

LS-2151 HIGH POWER PICOSECOND MODE-LOCKED ND:YAG LASER

LS-2151 is actively mode-locked and Q-switched MOPA Nd:YAG laser that incorporates:

- all solid state master oscillator (MO);
- two-pass amplifier(PA);
- built-in second harmonic generator;
- remote control from PC software;

Features & Benefits:

Separate MO and PA pump power control in single unit

Water to air heat exchanger without external water cooling

TEM00 master oscillator

Forth and third harmonics generators (optional)

Autocorrelator for laser adjustment and pulse duration monitoring (optional),

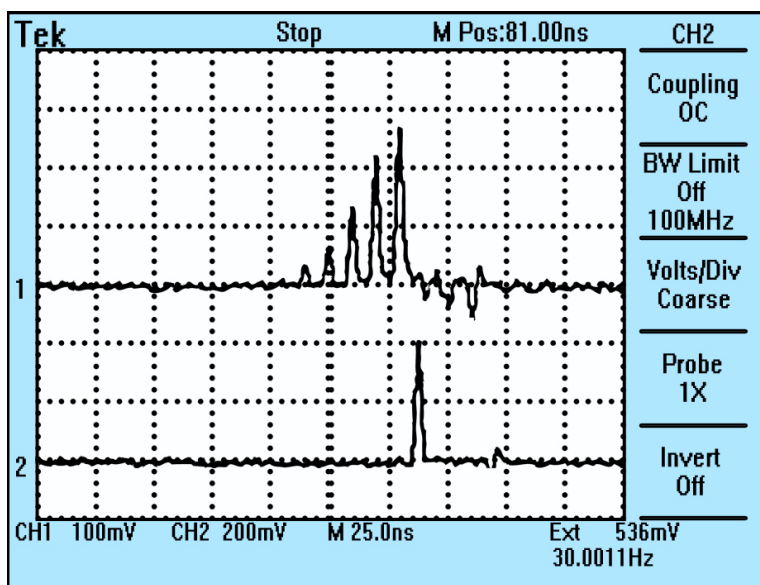
Built in aiming laser and MO, PA and SH energy monitoring

Master oscillator is operating under the comprehensive cavity Q-control providing mode locking at feedback pre-lase stabilization, Q-switching and selection of the single optical ultrashort pulse from the master oscillator cavity.

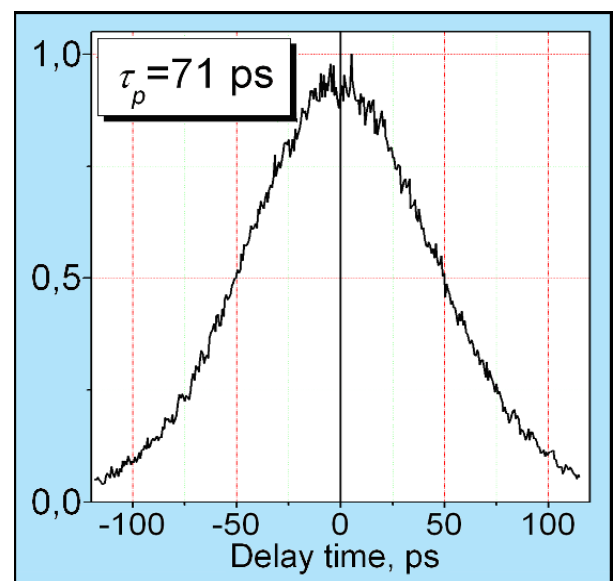
Intracavity oscillations signal (upper trace)

Output signal (lower trace)

Pulse formation at feedback stabilized pre-lase provides highly reproducible generation of 70 ps pulses.



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



Example of autocorrelation function

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 multichannel 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 in the range $\pm 120\mu\text{s}$ 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 $\pm 10\text{ns}$;
- two LS-2151 lasers synchronization with the accuracy about $\pm 15\text{ ps}$.

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.

Specification

Parameter	Value	
Wavelength, nm	1064, 532, 355 ¹⁾ , 266 ¹⁾ , 213 ¹⁾	
Energy, mJ	1064 nm	90
	532 nm	50
	355 nm	25 ¹⁾
	266 nm	18 ¹⁾²⁾
	213 nm	3.5 ¹⁾
Pulse duration, ps	FWHM	70-100
Pulse repetition rate, Hz	15	
Beam divergence, $\theta_{0,86}$, mrad	≤ 0.7	
Jitter*, $\pm\text{ns}$ (RMS)		
Relative to external triggering	10.0	
Relative to service sync pulse	0.2	
Pulse energy Stability (RMS),%		
	1064 nm	≤ 2.5
	532 nm	≤ 3.5
	355 nm	≤ 4.0
	266 nm	≤ 3.0 ²⁾
	213 nm	≤ 3.5
Beam diameter, mm	≤ 9.0	
Power Consumption, W	≤ 1000	
Input Power requirements	(220 \pm 20) V, (50, 60) Hz single phase	
Size L x W x H, mm	Laser head	820 x 406 x 136
	Power supply	512 x 485 x 177
	Cooling system	542 x 485 x 266
	Control Unit	512 x 485 x 133
Weight, kg	Laser head	53.0
	Power supply	23.0
	Cooling system	20.0
	Control Unit	9.0

1) Harmonic generator HG-TF and HG-Fifth are optional as separate units

2) With autotracker