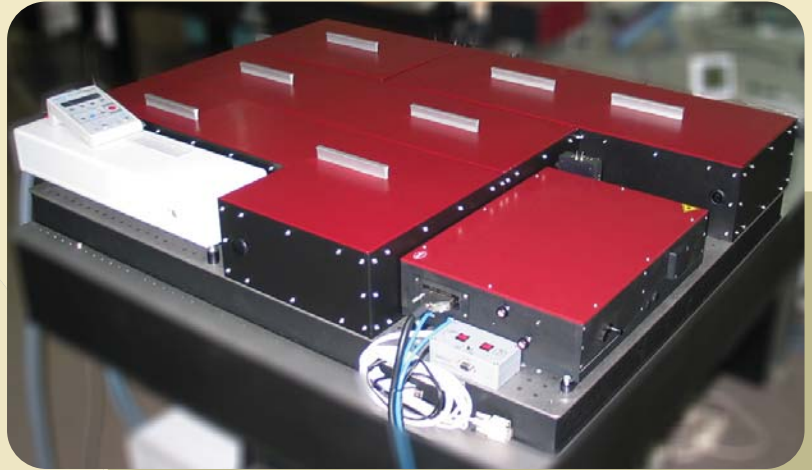


## Amplifiers



## Ti:Sapphire Amplifier MATEKO

- Compact single-box design
- >10 mJ/pulse
- Variable repetition rate
- Contrast ratio >10<sup>4</sup>
- Upgradeable up to TW level
- <40 fs pulse duration



Femtosecond Ti:Sapphire amplifier MATEKO

## Product overview

The MATEKO femtosecond amplifier is designed to provide mJ-level output by amplifying pulses from a Ti:S or fiber ultrafast seed oscillator. The amplification ratio in such a system is more than 10<sup>6</sup> and happens in a Ti:S crystal during several passes while pumping by a Q-switched 515-532 nm laser. The hybrid system comprises two amplifiers: a regenerative stage and a multipass stage, thus enabling higher pulse energies. A single pump laser is used to pump both stages which reduces the cost of the system and boosts stability and performance. Additional Pockels cell operates as a pulse slicer and allows full control over PRR and increases contrast ratio to 10<sup>4</sup> level at >5 ns.

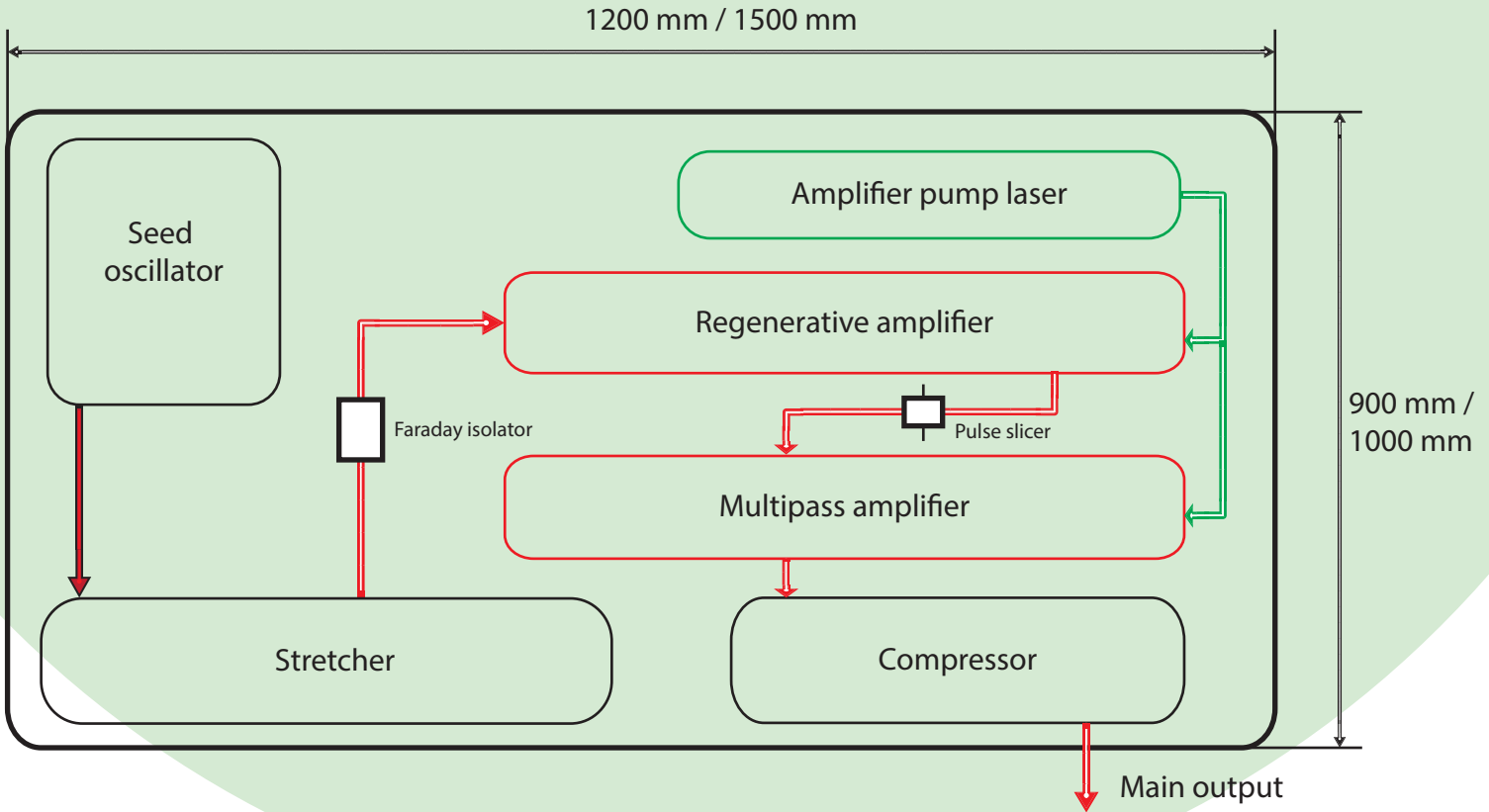
The MATEKO systems comprise an ultrafast seed oscillator (solid-state TiF-15F3 or fiber EFOA-SH), stretcher, Faraday isolator, Pockels cell, control and synchronization unit, regenerative and multipass amplifiers, pulsed amplifier pump laser, optional pulse slicer and grating compressor unit. All elements are integrated into a single box for better overall stability and have compact optical layout.

Upon request we may offer systems with output pulse energy of >500 mJ and TW peak power level. The upgrade may also be performed in stages to fit into tighter funding.

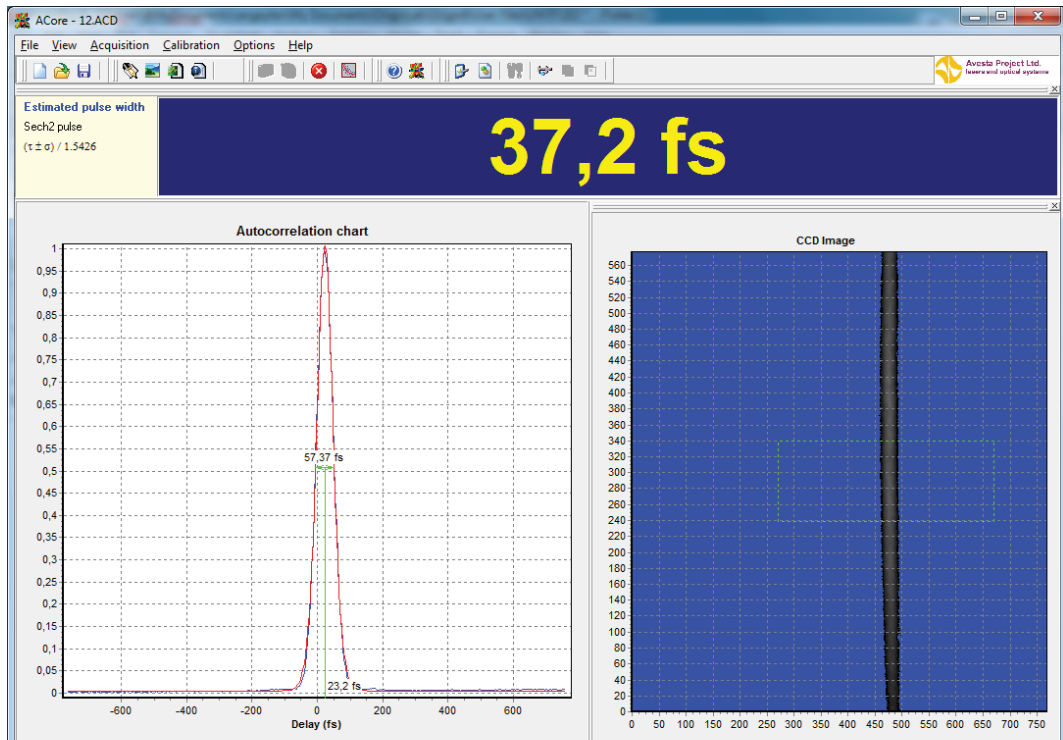
	MATEKO-40F1K	MATEKO-40F10 (-40F15)
Pulse duration*	<40 fs	
Central wavelength	800±15 nm (fixed)	
Repetition rate	1 kHz**	0...10 Hz (variable); 0...15 Hz (variable)
Pulse energy*	>5 mJ	>10 mJ
Beam diameter (1/e <sup>2</sup> )	10 mm	8 mm
Stability	<1.0% rms	<2.5% rms
Contrast ratio at 10 ns	>10 <sup>4</sup> :1** / 200:1	>10 <sup>4</sup> :1
Contrast ratio at <10 ns	>10 <sup>3</sup> :1 @ 1 ps >10 <sup>6</sup> :1 @ 5 ps >5x10 <sup>7</sup> :1 @ 10-20 ps >5x10 <sup>7</sup> :1 @ ASE	
M <sup>2</sup>	<1.3	
Spatial profile	TEM <sub>00</sub>	
Output polarization	linear, horizontal	
Optical head dimensions	1500x1000x220 mm	1200x900x220 mm

\* - upon request: 30...120 fs systems; up to 500 mJ TW systems;

\*\* - an additional pulse slicer may be added to the unit. This improves the contrast ratio and allows the repetition rate to be adjusted from single-shot to the maximum repetition rate of the amplifier.



MATEKO-40F10 / MATEKO-40F1K Amplifier Layout



MATEKO pulse duration measured by ASF single-shot autocorrelator