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ePulse: Laser Measurement News May 2017

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.*

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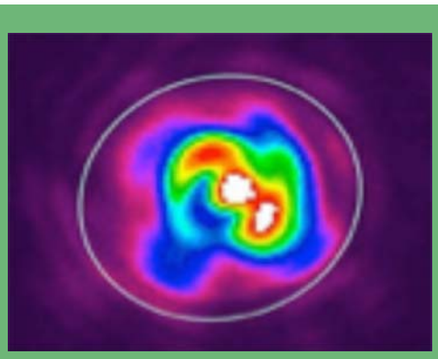
Features



Sensor Fusion in Additive Manufacturing

By Kevin Kirkham, Senior Manager, Product Development, Ophir

Laser sintering applications must monitor the power density of the presented laser beam so the power density is neither too “hot” nor too “cold” for material modification. But how do we know if the laser is delivering exactly the beam that's needed? Hybrid systems that employ multiple sensors can provide meaningful insight.

Additive Manufacturing

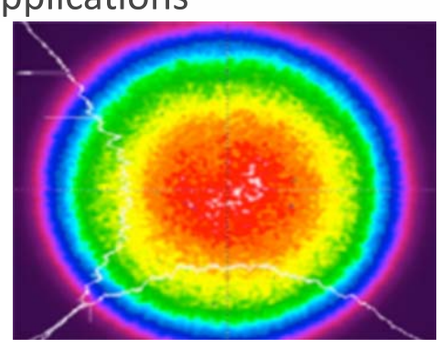
Measuring Signals Below the Noise Floor with a Lock-In Amplifier

By Shimon Elstein, Senior Physicist, Ophir

Measuring optical signals in the femtowatt (10-15) to nanowatt (10-9) range can be daunting. Signal levels this low are lost in detector noise levels and swamped by background light. Lock-in amplifiers can improve noise rejection and provide background signal rejection several orders of magnitude higher than noise rejection.

Lock-In Amplifiers

Applications



What to Expect in a Laser Profiling Demo

Can You Measure Beam Quality (M2) in Real Time?

By Chuck Reagan, Sales Engineer, Ophir (U.S.)

You may be wondering what to expect when you ask for a laser beam profiling demo. At Ophir, we start by exchanging information about you, your laser, and your application. We then examine equipment capabilities and limitations specific to your needs and perform a site survey. Here are the details.

Beam Profiling Demo

By Ilan Haber, Dir R&D and Marketing, Ophir

Since beam quality (M-Squared) can be calculated only by taking several measurements along the laser beam caustic, you will typically need to move either the camera or laser source along its axis to get snapshots at different locations. Here are two approaches that don't move the camera or the laser.

Real Time M-Squared

Videos of the Month

Helios Industrial Meter

Ophir's Helios industrial laser power meter is a compact instrument for measuring high power lasers in factory environments. Here's how to set it up and how to operate it.

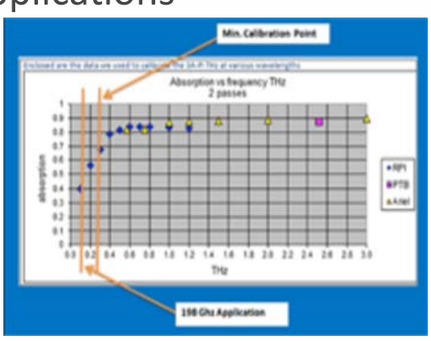
VIDEO: Helios

LBS-300 Beam Sampler

The LBS-300 beam sampler allows you to safely measure laser beams with diameters up to 15mm and powers ranging from 10mW to ~400W using a CCD camera.

VIDEO: LBS-300

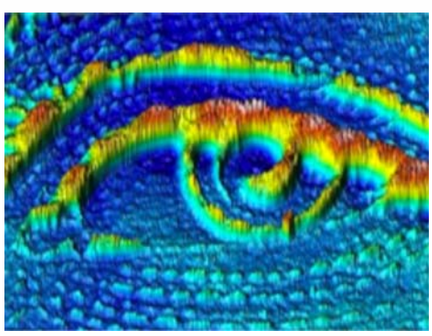
Applications



Laser Beam Diagnostics in GHz Applications

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

When working with exotic optical wavelengths and unusually low average powers, multiple measurement technologies are often required. In nuclear magnetic resonance spectroscopy, measurements need to be made at the output of the source, as well as



3D Measurements for Label Authentication

By Roei Yiftah, Industrial Product Manager; Moshe Danziger, Application Engineer, and Shmulik Barzilay, International Sales Manager, Optimet

When a customer needed to measure a printed logo on a label and confirm authenticity, we performed an analysis for traceability and authentication purposes. The objective was to measure the height map of the

along the optical path before the beam is deposited into a cryogenically cooled magnet.

NMRS

design and show typical heights of the printed authentication design.

Label Authentication

What's New

FluxGage LED Luminaire Measurement

Efi Rotem, Ophir Project Manager, discusses FluxGage, a revolutionary, compact system that measures flux, color, and flicker, important quantities for evaluating the performance of LED products.

Video: FluxGage

BeamCheck for Additive Manufacturing

BeamCheck™ is a beam profiling system that ensures accurate laser performance in additive manufacturing applications, including selective laser sintering (SLS) and selective laser melting (SLM).

BeamCheck

FAQs

Beam Profiling

- How do I get my Ophir power meter to work with BeamGage Software?

  FAQ

- What is a quick way to verify that the BeamGage installation is complete and working?

  FAQ

- Why doesn't the CCD camera display a beam with a valid trigger signal connected from a photo detector with BeamGage set to Trigger In mode?

  FAQ

Power/Energy Meters

- Can I see some of the functionality of a power meter with different sensor types?

  FAQ

- For the 120K-W sensor, what is the maximum power density?

  FAQ

- To connect a fiber to an Ophir sensor, why do I need two items, an "adapter" and a "mounting bracket?"

  FAQ

- Why wasn't the firmware upgraded to the latest version when my meter was sent in for recalibration?

FAQ

Social Media

Laser Beam Optics Calculators

Whether you're a lab researcher or an industrial worker, there are laser parameters you will need to calculate, such as power density or ideal focus spot size. Here are some laser beam optics calculators to make your work a bit easier.

Laser Calculators

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**. 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 **Michael Jones, Lash Miller Chemical Laboratories**. "Our laboratory employs a variety of laser sources in equipment used for spectroscopy, gel characterization, and other analytical experiments. Laser energy meters and beam profilers maintain our various instruments and ensure our data is as accurate and reproducible as possible." - Michael Jones.

New 2017 Catalogs: Power Meters & Beam Profiling

Download the new 2017 Ophir Laser Measurement Catalogs today. Tutorials and product specifications for **Power Meters** and **Beam Profilers**. **Beam Profiling Magalog** includes application notes, technology articles, and reference algorithms.

Trade Shows

- **Photonics North,** June 6-8, 2017, Ottawa, Canada
- **MD&M,** June 13-15, 2017, New York, NY
- **Photonics Veldhoven,** June 14, 2017, Veldhoven, Netherlands
- **OPTO Taiwan,** June 14-16, 2017, Taiwan
- **Laser World of Photonics,** June 26-29, 2017, Munich, Germany
- **Photonics & LED Seoul,** June 27-29, 2017, Korea
- **SPIE Optics + Photonics,** August 6-10, 2017, San Diego, CA
- **CIOE,** September 6-9, 2017, Shenzhen, China
- **Taipei International Mold & Die Industry Fair,** September 6-9, 2017, Taiwan
- **Taipei International Industrial Automation Exhibition,** September 6-9, 2017, Taiwan
- **OSA Frontiers in Optics (FiO),** September 19-20, 2017, Washington, DC
- **Touch Taiwan,** September 20-22, 2017, Taiwan
- **LPS 2017: LED Symposium & Expo,** September 26-28, 2017, Bergenz, Austria
- **TCTShow,** September 26-28, 2017, Birmingham, UK

Fast Ship Program

Ophir'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 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**.

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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