Cobolt 08-01 Series

Compact | Narrow linewidth lasers

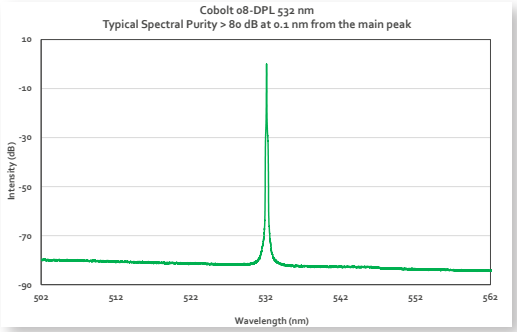
Applications

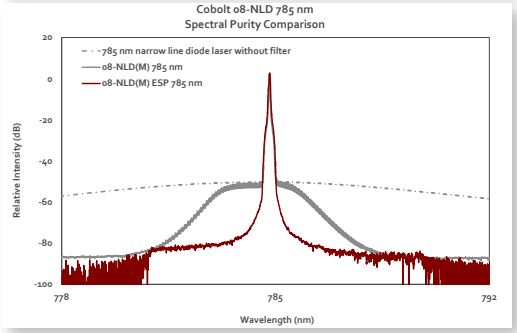
Raman Spectroscopy

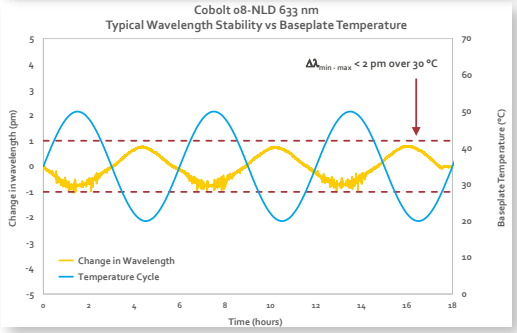
Interferometry

Quantum Research

- Single frequency diode pumped lasers (DPL) and narrow linewidth diode (NLD) lasers with up to 800 mW continuous-wave output power
- Engineered for stable spectral performance and low wavelength drift
- Integrated spectral filter for ensured side mode suppression ratio (SMSR)
- Integrated isolator, immune to optical feedback
- Ultra-robust package and proven field reliability
- Permanently aligned, true fiber pigtailed option
- 375 nm, 405 nm, 457 nm, 473 nm, 488 nm, 515 nm, 532 nm, 561 nm, 594 nm, 633 nm, 638 nm, 660 nm, 785 nm, 830 nm, 1064 nm







The Cobolt 08-01 Series is a family of narrow linewidth continuous-wave lasers, including diode pumped lasers (DPL) as well as narrow linewidth diode lasers (NLD) operating at fixed wavelengths between 375 nm and 1064 nm with output power up to 800 mW. The lasers are designed and manufactured to ensure the highest level of reliability.

Cobolt lasers are built using proprietary HTCure™ manufacturing technology for ultra-robustness into a compact package. The lasers emit a high quality laser beam with very stable characteristics and reliable spectral performance, making them ideal for advanced analytical applications where stable and narrow spectral linewidth is crucial, such as Raman Spectroscopy and Interferometry.

The Cobolt 08-01 Series are certified for use as stand-alone laboratory devices, but with a compact design and fully integrated drive and control electronics they are also very well suited for integration as OEM components in analytical instrumentation.

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Cobolt 08-01 Series

Performance Specifications

	375 nm	405 nm	457 nm	473 nm	488 nm	515 nm	532 nm	561 nm	594 nm
	08-NLD		08-DPL						
Center wavelength (nm)	375.0 ± 0.5	405.0 ± 0.5	457.0 ± 0.3	473.0 ± 0.3	488.0 ± 0.3	514.4 ± 0.3	532.1 ± 0.3	561.2 ± 0.3	593.6 ± 0.3
Power (mW) without isolator [with isolator] (mW)	20 [n/a]	50 [40]	30 [25]	50 [40]	100 [n/a]	50 [50]	25 [25] 50 [50] 100 [100] 200 [160] 400* [n/a]	25 [n/a] 50 [n/a] 100 [n/a] 200* [n/a]	50 [n/a] 100 [n/a] 150 [n/a]
Integrated optical isolator available	No	Yes			No	Yes		No	
Spectral bandwidth (FWHM)	< 1 pm		< 1 MHz						
Spectral purity (SMSR) @ ± > 0.5 nm from the main peak	> 40 dB		> 60 dB						
@ ± > 5 nm from the main peak	> 80 dB								
Wavelength stability (8hrs, ± 3°C)	< 1 pm								
Beam divergence (full angle)	< 1.2 mrad								< 1.4 mrad
Spatial mode TEM_{00}	M^2 < 1.3		M^2 < 1.1						
Beam symmetry at aperture	> 0.90:1		> 0.95:1						
Beam diameter at aperture	700 ± 100 µm		700 ± 70 µm						
Noise, 250 Hz - 2 MHz (RMS)	< 0.2 %		< 0.25 %, (typical < 0.15 %)						
Power stability (8 hrs ± 3°C)	< 2 %								
Polarization extinction ratio (PER)	> 100:1, Vertical								
Total system power consumption	< 12 W		< 20 W						
Power supply requirements	5 V / 3 A		5V / 5A						
Warranty	12 months	24 months			12 months	24 months			12 months

	633 nm	638 nm	660 nm	785 nm			830 nm	1064 nm
	08-NLD		08-DPL	08-NLD	08-NLD(M)	08-NLD(M) ESP	08-NLD	08-DPL
Center wavelength (nm)	632.8 ± 0.5	638.0 ± 0.5	659.6 ± 0.3	784.8 ± 0.5			830.0 ± 0.5	1064.2 ± 0.6
Power (mW) without isolator [with isolator] (mW)	n/a [30]	n/a [80]	50 [50] 100* [n/a]	n/a [120]	n/a [500] n/a [800]	n/a [400]	100 [n/a]	400* [n/a]
Integrated optical isolator available	Yes		Yes	Yes			No	No
Spectral bandwidth (FWHM)	< 1 pm		< 1 MHz	< 1 pm	< 70 pm		< 1 pm	< 1 MHz
Spectral purity (SMSR) @ ± > 0.5 nm from the main peak	> 40 dB		> 60 dB	> 40 dB		> 60 dB	> 40 dB	> 60 dB
@ ± > 5 nm from the main peak	> 80 dB							
Wavelength stability (8hrs, ± 3°C)	< 1 pm			n/a			< 1 pm	
Beam divergence (full angle)	< 1.6 mrad		< 1.5 mrad	< 2.0 mrad	Horizontal : < 15 mrad Vertical : < 3 mrad		< 2.3 mrad	< 1.8 mrad
Spatial mode TEM_{00}	M^2 < 1.3		M^2 < 1.1	M^2 < 1.3	Multimode		M^2 < 1.3	
Beam symmetry at aperture	> 0.90:1		> 0.95:1	> 0.90:1	n/a		> 0.90:1	> 0.95:1
Beam diameter at aperture	700 ± 100 µm		700 ± 70 µm	700 ± 100 µm	H: 1.4 ± 0.2 mm V: 1.7 ± 0.2 mm	H: 1.6 ± 0.3 mm V: 1.2 ± 0.2 mm	700 ± 100 µm	1000 ± 100 µm
Noise, 250 Hz - 2 MHz (RMS)	< 0.2 %		< 0.25 %	< 0.2 %	< 0.25 %		< 0.3 %	< 0.25 %
Power stability (8 hrs ± 3°C)	< 2 %				< 1 %		< 2 %	
Polarization extinction ratio (PER)	> 100:1, Vertical							
Total system power consumption	< 12 W		< 20 W	< 12 W	< 15 W			< 20 W
Power supply requirements	5V / 3A		5V / 5A	5V / 3A	5V / 3A			5V / 5A
Warranty	12 months		24 months	12 months	24 months		12 months	24 months

* Wavelength and power level only available as model 08-51. Cobolt 08-51 lasers are inherently insensitive to back reflections, and do not require an integrated optical isolator. See Cobolt 08-01 Series Manual for more detailed specifications, sensitivity may vary between wavelengths.

Model Number

WWWW-08-XX-(Y)-PPPP-CCC

Wavelength

Power

Version:
01 Free beam, no optical isolator
03 Fiber pigtailed, no optical isolator
53 Fiber pigtailed (ring laser)*
11 Free beam, integrated optical isolator
51 Free beam (ring laser)*
21 Enhanced Spectral Purity (ESP), free beam, with isolator
X6 Fiber coupled option - MM
X7 Fiber coupled option - SM/PM

M Multimode (beam) - 785 nm only

Configuration:
100 = USB, CE / CDRH Compliant
200 = USB, OEM
300 = RS-232, CE / CDRH Compliant
400 = RS-232, OEM
xxx = OEM customization

Cobolt 08-01 Series

True fiber pigtailing option for 08-01 Series lasers

The fiber pigtailed option for the Cobolt 08-01 Series is delivered with the fiber permanently aligned and fixed inside the hermetically sealed package using Cobolt's proprietary HTCure™ Technology, providing stable output over a large temperature range and insensitive to transport conditions.

Fiber pigtailed 08-NLD

Cobolt 08-03 : Fiber pigtailed option - Specifications

	08-NLD 405 nm	08- DPL 532 nm	08-DPL 561 nm	08-NLD 785 nm STM	08-NLD(M) 785 nm
Available power (mW) - Out of fiber	25 mW	Up to 100 mW 200 mW*	Up to 100 mW	60 mW	400 mW 500 mW
Power stability (8 hrs ± 3°C)	< 3 %				
Mode field diameter (MFD)**	3.5 ± 0.5 µm	4.0 ± 0.5 µm		4.5 ± 0.5 µm	n/a
Fiber core diameter	n/a				105 µm
Fiber output	FC/APC, Narrow key				FC/PC, Narrow key
Fiber type	SM/PM				MM
Fiber end-cap	Yes*		No		
Polarization	PER > 100:1, ± 3°				n/a
Standard fiber length	1 m				
Jacketing	Ø 3mm, Stainless Steel				
Warranty	Laser warranty and 12 months on workmanship				

* 08-DPL 532 nm 100 mW laser is without end cap.
** MFD is measured at the nominal wavelength for the fiber, 480 nm and 630 nm respectively

Fiber coupled options for 08-01 Series lasers

The fiber coupled option for the Cobolt 08-01 Series is delivered with an external fiber coupler and fiber, available with either single-mode or multi-mode fibers. The external coupler is fastened directly onto the laser head. The coupling efficiency and stability are tested during manufacturing.

Fiber coupled option - 08-DPL

Cobolt 08-X7 : Single-mode (SM) fiber - Specifications

	405 - 660 nm	785 nm	1064 nm
Coupling efficiency	> 50 %		
Mode field diameter (MFD)	3.5 @ 405 nm - 7.5 @ 660 nm	6.4	10.6
Fiber output	FC / APC , Narrow key		
Fiber type	SM / PM		
Fiber end-cap	Yes	No	
Standard fiber length	2 m		
Jacketing	PVC		
Warranty	Laser warranty and 12 months on workmanship		

Cobolt 08-X6 : Multi-mode (MM) fiber - Specifications

	532	785
Coupling efficiency	> 60 %	> 70 %
Fiber core diameter	105 µm	
Fiber output	FC / PC, Narrow key	
Fiber type	MM	
Standard fiber length	2 m	
Jacketing	PVC	
Warranty	Laser warranty and 12 months on workmanship	

Communication Interface

Communication	USB or RS-232
Standard Baudrate	115200

This device is sensitive to Elecrostatic Discharge (ESD). Always handle diode lasers with care to prevent electrostatic discharge.

WARNING VISIBLE and INVISIBLE LASER RADIATION
Avoid eye or skin exposure to direct or scattered radiation

Class 3B Laser Product
Classified per IEC 60825-1:2014

Wvl (nm)	Max.Pwr (mW)
375	200
405	360
457	400
473	400
488	400
515	400
532	499
561	499
594	499
633	200
638	200
660	499
785 STM	300
785 ESP	499
830	400
1064	499

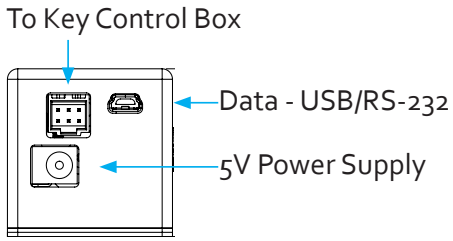
Class 4 Laser Product
Classified per IEC 60825-1:2014

Wvl (nm)	Max.Pwr (mW)
785 M	2000

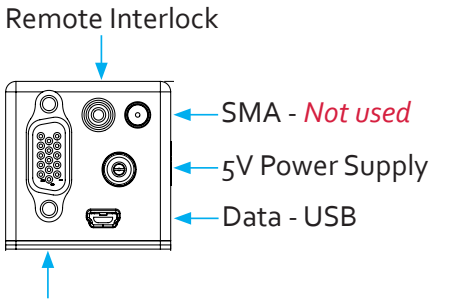
Cobolt 08-01 Series

Electrical Interface

08-DPL and 08-NLD(M) Laser head



08-NLD Laser head



Molex 6 pin - To Key control box

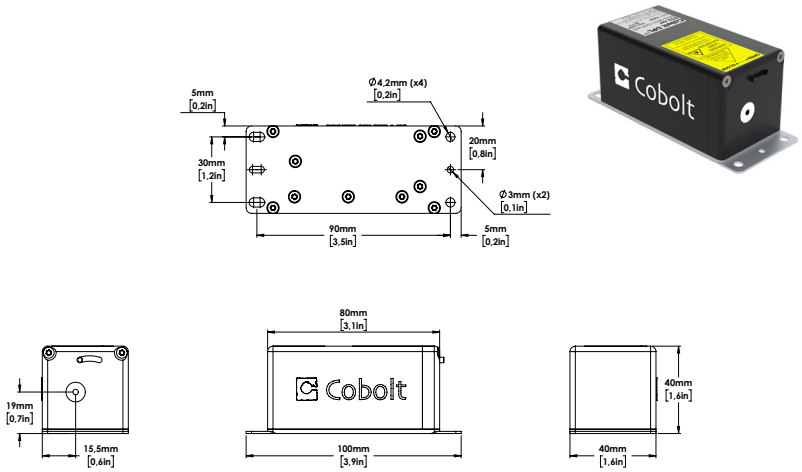
Pin	Function
1	Remote interlock
2	0 V – Ground
3	Direct On/Off (+5 V Input)
4	Key Switch
5	LED 1 (Laser On)
6	LED 2 (Error)

VGA 15 pin - To Key control box

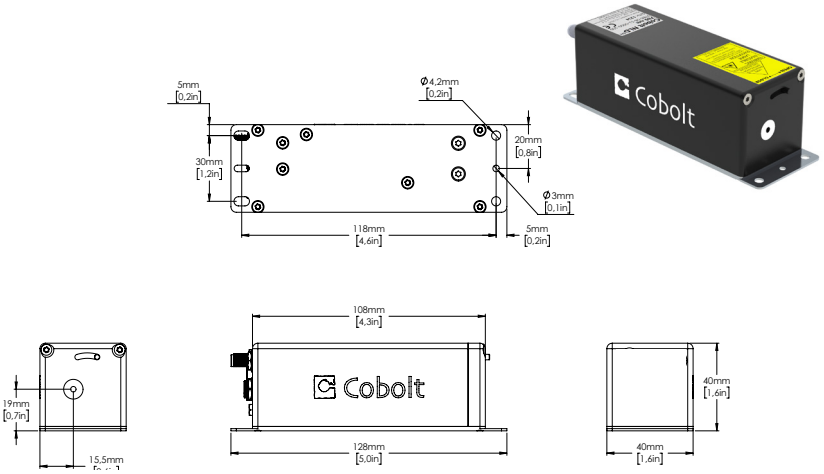
Pin	Function
1	LED1 (Laser on)
2	LED2 (Error)
3	*Not used*
4	0 V (ref)
5	Key Switch
6	Remote interlock
7	RS-232 TX
8	RS-232 RX
9	Spare
10	0 V GND (ref pin 15)
11	Direct On/off
12	*Not used*
13	*Not used*
14	*Not used*
15	+5V to keybox

Mechanical Specifications

Laser Head without Isolator



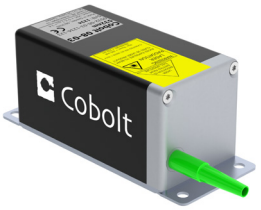
Laser Head with Isolator

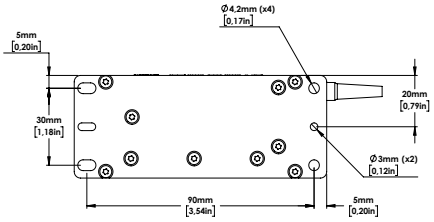


Cobolt 08-01 Series

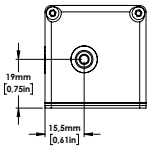
Mechanical Specifications (continued)

Fiber pigtailed Laser head

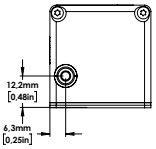


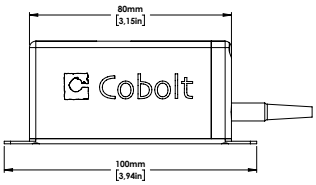


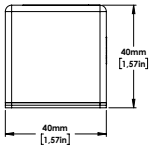
o8-NLD



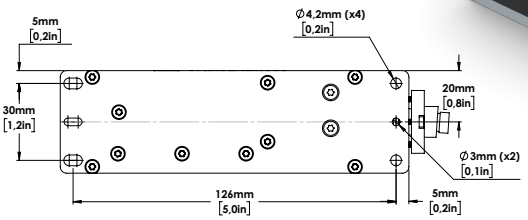
o8-DPL and o8-NLD(M)

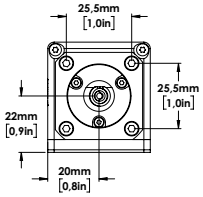


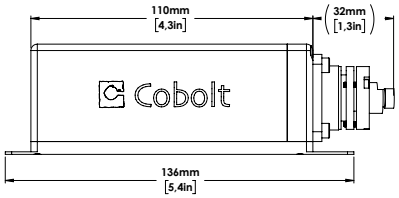


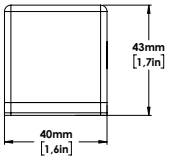


Laser Head with integrated fiber coupler*





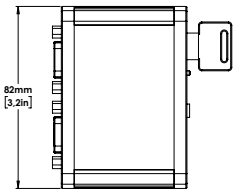


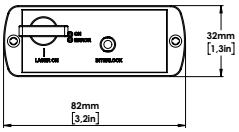


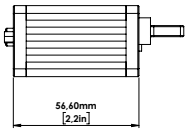
*Exact dimensions of the fiber coupler may vary. See owner's manual for more details.

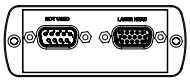
Key box

Art. Nr. 12482









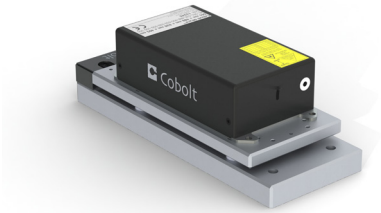
Cobolt 08-01 Series

Options and Accessories

- Cobolt 08-01 lasers can be integrated into C-FLEX Laser combiner
- Laser head heatsink HS-03
- TEC Plate for active temperature control
- Laser head heatsink with fan HS-07
- Mounting plate for fiber coupling (FIC-06)

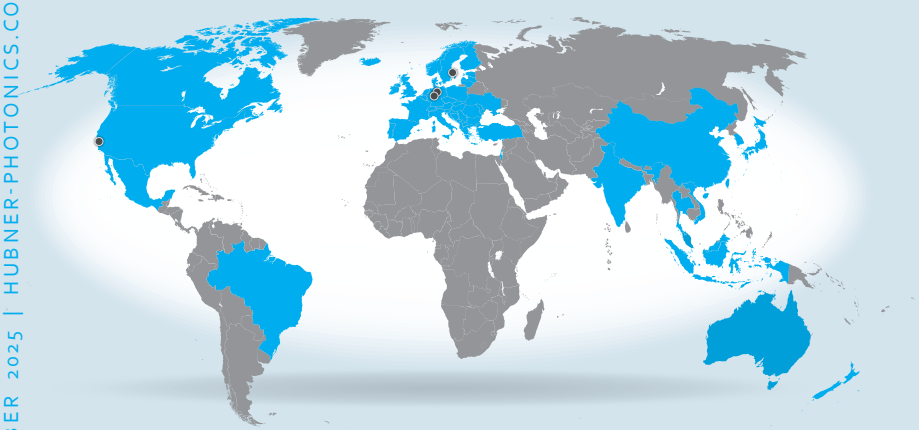
C-FLEX Laser combiner

Heatsink HS-03



TEC-Plate for active temperature control

Heatsink HS-07



Our Locations

Cobolt AB , a part of HÜBNER Photonics
(Sales in Norway, Sweden, Finland and Denmark)
Solna, Sweden
Phone: +46 8 545 912 30
Fax: +46 8 545 912 31
E-mail: info.se@hubner-photonics.com

HÜBNER Photonics GmbH
(Sales in Germany, Switzerland and Austria)
Kassel, Germany
Phone: +49 561 994 060-0
Fax: +49 561 994 060-13
E-mail: info.de@hubner-photonics.com

HÜBNER Photonics Inc.
(Sales in USA, Canada and Mexico)
San Jose, California, USA
Phone: +1 (408) 708 4351
Fax: +1 (408) 490 2774
E-mail: info.usa@hubner-photonics.com

HA Photonics Pty Ltd
(Sales in UK and Ireland)
London
United Kingdom
Phone: +44 7359 440 871
E-mail: info.uk@hubner-photonics.com

VALO Innovations, a part of HÜBNER Photonics
(VALO Sales and Service)
Hannover, Germany
Phone: +49 511 260 390 70
E-mail: info.valo@hubner-photonics.com

Find local sales representatives at hubner-photonics.com

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