

Cobolt o6-01 Series

Plug & Play | Modulatable | Continuous Wave lasers



Applications

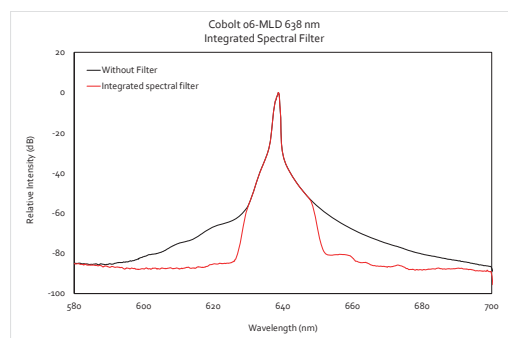
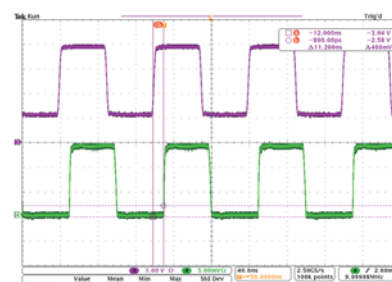
Fluorescence Microscopy
Optogenetics
Flow Cytometry
Quantum Research

- Easy-to-integrate compact and powerful laser modules
- Power up to 400 mW
- Direct intensity modulation capability: fast and deep modulation to a complete dark state from versatile input signals
- All control electronics fully integrated into laser head
- Ultra-robust design
- Integrated clean-up filter on all diode lasers
- 405 nm, 415 nm, 425 nm, 445 nm, 457 nm, 473 nm, 488 nm, 505 nm, 515 nm, 532 nm, 553 nm, 561 nm, 633 nm, 638 nm, 647 nm, 660 nm, 685 nm, 730 nm, 760 nm, 785 nm, 808 nm, 830 nm, 940 nm, 975 nm

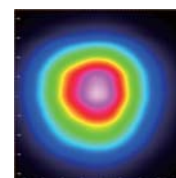
The Cobolt o6-01 Series lasers offer a compact form factor and a wide wavelength span in an industry standard plug and play format, utilizing the most ideal laser technology to achieve each wavelength while maintaining the same footprint. The Cobolt o6-01 Series consists of high performance fixed wavelength diode laser modules (MLD) and diode-pumped solid-state lasers (DPL) and offer direct intensity modulation capability, allowing fast and deep modulation from versatile input signals between 405 nm and 975 nm.

The lasers are manufactured using Cobolt's unique HTCure™ Technology to ensure world-class quality and reliability, as well as unmatched robustness. The Cobolt o6-01 Series lasers are intended for stand-alone use in laboratory environment, or for integration into laser combiners (C-FLEX) or analytical instrumentation and are ideally suited for demanding fluorescence analysis applications such as confocal microscopy and flow cytometry.

Cobolt o6- MLD
Typical Digital Modulation at 10 MHz

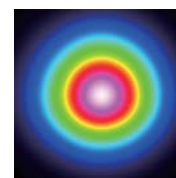


Typical Beam Profile



Cobolt o6-MLD
 $M^2 < 1.2$

Typical Beam Profile



Cobolt o6-DPL
 $M^2 < 1.1$

HÜBNER Photonics | Coherence Matters.



Cobolt o6-o1 Series

Optical Performance Specifications

	405 nm	415 nm	425 nm	445 nm	457 nm	473 nm	488 nm	505 nm	515 nm
Platform	o6-MLD								
Center Wavelength (nm)	405 ± 5	415 ± 5	425 ± 5	445 ± 5	457 ± 5	473 ± 5	488 ± 5	505 ± 5	515 ± 5
Power (mW)	150 365	120	120	100 400	100 400	100 300	60 200	80	80 150
Spectral bandwidth (FWHM)	< 1.2 nm						< 1.5 nm		
Spatial mode (TEM ₀₀)	M ² <1.2								
Beam symmetry	> 0.90:1								
Beam diameter at aperture (μm)	700 ± 100								
Beam divergence (full angle, mrad)	< 1.1	< 1.2				< 1.3			
Noise, 250 Hz - 2 MHz (rms)	< 0.2%								
Power stability over 8 hrs	< 1%								
Polarization ratio (vertical)	> 100:1								
Warranty	24 months, unlimited hours								

	532 nm	553 nm	561 nm	633 nm	638 nm	647 nm	660 nm	685 nm	730 nm
Platform	o6-DPL			o6-MLD					
Center Wavelength (nm)	532.1 ± 0.3	552.8 ± 0.3	561.2 ± 0.3	633 ± 5	638 ± 5	647 ± 5	660 ± 5	685 ± 5	730 ± 5
Power (mW)	100 200	50	50 100	80	180	130	100	40	50
Beam divergence (full angle, mrad)	< 1.2			< 1.6				< 1.75	< 1.9
Spectral bandwidth (FWHM)	< 1 MHz			< 1.2 nm					
Spatial mode (TEM ₀₀)	M² < 1.1			M² <1.2					
Beam symmetry	> 0.95:1			> 0.90:1					
Beam diameter at aperture (µm)	700 ± 70			700 ± 100					
Polarization ratio (vertical)	> 100:1								
Noise, 250 Hz - 2 MHz (rms)	< 0.3 %	< 0.25 %		< 0.2 %				< 0.5 %	< 0.2 %
Power stability over 8 hrs	< 2 %			< 1 %				< 2 %	
Warranty	24 months, unlimited hours			24 months or 5000 hours					

	760 nm	785 nm	808 nm	830 nm	940 nm	975 nm
Platform	o6-MLD					
Center Wavelength (nm)	760 ± 5	785 ± 5	808 ± 5	830 ± 5	940 ± 5	975 ± 5
Power (mW)	25	250	120	100	250	120
Beam divergence (full angle, mrad)	< 1.9	< 2.0	< 2.6	< 2.3	< 2.6	
Spectral bandwidth (FWHM)	< 2 nm					
Spatial mode (TEM ₀₀)	M² < 1.2		M² < 1.3			
Beam symmetry	> 0.90:1					
Beam diameter at aperture (µm)	700 ± 100					
Polarization ratio (vertical)	> 100:1					
Noise, 250 Hz - 2 MHz (rms)	< 0.2 %					
Power stability over 8 hrs	< 2 %					
Warranty	24 month, 5000 hours					



This device is sensitive to Electrostatic Discharge (ESD).

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

Wvl (nm)	Max.Pwr (mW)
405	450
415	200
425	200
445	499
457	499
473	450
488	300
505	120
515	200
532	400
553	400
561	400
633	120
638	200
647	200
660	150
685	100
730	100
760	100
785	499
808	200
830	200
940	400
975	400

Cobolt o6-o1 Series

True fiber pigtailed option for o6-MLDs

The fiber pigtailed option for the Cobolt o6-MLD are delivered with the fiber permanently aligned and fixed inside the sealed package using Cobolt's proprietary HTCure™ Technology, providing stable output over a large temperature range and insensitive to transport conditions.



Fiber pigtailed option Specifications

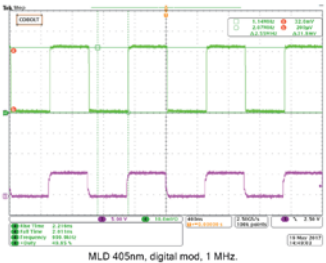
Center Wavelength (nm)	405	415	425	445	457	473	488	505	515	633	638	647	660
Power (mW)	75 150	60	60	50 150	50 150	50 150	30* 100**	40	40 75	40	80	60	50
Long-term stability (8 hrs ± 3°C)	< 2 %												
Exit ferrule	End-cap						No end-cap						
Fiber Output	FC/APC, 8°, non-collimated												
Fiber Type	SM/PM												
Polarization	PER > 100:1, ± 2°												
Standard Fiber Length	1 m												
Jacketing	Ø 3mm, Stainless Steel												
Warranty	Laser warranty including 12 months on fiber and workmanship												

* Without end-cap in standard configuration
** With end-cap in standard configuration

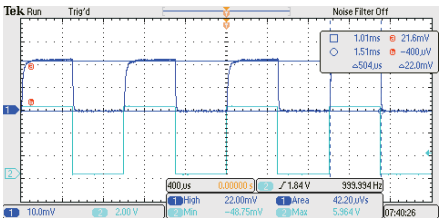
Modulation Specificaitons

Product	o6-MLD	o6-DPL		
Nominal Wavelength	405 - 515 nm, 633 - 975 nm	532	553	561
Digital modulation				
Bandwidth	DC - 150 MHz	DC-50 kHz	DC-5 kHz	DC-10 kHz
Extinction ratio @10 MHz	>10 000 000 : 1 (>70dB)	--	--	--
Rise/fall time	< 2.5 ns	< 6 μs	< 60 μs	< 30 μs
Input signal	0 - 5 V, TTL			
Analog modulation				
Bandwidth	DC - 2 MHz	DC-50 kHz	DC-5 kHz	DC-10 kHz
Extinction ratio @ 250 kHz	>10 000 000 : 1 (>70dB)	--	--	--
Rise/fall time	< 300 ns	< 6 μs	< 60 μs	< 30 μs
Input signal	0 - 1 V, Arbitrary			
ON-OFF modulation				
Bandwidth	DC - 500 kHz	N/A		
Extinction ratio	inf : 1			
Rise/fall time	< 300 ns			
Input signal	0 - 5 V, TTL			

Cobolt o6-MLD
Typical Digital Modulation at 1 MHz



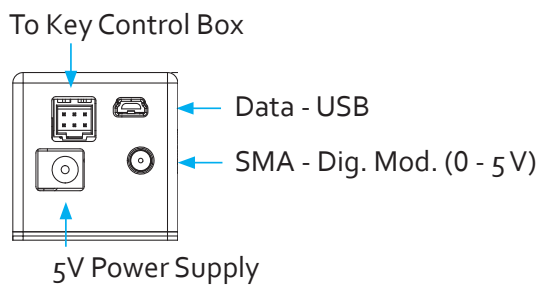
Cobolt o6- DPL
Typical Digital Modulation at 1 kHz



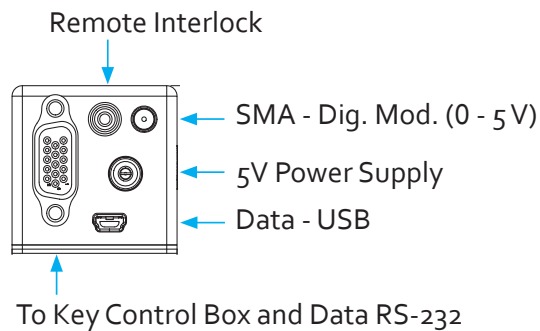
Cobolt o6-o1 Series

Electrical Interface

o6-DPL Laser Head



o6-MLD Laser head



Molex 6 pin - To Key control box

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

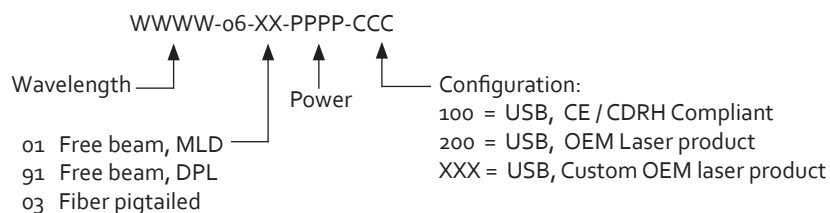
VGA 15 pin - To Key control box

Pin	Function
1	LED1 (Laser on)
2	LED2 (Error)
3	Analog modulation (0 - 1 V)
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	On / Off Modulation
12	Not used
13	Not used
14	Not used
15	+5V to keybox

Operational Environment

Product	o6 - MLD	o6 - DPL
Power supply requirements	5 VDC, 3 A	5 VDC, 5 A
Intended use environment	Laboratory (indoor)	
Maximum baseplate temperature	50 °C	
Ambient temperature, pointing	< 5 µrad / °C	
Ambient temperature, operation	10 - 40°C	
Ambient temperature, storage	-10 to +60°C	
Humidity	0-90% RH non-condensing	
Ambient Air pressure	950-1050 mbar	
Laser Head heat sink thermal impedance (at 40°C ambient)	< 0.8 K/W	< 0.5 K/W
Maximum heat dissipation of Laser Head	< 12 W	< 20 W

Model Number



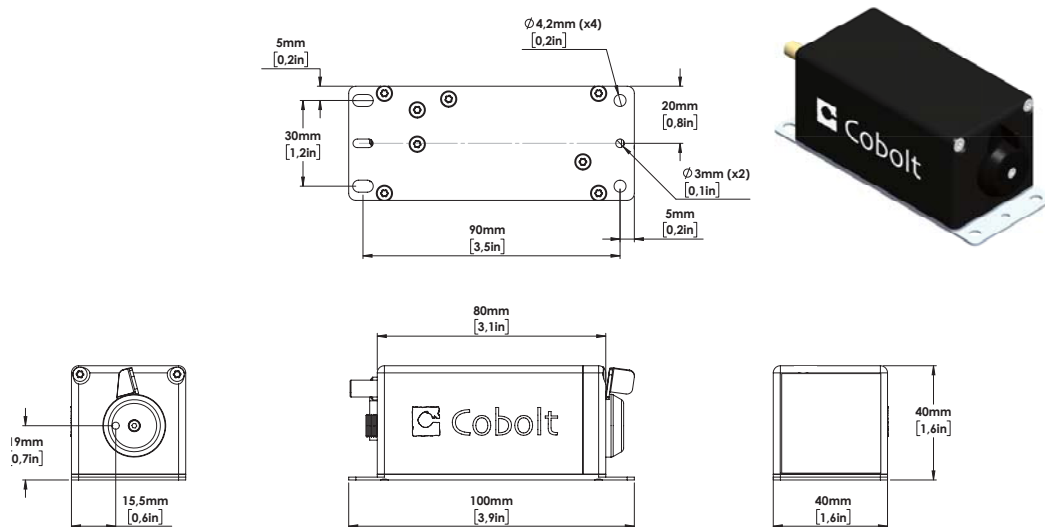
Communication Interface

Communication	USB or RS-232
Standard Baudrate	115200

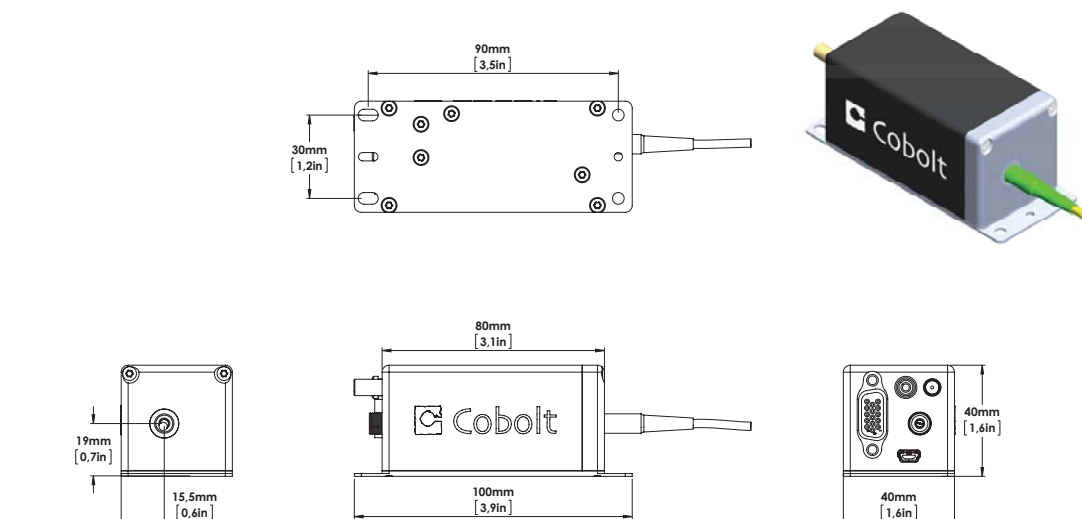
Cobolt o6-o1 Series

Mechanical Specifications

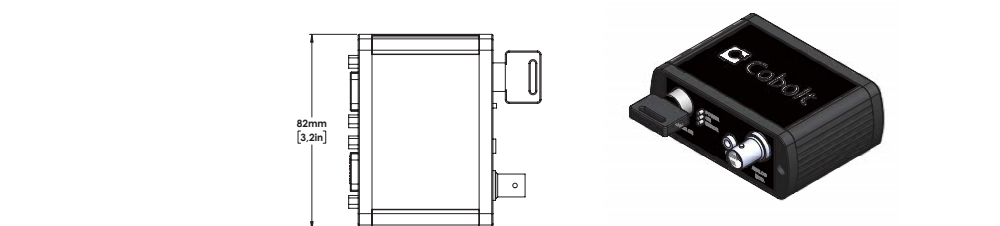
Laser head dimensions



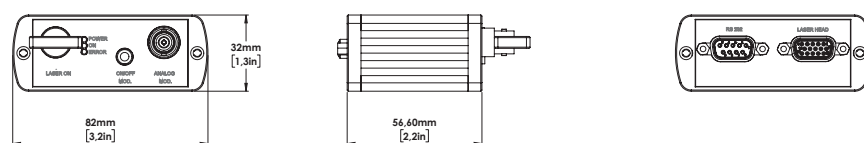
Fiber pigtailed laser head dimensions : o6-o3



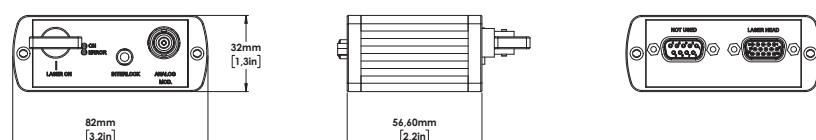
Key control box dimensions



o6-MLD



o6-DPL



Cobolt o6-o1 Series

Options and Accessories

- C-FLEX Laser Combiner
- Laser head heatsink HS-03
- Fiber coupled mounting plate FIC-05
- 2 - to 1 Laser combiner for optogenetics



C-FLEX Laser Combiner



Heatsink HS-03



2-to-1 Laser combiner for optogenetics
Cobolt o6-MLD with Cobolt o4-o1 series



2-to-1 Laser combiner for optogenetics
Two Cobolt o6-MLDs

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