

BEOC's 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. BEOC's 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

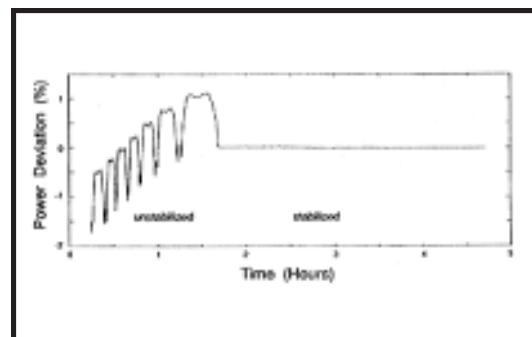


Figure 1. Stabilization of a 5 mW He-Ne laser.

The LS-PRO is designed to fit externally 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 BEOC 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.

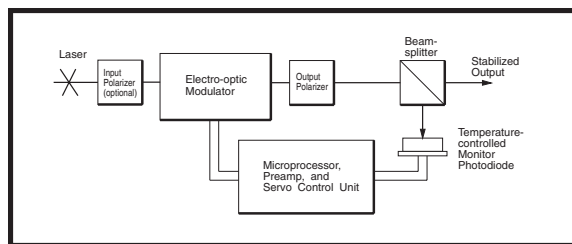


Figure 2. LS-PRO system

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

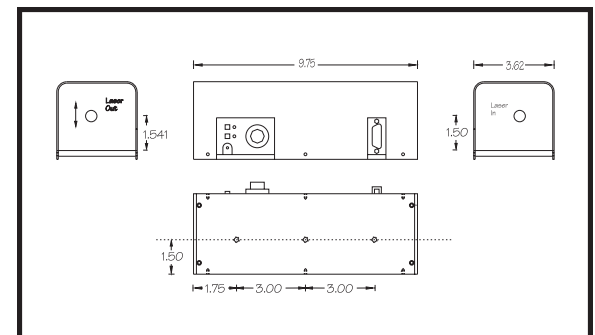


Figure 3. Mechanical diagram

CUSTOM CAPABILITIES

BEOC can often customize a Laser Stabilizer to suit your needs. The LPC, Laser Power controller can be customized to work with powers up to 65 watts. Custom OEM units are also available for integration into new or existing systems. Visit the Services page on our website for additional information.