DLC102/202/252/502 Diode Laser Controller

The MOGLabs Diode Laser Controller provides everything needed to drive your tunable external cavity diode laser (ECDL), and lock it to an atomic or other frequency reference.

It offers a combination of impressive performance and ease-of-use: ergonomic and low-noise analogue controls, and intuitive front-panel selection of the signals you need to monitor.

Features

- Intuitive controls with logarithmic response
- Auto-lock to centre of oscilloscope trace
- Two oscilloscope trace selector switches
- Eight functions in one unit:
  - Ultra low noise current source
  - Temperature controller
  - Photodetector
  - Demodulator (lock-in amplifier)
  - Feedback servos
  - Piezo drivers
  - Modulator driver
  - Sweep ramp generator

Applications

- Laser cooling and trapping
- Bose-Einstein condensation
- Trapped ion quantum computing
- Quantum optics: squeezed light
- Electromagnetic transparency and slow light
- Time and frequency standards
- Laser spectroscopy

Diode Laser Controller

Specifications DLC102/202/252/502 Rev 9.0

Current	
Output current	DLC102/202: 0 – 100mA/200mA,±10µA display resolution DLC252/502: 250mA/500mA,±100µA display resolution
Noise	Below 100pA/√Hz (DC to 1MHz)
External modulation	0 – 1.0MHz (–3dB), 100µA/V; current modulation to 10MHz (–3dB)
Compliance voltage	Max diode voltage 3.2V@200mA, 6V@100mA; optionally higher
Temperature	
Range	0 – 30°C (–40°C to 50°C optional), ±0.1°C display resolution
Stability	±5mK/°C
TEC power	±2.5A, ±9V (22W)
Sensor	NTC 10kΩ (provided)
	Alternately AD590, AD592, auto-detected; reads °C in all cases
Photodetector	
Photodiodes	Si-PIN, 740–1100nm, lensed ±10°; options: 370/400–1100nm, ±20°
Bandwidth	720kHz (–3dB); CMRR >120dB
Coupling	ac, dc, differential pair
Dimensions	30x30x60mm (approx)
Frequency feedback servos	
Modulation	250kHz ± 20kHz; current driver output ±500mA ±8V
Bandwidth	40kHz typical (laser-dependent)
Phase	0 – 360°
Feedback	Double integrator (slow, piezo) + single integrator (fast, current)
Gain	±20dB master plus ±20dB on slow, fast channels
Sample and Hold	External control of lock/sweep; allows frequency jump and relock
Sweep/scan	
Sweep	Scan rate 4Hz to 70Hz
Piezo output	0 – 150V, 5mA, 2 channels; stack output limit can be set to 120V
Range	Typically 50GHz, laser dependent
Power and dimensions	
IEC input	100 or 110/120 or 220/240V, 50/60 Hz, 3A
IEC output	Common ground with input
Dimensions	19” 2U, 88x422x210mm (H x W x D), 4.3kg, optional rack-mount kit
Power consumption	35W/60W with low/high TEC load

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