

Laser & LED Measurement for Your Application



Calibration Capability for your Ophir Products

Taking the extra step

MKS offers worldwide calibration services for its Ophir products. In order to ensure the best and fastest possible calibration of your instruments, we operate four calibration centers located in the United States, Japan, Israel and Germany. We take a number of extra steps to provide you with extraordinary service: since laser absorption varies with wavelength, the calibration process must take this into account. If the variation is small, then the sensors are

calibrated at several laser wavelengths. If the absorption variation with wavelength is considerable, the sensor is provided with an absorption correction curve activated by the wavelength of use. In addition to standard calibration wavelengths, customers can have their Ophir sensor calibration customized by specific wavelength, power or energy settings.



YOUR ADVANTAGES:

- ISO 17025
- Fast turnaround
- Widest range of wavelengths available
- Customized calibration available

Ophir runs four extensively equipped calibration laboratories

Ophir Power and Energy Meters

Versatility for every application

Ophir offers the widest range of sensors for measuring the power or energy of laser beams. When combined with a hand-held meter or a computer interface they serve as a precise and calibrated measurement solution. The measurement results can be viewed on the power meter screen, stored on board or sent to a PC for presentation in many ways and on several platforms.

The Ophir spectrum includes:

- Pyroelectric sensors – for measuring repetitively pulsed energy at up to 25 kHz from pJ to Joules
- Thermal sensors – to measure power from mW to kW and single shot energy
- Photodiode sensors – offering a high degree of linearity over a large range of light power levels to enable power measurements from pW to Watt.
- High damage threshold laser power/energy sensors – designed for CW lasers with high power densities, as well as for long pulse lasers.
- Helios – a power meter for laser systems in automated production capable of measuring high power industrial lasers of up to 12 kW without additional cooling

Additionally, Ophir offers a large variety of OEM solutions individually designed for laser systems manufacturers.



Broad range of power and energy sensors



Centauri – Compact touchscreen meter



Individualized measurement solutions

Ophir Laser Beam Analysis

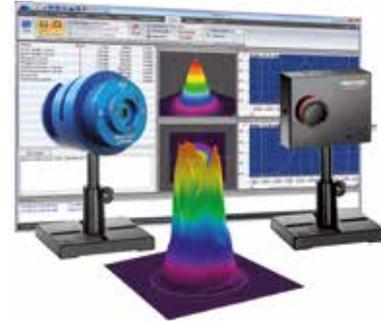
Getting more out of your laser

As soon as you need more information than laser energy or power, a beam profiler is the solution of choice. Especially when you design or apply a laser – or when you find your laser system is no longer meeting specifications – you need to know beam width or size, beam profile or parameter like M2. As Lord Kelvin said: “You cannot improve it if you cannot measure it”.

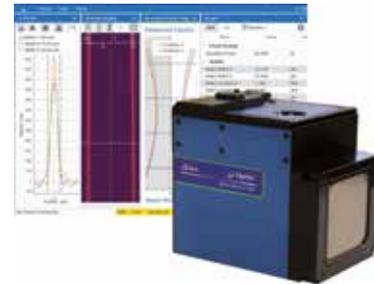
We are proud to have the largest installed base of laser beam profiling equipment – both camera-based as well as slit-based profilers. We provide solutions for laser measurement needs from EUV to THz (Far IR) and in terms of power from nW to kW. Our patented non-contact beam profiling system BeamWatch places no upper limit on the measurable laser power.

The latest Ophir innovations include:

- BeamWatch AM – cutting edge technology for additive manufacturing
- BeamWatch Integrated – for automated cutting and industrial welding processes
- BeamSquared – a robust, portable, fast M2 laser beam propagation system for CW and pulsed lasers



Beam analysis made easy



BeamWatch AM meets the needs of the SLM industry



BeamSquared – Camera-based beam propagation profiler

Ophir LED Measurement

Easily measure total flux, color & flicker

Since 1979, Ophir has been developing and manufacturing innovative devices for measuring such characteristics of light as its power, energy, beam size and beam distribution. Having secured our position as market leader for laser measurement, we now also offer unique tools for the LED luminaire market.

Our flagship product is FluxGage, an all-in-one-device for the fast and easy measurement of key light parameters of LED luminaires. The compact photometric system accurately measures luminous flux, flicker and many color parameters such as CCT, CRI, Duv and chromaticity. Compared to integrating spheres, FluxGage saves a lot of space and time. Measurement is simplified and the instrument can easily be integrated into production environments.

Benefits of using FluxGage:

- Much smaller than comparable integrating sphere
- Robust, can be used in a production environment
- Easy to use, no need for frequent calibration
- Full measurement can be performed from cold start in just a few minutes
- All functions are in a single system
- Can measure a preset time after the source is switched on
- Equipped with fans for temperature control

FluxGage is available in different versions to meet specific customer needs. In order to easily calibrate the measurement solution, Ophir offers the FGC100 calibration standard, a current- and temperature-stabilized LED source.



FluxGage Photometric system for measuring LED luminaires



Ophir calibration unit FGC100

www.ophiropt.com/photonics

About MKS Ophir Brand

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-kilo-watt lasers, high-performance IR and visible optical elements, IR thermal imaging lenses and zoom lenses for defense and commercial applications, OEM and replacement high-quality optics and sub-assemblies for CO2 and high-power fiber laser material processing applications. Ophir products enhance our customers' capabilities and productivity in the semiconductor, industrial technologies, life and health sciences, research and defense markets. For more information, visit www.ophiropt.com.

About MKS instruments

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. Our products are derived from our core competencies in pressure measurement and control, materials delivery, gas composition analysis, control and information technology, power and reactive gas generation, vacuum technology, photonics, lasers, optics and motion control. Our primary served markets are manufacturers of capital equipment for thin film including semiconductor devices, process manufacturing, environmental, life sciences and scientific research.

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