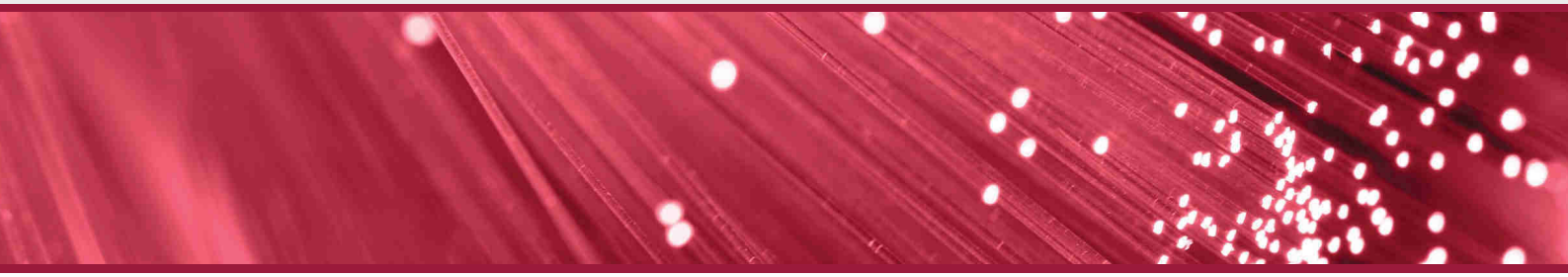
ADD-ONS TO AFS PRODUCTS

activefiber systems

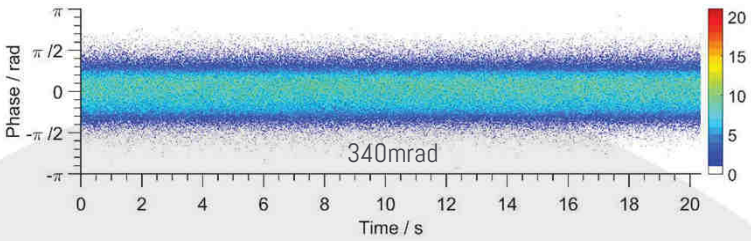


ADD-ON: NONLINEAR COMPRESSION

Nonlinear compression is an elegant way to shorten the pulse duration of pulses beyond the capabilities of the employed laser gain medium. It is characterized by highest beam quality and stability, power scalability and high efficiency. In addition, the technique perfectly fits to AFS fiber-based ultrafast laser systems in terms of mode-matching. The nonlinear-compression add-on can be applied to a large span of pulse energies ranging from µJ to several mJ, supports average powers in the kW-range and enables high quality few-cycle pulses when starting from pulses as long as 300 fs.

ADD-ON: CEP-STABILITY

A stable carrier-envelope phase is a key requirement for many applications, in particular when working with few-cycle pulse-durations. AFS offers CEP-stability as an upgrade for most ultrafast laser system.



Exemplary measurement of the phase noise of a CEP-stable high-power few-cycle fiber laser system.

CEP stability	< 350 mrad integrated CEP noise within 10Hz to 50kHz

MORE INFORMATION

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Pulse energy (output)	up to 1.5 mJ
Average power (output)	up to 250 W
Pulse duration	down to 6fs
Polarization	linear
Beam quality	Close to diffraction-limited, $M^2 < 1.3$
Average power stability	< 1% RMS
Pulse energy stability	< 1% RMS
Beam pointing	< 20 µrad RMS

Performance range offered by nonlinear compression

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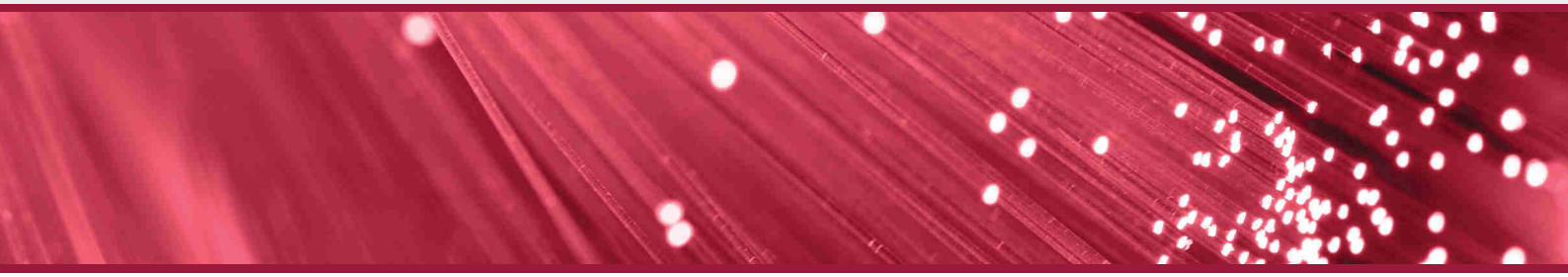
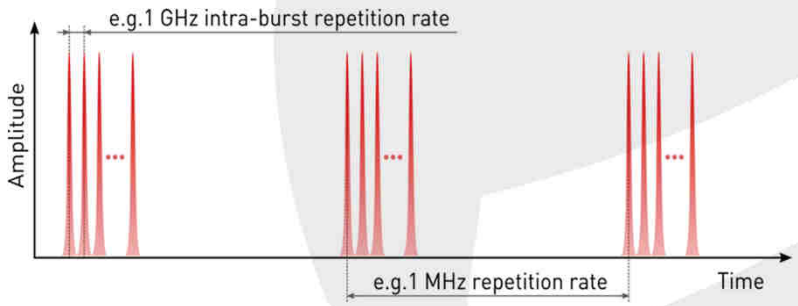


ADD-ON: GHz-BURST

Materials processing at highest average power might lead to an unwanted thermal load into the work piece even when using femtosecond pulses. Applying a GHz-pulse burst structure instead of an energetic single pulse holds the promise to significantly reduce the thermal load due to ablation cooling, therefore, enhances processing quality and speed. AFS ultrafast fiber-laser systems can be operated in a patented burst mode with negligible variation of pulse duration over the burst and with a flexible pulse structure.

Number of pulses	2, 4, 8, 16, 32, 64, 128
Intra-burst repetition rate	up to 10 GHz
Variation of pulse duration	< 3% at 300 fs
Variation of pulse energy	< 5%

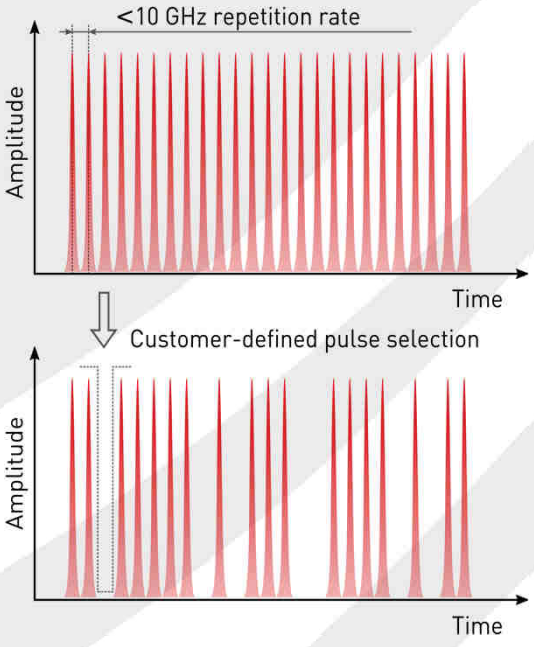
GHz-burst parameters



ADD-ON: FAST SWITCH

As a part of AFS leading-edge fiber-laser technology, the fast pulse-switching feature provides an optional extension of the laser's capability.

Single-pulse selection can be achieved up to 10 GHz repetition rate with this patented technology. Full control over the pulse sequence is guaranteed on both their occurrence and their amplitude, which can be adapted to the customers needs. Most important, the ultrafast modulator works at highest average power levels (kW and beyond) without any detrimental effects on the laser characteristics.



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