

PHOTONICS NEWS

Company Newsletter of LASER COMPONENTS (UK) LTD

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Polarising Fibres (PZ)

Polarising fibres (PZ) only allow one polarisation of light to propagate along the fibre; the other polarisation will experience high losses. This is different to a polarisation maintaining fibre (PM) which will support propagation of both polarisations. PZ fibres have a specific waveguide design and a high birefringence so that the cut-off wavelength for the two polarisations is



different. Coiling the fibre introduces higher losses for one of the polarisations so PZ fibres can be used to create a high extinction ratio 'all-fibre' polariser.

We can offer IXFiber polarising fibre and polarising modules that can be suited to your application. The modules have the correct design of fibre and coil diameter to produce polarisers with a high extinction ratio (>30dB), large bandwidth (>80nm), and low loss. The modules are available for a range of wavelengths, with a variety of connector options. They are particularly useful in polarisation-sensitive applications including laser cooling atom trapping.

Webcode: **UK54-0110**

Dear colleagues

As our plants blossom in the summer sun so too have our products. We now have more products than ever before in the 34 years since the company formed.

It is a pleasure to share both company manufactured components together with

QCW Drivers for High Power Laser Diodes

The LDP-QCW 300-12 supplied by LASER COMPONENTS offers a QCW driving solution for high power laser diodes. These compact and efficient current supply units are designed to work with very high currents up to 300A and can provide powers up to 3600W with pulse durations between 100µs and 5ms.

Just one supply voltage is required for the control logic and the power stage making these units very easy to use, as well as safe, thanks to the inclusion of the stackprotector® and other protective features. Additional



complementary evaluation boards such as the PLB-21 provide further tuning and control options.

These drivers lend themselves well to applications including illumination, pumping of solid state lasers and spot welding.

Webcode: **UK54-0550**

partner suppliers' products, including but not limited to; Keopsys, iXBlue, Dexter, Femto, Helioworks, Holo/Or, Omega, Optometrics, PD-LD, PicoLAS and SiTek, to name a few.

Whilst we have a vast range of standard components we specialise in providing

Flexpoint® Heavy Duty Green Laser Modules

The Flexpoint® HD (Heavy Duty) series is designed to provide laser users a tough and robust solution for use in environments where most lasers will fail. The FP-HD series features a ruggedised housing



with a protective rating of IP67 which is dust tight and resistant to submersion in water at depths of up to 1m for up to 30 minutes. The lasers can be used through a large range of environments, thanks to the -20 to +50°C operating temperature and -20 to +60°C storage temperature.

The FP-HD series maintains all of the optional upgrades as seen in the standard Flexpoint® series such as modulation and brightness adjustment. The 520nm option provides users with a clear, crisp, green laser spot (spot, line, or crosshair). Being focusable the lasers can be adjusted to produce a sharp image at any working distance.

The FP-HD series is used for targeting, marking, and positioning tasks in absolutely any conceivable environment.

Webcode: **UK54-0740**

custom parameters, so please contact us with your requirements and we'll look forward to working together.

Chris Varney
Managing Director



Optical Beam Analysis

For materials processing laser applications, the result is dependant primarily on the laser beam profile at the work piece. Analysing the beam profile provides the opportunity to refine the system and gives an early warning of any potential problems. This acts to increased quality, process reliability and reduced waste.

We are happy to be working with Haas Laser Technologies to provide modular beam analysis systems including software, cameras, beam reduction optics attenuation modules and filters. These systems allow for 'real-time' monitoring of high power CW or pulsed lasers, providing valuable data such as the laser beam's spatial profile, circularity, centroid, astigmatism and M2 values.

The Haas laser beam analyser system design has no moving components and provides near instantaneous measurements of your laser beam and all active optical elements.

Webcode: **UK54-0032**

Non-Polarising Beam Splitters

A classic 50:50 beam splitter will change the polarisation characteristics of incident light. Circularly-polarised laser radiation is divided into elliptically-polarised partial beams, corresponding to the different reflection values for p-polarisation and s-polarisation.

This however does not have to be the case! For CO₂ lasers, we have 'non-polarising' beam splitters, designed to maintain the polarisation state of the laser beam for both the reflected and the transmitted partial beam. The coating is applied to laser grade ZnSe, and achieves split ratio of 50±1% at 10.6µm, while maintaining the polarisation state of the incident light. One of the several coating layers is germanium, making the coating opaque in the visible spectrum.

Non-polarising beam splitters are suited for a laser intensity of <500 W/cm². Exceeding this may give rise to thermal lensing effects.

We have a range of standard non polarising beam splitters of diameter between 25.0mm and 50.8mm available for quick dispatch, as well as custom options upon request.

Webcode: **UK54-0010**

Photline Range of RF Drivers

Modulator drivers can be used to boost the signal voltage to the levels suitable for the modulator. We are pleased to offer the Photline range of RF drivers. These are available in a range of speeds and types according to the input signal. Selecting the correct driver ensures the input signal is faithfully reproduced, with no ringing or distortion. The range includes a driver specifically designed for generating pulses.

Electrical pulsed signals differ from classical telecom signals by having long periods with



no signal, when telecom signals are usually more balanced between 1 and 0. They also differ from analogue signals by having wider frequency content. Using a driver specifically designed for pulses will ensure clean optical pulses with sharp edges, sustained high and low levels and no overshoot.

The operating range of the Photline DR-PL-10-MO driver has been extended to include low and high Pulse Repetition Frequency (PRF) signals from 10Hz to 1GHz. The bandwidth up to 10GHz accommodates 100ps narrow pulse width with short rise and fall time (down to 25ps) and can withstand longer pulses up to 100ns.

The Photline DR-PL-10-MO drivers come in compact connectorised modules that match directly with Photline modulators; they use a single voltage power supply for ease and safety of use and feature an output voltage control for maximum flexibility. An optional heat sink is available as an accessory.

Webcode: **UK54-0960**

Thulium Fibre Laser up to 30W : CTFL-TERA

We are pleased to offer a new thulium fibre laser from Keopsys. The wavelength can be chosen between 1900 and 2050nm. The CTFL fibre laser has a 1nm linewidth, M²<1.1 and is available with output up to 30W, with a randomly or linearly polarised output and with the option to modulate the output.

Totally air cooled, no maintenance is needed. The laser is available in a friendly benchtop or in an OEM module that is easy to integrate. This high performance laser will be an ideal tool for scientific research as well as for polymer processing or OPO pumping.

The Keopsys range of fibre lasers also includes pulsed thulium, UV and green fibre



lasers, CW Raman fibre lasers and both CW and pulsed, Erbium and Ytterbium fibre lasers.

Webcode: **UK54-1110**

Blue Laser Diodes

LASER COMPONENTS is proud to supply a range of blue laser diodes in the wavelength range 405nm (violet) to 488nm (cyan).

These diodes are available with output powers up to 1.6W at 450nm and are functional as both CW and pulsed sources making them ideal for aesthetic applications such as projection and stage lighting, and also for metrology. The cyan diodes are

used in the medical and biomedical sectors.

By incorporating multiple chips into a single butterfly package, output powers of up to 50W are readily achieved when operating in continuous wave - ideal for laser projection, laser shows and general illumination.

Webcode: **UK54-0480**



Hermetic Feedthroughs for High Power Lasers in HV/UHV

Hermetically sealed optical feedthroughs allow optical signals to be guided into a pressure vessel or vacuum chamber. The bulkhead option



has a connector on each side and the inline version reduces the optical losses by having a permanently connected optical fibre extending each side of the feedthrough to

minimise the numbers of connections. In both cases the hermetic seal is maintained even when an optical fibre is not connected. We offer a range of solutions to match to the optical fibre and application requirements.

For HV and UHV applications epoxies or adhesives may not be suitable. We offer a brazed solution with metal coated optical fibres that avoids the use of these products and can also withstand high temperatures. By using the same brazing technique for the connectors at the ends of the optical fibres, the complete assembly can be heated to bake out temperatures (typically over 200°C).

This solution is also suitable for high power lasers, with a range of fibre types and optical connectors available. The feedthroughs can be mounted on a KF or CF flange.

Webcode: **UK54-0135**

Monochromators

We are delighted to offer a range of high performance, low cost monochromators for UV-VIS-NIR, used in research, system integration, quality control and education. Throughput, resolution, stray light and power handling are comparable to many larger, more expensive monochromators. This series is designed to minimise astigmatic aberrations, for high instrument resolution. Each unit includes a set of fixed slits which can be easily changed to wider or narrower slits to optimise throughput or resolution for your specific application.

A number of models are available including the standard unit, which uses a micrometer for wavelength selection and readout, and the digital variant which has a digital counter for wavelength selection. In addition, there are scanning variants, which are driven by a stepping or servo controlled motor. The

scanning monochromator is also available in standard and digital formats. All of our monochromators can be optimised to a wide range of standard wavelength ranges. To enhance your setup, we offer a variety of accessories including a stepping motor



controller, silicon detector module, sample compartment, and tungsten halogen lamp with power supply.

Webcode: **UK54-0852**

Optomechanical Mounts

LASER COMPONENTS has manufactured high quality coated laser optics in house since 1986. For the majority of applications, optomechanical components will be required to integrate these optics precisely and easily into the beam path.

Basic optical mounts serve as an inexpensive option that feature a simple design for high stability and ease of use. For applications which require a higher level of precision and adjustability, multiaxially adjustable mounts are available, allowing optics to be easily

tilted along two to four axes. Our range is sure to include an option for just about any simple mirror, prism, cube or wave-plate, with metric or imperial thread options, and adaptors available for different diameter optics.

To complete your setup, we have beam steering sets, laser module mounts, optics bench sliders and base plates as well as a vast selection of additional optomechanical accessories.

Webcode: **UK54-0940**

Signal Processing Circuits for Position Sensing

Position Sensing Detectors (PSDs) are becoming more popular thanks to their simple, robust design, and high positional accuracy. To further compliment these detectors we highly recommend using a Signal Processing Circuit (SPC).

A Signal Processing Circuit is designed to directly interface with a PSD, providing it with the supply voltage and delivering the position measurement data in an easy to handle format.

PSDs generate two photocurrents per axis which travel to two contacts. One can calculate the absolute laser spot position by performing a difference over sum calculation. These photocurrents are very small. To accommodate for this the SPC converts and amplifies these small photocurrents into an easily readable value of $\pm 12V$.

To simplify the use of PSDs in your system we can also mount PSDs as large as 10x10mm directly onto the SPC, meaning no soldering required!

Webcode: **UK54-0230**

Tailored Solutions for Integrated Photonics

Moving beyond the supply of photonics equipment at component level, LASER COMPONENTS is proud to be a provider of customised and integrated solutions for custom requirements.

Simply choose your detector or emitter performance and allow us to work with you to engineer and manufacture a product with optimum performance that may be unavailable using standard products.

Tailored solutions using flexible circuits, application-specific mouldings and project-specific PCB boards are just some of the concepts that have been realised, designed and manufactured for customers, providing high reliability solutions, often at a saving over previously adopted techniques.

Webcode: **UK54-0250**

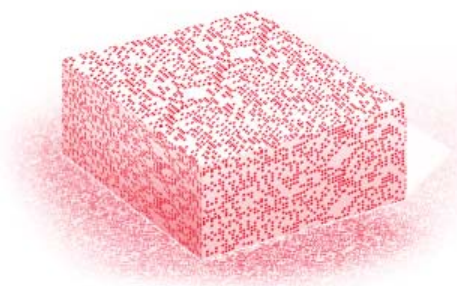


MVstereo - Machine Vision Made Easy!

We are pleased to present our first dedicated random pattern generator; the MVstereo. The MVstereo generates a pseudo random dot matrix of 33,000 eye safe, divergent dots in either 660nm or 830nm.

The MVstereo laser modules also contain our new digital laser driver which offers various programming and reporting features, such as modulation, triggering, and power adjustment.

The laser's focus can be adjusted without removing the optics and locked into place with an attached locking ring. The laser is



powered via an M12 connector with a supply voltage of 4.5-30VDC.

Some common applications for the MVstereo include 3D stereo machine vision, gesture recognition, depth sensing, and volume measurement.

Webcode: **UK54-1740**

See us at

Photonex Scotland Roadshow
June, 08, 2016
Heriot-Watt University
Booth S22



8th June 2016 · Heriot-Watt University

Thermopile Detectors

Dexter Research Centre (DRC) in Dexter Michigan USA, has over 40 years of experience in the manufacture of thermopile detectors. DRC provide the largest selection



of thermopiles in the world including high quality, high output Bismuth-Antimony thin film and silicon-based radiation sensing thermopile detectors. A particular feature of DRC is their specialisation in customising detectors to meet specific requirements to provide superior detector performance and subsequent superior system performance. They also provide a variety of integrated solutions including digital radiometers, thermal imaging arrays and passive presence detection.

Packaging options include TO-18, TO-5, TO-8 and LCC, for single, dual, quad and up to 2x16 and 1x64 element array configurations. Window choices are vast, being able to supply almost any IR window material as well as custom narrow band pass filters. Applications include gas sensing, fire and flame detection, temperature measurement, security and detection, laser power and targeting, as well as a range of imaging solutions.

Webcode: **UK54-0340**

3rd International WORKshop on Infrared Technologies

November, 07-08, 2016
LASER COMPONENTS' headquarters,
Olching, near Munich



Infrared Emitters

Applications such as gas sensing using nondispersive infrared (NDIR) sensors require an IR source to pass through a gas onto an IR detector. Any absorption by the gas at specific wavelengths indicates a certain concentration of that gas. Wavelengths are selected using narrow band pass (NBP) optical filters placed within the optical path, but often placed within the detector envelope. Popular IR gas absorbing wavelengths are 3.4µm (methane), 4.26µm (CO₂), 4.66µm (CO), 7.3µm (SO₂), and more, found on our [website](#).

Helioworks based in Santa Rosa California USA manufacture both steady state and pulsable IR emitters, with a choice of windows such as sapphire, calcium fluoride and zinc selenide, or no window, to suit the spectral design of the sensor, and housed in TO-5,



TO-8 or TO-3 packages. Filaments include tungsten, NiCr, and Kanthal. Custom configurations are possible.

Key features include long term stability, desirable signal to noise ratio, larger temperature modulation in pulsed mode, and the use of latest technology in packaging and window design.

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