

FEMTOSOURCE™  
**XL**

| 100 - 650 nJ | 4 MHz / 5 MHz | > 13 MW | sub-50 fs |

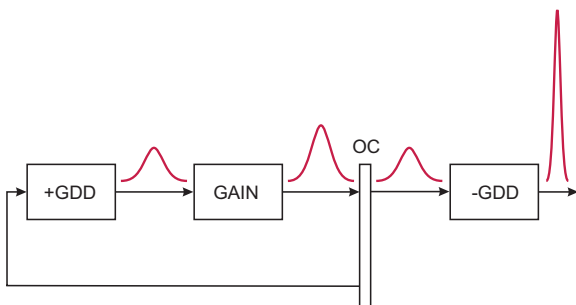
**Applications**

- Materials processing
- Coherent THz generation
- Multiphoton microscopy
- Ultrafast spectroscopy
- Nonlinear optics



**FEMTOSOURCE™ XL™100 | 200 | 300 | 500 | 650** represent the new generation of high pulse energy ultrafast compact Ti:Sapphire oscillator systems, based on patented revolutionary chirped pulse oscillator (CPO) technology.

In the XL™ CPO design a relatively long (chirped) pulse circulates in an extended cavity allowing the pulse energy to build to extraordinarily high levels. With dispersive mirror (DM) technology (patented by FEMTOLASERS™) for low loss intracavity dispersion control, the broadest bandwidth directly from a high energy oscillator is guaranteed. After recompression, the system offers the shortest optical pulses in combination with the highest pulse peak power and pulse energy commercially available in a compact, high repetition rate laser system.



## Extraordinary Features

- High pulse energy
- Ultra high peak power
- Ultrashort pulses
- Compact footprint
- Integrated compressor
- Temperature stabilized base plate

## Options

- Length stabilization with FEMTOLOCK™
- Continuous variable attenuator
- Pulse picker
- EUROPA™ Optical Parametric Amplifier
- XS™ Short Pulse Module

## Telescope

Two mirrors combine to form a multipass cell in order to introduce a long propagation distance inside the cavity on a compact footprint. A careful telescope design guarantees superior system stability, eliminating beam pointing variations to first order. The transverse beam profile of the output is similar to the other FEMTOSOURCE™ oscillators.

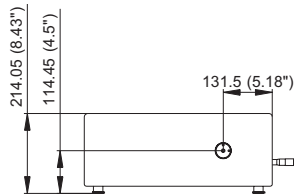
## Stability

The intracavity dispersion in DM technology systems is not sensitive to cavity alignment, in strong contrast to prism controlled systems. Oscillator and pump source are fixed to a single temperature stabilized base plate. Hence, the day-to-day reproducibility as well as the stability of the laser output parameters is excellent in the sub-50 fs regime.

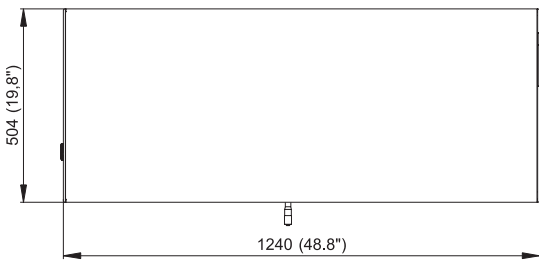
## Flexibility

A prism sequence is used to externally compress the chirped pulses from the oscillator cavity. This opens the possibility to continuously adjust the peak power by tuning the pulse duration down to sub-50 fs to match different application requirements. Continuous attenuation and a pulse picker are optionally available.

XL™ laser head - FRONT VIEW, Dimensions in [mm] ([in])



XL™ laser head - TOP VIEW, Dimensions in [mm] ([in])



## Dimensions W x H x D in mm [in]:

Power Supply: 440 x 260 x 450 mm  
[17.3 x 10.2 x 17.7]

Chiller: 186 x 311 x 384 mm  
[7.3 x 12.2 x 15.1]

FEMTOSOURCE™	XL 100	XL 200	XL 300	XL 500	XL 650
Pulse energy	> 100 nJ	> 200 nJ	> 300 nJ	> 500 nJ	> 650 nJ
Pulse duration <sup>1)</sup>	< 50 fs	< 50 fs	< 50 fs	< 50 fs	< 50 fs
Mode locked output power (avg.)	> 0.5 W	> 1.0 W	> 1.5 W	> 2.5 W	> 2.6 W
Bandwidth @ 800 nm	> 30 nm	> 30 nm	> 30 nm	> 30 nm	> 30 nm
Repetition rate	5.1 MHz	5.1 MHz	5.1 MHz	5.1 MHz	4 MHz
Peak power	> 2 MW	> 4 MW	> 6 MW	> 10 MW	> 13 MW
Beam diameter (1/e <sup>2</sup> )	< 5 mm				
Beam divergence	< 2 mrad				
Spatial mode	TEM <sub>00</sub> (M <sup>2</sup> < 1.3)				
Polarization	> 100:1 (horiz.)				

1) Assumed pulse form sech<sup>2</sup>

All specifications are subject to change without notice



**FEMTOLASERS Produktions GmbH**  
Ferknorgasse 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.