Synergy™

ULTRA-BROADBAND SUB-10 fs Ti:SAPPHIRE OSCILLATOR

The Synergy Advantage

- *Ultrafast pulses*
- *Extreme peak power*
- *Dispersive mirror cavity*
- *Ultra-low noise*
- *Ease of operation*
- *Highest contrast*
- *Outstanding pulse quality*

Applications

- *Amplifier and OPCPA seeding*
- *THz spectroscopy and imaging*
- *Optical coherence tomography*
- *Ultrafast spectroscopy*
- *Pump-probe measurements*
- *Materials processing*
- *Two-photon polymerization*
- *Thin-film metrology*
- *Nonlinear optics*
- *Multiplex CARS*
- *Surface enhanced HHG*

Synergy™ is a family of Ti:Sapphire oscillators generating pulse durations from sub-10 to sub-20 fs. Based on Femtolasers' experience gained from the largest installed base of ultrafast oscillators in this class, Synergy lasers are setting the benchmark for reliability and performance.

With the largest variety of models on the market, there is a Synergy oscillator for your ultrafast application with average powers ranging from 500 mW to 1.2 W and pulse durations of sub-10 fs yield peak powers of over 1 MW. Low cost of ownership is ensured with superior efficiency at lower pump power levels compared to competitive systems.

Reliability and Ultra-low Noise

At the heart of every Synergy, the Dispersive Mirror (DM) based oscillator cavity rests on a thermally-stabilized base plate. Highest quality ultra-low loss optics and compact mechanical components offer unsurpassed pulse duration, power levels and efficiency. The Extra Cavity Dispersion Control (ECDC) unit guarantees ultrafast pulses arrive at your target undistorted. When equipped with GreenAlign™, active opto-mechanical component developed for our industrial grade oscillators, this design sets the leading level of active stability and ease of operation. The DM cavity exhibits rock-solid passive stability, ultra-low noise and superior performance due to the radical reduction in the number of components.

Extreme Performance and Flexibility

For applications where shortest laser pulses or highest peak power are required, Spectra-Physics offers the unique Synergy M1 system. Our proprietary DM technology enables the M1 models to sustain the largest bandwidth with a near Gaussian shape and the highest level of peak power guaranteed from a commercial femtosecond oscillator.

If your application requires parameters not offered by the standard Synergy models, custom tailored systems with distinct spectral shape, pulse duration, power and repetition rate are available upon request. To ensure this outstanding performance over its lifetime, Spectra-Physics is dedicated to providing the highest level of customer care for your Synergy ultrafast oscillator.

Spectra-Physics®
A Newport Company

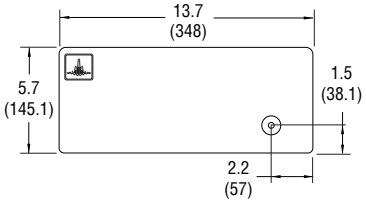
Synergy™

Specifications[1,2,7]

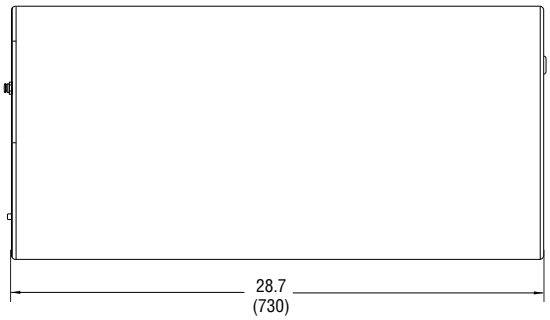
	Synergy PRO[3]	Synergy M1[4]	Synergy 20[3]	Synergy 20 UHP[4]
Pulse Duration	<10 fs	<10 fs	<20 fs	<20 fs
Bandwidth (FWHM)	>100 nm	>100 nm	>40 nm	>40 nm
Average Power	>500 mW	>1000 mW	>500 mW	>1200 mW
Pulse Energy	>6.6 nJ	>13.3 nJ	>6.6 nJ	>16 nJ
Peak Power	>660 kW	>1330 kW	>330 kW	>800 kW
Central Wavelength (standard)[5]	800 ±10 nm			
Repetition Rate (standard)[5]	75 MHz			
Noise (10 Hz–100 kHz)	<0.05% rms			
Power Stability (peak-to-peak)[6]	±1%			
Beam Diameter ($1/e^2$)	<2 mm			
Beam Divergence	<2 mrad			
M^2	<1.3			
Polarization	>100:1 (horizontal)			
Femtolock™ 2	Optional			

1. Due to our continuous improvement program, all specifications are subject to change without notice.
2. Specifications apply to standard wavelength and standard repetition rate.
3. Pumped with Millennia® eV™ 5. For other pump configurations, please contact Spectra-Physics.
4. Pumped with Millennia eV 10. For other pump configurations, please contact Spectra-Physics.
5. For other values, please contact Spectra-Physics.
6. Measured over two hours after 30 minute warm up at constant environmental conditions.
7. The Synergy is a Class IV – High Power Laser, whose beam is, by definition, a safety and fire hazard. Take precautions to prevent exposure to direct and reflected beams. Diffuse as well as specular reflections can cause severe skin damage.

Synergy Dimensions



Output View



Top View

Dimensions in inch (mm)

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www.spectra-physics.com

3635 Peterson Way, Santa Clara, CA 95054, USA
PHONE: 1-800-775-5273 1-408-980-4300 FAX: 1-408-980-6921 EMAIL: sales@spectra-physics.com

China	+86-10-6267-0065	info@spectra-physics.com.cn	Belgium	+32-(0)0800-11 257	belgium@newport.com
France	+33-(0)1-60-91-68-68	france@newport.com	Netherlands	+31-(0)30 6592111	netherlands@newport.com
Japan	+81-3-3794-5511	spectra-physics@splasers.co.jp	United Kingdom	+44-1235-432-710	uk@newport.com
Taiwan	+886 -(0)2-2508-4977	sales@newport.com.tw	Germany / Austria / Switzerland		
Singapore	+65-6664-0400	sales.sg@newport.com		+49-(0)6151-708-0	germany@newport.com