

## MS-FROG

MS-FROG stands for Multi-Shot Frequency Resolved Optical Gating. The MS-FROG is based on second harmonic generation, making it reliable and compact. It has been specially developed for sources with energy per pulse of less than 1 nJ. It allows the measurement of pulses from 50 fs to 40 ps in the standard version. The scan speed is so high that it allows real-time operations for measurement and optimization. The MS-FROG-LP can perform scan at 130 ps/s, making it the fastest scanning FROG on the market. Also, the MS-FROG-SP allows the measurement of both ultra-short and long pulses thanks to its dual-mode (standard mode for pulse duration > 50 fs and fine-scan mode for pulse < 50 fs). On top of that, our recently developed algorithm allows to extract information from each recorded spectra instantaneously, leading to real time reconstruction of your pulses! Like every products, the MS-FROG is easy to install and use.

### MS-FROG



### Key features

- ◆ User-friendly: no calibration and no tweaking necessary
- ◆ Versatile: *instant-swap* of spectrometer for different wavelength ranges
- ◆ Large pulse duration measurement range (from 5 fs to 80 ps)
- ◆ High sensitivity (sub-nJ pulse)
- ◆ User-friendly and powerful software  
(STAR : Software Technology for Acquisition and Retrieval)
- ◆ Broad available spectral range
- ◆ Fiber connector available (FC/APC, FC/PC)

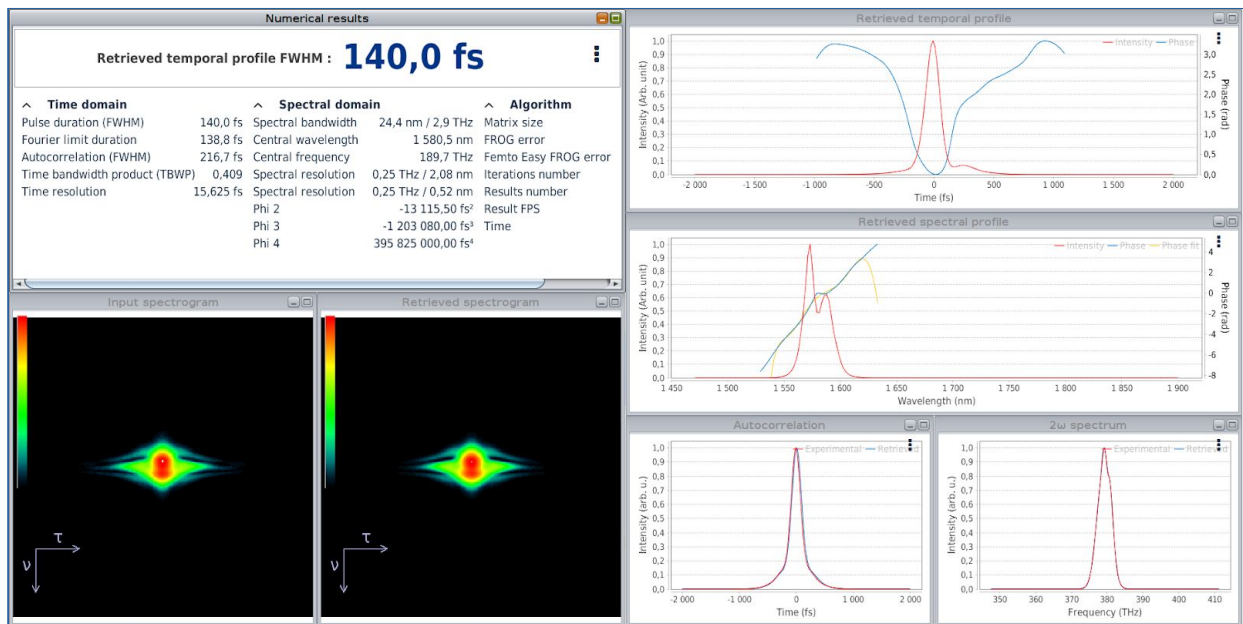
# Specifications

Models		MS-FROG	MS-FROG-SP	MS-FROG-LP	MS-FROG-SLP
Pulse duration range	min	50 fs	5 fs	100 fs	25 fs
	max	40 ps	40 ps	80 ps	80 ps
Fine scan mode range		not applicable	5 – 50 fs	not applicable	25 – 500 fs
Accessible spectral range (nm)		500 - 2000 <sup>1</sup>			
Spectral Window $\Delta\lambda$ (nm)		From 200 to 700 <sup>1</sup>			
Minimum temporal resolution		6.7 fs	standard : 6.7 fs fine scan : 0.1 fs	13.4 fs	standard : 13.4 fs fine scan : 0.2 fs
Scan speed		> 65 ps/s	standard : > 65 ps/s fine scan : > 50 fs/s	> 130 ps/s	standard : > 130 ps/s fine scan : > 500 fs/s
Input pulse repetition rate		100 Hz to GHz <sup>2</sup>			
Min input pulse energy <sup>3</sup>	1 MHz	500 pJ	10 nJ	500 pJ	1 nJ
	100 MHz	50 pJ	1 nJ	50 pJ	100 pJ
Input polarization		linear vertical			
Detection		CMOS 12 Bits – 3 Mpx – 72 dB			
PC Interface		USB 3.1			
Beam height (mm)		75 - 155			
Dimensions (mm)		326 x 194 x 129			

<sup>1</sup> Effective spectral bandwidth to be defined within the accessible spectral range according to customer's requirements. Additional spectrometers can be provided to address different spectral windows.

<sup>2</sup> Low repetition rate available as an option

<sup>3</sup> Those values give an order of magnitude. The exact sensitivity depends on many parameters (pulse duration, beam profile, wavelength...)



- ◆ Live extraction of shot to shot pulse properties: temporal profile intensity and phase, fundamental spectrum and phase, Chirp, Third-order dispersion...
- ◆ Several algorithms (including the Ptychographic Iterative Engine) are combined to enhance the reconstruction speed and quality
- ◆ Enhanced background & hot pixels treatment, for optimum dynamic and signal to noise ratio
- ◆ Client / Server interface, allowing remote control through network
- ◆ All data exportable into most common formats