

Ultra-Low Noise Laser Diode Controller

The lowest noise, highest bandwidth and most flexible of any commercially available products



Description

The SR300 is the ideal instrument for controlling the current and the temperature of diodes laser. Including ultra-low noise current sink, sub-mK temperature controller and modulation inputs, the SR300 is the right choice to meet the requirements of the most demanding applications. The SR300 hardware is based on the modular instruments of the SMC-Series *Diode Laser Controller*, which can be also ordered separately.

From modular instruments to complete turn-key solutions, Sisyph provides flexible and high-performance electronics for cutting-edge research and engineering.

Applications

- Photonics
- Opto-electronic oscillators
- Time-frequency standards
- Optical phase-locked loops
- Inertial navigation
- Atomic clocks
- Cold-atom physics
- Quantum computing
- Gravity measurements
- Ideal for RIO PlanexTM and DFB lasers

Included Hardware

SMC11	Ultra-low noise current sink
SMC20	Sub-mK temperature controller
SMC31	1-A linear TEC driver
SMC11x	BNC interface
SMC51	Laser industry interface (optional)
SMC41	Laser mount 14-pin butterfly (optional)
SMZ00	Power interface
SZ310	3U/84HP powered desktop case (optional)
SZ311	3U/42HP desktop case (optional)

Main features and benefits

Product feature	Your benefit
Ultra-low noise current sink	Preserve laser linewidth Reduce laser intensity noise (RIN)
High-speed current modulation	Provide servo input from DC to 30 MHz
RF current modulation	Allow direct modulation up to 1 GHz
Sub-mK temperature stability	Ensure long-term frequency stability
Temperature servo input	Extend lock-range in phase/frequency stabilized lasers
Linear TEC driver	Free of digital-noise arising from pulse-width modulated amplifiers
Analog temperature controller	No limit-cycles oscillations due to the finite quantization or dead-zone
Laser mount for 14-pin butterfly cases	Remove cables Maximise bandwidth

Specifications(*)

Current source	
Range	0-210 mA or 0-470 mA
Noise density	$<15 \text{ pA}/\sqrt{\text{Hz}}$
Noise RMS (100 Hz-1 MHz)	$<25 \text{ nA}$
Drift	$<5 \mu\text{A}/^\circ\text{C}$
Current servo input	
Bandwidth	DC-30 MHz
Sensitivity	1 mA/V
Range	$\pm 10 \text{ mA}$
Impedance	1 k Ω
Temperature control	
Range	10-50 $^\circ\text{C}$
Stability	$<1 \text{ mK}$
Command	Analog PID
Temperature servo input	
Sensitivity	50 mK
Range	$\pm 500 \text{ mK}$
Impedance	10 k Ω

(*) Refer to data sheet online for more detailed specifications

