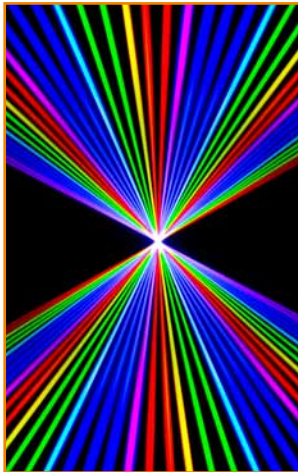


The Show Laser Light Guide



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You're about to buy your first show laser light system?

That's a great decision!

Laser systems are available at low prices and can easily be operated by everyone nowadays.

It's not only the laser power that matters: Visibility is the important factor.

There are many different aspects to consider, e.g. control option(s), scan speed, beam

specifications, laser sources, etc .

The most important facts about show laser systems are listed in this brochure to help you in finding YOUR laser.

Have fun!

Yours,
The Laserworld Team



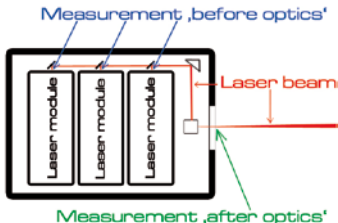
1

Laser Power

The total output power of a laser is the total result of all built in laser sources combined. This power is measured in mW (Milliwatts) or W (Watts).

The power specification can be given „before“ or „after“ optics. „Before“ means directly at the laser sources, „after“ means measurement after the laser aperture.

Values given „after optics“ / „after aperture“ already comprise power loss due to optical components.



2 Laser Sources

Modern show laser light systems use solid state or semiconductor laser sources: DPSS, Diodes and OPSL. DPSS (diode pumped solid state) laser sources are mainly used in smaller laser systems, but special types also in very high end lasers.

Diode sources have a good price-quality ratio and they are the most common laser sources. Diode-Only / Pure

Diode laser systems are considered long-lasting and durable, due to the semiconductor technology of the diode sources. OPSL (optically pumped semiconductor laser) technology is used in high end laser projectors due to their great beam specifications.



3

Scan Speed & Angle

The possible scan speed of a laser system depends on the scanning system. The speed is specified in pps (points per second) or kpps (kilo points per second). It describes how fast both mirrors of the scanning system can move and how fast they can deflect the beam. The



higher the scan speed, the better and the smoother the laser beam / graphics.

Important: The possible maximum scan speed depends on the actual scan angle.

To project graphics it is recommended to at least have 25kpps @ 8° ILDA.

Aerial or beam shows can be created with less speedy scanners as well.

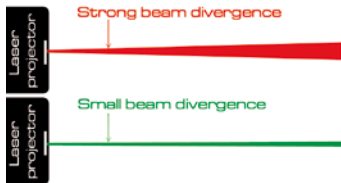
4 Beam Specifications

Laser beam specifications have two parameters: beam size and beam divergence. The beam size specifies the width of the beam at aperture (mm), the beam divergence specifies the widening of the beam over distance (in mrad).

The divergence is the most important factor. It also heavily influences the actual visibility of a laser after a certain dis-

tance. The beam stays much tighter over distance so the power is more concentrated.

Follow the link at the bottom to learn more on beam divergence



5 Operation Modes

Most small laser projectors have an automatic and / or sound-to-light mode. If the automatic (stand-alone) mode is active, the showlaser displays preset patterns automatically. If the music (sound-to-light) mode is chosen, the laser triggers beams according to the ambient noise or music. Many laser systems can also be controlled by DMX512, where pre-pro-

grammed patterns can be selected with a DMX controller or DMX software.

Lasers with ILDA mode can be controlled by laser show control software. Professional laser shows are controlled with ILDA software.

Scan to read more:



6 Wavelengths, Colors

The wavelength of laser sources defines its output color. By combining laser sources of different wavelengths it is possible to create color blending and even white laser light.

The human eye perceives different wavelengths at



different intensities: green is very visible, but blue and red not that much (only about 1/3 of green). The white balance of an RGB whitelight laser system depends on the power values per color source, so the power per source specifies the color temperature of the output.

7 How much is a laser?

The cost for a laser system depends on many factors: The performance and quality of the components as well as their alignment and durability define the product price.

Show laser systems for home or DJ use are very affordable and can be bought for less than 100 € up to ~500 €. The features of such devices are

limited, but are sufficient for the intended field of use. Mid-priced show lasers range from ~500 € up to ~2,000 €. These semi-professional projectors are very versatile and can be used for beam shows, in clubs or discotheques. Professional laser systems start at ~2,000 € and up are very powerful and offer high quality for professional laser shows.



8

Which laser for which venue?

This mainly depends on the desired application of the laser system:

- beam show, aerial effects
- graphics projections
- indoor
- outdoor, etc.

Power and scanners (see „3. Scan Speed“) are decisive factors. For mobile DJs, home use and private parties, small bars etc., show laser systems with a



total output power of up to 500mW are well suitable in most cases. Lasers in a power range of $\sim 500\text{mW}$ to $\sim 1,500\text{mW}$ are good for small clubs and discos, $\sim 1,500\text{mW}$ to $\sim 5,000\text{mW}$ suit large nightclubs, discos and mid-sized events. Lasers with 5,000mW and up are used at large in- and outdoor events, festivals, concerts etc.



9 Graphics, Logos, Texts ...

Many laser applications require more than just beams and standard patterns: graphics, logos, individual patterns, or texts. The more complex the projection, the more professional the laser system should be. A minimum scan speed of 25kpps is suggested for any



graphics or text projection. To create own logos, text, graphics etc. it is necessary to use laser software - and of course a computer controllable laser system (ILDA). Laser software, like the Laserworld Showeditor, is available for less than 350 €. There is also the Showeditor FREE laser software which can be used with some laser systems.

10 **Modulation**

The modulation of a laser describes its ability to switch output on and off during drawing a pattern and to create color mixture. Modulation can be TTL, which means the laser source can only switch on and off, but not dim. The other option is an analog modulated laser.

RGB laser systems with TTL modulation can create maxi-

mum 7 colors, whereas analog modulated systems can create many million color shades. Entry level laser systems are often TTL, professional laser systems are analog modulated.

Scan to read more:



11

Laser classes

Laser systems are classified in several levels, according to their accessible radiation. The classification is meant to indicate the hazard level of laser system. Show laser light systems can be of class 2, 2M, 3R, 3B or 4 (in the order of their hazardousness). Laser class 2 classifies very small

and weak laser devices with an output power of $<1\text{mW}$. Laser systems with an output power between 1mW and 5mW are rated class 3R, between 5mW and 500mW are rated class 3B.

Every laser with more than 500mW accessible radiation is specified class 4.

Even class 4 lasers are safe for audience scanning, if the MPE* is not exceeded in the audience area.**



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www.laserworld.com

* MPE: Maximum Permissible Exposure. It's is the level of laser radiation, that, under normal circumstances, persons may be exposed without suffering damage.

**Remember to always respect local regulations and laws when operating a laser system

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