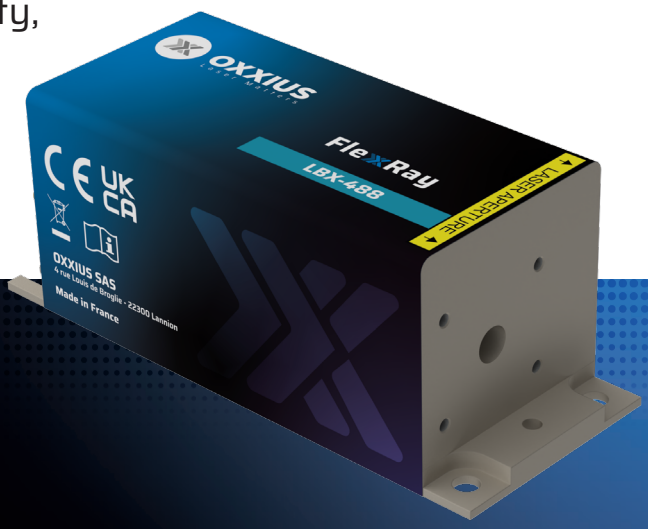
Photonic Solutions Ltd
Edinburgh
EH14 4AP
+44 131 664 8122
www.photonicsolutions.co.uk

FlexxRay
By Oxxius

CW & Modulated Lasers

375 nm to 1064 nm

Experience precision and power with Oxxius FlexxRay® lasers, engineered for stability, efficiency, and superior beam quality.



- Up to 1000 mW
- Ultra low noise ≤ 0.2% rms
- TEM_{00} beam
- Compact size
- Integrated control electronics
- Modulation possible up to 150 MHz
- Same interface for all wavelengths

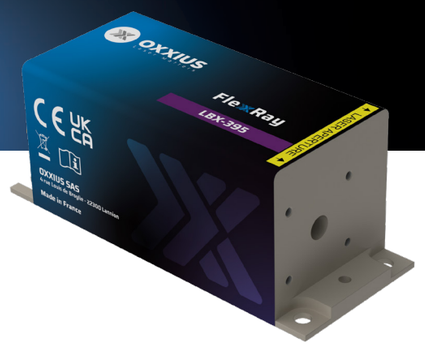
OXXIUS
Laser Matters

Engineered for Precision. Trusted in the Field.

Oxxius CW & Modulated Lasers

At Oxxius, we build lasers that push the limits of optical performance with ultra-narrow linewidth and exceptional stability.
Our FlexxRay® series is a **line of compact laser sources that deliver powerful, continuous-wave output in a TEM_{00} beam ; ready for seamless integration from UV to NIR.**

Why Oxxius FlexxRay?



- Consistent, low-noise output for precise, repeatable results
- High beam quality for diffraction-limited imaging and tight focusing
- Low heat dissipation for compact enclosures and simple thermal management
- A common mechanical and electrical interface across wavelengths to speed design, qualification, and service

1 Key features

- TEM_{00} beam, up to 1000 mW
- Ultra low noise ≤ 0.2% rms
- CW output
- Low-profile laser head with integrated electronics
- USB & RS-232 interfaces
- Fiber coupling options: SM / PM / MM
- Industry-standard 100 × 40 mm² footprint (LBX & LCX)

2 Reliable Performance You Can Count On

- Power stability (over 8 h, ±3°C): **±1%**
- Optical noise (10 Hz - 20 MHz): **≤ 0.2% rms**
- Optional power modulation via **L1C-MPA or AOM** for our DPSS lasers

Alignment-free monolithic resonator
Oxxius unique and proprietary technology at the heart of its DPSS lasers.

Oxxius Patented Technology

Oxxius has developed a proprietary monolithic resonator technology, protected by over 10 patents, that sets our DPSS lasers apart with:

- **Exceptional robustness**: withstands wide thermal and mechanical variations, no moving parts or adhesives.
- **High beam quality**: enables diffraction-limited resolution in imaging systems.
- **Ultra-low heat emission**: compact, high-efficiency cavity minimizes thermal load.

3 Need power adjustment or modulation?

While LBX models allow their output power to be tuned and modulated, DPSS lasers operate at a fixed power level. The LCX and LPX models are available in the following power-control versions:

- A fixed-power version
- An adjustable-power version with direct tuning over a limited range (available only for power levels below 200 mW)
- An adjustable-power version with a full dynamic range (0% to 100%), where the laser is integrated in a **L1C head** followed by a **Motorized Power Attenuator (MPA).**

High-rate modulation on DPSS lasers
LCX and LPX models can be upgraded with analog and digital modulation capabilities using the **L1C-AOM platform**.

L1C⁺ - AOM

Target models	LCX or LPX
Rise time / Fall time	≤ 150 ns
Modulation bandwidth	3 MHz
Insertion losses	≤ 15 %
Wavelength range	from 405 to 1064 nm Other wavelengths available upon request
Interfacing	Interfaces with the BTC-AOM driver, providing: - **Input ports** for digital and analog modulation - **USB and Ethernet connectivity** for monitoring
Laser head dimensions	**L1C+** 208(l) x 62 (w) x 64 (h) mm
Driver dimensions	**BTC-AOM** 156(l) x 203 (w) x 90 (h) mm

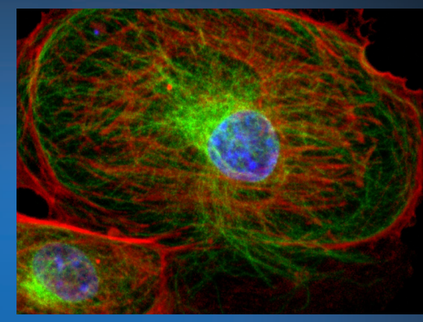
Test Our Lasers!

We offer demo units so you can validate performance in your own environment before moving forward.
» Contact us to check availability, lead times and the best configuration for your application.

Applications at a Glance

FlexxRay® is the ideal choice for a wide range of life science and industrial applications:

- Super-resolution Imaging
- Confocal microscopy
- Flow cytometry
- DNA sequencing
- Optogenetics
- Fluorescence excitation
- Wavelength combination
- Photoluminescence
- Polymer curing



Optical specifications

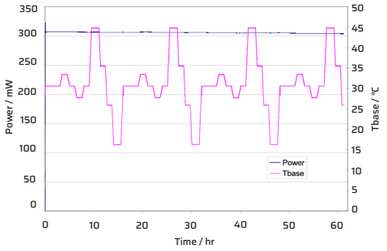
Lasers specifications

	LBX-375	LBX-395	LBX-405	LBX-415	LBX-445	LBX-450	LBX-458	LBX-473	LBX-488	LBX-505	LBX-515	LBX-522	LCX-532	LPX-532	LCX-553
Central wavelength (Tolerance)	375nm ±5 nm	395nm ±5 nm	405nm ±5 nm	415nm ±5 nm	445nm ±5 nm	450nm ±5 nm	458nm ±5 nm	473nm ±5 nm	488nm ±5 nm	505nm ±5 nm	515nm ±2 nm	522nm ±2 nm	532.3nm ±0.3 nm		553 nm ±0.4 nm
CW Output power (mW)	70	120	50 100 180 300	120	100 500	100	100	100 300	40 60 100 200 300	70	150	70 100	50 100 150 200 300	500 800	50 100 200
Linewidth (FWHM)	≤ 1.5 nm				≤ 2.0 nm								≤ 0.1 nm		
Power stability over 8 hours, temperature within +/-3°C	±0.5 %												±1.0 %		
Control modes	Automatic Power Control (APC) and Automatic Current Control (ACC)												APC only		
Power adjustment range	0 % to 100 %												0% to 100% with optional L1C-MPA [1]		
Optical noise, 20Hz to 20kHz bandwidth	≤ 0.2 % rms									≤ 0.2 % rms (10 Hz - 2 MHz)			≤ 0.2 % rms	≤ 0.5 % rms	≤ 0.2 % rms
M²	≤ 1.3	≤ 1.25											≤ 1.1		
Typ. Beam diameter ($1/e^2$ level)	0.7 mm	0.8 mm	0.7 mm	0.7 mm	0.7 mm	0.55 mm	0.7 mm	0.8 mm	0.7 mm	0.7 mm	0.8 mm	0.8 mm	0.7 mm		
Full angle divergence ($1/e^2$ level)	< 1.3 mrad	< 1.1 mrad	< 1.3 mrad	< 1.4 mrad	< 1.4 mrad	< 2.1 mrad	< 1.5 mrad	< 1.3 mrad	< 1.6 mrad	< 1.6 mrad	< 1.6 mrad	< 1.4 mrad	< 1 mrad	< 1 mrad	< 1 mrad
Beam circularity	≥ 90% in far field														
Beam pointing stability	≤ 5 µrad / °C														
Polarization state	Linear, vertical, extinction ratio ≥ 100:1														
Analog modulation															
-3 dB bandwidth	≥ 3 MHz												≥ 3 MHz		
Digital modulation															
Rise/fall time	≤ 2 ns				≤ 4 ns								≤ 150 ns		
-3 dB bandwidth	≥ 150 MHz												≥ 3 MHz		
Warm-up time	≤ 2 minutes												≤ 10 minutes		
Power consumption	≤ 5 W	≤ 5 W	≤ 7 W	≤ 10 W	≤ 7 W	≤ 5 W	≤ 10 W	≤ 10 W	≤ 10 W	≤ 7 W	≤ 7 W	≤ 7 W	≤ 20 W	≤ 25 W	≤ 20 W

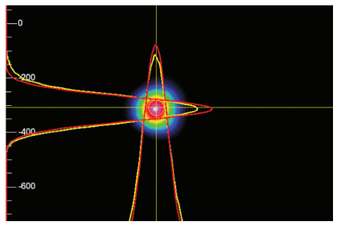
(1) Refer to "Modulation" section page 3

	LCX-561	LPX-561	LPX-607	LBX-633	LBX-638	LPX-640	LBX-642	LBX-660	LBX-690	LBX-730	LBX-785	LBX-808	LBX-830	LBX-915	LBX-980	LBX-1064
Central wavelength (Tolerance)	561.4 nm ±0.4 nm		607.5 nm ±1 nm	633 nm ±3nm	638 nm ±5 nm	639.7 nm -/+5 nm	642 nm -7/+5 nm	660 nm -8/+5nm	690 nm ±5 nm	730 nm ±10 nm	785 nm ±10 nm	808 nm ±10 nm	830 nm ±10 nm	915 nm ±10 nm	980 nm ±10 nm	1064 nm ±10 nm
CW Output power (mW)	50 100 150 200 300	300 500	100 200	100	100 150 180	300 500 1000	140	100	180	40	100 250 350	200	100	200	250	200
Linewidth (FWHM)	≤ 0.1 nm		≤ 0.3 nm	≤ 1.2 nm												
Power stability over 8 hours, temperature within +/-3°C	±0.5%		±1.0%	±0.5%						±1 %						±2 %
Control modes	APC and ACC		APC	APC and ACC						ACC						
Power adjustment range	0% to 100%															
Optical noise, 20Hz to 20kHz bandwidth	≤ 0.2 % rms									≤ 1 % rms	≤ 0.2 % rms				≤ 0.8 % rms	
M²	≤ 1.1		≤1.25			≤ 1.1	≤1.25									
Typ. Beam diameter ($1/e^2$ level)	0.7 mm		1.0 mm			0.7 mm	1.0 mm	1.0 mm	1.0 mm	0.8 mm	0.55 mm [2]	0.6 mm	0.4 mm	0.8 mm	0.9 mm	0.9 mm
Full angle divergence ($1/e^2$ level)	< 1 mrad	< 1.2 mrad	< 1.7 mrad	< 1.5 mrad		< 1 mrad	< 1.3 mrad	< 1.3 mrad	< 1.4 mrad	< 2 mrad	< 2.5 mrad	< 3.3 mrad	< 4.4 mrad	< 2.4 mrad	< 2.3 mrad	< 2.4 mrad
Beam circularity	≥ 90% in far field															
Beam pointing stability	≤ 5 µrad / °C						≤ 5 µrad / °C									
Polarization state	Linear, vertical, extinction ratio ≥ 50:1 [3]						Linear, vertical, extinction ratio ≥ 100:1 [4]				Linear, vertical, extinction ratio ≥ 50:1		N/A		Linear, vertical, extinction ratio ≥ 50:1	
Analog modulation																
-3 dB bandwidth	Not natively available [1]		≥ 1.5 kHz	≥ 3 MHz	≥ 1.5 kHz	≥ 3 MHz										
Digital modulation																
Rise/fall time			≤ 20 µs	≤ 2 ns	≤ 20 µs	≤ 2 ns			≤ 4 ns	≤ 2 ns						
-3 dB bandwidth			≥ 1.5 kHz	≥ 3 MHz	≥ 1.5 kHz	≥ 150 MHz										
Warm-up time	≤ 10 minutes		≤ 5 min.	≤ 2 minutes	≤ 5 min.	≤ 2 minutes										
Power consumption	≤ 20 W	≤ 25 W	≤ 25 W	≤ 5 W	≤ 5 W	≤ 25 W	≤ 7 W	≤ 5 W	≤ 5 W	≤ 5 W	≤ 7 W	≤ 5 W	≤ 5 W	≤ 5 W	≤ 5 W	≤ 5 W

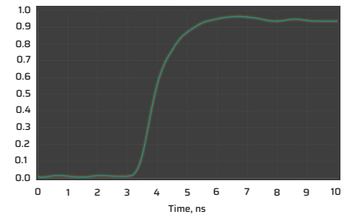
(2) 0.7 mm for the 785 nm at 250 and 350 nm
(3) PER not specified for 180 mW
(4) N/A for the 785 nm at 250 and 350 mW



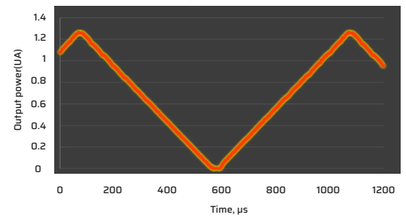
› Power stability vs. Temperature (LPX-532)



› Beam profile LCX-553L-200-CSB



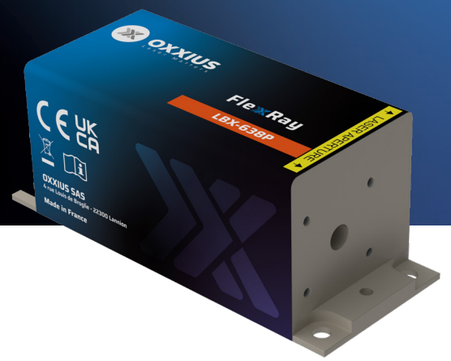
› Digital modulation: rise time < 2 ns (LBX-450)



› Analog modulation: linear output over the full range (LBX-638)

Available options

Extend Your Performances



1 Fiber coupling

FOR EFFICIENT, TEMPERATURE-STABLE POWER DELIVERY

A rugged, compact assembly that injects the output beam into an optical fiber, providing high coupling efficiency and stable throughput across temperature variations.

STANDARD SPECIFICATIONS	Polarization-maintaining fiber FC-PM	Single-mode fiber FC-SM	Multimode fiber Round core FC-MM-R	Multimode fiber Square-shaped core FC-MM-SQ
Power injection ratio	≥ 70%		≥ 80%	
Power stability over 8 hours, temperature within ±3°C	≤±2.0%			
Fiber model and characteristics	PM-S405-XP+ N.A: 0.12	S405-XP N.A: 0.11	50, 105 or 200 µm diameter, 0.22 NA: FC-MM-R50 to -R200	70 or 200 µm side length, 0.22 NA: FC-MM-SQ70 or -SQ200
Polarization extinction ratio	≥ 20 dB	N/A		
Fiber output connector	FC/APC Other types available upon request			

2 Heat management

FOR STABLE OPERATION AND EXTENDED LASER LIFETIME

Use Oxxius heatsinks when:

› Ambient temperature is high (≥ 35 °C)

› The mounting structure has low thermal mass or poor heat dissipation

Compatibility

› **HTSK-1 / HTSK-7:** LBX, LCX, LPX, LSX

› **HTSK-10:** L1C, L1C+

3 Customization and other options

› Tailored beam diameter

› Band-pass filter for fluorescence applications

› Specific wavelength selection

› Optical isolator

› Customized designs for your application

Two Configurations. Same Performance.

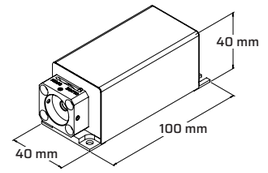
› End-User Version

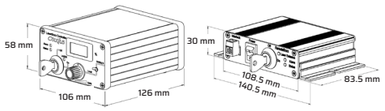
Ready to operate out of the box. Supplied with controller, power supply, and accessories. Safety functions are accessible via the laser controller (ControlBoxx for variable-power units, RemoteBoxx for fixed-power units).

› OEM Version

Designed for seamless integration into larger systems.
Includes the safety features needed to form part of a laser system compliant with IEC 60825-1 and FDA 21 CFR 1040.10.

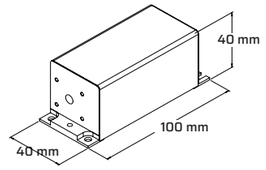
End-User Version (LBX model)
Supplied with controller, power supply and accessories ⌄





ControlBoxx RemoteBoxx

OEM Version (LBX model)
Stand-alone version for integrators ›



GENERAL SPECIFICATIONS (ALL MODELS)

	End-User Version	OEM Version
Compliance	CE compliant, including 60825-1 FDA 21 CFR 1040.10 and 1040.11	FDA 21 CFR 1040.10 and 1040.11
Operating temperature	10°C to 50°C (baseplate temperature) Refer to "Heat management" for the performance with a heatsink Humidity is non-condensing	
Storage temperature	0°C to 60°C	
Supply voltage	110 to 240 VAC	5 V to 12 V DC
Communication	USB, RS-232	

Combine up to 4 or 6 wavelengths by selecting your FlexxRay® lasers

Harness multiple wavelengths in a single, powerful beam

A single laser beam combining multiple wavelengths has become an essential tool for many applications. The MixxWave combiner is designed for this purpose: a customizable laser source integrating several FlexxRay modules.
Its output delivers multiple collinear laser beams, either coupled into a fiber or emitted in free space.

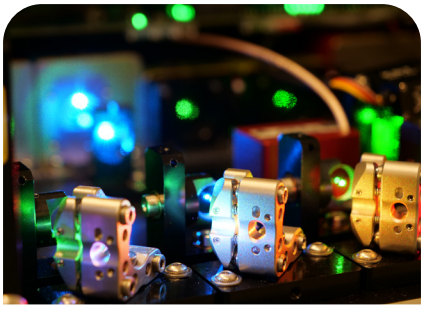
› Combine up to 4 wavelengths in the L4Cc or 6 in the L6Cc, by selecting your lasers from the FlexxRay range

› Compact, robust design

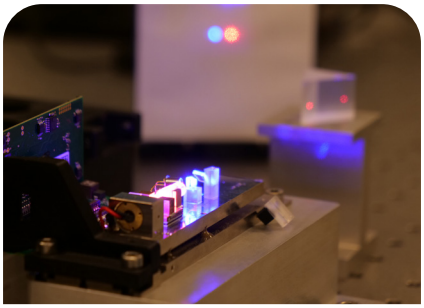
› High-efficiency coupling into a single-mode fiber

MixWave By Oxxius

When laser matters, innovation happens.



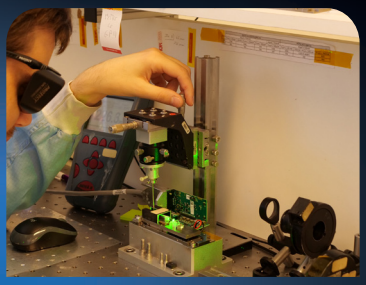
Rely on Oxxius' stable and compact lasers to speed your development in life science, metrology, and industrial applications.



Oxxius develops, designs and delivers powerful, high-performance, spectrally pure visible lasers, built to evolve with your needs.

Our compact, ultra-stable, ISO 9001-certified solutions speed development, simplify integration, and enable breakthroughs in medical diagnostics, research, semiconductor inspection, and more.
Every system is backed by fast iteration, proven reliability and dedicated customer support.

Let's configure the right laser for your application: contact us for technical guidance, lead times and demo options at sales@oxxius.com.



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