

## ePulse: Laser Measurement News

The true measurement of laser performance



### ePulse: Laser Measurement News

January 2018

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](#).



### Feature

#### Laser Beam Measurement, Rayleigh Scatter, and Adhering to ISO 11146

*By David K. Moser, Optical Engineer, and Jed Simmons, Physicist, Ophir (U.S.)*

Rayleigh-scatter measurement technology can be used to analyze the properties of a laser beam without having the beam incident on the sensor. This is the core design of the BeamWatch® non-contact beam monitoring system for high power YAG, fiber, and diode lasers used in industrial material processing. Despite the technology's infancy and the lack of official standards for the approach to data acquisition, test comparisons of results with those from the widely-accepted scanning-slit technology of the NanoScan 2 show that BeamWatch achieves ISO-compliant measurements. It has been demonstrated that the methods used to obtain and refine the BeamWatch data validates the claim that the technology meets ISO 11146 standards. [ISO 11146 Validation](#).

### Applications

#### Laser Beam Diagnostics in GHz Applications

*By Dick Rieley, Sales Manager, Mid-Atlantic Region, Ophir (U.S.)*

It is usually insufficient to rely on one standard measurement technology when working with applications in exotic optical wavelengths and unusually low average powers. Using multiple measurement technologies is often the best approach to validate results with a level of high confidence. This paper goes through an example of calculating many laser beam diagnostics within high GHz applications. [GHz Applications](#).

#### Sensor Finder

*By Mark Slutzki, Product Manager, Ophir Optronics*

There are around 130 different types of power and energy sensors available from Ophir. Each has unique performance specifications for optimal measurement, whether CW or pulsed; low or high power and energy; visible, UV or IR...etc. How can you know which sensor will provide the required measurement resolution and work for a particular application, while avoiding risk of being damaged? [The answer is the Sensor Finder](#).

### Videos of the Month

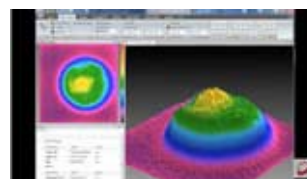
#### Is Laser Measurement Affected by Distance?

Can a laser measurement depend on the distance from the laser to the sensor? The answer is...well, it's not supposed to. But sometimes it does. In this video, you'll learn what could make that happen...and what to do about it. [Laser Measurement](#).



#### Fundamentals of Laser Measurement & Beam Profiling

Is your laser's beam profile shaped correctly for your application? This video teaches the fundamentals of laser beam profiles and discusses the benefits of profiling your laser beam. Several case studies are presented showing before and after laser beam profiles. [Beam Profiling](#).



### Laser Puzzle

[Try your hand at this month's Laser Puzzle](#). All submissions will receive an 8GB USB pen drive. The grand prize winner will receive a 16GB iPad. E-mail answers to [sales@us.ophiropt.com](mailto:sales@us.ophiropt.com). Need a hint? E-mail [john.mceldowney@us.ophiropt.com](mailto:john.mceldowney@us.ophiropt.com)

[Here's the answer to last issue's puzzle](#). The winner of last issue's puzzle is **Violin Dimitrov, Intel**. "The Ophir-Spiricon laser beam measuring equipment is incorporated in most of the laser marking machines that I've been working with for years. These machines are used 24/7 and the routine calibrations to external meters only prove Ophir-Spiricon equipment to be very reliable. I

## What to Expect in a Laser Profiling Demonstration

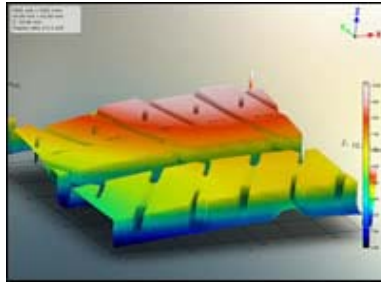
By Chuck Reagan, Sales Engineer, Ophir

When asking someone for a laser beam profiling demonstration, it is important to understand what you are asking for and what you should expect. This white paper covers the steps needed to take to set up a demonstration, and what is expected of each party. [Laser Profiling](#).

## The Challenge of Measuring Rubber

By Moshe Danziger, Application Engineer, Optimet

Unlike most industrial materials, rubber surfaces might be elastic. If you put a little pressure on it, it will curve, even if it's not visible to the naked eye. The best way to measure soft rubber is using a non-contact laser sensor, as touching the probe may change both the measurements results and accuracy. [Measuring Rubber](#).



## Webinars

### The Challenges of Laser Additive Manufacturing: Power Density, Focus Shift, and Spot Size

To create consistent, strong structures using laser-based additive manufacturing processes that meet flyable DoD standards or FDA requirements, the metallurgy must be consistent. In addition, a laser beam of known dimension, power density, and focal spot location is required. In this webinar, Ophir's Dick Rieley discusses additive laser processing and the challenges that arise with high-power laser material processing. This *3D Metal Printing* webcast describes the challenges faced in laser additive manufacturing applications. **Webinar: February 22, 2018, 1pm ET, 6pm GMT.** [Laser Additive Manufacturing](#).

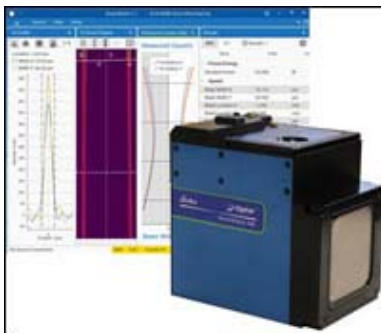
### Best Practices: How to Avoid Choosing the Wrong Power/Energy Sensor

Sensors are critical for accurate laser measurement, yet are often selected based on the wrong criteria. Choosing solely on the measurable power range or aperture size is typical but insufficient. In this *Laser Focus World* webinar, Ophir's Dick Rieley focuses on key factors in the selection process, including beam diameter, beam density values, cooling requirements, and exposure duration. **Webinar: March 1, 2018, 1pm ET, 6pm GMT.** [Laser Consistency](#).

## What's New

### BeamWatch® AM

BeamWatch AM is the industry's first non-contact laser beam monitoring system for additive manufacturing. It is a lightweight, compact system designed for real-time measurement of focal shift during laser startup of powder bed fusion manufacturing processes. BeamWatch AM measures key beam size, position, and quality parameters, including focus spot size and beam caustic. These measurements allow users to more easily determine when the beam is aligned and in focus, providing more consistent metallurgy. Measurements can be displayed as tabular, 2D, and 3D views, providing a quick and realistic display of laser characteristics. [BeamWatch AM](#).



have no doubts of what tools I should use when it comes to beam measurement – it's Ophir-Spiricon." - *Violin Dimitrov, NGWP Engineer Technician, Intel, Chandler, ATTD.*

## Social Media

### Blog: Measuring Kilowatt Laser Power with No Water Cooling

You have a KW laser in use. But water cooling is causing you headaches. Here are three solutions for measuring KW lasers without needing to call the plumber. [Measuring KW Lasers](#).

## Catalogs: Power Meters & Beam Profiling

Download the new 2018 Ophir Laser Measurement Catalogs today. Tutorials and product specifications for [Power Meters](#) and [Beam Profiling](#). [Beam Profiling Magalog](#) includes application notes, technology articles, and reference algorithms.

## Trade Shows

### [DESY Photon Science](#)

January 26, 2018  
Hamburg, Germany

### [NEPCON Japan](#)

January 17-19, 2018  
Tokyo, Japan

### [Photonics West](#)

January 27 - February 1, 2018  
San Francisco, CA

### [EALA: European Automotive Laser Applications 2018](#)

February 6-7, 2018  
Bad Nauheim, Germany

### [The LED Show](#)

February 13-15, 2018  
Long Beach, CA

### [Int. Laser- und Fugesymposium](#)

February 27-28, 2018  
Dresden, Germany

### [Photonics, World of Lasers and Optics](#)

February 27 – March 2, 2018  
Moscow, Russia

### [LEF: Laser in der Elektronikproduktion & Feinwerktechnik](#)

March 6-7, 2018  
Furth, Germany

### [RapidPro](#)

March 7-8, 2018  
Veldhoven, Netherlands

### [OFC](#)

March 13-15, 2018  
San Diego, CA

### LBS-300s

The LBS-300s is a compact, portable laser beam splitter for handling small beam diameters and a wide range of powers. It measures laser beams with diameters up to 15mm and powers from 10mW to 400W. It is designed with a shorter distance from the input surface to the camera array to accommodate finding focus spots with shorter working distances. This makes the LBS-300s ideal for enclosed workstations, such as micromachining, microwelding, and medical device manufacturing. [LBS-300s](#).



### NanoScan: Quality of Life Improvements

We are pleased to announce that thanks to the feedback and help of our customers, we have significantly improved the NanoScan software. Improvements include software consistency and easy firmware upgrades. Find out more. [NanoScan](#).

## FAQs

### Power Meters

How can I clean diffuser-based Pyro sensors? [Read the FAQ](#).

What is the damage threshold of the 120K-W sensor? The spec does not say. [Read the FAQ](#).

Ophir high-power sensors are calibrated using moderate-power lasers, not exceeding 1000W. How, then, can we know that these highest power sensors are indeed accurate to  $\pm 5\%$  over their entire measurement range as specified? [Read the FAQ](#).

Can you run COM Object Automation control of the EA-1 Ethernet Adapter? [Read the FAQ](#).

I downloaded the new version of StarLab and my Power meter is not connecting to StarLab or through my automation client. What do I do now? [Read the FAQ](#).

### Beam Profiling

What is new in the latest version of the beam profiling software available from the software download webpage? [Read the FAQ](#).

When will the Pyrocam III and other 1394 FireWire cameras be supported in Windows 10? [Read the FAQ](#).

### [Laser World of Photonics](#)

March 14-16, 2018  
Shanghai, China

### [Eurolab](#)

March 14-16, 2018  
Warsaw, Poland

### [Automaticon](#)

March 20-23, 2018  
Warsaw, Poland

### [Physics Days](#)

March 21-23, 2018  
Turku, Finland

### [Expomed Eurasia](#)

March 22-25, 2018  
Istanbul, Turkey

### [Beauty & Care 2018](#)

March 22-25, 2018  
Istanbul, Turkey

### [LME](#)

March 28-29, 2018  
Schaumburg, IL

## Fast Ship Program

Ophir's [Fast Ship program](#) provides one-day shipment of the most popular power/energy, beam profiling, and M<sup>2</sup> laser measurement equipment across the U.S.

## How to Get a 15% Discount

If you're an end user of our laser equipment, we'd like to know more about how you use it. Provide us with 500 words and a few images. In exchange, we will give you a 15% discount on your Ophir laser measurement equipment. Here's a [sample application article](#) to get you started. We'll showcase your application in our ePulse newsletter and you'll get recognition by the industry for your commitment to providing high quality laser services. And you'll get the discount! E-mail [kevin.kirkham@us.ophiropt.com](mailto:kevin.kirkham@us.ophiropt.com)

## Follow Us Online

### Social Media



### Blog

[The Ophir Laser Measurement Group](#)

### Web

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

## About Ophir

MKS Instruments, Inc. is a global provider of instruments, subsystems and process control solutions that measure, control,

power, monitor, and analyze critical parameters of advanced manufacturing processes to improve process performance and productivity. With over 40 years of experience, the Ophir brand comprises a complete line of instrumentation, including power and energy meters and beam profilers. Dedicated to continuous innovation in laser measurement, the company holds a number of patents, including the **R&D 100** award-winning **BeamTrack** power/position/size meters and Spiricon's **Ultracal™**, the baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy. The Photon family of products includes **NanoScan** scanning-slit technology, which is capable of measuring beam size and position to sub-micron resolution. The company is **ISO/IEC 17025:2005** accredited for calibration of laser measurement instruments. The company's modular, customizable solutions serve manufacturing, medical, military, and research industries throughout the world. An ISO 9001:2008 Registered Company.

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3050 North 300 West, North Logan, UT 84341  
Tel: +1 435-753-3729  
[www.ophiropt.com/photonics](http://www.ophiropt.com/photonics)