

# CRONUS | 3P

## Laser Source for Advanced Nonlinear Microscopy

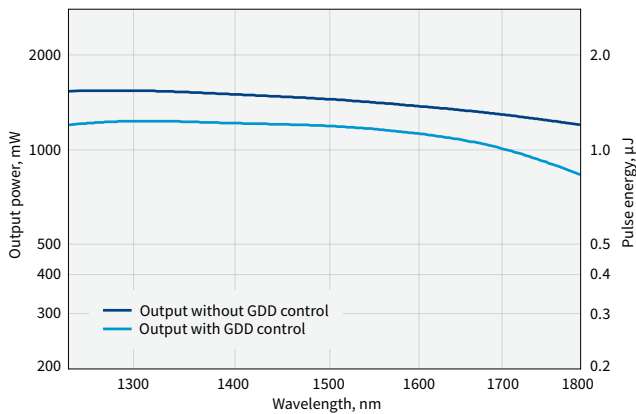
### FEATURES

- High pulse energy for deep imaging
- 1250 – 1800 nm tuning range for 3P imaging
- Down to 50 fs pulse duration for high peak power
- Automated wavelength and GDD control for optimal signal
- Market-leading pulse-to-pulse energy stability

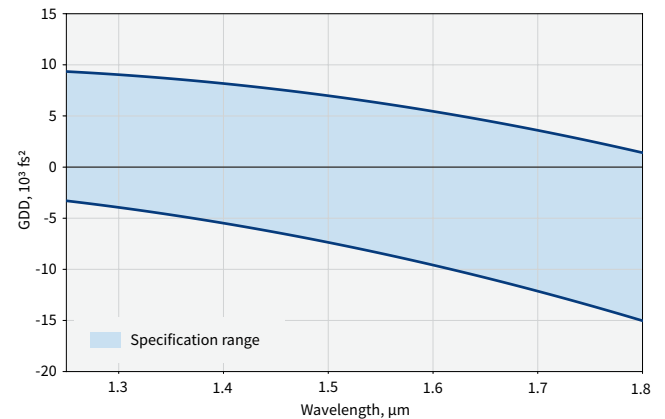


CRONUS-3P is a laser source developed for advanced nonlinear microscopy. It provides  $\mu\text{J}$ -level pulses down to 50 fs at repetition rates of up to 2 MHz and tunable in the short-wavelength infrared (SWIR) range from 1250 to 1800 nm, thus covering the biological transparency windows at 1300 and 1700 nm for three-photon (3P) microscopy. In addition, CRONUS-3P offers simultaneous 1030 nm amplifier and oscillator outputs.

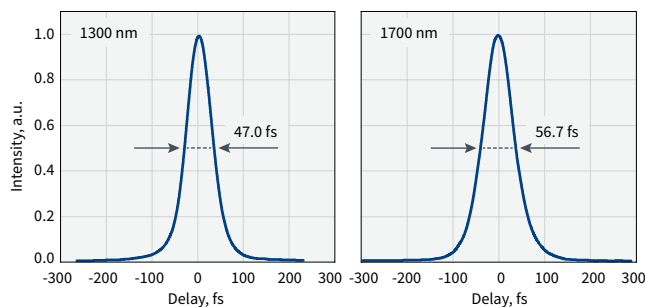
Typically, multiphoton imaging in the SWIR range requires a complex multi-device laser system, a large optical table, and skilled staff. This reality encumbers neuroscience and other biomedical applications. The CRONUS-3P system is a next-generation, industrial-grade, single-supplier solution that is more compact, more reliable, and more versatile. It achieves tunable femtosecond excitation with integrated group delay dispersion (GDD) control, ensuring optimal pulse duration at the sample, while industrial-grade design guarantees high pulse-to-pulse energy and long-term power stability.



Output power and pulse energy vs wavelength.  
Pump: 40 W, 1 MHz.



GDD control range



Typical pulse duration at 1300 nm and 1700 nm

## SPECIFICATIONS

Model	<b>CRONUS-3P</b>	
Tuning range <sup>1)</sup>	1250 – 1800 nm	
Repetition rate <sup>2)</sup>	Single-shot to 2 MHz	
	<b>1300 nm</b>	<b>1700 nm</b>
Pulse duration	< 50 fs	< 65 fs
Output power	> 1100 mW @ 1 MHz > 800 mW @ 2 MHz	> 800 mW @ 1 MHz > 500 mW @ 2 MHz
GDD control range <sup>3)</sup>	-4000 to +9000 fs <sup>2</sup>	-12000 to +3500 fs <sup>2</sup>
Beam diameter <sup>4)</sup>	3 – 5 mm	
Beam quality (M <sup>2</sup> )	< 1.2	
Beam ellipticity	> 0.8	
Beam divergence	< 1 mrad	
Long-term power stability, 24 h <sup>5)</sup>	< 1%	
Pulse-to-pulse energy stability, 1 min <sup>5)</sup>	< 1%	

### MAIN OUTPUT WITHOUT GDD CONTROL

Output power	> 1500 mW @ 1 MHz > 1000 mW @ 2 MHz	> 1050 mW @ 1 MHz > 700 mW @ 2 MHz
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### ADDITIONAL OUTPUTS

Auxiliary 1030 nm amplifier output	1030 ± 10 nm, up to 40 W, up to 2 MHz, < 250 fs	
Optional 1030 nm oscillator output	1030 ± 10 nm, up to 500 mW, ≈ 65 MHz, ≈ 200 fs	

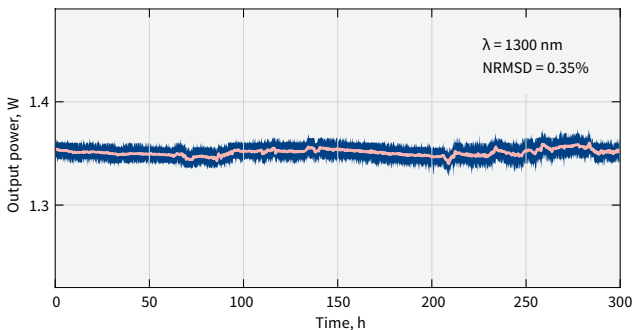
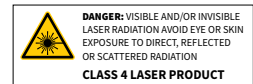
<sup>1)</sup> Alternative 2P+3P configuration with extended tuning range to 650 – 920 nm is available, contact sales@lightcon.com.

<sup>2)</sup> Lower repetition rate with higher pulse energy option available.

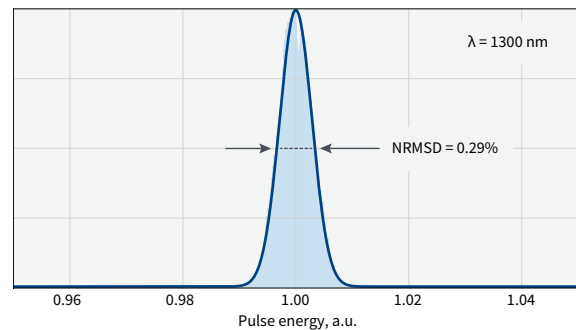
<sup>3)</sup> Continuous dispersion control; -3000 fs<sup>2</sup> compensates a microscope with +3000 fs<sup>2</sup>.

<sup>4)</sup> 1/e<sup>2</sup>, measured at compressor output.

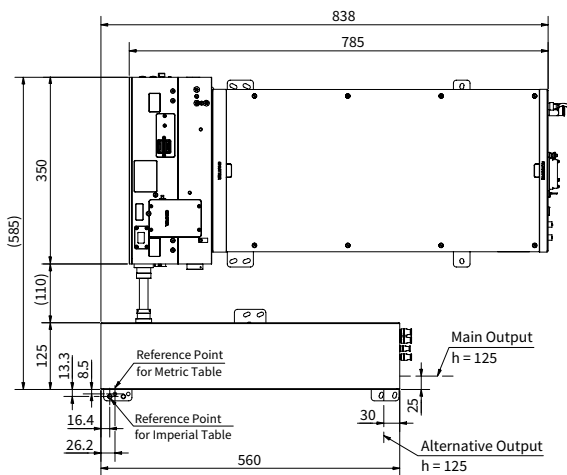
<sup>5)</sup> Expressed as NRMSD (normalized root mean squared deviation).



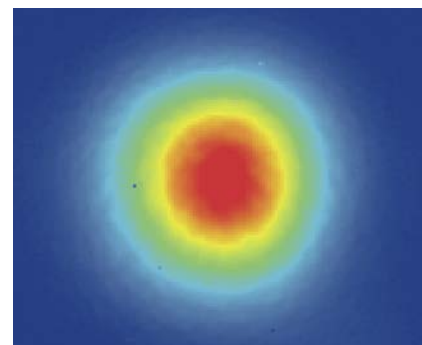
Typical long-term power stability at 1300 nm



Typical pulse-to-pulse energy distribution at 1300 nm



CRONUS-3P drawing



Beam profile at 1300 nm,  
4.2 mm diameter (1/e<sup>2</sup>)