

HARPIA | TA

Ultrafast Transient Absorption Spectrometer

FEATURES

- Market-leading sensitivity
- 330 nm – 24 μm spectral range
- Probe delay ranges from 2 ns to 8 ns
- Pump pulse energies down to nJ
- Cryostat and peristaltic pump support

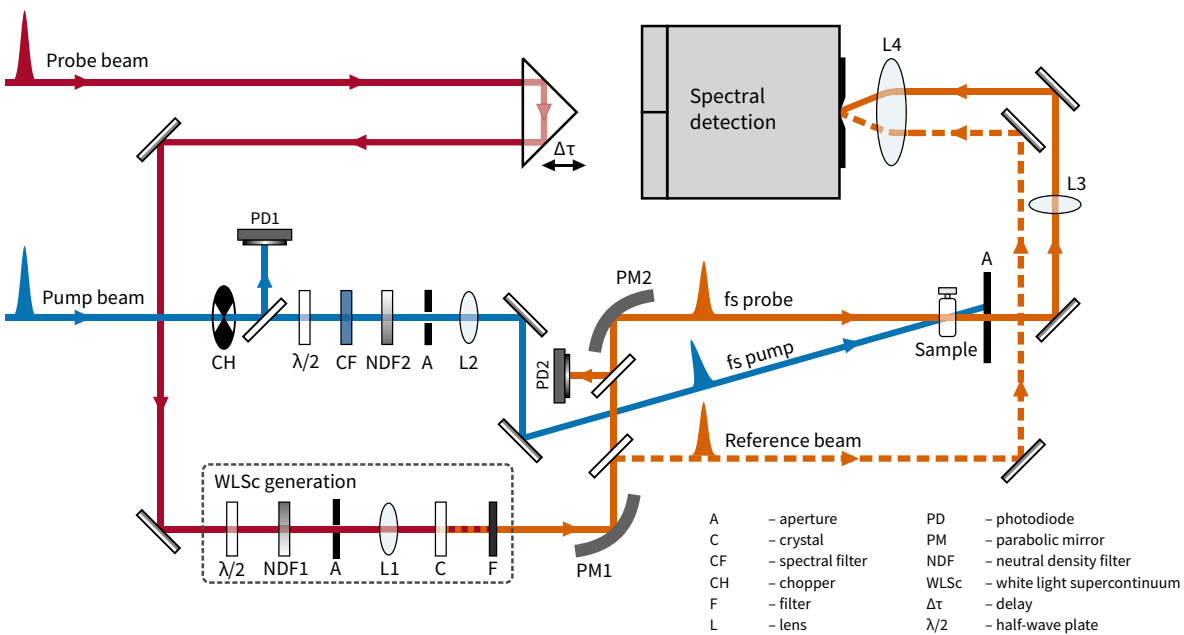


The HARPIA-TA ultrafast transient absorption spectrometer provides pump-probe measurement functionality in a HARPIA system. Several probe light configurations and detection options are available: from a photodiode for single-wavelength detection to white-light supercontinuum probing combined with spectrally-resolved broadband detection. HARPIA-TA features extensive automation options providing pump and probe beam position tracking and alignment, pump polarization control, supercontinuum generator switching, sample positioning, as well as switching between transient absorption and transient reflection measurements.

Broadband probe options cover a 330 – 1600 nm range, while a monochromatic probe can be used up to 24 μm. The probe delay stage is configurable from 2 ns to 8 ns.

HARPIA-TA features market-leading sensitivity of 0.05 mOD ($10^{-4} \Delta T/T$) and can be operated at high repetition rates of up to 1 MHz when used with a PHAROS or CARBIDE laser and an ORPHEUS series OPA, which allows the study of transient absorption dynamics with excitation pulse energies down to several nanojoules.

HARPIA-TA is compatible with cryostats and peristaltic pumps, and the capabilities of the spectrometer are extendable using expansion modules.



HARPIA-TA optical layout for pump-probe experiments

SPECIFICATIONS

Model	HARPIA-TA		
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PUMP-PROBE SPECIFICATIONS

Configuration	UV / VIS / NIR / SWIR			MIR
Probe excitation wavelength	1030 nm	515 nm	800 nm	n/a ¹⁾
Probe spectral range	460 – 1600 nm	350 – 750 nm	330 – 1400 nm	190 nm – 16000 nm ²⁾
Detection spectral range	200 – 1100 nm / 900 – 1700 nm / 900 – 2600 nm			2 – 13 μm ³⁾
Delay range	2 ns / 4 ns / 8 ns			
Delay resolution	2.1 fs / 4.2 fs / 8.3 fs			
Laser repetition rate	1 – 1000 kHz			
Temporal resolution	< 1.4× pump or probe pulse duration, whichever is longer			
Maximum data acquisition rate	4000 spectra/s			-
SNR ⁴⁾	250 : 1			-

OPTIONAL FLASH PHOTOLYSIS EXTENSION

Delay resolution	100 ps
Temporal resolution	2 ns
SNR ⁵⁾	40 : 1

DIMENSIONS

Physical dimensions (L × W × H) ⁶⁾	730 × 420 × 160 mm
Internal sample chamber area (L × W) ⁷⁾	205 × 216 mm

¹⁾ A wavelength-tunable source such as ORPHEUS-HP is used instead of a laser-excited white-light continuum.

²⁾ An extended tuning range of ORPHEUS-HP. Also applicable to UV / VIS / NIR / SWIR configuration.

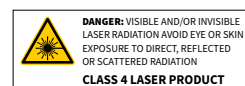
³⁾ Up to 24 μm available upon request; contact sales@lightcon.com for more details.

⁴⁾ Estimated as the standard deviation of a set of 2500 spectra measured in SCHOTT OG530 glass with 54 nJ, 370 nm pump and > 4.5 mOD at a maximum of the spectrum. Not applicable to all samples and configurations.

⁵⁾ Estimated as the standard deviation of a set of 2000 spectra measured in SCHOTT OG530 glass with 515 nm pump and > 10 mOD at a maximum of the spectrum. Not applicable to all samples and configurations.

⁶⁾ Without external spectrograph.

⁷⁾ External sample placement option is available.



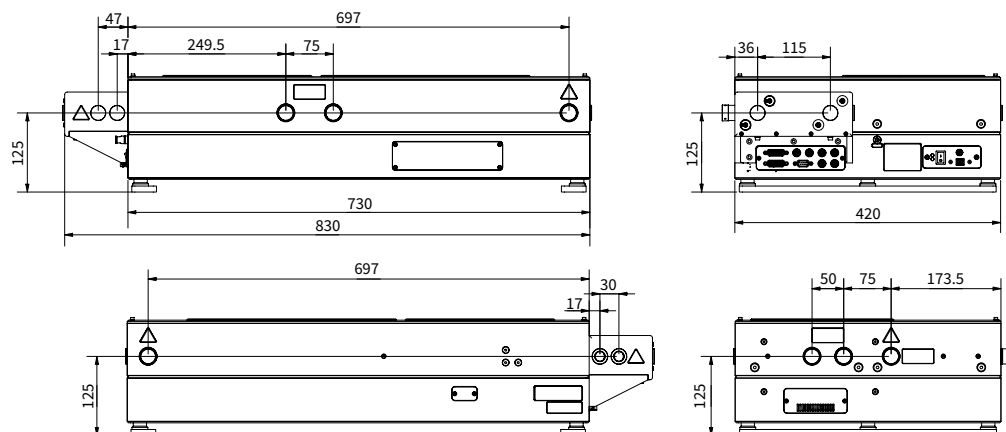
CRYOSTAT MOUNTING OPTION

HARPIA-TA supports cryostats that can be mounted externally or internally. For more details, contact sales@lightcon.com.



Internal cryostat mounting option

DRAWINGS



HARPIA-TA drawings