



# Dragon™ – Ultrafast Amplifier System

## Applications

- High harmonic generation (HHG) experiments
- Pumping OPAs and HG units
- Materials research
- Femtochemistry
- Laser particle acceleration
- Spectroscopy
- Attosecond studies
- Ultrafast Imaging
- Pump probe experiments

## Features

- Cryogenic cooling enables highest average powers on the market
- Average power >10W from a single box configuration
- Pulse energies up to 5 mJ
- Repetition rates from 1 to 10 kHz
- Shortest pulse duration <25fs
- Excellent beam quality:  $M^2$  typically 1.2-1.3
- Intuitive control GUI including wavelength, bandwidth, power, and repetition rate control with integrated diagnostics
- One-box configuration with integrated pumps and oscillator
- Combination of clean (low pedestal), short pulses and high energies gives higher peak intensities for nonlinear processes
- CEP stabilization available
- Custom configurations available

## Variable repetition rate multipass ultrafast Ti:sapphire amplifier



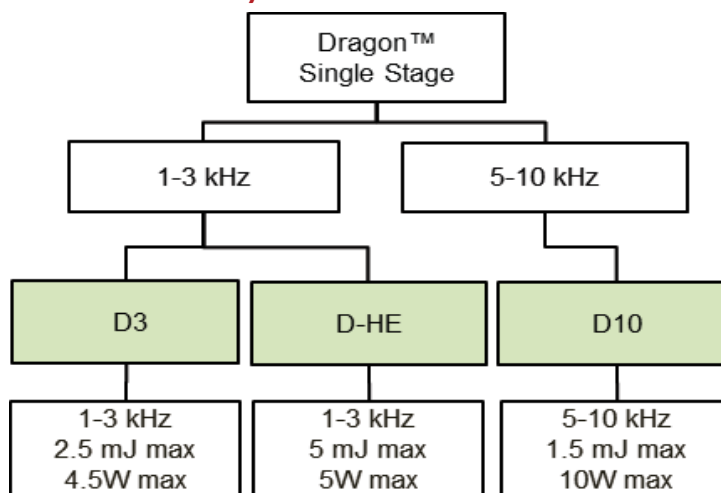
Dragon™ is KMLabs' single-stage, sub-25 fs multipass amplifier. It is a fully engineered and integrated commercial source based on a single rugged opto-mechanical platform. It employs patented (US 6,804,287) cryogenically-cooled amplifier technology, allowing for a continuous trade-off between pulse energy and repetition rate.

Tailor the laser output to the optimum for your experiment.

### Dragon™ Unique Features

- Highest peak power available at 1 kHz in a single stage amplifier
- Optimized for pumping HHG (KMLabs' XUUS product)
- Tunable repetition rate: 1-3 kHz or 5-10kHz in a single instrument
- Clean pulses due to cryogenic thermal management
- Sealed, modular stretcher and compressor

### Dragon™ Product Family



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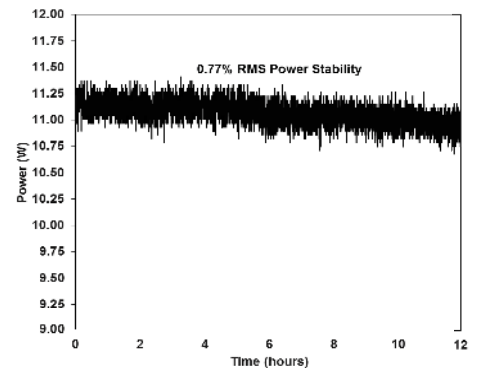
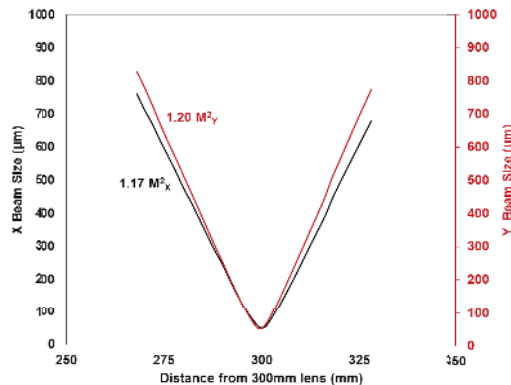
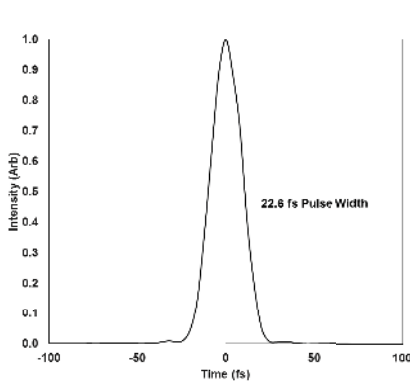
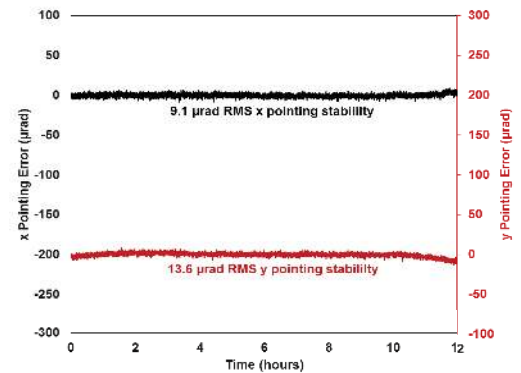
The Dragon™ product family provides 1 to 10 kHz repetition rates with < 25fs pulse duration

- Tunable repetition rate: 1-3 kHz or 5-10kHz in a single instrument
- Clean pulses due to cryogenic thermal management

	D3	D-HE	D10
<b>Repetition Rate</b>	1-5kHz	1-3kHz	5-10kHz
<b>Pulse Duration</b>	$\leq 25$ fs Measured using FROG	$\leq 25$ fs Measured using FROG	$\leq 25$ fs Measured using FROG
<b>Pulse Energy [Avg. Power]</b>	2.5mJ @ 1kHz [2.5W] 1.5mJ @ 3kHz [4.5W]	5mJ @ 1kHz [5W]	1.5mJ @ 5kHz [7.5W] 1mJ @ 10kHz [10W]
<b>Beam Quality</b>	$M^2 < 1.4$ , Near-TEM <sub>00</sub>	$M^2 < 1.4$ , Near-TEM <sub>00</sub>	$M^2 < 1.4$ , Near-TEM <sub>00</sub>

## Common Specifications

- Pre-pulse Contrast: >1000:1 on ns scale
- Post-pulse Contrast: >100:1 on ns scale
- Contrast on sub-ps scale: >1000:1 at ~500 fs, >300:1 at ~270 fs from FROG measurement
- Polarization: Horizontal “p” with >100:1 polarization purity
- Long-term stability: <1% RMS over >12 hours (after warm-up)
- Beam pointing stability: <20  $\mu$ rad over 12 hours (after warm-up)
- Operational temperature range - full compliance: 23 +/- 0.5 C
- Optical assembly size: 2.5' x 6.5'



Dragon D10™ Example Performance Data at 10 kHz