

TL-1000 TL-1000-ASOPS

Timing stabilisation units

TECHNICAL DATA SHEET



TL-1000 TL-1000-ASOPS



Timing stabilisation units

Overview

Laser Quantum offers the timing stabilisation units **TL-1000** and **TL-1000-ASOPS** as accessories to the gigajet series high-speed femtosecond oscillators and the taccor femtosecond laser. **TL-1000** allows to tightly phase-lock the oscillator repetition rate to an external reference, a synthesizer or another modelocked laser, with a residual timing jitter below 100fs. **TL-1000-ASOPS** enables a repetition rate offset-lock between two femtosecond oscillators (e.g. contained in a gigajet TWIN) at a repetition rate difference between 2kHz and 20kHz. System parameters are accessible via touchscreen and USB port.

Applications

Repetition rate stabilisation is essential for applications requiring a well-defined timing relation between a femtosecond oscillator and a reference signal. Such applications are for example two-color pump-probe spectroscopy using two synchronised mode locked lasers, optical experiments synchronised to a pulsed electron source, or high speed asynchronous optical sampling (ASOPS) experiments. ASOPS is an ultra-rapid and precise time-domain spectroscopy technique pioneered by Laser Quantum GmbH (formerly Gigaoptics) out performing classical approaches by orders of magnitude in measurement speed and noise performance.

TL-1000 and **TL-1000-ASOPS** are specifically designed to serve these applications. Repetition rate fluctuations of a free-running oscillator are efficiently suppressed with a residual timing jitter below 100fs. **TL-1000-ASOPS** permits high-speed ASOPS based ultrafast time-domain spectroscopy using two femtosecond oscillators with better than 60fs time-delay resolution.

Optional features

Low timing jitter option

This option is available for the **TL-1000** timing stabilisation unit to suppress timing jitter to typically below 10fs (0.1Hz to 100kHz). A suitable 10GHz reference synthesiser must be provided by the customer. Stabilisation is performed at higher repetition rate harmonic.

ASOPS experiment support

TL-1000-ASOPS is capable of driving and monitoring a PR-130 photoreceiver, an OT-1000 two-photon detector for optical trigger generation, and a Tera-SED THz emitter element via its umbilical port. This feature is beneficial for high-speed ASOPS experiments.

Technical Specifications

TL-1000

Repetition rate range ^{*1}	75MHz-1GHz
Timing jitter ^{*2, *3}	≤100fs (0.1Hz to 100kHz)
Power requirement	110/220 VAC (60/50Hz)

TL-1000-ASOPS option

Repetition rate ^{*4}	332-334MHz 498-502MHz 0.996-1.004GHz
Repetition rate offset	2-20kHz
Time-resolution in high-speed ASOPS	<60fs
Trigger signal	TTL level at offset frequency, ≤10ns rise time
Power requirement	110/220 VAC (60/50Hz)

^{*1} Below 333MHz repetition rate the customer supplied reference signal must be at a repetition rate harmonic with frequency above 333MHz.

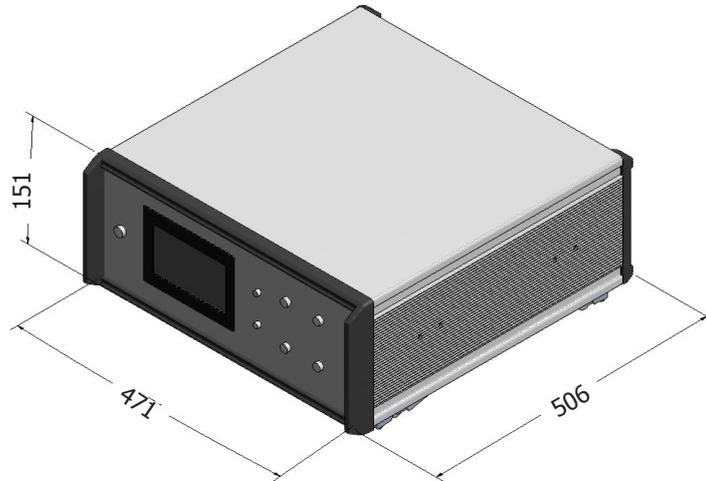
^{*2} Relative to customer provided reference signal at +7dBm, 50 Ohm with <.125dBc/Hz phase noise above 10kHz offset from carrier.

^{*3} If used with a femtosecond oscillator of the gigajet series and suitable built-in piezo backed cavity mirror(s).

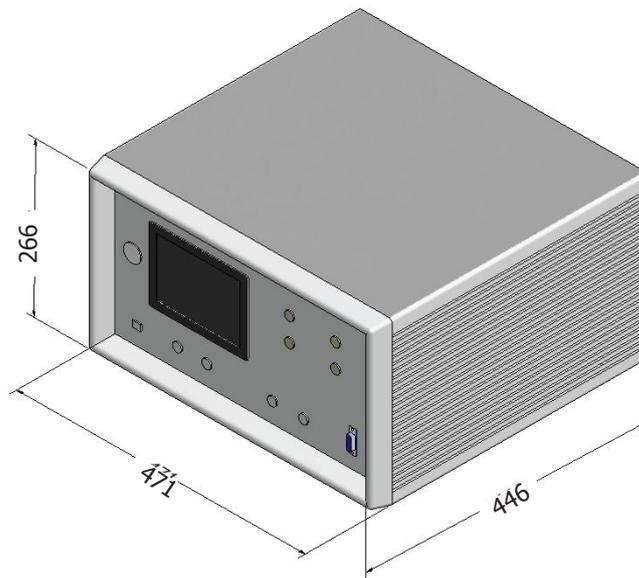
^{*4} Range must be selected upon order.

TL-1000

Dimensions (mm)



TL-1000-ASOPS



- INNOVATIVE
- RELIABLE
- INTELLIGENT

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INNOVATIVE RELIABLE INTELLIGENT

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