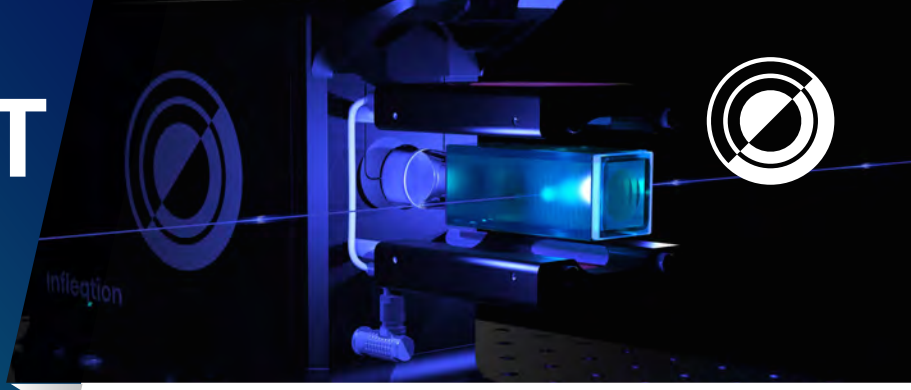
desqtopMOT

Infleqtion's Cold Atom Platform Tailored for Quantum Education and Workforce Development



As the global quantum ecosystem experiences unprecedented growth, the demand for advanced tools in quantum education and workforce development has become more apparent. Infleqtion, a pioneer in the field of cold atom product technologies, proudly presents– a revolutionary platform designed to meet the evolving needs of the quantum education and workforce development markets through experimental interaction with atomic quantum systems.

Addressing Quantum Workforce Challenges:

With an estimated 580,000 jobs projected in quantum-enabled industries by 2040, developing a highly trained and skilled workforce is crucial. However, key roadblocks hinder the commercialization of quantum technologies, including:

- The need for more user-friendly equipment and teaching tools for quantum matter creation and control
- Essential laser, optic, and photonics skills required for developing cold-atom quantum products
- Experimental measurement analysis and report writing skills that are built into the teaching curriculum

Customer-Inspired Design:

Building upon the success of the award-winning miniMOT V2, desqtopMOT's compact, modular design seamlessly integrates into any research or teaching laboratory, enabling cold atom applications from entry-level quantum education to advanced experimentation. Its "plug-and-play" setup enhances user accessibility while still inviting exploration and learning about the fundamentals of atomic physics.

Vacuum System
Reliable ultra-high vacuum system, fully contained, portable, and controlled via touchscreen or remote interface.

Atom Source
Proven Rubidium atom source capable of providing atoms for cooling and trapping for years.

Stabilized Laser System
Precision laser system stabilized using a unique spectroscopy cell designed for the desqtopMOT, with offset repump beam for cooling and trapping ^{87}Rb.

Comprehensive Teaching Curriculum
Cold atom quantum teaching curriculum covering cold atom physics, lasers, optics and photonics, and quantum measurements, ensuring a holistic quantum educational experience.

Enabling the Quantum Education and Workforce Ecosystem

The desqtopMOT offers a self-contained platform that can be upgraded over time as users advance their understanding of quantum concepts. Its modular design and operation provide enhanced accessibility, catering to users involved in undergraduate quantum education, workforce training, and development. The desqtopMOT can easily be integrated into corporate R&D laboratories, and can function as a centralized toolkit for quantum research and quantum sensing application development.

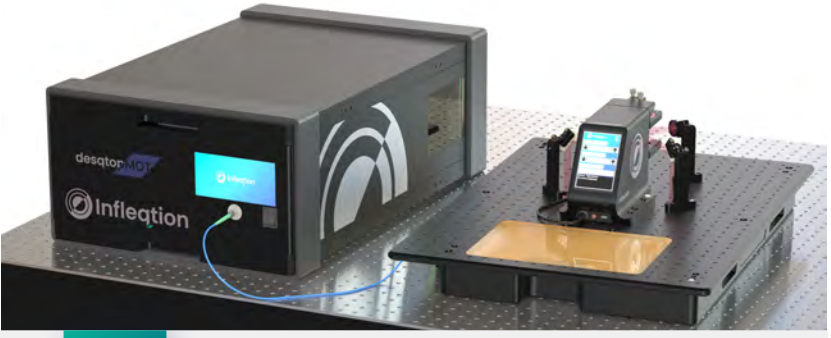
Ready to learn more?
Visit our website
Infleqtion.com

desqtopMOT

Explore, Educate, Empower

Technical Specifications

- **MOT Atomic Species:** Rubidium-87
- **Vacuum Level:** <1 x 10^{-8} Torr
- **Magnetic Field Gradient:** 13-14 G/(A-cm)
- **Laser Wavelength λ_0:** 780.241 nm
- **Repump λ: λ_0+6.4-6.9 GHz**
- **Laser Power to MOT Cell:** 30-50 mW
- **Wavelength Tunability :** Δλ = ±50 MHz
- **Achievable MOT Temperature:** <300 μK
- **Incident MOT Laser Power:** 30-50 mW



Physical Specifications

Power	110-240 V / 50-60 Hz (Standard electrical power)
Laser & Controls Box Dimensions	24 X 21 in. (61 X 53 cm) Height: 8 in. (21 cm)
Physics Package Dimensions	20 X 28 in. (51 X 71 cm) Height: 10 in. (25 cm)
Optical Breadboard	Imperial units, ¼-20 threaded screw holes, 1 inch grid
Curriculum	Options include a password-protected PDF document or a bound textbook

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Boost your Quantum Teaching Potential

The desqtopMOT reimagines how atom-based quantum is taught and enables users to learn the fundamentals in:

- Atomic physics
- The nature of and properties of light
- Laser operation, beam delivery and optimization
- Geometrical optics
- Vacuum engineering and science
- Magneto-optical trapping of atoms
- Characterization of cold atoms
- Explore unique properties of cold atom ensembles such as Faraday rotation

Teaching Curriculum

The desqtopMOT unites, in one product, the hardware and teaching materials missing in today's Quantum Information Science and Engineering (QISE) education ecosystem. Our approach has been to create a teaching curriculum that is accessible to all; 4-year and 2-year undergraduates, graduates, industry scientists and engineers.

To capture the emerging needs in quantum education, our curriculum includes:

Base Model

Chapter 1: Introductory Atomic Physics
Atomic structure and energy levels

Chapter 2: desqtopMOT User Manual
Experimental setup with your desqtopMOT system

Chapter 3: Optics for Atomic Physics
Measurement of input light characteristics

Chapter 4: Experiments with Thermal Atoms
Spectroscopy of ^{87}Rb energy level transitions

Chapter 5: Laser Cooling Part 1
Create and measure a MOT of ^{87}Rb atoms!

Advanced

Chapter 6: Laser Cooling Part 2
Compress, sub-Doppler cool and image atoms in the MOT cloud

Chapter 7: Experiments with Cold Atoms
Measure Faraday rotation and demonstrate Electronically Induced Transparency (EIT)