



## Showing valuable customer insights into applications that use a TOPTICA EAGLEYARD laser diode component

**Customer:** Nomad Atomics  
**Product:** *mini*ECL 780 nm,

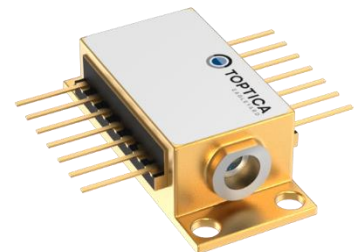
### About Nomad Atomics:



Nomad Atomics specializes in advanced quantum sensors that measure gravity, acceleration, magnetism, and time, offering high precision and reliability for industries like mining, resource exploration, and navigation. By utilizing atomic properties and light interactions, Nomad's sensors bring cutting-edge insights to real-world environments, far beyond the lab. Founded by researchers from the Australian National University, Nomad Atomics transforms scientific breakthroughs into commercial tools, including robust gravimeters and magnetometers designed for extreme conditions. With high sensitivity, zero drift, and compact design, their instruments empower clients to monitor unseen changes in dynamic environments, providing critical data and unlocking new possibilities in understanding the world around us.

### About the laser diode:

The *mini*ECL is a miniaturized external cavity laser with a narrow linewidth of 100 kHz that is available at 671 nm, 770 nm, 780 nm, 852 nm and 895 nm. The hermetically sealed butterfly package with 14 pins is not only very robust but also integrates thermal management and beam collimation making it very convenient to operate. The narrow linewidth of the *mini*ECL enables usage especially for spectroscopy, QT, metrology, atomic clocks and life science. Moreover, wavelengths between 650 – 1100 nm are customizable upon request, opening more freedom across the spectrum.



## In which product does Nomad Atomics use EAGLEYARD's laser diode? For which application is your product used for?

**Nomad Atomics:** "We use EAGLEYARD's *miniECL* for laser cooling and coherent manipulation of quantum states in absolute quantum gravimeters. They are a fundamental component in our laser system."

## Can you give some insights on how your product works and what role EAGLEYARD's laser plays?

**Nomad Atomics:** "Atom interferometer gravimeters measure gravitational acceleration with high precision by using the wave-like properties of atoms. Atoms are cooled to near absolute zero using laser cooling techniques. These cooled atoms are then subjected to a sequence of laser pulses that split, redirect, and recombine their matter waves, creating an interference pattern sensitive to gravitational changes. The laser systems required include cooling and trapping lasers, Raman or Bragg lasers for manipulating the atoms, and detection lasers to measure the final state of the atoms. These lasers must be narrow linewidth, highly stable and precisely controlled to ensure accurate measurements."



Source: Nomad Atomics

## If you have used a different laser diode component before using the one from EAGLEYARD in your product, what was your motivation to switch?

**Nomad Atomics:** "We continuously work to enhance the robustness and reliability of our subsystems, ensuring they can withstand various conditions and deliver consistent performance. At the same time, we are focused on making our subsystems more portable, allowing for greater flexibility and ease of use in different environments. EAGLEYARD's lasers improve the functionality and simplifies the design of our laser systems. By integrating the latest developed components, we push the boundaries of innovation, ensuring our technology remains at the forefront of the industry."

## Can you share insights on the decision-making process towards EAGLEYARD's laser diode component?

**Nomad Atomics:** "The narrow linewidth of the *miniECL*, robust packaging, stable performance and ease of use made us take the risk on adopting a relatively new product as part of our subsystems."

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**How did you experience the collaboration with EAGLEYARD from the first request until the whole order was built into your product?**

**Nomad Atomics:** “We have a good relationship with EAGLEYARD and know we will always have an open communication regarding the performance of their products and how they meet our requirements.”

**What is the advantage of using the selected EAGLEYARD laser diode component compared to alternatives/prior solutions?**

**Nomad Atomics:** “The simplification and improved performance of our laser system.”

**How satisfied are you with EAGLEYARD in total?**

**Nomad Atomics:** “We like the *miniECLs* very much. Having longer lead-times and extra expenses for customization is a current challenge that we hope to overcome in the near future. We also just purchased our first *miniTAs* from EAGLEYARD and are keen to find out how they will help us reach our targets.

**We thank Nomad Atomics and Silvana Palacios (Lead Quantum Physicist) for these great insights!**