

GMP INFO

Special Ultrafast Lasers

Light at the heart of
leading-edge technologies

1. HighQLaser - Ultrafast



High Q Laser - We Think Ultrafast™

Summary:

1. HighQLaser - Ultrafast
2. High Pulse Energy, High Power and High Stability for Ti:sapph Pumping
3. Odin-II : Highest Peak Power with Shortest Pulsewidths
4. Quasi-CW 355nm Air-Cooled Format Laser
5. Ultra Power Series - Detectors for Femtosecond lasers
6. The First Polymer Laser Safety Spectacles for fs-Lasers
7. High Energy Picosecond Solid State Lasers
8. Grenouille Measurements of Femtosecond Pulses

High Q Laser offers a complete range of all-diode-pumped, solid-state pico- and femto-second mode-locked oscillators, cavity-dumped mode-locked oscillators and regenerative amplifiers:

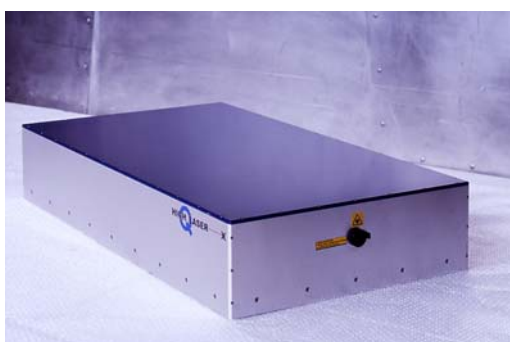
picoTRAIN™ / femtoTRAIN™
picoNOVA™ / femtoNOVA™
picoREGEN™ / femtoREGEN™

All lasers are based on the unique techniques of direct diode-pumping utilizing User Replaceable Diode Modules (URDM) and Semiconductor Saturable Absorber Mirror (SESAM) mode-locking. High Q Laser systems emit ultra fast laser pulses in the range of 266 nm to 1340 nm and are available **up to 10 W**, with repetition rates **from single shot to 1.5 GHz**.

At the Laser2005 in Munich High Q Laser has introduced a **µJ energy - MHz repetition rate** Ultrafast Laser Series - the Cavity-Dumped Mode-Locked- **femtoNOVA™** and **picoNOVA™** series.

The High Q Laser **picoNOVA™** and **femtoNOVA™** are a cost-effective and compact ultra fast laser solution, delivering pulse energies of up to 1 µJ at triggerable repetition rates up to 1 MHz and pulse durations down to 300 fs. The **NOVA™** series is available with Ti:Sapphire (800 to 900 nm) and Ytterbium (1040 nm) for femtosecond, and Nd:Vanadate (1064 nm) for picosecond operation.

Applications of the **NOVA™**



1 MHz

1 mJ

300 fs

series laser systems are in high-speed materials processing, tissue ablation and waveguide writing. Other applications are Non-Linear Optics (e.g. NOPA / OPA, Continuum Generation), Seeding Amplifiers, Ultra fast Spectroscopy as well as Multi-Photon-Microscopy.

High Q Laser introduces now the **VENTEON™** - a **Compact Dual Mode Ti:Sapphire Oscillator**. The Laser system is optimized to be SYNC pumped by a 5W 532nm **picoTRAIN™**. It allows access to synchronized 532 nm ps-pulse train of the **picoTRAIN™** pump laser for pump-probe or 4-wave-mixing experiments.

As all High Q laser systems it is

built on a thermally stabilized breadboard with an aluminum sealed enclosure. The package includes opto-mechanical mounts, adjustable components and adaptation optics for **picoTRAIN™** Pump Laser.

The dual mode of the **VENTEON™** consists of a **long pulse tunable mode** and a **ultra short broadband mode**. The long pulse is tunable between 700-950nm with 100fs pulse duration and 200mW output power. The ultra short broadband mode delivers a 200nm broad 10fs pulse with 200mW. Both modes run at 76MHz.



< 10 fs



> 25 mJ

2. High Pulse Energy, High Power and High Stability for Ti:sapph Pumping

Utilizing our patented technologies, Quantronix Darwin series of lasers maximize the potential offered by a Nd:YLF laser: High pulse energies, high repetition rates, excellent beam quality, and provide all of this in the smallest footprint commercially available. Darwin lasers come with an integrated Laser Control Unit, and the Laser Commander software.

High Power

- Greater than 35W
- Pulse energy >25mJ

Superior Performance

- Excellent beam profile for material processing
- Very low amplitude noise

Low Operating Cost

- Highly efficient wavelength conversion
- Long life diodes: 10,000 hour or 2 year diode warranty
- Field replaceable diodes changed in <3 minutes

Other features

- Q-Switched outputs
- Output powers exceed 35W
- Pulse energy >25mJ @ 1kHz
- Repetition rates to 10kHz

- Smallest footprint: 4" x 20"
- Polarized Output
- Enhanced Beam Quality
- Lowest output noise
- Superior long term stability for consistent 24/7 operations
- First Pulse Suppression
- Choice of modes: TEM₀₀, Low-Order-Mode, Multi-Mode, High Brightness, Top Hat and other specialized beam profiles
- Programmable mode selectors (optional)
- Pulse Width Modulation (optional)
- Pulse Shaping for specialized material processing
- High speed process shutter

3. Odin-II : Highest Peak Power with Shortest Pulsewidths

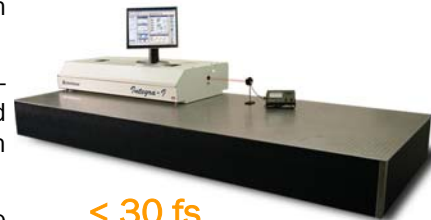
The *Odin-II* series introduces several unique engineering advancements. The multipass amplifier design minimizes material dispersion with shorter beam paths, contains a unique single-pass Pockels cell, patented spatial filtering and simple 3-mirror configuration to deliver <30 fs, 1 mJ pulses with pre and post pulse contrast >1000:1 and exceptional

beam quality of $M^2 < 1.4$. For high energy, the *Odin-II HE* utilizes the field-proven Quantronix second-stage power amplifier, delivering >2.5 mJ, <35fs pulses with $M^2 < 1.5$.

Odin-II is designed to accept most commercial seed oscillators with bandwidth >60 nm.

All ultrafast systems come with *Ultrafast Commander*

software for complete computer control.



< 30 fs

>2.5 mJ



4. Quasi-CW 355nm Air-Cooled Format Laser

Xcyte lasers offer the advantages of diode-pumped solid-state lasers in **quasi-CW 355nm air-cooled format**.

Xcyte series lasers provide near diffraction-limited beam profile, excellent stability, long life time and low amplitude noise in a compact, low cost of ownership (COO) package. These

qualities make the Xcyte laser the ideal **replacement for bulky and inefficient HeCd and Argon lasers** in varied applications such as flow cytometry, microstereolithography and semiconductor wafer inspection.

Applications

- Flow Cytometry
- Microstereolithography
- Semiconductor Wafer Inspection
- Biomedical to semiconductor processing and inspection applications

5. Ultra Power Series - Detectors for Femtosecond lasers

Gentec-EO has the solution for measuring your femtosecond laser: the Ultra Power UP19K-W5 family. This power detector family features the tough W5 coating that can withstand the high peak powers generated by short femtosecond pulses. This robust coating provides a very **high damage threshold of 100 kW/cm²** that guarantees the durability of these detectors.

The UP19K-W5 is offered in a variety of configurations

to accommodate various applications: the stand alone UP19K-15S-W5 for up to 15 W, the UP19K-30H-W5 with a heat sink to 30 W, and a choice of fan, large heat sink or water module to reach 50 W. The UP19K-W5 has a **wide detection range from 0.19 to 10 μm that covers all wavelengths of femtosecond lasers**. The compact package of the UP19K-W5 series enables you to fit it in tight spaces. Like all other Gentec-EO products,

the UP19K-W5 detectors are **NIST traceable** to give you the best possible accuracy.

gentec-EO



6. The First Polymer Laser Safety Spectacles for fs-Lasers

GPT Glendale Inc. has achieved what many people believed to be impossible: The world-wide **first laser safety spectacles** with polymer lenses offering protection against fs-lasers.

These unique laser safety spectacles were EN 207 certified by Din Certco in Aalen, Germany. Due to the polymer lens, the spectacles is particularly **lightweight and comfortable to wear**.

Until now, only laser safety

goggles with glass lenses were certified for use with fs-lasers. These are unable to meet high comfort requirements due to their weight.

FS-800 and FS Nd:YAG & Harmonics, both M-certified in accordance with EN 207, represent an addition to the extensive range of CE / DIN certified laser safety products which GPT Glendale offers.

GPT Glendale Inc. is a subsidiary of Bacou-Daloz, the world leader in personal pro-

TECTIVE equipment. GPT Glendale Inc. specializes in laser safety products, patient eye-wear and absorptive filter tech-

Glendale™

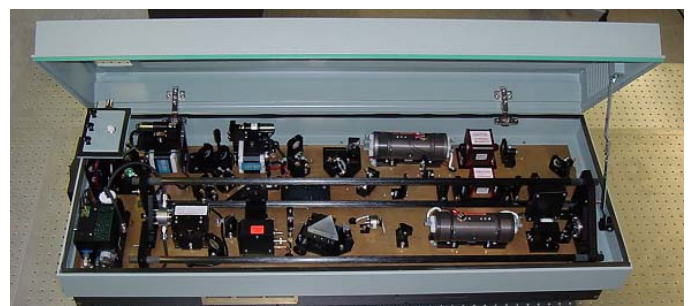


7. High Energy Picosecond Solid State Lasers

The new Leopard™ series provides the **shortest picosecond lasers** from Continuum® represents the highest level of technology available in a commercial system. The passive negative feedback employed in the oscillator allows for controlled energy extraction rates from the gain media resulting in exceptionally long and stable pulse trains. The Leopard™ D

provides the **shortest pulses available** without the high cost and complexity of a regenerative amplifier. The use of a solid state saturable absorber in the Leopard™ SS eliminates the difficulty of working with dyes, resulting in the most turnkey and modestly priced picosecond laser available.

Continuum®
An Excel Technology Company



20 -120 ps

3 mJ @ 266 nm, up to 230 mJ @ 1064 nm

8. Grenouille Measurements of Femtosecond Pulses

**ARE YOU STILL SMOKING POT, WEARING BELL BOTTOMS,
OR MEASURING ULTRASHORT PULSES
WITH AN AUTOCORRELATOR¹?**

YOU COULD BE STUCK IN THE '60s!

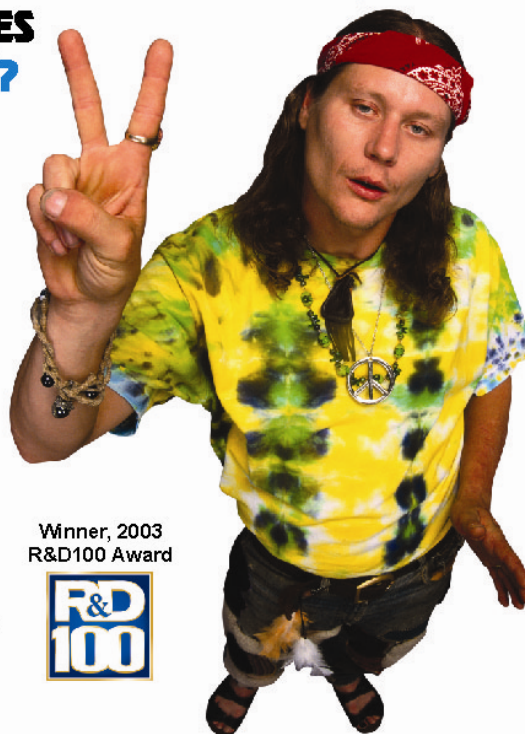
Leap into 21st-century ultrashort-laser-pulse measurement technology: GRENOUILLE²

GRENOUILLE measures nearly everything about a pulse: its intensity and phase vs. time, spectrum, spectral phase, spatial chirp, pulse-front tilt, spatial profile, and – for those who still think slide rules are groovy – the autocorrelation.



GRENOUILLE makes no assumptions, needs no alignment, and is fast, sensitive, compact, lightweight, and inexpensive.

So stash your autocorrelator with your old 8-tracks and experience the state of the art: GRENOUILLE. And if you miss the '60s, GRENOUILLE is available in five mod **COLORS** (black light not included).



Winner, 2003 R&D100 Award



1. Maier, et al., Phys. Rev. Lett., 17, 1275 (1966).
2. Trebino, et al., Opt. Phot. News, 12, 22 (2001).

GMP

General Microtechnology & Photonics
Instruments for Industry, Research, Telecom & Medicine

Interface active entre producteurs et utilisateurs d'instruments de haute technologie, GMP SA assure conseils, fourniture, ingénierie, mise en service et suivi évolutif.

Als aktives Bindeglied zwischen Herstellern und Anwendern von High-Tech-Geräten bietet GMP SA Beratung, Beschaffung, Engineering, Inbetriebsetzung und fortlaufende Wartung.

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**GMP : The one stop photonics shop
since 1977!**



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