

**fun**generation

LaserDerby  
LED effect

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# 1 General information

This user manual contains important information on the safe operation of the device. Read and follow all safety notes and all instructions. Save this manual for future reference. Make sure that it is available to all persons using this device. If you sell the device to another user, be sure that they also receive this manual.

Our products and user manuals are subject to a process of continuous development. We therefore reserve the right to make changes without notice. Please refer to the latest version of the user manual which is ready for download under [www.thomann.de](http://www.thomann.de).

## 1.1 Further information

On our website ([www.thomann.de](http://www.thomann.de)) you will find lots of further information and details on the following points:

Download	This manual is also available as PDF file for you to download.
Keyword search	Use the search function in the electronic version to find the topics of interest for you quickly.
Online guides	Our online guides provide detailed information on technical basics and terms.
Personal consultation	For personal consultation please contact our technical hotline.
Service	If you have any problems with the device the customer service will gladly assist you.

## 1.2 Notational conventions

This manual uses the following notational conventions:

### Letterings

The letterings for connectors and controls are marked by square brackets and italics.

**Examples:** *[VOLUME]* control, *[Mono]* button.

### Displays

Texts and values displayed on the device are marked by quotation marks and italics.

**Examples:** *'24ch'*, *'OFF'*.

### Instructions

The individual steps of an instruction are numbered consecutively. The result of a step is indented and highlighted by an arrow.

#### Example:

1. ▶ Switch on the device.
2. ▶ Press *[Auto]*.
  - ⇒ Automatic operation is started.
3. ▶ Switch off the device.

## 1.3 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this manual.

Signal word	Meaning
<b>DANGER!</b>	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
<b>WARNING!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.
<b>NOTICE!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.
Warning signs	Type of danger
	Warning – high-voltage.
	Warning – laser radiation.

Warning signs	Type of danger
 A yellow triangular warning sign with a black border and a black sunburst symbol in the center, representing dangerous optical radiation.	Warning – dangerous optical radiation.
 A yellow triangular warning sign with a black border and a black symbol of a crane hook lifting a load, representing a suspended load.	Warning – suspended load.
 A yellow triangular warning sign with a black border and a black exclamation mark in the center, representing a general danger zone.	Warning – danger zone.

## 2 Safety instructions

### Intended use

This device is intended for use as an electronic lighting effect by means of LED technology and for the projection of laser light effects. The device is designed for professional use only and is not suitable for use in households. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

Extend the operating life of the device by regular breaks and by avoiding frequent switching on and off. The device is not suitable for continuous operation.

### **Laser safety basics**

It is based on DIN EN 60825-1: 2015. The corresponding accident prevention regulation of the professional association in Germany is BGV-B2.

This device uses a class-3R laser. It is equipped with a safety key and a connection for an external safety switch. Always remove the safety key when the device is not attended by a trained operator.

As an operator you are responsible for the safety of all persons present. Familiarize yourself with the laser safety regulations that apply in your country. To ensure safe operation, it is important to pay attention to the following instructions.

Prior to commissioning, the company/operator must appoint a qualified person as laser protection officer in writing and notify the operation of the laser equipment to the Accident Prevention and Insurance Association and to the authority responsible for occupational safety. In the event of public use, the complete laser equipment must be approved by an expert before use.

**Safety****DANGER!****Danger for children**

Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!

Ensure that children do not detach any small parts (e.g. knobs or the like) from the unit. They could swallow the pieces and choke!

Never let children unattended use electrical devices.

**DANGER!****Electric shock caused by high voltages inside**

Within the device there are areas where high voltages may be present. Never remove any covers.

There are no user-serviceable parts inside.

Do not use the device if covers, protectors or optical components are missing or damaged.



### **DANGER!**

#### **Electric shock caused by short-circuit**

Always use proper ready-made insulated mains cabling (power cord) with a protective contact plug. Do not modify the mains cable or the plug. Failure to do so could result in electric shock/death or fire. If in doubt, seek advice from a registered electrician.



### **DANGER!**

#### **Laser radiation – avoid exposure to beam**

The device uses a class-3R laser, classified according to EN 60825-1:2015. Do not look into the laser beam. The laser beam can injure your eyes when you directly look into it. Do not expose to the laser beam. The laser beam can cause skin burns.

In this context take extreme care when using converging optical instruments.



**WARNING!**

**Eye damage caused by high light intensity**

Never look directly into the light source.



**WARNING!**

**Risk of epileptic shock**

Strobe lighting can trigger seizures in photosensitive epilepsy. Sensitive persons should avoid looking at strobe lights.



**NOTICE!**

**Risk of fire**

Do not block areas of ventilation. Do not install the device near any direct heat source. Keep the device away from naked flames.



### **NOTICE!**

#### **Operating conditions**

This device has been designed for indoor use only. To prevent damage, never expose the device to any liquid or moisture. Avoid direct sunlight, heavy dirt, and strong vibrations.

Only operate the device within the ambient conditions specified in the chapter 'Technical specifications' of this user manual. Avoid heavy temperature fluctuations and do not switch the device on immediately after it was exposed to temperature fluctuations (for example after transport at low outside temperatures).

Dust and dirt inside can damage the unit. When operated in harmful ambient conditions (dust, smoke, nicotine, fog, etc.), the unit should be maintained by qualified service personnel at regular intervals to prevent overheating and other malfunction.



**NOTICE!**

**Power supply**

Before connecting the device, ensure that the input voltage (AC outlet) matches the voltage rating of the device and that the AC outlet is protected by a residual current circuit breaker. Failure to do so could result in damage to the device and possibly injure the user.

Unplug the device before electrical storms occur and when it is unused for long periods of time to reduce the risk of electric shock or fire.



**NOTICE!**

**Possible damage due to installation of a wrong fuse**

The use of different types of fuses can cause serious damage to the unit. Fire hazard!

Only fuses of the same type may be used.



### **NOTICE!**

#### **Possible staining**

The plasticiser contained in the rubber feet of this product may possibly react with the coating of your parquet, linoleum, laminate or PVC floor and after some time cause permanent dark stains.

In case of doubt, do not put the rubber feet directly on the floor, but use felt-pad floor protectors or a carpet.

### 3 Features

The device features a unique combination of laser and LED effects.

- Laser configuration:
  - Red (650 nm), 100 mW
  - Green (532 nm), 50 mW
- LED configuration
  - Derby effect: 4 LEDs (1 × red, 1 × green, 1 × blue, 1 × white), each 3 W
- Control via DMX (2 or 8 channels, depending on operation mode), buttons and display on the unit as well as the supplied remote control
- Preprogrammed automatic shows
- Sound control
- Stand-alone mode
- Strobe effect

For technological reasons, the light output of LEDs decreases over their lifetime. This effect increases with higher operating temperature. You can extend the service life of the illuminants by providing adequate ventilation and operating the LEDs with the lowest possible brightness.

## 4 Installation

Unpack and check carefully there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the product against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

You can install the device standing or hanging. When in use, the device must be mounted at a solid surface or clamped to an approved truss.

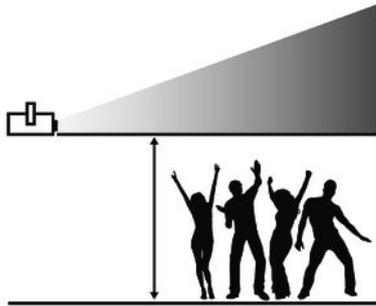
Work from a stable platform whenever you install or move the device or when you perform any kind of maintenance. Block access under the work area.

**Safety switch (emergency stop)**

Connect the external safety switch (not supplied) to the provided connection socket on the device. If you press the external switch, the laser beam will be switched off immediately.

Observe the safety instructions of the switch manufacturer and the regulations for the intended use.

## Minimum height



In order to meet the limits for maximum irradiation (MZB limit value for the non-hazardous irradiation of the eye or the skin with a laser), the device must be installed at a height of at least 2.7 m according to the BGV-B2 valid in Germany.

The determination of the MZB limit values depends on the specific environmental conditions in individual cases and must be carried out by the responsible laser protection representative on site, based on the applicable standard DIN EN 60825-1.



### **WARNING!**

#### **Risk of injury caused by falling objects**

Make sure that the installation complies with the standards and rules that apply in your country. Always secure the device with a secondary safety attachment, such as a safety cable or a safety chain.



**DANGER!**

Follow the instructions in the chapter titled "Safety Instructions" in the user manual.

To avoid laser emission, remove the safety key before you start to install the device.



**WARNING!**

**Stray laser radiation**

Inadequately secured additional components may cause stray laser radiation.

Make sure that all additional components are adequately secured.



### **NOTICE!**

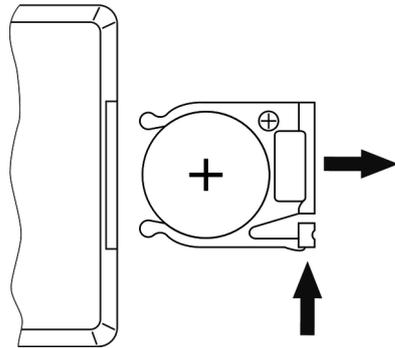
#### **Risk of overheating**

The distance between the light output and the illuminated surface must be more than 2.0 m (78.7 in).

Always ensure sufficient ventilation.

The ambient temperature must always be below 40 °C (104 °F).

### Inserting the battery into the remote control



Press the lock of the battery holder to the centre of the housing and pull out the battery holder like a drawer. Insert the battery. The battery is correct if the positive pole points to the housing base of the remote control. Slide the battery holder back into the remote until it clicks into place.

When shipping, the battery is already installed in the remote and protected against discharge by a transparent plastic foil. Remove the plastic foil prior to first use.



### **NOTICE!**

#### **Possible damage by leaking batteries**

Leaking batteries can cause permanent damage to the device.

Take batteries out of the device if it is not going to be used for a longer period.



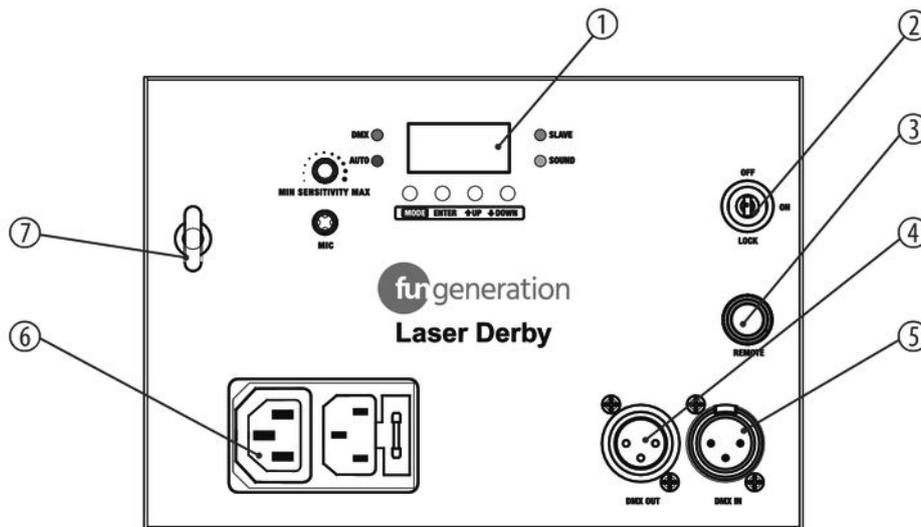
### **NOTICE!**

#### **Risk of fire due to incorrect polarity**

Incorrectly inserted batteries may destroy the device or the batteries.

Ensure that proper polarity is observed when inserting batteries.

## 5 Connections and controls



1 Display and control buttons:

*[MENU]*

Activates the main menu and toggles between menu items. Closes an opened submenu.

*[ENTER]*

Selects an option of the respective operating mode, confirms the set value.

*[UP]*

Increases the displayed value by one.

*[DOWN]*

Decreases the displayed value by one.

*[DMX]*

The LED indicates that a signal is present at the DMX input.

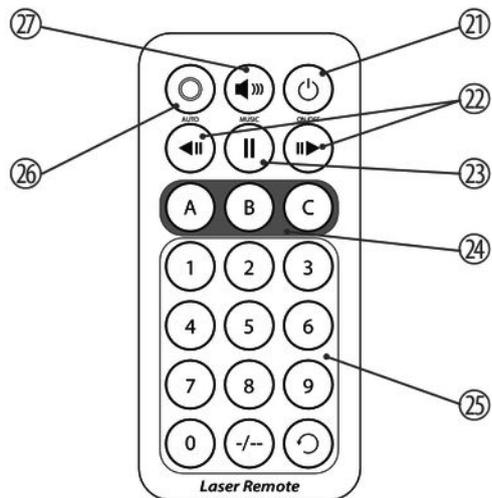
*[SOUND]*

The LED lights up when the built-in microphone for the sound control detects a signal.

	<i>[AUTO]</i> The LED lights up when an automatic show is running.
	<i>[SLAVE]</i> The LED indicates that the device is in 'Slave' mode.
	<i>[MIC]</i> Microphone for sound control
	<i>[SENSITIVITY MIN/MAX]</i> Controller for the sensitivity of the built-in microphone
2	<i>[LOCK]</i> Safety key switch: switches the laser output on or off.
3	<i>[REMOTE]</i> Connection for optional remote safety switch (emergency stop). An adapter for safety switches equipped with phone jacks is included in the delivery.
4	<i>[DMX OUT]</i> DMX output

5	<i>[DMX IN]</i> DMX input
6	Plug for mains cable with fuse holder
	<i>[POWER OUTPUT]</i> IEC chassis socket for the power supply of further devices
7	Safety cable eyelet.

Remote control



21	Main switch, turns the device on and off.
22	Colour change, forward or backward
23	Pause
24	<ul style="list-style-type: none"><li>■ A: Turns the derby effect of the four-colour LEDs on and off</li><li>■ B: Laser programme selection</li><li>■ C: Turns the stroboscope effect on and off</li></ul>
25	Numeric buttons to set the progress speed (0: slow, 9: fast)
26	Activates the 'Automatic' mode (playback of preprogrammed automatic shows)
27	Activates the 'Sound-control' mode (playback of sound-controlled automatic shows)

## 6 Operating

### 6.1 Switching the device on / off

#### Switching on

Perform the following steps to switch the device on:

1. ▶ Verify that all required laser safety precautions have been taken. Make sure that there is no one in the reach of the laser beam.
2. ▶ Connect an external safety switch to the *[REMOTE]* connection (e.g. an emergency stop button) or another equivalent device with protection function.
3. ▶ Insert the safety key into the lock.
4. ▶ If not already done, connect the device to the mains. After a few seconds, the fan and the motors start to work. The display shows the current operation mode. The device is now operational.
5. ▶ Turn the safety key to the 'ON' position to turn the laser beam on.

### Turning off

Perform the following steps to switch the device off:

1. ➤ Turn the safety key to the 'OFF' position to turn the laser beam off and remove the key. Keep the safety key under control.
2. ➤ Disconnect the device from the mains.

## 6.2 Main menu

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select one of the following menu items: 'Aut', 'Sou', 'CoL', 'dNH', 'SLA' or 'SYS'. Press *[ENTER]* to open the selected menu.

Change the currently displayed value with *[UP]* and *[DOWN]* and confirm all new values again with *[ENTER]*. To return to the main menu without making changes, press *[MENU]*.

All settings are saved, even if you disconnect the device from the power supply.

## Menu Auto

In this menu, you can select an automatic show that optionally controls the laser, the derby effect LEDs or a combination of both.

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the menu item 'Aut' and confirm with *[ENTER]*. Use *[UP]* and *[DOWN]* to select a show. To confirm and to set the programme speed, press *[ENTER]*. With *[UP]* and *[DOWN]* you can select a value between 'S.01' (slow) and 'S.99' (fast). Confirm with *[ENTER]*.

Show group	Elements used
'Aut1'	Laser and derby effect LEDs
'Aut2'	Derby effect LEDs
'Aut3'	Laser

### Menu sound

In this menu, you can select an automatic show that optionally controls the laser, the derby effect LEDs or a combination of both.

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the menu item 'Sou' and confirm with *[ENTER]*. Use *[UP]* and *[DOWN]* to select a show and confirm with *[ENTER]*.

Use the *[SENSITIVITY MIN/MAX]* control to set the sensitivity of the built-in microphone.

Show group	Elements used
'Sou1'	Laser and derby effect LEDs
'Sou2'	Derby effect LEDs
'Sou3'	Laser

## Menu colour

In this menu you can adjust the colour of the LEDs for the derby effect. In addition, a stroboscope effect can be activated for these LEDs.

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the menu item 'CoL' and confirm with *[ENTER]*.

Change the currently displayed parameter with *[UP]* and *[DOWN]* and confirm with *[ENTER]*. To return to the main menu without making changes, press *[MENU]*. To adjust the speed of the selected stroboscope effect, press *[ENTER]*. With *[UP]* and *[DOWN]* you can select a value between 'F.00' (no stroboscope effect) and 'F.99' (fast).

Parameter	Meaning
'r000' ... 'r255'	Intensity red
'G000' ... 'G255'	Intensity green
'b000' ... 'b255'	Intensity blue
'U000' ... 'U255'	Intensity white

## Operating mode DMX

In this mode the device is controlled via a DMX controller.

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the menu item 'dNH' and confirm with *[ENTER]*.

The display shows 'd001'; press *[ENTER]*. Use *[UP]* and *[DOWN]* to select a DMX mode: 2-channel ('2Ch') or 8-channel ('8Ch') and confirm with *[ENTER]*. Now you can set the number of the first DMX channel to be used by the device (DMX address). Use *[UP]* and *[DOWN]* to select a value between 1 and 512 (the display shows '001' ... '512'). Confirm with *[ENTER]*.

Make sure that this number matches the configuration of your DMX controller. The following table shows the highest possible DMX address for the various DMX modes.

Mode	Highest possible DMX address
2-channel	511
8-channel	515

To return to the main menu without making changes, press *[MENU]*.

## Operating mode SLAVE

In this mode, the device exactly follows the operation of the master that it is connected to.

Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the menu item 'SLA' and confirm with *[ENTER]*.

The display shows 'SLAV', the unit is now in Slave mode. When the display flashes, no master is connected.

To return to the main menu without making changes, or to change back to an active operating mode, press *[MENU]*.

### Menu system

In this menu, you can adjust various device settings.

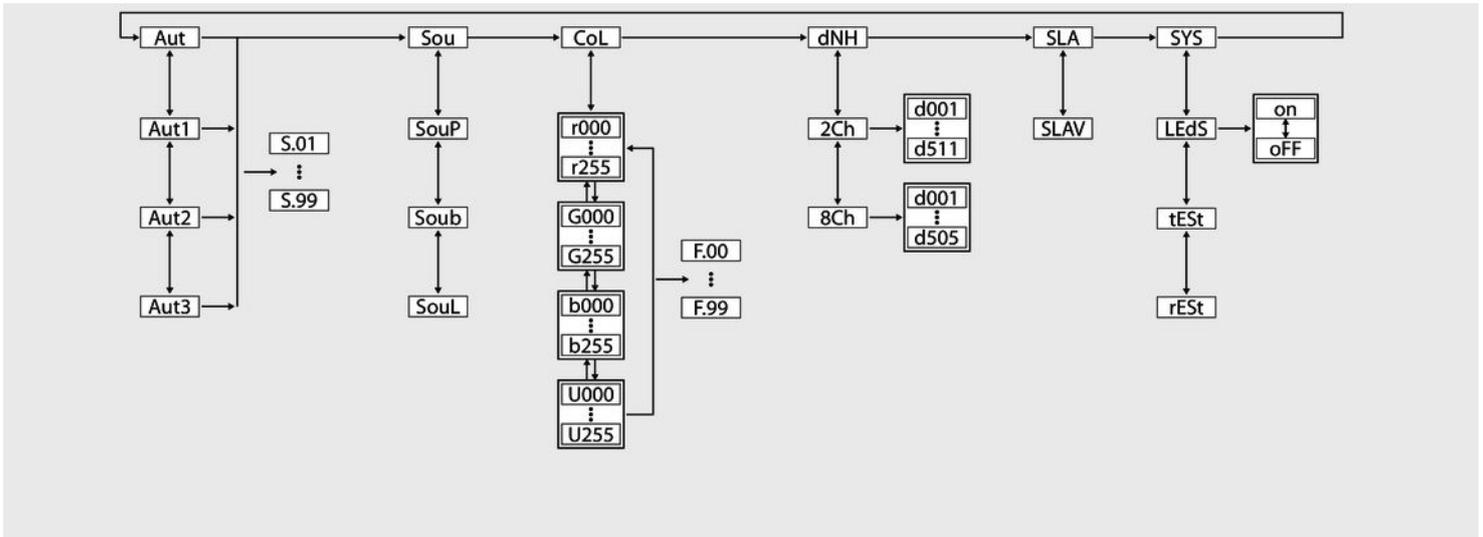
Press *[MENU]* to open the main menu.

Press repeatedly *[MENU]* or *[UP]* and *[DOWN]* to select the 'SYS' menu and confirm with *[ENTER]*.

Change the currently displayed parameter with *[UP]* and *[DOWN]* and confirm with *[ENTER]*. To return to the main menu without making changes, press *[MENU]*.

Parameter	Meaning	Value range
'LEdS'	Automatic display blackout	ON, OFF
'tESt'	Starts a self-test. To stop it, press <i>[MENU]</i>	
'rESt'	Reset to factory defaults.	

### 6.3 Menu overview



## 6.4 Functions in 2-channel DMX mode

Channel	Value	Function
1	Selecting a preprogrammed automatic show	
	0...5	Blackout
	6...90	Derby effect and laser show
	91...173	Derby effect
	174...255	Laser show
2	0...250	Progress speed of the selected show, slow to fast
	251...255	Sound control for the selected show.

## 6.5 Functions in 8-channel DMX mode

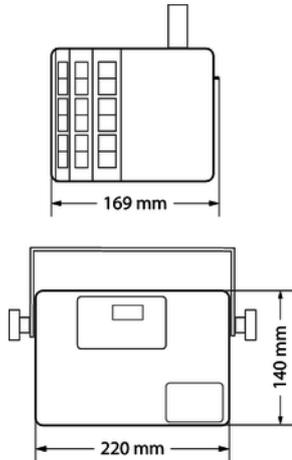
Channel	Value	Function
1	Selecting an operating mode or a preprogrammed automatic show	
	0...5	No automatic show, settings via channels 2 to 8
	6...90	Derby effect and laser show
	91...173	Derby effect
	174...255	Laser show
2	0...250	Progress speed of the selected show, slow to fast
	251...255	Sound control for the selected show.
3	Derby effect, if channel 1 = 0...5	
	0...5	Without function
	6...20	Red
	21...35	Green

Channel	Value	Function
	36...50	Blue
	51...65	White
	66...80	Red + green
	81...95	Red + blue
	96...110	Red + white
	111...125	Green + blue
	126...140	Green + white
	141...155	Blue + white
	156...170	Red + green + blue
	171...185	Red + green + white
	186...200	Green + blue + white
	201...215	Red + green + blue + white
	216...230	Automatic colour change (4 colours)

Channel	Value	Function
	231...255	Automatic colour change (7 colours)
4	Strobe effect (derby LEDs)	
	0...5	Strobe effect off
	6...255	Strobe effect, increasing speed
5	Motor (derby LEDs)	
	0...5	Without function
	6...127	Fixed, adjustable position
	128...255	Rotation speed
6	Laser	
	0...5	Laser off (blackout)
	6...47	Red
	48...89	Green
	90...131	Red + green

Channel	Value	Function
	132...172	Red + green strobe effect, if channel 7= 6...255
	173...214	Green + red strobe effect, if channel 7= 6...255
	215...255	Green strobe effect + red, if channel 7= 6...255
7	Strobe effect (laser)	
	0...5	No strobe effect
	6...250	Strobe effect, increasing speed
	251...255	Sound-controlled strobe effect
8	Rotation of laser projection axis	
	0	No rotation
	1...127	Clockwise rotation, speed increasing
	128	No rotation
	129...255	Counter-clockwise rotation, speed increasing

## 7 Technical specifications



Laser medium	Red: 650 nm (typical)	
	Green: 532 nm (typical)	
Laser power	Red: 100 mW	
	Green: 50 mW	
Laser classification acc. to DIN EN 60825-1:2015	3R	
Light source	Derby effect: 4 LEDs (1 × red, 1 × green, 1 × blue, 1 × white), each 3 W	
Input connections	Power supply	IEC chassis plug C14
	DMX control	XLR chassis socket, 3-pin
Output connections	Power supply of further devices	IEC chassis plug C13
	DMX control	XLR chassis socket, 3-pin

Number of DMX channels	2 or 8	
Power consumption	25 W	
Supply voltage	100 – 240 V ~ 50/60 Hz	
Fuse	5 mm × 20 mm, 1 A, 250 V, slow-blow	
Degree of protection	IP20	
Mounting options	Hanging, standing	
Dimensions (W × H × D)	220 mm × 140 mm × 169 mm	
Weight	1.7 kg	
Ambient conditions	Temperature range	0 °C...40 °C
	Relative humidity	50 %, non-condensing

**Further information**

Similar design	Combined device
DMX control	Yes
Master/Slave	Yes
Remote control	included
Sound control	Yes
Display	Yes

## 8 Plug and connection assignments

### Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment so that a perfect light experience is guaranteed.

Please take our tips, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into a socket, the result of an incorrect connection may be a destroyed DMX controller, a short circuit or 'just' a not working light show!

### DMX connections

The unit offers a 3-pin XLR socket for DMX output and a 3-pin XLR plug for DMX input. Please refer to the drawing and table below for the pin assignment of a suitable XLR plug.



Pin	Configuration
1	Ground, shielding
2	Signal inverted (DMX-, 'cold signal')
3	Signal (DMX+, 'hot signal')

## 9 Troubleshooting



### **NOTICE!**

#### **Possible data transmission errors**

For error-free operation make use of dedicated DMX cables and do not use ordinary microphone cables.

Never connect the DMX input or output to audio devices such as mixers or amplifiers.

In the following we list a few common problems that may occur during operation. We give you some suggestions for easy troubleshooting:

Symptom	Remedy
The unit does not work, no light	1. Check the mains connection and the main fuse.
	2. Check the safety key switch.
	3. Check the external safety switch (e.g., emergency stop button).
No response to the DMX controller	1. If the display shows a flashing number, for example '001', no DMX signal is being received. Check the DMX connectors and cables for proper connection.
	2. Check whether the DMX cables run near or parallel to high-voltage cables that may cause damage or interference to a DMX interface circuit.
	3. Try using another DMX controller.
No response to the remote control	1. Try using the remote control at a different angle to the IR sensor on the front panel of the device.
	2. Check the remote control battery.

If the procedures recommended above do not succeed, please contact our Service Center. You can find the contact information at [www.thomann.de](http://www.thomann.de).

## 10 Cleaning



### **DANGER!**

#### **Laser radiation**

When cleaning, observe the instructions in the 'Safety instructions' chapter of this manual.

To avoid laser emission, remove the safety key before you start to clean the device.

### **Optical lenses**

Clean the optical lenses, that are accessible from the outside, regularly in order to optimize the light output. The frequency of cleaning depends on the operating environment: wet, smoky or particularly dirty surroundings can cause more accumulation of dirt on the optics of the device.

- Clean with a soft cloth using our lamp and lens cleaner (item no. 280122).
- Always dry the parts carefully.

### **Fan grids**

The fan grids of the device must be cleaned of any contamination, such as dust, etc. on a regular basis. Before cleaning, switch off the device and disconnect mains-operated devices from the mains. Only use pH-neutral, solvent-free and non-abrasive cleaning agents. Clean the unit with a slightly damp lint-free cloth.

## 11 Protecting the environment

### Disposal of the packaging material



For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose of these materials with your normal household waste, but make sure that they are fed to a recovery. Please follow the notes and markings on the packaging.

### Disposal of batteries



Batteries must not be disposed of as domestic waste or thrown into fire. Dispose of the batteries according to national or local regulations regarding hazardous waste. To protect the environment, dispose of empty batteries at your retail store or at appropriate collection sites.

### Disposal of your old device



This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) in its currently valid version. Do not dispose with your normal household waste.

Dispose this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.







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