

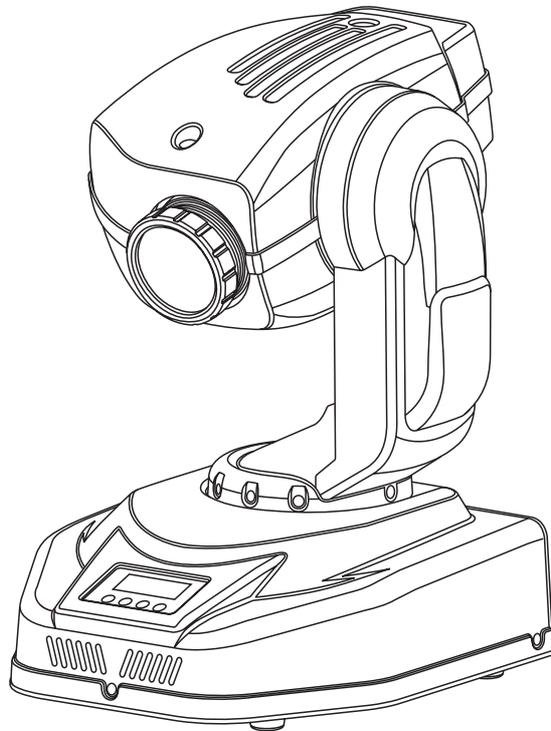
# Futurelight®

LIGHTING SYSTEMS MADE IN EUROPE

USER MANUAL

# MH - 460

# Spotlight



Version 1.0

Keep this manual for future needs!



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# MH - 460 Spotlight

## User manual

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**CAUTION!**  
Keep this device away from rain and moisture!  
Unplug mains lead before opening the housing!



**FOR YOUR OWN SAFETY, PLEASE READ THIS USER MANUAL CAREFULLY  
BEFORE YOU INITIAL START - UP!**

## Introduction

Thank you for having chosen a FUTURELIGHT MH-460. You acquired a versatile, powerful and intelligent lighting-effect.

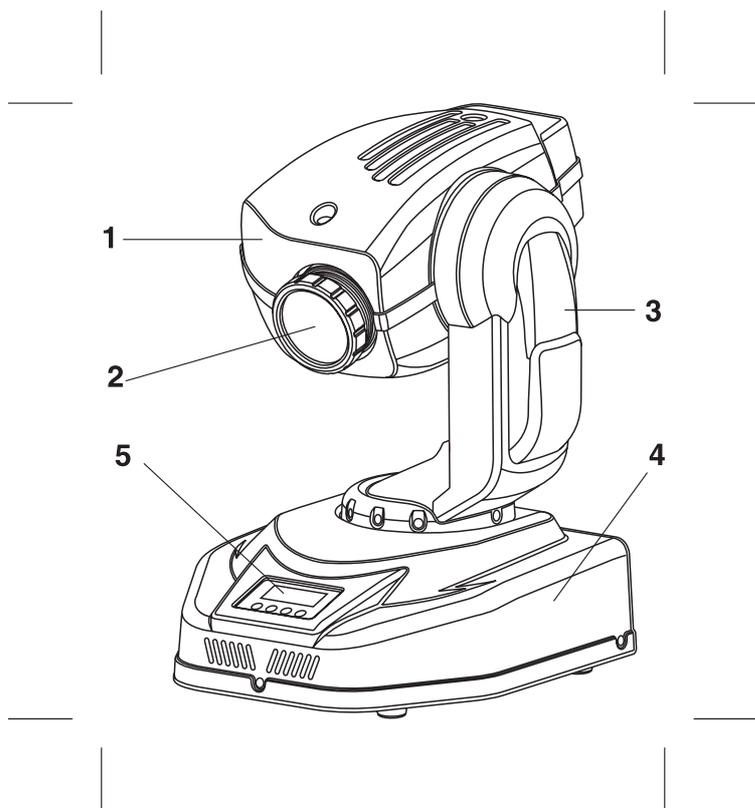
Unpack your FUTURELIGHT MH-460 and make sure that there are no damages caused by transportation. Should there be any, please consult your local dealer and do not take the device into operation.

## Features

### Moving-head spot

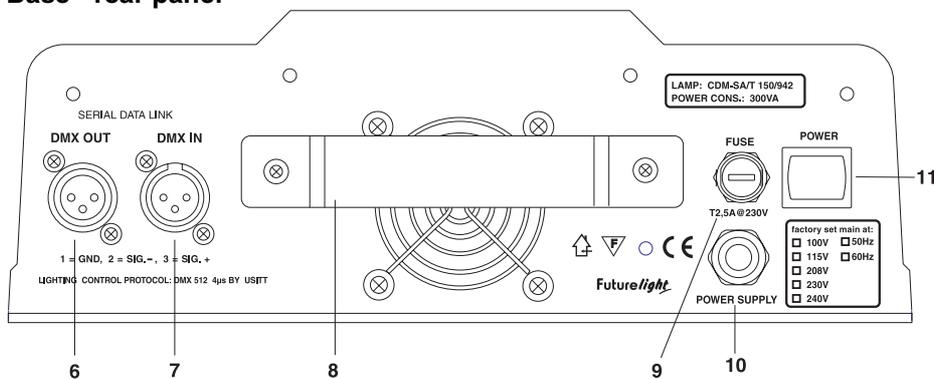
Cam Lock system with 2 Omega holders included in the delivery • Versatile operation modes via DMX-512, as stand alone or in Master/Slave-mode (up to 9 slaves) • Three freely programmable programs by which all slaves can be controlled via the master-device • Quick Lock system for easy opening of the projector head • Easy lamp-exchange via service screws • Optimized optical system for highest light output • Rotating gobo-wheel with 7 interchangeable and indexable rotating gobos plus open. Rotating gobos: 4 metal gobos, 1 multicolor dichroic gobo, 1 glass gobo. Rotating gobo-wheel continuous rotation • The rotating gobos can be turned by 360°, the adjusted position is memorized • Colour-wheel with 11 dichroic filters plus white. • Rainbow-effect in both directions • Shutter/dimmer unit allowing very smooth dimming and strobo effect 1-8 flash per sec. • Modular construction of fixture • Addressing, special functions setting, effects calibration via control panel with 4-digit LED display • Readout fixture and lamp usage, receiving DMX values, temperature, etc • Built-in analyzer for easy fault finding, error messages • Built-in demo sequences • Remotely controllable speed of Pan/Tilt movement for easy programming • Remote reset function • Intelligent control panel with 4-digit LED display • 4 DMX-channels • Exact positioning within 530° Pan and 285° • Tilt Automatic Pan/Tilt position correction • High luminous-efficiency parabolic mirror and double condenser system • 19° standard objective • All lenses are anti-reflection coated • 6 high-quality stepper-motors for smooth movements • Self-resettable thermo-fuse • For CDM-SA/T 150/942, G-12 socket lamp • DMX-control via every standard DMX-controller • Suitable FUTURELIGHT controllers: CP-256 Controller, EX-4 Controller, CP-528 Controller

## Description of the fixture

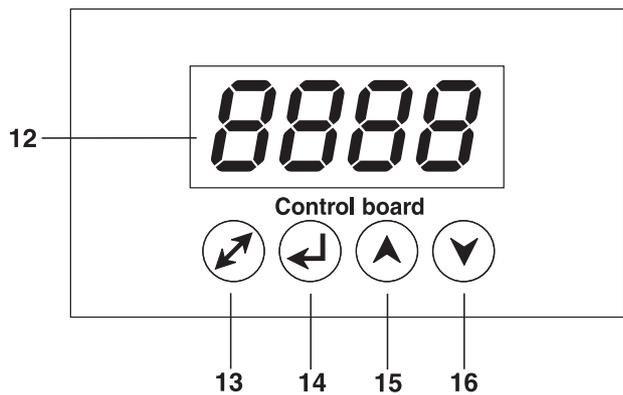


- 1 - Projector-head
- 2 - Lense
- 3 - Carrying handle
- 4 - Base
- 5 - Control Board

## Base - rear panel



- 6 - DMX-output
- 7 - DMX-input
- 8 - Carrying handle
- 9 - Fuseholder
- 10 - Powercord
- 11 - Power-switch



- Control Board:**
- 12 - Display
  - 13 - Mode button
  - 14 - Enter-button
  - 15 - Up-button
  - 16 - Down-button

## Safety instructions



### CAUTION!

Be careful with your operations. With a dangerous voltage you can suffer a dangerous electric shock when touching the wires!

This device has left our premises in absolutely perfect condition. In order to maintain this condition and to ensure a safe operation, it is absolutely necessary for the user to follow the safety instructions and warning notes written in this user manual.



### Important:

*Damages caused by the disregard of this user manual are not subject to warranty. The dealer will not accept liability for any resulting defects or problems.*

If the device has been exposed to drastic temperature fluctuation (e.g. after transportation), do not switch it on immediately. The arising condensation water might damage your device. Leave the device switched off until it has reached room temperature.

This device falls under protection-class I. The power plug must only be plugged into a protection class I outlet.

Never let the power-cord come into contact with other cables! Handle the power-cord and all connections with the mains with particular caution!

Make sure that the available voltage is not higher than stated on the rear panel.

Make sure that the power-cord is never crimped or damaged by sharp edges. Check the device and the power-cord from time to time.

Always disconnect from the mains, when the device is not in use or before cleaning it. Only handle the power-cord by the plug. Never pull out the plug by tugging the power-cord.

During the initial start-up some smoke or smell may arise. This is a normal process and does not necessarily mean that the device is defective.

**Caution:** During the operation, the housing becomes very hot.



### HEALTH HAZARD!

Never look directly into the light source, as sensitive persons may suffer an epileptic shock (especially meant for epileptics)!

Keep away children and amateurs!

## Operating determinations

This device is a moving-head spot for creating decorative effects. This product is only allowed to be operated with an alternating current of 230 V, 50 Hz (EU-version) or 110 V, 60 Hz (US-version) and was designed for indoor use only.

This device is designed for professional use, e.g. on stages, in discotheques, theatres etc.

Lighting effects are not designed for permanent operation. Consistent operation breaks will ensure that the device will serve you for a long time without defects.

Do not shake the device. Avoid brute force when installing or operating the device.

Never lift the fixture by holding it at the projector-head, as the mechanics may be damaged. Always hold the fixture at the transport handle.

When choosing the installation-spot, please make sure that the device is not exposed to extreme heat, moisture or dust. There should not be any cables lying around. You endanger your own and the safety of others!

The symbol  determines the minimum distance from lighted objects. The minimum distance between light-output and the illuminated surface must be more than this value.

Make sure that the area below the installation place is blocked when rigging, derigging or servicing the fixture.

Always fix the fixture with an appropriate safety-rope. Fix the safety-rope at the correct holes only.

Only operate the fixture after having checked that the housing is firmly closed and all screws are tightly fastened.

The lamp must never be ignited if the objective-lens or any housing-cover is open, as discharge lamps may explode and emit a high ultraviolet radiation, which may cause burns.

The maximum ambient temperature  $t_a$  must never be exceeded.

**CAUTION!**  
**The lens has to be replaced when it is obviously damaged,  
 so that its function is impaired, e. g. due to cracks or deep scratches!**

Operate the device only after having familiarized with its functions. Do not permit operation by persons not qualified for operating the device. Most damages are the result of unprofessional operation!



**CAUTION!**  
**The lamp has to be replaced when it is damaged  
 or deformed due to the heat!**



Please use the original packaging if the device is to be transported.

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

Never remove the serial barcode from the device as this would make the guarantee void.

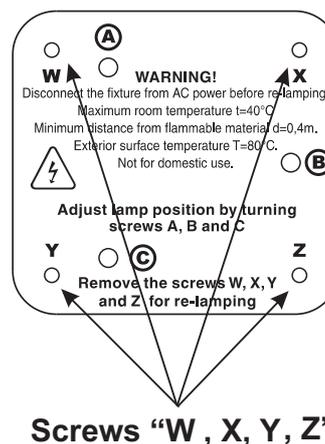
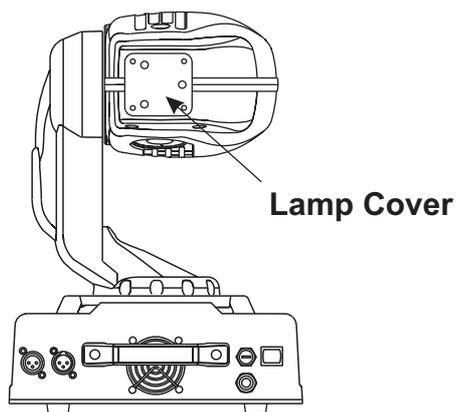
If this device will be operated in any way different to the one described in this manual, the product may suffer damages and the guarantee becomes void. Furthermore, any other operation may lead to dangers like short-circuit, burns, electric shock, lamp explosion, crash etc.

## Installation

### Fitting/Exchanging the lamp



**DANGER!**  
Install the lamp with the device switched off only.  
Unplug from mains before!



Screws "W , X, Y, Z"

To insert the lamp (CDM-SA/T 150/942, G-12 socket) open the top cover of the head (see the drawings to identify which cover is top) by loosening the 4 Phillips screws on the front and rear sides of the top cover.

If changing the lamp, remove the old lamp from the socket. Insert the lamp to the socket.

Do not install a lamp with a higher wattage! A lamp like this generates temperatures the device is not designed for.

Damages caused by non-observance are not subject to warranty. Please follow the lamp manufacturer's notes!

Do not touch the glass-bulb bare-handed during the installation! Make sure that the lamp is installed tightly into the lampholder system.

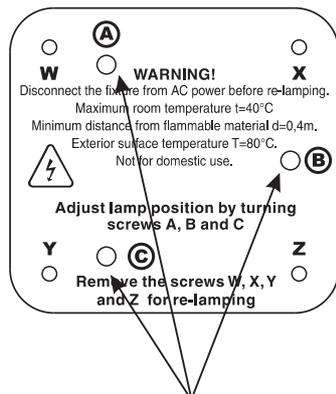
Adjust the optimal distance 1-1.5 mm from the lens by turning the screw "A" (see the drawings "Lamp adjustment" below).

Reclose the top cover of the head and tighten the Phillips screws.

Before striking the lamp, reset the "LAti" counter and the "LAST" counter in the main menu of the Control Board, by pressing the "Up" and "Down" buttons in one time and then confirming with the Enter-button.

**Do not operate the fixture with opened housing-cover!**

## Lamp adjustment



Screws "A, B, C"

The MH-460 lampholder is aligned at the factory. Due to differences between lamps, fine adjustment may improve light performance.

Strike the lamp and focus the light on a flat surface (wall). As the optimum distance of lamp from lens was adjusted during the installing or changing the lamp (by turning the screw "A"), it is necessary to adjust only the second position by turning the screw "B", in order to center the hot-spot (the brightest part of the beam).

If the Hot Spot seems to be too bright, you can lower its intensity by moving the lamp closer to the reflector. Do so by turning screw "A" until the light is evenly distributed.

If the light on the edge seems to be brighter as in the center, the lamp is too close at the reflector. In this case, you need to move the lamp away from the reflector until the light is evenly distributed and the beam appears bright enough.

## Inserting/Exchanging gobos

**DANGER**  
HIGH VOLTAGE

**DANGER!**  
Install the gobos with the device switched off only.  
Unplug from mains before!

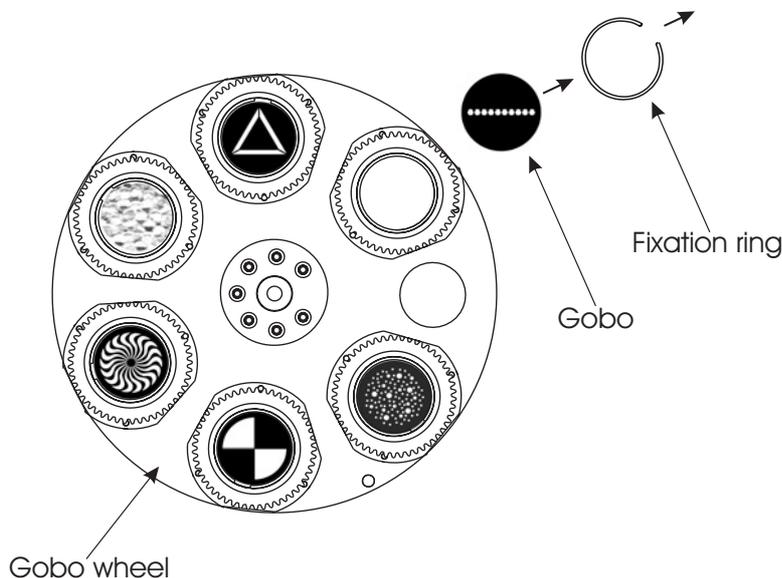
To insert the gobos open the top cover of the head by loosening the screws on the front and rear sides of the top cover.

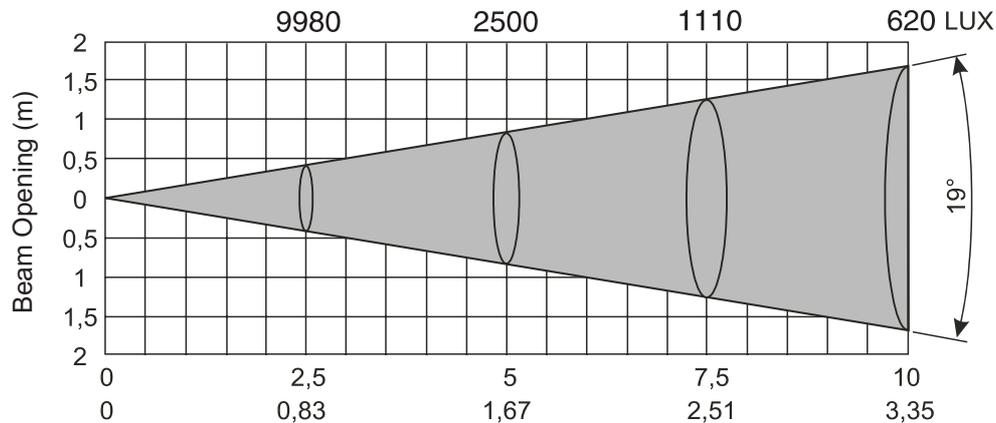
If you wish to use other forms and patterns as the standard-gobos, or if gobos are to be exchanged, please follow the instructions below:

### Rotating gobo-wheel:

**CAUTION!**  
Never unscrew the screws of the rotating gobo as the ball bearing will otherwise be opened!

Remove the fixation-ring with an appropriate tool. Remove the gobo and insert the new gobo. Press the fixation-ring together and insert it in front of the gobo.



**Beam path:****19° Lens****Rigging****DANGER TO LIFE!**

Please consider the EN 60598-2-17 and the respective national norms during the installation! The installation must only be carried out by an authorized dealer!

The installation of the projector has to be built and constructed in a way that it can hold 10 times the weight for 1 hour without any harming deformation.

The installation must always be secured with a secondary safety attachment, e.g. an appropriate catch net. This secondary safety attachment must be constructed in a way that no part of the installation can fall down if the main attachment fails.

When rigging, derigging or servicing the fixture staying in the area below the installation place, on bridges, under high working places and other endangered areas is forbidden.

The operator has to make sure that safety-relating and machine-technical installations are approved by an expert before taking into operation for the first time and after changes before taking into operation another time.

The operator has to make sure that safety-relating and machine-technical installations are approved by an expert after every four year in the course of an acceptance test.

The operator has to make sure that safety-relating and machine-technical installations are approved by a skilled person once a year.

**Procedure:**

The projector should be installed outside areas where persons may walk by or be seated.

**IMPORTANT! OVERHEAD RIGGING REQUIRES EXTENSIVE EXPERIENCE**, including (but not limited to) calculating working load limits, installation material being used, and periodic safety inspection of all installation material and the projector. If you lack these qualifications, do not attempt the installation yourself, but instead use a professional structural rigger. Improper installation can result in bodily injury and/or damage to property.

The projector has to be installed out of the reach of people.

If the projector shall be lowered from the ceiling or high joists, professional trussing systems have to be used. The projector must never be fixed swinging freely in the room.

**Caution:** Projectors may cause severe injuries when crashing down! If you have doubts concerning the safety of a possible installation, do NOT install the projector!

Before rigging make sure that the installation area can hold a minimum point load of 10 times the projector's weight.



**DANGER OF FIRE!**

When installing the device, make sure there is no highly-inflammable material (decoration articles, etc.) within a distance of min. 0.5 m.

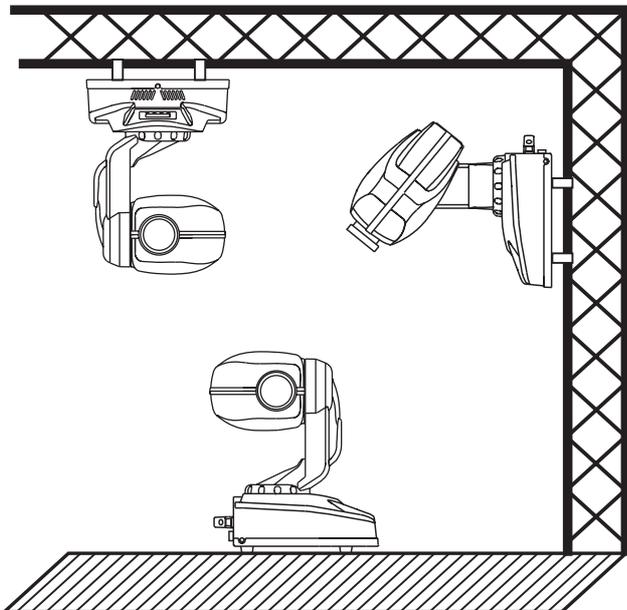


**CAUTION!**

Use 2 appropriate clamps to rig the fixture on the truss.  
Follow the instructions mentioned at the bottom of the base.



Make sure that the device is fixed properly! Ensure that the structure (truss) to which you are attaching the fixtures is secure.

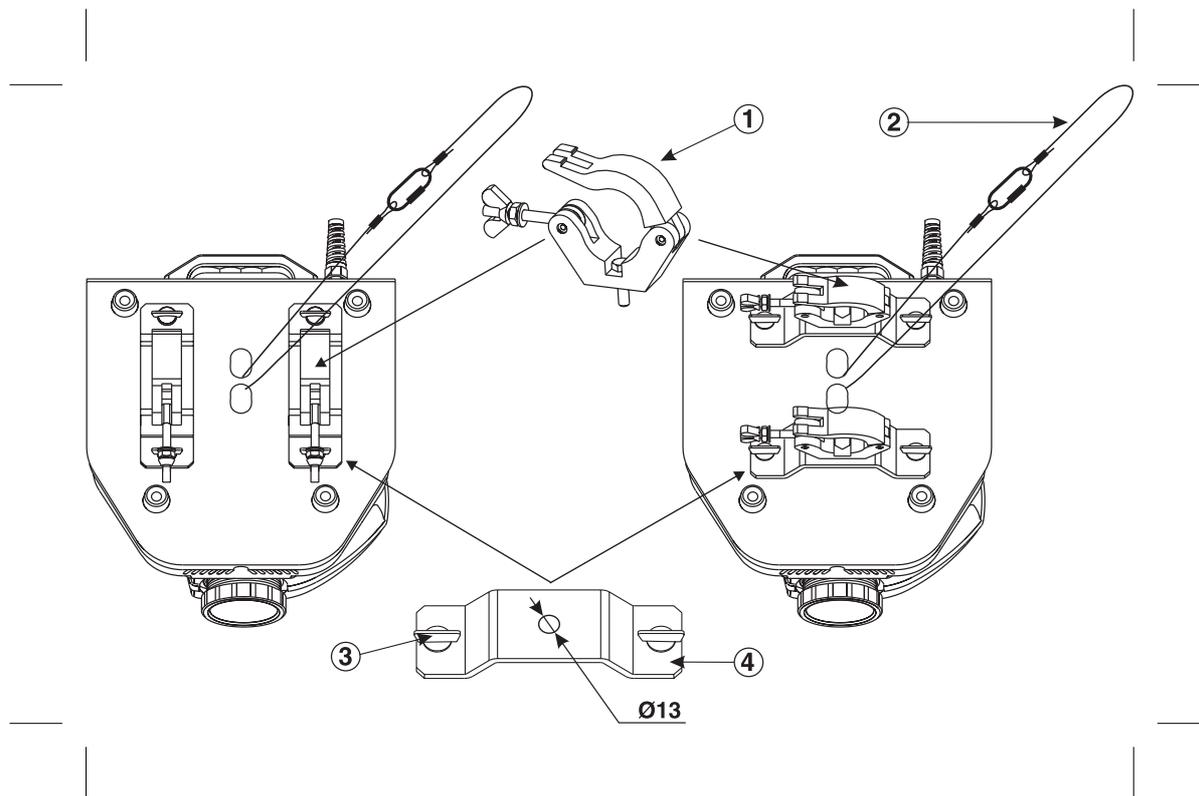


The Moving-Head can be placed directly on the stage floor or rigged in any orientation on a truss without altering its operation characteristics (see the drawing).

The fixture's base enables to be mounted in two ways: via the Omega-holders or via the adapter plate. Use the clamps with screws M12.

For overhead use, always install a safety-rope that can hold at least 12 times the weight of the fixture. You must only use safety-ropes with screw-on carabines.

**Installation via the Omega holders**



- (1) Clamp
- (2) Safety rope
- (3) Quick-lock fastener
- (4) Omega-holders

Screw one clamp each via a M12 screw and nut onto the Omega holders. Insert the quick-lock fasteners of the first Omega holder into the respective holes on the bottom of the device. Tighten the quick-lock fasteners fully clockwise. Install the second Omega holder. Pull the safety-rope through the holes on the bottom of the base and over the trussing system or a safe fixation spot. Insert the end in the carabine and tighten the safety screw.

### Connection with the mains

Connect the device to the mains with the power-plug.

The occupation of the connection-cables is as follows:

Cable	Pin	International
Brown	Live	L
Blue	Neutral	N
Yellow/Green	Earth	

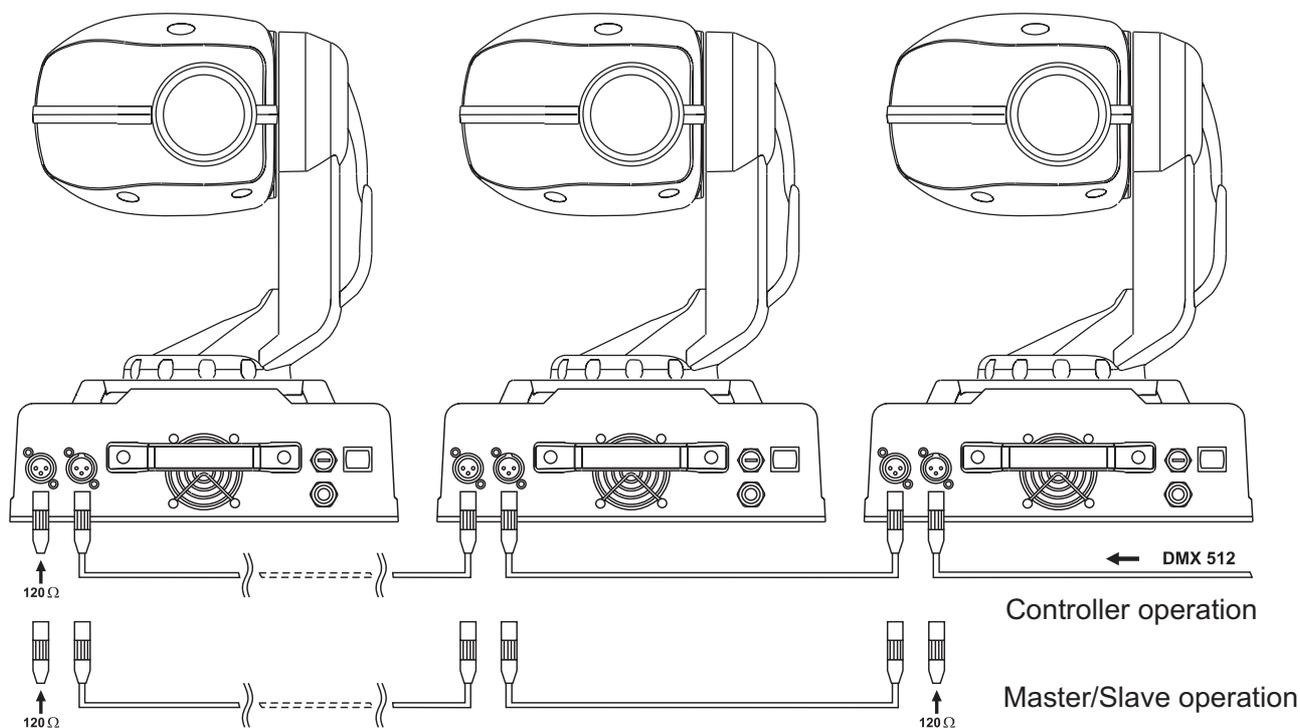
The earth has to be connected!

In general, lighting effects should not be connected to dimming-packs.



**DANGER TO LIFE!**  
Before taking into operation for the first time, the installation has to be approved by an expert!

### DMX-512 connection / Master/Slave connection



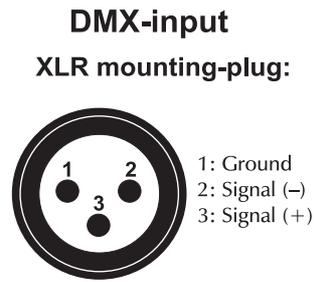
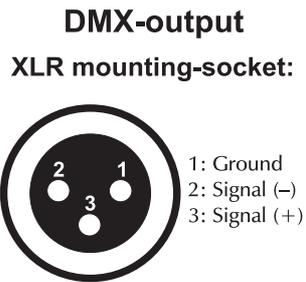


**The wires must not come into contact with each other, otherwise the fixtures will not work at all, or will not work properly.**



Only use a stereo shielded cable and 3-pin XLR-plugs and connectors in order to connect the controller with the fixture or one fixture with another.

## Occupation of the XLR-connection:



If you are using the recommended FUTURELIGHT-controllers, you can connect the DMX-output of the controller directly with the DMX-input of the first fixture in the DMX-chain. If you wish to connect DMX-controllers with other XLR-outputs, you need to use adapter-cables.

### Building a serial DMX-chain:

Connect the DMX-output of the first fixture in the DMX-chain with the DMX-input of the next fixture. Always connect one output with the input of the next fixture until all fixtures are connected.

**Caution:** At the last fixture, the DMX-cable has to be terminated with a terminator. Solder a 120  $\Omega$  resistor between Signal (-) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output of the last fixture.

### Master/Slave-operation

The master/slave-operation enables that several devices can be synchronized and controlled by one master-device.

On the side panel of the MH-460 you can find an XLR-jack (DMX Out) and an XLR-plug (DMX In), which can be used for connecting several devices.

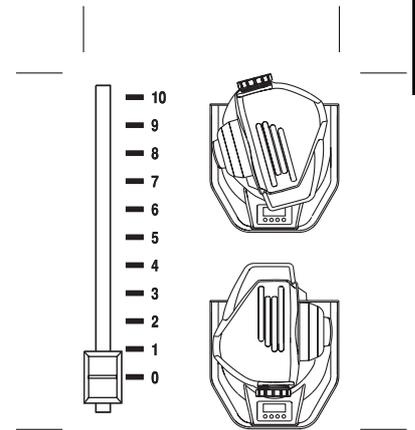
Choose the device which is to control the effects. This device then works as master-device and controls all other slave-devices, which are to be connected to the master-device via a balanced microphone lead. Connect the DMX OUT-jack with the DMX IN-plug of the next device.

**Caution:** At the master-device and at the last slave-device, the DMX-cable has to be terminated with a terminator. Solder a 120  $\Omega$  resistor between Signal (-) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output.

## Function of the control channels

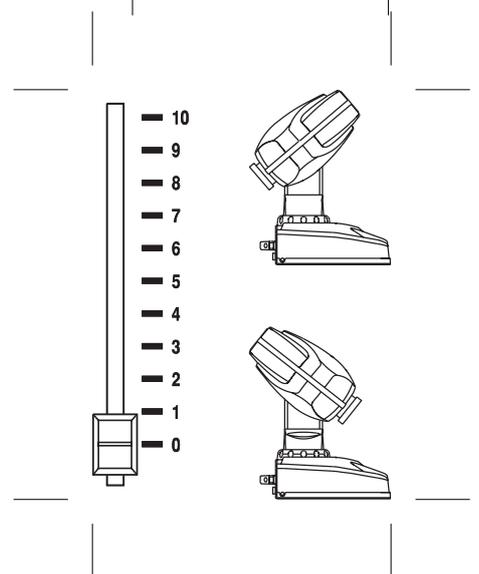
### Channel 1 - Horizontal movement (Pan)

Push slider up in order to move head horizontally (PAN).  
 Gradual head adjustment from one end of the slider to the other (0-255, 128-center). The head can be turned by 530° and stopped at any position you wish.



### Channel 2 - Vertical movement (Tilt)

Push slider up in order to move head vertically (TILT).  
 Gradual head adjustment from one end of the slider to the other (0-255, 128-center). The head can be turned by 280° and stopped at any position you wish.



### Channel 3 - Pan fine 16 bit

### Channel 4 - Tilt fine 16 bit

### Channel 5 - Speed of PAN / TILT movement

0	Max speed (tracking mode)
1	Max speed (vector mode)
249	Min. speed (vector mode)
250-252	Max. speed, black-out color changes (tracking mode)
253-255	Max. speed, black-out while PAN, TILT moving and/or color changes (vector mode)

### Channel 6 - Colours

Linear colour change following the movement of the slider. In this way you can stop the colour-wheel in any position - also between two colours creating double-coloured beams.

Between 128 and 189 and between 194 and 255, the colour-wheel rotates continuously the so-called "Rainbow" effect.

0	Open / white
10	Turquoise
21	Red
32	Cyan
42	Light Green
53	Magenta
64	Light Blue
74	Yellow
85	Green
96	Pink
106	Blue
117	Orange
128 - 189	Forwards rainbow effect from fast to slow
190 - 193	No rotation
194 - 255	Backwards rainbow effect from slow to fast

### Channel 7 - Rotating gobos

0 - 15	Open
16 - 31	Gobo 1 (metal)
32 - 47	Gobo 2 (multicolor dichroic)
46 - 63	Gobo 3 (metal)
64 - 79	Gobo 4 (metal)
80 - 95	Gobo 5 (metal)
96 - 111	Gobo 6 (glass)
<b>112 - 231</b>	<b>Shaking gobos with variable speed</b>
112 - 131	Gobo 1
132 - 151	Gobo 2
152 - 171	Gobo 3
172 - 191	Gobo 4
192 - 211	Gobo 5
212 - 231	Gobo 6
232 - 255	Gobo wheel rotation from slow to fast

### Channel 8 - Rotating gobo index, rotating gobo rotation

0 - 127	Gobo indexing
128 - 190	Forwards gobo rotation from fast to slow
191 - 192	No rotation
193 - 255	Backwards gobo rotation from slow to fast

**Channel 9 - Shutter, Strobe, Reset**

0	Shutter closed
1 - 63	Intensity from 0 to 100 %
64 - 95	Shutter open
96 - 127	Strobe-effect from slow to fast (max. 8 flashes/second)
128 - 139	Reset, shutter closed
140 - 159	Shutter closed
160 - 175	Pulse-effect in sequences from slow to fast
176 - 191	Pulse-effect in sequences from fast to slow
192 - 223	Random strobe-effect from slow to fast
224 - 255	Shutter open

**Function of the control channels – 2-16 bit protocol:****Channel 1 - Horizontal movement (Pan)****Channel 2 - Pan fine 16 bit****Channel 3 - Vertical movement (Tilt)****Channel 4 - Tilt fine 16 bit****Channel 5 - Speed of PAN / TILT movement**

0	Max speed (tracking mode)
1	Max speed (vector mode)
249	Min. speed (vector mode)
250-252	Max. speed, black-out color changes (tracking mode)
253-255	Max. speed, black-out while PAN, TILT moving and/or color changes (vector mode)

**Channel 6 - Colours**

0	Open / white
10	Turquoise
21	Red
32	Cyan
42	Light Green
53	Magenta
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74	Yellow
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96	Pink
106	Blue
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194 - 255	Backwards rainbow effect from slow to fast