

Femtosecond IR OPO for Ti:Sapphire Oscillators

Hands-Free Optical Parametric Oscillator Tunable Across 990 - 4090 nm
(2444 - 10101 cm^{-1})



ORIA IR



KEY FEATURES

- Broad tuning across 990 - 1550 nm (6451 - 10101 cm^{-1}) and 1696 - 4090 nm (2444 - 5890 cm^{-1}).
- Independent pump and signal/idler tuning.
- Highest average power, >1 W at the peak of the tuning range.
- Hands-free operation.
- Compatible with standard MHz femtosecond Ti:Sapphire

APPLICATIONS

- Coherent Anti-Stokes Raman Spectroscopy (CARS).
- Pump-Probe Spectroscopy.
- Second Harmonic Generation Microscopy.
- Time-Resolved Spectroscopy.
- Two-Photon Microscopy.

TUNE YOUR WAVELENGTH

Broadly Tunable Laser Systems for Science & Technology

Description

Sealed fully-automated femtosecond optical parametric oscillator (OPO) offering broad wavelength coverage across 990 - 4090 nm (2444 - 10101 cm^{-1}), with highest average power (>1 W at the peak of the range). The Oria IR is compatible with standard femtosecond Ti:Sapphire oscillators at MHz repetition rate. Designed for pick-and-place installation, it ensures virtually maintenance-free operation and highest usability since it does not require manual alignment of the cavity, being exclusively controlled by a PC.

To ensure shortest pulse durations across the spectral range, a dynamic dispersion compensation module is incorporated within the Oria IR which enables independent control of the dispersion for every wavelength.

High peak-to-peak power stability and excellent beam pointing across the complete spectral range make the Oria IR an ideal tool for advanced ultrafast spectroscopy and nonlinear microscopy applications.

Specifications⁽¹⁾

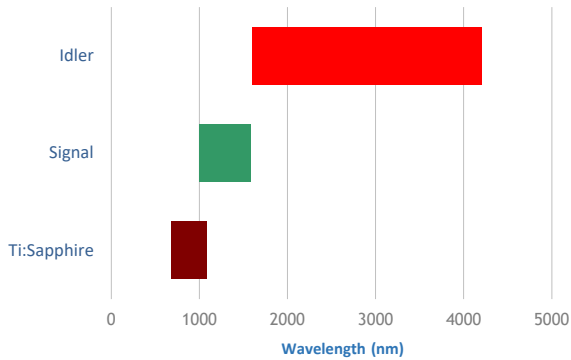
Pumped by mode-locked Ti:Sapphire laser, at 2.8 Watts, 80 MHz, 90 fs

Output Characteristics	Oria IR	Oria IR XT
Signal tuning range ⁽²⁾	990 – 1550 nm (6451 - 10101 cm^{-1})	990 – 1550 nm (6451 - 10101 cm^{-1})
Idler tuning range ⁽²⁾	n/a	1696 – 4090 nm (2444 - 5890 cm^{-1})
Pump tuning range ⁽²⁾⁽³⁾	720 – 810 nm (12195 - 14084 cm^{-1})	720 – 810 nm (12195 - 14084 cm^{-1})
Signal output power ⁽⁴⁾	> 1 W	> 1 W
Idler output power ⁽⁴⁾	n/a	> 350 mW
Signal pulse width ⁽⁵⁾	< 200 fs	< 200 fs
Idler pulse width ⁽⁵⁾	n/a	< 120 fs across 1696 – 2000 nm (5000 - 5890 cm^{-1})
Beam diameter @ 1300 nm	1.4 mm +/- 10%	1.4 mm +/- 10%
Beam divergence	< 1 mrad	< 1 mrad
Signal beam displacement with wavelength	< 600 microns / 540 nm (18518 cm^{-1}) at < 40cm from output	< 600 microns / 540 nm (18518 cm^{-1}) at < 40cm from output
Signal beam pointing with wavelength	< 300 mrad / 540 nm (18518 cm^{-1}) at < 40 cm from output	< 300 mrad / 540 nm (18518 cm^{-1}) at < 40 cm from output
Spatial mode	TEM ₀₀ M ² ≤ 1.2	TEM ₀₀ M ² ≤ 1.2 (signal) TEM ₀₀ M ² ≤ 1.3 (idler)
Signal noise at 1300 nm	< 1% rms	< 1% rms
Output ports	1) 100% signal and idler with no pump bypass. 2) Partial signal and idler with 20% pump bypass. 3) 100% pump bypass.	
Power stability	5%	5%
Polarization	Horizontal (>100:1)	Horizontal (>100:1)
Repetition rate	80 MHz	80 MHz
Size (W x L x H)	703 x 395 x 192 mm (27.6 x 15.5 x 7.5 inch)	

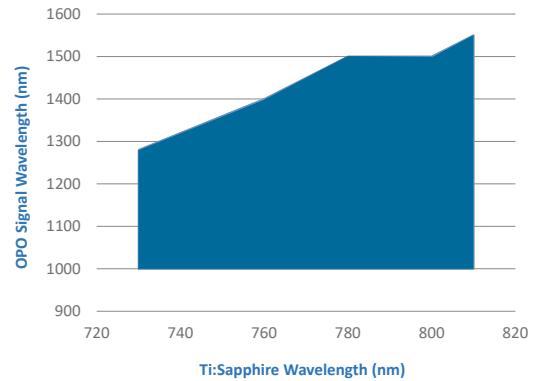
Notes: (1) Specifications are subject to change without notice. (2) Extended range available upon request. (3) Pump tuning range simultaneous with signal and idler tuning range. (4) At peak of pump and OPO signal tuning range. (5) Pulse width can be reduced upon request.

Oria IR XT Wavelength Coverage

Output Ports



Diamond Plot



The Oria IR XT includes three output ports which deliver

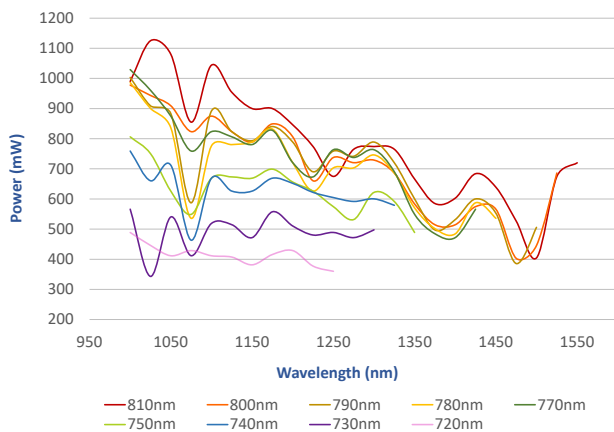
- 1) The Signal 990 - 1550 nm ($6451 - 10101 \text{ cm}^{-1}$)
- 2) The Pump (typically) 690 - 1040 nm ($9615 - 14492 \text{ cm}^{-1}$)
- 3) The Idler 1696 - 4090 nm ($2444 - 5890 \text{ cm}^{-1}$)

An important feature of the Oria IR XT is the incorporated Ti:Sapphire pump bypass which enables the selection of 100% of the pump (with no signal and idler power), a percentage of the pump (simultaneously with partial signal and idler power) or 0% of the pump (with full signal and idler power).

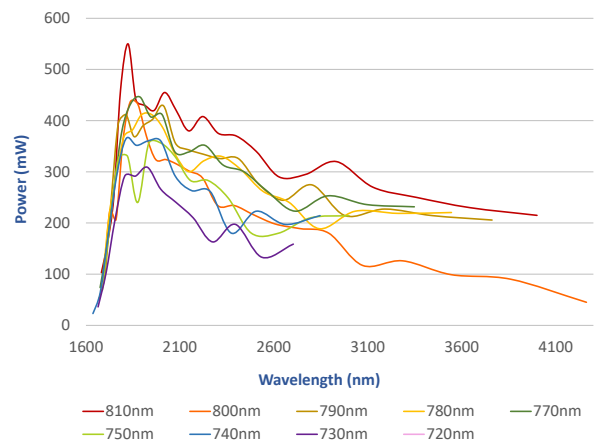
The Oria IR provides independent tuning of the pump and OPO wavelengths, which is achieved easily using the Oria IR advanced control software.

Oria IR Typical Tuning Curves

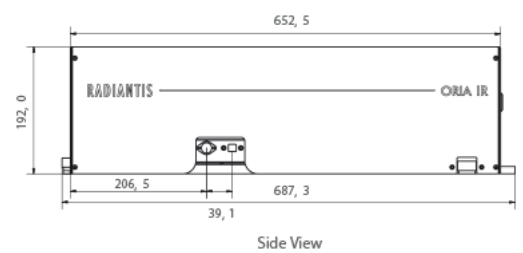
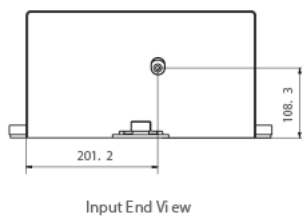
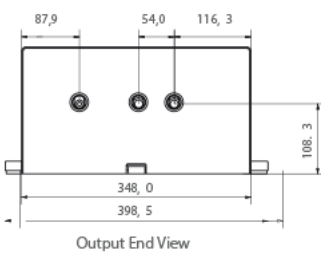
Oria IR and Oria IR XT



Oria IR XT



Dimensions



Notes: Dimensions in cm