

ePulse: Laser Measurement News

The true measurement of laser performance



ePulse: Laser Measurement News March 2016

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](#).



Business Perspective

Overcoming Barriers to Industrial Laser Performance Measurement

By John McCauley, Midwest Regional Sales Manager, Ophir-Spiricon and Christian Dini, General Manager, Ophir-Spiricon Europe

Sophisticated performance measurement of the industrial laser system and components is performed during development and installation of the lasers. Periodic measurements of the laser system are the only way to manage changes inherent in the process. Yet ensuring the system continues to perform as designed once installed does not seem to be a high priority for the end user. Is protection of this large investment not a priority? As seen in *Optik & Photonik*, January 2016. [Industrial Laser Performance](#).

Features

Development of a Non-Contact Diagnostic Tool for High Power Lasers

By Jed Simmons, Jeffrey Guttman, and John McCauley, Ophir-Spiricon
High power lasers in excess of 1 kW generate enough Rayleigh scatter, even in the NIR, to be detected by silicon based sensor arrays. A lens and camera system in an off-axis position can be used as a non-contact diagnostic tool for high power lasers. Yet technical challenges remain when creating a measurement system like BeamWatch®. These include reducing background radiation, achieving high signal to noise ratio, reducing saturation events caused by particulates crossing the beam, correcting images to achieve accurate beam width measurements, creating algorithms for the removal of non-uniformities, and creating two simultaneous views of the beam from orthogonal directions. [BeamWatch](#).

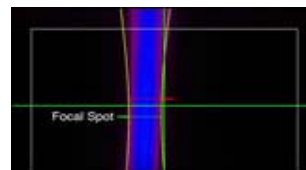
No Hassle Calibration Program and Calibration Portal

We continuously work to improve our Calibration Program. Some of our current projects include the Online RMA tracking system that allows you to see when RMAs are generated, the calibration status of your equipment, and historical purchases and calibrations. The No Hassle Calibration program further decreases the time that your equipment is out of your hands and limits the cost of repairs. [Calibration](#).

Videos of the Month

Focus Spots Do Shift in High Power Lasers

Is your laser's focus spot affecting the quality of the process? In this video, we see the focal shift of a 100KW laser during the first four seconds of startup using BeamWatch non-contact beam analyzer. [Video: Laser Focus Spot](#).



Lasers in Medical Devices

Here we discuss the top mistake medical device engineers make when designing laser integration. [Video: Medical Devices](#).



Laser Puzzle

[Try your hand at this month's Laser Puzzle](#). The first 50 submissions will receive the 2016 Photonics Spectra wall poster, "Photonics Spectrum Reference Chart." The grand prize winner will receive a 16GB iPad. E-mail answers to sales@us.ophiropt.com. Need a hint? E-mail john.mceldowney@us.ophiropt.com

Here are the [answers to the last issue's puzzle](#). The winner of last issue's puzzle was **Jim Evangelista, Director, CORE, Advanced Engineering, Lab Services, Shiloh Industries, Inc.** "We are using the BeamWatch as a setup and check on production laser welding lines. The intention is to have a home position (eventually on all our lines) where the BeamWatch will be installed when running the setup or checks. This will eliminate the trial and error in determining focal position. It will also check for focal

Webinars

Laser Measurements Critical to Successful Additive Manufacturing Processes

When a laser is used during additive manufacturing processes, knowing how the laser interacts with the material is crucial to the success of the parts being built up. But what variables does the laser introduce? How can they be monitored and controlled? How often should measurements be taken? This webinar will discuss all of these questions to help laser users better understand their laser system, and help to ensure a consistent and high-quality laser additive manufacturing process.

Available On Demand. [Additive Manufacturing](#).

Managing Inherent and Environmental Thermal Effects On High-Power Laser Systems

A laser will only perform as designed if it emits the correct amount of power or energy and if the beam size is correct for the intended use. The same is true for high-powered lasers, however, the thermal effects that these lasers have on the system add a level of complexity to the application. This webinar will discuss the thermal effects that are common to high-power lasers, how to measure them, how to identify when these thermal effects will be a problem in the process, and how they are being managed. Join us **April 13th**. [Managing Inherent and Environmental Thermal Effects](#).

Technical Tips

Power/Energy Meters

Minimizing Corrosion in Water-Cooled Sensors

For Ophir's water-cooled sensors, our current recommendation is to use DI water that has been titrated to a neutral pH (using a bit of sodium hydroxide, for example). While it is commonly believed that DI water is especially corrosive, we were unable to find many relevant documented measurements. Here's what you need to know. [Read the Tech Tip](#).

How to Measure Large, High Energy Density CO² Pulses

You can use the large aperture L100(500)A-PF-120 to measure large, high energy density pulses of CO² wavelength. Although that sensor is not defined for, or calibrated at, 10.6 μm , the PF absorber's response to 10.6 μm is exactly the same as at 1064nm. [Read the Tech Tip](#).

Beam Profiling

Finding the Center of the NanoScan

The center of the NanoScan can be found with the following steps. [Read the Tech Tip](#).

How to Profile Very Small Laser Beams

When discussing narrow laser beams, the question is, how many pixels do I need in my beam to get a "reasonable" resolution? [Read the Tech Tip](#).

FAQs

Beam Profiling

What filter frequency is the right setting for the NanoScan? [Read the FAQ](#).

Why does my profile work well while running the NanoScan software, but the profile diminishes in the NanoModeScan software? [Read the FAQ](#).

Power/Energy Meters

Once and for all: Is DI (deionized) water good or bad for water-cooled

shift and allow us to adjust for this. Currently we have used this on our R&D line and one production line."

From the Blog

How to Use a 50 W Sensor to Measure 8 kW Lasers

This is a trick that should NOT be used lightly. However, in many cases Ophir sensors can be used for far higher powers than in the spec, as long as it's only for a short time exposure. This is because energy has a greater impact on the sensor than average power. [High Powers](#).

Catalogs: Power Meters & Beam Profiling

Download the Ophir-Spiricon 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

[Photonics World of Lasers and Optics](#)

March 14-17, 2016
Moscow, Russia

[Laser World of Photonics China](#)

March 15-17, 2016
Shanghai, China

[OFC/NFOEC \(OSA\)](#)

March 22-24, 2016
Anaheim, CA

[Additive Manufacturing Users Group](#)

April 3-7, 2016
St. Louis, MO

[Photonix 2016](#)

April 5-8, 2016
Tokyo, Japan

[EUROLAB](#)

April 12-14, 2016
Warsaw, Poland

[Defense & Security Show \(SPIE DSS\)](#)

April 17-21, 2016
Baltimore, MD

[Lasers for Manufacturing Event \(LME LIA\)](#)

April 26-27, 2016
Atlanta, GA

[AKL International Lasercongress](#)

April 27-29, 2016
Aachen, Germany

[Laser EXPO 2016](#)

May 18-20, 2016
Yokohama, Japan

sensors? Does it help prevent corrosion or does it increase the risk? [Read the FAQ.](#)

How can I communicate with an Ophir instrument using a Linux machine? [Read the FAQ.](#)

Can an unused laser wavelength selection be disabled on a thermal sensor to avoid the possibility of an out-of-tolerance failure at that wavelength during the recalibration? [Read the FAQ.](#)

What is the resolution of my sensor? [Read the FAQ.](#)

What's New

If You Missed Photonics West 2016...

Dan Ford walks us through some of what was on display for laser beam profiling and analysis applications at the Ophir booth, then shares information on the company's high-power laser application initiative over the last year. [Photonics West.](#)



New M² Beam Propagation Software

The new M² Beam Propagation software for the Pyrocam™ family of pyroelectric laser beam profiling cameras is designed for measuring laser quality. The software incorporates M² calculations that predict how a laser will focus and beam propagation parameters (BPP) that describe how the laser diverges as a function of the beam waist width. [M² Beam Propagation Software.](#)

StarViewer Mobile App for Viewing Laser Power/Energy

StarViewer is an Android app that brings laser power/energy measurements to Android smartphones and tablets. It can be used with virtually any Ophir thermopile, photodiode, or pyroelectric PE-C laser sensor. Data can be displayed in a variety of formats: time-based line graph, needle display, or large numeric display with statistics. [StarViewer.](#)

Low Noise, High Sensitivity Radiometer Measures Very Low Powers Down to 300fW

The RM9-PD Radiometer measures the power of very low level CW or quasi CW sources. The sensor integrates a photodiode sensor and an 18Hz chopper into an easy-to-use system that measures very low powers. The sensor is calibrated over the entire range of wavelengths, from 0.2μm to 1.1μm, not just a single wavelength. Measures power levels from 300fW to 300nW. [RM-9 Radiometer.](#)

Ethernet Adapter for OEM Smart Laser Systems

The EA-1 Ethernet Adapter connects Ophir's smart laser sensors directly to an Ethernet bus, no PC connection required. The EA-1 is designed for OEMs who need Ethernet connectivity and want to control the sensor via their own custom software. [EA-1 Ethernet Adapter.](#)

Fast Ship Program

Ophir-Spiricon's [Fast Ship program](#) provides one-day shipment of the most popular power/energy, beam profiling, and M² 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-Spiricon 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

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www.ophiropt.com/photonics

About Ophir-Spiricon, LLC

Celebrating 40 years of experience, Ophir Photonics, a Newport Corporation company, provides a complete line of instrumentation including power and energy meters, beam profilers, spectrum analyzers, and goniometric radiometers. 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's modular, customizable solutions serve manufacturing, medical, military, and research industries throughout

the world.

An ISO 9001:2008 Registered Company. ISO/IEC 17025:2005 accredited for calibration of laser measurement instruments.

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