60-CHANNEL HIGH VOLTAGE DRIVER FOR ADAPTIVE OPTICS APPLICATIONS: HVD-1

This high voltage driver unit was developed to drive up to 60 electrostatic or piezoelectric actuators with voltages of up to 300 V. It features an internal microprocessor and a USB 1.0 interface for ease of integration into experimental setups. There are 4 low-current input channels with high-gain amplifiers that can be used to feed back optimization signals to the computer. This is especially useful for adaptive optics application when a genetic algorithm is used to drive a deformable mirror. When used in conjunction with a genetic algorithm, the microprocessor can store up to 100 voltage patterns for the 60 actuators, sequentially apply all patterns to the actuators in just 1.5 s, store the resulting feedback signals for all patterns, and return them to the computer. The HVD-1 can also be used in conjunction with a wavefront sensor. In this case it takes 290 ms to apply one voltage pattern.
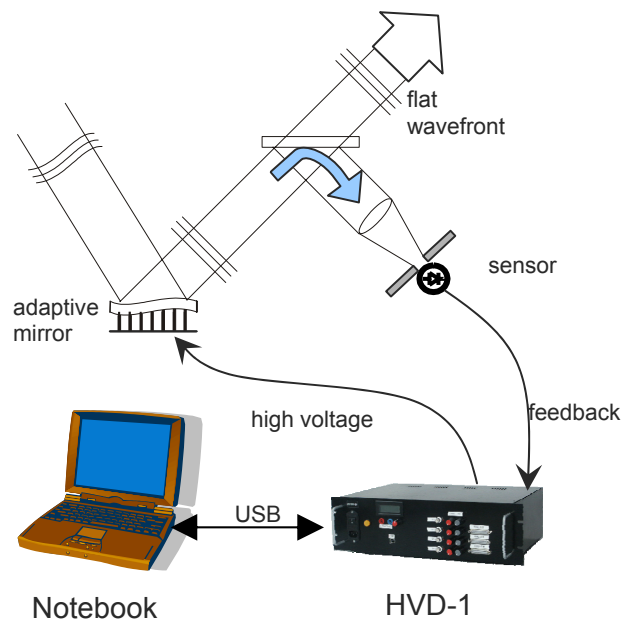
Diagram:

Photo:

Specifications:

<u>High-Voltage:</u>

Maximum output voltage:	50 V … 300 V unipolar, user adjustable
	+/- 150 V bipolar, user adjustable
	max. voltage setting is displayed on LCD
Output Channels:	60 (optional: 40 channels or 20 channels)
Voltage resolution:	6 bit
HV power supply:	internal (30 W)
	Option: external power supply for higher loads

<u>Feedback:</u>

A/D-Channels:	4
Amplification:	max.: $1 \cdot 10^6$ V/A, adjustable
SNR:	5 V / 20 mV
Resolution:	8 bit
Bandwidth:	5 kHz

<u>Interface:</u>

Software:	C++ DLL, documented, Labview LLB
Hardware, data (bi-directional):	USB 1.0
Hardware, high voltage output	Sub-D (3 pieces, 25 connections each)
Hardware, feedback input	BNC (4 pieces)

<u>Dimensions etc.:</u>

Type	19" rack
Dimensions:	480 mm x 290 mm x 140 mm
Weight:	4 kg
Input:	240 V, 50 Hz, 0.5 A

This device has no CE certification. It should only be operated by qualified personnel in laboratories suitable for experiments with high voltages.

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