

CW LASER SYSTEMS

Product: CW LASER SYSTEMS

Product Introduction: Continuous Wave laser systems with integrated pump laser and OPO. Hands-free wavelength tuning in the Near-IR and Mid-IR across 1450 - 4000 nm with superior power and stability.



Key Features

- Wide wavelength tuning across 1435 – 4138 nm (6969 – 2416 cm⁻¹)*
- High output power with >4 W at the peak of the range
- Excellent beam pointing stability with wavelength
- TEM₀₀ spatial profile
- Hands-free operation with dedicated control software. Control drivers available
- Sealed, compact, and virtually maintenance-free
- Spectral monitoring with integrated spectrometer

Continuous Wave Laser

Radiantis manufactures CW tunable laser / Continuous Wave Tunable Lasers for scientific research and technology. These lasers emit a continuously tunable selection of wavelengths with high average power and excellent beam properties for applications such as spectroscopy, microscopy, quantum optics, telecommunications and optical sensing. With exceptional performance, reliability and usability, our lasers are a versatile tunable illumination source for any laboratory of experimental sciences related to material characterisation, device calibration, optical fibers, pump-probe experiments and reflectometry, amongst many others. Explore our product category and find out more about the cutting-edge tunable laser solutions we can offer you.

Description

The CW tunable laser and extraordinary Titan is the pioneer commercial fully-automated mid-infrared continuous-wave optical parametric oscillator (**CW OPO**). Introduced to the market in 2018, Titan delivers continuously tunable output wavelengths in the mid-IR, across 1435 – 4138 nm (6969-2416 cm⁻¹)*. The full spectral range is achieved with a single set of optics without the need to exchange any module.

Radiantis' unique expertise in frequency converted lasers has enabled the exceptional design of the Titan OPO family. As a sealed and fully-automated system, with excellent TEM00 beam quality ($M^2 < 1.3$) and beam pointing stability ($< 80 \mu\text{rad}$), Titan delivers high CW output power ($> 4 \text{ W}$ at the peak of the tuning range) with a linewidth $< 100 \text{ MHz}$ in the signal range.

Hands-free operation is ensured thanks to the all-digital control electronics and user control software which can be accessed through the PC GUI interface installed on a dedicated laptop delivered with the OPO. Titan can also be controlled via remote commands.

The CW tunable laser Titan integrates 4 key modules: 1) the DFB fiber laser and amplifier unit, 2) the DFB fiber laser control unit (integrated on a rack), 3) the OPO optical head (to be located on an optical table), 4) the OPO all-digital control electronics unit (integrated on a rack).

The broad wavelength range, narrow linewidth, and fully-automated tunability across the mid-IR will enable cutting-edge research in diverse areas such as high-resolution spectroscopy and microscopy for biotechnology, fundamental physics and chemistry, as well as on device and material characterisation and quantum technologies.

Several Titan models are available which provide different characteristics of average output power and wavelength coverage, as detailed in the specification table below.



Titan LP

Tuning range

Signal wavelength: 1435 – 2000 nm
 Idler wavelength: 2270 – 4138 nm
 Pump wavelength: –
 SHG wavelength: –

Average power

Signal average power: $> 1.5 \text{ W}$
 Idler average power: $> 2.5 \text{ W}$
 Pump average power: –
 SHG average power: –

Pulse duration: Continuous-wave

Integrated pump: Yes



Titan HP

Tuning range

Signal wavelength: 1435 – 2000 nm
 Idler wavelength: 2270 – 4138 nm
 Pump wavelength: –
 SHG wavelength: –

Average power

Signal average power: $> 2.5 \text{ W}$
 Idler average power: $> 4 \text{ W}$
 Pump average power: –
 SHG average power: –

Pulse duration: Continuous-wave

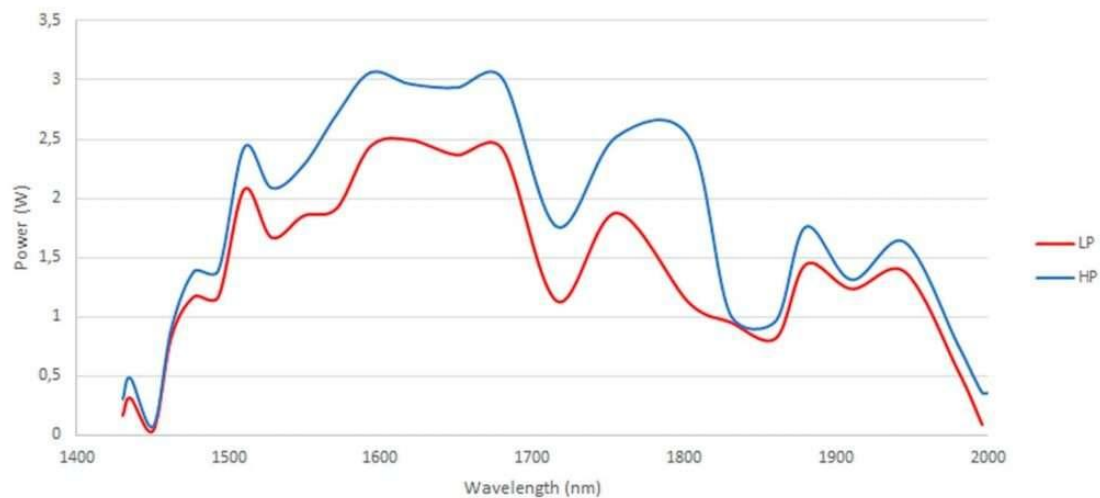
Integrated pump: Yes

Output Characteristics	TITAN LP	TITAN HP
Tuning Range		
Signal output	1435 – 2000 nm (5000 – 6968 cm-1)	1435 – 2000 nm (5000 – 6968 cm-1)
Idler output	2270 – 4138 nm (2416 – 4405 cm-1)	2270 – 4138 nm (2416 – 4405 cm-1)
Output Power(2)(3)		
Signal output	>1.5 W	>2.5 W
Idler output	>2.5 W	>4 W
Linewidth		
Signal output	<100 MHz	<100 MHz
Idler output	<2 GHz	<2 GHz
Beam Parameters		
Beam diameter at 1650 nm	<3.0 mm	<3.0 mm
Beam diameter at 3000 nm	<3.0 mm	<3.0 mm
Spatial mode	TEM00 ($M2 \leq 1.3$)	TEM00 ($M2 \leq 1.3$)
Beam pointing signal	<80 μ rad	<80 μ rad

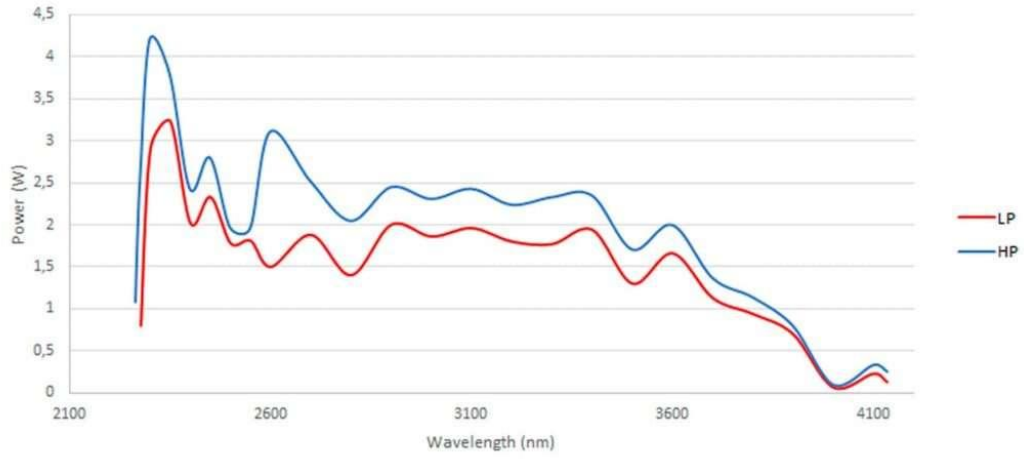
Beam pointing idler	<20 μ rad	<20 μ rad
Beam displacement with tuning Idler	<0.3 mm	<0.3 mm
Polarization	Linear (horizontal)	Linear (horizontal)
Power stability		
Signal	< 0.5% rms(5)	< 0.5% rms(5)
Idler	< 0.5% rms(6)	< 0.5% rms(6)
Size (W x L x H)	610 x 350 x 215 mm (24.0 x 13.8 x 8.5 inch)	610 x 350 x 215 mm (24.0 x 13.8 x 8.5 inch)

Note:

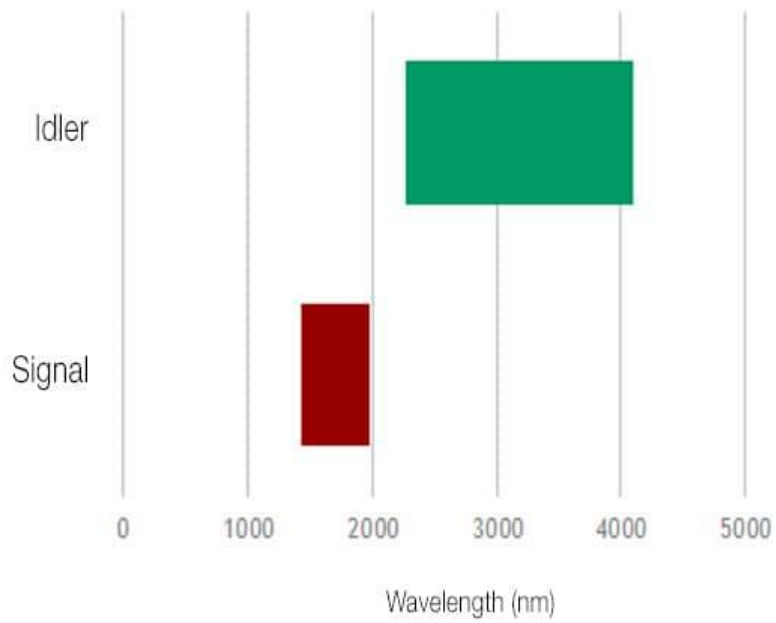
- (1) Specifications are subject to change without notice.
- (2) At Peak of OPO tuning range.
- (3) Higher powers available on request.
- (4) Across the full spectral range.
- (5) At 1478 nm.
- (6) At 3800 nm.



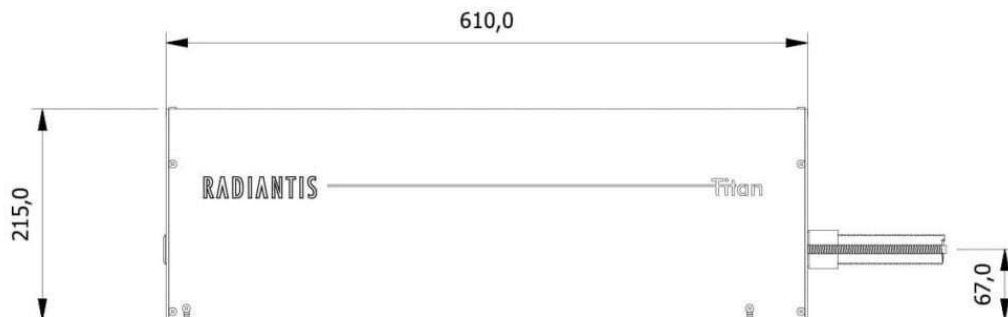
Typical Signal Tuning Curve

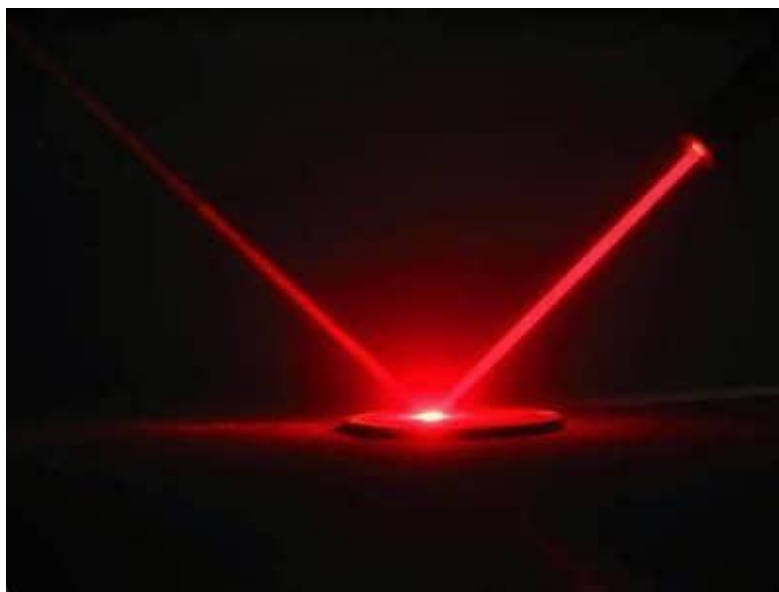
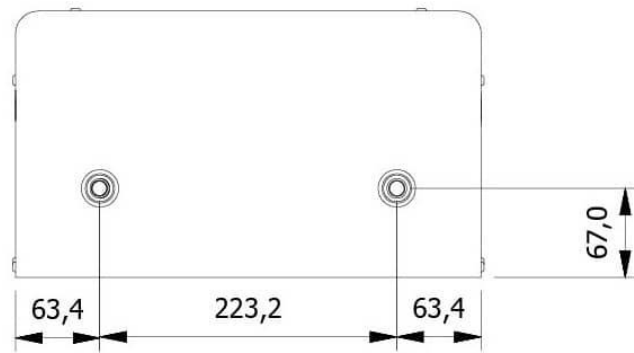


Typical Idler Tuning Curve

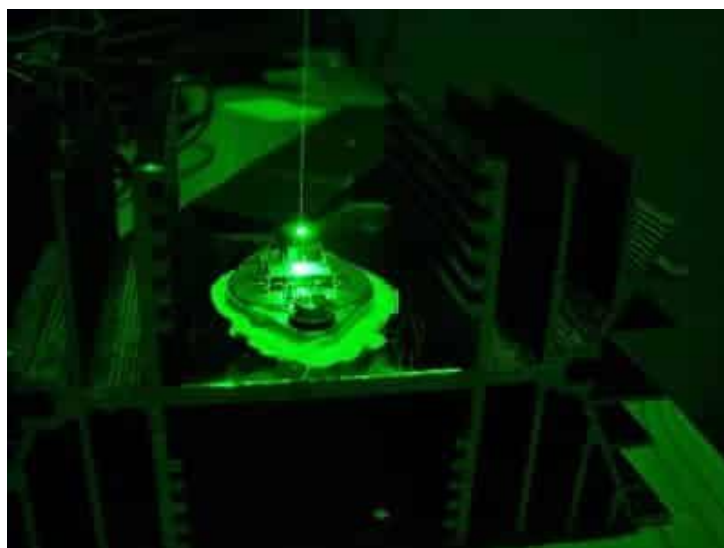


Titan Wavelength Coverage

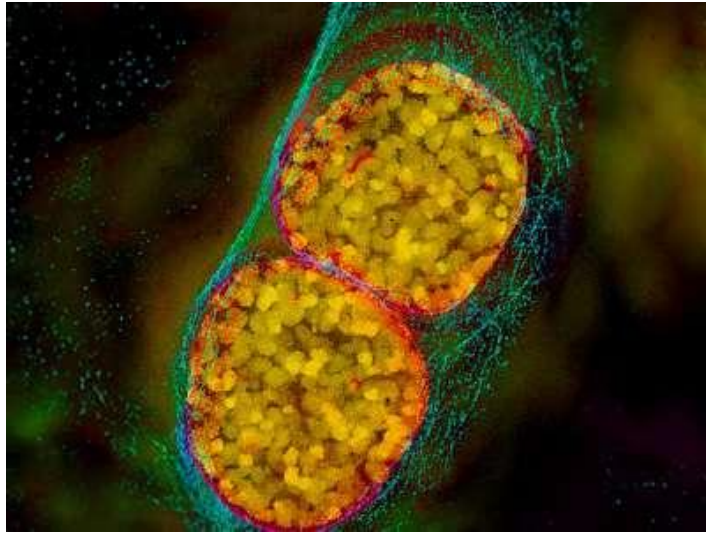




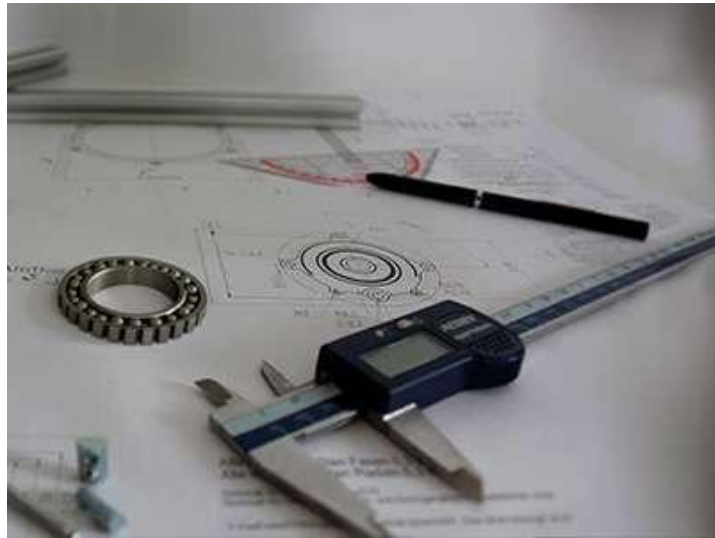
Component characterisation



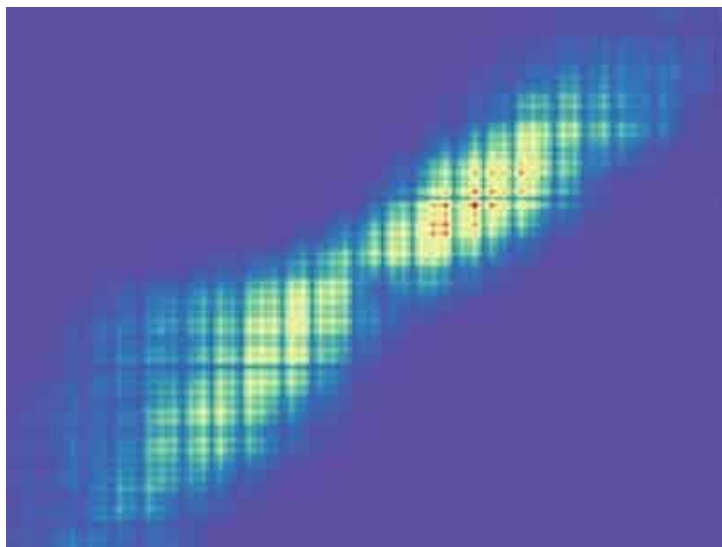
Device characterisation



Spectroscopy and microscopy



Metrology



Mid-IR communications



Quantum technology