



## PRONTO - Redefining Mobile Power Meters

Hard to Believe: It Comes from Quebec – Not from Cupertino

Gentec-EO introduced the PRONTO-250 mobile power meter for the first time in Munich at LASER World of PHOTONICS.

The PRONTO-250 offers a range of functions for power measurement between 1 and 250 watts that significantly exceeds the functional range of the mobile power meters currently available on the market. The integrated power sensor has a diameter of 19 mm and is equipped with a broadband absorber that exhibits a damage threshold of up to 45 kW/cm<sup>2</sup>.

The PRONTO-250 is calibrated for the wavelength range from 248 nm to 2.5 μm; an additional calibration is available on an optional basis for 10.6 μm.

This power meter is operated using the self-explanatory symbols on the illuminated, color touchscreen. One push of a button and within seconds, the measurement results can be displayed. An internal memory stores the measurement results.

The Li ion battery lasts for up to 5,000 measurements (a maximum of 20 hours of operation); it can be charged using the integrated USB port.

And the best part is that due to its unbelievably small dimensions, the PRONTO-250 fits practically into any pocket. ■

**Webcode N03-071**

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Dear Reader,

LASER COMPONENTS Nordic took an active part in this year's LASER Munich and we are very happy with the outcome. Most of all, it was a pleasure to meet both customers and business partners in the dynamic but relaxed setting of the show. LASER COMPONENTS had 50% more space than at the last trade show and more products and suppliers on the booth than ever before. Looking back, we are all very pleased with the turnout and especially with the quality of the inquiries. The interest in our products was high and new market segments opened up that would not have been possible without the LASER show. We thank every one that took time to stop by and discuss present and future business collaborations!

In this issue, you will be able to read about several exciting developments from within LASER COMPONENTS' in-house product portfolio. The Pyro Group is expanding, we present new TE-cooled PbS and PbSe detectors and the x-InGaAs and InAs photodiode family has new members. We also report on our new coating systems and quality assurance processes. As always, our suppliers continue to push forward. One interesting product that I'd like to mention especially is the PRONTO from Gentec-EO. This hand held power meter will redefine mobile power meters by its range of functions, which significantly exceeds the functional range of meters currently available on the market. Please also take the time to check out PicoLAS (page 2), our supplier of drivers, pulse generators and accessories for high power laser diodes.

LASER COMPONENTS Nordic AB will take part in this year's Optics & Photonics in Sweden (OPS) 2015, which will take place October 28<sup>th</sup> – 29<sup>th</sup> at Alba Nova University Center, Stockholm. Please visit us there for more information on company and product news!

Yours,

Mikael Winters

### Recalibration!

All power detectors of up to 2.5 kW and all standard monitors from Gentec-EO can currently be recalibrated in our calibration laboratory at LASER COMPONENTS GmbH in Germany.



## New Partner: PicoLAS GmbH

### State of the Art OEM Laser Diode and TEC Drivers

LASER COMPONENTS Nordic is happy to announce the collaboration with PicoLAS GmbH.

PicoLAS is specialized in the development and manufacturing of OEM laser diode drivers and drivers for TECs. Their drivers are compact, efficient and reliable. Typical specifications range from extreme < 1 ns short pulses up to CW, from < 1 A up to 300 A and voltages of up to 120 V. The PicoLAS R&D team also develops customized drivers in close cooperation with our customers.



If your company is looking for professional, state of the art technology to drive your laser diodes, let us help. We take your laser diodes to their technical performance limits – no matter whether in ultra short pulse operation or CW. ■ **Webcode N03-055**

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There was no escape ... and no alternative for the cooperation ■  
CEO Dr.-Ing. Markus Bartram @ LASER 2015

## Green Laser Diode from Osram Opto Semiconductors

### Promoting Modern Technology: 520 nm at up to 120 mW

We have included three different laser diodes with an emission wavelength of 520 nm in our product range.

#### Space Saving and Efficient: Made for Embedded Solutions

The small PL 520 monomode laser diode brings you one step closer to mobile projection. It is an efficient laser source in both cw and pulsed operation: in cw operation, this green laser diode, which comes in a TO-38 ICut housing, has an output power of 50 mW. In addition to embedded solutions, it is also perfectly suited for use in cameras and head-up displays.

The PLT5 520 model can do even more: with the same characteristics as the PL 520, this laser diode is housed in a somewhat larger TO-56 housing because a photodiode for power control purposes is also integrated. Both versions feature a high modulation bandwidth.



#### PLP 520: Professional Power for Successful Business Solutions

The green PLP 520 multimode laser diode is used, for example, in laser projectors in home entertainment systems. The output power is 120 mW. The beam quality meets the highest demands. The compact TO-56 housing features an improved thermal stability. With this laser diode, you will be well equipped for applications that require high efficiency! ■ **Webcode N03-048**

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## LASER COMPONENTS Pyro Group has Expanded Production Facility in Florida has Moved

In January we met for the groundbreaking ceremony, and in June the opening of the new production facility was celebrated.

With this opening, the LASER COMPONENTS Pyro Group has paved the way for further expansion of the company. Just this past summer, LASER COMPONENTS acquired the majority of Microwatt Applications, LLC, including the entire staff. They have significantly increased personnel over the course of the past few months. With the building's opening, they increased available space by 500%.

"This is how it should continue to go," began Patrick Paul in his opening speech, "The first pyroelectric detector samples have reached selected customers."

We have placed high expectations on ourselves regarding the expansion of our product range. "Not only do we have high standards, but our customers have expressed concrete thoughts on future products as well. Naturally, we aim to meet these demands – and as quickly as at all possible. We expect to surpass the current state of the art," concluded Alan Doctor, general manager of the Pyro Group, during the official part of the ceremony. ■

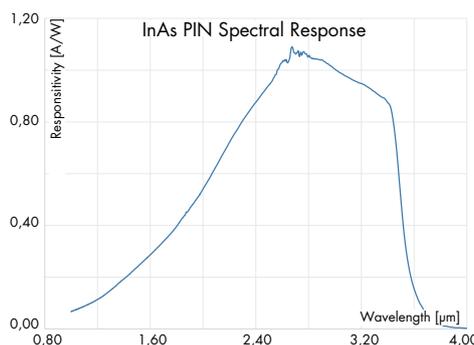
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## x-InGaAs and InAs Photodiodes Production Expanded to MIR

LASER COMPONENTS Detector Group will be introducing two new IR detectors at the Sensor + Test: IG19 and IA35.

**IG19:** The IG19 is a new x-InGaAs photodiode with a peak wavelength at 1.75  $\mu\text{m}$ . Thus, it is ideal for applications that cannot be fulfilled spectrally with a regular InGaAs photodiode. The IG19X1000S4i with a 1 mm chip diameter in a TO-46 housing is the standard product.



**IA35:** IA35 describes a heterostructure photodiode on an InAs substrate with a relatively wide peak at 2.8  $\mu\text{m}$ . The curve of the spectral response can be seen in the figure.

The IA35S500S4i is available. This detector with a 0.5 mm chip is designed especially for uncooled operation and a spectral range of up to 3.5  $\mu\text{m}$  (20% cut-off). ■

Webcode N03-032

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## TE-Cooled PbS and PbSe Detectors

### Range of Lead Salt Detectors Expanded



With its first delivery of TE-cooled detectors, the LASER COMPONENTS Detector Group has reached its next milestone. Single-stage and multistage cooled PbS versions are available under the designations PB27 for standard coolers and PB30 for special coolers. The designations of the analogous PbSe series read PB50 (standard) and PB55 (ultimate). Production is based on a solid foundation: All standard options are already available for delivery.

The nomenclature can be explained using the following example: PB50S3030T27L. This is a designation for multistage cooled PbSe

detectors with a standard cooler ("PB50"), sapphire window ("S"), square chip 3.0 x 3.0 mm<sup>2</sup> ("3030"), dual stage cooling ("T2") in a TO-37 housing with a long cap ("7L").

At the next expansion phase, production capacity will be ramped up. This started in August 2015, with the goal being to be able to offer a delivery time of approximately six weeks for standard products; and new OEM components that have not been manufactured before. ■

**Webcode N03-031**

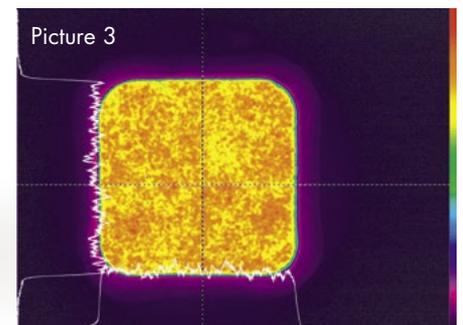
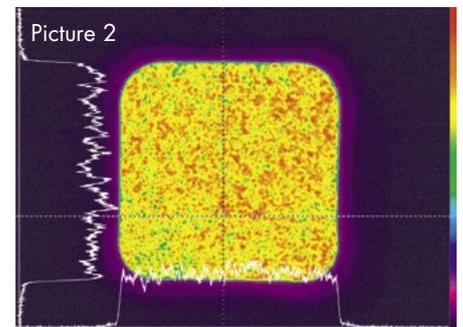
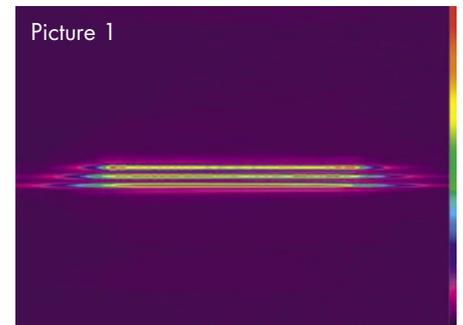
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## Pulsed Laser Diodes with a Homogeneous Beam Profile

### Compact and Robust

Pulsed laser diodes are becoming more and more efficient and powerful. Thus, they represent a viable alternative to large and expensive laser systems. One advantage of solid-state lasers is the very good beam profile. Achieving this with semiconductor laser diodes requires the use of external beam-shaping elements or homogenizers. Diffusive elements, diffractive elements, or long optical fibers may be used; however, in all of these approaches either power is lost or the mechanical effort is very large. Our developers in Canada were successful in connecting powerful, multi-junction PLDs to a special fiber structure, thus allowing a homogeneous beam profile to be achieved after just a few centimeters. Picture 1 shows the near-field distribution of a pulsed laser diode with three epitaxially-integrated emitters. After just 13 mm (see Picture 2), a significantly more homogeneous beam profile is visible. Picture 3 shows the beam profile after 55 cm. The advantage of this assembly is that it is compact and robust and simultaneously exhibits low losses and thus a higher peak power. Prototypes are currently being built. If you are interested, we are still able to include any desired changes. ■

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## A Wide Selection Offered Exclusively by Us High-Power Laser Diodes from the U.S.A.

Axel Photonics and Sheamann have merged and will be operating in the future under the name Sheaman Laser, Inc.

We are happy to have strengthened the collaboration with both companies and that we at LASER COMPONENTS will be selling the entire range of products exclusively from now on.

Sheamann's lasers are the first choice in free-beam and fiber-coupled high-power diodes in the NIR. These products consist of highly-efficient single-stripe diodes that are also known for their reliability.

Packaging options for the chips include, for example, C mounts, TO cans, or HHL packages, all of which ensure small and robust products. The wide power range of the lasers is no less impressive: the optical output power ranges from a few hundred milliwatts up to 425 W. ■ Webcode N03-045

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Details and datasheets on Sheamann's high-power laser diodes can be found using the laser diode configurator on our website!

## Inexpensive Replacement for HeNe Lasers Smaller and Easier!

PD-LD has presented its inexpensive alternative to HeNe lasers: the SLM-632.

Single longitudinal mode diode laser:  
These laser modules fulfill the requirements of high-power illumination with a stabilized wavelength. The SLM-632 module offers up to 50 mW at a wavelength of 632.8 nm and is thus a viable alternative to conventional HeNe lasers – and that in a compact design.

Would you like to receive information on this product? Then we suggest viewing the following video:  
<https://youtu.be/3OTz6106Qz0> ■  
Webcode N03-043

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## New Coating Systems and Quality Assurance Prepared for the Future



April 2015: A new coating system was delivered.

### PluTO+

The project PluTO+, Plasma and Optical Technologies: Increasing the Quality and Effect of Optical Coating Technologies was launched in October of 2014 with the goal of researching new production methods for the modern optics industry. This project unites industrial companies and research institutes and is funded by the Federal Ministry of Education and Research (BMBF) with a total of 9.5 million euros across a time span of three years (FKZ: 13N13204 .. 15). This project is part of a series of research projects under the BMBF funding initiative "The Basis of Photonics: Functional Layers and Systems." In addition to renowned institutes, Laser Components is participating as an active industrial partner in the research and development of new groundbreaking technologies.

### Improving Process Stability

The goal of the project is to improve process stability during the production of optical coatings through the characterization and control of the plasma processes used.

### Optical Elements in the IR Range

Our work is focused on the production of optical elements in the infrared range at 2.1  $\mu\text{m}$  and 2.9  $\mu\text{m}$ . The physical processes in the ion sources of two LC coating systems are currently being examined in detail using plasma diagnostic methods. Based on this study, a control system is being developed that makes it possible to increase control of the coating process and improve product quality.

Further information about our production facility can be obtained directly from LASER COMPONENTS. ■

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For almost thirty years we have been manufacturing high-power laser optics in house. The production facility for hard dielectric coatings was opened in 1986. In 2008, we began producing substrates for lenses in house. Since that time, our CNC-produced spherical optics have had particularly fast delivery times. Prior to being coated, the substrates are cleaned using our ultrasound cleaning system.

### The Whole Nine Yards: PVD, IAD, and IBS

We can accommodate all standard coating technologies in our facility – to the complete advantage of our customers. There is an optimal coating for each application.

Physical vapor deposition (PVD) is an established coating method that is used for all standard coatings. Ion-assisted deposition (IAD) was introduced for compact layers; ion beam sputtering (IBS) was then added for the purpose of producing coatings with extremely low scattering that feature neither temperature nor moisture drifts. Almost all spectral curves can be implemented.

The state-of-the-art IBS method is used, for example, for mirrors with the highest reflectivity values or for very complex coatings.

### State-of-the-art Systems with integrated Measurement Technology

Over the course of the past two years we have invested heavily in new systems and modernized the existing ones. Our coating systems are for the most part fully automated, computer controlled, and equipped with online monitoring capabilities that supervise the composition of the layers during the coating process. This ensures a high level of process reliability; it also allows coatings to be produced precisely according to specifications and designs to be reproduced exactly.

### Prototypes and Large Quantities

We coat glass and fused silica substrates from a few millimeters to a maximum size of  $\varnothing$  400 mm. With our equipment, we can manufacture both small and very large quantities cost effectively: In one production run, for example,

either a few parts with a diameter of 400 nm or a lot of parts with a diameter of 1" or 2" can be manufactured.

### From Interferometric Measurements to Damage Threshold Tests: Comprehensive Measurement Equipment along the Chain of Production

For internal quality assurance purposes we set up several measuring stations at different steps along the chain of production. In substrate production, the centricity of a lens can be ascertained. The radius of curvature and surface figure can be determined interferometrically. The cleanliness can be checked and the microroughness of the surface measured with a white-light interferometer. This value is necessary in order to produce mirrors that have the highest reflectivity values using low-dispersion IBS coatings.

In the end, the coating specifications are checked using spectral photometers; the measurement curves can be delivered upon request. In accordance with the ISO standard, we also perform damage threshold tests at 1064 nm in house.

Process stability and a comprehensive range of measurement options ensure the lasting quality of our laser optics!

### Documentation

To ensure clear product classification and traceability, the completed optics can be labelled with the batch number: this is applied to the edge of the optic using a CO<sub>2</sub> laser. ■

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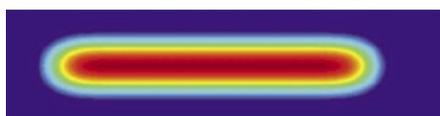
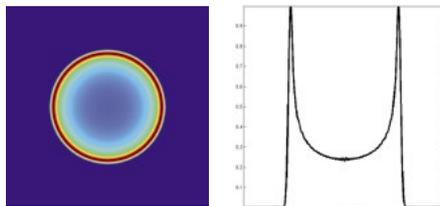
## M-Shaper for Optimal Scanning Results

### Diffractive Optical Elements

Do you scan using a laser? Then you are probably familiar with the problem of illuminating a line uniformly using a dot laser.

To date, customers have used round Top-Hat elements as DOEs for the purpose of creating a homogeneous line; however, this has always led to a decrease in the distribution of intensity at the edge across the width of the line.

The M-shaper is a different story! It is perfectly suited for a high homogeneity in all directions. This diffractive optical element changes your laser beam in such a way that the intensity at the edge (flanks) is higher than in the center of the element. If you look at a cross section of the intensity distribution, the shape is similar to the letter M. Do you see it, too?



Accumulated intensity of scanning Gaussian



Accumulated scanning M-Shaped Top Hat

To put it another way: If you use the M-shaper to scan across a line, then you will achieve the beam quality of a Top-Hat element both in length and width and thus optimal scanning results! Neither with refractive nor with reflective elements can this be achieved.

Fifteen different standard designs are available; naturally, we offer custom solutions to meet your specifications. Tell us your requirements! ■ **Webcode N03-002**

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## EVER-GUARD® Laser Protective Curtains Made of Metal

### So You Think This Is a Contradiction of Terms...?

They really exist: curtains made of metal panels that are mounted to the ceiling, can be moved freely, and offer the extraordinary protection of metal screens.



The individual panels are approximately 25 cm wide, are movable due to the hinges they are equipped with on both sides, and are available for delivery at any height requested.

The honeycomb-like surface structure absorbs and disperses laser radiation. This material is suited for all standard wavelengths and certified according to DIN EN 12254.

By applying the same assembly material used in our SLC-250WB textile curtains, different configurations (L forms and U forms) can be implemented. Laser protective windows can also be integrated into the panels on an optional basis.

The protection levels of the EVER-GUARD® curtains correspond to those of the PT-EVG material used in metal screens:

Wavelength [nm]	Protection Level
190 – 315	D AB10 CE R AB4 CE
> 315 – 1400	D AB7 CE IR AB8 CE M AB7 CE
>1400 – 11100	D AB5 CE R AB3 CE

The power density is 12 MW/m<sup>2</sup>. We will display different curtains at our trade show booth. Come and visit us! We would be happy to address any inquiries you may have. ■ **Webcode N03-052**

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## QNP™ Piezo Stages & QLAB™ Controller

### High-End Functionality Allows Sub-Nanometer Resolution

In January we met for the groundbreaking Aerotech's QNP™ piezo stages and QLAB™ controller make positioning to nanometers incredibly easy. The QLAB™ controller brings high-end functionality with many advanced tools while providing an easy-to-use modern interface. The QNP™ stages offer high-dynamics, sub-nanometer resolution and nanometer-level linearity for higher throughput processes without sacrificing precision. The stages are guided by precision flexures that are optimized using finite element analysis to ensure high-stiffness and long device life. The resulting

design offers outstanding stiffness and resonant frequency enabling high process throughput and fast closed-loop response. All of the QNP™ piezo stages have the option of closed-loop feedback using a unique capacitive sensor design that allows for sub-nanometer resolution and high linearity. When coupled with Aerotech's Q-series controllers and drives, the QNP™ piezo nanopositioning stages demonstrate sub-nanometer positioning resolution and in-position stability (jitter), and high-positioning bandwidth. ■ **Webcode N03-201**



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## OPTICS & PHOTONICS Sweden

October,  
28 – 29, 2015

### Optics & Photonics Sweden

KTH - Alba Nova University Center - Stockholm  
October, 28 – 29, 2015

LASER COMPONENTS Nordic will exhibit at Optics & Photonics in Sweden (OPS) 2015, which will take place October 28<sup>th</sup> – 29<sup>th</sup> at Alba Nova University Center, Stockholm. Invited talks will cover a variety of topics in Optics and Photonics, reflecting current Swedish research and development at universities, institutes and in the industry. Keynote speakers will highlight European research and developments. We are very happy to be a part of this event, as it gives a good overview of Optics and Photonics in Sweden and moreover offer a good platform for creating new collaborations. The exhibition will be held in parallel to the technical sessions and we will display our products and also bring some demo equipment. The conference is organised by PhotonicSweden (PS) and the Swedish Optical Society (SOS). For more information, please refer to [www.photonicsweden.com](http://www.photonicsweden.com).



## Elmia Subcontractor

November,  
10 – 13, 2015

### Elmia Subcontractor

Elmiavägen 11, SE-554 54 Jönköping, Sweden  
November, 10 – 13, 2015

Elmia Subcontractor is Northern Europe's leading trade show for subcontractors in the manufacturing industry and their customers - a genuine specialist fair for product development and purchasing. The fair is held annually at Elmia in Jönköping, Sweden.

Visit the LASER COMPONENTS Nordic Group!  
[www.elmia.se/en/subcontractor/](http://www.elmia.se/en/subcontractor/)

