



SONATA

1030 nm Yb femtosecond Laser

SESAM-free, all-PM, low-noise fiber laser with high environmental stability



APPLICATIONS

Femtosecond fibered light source for

- Ultrafast pump-probe experiments with synchronization
- Seeding high-power amplifiers
- ASOPS setups
- Nonlinear microscopy
- Robust, turnkey research or industrial ultrafast applications

BENEFITS

- Turn-key, hands-free operation
- 30s laser start-up time
- High frequency and intensity stability
- Low timing jitter and relative intensity noise (RIN)
- Dual isolated output ports at 1030 nm

DESCRIPTION

Cycle's SONATA femtosecond laser delivers low-noise, clean pulses, and has dual laser outputs. It provides a chirped picosecond pulse from fiber port for amplification and a compressed free-space output with around 150 fs pulses for timing synchronization—ideal for ultrafast applications, amplifier seeding, and nonlinear microscopy.

With optics and electronics integrated into a single compact unit, SONATA ensures a seamless, plug-and-play experience. Its femtosecond pulses, stable repetition rate, and fiber-based reliability make it a top choice for optics labs and industry.

Contact us by sales@cyclelasers.com and find the best configuration for your needs.

SPECIFICATIONS

Parameters	Fibered output	Free-space output	Notes
Center wavelength	1030 nm +/-2 nm	1030 nm +/-2 nm	Other center wavelength is possible
Spectral bandwidth	>14 nm	>14 nm	
Repetition rate	40 MHz	40 MHz	Other Rep. rate is possible
Pulse duration	>3.0 ps	< 150 fs	Transform limited pulse at free-space output port
Avg. output power	~ 10 mW	> 100 mW	
Pulse energy	0.25 nJ	2.5 nJ	Other power level is possible
Beam quality		$M^2 < 1.1 \text{ TEM}_{00}$	
PER	> 20 dB	> 20 dB	
Laser output	PM fiber	0.8-mm diameter	Collimated Gaussian beam
Laser TEC tuning range	~ 8000 Hz		It can be used for a slow rep rate stabilizing actuator
Slow PZT tuning range	~ 400 Hz		
Fast PZT tuning range	~ 20 Hz		
Power supply	100 – 240 VAC		
Laser dimension	326 × 266 × 199 mm		

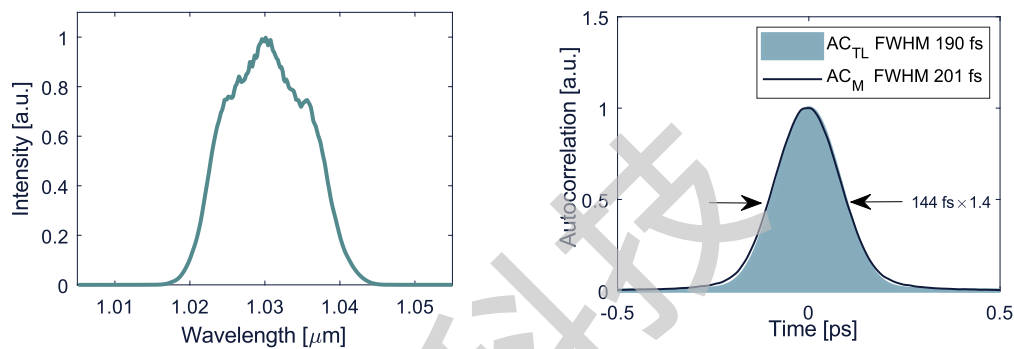




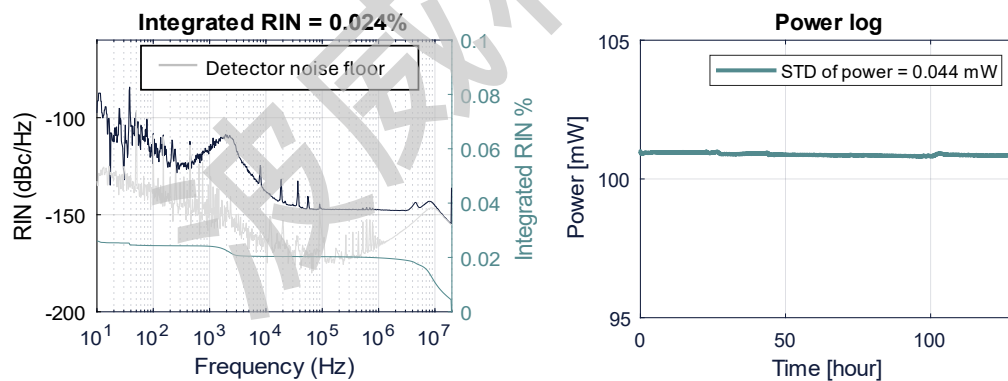
MEASUREMENT DATA

The laser output measurement for the Sonata is provided for reference purposes.

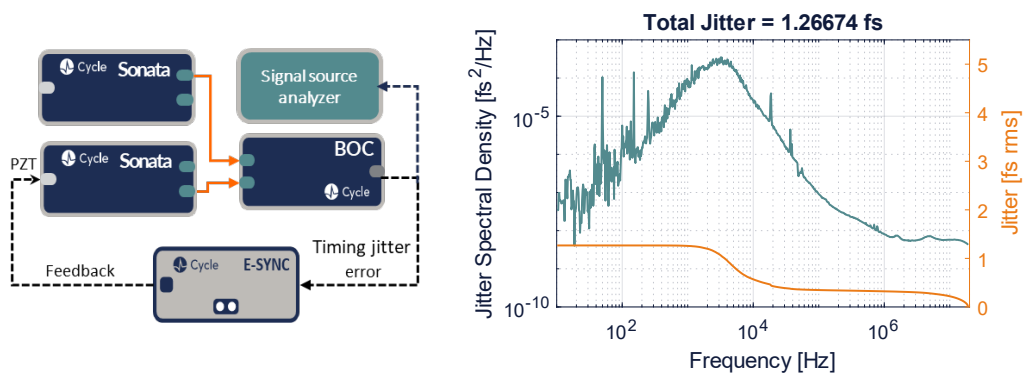
Spectrum & Autocorrelation



RIN & Power log



Timing jitter measurement



The absolute timing jitter is 1.26 fs (3 kHz–20 MHz). Two identical SONATA lasers are synchronized using the Cycle 1- μm BOC [\[link\]](#), highly sensitive timing error signal detector, and Cycle E-Sync [\[link\]](#), an integrated PID and PZT controller, with a \sim 3 kHz feedback bandwidth for larger out-of-loop jitter measurements. Due to laser symmetry, the absolute timing jitter is half of the relative timing jitter detected by BOC and measured by signal source analyzer.

