



## ANTAUS. Yb-Doped Amplified Femtosecond Fiber Laser

- Average power >40 W at 1030 nm
- Pulse energy >40  $\mu$ J at 1 MHz
- Extra-clean Gaussian fit AC trace down to <200 fs
- Tunable pulse duration option up to 10 ps
- Frep and Fceo locking options
- Small footprint and 24/7 turn-key operation



ANTAUS-20W-20u/1M femtosecond fiber laser with its control unit

### Product overview

The ANTAUS microjoule ultrafast fiber laser engine features high pulse energy along with fast repetition rate, which is an ideal combination for subtle material processing applications, as well as for many kinds of scientific research. Unlike most of the competition, the ANTAUS features short pulse duration and near-perfect AC trace with almost no pulse pedestal. The system is an all-Yb-doped-fiber oscillator + amplifier with a free-space final pulse compressor. Such design architecture ensures greater stability and true turn-key operation with no maintenance as well as the highest possible output pulse energy and spatial beam quality. The output repetition rate of the system is user-adjustable in a certain range of frequencies and may be increased into tens of MHz range on custom basis. The repetition rate of any model may be modulated from single-shot via an optional output pulse slicer. The system may also include an optional feedback loop for a built-in attenuator for stabilization of the output power by an external photodetector signal. The ANTAUS systems may optionally be upgraded with the ALock PLL locking electronics for Frep syncing or Fceo locking.

The basic models of the ANTAUS family are:

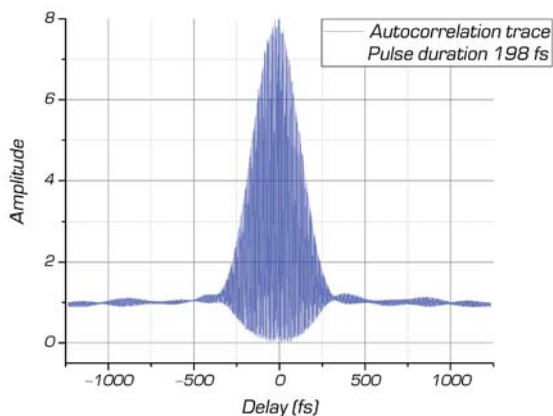
The **ANTAUS-10W-4u/2.5M** has the smallest single pulse energy from the three, however, the average power of the system is still on par with the other two models and offers high flexibility of application, while the default output repetition rate is the highest of all three systems.

The **ANTAUS-20W series** has the optimal set of output parameters: significant output power, higher pulse energy and fast repetition rate.

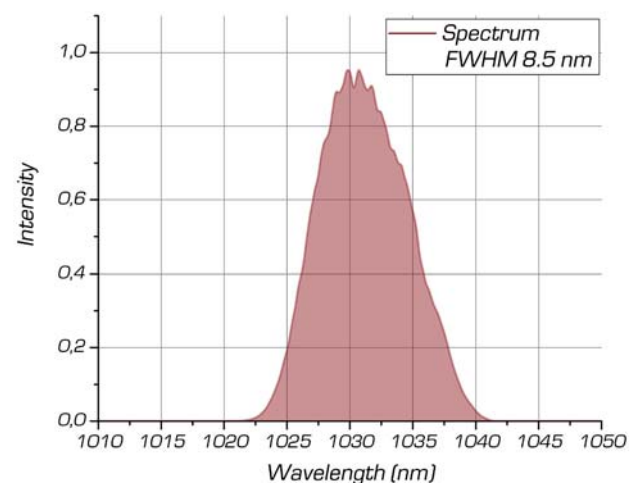
The **ANTAUS-40W series** feature the highest output power and pulse energy of all the units and are suitable for power-demanding and energy-eating applications like multistage OPO and OPA pumping.

Any system can be upgraded with a novel dense-burst mode in which it can produce a burst of closely spaced pulses (~25 ns intra-pulse distance) with total burst energy being much higher than the energy of a single pulse. This mode is beneficial for certain micro-machining and surface structuring applications.

The laser is already being used by our customers as an OEM laser source in ophthalmology (in LASIK-type eyesight correction apparatus), as well as for THz studies, surface modification, two-photon polymerization techniques and many more. The models with up to 20 W do not require any water-cooling and feature convective cooling of the power supply unit which facilitates integration in any third-party equipment.



ANTAUS-10W-4u/2.5M typical IAC trace  
(4  $\mu$ J, 2.5 MHz, 10 W, pulse duration 198 fs with Gaussian fit)



ANTAUS typical output spectrum



# AVESTA

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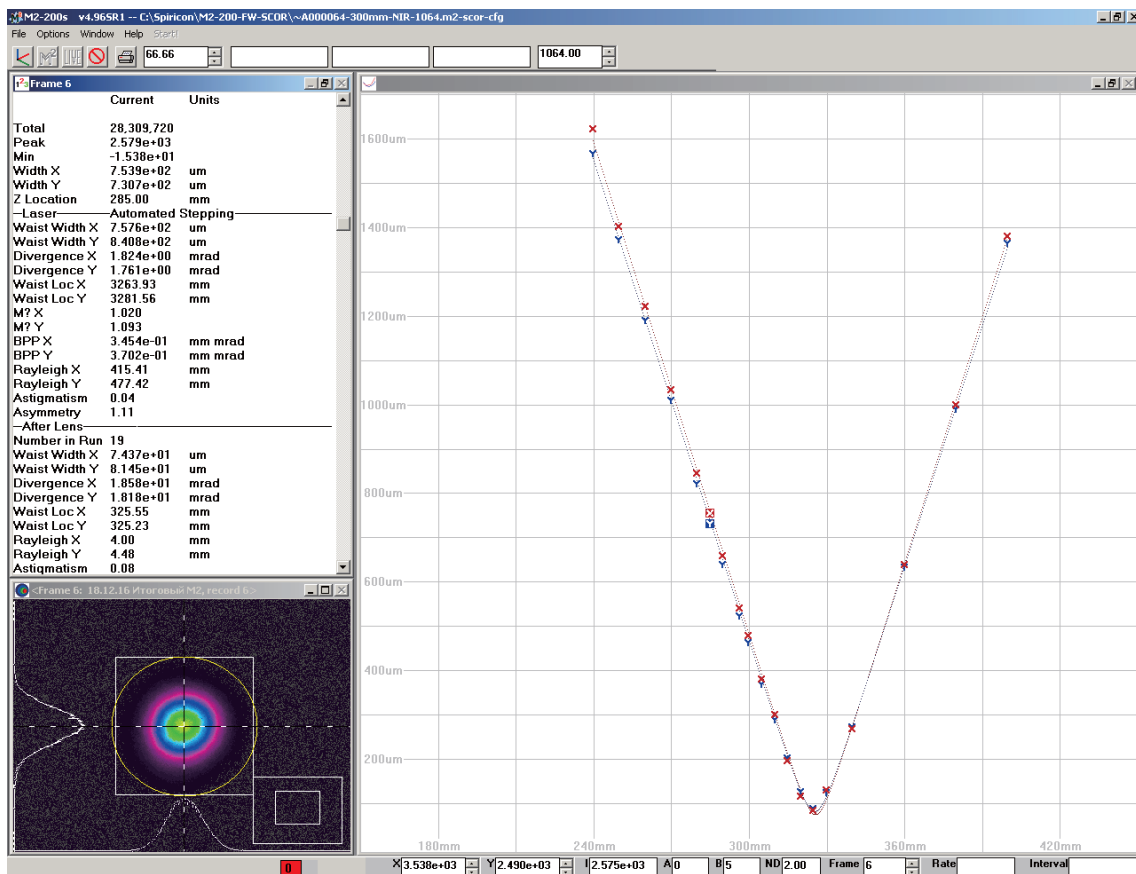
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	ANTAUS-10W-4u/2.5M	ANTAUS-20W-xx/xx	ANTAUS-40W-xx/xx
<b>Central wavelength</b>	1030±5 nm (fixed; 1040 and 1050 nm upon request)		
<b>Average output power</b>	>10 W	>20 W	>40 W
<b>Pulse duration* (FWHM)</b>	<220 fs (typical 190-200 fs)	<250 fs (typical 200-220 fs)	<280 fs (typical 220-240 fs)
<b>Pulse energy</b>	>4 uJ	>20 uJ / >40** uJ	>40 uJ / >60** uJ
<b>Pulse peak power</b>	>18 MW	>75 MW / >150** MW	>130 MW / >200** MW
<b>SHG module (optional)</b>	515±2 nm; >40% typical conversion efficiency		
<b>Pulse repetition rate*** (user-adjustable)</b>	200 kHz...2.5 MHz	200 kHz...1 MHz	200 kHz...1 MHz
<b>Output pulse slicer (optional, user-adjustable)</b>	single-shot...1.8 MHz	single-shot...1 MHz	single-shot...1 MHz
<b>Built-in power attenuator (optional, user-adjustable)</b>	1...100%		
<b>Output polarization</b>	linear, vertical		
<b>Output type and mode</b>	free-space, TEM00, M <sup>2</sup> <1.2		
<b>Long-term stability</b>	<1% rms (during 24 hours at equal ambient conditions)		
<b>Burst mode</b>	conventional burst mode: included; optional: ~25 ns intraburst pulse distance		
<b>Remote output control</b>	USB COM and PC software, CAN; optional: analog TTL in (w. pulse slicer), attenuator analog in		
<b>Optical unit dimensions</b>	341x172x115 mm	383x240x122 mm	450x450x160 mm
<b>Control unit dimensions</b>	450x320x140 mm	483x380x140 mm	483x440x140 mm
<b>Closed-loop water chiller</b>	no, air cooling (water optional)	no, air cooling (water optional)	430x340x190 mm

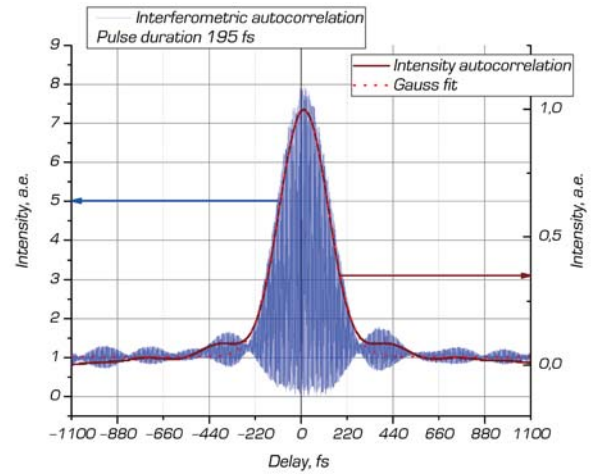
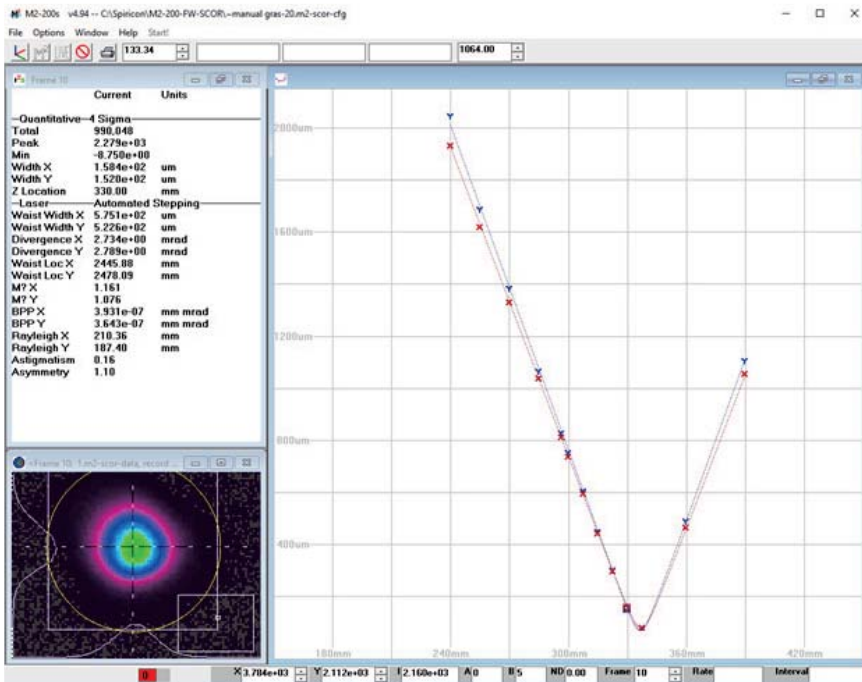
\* - pulse duration tuning up to 10 ps on request;

\*\* - high-energy versions, please enquire;

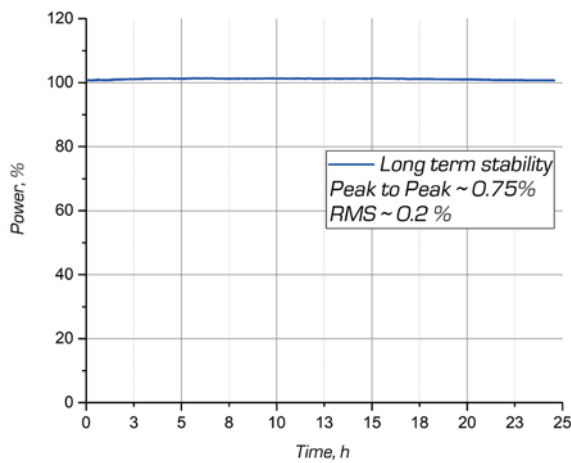
\*\*\* - without pulse slicer or with the pulse slicer bypassed; up to 75 MHz upper limit on request; Freq sync to an external reference or Fceo locking on request.



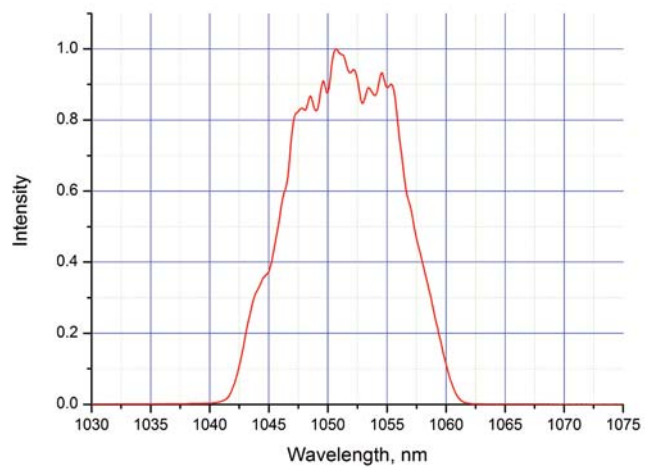
Typical M<sup>2</sup> data of the ANTAUS-10W-4u/2.5M model  
(10 W, 4 uJ, 2.5 MHz, 198 fs)



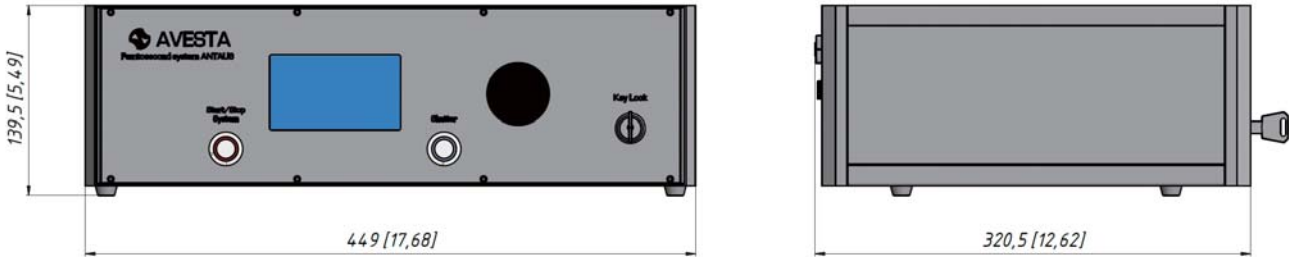
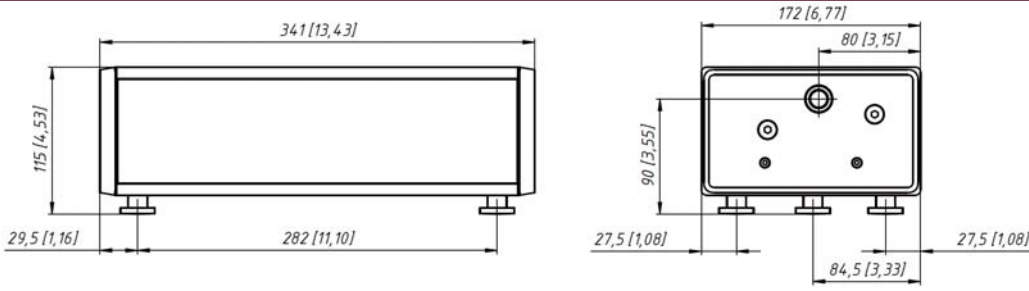
ANTAUS-20W-20u/1M typical  $M^2$  data and corresponding typical interferometric and intensity AC traces (20  $\mu\text{J}$ , 20 W, 1 MHz, 195 fs with Gaussian fit)



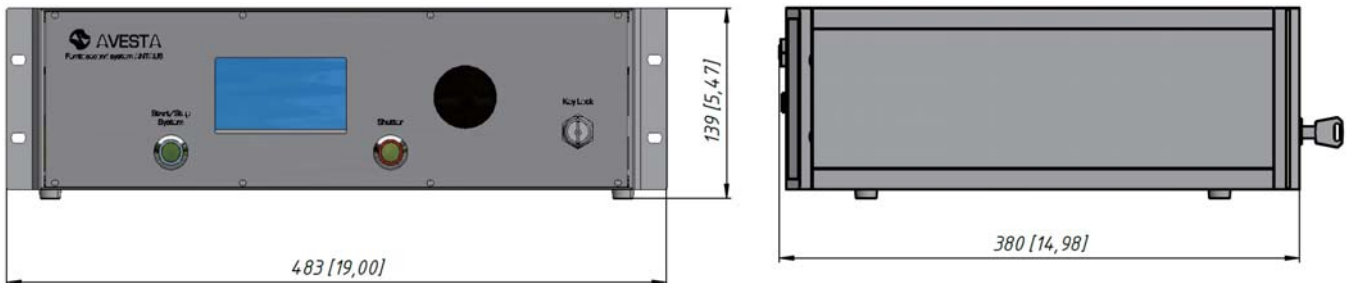
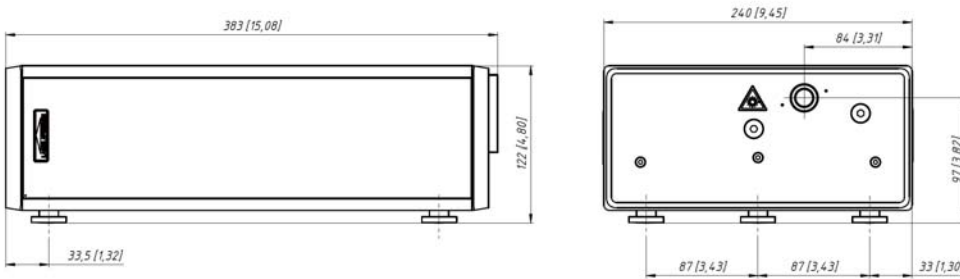
Typical long-term power stability of the ANTAUS platform



Output spectrum of a customized 1050-nm system



ANTAUS-10W-4u/2.5M laser head and control unit in mm



ANTAUS-20W-20u/1M laser head and control unit in mm