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ePulse: Laser Measurement News

June 2015

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

Technology's Role in the Evolution of Laser Technicians to Laser Technology Specialists

By John McCauley, Product Specialist, Ophir-Spiricon

Most anyone working with lasers today will tell you that it is an exciting field. Applications of coherent light at different wavelengths are ever increasing and show no signs of plateauing. The skills required to understand, troubleshoot, and correct problems with lasers, and the systems they are a part of, are in high demand. It's all part of an evolution as yesterday's laser technician turns into today's laser technology specialist. Evolution.

Features

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

By John McCauley, Product Specialist, Ophir-Spiricon

In order to apply a laser to an industrial process, medical therapy, or communications technology, it is usually necessary to modify the laser beam to achieve the desired results. Laser beam measurement tools make this possible. Here's how to match the laser beam profiling technique to the application, from building an aligned optical system to collimating and focusing to proper attenuation techniques for accurate measurements. Modifying Laser Beams.

Multi-Kilowatt Lasers for Industrial Materials Processing

By John McCauley, Product Specialist, Ophir-Spiricon

In case you missed this in the latest Technical Digest from *Industrial Laser Solutions* – Laser output power, along with focused spot size and its temporal location, are critical for optimizing laser materials processing, especially for high-power, multi-kilowatt class lasers. We look at several high-power laser applications, including laser machining/processing of composites in automotive/aerospace applications and such tools as high-power fiber lasers that can handle new material designs and surface non-uniformities – all with an eye toward the beam characterization equipment needed to insure the integrity of the cut or weld created by these tools. Multi-Kilowatt Lasers.

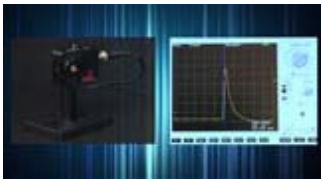
Videos of the Month

Precision Laser Measurement

Ophir-Spiricon is the world leader in laser beam measurement systems, from power and energy meters and sensors to spatial beam profiling. This video introduces our company and the state-of-the-art award winning products that help you get the most from your laser. Video: Laser Measurement.

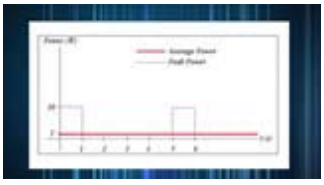
How to Measure the Pulse Shape of a Laser

See how a fast photodiode measures the temporal profiles of pulsed lasers. The FPS-1 has a rise time of 1.5 ns, so even nanosecond pulsed lasers can be measured accurately. Video: Pulse Shape.



Peak Power vs Average Power

What's the difference between peak power and average power and how are they measured? Video: Peak Power vs Average Power.



Laser Puzzle

Try your hand at this month's Laser Puzzle. All entries will

Tutorial

Apples to Apples: Which Camera Technologies Work Best for Beam Profiling Applications, Part 4
By Greg Slobodzian, Director of Engineering-Retired, Ophir-Spiricon
This white paper takes an in-depth look at the evolution of today's commercial camera technologies and their use in measuring laser beams. Here we take a look at scanning slit vs camera-based beam analyzers. Laser Beam Width, Pt 4.

Applications

LIDAR Guns, Accuracy, and Speeding Tickets
Our most popular article continues to be covered by the industry press, this time by *Photonics Online*. 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 speeding fines. Let's take a look at how radar gun performance is tested. LIDAR Guns & Speeding.

Webinar

Right and Wrong Ways to Manage Laser System Variables in Material Processing
A primary goal in material processing is to maintain consistency across the many variables introduced into the process. When a laser is being used for the production of parts, the laser system has its own set of variables. How are you managing them? This webinar presents real-world case studies of right and wrong ways to approach material processing when variables change during laser welding, cutting, engraving, drilling, etc. If you missed this March *Industrial Laser Solutions* webcast, here is the on-demand version. On-Demand Webcast: Laser System Variables.

Technical Tips

Power/Energy Meters

Using the FL250A-LP1-DIF-33 at "None of the Above" Wavelengths
The FL250A-LP1-DIF-33 is specified over the range 0.4µm – 3 µm. However, as the spec points out, it is only calibrated at three specific wavelengths: 532nm, 755nm, and 1064nm. What if your laser is "none of the above," say Erbium at 2940nm? Read the Tech Tip.

Beam Profiling

Is Goodness of Fit a Better Metric Than Circularity?
Questions like this are common, given the large number of parameters that Ophir's BeamGage® software calculates from each beam profile. When faced with these metrics, it's natural to wonder which are more important or if one parameter is the best one to describe your laser. Read the Tech Tip.

How to Set BeamGage to Lock Out Making Changes to Settings Inadvertently
BeamGage allows you to lock out settings changes to prevent you from inadvertently changing something you shouldn't. This feature also lets you lock out operators in a production environment so they won't violate testing procedures. Read the Tech Tip.

FAQs

receive a 8GB 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 john.mccauley@us.ophiropt.com

Here are the answers to the last issue's puzzle. The winner of last issue's puzzle was **Wayne Rees, Daisymoon Designs Ltd., UK.** The customer is currently using power meters to measure his range of CO_2 lasers used in the cutting of thin plywood for a range of craft products they sell. The laser is checked every few weeks.

From the Blog

How to Keep a Laser Power Sensor Clean
Can you keep a laser sensor clean in a messy, industrial environment? It's possible. Here's how. Keeping a Laser Sensor Clean.

2015 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

LASER World of PHOTONICS 2015
June 22-25, 2015
Munich, Germany
Hall B3, Booth 319

SPIE's Optics & Photonics
August 11-13, 2015
San Diego, CA

Material Science & Technology (MS&T)
October 4-8, 2015
Columbus, OH

ICALEO
October 18-22, 2015
Atlanta, GA

OSA's Frontiers in Optics
October 21-22, 2015
San Jose, CA

Beam Profiling
Why does the BeamGage cursor location always draw to the middle of a pixel location, even though peaks and centroids, which can be tracked by the cursor, can be computing to sub-pixel resolution? Read the FAQ.

Why does my laptop computer fan run constantly at high speed and my laptop battery life diminish after running and closing BeamGage with a Point Grey camera? Read the FAQ.

What is the biggest barrier you've seen from customers who should be benchmarking a process but, ultimately, don't? Equipment cost/skill set/personnel? Read the FAQ.

Power/Energy Meters
Why doesn't the StarLab software recognize the Nova II or Vega meter when an RS232 to USB adapter cable is used with the supplied RS232 cable for an interface? Read the FAQ.

Why will my PE sensor not detect my CW laser? Read the FAQ.

What's New

See Us at LASER World of Photonics 2015

The Munich LASER show is the most important exhibition for the Photonics Industry in Europe. Almost the entire industry serving the opto-electronics and laser markets will be present. It's a great opportunity to meet people and learn more about the latest product developments in and around the laser community. As in previous years, Ophir will be present with its three brands — OPHIR, SPIRICON, and PHOTON. Our teams from Israel, USA, and Europe look forward to welcoming you to our booth. Our R&D departments have been very busy the last two years, so you can expect to find several new products exhibited in the booth. These include the world record holding 120 kW Power Sensor, a new line of High Power Fan Cooled sensors, very low power Radiometer sensors, and several new developments in beam profiling, like the new generation of Pyrocams, large format cameras, and the first non-contact dual axis Beam Profiler that can measure unlimited power and real time focus shift within the split of a second.

Please consider this a standing invitation. Come and meet the people behind those unique and groundbreaking products in **Hall B – Stand 319** and let us enjoy the show together. We look forward to seeing you in Munich. Download the trade fair planner app to help you navigate the six halls and countless events.

Ophir-Spiricon Engineers Support Physics Day
Ophir-Spiricon's engineers are in the news this month. This year they supported the University of Utah's Physics Lagoon Day at Lagoon Park. The goal of the event is to encourage science as a career. This year, students of all ages gathered to learn the science behind the famous Colossus roller coaster. Video: Roller Coaster Physics.

BeamWatch® Wins 2015 Utah Innovation Award
Ophir-Spiricon has been honored with a 2015 Utah Innovation Award from the Utah Technology Council. Designed to draw attention to the high level of innovation taking place throughout Utah, the awards program recognizes significant innovations and the companies that created them. Ophir-Spiricon was presented with the award in the category of Mechanical Systems/Chemicals/Manufacturing for BeamWatch, the industry's first non-contact, focus spot size and position monitor for very high power YAG, fiber, and diode lasers. Innovation Award.

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.

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

High Power Fan-Cooled Laser Sensor
The FL1100A-BB-65, FL600A-BB-65, and FL600A-LP1-65 are high power, fan-cooled laser sensors. These compact devices can measure very high powers up to 1100W with no need for water cooling; this is almost twice the power of competitive devices. They can measure laser power from 600mW to 1100W and energy from 250mJ to 600J. High Power Fan-Cooled Sensors.

About Ophir-Spiricon, LLC

With over 35 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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