

# PhotoSonus X

## High Output Power DPSS Tunable Laser for Photoacoustic Imaging



PhotoSonus X is a perfect solution for photoacoustic imaging in pre-clinical and clinical use and when fast sample scanning is required. Having high output energy of up to 90 mJ at the peak, a broad wavelength tuning range from 660 to 2600 nm, high pulse repetition rate up to 100 Hz and fast wavelength switching makes it a perfect photoacoustic imaging source for gaining high-resolution images and ensuring high data acquisition rate. Moreover, being built on a diode pumped solid-state laser platform, PhotoSonus X assures significantly

quieter operation (< 60 dB) compared with flash-lamp pumped lasers, which is very beneficial for clinical use.

Diode pumped laser technology and well-engineered system design ensures high reliability and low-cost system operation. PhotoSonus X output can be coupled with almost any type of fiber bundle.

With additional options of an internal energy meter and electromechanical shutter with laser self-test capability, PhotoSonus X can be ready for certification in clinical photoacoustic applications.

### FEATURES

- ▶ Hands-free wavelength tuning from 660 to 2600 nm
- ▶ Fully motorized wavelength tuning
- ▶ Externally triggerable
- ▶ High, up to 90 mJ pulse energy from OPO
- ▶ 100 Hz or 50 Hz pulse repetition rate
- ▶ Low-cost maintenance
- ▶ Certification ready
- ▶ Quite operation < 60 dB
- ▶ Integrated DPSS pump laser and OPO into a single housing
- ▶ Fiber bundle holder with safety interlock
- ▶ Signal and Idler through the same output (optional)
- ▶ Fast Wavelength Switching of up to 300 nm range between two consecutive pulses (optional)
- ▶ Motorized attenuator (optional)
- ▶ Integrated energy meter (optional)
- ▶ Electromechanical output shutter with laser self-test capability (optional)

### PERFORMANCE

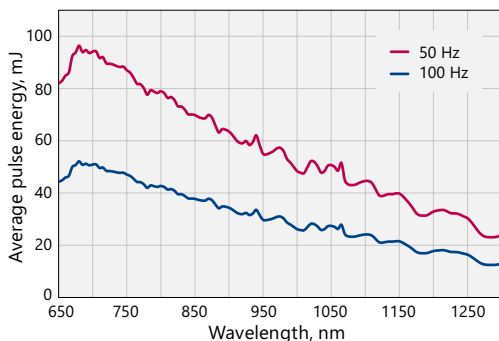


Fig 1. Typical PhotoSonus X free space extended range signal output energy vs. wavelength

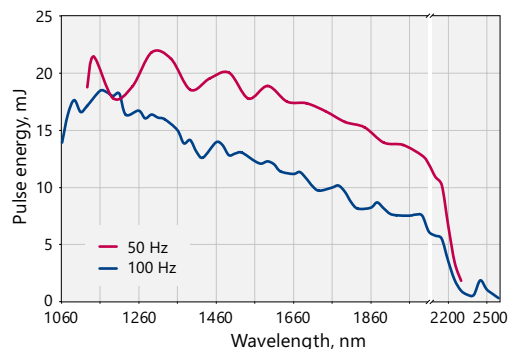


Fig 2. Typical PhotoSonus X free space idler output energy vs. wavelength

SPECIFICATIONS <sup>1)</sup>

Model	PhotoSonus X-50	PhotoSonus X-100
<b>OPO</b>		
Wavelength range		
Signal	660 – 1064 nm	
Signal extended range (optional)	660 – 1300 nm	
Idler (optional)	1065 – 2600 nm	
OPO output pulse energy <sup>2)</sup>	> 90 mJ	> 50 mJ
Pulse repetition rate <sup>3)</sup>	50 Hz	100 Hz
Scanning step		
Signal (660–1064 nm)	0.1 nm	
Idler (1065 –2600 nm)	1 nm	
Pulse duration <sup>4)</sup>	2 – 5 ns	
Signal linewidth <sup>5)</sup>	< 15 cm <sup>-1</sup>	< 10 cm <sup>-1</sup>
Typical signal beam diameter (1/e <sup>2</sup> ) <sup>6)</sup>	5 ± 1 mm	
Control interfaces	USB, LAN, RS232	
<b>PHYSICAL CHARACTERISTICS</b>		
Cooling	Closed loop air-water cooled <sup>7)</sup>	
Unit size (W × L × H)	551 × 400 × 162 mm	
Power supply size (W × L × H)	483 × 390 × 140 mm	
Umbilical length	2.5 m	
<b>OPERATING REQUIREMENTS</b>		
Room temperature	18 – 27 °C	
Relative humidity	20 – 80 % (non-condensing)	
Power requirements	100 – 240 VAC, single phase 50/60 Hz	
Power consumption	< 2 kW	

<sup>1)</sup> Due to continuous improvement, all specifications are subject to change without notice. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise all specifications are measured at 700 nm.  
<sup>2)</sup> Free space measurement at 700 nm. See tuning curves for typical outputs at other wavelengths.

<sup>3)</sup> Other fixed pulse repetition rates are available upon request.  
<sup>4)</sup> FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.  
<sup>5)</sup> At 700 nm or higher wavelength.  
<sup>6)</sup> Measured at the free space output at 700 nm wavelength.  
<sup>7)</sup> Using external chiller.



**Note:** Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer that 1 hour then laser (system) needs warm up for a few hours before switching on.

OUTLINE DRAWINGS

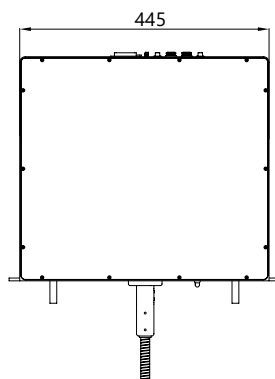
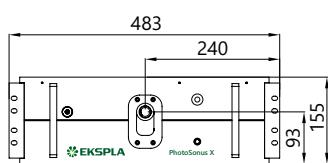
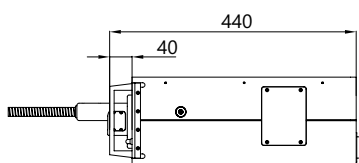


Fig 3. PhotoSonus X series laser head dimensions

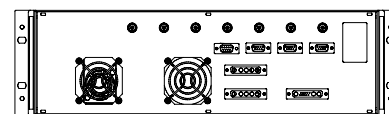
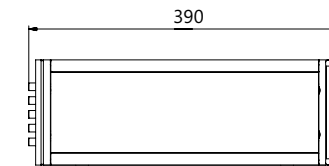


Fig 4. Outline drawing of PhotoSonus X power supply unit