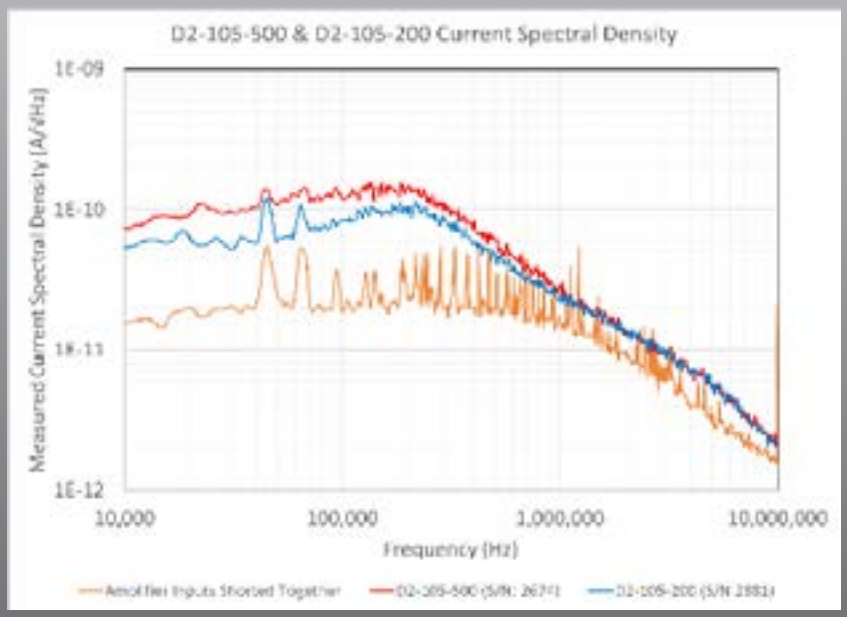
D2-105 Laser Controller

D2-105
Laser Controller

The D2-105 is a complete diode laser controller, including low-noise current controller, temperature control, and modulation input. The precision laser current source is based on the Libbrecht-Hall* circuit, well-known to be the lowest-noise design available. Two stages of temperature control provide long-term frequency stability. Front-panel BNC ports enable both high-speed (>10 MHz) servo control of the laser frequency and RF modulation directly to the laser current output SMA. Powered with the D2-005 linear power supply.



Noise spectra of D2-105

Features:

- Ultra-low noise current source
- Two stages of temperature control with adjustable PID parameters
- High-bandwidth servo input
- Gigahertz modulation capabilities
- Temperature servo input

Applications:

- Cold-atom physics
- Atomic clocks
- Inertial navigation
- Gravity measurements
- Quantum computing & cryptography
- Electromagnetically induced transparency
- Cavity transfer of frequency standards
- Precision magnetic coil driving

*Libbrecht and Hall, A Low-Noise, High-Speed Current Controller, Rev. Sci. Inst. 64, pp. 2133-2135 (1993).

Vescent PHOTONICS

D2-105 Laser Controller

Parameter	D2-105-200	D2-105-500	Units
Current Source			
Current Range	0-200	0-500	mA
Current Noise Density	<100	<200	pA/√Hz
rms noise (10 Hz - 100 kHz)	<50	<100	nA
rms noise (10 Hz - 1 MHz)	<100	<150	nA
rms noise (10 Hz - 10 MHz)	<300	<500	nA
Display Resolution	0.1	1	mA
Absolute Accuracy	2	2	%
Temperature Coefficient	<1	<5	µA/°C
Current Servo			
Input Impedance	1	1	kΩ
Servo Bandwidth	10	10	MHz
Modulation Coefficient	1	1	mA/V
Temperature Servo			
Input Impedance	100	100	kΩ
Temperature Control			
Setpoint Range	1-50	1-50	°C
Long-term Stability	~1	~1	mK/day
Max TEC Current (Voltage)	1 (4)	1 (4)	A (V)
Operation			
Power Input	+5, ±15		VDC
Dimensions	8.9×3.8×7.3 (22.6×9.7×18.5)		inches (cm)

The D2-105 laser controller features ultra-low current noise and is ideally suited for precision spectroscopy and metrology applications. Furthermore two-stages of temperature control plus a servo input for the second stage provide sub-millikelvin temperature stability, ensuring long-term frequency stability.

Designed to meet the most stringent requirements for low-noise applications, the D2-105 will drive the Vescent Photonics D2-100 series of DBR lasers as well as many third-party diode lasers and home-built designs.

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