

Advanced Retinal Laser Technology

An embedded laser system for retina offers more control and versatility to the surgeon.

By Steve Charles, MD

ADVANCED TECHNOLOGY

The PUREPOINT Laser System (Alcon Laboratories, Inc., Fort Worth, TX) is the newest introduction into the 532-nm green laser market. It has been designed to provide more surgeon control during the laser procedure by offering advanced technology, increased versatility and a full range of operating room and office setting accessories. The PUREPOINT laser system's advanced technology and features make it an ideal laser for both the operating room and office settings. The advanced footpedal design provides surgeon control of power increase and decrease, as well as surgeon control of the standby-to-ready transition. The corresponding voice confirmation eliminates the need for the surgeon, circulating nurse, or scrub technician to view the graphical user interface and reduces overall dependence on the circulating nurse. The ENGAUGE

Radio Frequency Identification Device (RFID; Alcon Laboratories, Inc.) features enable automatic

accessory recognition and preset surgeon treatment parameters for power, duration, and interval settings. The dual port availability (Figures 1 and 2) and single button port switch enables connection of both the endoprobe and laser indirect ophthalmoscope (LIO) in the operating room, thereby eliminating the need to connect and reconnect devices and the need to change

power settings. These advanced features provide increased surgeon control and significant time saved, both of which will also be reflected in labor cost savings.

INCREASED VERSATILITY

The PUREPOINT Laser System provides increased versatility in the operating room through multiple configuration options. The surgeon can now choose to use the laser as a standalone console, or can tether or embed the PUREPOINT into the new CONSTELLATION Vision System (Alcon Laboratories, Inc.). In tethered mode, the standalone version is connected to the CONSTELLATION by an Ethernet cable. This configuration transfers the laser controls to the CONSTELLATION's graphical user interface and takes advantage of the associated smart keys and multiple surgeon pre-set settings. The optimal configuration for operating room use is embedded in the CONSTELLATION. Embedding the PUREPOINT within the CONSTELLATION

eliminates the need for a separate cart, cables, knobs, and display. Integration with the CONSTELLATION system saves time and storage space as well as eliminating the possibility of cable damage or lost components. Embedded operation also completely eliminates the need to use the circulator by enabling control by the surgeon, freeing staff for other OR duties.

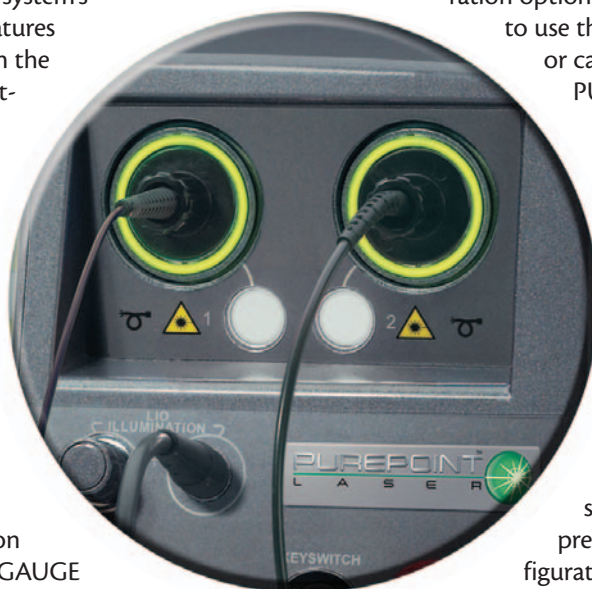


Figure 1. The dual-port availability on the PUREPOINT console allows surgeons to have both the endoprobe and the LIO plugged in so there is no need to connect and reconnect.



Figure 2. Endoprobe and LIO plugged into the console.

FULL RANGE OF ACCESSORIES

The PUREPOINT laser system incorporates a variety of accessories designed to enable surgeon control in both the OR and office settings. OR accessories include laser probes, an enhanced laser indirect ophthalmoscope, and both fixed and tethered microscope filters. Laser probes, available in 20-, 23-, and 25-gauge include the ENGAUGE RFID connectors to enable the surgeon control features offered by the PUREPOINT system. The PUREPOINT LIO is a coaxial design offering multiple spot sizes, pupil adjustment, an improved, reinforced fiber, and also includes ENGAUGE RFID connector. This plug-and-play approach saves time and reduces the training and skill set requirements on the OR staff. Office accessories include the LIO, slit lamps, and slit-lamp adaptation devices. The newly released Advanced Adaptation includes an ergo-nomic handle with magnetic micromanipulator and RFID connection capability.

The PUREPOINT laser is a novel, advanced, thin-disk

532-nm solidstate laser. The thin-disk laser engine reduces thermal lensing, which are changes in the index of refraction of the Nd:Vanadate lasing medium as it heats up. The thin-disk design produces a more constant laser output especially with higher powers and firing rates because of thermal stability. The Lithium Triborate frequency upconversion crystal (1064 nm to 532 nm), thermal electric cooler, and all optomechanical components are solder mounted in a fixed, mechanically and thermally stable position. The PUREPOINT laser engine has been tested under very rigorous thermal (50° Centigrade, 50 million shots, over a several-week period using 13 lasers) and mechanical (44Gs) conditions.

The author has had the opportunity to use the laser in a clinical setting and found that the PUREPOINT laser combined with the CONSTELLATION Vision System reduced setup time and, subsequently, operating time. In addition, foot pedal control of power with voice confirmation resulted in a more consistent treatment effect because the power could be changed easily and often without requiring the circulator. The author uses endophotocoagulation for hemostasis after delamination of epiretinal membranes in diabetic traction retinal detachment cases, which is a clinical scenario requiring frequent changing of the power settings. ■

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