

INTEGRAL™
element™

| > 1.5 W

| sub-10 fs

| < 0.05 % power noise

| hands-off

Applications

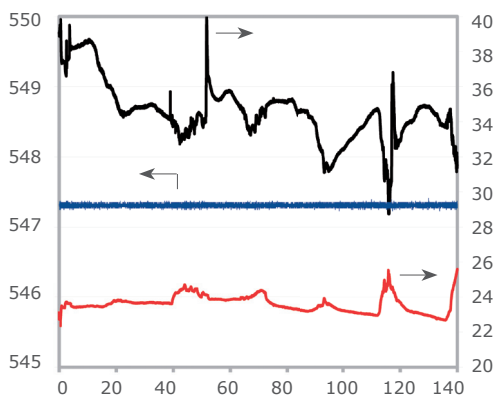
- Amplifier seeding
- Coherent THz generation
- Multiphoton microscopy
- Ultrafast spectroscopy
- Pump-probe measurements
- Materials processing
- Thin-film metrology



INTEGRAL™ element™ is a sealed single box, hands-off femtosecond oscillator. It provides a complete solution from the power outlet to the femtosecond laser output. The INTEGRAL™ element™ is based on a low threshold femtosecond oscillator powered by an integrated diode pumped green solid state laser.

Generation of ultrashort pulses directly from a low-loss laser oscillator is guaranteed by FEMTOLASERS patented Dispersive Mirror (DM) technology. Active feedback loops in combination with a compact design enable output parameters of unprecedented quality, stability, and reproducibility.

Due to its turn-key hands-off operation, the INTEGRAL™ element™ is the perfect laser for everyday use in any environment, be it industrial, medical or scientific.



Long term power noise data [mW] (blue) showing an impressive power stability of 0,004% rms and $\pm 0,02$ % peak to peak over 140 h in a non-stabilized environment (relative humidity [%]: black; temperature [°C]: red).

INTEGRAL™ element™

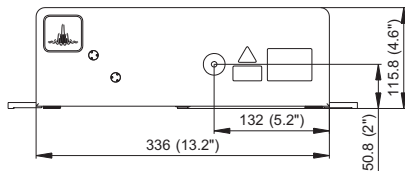
Extraordinary Features

Turn-key operation | Computer interface
Sealed cavity | Integrated diagnostics system
Active system parameter stabilization
Ultrashort pulses | Ultra low noise
Temperature stabilized laser head

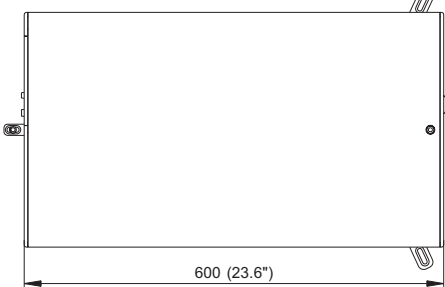
Options

Custom bandwidth & center wavelength
Custom pulse duration
SHG frequency doubling unit
Fiber delivery module | OCT-MPM module
Higher power levels on request

INTEGRAL™ element™ - FRONT VIEW, Dimensions in [mm] ([in])



INTEGRAL™ element™ - TOP VIEW, Dimensions in [mm] ([in])



Ultrashort Pulses

With DM technology, intracavity high order dispersion can be virtually eliminated, generating high quality, near bandwidth limited pulses down to sub-10 fs from a low threshold Ti:Sapphire oscillator. An Extra Cavity Dispersion Control unit (ECDC) provides precise control over dispersion outside of the oscillator in order to transmit pulses with extraordinary parameters to your application.

The INTEGRAL element various models span a broad range of pulse duration (10 - 100 fs) and output power (200 mW - 1.5 W) levels. Should your application require parameters not covered by the standard versions, custom tailored systems are available upon request.

Compactness & Ease of use

DM systems contain no intracavity elements other than the gain medium resulting in an extremely compact and simple design guaranteeing the ultimate laser performance for your application. No other Ti:Sapphire based laser comes even close to the stability and ease of use of the INTEGRAL™ element™.

Stability & Reliability

The intracavity dispersion is not sensitive to cavity alignment, in strong contrast to prism controlled systems. Hence the day-to-day reproducibility as well as the stability of the laser output parameters are excellent down to the sub-10 fs regime. Due to the compact DM resonator, the sealed cavity technology, as well as the active stabilization of system parameters, the INTEGRAL™ element™ features the highest stability demonstrated down to the sub-10 fs regime to date.

INTEGRAL™ element™	PRO	20	50	100
Pulse duration	< 10 fs	< 20 fs	< 50 fs	< 100 fs
Bandwidth (FWHM)	> 100 nm @ 800 nm	> 40 nm @ 800 nm	> 15 nm @ 800 nm	> 10 nm @ 800 nm
Mode locked min. output power	200 mW - 1000 mW	200 mW - 1200 mW	250 mW - 1200 mW	250 mW - 1500 mW
Pulse energy @ 85 MHz	2.3 nJ - 11.7 nJ	2.3 nJ - 14.1 nJ	2.9 nJ - 14.1 nJ	2.9 nJ - 17.6 nJ
Peak power @ 85 MHz	230 kW - 1170 kW	115 kW - 705 kW	58 kW - 282 kW	29 kW - 176 kW
Beam diameter (1/e ²)	< 2 mm			
Beam divergence	< 2 mrad			
Spatial mode	TEM ₀₀ (M ² < 1.3)			
Polarization	> 100:1 (horiz.)			
Noise (measured at 1 Hz - 100 kHz)	< 0.05 % rms			
Power stability ¹⁾	± 0.05 %			

1) Measured over 24 hours after 5 min. warmup at constant environmental conditions

All specifications are subject to change without notice



FEMTOLASERS Produktions GmbH
Fernkorngasse 10 | 1100 Wien | Austria
P: +43 1 503 7002 0
F: +43 1 503 7002 99
info@femtolasers.com

FEMTOLASERS, Inc.
1 Mifflin Pl. | 119 Mt. Auburn St. | Suite 400
Cambridge | MA 02138 | USA
P: +1 978 456 9920
F: +1 978 456 9922
info@femtolasers.com



FEMTOLASERS' laser products are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by Center of Devices and Radiological Health on all systems ordered for shipment after October 1, 2003.