

ePulse: Laser Measurement News

The true measurement of laser performance



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June 2013

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](#).



Tutorials

Modifying Laser Beams: No Way Around It, So Here's How

Applications of laser technology are growing in leaps and bounds, from industrial material processing to medical therapy to communications systems. Before using the laser, it is usually necessary to modify the laser beam to achieve the desired results. This paper discusses using beam measurement tools, aligning optical systems, collimation and focusing, handling high power lasers, and attenuation. [Laser Beam Profiling](#).

Pulsed Beams: Understanding Q-Switched, CO² with Pulse Width Modulation, and Pico- and Femtosecond Lasers

Many lasers are operated in pulsed mode. Measuring these beams has generally required the use of a CCD array profiler and external attenuation. Scanning slit profilers offer an alternative, incorporating a "peak connect" algorithm and software controlled variable scan speed on all scanheads that enables the measurement of a wide variety of pulsed lasers. [Pulsed Beam Measurement](#).

Applications

Characterizing Angular Radiation Intensity to Position Light Sources

Goniometric Radiometers enable the user to characterize the angular radiation intensity of a wide range of light-emitting sources, including VCSELs, laser diodes, optical fibers, and optical waveguides. To achieve accurate characterization, the light source in question must be positioned in a way that is both measured and repeatable. This application note suggests methods for using the LD 8900 and LD 8900R to position light sources. [Positioning Light Sources](#).

LIDAR Guns, Accuracy, & Speeding Tickets

Anyone who has driven a vehicle has encountered a Light Detection and Ranging (LIDAR) system in action...and probably knows how much it can cost in terms of speeding fines. But is the detector measuring your speed correctly? Behind the scenes, the LIDAR device sends out a 130 μ W 904 nm beam produced by three LEDs. This app note takes a look at how radar gun performance is tested. [LIDAR Guns & Speeding](#).

Webinar

Laser Measurement Techniques for Beam Control in Materials Processing

In a growing number of material processing applications - welding,

Video of the Month

Why Should You Measure Your Laser's Beam Profile?

This tutorial shows you how to get the most out of your laser beam. Presented by Ophir-Spiricon's sales engineers, experts in the field of laser measurement. Find out more in the [beam profiling video](#).



Measuring Long Wavelength Lasers

Gary Wagner, General Manager at Ophir-Spiricon, introduces the Pyrocam IV and discusses new developments in measuring long wavelength lasers. [SPIE Defense, Security, and Sensing Conference](#).

Laser Puzzle

[Try your hand at this month's Laser Puzzle](#). All entries will receive a 4GB pen drive and the new Ophir Laser Measurement Poster. The grand prize winner will receive a 16GB iPad. E-mail answers to sales@us.ophiropt.com. Need a hint? E-mail kevin.kirkham@us.ophiropt.com

Here are the [answers to the last issue's puzzle](#). The winner of last issue's puzzle was **Rick McGill, Technical Associate, Eastman Chemical Company**. "We use power meters and beam profilers routinely to ensure the optimum performance from our lasers. We use lasers in advanced spectroscopy, atomic force microscopy, and other opto-analytical equipment and the data from those instruments has to be precise for our work!" - Rick McGill

From the Blog

How to Measure High Power Laser Beams. Really High.

Deciding how to measure your laser usually means sifting through vendors to find the laser

cutting, ablating, even marking and scientific instruments - lasers are an integral part of the production process. Understanding how the laser is performing, assuring it is working as expected, and maintaining a system that results in a consistent, high-quality, high-throughput process is not only desired, but is critical. To ensure that it is performing as efficiently as possible, the user must understand how the laser interacts with the material being processed. *Industrial Laser Solutions* exclusive: presented live June 19th and available on-demand. [Material Processing](#).

Business News

Lean Journey Leads to Fewer Repairs

The Lean journey at Ophir-Spiricon has proven fruitful. As we work to improve the customer experience, we encounter processes in need of change. As these improvements are made, we see fewer repair charges for our customers. This translates to higher uptime and lower cost of ownership. Here's a look at the data. [Lean at Ophir-Spiricon](#).

Technical Tips

Beam Profiling

Camera Correction Factors

I'm using an optical assembly on a camera and need to input a correction factor so the readings in the results are of the raw beam and not what is hitting on the camera. How do I do this? [Read the Tech Tip](#).

Power/Energy Meters

Thermal BB Coating Power Meter Sensor Angular Dependence

For optimal accuracy, the Ophir thermal power meter sensor is placed in the beam path perpendicular to the incident beam. There is an angular dependence that will reduce the measurement accuracy by a certain percentage. [Read the Tech Tip](#).

Measuring Beams Coming Out of a Fiber

When you need to measure a beam coming out of a fiber, there are some parameters that might have a somewhat different meaning than they do when referring to "regular" beam measurements. [Read the Tech Tip](#).

Thermal Sensors for Measuring Low, Medium, and High Laser Powers

In this short "Basics" video we review the use and selection of thermal sensors for measuring low, medium, and high laser powers. [Read the Tech Tip](#).

FAQs

Power/Energy Meters

Is there a coolant pressure specification for Ophir water-cooled sensors? [Read the FAQ](#).

How can I obtain a specification sheet for an out of production sensor? [Read the FAQ](#).

Beam Profiling

When do I need to use the photodiode for triggering the camera vs Video Trigger? [Read the FAQ](#).

How fast will the SP620 camera run? SP503? L11059? [Read the FAQ](#).

How do I use a CCTV or other lens to re-image a beam that is too big to fit directly on the CCD sensor? [Read the FAQ](#).

Using a NanoScan, does slit length (3.5mm or 9mm) affect measurement precision? [Read the FAQ](#).

I just purchased a USB Ophir power/energy meter and am trying to get the BeamGage software to display the reading. How do I make them work together? [Read the FAQ](#).

power meter that best fits your needs. For some lasers, such as really high power lasers, the difficulty is not in choosing a power meter, but in finding one at all. [High Power Lasers](#).

Laser Power Sensors Accuracy Specs Unveiled.

This go-to guide of all the major contributions to laser sensor error includes rules-of-thumb that can be used for Ophir power and energy sensors. Also includes tips for when some parts of the error can be neglected. [Power Sensor Specs](#).

2013 Catalogs: Power Meters & Beam Profiling

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

Trade Shows

[SPIE Optics + Photonics](#)

August 27-29, 2013
San Diego, CA
Booth 1117

[InterOpto 2013](#)

October 16-18, 2013
Pacifico Yokohama, Japan

Fast Ship Program

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

Free Laser Measurement Equipment

If you're an end user of our laser equipment, let's hear about how you use it in your application. You can write the whole article or you can collaborate with our talented writers. In exchange, we can negotiate you receiving one of our latest innovative instruments, detectors, or profiling cameras and software to use in your lab. E-mail kevin.kirkham@us.ophiropt.com.

In a few nanoseconds, you'll be telling the laser world about your application using our equipment and a femtosecond or two later you'll be logging your data on our equipment like the Nova II, Vega, Quasar or BeamGage.

I'm seeing a vertical line through my beam profile that is producing incorrect beam width measurements in this direction. What is causing this? [Read the FAQ.](#)

What's New

IR Phosphor Viewer Card: 1st 10 Replies Get One FREE

We offer a glass IR phosphor card that allows you to see NIR lasers from 810 – 860 nm, 900-1100 nm, and 1500-1600 nm. The card does not require charging before use. It's excellent for beam alignment and has a large damage threshold compared to others: 1 KW/cm² or .5 J/cm². We will award one card to the first ten (10) customers who reply. Order part number 7F01235A. Cost is \$75 each, after the first ten are given out. E-mail: kenneth.ferree@us.ophiropt.com



VIDEO: LASER World of Photonics

Gary Wagner, General Manager of Ophir-Spiricon, talks with Pro-Physik Magazine about the newest technologies for measuring long wavelength lasers. [Pro-Physik.](#)

30K-W Power Meter Directly Measures Very High Power Lasers

Created for material processing lasers, the 30K-W Power Meter features a unique design that allows direct measurement of very high powers and power densities. It measures YAG and fiber lasers in the 800-2000 nm range, and CO₂ lasers at 10.6 microns. A wide aperture of 74 mm allows it to handle large diameter beams. [30K-W Power Meter.](#)

Beam Profiling Software Adds Custom Computations

BeamGage now includes Custom Computations, allowing laser manufacturers and researchers to easily import their own custom algorithms created in C#/.NET. Once imported, users can apply more than 55 advanced measurement and statistical analysis functions including fast, off-axis correction of distorted beam images; trend charting; data logging; power/energy calibration; and pass/fail production testing [BeamGage.](#)

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About Ophir-Spiricon, LLC

With over 30 years of experience, Ophir Photonics, a Newport Corporation brand, 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 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. Their 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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3050 North 300 West, North Logan, UT 84341
Tel: +1 435-753-3729
www.ophiropt.com/photronics