



  
STARVILLE

MH-X20 Micro LED  
Spot  
moving head

Musikhaus Thomann e.K.

Treppendorf 30

96138 Burgebrach

Germany

Telephone: +49 (0) 9546 9223-0

E-mail: [info@thomann.de](mailto:info@thomann.de)

Internet: [www.thomann.de](http://www.thomann.de)

19.07.2013

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# 1 General notes





This user manual contains important information on 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, include the manual for the next owner.

Our products are subject to a process of continuous development. We therefore reserve the right to make changes without notice.

## **Symbols and signal words**

This section provides an overview of the symbols and signal words used in this user 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>CAUTION!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in minor 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 – hot surface.
	Warning – suspended load.
	Warning – danger zone.

## 2 Safety instructions

### Intended use

This device is intended to be used as moving-head spotlight. 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.

### 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.



**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.



**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.



**WARNING!**

**Risk of burns**

The surface of the device can become very hot during operation.

Do not touch the device with bare hands during operation, and after switching off wait for at least 15 minutes.

**CAUTION!****Risk of injury due to movements of the device**

The head of the device can move quickly (pan, tilt) and can produce very bright light. This is also valid immediately after you turn on the device, when the device operates in automatic mode or under remote control and when you turn off a DMX controller that is connected to the device. Persons staying near the device could be injured or frightened.

Before you turn on the device and during the operation, always ensure that nobody stays close to the device. If work has to be performed in the area of movement or in the near vicinity of the device, it must remain turned off.

**NOTICE!****Risk of fire**

Do not cover the device nor any ventilation slots. Do not place 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.



### **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.

## 3 Features

This Moving Head is specially suited for professional lighting, e.g. at events, on rock stages, in theatres, musicals or discos.

Special features of the device:

- Two moving axes with 8 or 16 bit resolution:
  - Tilt (270 °)
  - Pan (540 °)
- Control via DMX (six or eleven channels) as well as via buttons and display on the unit
- Preprogrammed automatic shows
- Sound control
- Master / slave mode
- Colour wheel with white, seven full colours and rainbow effect
- Gobo wheel with seven gobos
- Electronic dimmer
- Shutter frequency: 0...10 Hz

## 4 Installation

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



### **WARNING!**

#### **Risk of injury by falling off**

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.

The carrying capacity of the truss or other mounting must be sufficient for the intended number of devices. Note that the movement of the head may additionally stress the load-bearing structures.

**CAUTION!****Risk of injury due to movements of the device**

The head of the device can move quickly (pan, tilt) and can produce very bright light. This is also valid immediately after you turn on the device, when the device operates in automatic mode or under remote control and when you turn off a DMX controller that is connected to the device. Persons staying near the device could be injured or frightened.

Before you turn on the device and during the operation, always ensure that nobody stays close to the device. If work has to be performed in the area of movement or in the near vicinity of the device, it must remain turned off.

**NOTICE!****Risk of overheating**

Always ensure sufficient ventilation.

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



### **NOTICE!**

#### **Possible damage caused by movements of the device**

Always ensure that enough space is free around the device for the movements of the head (pan, tilt).



### **NOTICE!**

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

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

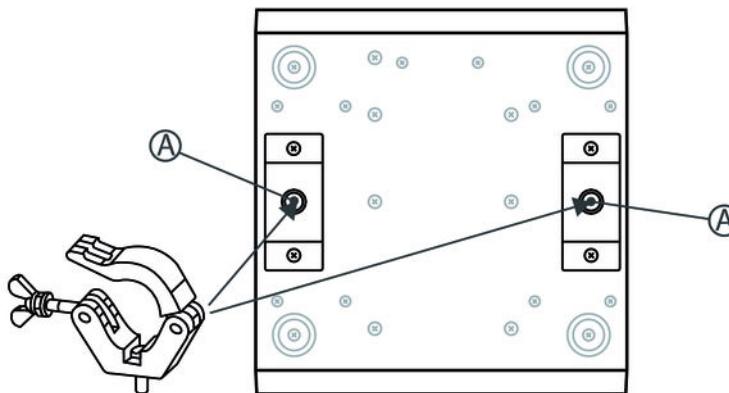
Never connect the DMX input or output to audio devices such as mixers or amplifiers.



## Installation options

You can install the device on the wall, the ceiling or on the floor.

Use the threads on the bottom panel for secure attachment of a mounting bracket or truss clamps, as shown in the following figure.



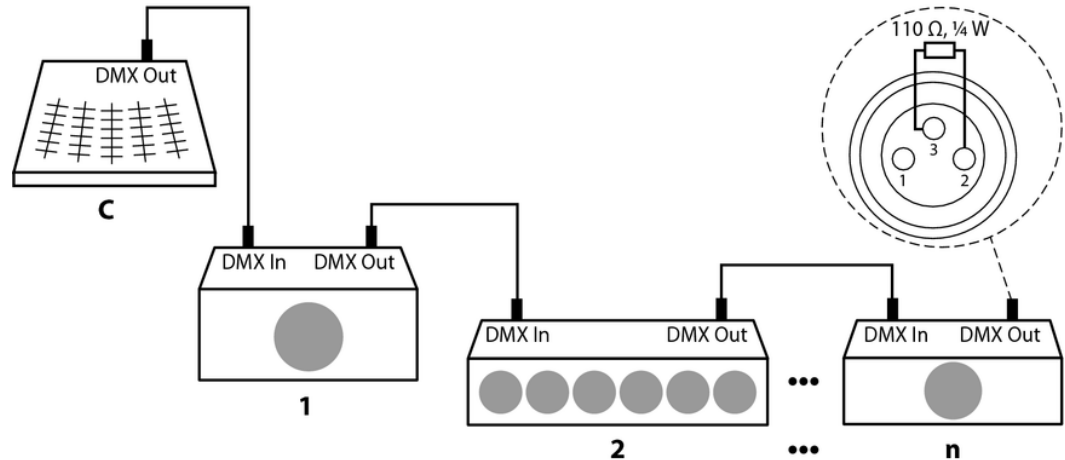
A Threads for mounting bracket or truss clamps

## 5 Starting up

Establish all connections as long as the unit is switched off. Use the shortest possible high-quality cables for all connections.

**Connections in DMX mode**

Connect the DMX input of the device to the DMX output of a DMX controller or another DMX device. Connect the output of the first DMX device to the input of the second one, and so on to form a daisy chain. Always ensure that the output of the last DMX device in the daisy chain is terminated with a resistor ( $110\ \Omega$ ,  $\frac{1}{4}\text{ W}$ ).



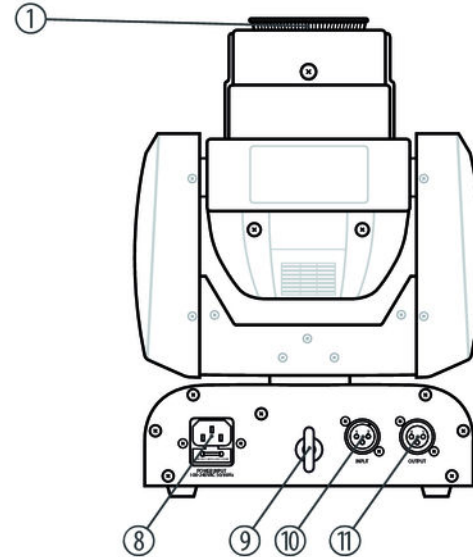
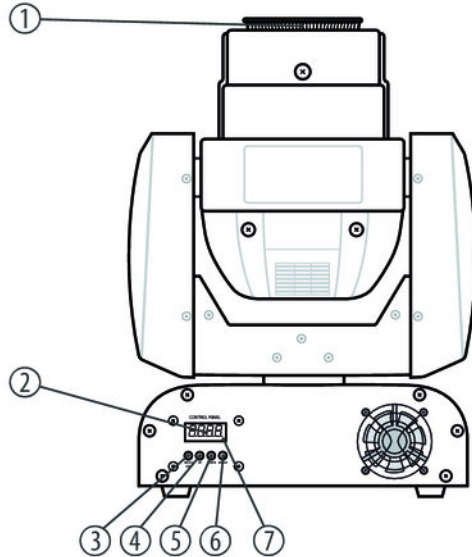
### **DMX indicator**

If the device and the DMX controller are in operation, the DMX indicator shows an incoming DMX signal at the input.

### **Connections in master/slave mode**

When you configure a group of devices in master/slave mode, the first unit will control the other units for an automatic, sound-activated, synchronized show. This function is ideal when you want to start a show immediately. Connect the DMX output of the master device to the DMX input of the first slave device. Then connect the DMX output of the first slave device to the DMX input of the second slave device and so on.

## 6 Connections and operating elements



MH-X20 Micro LED Spot

1	Light aperture with projection lens (manual focussing).
2	<b>CONTROL PANEL</b> Display.
3	<i>[MODE/ESC]</i> button Activates the main menu and the settings menu and switches between menu items. Closes an open submenu without saving the changes.
4	<i>[UP]</i> button Increases the displayed value by one.
5	<i>[DOWN]</i> button Decreases the displayed value by one.
6	<i>[ENTER]</i> button Selects an option of the respective operating mode, confirms the set value.
7	DMX indicator.

8	<b>POWER</b> IEC chassis connector with fuse holder.
9	Safety eye.
10	<b>INPUT</b> DMX input.
11	<b>OUTPUT</b> DMX output.

## 7 Operating

### 7.1 Starting the device



#### **CAUTION!**

#### **Risk of injury due to movements of the device**

The head of the device can move quickly (pan, tilt) and can produce very bright light. This is also valid immediately after you turn on the device, when the device operates in automatic mode or under remote control and when you turn off a DMX controller that is connected to the device. Persons staying near the device could be injured or frightened.

Before you turn on the device and during the operation, always ensure that nobody stays close to the device. If work has to be performed in the area of movement or in the near vicinity of the device, it must remain turned off.

Connect the device to the power grid to start operation. After a few seconds, the fans start to work and the head moves to the pan (rotation) and tilt (inclination) home position. After some more seconds the display shows 'd001'. Now the device is operational.



## 7.2 Main menu

Press *[MODE/ESC]* to activate the main menu. Press *[MODE/ESC]* again to select a main menu item.

Use *[UP]* and *[DOWN]* to change the respectively indicated value. When the display shows the desired value, press *[ENTER]*. To return to the main menu without any changes, either press *[MODE/ESC]* or wait a minute.

If you don't press any button for about one minute, the display turns dark. Then press *[MODE/ESC]* briefly to turn it on again.

All previous settings are saved, even if you turn the device off and disconnect it from the mains. To restart with default values, use the 'LoAd' function (☞ 'Loading default values' on page 31).

### DMX address

Press *[MODE/ESC]* repeatedly until the display shows 'dxxx'. 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.

When the display shows the desired value, press *[ENTER]* to confirm the setting, and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

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
6 channels	507
11 channels	502

**Operating mode 'Auto-Show'**

Press *[MODE/ESC]* repeatedly until the display shows 'NASL', 'NAFA', 'NSt5' or 'SLAv'. Now use *[UP]* and *[DOWN]* to select one of the preprogrammed shows. Press *[ENTER]* to start operation in the selected operating mode.

Display with open menu	Display after confirmation by <i>[ENTER]</i>	Operating mode
'NASL'	'SLoU'	Automatic show type 1 (slow), in stand-alone mode or as Master in Master/Slave operation
'NAFA'	'FASt'	Automatic show type 2 (fast), in stand-alone mode or as Master in Master/Slave operation

Display with open menu	Display after confirmation by [ENTER]	Operating mode
'NSt5'	'SrUn'	Sound-controlled show in stand-alone mode or as Master in Master/Slave operation
'SLAv'	'Son'	The unit works as Slave and copies the Master's performance

## Pan inversion

Press [MODE/ESC] repeatedly until the display shows 'PAN' or 'rPAN'. Now use [UP] and [DOWN] to toggle between 'rPAN' (inverse rotational direction) and 'PAN' (normal rotational direction).

When the display shows the desired value, press [ENTER] to confirm the setting and then [MODE/ESC] to proceed to the next menu item. To switch the menu item without changes, press [MODE/ESC] or wait a minute.

**Tilt inversion**

Press *[MODE/ESC]* repeatedly until the display shows 'tiL' or 'rtiL'. Now use *[UP]* and *[DOWN]* to toggle between 'rtit' (inverse direction of inclination) and 'tit' (normal direction of inclination).

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

**Display reversal**

Press *[MODE/ESC]* repeatedly until the display shows 'diS' or 'rdis'. Now use *[UP]* and *[DOWN]* to toggle between 'rdis' (display text is shown upside down) and 'dis' (display text is shown normally).

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

**DMX mode**

Press *[MODE/ESC]* repeatedly until the display shows '6CH' or '11CH'. Now use *[UP]* and *[DOWN]* to select one of the following DMX operating modes: 11 channel (display shows '11-CH') or 6 channel (display shows '6-CH'). This setting is only relevant if the device is controlled via DMX.

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

### **Pan range**

Press *[MODE/ESC]* repeatedly until the display shows 'PAxx'. Now use *[UP]* and *[DOWN]* to determine the Pan range. Choose between 'PA54' (Pan range = 540°), 'PA36' (Pan range = 360°) and 'PA18' (Pan range = 180°).

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

### **Tilt range**

Press *[MODE/ESC]* repeatedly until the display shows 'tixx'. Now use *[UP]* and *[DOWN]* to determine the Tilt range. Choose between 'ti27' (Tilt range = 270°), 'ti18' (Tilt range = 180°) and 'ti 9' (Tilt range = 90°).

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

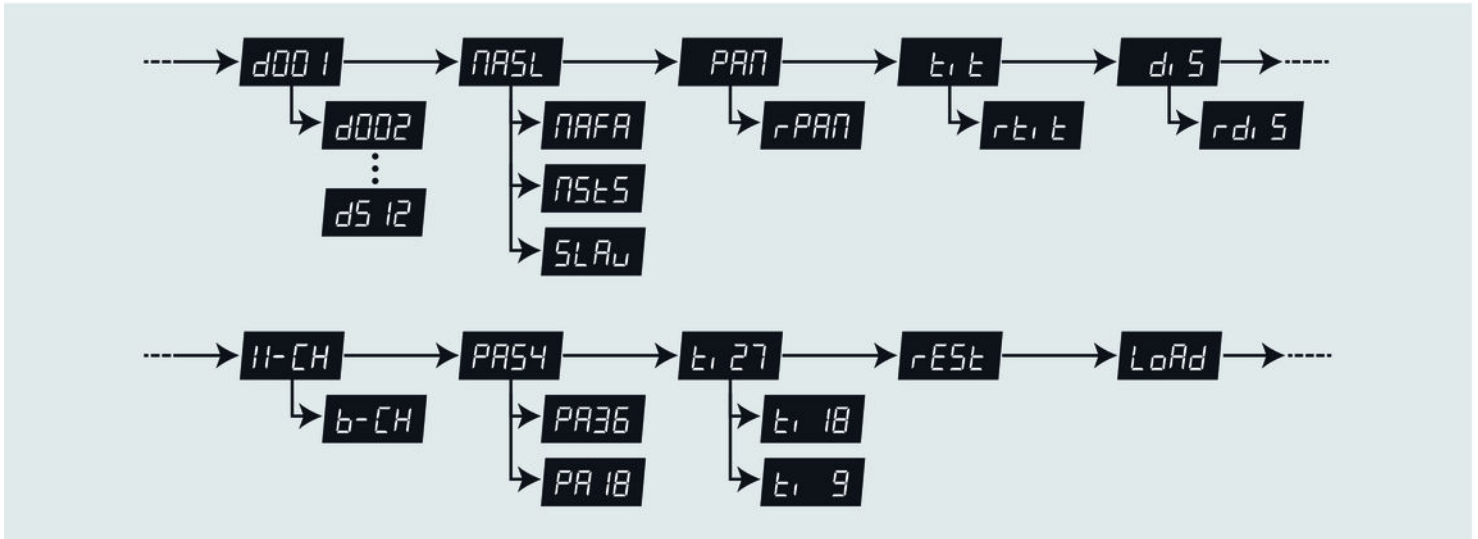
### **System reset**

Press *[MODE/ESC]* repeatedly until the display shows 'rESt'. Press *[ENTER]* to reset the servomotors for the moving axes, the Gobo wheel and the colour wheel to their home positions (mechanic reset).

**Loading default values**

Press *[MODE/ESC]* repeatedly until the display shows 'LoAd'. Press *[ENTER]* to reset all values that can be adjusted in the main menu to their defaults.

Overview (main menu)





## 7.3 Settings menu

Press *[MODE/ESC]* for about five seconds to activate the settings menu. Use *[UP]* and *[DOWN]* to enter the password 2323. Use the *[UP]* button to change the digit on the cursor position, the *[DOWN]* button moves the cursor to the next position. Press *[ENTER]* when all digits have been entered.

Press *[MODE/ESC]* for about five seconds to quit the settings menu and return to the main menu.

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



*For those values that can be adjusted in the settings menu, there's no reset function available.*

### **Rotation preset (pan offset)**

Activate the settings menu. Press *[MODE/ESC]* repeatedly until the display shows 'Pxxx'. Use the *[UP]* and *[DOWN]* buttons to enter a value between 0 and 255 until the head has moved into the desired home position.

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

### **Inclination preset (tilt offset)**

Activate the settings menu. Press *[MODE/ESC]* repeatedly until the display shows 'txxx'. Use the *[UP]* and *[DOWN]* buttons to enter a value between 0 and 255 until the head has moved into the desired home position.

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

### **Gobo wheel preset**

Activate the settings menu. Press *[MODE/ESC]* repeatedly until the display shows 'Gxxx'. Use the *[UP]* and *[DOWN]* buttons to enter a value between 0 and 255 until the Gobo wheel has moved into the desired home position.

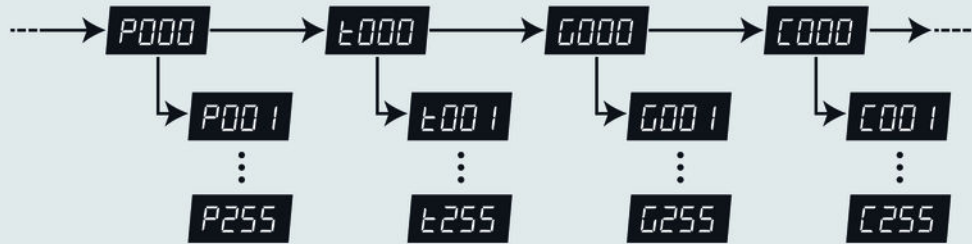
When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

**Colour wheel preset**

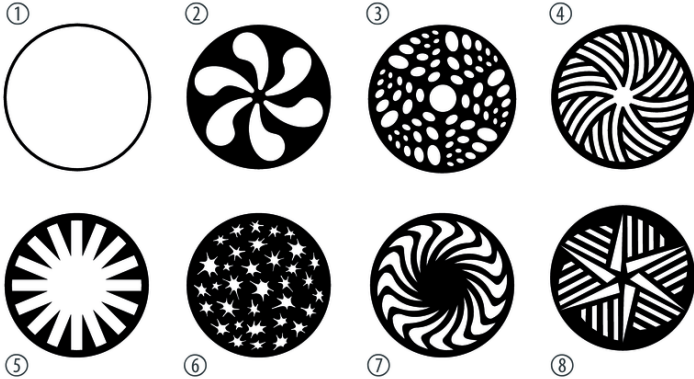
Activate the settings menu. Press *[MODE/ESC]* repeatedly until the display shows 'Cxxx'. Use the *[UP]* and *[DOWN]* buttons to enter a value between 0 and 255 until the Colour wheel has moved into the desired home position.

When the display shows the desired value, press *[ENTER]* to confirm the setting and then *[MODE/ESC]* to proceed to the next menu item. To switch the menu item without changes, press *[MODE/ESC]* or wait a minute.

Overview (settings menu)



### 7.4 Gobos



## 7.5 Functions in 6 channel DMX mode

Channel	Value	Function
1	0...255	Rotation (pan) (0° to maximum Pan range value: 180°, 270° or 540°)
2	0...255	Inclination (tilt) (0° to maximum Tilt range value: 90°, 180° or 270°)
3	Colour wheel	
	0...15	White
	16...31	Yellow
	32...47	Pink
	48...63	Green
	64...79	Red
	80...95	Light blue
	96...111	Orange
	112...127	Blue

Channel	Value	Function
	128...191	Rainbow effect clockwise, increasing speed
	192...255	Rainbow effect counter-clockwise, increasing speed
4	Shutter	
	0...3	Closed (blackout)
	4...7	Open
	8...76	Strobe light, increasing speed
	77...145	Triple strobe light, increasing speed
	146...215	Strobe light, increasing speed
	216...255	Open
5	0...255	Dimmer (0 to 100 %)
6	Gobo wheel	
	0...7	Open
	8...15	Gobo 2

Channel	Value	Function
	16...23	Gobo 3
	24...31	Gobo 4
	32...39	Gobo 5
	40...47	Gobo 6
	48...55	Gobo 7
	56...63	Gobo 8
	64...71	Gobo 8 shake, increasing speed
	72...79	Gobo 7 shake, increasing speed
	80...87	Gobo 6 shake, increasing speed
	88...95	Gobo 5 shake, increasing speed
	96...103	Gobo 4 shake, increasing speed
	104...111	Gobo 3 shake, increasing speed
	112...119	Gobo 2 shake, increasing speed



Channel	Value	Function
	120...127	Open
	128...191	Rainbow effect clockwise, increasing speed
	192...255	Rainbow effect counter-clockwise, increasing speed

## 7.6 Functions in 11 channel DMX mode

Channel	Value	Function
1	0...255	Rotation (pan) (0° to maximum Pan range value: 180°, 270° or 540°)
2	0...255	Inclination (tilt) (0° to maximum Tilt range value: 90°, 180° or 270°)
3	0...255	Fine adjustment of rotation (pan)
4	0...255	Fine adjustment of inclination (tilt)
5	0...255	Pan / Tilt movement speed, fast to slow

Channel	Value	Function
6	Colour wheel	
	0...15	White
	16...31	Yellow
	32...47	Pink
	48...63	Green
	64...79	Red
	80...95	Light blue
	96...111	Orange
	112...127	Blue
	128...191	Rainbow effect clockwise, increasing speed
	192...255	Rainbow effect counter-clockwise, increasing speed
7	Shutter	
	0...3	Closed (blackout)

Channel	Value	Function
	4...7	Open
	8...76	Strobe light, increasing speed
	77...145	Triple strobe light, increasing speed
	146...215	Strobe light, increasing speed
	216...255	Open
8	0...255	Dimmer (0 to 100 %)
9	Gobo wheel	
	0...7	Open
	8...15	Gobo 2
	16...23	Gobo 3
	24...31	Gobo 4
	32...39	Gobo 5
	40...47	Gobo 6

Channel	Value	Function
	48...55	Gobo 7
	56...63	Gobo 8
	64...71	Gobo 8 shake, increasing speed
	72...79	Gobo 7 shake, increasing speed
	80...87	Gobo 6 shake, increasing speed
	88...95	Gobo 5 shake, increasing speed
	96...103	Gobo 4 shake, increasing speed
	104...111	Gobo 3 shake, increasing speed
	112...119	Gobo 2 shake, increasing speed
	120...127	Open
	128...191	Rainbow effect clockwise, increasing speed
	192...255	Rainbow effect counter-clockwise, increasing speed
10	Special functions	

Channel	Value	Function
	0...7	Unused
	8...27	Blackout during Pan or Tilt movement
	28...47	Blackout during Gobo wheel movement
	48...67	Blackout during Pan, Tilt or Gobo wheel movement
	68...87	Blackout during colour wheel movement
	88...107	Blackout during Pan, Tilt or Colour wheel movement
	108...127	Blackout during Gobo or Colour wheel movement
	128...147	Blackout during Pan or Tilt movement, or Gobo or Colour wheel movement
	148...167	Pan reset
	168...187	Tilt reset
	188...207	Colour wheel reset
	208...227	Gobo wheel reset
	228...247	All channels reset

Channel	Value	Function
	248...255	Unused
11	Built-in programmes	
	0...7	Unused
	8...23	Programme 1
	24...39	Programme 2
	40...55	Programme 3
	56...71	Programme 4
	72...87	Programme 5
	88...103	Programme 6
	104...119	Programme 7
	120...135	Programme 8
	136...151	Sound-control 1
	152...167	Sound-control 2

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Channel	Value	Function
	168...183	Sound-control 3
	184...199	Sound-control 4
	200...215	Sound-control 5
	216...231	Sound-control 6
	232...247	Sound-control 7
	248...255	Sound-control 8

## 8 Technical specifications

Number of DMX channels	6, 11
LED	xTreme PX, 10 W, white
Light flux (1 m distance)	9.800 lm
Dispersion angle	13 °
Operating supply voltage	AC 230 V ~ , 50 Hz
Power consumption	40 W
Fuse	5 mm × 20 mm, 2 A, 250 V, fast acting
Dimensions (W × D × H), when beam is pointing upwards	200 mm × 210 mm × 290 mm
Weight	4.2 kg



# 9 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')

## 10 Cleaning

### Optical lenses

Clean the exterior of accessible optical lenses periodically to optimise 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 normal glass cleaning products.
- Always dry the parts carefully.

### Fan grids

The fan grids of the device must be cleaned on a regular basis to remove dust and dirt. Before cleaning, switch off the device and disconnect AC-powered devices from the mains. Use a lint-free damp cloth for cleaning. Never use solvents or alcohol for cleaning.

## 11 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, the fan does not run	Check the mains power connection and the main fuse.
No response to the DMX controller	<ol style="list-style-type: none"><li>1. The DMX indicator should light up. If it doesn't, check DMX connectors and cables for proper connection.</li><li>2. If the DMX indicator lights up but with no response, check the address settings and DMX polarity.</li><li>3. Try using another DMX controller.</li><li>4. Check whether the DMX cables lie near or adjacent to high voltage cables, which could cause damage or interference with a DMX interface circuit.</li></ol>

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).

## 12 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 collected for recycling. Please follow the notes and markings on the packaging.

### Disposal of your old device



This device is subject to the European directive 2002/96/EC.

Do not dispose of the device with your normal household waste.

Dispose of 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.





