LS-PRO
Laser Intensity Stabilizer

Laser Intensity Stabilizers reduce laser noise and drift by a factor of up to 400 over a wide range of wavelengths and laser powers

Features

- Stabilizes CW and mode-locked laser power to 0.03%
- Transmittance of 74 - 80%
- Wavelength range 400 - 740 nm (UV optional)
- Remote control of laser intensity
- Bandwidth DC to 2 MHz

The ability of CW lasers to perform photometric measurements and calibrations at the accuracies required by science and industry is typically limited by fluctuations in beam power. LS-PRO Laser Intensity Stabilizer can be used with virtually any CW or mode-locked laser to reduce these fluctuations to below 0.03%. It removes laser noise to within 6 dB of the shot noise limit (for a 25 mW beam), enhancing performance in such areas as:

Optical Systems

- Precise exposure control in laser writing systems
- Accurate photometric characterization of detectors and CCDs

Calibrations

- Relative and absolute response calibrations
- Precise characterization of detector linearity

Spectroscopy

- Improved sensitivity due to reduced laser power fluctuation
- Raman and non-linear spectroscopy measurements

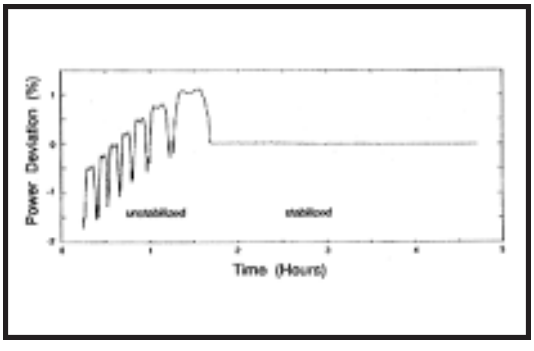

Figure 1. Stabilization of a 5 mW He-Ne laser.

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The LS-PRO is designed to fit extrenally in the laser beam. Using electro-optic modulators and a thermally-controlled monitor photodiode in an electronic servo system, it stabilizes laser intensity at the desired level (see Fig. 2). Intensity level can be selected by a ten-turn dial counter, or with a hand-held control panel. Alternatively, the intensity can be set by applying a voltage to the LS-PRO's remote control jack, making it easy to generate optical test signals or to automate repetitive measurements.

Based on a proven design, the Laser Intensity Stabilizers have been used effectively with He-Ne, He-Cd, Argon-ion, dye, and Ti:Sapphire lasers. These instruments project your CW lasers into stability levels not previously attainable, and into applications you may not have thought possible.

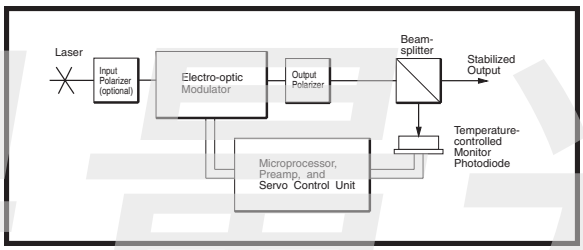


Figure 2. LS-PRO system

Photodiode output voltage is compared in servo-control unit with user selected intensity level; amplified difference signal adjusts modulator to maintain constant radiative flux.

Specifications

Clear aperture	2.0 mm
Wavelength range	400 - 740 nm
Transmittance @ 633 nm	80 %
Long-term stability	<0.03% rms over 8 hours
Noise attenuation	400:1 at 1 Hz (typical)
Bandwidth	DC - 2 MHz
Input power range	0.1 mW - 1W
Noise floor	-140 dB/Hz$^{1/2}$ with 25 mW signal
Max. input beam divergence	5 mrad
Operating temperature	+16<C to +28<C
Storage temperature	-10<C to +45<C
Operation	110/220 VAC @ 50/60Hz, 6 W
Dimensions	3.5" x 3.6" x 9.75"

General

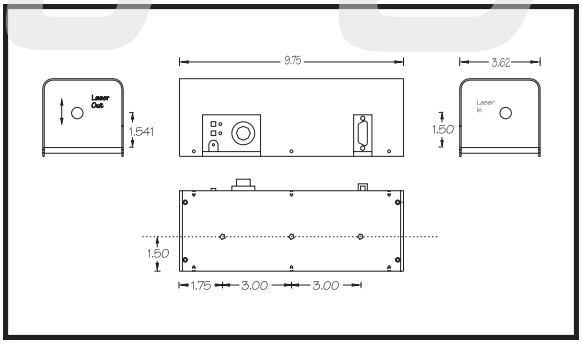
- Operates with monochromatic, collimated laser sources, either CW or mode-locked
- The LS-PRO system consists of an optics module with 1/4"-20 optical mounting threads as shown in diagram
- A subminiature jack provides connections for linear, electronic control of output beam intensity, and the use of the RD-50 remote detector .

Options

- Input polarizer (for use with unpolarized lasers)
- UV optics for operation to 325 nm
- RD-50 remote photodetector

Warranty

- One year full parts and labor warranty against defects in manufacture or materials



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