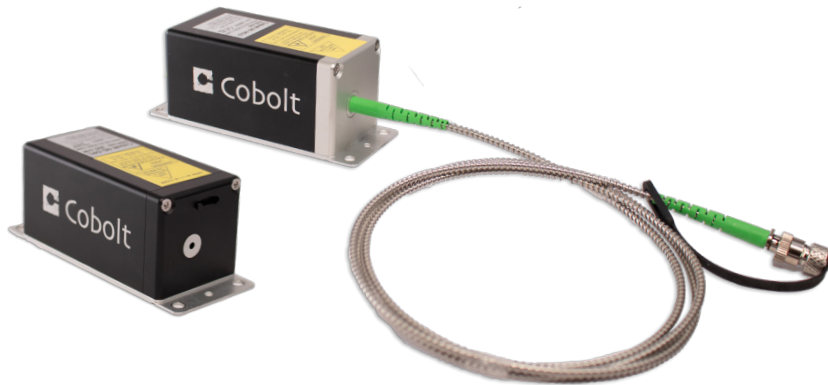


Cobolt o6-o1 Series

Plug & Play | Modulatable | Continuous Wave lasers



- Easy-to-integrate compact and powerful laser modules
- Output power up to 400 mW
- Wavelengths from 375 nm to 1064 nm, including 532 nm, 553 nm, 561 nm and 594 nm
- Integrated clean-up filter on all diode lasers
- Fast and deep intensity modulation to a complete dark state on all lines
- Versatile modulation controls, with linear response to analog power control signals
- Full duty cycle flexibility and ensured stability within a pulse through active power control
- Free space and fiber pigtailed beam delivery
- Ultra-robust design

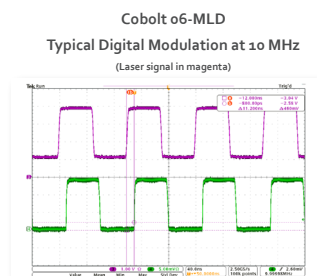
The Cobolt o6-o1 Series lasers offer a compact form factor and a wide wavelength span in an industry standard plug and play format, utilizing the most ideal laser technology to achieve each wavelength while maintaining the same footprint. The Cobolt o6-o1 Series consists of high performance fixed wavelength 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 fiber pigtailed option for the Cobolt o6-o1 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.

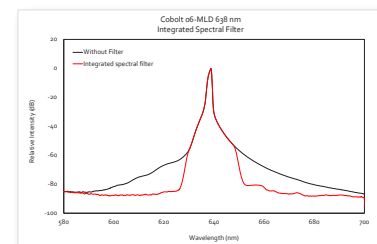
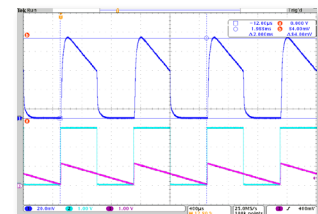
The lasers are manufactured using Cobolt's unique HTCure™ Technology to ensure world-class quality and reliability, as well as unmatched robustness. The Cobolt o6-o1 Series lasers are intended for stand-alone use in laboratory environment, or for integration into laser combiners (C-FLEX) or analytical instrumentation and are ideally suited for demanding fluorescence analysis applications such as confocal microscopy and flow cytometry.

Applications

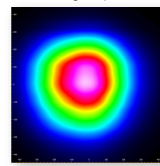
Fluorescence microscopy and imaging
Super resolution microscopy
Flow cytometry
Optogenetics
Quantum research



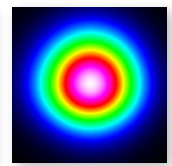
Cobolt o6-DPL
Typical Mixed Digital and Analog Modulation at 1 kHz



Cobolt o6-MLD
 $M^2 < 1.2 - 1.4$
(wavelength dependent)



Cobolt o6-DPL
 $M^2 < 1.1$



HÜBNER Photonics



Cobolt o6-o1 Series

Optical specifications

	375	395	405	415	425	445	457	473	488
Platform	o6-MLD								
Center Wavelength (nm)	375 ± 5	395 ± 5	405 ± 5	415 ± 5	425 ± 5	445 ± 5	457 ± 5	473 ± 5	488 ± 3
Spectral bandwidth (FWHM)	< 1.2 nm								< 1.5 nm
Free beam power (mW)	70	120	150 365	120	120	100 400	100 400	100 300	100 200 300
Power stability over 8 hrs (%)	< 1.0								
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.2								
Beam diameter at aperture (µm)	700 ± 100								
Beam symmetry	> 0.90:1								
Beam divergence (full angle, mrad)	< 1.1			< 1.2				< 1.3	
Spatial mode (TEM ₀₀)	M ² < 1.2								
Fiber pigtailed power (mW)	25	25	75 150	60	60	50 200	50 200	50 150	30* 100* 150
Power stability over 8 hrs (%)	< 2.0								
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.3								
Fiber exit ferrule	End-cap (red boot)								
Fiber Output	FC/APC, Narrow key								
Fiber Type	SM/PM								
Polarisation	PER > 100:1 (> 20 dB), ± 3° relative to key, vertical								
MFD (µm)	3.5 ± 0.5								4.0 ± 0.5
Standard Fiber Length	1 m								
Jacketing	Ø 3mm, stainless steel								
Warranty***	12 mo., 5000 hrs		24 months, unlimited hours						

	505	515	520	532	553	561	594
Platform	o6-MLD			o6-DPL			
Center Wavelength (nm)	505 ± 3	515 ± 3	520 ± 5	532.1 ± 0.3	552.8 ± 0.3	561.2 ± 0.3	593.6 ± 0.3
Spectral bandwidth (FWHM)	< 1.5 nm			< 1 MHz			
Output power (mW)	80	80 150	80	50 100 200 400	25 50 100	25 50 100 200	50 100 150
Power stability over 8 hrs (%)	< 1.0			< 2.0			
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.2			< 0.25			
Beam diameter at aperture (µm)	700 ± 100			700 ± 70			
Beam symmetry	> 0.90:1			> 0.95:1			
Beam divergence (full angle, mrad)	< 1.3			< 1.2			< 1.4
Spatial mode (TEM ₀₀)	M ² < 1.2			M ² < 1.1			
Fiber pigtailed power (mW)	40	40 75	40	25 50 100 200**	25 50	25 50 100	50
Power stability over 8 hrs (%)	< 2.0						
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.3						
Fiber exit ferrule	No end-cap (green boot)						
Fiber Output	FC/APC, Narrow key						
Fiber Type	SM/PM						
Polarisation	PER > 100:1 (> 20 dB), ± 3° relative to key, vertical						
MFD (µm)	4.0 ± 0.5						4.5 ± 0.5
Standard Fiber Length	1.0						
Jacketing	Ø 3mm, stainless steel						
Warranty***	24 months, unlimited hours						

*Without end-cap in standard configuration
**With end-cap in standard configuration
***Warranty covers laser only, 12 months limited warranty on fiber workmanship

Cobolt o6-o1 Series

Optical Performance Specifications

	633	638	642	647	660	675	685	690	705
Platform	o6-MLD								
Center Wavelength (nm)	633 ± 3	638 ± 5	642 ± 5	647 -1/+4	660 ± 5	675 ± 5	685 ± 5	690 ± 5	705 ± 10
Spectral bandwidth (FWHM)	< 1.2 nm								< 2 nm
Output power (mW)	80	180	180	130	100	200	40	200	30
Power stability over 8 hrs (%)	< 1.0						< 2.0		
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.2						< 0.5	< 0.2	
Beam diameter at aperture (µm)	700 ± 100								
Beam symmetry	> 0.90:1								
Beam divergence (full angle, mrad)	< 1.6						< 1.75		< 1.9
Spatial mode (TEM ₀₀)	M ² <1.2								
Fiber pigtailed power (mW)	50	80	80	60	50	100	20	100	15
Power stability over 8 hrs (%)	< 2.0								
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.3						< 0.6	< 0.3	
Fiber exit ferrule	No end-cap (green boot)								
Fiber Output	FC/APC, Narrow key								
Fiber Type	SM/PM								
Polarisation	PER > 100:1 (> 20 dB), ± 3° relative to key, vertical								
MFD (µm)	4.5 ± 0.5								
Standard Fiber Length	1.0								
Jacketing	Ø 3mm, stainless steel								
Warranty***	24 months, 5000 hours								

	730	785	808	830	850	915	940	975	1064
Platform	o6-MLD								
Center Wavelength (nm)	730 ± 5	785 ± 5	808 ± 5	830 ± 5	850 ± 10	915 ± 10	940 ± 10	975 ± 5	1064 ± 10
Spectral bandwidth (FWHM)	< 2 nm								
Output Power (mW)	50	250	120	250	200	250	250	250	200
Power stability over 8 hrs (%)	< 2.0								
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.2						< 0.5		
Beam diameter at aperture (µm)	700 ± 100								
Beam symmetry	> 0.90:1								
Beam divergence (full angle, mrad)	< 1.9	< 2.0	< 2.6	< 2.3		< 2.6			< 3.0
Spatial mode (TEM ₀₀)	M² < 1.2		M² < 1.3			M² < 1.4			
Fiber pigtailed power (mW)	20	100	50	100	20	100	100	100	100
Power stability over 8 hrs (%)	< 2.0								
Noise, 20 Hz – 2 MHz (RMS, %)	< 0.3						< 0.5		
Fiber exit ferrule	No end-cap (green boot)								
Fiber Output	FC/APC, Narrow key								
Fiber Type	SM/PM								
Polarisation	PER > 100:1 (> 20 dB), ± 3° relative to key, vertical								
MFD (µm)	4.5 ± 0.5		5.5 ± 0.5						6.6 ± 0.5
Standard Fiber Length	1.0								
Jacketing	Ø 3mm, stainless steel								
Warranty***	24 months, 5000 hours								

*** Warranty covers laser only, 12 months limited warranty on fiber workmanship

Cobolt o6-o1 Series

Modulation Specificaitons

Product	o6-MLD	o6-DPL
Nominal Wavelength	375 - 520 nm, 633 - 1064 nm	532 - 594 nm
Digital power modulation		
Modulation frequency	DC - 10 MHz	DC - 1 kHz
Rise/fall time	< 2.5 ns*	< 100 μs
Extinction ratio	> 10 000 000 : 1 (>70dB)	
Input signal - Low	0 - 0.8 V	
Input signal - High	2 - 5 V	
Input signal - Impedance	2 kΩ	
Analog power modulation		
Modulation frequency	DC - 10 Hz	DC - 1 kHz
Rise/fall time	< 10 ms	< 100 μs
Extinction ratio	> 10 000 000 : 1 (>70dB)	
Input signal	0 - 1 V -or- 0 - 5 V	
Threshold voltage	37 ± 5 mV (0 - 1 V) 68 ± 5 mV (0 - 5 V)	< 0.1 V (0 - 1 V) < 0.5 V (0 - 5 V)
Input signal - Impedance	2 kΩ -or- 50 Ω	
Digital current modulation		
Max. modulation frequency	> 100 MHz	> 10 kHz
3 dB Bandwidth	150 MHz	---
Rise/fall time	< 2.5 ns*	< 30 μs
Input signal - Low	0 - 0.8 V	
Input signal - High	2 - 5 V	
Input signal - Impedance	2 kΩ	
Analog current modulation		
Max. modulation frequency	> 300 kHz**	> 10 kHz
Rise/fall time	< 2 μs	< 30 μs
Input signal		
Threshold voltage	37 ± 5 mV (0 - 1 V) 68 ± 5 mV (0 - 5 V)	
Input signal - Impedance	2 kΩ -or- 50 Ω	

* Rise and fall time increased to up to 250 ns for IR wavelengths
** Up to 2 MHz analog modulation available on the o6-o1 Series legacy 5 V lasers, see datasheet on hubner-photonics.com

Model Number

WWWW-o6-XX-PPPP-CCCC

Wavelength

Power

Configuration:

01 Free beam, MLD

51 Free beam, DPL (high power)

91 Free beam, DPL

03 Fiber pigtailed, MLD

53 Fiber pigtailed, DPL (high power)

93 Fiber pigtailed, DPL

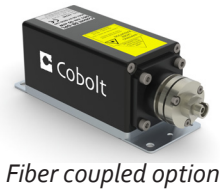
X6 Fiber coupled option - MM fiber

X7 Fiber coupled option - SM/PM

1100 = CE / CDRH Compliant

1200 = OEM Laser product

1XXX = Custom OEM laser product

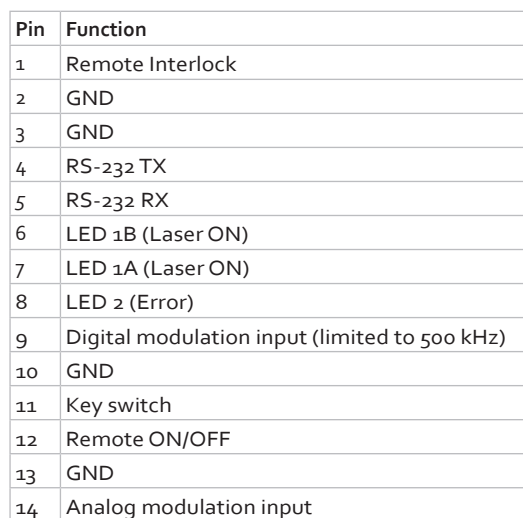


 	 	WARNING VISIBLE OR INVISIBLE LASER RADIATION Avoid Exposure to beam Class 3B Laser Product Classified per IEC 60825-1:2014 This device is sensitive to Electrostatic Discharge (ESD).	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)	Wvl (nm)	Max.Pwr (mW)
			375	200	505	120	642	200	808	200
			395	200	515	200	647	200	830	200
			405	450	520	200	660	150	850	300
			415	200	532	499	675	300	915	450
			425	200	553	400	685	100	940	400
			445	499	561	400	690	300	975	400
			457	499	594	499	705	100	1064	400
			473	450	633	120	730	100		
			488	499	638	200	785	499		

Operational Environment

Electrical Interfaces

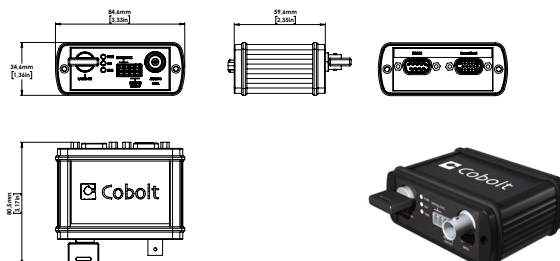
Molex 14 pin - Control I/O (to key control box)



Molex 2 pin - to power supply

Pin	Function
1	+ 12 V DC, max 3 A
2	GND

Laser head dimensions



Cobolt o6-o1 Series

Options and Accessories

- C-FLEX Laser Combiner
- Laser head heatsink HS-07
- Fiber coupled mounting plate FIC-05
- 2 - to - 1 Laser combiner for optogenetics



C-FLEX Laser Combiner



Heatsink HS-07



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



*2-to-1 Laser combiner for optogenetics
Example : o6-MLD 473 and o6-DPL 594 nm*

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