Cobolt 08-01 Series

Compact | Narrow linewidth lasers

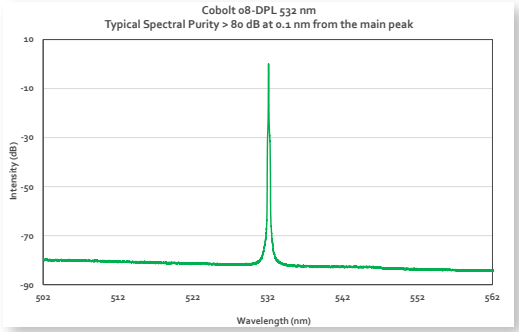
Applications

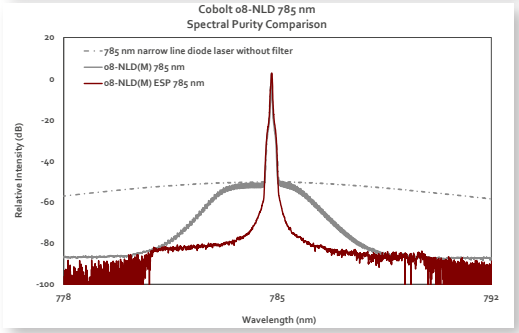
Raman Spectroscopy

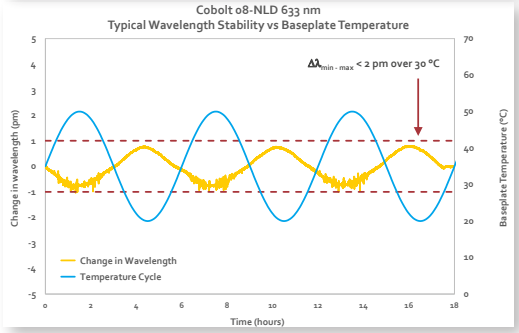
Interferometry

Quantum Research

- Single frequency diode pumped lasers (DPL) and narrow linewidth diode (NLD) lasers with up to 500 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
- 405 nm, 457 nm, 473 nm, 488 nm, 515 nm, 532 nm, 561 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 frequency stabilized diode lasers (NLD) operating at fixed wavelengths between 405 nm and 1064 nm with output power up to 500 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

	405 nm	457 nm	473 nm	488 nm	515 nm	532 nm	561 nm
	08-NLD	08-DPL		08-NLD	08-DPL		
Center Wavelength (nm)	405.0 ± 0.5	457.0 ± 0.3	473.0 ± 0.3	488.0 ± 0.5	514.4 ± 0.3	532.1 ± 0.3	561.2 ± 0.3
Power (mW) without isolator [with isolator] (mW)	40 [30]	30 [25]	50 [40]	40 [n/a]	50 [50]	25 [25] 50 [50] 100 [100] 200 [160]	25 [n/a] 50 [n/a] 100 [n/a]
Integrated optical Isolator available	Yes			No	Yes		No
Spectral bandwidth (FWHM)	< 1 pm	< 1 MHz		< 1 pm	< 1 MHz		
Spectral Purity (SMSR) @ ± > 0.5 nm from the main peak	> 40 dB	> 60 dB		> 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			< 1.3 mrad	< 1.2 mrad		
Spatial mode $TEM_{(00)}$	M^2 < 1.3	M^2 < 1.1		M^2 < 1.3	M^2 < 1.1		
Beam symmetry at aperture	> 0.90:1	> 0.95:1		> 0.90:1	> 0.95:1		
Beam diameter at aperture	700 ± 100 µm	700 ± 70 µm		700 ± 100 µm	700 ± 70 µm		
Noise, 250 Hz - 2 MHz (rms)	< 0.2 %	< 0.25 %, (typical < 0.15 %)		< 0.2 %	< 0.25 %, (typical < 0.15 %)		
Long-term power stability (8 hrs ± 3°C)	< 2 %						
Polarization Extinction Ratio (PER)	> 100:1, Vertical						
Total system power consumption	< 12 W	< 20 W		< 12 W	< 20 W		
Power Supply Requirements	5 V / 3 A	5V / 5A		5 V / 3 A	5V / 5A		
Warranty	24 months			12 months	24 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]	n/a [120]	n/a [500]	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 %
Long-term 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

Model Number

WWWW-08-XX-Y-PPPP-CCC

- WWWW: Wavelength
- XX: Version:
  - 01 Free beam, no optical isolator
  - 03 Fiber pigtailed, no optical isolator
  - 11 Free beam, integrated optical isolator
  - 51 Free beam (ring laser), no optical isolator
  - 21 Enhanced Spectral Purity (ESP), free beam with isolator
  - X6 Fiber coupled option - MM
  - X7 Fiber coupled option - SM/PM
- Y: M Multimode (beam)
- PPPP: Power
- CCC: 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- DPL 532 nm	08-DPL 561 nm	08-NLD 785 nm STM	08-NLD(M) 785 nm
Available Power (mW) - Out of fiber	Up to 100 mW	Up to 50 mW	60 mW	400 mW
Power stability (8 hrs ± 3°C)	< 3 %			
Mode field diameter (MFD)*	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	No			
Polarization	PER > 100:1, ± 2°			n/a
Standard Fiber Length	1 m			
Jacketing	Ø 3mm, Stainless Steel			
Warranty	Laser warranty and 12 months on workmanship			

* 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 and 830 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		

* Not including 488 nm

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	
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)
405	360
457	400
473	400
488	200
515	400
532	400
561	400
633	200
638	200
660	400
785 STM	300
785 ESP	499
830	400
1064	499

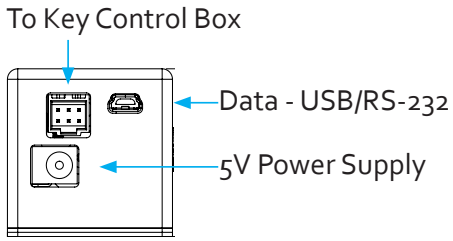
Class 4 Laser Product
Classified per IEC 60825-1:2014

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

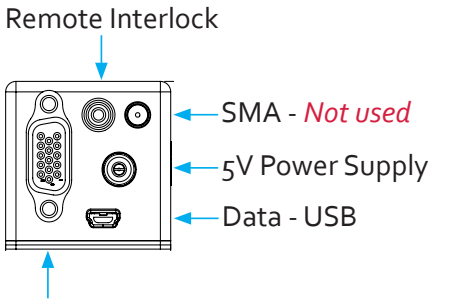
Cobolt 08-01 Series

Electrical Interface

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



08-NLD Laser head



Molex 6 pin - To Key control box

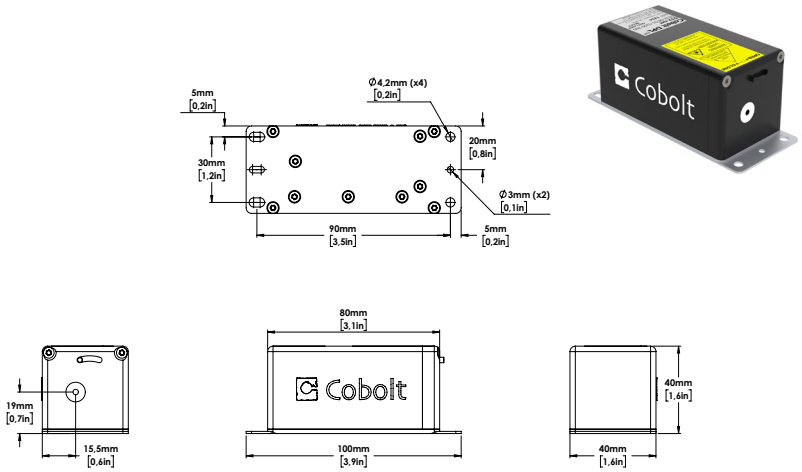
Pin	Function
1	Remote interlock
2	0 V – Ground
3	Direct On/Off (+5 V Input)
4	Key Switch
5	LED 1 (Laser On)
6	LED 2 (Error)

VGA 15 pin - To Key control box

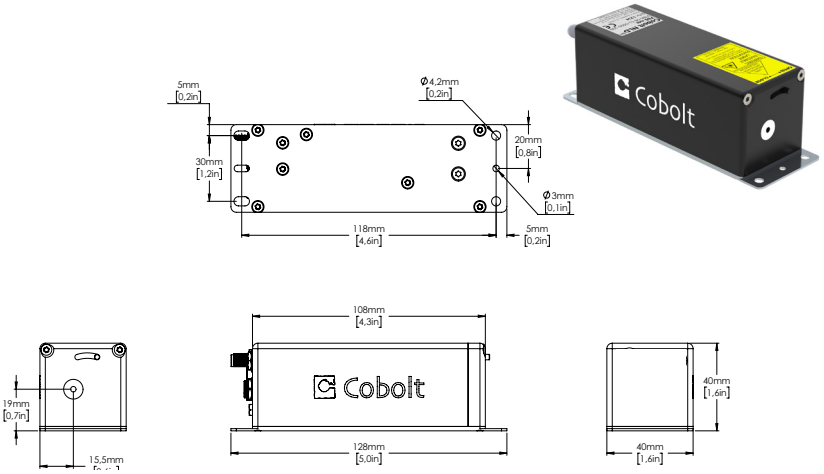
Pin	Function
1	LED1 (Laser on)
2	LED2 (Error)
3	*Not used*
4	0 V (ref)
5	Key Switch
6	Remote interlock
7	RS-232 TX
8	RS-232 RX
9	Spare
10	0 V GND (ref pin 15)
11	Direct On/off
12	*Not used*
13	*Not used*
14	*Not used*
15	+5V to keybox

Mechanical Specifications

Laser Head without Isolator



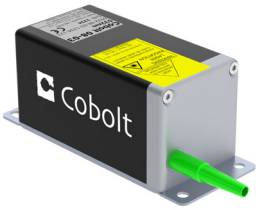
Laser Head with Isolator

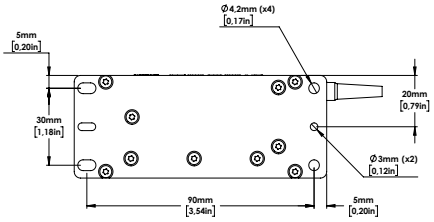


Cobolt 08-01 Series

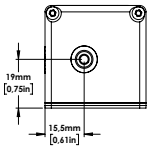
Mechanical Specifications (continued)

Fiber pigtailed Laser head

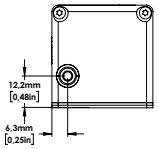


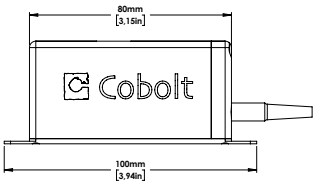


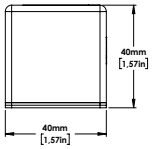
o8-NLD



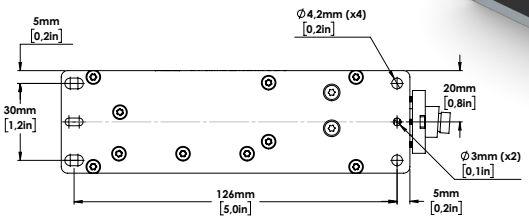
o8-DPL and o8-NLD(M)

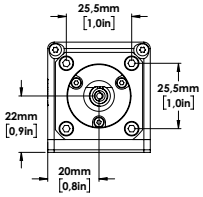


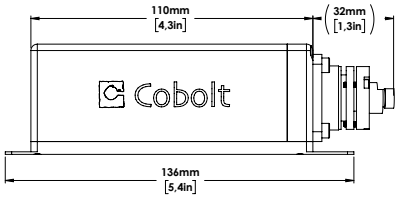


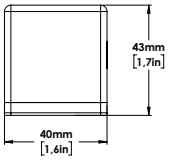


Laser Head with integrated fiber coupler*





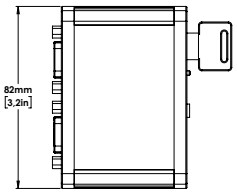


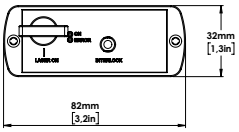


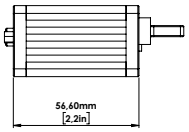
*Exact dimensions of the fiber coupler may vary. See owner's manual for more details.

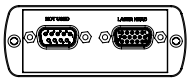
Key box

Art. Nr. 12482









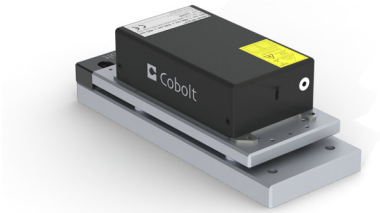
Cobolt 08-01 Series

Options and Accessories

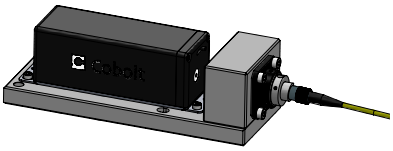
- C-FLEX Laser combiner
- Laser head heatsink HS-03
- TEC Plate for active temperature control
- Mounting plate for fiber coupling (FIC-06)

C-FLEX Laser combiner

Heatsink HS-03



TEC-Plate for active temperature control



Mounting plate for fiber coupling FIC-06

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