

# **K2-1000**

High-power dual-comb laser system

1 GHz repetition rate2 W per beam100 fs pulse durationSub-cycle relative timing jitter





Compact solution for spectroscopy



High-power for nonlinear studies



Ultra-low RIN and relative timing noise

### **DESCRIPTION**

K2-1000 is an ideal platform for R&D applications. The system produces a pair of modelocked 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 1 nanosecond. 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 is able to achieve ultra-low noise simply in free-running operation.

### **CUSTOM OPTIONS**

- Wavelength options via OPO (inquire)
- Integrated second harmonic
- OEM version (K2-1000-mini line)
- Ultrabroadband configuration

### **APPLICATIONS**

- Time-resolved spectroscopy
- Multi-species gas sensing
- Precision ranging
- THz-TDS

# **Related publications**

Coherently averaged dual-comb spectroscopy with a low-noise and highpower free-running gigahertz dual-comb laser

Phillips et al., Optics Express 31, 7103 (2023)



Ultra-low noise spectral broadening of two combs in a single ANDi fiber Camenzind et al., APL Photonics 10, 036119 (2025)

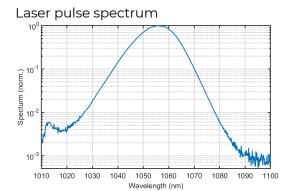


Long-Range and Dead-Zone-Free Dual-Comb Ranging for the Interferometric Tracking of Moving Targets

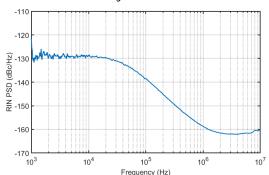
Camenzind et al., ACS Photonics 12, 1829 (2024)



## **EXAMPLE CHARACTERIZATION**



# Relative intensity noise measurement



### LASER SPECIFICATIONS

Laser wavelength Power per comb

Pulse duration (FWHM)

Repetition rate

Pulse energy

Repetition rate difference

Relative timing jitter

Standard 1050 +/- 10 nm >2 W

SHG option 525 +/- 5 nm  $> 100 \, \text{mW}$ 

<100 fs, clean sech<sup>2</sup> pulses, < 150 fs for SHG option

1 GHz +/- 0.1 GHz

> 2 nJ

tunable +/- 100 kHz <10 fs [1 kHz, 100 kHz]

# **AVAILABLE OUTPUTS**

Optical

Cross-correlation signal

Digital signals

Two spatially separated pulse trains

Trigger signal at the repetition rate difference

 $\Delta f_{\text{rep}}$  and  $f_{\text{rep}}$  values, logging and remote control via K2-Link

# **AVAILABLE INPUTS**

Repetition rate

Repetition rate difference

Pump current

Power

 $f_{\text{rep}}$  piezo actuation with integrated high-voltage amplifier (option)

Active  $\Delta f_{rep}$  stabilization and digital control

Pump diode current modulation capability for  $f_{\text{CEO}}$  locking

Power allocation between fundamental and harmonic (if applicable)

## PHYSICAL DIMENSIONS

Laser head  $(L \times W \times H)$ 

Beam output height

K2-Link control unit

494 x 291 x 179 mm<sup>3</sup>

75 mm on (W) side

395 x 436 x 88 mm<sup>3</sup> (19" rack mountable, 2U)

## REQUIREMENTS

Operating temperature

Relative humidity

Rated power

Electrical requirements

15 – 30 °C (Water or air options - hybrid design)

Non-condensing environment

300 W

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.



