DLC TOPO

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Widely Tunable High-Power Continuous-Wave OPO Laser System

The revolutionary DLC TOPO by TOPTICA stands alone as the only fully automated, continuous-wave, Optical Parametric Oscillator laser source on the market. High resolution spectroscopy across 1.45 - 4.0 µm (2500 - 6900 cm^{-1}) has never been easier.

TOPTICA's unique optical design enables broadly tunable laser light. No module or mirror exchange is necessary. Additionally, the all-digital control electronics enable hands-free coarse wavelength tuning, fine tuning, and frequency locking.

A wide mode-hop-free tuning range up to 300 GHz (10 cm^{-1}) enables visibility of full spectroscopic signatures. Simultaneously, the DLC TOPO maintains a narrow linewidth (2 MHz, $1 \cdot 10^{-5}$ cm^{-1}) giving a resolution that reveals narrowatomic and molecular features. As with all TOPTICA systems, the TOPO is low maintenance due to having no external cooling systems. Turn-key operation allows more time to be put into research and less into instrumentation.

The full TOPTICA TOPO laser system integrates 4 key technologies: a DFB seed laser, fiber amplifier, Optical Parametric Oscillator, and DLC Digital Control.

This same DLC pro platform is extensively used throughout TOPTICA laser product lines.

TOPTICA has extended the proven digital DLC pro unit to now control all adjustable components inside of the OPO cavity. The DLC pro allows simple hands-free operation through touchscreen, PC GUI interface, and through remote commands. All aspects of DLC TOPO design are centered on the user experience.

The wide wavelength coverage and low noise will make you explore further in molecular and biomedical spectroscopy, physical chemistry, and quantum technologies with the only widely-tunable MIR laser designed with top performance and ease of use in mind: the DLC TOPO.

Applications

- Gas Sensing
- Molecular Spectroscopy
- Quantum Optics
- Materials Testing
- Biophotonics
- Physical Chemistry

Key Features

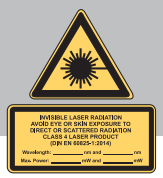
- 1.45 - 4.0 µm (2500 - 6900 cm^{-1})
- 300 GHz (10 cm^{-1}) mode-hop-free tuning range
- Narrow linewidth: 2 MHz ($1 \cdot 10^{-5}$ cm^{-1})
- Hands-free motorized tuning
- Easy all-digital DLC pro control
- Watt class power

*Only available in North America

PRISM AWARDS FINALIST

TOPTICA PHOTONICS

DLC TOPO



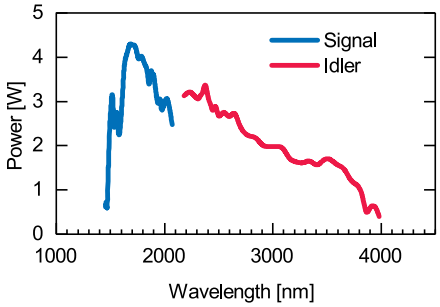
Laser Specifications			
	Signal	Idler	
Coarse tuning range*	1.45 - 2.07 µm	2.19 - 4.00 µm	2500 - 4570 cm^{-1} (idler), 4830 - 6900 cm^{-1} (signal)
Output Power**	2 W	1 W	
Linewidth	< 2 MHz	2 MHz	1 x 10^{-5} cm^{-1}
Mode hop free tuning range***	500 MHz	Up to 300 GHz****	Up to 10 cm^{-1} (idler)
Frequency modulation and lock	PZT modulation	PZT modulation, Pump frequency modulation	
Control interfaces	DLC pro touchscreen, PC software, Ethernet, USB, analog remote control		

* Course tuning is established by full automatic crystal shifting and temperature control. No optics exchange necessary.

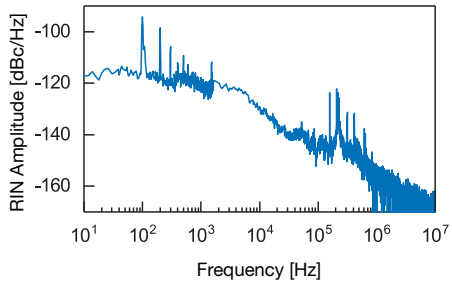
** Power specifications valid 1.5 - 2 µm, 2.2 - 3.8 µm

*** Fine tuning is established via pump tuning (idler) and PZT tuning (signal and idler).

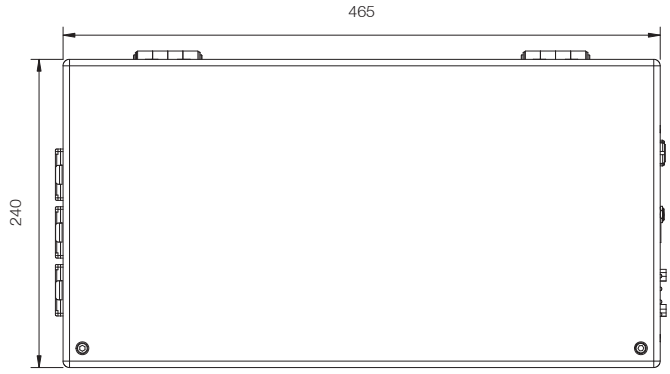
**** 30 GHz - 300 GHz, depending on output wavelength

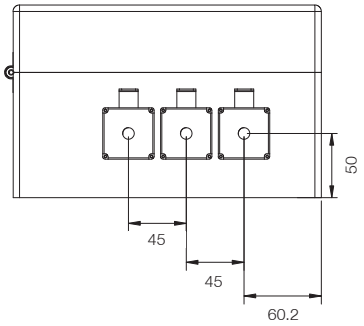


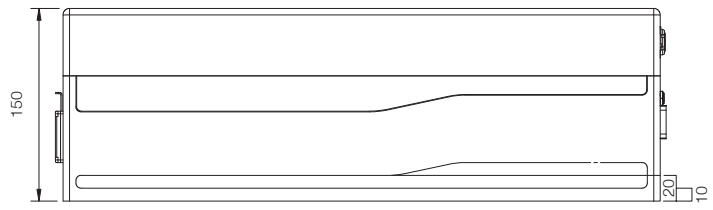
Characteristic Tuning Curve

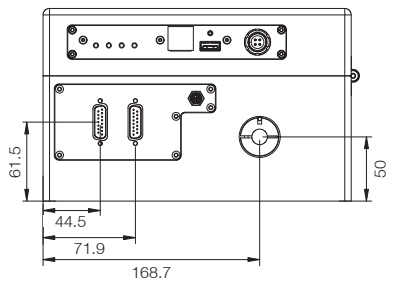


Signal at 1.7 µm: RMS 0.15 %









All dimensions given in mm.

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