



# Coherent

Superior reliability & performance

## Highest Power UF Amplifier and First Complete CEP-Stabilized UF Amplifier



Newsletter January 2010

## Coherent introduces Highest Power UF Amplifier and First Complete CEP-Stabilized UF Amplifier

Dear Customer,

We are glad to inform you that **Coherent Inc.** has just introduced two new **Ultra-Fast Amplifier systems**:

1. **Legend-Elite-Duo-HP Amplifier**: A new Ti:Sapphire ultrafast laser amplifier delivers over twice the power of any comparable product. Specifically, the **Legend Elite Duo-HP** offers over **15 Watts** of output power, and the highest pulse energy (up to **10 mJ**) currently on the market for a kHz class, thermoelectrically (TE) cooled amplifier. Legend Elite Duo-HP can be configured to provide output pulse durations of **<25 fs, <35 fs, <130 fs, or 0.5 ps to 2 ps** with repetition rates in the range **1 kHz to 10 kHz**. Thermal gradients and consequent thermal lensing in the Ti:Sapphire crystal present significant design and performance challenges at output power levels higher than a few Watts. Until now, the only viable solution has been to cool the Ti:Sapphire crystal to cryogenic temperatures. **Legend Elite Duo HP** avoids the cost and complexity of cryo-cooling by using **improved TE solid-state cooling**, together with a Ti:Sapphire crystal and mounting interface shaped to maximize cooling efficiency and reduce thermal gradients. As with the standard Legend Elite Duo, this new system incorporates **two stages of amplification ? a regenerative amplifier followed by a simple single-pass amplifier**. This approach ensures superior beam quality, stability and efficiency compared to designs based on multi-pass amplification. Applications for the Legend Elite Duo-HP span several areas of research. Examples include time-resolved spectroscopy using multiple optical parametric amplifiers (OPAs), THz generation, and high-field physics.

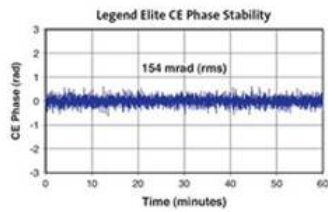
2. **Legend Elite CEP Amplifier**: With the launch of the new **Legend Elite CEP amplifier**, Coherent, Inc. (Santa Clara, CA) (Nasdaq: COHR) becomes the first and only company to offer a complete CEP-stabilized ultrafast amplifier system designed, built and supported by a single manufacturer. Seeded by the Coherent **Micra CEP oscillator**, the new **Legend Elite CEP** delivers a **sub-35 fs** pulse duration with a repetition rate of **1 kHz**. **Legend Elite CEP** is currently available **up to 4 Watts** of average power and **4 mJ per pulse** with more configurations to be released in the near future. The final carrier envelope offset (CEO) stability depends on the operating environment, with typical laboratory performance better than 200 mrad. Carrier envelope phase (CEP) stabilization refers to fixing the temporal relationship between the overall ultrafast pulse envelope and the underlying electric field oscillations. In the **Legend Elite CEP**, the offset is detected by the well-established f-2f interferometer method, and this feedback signal is used to actively control the dispersion of the amplifier cavity by changing the relative angle of the dispersion compensation gratings. Successful CEP stabilization requires low-noise system components and a low-noise operating environment. Since Coherent **Verdi** is currently the only oscillator pump to provide sufficiently low noise for CEP operation, Coherent is the only laser



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manufacturer capable of providing a complete off-the-shelf solution for this fast growing field of research. Principal applications for the Legend Elite CEP are attosecond physics, coherent X-ray generation, and several other sophisticated experiments relying on highly non-linear optical processes.



You will find the Data Sheet herewith attached.

Please feel free to contact us for any further detail.

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