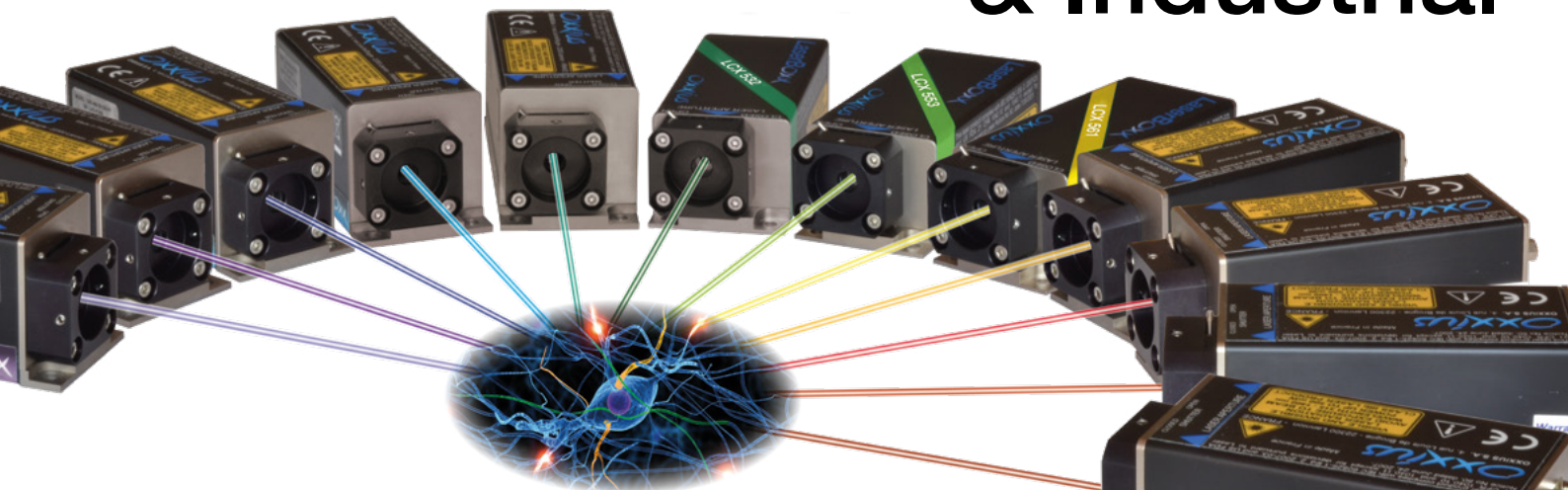


# Biophotonics & Industrial



## LaserBoxx

One platform for all colors

### Low Noise CW Monolithic DPSS benefits

- Up to 500 mW
- Low profile laser head (32 mm)
- Lowest power consumption
  - $\leq 12$  W for LCX's, any wavelength, less than 200 mW
  - $\leq 15$  W for LCX-532 & LPX-640, 500 mW
  - $\leq 15$  W for LCX-561, 300 mW
- Tailored beam diameter capability (0.6 up to 1.4 mm)

### Laser Diode modules benefits

- Fast TTL and analog modulation
- Optional clean up filter

### Common key features

- Ultra Low Noise  $\leq 0.2\%$  rms
- TEM<sub>00</sub> Beam
- Beam pointing  $\leq 5 \mu\text{m}/^\circ\text{C}$
- SM/PM/MM fiber coupling options
- USB and RS232 computer interfaces
- Graphic User Interface with remote diagnostics
- Remote *ControlBoxx* with power display (Plug&Play versions - CDRH)
- Controllers integrated into laser head
- LBX and LCX - Industry standard footprint (100x40 mm<sup>2</sup>)

Super Resolution Imaging  
Confocal Microscopy  
Flow Cytometry  
DNA Sequencing  
Optogenetics  
Fluorescence Excitation  
Wavelength Combiner  
Polymer Curing  
Material Analysis  
Laser Marking

375 405 445 450 473 488 505 515 520 532 553 561 633 638 640 642 647 660 730 785

# Specifications

# Biophotonics & Industrial

Technology	LBX-375	LBX-405	LBX-445	LBX-450	LBX-473	LBX-488	LBX-505	LBX-515	LBX-520	LCX-532L	LCX-553L	LCX-561L	LPX-640L	LBX-633	LBX-638	LBX-642	LBX-647	LBX-660	LBX-730	LBX-785		
	Laser diode										DPSS			Laser diode								
<b>Optical characteristics</b>																						
Emission wavelength (typ.)	375 nm	405 nm	445 nm	450 nm	473 nm	488 nm	505 nm	515 nm	520 nm	532.3 nm	553.0 nm	561.4 nm	639.0 nm	633 nm	638 nm	642 nm	647 nm	660 nm	730 nm	785 nm		
Wavelength range	± 5 nm	± 5 nm	± 5 nm	± 10 nm	± 5 nm	± 5 nm	± 5 nm	± 5 nm	-5/+10 nm	± 0.5 nm			± 1 nm	± 3 nm	-6/+4 nm	-7/+5 nm	-1/+4 nm	-8/+5 nm	± 10 nm	± 10 nm		
Linewidth	≤ 1.5 nm - Clean Up filter (optional)										≤ 0.1 nm			≤ 1.2 nm - Clean Up filter (optional)								
Output power, continuous wave	70 mW	50, 100, 180, 300 mW	100 mW	70 mW	100, 300 mW	50 mW	40, 60, 100, 150, 200 mW	70 mW	150 mW	70 mW	50 mW to 500 mW	50 mW to 200 mW	50 mW to 300 mW	300, 500 mW	100 mW	100, 150, 180 mW	130 mW	140 mW	100 mW	40 mW	100, 250, 350 mW	
Control mode(s)	Automatic Power Control (APC), Automatic Current Control (ACC)										APC			APC, ACC								ACC
Power stability over 8 hours and within ±3°K	± 0.5 %										± 1 %			± 0.5 %								
Power adjustment range	0 - 100%										optional: 30 - 100% or 0 - 100% with L1C-MPA			0 - 100%								
Optical noise % RMS, 10Hz - 20MHz bandwidth	≤ 0.2 %										≤ 0.2 %			≤ 0.2 %								
<b>Transverse singlemode free-space beam *</b>																						
Beam waist diameter (typ.) at 1/e <sup>2</sup> , 50mm from output aperture	0.7 mm	0.7 mm	0.7 mm	0.55 mm	0.8 mm	0.6 mm	0.7 mm	0.7 mm	0.8 mm	0.7 ± 0.1 mm			0.8 mm	0.9 mm	1 mm	1 mm	1 mm	1 mm	0.8 mm	0.5 mm		
Beam divergence at 1/e <sup>2</sup> , full angle, in far field	≤ 1 mrad	≤ 1 mrad	≤ 1.2 mrad	≤ 1.4 mrad	≤ 1.1 mrad	≤ 1.4 mrad	≤ 1.2 mrad	≤ 1.1 mrad	≤ 1 mrad	1.0 to ± 0.2 mrad			≤ 1.5 mrad	≤ 1.3 mrad	≤ 1.3 mrad	≤ 1.3 mrad	≤ 1.3 mrad	≤ 1.3 mrad	≤ 1.7 mrad	≤ 2.3 mrad		
Beam quality factor (M <sup>2</sup> )	≤ 1.3	≤ 1.25	≤ 1.40	≤ 1.25	≤ 1.40	≤ 1.25			≤ 1.1			≤ 1.25										
Beam circularity, in far field	≥ 90 %										≥ 90 %			≥ 90 %								
Beam pointing stability	≤ 5 μrad/°K										≤ 5 μrad/°K			≤ 5 μrad/°K								
Polarization state	linear, vertical at +/-5°										linear, vertical at +/-5° ***			linear, vertical at +/-5° ***								
Polarization extinction ratio (typ.)	100:1										1000:1			100:1								100:1**
<b>Modulation functions</b>																						
<b>Digital modulation</b>	TTL levels										TTL levels			TTL levels								
Max. modulation frequency	150 MHz					15 MHz	150 MHz	150 MHz			DC-20 kHz***			150 MHz								
Rise / fall time, 10%-90%	≤ 2 ns					≤ 20 ns	≤ 2 ns			20 μs			≤ 15 ns	≤ 2 ns								
<b>Analog modulation</b>	0 - 5V input voltage										Optional L1C-AOM DC - 3 MHz			0 - 5V input voltage								
Bandwidth 3dB cut-off frequency, ACC mode	≥ 3 MHz										DC-20 kHz***			≥ 3 MHz								
Rise / fall time 10%-90%, ACC mode	≤ 150 ns										20 μs			≤ 150 ns								
<b>PM fiber coupling option *</b>																						
Output power	35 mW	35 mW to 210 mW	70 mW	45 mW	70 mW to 210 mW	35 mW	25 mW to 140 mW	50 mW	105 mW	50 mW	35 mW to 350 mW	35 mW to 140 mW	70 mW to 210 mW	210 mW to 350 mW	70 mW	70 mW to 120 mW	90 mW	95 mW	70 mW	25 mW	70 mW to 240 mW	

Other available wavelengths: 395 nm, 415 nm, 705 nm, 808 nm, 830 nm, 980 nm, 1064 nm  
 \* Specifications at nominal power \*\* Polarization ratio is not specified for LBX-638-180 and for LBX-785-250/350 \*\*\* preliminary

Version	LCX, LPX, LBX	LCX & LPX	LBX
	Plug and play	OEM	OEM
CDRH compliance	Yes	No	No
Device qualification	CE		
Operating temperature	10 - 38 °C (ambient)	10 - 50 °C (baseplate)	
Power Consumption	≤ 25 W	≤ 20 W	≤ 10 W
Storage temperature	0 - 60 °C		
Supply voltage	100 - 240V AC external power supply	5 - 12V DC	
Warm-up time	≤ 10 minutes (LCX, LPX) / ≤ 2 minutes (LBX)		
Communication interfaces	USB, RS-232, dedicated I/O interface		
Laser head dimensions	see drawings	100 x 40 x 32 mm <sup>3</sup> (LCX) 120 x 40 x 32 mm <sup>3</sup> (LPX)	100 x 40 x 40 mm <sup>3</sup>
Laser head weight	≤ 600 g including heatsink	≤ 250 g	≤ 330 g
Electronic	integrated into laser head		
<b>Controller Plug&amp;Play</b>			
Controller (LCX, LPX, LBX) with power adjustment	ControlBoxx	optional	
Controller (LCX) fixed power	RemoteBoxx		

## Electro-Mechanical shutter option

The ACX-SHTE is a compact and affordable electro-mechanical shutter. It is mounted directly on the LCX or LPX in place of the standard manual shutter.

The fiber coupling and other options are fully compatible with the electro-mechanical shutter.

The ACX-SHTE is actuated via the LCX/LPX embedded software or via a standard TTL signal.



## LCX & LPX - DPSS Monolithic Resonator

### Technology

The unique feature of the LaserBoxx DPSS is a proprietary, Alignment-free Monolithic Resonator (AMR). The elements of resonator are assembled into a single ultra-low-loss optical subsystem, using a proprietary crystal bonding technique.

A highly transparent compound, deposited on chemically activated end-faces of two crystals, creates a bond that is extremely robust over time, temperature variations, and insensitive to mechanical vibrations. Dielectric mirrors coated at the end-faces of the crystals complete the monolithic assembly with no moving parts.



### Benefits of the AMR

The OXXIUS AMR technology offer the highest spectral quality of the market and a high robustness over the time. The LCX & LPX lasers are insensitive to temperature variations and mechanical vibrations. High stability and reliability.

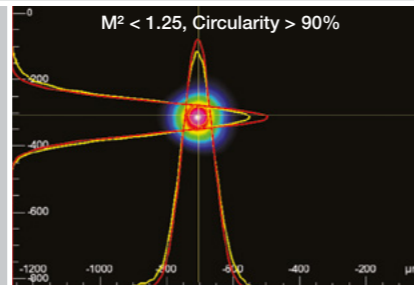
## LBX Platform

### Technology

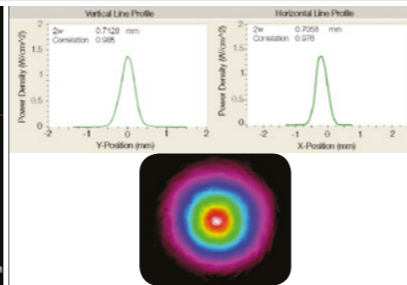
The LBX line is a performing driver integrated platform for laser diode. It provides fast TTL and analog modulation.

### Benefits

The LBX lasers provide superior beam quality, excellent stability and fast modulation capabilities.

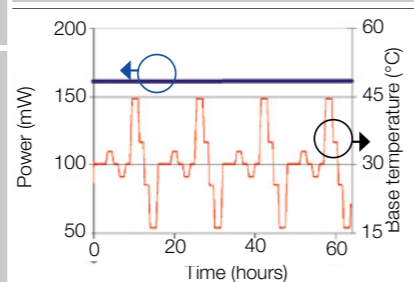


Beam profile - Far Field  
LBX-488-100-CSB-OE

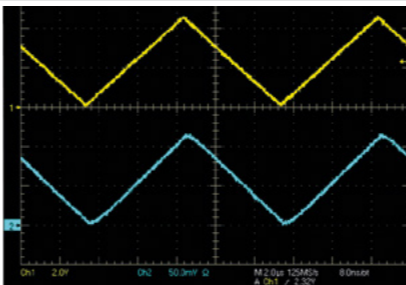
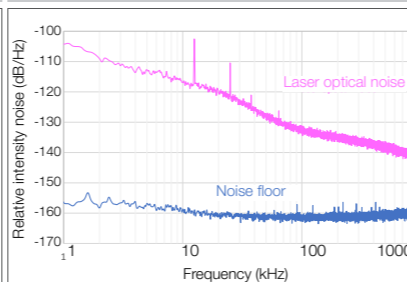


Beam Profile  
LCX-553L-200-COL-PP

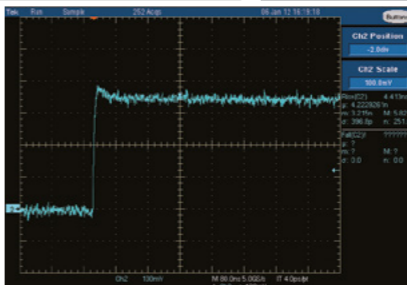
Power Stability  
LCX-561L Power vs temperature



Relative Intensity Noise  
LCX-561L-200



Analog Modulation  
LBX-405-100-CSB  
up to 3 MHz



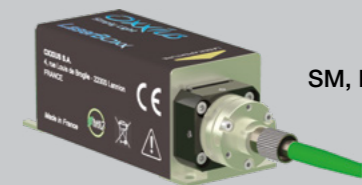
Digital Modulation  
LBX-488-100-CSB  
Rise / Fall times ≤ 2 ns

## Custom Capabilities

- o Tighter wavelength selection
- o Custom wavelengths
- o Wavelengths combiners (L2C, L4Cc, L6Cc)
- o Specific beam diameter or beam shaping
- o Optical isolator
- o Extended operational temperature range

## Fiber coupling options

Fiber coupling options offer rugged and compact solutions to couple LaserBoxx into polarization maintaining fiber, standard single mode fiber or multimode fiber.

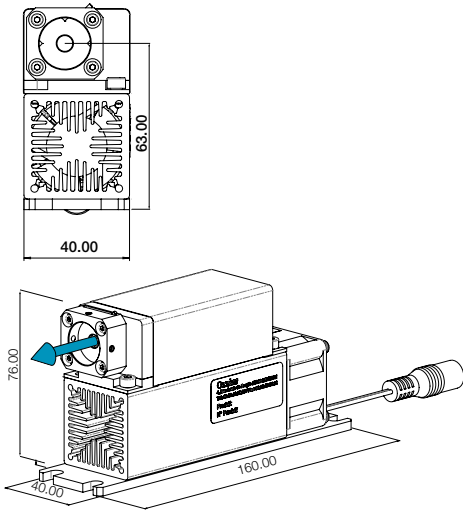


SM, PM & MM Fiber coupling

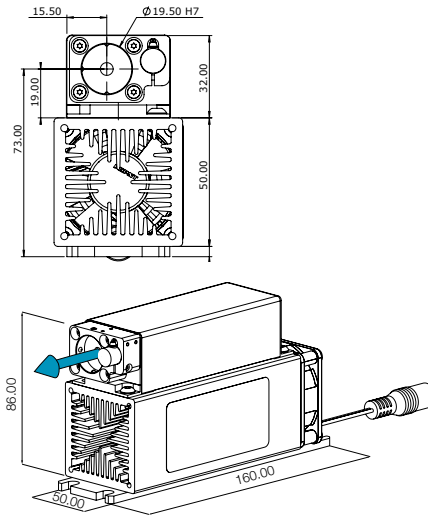
Specifications		
SM and PM Fiber		MM Fiber (50 μm, 0.22 NA)
≥ 70 %	<b>Coupling Efficiency</b>	≥ 80 %
100 : 1	<b>Polarization Ratio</b> (PMF only)	n/a
FC-APC FC/PC, FCP8 on demand	<b>Fiber Output Connector</b>	SMA
± 2 %	<b>Power Stability</b> over 8 hours, ± 1.5 °C	± 2 %
2.0 m	<b>Fiber length</b>	2.0 m

# Mechanical Drawings

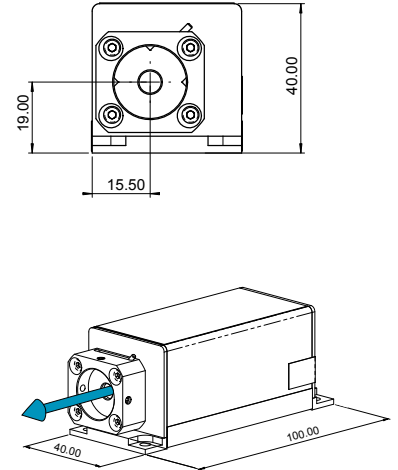
LCX series, Plug & Play  
DPSS Laser



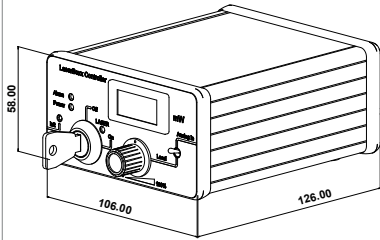
LPX series, Plug & Play  
DPSS Laser



LBX series, Plug & Play  
Laser diode

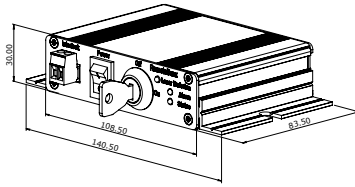


PPA - ControlBoxx



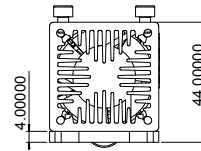
With power adjustable

PPF - RemoteBoxx

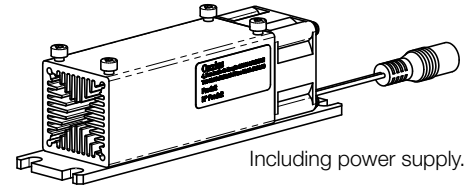


Standard fixed output power

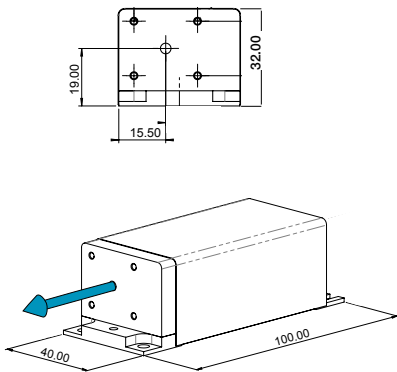
Optional heatsink for LCX and LBX series



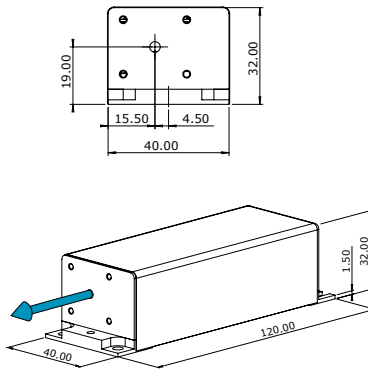
Optional air-forced heat sink for maximum ambient temperature of 38°C.



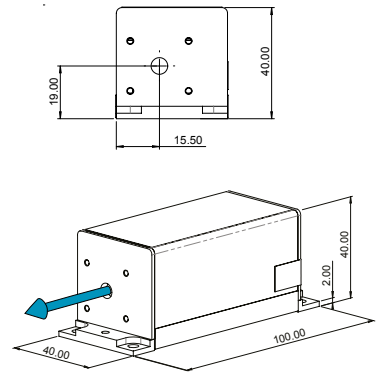
LCX series, OEM  
DPSS Laser



LPX series, OEM  
DPSS Laser



LBX series, OEM  
Laser diode



All-In-One laser head with built-in controllers. Input voltage range: 5-12 V DC



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Email [sales@photronicsolutions.co.uk](mailto:sales@photronicsolutions.co.uk) Web [www.photronicsolutions.co.uk](http://www.photronicsolutions.co.uk)



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Power up to 500 mW

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DIRECT OR SCATTERED RADIATION  
CLASS 4 LASER PRODUCT