

# CRONUS | 3P



NEW

## Laser Source for Advanced Nonlinear Microscopy

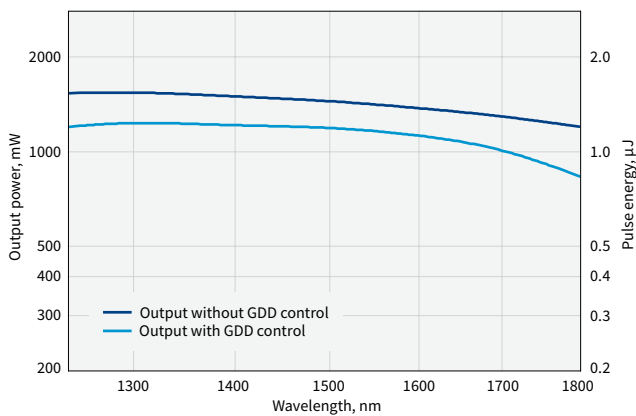
### FEATURES

- 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

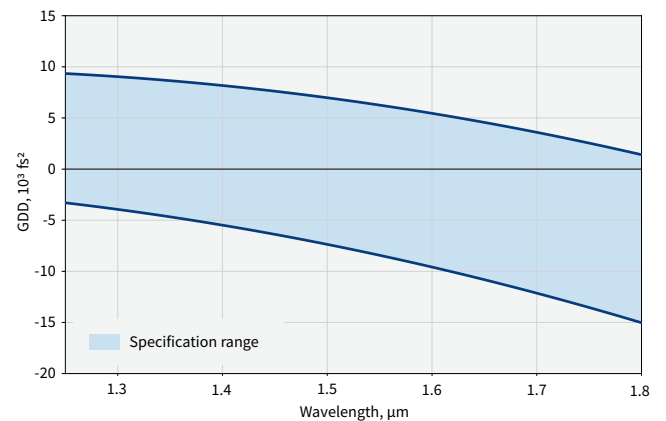


CRONUS-3P is a turn-key laser source developed for advanced nonlinear microscopy. It provides  $\mu\text{J}$ -level pulses down to 50 fs at repetition rates of up to 2 MHz and tunable in the short-wavelength infrared (SWIR) range from 1250 to 1800 nm, thus covering the biological transparency windows at 1300 and 1700 nm for three-photon (3P) microscopy. In addition, CRONUS-3P offers integrated group delay dispersion (GDD) control and beam steering, as well as an option for simultaneous 1030 nm output.

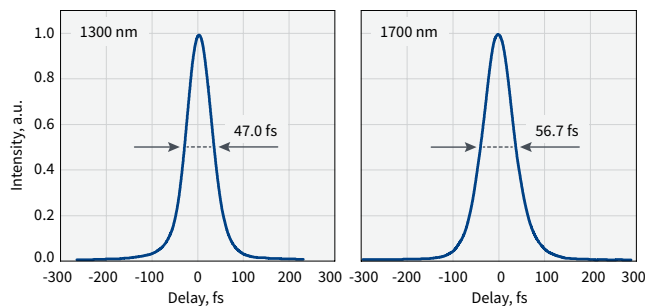
Typically, multiphoton imaging in the SWIR range requires a complex multi-device laser system, a large optical table, and skilled staff. This reality encumbers neuroscience and other biomedical applications. The CRONUS-3P system is a next-generation, industrial-grade, single-supplier solution that is more compact, more reliable, and more versatile. It achieves tunable femtosecond excitation with GDD compensation, 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, at 1 MHz



GDD control range



Typical pulse duration at 1300 nm and 1700 nm

# SPECIFICATIONS

NEW

Model	CRONUS-3P		CRONUS-3P with power control	
Tuning range <sup>1)</sup>	1250 – 1800 nm			
Repetition rate <sup>2)</sup>	Single-shot – 1 MHz or 2 MHz			
	1300 nm	1700 nm	1300 nm	1700 nm
Pulse duration	< 50 fs	< 65 fs	< 50 fs	< 65 fs
Output power	> 1100 mW @ 1 MHz > 800 mW @ 2 MHz	> 800 mW @ 1 MHz > 500 mW @ 2 MHz	> 1000 mW @ 1 MHz > 700 mW @ 2 MHz	> 700 mW @ 1 MHz > 400 mW @ 2 MHz
GDD control range <sup>3)</sup>	-4000 to +9000 fs <sup>2</sup>	-12000 to +3500 fs <sup>2</sup>	-4000 to +9000 fs <sup>2</sup>	-12000 to +3500 fs <sup>2</sup>
Beam diameter <sup>4)</sup>	2 – 4 mm			
Beam quality, M <sup>2</sup>	< 1.2			
Beam ellipticity	> 0.8			
Beam divergence	< 1 mrad			
Beam pointing stability	< 100 μrad			
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 <sup>6)</sup>	> 1500 mW @ 1 MHz > 1000 mW @ 2 MHz	> 1050 mW @ 1 MHz > 700 mW @ 2 MHz	n/a
----------------------------	--	---------------------------------------	-----

## 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> 2P+3P configuration with extended tuning range to 650 – 920 nm is available, contact sales@lightcon.com.

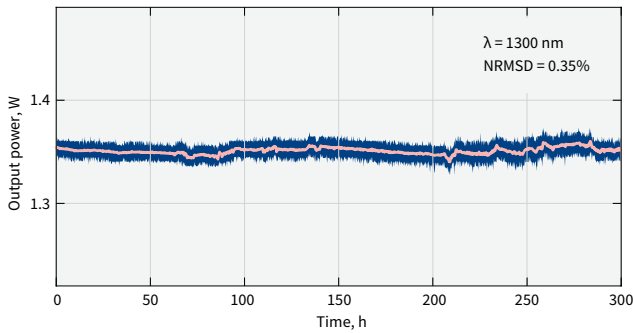
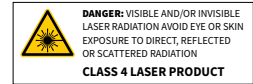
<sup>2)</sup> Lower repetition rate with higher pulse energy option available.

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

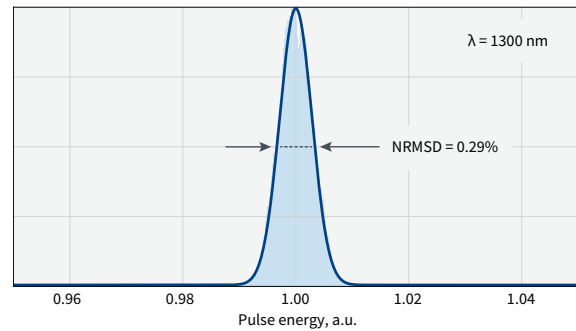
<sup>4)</sup> 1/e<sup>2</sup>, measured at compressor output.

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

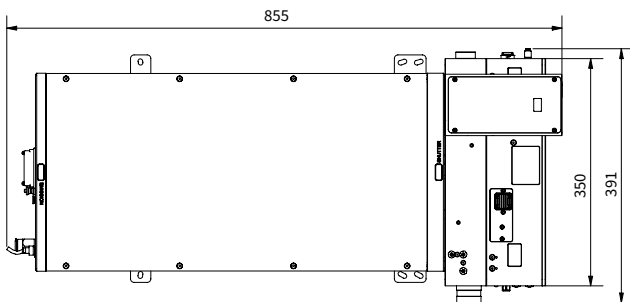
<sup>6)</sup> Available only for v1. Contact sales@lightcon.com for more details.



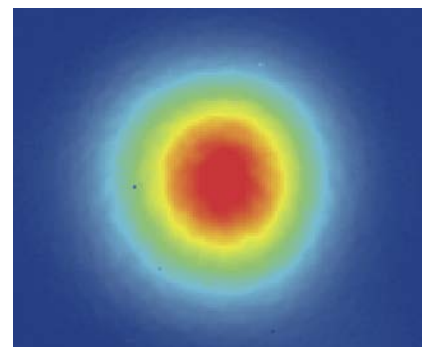
Typical long-term power stability at 1300 nm



Typical pulse-to-pulse energy distribution at 1300 nm



CRONUS-3P drawing



Beam profile at 1300 nm