Manual

LPS-Laser Array Beam Bar

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Foreword / Confirmation of EG/CE conformity

Thank you for purchasing an LPS product.
Before you operate this product the first time, please read this manual carefully, because thus you should be able to operate your device safely, properly and economically. By observing the operating instructions, hazards are avoided, repair costs and downtimes are reduced and the reliability and service life of our products are increased. In the case of improper use, dangers may arise for the user or third parties or impairments may occur on the device or other property. Therefore, use the device only as intended and in perfect condition, observing all the instructions in this manual. Our operating instructions contain the important guidelines for the intended use of the device. Only compliance with them shall be considered as proper use. Errors and risks arising from incorrect application are not the responsibility of the manufacturer. Therefore our request:

Before installing or commissioning the laser system, please be sure to read the operating instructions.

Our laser systems are equipped with highly sensitive electronics and mechanics.
Pay attention to the safety of your device during transport.
Strong vibrations or shocks can cause significant damage to the system.
Furthermore, the laser system must be regularly maintained to guarantee error-free operation.

CAUTION!

Should an error occur due to improper handling or maintenance, there is no warranty.

ONLY special trained persons are allowed to operate this device!

LPS-Lasersysteme reserves the right for any technical and/or design changes.

LPS-Lasersysteme is not liable for errors and printing errors.

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EC/CE Confirmation of conformity

We hereby confirm that the design and construction of the product named below, as well as the version we have placed on the market, comply with the specifications and requirements of the harmonized EU regulations named below.

Model: LPS-Laser Array Beam Bar
Variants: This declaration covers all variants of the above product.

The object of the declaration described above is in compliance with the relevant Union harmonization legislation:

2014/30/EU EMC Directive
(Standards: EN 61000-6-4:2020-9, EN 61000-6-2:2019-11)
2011/65/EU RoHS Directive (RoHS 2 and RoHS 3 conform 2015/863/EU)
(Standards: EN 63000:2018)
2014/35/EU Low Voltage Directive
(Standards: EN 62368-1:2021-5)

Note: the product ranges mentioned and their variants also comply with the following guidelines:

2006/25/EG Protection against artificial optical radiation
(Standards: EN 60825-1:2014 "Safety of laser devices", please note the information in the product documentation)

In the case of changes that have not been carried out by LPS-Lasersysteme, this declaration of conformity immediately loses its validity.

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1. Commissioning

Intended use
Laser devices must be equipped with the protective devices required for safe operation in accordance with their laser protection class and use.

Do not put the show laser device into operation until you have familiarized yourself with its functions.

This laser system is designed for entertainment laser shows.
During installation, both permanent and temporary, all requirements of the current TROS and OStrV must be complied with.
The laser system may only be operated by qualified, commissioned and trained personnel. The company must instruct all persons who use laser equipment or are in the laser protection area about the dangers of laser beams and responsible behavior. This training shall be repeated several times a year, if necessary.

Please note that unauthorized modifications to the device are prohibited for safety reasons.

If the show laser device is used other than as described in this manual, this may cause damage to the product and void the warranty. In addition, any other use involves hazards, such as short circuit, fire, electric shock, etc.

The operator must ensure that the instructions have been understood. The operating instructions must be kept at all times at the place of use of the system.

Check for transport damage
Before commissioning the laser system, please check the following points:
1. Check that the packaging (carton) is undamaged.
2. Control of the laser system for external damage.
3. Any damage to the packaging or defects to the delivered product must be carried out within 24 hours to the freight forwarder and the company LPS-Lasersysteme.
4. After consultation with LPS laser systems send back only in original packaging or with correspondingly good foam padding.

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1.1 Areas of use

This laser system is designed for professional applications, such as event stages, entertainment centers, theaters, etc.

This laser must only be used as intended for laser shows. The operation of a class 3B and 4 show laser is only permitted if the laser operation is controlled and monitored by a laser safety officer or a competent person.

This device is intended for both mobile operation and fixed installations.

Laser devices are not designed for continuous operation. Remember that regular breaks in operation increase the life of the device.

1.2 Safety Instructions

Please read this information carefully and keep it safe!

- Please refer to the technical specifications of the laser system.
- Operate the laser system only with the specified operating voltages.
- For any changes made to the laser system, such as changes to electronics, manipulation of controllers, housings or optics is not assumed any liability or warranty.
- Manipulation of laser systems may lead to the output power deviates significantly from the guaranteed values!
- Lasers can emit visible or invisible laser radiation. On the laser device is a warning attached or enclosed, observe the instructions for the corresponding laser class!
- The accident prevention regulation TROS (formerly "laser radiation" BGV B2 or Occupational Health and Safety Ordinance on Artificial Optical Radiation) and OstrV must be observed. The operator of the laser show device is responsible for compliance with the protective measures.
- The operation of class 4 laser equipment must be registered with the employers' liability insurance association. When operating such lasers, a laser protection area must be demarcated and be marked. In addition, the operator of Class 4 laser equipment must appoint exper personnel as laser safety officers.

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Laser radiation! Avoid irradiation of the eye or skin by direct or scattered radiation. This warning is intended to remind you to comply with all safety regulations, as you are working with a Class 3b laser. Decisive for the classification of the laser device into the classes is the standard EN 60825-1, laser devices are classified according to their dangerousness in classes. See point 2.1.1. Laser Classes.

Beware of laser radiation! This marks the **output windows** of the visible laser radiation. Avoid direct or indirect contact with the eye and skin. Never look directly into the beam! Also, do not use optical or mechanical components to look into the laser beam or deflect it accordingly!

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Unplug before opening the housing! This prevents injuries caused by electric shock and also protects your laser device from electronic damage. . **ONLY specially trained specialist personnel or laser technicians from LPS-Laser are allowed to do this!**

1.3 Electrical Connection

This product is approved to be operated only with an alternate current of 100 - 240 V.

Do not use dimmer or other electronically switched sockets. Do not use the laser device together with other large devices, like smoke machines, on the same mains.

1.4 Installation

The laser system may only be mounted via the mounting bracket or on a stable platform. To ensure good air circulation, a free space of at least 50 cm must be maintained around the device.

When installing, dismantling and performing service work, make sure that the area below the installation site is cordoned off.

The equipment must always be secured with a suitable safety rope.

1.5 Operation

Operate the device only if you are familiar with its functions. Do not permit operation by persons not qualified for operating the device. Most accidents and damages are the result of unprofessional operation!

Please consider that unauthorized modifications on the device are forbidden due to safety reasons!

If the device is operated in any way different to the one described in this manual, the product may suffer damages and the guarantee becomes void.

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1.6 Unpack and connect

Check the content of the package of its completeness. The following parts are included:

- LPS Laser Array Beam Bar (1 piece)
- Manual
- Power plug (1 piece)
- Key (2 pcs)

Before connecting the show laser device, please read "2. Laser Safety" carefully and conscientiously.

Use this device **only according to these operation instructions**. Read them carefully.

If there are any **visible damages** at the housing or cables, do NOT use this device.

Never look directly into the laser light source. Risk of blindness!!!

All systems can be operated from 100 V to 240 VAC. Make sure these voltages are available.

Connecting the system is very simple:

- Plug the power plug into the laser system first, then into the socket.

- Place or hang the show laser system stably and securely and ensure that it cannot be moved or fall down.

Important!
For reasons of laser and operational safety, you should be able to switch off the laser beam by a lockable emergency-stop-button. Operation without an emergency-stop-button is not permitted by law.
LPS-Lasersysteme is not liable for damage caused by improper installations and improper operation!

CAUTION!

If you make adjustments, or perform procedures other than those listed here, this can lead to dangerous radiation exposure!

The laser beams of this laser system are capable of igniting flammable materials.
Improper use of the laser system can also harm people.
There is a high risk of eye and skin injuries if the laser beams are accessible to unauthorized persons.

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1.7 Warranty

The duration of the warranty depends on the condition of this device (used or new). You will find this information on the invoice.

The warranty claim expires if the following points are intentionally or unintentionally disregarded

- Only special trained persons are allowed to operate the device.
- Only use the correct voltage. Therefore, see information on device and read this manual.
- Make sure, the laser device is not connected to mains during installation or service. These points are **ONLY allowed by specially trained specialist personnel or laser technicians from LPS-Laser** according to safety regulations of the concerned country.
- Use the device only according to these operation instructions.
- Do not use the device if there are any visible damages at the housing, technical slots or cables.
- Avoid overheating through bad installation. Mount the device with a minimum distance of 25 cm from each kind of objects (other devices, walls, …) and avoid exposing to spotlights like moving heads.
- Make sure to use appropriate safety cords to protect the device from falling. It should be able to withstand tenfold the weight of the device. Protection for device and people!
- Give the device time to adjust to the room or outside temperature before you turn it on.
- Do not cover the device at any time.
- Protect the device against water, rain and other liquid (like soft drinks, foam, …).
- Never use it improperly. Avoid misuse.
- Damages to the device caused by improper handling, disregard or neglect the safety instructions and the information of this manual will void the warranty.

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2. Laser Safety

2.1 Legal Notice

Despite all fascination for this "magic light", it should not be forgotten that a laser also includes certain dangers.
On these pages you will learn how it is possible to create a fascinating laser spectacle for you and your guests without danger, despite the many regulations.
Please read this carefully. LPS-Lasersysteme is not liable for damage caused by improper installation and improper operation!

2.1.1. Laser Classes

Laser devices are technical work equipment in accordance with the Equipment Safety Act.
They must comply with its requirements, as well as the generally accepted rules of technology.

Laser Classes:

Class 1	All wavelengths	The accessible laser radiation is harmless to human eyes under foreseeable conditions. **LASER RADIATION**
Class 1M	302,5 nm – 400 nm	Eye-safe without the use of optical instruments; unsafe when using optical instruments such as telescopes or lenses. **LASER RADIATION – DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS**
Class 2	400 nm – 700 nm, up to 0,25 s	Eye-safe through aversion reactions plus eyelid closure reflex; unsafe when using optical instruments. **LASER RADIATION – DO NOT LOOK INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS**

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Class 2M	400 nm – 700 nm, 0,25 s	As with Class 2 lasers, as long as using no optical instruments, such as magnifying glasses, lenses, telescopes and similar. **LASER RADIATION – DO NOT LOOK INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS**
Class 3R	400 nm – 700 nm, 0,25 s 302,5 nm – 400 nm 700 nm – 10 nm, 100 s	If the GZS value (limit value of accessible radiation) exceed the radiation a maximum of five times higher than the GZS values of class 1 or class 2, it becomes dangerous for the human eye. **LASER RADIATION – AVOID DIRECT EYE EXPOSURE**
Class 3B	all wavelengths Laser devices with laser power up to 0,5 W	Dangerous to human eye and in special cases also to human skin. **LASER RADIATION – AVOID EXPOSURE TO BEAM**
Class 4	All wavelengths Laser devices with laser power of more than 0,5 W	The accessible laser radiation is very dangerous for eyes and skin. Diffuse radiation can also be dangerous. The laser radiation can cause fire or explosion hazard. **LASER RADIATION – AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION**

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The laser class 3b and class 4 (from 0.5 W) used by us requires the following points to be observed and avoided:

1. Danger to the eye

The most light-sensitive organ of humans is the eye. A laser beam is coherent and very high-energy light. Even over long distances, a laser beam almost retains its intensity. If a laser beam hits the human eye, it can suffer irreparable damage and the retina can be destroyed.
Never look directly into the laser beam and do not place objects in the laser beam, because even diffusely reflected radiation can cause eye damage.
Never direct the laser beam at a person's eyes.

2. Danger to the skin

The high energy density of the laser beam causes painful burns when it hits the human skin. The laser beam also burns holes in textiles.
Never reach into the laser beam and do not get into the laser beam with other body parts.

3. Danger through life-threatening voltages

When operating your laser system, observe the warnings on the laser, as well as the information on laser safety in the operating instructions of your laser. Make sure that unauthorized persons do not have access to your laser system!

4. Fire hazard

If a laser beam hits easily flammable material, e.g. paper, it ignites and a fire can start quickly. Therefore, before turning the laser on, you should make sure that there is no easily flammable material in the beam path.
In addition, regularly check your air cooling system on the laser. Especially the filters (if available) and fans should be checked regularly for their function to avoid defects caused by overtemperature.

The use of a laser is only considered harmless if the laser beam is sufficiently attenuated, widened, split or moved very quickly. The eye is thus only hit for a short time and the values for the maximum permissible irradiation (MZB, depending on the wavelength, the irradiation time and the repetition frequency of pulse sequences) or the limit value of accessible radiation (GZS) are not exceeded.

To ensure that you are always up to date on the topic of "laser radiation" and its legal basis, we recommend that you inform yourself regularly about the legal provisions and regulations of your country. Comprehensive information (also in pdf for download) on TROS, OStrV and other provisions can be obtained directly from the employers' liability insurance association or its website. LPS-Lasersysteme assumes no liability for the content and availability there; the operators of the website are solely responsible.
We are happy to help you via phone +49 7473 271177.

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2.2 Danger by laser beams

The first commissioning of a show laser of classes 3B and 4 (more detailed explanations under point 1. Commissioning) must be reported to the authority responsible for occupational safety and health and to the competent employers' liability insurance association in accordance with the accident prevention regulations TROS and OStrV (formerly BGV B2).

The operating personnel and persons who are in the laser protection area must be informed about the dangers.
Instruction includes imparting knowledge about the dangers of laser radiation, other hazard possibilities, protective regulations, behavior in the laser protection area, safety precautions, as well as familiarization with the operating procedures when using show laser systems.

The operating personnel can be trained by LPS laser systems in a seminar to become a laser safety officer according to the specifications of the OStrV and TROS laser radiation.

Anyone operating this system must be a proven laser safety officer.

A laser safety seminar includes the following points:

- Physical quantities and properties of laser radiation
- Biological effect of laser radiation
- legal foundations and rules of technology
- Laser safety and protection (incl. indirect hazards)
- Laser safety practice: Exemplary performance of a risk assessment
- Tasks and responsibilities of the laser safety officer in operation
- Written examination

The company that operates class 3B or 4 lasers must name at least one permanent employee as laser safety officer in writing!

Eye and skin damage caused by improperly operated laser devices can constitute bodily injury and be prosecuted.

Please note that the organizer is responsible for compliance with all protective measures. If a laser system gets out of control, the event may need to be canceled.

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If the organizer does not comply with his traffic safety obligations, he is liable under civil law for all resulting damages, e.g.:

- The health insurance fund of the injured party can claim the costs of treatment.
- The injured parties themselves can sue for compensation.
- Any resulting (economic) damage can be claimed from the operator of the laser device by means of a civil lawsuit.

Please note:
LPS-Lasersysteme is not liable for damage caused by improper installations and improper operation!

Protective measures for safe operation

For the generation and application of laser radiation, the safety precautions from the current DIN EN 60825-1 "Safety of laser equipment", the BG regulation TROS Laser Radiation (formerly BGV B2), OStrV, and also the state occupational safety regulations, the otherwise applicable accident prevention regulations and the generally recognized rules of technology must be observed.

Only excerpts of the above provisions are reproduced here. The information status of this instruction manual corresponds to the time of printing. When a laser product is put into operation in the public or industrial sector, a number of safety regulations must be followed, of which this manual is only reproducing a part. The operator must independently seek to procure the current safety regulations and comply with them – depending on the country where the laser system is used!

2.3 Safety Shutdown

Show lasers must have a manual safety shutdown that allows to interrupt the laser beam (beam output) at any time. For this our laser devices are fitted with E-Stop.

2.4 Mechanical Construction

The show laser must be secured against adjustment and unintentional changes in position. The show laser must be set up in such a way that improper leakage of the laser beam during operation is prevented.
Any optically effective components in the room (e.g. mirrors) must be firmly attached to the wall or similar; access by unauthorized third parties must be prevented. The load-bearing elements (e.g. trussing) must themselves be firmly attached.

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2.5 Public Area

In the public area (spectator area), the limit values for irradiation and scanner strength must not be exceeded.

Persons must not be intentionally exposed to laser radiation above the GZS values.

The contractor must take technical or organizational measures to ensure that irradiation above the maximum permissible irradiation, including reflected or scattered laser radiation, is prevented.

2.6 Laser Safety Area

The following steps must be carried out by the designated laser safety officer before each commissioning:

Before each operation, a visual inspection must be carried out to check whether safety-relevant changes have occured.

This includes following points:

- Are there highly flammable objects (such as decoration) crossing the laser beam?
- Are all plugs, especially all with electricity, plugged in and have safety deficiencies, e.g. defect of the sheathing or insulation?

If one of the above questions has been answered with “yes”, the defect that has occurred must be remedied immediately. For this purpose, please consult with LPS laser systems
(Phone number: +49 7473 271177 or email)

The operation of the show laser results in a dangerous area, the so-called laser safety area, in which the specified limit values for irradiation duration and strength can be exceeded. This area must not be entered by any unauthorized person during operation.

The laser safety area must be kept as small as possible within the framework of the applicable regulations. Only persons whose stay there is necessary should be present in the laser safety area.

The laser safety area may only be entered by instructed and authorized persons. Appropriate protective measures must be taken.

If, for scenic reasons, it is necessary for persons to be present in the laser safety area, suitable protective measures must be taken to avoid dangers, e.g. spatially defined and marked positions.

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The geometrical boundaries of the laser safety area must be calculated or measured before commissioning.

Laser radiation may only extend as far as it is necessary for the type of use. As far as possible, the beam shall be limited at the end of the useful distance by a diffusely reflecting target surface in such a way that the risk of direct or diffuse reflections is as low as possible.

Uncontrolled reflected radiation from laser devices must be avoided; reflective or shiny objects or surfaces must be kept away from the scope of the laser beam as far as possible, removed or covered.

To protect against dangerous reflections, tools, accessories and adjustment devices used in the laser safety area should not have highly reflective surfaces. In addition, present persons should not visibly carry any highly reflective objects with them in the laser safety area.

The laser safety area must be safely separated from the spectator area, e.g. by a raised stage area (minimum height 0.8 meters) or grids. A safety distance of at least 1 meter must be provided laterally between the laser safety area and the spectator area. The distance from the lowest point of the spectator area to the top must be at least 2.70 meters.

If the laser system is used in mobile use, further special safety regulations must be observed:

2.7 Registration of a laser show

Any temporary laser show must be reported to the competent authority and requires a risk assessment by an expert. The nearest expert in Germany can be obtained from LPS laser systems. Phone +49 7473 271177.

If a laser show takes place outdoors, it must also be reported to air traffic control or the public order office.

Please check and comply with the regulations in force in your country.

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2.8 Operating Area

The operating area of the show laser must be located outside the laser safety area, and from there the entire laser safety area must be visible.

The operating area shall be accessible only to authorised persons.

The show laser must never be operated unattended!

During an event, no repairs or other operations such as new adjustments or corrections of the laser beams may be carried out on laser systems.

During a break of the current laser show, the beam must be interrupted or switched off as close to the laser as possible.

After changes that may affect the safety of the audience, e.g. change in the position of the laser device, a new risk assessment by a specialist is required.

The system must be protected against unauthorized activation or operation. If the system is not in operation, it must be ensured that the key for the "emergency off button" is removed and stored safely. Before removing the key, it must be checked whether the system is switched off.

2.9 Operating personnel

The laser show may only be done by a laser safety officer or a competent person. He/She must monitor the beam path during the show and switch off the device or interrupt the laser beam in the event of malfunctions on the device or unsafe operating conditions (pressing the "emergency off button”!).

The operator must ensure that authorised persons who use laser devices of classes 2 to 4, or who are in laser protection areas of laser devices of classes 3B or 4, have been instructed about the behavior to be observed. The operator must be aware that incorrect or careless handling of the laser system is a dangerous instrument that can lead to irreparable damage, especially to the eyes and skin. Therefore, the operation of the laser system is always associated with extreme caution and consistent compliance with safety regulations.

In the case of laser equipment used for demonstrations, displays, displays and representations of lighting effects, the operator must give instructions to authorised persons on how to keep accessible irradiation as low as possible. The authorized persons must follow these instructions.

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The employer must ensure that employees are informed at least once a year about the dangers of laser radiation and are familiarised with the safety equipment in place and with the necessary protective measures if a class 2 to 4 laser device is operated.

The employer may not employ young people in laser protection areas where class 3B or 4 laser equipment is operated. This does not apply to the employment of young people in age of over 16 years, if this is necessary to achieve their educational objective and their protection is guaranteed by the supervision of a competent person.

The employer must ensure that only authorized persons whose presence is required there are in the laser protection area.

2.10 Medical Care

If there is reason to believe that eye damage has been caused by laser radiation, the employer must ensure that the employee concerned visits an ophthalmologist immediately or, in the case of skin damage, a dermatologist.

2.11 Improper Use / Conduct in Incidents

This laser system must not be operated in private households, as there is hardly any possibility to demarcate and monitor laser protection areas. Furthermore, there is a risk that children play with the laser.

This laser must NOT be used if the device is not equipped with all the protective devices necessary for safe operation.

CAUTION!
If controls or adjusting devices other than those specified herein are used or other procedures are used, this may result in dangerous radiation exposure.

If the laser beam does not move automatically in the scanner path when the device is switched on, it must be taken out of operation immediately. Have the device checked by a technician from LPS-Lasersysteme.

Class 2 to 4 laser equipment shall be arranged to prevent unintentional radiation. Unintentional radiation occurs when laser radiation emits from the laser device without actuating the intended control devices, e.g. through defective insulation or interference pulses; or if it is not prevented that control devices can be operated unintentionally.

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3 Technical Specification

Laser source	Laser diodes (Pure Diode)
Operating voltage	100 V – 240 VAC
Voltage line frequency	50 Hz / 60 Hz
Operating current	1 A @ 230V / 2 A @ 115V
Power consumption	120 W @ 230V / 240W @ 115V
Cooling requirements	air-cooled
Protection class	1, protection ground
Operating temperature	5° - 40° C
Warm-up time	none
Total laser power	LPS Laser Array Beam Bar RGB, 3W 390mW combined each Lasermodule > 320mW RGB each output at aperture
Modulation	analogue modulation
Wavelength	LPS Laser Array Beam Bar RGB Each beam fitted with (x 8): 185mW red@638nm 120mW green@520nm 85mW blue@450nm
Dimension and weight	Weight: 10kg Dimensions (l x w x h): 100 x 16 x 18 cm with brackets Dimensions (l x w x h): 100 x 16 x 8 cm without brackets

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4 Overview

The overview will help you to find a better handle to the functions of the systems.

4.1 Housing, front view

1-8	**Laser output**
9-16	**LED output**
17	**Hanging bracket**

4.2 Beam Alignment

Outside Beam Alignment in X and Y axxis

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4.3 Housing back view

1	**DMX 5-pin IN / OUT**
2	**Key-Switch**
3	**E-Stop XLR 3-pin IN/OUT**
4	**Display and control buttons**
5	**PowerCon True 1 In/Out**
6	**Fuse**
7	**Power switch**
8	**Hanging bracket**
9	**Hanging or stand bracket**
10	**Safety eyelet**

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4.4 Emergency-Off Interlock In / Interlock Out (E-Stop XLR)

Connect the emergency stop switch to these 3-pin sockets (male/female).

Pin Assignment:

Pin No.	Name	Description
Pin 1	GND	GND
Pin 2	Vcc out	4.3 V Signal output
Pin 3	Return	Signal In

4.5 Key Switch

Use the key switch to activate and deactivate the laser system.
Only the lasers are switched. All other components installed in the laser system continue to function.

4.6 Power Switch

Use the power switch to turn the laser system on and off.
When the laser system is turned on, the light of the power is on.

4.7 How to start LPS-Laser Array Beam Bar

ONLY special trained persons are allowed to operate this device!

To emit laser output, the power switch and key switch must be ON and the E-Stop must be pulled. Only after starting this three technical specs, the laser emits.

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5 LED function

Menu	Secondary menu
DMX adress	DMX 512 001 – 512
Channel mode	11CH/43CH
Mode Select	DMX-512
	Master
	Slave1
	Slave2
Light mode	All
	Laser
	Led
	Random
Auto mode	Auto 0 – 12 Speed 0 – 9
Sound mode	Show 0 – 12
Sound sense	0 – 100
Back lights	On/Off
Auto Test	Testing
Running time	0 – 99999
Software version	Version
Default	Yes/No

5.1 DMX 512 Channel Introduction

1. 11CH / 43CH mode as following:

Channel	Value	Function
CH1	000-255	Master Dimmer 0% - 100%
CH2	000-007	Valid for individual control
	008-255	Red color brightness 0% - 100%
CH3	000-007	Valid for individual control
	008-255	Green color brightness 0% - 100%
CH4	000-007	Valid for individual control
	008-255	Blue color brightness 0% - 100%
CH5	000-255	LED on 0% - 100%
CH6	001-255	Laser strobe

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CH7	001-255	LED strobe
CH8	000-014	Off
	015-255	Laser color chase
	015-035	Laser color chase 1
	036-055	Laser color chase 2
	057-076	Laser color chase 3
	077-097	Laser color chase 4
	098-117	Laser color chase 5
	118-138	Laser color chase 6
	139-159	Laser color chase 7
	160-179	Laser color chase 8
	180-200	Laser color chase 9
	201-220	Laser color chase 10
	221-241	Laser color chase 11
	242-248	Laser color chase 12
	249-255	Random 1-12
CH9	001-255	Laser Speed (CH10)
CH10	000-014	LED off
	015-035	LED color chase 1
	036-055	LED color chase 2
	057-076	LED color chase 3
	077-097	LED color chase 4
	098-117	LED color chase 5
	118-138	LED color chase 6
	139-159	LED color chase 7
	160-179	LED color chase 8
	180-200	LED color chase 9
	201-220	LED color chase 10
	221-241	LED color chase 11
	242-248	LED color chase 12
	249-255	Random 1-12
CH11	001-255	LED speed (CH12)
CH12	001-255	R1 laser 0% - 100%
CH13	000-255	G1 laser 0% - 100%
CH14	000-255	B1 laser 0% - 100%
CH15	000-255	R2 laser 0% - 100%
CH16	000-255	G2 laser 0% - 100%
CH17	000-255	B2 laser 0% - 100%
CH18	000-255	R3 laser 0% - 100%

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CH19	000-255	G3 laser 0% - 100%
CH20	000-255	B3 laser 0% - 100%
CH21	000-255	R4 laser 0% - 100%
CH22	000-255	G4 laser 0% - 100%
CH23	000-255	B4 laser 0% - 100%
CH24	000-255	R5 laser 0% - 100%
CH25	000-255	G5 laser 0% - 100%
CH26	000-255	B5 laser 0% - 100%
CH27	000-255	R6 laser 0% - 100%
CH28	000-255	G6 laser 0% - 100%
CH29	000-255	B6 laser 0% - 100%
CH30	000-255	R7 laser 0% - 100%
CH31	000-255	G7 laser 0% - 100%
CH32	000-255	B7 laser 0% - 100%
CH33	000-255	R8 laser 0% - 100%
CH34	000-255	G8 laser 0% - 100%
CH35	000-255	B8 laser 0% - 100%
CH36	000-255	LED1 0% - 100%
CH37	000-255	LED2 0% - 100%
CH38	000-255	LED3 0% - 100%
CH39	000-255	LED4 0% - 100%
CH40	000-255	LED5 0% - 100%
CH41	000-255	LED6 0% - 100%
CH42	000-255	LED7 0% - 100%
CH43	000-255	LED8 0% - 100%

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6. Maintenance / Service

Service means all work inside the device and thus to open a service flap or lid. For this, the interlock has to be bridged. **ONLY specially trained specialist personnel or laser technicians from LPS-Laser are allowed to do this!**

If you are allowed to do the service, you must urgently consider the following points:

1. Make sure the complete laser system is de-energized. That means, the main plug is not connected to the power supply while installing or opening it.
2. Anything that could reflect (such as jewelry, …) has to be removed before.
3. Use only non-reflecting tools
4. Wear protective clothing like special laser goggles, gloves and so on.

Dust, fog fluid, etc. cause deposits on mirrors, which might evoke a substantial decrease in laser power. This applies to the mirrors inside the laser system as well as the glass pane. But also by open-air events, depending on the location, contamination in the laser system can occur.

Therefore a professional and periodic cleaning is essential!

LPS-Lasersysteme recommends a regular service, which should be implemented at least once a year by a technician or a trained person.
Even if, in addition to the prescribed service, you need further cleaning of the mirrors, this may only be done with special instruction! For this purpose, LPS-Lasersysteme has no liability!

Caution: ONLY specially trained specialist personnel or laser technicians from LPS-Laser are allowed to do this!

UNPLUG the show laser system before opening the device for cleaning!!!

Benefits:

- A complete professional check of the system by an expert can prevent minimum technical errors and / or attrition with large consequences.

- Due to inadequate cleaning of the fan and the heatsink, overheating and electronic defects may occur.

- By its completely closed optical area, a pollution is hardly possible, but still not excluded. Therefore, it should be checked during the regular cleaning of the electronics sector, whether and how dirty the optical area is.

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- For cleaning the electronic area, please remove the top plate of the laser system and remove all dust particles.
- For cleaning the optical and the laser area, please remove the top plate of the laser system.
- For cleaning, only manufacturer's recommended products should be used, because wrong cleaning supplies can damage the components and warranty voids.

7. Cleaning

To clean the housing:

Use a damp cloth without chemical cleaning agents. Water and / or glass cleaner are enough.

Disconnect all cables and make sure, that the device is cooled down.
Then remove dirt particles and dust by using a soft brush and cotton swab. Be careful when using compressed air or vacuum cleaners.

8. Questions?

If you have any question about this device, or if you are not sure, if or what you are allowed to do, it is better to contact us. Feel free to call us or send an email.

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