The fiber laser based chirped pulse amplification system (FLCPA) starts with a passively mode-locked seed fiber laser. The short pulse is time stretched by frequency (chirped) for lower intensity amplification through a high power fiber amplifier stage. Up to 30 μJ of short pulse energy is delivered into free space, with a typical minimum pulse width of 370 fs.

The pulse repetition rate and pulse energy are user selectable. The pulse width is tunable up to 30 ps. Minimum pulse width and its pulse shape can both be optimized for any given pulse repetition rate. Our Arbitrary Pulse Picker feature allows you to easily select individual pulses to be emitted from the laser. An RF output signal is provided to allow easy synchronization to the laser. Our unique data log is a powerful tool both for system diagnostics and quality assurance, measuring and recording all relevant laser performance data over the life of the laser. Optional pulse compression can generate < 100 fs at a specific energy level.

The Cazadero Scientific fiber based femtosecond laser is lightweight, compact, and flexible, offering a reliable, cost-effective alternative to solid state laser amplifiers for biomedical, scientific, industrial, and research applications.
## Technical Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>FLCPA-05U-20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output Wavelength</strong></td>
<td>Primary</td>
</tr>
<tr>
<td><strong>OPTICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Central Wavelength (nm)</td>
<td>1030</td>
</tr>
<tr>
<td>Minimum Pulse Width(^1) (ps)</td>
<td>&lt; 0.4 (0.37 typical)</td>
</tr>
<tr>
<td>Average Power(^2) (W)</td>
<td>&gt; 2.4</td>
</tr>
<tr>
<td>Tunable Pulse Width (ps)</td>
<td>Up to 30</td>
</tr>
<tr>
<td>Primary Repetition Rate and Pulse Energy</td>
<td></td>
</tr>
<tr>
<td>There are 16 switchable repetition rates (&lt; 27 MHz) can be chosen. The highest pulse energy of 20 µJ is at 120 kHz</td>
<td>8.4 µJ of pulse energy at 120 kHz</td>
</tr>
<tr>
<td>Arbitrary Repititon Rate(^3) (optional)</td>
<td>From single shot up to primary repetition rates. Required an external gating signal generator</td>
</tr>
<tr>
<td>Polarization Extinction Ratio</td>
<td>100:1</td>
</tr>
<tr>
<td>Beam Quality, M(^2)</td>
<td>1.2 (typ. 1.1)</td>
</tr>
<tr>
<td>Beam Diameter at Exit, (\omega_0) (mm)</td>
<td>(2\omega_0 \sim 3.0 \pm 10%)</td>
</tr>
<tr>
<td>Beam Divergence (mrad, full angle)</td>
<td>&lt; 0.55</td>
</tr>
<tr>
<td>Pulse Energy Stability (%rms, 100 hours)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Termination / Output</td>
<td>Free space collimated beams, 3 wavelength can be collinear from one output port or separated output ports</td>
</tr>
<tr>
<td>Cold Start Time (min.)</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Warm Start Time (min.)</td>
<td>&lt; 2</td>
</tr>
<tr>
<td><strong>ELECTRICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Supply Voltage (VAC)</td>
<td>85 - 264 auto-ranging</td>
</tr>
<tr>
<td>Supply Frequency (Hz)</td>
<td>47 - 63 auto-ranging</td>
</tr>
<tr>
<td>Power Consumption (VA)</td>
<td>&lt; 200 (150 typical)</td>
</tr>
<tr>
<td>Synchronization Output</td>
<td>LVCMOS laser clock signal</td>
</tr>
<tr>
<td><strong>MECHANICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions (cm): Laser Head</td>
<td>48 (W) x 76 (D) x 14 (H)</td>
</tr>
<tr>
<td>Dimensions (cm): Laser Controller</td>
<td>48 (W) x 50 (D) x 18 (H)</td>
</tr>
<tr>
<td>Weight (kg): Laser Head</td>
<td>27.3 (typical)</td>
</tr>
<tr>
<td>Weight (kg): Laser Controller</td>
<td>13.6 (typical)</td>
</tr>
</tbody>
</table>
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<th>Model Number</th>
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<tr>
<td><strong>Output Wavelength</strong></td>
<td>Primary</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL</strong></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Air-low noise fan</td>
</tr>
<tr>
<td>Operating Temperature (°C)</td>
<td>17 - 32</td>
</tr>
<tr>
<td>Storage Temperature (°C)</td>
<td>0 - 50</td>
</tr>
<tr>
<td><strong>I/O CONTROL</strong></td>
<td></td>
</tr>
<tr>
<td>Communication Interface Type</td>
<td>RS232, Gate in and Sync (optional)</td>
</tr>
<tr>
<td>Front Panel Indicators and Controls</td>
<td>Pulse width dispersion knob, Repetion rate switch, Electrical power on/off, Laser on/good indicators, Emergency Stop, Interlock</td>
</tr>
<tr>
<td><strong>OPTIONS</strong></td>
<td></td>
</tr>
<tr>
<td>Remote Pulse Amplitude Adjustment</td>
<td>Pulse amplitude control via 0 - 5 V analog input</td>
</tr>
<tr>
<td>Programmable Burst Mode</td>
<td>Programmable pulse pattern actuated by a single trigger</td>
</tr>
</tbody>
</table>

1. A sech\(^2\) pulse shape (convolution factor of 0.65) is used to determine the pulse width for the second harmonic autocorrelation trace.
2. Unless otherwise stated, all specified values are measured after the pulse picker, at the output of the laser.
3. LVCMOS digital input

*Due to our continuous improvement program, specifications are subject to change without notice.*

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1. **Figure 1** – Dimensions of Cazadero FLCPA-05U head
2. **Figure 2** – Dimensions of Cazadero FLCPA-05U controller