OXXIUS

Simply Light

Continuous and Modulated Lasers

2023

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

LaserBoxx

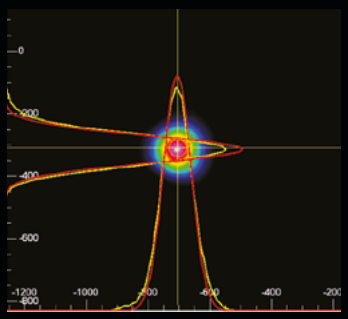
One platform for all colors

Monolithic DPSS lasers

- Up to 500 mW continuous wave
- Low profile laser head (32 mm)
- Lowest power consumption on the market
  - ≤ 12 W for LCX's, any wavelength, less than 200 mW
  - ≤ 20 W for LPX-532 & LPX-640, 500 mW
  - ≤ 15 W for LPX-561, 300 mW

Laser Diode modules benefits

- Fast TTL and analog modulation
- Optional clean up filter



Beam Profile
LBX-553L-200-CSB

Common key features

- TEM_{00} beam, up to 500 mW
- Ultra-low noise ≤ 0.2% rms
- Industry standard footprint (100x40 mm, LBX and LCX)
- Integrated control electronics
- SM/PM/MM fiber coupling options
- USB and RS232 interfaces
- Dedicated control software
- External controller with power display (Plug&Play versions, CDRH-compliant)

Technology

DPSS lasers

The LCX and LPX LaserBoxx are diode-pumped solid-state (DPSS) laser sources. The unique feature of these models is a proprietary, Alignement-free Monolithic Resonator (AMR).

The elements of resonator are assembled into a single ultra-low-loss optical subsystem, using a proprietary crystal bonding technique.

Benefits of the AMR

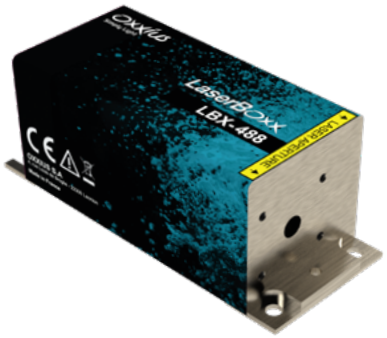
This technology yields to highly efficient pump schemes and also to the highest spectral quality on the market, as well as an important robustness over time. The LCX and LPX models are insentive to temperature variations and to mechanical vibrations.

Diode lasers

The LBX LaserBoxx consists of a laser diode emitter with an integrated driver. It provides a low-noise optical output, and allows for fast modulation.

Benefits

The LBX LaserBoxx provides superior beam quality, excellent stability and fast modulation capabilities.



Optical Specifications

		Emission wavelength (typ.)	Linewidth (FWHM)	Power stability over 8h and ±3K	Output power continous wave	Beam waist diameter (typ.)	Beam quality factor (M^2)	Polarization extinction ratio linear,vertical at ± 5°	Digital modulation Rise/fall time	Analog modulation Bandwidth
Diode Lasers	LBX-375	375 nm (±5 nm)	≤ 1.5 nm	± 0.5% APC and ACC	70 mW	0.7 mm	≤1.3	100:1	≤ 2 ns	≥ 2.5 MHz
	LBX-395	395 nm (±5 nm)			120 mW	0.8 mm	≤1.25			
	LBX-405	405 nm (±5 nm)			50/100/180/300 mW	0.7 mm	≤1.25			
	LBX-415	415 nm (±5 nm)			120 mW	0.7 mm				
	LBX-445	445 nm (±5 nm)			100/500 mW	0.7 mm				
	LBX-450	450 nm (±10 nm)			70 mW	0.55 mm				
	LBX-473	473 nm (±5 nm)	≤ 2 nm		100/300 mW	0.8 mm				
	LBX-488	488 nm (±5 nm)			40/60/100/ 200/300 mW	0.7 mm				
	LBX-505	505 nm (±5 nm)			70 mW	0.7 mm				
	LBX-515	515 nm (±2 nm)			150 mW	0.8 mm				
	LBX-522	522 nm (±2 nm)			70/100 mW	0.8 mm				
DPSS Lasers	LCX-532L	532.3 nm (±0.3 nm)	≤ 0.1 nm	± 1% APC	50/100/150/ 200/300 mW	0.7 ± 0.1 mm	≤1.1	1000:1	Optional L1C-AOM DC-3MHz	
	LPX-532L				500 mW					
	LCX-553L	553 nm (±0.4 nm)			50/100/200 mW					
	LCX-561L	561.4 nm (±0.4 nm)			50/100/150/200 mW					
	LPX-561L				300 mW					
	LPX-607L	607.5 nm (±1 nm)			100/200 mW					
	LBX-633	633 nm (±3 nm)	≤ 1.2 nm	± 0.5% APC and ACC	100 mW	0.8 mm	≤1.25	100:1	≤ 15 ns	≥ 2.5 MHz
	LBX-638	638 nm (-6/+4 nm)			100/150/ 180 mW	0.9 mm		100:1*	≤ 2 ns	
	LBX-642	642 nm (-7/+5 nm)			140 mW	1 mm		100:1		
	LPX-640L	639.7 nm (±1 nm)	≤ 0.3 nm	± 1% APC	300/500 mW	0.7 ± 0.1 mm	≤1.1	100:1	Optional L1C-AOM DC-3MHz	
Diode lasers	LBX-647	647 nm (-1/+4 nm)	≤ 1.2 nm	± 0.5% APC and ACC	140 mW	1 mm	≤1.25	1000:1	≤ 2 ns	≥2.5 MHz
	LBX-660	660 nm (-8/+5 nm)			100 mW	1 mm		100:1		
	LBX-730	730 nm (±10 nm)		± 1% ACC	40 mW	0.8 mm				
	LBX-785	785 nm (±10 nm)			100 mW 250/350 mW	0.7 mm 0.5 mm		100:1*		
	LBX-808	808 nm (±10 nm)			200 mW	0.7 mm		100:1		
	LBX-830	830 nm (±10 nm)			100 mW	0.9 mm				
	LBX-980	980 nm (±10 nm)			200 mW	0.9 mm		50:1		
	LBX-1064	1064 nm (±10 nm)		± 2% ACC	200 mW	0.9 mm				

*Polarization ratio is not specified for LBX-638-180 and for LBX-785-250/350

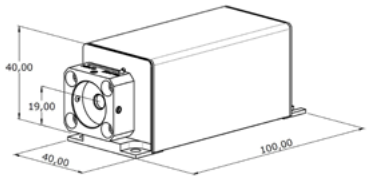
Power adjustment range
Diode lasers : 0 - 100 %
DPSS lasers : 0 to 100% when mounted in a L1C-MPA platform. 30% to 100% with the power adjustment option

Optical noise : ≤ 0.2 %
LPX-640L ≤ 1.5 % ; LBX-730 ≤ 1% ; LBX-980/1064 ≤ 0.8 %

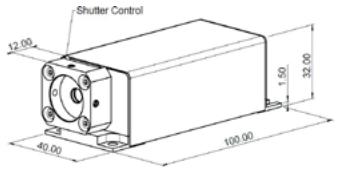
System Specifications

Plug and Play, CDRH-compliant versions

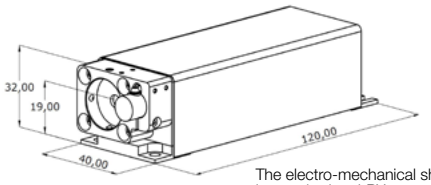
LBX series
Laser diode



LCX series
DPSS Laser



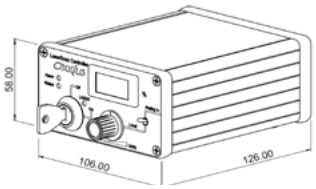
LPX series
DPSS Laser



The electro-mechanical shutter is standard on LPX

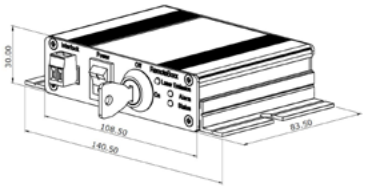
Power-adjustable versions (PPA)

PPA - ControlBoxx



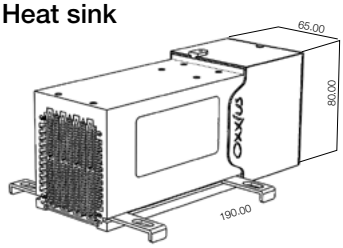
Fixed power versions (PPF)

PPF - RemoteBoxx



For improved stabilization (ACX)

Heat sink



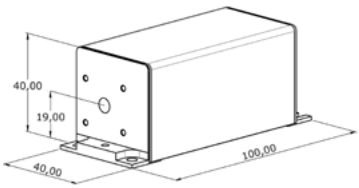
Compliance	CE and FDA 21 CFR 1040.10 / 1040.11
Operating temperature	10 to 38 °C (ambient air)
Power consumption	≤ 25 W
Storage temperature	0 to 60 °C

Supply voltage	100 to 240 VAC external power supply
Warm-up time	LCX, LPX : ≤ 10 minutes LBX, LSX : ≤ 2 minutes
Communication interfaces	USB, RS-232, dedicated interface

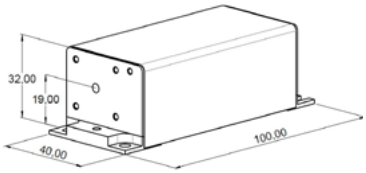
OEM - dedicated versions

Control electronics is integrated into the laser head

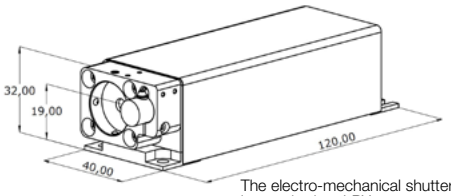
LBX series
Laser diode



LCX series
DPSS Laser

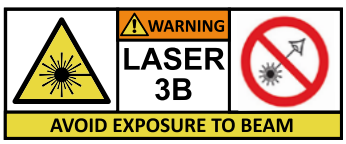


LPX series
DPSS Laser



The electro-mechanical shutter is standard on LPX

	LCX and LPX	LBX
Compliance	FDA 21 CFR 1040.10 / 1040.11	
Operating temperature	10 to 50 °C (baseplate)	
Power consumption	≤ 20 W	≤ 10 W
Storage temperature	0 to 60 °C	
Supply voltage	5 to 12 VDC	
Warm-up time	≤ 10 minutes	≤ 2 minutes
Communication interfaces	USB, RS-232, dedicated electronic interface	

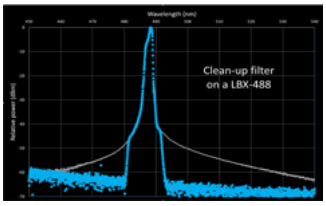


Options

Electro-mechanical shutter

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

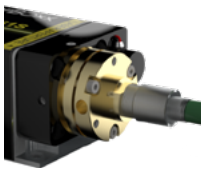
Clean-up filter



Fluorescence-based applications require to control the unwanted optical energy in order to improve the signal-to-noise ratio on the detection path. Fluorescence-based applications require to control the unwanted optical energy in order to improve the signal-to-noise ratio on the detection path.

Oxxius' emission clean-up filters are options that attenuate the background spontaneous emission (and other unwanted secondary peaks) 10nm or 20nm around the main emission peak.

Fiber coupling



Some rugged and compact solutions to inject the output beam into a single mode (SM) fiber, a polarization maintaining (PM) fiber, or a multimode (MM) fiber.

	SM and PM Fiber	MM Fiber (50 µm, 0.22 NA)
Coupling Efficiency	≥ 70 %, 80% typical	≥ 80 %, 90% typical
Power Stability over 8 hours, ± 1.5 K	± 2 %	± 2 %
Polarization extinction ratio (PMF only)	100 :1	n/a
Available optical connectors	FC-APC FC-PC, FCP8	AR-coated SMA FC-APC
Fiber length	2.0 m	2.0 m

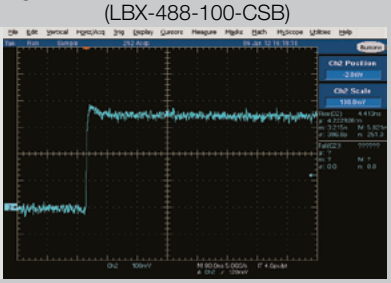
Customization and other options

- Specific wavelength selection
- Wavelength stabilization (infrared LBX)
- Wavelengths combiners (L4Cc, L6Cc)
- Specific beam diameter or beam shaping
- Optical isolator
- Extended operational temperature range

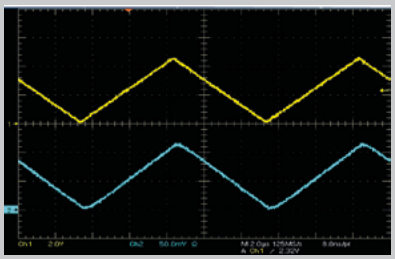
Performances

Diode Lasers

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

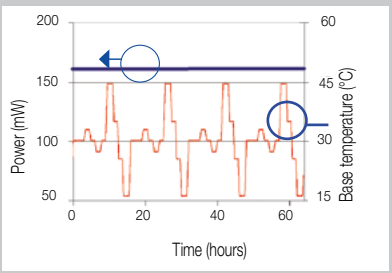


Analog Modulation up to 3 MHz
(LBX-405-100-CSB)

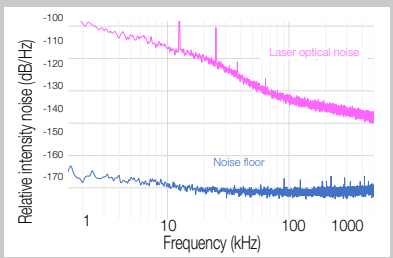


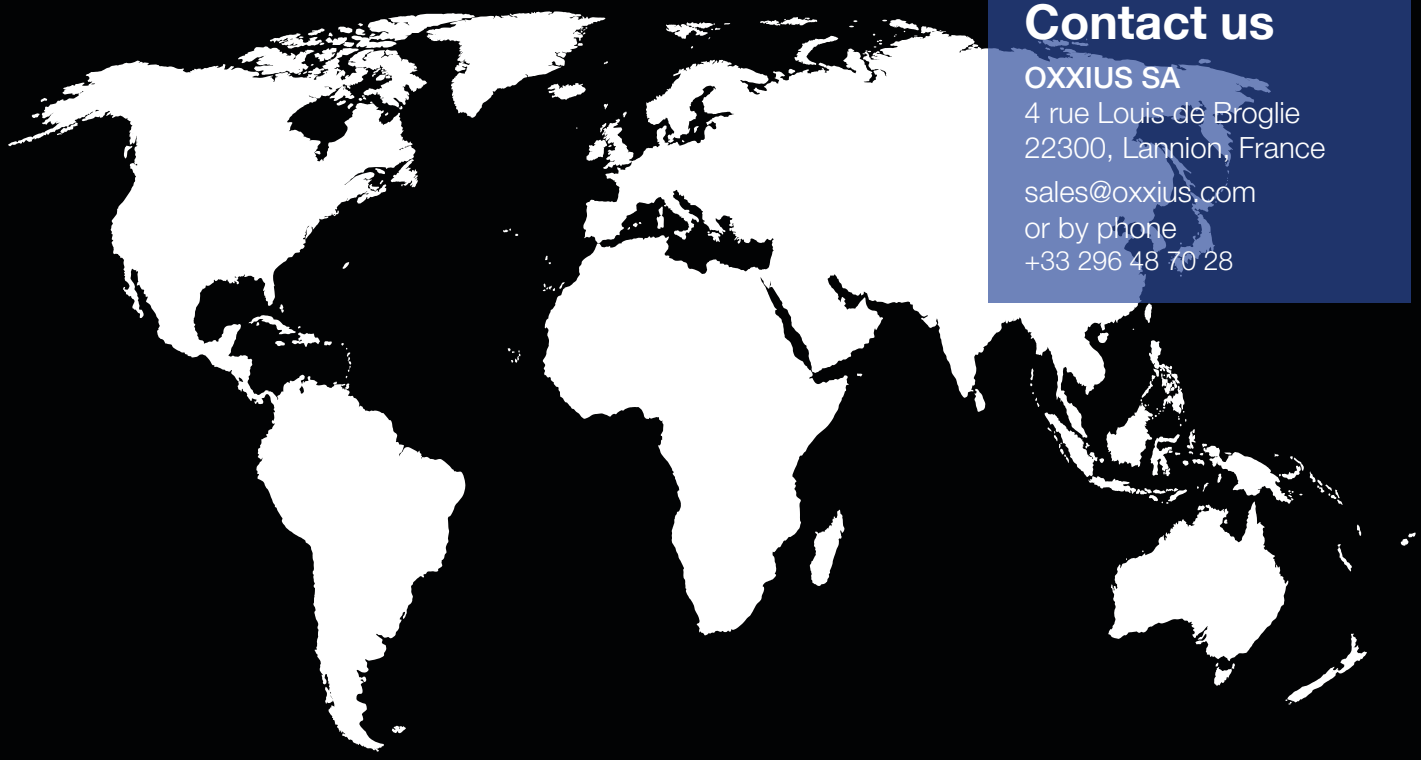
DPSS Lasers

Power stability
(LCX-561L-power vs temperature)



Relative Intensity Noise
LCX-561L-200





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