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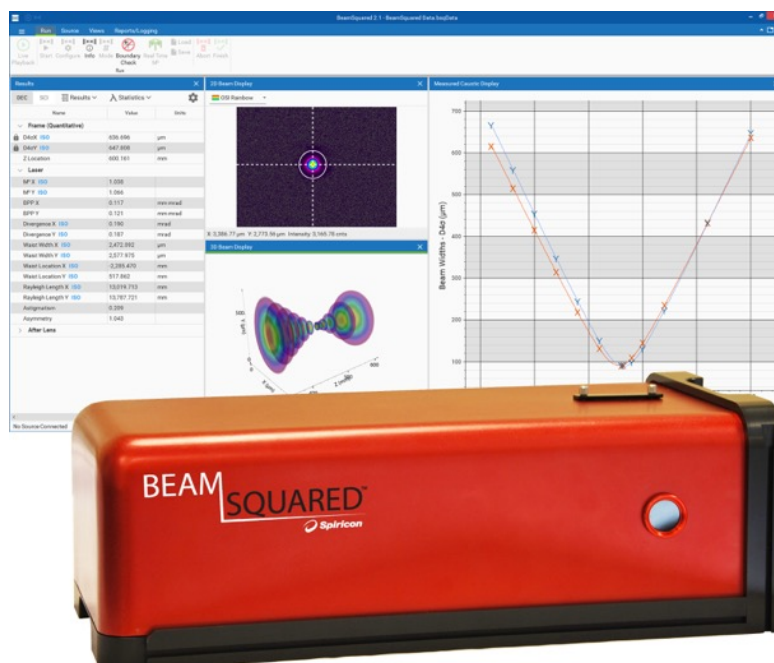
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MKS Announces Ophir® BeamSquared™ 2.0, Laser Beam Propagation System for Continuous Use Applications

Munich, Germany – June 27, 2017 – [MKS Instruments, Inc.](http://www.mksinst.com) (NASDAQ: MKSI), a global provider of technologies that enable advanced processes and improve productivity, announces **Ophir® BeamSquared™ 2.0**, the newest version of the company's M² laser beam propagation system designed to help users optimize laser performance. A robust, portable device, BeamSquared automatically measures the propagation characteristics of CW and pulsed lasers quickly, in less than one minute. It can optionally measure wavelengths above 1.8µm, including CO₂ and terahertz, in manual mode. The new version adds expanded 3D display and reporting options, an Automation interface via .NET components, and customizable measurement options.

BeamSquared is designed for continuous use applications, from scientific research to rapid prototyping to fabrication and machining. The system includes the BeamSquared M² software and an optical train. The software measures beam propagation characteristics on both the X and Y axes, including waist diameters, full angle divergences, waist locations, Rayleigh lengths, M² or K and BPP factors, astigmatism, and asymmetry. The system displays 2D or 3D beam profiles for visual verification of beam behavior through focus.

The BeamSquared 2.0 system can be mounted horizontally or vertically to optimize bench space. New 3D functions include a 3D slice display and the ability to add 3D displays to reports. Reports can also incorporate a new beam



caustic chart, in addition to setup information, laser measurements, and a variety of statistics. A new Automation interface via .Net components allows users to build custom applications that incorporate the laser beam analysis and processing power of BeamSquared.

BeamSquared is a camera-based system. Users add their choice of camera best suited for their application:

- The **Ophir Pyrocam** pyroelectric array camera accurately captures and analyzes wavelengths from 1.06 μm - >3000 μm . Available in two versions: Pyrocam IVs, a 25.6 X 25.6mm active array and Pyrocam IIIHR, a smaller-format OEM version with a 12.8 X 12.8mm array.
- The **Ophir SP300** silicon CCD camera accurately captures and analyzes wavelengths from 190nm - 1100nm. It features a compact design, wide dynamic range, unparalleled signal to noise ratio, and reduced blooming
- The **Xeva XC-130** high resolution InGaAs camera accurately captures and analyzes wavelengths from 900nm - 1700nm. It features operation at room temperature, a wide dynamic range, a fast data capture rate, and a large array that makes it ideal for large beam NIR laser and telecom mode field analysis.

Availability & Pricing

The automatic BeamSquared 2.0 M² Beam Propagation system is available now. Cameras and manual M² software are priced separately. OEM prices available on request.

VIDEO: <https://www.youtube.com/watch?v=eTAqIHZoJeg>

DATA SHEET: <http://ow.ly/7ABu308jTI7>

About MKS Instruments

MKS Instruments, Inc. (NASDAQ: MKSI) 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, flow measurement and control, gas and vapor delivery, gas composition analysis, residual gas analysis, leak detection, control and information technology, ozone generation and delivery, RF & DC power, reactive gas generation, vacuum technology, photonics, sub-micron positioning, vibration isolation and optics. Our primary served markets include semiconductor capital equipment, general industrial, life sciences and research. Additional information can be found at www.mksinst.com.

About the Ophir Brand

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 and LED measurement, MKS, through its Ophir brand, holds a number of patents, including the R&D 100 award-winning BeamTrack power/position/size meters; BeamWatch®, the industry's first non-contact, focus spot size and position monitor for lasers in material processing; and Spiricon Ultracal™, the baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy. The NanoScan family of scanning-slit technology products are capable of measuring beam size and position to sub-micron resolution. The Ophir Optics products include high performance IR thermal lenses and optical elements for the defense, security, and commercial markets, as well as high quality optics for high power CO² lasers and 1 micron lasers for cutting, welding, drilling, and 3D printing systems. Ophir is ISO/IEC 17025:2005 accredited for calibration of laser measurement instruments. Their modular, customizable solutions serve manufacturing, medical, military, and research industries throughout the world. For more information, visit <http://www.ophiropt.com/>.

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