MODULES

LDC**/E**-Current

High performance and ultra-low noise
current controller module for laser diodes (200 mA and 500 mA)

_**MAIN** FEATURES

Ultra-high resolution with 20 bits DAC

Ultra-low noise (down to 300 pA/rtHz noise floor). Lowest noise current controller on the market (floating output system)

200 mA and 500 mA versions available

Compatible with all laser diodes configurations (see Table 1)

Ultra-high resolution anode-cathode voltage readout. Useful for advanced control and monitoring needs

Integrated laser diode safety features

Constant current operation. Constant voltage operation

Powerful, soft panel GUI

OEM versions available.

_**PRODUCT** SPECIFICATIONS

	LDC/E-Current200	**LDC/E-Current500**
Output current		
Output current range	0-200 mA	0-500 mA
Compliance voltage	0.2 µA	0.5 µA
Relative accuracy	±0.2 µA	±0.5 µA
Ripple	<1 µA	<2 µA
Current noise density	See comparison table (down to 300 pA/rtHz)	
Long term stability	<3 µA	<6 µA
Polarity	Floating output (compatible with all laser diode configurations)	
Control mode	Constant current, constant voltage (digital control, can be for lasers with no monitor PD)	
Current limit		
Range	0-200 mA	0-500 mA
Laser voltage measurement		
Measurement	4-wire	
Measurement range	-5 to 5 V	
Resolution	Sigma delta 24 bits. 0.3 µV	
Accuracy	0.0005%	
Noise	Down to 0.2 µV (RMS, with 50/60 Hz rejection)	
Laser modulation		
Internal	Available soon, firmware update	
External	Available on laser mount	
General		
Protection features	Output short circuit at laser off, Open output detection, Current	
Connector	D-SUB9 (female)	
Format	VME 160mm depth (for use with chassis/ xxHP series and SOM/E controller)	
Operating temperature	0-40 ºC	
Storage temperature	-40-70 ºC	
Size	3U height, 4 HP width, 160 mm depth	

_PRODUCT SPECIFICATIONS

Low noise performance benchmarked with competitors

Methodology

All controllers are measured under the same conditions (warm-up time, AC socket, measurement setup and integration time).

The measurement setup consists of:

- Premium shielded DB9 (male) to DB9 (female) housed in a heavy duty cable that connects the controller to a shielded box.
- 25 Ω shielded box precision resistor, DC block (capacitor array of 1.2 mF) and a 50 Ω termination to match the next stage.
- Low noise preamplifier (Analog Modules 351A-3-50, DC-3MHz, 50 Ω input-output, adjusted to a gain of 56 V/V measured and calibrated on a 50 Ω system).
- High performance Lock-In Amplifier (Zurich Instruments HF2LI) working under FFT analyzer mode (5 nV/rtHz noise floor). Scaling factor applied is 1/700 A/V.

The resulting noise floor reaches approximately 250 pA/rtHz.

Disclaimer: These results are shown for reference only.

Results summary

These results demonstrate that the Luz Wavelabs modular current controller has a noise performance superior to that of competitors including bulky benchtop controllers (even ultra-low noise, battery operated benchtop current controllers).
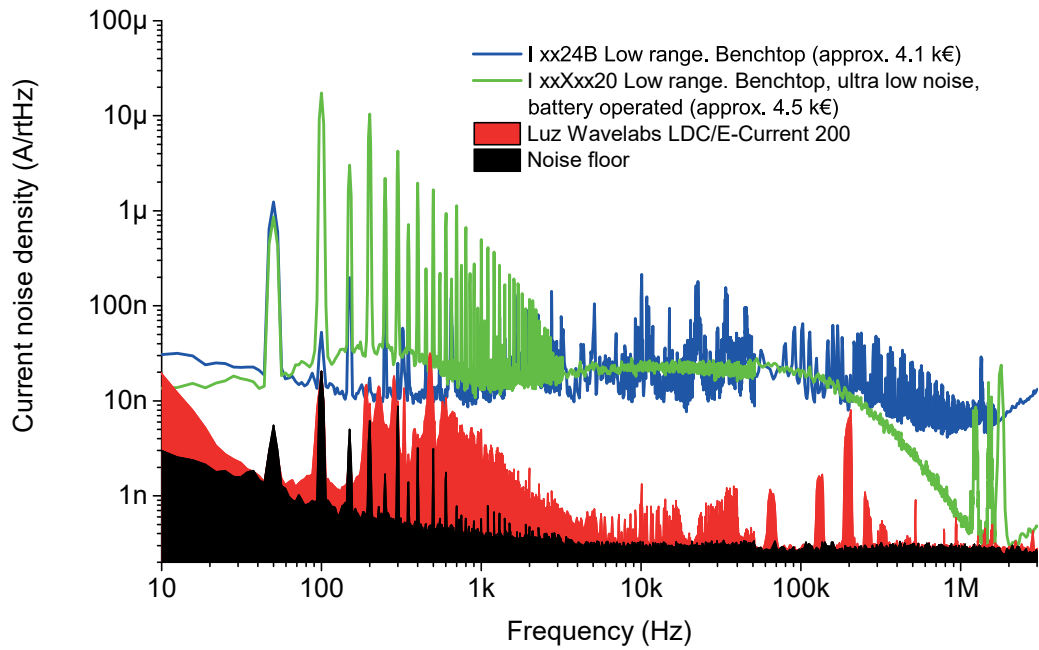
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Figure 1 Luz Wavelabs vs. I Competitor

Legend:
- I xx24B Low range. Benchtop (approx. 4.1 k€)
- I xxXxx20 Low range. Benchtop, ultra low noise, battery operated (approx. 4.5 k€)
- Luz Wavelabs LDC/E-Current 200
- Noise floor

Axes: Current noise density (A/rtHz) vs Frequency (Hz)

Figure 2 Luz Wavelabs vs. T Competitor

Legend:
- T xxx10. Benchtop (replaced by xxx01, approx. 2.8 k€)
- T xxxx005. Modular (approx. 1 k€)
- Luz Wavelabs LDC/E-Current 200
- Noise floor

Axes: Current noise density (A/rtHz) vs Frequency (Hz)
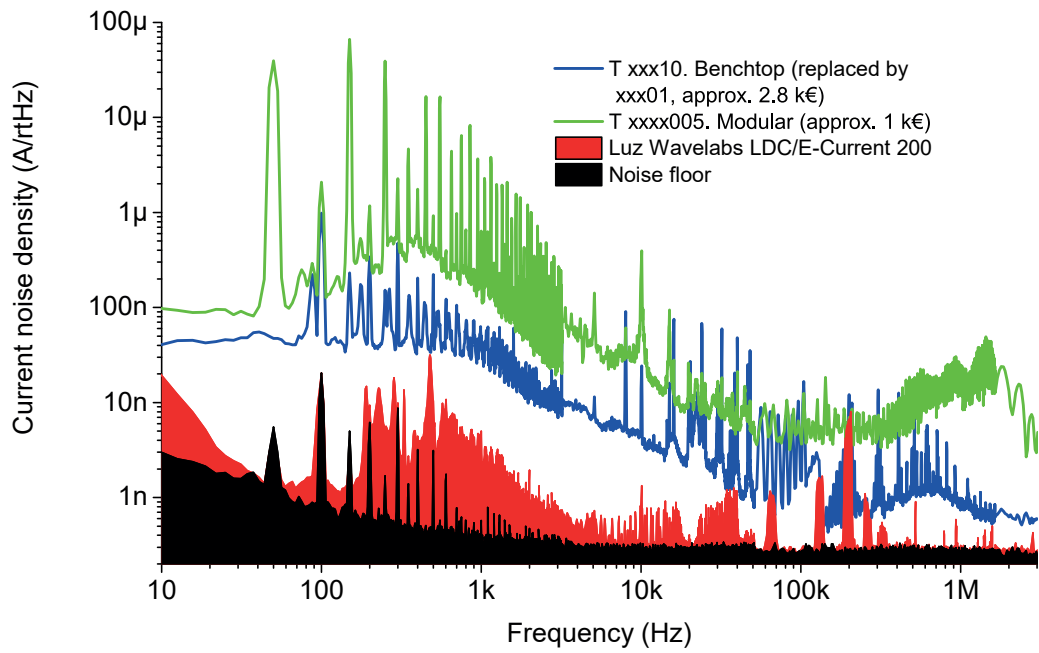
Figure 3 Luz Wavelabs vs. A Competitor

Figure legend:
- A xx05. 250 mA range. Benchtop (approx. 2.9 kUSD)
- A xx05. 500 mA range. Benchtop (approx. 2.9 kUSD)
- Luz Wavelabs LDC/E-Current200
- Noise floor

Y-axis: Current noise density (A/rtHz)
X-axis: Frequency (Hz)
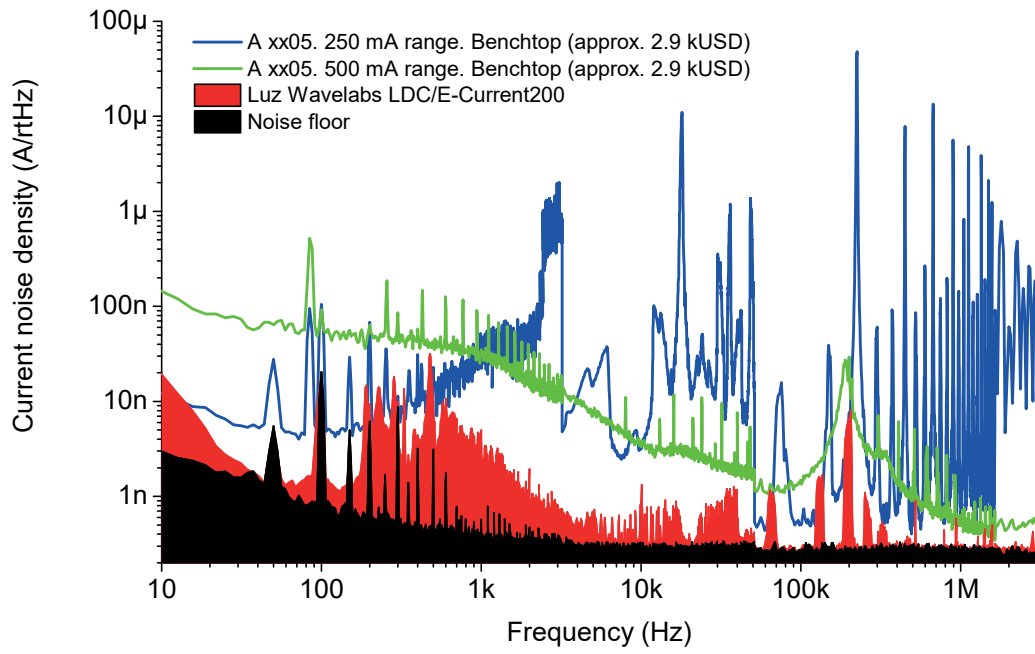
_PINOUT

Table 1 LDC/E-Current pinout

Pin	Name	IN/OUT	Description
1	NC		Not Connected
2	NC		Not Connected
3	GND	I/O	Ground (chasis)
4	LD_SENSE-	I	LD Sense (negative, cathode)
5	LD-	I	Laser Diode (negative, cathode)
6	NC		Not Connected
7	NC		Not Connected
8	LD_SENSE+	I	LD Sense (positive, anode)
9	LD+	O	Laser Diode (positive, anode)
C	Connector	I/O	Ground (chassis)

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_ORDERING INFORMATION

This product is commercialized by Eblana Photonics:

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Part number:

LDC**/E**-Currentx00

x: 2 (200 mA)

      5 (500 mA)

You can acquire this product as part of a MPPI system (see MPPI Brochure for further information and system configuration)

_v1.1 datasheet

LDC**/E**-Currentx00

All product specifications are subject to change without prior notice

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