Miltenyi Biotec

CRONUS laser

Expanding the possibilities of multiphoton microscopy

The CRONUS laser is a femtosecond laser with three synchronized outputs for multiphoton microscopy. With its two tunable (680–960 nm, 960–1300 nm) and one fixed (1025 nm) output channels it allows a free choice of fluorophores for multiphoton microscopy.

- **Simultaneous excitation of fluorescent probes, calcium indicators or opsins right at their spectral absorption maxima**
- **Parallel use of label-free techniques with appropriate wavelengths**
- **Compact and cost efficient**

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Specifications and dimensions

	Wavelength range (nm) 600 800 1000 1200 1400	Simultaneous excitation of two fluorophores	GFP excitation maximum covered	Combined imaging and optogenetics	Cost efficiency
CRONUS laser		+	+	+	+
Ti:sapphire + OPO		+	–	+	+
Broad band (dual option)		–	+	–	+
Broad band + Ti:sapphire (dual option)		+	+	+	–

Table 1: Application features of CRONUS laser compared with conventional laser systems used for multiphoton microscopy.

	Optical output A	Optical output B	Optical output C
Tuning range	680–960 nm	960–1300 nm	1025 nm (fixed)
Average power	>700 mW	>700 mW	>800 mW
Pulse width [1]	<160 fs	<160 fs	<160 fs
Repetition rate	76.8 MHz ±1 MHz	76.8 MHz ±1 MHz	76.8 MHz ±1 MHz
Noise [2),3)]	<0.5%	<0.5%	<0.5%
Stability [3),4)]	<±1%	<±1%	<±1%
Spatial mode	TEM_{00} M^2 <1.2 <1	TEM_{00} M^2 <1.2 <1	TEM_{00} M^2 <1.2
Beam divergence, full angle	<1 mRad	<1 mRad	<1.5 mRad
Beam diameter ($1/e^2$)	3.0 mm ±0.4 mm	3.2 mm ±0.4 mm	2.8 mm ±0.4 mm
Beam roundness	0.8–1.2	0.8–1.2	0.8–1.2
Beam pointing stability [5)]	<200 µRad	<200 µRad	-
Pre-compensation GDD range	700 nm: –10,000 to –35,000 fs^2 800 nm: –3,000 to –20,000 fs^2 950 nm: 0 to –10,000 fs^2	960 nm: 0 to –10,000 fs^2 1100 nm: –3,000 to –10,000 fs^2 1300 nm: –6,000 to –12,000 fs^2	-
Power consumption	1100 W (power supply), 900 W (chiller)		

1) determined with $sech^2$-shaped pulse; 2) rms noise measured in 100 Hz to 10 MHz bandwidth; 3) tunable wavelengths 850, 1050, and fixed 1025 nm; 4) percent rms power drift in any 2 h period with less than ±1 °C temperature change after 1 h warm up; 5) entire beam pointing deviation through wavelength tuning and GDD tuning range

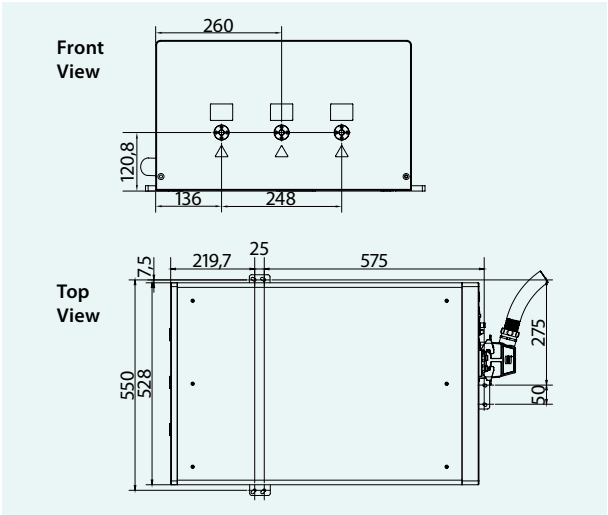

Figure 1: Dimensions of the CRONUS laser. Front view, from left to right: output A, B and C.

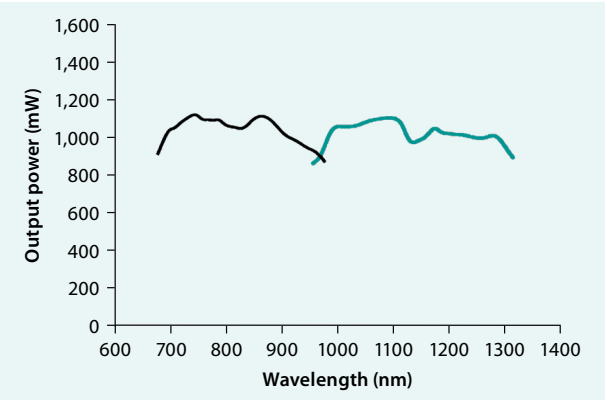

Figure 2: Typical CRONUS laser tuning curve for output A (black curve) and output B (teal curve).

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