

GIGAJET TWIN

dual femtosecond oscillator



Highspeed femtosecond oscillators

GIGAOPTICS designs and manufactures femtosecond laser oscillators that operate at uniquely high repetition rates of up to 5GHz and offer a remarkable versatility and compactness. Since 1999, their robust design allows them to serve as a reliable tool in a variety of scientific and industrial applications. We offer expertise in femtosecond technology. Visit us at www.gigaoptics.com.

The TWIN version of models GIGAJET 20/20c/30s

GIGAOPTICS' femtosecond oscillators GIGAJET 20/20c/30s are available as TWIN version. Any two of the three models can be combined on a single temperature-stabilized monolithic platform to form a TWIN VERSION. The repetition rate of a single laser is long-term stable to within 500Hz. Repetition rate fluctuations of the free-running lasers are highly synchronous. Thus, if required, active stabilization of the lasers at equal repetition rates or at a fixed detuning is straightforward and easy. This allows for an extraordinarily compact realization of spectroscopy techniques that use two femtosecond lasers with Gigahertz repetition rates, e.g. high-speed ASOPS.

The monolithic TWIN housing accommodates two GIGAJET oscillators on an extremely small footprint of only 31cm × 36cm at a height of 9cm.

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Applications of the GIGAJET TWIN oscillators

The TWIN version of the GIGAJET oscillators is used for applications where two femtosecond lasers with high absolute and relative repetition rate stability are required. The two lasers can be stabilized at equal repetition rates or with fixed repetition rate using our products TL-1000 and TL-1000-ASOPS.

Aside from applications at equal repetition rates, e.g. two-color pump-probe spectroscopy, novel spectroscopy techniques where the repetition rates have a fixed detuning are especially interesting. Such applications that are very efficiently realized with Gigahertz repetition rates are high-speed asynchronous optical sampling ([A. Bartels et al., Rev. Sci. Instrum. **78**, 035107 (2007)], also see www.gigaoptics.com for a detailed application note) or time-domain FTIR spectroscopy [F. Keilmann et al., Opt. Lett. **29**, 1542 (2004)].

High-speed ASOPS is a novel technique that utilizes a GIGAJET 20/20C/30S TWIN version for time-domain and THz spectroscopy without moving mechanical parts. High-speed ASOPS allows for rapid temporal delay scanning over windows as long as 1 ns and has the capability for much higher data acquisition rates than conventional delay scanning techniques.

Installation and training in customer's application lab are provided. Protected by U.S. patent 6,618,423 and European patents.

technical specifications

(for a dual GIGAJET 20C on a TWIN platform, subject to changes without notice)

repetition rate	1 GHz (± 10 MHz)
pulse length	≤ 50 fs ^{*1}
output power	700 mW ^{*2}
tuning range	750 nm – 850 nm ^{*3}
beam quality	$M^2 \leq 1.2$ (sag. plane) ≤ 1.6 (tang. plane)
dimensions	310×360×90 mm ³
^{*1} after appropriate extracavity compression	
^{*2} @ 5.5 W pump power in a TEM ₀₀ mode pump beam of 532 nm wavelength (equivalent to a Coherent Verdi™)	
^{*3} tuning accomplished manually	
operating temp.	21°C \pm 5°C
power requirements	no electrical power required
cooling water req.	flow 0.5 – 1.5 l/min. temp. \sim 20°C, stable to ± 0.1 °C

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