

K2-ASOPS

High-power dual-comb laser system

60-80 MHz repetition rate

High power operation

Ultrashort pulses

Sub-cycle relative timing jitter



Compact solution
to ASOPS



High-power for
nonlinear studies



Ultralow RIN and
relative timing noise

DESCRIPTION

The system produces a pair of mode-locked femtosecond lasers (optical frequency combs) with a slightly different pulse repetition rate. In the time domain, the optical delay is rapidly swept through a range of 12.5 nanoseconds at high speeds. In the frequency domain, beat notes between each pair of optical comb lines are generated via heterodyne detection. Through a novel shared-cavity architecture, our system achieve ultra-low noise simply in free-running operation.

CUSTOM OPTIONS

- Integrated second or third harmonic
- Passive (air) or active (water) cooling
- Repetition rate control
- Supercontinuum option (SCG)

APPLICATIONS

- Pump-probe sampling
- Thin film inspection
- Precision ranging
- Nonlinear microscopy

Related publications

**Efficient pump-probe sampling with a single-cavity dual-comb laser:
Application in ultrafast photoacoustics**

Pupeikis et al., Photoacoustics **29**, 100439 (2023)

**Rapid-Scan Nonlinear Time-Resolved Spectroscopy over
Arbitrary Delay Intervals**

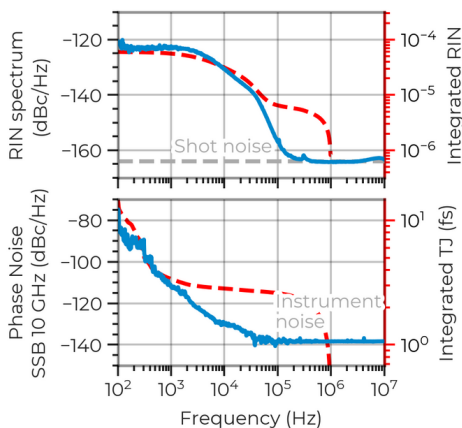
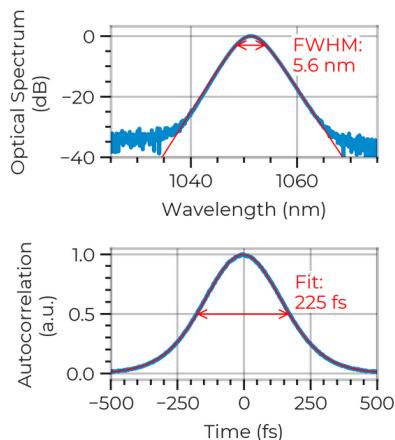
Flöry et al., Ultrafast Science **3**, 0027 (2023)

**High-Sensitivity Pump-Probe Spectroscopy with a Dual-Comb Laser
and a PM-ANDi Supercontinuum**

Gruber et al., Optics Letters **49**, 6445-6448 (2024)



EXAMPLE CHARACTERIZATION



SPECIFICATIONS

	Standard	SHG option	THG option	SCG option
Laser wavelength	1050 +/- 10 nm	525 +/- 5 nm	350 +/- 3 nm	inquire for specific fiber integration
Power per comb	>1.5 W	> 500 mW	>80 mW	
Pulse duration (FWHM)	<250 fs, clean sech ² pulses			
Repetition rate	80 MHz standard, 60 MHz option available			
Repetition rate difference	tunable between -1000 and +1000 Hz			

OUTPUTS

Optical	Two spatially separated pulse trains
Cross-correlation signal	Trigger signal at the repetition rate difference
Digital signals	Δf_{rep} and f_{rep} values, logging and remote control

CONTROLS

Repetition rate difference	Active Δf_{rep} stabilization and digital control
Power	Power allocation between fundamental and harmonic (if applicable)
Pump current	Pump diode current modulation capability for f_{ceo} locking

DIMENSIONS

Laser head (L x W x H)	540 x 321 x 179 mm
Beam output height	75 mm on (W) side
K2-Link control unit	395 x 436 x 88 mm (19" rack mountable, 2U)

REQUIREMENTS

Operating temperature	15 – 30 °C (Water or air options - hybrid design)
Relative humidity	20 – 70% (non-condensing)
Power consumption	<150 W
Electrical requirements	100-120 VAC, 3 A, 50-60 Hz / 200-240 VAC, 1.5 A, 50-60 Hz

Product specifications and descriptions in this document are subject to change without notice.
Specifications are for temperature of $\pm 1^\circ\text{C}$ and humidity of $\pm 10\%$ variation.

