

picoEmerald Narrow-band Tunable ps Laser

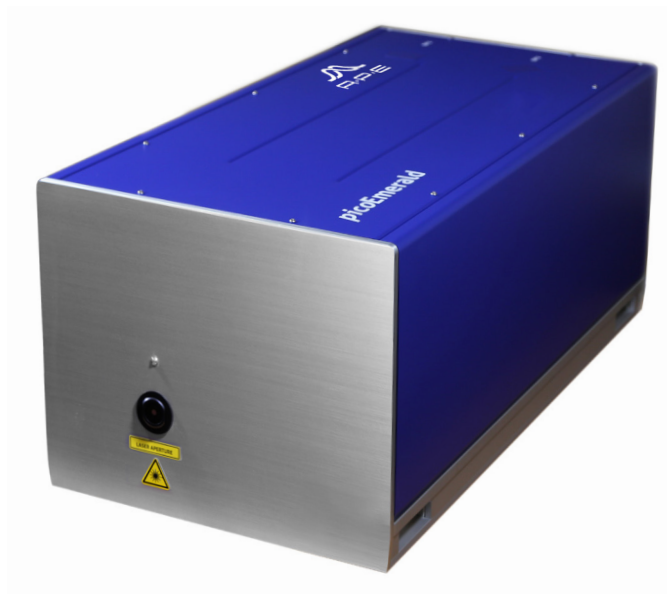
Automated Picosecond (Narrow-band) Tunable Light Source

- picoEmerald is made for the efficient generation of tunable narrow-bandwidth pulses. The narrow bandwidth compared to femtosecond lasers is beneficial for performing resonance and vibrational mode excitation experiments.
- A wavelength scan / sweep function for fast spectra acquisition is included.

Typical Applications

- Pump-Probe Spectroscopy
- Quantum Dot Single-Photon and Entangled-Photon Generation
- Surface Enhanced Hyper Raman Spectroscopy (SEHRS)
- Stimulated Raman Spectroscopy (SRS) and
- Coherent Anti-Stokes Raman Spectroscopy (CARS)

[Refer to APE's CARS & SRS brochure for further information on CARS & SRS with picoEmerald](#)



At a Glance

- Wavelength 1 IR beam 1032 nm
- Wavelength 2 tunable 700 ... 990 nm
- Wavelength 3 tunable 1080 ... 1950 nm
- Fully automated wavelength tuning
- Temporal and spatial overlap of the output wavelengths
- Integrated delay stage for versatile temporal adjustment

picoEmerald Specifications

Main Parameters

Type of Source	Automated picosecond (narrow-band) tunable light source
Wavelength 1 1032 nm Beam	1032 ± 1.5 nm
Wavelength 2 OPO Signal	700 ... 990 nm
Wavelength 3 OPO Idler	1080 ... 1950 nm
Power 1 1032 nm Beam	> 700 mW (higher power on request)
Power 2 OPO Signal	> 700 mW at 800 nm (higher power on request)
Power 3 OPO Idler	> 400 mW at 1250 nm
Δν OPO Signal - OPO Idler	800 ... 9000 cm ⁻¹
Δν OPO Signal - Fundamental	400 ... 4500 cm ⁻¹
Pulse Width	2 ps (others on request)
Repetition Rate	80 MHz
Spectral Bandwidth Signal, 1032 nm beam	~ 10 cm ⁻¹ (Spectral bandwidths down to 0.1 cm ⁻¹ available in combination with pulseSlicer)

Beam

Beam Diagnostics	Integrated for Signal Wavelength, Power, Bandwidth, Beam position, Temporal overlap
Pointing Stability	< 100 μrad per 100 nm
M ²	< 1.2 (OPO Signal and Idler), typ. 1.2 (1032 nm beam)
Ellipticity	< 20 %
Polarization	Linear; Horizontal > 100:1
Beam Divergence	1.0 (± 0.2) mrad (at 800 nm and 1032 nm)
Beam Waist Diameter	1.2 (± 0.2) mm at 800 nm; 1.7 (± 0.2) mm at 1032 nm

Possible Device Options*

High Power for 1032 nm Beam	> 2 W
High Power for Signal Beam	up to 1.0 W at 800 nm (higher Power available on request)
Narrow-Bandwidth Option	~ 5 cm ⁻¹ (~ 4.5 ps) for OPO Signal
Additional IR Output Port	Additional output e.g. for pumping another OPO (Levante IR); Outputs (Signal and Idler) of 2nd OPO are synchronized to picoEmerald's main output Wavelength: 1032 ± 1.5 nm Average output power: > 4 W

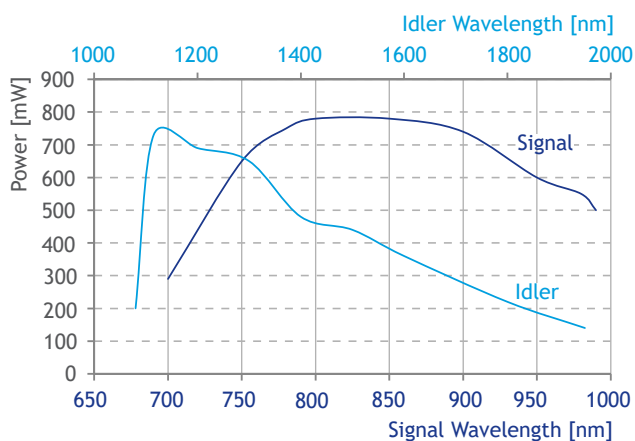
Related Device:

pulseSlicer	Narrowing Spectral Bandwidth
HarmoniXX	Wavelengths down to UV
pulseSelect	Reducing Repetition Rate

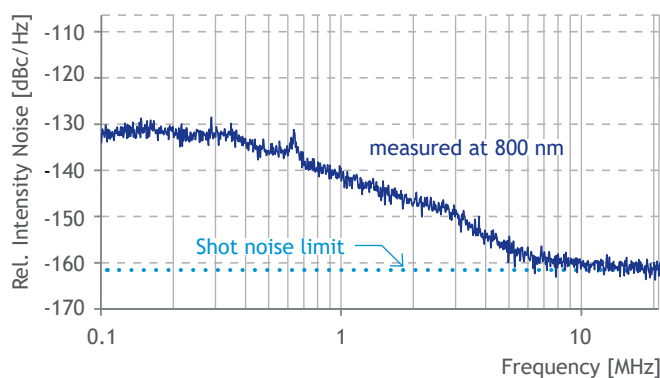
* Contact APE sales team for more information.

... Specifications

Diagrams



Typical Signal and Idler power vs. wavelength



Relative intensity noise (RIN): Shot noise limited
OPO Signal output for frequencies > 10 MHz

Software

Software and Automation	Included
Wavelength Sweep Function	Start/End Function, User-defined Holding Time, Trigger Function, max. 2 nm step size, approx. 5 s per wavelength step
Remote Control	Possible via USB / Ethernet TCP/IP / Serial RS232

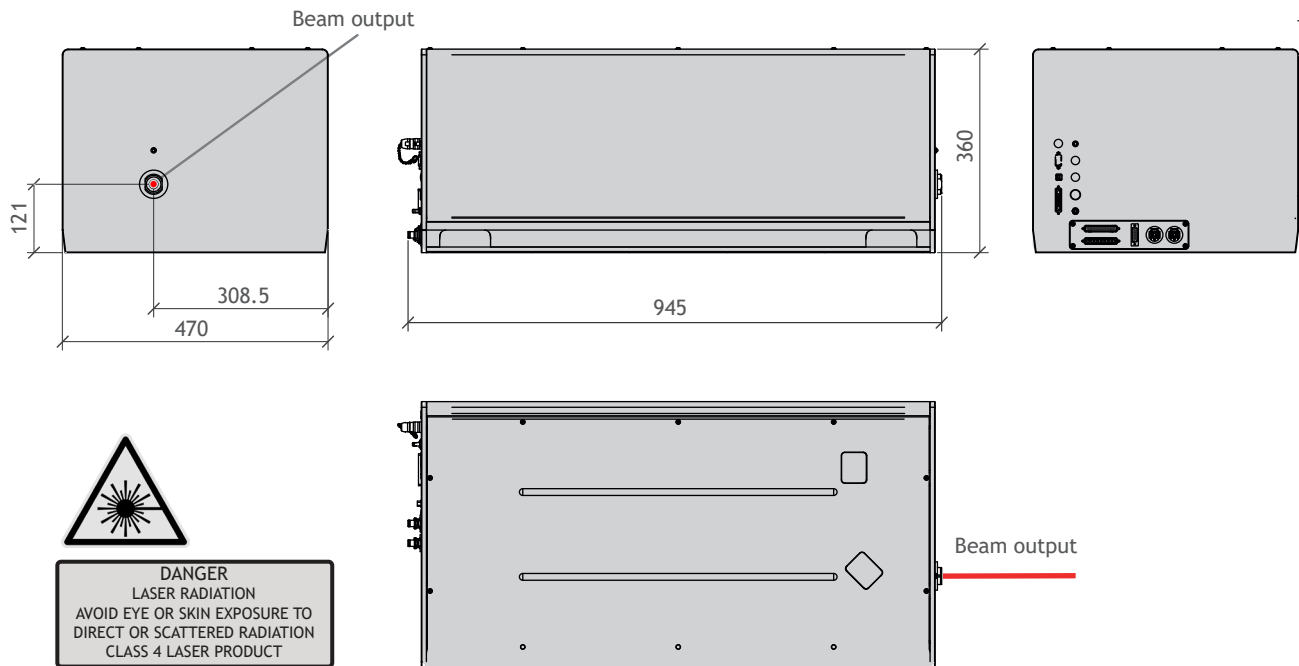
EOM (Optional) for CARS & SRS

SRS Modulator EOM	Resonant 20 MHz EOM for 1032 nm, modulation frequency is phase locked to laser repetition rate.
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Dimensions and Power

Dimensions	picoEmerald: 945 mm x 360 mm x 470 mm, 98 kg (see drawing for details) Panel PC: 234 mm x 41 mm x 128 mm, 2 kg Laser Control Unit: 19 inch (4 U), 11 kg Chiller: 197 mm x 330 mm x 279 mm, 10 kg
Power	100 ... 240 V, 50 ... 60 Hz, max. 600 W (Setup incl. PC) 100 ... 240 V, 50 ... 60 Hz, max. 600 W (Chiller)

... Technical Drawing



Contact

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