

# FC Spider Few Cycles

## Precise Characterization of Very Short Pulses Down to < 5 fs

- The FC Spider (Few Cycle Spider) by APE provides spectral and temporal characterization of ultrashort laser pulses down to below 5 fs. It covers both the red and near infrared range, and visible wavelength region with the FC Spider VIS.
- This high-precision tool is ideal for aligning and monitoring the performance of broadband Ti:Sa oscillators and amplifier chains with bandwidths starting at 30 nm.
- The FC Spider VIS supports the visible spectral region down to 450 nm, suitable for characterization of e.g. nonlinear optical parametric amplifiers (NOPA).
- Based on the proven and patented Spider\* technology, using a non-drifting, etalon interferometer and a material dispersion stretcher, the FC Spider directly measures the spectral phase by analyzing a spectral interferogram. In combination with a simultaneously measured power spectrum, real-time calculation and visualization of the spectral and temporal amplitude and phase is accomplished.



- Short pulse characterization down to < 5 fs
- Spectral coverage in the IR range and VIS range
- Real-time and single-shot measurement of phase and intensity
- High level of automated software support and internal camera-assisted alignment
- Full software suite included
- Ideal for broadband Ti:Sa oscillators, hollow-core fiber compressors, and NOPA

\*Spectral Phase Interferometry for Direct Electric-field Reconstruction;

International Patent No.: EP 1000315, WO 1999/006794

# FC Spider Specifications

Specifications	FC Spider NIR	FC Spider VIS
Wavelength Range	550 ... 1050 nm *	450 ... 900 nm *
Typical Application	Characterization of very short pulses, broad bandwidths; E.g. Ti:Sa Laser, hollow-core fiber compressor	Characterization of very short pulses, broad bandwidths; Visible wavelength range; E.g. NOPA
Spectral Bandwidth	> 30 nm at e.g. 800 nm	10 ... 50 nm at e.g. 550 nm, other options available
Pulse Width	< 5 ... 200 fs	10 ... < 150 fs at e.g. 550 nm, other options available
Laser Repetition Rate	Any; Single Shot	Any; Single Shot
Input Polarization	Linear horizontal	Linear horizontal
Input Power	> 50 mW at e.g. 80 MHz, 10 fs 20 mW at e.g. 1 kHz, 20 fs	On request
Input Trigger	TTL for f < 10 Hz	TTL for f < 10 Hz
Connection	USB	USB
Software	Included; Features e.g. <ul style="list-style-type: none"> <li>▪ Alternative interferogram demodulation analysis: Fourier / Wavelet</li> <li>▪ Peak power calculation</li> <li>▪ Measurement of phase differences (Dispersion measurement)</li> <li>▪ Spectral phase derivation up to fourth order</li> <li>▪ Simulation of additional theoretical dispersion (GDD, TOD, FOD)</li> <li>▪ Spectrogram (X-FROG, SHG-FROG) and Wigner trace representation of the pulse</li> <li>▪ E-field plot</li> </ul>	

## Options

<ul style="list-style-type: none"> <li>▪ Wavelength Range</li> </ul>	500 ... 1000 nm 660 ... 1160 nm Customized wavelengths on request	Pre-mounted optics optimized for various center wavelengths, e.g. <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Center Wavelength:</th> <th>Pulse width:</th> <th>Spectral bandwidth:</th> </tr> </thead> <tbody> <tr> <td>▪ 500 nm</td> <td>12 ... 180 fs</td> <td>6 ... 30 nm</td> </tr> <tr> <td>▪ 600 nm</td> <td>8 ... 120 fs</td> <td>14 ... 70 nm</td> </tr> <tr> <td>▪ 700 nm</td> <td>6 ... 100 fs</td> <td>25 ... 125 nm</td> </tr> <tr> <td>▪ 800 nm</td> <td>7 ... 80 fs</td> <td>40 ... 140 nm</td> </tr> </tbody> </table>	Center Wavelength:	Pulse width:	Spectral bandwidth:	▪ 500 nm	12 ... 180 fs	6 ... 30 nm	▪ 600 nm	8 ... 120 fs	14 ... 70 nm	▪ 700 nm	6 ... 100 fs	25 ... 125 nm	▪ 800 nm	7 ... 80 fs	40 ... 140 nm
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<ul style="list-style-type: none"> <li>▪ External Beam Splitter and Beam Routing Kit</li> </ul>	For lasers with low repetition rates (kHz or less)	For lasers with low repetition rates (kHz or less)															
<ul style="list-style-type: none"> <li>▪ Pre-installed Notebook</li> </ul>	Available	Available															
<ul style="list-style-type: none"> <li>▪ Fiber Coupling</li> </ul>	Available for fundamental input port	Not available															

## Dimensions

561 x 244 x 316 mm (W x H x D)  
See appendix for details

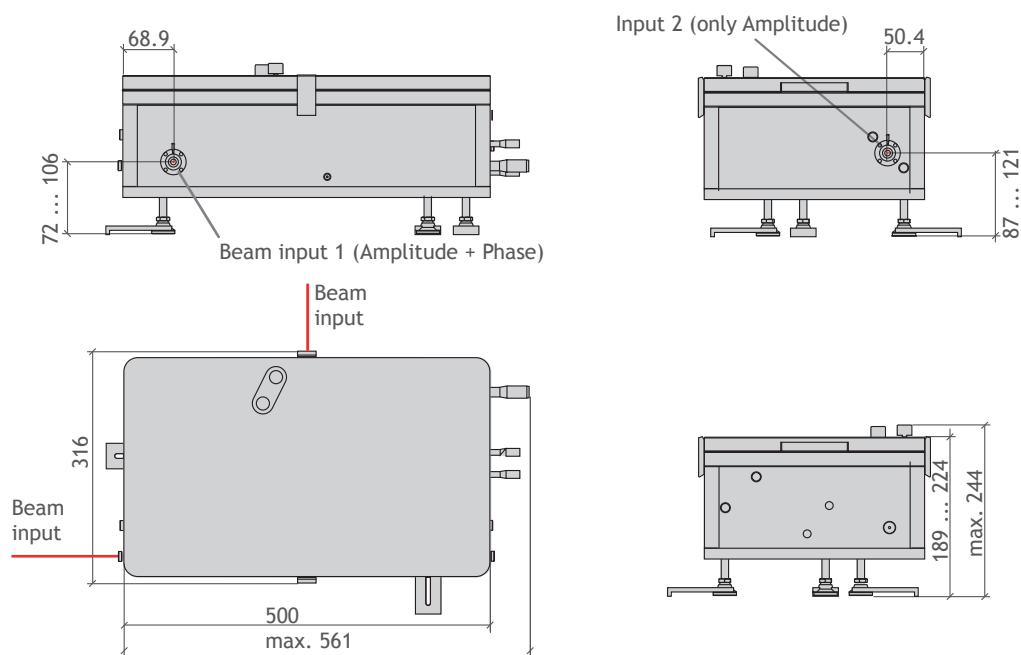
561 x 244 x 316 mm (W x H x D)  
See appendix for details

\* Other wavelength ranges on request

# FC Spider Technical Drawings

## FC Spider

- Measurement of very short pulses with only a few cycles



### Similar Products

- Compact LX Spider - Compact version, ideal for the characterization of Ti:Sa lasers
- Spider IR - Measurement at central wavelengths of around 1  $\mu\text{m}$
- pulseCheck - Autocorrelator multitasking for any task
- Mini PD - Autocorrelator routine tasks with a fixed wavelength range
- Carpe - Autocorrelator first choice for multiphoton microscopy
- waveScan - High resolution spectrometer
- peakDetect - Pulse quality monitoring

### Contact

APE Angewandte Physik & Elektronik GmbH

Plauener Str. 163-165 | Haus N | 13053 Berlin | Germany  
 T: +49 30 986 011-30  
 F: +49 30 986 011-333  
 E: sales@ape-berlin.de  
 www.ape-berlin.de

### Local Contact

Applied Physics & Electronics, Inc.  
 45401 Research Avenue | Suite 141  
 Fremont | CA 94539 | USA  
 T: +1 (888) 690-3250 sales@ape-america.com  
 www.ape-america.com

APE follows a policy of continued product improvement. Therefore, specifications are subject to change without notice.

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