



DESCRIPTION

TiPA is an invaluable tool for alignment of ultrashort pulse laser systems based on the chirped pulse amplification technique. Its unique design allows monitoring and measuring the pulse duration as well as the pulse front tilt in both vertical and horizontal planes. TiPA is a straightforward and accurate direct pulse-front tilt measurement tool. The device is recommended to be used to measure pulse duration from our PHAROS system as well as from TOPAS and ORPHEUS series of Optical Parametric Amplifiers.

Operation of TiPA is based on non-collinear second harmonic (SH) generation, where the spatial distribution of the SH beam contains information on the temporal shape of the fundamental pulse. This technique combines low background and single-shot measurement capability. The basic idea is that two replicas of a fundamental ultrashort pulse pass non-collinearly through a nonlinear crystal, in which SH generation takes place. SH beam's width and tilt in a plane perpendicular to propagation provide information about the pulse duration and tilt of pulse front. The SH beam is sampled by the included CCD camera.

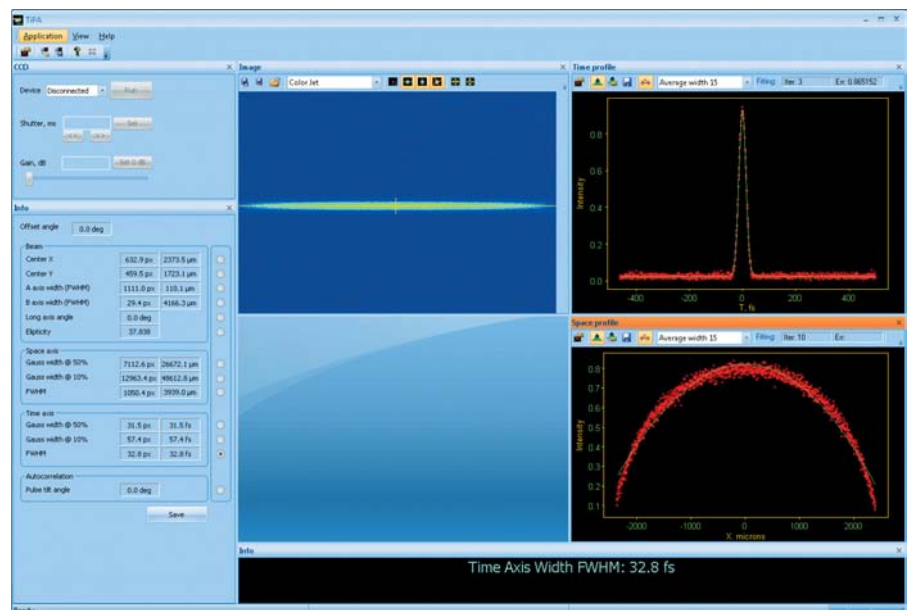
TiPA comes with a user friendly software package, which ensures on-line monitoring of incoming pulse properties.

FEATURES

- Measures pulse duration in 30–1000 fs range
- Measures pulse-front tilt
- Working range – from 500 nm up to 2000 nm
- Easy to align and operate
- Compact design
- Hi-speed 12-bit CCD camera
- User friendly pulse-analysis software

APPLICATIONS

- PHAROS pulse duration measurement
- TOPAS and ORPHEUS pulse duration measurement
- Ti:saph amplifier's compressor optimization and pulse duration measurement



View of the TiPA software window

CCD control and info panels on the left; image captured by CCD – middle; processed time profile of the image with Gaussian fit, and processed space profile of the image – right top and bottom respectively.

TiPA MODELS*

Model	Operation wavelength
AT1C1	700 – 900 nm
AT2C1	900 – 1100 nm
AT5C3	500 – 2000 nm

*Non-standard models available on request.

PERFORMANCE SPECIFICATION

Wavelength range	500 – 530 nm	530 – 700 nm	700 – 2000 nm
Temporal resolution	~500 fs/mm		
Measurable pulse width	40 – 120 fs	40 – 1000 fs	30 – 1000 fs
Minimum average power of radiation	~5 mW	~5 mW	~1 mW
Detector	CCD		

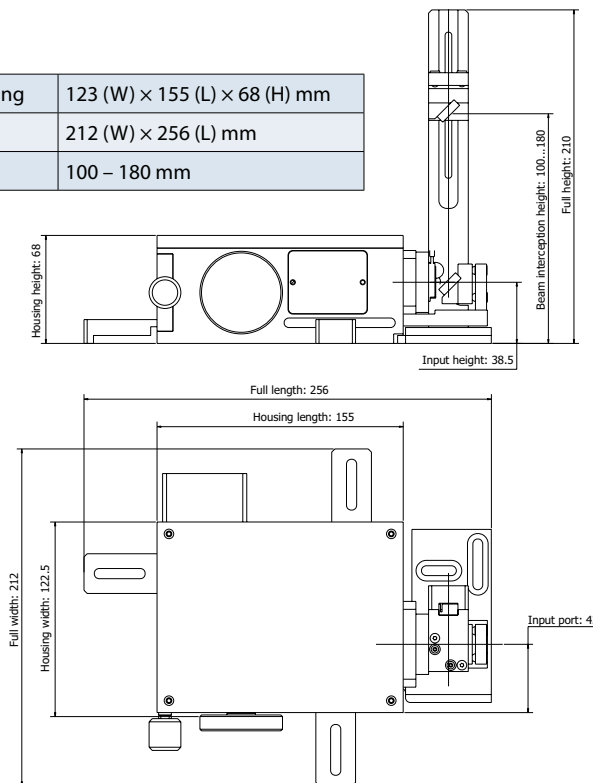
CCD SPECIFICATIONS

Maximum resolution	1296 (H) × 964 (V)
Pixel size	3.75 μm × 3.75 μm
Analog-to-Digital converter	12 bits
Spectral response*	0.35 – 1.06 μm
Power consumption from USB bus	2 W (max) at 5 V

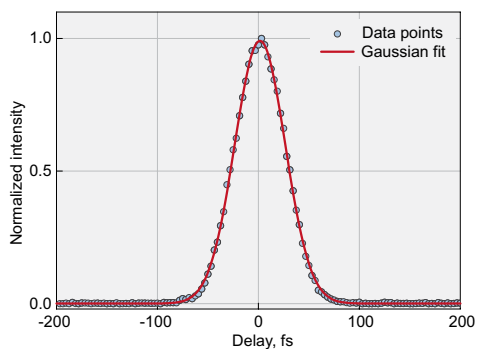
*With glass window.

DIMENSIONS

General dimensions of the housing	123 (W) × 155 (L) × 68 (H) mm
Recommended area for fixing	212 (W) × 256 (L) mm
Beam interception height	100 – 180 mm



SAMPLE AUTOCORRELATION WITH DATA FITTING



TOPAS Idler Autocorrelation
at 1700 nm (40 fs pump)

MEASUREMENT INFO

Gaussian Width:	18.8 px – 58.8 fs
FWHM Width:	19.2 px – 59.8 fs
Gaussian Pulse Duration:	41.6 fs
Sech ² Pulse Duration:	38.2 fs
Pulse Tilt:	-0.210 deg

Local distributor list available at
www.lightcon.com

Specifications are subject to change
without notice.



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