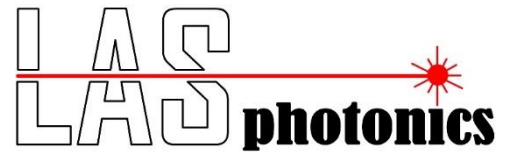


***YOUR SUPPLIER FOR  
INNOVATIVE PHOTONIC  
SOLUTIONS***



*Laser and Light sources*

*Laser Material Processing solutions*

*Fiber-optics, Electro-optics and Optical components*

*Instruments and Systems*

*Imaging and Detection modules*

**2022/2023**

LAS Photonics Ltd. founded in 2010 is a representative company of leading worldwide suppliers in the field of lasers and electro-optics providing innovative products and after sales support for the industrial and scientific markets.

We supply a wide range of Lasers sources, Laser Accessories, LED and Light Lamps sources, Fiber-Optics, Electro-Optics, Optical Components, instrumentation products for analysis and measurement, Imaging and Detection Modules.

The company combines certified engineers qualified in the field of Physics and Electro-Optics with a dynamic and executive team having an extensive experience in the laser industry.

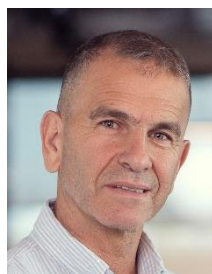
## Our team



**Bernard Azout**  
Managing Director



**Johanna Taieb**  
Electro-Optics  
Sales Engineer



**Miki Iluz**  
Technical Sales Engineer  
Service Manager



**Lea Guez**  
Sales Coordinator

# TABLE OF CONTENT

<b>Solid State Lasers</b>	<b>4</b>
Single Frequency Lasers	4
High Energy Pulsed Solid State Lasers	4
ns-ps Lasers	5
Frequency Doubled diode-pumped disk lasers	5
Eye-safe 1,54μm ns lasers	6
<b>Dye Lasers</b>	<b>7</b>
Tunable dye laser systems	7
<b>Fiber Lasers</b>	<b>8</b>
Supercontinuum Lasers	8
Ultrafast low noise laser solutions	8
Femtosecond and Picosecond Lasers for LifeScience and Biophotonics	9
Femtosecond Industrial Lasers	10-11
MultiKW CW Lasers	12
Pulsed ns Lasers	12
<b>High Power Diode Lasers</b>	<b>13</b>
Epitaxy wafers	14
High Power Heatsink Diode Laser	14
CW diodes	15
QCW stacks	15
ns Pulse Diode Laser illuminator	16
Diode pumping modules	16
Single Emitter Diode Laser	17
Multi-single Emitter Diode Laser	17-18
Diode System Laser	18
<b>Quantum cascade Lasers</b>	<b>19</b>
<b>DFB Lasers</b>	<b>20</b>
1020-1180 nm DFB laser	20
1240-1300 nm quantum dot laser	20
Epitaxial wafer on GaAs substrate	20
532, 561, 594nm compact visible lasers	21
640-940nm High Power lasers	21
<b>Tunable Diode Laser Systems</b>	<b>22</b>
Tunable Littrow and Cateye Lasers	22
<b>Individual dies/chips, laser modules, laser systems, laser products</b>	<b>23</b>
Medical Laser System ML7710	23
Plug and Play stand-alone laser products	23
Low power Fabry Perot/DFB/Customized laser chips / TO-CAN modules/pigtail	23
Single-frequency diode lasers in butterfly package/ Visible light Individual	23
Addressable Bar (IAB)	
<b>X-Rays cameras</b>	<b>24</b>
<b>Adaptive Optics and Deformable mirrors</b>	<b>25</b>
Adaptative optics for ultra-high intensity lasers	25
Microscopy and Bio-Imaging	26

# TABLE OF CONTENT

Shack – Hartmann and Hartmann WFS	27
<b>Metrology Systems</b>	<b>28</b>
<b>Light Shaping products</b>	<b>29</b>
<b>Autocorrelator/Beam Profiler/Mini Imaging Spectrometer</b>	<b>29</b>
Autocorrelator	29
Mini Imaging Spectrometer	29
Beam Profiler	29
<b>Gas analyzer</b>	<b>30</b>
<b>Laser Wavemeter</b>	<b>31</b>
<b>Lock-in Amplifiers/Impedance Analyzers/Waveform Generator</b>	<b>31</b>
<b>High Power Fiber components</b>	<b>32</b>
High Power Pump Combiner – Nx1 Pump Combiner	33
High Power Pump Signal Combiner – (N+1)x1 Pump signal Combiner	33
High Power Signal/Beam Combiner	34
Active Fiber Combiner	34
NxM Combiner Splitter	34
1µm 300mW -2W Low Power Optical Isolator	35
1µm 10W -100W High Power Optical Isolator	35
1550/2000nm High Power In-Line Optical Isolator	35
Cladding Power Stripper	36
Mode Field Adaptator	36
<b>High Quality Specialty Optical Fiber Solutions</b>	<b>37</b>
Preforms, Fibers, Fibers Cables, Fiber Bundles, Assemblies	38
<b>Non Linear crystals (LBO, KTP, RTP cells, PPLN)</b>	<b>38</b>
MgO:PPLN Crystals	38
PPLN Waveguides	38
<b>Laser crystals (ND:YAG, Er:YAG, CTH:YAG)</b>	<b>39</b>
<b>Motorized laser attenuators and Beam expanders</b>	<b>40</b>
Motorized laser beam expnaders MEX	40
Motorized laser attenuators	40
<b>Optical Components</b>	<b>41</b>
Crystals, Laser Components, Polarization optics, Beam delivery devices	41
<b>Nanosecond/picosecond/femtosecond laser machines</b>	<b>42-43</b>
<b>Laser Rangefinders and LIDAR sensors</b>	<b>44</b>
OEM Laser Rangefinders for Defense & Security applications	44
<b>High-Speed Cameras</b>	<b>45</b>
i-Speed 2 Series Cameras	45
i-Speed 5 Series Cameras	45
i-Speed 7 Series Cameras	46
<b>UV LED</b>	<b>47</b>
UV Curing Lamps	47
UV Chamber	47
<b>Accessories for laser diodes</b>	<b>48</b>
<b>Service and Support</b>	<b>49</b>



Single Frequency Lasers

Skylark Lasers develops, designs, and manufactures narrow linewidth and single frequency, continuous wave DPSS lasers from the UV to NIR at mid- to high power outputs.

Application examples:  
Raman Spectroscopy, Holography & Imaging, Quantum Technology, Fluorescence, Lithography.



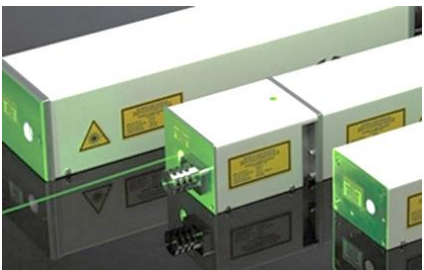
Serie	Wavelength	Output power	Spectral Bandwidth	Spatial Mode	Coherence Length
Duetto	349 nm 532 nm	50 mW 10-1000 mW	≤ 0.5 MHz	TEM00	> 100 m
Solo	640 nm 1064 nm	10-1000 mW 10 - 2000 mW	≤ 0.5 MHz	TEM00	> 100 m

High Energy Pulsed Solid State Lasers



Litron Lasers has a unique offering of laser cavity configurations (cavity super-Gaussian, stable multimode cavity or telescopic cavity "true-TEM00") in diode pumped lasers, flashlamp pumped lasers to adapt to each need.

Application examples:  
PIV & Visualisation, Spectroscopy & LIBS, Scientific Research

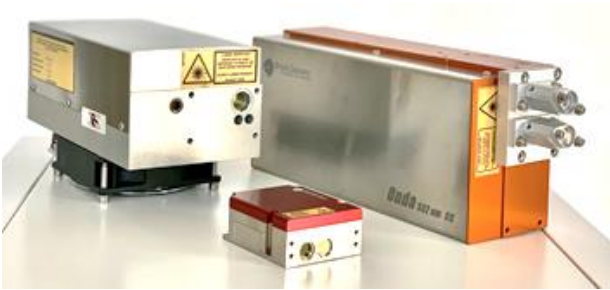


	Flashlamp pumped lasers	Diode pumped lasers
Wavelength	212, 266, 355, 523, 526, 532, 1047, 1053, 1064 nm	
Rep. rate	0 to 100 Hz	0 to 300 Hz
Pulse energy / Power	mJ to 10 J	mJ to 1 J
Pulse width	3 to 10 ns	Sub ns to 20 ns
Spatial Mode	TEM00, multimode, super-Gaussian cavity	
Options	Design without cooling water, OPO, double pulse for PIV, single-frequency transmission, transmission duration ps up to 8 MHz ...	

ns-ps Lasers

Bright Solutions offers a wide range of Pulsed DPSS lasers.

Application examples:  
Defense, Micromachining of glass, LIDAR, Non-linear Spectroscopy



Name	Wavelength	Pulse energy	Average Output power (W)	Pulse width	Rep. rate
ONDA	266, 355, 532, 1064nm	> 0.8mJ		2ns - 12ns	Single shot to 100kHz
SOL	1064, 532nm		40W@1064nm 10W@532nm	6ns - 80ns	> 200kHz
WEDGE	266, 355, 532, 1064nm	> 4mJ		500ps - 3ns	Single Shot to 100 kHz
VENTO	1064, 532nm		> 100W @1064nm > 50W @532nm	<300ps	> 200kHz
ONE DPSS	1µm	> 100µJ	> 3W	10ns - 20ns	> 30kHz
Microchip	1064, 532, 355, 266, 946, 473nm	> 80µJ		350ps - 2ns	1Hz-100kHz

Frequency Doubled diode-pumped disk lasers

Jenoptik provides 532 nm laser sources with up to 8W continuous-wave output power for proven applications in medicine, illumination and signaling

Application examples:  
Ophthalmology, dermatology, veterinary medicine, laser projection and quality control.



## Eye-safe 1.54μm ns lasers

**Optogama** is a high-tech company that designs, develops and commercializes custom and unique laser products.

Optogama team designs and manufactures a variety of “eye-safe” 1,54 μm diode pumped passively q-switched erbium glass laser transmitters.



### Application examples:

*LIDAR & laser ranging, LIBS, Metrology and instrumentation, Automotive*

Name	Wavelength	Pulse energy	Energy Stability	Pulse duration
Kaukas 1	1534nm	1 mJ	1 to 5 Hz	< 10ns
Kaukas 2	1534nm	> 2 mJ	< 2% @1 Hz per 300 pulses	< 14ns
Kaukas 3	1534nm	> 3 mJ	0,5 to 1 Hz	< 12ns
Kaukas HR	1535nm ± 5	> 30 μJ or > 45 μJ	1 kHz or 100 Hz	< 7ns



Tunable dye laser systems

Liop-Tec supplies widely tunable dye laser systems delivering laser radiation from the UV (197 nm) to the IR (5 μm), dye laser amplifiers and laser accessories

Application examples:  
*Laser-induced fluorescence: LIF, Photolysis, Combustion & atmospheric studies.*  
*Light detection and ranging: LIDAR, Raman spectroscopy, Coherent anti-Stokes Raman spectroscopy: CARS*



	LIOPSTAR, LIOPSTAR-E
Linewidth	down to 0,02 cm-1
Spectral range	197nm – 5000nm
ASE	< 0,5%
Features	<ul style="list-style-type: none"><li>• friendly LabView Software</li><li>• intelligent PI control for FCU autotracking unit</li><li>• USB port</li><li>• remote control via TCP / IP protocol</li></ul>
Comments	<ul style="list-style-type: none"><li>• third dye cell for high power pump laser</li><li>• highly efficient laser resonator</li><li>• exchangeable grating</li><li>• near Gaussian beam quality due to Bethune cells</li><li>• eroded stainless steel case for oscillator and amplifier cells</li><li>• new state-of-the-art integrated electronics and user temperature stabilized crystals</li><li>• smallest footprint</li></ul>





Supercontinuum Lasers

YSL Photonics explores, develops and manufactures next-generation of supercontinuum source (supercontinuum laser, white light source, white light laser) for a diverse range of industrial and R & D applications.



Application examples:  
OCT, Fluorescence Spectroscopy and Microscopy, Nanophotonics, Super-Resolution Imaging

Name	Wavelength range	Total Power	Repetition rate	Visible power	Pulse width
SC-Pro	430 – 2400nm	> 8 W	10 kHz – 80 MHz Adjustable	>1000 mW	~100 ps
SC-Pro-M	410 – 2400nm	> 1.5 W - > 7 W	10 kHz - 80MHz	> 0.5 W - > 2 W	~6 ps



Ultrafast low noise laser solutions

Menhir Photonics offers innovative ultrafast laser solutions.

Application examples:  
Frequency-comb, Spectroscopy, Quantum



	MENHIR -1550 (Oscillator without amplifier)	MENHIR -1550+ (Oscillator withamplifier)
Average power	> 50mW	> 2W
Peak power	0.1kW	> 4kW
Pulse energy	0.05nJ	> 1nJ
Repetition rate	216, 250 MHz, 1, 1.25, 2 or 2.5 GHz Custom design: from 200 MHz to 2.5 GHz	
Center wavelength	1555 ± 10nm	
Pulse width	< 250fs, Transform limited	

Femtosecond and Picosecond Lasers for LifeScience and Biophotonics

Spark Lasers develops compact femtosecond and picosecond lasers for industrial and scientific applications, combining innovative technology, high performance, high quality, compact modern design and reliability..



Application examples:  
Bioimaging, Neurosciences, Non-linear optics

Name	Wavelength (nm)	Average power	Pulse duration	Repetition rate	M <sup>2</sup>
ALCOR 780	780	0.8W	< 150fs	80 +/- 2 MHz	< 1.2
ALCOR 920-1	920	1.5W	< 100fs	80 +/- 2 MHz	< 1.2
ALCOR 920-2	920	2.5W	< 100fs	80 +/- 2 MHz	< 1.2
ALCOR 920-4	920	4W	< 130fs	80 +/- 2 MHz	< 1.3
ALCOR 1064-2 /ALCOR 1040-2	1064 or 1040	2W	< 100fs	80 +/- 2 MHz	< 1.2
ALCOR 1064-5 /ALCOR 5	1064 or 1040	5W	< 120fs	80 +/- 2 MHz	< 1.2



Femtosecond industrial Lasers

**Amplitude** is the international specialist and leader in femtosecond lasers for industrial, medical and scientific applications. Combining research & innovation and industrial efficiency.

Application examples:

Industry: Micro Processing, Semiconductor

Science: Cellular Imaging, Neuroscience/Optogenetic, Spectroscopy

Medical: Ophthalmology



Name	Central Wavelength (nm)	Average power	Energy per pulse	Repetition rate	Pulse width
TANGOR 300	1030	>300W	>3mJ	From single shot to 40 MHz	< 500 fs to > 10 ps
	515	>200W	>1.5mJ	Single shot to 2 MHz	< 500 fs
	343	>100W	>200μJ	Single shot to 2 MHz	< 500 fs
SATSUMA NIJI	Fully customizable and versatile femtosecond laser Industrial laser platform offering all possible wavelengths from 257 nm and up to 4000 nm.				
TANGOR UV	343 ± 2	>15W, >30W	up to 80μJ	From single shot to 2 MHz	500fs
MAGMA	1030	Peak power >4GW to >1TW	2 to 500mJ	From single shot to 5 kHz to 300 kHz	< 500fs



Name	Central Wavelength (nm)	Average power	Energy per pulse	Repetition rate	Pulse width
GOJI	1030 ± 5	> 5W	> 125nJ - >500nJ	10 to 40 MHz	<150fs
MIKAN	1025 ± 5	> 1,3W	>24nJ	54 MHz	< 250fs
TANGOR	1030 ± 5	> 50W to > 300 W	> 300μJ - > 3mJ	From single shot to 40 MHz	< 500fs - >10ps
TANGERINE	1030 ± 5	> 20W - 50W	>250μJ	From single shot to 40 MHz	< 350fs - 10ps
SATSUMA	1030 ± 5	>5W - >50W	> 10μJ - > 40μJ / 150 μJ	From single shot to 40 MHz	< 350fs - >10ps

**TRUMPF Laser Technology** is the market and technology leaders in machine tools and lasers for industrial manufacturing, and work with our innovations in almost every sector.



**Multi CW lasers**

Application examples:  
*Cutting, Welding, Fine cutting, Additive manufacturing, Ceramic scribing*

CW fiber lasers - TrueFiber P Compact Series	
Laser Power at the LLK Plug	100 – 2000W
Typical Power Constancy at Rated Power	± 2 % (peak)
Continuously Adjustable Power Range	10 – 300W
Beam Quality	0.38 ±0.003 mm•mrad to 13 ± 4 mm•mrad
Wavelength Spectrum	1068 – 1082nm
Diameter of Laser Light Cable	10 – 100µm
Length of the Laser Light Cable	5 – 20m



**Pulsed ns lasers**

Application examples:  
*Ablation, Cleaning, Drilling, Engraving, Marking, Micro-machining*

ns fiber laser - TruePulse Nano Series	
Average Output power	20 – 200W
Maximum Peak Pulse Power	> 7 - >50kW
Beam Quality (M²)	< 1.3 - 6
Wavelength Spectrum	1059 – 1065nm
Maximum Pulse Energy	> 0.6 – 5mJ
Pulse Duration Range	3 - 2000ns
Pulse Repetition Frequency	1 – 4000kHz



Jenoptik develops and manufactures High-power diode lasers in the 760 nm to 1060 nm near-infrared (NIR) wavelength region covering the entire value chain– from epitaxial wafer growth to laser system assembly with full flexibility in designing, assembling and packaging **high-power diode lasers** in order to provide **customized, diode laser based OEM solutions** on the component-, module- or sub-system level.

- Epitaxial wafers and unmounted **high-power laser diodes** based on (Al, In, Ga) (As, P) compound semiconductors
- Open heat sink diode lasers: single-laser-bar packages based on passively (conduction-) cooled or actively (convection-) cooled heat sinks
- Diode laser stacks for power scaling into the multikilowatt range: multi-laser-bar packages based on actively (convection-) cooled or passively (conduction-) cooled submounts/ substrates
- Fiber-coupled diode laser modules: single- or multi-laser-bar fiber coupled modules in a rugged OEM design

## Application examples:

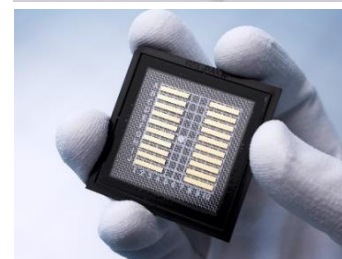
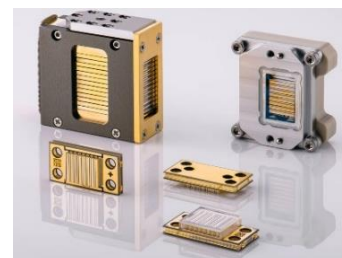
*Medicine: Laser based therapy for ophthalmology, dermatology and aesthetics*

*Material processing / Direct diode laser application: Welding, soldering, hardening and annealing*

*Optical pumping for solid state lasers*

### Laser Bars / CW/QCW Diode Laser Stacks/ Diode Laser Modules

Wavelength (nm)	760, 792, 808, 880, 905, 915, 940, 976, 1020, 1060
Output Power (W)	20 - 2400
Operation mode	CW / QCW
Cooling	actively cooled/passively cooled
Collimation	fast axis/ fast axis and slow axis / without / couplage fibre 200µm-600µm for diode laser modules



## Epitaxy wafers

**Jenoptik** provides custom design epitaxial wafer structures for a variety of optoelectronic devices operating in the 630 nm – 1200 nm spectral range.

### Application examples:

*Medicine, Material processing / Direct diode laser application and Optical pumping*

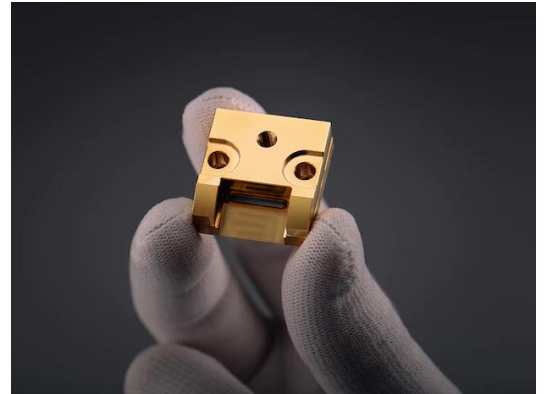


## High Power Heatsink Diode Laser

**Jenoptik** provides high power open heat sink diode lasers. Optical output power levels up to 300 W in cw- and even hard-pulse mode can be reached in the 9xx nm region.

### Application examples:

*Optical pumping / direct-diode laser technology.  
Low- or high-brightness applications, e.g. based on spatial and spectral beam combining techniques.*





**Lumibird** manufactures a wide range of laser diodes and laser diode module: QCW diode stacks, CW laser diode modules, fiber coupled QCW diode stacks, short pulse laser diode illuminators, as well as high brightness diode source, IALDA, and pulsed power supply drivers for QCW diodes.

**CW diodes**

*Application examples:*  
*Optical Pumping, Medicine, Industry*

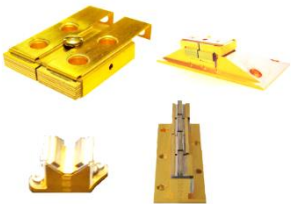
Wavelength (nm)	Output power (W)
800-980	>500W per 10mm bar 5mm and 3mm also available
1532	>50W per 10mm bar
1550	>50W per 10mm bar
1560	>50W per 10mm bar
Other Wavelengths Available Wavelength Agnostic Technology!	



**QCW stacks**

*Application examples:*  
*Ablation, Engraving, LIBS, LIDAR, Surface treatment, Spectroscopy, Marking, Pumping*

Wavelength (nm)	Output power (W)	Efficiency
808-980	Up to 500 W per 10mm bar 5mm and 3mm also available	>65%
1532	>50W per 10mm bar	>25%
1550	>50W per 10mm bar	>25%
1560	>50W per 10mm bar	>25%
Other Wavelengths Available Wavelength Agnostic Technology!		



ns Pulse Diode Laser illuminator

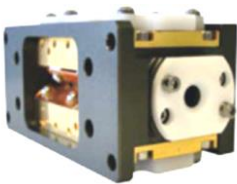
*Application examples:*  
 Ultrasound generation, Photoacoustics,  
 NIR spectroscopy, 3D flash LIDAR, Time of  
 flight



	Short pulses	Ultra compact	Ultra short pulses
Output Energy	0.5 - 1.5mJ	1 - 4mJ	1 - 50μJ
Pulse width	10 - 15ns	30 - 100ns	2 - 10ns
Pulse repetition rate	>1kHz	>10kHz	>640kHz
Wavelength	808, 915, 940, 980 nm		808, 905, 1370, 1470, 1550 nm
Fast & Slow axis divergence ( without collimation)	Typ. 35° by 9°		FA (3 to 35°) by SA (9°)

Diode pumping modules

Wavelength	Output power	Efficiency
Based on QCW stack technology		
800-980nm	QCW: Up to 500 W per 10mm bar 5mm and 3mm also available	>65%
1532nm	>50W per 10mm bar	>25%
1550nm	>50W per 10mm bar	>25%
1560nm	>50W per 10mm bar	>25%
Other Wavelengths Available Wavelength Agnostic Technology!		



# HIGH POWER DIODE LASERS



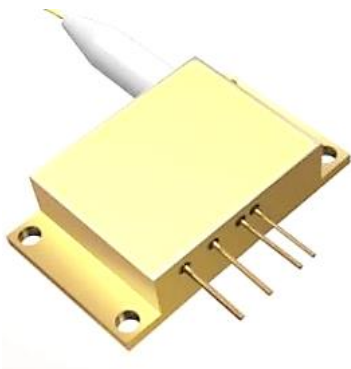
**BWT** Beijing develops and manufactures various diode laser products with wavelength from 405nm to 1470nm, output power from 2mW to 4000W, and integrated functions like aiming beam, internal TEC, fiber sensor etc..

## Single Emitter Diode Laser

### Application examples:

*Fiber laser pumping ,computer to plate (CTP), DPSS laser pumping, medical use, aiming beam, industry.*

*For different applications, varieties of packages with optional functions of aiming beam, photo detector, TEC, fiber detector, thermistor and other functions are available.*

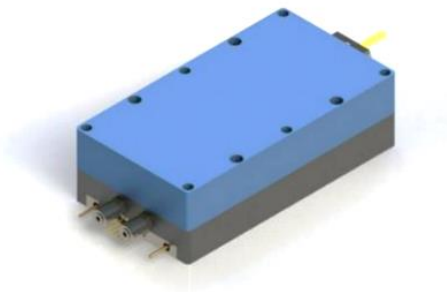


Wavelength (nm)	Type	Output power (W)	Output
445	Single Emitter	0.8, 3	Multimode Fiber
520	Single Emitter	0.005	Multimode Fiber
635	Single Emitter	0.002, 0.02	Single Mode Fiber
785	Single Emitter, Volume Bragg Grating (VBG)	0.6	Multimode Fiber
793	Single Emitter	4	Multimode Fiber
808	Single Emitter	4, 8	Multimode Fiber
830	Single Emitter	1	Multimode Fiber
915	Single Emitter	12	Multimode Fiber
940	Single Emitter	10, 11, 20	Multimode Fiber
960	Single Emitter	9	Multimode Fiber

## Multi-Single Emitter Diode Laser

### Application examples:

*Illumination, Scientific research, Material processing, 3D printing*



Wavelength	Type	Output power (W)	Output
445nm	Multi-Emitter	10, 15, 20, 50	Multimode Fiber
635nm	Multi-Emitter	5	Multimode Fiber
793nm	Multi-Emitter	8, 12, 16, 30, 50, 80, 90	Multimode Fiber
808nm	Multi-Emitter	15, 25, 30, 60, 150	Multimode Fiber
878nm	Multi-Emitter, Volume Bragg Grating (VBG)	30, 65, 120	Multimode Fiber
888nm	Multi-Emitter, Volume Bragg Grating (VBG)	65, 120	Multimode Fiber
915nm	Multi-Emitter	30, 70, 150, 200	Multimode Fiber
976nm	Multi-Emitter	15 , 20, 30, 70, 150, 200, 330, 540	Multimode Fiber
976nm	Multi-Emitter, Volume Bragg Grating (VBG)	18, 27, 60, 100, 140, 180, 400	Multimode Fiber

## Diode System Laser

### Application examples:

Laser Pumping , Medical, Material processing, Scientific Research, 3D printing ...

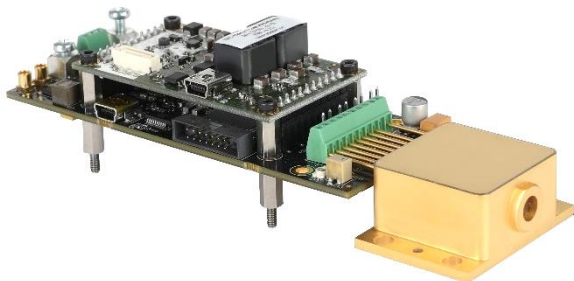


Wavelength (nm)	Output power (W)	Operation mode	Core diameter/ Numeric Aperture
635	Up to 5	CW or Modulated	4/9/105μm 0.22NA
808	Up to 150	CW or Modulated	105/200/400μm 0.22NA
9xx	1 – 400	CW or Modulated	105/135/200/400μm 0.22NA
915/976	1000-4000	CW or Modulated	220/600/800μm
915/980	60-200	CW or Modulated	105/135/200μm 0.22NA
635/808/915/980	0.4, 2, 4, 8, 10, 15, 20, 30, 50	CW/QCW	105/200/300/400μm 0.22NA

**mirSense** is a French high tech company designing and manufacturing high-power QCL (Quantum Cascade Laser) based solutions, typically watt-level in the 4.0µm, 4.6µm, 4.8µm, and 9.5µm wavelengths addressing the defense and industry/environment markets.

The mirSense offer splits into three product lines :

- uniMir: DFB Lasers (for spectroscopy)
- powerMir: high power Lasers (for defense and security)
- multiSense: OEM Laser gas analyser (for industry/environment) mirSense patented QCL technologies bridge the gap between high performance, miniaturization and cost effectiveness.



Wavelength	Power	Product line	Options
~4.0µm	>1W	PowerMir high-power QCL pulsed lasers	<ul style="list-style-type: none"><li>• Plug-and-play turnkey system</li><li>• OEM system (laser+electronics board)</li><li>• HHL-packaged laser</li><li>• Laser chips</li></ul>
~4.6µm	>1W		
~4.8µm	>1.5W		
~9.5µm	>200mW		
10 to 17 microns	<20mW	UniMir CW QCL lasers	<ul style="list-style-type: none"><li>• HHL-packaged laser</li></ul>

**QD Laser** delivers laser-based solutions to customers in a broad range of fields, including telecommunications, manufacturing, medicine and consumer products. new semiconductor.

## 1020-1180 nm DFB laser

Application examples:

*Seeder for high power laser: Micromachining, LiDAR, Semiconductor inspection equipment*

Pulse Width	Wavelength	Peak Power (Pulsed)	Optical Power (CW)
15ps	1030nm 1064nm	>50mW	n/a
50ps, 1-20ns	1024-1120nm 1180nm	>100mW	n/a
1-20ns	1030nm 1053nm 1064nm	>300mW >400mW	n/a
CW	1024-1120nm 1180nm	n/a	>30mW



## 1240-1300 nm quantum dot laser

Application examples:

*Silicon photonics, Underground resources exploration (175-200°C)*

Wavelength	Type	Form	Output Power (mW)
1300nm	FP	Chip, TO-CAN	>10
1300nm	DFB	Chip, TO-CAN	>10
1240nm	DFB	Chip, TO-CAN	>10



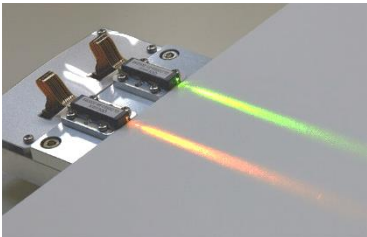
## Epitaxial wafer on GaAs substrate

Wavelength	Type	Form
1120-1310nm	Epitaxial wafer	Wafer



532, 561, 594nm compact visible lasers

Application examples:  
Biomedicine: Flow cytometry, Fluorescence microscopy

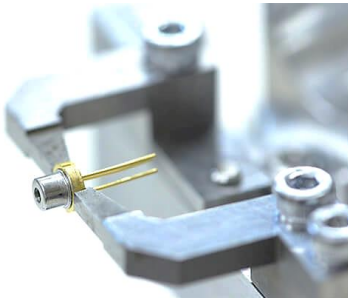


		Standard type	Fiber pigtailed type	CW driver integrated BOX
Wavelength		532, 561, 594nm	532, 561nm	532, 561, 594nm
Light output		Free space	Optical fiber	Free space
Output power	CW to 100 MHz	532nm: 20, 30mW 561nm: 5, 20, 30, 50mW 594nm: 5, 20mW	SMF/PMF: 15mW MMF: 25mw	20mW CW only
	50ps Gain switching mode	50ps Gain switching mode	532nm: 20mW 561nm: 50mW 594nm: 20mW	n/a
Required instruments		<ul style="list-style-type: none"><li>Current sources: 2 units</li><li>Temperature controller: 1 unit</li></ul>		PC

640-940nm High Power lasers

Application examples:  
Particle counter, Leveler, Machine Vision, LiDAR, Biomedical equipment, Color Projector, Visible Light Communication

Wavelength	Output Power (mW)	Operating Temperature °C
640-940nm	30-250	-10 - 70





Tunable Littrow and Cateye Lasers

**MOGLabs** is a company of in-the lab scientists and engineers that focus on developing scientific instrumentation from a researcher perspective.

Application examples:  
*Laser cooling and trapping, Bose-Einstein condensation, Quantum optics: squeezed light, Electromagnetic transparency and slow light, Time and frequency standards, Laser spectroscopy*



	Littrow Laser - LDL	Cateye Laser - CEL
Wavelength	368nm to 1612nm	450 – 530nm; 630 – 1620nm
Output power	Up to 250mW	Up to 250mW
Linewidth	diode dependent	diode dependent
	Typically <200kHz, diode dependent Modulation - 20MHz bandwidth, AC or DC coupled, 20ns latency RF bias tee option: >2.5GHz bandwidth	Typically 2.5GHz bandwidth AC or DC coupled, 2.5GHz bandwidth
Coarse tuning range	Up to 50nm for single diode	Diode dependent; e.g. 776nm – 802nm or 850 – 895nm (single diode)

# INDIVIDUAL DIES/CHIPS, LASER MODULES, LASER SYSTEMS, LASER PRODUCTS



**Modulight** designs and manufactures lasers and optics for personalized medicine and better life. They provide supporting laser solutions like system integration service and laser design & manufacturing.

Application examples:

*Biomedicine: Oncology, Genetics and Ophthalmology/ Quantum computing, lidar, digital printing, , 3D sensing, Diagnostics, displays*

### Medical Laser System ML7710

Clinical laser system platform, suitable for various medical applications, **ML7710** can house up to 8 lasers optionally with aiming beams. Each laser can be individually configured with a graphical touchscreen interface.



### Plug and Play stand-alone laser products

#### Mutli-wavelength laser sources ML 6600

**ML6600** is a small plug-and-play laser system for users that don't have time or interest for all the complexity with drivers, cooling, power supplies, etc. Just unbox it, and take into use!



#### Single-wavelength laser source ML 6500

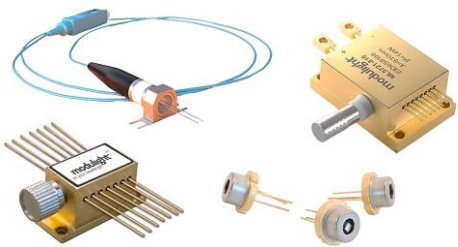
**ML6500** is a laser system which contains one built-in laser. ML6500 includes all necessary electronics, wrapped up in a conveniently small package.

ML6500 is controlled by a PC software or directly by analog/digital signals.



### Low power Fabry Perot/DFB/Customized laser chips / TO-CAN modules/pigtail

Wavelength	400–2000 nm
Output Power	1mW to 10W
Operation mode	CW / QCW / Pulsed
Fiber optics	Single mode / Multimode



### Single-frequency diode lasers in butterfly package/ Visible light Individual Addressable Bar (IAB)



Advacam's imaging cameras are direct conversion single photon counting pixel detectors that represent the cutting edge of current radiation imaging technology. The technology allows material specific information to be displayed in colors.

Application examples:  
*Non-Destructive Testing, Small Animal Spectral Imaging, X-ray diffraction*



Model	Characteristics	Speed	Size
ADVAPIX TPX3	Fast Spectral Imaging Camera	40M hits/s	65K pixels
MINIPIX TPX3	Miniaturized Spectral Imaging Camera	2.35M hits/s or 16 fps	65K pixels
WIDEPIX 2(1)X5 - MPX3	Industrial Spectral Imaging Camera	20 (50) fps	655 (328) K pixels
WIDEPIX 10X10	Custom Large Area Imaging Camera	10 fps	6.5M pixels



**Imagine Optic** is a company specializing in wavefront expertise. It has a strong engineering and R&D culture providing ultra-precise wavefront sensors and adaptive optics solutions.

Adaptative optics for ultra-high intensity lasers

ILOA Star is the first stepper-motor deformable mirror dedicated to ultra-intense lasers that can perform wavefront correction during full-power operation. Its customizable design will perfectly fit any laser characteristics.

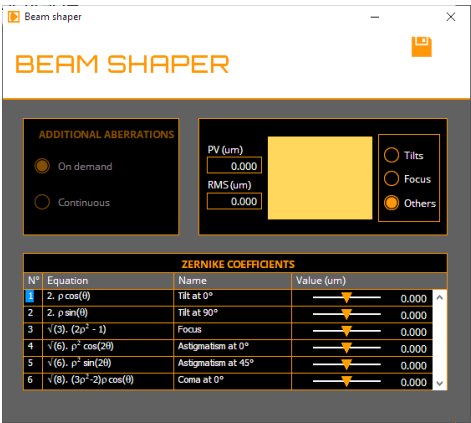
Example	Angle of Incidence	Correction Beam Size	Number of actuators
ILOA STAR 50	<10°	Circular, Φ 22 mm	19
ILOA STAR 100	5°	Circular, Φ 30 mm	37
ILOA STAR 200	45°	Elliptical, Φ 80 × 110 mm	37
ILOA STAR 400	45°	Rectangular, Φ 140 × 200 mm	52



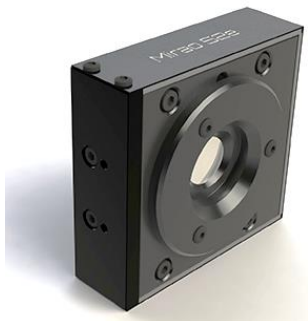
Wavetune

Perfect loop control for imperfect wavefronts

Unique application that seamlessly combines wavefront measurement and correction features with extensive instrument diagnostics.



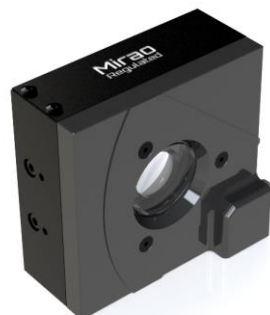
## Microscopy and Bio-Imaging



### MIRAO 52E

#### Optimized for closed-loop operations

Mirao 52e deformable mirror offers an exceptionally large stroke and high optical quality combined with low power consumption. It incorporates 52 electromagnetic actuators and provides an exceptional 50  $\mu\text{m}$  PV deformation amplitude.



### MIRAO 52ES

#### For long-term wavefront stability

The exceptional feature of Mirao 52es deformable mirror is its long-term stability in an open-loop mode, with typical drift of less than 10 nm RMS after 12 hours and up to 3 days.



### MICAO 3DSR

#### High Resolution 3D for SMLM

MicAO 3DSR is the first plug & click adaptive optics device dedicated to 3D single molecule localization microscopy techniques.



### AO KIT BIO

AOKit Bio is a set of adaptive optics components composed of a wavefront sensor, either HASO4 First or HASO4 SWIR, a deformable mirror or phase modulator, and WaveTune adaptive optics software

Shack – Hartmann and Hartmann WFS

Metrology application examples:  
High spatial sampling frequency, Very large dynamic range, Freeform optics characterization, Aspheric optics characterization, High spatial frequency aberrations



Product name	Absolute Accuracy (RMS $\lambda/n$ )	Repeatability (RMS $\lambda/n$ )	Microlens number	Pupil Size (mm <sup>2</sup> )	Max Freq. (Hz)	Wavelength (nm)
HASO Lift 272	100	200	50 x 68	5.2 x 7.0	20	400-800
HASO Lift 680	100	200	126 x 170	10.21 x 13.78	30	400-800
HASO SWIR	100	200	32 x 40	7.44 x 9.30	150	900-1700
HASO SWIR 1550	35	70	32 x 40	3.60 x 4.5	99	1500-1600
HASO4 Broadband	100	200	50 x 68	5.2 x 7.0	20	350-1100
HASO4 126 VIS	100	200	126 x 170	10.21 x 13.7	30	400-800
HASO4 FIRST	100	200	32 x 40	3.6 x 4.6	99	400-1100 <sup>(3)</sup>
HASO4 FAST	100	200	16 x 16	1.19 x 1.19	1000	400-900
HASO EUV	50	200	72 x 72	13 x 13	1	4-40
HASO HXR	10	30	150 x 150	3 x 3	10	0.05-0.25 (5-25 keV)



R-Flex2 is the second generation of our versatile optical metrology system that instantly combines any of our HASO4 wavefront sensors in the 400 – 1100 nm range with a collimator and a light source.



The R-FLEX2 SWIR metrology system is the second generation of our versatile optical metrology system in the 1000-1700 nm range. It instantly combines our HASO4 SWIR or HASO4 SWIR 1550 wavefront sensors with a collimator and a light source.



The R-Flex LA is the collimating platform that extends the capabilities of the HASO R-Flex2 to large optics and optical surfaces. The output collimated beam size ranges from 30 to 150 mm.



The R-Flex LA is the collimating platform that extends the capabilities of the HASO R-Flex2 SWIR to large optics and optical surfaces. The output collimated beam size ranges from 30 to 150 mm.



The Optical Engineer Companion combines any of Imagine Optic's 9 compatible HASO wavefront sensors in the 400 – 1100 nm, or in the 1000-1700 nm range, with a collimator and a light source.



# LIGHT SHAPING PRODUCTS



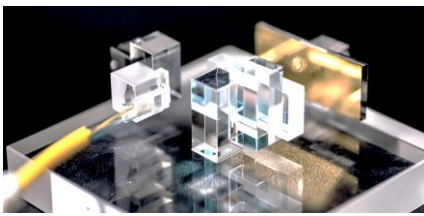
**Cailabs** has mastered light shaping so that it can design, manufacture and sell innovative photonic products for free-space transmission, industrial lasers, local area networks (LANs) and telecommunications.

Application examples:  
*Space, Aeronautics, Defense, Laser Machining, Local networks, Telecom networks, Energy*



**TILBA-ATMO**

optical receiver is designed to improve the reliability of free-space optical links in the presence of atmospheric turbulence or pointing errors



**TILBA-EMIT**

optimally combines several optical sources in a coherent manner, to increase their range and accuracy



**CANUNDA**

solution provides high-power continuous or pulsed beam shaping to boost all kinds of laser machining processes

## AUTOCORRELATOR / BEAM PROFILER / MINI IMAGING SPECTROMETER

**Femto Easy** products are designed to provide accurate and reliable measurements, whatever the experimental conditions. They can yield proper measurements without caring about the accuracy of the alignment.



**Autocorrelator**

Model type	Single-Shot / Multi-Shot
Use case	Single pulses and repetitive pulses / Repetitive pulses
Pulse duration	5 – 1500fs
Spectral range (nm)	480 – 2100 / 700 - 900 Ti:Sa / 1020 - 1080 Yb



**Mini Imaging Spectrometer**

Spectral range:  
240 – 1100nm



**Beam Profiler**

Spectral range:  
375 – 1100nm /  
190 – 1100nm with UV option



**mirSense MultiSense** module is a OEM multigas on line analyzer for industrial use, specifically designed to meet the expectations of integrators, gas system manufacturers, gas analyzer manufacturers...

Gases such as H<sub>2</sub>O, NH<sub>3</sub>, CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, SF<sub>6</sub> and CF<sub>4</sub> (SO<sub>2</sub> and benzene) can be simultaneously detected in real time at ppm, even ppb trace concentrations, levelling up to percent, with a high level of specificity / reliability.



Gases	Range* (ppm)	Detection limit** (ppm)	Precision***
H <sub>2</sub> O	0.2 – 1 000	0.2	<1 %
NO	0.5 – 1000	0.5	<1 %
NO <sub>2</sub>	0.5 – 1000	0.5	<1 %
N <sub>2</sub> O	0.15 – 100	0.15	<1%
NH <sub>3</sub>	0.05 – 100	0.05	<1 %
CO	0.1 – 100	0.1	<1 %
CO <sub>2</sub>	1 – 4 000	1	<1 %
CH <sub>4</sub>	0.4 – 500	0.4	<1 %
SF <sub>6</sub>	0.02 – 150	0.02	<1%

\*Indicative values, depending on application/gas matrix – \*\* 3 G, 60 s integration time – \*\*\* % of the measured value or LOD

# LASER WAVEMETER



**MOGLabs** is a company of in-the lab scientists and engineers that focus on developing scientific instrumentation from a researcher perspective.



## Fizeau wavemeter (FZW)

a compact wavelength measurement device based on Fizeau interferometers, providing reliably accurate measurements over a wide range of wavelengths (400-1100nm) without recalibration.



## Economical Wavemeter (MWM)

clearly reveals multimode laser operation, making it particularly suitable for use with external cavity diode lasers and atom cooling and trapping experiments.

# LOCK-IN AMPLIFIER / IMPEDANCE ANALYZER / WAVEFORM GENERATOR



**Zurich Instruments** is a test and measurement company headquartered in Zurich, Switzerland, developing and selling measurement instruments.

## Lock-in Amplifier MFLI 500 kHz / 5 MHz

- DC - 500 kHz / 5 MHz, 60 MSa/s, 16 bits
- Current and differential voltage inputs
- Plug & Play with embedded LabOne® Web Server

## Impedance Analyzer MFIA 500 kHz / 5 MHz

- 1 mHz to 5 MHz, 1 mΩ to 1 TΩ
- Fast and accurate measurements
- Ideal fit for DLTS, MEMS and ESR & ESL applications



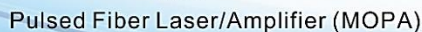
## Arbitrary Waveform Generator HDAWG 750 MHz

- 2.4 GSa/s, 16 bits, 750 MHz signal bandwidth
- 5 Vpp maximum amplitude
- Scalable up to 144 output channels
- Highest channel density available
- Less than 50 ns trigger-to-output delay

## Arbitrary Waveform Generator UHFAWG 600 MHz

- Dual 600 MHz arbitrary waveform generator
- 14-bit resolution, 2 markers per channel
- 128 MSa waveform memory per channel
- Amplitude modulation with internal and external phase reference
- Two 600 MHz signal inputs with oscilloscope and optional demodulation, pulse counter, boxcar averager
- Cross-trigger engine for low-latency triggering and sequence branching.

## High Power CW Fiber Laser



- 32

## High Power Pump Combiner – Nx1 Pump Combiner



Typical Product Highlight:

Configuration	Input Fiber	Output Fiber	Power Handling	Efficiency
2x1	105/125 0.15NA	105/125 0.22NA	≤200W/Port	>90%
7x1	105/125 0.15NA	200/220 0.22NA	≤200W/Port	>90%
7x1	200/220 0.22NA	20/400 0.08/0.46NA	≤1000W/Port	>98%
19x1	105/125 0.15NA	400/440 0.22NA	≤200W/Port	>97%
19x1	105/125 0.22NA	20/400 0.8/0.46NA	≤200W/Port	>99%
37x1	105/125 0.22NA	20/400 0.8/0.46NA	≤200W/Port	>98%

## High Power Pump Signal Combiner – (N+1) x1 Pump Signal Combiner

Typical Product Highlight:

Configuration n	Pump Fiber	Input Fiber	Output Fiber	Power Handling	Efficiency
(2+1)x1	105/125 0.22NA	x/125 SCF/DCF	y/125 DCF y/250 DCF	≤200W/Port	>90%
(2+1)x1	105/125 0.22NA	x/250 SCF/DCF	y/250 DCF y/400 DCF	≤200W/Port	>90%
(2+1)x1	200/220 0.22NA	x/250 SCF/DCF	y/250 DCF y/400 DCF	≤200W/Port	>90%
(6+1)x1	105/125 0.22NA	x/125 SCF/DCF	y/250 DCF y/400 DCF	≤200W/Port	>98%
(6+1)x1	200/220 0.22NA	x/250 DCF x/400 DCF	y/400 DCF	≤1000W/Port	>98%
(18+1)x1	105/125 0.22NA	x/125 SCF/DCF	y/250 DCF y/400 DCF	≤200W/Port	>97%

## High Power Signal/Beam Combiner

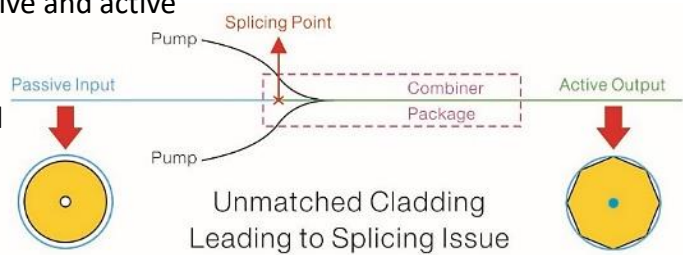
Typical Product Highlight:

Configuration	Input Fiber	Output Fiber	Power Handling	Efficiency
3x1	20/400 DCF	100/120/360 0.22NA	Up to 1500W/Port	>97%
3x1	25/400 DCF	100/120/360 0.22NA	Up to 1500W/Port	>97%
4x1	20/400 DCF	100/120/360 0.22NA	Up to 1500W/Port	>97%
4x1	25/400 DCF	100/120/360 0.22NA	Up to 1500W/Port	>97%
7x1	20/130 DCF	100/120/360 0.22NA	Up to 800W/Port	>97%
7x1	25/250 DCF	100/120/360 0.22NA	Up to 200W/Port	>97%

## Active Fiber Combiner

### Features:

- Output fiber to be active fiber (only available in side pump scheme)
- Eliminate splicing difficulty between passive and active fiber
- Reduce heating issue at splicing point
- Increase signal isolation to pump channel



## NxM Combiner Splitter

### Features:

- Used for sensing application in electric power and illumination aerospace etc.
- Excellent total transmission efficiency and beam splitting uniformity
- High power handling capability and high reliability



## 1μm 300mW – 2W Low Power Optical Isolator

Typical Product Highlight:

Operating Wavelength	Polarization	Power Handling	Insertion Loss (1mW/Max. Power)	Isolation Bandwidth/ Peak Isolation
1064nm±5nm	non-PM	500mW	≤2.0/2.2dB	≥30/38dB
1064nm±5nm	non-PM	2W	≤2.2/2.6dB	≥28/35dB
1064nm±5nm	PM	300mW	≤2.0/2.2dB	≥30/38dB
1064nm±5nm	PM	1W	≤2.2/2.6dB	≥28/35dB

## 1μm 10W – 100W High Power Optical Isolator

Typical Product Highlight:



Operating Wavelength	Configuration	Power Handling	Insertion Loss (1mW/Max. Power)	Isolation Bandwidth/ Peak Isolation
1064nm±5nm	In-Line	10-100W	≤1.2dB	≥28/35dB
1064nm±5nm	Fiber in, Free space out	10-100W	≤0.5dB	≥28/35dB
1064nm±5nm	Fiber in, Beam expander out	10-50W	≤0.5dB	≥28/35dB

## 1550/2000nm High Power In-Line Optical Isolator

Typical Product Highlight:



Operating Wavelength	Polarization	Power Handling	Insertion Loss (1mW/Max. Power)	Isolation Bandwidth/ Peak Isolation	Fiber Type
1550nm	PM & non-PM	500mW	≤0.3dB	≥30dB	SMF-28e PM 1550...
1550nm	PM & non-PM	<5W	≤0.4dB	≥30dB	
1550nm	non-PM	5-10W	≤0.5dB	≥30dB	
2000μm	PM & non-PM	500mW	≤1dB	≥30dB	SM28e, SM1950, PM1950, PM1550...
2000μm	PM & non-PM	<5W	≤1dB	≥20dB	



## Cladding Power Stripper

Typical Product Highlight:

Fiber Type	Stripping Efficiency	Stripping Power Handling	Package Cooling Type
PM or non-PM x/125 DCF	>20dB	<40W	Passive Cooling
PM or non-PM x/250 DCF	>17dB	<200W	Passive Cooling
PM or non-PM x/250 DCF	>17dB	200-800W	Direct Water Cooling
PM or non-PM x/400 DCF	>17dB	<200W	Passive Cooling
PM or non-PM x/400 DCF	>17dB	200-800W	Direct Water Cooling

## Mode Field Adaptor

Typical Product Highlight:

MFA Type	Input Fiber (PM/non-PM)	Output Fiber (PM/non-PM)	Insertion Loss
Forward (Small-Large)	x/125	y/125	≤0.5dB
Forward (Small-Large)	x/125	y/250	≤0.5dB
Forward (Small-Large)	x/125	y/400	≤0.5dB
Backward (Large-Small)	y/125	x/125	≤0.7dB
Backward (Large-Small)	y/250	x/125	≤0.7dB
Backward (Large-Small)	y/400	x/125	≤0.7dB

# HIGH QUALITY SPECIALTY OPTICAL FIBER SOLUTIONS



**CeramOptec®** specializes in the manufacture of multimode fiber optic cables made from quartz glass. The company's range comprises optical fibers, optical fiber bundles, assemblies and cables for numerous application areas, amongst these industrial and medical laser applications, aerospace sensor systems and spectroscopic applications in the fields of astronomy and the chemical industry.

## Preforms

CeramOptec® covers the entire manufacturing chain from the preform to full fiber assembly. The preform largely defines both optical properties and the geometry of the all-silica fiber drawn from it.



## Fibers

CeramOptec® specializes in custom optical fiber products for every application, with a wide range of specs from high NA to low NA, a large selection of core diameters, and a variety of wavelength options, from deep UV to MIR.



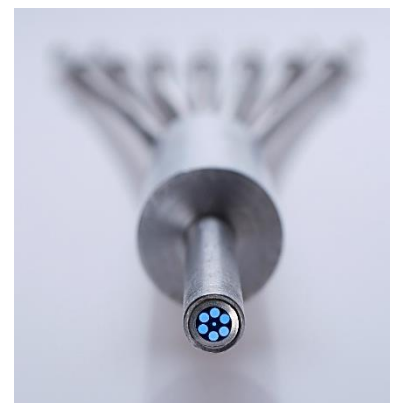
## Fiber cables

CeramOptec® offers a comprehensive range of cables and high-power cables tailored to your specific application needs. CeramOptec® is able to supply cables that meet the most demanding requirements regarding quality and fiber optic properties.



## Fiber bundles

Manufacturing custom bundle configurations is CeramOptec® specialty - any fiber, any design, for any application. Custom ferrules, machined in-house – or all standard connectors – are available.



## Fiber Assemblies

CeramOptec® in cooperation with Ceram Optec SIA manufactures a comprehensive line of assemblies, cable assemblies, bifurcated assemblies, patch cords, pigtails, bundles, and more - all custom designed to your specifications to suit applications from the deep UV to MIR.





## Non-linear crystals and Electro-optic Products

**Cristal Laser** is a technology leader that grows and fabricates non-linear optical crystals such as LBO, KTP, KTA, and RTP crystals for Electro-optics.

### Non-linear Optics

- LBO crystal
- KTP / KTP.fr
- KTA crystal
- RTP crystal

#### Application examples:

*Green and UV high power industrial lasers, Green lasers for Ti:Sapphire pumping, OPA/OPCPA applications, Biophotonics & medical lasers*



### Electro-optic Products

- RTP Pockels cell
- RTP pairs
- RTP modulator

#### Application examples:

*Phase-modulation, Single-frequency lasers, Amplitude modulation*



**Covesion** has more than 20 years' experience in the research, development and manufacture of commercial PPLN solutions..

## MgO:PPLN Crystals

Covesion's Magnesium-doped Periodically Poled Lithium Niobate (MgO:PPLN) crystals offer high efficiency wavelength conversion for visible and mid-infrared applications.



## PPLN Waveguides

PPLN waveguides facilitate highly efficient and cost-effective frequency conversion, providing a route to accessing wavelengths that are presently unavailable from commercial laser sources.

Select from our range of PPLN waveguide chips for the highest conversion efficiencies or our packaged PPLN waveguides for instant connectivity and rapid integration.



## Laser Crystals

**Cryslaser** grows large diameter YAG series crystals using the Czochralski technique, including Nd:YAG, Nd:Ce:YAG, Cr<sup>4+</sup>:YAG, Yb:YAG, Er:YAG and undoped YAG.

### Nd:YAG

- High gain
- Low threshold
- High efficiency
- Low loss at 1.06um
- Good thermal conductivity and thermal shock characteristics
- Mechanical strength
- High optical quality



### Er:YAG

- Very high slope efficiency
- Operates well at room temperature
- Operates in a relatively eye-safe wavelength range



### CTH:YAG

- High slope efficiency
- Pumped by flash lamp or diodes
- Operates well at room temperature
- Operates in a relatively eye-safe wavelength range



# MOTORIZED LASER ATTENUATORS and BEAM EXPANDERS



**Optogama** is a high-tech company that designs, develops and commercializes custom and unique laser products.

Application examples:

*Precise laser micromachining, Research*

## Motorized laser beam expanders MEX

### Compact motorized laser beam expanders MEX

- Highest beam pointing stability ( $< 0,1$  mrad)
- All-in-one design with integrated controller
- Two lenses simultaneous movement assuring no misfocus
- Absolute encoder (both lenses)
- Adjustment time  $< 1s$  (all magnifications)
- Fused silica optical elements
- No homing after switching on/off
- Diffraction limited performance for all magnification



### High-power motorized beam expanders MEX-HP

- High power optical design (up to 200 W @ 1030 nm, 500 fs, 1 Mhz)
- No internal reflections on optical elements
- High beam pointing stability  $< 0,2$  mrad
- All-in-one design with integrated controller
- Two lens simultaneous movement assuring no misfocus
- Absolute encoder (both lenses)
- Fused silica optical elements
- Diffraction limited performance for all magnifications



## Motorized laser attenuators



	Clear input aperture	Clear output aperture	Power attenuation range	Available Coatings
Motorized laser attenuator	$\varnothing 18$ mm	$\varnothing 18$ mm	0,1 - 98%	1064 nm, 1030 nm, 532 nm, 515nm, 355 nm, 343 nm, custom

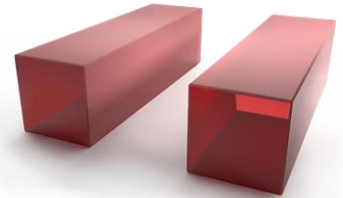


**Optogama** under its product line **4Lasers** offers the highest quality optical components and crystals for UV, VIS and NIR applications. Whether you are setting up your laser experiment or integrating a commercial product, we have competitively high performance components for your needs.

## Crystals

**4Lasers** offers wide range of crystals:

Laser crystals, Passive Q-switch crystals, Nonlinear crystals, Raman crystals, Photorefractive crystals, Scintillation crystals



## Laser components

**4Lasers** provide a standard list of laser components, which include dielectric thin-film mirrors, metal-coated mirrors, beamsplitters, lenses, prisms, windows, substrates, and filters for ultraviolet, visible, and infrared applications



## Polarization optics

**4Lasers** provide optical elements for polarization manipulation and control. Standard components include quarter-wave and half-wave three types of waveplates: zero-order compensated, air-spaced crystalline quartz waveplates, crystalline quartz and magnesium fluoride achromatic waveplates for broadband applications, and zero-order, monolithic design Mid-IR (MWIR, LWIR) waveplates. Standard polarization optics also include birefringent and thin-film polarizers: Glan-type polarizers, polarizing cubes, Brewster-type thin-film, and high-contrast thin-film polarizers for UV, VIS, and NIR applications.



## Beam delivery devices

**4Lasers** design and manufacture compact laser beam delivery systems, laser beam expanders, reducers, divergence compensators and laser power attenuators, which are used to increase or decrease laser beam diameter, control beam divergence, and adjust laser power.





# NANOSECOND/PICOSECOND/FEMTOSECOND LASER MACHINES



**Lasea** is manufacturing a large range of micromachining workstations starting with compact nanosecond or picosecond lasers to high precision, flexible femtosecond laser machines with robot option for applications such as cutting, drilling, texturing, engraving, marking, welding and thin layer removal. LASEA applies its expertise in many demanding industries such as luxury (watch making and jewellery), medical devices manufacturing, pharmaceuticals, electronics, automotive, R&D centers,... The company is located in Belgium, in France, in Switzerland and in the United States.

## OPTEC LightShot LSV3

### *UV Excimer Catheter Processing Workstation*

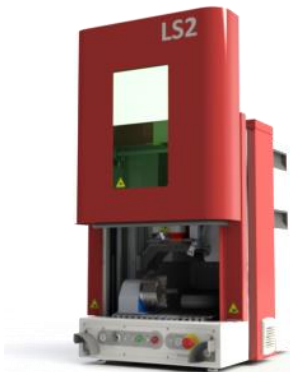
Versatile, robust and easy to use, the LightShot V3 (LSV3) makes it possible to bring laser processing in-house and reduce manufacturing costs, without the need for a skilled technician.



## OPTEC ECHO 360: FINE-WIRE, UV LASER STRIPPER

### *A turnkey workstation from the A-thermal laser experts*

Throughput equal to multiple mechanical & chemical stripping stations. Residue-free ablation of most polymers and other coating materials. No handling or wire rotation needed for perfect results every time.



## LS2

### *Easy, reliable, ultra compact*

Designed for the marking of small parts, the LS2 workstation is a class 1 machine for bench mounting. Its robust design (welded mechanical structure) enables operation in the most demanding of environments. picosecond lasers integration installation.

## LS3

### *The ultra-compact machine*

Specifically designed for micromachining applications in a industrial environment and integrates Lasea's complete rang of laser sources. It is compact, robust, modular and flexibl machine thanks to its multiple options that allow micromachining applications with high quality.





# NANOSECOND/PICOSECOND/FEMTOSECOND LASER MACHINES



## LS4

***The accurate, compact, modular, upgradeable micromachining machine***



The LS4 has been specifically designed for micromachining applications in an industrial environment and integrates Lasea's complete range of laser sources. It is a modular and flexible machine thanks to its options developed to reach extreme precisions.

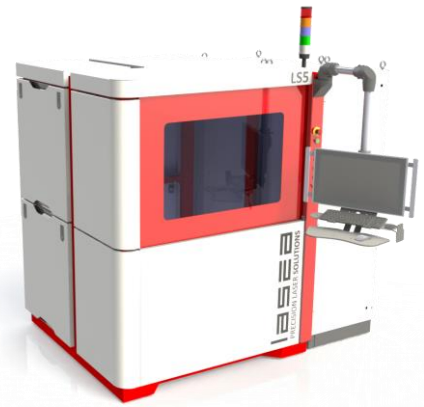
The 3D version allows micromachining of complex 3D pieces thanks to the combination of mechanical axis and optical axis movements.

## LS5

***The flexible machine for high precision micromachining***

High precision work can be achieved with no risk of external disturbance thanks to its granite structure and external enclosure perfectly isolated from the internal structure. The LS5 can include all kinds of laser sources (some of the most powerful of the market), including femtosecond sources of micromachining, or even multiple lasers for more flexibility.

The 3D version allows micromachining of complex 3D pieces thanks to the combination of mechanical axis and optical axis movements. The integration of a robot in the enclosure (or externally) combined with a double-head make it an ideal machine for production environments.



## SPECIAL LASER MACHINES

***The laser machine that you need. With an experienced partner.***



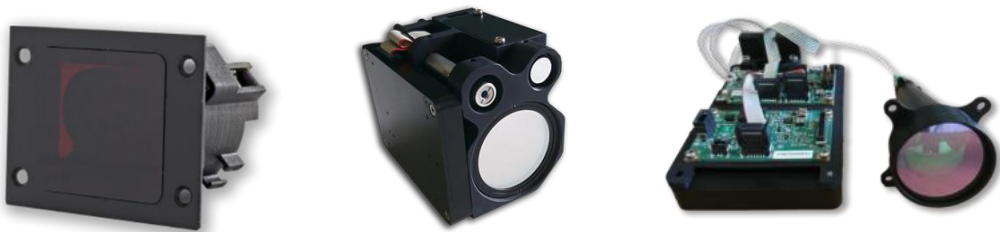
The Lasea laser systems have been specifically designed for simple and rapid integration into our workstations or the specific environments of our customers, for which we can design an appropriate solution.



OEM Laser Rangefinders for Defense & Security applications

SensUp is an innovative affiliated company of the Lumibird Group which designs, manufactures and commercializes LiDARs and laser range finders.

Application examples:  
Defense, 3D mapping, Preventive industrial maintenance, Topography, Environment, Wind sensing / wind measurement, UAS/UAV/RPAS/MAV



	LRF 905 SR <i>OEM mini Laser Altimeter for UAVs</i>	LRF 1550 MR <i>Military qualified and industrialized Laser Rangefinder</i>	LRF 1550 SR+ <i>Monochannel &amp; fully fibered OEM Laser Rangefinder</i>
Wavelength	905nm	1556nm	1556nm
Detection range	50m*	14,5km*	8km*
Accuracy	5cm	50cm	50cm
Measurement rate	20Hz	1/5/25Hz**	1/5Hz**
Dimensions/weight	55x45x42mm / 42g	113x81x72mm / 680g	119x70x36mm / 260g
Consumption	2,5W	5W	5W
Eye Safety class	1	1/1M/3B	1/1M

\* On cible with 0,2 albedo  
\* On NATO target, with 0,3 albedo, 20 km visibility  
\*\* Depending on laser class

# HIGH SPEED CAMERAS



**ix Cameras** is a world-leading technology and product company specializing in the field of high-speed (slow motion) imaging. Based on proprietary innovative technologies, we design, build and sell cutting-edge ultra-fast cameras and software for a wide range of advanced scientific research applications

## i-SPEED 2 Series Cameras

*Ultra Compact Slow Motion Digital Cameras*

Application examples:

*Slowing down most life science, auto-crash testing, robotics and machinery applications.*



	220/211	220/221	230
Speed	500 fps @ 1280 x 1024	600 fps @ 1600 x 1600	2,500 fps @ 1280 x 864
Max Frame Rate	79,500 fps	204,100 fps	225,000 fps
Pixel Size	14 $\mu\text{m}^2$	8 $\mu\text{m}^2$	13.7 $\mu\text{m}^2$
Storage	2GB / 4GB / 8GB	2GB / 4GB / 8GB / 16GB	8GB / 16GB
Light sensitivity Mono/Color	2,500 / 2,000	1,200 / 1,000	6,400 / 5,000

## i-SPEED 5 Series Cameras

*Perfect Balance Between Speed, Size and Memory*

Application examples:

*DIC, PIV, motion analysis*



	508	510	513
Resolution/ Frames Per Second*	8.3GP/s	10.3GP/s	13.2GP/s
Speed	3,980 fps @ 1920x1080	4,980 fps @ 1920x1080	6,382 fps @ 1920x1080
Max Frame Rate	1,000,000 fps		
RAM	8/36/72/96/144 GB		
Light sensitivity Mono (Gain off/on) 16,000/125,000			
Light sensitivity Color (Gain off/on) 4,000/32,000			

\*Resolution @ 1920X1080



i-SPEED 7 Series Cameras

Highest Resolutions, Fastest Speeds Available



*Application examples:*  
 PIV, DIC, fluid dynamics, ballistics and a wide range of scientific research.

	717	721	727
Resolution/ Frames Per Second*	17GP/s	21GP/s	27.1GP/s
Speed	5,315 fps @ 2072 x 1536 7,960 fps @ 1920 x 1080	6,642 fps @ 2072 x 1536 9,944 fps @ 1920 x 1080	8,512 fps @ 2072 x 1536 12,742 fps @ 1920 x 1080
Max Frame Rate	2.45 million fps		
RAM	36 / 72 / 96 / 144 / 192 / 288GB	36 / 72 / 96 / 144 / 288GB	
Light sensitivity Mono (Gain off/on) 16,000/125,000			
Light sensitivity Color (Gain off/on) 4,000/32,000			

\*Resolution @ 2072X1536

**UWAVE** designs and manufactures innovative, powerful, and easy-to-use UV curing LED lighting systems for photonics, cosmetics, electronics, medical, chemical or high-tech industries.

Today UWAVE diversifies itself and proposes new solutions for other markets such as fluorescence or UVC disinfection.

## UV Curing Lamps

UV LED spotlight curing systems deliver an optimized curing energy on a very precise point. They can be used manually by an operator or integrated into a high-speed automated assembly line.



UV LED linear light curing systems deliver high curing energy for high-speed processes. Their length can be adapted depending on the conveyor belt and the energy needed.



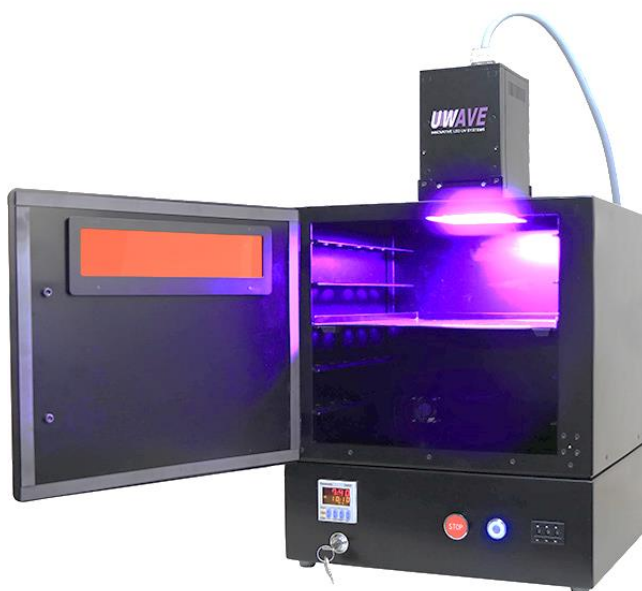
The UV LED curing lamp choice will differ according to insolation surface size, UV power/energy & controlling mode needed.

## UV Chamber

The **UV CHAMBER™** is an easy-to-use UV LED irradiation oven suitable for a wide range of applications: curing, bonding, photolithography or photoaging.

Thanks to its ergonomic design, the **UV CHAMBER™** gives you full control over your UV insolation processes and a great repeatability. You will be able to tune the time, the power of the illumination as well as the working distance.

These combined features make the **UV CHAMBER™** the ideal UV LED irradiation oven for semi-automatic UV curing processes or R&D lab work.



**AERODIODE** offers flexible optoelectronics solutions in the following 4 categories: laser diode drivers (CW, low noise, pulsed laser diode drivers); fiber-coupled laser diode sources; fiber intensity modulators and SOA pulsed drivers; synchronization electronics (pulse delay generator, pulse picker, AWG); and laser diode reliability test systems.



## Drivers

- CW drivers
- Pulsed drivers
- Multi Channel
- High power solutions
- Drivers for fiber lasers
- TDLAS – Gas sensing
- Ultra-low noise driver



## Modulators

- Fiber-coupled AOM
- Pulsed SOA Driver
- Fiber Optic Modulator (SOA-based)



## Synchronization tools

- Pulse delay generator
- Pulse picker
- Digital delay generator
- AWG
- Burst shaper
- Voltage converter



## Test systems

Laser diode qualification and reliability test system in CW or pulsed regime.



LAS Photonics dedicated service team of Engineers assists and supports our customers. Our well trained staff provides installation, repair and equipment maintenance either in our laboratory or on site.

