



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

**Customer:** NCAR  
**Product:** *miniTA* 765 nm

### About NCAR:

The National Center for Atmospheric Research (NCAR) is a world-class research center that concentrates on understanding the behavior of the atmosphere and related Earth and geospace systems. It was established by the National Science Foundation in 1960 and provides the atmospheric and related Earth system science community with state-of-the-art resources, including supercomputers, research aircraft, sophisticated computer models, and extensive data sets.



### About the laser diode component:

The *miniTA* is one of the newest innovations from TOPTICA EAGLEYARD and is well-known for its high level of integration in a robust, hermetically sealed butterfly package. This tapered amplifier has an integrated beam collimation and thermal management and users benefit from the 'plug & play' option with fiber pigtail seed lasers making it very easy to use as adjustment is not further needed.

NCAR is using a customized version of the *miniTA* at 765 nm which is usually in continuous wave operation. To better meet NCAR's needs, the *miniTA* is used in a pulsed mode here enabling higher peak powers.

The *miniTA* is available at 670 nm, 765 nm, 780 nm, 795 nm, 852 nm and 895 nm.



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

**NCAR:** "The device is used in a custom-built instrument used to profile the lower atmosphere. The instrument was built by the National Center for Atmospheric Research (NCAR) in Boulder CO, USA."

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

**NCAR:** "The product is called the MicroPulse DIAL. It is an active laser-based profiler for continuously measuring water vapor, aerosols, and temperature in the lower atmosphere. It was developed because of the lack of understanding water vapor and temperature in the lower atmosphere limits our ability to improve weather forecasts. The instrument uses spectroscopy of water vapor at 828 nm and molecular oxygen at 770 nm, in what is called the differential absorption lidar (DIAL) technique. We have developed a small test network of five devices. It is expected that similar devices will improve weather forecasts, including severe storms (e.g. hail and flooding).

EAGLEYARD's *miniTA* provides the final amplification stage in the instrument."



Source: NCAR

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

**NCAR:** "We have tested other tapered amplifiers from Sacher and Coherent/DILAS. The motivation to move to the *miniTA* device was the fiber coupling, and the willingness of EAGLEYARD to customize the design for our unique pulsed application (i.e. lidar). For the eventual large network of MicroPulse DIAL instruments, fiber coupling is critical for stable operation, and to reduce the technical difficulty of replacement (these devices will run continuously 24/7)."

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

**NCAR:** "As mentioned above, the fiber coupling is critical to enable robust, multi-year operation (without maintenance) for a large number of devices to make an impact on improving weather prediction."

---

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

**NCAR:** “Our collaboration with EAGLEYARD has been through their distributor XS Optix that covers the North American market. We have been very pleased with the experience and the final product.”

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

**NCAR:** “Alternative methods to continuously measure atmospheric water vapor and temperature at high vertical resolution, require high-power solid-state lasers. While being able to provide high quality observations, these devices (Raman Lidars) are very expensive to build, operate and maintain. This limits the ability to make the observation on nationwide scales required for weather prediction. The approach using laser diodes (including EAGLEYARD’s *miniTA*) in the MicroPulse DIAL makes these networks possible.”

## How satisfied are you with EAGLEYARD in total?

**NCAR:** “EAGLEYARD’s *miniTA* is a critical component to the MicroPulse DIAL technology. We are very satisfied with the product and are having a set of semi-customized *miniTAs* being developed for the water vapor at 828 nm (they are in production at time of writing).”

**We thank NCAR and Scott Spuler (Research Engineer) for these great insights!**