

PhotoSonus T

BENEFITS

High pulse energy (up to 230 mJ) is highly beneficial for photoacoustics imaging applications

Superior tuning resolution ($1 - 2 \text{ cm}^{-1}$) allows recording of high quality spectra

High integration level saves space in the laboratory

Flashlamps replacement without misalignment of the laser cavity saves on maintenance costs

In-house design and manufacturing of complete systems, including pump lasers, guarantees on-time warranty and post warranty services and spares supply

Variety of control interfaces: USB, RS232, optional LAN and WLAN ensures easy control and integration with other equipment

Attenuator and fiber bundle coupling options facilitate incorporation of PhotoSonus T systems into various experimental environments



High Energy Table-Top Tunable Wavelength Lasers for Photoacoustic Imaging

PhotoSonus T

PhotoSonus T series tunable laser seamlessly integrates in a compact housing a nanosecond optical parametric oscillator and Nd:YAG Q-switched laser.

Three models with different output pulse energy values and different repetition rates are offered. The most powerful model has more than 230 mJ pulse energy. Narrow linewidth ($<10\text{ cm}^{-1}$) is nearly constant trough almost whole tuning range, which makes laser suitable for many spectroscopy application.

The device is controlled from the remote keypad or PC using LabVIEW™ drivers that are supplied with the system. The remote pad features a backlit display that is easy to read even while wearing laser safety glasses.

System is designed for easy and cost-effective maintenance. Replacement of flashlamps can be done without misalignment of the laser cavity and deterioration of laser performance. OPO pump energy monitoring system helps to increase lifetime of the optical components.

Options

Optional items are available allowing optimization of the laser system for Your application, for example:

- / Fiber bundle coupled output;
- / Energy meter;
- / Efficient second harmonic generator for 330–660 nm range;
- / Pulse energy attenuator;
- / Water-air cooled power supply.

Please inquire custom-build versions and options.

Features

Hands-free, automated wavelength tuning from **330 to 2600 nm**

Ultra-wide OPO signal tuning range from **660 to 1320 nm**

Up to **230 mJ** in range 660 – 2600 nm, **35 mJ** in range 330 – 660 nm

Narrow linewidth across tuning range

3–5 ns pulse duration

Remote control via key pad or PC

Separate output port for 532 nm beam. Output for 1064 nm is optional

OPO pump energy monitoring

Fast wavelength switching within entire signal or idler ranges

Applications

- / Photoacoustic imaging
- / Flash photolysis
- / Photobiology
- / Remote sensing
- / Non-linear spectroscopy

330 –
2600 nm / 230 mJ / 3 – 5 ns



Learn more
about PhotoSonus T
www.ekspla.com

Specifications ¹⁾

Model	PhotoSonus T-10	PhotoSonus T-20	PhotoSonus T+			
OPO						
Wavelength range	Signal	660–1320 nm	660–1064 nm ²⁾			
	Idler	1065–2600 nm	1065–2600 nm			
	SH (optional)	330–660 nm	330 – 530 nm (330 – 659 nm) ³⁾			
Output max pulse energy ⁴⁾	OPO	150 mJ	230 mJ			
	SH	25 mJ	35 mJ			
Linewidth ⁵⁾		< 15 cm ⁻¹				
Tuning resolution ⁶⁾	Signal	1 cm ⁻¹				
	Idler	1 cm ⁻¹				
	SH	2 cm ⁻¹				
Pulse duration ⁷⁾		3–5 ns				
Typical beam diameter ⁸⁾	7 mm	7 mm	9 mm			
Typical beam divergence ⁹⁾		<2 mrad				
Polarization	Signal beam	horizontal				
	Idler beam	vertical				
	SH beam	vertical				
Pump laser ¹⁰⁾						
Pump wavelength		532 nm				
Pulse duration		4 – 6 ns				
Beam quality	"Hat-Top" in near field. Close to Gaussian in far field					
Beam divergence	<0.6 mrad					
Pulse energy stability (StdDev)	<2.5 %					
Pulse repetition rate	10 Hz	20 Hz	10 Hz			
Physical characteristics						
Unit size (W × L × H)	456 × 821 × 270 mm					
Power supply size (W × L × H)	330 × 490 × 585 mm					
Umbilical length	2.5 m					
Operating requirements						
Water consumption (max 20 °C) ¹¹⁾	<10 l/min					
Room temperature	18–27 °C					
Relative humidity	20–80 % (non-condensing)					
Power requirements ¹²⁾	200 – 240 VAC, single phase, 50/60 Hz					
Power consumption	< 1.5 kVA	< 2.5 kVA	< 2.5 kVA			
Cleanliness of the room	not worse than ISO Class 9					
<p>¹⁾ 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 and for basic system without options.</p> <p>²⁾ Optional signal extended range: 660 – 1320 nm.</p> <p>³⁾ When extended signal range is selected.</p> <p>⁴⁾ See tuning curves for typical outputs at different wavelengths.</p> <p>⁵⁾ At 700 nm or higher wavelengths.</p> <p>⁶⁾ When wavelength is controlled from PC. When wavelength is controlled from keypad, tuning resolution is 0.1 nm for signal, 1 nm for idler and 0.5 nm for SH.</p>						
<p>⁷⁾ FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.</p> <p>⁸⁾ Beam diameter is measured at 700 nm at the 1/e² level and can vary depending on the pump pulse energy.</p> <p>⁹⁾ Full angle measured at the FWHM level at 700 nm.</p> <p>¹⁰⁾ Separate output port for the 532 nm beam is standard. Output for 1064 nm beam is optional. Pump laser output will be optimized for the best OPO operation and specification may vary with each unit we manufacture.</p> <p>¹¹⁾ Air cooled power supply is available as option.</p> <p>¹²⁾ Mains voltage should be specified when ordering.</p>						
<div style="text-align: right; border: 1px solid black; padding: 5px; margin-top: 10px;">  DANGER: VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT, REFLECTED OR SCATTERED RADIATION CLASS 4 LASER PRODUCT </div>						

Performance

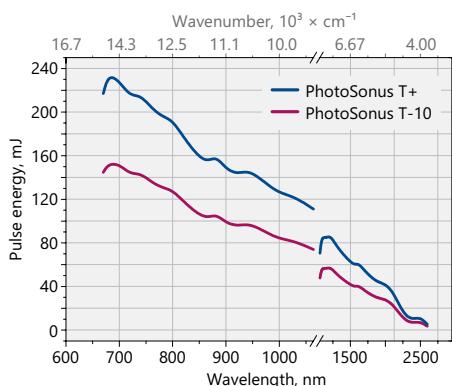


Fig 1. Typical output energy of the PhotoSonus T tunable wavelength systems

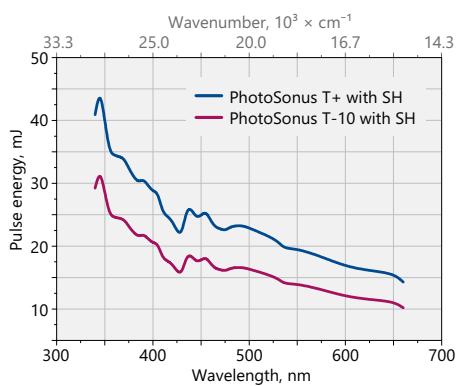


Fig 2. Typical output energy of the PhotoSonus T tunable wavelength systems with SH option

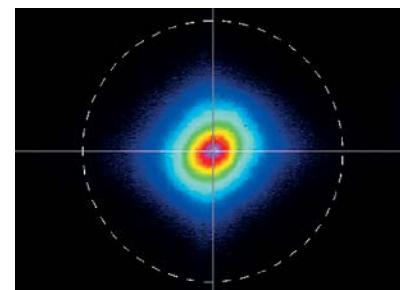


Fig 3. Typical far field beam profile of PhotoSonus T laser at 800 nm

Ordering information

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

PhotoSonus T-10-SH-FBC-ATTN-H-EM-AW10-TrigBox-110VAC	
Model	110VAC → transformer for 110 V AC mains
T → Table-top version	TrigBox → synchronization box
T+ → Table-top highest energy version (10 Hz only)	Water-air cooling unit: AW10 → for 10 Hz models AW20 → for 20 Hz models
Repetition rate: 10 → 10 Hz 20 → 20 Hz	EM → OPO energy meter
OPO extension: SH → OPO SH extension range ER → extended OPO signal range (for T+ model only)	H → additional output for 1064 nm pump wavelength
FBC → fiber or fiber bundle coupling of OPO output without attenuator	ATTN → OPO attenuator ATTN/FBC → OPO attenuator for FBC output ATTN/FBC/FS → OPO attenuator for both FBC and free space outputs