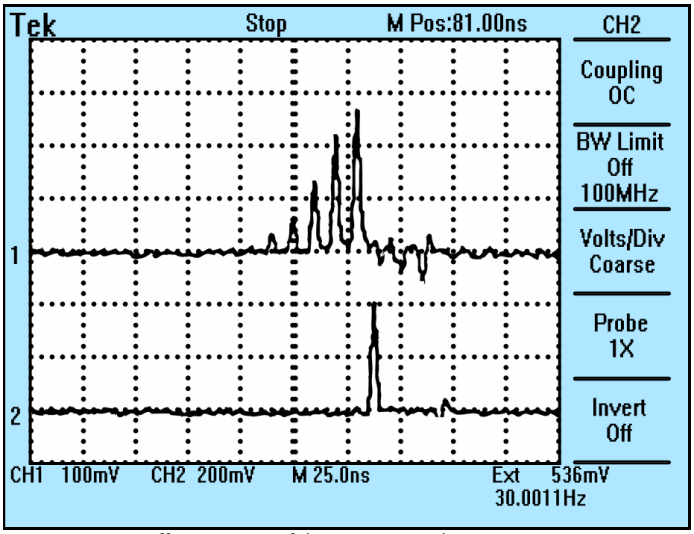
High Power Picosecond Mode-Locked Laser
LS-2151

LS-2151 is an actively mode-locked and Q-switched MOPA laser that incorporates all solid state master oscillator (MO), two-pass amplifier (PA), built-in second harmonic generator (SH), remote control from a computer.

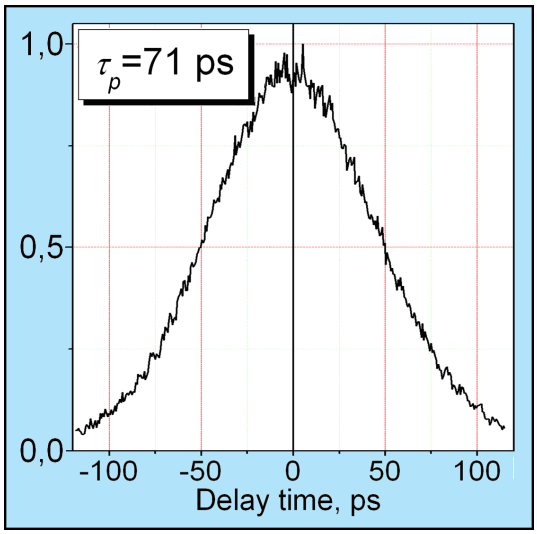
Main features:

- Separate MO and PA pump power control in single unit
- Water to air heat exchanger without external water cooling
- TEM00 master oscillator
- Built-in MO, PA and SH energy monitoring
- Computer-controlled laser operation via RS-232 or USB port
- Third and forth harmonic generators (optional)
-Autocorrelator for laser adjustment and pulse duration monitoring (optional)

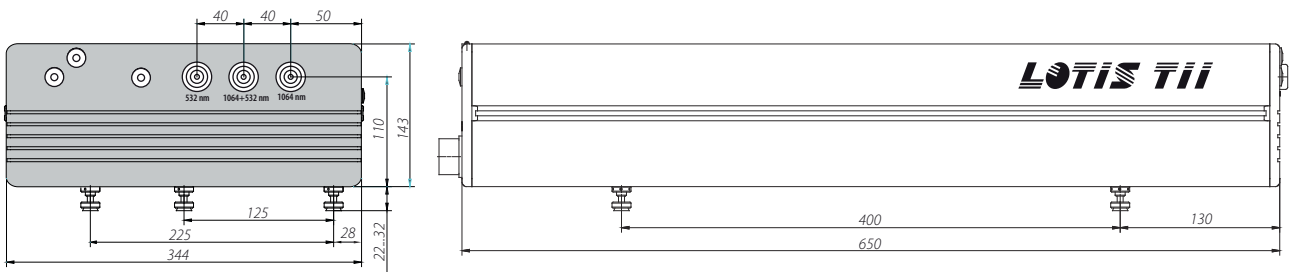
The master oscillator operates using comprehensive cavity Q-control which provides mode locking at feedback prelase stabilization, Q-switching and selection of the single optical ultrashort pulse from the master oscillator cavity. Pulse formation at feedback stabilized prelasing provides highly reproducible generation of 70 ps pulses.



Intracavity oscillations signal (upper trace 1)
Output signal (lower trace 2)



Autocorrelation function of MO output pulses



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Synchronization to external devices.

Flash lamps triggering and all Q-control events in laser: mode locking rf-pulse, Q-switching and cavity dumping are monitored by Control Unit with multi-channel timer phase-locked to the signal of reference oscillator, keeping system time in the cavity roundtrip units. The use of such timer opens new possibilities for the optical pulse synchronization to external devices:

- output TTL sync pulse either forthcoming or delayed relative to optical pulse in the range ±120μs with 1 ns resolution and timing jitter less than 200ps;

- laser triggering by external sync pulse with the optical pulse delay is in the range 110-140 μs at timing jitter ±10ns;

- two LS-2151 lasers synchronization with the accuracy about ±15 ps.

Energy monitoring.

LS-2151 has built-in photo-detectors monitoring the energies of MO, PA and SH output pulses. Energy values are indicated in laser control window of remote control PC.

Independent discharge circuits for MO and PA flash lamps open the opportunity to adjust the output energy of laser system according to application requirements.

Specifications[1]

Model		LS-2151
Energy, mJ	1064 nm	75
	532 nm	35
	355 nm	15[2]
	266 nm	15[2]
	213 nm	3[4]
Pulse duration (FWHM at 1064nm), ps		70-80
Pulse repetition rate, Hz		15
Beam divergence ($\Theta_{0.86}$), mrad		0.7
Beam diameter, mm		9
Jitter,ns		
	Relative to external triggering	±10.0
	Relative to service sync pulse	±0.2
Energy stability(StDev), %	1064 nm	2.5
	532 nm	3.0
	355 nm	3.0
	266 nm	10.0(4.0[3])
Size LxWxH, mm (Weight, kg)		
	Laser Head	650x344x143 (38.0)
	Power Supply	460x275x400 (23.0)
	Cooling System	580x290x470(22.0)
	Control Unit	512x485x133 (9.0)
	HG-T	150x145x55 (2.5)
	HG-F Autotracker	210x150x84 (3.0)
	HG-T-Fifth	234x210x62 (3.0)
	Autocorrelator	148x362x92 (5.0)
Power requirements		Single Phase, 220 V, 50/60 Hz, 1000 W

[1] All specifications are subject to change without notice
[2] Harmonic generators HG-T, HG-F, HG-T-Fifth are optional as separate units
[3] With HG-F Autotracker
[4] With HG-T-Fifth