PHOTONICS NEWS

Company Newspaper of LASER COMPONENTS (UK) Ltd

lasercomponents.co.uk
#65 ▪ 09|2020

CLIMATE & ENVIRONMENT

Ice and Laser Technology

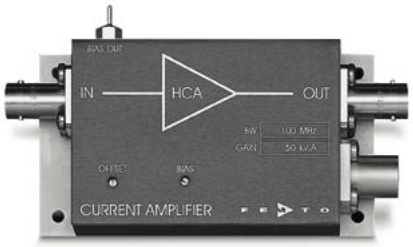
Intelligent Wind Energy

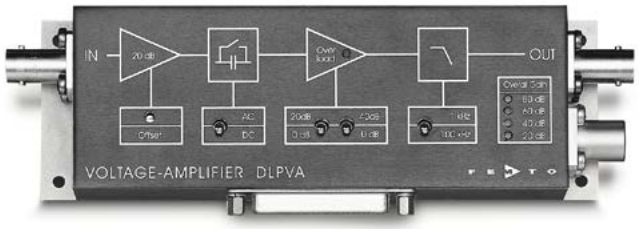
Sustainable Cleaning

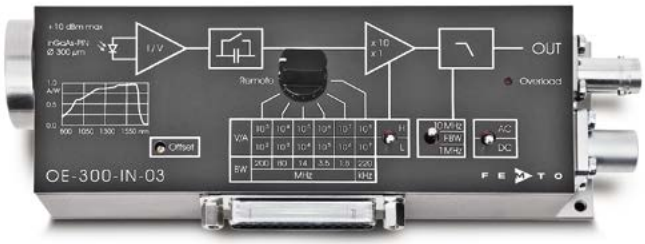
New Products

LASER COMPONENTS

MEASUREMENT DEVICES







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Keeping Tabs on Climate

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New Products

LASER COMPONENTS

Imprint

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Dear Colleagues

We are all in surreal times. Since March with a countrywide shut down, lagging behind other countries suffering more from the coronavirus pandemic, LASER COMPONENTS had to adjust. Within 2 days we re-organised our business to maintain, without hinderance, our services to our customers. This was possible due to the flexible nature of our communication systems, and the dedication of our staff. I extend a huge thank you to each and every one making the necessary adjustments. We are grateful too that no one has been affected directly by the virus and all employees remain healthy and continue to work full time.

Of course, we are far from seeing the back of this disease and we are further adapting to more changes that look set for some time to come. For example, we have noticed how much the exhibition community has been affected. With social distancing virtually impossible, all face to face trade shows have either been cancelled or organisers have braved a virtual experience. These digital alternatives are quite different to the real people events and having participated in on-line events as both 'exhibitor' and 'visitor', we see more work is needed to be attractive as this global menace runs its course. Just like with adjusting to home office environments I am confident these virtual tradeshows will find a successful way.

It is worth mentioning the impact on our business since our last newsletter. Whilst it is not surprising that there has been an impact, we have seen shifts with more medical application activity whilst there has been a reduction in academic interests. With schools and universities returning even as we speak there is already a clear sign of increasing business in this market sector. So, whilst overall there has been an impact we are confident the year will settle to an acceptable level of business, even if we do have to continue to be adaptable and work harder.

As our government continues to grapple with rules and policies to keep us all safe, and whilst in some cases the public has questioned some of these, like our business, the policy makers need to be flexible and adjust to the rise and fall of infections. If everyone pulls together and follows the guidelines, we should expect a better outcome even if COVID-19 is with us for a long time to come.

Keep safe – Yours sincerely,

Chris Varney
Managing Director, LASER COMPONENTS (UK), Ltd.

POLAR RESEARCH

How Perpetual is the Perpetual Ice?

The polar regions of our planet have special significance to the planet's climate. It is becoming increasingly clear that spectacular changes are currently taking place there. The retreat of the sea's ice is considered a classic indication of global climate change. However, in order to create meaningful climate models, scientists need reliable measurement data. But how do you gather such data in the hostile environment of the polar regions? Of course, resourceful researchers have already found solutions to this problem. While some are sending recording devices weighing several tons into the depths of the Arctic Ocean, others rely on a satellite that records the thickness of the ice layers thousands of metres above the earth. In both cases, optical technologies play an important role. ➔

High above the Ice

Perfectly Aligned thanks to Retroreflectors

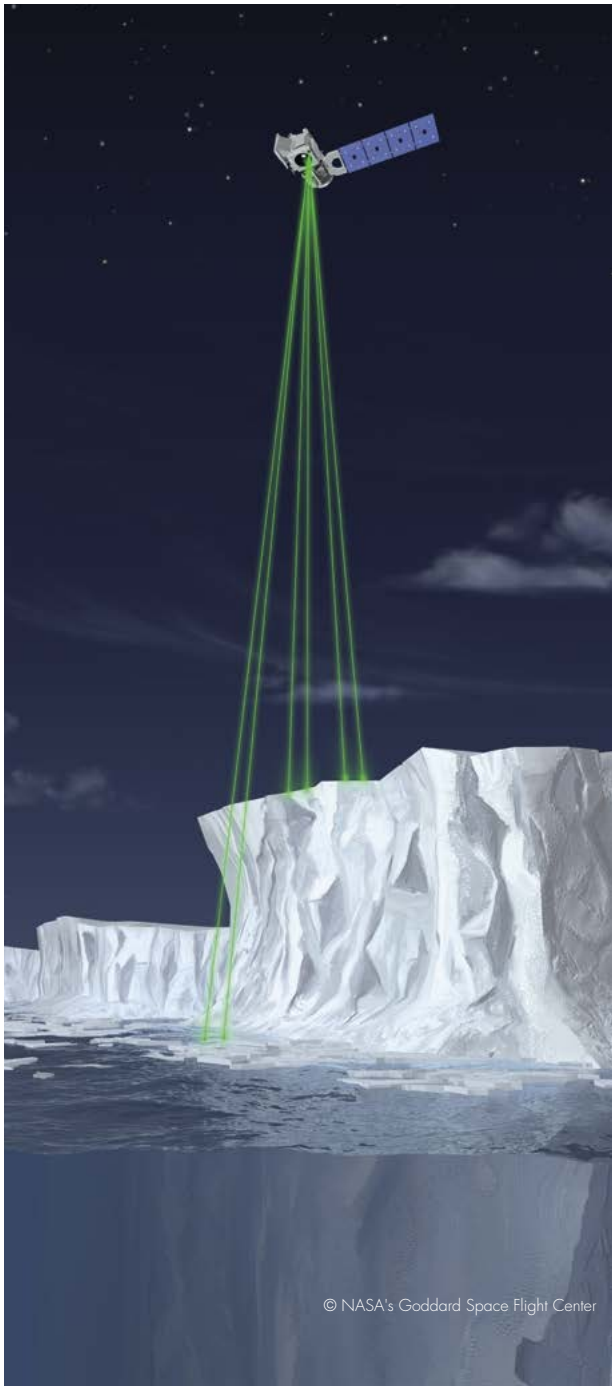
For centuries, the parts of our planet consisting of frozen water – the cryosphere – were considered hostile and useless. Those who ventured into the Arctic and Antarctic regions did so despite the icy climate. They were not searching for knowledge but for new trade routes and precious furs. Systematic exploration of the polar regions did not start until the late 19th century. Only recently scientists have become aware of the importance of these regions for global climate. They discovered that the high reflectivity of ice and snow, as well as their low thermal diffusiveness, are major factors in the complex mechanisms of our atmosphere.

Non-melting snow-covered surfaces typically reflect 80% to 90% of the incoming solar radiation back into the atmosphere. This keeps the average temperature in the polar regions cold and the snow from melting. At the same time, it is much more difficult for temperature waves to penetrate snow and ice than air. Generally speaking, snow cover insulates the ground surface, while sea ice does the same to the underlying ocean water. Both of these facts have a significant effect on the exchange of heat and moisture between the planet's surface and its atmosphere. Scientists are only just beginning to unravel the complex feedback mechanisms that define our climate. Due to the increase in global warming, they are expanding their efforts.

Scanning from Above

One way to help understand these correlations better is continuous surveillance of the cryosphere. Considering the generally hostile environment of the polar regions, it is better to gather the necessary data from a safe distance – for example, from space. This is the mission of the ICEsat-2 satellite, which NASA launched in September 2018. Its only cargo is the advanced topographic laser altimeter system (ATLAS), a space-based LiDAR instrument that scans the Earth's surface with six green laser beams at a wavelength of 532nm. Emitting 10,000 pulses per second, ATLAS can take measurements at a resolution of 0.7 metres along the satellite's ground path. The receiving telescope aboard contains highly sensitive single photon counting detectors. After all, only a handful of the 20 trillion photons released with each laser pulse hits the surface and returns to the satellite. ICEsat-2 circles the earth in a near-circular, near-polar orbit approximately 496km above the ground. At a speed of 6.9 kilometres per second, it takes 91 days to complete the orbital path. Every three months it produces a grid of the entire earth, covering not only the cryosphere but topography measurements of land and water surfaces, cities, and forests around the globe.

Around the world in 91 days.



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Perfectly Aligned

Considering the extremely low percentage of photons that return to the satellite, the laser emitter and telescope have to be perfectly aligned to each other, so that none of the photons goes astray. In the ICEsat-2 satellite this is achieved using an integrated laser reference system (LRS). On both the emitting and receiving end, reference beams are redirected to the LRS, which then adjusts the beam steering mechanism (BSM) (see figure). It is crucial to the mission that the reference beams be transmitted with the utmost accuracy. To achieve this goal, the ATLAS system uses patented lateral transfer hollow retroreflectors (LTHR) by PLX. The laser light is guided through an arrangement of first-surface mirrors – a flat mirror on one end and a roof mirror on the other – and redirected at a 180° angle so that both the incoming and outgoing beams are parallel to each other. Unlike standard solid retroreflectors, the optical path runs through the air rather than through solid material. This principle eliminates the effects of material absorption. The mirrors are connected by tubing made from the same material. At PLX, all these parts are fused together in a proprietary process. The resulting monolithic structure features extremely high thermal stability and is insensitive to mechanical influences such as vibrations or shock. With sub-arc second beam deviation and a wavefront error that is better than λ/10, LTHRs are the obvious choice for high-precision space applications. ■

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The satellite determines its own position to within 5 metres.

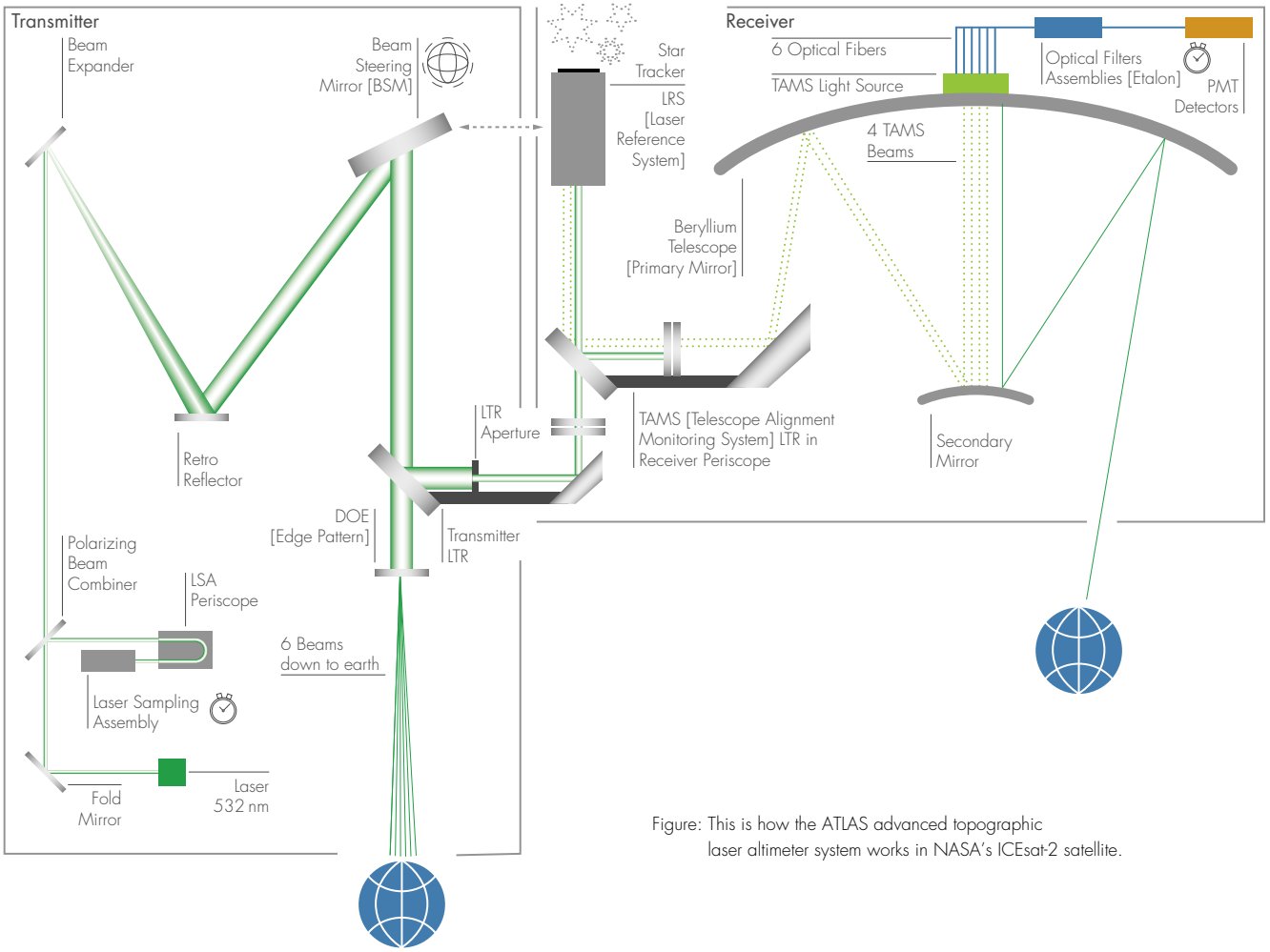


Figure: This is how the ATLAS advanced topographic laser altimeter system works in NASA's ICEsat-2 satellite.

5000 Metres below Sea Level

High-resolution Photos Taken in Absolute Darkness

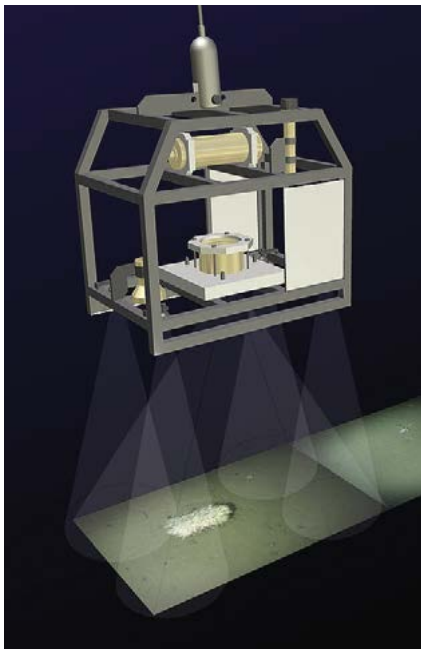
What are the effects of the current changes in the Arctic Ocean on the global ecosystem? Researchers from the Alfred Wegener Institute have been trying to get to the bottom of this issue. The most spectacular action they have taken thus far is currently the MOSAiC expedition. The research vessel Polarstern was frozen in the ice of the Arctic winter and is serving for one year as a base station for a variety of experiments. However, the scientists are also using high-tech equipment elsewhere in their work; for example, to non-invasively observe the sea floor.

At its underwater observatory "Hausgarten," the Alfred Wegener Institute (AWI) Helmholtz Centre for Polar and Marine Research has been observing the water, fauna, and (micro)flora in the Fram Strait since 1999. Both the warm, saline West Spitsbergen Current and the cold, low-salt East Greenland Current flow through the approximately 500 km wide strait. This makes it the Arctic Ocean's only deep-water connection to the system of the world's oceans, which is crucial for the exchange of oxygen and nutrients and an important variable in the global climate system.

Autonomous Measuring Stations

Hausgarten now has twenty-one stations with free-fall devices that serve as observation platforms on the seabed. They cover depths of water between 250 metres and 5500 metres. In addition to the physical properties of sea water (temperature, salt content, and nutrient content), researchers there observe, among other things, the Arctic microflora and fauna. During the ice-free summer months, additional equipment is used: a remote-controlled underwater vehicle takes specific samples at regular intervals, and experiments are carried out on site. Furthermore, an autonomous mini submarine traverses all vertical water layers to record the course and interaction of biochemical processes. At depths of up to 3000 metres, it is also used for large-scale observations on the seabed.

OFOS and OFOBS technology can withstand a pressure of 600 bars.



The ocean floor observation system OFOS takes pictures 1.5 metres above the sea floor.

Pictures from Depths of 5000m

The most important research equipment at Hausgarten includes camera systems towed by ships, such as the ocean floor observation system (OFOS) and the ocean floor observation and bathymetry system (OFOBS). High-resolution images of the sea floor are captured using a vertically-downward-aligned digital SLR camera, a video camera, spotlights, and flash lamps. The OFOBS is also equipped with a sonar system. All these components are housed in such a way that they can withstand the enormous pressure load at water depths of up to 6000 metres. OFOS and OFOBS are lowered on a steel cable down to approx. 1.5 metres above the sea floor in order to not affect the structures being recorded. The cable also accommodates fibre optic cables for data and video transmission and a copper cable for the power supply. A research vessel pulls the structure weighing several tons through the area to be surveyed at 1km/h. During this process, the video camera takes HD recordings of the seabed, while the single-frame camera provides a 23-megapixel snapshot every 30 seconds.

Underwater recordings provide frightening insights into the pollution of the seas.

Lasers Used to Survey Deep-sea Objects

In order to use the data obtained from the cameras scientifically, the size of the surveyed objects must be recorded. This is done with the help of three powerful FLEXPOINT® dot laser modules mounted in an equilateral triangle around the single image camera. Each module has a distance of 50cm to the other two modules. Three red dots are visible on each image. The scientists determine the number of pixels between the dots and can thus estimate the actual size of the depicted objects. The use of three lasers also makes it possible to determine the size of an object on uneven ground because then the distances between the dots no longer form an exact equilateral triangle. The wavelength of 635nm was chosen so that the laser dots on the images are optimally visible. A laser output of 50mW ensures that they are not over-illuminated even when using strong headlights and flash lamps.

At 50mW, the laser dots even outshine flash lamps.

Size Matters

There are many reasons to want to determine the size of seafloor objects; for example, to find out whether a particular area is more likely to contain young or adult fish and crabs. If distances can be measured, the size of geological structures (black smokers, hydrothermal vents, mineral resources) can also be determined. Finally, size determination also helps with an unpleasant topic that is becoming increasingly important. It can be used to determine the amount of plastic waste deposited on the sea floor. The concern of pollution in the Fram Strait is equally as worrying as in the deep-sea trenches off the Portuguese coast. ■

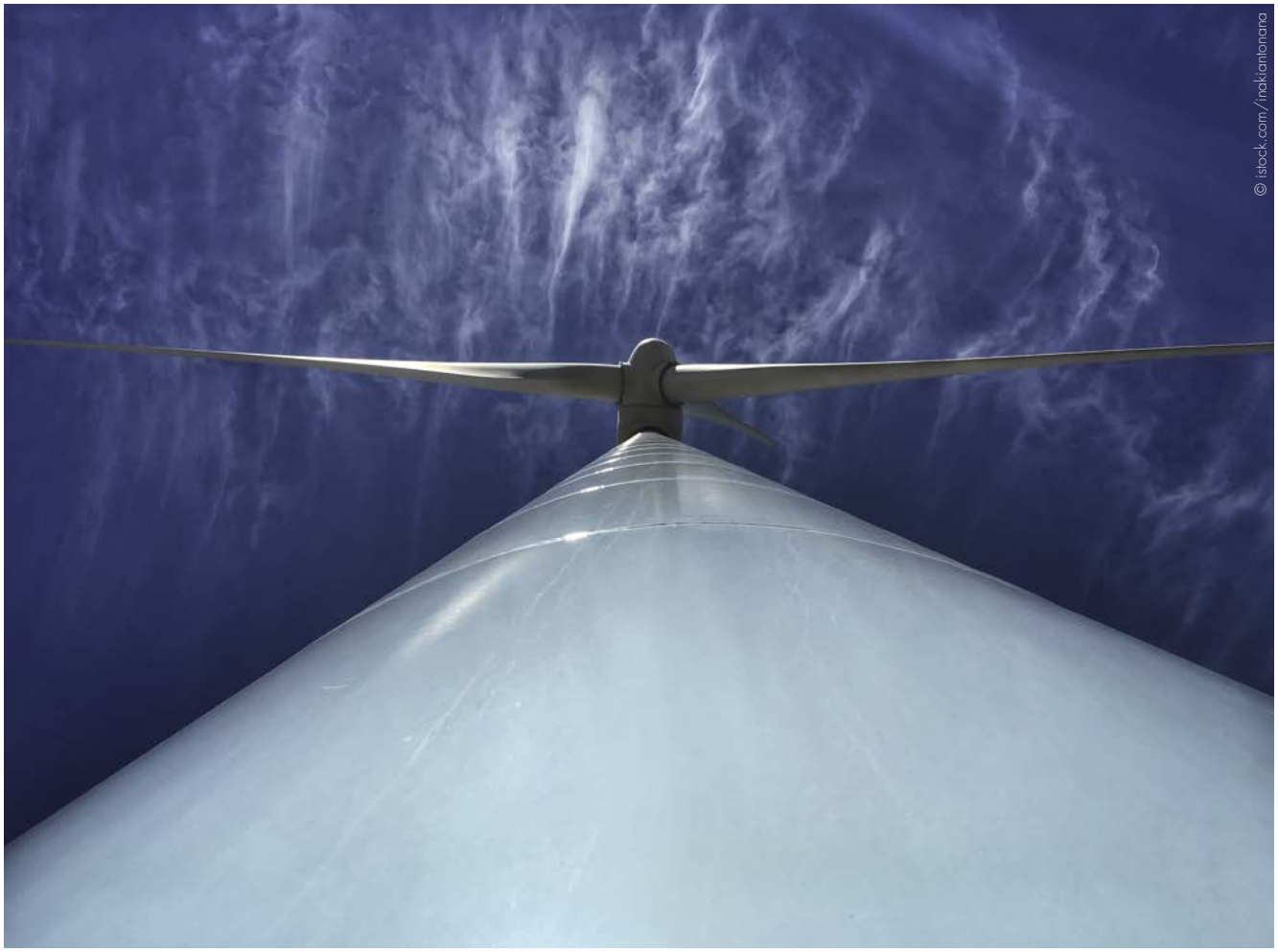
Dr. Autun Purser

Dr. Autun Purser is a scientist specialising in deep-sea ecology at the Alfred Wegener Institute in Bremerhaven. With the help of lasers, he was able to measure the deepest-existing octopod eggs ever observed as part of his current research.

Dipl.-Ing. (FH) Burkhard Sablotny

Burkhard Sablotny has been working in marine research since 1988 with a focus on deep-sea technology, twenty-four years of which he has spent at the Alfred Wegener Institute.

The Alfred Wegener Institute (AWI) Helmholtz Centre for Polar and Marine Research: ***www.awi.de***



From Where the Wind Blows

Fibre Technology Makes Intelligent Wind Turbines Possible

Every year, approximately 25,000 new wind turbines are built worldwide – and the demand for this renewable energy source continues to increase. The answer from manufacturers and wind farm operators has always been the same: they built larger and therefore more powerful turbines. On the other hand, the control technology for limiting and optimising output has remained largely identical. At 170m, the rotor diameters in offshore wind farms are now 3 times taller than Nelson's Column, and thus at the limit of what is technically feasible. On average, even these huge wind turbines only achieve an efficiency of around 45 percent and run at reduced capacity far too often – for example, when the wind load is too high and could damage the wind turbine.

The Munich-based company fos4X GmbH optimises the turbines using a combination of fibre measurement technology and artificial intelligence, thus increasing their efficiency. As a result, either considerably more power could be achieved even with smaller rotors or large but lighter rotors could be operated more load-efficiently and with less damage to the turbine.

Sensors in the Rotor Blade

The most important components in increasing the performance of a wind turbine are, besides the generator, the rotor blades. Their direction of inflow determines how efficiently the energy of the wind can be converted into electrical power. Not only the general wind direction should be taken into account, which is the case in conventional turbines, but the orientation (i.e., the so-called pitch angle of the rotor blades) should also be adjusted to allow the wind energy to be used optimally as well. Fibre-optic sensors inside the blades provide round-the-clock information about the physical properties of the rotor blade and the wind forces that strike it.

Wind power plays a crucial role
in the expansion of renewable energy.

FBG sensors in the rotor blades provide detailed measurement data around the clock.

The Wavelength Shows the Force

For its measurements, fos4X uses industrialised edge filter systems in combination with fibre Bragg gratings (FBG). If broadband light is fed into the fibre, a certain wavelength is reflected by the grating. This wavelength depends on the effective refractive index of the fibre core and the grating constant. If one of these factors changes due to external influences such as temperature fluctuations or expansion of the fibre, the Bragg wavelength also changes. This principle can be used in various sensors, for example, to measure the acceleration or elongation of the rotor blades to deduce the shear and torsional forces acting on the turbine at a given point in time. With little cost and effort, these sensors can also be installed in existing turbines. In contrast to conventional electrical sensors, these sensors are insensitive to electromagnetic fields. This makes it possible to use these sensors at crucial measuring points in rotor blades despite the danger of lightning strikes. Furthermore, FBG application is considerably more robust than electrical sensor components that cannot cope with the enormous dynamic loads.

Intelligent Control Technology

Real added value is only created from the data recorded by the sensors through complex, self-learning algorithms. This digital technology transforms the wind turbine into an intelligent power generator based on the measured data. For this purpose, an industrial PC – a so-called thin-client – is in each turbine. The individual computers are linked with each other via the industrial internet of things (IIoT). This means that the wind farm operator always has an overview of the output and operating status of each individual turbine. At the same time, an eye can be kept on the values of the entire wind farm. The collected data is continuously recorded and evaluated using artificial intelligence. The self-learning analysis software is increasingly capable of aligning the rotors of the individual wind turbines in such a way that the entire wind farm always delivers optimum performance. ■

At LASER COMPONENTS you can select the right fibre for your FBG-supported application in sensors, lasers, and spectrometers. In addition to fibres, in which one or more FBGs are already permanently inscribed, we also offer photosensitive fibres with various dopants. Customers with UV and femtosecond lasers can inscribe their own gratings.

WEB UK65-0115

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Schematic representation of the fos4Blade sensor platform inside a wind power plant.

With Industry 4.0, electricity generation can be made much more efficient.

Clean without the Mess

Following the major scandals of the 1970s and 1980s, strict international approval procedures and safety regulations were introduced regarding environmentally harmful chemicals. These are often very tedious. In addition, it is often the case that substances that were originally considered harmless do not turn out to be harmful until many years later. It is better to refrain from using such hazardous substances immediately. Thanks to alternative technologies, this is now also possible in industries in which the use of chemicals was long considered essential. A good example of this is the cleaning of materials and components in industry. Laser ablation is a "green" alternative that works completely without chemicals. The managing partners of Clean-Lasersysteme GmbH (cleanLASER) have already been honoured with the Federal Environment Award for this development. ➔

CLEAN ME

Sustainable Laser Cleaning without Chemicals

A Clear Beam Profile Ensures the Highest Precision

Many production steps in modern industry require clean, precisely pre-treated materials. For example, the surface condition is important for the embossing structure of printing rollers in the paper industry. One other application is, for example, the degreasing and microstructuring of rotor shafts in electric mobility. If components are to be bonded to metal surfaces, not only do the oxide layers have to be removed in advance but their surface also has to have exactly the right amount of roughness in order to achieve stable, reproducible, and process-reliable adhesion with the selected adhesive. It is precisely in this area that cleanLASER technology has made "quantum leaps in quality." The laser can also be used in marking glass and removing coatings, for example to generate transmission points on windshields for GPS transmitters and radio reception.

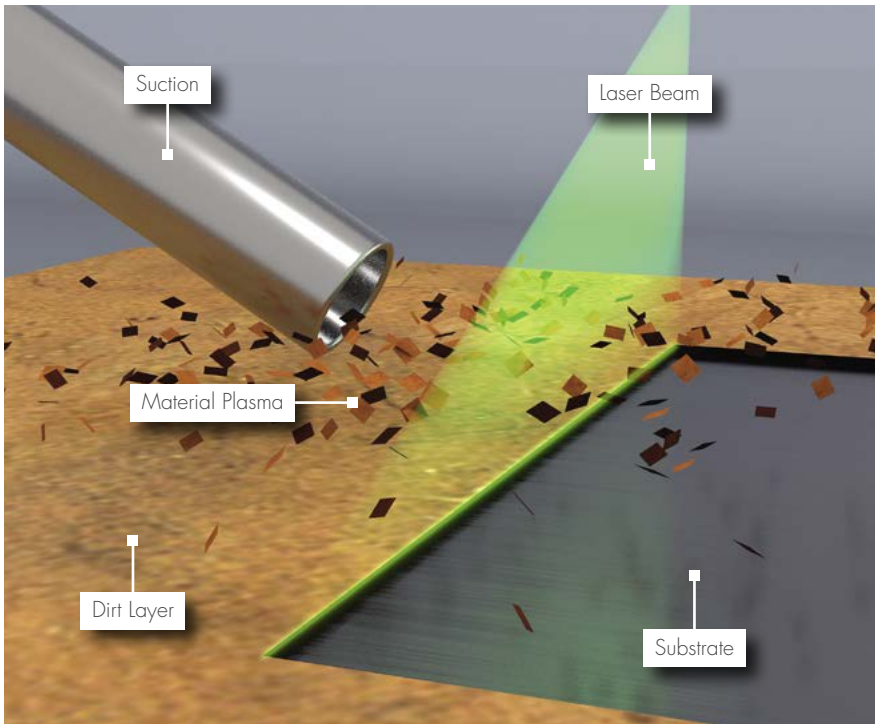
Lasers Clean "Gently" and Quietly

The coating should be completely or partially removed from other parts. In the past, aggressive chemicals such as acids or alkalis were used for this purpose. The handling of these hazardous substances requires elaborate safety precautions, and then there is always the question of disposal. Alternative methods such as particle blasting are associated with noise and dust generation. Furthermore, conventional cleaning methods often attack the base material in addition to the undesirable coating. For many applications, laser cleaning is therefore an attractive alternative. Precision, automation, and reproducible results guarantee the desired quality. There are also the environmental aspects to consider. Energy consumption of a few kilowatt hours and the fact that cleaning media are not required make the laser process the most sustainable cleaning technology on the market.

Layers as Thin as Possible

Basically, the cleaning process is based on the principle of laser ablation. In this process, material is strongly heated by a short laser pulse. Since heat conduction is a very slow process, the thermal movement of the atoms remains concentrated at the focal point of the laser, which leads to higher temperatures. As a result, the heated material layer can suddenly be vaporised and extracted. If the laser beam reaches the basic substance – which is usually a metal in industrial cleaning – it is reflected by the surface and remains undamaged. It is crucial that the wavelength, pulse duration, and shape of the laser beam precisely match the base material and the layer to be removed. A "sledgehammer method" that is equally successful in

The debris is evaporated by the laser beam.



Together with our partner Holo/OR we offer you a wide range of diffractive optical elements for lasers of all power classes and wavelengths. The range extends from classic multi-spot beam splitters to complex designs for beam shaping and profile change. Our experts will be happy to work with you to develop the perfect beam profile for your application.

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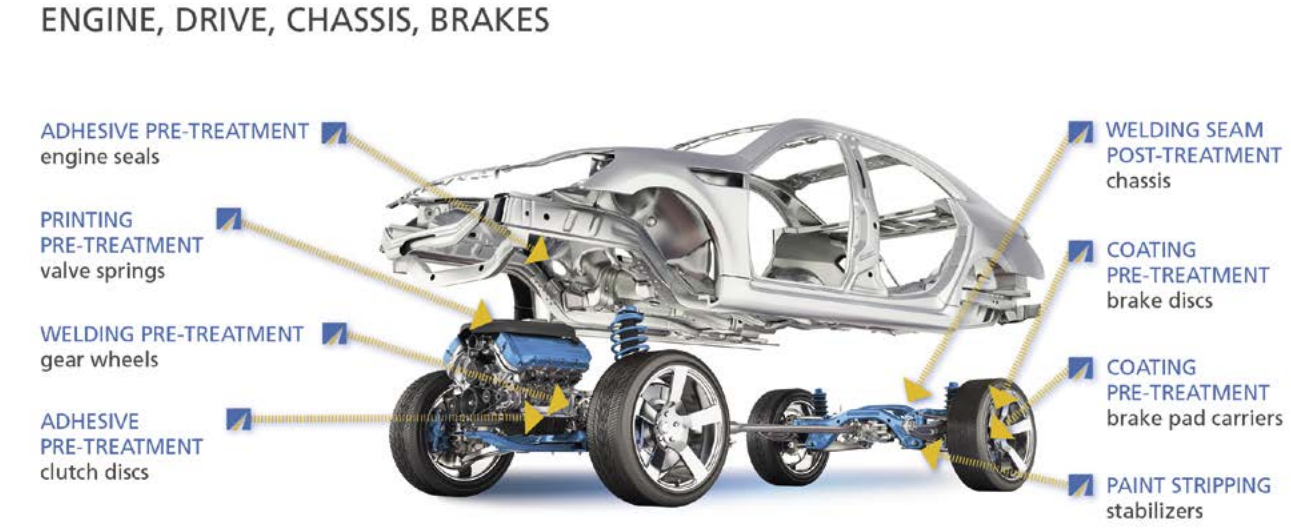
WEB UK65-0031

all applications does not exist here. In automobile production alone, laser cleaning has significant advantages in around 30 areas. These areas include the adhesive pretreatment of engine seals, structural parts, and control units, as well as the welding and soldering pretreatment of gear wheels, aluminum bodies, and airbags. Paint must be removed from stabilisers and contact points for the ground wires on the car body. Electromobility is adding further fields, especially in the manufacture and assembly of batteries.

Uniform Power Distribution

While most laser applications use a laser beam with a Gaussian intensity distribution, laser cleaning requires the homogeneous illumination of a comparatively large area of just under one millimetre. There the laser power should be distributed evenly across the material. A so-called top hat profile, in which the beam exits the optics bundled like a top hat and strikes the material with a clearly defined edge, is optimal. This shape can be achieved with diffractive optical elements (DOEs). These include glass carriers into which complex microstructures are etched. Targeted phase modulation in these microstructures generates the optimum intensity profile by interference in the working plane of the laser. ■

In car manufacturing, laser cleaning offers considerable advantages for more than 30 work stages.



Components made of aluminum and magnesium can be pre-treated particularly well with the laser.

NEW PRODUCTS

01 **UVC arrays**. Preassembled arrays with 100mW per chip. ■
02 **VCSEL emitter**. High power and short rise time at 850nm and 940nm. ■
03 **Smallest green dot laser available**. 515nm from an ultra-compact 3.3mm module. ■
04 **Powerful cw laser diode**. 250mW from a 5.6mm housing. ■
05 **New Xenon lamp driver board**. Input current in the range 6-30A. ■
06 **InGaAs PIN detector**. Available in TO-46 and TO-39 packages. ■
07 **Optical table safety barriers**. A variety of flexible options available. ■
08 **Advanced cleaving instrument**. Fully automated system. ■
09 **Six versions of fibre strippers**. Produced in house. ■
10 **Electro-optical modulators**. Tested for wavelengths 780nm, 850nm or 950nm. ■

Bolb's Germicidal UVC Arrays

100mW of Power per Chip

WEB UK65-0810

Bolb offers its UV LEDs not only as single emitters but as fully assembled arrays as well. The easy-to-install boards provide an optical power of 100mW or more per chip. Currently, both the S6060 and S3535 types of LEDs are available in arrays with 1x4, 1x12, and 5x5 diodes. UVC LEDs (typically 270nm) are used in many different applications (e.g., for sterilising and disinfecting air, water, and surfaces in industry and healthcare).

The device developers in these industries are specialists in their field but often have little experience with LED technology. They are mainly interested in a compact design and quick application in their own devices. Arrays offer exactly this advantage. In addition, their high performance allows significantly shorter treatment times, which would not be possible with individual LEDs. ■

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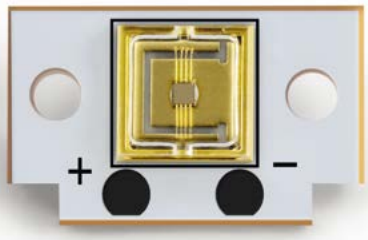
Powerful VCSELs for LiDAR Applications

IR Emitters with Short Rise Times



WEB UK65-0830

Leading market research institutes forecast rapid growth for the global VCSEL market until 2030. LASER COMPONENTS covers power ranges between 200mW and 50W with a wide range of IR wavelengths between 850nm and 940nm. Upon customer request, laser diodes are also available as high-power arrays. Such compact, high-power, multi-mode lasers are primarily required in the LiDAR range, where high power lasers are crucial for the range of a system.

Vertical-cavity surface-emitting lasers (VCSELs) are so-called surface emitters in which the light is emitted perpendicular to the chip's surface to allow the beam to be easily collimated. The extremely short rise times enable fast pulse sequences in the low nanosecond range and below. Due to the semiconductor structure, the emission wavelength hardly changes with temperature fluctuations. Thus, a narrow-band bandpass filter can be integrated on the detector side. ■

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The Smallest Laser Module at 515nm

Automatic Overload Protection

WEB UK65-1740

We would like to present the LC-LMD-515-07-01-TM-01, currently our smallest laser module with a green dot (515nm). With a diameter of 3.3mm and a length of 7.8mm (without pins), it can be integrated into even the smallest system (e.g., in alignment, positioning, and measuring devices).

The proven automatic power control (APC) feature protects the module's electronics from overloading. High-quality glass lenses ensure optimum beam quality even with a small form factor. ■

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IR Laser Diode ADL-85Y51TL

Small Package, Great Performance

WEB UK65-0490

With an output of 250mW from a 5.6mm housing, Arima's ADL-85Y51TL offers the highest laser power in a small package at a reasonable price. The single-mode laser diode emits a continuous beam (cw) at an IR wavelength of 850nm. It is especially designed for applications in which the power distribution remains comparatively consistent even across longer distances. This is ensured by the divergence angle of 8°x17°, which is small for a laser diode.

The ADL-85Y51TL is interesting for use in many industries (e.g., for laser distance measurement, sensor technology, and face recognition). It also opens up new fields of application in aesthetic medicine and photodynamic therapy. ■

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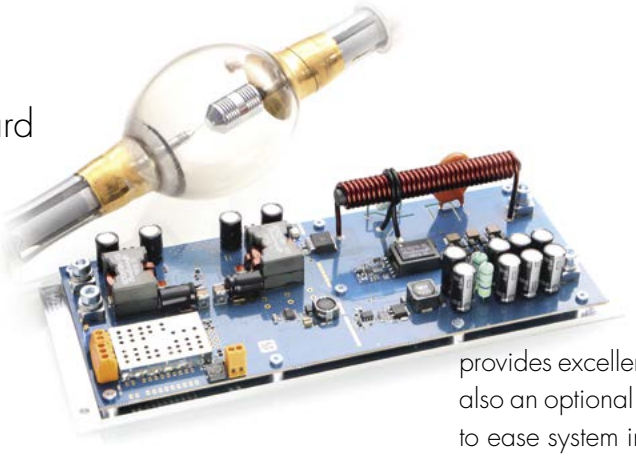
New Xenon Lamp Driver Board

To Complement our Existing Range



WEB UK65-0550

PicoLAS are proud to announce a new Xenon lamp driver board. This new board complements their existing range of laser and LED drivers, for which PicoLAS has an excellent reputation for reliability and cost-effectiveness. The new PL-XBO driver can drive any Xenon arc lamp with input current in the range 6–30A. Cold and hot lamp ignition and re-ignition is guaranteed with >33kV ignition voltage as well as selectable booster voltage from 60–120V. Low current ripple of <3% provides excellent arc stability. There is also an optional DMX control interface to ease system integration. ■

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The IG17-Series PIN Photodiode

Ideal for Gas Analysis

WEB UK65-0280

LASER COMPONENTS is a leading producer of InGaAs PIN detectors. A PIN diode has a broad undoped intrinsic region inserted between P and N type doped semiconductor regions. The InGaAs material captures incident infrared photons in the intrinsic region generating electron hole pairs which are gathered at external electrodes, generating an electrical output. Photovoltaic detectors are an excellent choice in many applications due to their high sensitivity, fast response, low noise and wide dynamic range.

A typical standard product is the IG17 with a peak wavelength of 1.55 microns and cut off at 1.65 microns, making it ideal for applications such as gas analysis, laser monitoring and tuneable diode laser spectroscopy.

The detector chips are housed in standard TO style packages, typically TO-46 and TO-39. The detectors have active area diameters ranging from 0.23 through to 3.00mm. ■

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Table and Bench Top Laser Safety Barriers

Custom Designs Available

WEB UK65-0540

Building a laser shield on or around an optical table is easy with a variety of flexible options from the Kentek Table-Guard and Bench-Guard systems. A modular and highly flexible approach to blocking laser beams on an optical table utilises our mini laser barriers.

LASER COMPONENTS offers custom designs if required for a variety of applications including the option of an acrylic viewing window or shoebox style removable top for applications that require ease of access.

Table-Guard
The panels of this flexible modular table system easily slide into table mounted posts to create an area of any rectangular shape.

Bench-Guard
The black anodised metal surfaces apt for clean room use and their light-diffusing textures absorb and diffuse laser beams regardless of their wavelengths. The panels can be attached to any position using a few thumb screws.

Both are built to withstand laser powers of up to 1,200W/cm² for at least 180 seconds, and are EN 12254 compliant and certified for use in all EU countries. ■

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Robust and Production-Ready Fibre Cleaver

Reliable Fibre Optical Processing Equipment

WEB UK65-0131

ProCleave LD II is one of our robust and most advanced cleaving instruments. It allows for smooth operation while cleaving large diameter fibres (cladding diameters from 125µm to 500µm, coating diameters from 250µm to 900µm), and ease-of-use while maintaining high production yield and process speed.

Low cleaving angles with flat surfaces can be easily achieved (<0.5o). Special platforms are available that support Fujikura, Fitel, 3SAE, but can be used without fibre holders too. This cleaver can be operated while connected to an external power supply as well as a battery (can be supplied with built in rechargeable Li-Ion battery).

The ProCleave has a fully automated system, which detects the fibre and adjusts the clamping strength to the required level (while detecting the fibre diameter and adjusting the system accordingly). The diamond blade with a vibration frequency sweep adjusts itself until the fibre is cleaved. These techniques result in a fully automated and maintenance free cleaving.

ProCleave LD II is an excellent tool and is chosen by our customers frequently – both in high volume manufacturing as well as R&D environments. ■

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Quality Tool for Processing Large-Core Fibres

Fibre Strippers for Industrial Applications

WEB UK65-1131

LASER COMPONENTS now offers fibre strippers for industrial applications that are produced in house. Six different versions are available for processing large-core fibres with outer diameters between 230µm and 690µm. This range is supplemented by a stripper for telecom fibres with an outer diameter of 125µm.

Fibre strippers are required to remove the buffer or coating from the fibre. This requires very precise work to ensure that the cladding of the fibre is not damaged. LASER COMPONENTS guarantees this precision through in-house production. This means that customer requirements such as individual diameters or markings with company logos can be implemented at any time. ■

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NIR-MX800-LN and NIR-MPX800 Series from iXblue

Used in Quantum Optics

WEB UK65-0960

LASER COMPONENTS is excited to introduce iXblue's NIR-MX800-LN amplitude and NIR-MPX800 phase electro-optical modulators featuring a wide bandwidth of up to 40GHz, designed to operate between 780nm to 960nm. The modulator chip is tested for wavelengths 780nm, 850nm or 950nm to guarantee mono-mode propagation property over the optical $LiNbO_3$ waveguide.

These modulators have become the reference components for many applications. In telecommunications and particularly data-com applications (short reach SR4 standard), the NIR-MX800 is integrated in transmitters to generate bit rates of up to 56Gb/s, and also used by the scientific community for quantum optics, cold atoms and atomic clocks. Amplitude modulators offer high carrier suppression to generate high quality carrier-suppressed double-sideband (CS-DSB) signal. Both the NIR-MX800 and NIR-MPX800 are today used for CS-DSB.

The NIR-MPX800 is designed with a specific RF electrode which enables generation of ultra-short optical pulses with very short rise times (in the order of a few picoseconds). Furthermore, we can offer extinction ratio greater than 30dB. ■

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LASER COMPONENTS

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MASSIVE IMPACT

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- Optical filters
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