CLS Clock Laser System: Elevating Qubit Fidelity

Precision Redefined for Quantum Computing and Optical Clocks
with TOPTICA's Ultra-Stable Clock Laser Systems

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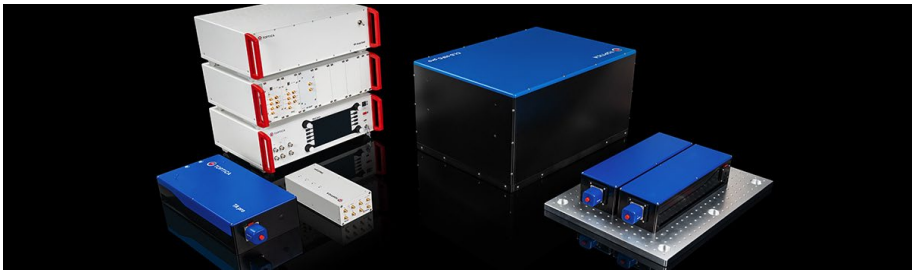
The rapid evolution of quantum computing and optical clocks has precipitated a demand for an unparalleled degree of stability, thereby driving the boundaries of contemporary laser technology.TOPTICA's Clock Laser System (CLS) has been developed to address these challenges, providing industry-leading frequency stability and ultra-narrow linewidths to satisfy the exacting requirements of next-generation quantum applications.



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Featuring diode lasers with an ultra-narrow linewidth below 1 Hz, stabilized to high-finesse optical ULE cavities, the CLS achieves exceptional frequency stability far beyond 1-second integration time. This makes it an essential tool for driving the narrow atomic clock transitions of neutral atoms like Yb and Sr, as well as ions such as Yb+, Sr+, Ca+, and Ba+.

Engineered for real-world applications, the CLS combines robust passive shielding, active vibration compensation, and advanced temperature stabilization to ensure peak performance even outside laboratory environments. Whether for quantum computing, precision timekeeping, or quantum sensing, TOPTICA's CLS sets a new benchmark in ultra-stable laser technology.

The system is controlled by a single interface, which is hosted by the DLC pro and can be accessed via the PC GUI TOPAS. The interface is responsible for controlling, monitoring and locking the laser, and supports full remote operation. This interface also allows for easy integration into the user experiment control via a convenient programming SDK.

The CLS can also be obtained as a rack solution (MCLS) that has been integrated into a TOPTICA T-RACK, without any compromise to the performance of the system. This solution is ideal for users who have limited space available, and it also enables the system to be transported with ease.

For more information, visit www.toptica.com/fidelity

About TOPTICA

TOPTICA has been developing, producing, and marketing high-end lasers and laser systems for science, research, and industry for over 25 years. The portfolio includes diode lasers, ultrafast fiber lasers, terahertz systems, and optical frequency combs. Worldwide, TOPTICA has 600 employees in seven business units with a consolidated group revenue of €140 million.

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