Closed Loop Stabilization Kit

The Closed Loop Stabilizer kits include a beam sampler and closed loop control system that stabilize the output power of Synrad's water-cooled *48-1* and *48-2* lasers. They are factory installed and include a *UC-2000*.

The optical sampler portion of the kit is attached to the front of the laser and replaces the standard end plate. The beam passes through the adapter with only a minor vertical displacement of the beam axis (less than .05"). There is no shift in beam direction.

A beamsplitter internal to the sampler diverts 8% of the output beam to a diffuser and thermo-pile detector. The thermo-pile detector signal is amplified within the sampling enclosure to a 1 to 12V signal level. A remotely located controller generates a variable duty cycle 5 kHz signal to maintain constant average power of the laser. On a custom basis, the control frequency can be raised to 20kHz for less optical ripple.

The power "set point" can be adjusted on the controller panel from less than 2W to maximum available power. In order to maintain dynamic range and full regulation, the "set point" chosen must leave a power reserve. Within the dynamic response time of the system, the controller can be driven from another (low frequency) signal source. Servo settling time (to 90% of final value) is approximately 7 msec. Faster response is available on a custom basis.

Performance of the system is typically ±2% even though the laser line hops between 10.57 and 10.63µm. This accuracy is achieved by a combination of a wavelength insensitive beamsplitter and assured linear polarization of the signal impinging on the beamsplitter. The beamsplitter is a 45° oriented disc of ZnSe, AR coated on one side only. The optical input is provided through a Brewster angle polarizer, removing any residual orthogonally polarized components. The uncoated side of the ZnSe beamsplitter provides a wavelength independent signal used as sample input. Spatial non-uniformities of the beam are removed by reflecting the sampled signal from a metal grid diffuser before entering the broadband detector. The sampling detector has no window and has a flat black coating.

Power to the kit is provided through a wall plug transformer delivering 24VDC. Power can also be derived by connecting the *48-CL* to the laser's 28 VDC power supply.

Specifications

Optical Transmission	92±1%
Input Power (Optical)	240W max.
Power Stability (Guaranteed)	±2%
Control Range	2W to max. power
Servo Settling Time (90%)	2msec (typical)
Control Frequency	5 kHz
Power Input (Electrical)	24-32VDC at 100mA max.
*Power instabilities are guaranteed not to exceed 2%. Specifications subject to change without notice	

SYNRAD®
An Excel Technology Company

Synrad, Inc., 4600 Campus Place Mukilteo, WA 98275 USA• 1.425.349.3500 *tel* • 1.425.349.3667 *fax* • synrad@synrad.com *e-mail* • www.synrad.com *on the web*

Product Portfolio