials and tooling. But variability of laser performance can often be the source of many problems to the laser operator since the tool involves invisible light being generated from a complex system. [Output Power](#).

### High-Power Lasers and Industry 4.0: Focusing on Knowledge

A new measurement procedure allows for the fast and contact-free measurement of the focused laser beam. At the same time, modern measuring devices have Profinet interfaces and allow the processes to be documented. These are enormous advantages, especially for just-in-time production. [Industry 4.0](#).

### New Catalogs: Power Meters, Beam Profiling, IR Optics

The [2023 Ophir Laser Measurement Catalogs](#) include tutorials and product specifications for laser power

production environments.

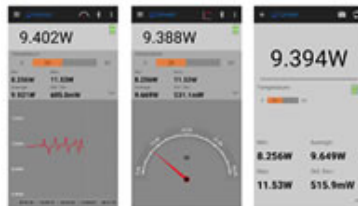
- 1200mm MWIR Continuous Zoom Lenses for long range observation systems and C-UAS.

Stay up to date with the latest innovative solutions in laser measurement. Download the free [2023 Ophir Laser Measurement Catalog PDFs here](#). Download the [2023 Ophir IR Optics Thermal Imaging Lenses Catalog here](#).



### StarViewer iOS App for Ariel Industrial Laser Power Meter

The Ophir StarViewer iOS App delivers laser power/energy measurements wirelessly to iOS iPhones and iPads. Data can be displayed in a variety of formats: time-based line graph, needle display, or large numeric display with statistics. Users can also capture a screenshot and share it, such as when a field technician needs to report results back to the lab. The app is designed to work with the Ophir Ariel laser power meter to remotely support applications in additive manufacturing, as well as industrial cutting and welding, medical devices, laboratory research, and more. [StarViewer iOS App](#).



### MWIR Continuous Zoom Lenses for Long Range Observation Systems

The Ophir SupIR 80-1200mm MWIR f/5.5 and SupIR 60-1200mm MWIRf/4 lenses are designed for 15 $\mu$ m and SXGA/ HD 10 $\mu$ m pitch FPAs (focal plan arrays) cooled MWIR detectors, respectively, providing detection ranges exceeding 28km. Their extended observation range, along with high performance continuous zoom capabilities and ruggedized design allow for early accurate identification and tracking of fast-moving targets without losing sight. [MWIR Continuous Zoom Lenses](#).



## Research News

### Spatial Coherence in VCSEL Dot Array

Researchers report on a self-induced spatially-coherent dot array consisting of 14 units of vertical-cavity surface-emitting modes that exhibit spatially uniform spectra. A 47.5 $\mu$ m total beam width and 0.5° narrow emission are achieved using an oblong cavity enclosed with a flat top mirror, cylindrically curved bottom mirror, and side facet. For far-field pattern (FFP) measurement, the Ophir L11059 beam profiler was used. [VCSEL Dot Array](#).

### Ultrafast Laser Surgery Probe for Sub-Surface Ablation in Vocal Folds

Researchers present a miniaturized ultrafast laser surgery probe designed to perform sub-epithelial ablation in vocal folds. The requirement of high numerical aperture for sub-surface ablation, in addition to the small form factor and side-firing architecture required for clinical use, made for a challenging optical design. The fiber mode-field radius was determined by imaging the beam profile within the fiber core using a 40 $\times$  objective and Ophir SP928 beam profiler. [Ultrafast Laser Surgery](#).

## FAQs

meters and beam profiling systems.

The [2023 Ophir IR Optics Thermal Imaging Lenses Catalog](#) includes a wide range of LWIR and 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.

## Trade Shows

[SPIE Defense and Commercial Sensing](#)

May 2-4, 2023  
Florida, USA  
Booth 711

[Laser World of Photonics](#)

June 27-30, 2023  
Munich, Germany  
Booth A3.219

[Laser World of Photonics China](#)

July 11-13  
Shanghai, China  
Booth W2.2420

[DSEI London](#)

September 12-15, 2023  
London, UK

[ADEX Seoul](#)

October 17-22, 2023  
Seoul, South Korea

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[www.ophiropt.com/photonics](http://www.ophiropt.com/photonics)

### **Beam Profiling**

What length of USB cable can be used with an Ophir-Spiricon beam profiling camera? [Read the FAQ.](#)

Can I install Ophir BeamGage and the required camera drivers if I do not have administrator rights on my computer? [Read the FAQ.](#)

### **Power Meters**

I'm trying to measure a moving (scanning) beam, using a thermal sensor, but I'm getting strange readings. Is there a problem working this way? [Read the FAQ.](#)

I'm trying to use the StarViewer Android app with the Juno device and a pyroelectric sensor, but I keep getting the message "Couldn't connect to the Device". What's the problem? [Read the FAQ.](#)

## **About Ophir**

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<sub>2</sub> 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](http://www.ophiropt.com).

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