

ePulse: Laser Measurement News

The true measurement of laser performance



ePulse: Laser Measurement News September 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

Beam Width Measurement Accuracy

CCD cameras are commonly used for a variety of imaging applications, as well as in optical instrumentation applications. These cameras have many excellent characteristics for both scene imaging and laser beam analysis. However, CCD cameras have two characteristics that limit their potential performance. Read the details at [Measurement Accuracy](#).

Beam Profiling in Machine Vision for Industrial Parts Inspection

A high volume manufacturer of molded devices needed to measure the size and shape of a hole that measured <100um wide by <100um deep. The machine vision approach was effective at measuring the diameter and ellipticity of the hole from both sides of the device. However, the technique was unable to detect a blockage of any type or thickness that was inside the hole. Find out how they made it work, [Machine Vision](#).

Understanding Beam Profiling Dynamic Range

It all started when a slow-witted engineer was teased one too many times. Tired of being the butt of all his colleagues' jokes, he plotted revenge. "I will create such a convoluted unit for dynamic range that none of them will be able to understand it. We'll see who's laughing then. Mwahaha!" Actually, the decibel was invented in Bell Labs in the 1920s. Although it is convoluted, it's also a very useful method of measuring wide ranges or ratios. Get the details on [Dynamic Range](#).

Applications

Ensuring Quality Welds in Medical Devices

Many customers involved with laser welding measure the pulse energy output of their lasers, but is this all the data required to ensure quality welds? Steve Schellenberg at Spinal Modulation had his doubts. [Quality Welds](#).

Business News

Recalibration and Repair Upgrade Docs

In response to your needs, and in order to better serve you, we have recently made a few changes on our calibration forms to increase the consistency between meter and sensor calibration documents. Here's a look at the new forms. [Recalibration and Repair](#).

Video of the Month

OEM Laser Measurement Solutions

In this video, Jimmy Green, Ophir OEM Specialist, explains how Ophir can solve special laser measurement challenges with a custom solution if a product cannot be found among the hundreds of products in our catalog. [Find out more in the video](#).



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. Missing some of these points could lead to incorrect measurement, and possible equipment damage. [Watch the video for details](#).

Laser Puzzle

Are you ready to take the Laser Measurement Myth Buster Challenge? Find out where you rank. FACT or MYTH? Take the Laser Measurement Myth Buster Challenge to get your score and enter a drawing for an Apple® iPad®. [Try your hand at this month's Laser Puzzle](#).

All entries will receive the new Ophir Laser Measurement Poster. Highest score 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 **Tobias Lernvall, Electronics Designer, LIMAB AB**. "Our company produces laser triangulation sensors and systems used for dimension

Technical Tips

Power/Energy Meters

Online Sensor Finder

The Online Sensor Finder now provides comments to help the user find a solution in case they do not succeed. Here are examples. [Read the Tech Tip](#).

Setting Power/Energy Meter Range

How do I know what range, or scale, to set my power/energy meter to? What happens if I go over range? [Read the Tech Tip](#).

Selecting Laser Wavelength

Here's how to select the correct laser wavelength for accurate power/energy measurement. [Read the Tech Tip](#).

Beam Profiling

Selecting the Correct Lens for M² Measurements with NanoModeScan

Given the broad range of wavelengths that can be measured by NanoModeScan, there are a number of considerations when choosing the correct lens. [Read the Tech Tip](#).

Gevicam Gig-E Camera Installation

Here are the steps for ensuring a proper connection between the Gevicam and BeamGage. [Read the Tech Tip](#).

Installing the Pyrocam III

Here are helpful hints for installing the Pyrocam III, particularly on Windows 7. [Read the Tech Tip](#).

FAQs

Beam Profiling

I've installed BeamGage on my laptop and connected my USB camera, but I can't connect to the camera. Why will BeamGage not see my camera? [Read the FAQ](#).

I get an Error Code -22 when I start my NanoScan software and I cannot use my system. What is Error Code -22? [Read the FAQ](#).

What is the maximum total attenuation stack-up of ND filters that can be used with a beam profiling camera for laser beam attenuation? [Read the FAQ](#).

Power/Energy Meters

My Ophir equipment keeps telling me it's time to recalibrate. Why do I need to send it in for calibration? [Read the FAQ](#).

Sensor Finder doesn't find a match for my application. Is there a way to create an OEM sensor for my application? [Read the FAQ](#).

I don't see my exact wavelength in the wavelength option for my Ophir sensor. I only see a couple of ranges. What should I do? [Read the FAQ](#).

Are the new Pyro-C energy sensors compatible with all Ophir meters? [Read the FAQ](#).

When using a BeamTrack sensor with StarLab on a PC, can I have StarLab log Position and Size data? At what sampling rate? [Read the FAQ](#).

What are the differences between the StarCam and StarLab PC applications? [Read the FAQ](#).

measurements in the industry. For the sensors we use a wide range of different wavelengths and power levels. An accurate laser power is essential and with the Ophir Nova II we have been able to automate the power adjustment of our laser modules and thus increased both the quality and reduced the production time." - Tobias Lernvall

From the Blog

What is an Integrating Sphere?

You know that you can measure laser power with a thermal or photodiode head. An integrating sphere is actually not an additional sensor category. It is more like a super-accessory for a photodiode detector, which does the actual power measurement. [Find out more on the blog](#).

OEM Options: Get Exactly the Right Laser Sensor

You know what you need to measure, so we don't want to limit your choices. Ophir's OEM solutions are designed to provide you with the right product for your application. [OEM Laser Sensor Solutions](#).

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

ICALEO

October 16-18, 2013
Miami, FL USA

Photonex

October 16-17, 2013
Coventry, UK
Booth 20C

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 M² laser measurement equipment across the U.S.

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



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](#).

First Commercial Power Sensor Measures Very High Power Fiber Lasers

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](#).

New Pyroelectric Energy Sensors for High Power, High Repetition Rate Lasers

The PE-C line of pyroelectric pulsed laser sensors are compact devices that provide the industry's lowest measurable energy, longest measurable pulse width, and highest accuracy. The PE50-DIF-ER-C measures average power to 60W and has a wide dynamic range that extends to infrared lasers, including 2.94µm Erbium laser pulses. The PE50BB-DIF-C features a spectrally flat BB (broadband) coating, usable from far UV to far IR. [Pyro-C Pyroelectric Energy Sensors](#).

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. 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