UltraFast Innovations

YOUR KEY to innovation and success

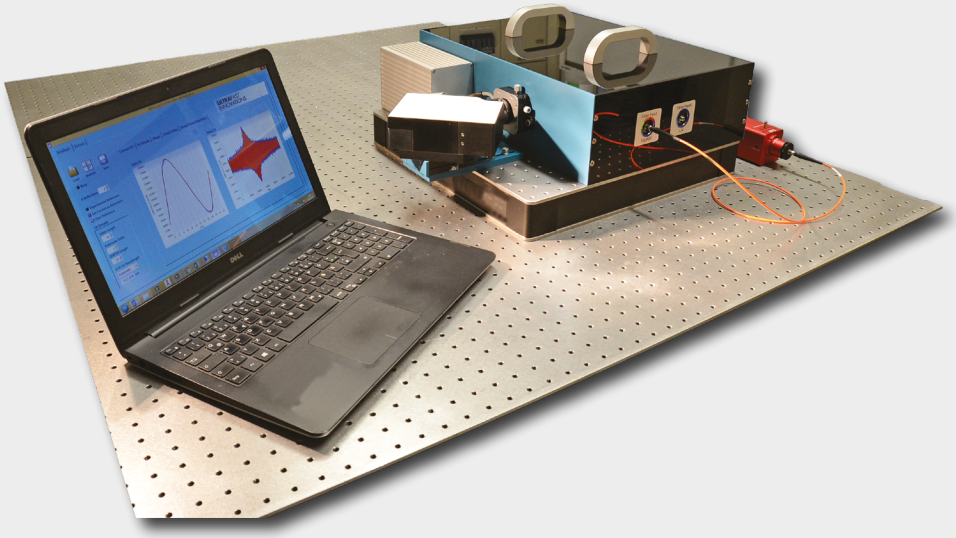
White Light Interferometer

GOBI

Our White Light Interferometer GOBI uses spectrally resolved interferometry to accurately measure the Group Delay Dispersion (GDD) of multi-layered ultrafast optics. The device has been developed at the Max-Planck-Institute of Quantum Optics (Garching, Germany) to characterize and refine some of the most advanced coatings to date [1-3].

Combining spectral with temporal information and the possibility to accumulate multiple passes over the same optic ensures reliable results with unique spectral coverage of up to 250-1000 nm (UV/VIS/NIR version) and 900-2400 nm (IR version).

Spectrally resolved detection makes reference lasers together with any related test sample restrictions on specific reflection or transmission bands obsolete. This opens the full spectral range to characterize even ultra-broadband or advanced narrowband coatings. The flexible optical setup can measure mirrors and transparent samples under angles of incidence variable between 0 and 70 degrees.



Key Product Features:

- Ultrabroad spectral coverage
  - 400-1000 nm (VIS/NIR basic version)
  - 250-1000 nm (UV/VIS/NIR version)
  - 900-2400 nm (IR version)
- Direct spectrally dispersed measurement with a spectrometer
- No need for reference lasers, no requirements on specific reflectivity
- s and p polarization (separately)
- Angle of incidence: 0° and 5-70°
- Measurement of single mirrors or mirror pairs
- Laptop and user-friendly software interface included
- Footprint 45 x 45 cm^2

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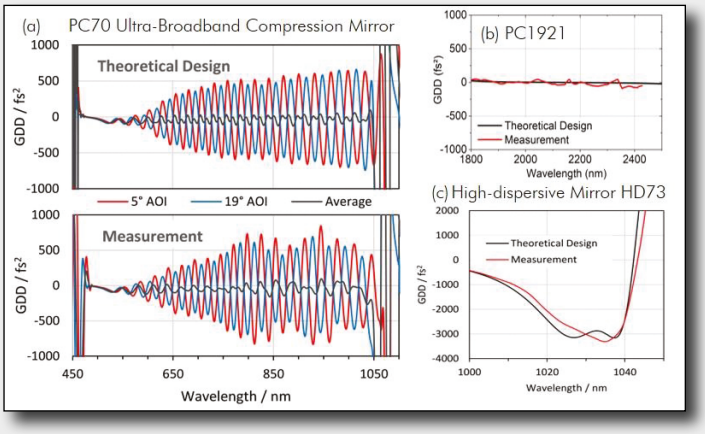
Specifications:	GOBI	GOBI+	GOBIIR
Spectral range	VIS/NIR	UV/VIS/NIR	IR
Wavelength range	400-1000 nm	250-1000 nm	900-2400 nm
Spectral accuracy	1 nm		4 nm
GDD accuracy	± 5 fs²		
Angle of incidence range	0° and 5-70°		
Polarization	s and p (separately)		
Optics size	1 inch (other sizes upon request)		
Footprint	45 x 45 cm²		

Gobi is based on a Michelson Interferometer with an incoherent white light (WL) source. Data is acquired by scanning the delay of one arm and spectrally record the evolving interference pattern. Fully automated analysis yields the spectral phase and GDD. The spectrometer directly provides the spectrally resolved information avoiding artefacts from time-domain reconstruction. It also provides an intrinsic calibration reference for the delay scan, so that no additional reference lasers are required. This makes GOBI suitable for any optics measurements in the detection range without the need to cover a reference laser wavelength in transmission or reflectance.

Sample Measurement:



In contrast to other devices GOBI is able to resolve strong GDD oscillations. Note that differences between measured and theoretical curves reflect tolerances in the manufacturing process of the coatings.

Examples of GDD measurements with our White Light Interferometer GOBI, and comparison to the theoretical design. (a) Ultrabroadband PC70 mirrors with our unique double-angle design, measured at 5° and 19° angle of normal incidence, together with the average. (b) Pulse Compression Mirror PC1921 for the infrared. (c) High dispersive HD73 mirror with -3000 fs² per bounce at 1030 nm.

References:

[1] M. Th. Hassan et al., "Optical attosecond pulses and tracking the nonlinear response of bound electrons," Nature **530**, 66-70 (2016).

[2] E. Fedulova et al., "Highly-dispersive mirrors reach new levels of dispersion," Optics Express **23** (11), 13788-13793 (2015).

[3] V. Pervak, "Recent development and new ideas in the field of dispersive multilayer optics," Applied Optics **50** (9), C55-C61 (2011).