Polaris
Pulsed Nd:YAG Laser

Polaris

A Family of Small, Low-Cost, EO Q-Switched Nd:YAG Laser Systems Designed to Support a Wide Range of Industrial, Scientific and OEM Applications.

Polaris systems are high-performance, flexible and extremely compact flash-lamp pumped Nd:YAG laser systems. They feature exceptional beam quality and energy stability in a small, easy-to-set up, easy-to-operate package. The available range of wavelengths, energy levels and repetition rates provide great application flexibility.

NEW WAVE RESEARCH

Important advantages of Polaris include:

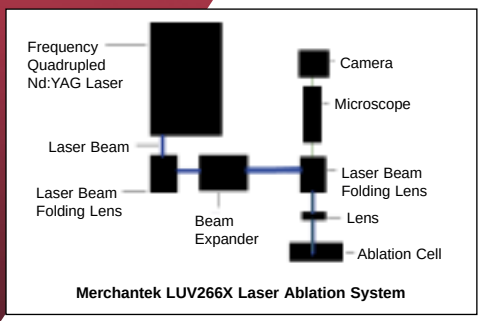
- Laser head requires minimum space
  - 1064nm laser head: 8 1/2in. (216mm) L, 3in. (76mm) W, 2in. (51mm) H
  - Laser head with harmonics and attenuator: 11 3/4in. (298mm) L, 5 3/4in. (146mm) W, 3in. (76mm) H
- High-output energy >90mJ @ 10 or 20Hz
- Excellent beam quality with spatial mode at 1064nm >90% Gaussian
- Operating convenience provided through multiple triggering capabilities
  - Control panel
  - TTL via BNC
  - RS 232
- Optional 2nd, 3rd and 4th harmonic generators extend system wavelength flexibility
- Optional motorized optical attenuator provides precise energy control while maintaining excellent pulse-to-pulse stability
- Easy set up with internal, closed-loop cooling system and operation on 100 – 240VAC, 50/60Hz
- Convenient operation made possible with:
  - Remote positioning of power supplies saving valuable lab space
  - Local control panel with all system controls, including optional optical attenuator
- PFN control allows reduced energy during optics alignment.

Operation and Applications

System power is activated by means of a key switch located on the remote power supply. The control panel, which is also remote from the laser head, is used for safe and convenient control of all system variables, such as pulse repetition rates and triggering options, including single shot, variable or continuous.

The many possible applications of Polaris include: laser induced breakdown spectroscopy; Raman and UV fluorescence studies; providing a pump source for OPO or dye lasers; and for OEM applications, such as TOF mass spectrometry, and microelectronics trimming and repair.

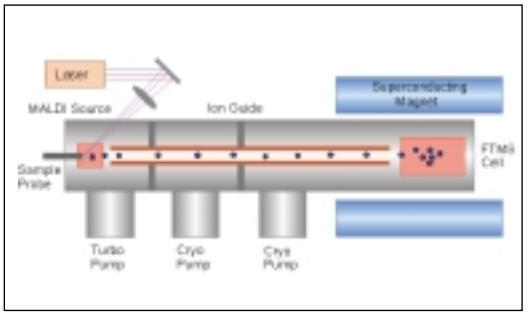
Examples of Applications



Merchantek LUV266X Laser Ablation System

Laser ablation inductively coupled plasma—mass spectrometry (ICP-MS) is an established technique for solid analysis, offering full elemental sample information. It is a great tool for analytical chemists and material analysts engaged in examining geological, life science, metal, and pharmaceutical samples, among others.

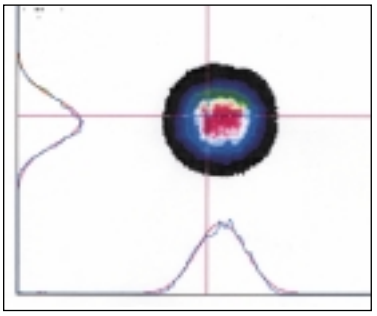
Polaris can be configured into a laser ablation system as shown in the diagram above. It is well suited for ablating biological, geological and environmental samples.



Matrix-Assisted Laser Desorption/Ionization (MALDI) was introduced first in 1987. Since then, MALDI has become a widely used method for determining the molecular weight of a wide variety of biological samples, including proteins, peptides, carbohydrates, glycolipids and more.

A Polaris-generated short-pulse, high-intensity laser beam is a perfect tool to desorb and ionize analyte molecules for mass spectrometry analysis. *Application information provided by IonSpec.*

Beam Profile



Polaris incorporates a stable resonator design that produces excellent beam quality. Energy level and beam divergence do not vary dramatically with repetition rate.

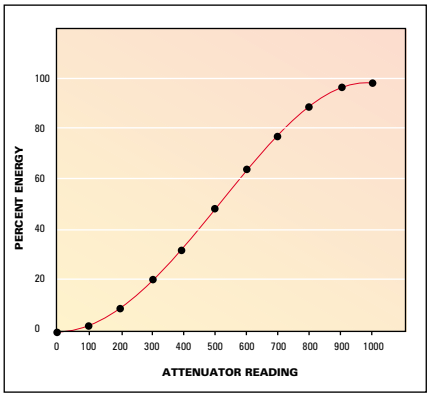
Control Options

The front panel "Trigger Control" switch permits choosing single shot control, or continuous firing at a front-panel, potentiometer-controlled variable rate up to the maximum possible with the model being used, 10, 20 or 30Hz.

The laser can also be fired from an external control source through a rear-panel BNC. Each externally supplied pulse fires the laser once at a repetition rate up to the maximum for the model. Q-switched activation can be controlled by internal laser electronics, or by means of an external timing source that can provide precise timing control of the laser energy pulse.

PC-generated ASCII commands can control most laser functions through an RS 232 port. These functions include: laser start/stop; fire laser; fire a burst or fire continuously; set repetition rate (up to maximum possible for the model); set number of shots per burst; and control attenuator setting (if equipped with optional optical attenuator).

Optional Optical Attenuator



A motorized optical attenuator is available as an option. It consists of a one-half wave plate and polarizer that provides precise control of laser output energy without degrading energy stability that usually results from varying lamp voltage. A front-panel potentiometer controls rotation of the one-half wave plate. A 3-digit LED indicates relative energy level (0-999). The attenuator can also be controlled through the RS 232 interface, described to the left. The optical attenuator reduces maximum energy by approximately 10%. The figure above shows 1064 energy output vs. the attenuator LED reading.

NEW WAVE RESEARCH

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Polytec

POLYTEC GmbH
Büro Berlin Schwarzschildstraße 1 D - 12489 Berlin GERMANY wl@polytec.de
Tel: +49 (30) 63 92 51 40 Fax: +49 (30) 63 92 51 41 www.polytec.de

VISIBLE AND INVISIBLE
LASER RADIATION. AVOID
EYE AND SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
Wavelength 1064nm/150 mJ/6ns
Wavelength 532nm/90 mJ/6ns
Wavelength 355nm/50 mJ/5ns
Wavelength 266nm/40 mJ/5ns
Wavelength 635-670nm 3mW
CLASS 4 LASER PRODUCT