SLICE-DLC

Super-low-noise Dual-channel Laser Controller

The SLICE-DLC is a dual-channel precision diode laser controller. Each channel offers an ultra-low-noise current source and two temperature control loops. With a current noise density <100 pA/√Hz, the SLICE-DLC has the lowest noise of any commercially available laser controller. This noise performance is ideally suited to precision spectroscopy and metrology applications. The two-stage design of temperature control provides sub-millikelvin stability of the diode resulting in minimum frequency fluctuations and drift.

A current servo input enables high-speed (≥10 MHz) control of the laser frequency. High-speed modulation is enabled by an RF input. This enables the user to easily write sidebands onto the laser via injection current, which facilitates a PDH-style peak lock without the use of expensive lock-in amplifiers and modulators.

SLICE-DLC Touchscreen GUI

The SLICE-DLC employs our proprietary hybrid switching/linear power supply technology and delivers the best of both worlds: acceptance of the full range of AC line voltages for power input and unsurpassed current noise performance.

SLICE-DLC Dual-Channel Laser Controller

Low noise, high-speed modulation, two stages of temperature control – all without an expensive, heavy, power-hungry linear power supply. The SLICE-DLC enables the highest performance from your diode laser.

Features:

- Two channels of current control each with two channels of temperature control
- Lowest-noise laser controller commercially available
- Automatic LIV Curve Capture
- Sub-millikelvin temperature stability with properly designed plant
- Hybrid switching/linear power supply accepts all AC line voltages
- High-speed servo and RF inputs
- Current limit and safe turn-on
- High servo and modulation bandwidths

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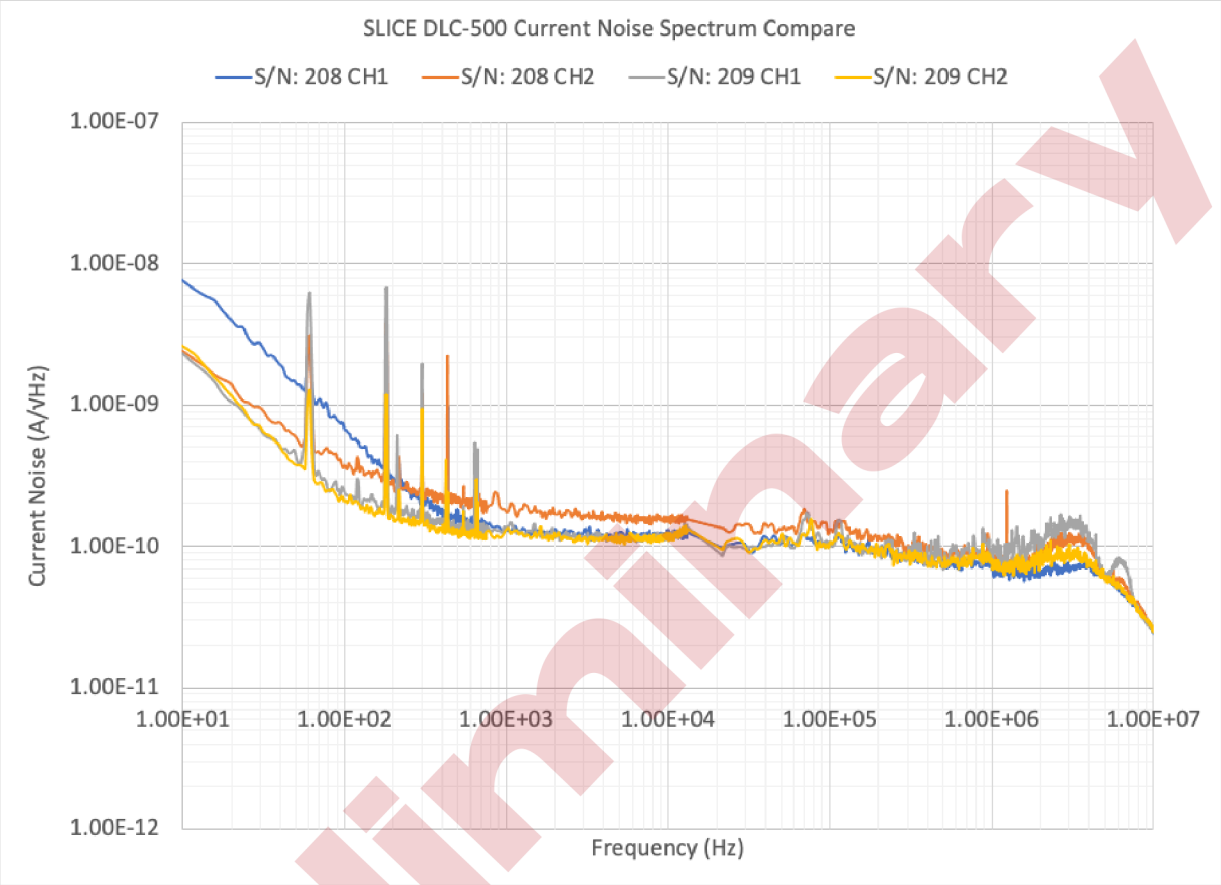
Super-low-noise validation



PSD (Power Spectral Density) plot of the SLICE-DLC (500 mA Model)

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SLICE-DLC Specifications

Parameter	Units	Value	Comments
Current Channels per unit		2	
User Interface			Touch screen & knobs or USB-based serial command API
Current Capacity per channel	mA	200 or 500	200 and 500 mA versions, respectively
Minimum deliverable current	mA	0	
Polarity			Cathode Ground
Current Noise Density	pA/√Hz at >1 kHz	≤100 or ≤200	
Current Noise	nA, rms	≤50 or ≤100	Integrated from 10 Hz to 100 kHz
	nA, rms	≤100 or ≤150	Integrated from 10 Hz to 1 MHz
	nA, rms	≤300 or ≤500	Integrated from 10 Hz to 10 MHz
Current Set Point Resolution	mA	≤0.0002	
Temperature Drift	µA/°C	≤1	
Compliance Voltage	V	≥7 at max current	
Servo Input Bandwidth	MHz	≥10	
RF Input Modulation Bandwidth	GHz	1	
LIV Acquisition Range	mA	0 to I_{max}	
LIV Acquisition Rate	Hz	0.01 to 50	
Power Input		90-240 VAC 50 & 60 Hz	

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