ePulse: Laser Measurement News

June 2019

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.

Laser World of Photonics

See What's New at Laser World of Photonics 2019

We continue to push the boundaries of laser and LED measurement, applying new technologies to create sophisticated yet easy-to-use systems to ensure laser performance and stability. Check out our end-to-end material processing and industrial solutions in Munich at the MKS booth, Hall A2, Stand #209, June 24-27, 2019:

- *Ophir 1-micron fiber laser optics, CO2 laser optics, laser power & energy meters, laser beam profilers, non-contact sensors & scanners*
- *Newport opto-mechanics, motion control, and light sources*
- *Spectra-Physics ultrafast, pulsed, CW, quasi and tunable lasers*

Features

Battle Axe vs Scalpel: How to Work with High Power Density Lasers

Random quality inspections of finished products will not cut it for quality control in Industry 4.0 laser applications. Although data points about the laser source are important for digitization, it is the focused beam itself that is the actual tool. It must be monitored closely to avoid producing faulty parts. A big challenge is how to handle the massively increased power density of the lasers. This is where non-contact measurement provides big advantages. Non-Contact Measurement.

Technical Notes

ISO Compliance of Non-Contact, Real-Time Beam Analysis

By Dr. Jed Simmons and Kevin Kirkham, Ophir Photonics

During the past decade, laser power levels used in production applications have risen significantly. To deliver continuously high product quality, the key parameters of the laser beam must be measured on a regular basis. Ophir has developed a non-contact measurement

Videos of the Month

Improving Patient Outcomes

Laser measurement has become popular for treating patients as well as for manufacturing medical products and instrumentation. This video explains how Ophir's laser measurement technology can improve patient outcomes. Video: Medical Applications.

Centauri: A New Experience in Laser Measurements

Ophir's new high-end dual channel laser power/energy meter combines a large 7" color touch screen, small form factor, and advanced processing so you have all the functionality of a benchtop instrument in a compact, portable meter. Video: Centauri.

Laser Puzzle

Try your hand at this month's Laser Puzzle. The old clockmaker has a clever way of determining the prices of his beautiful masterpieces. Can you figure out his secret?

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@enigmaturge.com.

technology based on the Rayleigh scattering that enables the measurement of high-power beams without touching the laser beam. Here we compare Rayleigh Scatter based beam profiling methods with other beam profiling techniques and show that non-contact beam profiling based on Rayleigh scattering provides accurate and repeatable measurements that fully comply with the ISO11146 standard. ISO Compliance.

Surround the Workpiece
Surround the Workpiece℠ is the MKS strategy that serves the needs of Advanced Markets that require laser-based solutions. Our goal is to provide customers with the key components, systems, and services to enable the successful implementation of these solutions. An example of this strategy is our unique offering for the laser machining market, including beam delivery, motion and positioning, and monitoring of the laser beam delivery. Surround the Workpiece.

Research News

Subsurface LIBS Sensor for In Situ Groundwater Quality Monitoring
A Laser Induced Breakdown Spectroscopy (LIBS) based sensor is developed for sub-surface water quality monitoring. The sensor head is built using a low cost passively Q-switched (PQSW) laser and is fiber coupled to a pump laser and a gated spectrometer. Pulse energy measurements were made with a pyroelectric meter (Ophir PE25BF-C) and the temporal beam profiles were measured with a biased silicon photodiode and a 500 MHz oscilloscope. LIBS Sensor.

Plasmonic Refractive Index Sensor
The sensitivities of refractive index sensors based on surface plasmon resonance (SPR) promise to deliver high sensitivities but are constrained by a relatively narrow detection range for refractive index changes. We introduce an idea to improve the detection range refractive index through a high-contrast-index curved waveguide surrounded with an outer gold ring. The refractive index resolution calculation is based on the normalized output power of a photodiode sensor (Ophir PD300-IR). Refractive Index Sensor.

Silicon-on-Insulator Slab for Topological Valley Transport
Valley physics provides an intriguing way for robust information transfer

Here's the answer to last issue's puzzle. Congratulations to the winner of last issue's puzzle - **Greg Brisebois, Staff Applications Engineer, Signal Conditioning, Analog Devices**.

Social Media: Blog

OEM Ethernet Solutions
Ophir has the widest selection of OEM laser measurement solutions. Our newest OEM product is the UAE: Universal Amplifier, Ethernet. This is similar to our other "UA" boards, which turn a "dumb" sensor into a smart Ethernet laser power meter. OEM Ethernet Solutions.

Catalogs: Power Meters & Beam Profiling

Download the new 2019 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

Laser World of Photonics 2019
June 24-27, 2019
Messe München

Laser Korea
July 3-5, 2019
Seoul, Korea

SPIE Optics & Photonics
August 13-15, 2019
San Diego, CA

Additive Manufacturing Conference
August 27-29, 2019
Austin, TX

CIOE: China International Optoelectronics Expo
September 4-7, 2019
Shenzhen, China

Frontiers in Optics (FiO)
September 16-19, 2019
Washington, DC

LED Professional Symposium & Expo
September 24-26, 2019
Bregenz, Austria

Subcontracting Trade Fair
September 24-26, 2019
Tampere, Finland

and unidirectional coupling in topological nanophotonics. Here we realize topological transport in a SOI valley photonic crystal slab. For robust transport measurement, the output signals were collected by a lensed fiber and detected by an optical power meter (Ophir Nova-II). Silicon-on-Insulator Slab.

Applications

Applying Laser Measurement in Real-World Applications
Here's how to put laser measurement to work in real-world applications, from quality control to medical devices to industrial materials processing.

- Additive Manufacturing
- Fiber Optics
- Medical

What's New

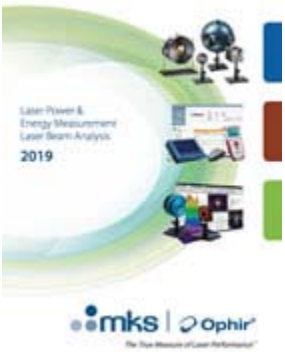
InGaAs Camera-Based Beam Profiling Systems

The Ophir® SP1201 and SP1203 are compact InGaAs camera-based beam profiling systems for real-time viewing and measuring of the optical performance of laser beams. Designed for high sensitivity imaging, the SP1201 features a QVGA resolution InGaAs camera and the SP1203 features a high-resolution VGA InGaAs camera; both include BeamGage® Professional beam profiling software. The cameras accurately capture and analyze wavelengths from 900nm - 1700nm. They feature a compact design, small pixel pitch (15µm – 30 µm), high frame rates in excess of 60 frames per second, excellent signal-to-noise ratio, and a high-speed GigE (Gigabit Ethernet) interface. Beam Profiling Systems.

OEM Laser Sensors Directly Connect to Ethernet Bus

The Ophir® UAE family of OEM sensors can be directly connected to an Ethernet bus. Designed for OEM users that want to control laser power measurements via their own software, Universal Adapter (UA) power sensors can be fully integrated into host Ethernet systems for local, remote, and long distance measurements, such as in material processing and Internet of Things (Industry 4.0, IIoT, Connected Industries). OEM Laser Sensor.

2019 Catalog: Laser Power/Energy Measurement & Laser Beam Analysis



If you have a laser, you need to measure it. Ophir's 2019 catalog covers a wide range of laser power and energy sensors, meters and laser beam profiling systems for industrial, medical, defense, and research applications. Download the catalog PDF today at 2019 Ophir Catalog.

FAQs

MS&T19: Materials Science & Technology
September 29 – October 3, 2019
Portland, OR

Fast Ship Program

Ophir'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.

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www.ophiropt.com/photonics

Power Meters
The IS6 integrating spheres have a specified "sensitivity to beam size" and "sensitivity to beam divergence." What is that? Read the FAQ.

When I log data, does the log file store the results of any functions I applied (e.g. Average) or just the actual power readings themselves? Read the FAQ.

The Ophir catalog product specification sometimes states the spectral range to be wider than the spectral range that is programmed into the sensor or indicated in the spec sheet. For instance, the spectral range of the 1000W-BB-34 is specified at 019 – 20µm, but the footnote states that it is calibrated for ~0.8µm, 1.07µm, and 10.6µm. What does it mean to have a spectral range outside the calibrated wavelength range? Read the FAQ.

Beam Profiling
I've acquired a NanoModeScan system and I'm trying to operate it on a Windows 10 computer, but it is not working. Why not? Read the FAQ.

Does BeamGage Professional support a connection with Python? Read the FAQ.

About Ophir

Ophir is a brand within the MKS Instruments Light & Motion division. The Ophir product portfolio consists of laser and LED measurement products, including laser power and energy meters, laser beam profilers measuring femto-watt to hundred-kilowatt lasers, high-performance IR and visible optical elements, IR thermal imaging lenses and zoom lenses for defense and commercial applications, and OEM and replacement high-quality optics and sub-assemblies for CO_2 and high-power fiber laser material processing applications. Dedicated to continuous innovation in laser measurement, the product portfolio includes the **R&D 100** award-winning **BeamTrack** power/position/size meters and Spiricon **Ultracal™**, the baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy. The company is **ISO/IEC 17025:2005** accredited for calibration of laser measurement instruments. The company's modular, customizable solutions serve semiconductor, industrial, life and health sciences, research, and defense industries throughout the world. An ISO 9001:2008 Registered Company.

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