
## ePulse: Laser Measurement News

**October 2013**


Welcome to this special high power lasers edition of the **ePulse: Laser Measurement News**. Please forward to interested colleagues or have them subscribe.


## Tutorials

**Monitoring High Power YAG and Fiber Lasers, or "Why is the Sky Blue?"**

At the Laser Institute of America's Lasers for Manufacturing Event (LME), Gary Wagner, Ophir's Director of Operations, U.S., discusses measuring high power YAG and fiber laser beams and what this has to do with the physics of why the sky is the color blue. VIDEO: YAG and Fiber Lasers.

**Industrial Laser Beam Profiling: What's Going On Under the Hood?**

What's all the fuss over laser beam profiling? Why worry about the quality of the laser beam that you've just put into production? The process is humming along nicely, why fix what isn't broken? Hasn't laser beam quality been addressed at the research and development stage? You might be surprised to learn...this is not always the case. Industrial Beam Profiling.

**Making High Power Measurements with Little to No Attenuation**

In general, long infrared wavelengths, such as those of the $CO^2$ laser at 10.6 microns, are highly reflective. This leads to concerns about heat buildup in the scan head. At 5kW, this represents a heat load of 100W that will raise the temperature of the internal components and may cause damage to the detector and encoder electronics. Here's how to avoid problems. High Power Measurements.

## Webcast

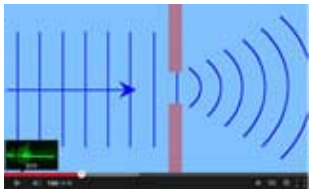
## Video of the Month

**Lasers and Materials Processing**

Optimizing processes and diagnosing problems has become harder with the use of high power lasers that can run up to 30kW and higher. Here's how to take measurements during the critical start up phase, and avoid disrupting or intercepting the beam during the process. VIDEO: Materials Processing.

**FAQ: How to Measure a Beam Coming Out of a Fiber**

Fiber beam measurements have different geometries from "regular" beams. The core diameter of the beam is not the beam diameter. Missing parameters related to diverging beams could lead to incorrect measurements and equipment damage. Here are the issues to keep in mind. VIDEO: Fiber Beam Measurements.



## 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 **John Honig, Lawrence Livermore National**

**Laser Beam Measurement**


This informative webcast from Electro Optics magazine covers every aspect of laser beam measurement. John McCauley and Dan Ford of Ophir-Spiricon provide expert advice on topics such as: what measurements should be taken and why, what technologies are available for laser measurement, and when these measurements should be taken. WEBCAST: Beam Measurement.

## Business News

**Rube Goldberg, Continuous Improvement, and Idea Generation**

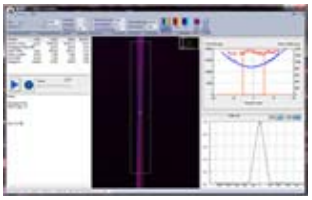
What's not to love about Rube Goldberg machines? They're creative, fun, and often lead to unexpected and interesting results. Ophir-Spiricon uses continuous improvement, the Shingo Model of Operational Excellence, and Rube Goldberg Team Building Events to encourage new product and cost-saving ideas. VIDEO: Rube Goldberg.

## What's New

**Power Sensor Measures Very High Power Fiber Lasers to 100kW**

The 100K-W Laser Power Meter is the first commercial sensor for measuring very high power 100kW lasers. It is designed for fiber lasers used in industrial material processing and military directed-energy applications. The portable meter features a unique design that allows measurement of very high power, near infrared, Nd:YAG and fiber lasers. 100K-W Power Meter.

**First Non-Contact Industrial Beam Monitoring System for Very High Power YAG and Fiber Lasers**



BeamWatch is a non-contact, focus spot size and position monitor for high power YAG and fiber lasers. It is the industry's first laser monitoring system to quickly and accurately measure laser parameters without requiring contact with the laser beam. It takes measurements every 60ms, measuring the Rayleigh scatter caused by the beam. This provides instant readings of focus spot size and beam position, as well as dynamic measurements of focal plane location during process start-up. BeamWatch.

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

The 30K-W meter measures YAG and fiber lasers in the 800-2000 nm range, and $CO^2$ lasers at 10.6 microns. Created for material processing lasers used in such applications as metal cutting and welding, the meter features a unique design that allows direct measurement of very high powers and power densities. A wide aperture of 74mm allows it to handle large diameter beams. 30K-W Power Meter.

**Laboratory**. "We have a number of uses for Ophir equipment. In our OMF (Optics Mitigation Facility) we use a Nanoscan at each of our 4 mitigation stations. The Nanoscan allows us to fully characterize our 10.6-micron $CO^2$ beam (beam size, nominal beam quality, and beam pointing) before we process each optic. When we commission new, or re-furbished $CO^2$ lasers for each mitigation station, we use the Pyrocam to precisely locate our lenses and apertures to create a specific beam profile. And finally, we use both air-cooled and water-cooled Ophir power meters on each station to set both $CO^2$ output power and $CO^2$ delivered power." - John Honig

## From the Blog

**How to Measure a 100kW Laser Directly**

One of the issues that comes up with laser measurement, especially at high powers is, how can you put any sensor in front of a laser that's specifically designed to pulverize steel?! Here's How it Works.

## 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.

## 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.

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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. 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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