



picoEMERALD



The **picoEMERALD** was especially designed as a light source for CARS- and coherent RAMAN microscopy.

The **picoEMERALD** combines a picosecond OPO (optical parametric oscillator) and its pump laser in a single integrated housing. Besides the wavelengths of the OPO the fundamental wavelength of the pump laser at 1064 nm is available to the user as well. The OPO itself is pumped with the frequency doubled wavelength at 532 nm. The optics modules were optimized by finite element analysis and mechanical stability algorithms (misalignment sensitivity optimization) to obtain maximum passive stability. In addition, the OPO resonator can be actively controlled with the user interface and optimized by software routines.

The **picoEMERALD** supplies fully automated three temporally and spatially overlapping picosecond pulse trains: the fundamental of the pump laser at a wavelength of 1064 nm, the OPO Signal and the OPO Idler. The wavelength of the OPO Signal is selected via the user terminal and is actively being held at the target wavelength with the use of a built in high resolution spectrometer.

Fully remote-controlled and hands free

Three output wavelengths perfectly overlapped in space and time monitored by sensors

Jitter free pulse generation

Constant power control

Picosecond pulses for best resolution in vibrational spectroscopy

Optional modulation of the 1064 nm-beam for SRS microscopy

Ultrafast Pulse Diagnostics

Wavelength Conversion

Pulse Management

Acoustooptics

Your Partner in Ultrafast

picoEMERALD

SPECIFICATIONS

Tuning ranges:

Signal	720 ... 990 nm ¹⁾
Idler	1150 ... 2030 nm

$\Delta\nu$ Signal - Idler	1350 ... 9000 cm ⁻¹
$\Delta\nu$ Signal - 1064 nm	700 ... 4500 cm ⁻¹

Output power:

Signal (@750 ... 990 nm)	> 600 mW
Idler (@1150 ... 1350 nm)	> 500 mW
Laser fundamental @ 1064 nm	> 750 mW

Repetition rate	80 MHz
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Pulse width @ 1064 nm	typ. 7 ps
Pulse width OPO	typ. 5 ... 6 ps
Spectral bandwidth (Signal)	typ. 0.3 ... 0.4 nm
Time bandwidth product (Signal, Idler)	typ. 0.6

Beam diameter	ca. 1.2 mm
Divergency	typ. 1 mrad
M ² (OPO Signal, Idler and 1064 nm)	< 1.2
Ellipticity	< 10%
Pointing stability	< 100 μ rad / 100nm
Noise	< 0.5 % RMS @ 300 Hz – 1MHz
Polarisation	Linear / horizontal
Contrast	> 100:1
Common beam exit is selectable for OPO Signal and 1064 nm or OPO Signal and Idler with overlap in space and time.	
Interface	USB / RS232

OPTIONS

Integrated acousto-optic amplitude or phase modulator for the laser fundamental beam at 1064 nm with modulation frequency of up to 1.5 MHz or electro-optical amplitude modulator for 10 or 20 MHz synchronized to the pulse train (Please ask for details)

SIZE (d x h x l in mm)	910 x 225 x 470
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1) The Signal range is limited to 780 ... 990 nm when using "Signal only" or "Signal + 1064 nm" (limitation by the output filter).



Distributors
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