

Cobolt Skyra™

The new multi-line laser

- Up to 100 mW of optical power per laser line
- Direct intensity modulation capability
- Combine up to 4 laser lines
- 405 nm, 445 nm, 473 nm, 488 nm, 515 nm, 532 nm, 553 nm, 561 nm, 633 nm, 638 nm, 647 nm and 660 nm



Cobolt proudly introduces the Cobolt Skyra™.

A revolutionary multi-line laser platform. Offering up to 4 laser lines in a box that can fit into the palm of your hand, requiring no external electronics, the Cobolt Skyra™ will enable the next generation of compact and easy-to-use analytical instrumentation for the life science market.

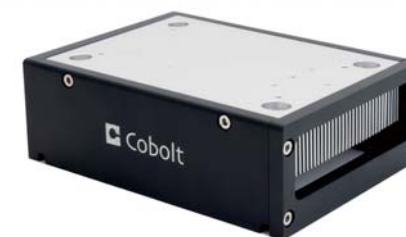
Each laser is permanently aligned and fixed inside the sealed package using Cobolt proprietary HTCure™ Technology, providing stable output power and beam overlap over a large temperature range and high level of insensitivity to transport conditions.

Cobolt Skyra™

Available Wavelength and Power

Options & Accessories

- Laser head heat sink HS-05
- Control box with key-switch (CDRH)
- Fiber coupling options



This device is sensitive to Electrostatic Discharge (ESD). Always handle diode lasers with extreme care to prevent electrostatic discharge, the primary cause of unexpected diode failure.



WARNING LASER RADIATION
Avoid Exposure to beam
Class 3B Laser Product
Classified per IEC 60825-1:2014



Wvl (nm)	Max.Pwr (mW)
405	360
445	120
473	120
488	240
515	100
532	300
561	300
553	300
633	120
638	170
647	200
660	170

	532 nm	553 nm	561 nm	405 nm	445 nm	473 nm	488 nm	515 nm	633 nm	638 nm	647 nm	660 nm
	Cobolt DPL			Cobolt MLD								
Center Wavelength (nm)*	532.1 ± 0.3	552.8 ± 0.3	561.2 ± 0.3	405 ± 5	445 ± 5	473 ± 5	488 ± 5	515 ± 5	633 ± 5	638 ± 5	647 ± 5	660 ± 5
Power (mW)	100	50	50	100	50	50	50	50	50	50	50	50

* One DPL laser line at 532nm, 553nm or 561nm can be combined with any 3 of the MLD wavelengths.

Optical Specifications

Beam divergence, full angle	< 1.8 mrad
Spatial mode (TEM ₀₀)	M ₂ < 1.25
Beam diameter at aperture	700 ± 100 μm
Polarization extinction ratio	> 100:1, vertical
Beam symmetry	> 0.85 : 1
Noise 250 Hz - 2 MHz (rms)	< 0.3 %
Power stability over 8 hrs	< 3 %
Beam position accuracy	< 0.5 mm
Beam angle accuracy	< 5 mrad
Beam overlap at aperture	< 50 μm
Beam angle overlap	< 150 μrad
Ambient temperature & pointing - 20-50 °C	< 10 μrad / °C

Operation Environment Specifications

Power supply requirements	12 VDC, 6.67 A
Communication protocol	USB or RS 232
Maximum baseplate temperature	50 °C
Maximum heat dissipation of Laser Head	60 W
Warm-up time from complete "off"	< 3 min
Storage temperature	-10 °C to +60 °C
Laser Head heat sink thermal impedance at 40 °C ambient	< 0.17 K/W

Modulation Specifications

	MLD	DPL
Digital modulation		
Bandwidth	DC - 5 MHz	DC-5 kHz
Extinction ratio @ 1 MHz	>10 000 000 : 1 (>70dB)	--
Rise/fall time	< 150 ns	< 15 μs
Analog modulation		
Bandwidth	DC - 500 kHz	DC-5 kHz
Extinction ratio @ 100 kHz	>10 000 000 : 1 (>70dB)	--
Rise/fall time	< 1 μs	< 100 μs

Can new multi-line lasers help realise future clinical flow cytometers?

Håkan Karlsson, Peter Jänes, Magnus Rådmark and Gunnar Elgcrona, Cobolt AB

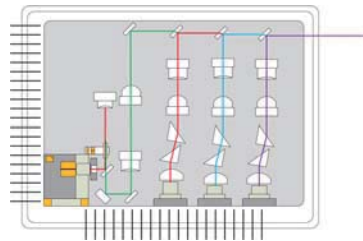
Introduction

Cobolt Skyra™ is an extremely compact, permanently aligned and service free multi-line laser with up to 4 laser lines integrated in a single hand sized package.



Compact housing : 144 x 38 x 70 mm

Conventional laser combiner solutions used in fluorescence-based bio-instrumentation equipment use multiple individual lasers combined through optical elements in systems that are bulky, costly to manufacture and challenging to keep aligned.



Optical assembly *patent pending

The HTCure™ laser manufacturing technology allows for a high precision mounting and ultra-stable permanent alignment of the output beams. A novel production process (*patent pending*) enables a beam overlap of better than 150 µrad. The optical platform can be customized for a higher degree of integration into the flow cytometer.

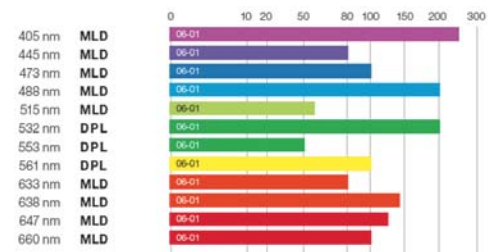
Technology

All optical elements are assembled onto one temperature-controlled platform and components for beam shaping and alignment are integral parts of the device.

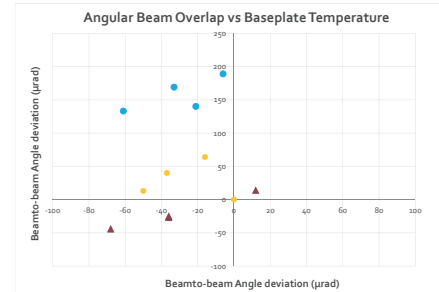


Hermetically sealed package with integrated electronics

Through fully integrated electronics all lines can be individually controlled and intensity modulated. By combining both diode-pumped and direct diode laser technology, 12 different colors in the wavelength range 405 nm to 660 nm are available, with up to 100 mW output power per line.



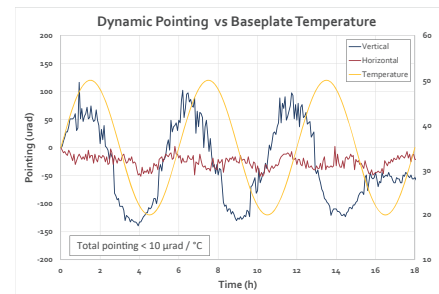
Performance



	561 nm	638 nm	488 nm	405 nm
20C	0	15	13	2
638 nm		0	21	16
488 nm			0	11
405 nm				0
35C	0	9	14	8
638 nm		0	16	15
488 nm			0	9
405 nm				0
50C	0	6	18	11
638 nm		0	20	16
488 nm			0	10
405 nm				0

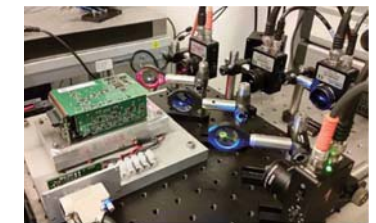
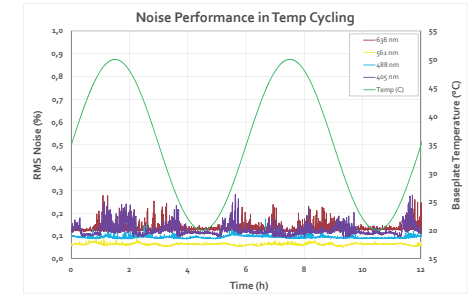
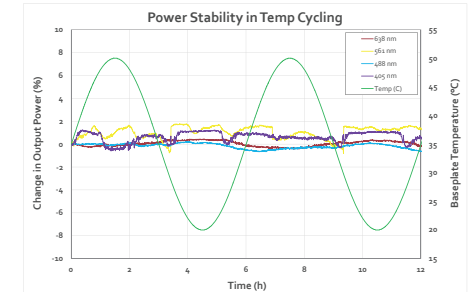


Beam position overlap at exit (µm)



Conclusion

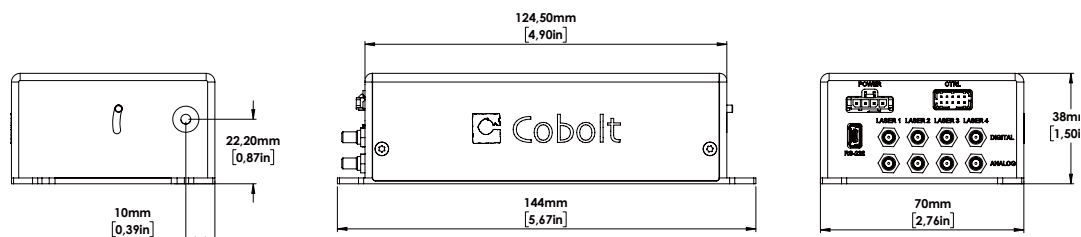
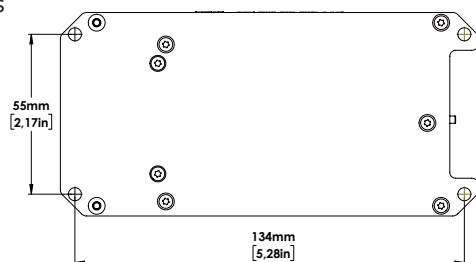
Cobolt Skyra™ will facilitate reducing the size and cost of cytometers and other instruments for bioanalysis by removing the complexity of integrating multiple lasers and simplifying service and maintenance.



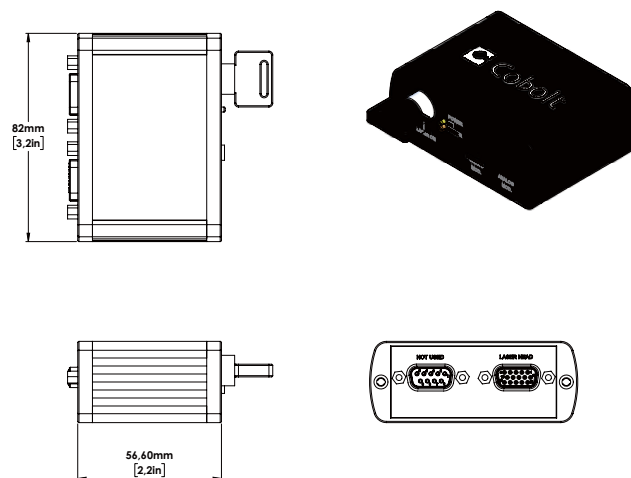
4-line measurement Setup

Cobolt Skyra™ Mechanical Specifications

Laser head dimensions



Key control box dimensions



Electrical Interface

Interface	Location	Connector Type
Input power	Laser Head	4 pin Molex (43650-0421)
Remote interlock connector	Laser Head	CTRL (10 pin Molex) pin 1 and 2 (OEM Only)
Data port	Laser Head	USB-type mini B (USB and RS-232 communication)
Key control Box connector	Laser Head	10 pin Molex (87832-1020)
Digital modulation	Key control box	SMB female (1-4)
Analog modulation	Key control box	SMB female (1-4)
Laser Head connector	Key control box	VGA D-SUB 15-pin male
Remote Interlock connector	Key control box	CDRH : 3.5 mm audio female

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