



# Mirror Head Quick Installation Guide

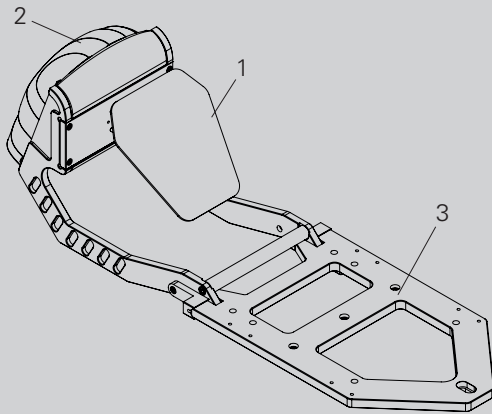
For the full manual please visit <http://dynamicprojection.com/mirror-head-assembly>



# Mirror Head Quick Installation Guide

For MH19

## MH19



1. Surface coated mirror
2. Mirror Head control unit
3. Mirror Head base plate



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## Introduction

Thank you for having chosen a Mirror Head unit. If you follow the instructions given in this Quick Installation Guide, we are sure you will enjoy this device for a long period of time.

For your own safety, please read this document carefully before you initially start-up.

Every person involved with the installation, operation and maintenance of this device has to:

- be qualified
- follow the instructions of this manual
- consider this manual to be part of the total product
- keep this manual for the entire service life of the product
- pass this manual on to every further owner or user of the product
- download the latest version of the user manual from our website



## Warning and Safety Information

NOTE: 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.

Never look directly into the light source of an attached projector!

Keep away children!

There are no user serviceable parts (fuse) inside this unit.

The Mirror Head is a projector add-on device for creating decorative effects. This product is only allowed to be operated with:

- the voltage labeled on the device
- the projector that the product is specified for
- the original accessories and add-on parts

The device is designed for indoor use only. This device is designed for professional use only.

Save the carton and all packing materials. In the event that a fixture must be returned to the factory, it is important that the fixture be returned in the original factory box and packing with all safety clamps mounted.

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.

WARNING: 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 device. 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.

CAUTION: Never project directly onto people or animals - the light of the projector can cause blindness.

Before starting to mount the Mirror Head make sure:

- the installation-spot is suited for the Mirror Head.
- the mirror can move freely.
- there are no vibrations by ventilation systems of any kind.
- all screws are secured.

WARNING: The Mirror Head and the projector can be very heavy – use a second person for help

NOTE: This device is only allowed for an installation via the original mounting brackets, clamps or stands.

NOTE: The manufacturer cannot be made liable for damages caused by incorrect installations, unauthorized parts or insufficient safety precautions!

In case you have questions about our product or need support during assembly and installation please contact our support!

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Commercial Register: FN400806x



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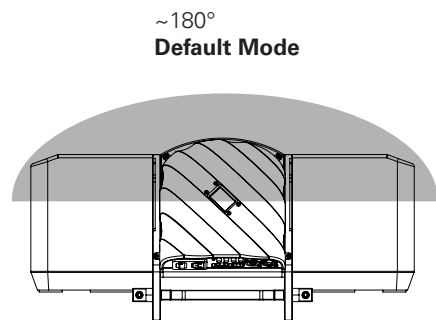
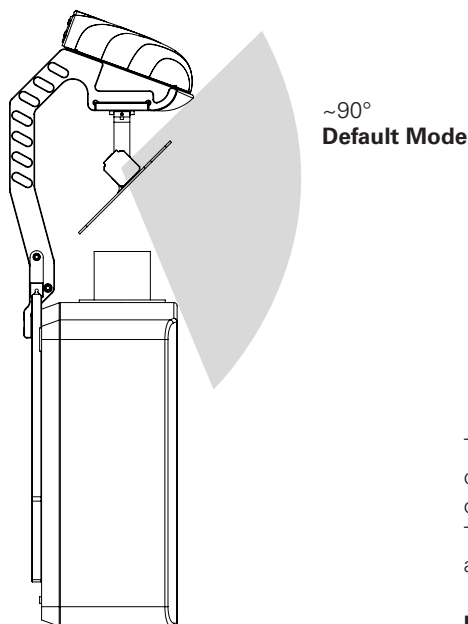
For the full manual please visit <http://dynamicprojection.com/mirror-head-assembly>



## Technical specifications

- High resolution 16bit Pan/Tilt mirror movement
- DMX-512 control over 14 DMX channels
- DMX-IN and DMX-OUT/Through port (5-pin male and female XLR connectors)
- 14 DMX channels are required to control the unit
- Art-Net™ connection (RJ45) (Art-Net™ designed by and Copyright Artistic License Holdings Ltd.) - OEM code 0x1140
- High resolution micro step motors with maintenance free direct drive
- Self calibrating mirror position for high accuracy
- Absolute reposition accuracy smaller than  $0.03^\circ$
- Movement accuracy: Pan and Tilt from the same direction to the programmed point within approximately  $0.01^\circ$
- RS232 remote control connection for projector (D-sub 9 male) - cable included
- Flash-able firmware (Mini USB OTG)
- High resolution LED-Display for easy configuration
- LED-Display back-light auto turn off for energy saving
- LED-Display Flip / Flop mode for easy reading in difficult positions
- Coated mirror for optimum reflection ~98% refraction factor
- Optimized mirror optics for the specific projector
- Ambient Light LED with high power RGB LEDs (17,9 Watt total) - see compatibility list if available for your model (MH08-MH13)
- Mounting plate optimized for specific projector mounting
- Easy to adjust mounting system
- Passive cooled system (excluding projector)
- Environmental tolerances: Ambient operating temperature range:  $5^\circ\text{--}35^\circ\text{C}$ , Humidity: 20%–80% (non-condensing)
- A/C power input; 100V / 2A / 60Hz – 240V / 1A / 50Hz, 10A max. 3-prong C14 male socket - 3W Standby - max. 30W (see type plate on device for details)

## Examples of positioning the Mirror Head



The illustrations show the approximate usable angular range of the projection cone depending on the operation modes. The shown ranges may differ depending on the lens-shift and blocking parts of the projector or mounting constructions. The modes can be set in the firmware of the Mirror Head using the „Mirror angle“ menu.

**Default Mode** („90 Degrees“), this is the „90° Tilt“ mode available on all Mirror Head models.



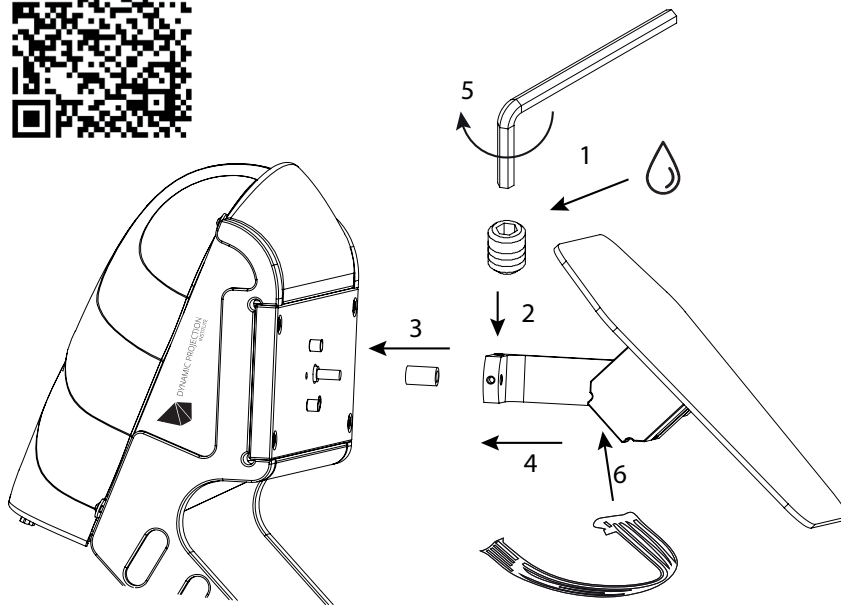
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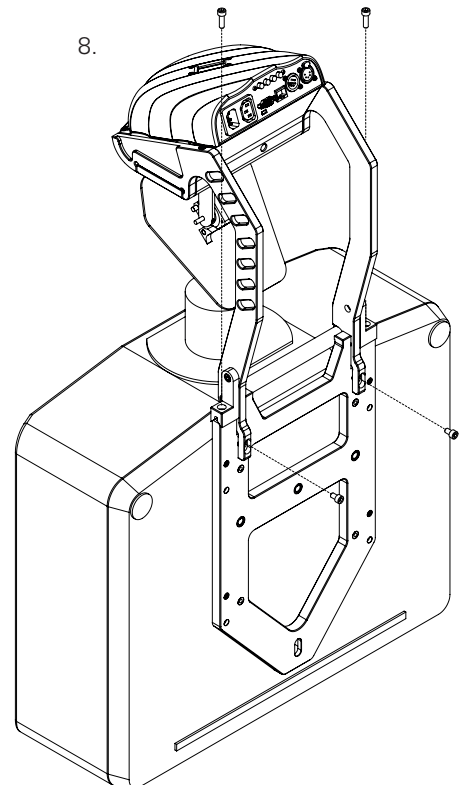
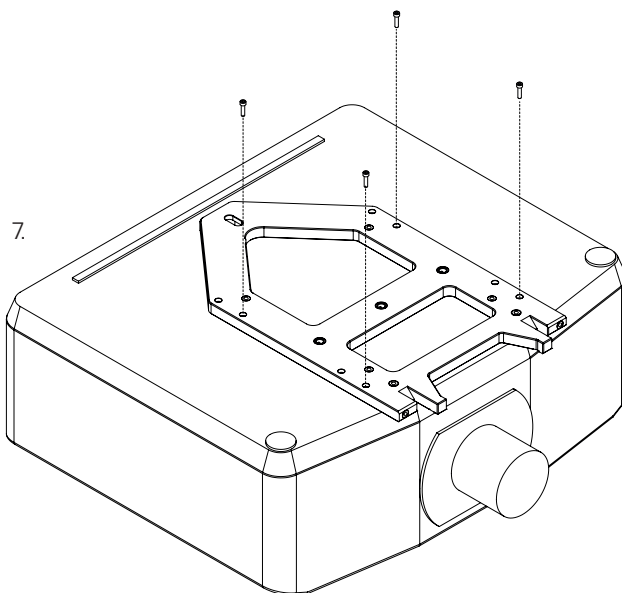
## Mounting of the projector

For further help on assembly please watch our assembly videos: <http://www.dynamicprojection.com/mirror-head-assembly/>



1. Prepare the setscrew on the hex key and put one drop of Loctite screw-lock onto it.
2. Turn the setscrew into the drive arm by two turns.
3. Slip over the end-stop (brass part) over the pan drive shaft.
4. Take the whole drive arm end slip it over the pan drive shaft until it reaches the end-stop.
5. Secure the setscrew with the hex key.
6. Connect the motor signal cable and mount the glue strip on the motor.

MH19



7. Mount the base-plate to the projector.  
WARNING: Secure the projector at any time so it cannot fall out or down. Use a second person to help.
8. Lock-in the Mirror Head into the base-plate and secure the two screws at the front and the two screws at the bottom.  
NOTE: This step of the installation can be reversed.
9. Connect the RS232 and AC power-cord to the projector and control unit.

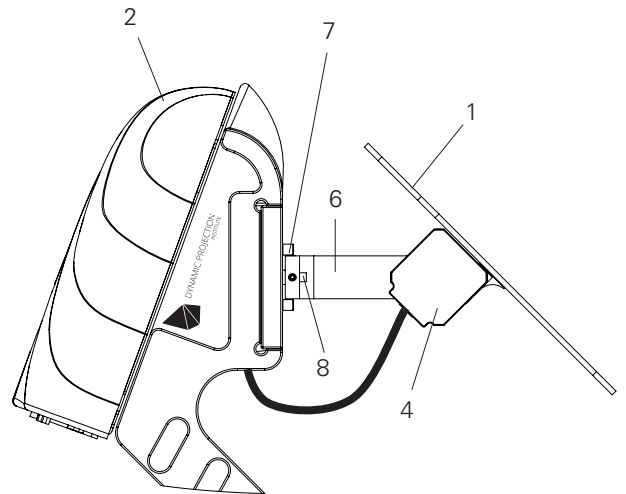
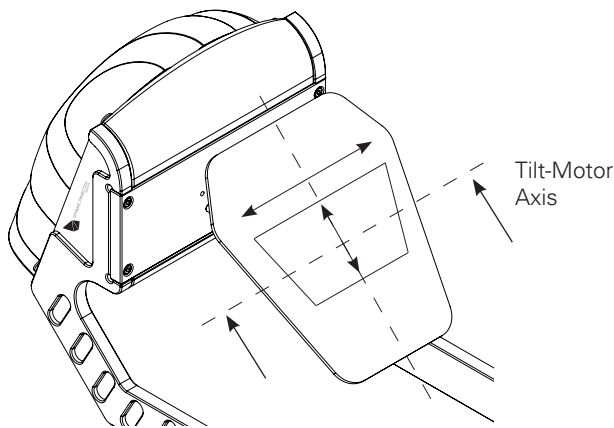


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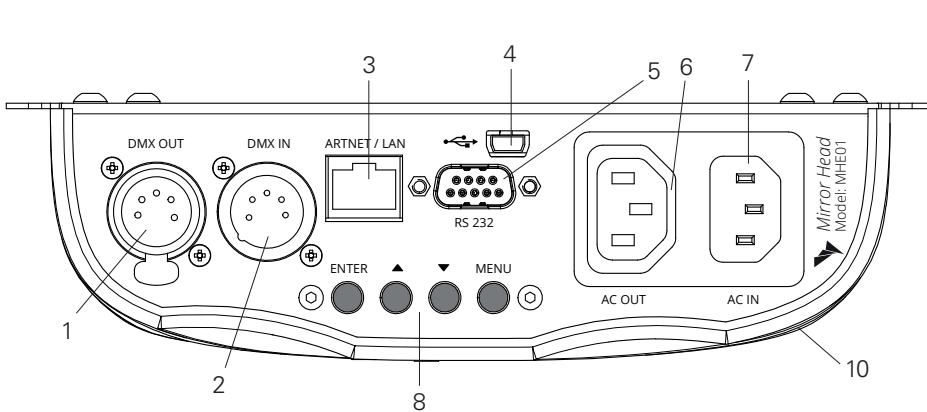
## Adjust lens shift



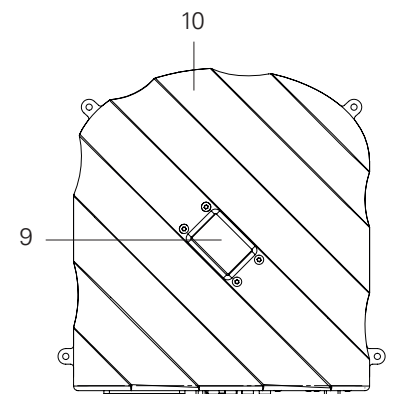
Use the lens shift of your projector to adjust the position of the projected image on the mirror as shown in the illustration. (Mirror position for adjustment = power on position)

1. Surface coated mirror
2. Mirror Head control unit
3. Mirror Head base plate
4. Tilt motor
5. Reference magnets
6. Motor-drive-arm
7. Reference screws
8. Pan drive shaft

## Mirror Head control unit / MHE01



Backside view



Top view

1. DMX-OUT / Through Socket - 5 Pins XLR
2. DMX-IN Socket - 5 Pins XLR
3. Art-Net™ network - 10Mb/s, 100Mb/s
4. Mini USB OTG - for firmware update
5. RS232 connector - male
6. A/C power output; loop trough, 3-prong C13 female socket
7. A/C power input; 100V / 2A / 60Hz - 240V / 1A / 50Hz, 10A max. 3-prong C14 male socket
8. Control buttons for menu navigation
9. LCD display
10. Control unit



# Mirror Head Quick Installation Guide

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## Using and operations (DMX512 / Art-Net™)

To use the Mirror Head as intended, a DMX512/Art-Net™ controller is needed with at least 14 channels. In order to control the Mirror Head at least a 14 channel DMX Master is required.

### DMX-512 controlled operation

1. Make sure the unit is turned off.
2. Connect the DMX XLR cable to the DMX-IN socket.
3. Connect the power-cord so the unit turns on.
4. Check the DMX settings in the control unit.
5. Start sending DMX commands and check if the system reacts.

NOTE: It is maybe necessary to insert a DMX / XLR termination plug (with 120 Ohm) in the last unit in the link in order to ensure proper transmission on the DMX data link – please ask your DMX operator.

### Art-Net™ controlled operation

1. Make sure the unit is turned off.
2. Connect the power-cord so the unit turns on.
3. Check the DMX settings in the control unit.
4. Check the IP address settings in the control unit.
5. Connect the CAT cable to the control board.
6. Start sending Art-Net™ DMX commands and check if the system reacts.

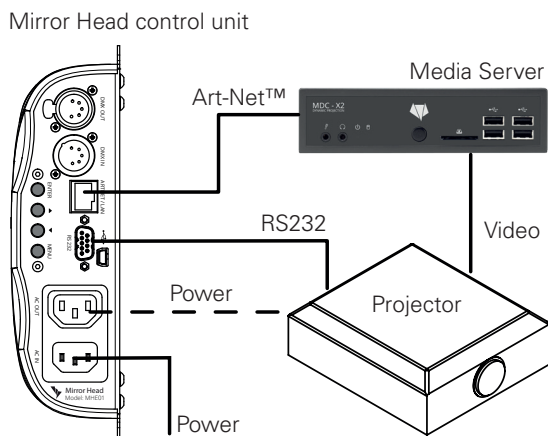
NOTE: If you change the IP address of the unit you have to replug the CAT cable in order to avoid ARP / IP caching of some intermediate switching equipment

### RS232 projector control

The Mirror Head control unit offers the possibility to send some basic remote control commands to the projector using the RS232 interface.

1. Make sure the projector is turned on and accepts RS232 commands corresponding to the RS232 compatibility list in the appendix.
2. The commands are sent to the projector whenever a specific DMX value is sent on the specific DMX channel – see DMX fixture chart.

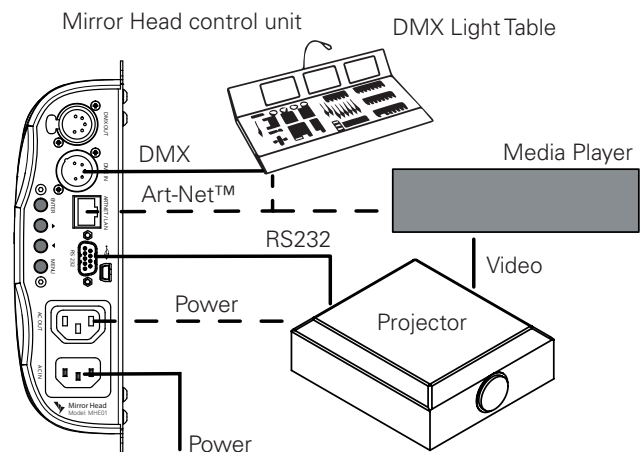
## Media Server with Art-Net™ control and video playback



optional — — — — —

This setup shows the combination of the Mirror Head and a Media Server (e.g. MDC-X) that is capable of Art-Net control, video playback and optional geometry effects. For more information about controlling the Mirror Head see the „Using and operations“ section.

## Media Player and DMX Light Table



optional — — — — —

This setup shows how the Mirror Head can easily be integrated into DMX-Light Management (DMX512-XLR or Art-Net DMX512) and Media-playback. For more information about controlling the Mirror Head see the „Using and operations“ section.



# Mirror Head Quick Installation Guide

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## Mirror Head control unit operations

The control unit of the Mirror Head offers the possibility to adjust the system to the projector and the control environment.

### Main screen

The Main-Screen shows the company logo. The back-light of the screen is turned off on default after 30 seconds of inactivity if the system is on this screen. To turn it on again press any of the Mirror Head buttons. On this screen you can change the screen orientation for better handling by pressing special keystroke combinations:

Function	(ENTER)	(UP) ▲	(DOWN) ▼	(MENU)
Display FLIP	X	X	-	-
Display FLOP	X	-	X	-

### Main menu

This is the top level menu to access all settings of the Mirror Head. You can return to this screen anytime by pressing the (MENU) button. To select an item in the list use the (UP) or (DOWN) buttons and press (ENTER) to access the sub-menu. Inside this menu you can start a mirror-reset (calibration) by pressing the following buttons for 3 seconds.

Function	(ENTER)	(UP) ▲	(DOWN) ▼	(MENU)
Mirror reset	-	X	X	-

### Version

The version menu shows the firmware version of the Mirror Head. The firmware of all Mirror Head products can be upgraded if needed using the USB OTG connector. In this menu you can override the factory default center of the calibration function. Under standard conditions you should never use this function.

Function	(ENTER)	(UP) ▲	(DOWN) ▼	(MENU)
SET Zero Position	X	X	-	-
RESET Zero Position	X	-	X	-

### Network

The network interface of the Mirror Head is for Art-Net™ DMX512 communication. Please note that the Mirror Head supports static IP addresses only (DHCP is not supported) and comes with a factory set IP address set to 2.0.0.3, netmask 255.0.0.0. To change the IP-address use the (UP), (DOWN) and (ENTER) buttons. After you changed the IP address press (ENTER) over and over again until you see "DONE" on the top of the screen. Changes will then apply immediately to the network interface of the Mirror Head. To force an ARP update disconnect the network cable for at least 5sec.

NOTE: Depending on the network infrastructure it is maybe necessary to reset the switches and / or network interfaces of other devices if the IP-address of the Mirror Head changes.

NOTE: Every device in an IP network must have its own IP address.

NOTE: You cannot use Art-Net™ DMX512 and analog DMX at the same time. Changing this physical layer requires a power off-on cycle of the Mirror Head.

### Projector

The Mirror Head offers the possibility for a remote control of the projector over DMX via the RS232 interface. This menu allows you to select the connected projector brand (see Appendix for compatibility and function list) to be used with the Mirror Head. The projector must be connected with the Mirror Head

using a RS232 cable and the remote control function must be enabled and set correctly on the projector.

### Mirror angle

This option offers you the possibility to change the tilt-axis between Mode-90° and Mode-162° for specific versions of the Mirror Head. Switching between Mode-90° and Mode-162° does not require a restart of the Mirror Head. If you switch the mode the center position on the tilt-axis of the Mirror Head changes.

**WARNING: Use the 162° only if your Mirror Head is compatible with this setting – Check the 162° compatibility list in the appendix.**

### DMX

By default the DMX-Address of the unit starts at 001. Here you can set the offset if you need to change the DMX-Address of this unit. The DMX fixture for the Mirror Head is in the appendix.

NOTE: The Mirror Head unit is always a slave device.

### LEDs (MH08–MH13 only)

By default the RGB LEDs of the Mirror Head (if available for your model - see appendix) are controlled over Art-Net™/DMX by selecting the specific RGB and intensity channel values. If the LEDs should be on no matter if there is a DMX signal or not, the fixed values can be set here.



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## DMX fixture definition

In order to control the Mirror Head at least a 14 channel DMX Master is required no matter what kind of Mirror Head and/or function of the fixture you use (see section „Using and operations“ for details).

Channel	Function	Value	Destination	Description	
001	Pan high	0 - 255	Mirror motors	Pan High Byte	
002	Pan low	0 - 255	Mirror motors	Pan Low Byte	
003	Tilt high	0 - 255	Mirror motors	Tilt High Byte	
004	Tilt low	0 - 255	Mirror motors	Tilt Low Byte	
005	Reset	255	Mirror motors	Starts mirror recalibration	
006	Picture mute off	0 - 10	RS232 / projector	Disables picture mute	
006	Picture mute on	20 - 30	RS232 / projector	Enables picture mute	
006	Shutter off	40 - 50	RS232 / projector	Disables the mechanical shutter	
006	Shutter on	60 - 70	RS232 / projector	Enables the mechanical shutter	
006	Picture freeze off	100 - 110	RS232 / projector	Disables picture freeze	
006	Picture freeze on	120 - 130	RS232 / projector	Enables picture freeze	
007	Image orientation 1	10 - 63	RS232 / projector	Image orientation mode 1	
007	Image orientation 2	64 - 127	RS232 / projector	Image orientation mode 2	
007	Image orientation 3	128 - 192	RS232 / projector	Image orientation mode 3	
007	Image orientation 4	192 - 255	RS232 / projector	Image orientation mode 4	
008	reserved	-	-	-	
009	Motor and LED drivers on	28 - 38	Mirror motors & LED	Turns the drivers on	
009	Motor and LED drivers off	50 - 58	Mirror motors & LED	Turns the drivers off	
009	Lamp mode 1	130 - 138	RS232 / projector	Lamp power mode 1	
009	Lamp mode 2	150 - 158	RS232 / projector	Lamp power mode 2	
009	Lamp mode 3	170 - 178	RS232 / projector	Lamp power mode 3	
009	Lamp on	230 - 238	RS232 / projector	Lamp lamp on	
009	Lamp off	250 - 255	RS232 / projector	Lamp lamp off	
010	LED intensity	0 - 255	LED	Main intensity of the combined RGB LEDs	available for MH08 – MH13 only
011	LED red	0 - 255	LED	Red LED intensity	
012	LED green	0 - 255	LED	Green LED intensity	
013	LED blue	0 - 255	LED	Blue LED intensity	
014	reserved	-	-	-	

Valid for firmware version 1.3.26