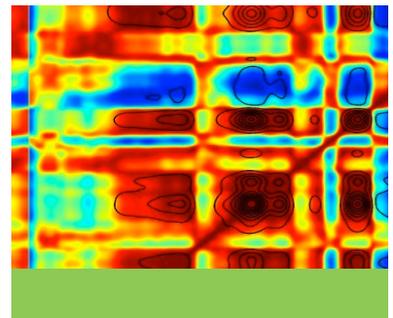
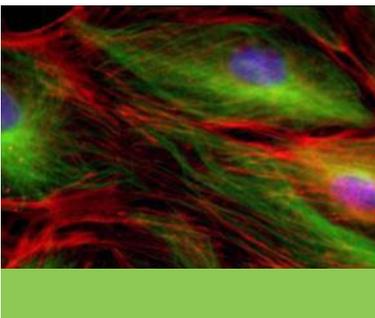




# taccor

- GHz femtosecond laser
- Self-starting and self-maintaining
- Stable and robust

## TECHNICAL DATA SHEET



INNOVATIVE RELIABLE INTELLIGENT



# Turn-key femtosecond laser

## Overview

The **taccor** is a unique turn-key femtosecond laser with a 1GHz repetition rate that delivers up to 1.8W of average power in pulses that can be as short as 15fs. Its innovative design combines a compact, hermetically sealed, vibration-resistant laser head that incorporates the Ti:Sapphire oscillator and pump laser, with a full feature support unit. The support unit houses the field replaceable pump diodes, isolating temperature effects from the head, and provides intelligent control that monitors laser performance and carries out diagnostics analysis. The result is a highly stable and reproducible product with a long lifetime and low cost of ownership, offering a 3 year/9000 hour warranty.

## Applications

### **Precision metrology and spectroscopy**

10 years of application leadership has led to the **taccor** having direct modulation access to pump power and repetition rate while offering a large mode spacing and high power per mode.

### **Ultra-rapid and precise time-domain spectroscopy**

Asynchronous optical sampling (ASOPS) is an ultra-rapid and precise time-domain spectroscopy technique pioneered by Laser Quantum GmbH (formerly Gigaoptics) which out-performs classical approaches by orders of magnitude in measurement speed and noise performance.

### **Nonlinear microscopy (SHG and TPE)**

The ability to reduce pulse energy and maintain the same level of nonlinear signal is key to reduced dye bleaching and cell damage needed for nonlinear microscopy.

## Optional Features

### **Measurement**

An integrated high bandwidth (10GHz) photodiode can be used for repetition rate monitoring and to supply a signal to the TL-1000 units or external electronics.

### **Repetition rate and active feedback**

Control of the repetition rate and active feedback is enabled by cavity mirrors mounted on a fast and/or a slow piezo crystal and in combination with the TL-1000 repetition rate stabilisation unit, timing jitter below 100fs can be achieved. Alternatively, the piezos can be driven by customer supplied electronics.

### **Pump power modulation**

Modulation access to the pump power with a bandwidth in excess of 100kHz and modulation depth up to 2% is provided for feedback purposes.

## TL-1000 Series

The TL-1000 is a supporting optional unit that enables tight phase-locking of the repetition rate to an external reference with jitter below 100fs. TL-1000-ASOPS enables a repetition offset lock between two GHz oscillators of 2 to 20kHz allowing ultrafast time-domain spectroscopy without mechanical delay stage.

### Technical Specifications\*

	taccor	taccor s	taccor c
Power	taccor 4 >800mW taccor 6 >1000mW taccor 8 >1400mW taccor 10 >1800mW	taccor 4 >700mW taccor 6 >900mW taccor 8 >1200mW taccor 10 >1600mW	taccor 4 >700mW <sup>1</sup> taccor 6 >900mW <sup>1</sup> taccor 8 >1200mW <sup>1</sup> taccor 10 >1600mW <sup>1</sup>
Wavelength	nominal 800nm (±/- 20nm)	nominal 800nm (±/- 20nm)	740nm to 920nm <sup>2</sup>
Beam diameter (FWHM)	2mm	2mm	2mm
Spatial Mode	near TEM <sub>00</sub>	near TEM <sub>00</sub>	near TEM <sub>00</sub>
Beam divergence	2.5mrad	2.5mrad	2.5mrad
M-squared	<1.2 (sag plane) <1.2 (tan plane)	<1.2 (sag plane) <1.2 (tan plane)	<1.2 (sag plane) <1.6 (tan plane)
Stability <sup>3</sup>	±/-1.0% rms	±/- 1.0% rms	±/- 1.0% rms
Noise	<0.1% rms	<0.1% rms	<0.1% rms
Polarisation	>100:1	>100:1	>100:1
Polarisation direction	horizontal	horizontal	horizontal
Operating temperature	21°C ±/- 5°C	21°C ±/- 5°C	21°C ±/- 5°C
Head weight	~12kg	~12kg	~12kg
Repetition rate	1000MHz	1000MHz	1000MHz
Pulse duration <sup>4</sup>	<30fs	<15fs	<50fs <sup>5</sup>
Peak energy	0.8 - 1.8nJ	0.7 - 1.6nJ	0.7 - 1.6nJ
Applications	two photon microscopy, two photon polymerisation, optical precision, metrology, ASOPS, optical spectroscopy, ultrafast spectroscopy		

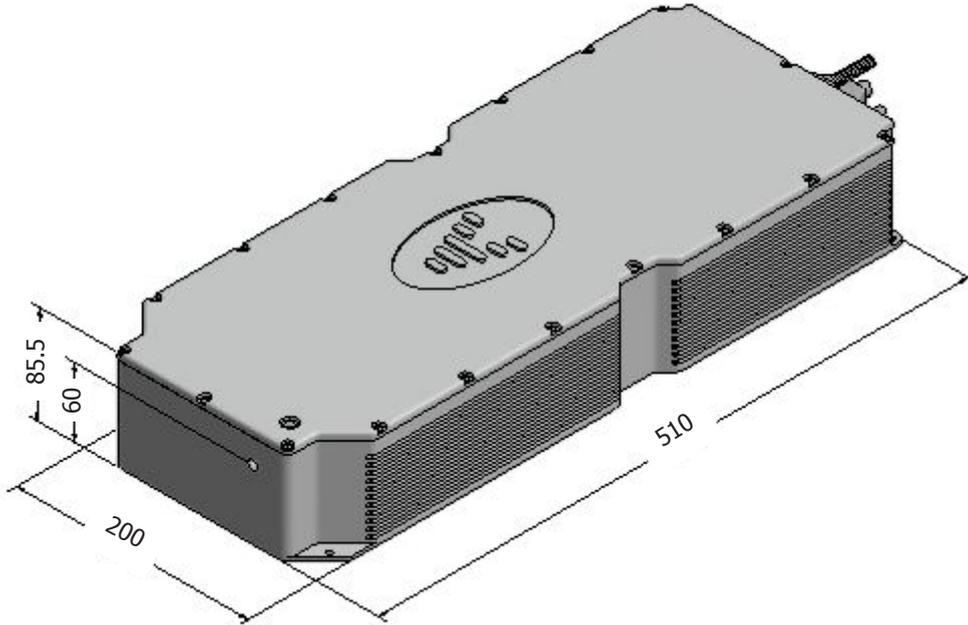
1. Power values below 780nm and above 820nm are reduced by 15%. Power is reduced by 35% above 880nm.
2. Select at time of order, fixed with accuracy ± 3nm.
3. Over a 12 hour period within operating temperature parameters.
4. Achieved with extra cavity dispersion compensation.
5. Pulse duration <100fs for center wavelength >880nm.

\*Subject to change without notice



# taccor

## Dimensions (mm)



- INNOVATIVE
- RELIABLE
- INTELLIGENT

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INNOVATIVE RELIABLE INTELLIGENT



Drawings are for illustrative purposes only, please contact Laser Quantum for complete engineer's drawings.

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