

# Cobolt o6-01 Series

Plug & Play | Modulatable | Continuous Wave Lasers



## Applications

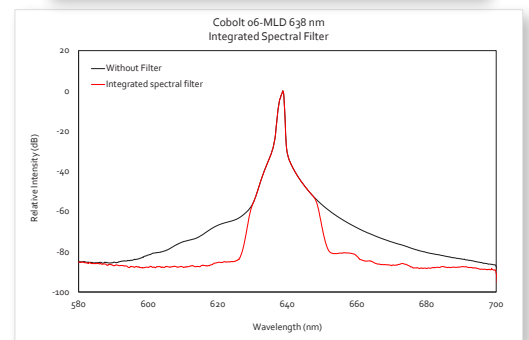
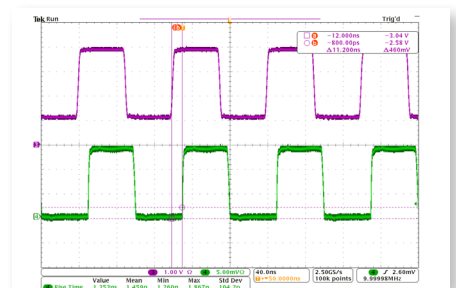
Fluorescence Microscopy  
Optogenetics  
Flow Cytometry  
Quantum Research

- 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
- 375 nm, 395 nm, 405 nm, 415 nm, 425nm, 445 nm, 457 nm, 473 nm, 488 nm, 505nm, 515 nm, 520 nm, 532 nm, 553 nm, 561 nm, 633 nm, 638 nm, 647 nm, 660 nm, 685 nm, 690 nm, 705 nm, 730 nm, 760 nm, 785 nm, 808 nm, 830 nm, 852 nm, 915 nm, 940 nm, 975 nm, 1064 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 375 nm and 1064 nm.

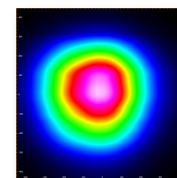
The lasers are manufactured using Cobolt's unique HTCure™ Technology to ensure world-class quality and reliability, as well as unmatched robustness. The Cobolt o6-01 Series lasers are intended for stand-alone use in laboratory environment, or for integration into laser combiners (C-FLEX) or analytical 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

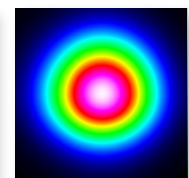


Typical Beam Profile

Typical Beam Profile



Cobolt o6-MLD  
 $M^2 < 1.2$



Cobolt o6-DPL  
 $M^2 < 1.1$

HÜBNER Photonics



# Cobolt o6-o1 Series

## Optical Performance Specifications

	375	395	405	415	425	445	457	473	488	505	515	520
Platform	o6-MLD											
Center Wavelength (nm)	375 ± 5	395 ± 5	405 ± 5	415 ± 5	425 ± 5	445 ± 5	457 ± 5	473 ± 5	488 ± 3	505 ± 3	515 ± 3	520 ± 5
Power (mW)	70	120	150 365	120	120	100 400	100 400	100 300	60 100 150 200 250*	80	80 150	80
Beam divergence (full angle, mrad)	< 1.1			< 1.2				< 1.3				
Spectral bandwidth (FWHM)	< 1.2 nm								< 1.5 nm			
Spatial mode (TEM <sub>00</sub> )	M <sup>2</sup> < 1.2											
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	< 1%											
Warranty	12 mo., 5000 hrs			24 months, unlimited hours								

\* 250 mW o6-MLD 488 nm wavelength specification : 488 +5 / -8 nm

	532	553	561	633	638	647	660	685	690
Platform	o6-DPL			o6-MLD					
Center Wavelength (nm)	532.1 ± 0.3	552.8 ± 0.3	561.2 ± 0.3	633 ± 3	638 ± 5	647 -1/+4	660 ± 5	685 ± 5	690 ± 5
Power (mW)	25 50 100 200 400	25 50	25 50 100 200	80	180	130	100	40	200
Beam divergence (full angle, mrad)	< 1.2			< 1.6			< 1.75		
Spectral bandwidth (FWHM)	< 1 MHz			< 1.2 nm					
Spatial mode (TEM <sub>00</sub> )	M <sup>2</sup> < 1.1			M <sup>2</sup> < 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, 5000 hours					

	705	730	760	785	808	830	852	915	940	975	1064	
Platform	o6-MLD											
Center Wavelength (nm)	705 ± 10	730 ± 5	760 ± 15	785 ± 5	808 ± 5	830 ± 5	852 ± 5	915 ± 10	940 ± 10	975 ± 5	1064 ± 10	
Power (mW)	30	50	25	250	120	250	50	250	250	250	200	
Beam divergence (full angle, mrad)	< 1.9		< 2.0	< 2.6	< 2.3		< 2.6			< 3.0		
Spectral bandwidth (FWHM)	< 2 nm											
Spatial mode (TEM <sub>00</sub> )	M <sup>2</sup> < 1.2				M <sup>2</sup> < 1.3				M <sup>2</sup> < 1.4			
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 %								< 0.5 %			
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

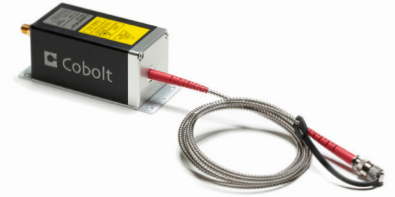
Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)
375	200	488	499	638	200	785	499		
395	200	505	120	647	200	808	200		
405	450	515	200	660	150	830	200		
415	200	520	200	685	100	852	100		
425	200	532	499	690	300	915	450		
445	499	553	400	705	100	940	400		
457	499	561	400	730	100	975	400		
473	450	633	120	760	100	1064	400		



# Cobolt o6-01 Series

## True fiber pigtailed option for the o6-01 Series

The fiber pigtailed option for the Cobolt o6-01 Series lasers 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.



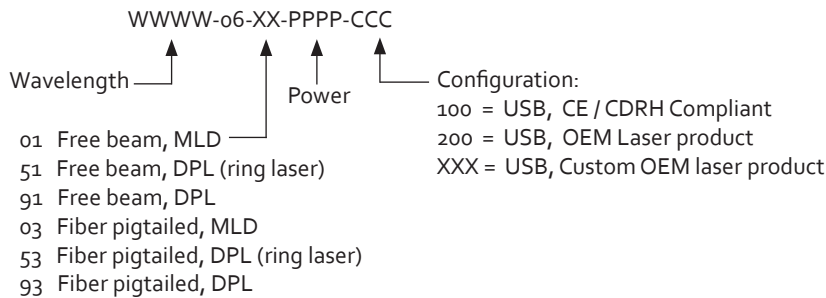
### Fiber pigtailed option Specifications

Center Wavelength (nm)	375	395	405	415	425	445	457	473	488	505	515	520	532	553	561	633
Power (mW)	25	25	75 150	60	60	50 150	50 150	50 150	30 100*	40	40 75	40	25 50 100 200*	25	25 50 100	40
Long-term stability (8 hrs ± 3°C)	< 2 %															
Noise, 250 Hz - 2 MHz (rms)	< 0.3 %															
Exit ferrule	End-cap (red boot)								No end-cap (green boot)							
Fiber Output	FC/APC, 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															

\* With end-cap in standard configuration

Center Wavelength (nm)	638	647	660	685	690	705	730	760	785	808	830	852	915	940	975	1064
Power (mW)	80	60	50	20	75	15	20	15	100	50	100	20	100	75	50	75
Long-term stability (8 hrs ± 3°C)	< 2 %															
Noise, 250 Hz - 2 MHz (rms)	< 0.3 %															
Exit ferrule	No end-cap (green boot)															
Fiber Output	FC/APC, 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															

### Model Number



### Communication Interface

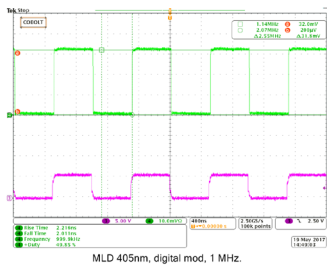
Product	o6 - MLD	o6 - DPL
Communication	USB or RS-232	USB
Standard Baudrate	115200	

# Cobolt o6-o1 Series

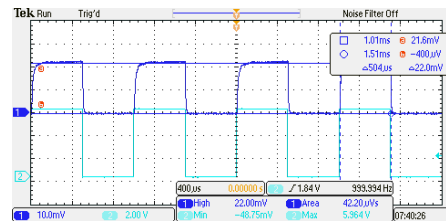
## Modulation Specifications

Product	o6-MLD		o6-DPL		
Nominal Wavelength	375 - 520 nm, 633 - 1064 nm		532	553	561
<b>Digital modulation</b>					
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				
<b>Analog modulation</b>					
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				
<b>ON-OFF modulation</b>					
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

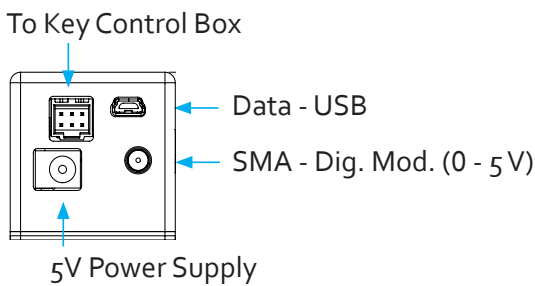


Cobolt o6- DPL  
Typical Digital Modulation at 1 kHz

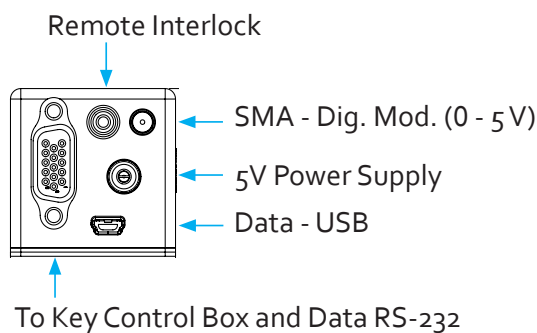


## Electrical Interface

### 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

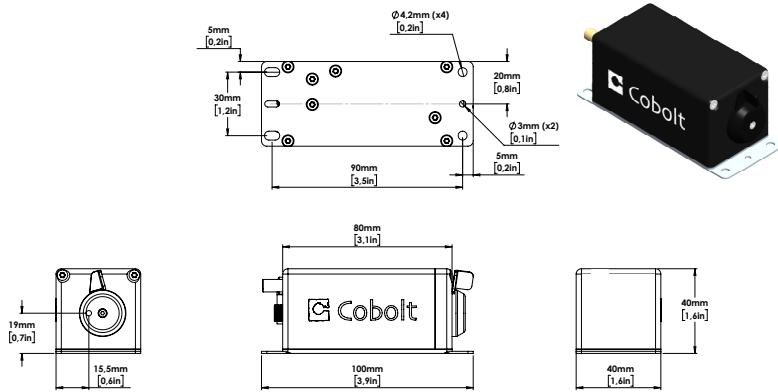
# Cobolt o6-o1 Series

## Operational Environment

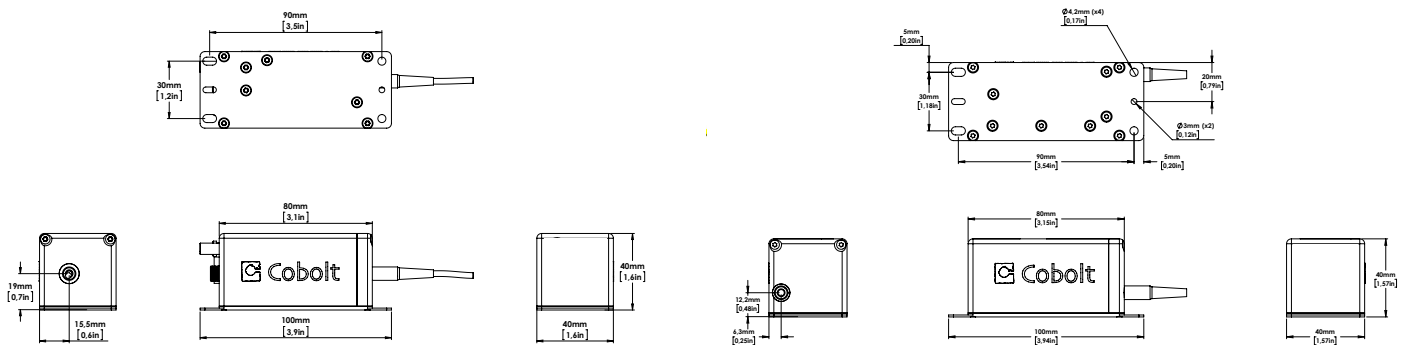
Product	o6 - MLD	o6 - DPL
Power supply requirements	5 VDC, 3 A	5 VDC, 5 A
Intended use environment	Laboratory (indoor)	
Maximum baseplate temperature	50 °C	
Ambient temperature, pointing	< 5 μrad / °C	
Ambient temperature, operation	10 - 40°C	
Ambient temperature, storage	-10 to +60°C	
Humidity	0-90% 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

## Mechanical Specifications

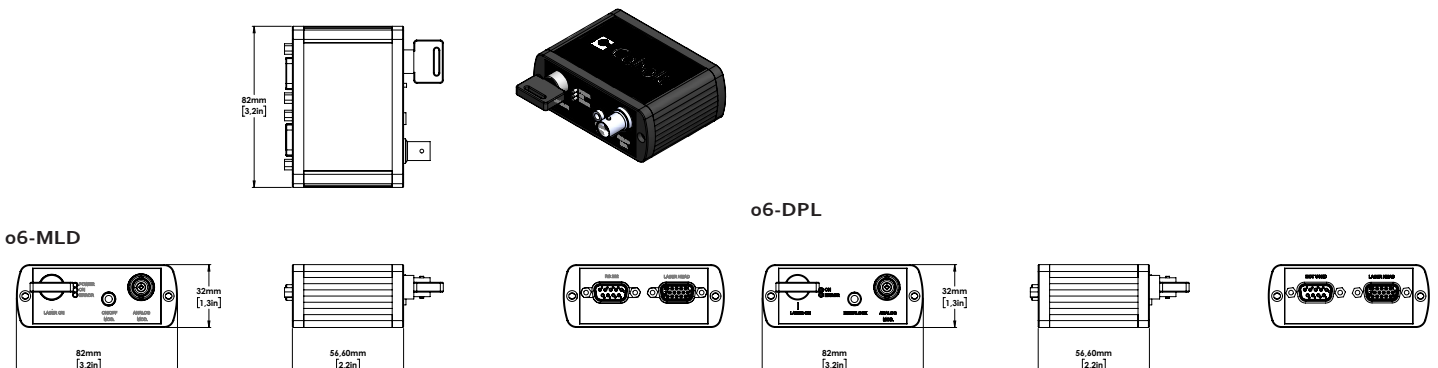
### Laser head dimensions



### Fiber pigtailed laser head dimensions : MLD (left) and DPL (right)



### Key control box dimensions



# Cobolt o6-o1 Series

## Options and Accessories

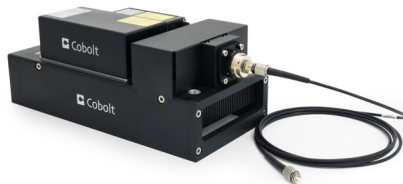
- C-FLEX Laser Combiner
- Laser head heatsink HS-03
- Fiber coupled mounting plate FIC-05
- 2 - to - 1 Laser combiner for optogenetics



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

## Our Locations

**Cobolt AB**  
(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](mailto:info.se@hubner-photonics.com)

**HÜBNER GmbH & Co. KG**  
(Sales in Germany, Switzerland and Austria)  
Kassel, Germany  
Phone: +49 561 994 060 - 0  
Fax: +49 561 994 060 - 11  
E-mail: [info.de@hubner-photonics.com](mailto: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](mailto:info.usa@hubner-photonics.com)

**HÜBNER UK Limited**  
(Sales in UK & Ireland)  
Derby, Great Britain  
Phone: +44 7359440871  
E-mail: [info.uk@hubner-photonics.com](mailto:info.uk@hubner-photonics.com)

Find local sales representatives at [hubner-photonics.com](http://hubner-photonics.com)

