



Manual

Abstract

The PowerVX HighPower Projector series is a state of the art lasershow device, which eliminates the need of watercooling or 3-phase power. The projector comes in different output power versions and dimensions, from 500mW to 3W in total.

Further highlights are the brandnew design, the sandwich mounting plate for good mechanical stability and also less weight. Brand new designed optical mounts ensure a very good optical stability over long terms.

Technique of PowerVX laser projectors

All PowerVX projectors are developed, tested and manufactured in Germany by MediaLas. Each projector and it's components run through extensive tests and alignment procedures, to ensure a long and stable lifetime. The sandwich heat exchanger not only increases stability, but also reduces thermal effects on the lasers and optics dramatically. Furthermore, active cooled lasers and laser diodes are used.

Due to the nature of high-tech optical equipment used in the optical table section of the PowerVX, the devices are more sensitive to external influences than normal lighting devices. Please use this manual for basic hints and tricks for maintenance of PowerVX Laser Systems. In case of any further help, please contact our service staff. Actual phone numbers and contact information is provided on our website at www.medialas.com

Adjusting the scanners

On normal circumstances and under normal operating conditions, there is no need to readjust the scanners. If, for any case, a readjustment has to be done, please refer to attachments "Scanner tuning".

Aligning the optical adjustment devices

After heavy transportation, or after large temperature differences, coming from outside cold ambient to an inside warm ambient, it might be necessary to realign the optical setup inside slightly. Under normal circumstances, the optical section is maintenance free, and does not need to be realigned.

Preparations

Remove the top cover by removing all screws on top and front of the cover. Lift the cover and unplug the earth connector on the left power supply section of the PowerVX. Be sure to work in a dust-free ambient, so the optical section is not contaminated. Now safely store the top cover and avoid touching the output window. During aligning process, also make sure not to touch any optical surface with sour fingers. Inside the PowerVX, high quality optical components are used, and not all optical surfaces can be cleaned the usual way. Most of the mirrors are very high reflective protected silver mirrors, cleaning is not recommended. If, in any case, the surface is dirty, it is recommended to replace the mirror.

Optical alignment

The optical alignment of the unit is quite easy. Depending on output power, there are one or more mirrors and optical elements inside the PowerVX.

PowerVX 500 – 1500:	1 optical element
PowerVX 2000 – 3000:	2-3 optical elements

The first optical element routes the full laser beam onto the scanning mirrors. This has to be adjusted in a straight line to the middle of the scanner mirrors. Make sure that both mirrors are hit in the middle to avoid beam disturbance or losses of power.

The second alignment is set by mirror and beam combiner, where both beams of the two lasers must be combined into one. The first beam of the laser with additional mirror is used as pilot beam, while the second beam has to be aligned and matched by adjusting mirror and beam combiner. After both beams match within a distance of 20m, the first optical element can be adjusted as described before.

Cleaning of the optical surfaces

Since production date end 2007, all mirrors are high reflective dielectric coating, and can be cleaned carefully with a soft tissue and window cleaner. Be careful during cleaning, and clean only if necessary.

MicroAmp galvo driver

Tuning and adjustment

Introduction

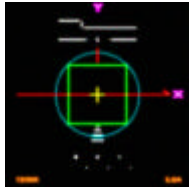
The MicroAmp is currently the smallest and fastest scanamp for various kind of galvo scanners on the world market. It's new technology allows to scan up to 60k with selected galvanometers, at a reduced scanangle of 5° optical. But even at large angles, the scanrate is increased.

The measuring procedure

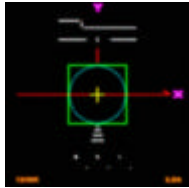
The MicroAmp was measured with CT6800HP, make 1999, passice cooled. Laboratory power supply, room temperature. Windows PC with LD Pro, 12/30k ILDA testframe. Later we did some measurements with 6210s, connector style, passive cooled. The speed differed from what we measured with the 6800s. Mainly this was caused by the mirrors and the different connector, which has a slightly higher resistance than the 6800 connector. We then changed to the older suttering style 6210s and found a speed increase at small step angles.

Deflection angle	Speed
25° optical deflection	25.000 pps
15° optical deflection	30.000 pps
8° optical deflection	35.000 pps
5° optical deflection	45.000 pps

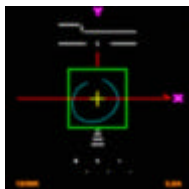
The ILDA standard



Driver is set too fast or output speed of computer is too slow. The inner circle is larger than the green square.



Driver and output speed matches together.



Driver is too slow or output speed of computer is too high. Readjust driver or slow down computer.

Adjustments

Standard configuration shows 7 adjustment pots, 4 of them are necessary for the user. The small pots, which are placed inside the board, should not be changed in setting. These are necessary for linearity and other galvo specific settings.

Basic adjustments

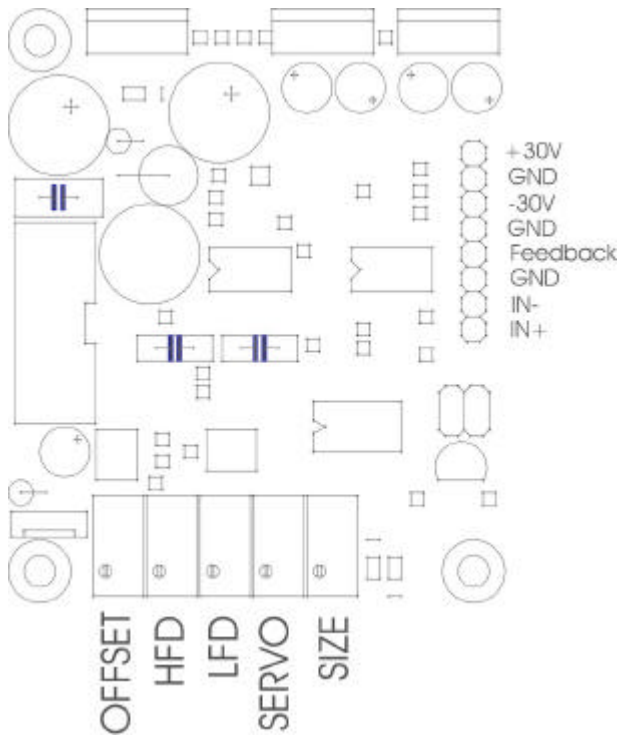
The MicroAmp comes already pre adjusted and needs to be set up for the galvo only in small areas. Every galvo is different, so minor adjustments are needed. For this, the ILDA test pattern is used, also a setup of the galvos in XY with a laser. If the driver is totally deadadjusted, this will be the procedure to retune it:

- Size, Servo-Gain, Damping und HF-Damping are adjusted counter clockwise to their left zero position. Now turn LFD 5 full rounds clockwise to right.
- Connect computer with ILDA test pattern, run it at approx. 20kpps.
- Power on the amplifiers.
- Slowly open the servo gain (clockwise). The mirror of the galvo should move now to its middle position. If yes, turn two rounds clockwise.
- Slowly open the size until you see the galvo moving.
- Increase servo gain until you see overshoots. Correct it with LFD.
- Decrease undershoots by opening the HFD pot slightly clockwise. Remove gain/LFD procedure and correct with HFD, until you the picture looks satisfying.
- Increase speed of test patterns and readjust for optimized picture.

Inverting of axis

By using the jumpers at the inputs, each driver can be inverted easily. This can be done during scanning also. Just pull out the jumpers and put them in at 90° rotated.

Important hints



- Do not remove the driver board from its mounting bracket. This additional metal plate is needed for ground and increases stability of the driver. The bracket is isolated from ground.
- Do not use cheap and unshielded cable. We recommend to use the MicroAmps only with MediaLas cables. These cables are tested and designed for this driver. We do not offer any warranty, if other cables are used.
- If the galvos gets very hot (above 48°C / 125°F), switch off the system and check for errors or problems. Use appropriate heatsink for the galvos. Do NOT run them without heatsink!!
- If the fuses blow continuously, do not replace them with a higher value. Check for possible errors.

Legend:

Offset:	Electrical offset of the driver, not the galvo! Is adjusted in factory.
HFD:	HighFrequency Damping. Corrects overshoots.
LFD:	LowFrequency Damping. Corrects undershoots.
Servo:	Servo-Gain. Power of the feedback signal for the internal PID controller.
Size:	Increases or decreases input sensitivity of the complete driver. Does not change driver settings.

ILDA Connector pins

DB25 male connector:

1:	X input +
2:	Y input +
3:	Blanking input +
5:	Red +
6:	Green +
7:	Blue +
14:	X input -
15:	Y input -
16:	Blanking input -
18:	Red -
19:	Green -
20:	Blue -
25:	Ground