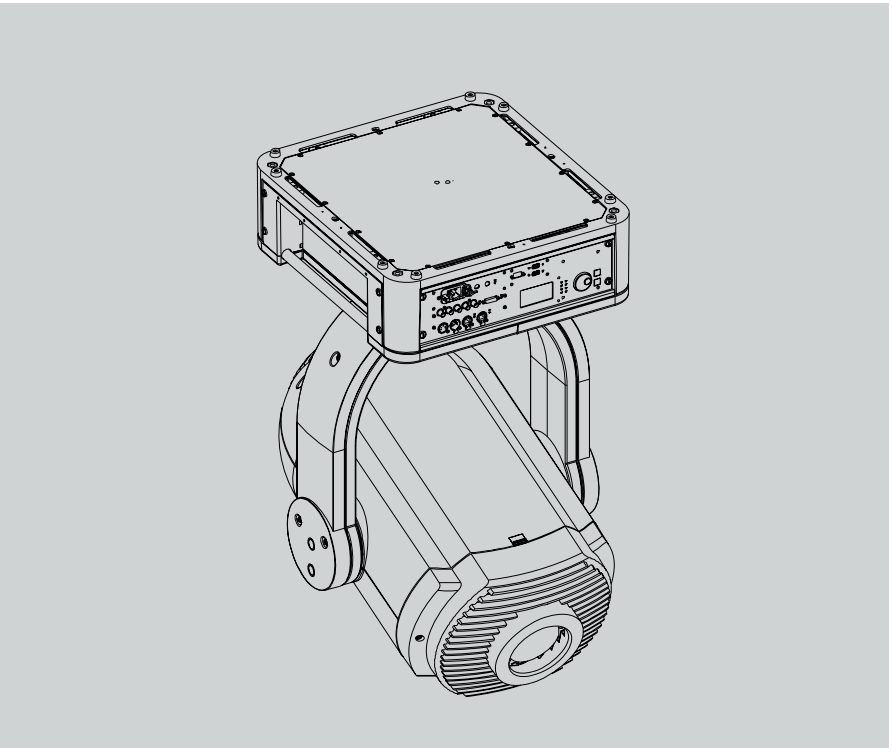
DML-1200



User guide
With embedded media player

R9050110

R59770209/04
06/11/2009

BARCO

Visibly yours

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Federal Communications Commission (FCC Statement)

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference at his own expense

EN55022/CISPR22 Class A ITE (Information Technology Equipment)

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning : This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Trademarks

Brand and product names mentioned in this manual may be trademarks, registered trademarks or copyrights of their respective holders. All brand and product names mentioned in this manual serve as comments or examples and are not to be understood as advertising for the products or their manufacturers.

Disposal Information

This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment. In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end of life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems. If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator. You can also contact us for more information on the environmental performances of our products.

GNU-GPL code

If you would like a copy of the GPL source code contained in this product shipped to you on CD, please contact Barco. The cost of preparing and mailing a CD will be charged.

Software License Agreement

You should carefully read the following terms and conditions before using this software. Your use of this software indicates your acceptance of this license agreement and warranty.

Terms and Conditions:

1. No redistribution of the software is allowed.
2. Reverse-Engineering. You may not reverse engineer, decompile, disassemble or alter anyhow this software product.

Disclaimer of Warranty:

This software and the accompanying files are sold “as is” and without warranties as to performance or merchantability or any other warranties whether expressed or implied. In no event shall Barco be liable for damage of any kind, loss of data, loss of profits, business interruption or other pecuniary loss arising directly or indirectly. Any liability of the seller will be exclusively limited to replacement of the product or refund of purchase price.

Uploading own media

It is your responsibility to handle all copyright issues relating to the media you create and upload. Barco will not accept responsibility for any breach of copyright incurred in these processes.

Pre-installed media

All libraries pre-installed on the system are supplied by Barco. Any queries regarding the use of these should be directed to Barco. Copyright laws may apply.

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1. SAFETY

1.1 General

Personal protection

Take care of the following warnings and cautions:

WARNING: Ensure you understand and follow all the safety guidelines, safety instructions, warnings and cautions mentioned in this manual.

WARNING: Be aware of suspended loads.

WARNING: Wear a hard hat to reduce the risk of personal injury.

WARNING: Be careful while working with heavy loads.

WARNING: Mind your fingers while working with heavy loads.

CAUTION: High pressure lamp may explode if improperly handled.

1.2 Important safety instructions

To prevent the risk of electrical shock

- This product should be operated from a mono phase AC power source. Power input voltage range must be between 200-240 V,10A 50/60Hz
- **Warning:** This apparatus must be grounded (earthed) via the supplied 3 conductor AC power cable.
  Mount a plug to the delivered power cord but take care of the local regulations about power cords and power plugs. Do not defeat the purpose of the grounding-type plug.
- Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating.
- Use only the power cord supplied with your device. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the device. For a replacement power cord, contact your dealer.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.
- Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Lightning - For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the device due to lightning and AC power-line surges.
- Do not guide the power cord over the base unit of the device. Ensure that the power cord cannot make contact with moving head.

To prevent personal injury

- When power is supplied to the device, the device starts a homing procedure which includes a movement of the head.
- When opening one of the shell covers of the projector head while power is supplied to the device, the movement of the head (pan and tilt) is blocked by the software.
- To reduce the lamp heat of the projector head, switch the device first to standby and let the projector lamp cool down for at least 5 minutes. Then the device may be disconnected from the power outlet.
- Isolated electrically before re-lamping. Caution : hot lamps.
- The customer should never attempt to disassemble the lamp casing. See "Recycling guidelines", page 8 for more information about handling a used lamp.
- To prevent injury and physical damage, always read this manual and all labels on the system before inserting the lamp casing, connecting to the wall outlet or adjusting the projector.
- To prevent injury, take note of the weight of the projector. Minimum 2 persons are needed to lift up the device. No twist is allowed. When lifting out of the flight case, a 3rd person has to push away the flight case while the first 2 are lifting up the device.
- To prevent injury, ensure that the lens and all cover plates are correctly installed. See installation procedures.
- Warning: high intensity light beam. NEVER look into the lens ! High luminance could result in injury to the eye.
- Before attempting to remove any of the device's covers, you must disconnect from the wall outlet.
- When performing setup work to a ceiling mounted device, to prevent injury caused by falling objects or the system, set out a keep out area.
- Consult a professional structural engineer prior to suspending the device from a structure not intended for that use. Always ensure that the working load limit of the structure can handle the load of the device.
- The power input at the base of the device is considered as the disconnect device. When required to switch off the device, to access parts inside, always disconnect the power cord at the base of the device. In case the power input at the base of the device is not accessible (e.g. ceiling mount), the socket outlet supplying the device shall be installed nearby the device and be easily accessible, or a readily accessible general disconnect device shall be incorporated in the fixed wiring.
- Do not place this equipment on an unstable cart, stand, or table. The product may fall, causing serious damage to it and possible injury to the user.
- When mounting the device to the ceiling or to a rigging system, always mount the delivered security cables and connectors. Before mounting the security cable, inspect the cable and connector. Do not use when visible damage is detected.
  Stretch the security cable completely. If necessary, turn the security cable a few times around the truss before closing the connection so that the cable is stretched as much as possible.
  Connector may not be mounted under bending stress.
- It is hazardous to operate without lens or shield. Shields, lenses or utra-vilolet screens shall be changed if they have become visible damaged to such an extent that their effectiveness is impaired. For example by cracks or deep scratches.
- **Mercury Vapor Warnings**: Keep the following warnings in mind when using the projector. The lamp used in the projector contains mercury. In case of a lamp rupture, explosion there will be a mercury vapor emission. In order to minimize the potential risk of inhaling mercury vapors:
  - Ensure the projector is installed only in ventilated rooms.
  - Replace the lamp module before the end of its operational life.
  - Promptly ventilate the room after a lamp rupture, explosion has occurred, evacuate the room (particularly in case of a pregnant woman).
  - Seek medical attention if unusual health conditions occur after a lamp rupture, explosion, such as headache, fatigue, shortness of breath, chest-tightening coughing or nausea.
- **Cooling liquid circuit.** The device head contains a cooling circuit filled with Blue antifreeze diluted 1,2 ethanediol (1/3 ethanediol – 2/3 Demi water).
  When the cooling circuit leaks, switch off the device and contact a service technician.
  The liquid is not for household use. Keep out of reach of children. Harmful by oral intake. Avoid exposure to pregnant women. Avoid contact with eyes, skin and clothing. Avoid inhale of the noxious fumes.
- **Restricted Access Location** The DML must be installed in a Restricted Access Location, where access can only be gained by persons who have been instructed about the reasons for the restriction applied to the location and about the precautions that shall be taken.
  Reasons for the applied restrictions: moving head in all directions, air outlet can reach high temperatures and light output may cause eye injury when looking directly into the lens.
-  Maximum temperature of enclosure : 90°C (194 °F)

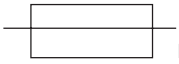
To prevent device damage

- The DML has been designed for use with a specific lamp type. See installation instructions for its correct lamp type.
- If the air filters are not regularly replaced, the air flow inside the device (projector head and base) could be disrupted, causing overheating. Overheating may lead to the device shutting down during operation.
- In order to ensure that correct airflow is maintained, and that the device complies with electromagnetic compatibility (EMC) requirements, and for safety requirements, it should always be operated with all of it's covers in place.
- Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. The device should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- The device must always be mounted in a manner which ensures free flow of air into its air inlets and unimpeded evacuation of the hot air exhausted from its cooling system. Heat sensitive materials should not be placed in the path of the exhausted air. Leave at least a free safety area of 2 meter (80") around the projector head.
- Ensure that nothing can be spilled on, or dropped inside the device. If this does happen, switch off and unplug the mains supply immediately. Do not operate the device again until it has been checked by qualified service technicians.
- Consult a professional structural engineer when you have the intention to use this device as ceiling mounted device. Always ensure the working load limit of the structure supporting the device.
- Do not mount the DML on a wall. Use it always in a ceiling mount or floor mount installation. When mounting on a chariot with wheels, always use wheels with brakes.
- Moving head. Make sure the head cannot touch any other materials.
- Do not use this equipment near water.
- **Special Care for Laser Beams**: Special care should be used when DLP projectors are used in the same room as high power laser equipment. Direct or indirect hitting of a laser beam on to the lens can severely damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Never place a DML in direct sun light. Sun light on the lens can severly damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Save the original packing material; they will come in handy if you ever have to ship your equipment. For maximum protection, repack your set as it was originally packed at the factory.
- Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning. Never use strong solvents, such as thinner or benzine, or abrasive cleaners, since these will damage the cabinet. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution.
- To ensure the highest optical performance and resolution, the projection lenses are specially treated with an anti-reflective coating, therefore, avoid touching the lens. To remove dust on the lens, use a soft dry cloth. Do not use a damp cloth, detergent solution, or thinner.
- Never use the device when not all four lamps are installed.
- Rated maximum ambient temperature, t_a = 40 °C (104°F)..
- The lamps shall be replaced if they have become damaged or thermally deformed.

To prevent battery explosion

- Danger of explosion if battery is incorrectly installed.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instruction.

To prevent fire hazard

-  Internal fuses provided. Contact a service technician to replace. Only replace with the same type and value.
- Warning "Risk of fire". Do not place flammable or combustible materials near the device !
  This device radiates heat on its external surfaces and from ventilation ducts during normal operation, which is both normal and safe. Exposing flammable or combustible materials into close proximity of this projector could result in the spontaneous ignition of that material, resulting in a fire. For this reason, it is absolutely necessary to leave an "exclusion zone" around all external surfaces of the projector whereby no flammable or combustible materials are present.
- 

. (Only in light mode) Do not illuminate objects within 2 meter (6.6 feet). Objects within this range can scorch, melt or ignite from the heat projected by the light beam. Leave at least a free safety area of 2 meter (80") to all combustible parts
- Do not cover the device or the lens with any material while the device is in operation.
- Mount the device in a well ventilated area away from sources of ignition and out of direct sun light.
- Never expose the device to rain or moisture.
- In the event of fire, use sand, CO_2, or dry powder fire extinguishers; never use water on an electrical fire.
- This product should never be placed near or over a radiator or heat register.
- This device should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- The operation room must be well ventilated or cooled in order to avoid build up of heat.

On servicing

- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage potentials and risk of electric shock.
- Refer all servicing to qualified service personnel.
- Fence off a restricted area of at least 3 meters around the projector using an eye-catching fence and “KEEP OUT” signs. This to prevent unauthorized persons coming near the projector during servicing.
- Unplug this product from the wall outlet and refer servicing to qualified service technicians under the following conditions:
  - When the power cord or plug is damaged or frayed.
  - If liquid has been spilled into the equipment.
  - If the product has been exposed to rain or water.
  - If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of the other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
  - If the product has been dropped or the cabinet has been damaged.
  - If the product exhibits a distinct change in performance, indicating a need for service.
- Replacement parts: When replacement parts are required, be sure the service technician has used original Barco replacement parts. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or other hazards. Unauthorized substitutions may void warranty.
- Safety check: Upon completion of any service or repairs to this device, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- Lamp replacement: high pressure lamp may explode if improperly handled.

1.3 Important warnings concerning DML flight cases

Important warnings concerning stacking/transporting DML rental flight cases

- Stack maximum two (2) DML rental flight cases high. Never higher.
- The surface on which a flight case is standing must be level to ensure that the total load is evenly spread out among the four wheels. The surface must also be able to support the load safely.
- Before stacking or transporting flight cases, check the wheels and their fixation screws for wear or defects.
- Before stacking or transporting flight cases, check that the six lock handles on each flight case are in good working order and locked securely.
- When stacked, make sure the wheels of the upper flight case are precisely positioned in the stacking dishes of the flight case below.
- Stacked flight cases may not be moved. Before stacking, the lower flight case must already be in its final resting position before placing the second upon it.
- Never stack loaded flight cases in a truck or other transport medium, unless each flight case is rigidly strapped tight.
- In the event of a wheel breaking, flight cases must be rigidly strapped tight to prevent a stack collapsing.
- Use an appropriate forklift to raise flight cases and take the necessary precautions to avoid personnel injury.

1.4 Recycling guidelines

WARNING: Do not break or crush lamps because this may pose health and environmental risks when mercury vapors are released.

CAUTION: To avoid breaking the lamps, repack carefully when storing and transporting them.

CAUTION: Lamps may not be disposed as normal household trash.

Contact your local waste disposal facility for information on the recycling program for HID (High Intensity Discharge) lamps in your area.

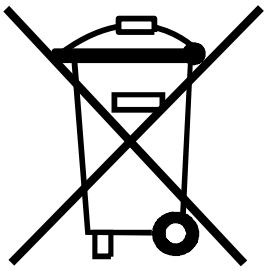


Image 1-1

Disposal options for mercury-containing lamps

- Recycle through a municipal or solid waste district household hazardous waste collection program in accordance with local regulations.
- Direct shipment to lamp recycler
- Shipment through a hazardous waste transporter

2. GENERAL

Overview

- Installation requirements
- Unpacking the device
- Projector air inlets and outlets

2.1 Installation requirements

Ambient temperature conditions

The maximum allowed ambient temperature for an operating DML-1200 may not exceed +40 ºC (+104 ºF).

The minimum allowed ambient temperature for an operating DML-1200 may not drop below +10 ºC (+50 ºF).

The projector will not operate if the ambient air temperature falls outside this range (+10 ºC → +40 ºC or +50 ºF → +104 ºF). Be aware that room heat rises to the ceiling. Check if the temperature near the installation site is not excessive.

The minimum storage temperature is -35 ºC (-31 ºF) and the maximum storage temperature is +65 ºC (+149 ºF).

Humidity conditions

Storage: 0 to 98% relative humidity, non-condensing.

Operation: 0 to 95% relative humidity, non-condensing.

High Altitude

For an optimal performance of the DML-1200 at high altitude, make sure that sufficient air flow is available (maximum ambient temperature 30°C).

Device weight

Do not underestimate the weight of one DML-1200, which is about ±75 kg (±166 lb.). Be sure that the table or truss installation on which the device(s) has to be installed is capable of handling five (5) times the complete load of the complete system.

Power requirements

One DML-1200 requires 200-240 V,10A 50/60Hz

Clean air environment

A device must always be mounted in a manner which ensures the free flow of clean air into the projectors ventilation inlets. For installations in environments where the projector is subject to airborne contaminants such as that produced by smoke machines or similar (these deposit a thin layer of greasy residue upon the projectors internal optics and imaging electronic surfaces, degrading performance), then it is highly advisable and desirable to have this contamination removed prior to it reaching the projectors clean air supply. Devices or structures to extract or shield contaminated air well away from the projector are a prerequisite, if this is not a feasible solution then measures to relocate the projector to a clean air environment should be considered.

Only ever use the manufacturer's recommended cleaning kit which has been specifically designed for cleaning optical parts, never use industrial strength cleaners on the projector's optics as these will degrade optical coatings and damage sensitive optoelectronics components. Failure to take suitable precautions to protect the projector from the effects of persistent and prolonged air contaminants will culminate in extensive and irreversible ingrained optical damage. At this stage cleaning of the internal optical units will be noneffective and impracticable. Damage of this nature is under no circumstances covered under the manufacturer's warranty and may deem the warranty null and void. In such a case the client shall be held solely responsible for all costs incurred during any repair. It is the clients responsibility to ensure at all times that the projector is protected from the harmful effects of hostile airborne particles in the environment of the projector. The manufacturer reserves the right to refuse repair if a projector has been subject to knowingly neglect, abandon or improper use.

2.2 Unpacking the device

About the flight case

The DML-1200 is shipped in a flight case specifically designed to protect the device during transport. Once the device has arrived at the installation site, take it out of the flight case and inspect the outside of the complete device for physical damage to components.

For base stand operation

1. Turn the flight case upside down.

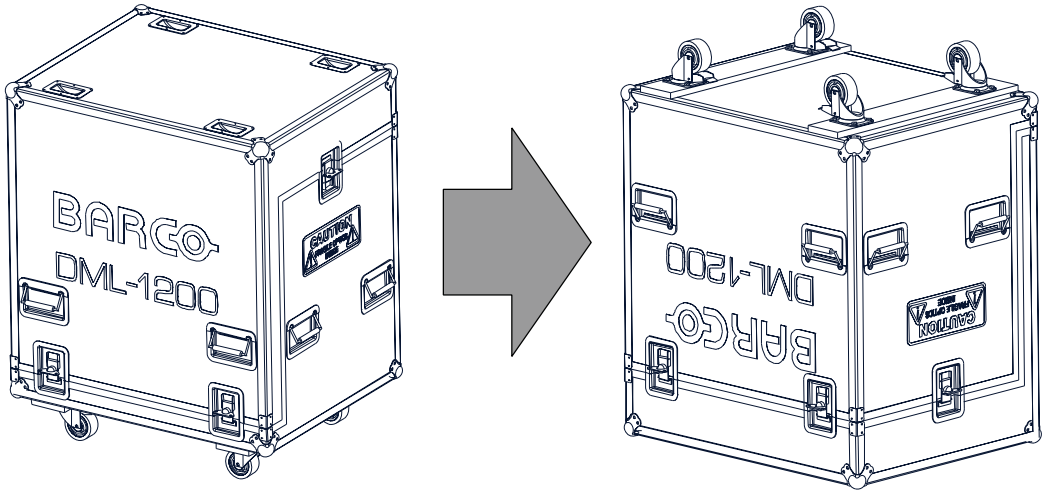


Image 2-1
Turn flight case upside down

2. Open the 6 locks.
3. Take off the cover with the wheels.

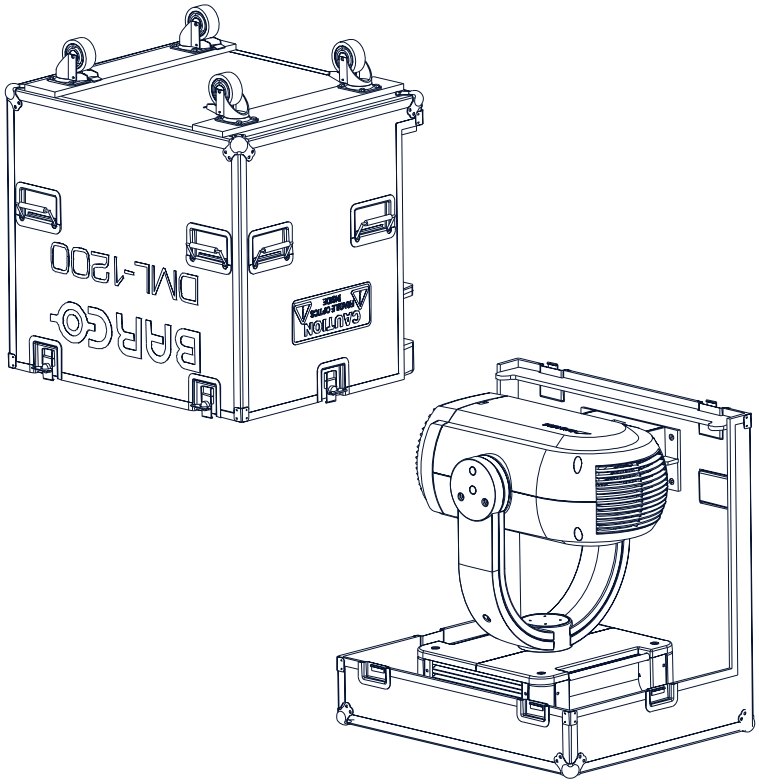


Image 2-2
Open flight case

4. Take out the device by its carrying handles and place it on its foot.
   Caution: *Lift it up with 2 persons while a 3rd person pushes away the flight case.*

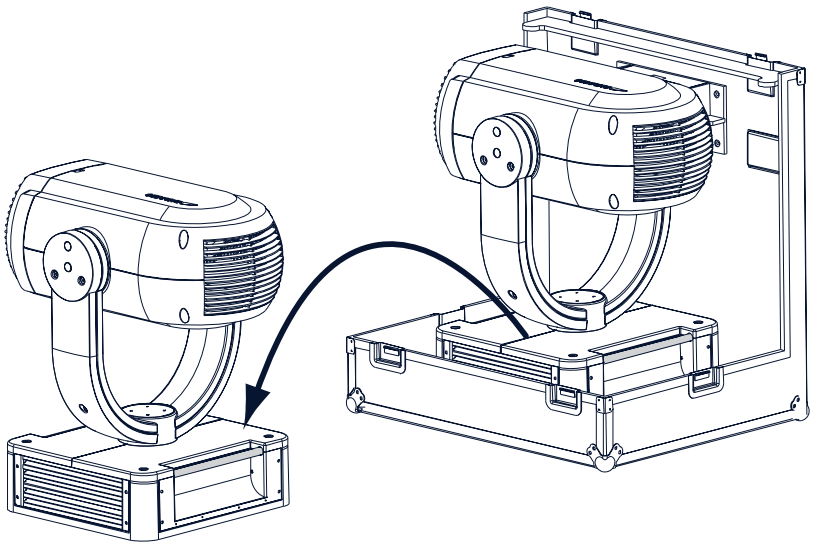


Image 2-3

CAUTION: Never use the head as carrying handle to lift up the DML-1200.

For rigged operation

1. Leave the flight case on its wheels and open the 6 locks.

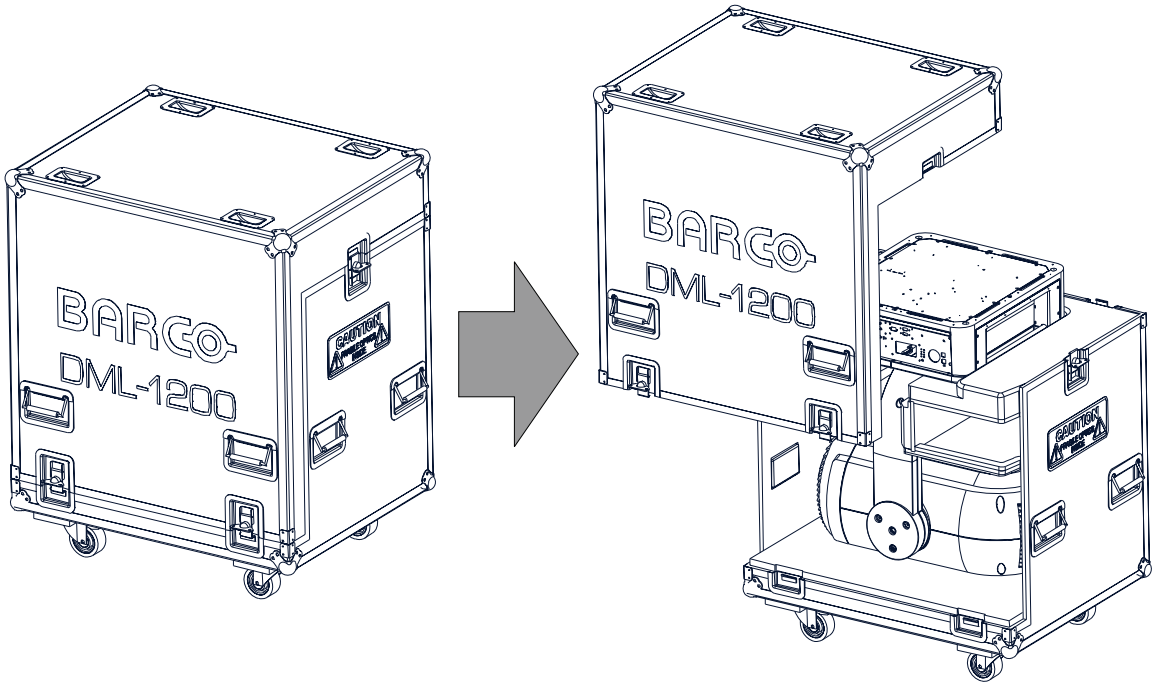


Image 2-4
Open flight case

2. Take off the L-shaped cover.

   The DML-1200 hangs in the fight case.

3. Turn in 4 rigging clamps.

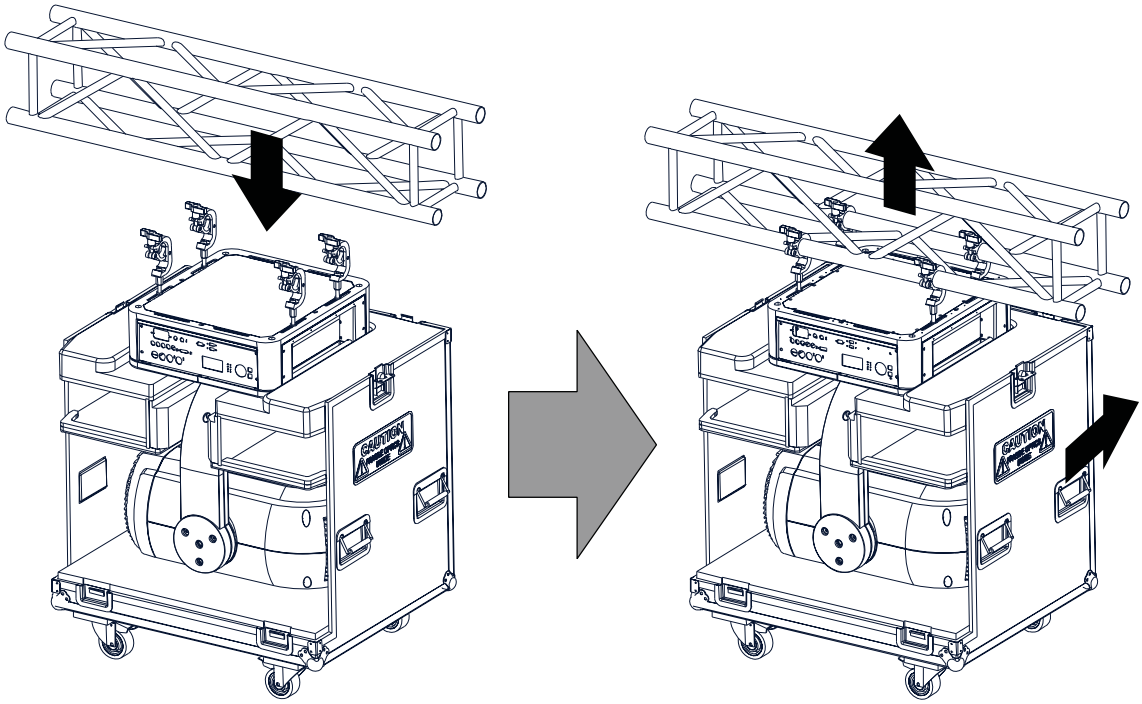


Image 2-5

4. Lower the truss and hook up all rigging clamps.
5. Lift up the device for a few centimeter.
6. Push the flight case away from the device.

For more information about how to mount the clamps, see "Truss mounting of the DML-1200", page 17

2.3 Projector air inlets and outlets

Air inlet and outlet

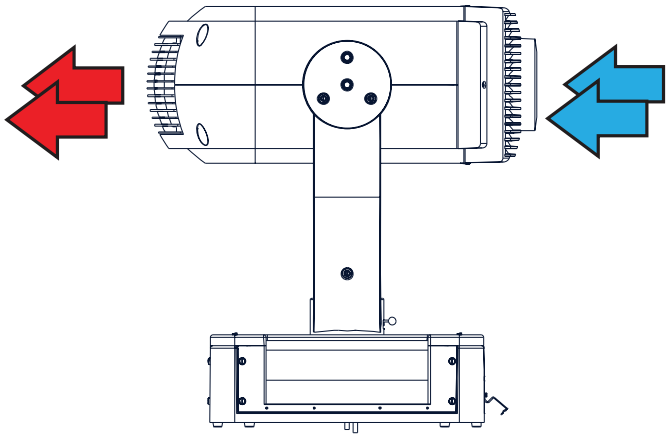


Image 2-6
Air flow

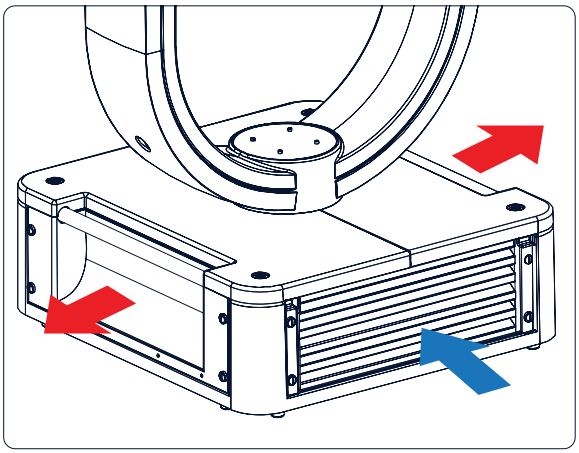


Image 2-7
Air flow base

The DML-1200 has an air inlet at the lens side of the head and an air outlet at the back side of the head. The base has an air inlet at the back side and an air outlet at the right side and left side.

3. PHYSICAL INSTALLATION

CAUTION: Do not mount the DML on a wall ! Only ceiling or floor mounted installation are allowed.

Overview

- Pan and tilt locking
- Mounting the DML-1200 upright
- Truss mounting of the DML-1200

3.1 Pan and tilt locking

CAUTION: Unlock the tilt and pan lock before operating the DML-1200 !

Tilt lock

The projector head can be locked each 45° starting from its packing position (7 lock positions).

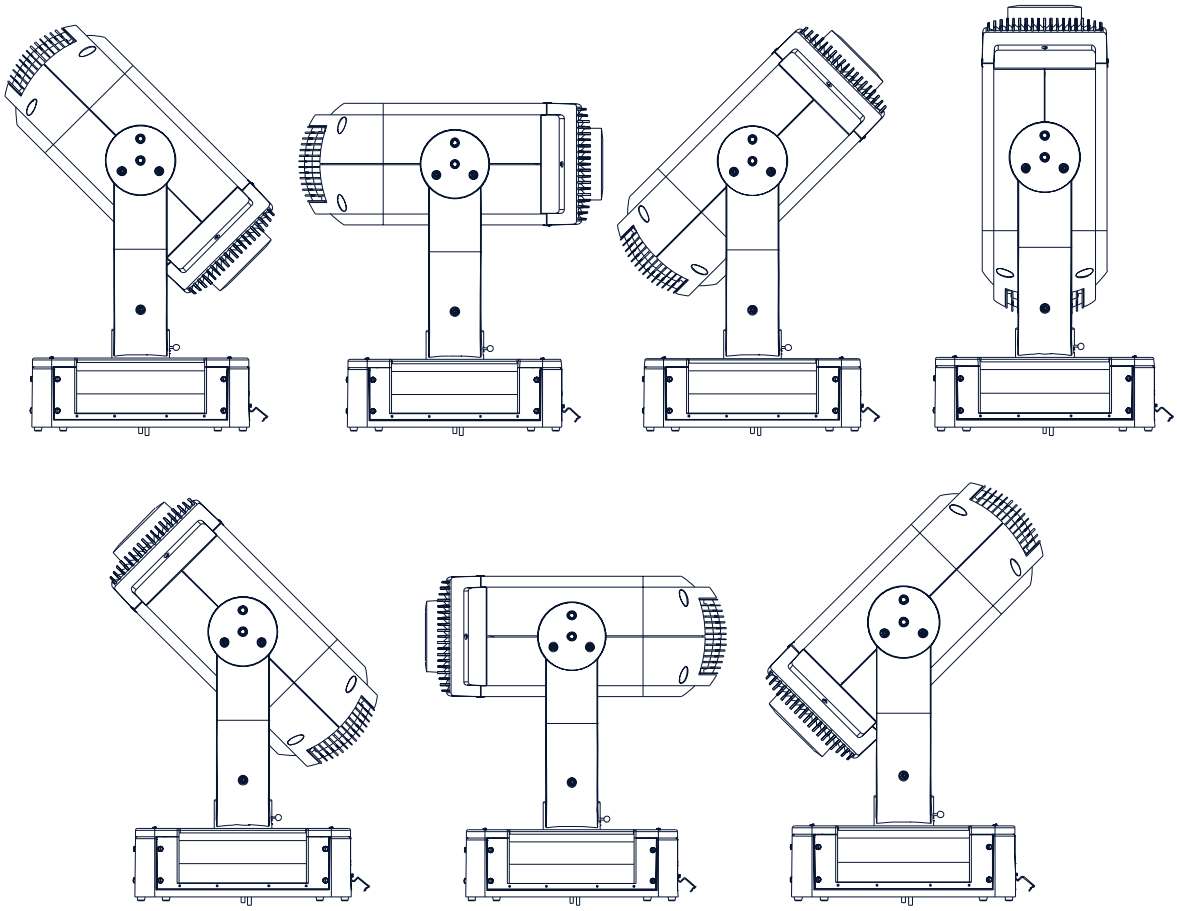


Image 3-1
Different lock positions

To lock the head, turn it in one of the 7 possible lock positions and press the red button on the rotation axis (F).

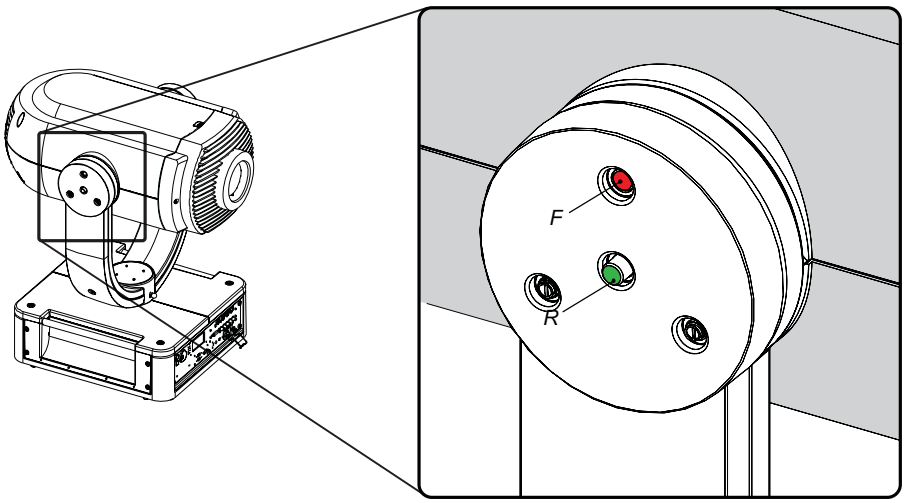


Image 3-2
Tilt lock buttons

To unlock the head, press the green button (R).

Pan lock

The panning of the yoke can be locked each 90°, starting from its packing position (4 positions).

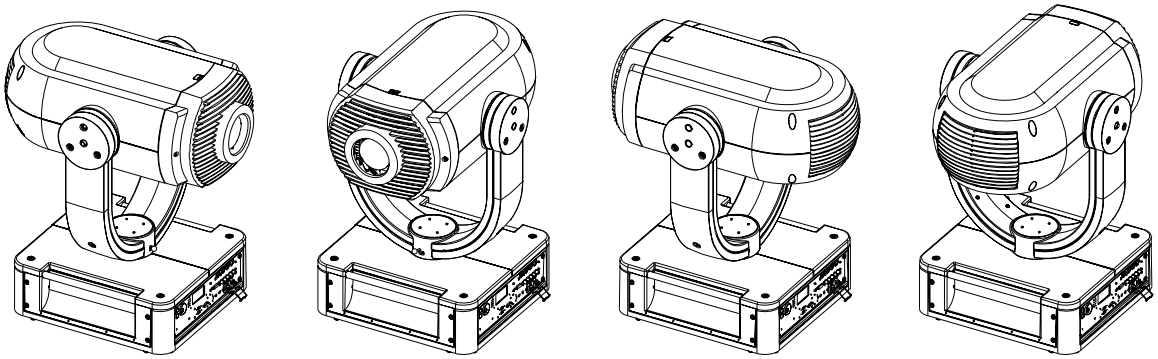


Image 3-3
Pan lock positions

To lock the yoke, rotate it in one of the 4 possible positions and then move the handle from the upper position (U) to the lower positions (L).

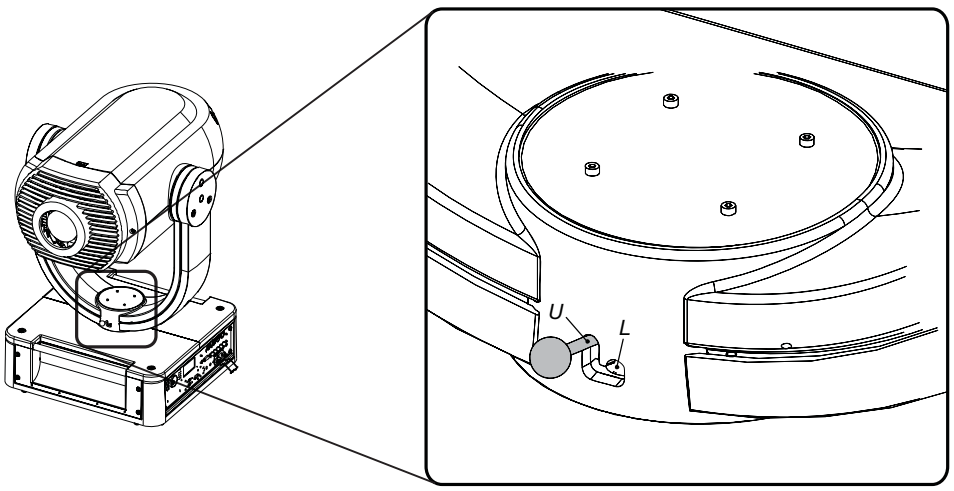


Image 3-4

To unlock the yoke, move the handle from the lower position (L) to the upper position (U).

3.2 Mounting the DML-1200 upright

CAUTION: Always pan and tilt lock the device while handling it.

How to mount

To mount the DML-1200 upright, place the device on a sturdy, stable surface that will support more than 75 kg (165.4 lbs). If the surface is above floor height, use safety cables to secure the device to the surface.

When mounting on a chariot with wheels, always use wheels with brakes.

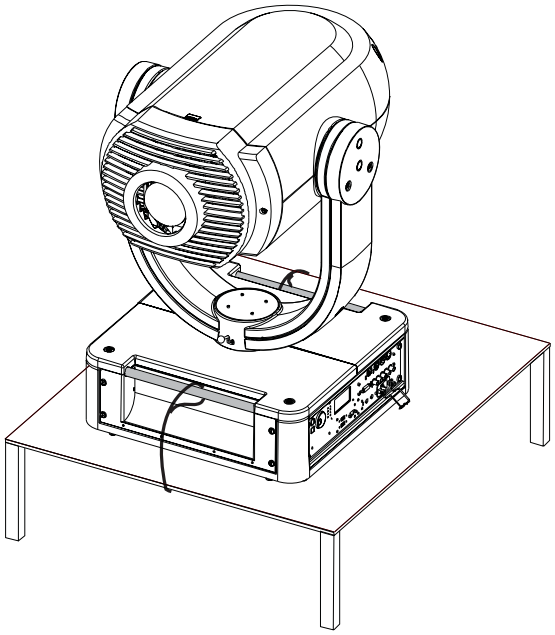


Image 3-5
Mounting upright

Restricted Access Location

The DML-1200 must be installed in a Restricted Access Location, where access can only be gained by persons who have been instructed about the reasons for the restriction applied to the location and about the precautions that shall be taken.

Reasons for the applied restrictions: moving head in all directions, air outlet can reach high temperatures and light output may cause eye injury when looking directly into the lens.

3.3 Truss mounting of the DML-1200

CAUTION: Verify the truss or support if it can handle the combined weight of all the devices on the truss. If necessary, consult a structural engineer.

WARNING: Before mounting, disconnect the power to the DML-1200. If it has been operating, allow to cool for five minutes before handling.

Rigging points and rigging clamps

Four slots are longitudinally (A) oriented and four slots are transversely (B) oriented. Each slot contains a rigging point of which the position in the slot can be adjusted depending on the size of the truss installation. The rigging clamps (C) can be attached to those rigging points, which allows an easy and fast physical setup of the device in a hanging configuration. The 4 corners contains also each a rigging point as well as 2 fixed positions in the middle of two sides.

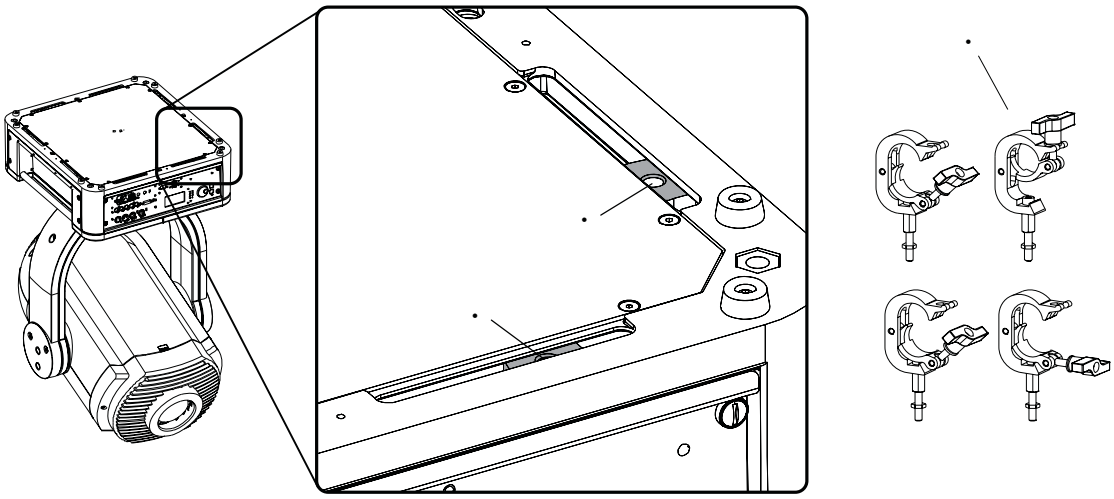


Image 3-6
Rigging points

CAUTION: Always pan and tilt lock the device while handling it.

CAUTION: Only experienced lighting personnel should attempt to hang a lighting fixture to an appropriate theatrical truss.

WARNING: In all cases a safety cable should also be fixed between the safety cable mounting point located at the bottom of the fixture base housing and the truss.

WARNING: Failure to use a safety cable could result in injury or death. High End Systems supplies the proper safety cables and may be contacted for replacements if necessary.

For more information go to: www.highend.com/trusshang

Necessary tools

4 Rigging clamps

How to mount

1. Measure the distance, center tube as reference, between the two used support bars of the truss.

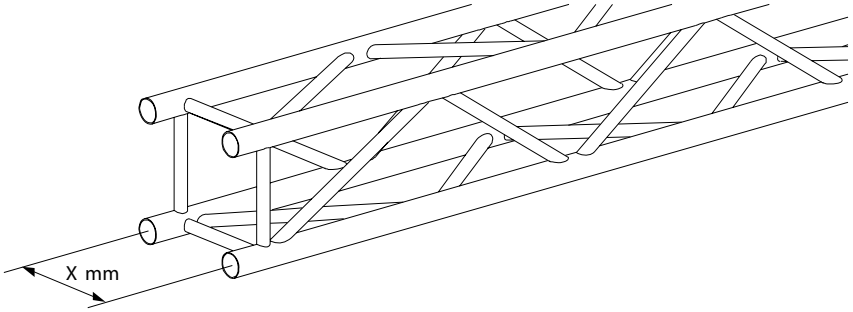


Image 3-7

2. Push the rigging point downwards and slide it at the same time to its place, according the measured distance. Release the rigging point.

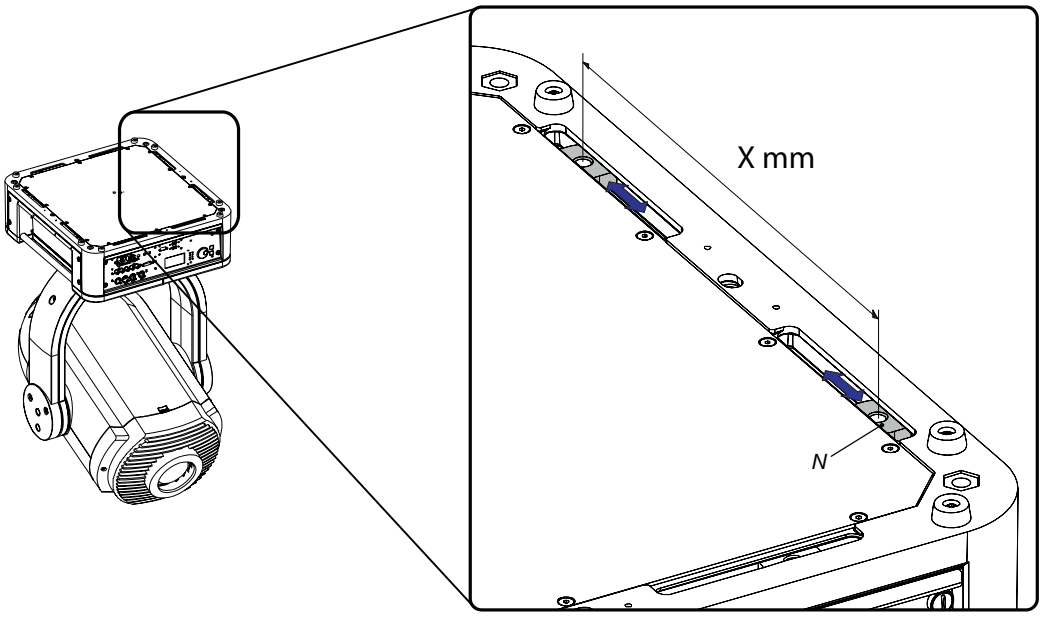


Image 3-8
Distance between rigging points

3. Turn in the rigging clamps (A) into the rigging points (screw thread M10). Secure the rigging clamp by turning the safety nut (B) on the rigging clamp against the rigging point.
   Warning: *Always use four (4) rigging points, equally spread, to suspend the device.*

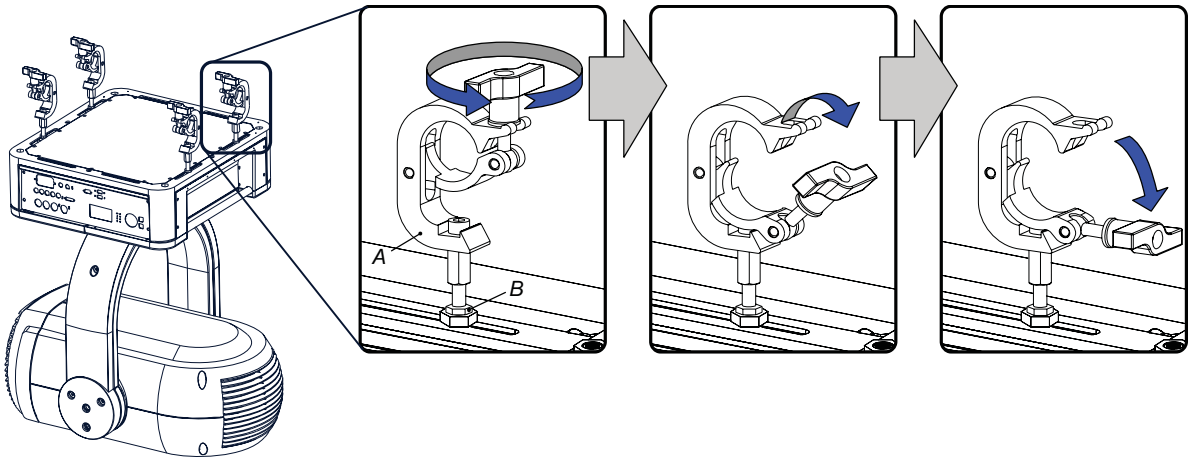


Image 3-9
Open rigging clamps

4. Place all four rigging clamps in open position.
5. Place the device under the truss installation and lower the truss until the support bars of the truss are nearby the rigging clamps mounted on the device.

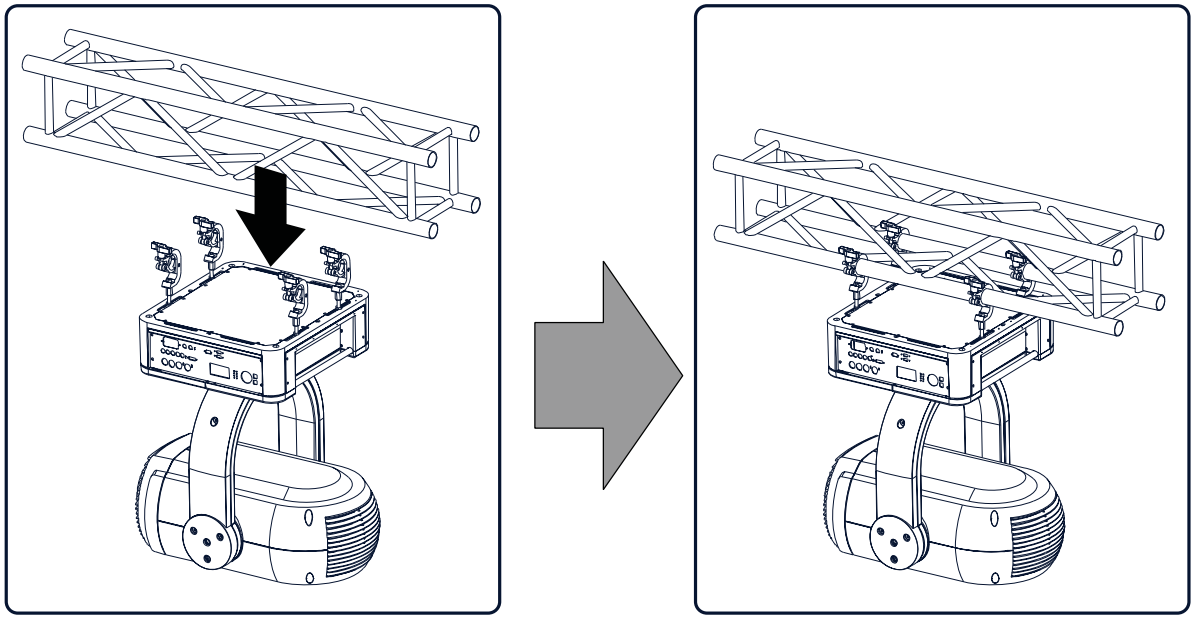


Image 3-10
Mount to truss

6. Hook the 4 rigging clamps over the support bars of the truss and lock all 4 rigging clamps.
7. Install a safety cable (S) around both sides of the carrying handles and around the truss (close to the rigging clamps). Close the cable with the cable clamp..
   - Always use the delivered cable and connector.
   - Before mounting the security cable, inspect the cable and connector. Do not use when visible damage is detected.
   - Stretch the security cable completely. If necessary, turn the security cable a few times around the truss before closing the connection so that the cable is stretched as much as possible.
   - Connector may not be mounted under bending stress.

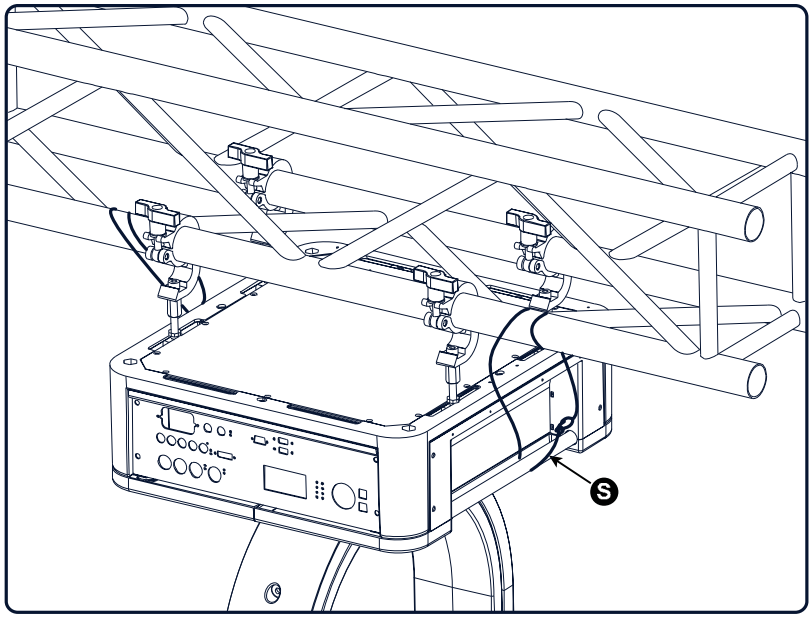


Image 3-11
Mount safety cable

8. Lift up the truss with attached device to the desired height.

4. CONNECTIONS

Overview

- Power connection
- Input connections
- Communication connections
- Linking DML-1200's

4.1 Power connection

CAUTION: Use only the power cord provided with the projector.

How to connect with the local power net

1. Connect the power cord with the power input socket of the projector (P)

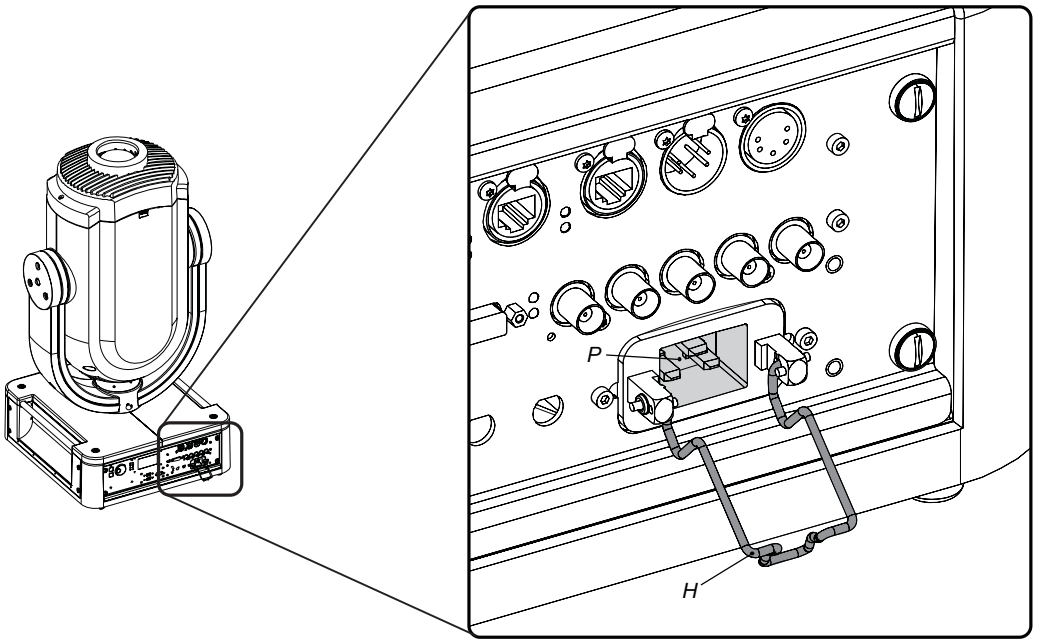


Image 4-1

2. Secure the power plug by locking the plug holder clamp (H).
3. Mount a plug to the delivered power cord but take care of the local regulations about power cords and power plugs. Do not defeat the purpose of the grounding-type plug. Plug this plug into the wall outlet.
   Caution: *Ensure that the power net meets the power requirements of the device, which are 200-240 V,10A 50/60Hz*

Homing the device

When the DML-1200 is connected to an appropriately-rated power source, it automatically begins a homing procedure to verify that the major functions of the device are oriented properly. This homing procedure includes movements of the projector head and yoke.

Do not block the device during its homing process to avoid a wrong detection of its end loop for tilt and pan.

4.2 Input connections

Overview

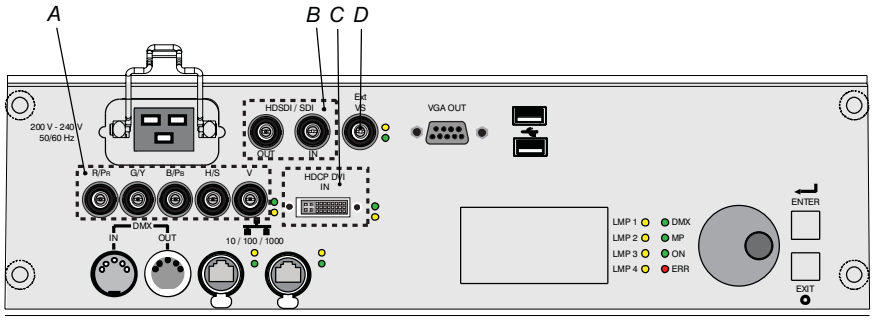


Image 4-2
Input indications (truss view)

A 5–cable input
B SDI / HD-SDI input output
C HDCP DVI input
D External sync (on with embedded media player)

All inputs have two status LEDs. The green LED lights up if the input is selected as the active input. The yellow LED lights up if the input has detected valid input syncs.

5-cable input, signal connectivity

Input signal	R / P_R	G / Y	B / P_B	H / S	V
RGBHV	R	G	B	H	V
RGBS	R	G	B	S	—
RGsB	R	Gs	B	—	—
		sync on green			

5-cable input, specifications

- Data and HD sources RGB and YUV [HS/VS, CS or SOG(Y)]:
  - Pixel clock maximum 170 MHz
  - 8 bit/color
- Video sources RGB
  - 525i, 625i, 525p, 625p
  - Macrovision copy protection robust
  - 8 bit/color
- Automatic detection of sync inputs but with manual override:
  - automatic mode : RGB
  - manual modes : RGB HS/VS - CS, RGB SOG
- Sync signals are 75 ohm terminated.
- Signal requirements:
  - RG(s)B
    - R : 0,7Vpp ±3dB 75 Ohm termination.
    - G(s) : 1Vpp ±3dB (0,7Vpp G + 0,3Vpp Sync) 75 Ohm termination.
    - B : 0,7Vpp ±3dB 75 Ohm termination.

SDI / HD-SDI, specifications

- 1 input (BNC), 1 active loop-through output (BNC)
- 10 bit/color
- SDI: 525/625 interlaced.
- Coax (75 Ohm).

- Supported HDSDI standards:
  - Progressive:
    - 1280x720/60/1:1/ (SMPTE 296M)
    - 1280x720/59.94/1:1/ (SMPTE 296M)
    - 1920x1080/30/1:1/ (SMPTE 274M)
    - 1920x1080/29.97/1:1/ (SMPTE 274M)
    - 1920x1080/25/1:1/ (SMPTE 274M)
    - 1920x1080/24/1:1/ (SMPTE 274M)
    - 1920x1080/23.98/1:1/ (SMPTE 274M)
  - Interlaced:
    - 1920x1035/60/2:1/ (SMPTE 260M)
    - 1920x1035/59.94/2:1/ (SMPTE 260M)
    - 1920x1080/60/2:1/ (SMPTE 274M)
    - 1920x1080/59.94/2:1/ (SMPTE 274M)
    - 1920x1080/50/2:1/ (SMPTE 274M)
    - 1920/1080/50/2:1 (1250)/ (SMPTE 295M)
    - 1920x1080/24/Segmented/ (SMPTE 274M)
    - 1920x1080//23.98/Segmented/ (SMPTE 274M)

HDCP DVI input, specifications

- DVI type: DVI-I (DVI-Integrated), but the analog signals are not supported. Single-link configuration.
- Supports UXGA Resolution (1600 x 1200) (Pixel Rates up to 165 MHz)
- Digital Visual Interface (DVI) and High-Bandwidth Digital Content Protection (HDCP) Specification Compliant
- Vertical frequencies: 24 - 75 Hz
- Horizontal frequencies: 20 - 90 kHz
- Cable lengths: up to 3 meter at UXGA speed.
- Compliance: DDC2B support according to VESA EDID Version 1.2

External Sync

Only with embedded media player.

External sync signal coming from external source to look the embedded media player on that source.

4.3 Communication connections

Overview

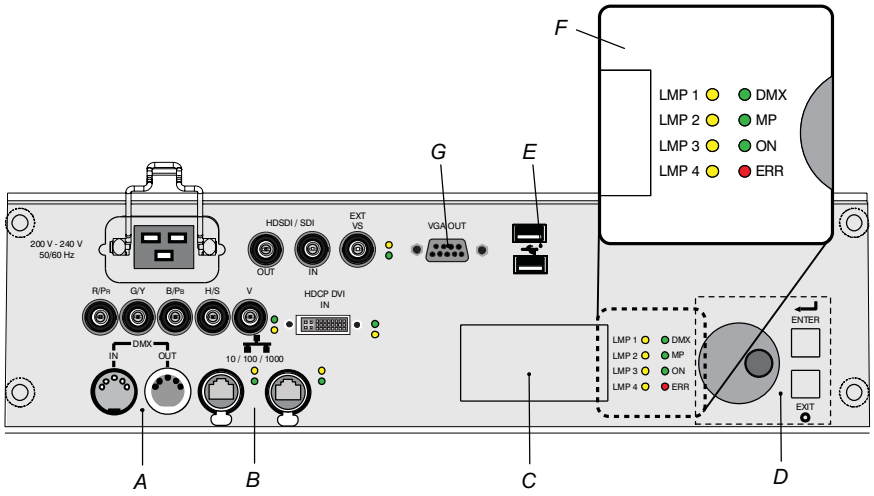


Image 4-3
Communications

A DMX512 data in, data out
B Ethernet connection
C LCD communication display
D Function buttons and jog dial
E USB inputs

F Status LEDs
G VGA out

DMX interface

The communication interface of the DML-1200 supports DMX. The DML-1200 is DMX512-A protected.

DMX is used as communication bus between different devices in the light technic. Each device has an input and a thru, so that the bus can be daisy chained between the different devices. According to the standard a two pair cable with shield and XLR connector is used. The shield must not be connected to or be in contact with the shell or body of either male/female connector. Use cables which are compliant with the DMX512 standard.

You can use the DMX input port (A) to connect a DMX device or lighting console. This way you can control the DML-1200 from that lighting console. The DMX output port (G) can be connected to the next device in the daisy chain. The DMX output port is a passive loop through and is functional even when the device is not powered.

Pin	Description
1	Shield
2	Data 1–
3	Data 1+
4	NC
5	NC

DMX

DMX-512 Lighting protocol over RS-485 interface. Carries information of 512 channels from a lighting controller to lighting devices. Standardized by USITT.

Ethernet network communication

The DML-1200 can be connected to a LAN (local area network) using one of the Ethernet ports (C) on the communication interface. Once connected to the LAN, users are capable of accessing the device from any location, inside or outside (if allowed) their company network using the DML control software: Projector Toolset. This toolset locates the device on the network in case there is a DHCP server or the user can insert the correct IP-address of the projector to access the projector. Once accessed, it is possible to check and manipulate all the projector settings. Remote diagnostics, control and monitoring of the projector can then become a daily and very simple operation. The network connectivity permits to detect potential errors and consequently improve the time to servicing.

Both Ethernet ports (C) are equipped with a yellow and green LED. The yellow LED lights up in case the port is connected with a 100/1000Mbit network. The green LED blinks in case there is network activity.

The connector used for the Ethernet ports (C) are of rugged Neutrik EtherCon RJ45 type, which is compatible with standard RJ45 cable connector. Straight (most common) as well as cross linked network cables can be used.

	10/100 Base-T — RJ45 port	1000 Base-T — RJ45 port
Pin	Description	Description
1	TXD+	TX0+
2	TXD-	TX0-
3	RXD+	RX0+
4	—	TX1+
5	—	TX1-
6	RXD-	RX0-
7	—	Rx1+
8	—	RX1-

It is recommended to use a 1 GigaBit switch to set up the Ethernet connection. Follow also the *Networking tips & tricks*.

Networking tips & tricks

- Use high quality network equipment
- Use CAT 5e or CAT 6 UTP cables
- Unless fitted by a professional network installer, do not use handmade cables. If handmade cables are used, make sure they are made with proper tools and are tested on performance.
- For UTP cabling, limit the length of the cables to 50 meter. If a bigger distance needs to be covered, it's adviced to use fiber optics or repeaters (hubs).
- Do not pull the cables with brute force
- Do not run cables along with or close to electric cabling
- Avoid sharp bends in the cabling
- If possible, separate the network with the DMLs from any corporate or public network to avoid performance loss, contamination (virus risk), and security breaches.
- It is advised to put all DMLs on the same network range (both embedded controller and EMP). This makes the network easier to use and understand, and all components will be reachable for the Projector Toolset

For complex and large network setups, we advice to contact a professional network specialist and installer.

USB port

The communication interface is equipped with two USB ports, type "A" connectors (E). These USB ports are use by service technicians to connect a keyboard and mouse to the available media player or another USB device.

VGA out

To connect a monitor to the available media player. This VGA out is used in combination with the USB ports to control the media player for service purposes.

LED indications

The LED indication next to the jog dial have the following function:

Yellow LEDs LMP1, LMP2, LMP3, LMP4 : On when the corresponding lamp is on. Off when the corresponding lamp is off.

Indication	Color	Description
LMP1	Yellow	ON : when lamp 1 is on ON - OFF (blinking): lamp 1 is in after cooling. OFF : when lamp 1 is not ignited.
LMP2	Yellow	ON : when lamp 2 is on ON - OFF (blinking): lamp 2 is in after cooling. OFF : when lamp 2 is not ignited.
LMP3	Yellow	ON : when lamp 3 is on ON - OFF (blinking): lamp 3 is in after cooling. OFF : when lamp 3 is not ignited.
LMP4	Yellow	ON : when lamp 4 is on ON - OFF (blinking): lamp 4 is in after cooling. OFF : when lamp 4 is not ignited.
DMX	Green	ON - OFF (blinking): when the device received DMX data within the last 3 seconds. OFF : no DMX data received.
MP	Green	ON : when the Media Player is on ON - OFF (blinking): when the Media Player software is up and running OFF : when Media Player is off
ON	Green	ON : when the head is on ON - OFF (blinking): when the head is on and ready OFF : head is not ready
ERR	Red	ON : indicates a warning in the head during operation. A warning allows normal operation, but some hardware in the device does not match the required specifications ON - OFF (blinking): indicates a fatal error. Service is required. OFF : no errors detected

LEDs are only active when the LCD panel is activated or when an activation command is sent via Projector Toolset.

4.4 Linking DML-1200's

Standard DMX linking

The number of devices on a link will be determined by the combined number of channels required by all devices. One link (universe) contains 512 channels.

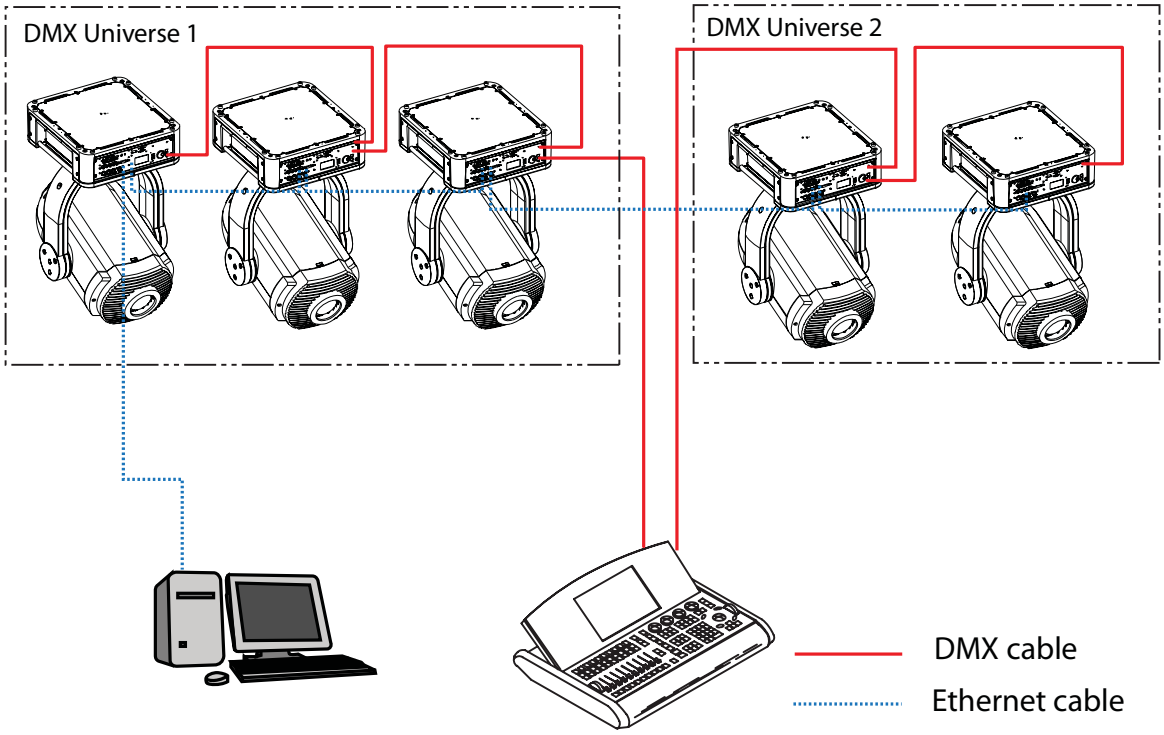


Image 4-4
DMX linking

Therefore, one DMX universe can contain up to 4 DML-1200 devices with a Media Player and up to 10 devices without Media Player.

To control a DML-1200 without Media Player, 51 DMX channel are necessary. When the Media Player is available, 128 channels are required.
How to make a link:

1. Connect the male connector of a DMX Data cable to the DMX Data Out connector of the console.
2. Connect the female connector to the DMX In connector of the first device.
3. Continue linking the remaining devices connecting a cable from the DMX Out connector of each device to the DMX In connector of the next device on the link.
4. Connect a male terminator (120 Ω) to the DMX Out connector of the last device in the link.

DML-1200 devices use an Ethernet network also for controlling. The Ethernet cable can link all devices one after each other, without looking to the DMX universes.

DMX over Ethernet

If you are using a DMX console and other automated lighting products compatible with Art-Net, the Ethernet network can serve as the link for DMX control.

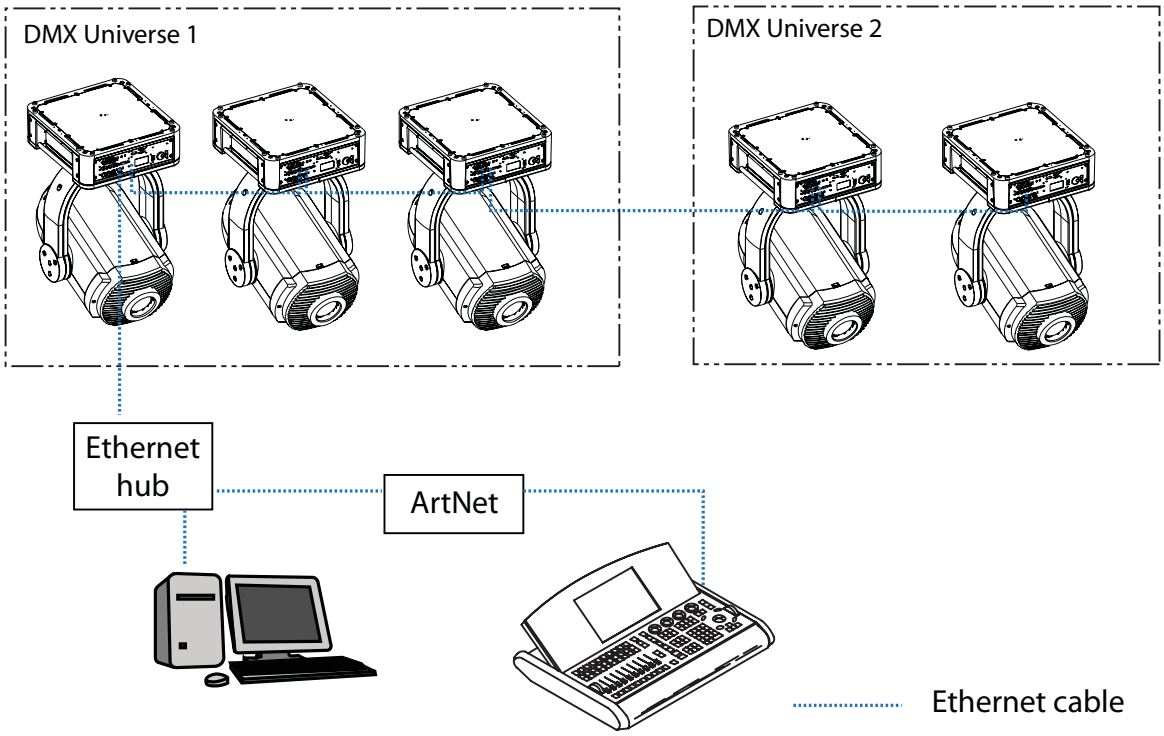


Image 4-5
DMX on Ethernet

Alternative setup:

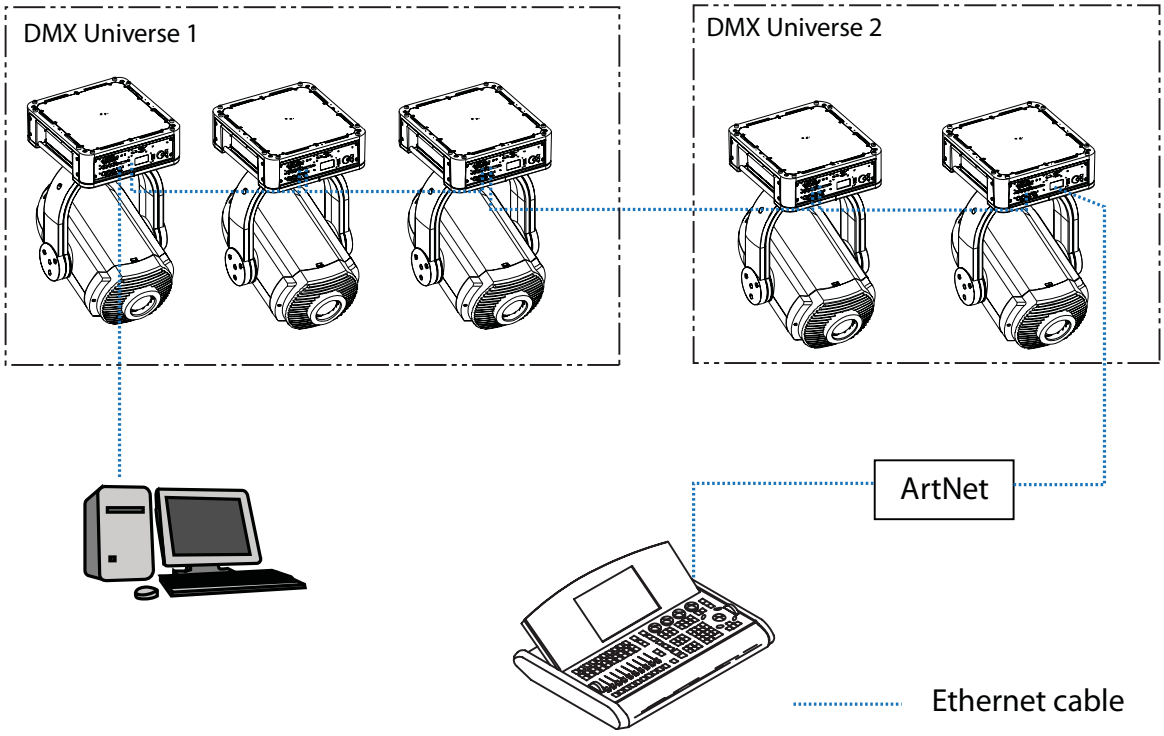


Image 4-6
DMX on Ethernet, alternative setup

5. START UP OF THE ADJUSTMENT MODE

5.1 About the adjustment mode

Overview

As the adjustment mode is the central place to control and align the head, the following functions can be done:

- Input setup: the different inputs can be configured for a specific format or input source.
- Image adjustment: these adjustments are organized per image source and contain the aspect ratio, timings and image settings.
- Lamp: manage the lamp mode, the lamp use, lamp type and history
- Alignment: groups all controls necessary during the setup of the device onto a screen.
- Control: contains the accessibility settings of the device, such as address and communication setup and the DMX controls for the device.
- Service: contains information about how the device is performing. This information will be useful when calling for a service intervention.

Some settings are applied (saved) immediately but other are only saved and applied after switching off the lamps (e.g. video related settings).

5.2 Start up of the adjustment mode

Start up tools

Only the local control panel can be used to start up the Adjustment mode.

How to start up

1. Press the **Enter** button on the local control panel to start up the *Adjustment* mode.

Image 5-1

5.3 Navigation and adjustments

How to navigate in the menu structure

Once in the menu structure, use the jog dial on the local control panel to scroll through the items in the displayed menu. The selected item will get a background color. To activate a selected submenu or function, press **Enter**.

How to make an adjustment

Once a function is selected with the jog dial, press **Enter** to activate this function. The value behind this selection is highlighted. Use the jog dial to change the value to the desired value. Press **Enter** to activate this value. and to return to the function selection. Repeat this action when necessary to change the value again.

About the menus

Both bottom lines on the display are used to indicate the last error or warning which has occurred. The first line of these two indicates the status, warning or error and the second line gives a description of the warning or error. To see an overview of all warnings and errors, see "Error list", page 165.

6. INPUT MENU

Overview

- Input selection
- Auto Image Alignment
- Reset to factory presets
- Image load mode
- Aspect ratio
- No input signal
- No source selected

6.1 Input selection

How to select an input

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial to select the desired input and press **Enter**.

   The corresponding input will be selected.
   Possible inputs:
   - No source : no source is selected.
   - RGBHV
   - HDSDI/SDI
   - DVI
   - Media player : internal built-in media player is selected.

Image 6-1

Image 6-2

6.2 Auto Image Alignment

What can be done ?

An alignment of the preview window is executed for the new source.

How to use

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *Auto image alignment* and press **Enter**.

An auto alignment of the current source is executed.

Image 6-3

Image 6-4

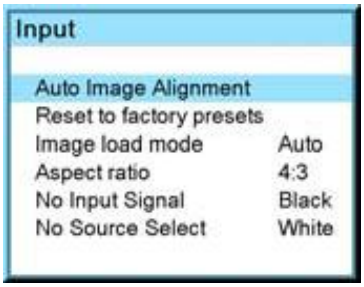


Image 6-5

6.3 Reset to factory presets

What can be done ?

All internally created image files due to switching from source or using the auto image alignment function can be cleared by a reset to factory presets.

Do not use this function during a show as it can delete previous created information necessary for the show. Use this function before the set up of a show.

How to reset

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *Reset to factory presets* and press **Enter**.

   A reset is executed.

Image 6-6

Image 6-7

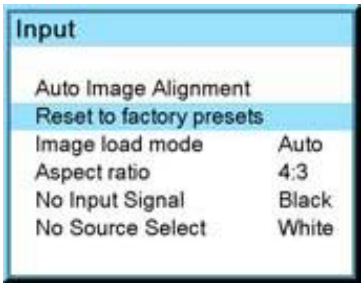


Image 6-8

6.4 Image load mode

What can be done ?

When the image lock mode is set to *Auto*, image files can be created and saved.

When the image lock mode is set to *Locked*, the current image files are immediately saved and locked. No new image files can be created or loaded. Settings can be changed during the show but are not saved. When reconnecting the source, the original settings are restored again.

When the source changes in lock mode, in some cases, the projected image can change, can distort or can fully disappear. Once the original source is restored, the projected image returns with the original settings.

Example : the lock mode is set to *Auto* while setting up the show. Once the setup is finished the lock mode is set to *Locked* so that the show always starts with the original settings.

How to set up

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *Image load mode* and press **Enter**.

   The option is selected.
4. Press **ENTER** to toggle between *AUTO* and *LOCKED*.

   Auto: Image files can automatically be loaded.

   Locked: Current image files are saved and locked.

Image 6-9

Image 6-10

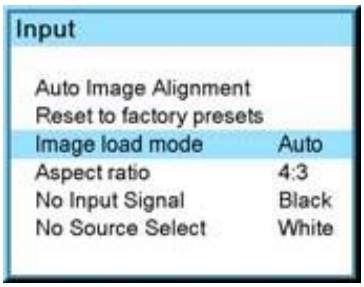


Image 6-11

6.5 Aspect ratio

Not for EMP source.

What can be done ?

The aspect ratio setting forces the device to project an image using a defined aspect ratio.

Aspect ratio	Description
4:3	Standard television format
16:9	Wide screen television format / anamorphic format
5:4	Workstation format

How to select an Aspect ratio

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *Aspects ratio* and press **Enter**.

   The option is selected.
4. Press **ENTER** to toggle between *4:3*, *16:9* and *5:4* .

Image 6-12

Image 6-13

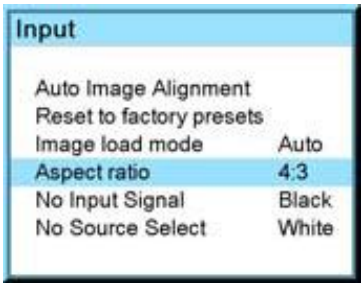


Image 6-14

6.6 No input signal

What can be done ?

When no input signal is available, the output can be set to black or white.

How to toggle

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *No Input Signal* and press **Enter**.

   The option is selected.
4. Press **ENTER** to toggle between *Black* or *White*.

Image 6-15

Image 6-16

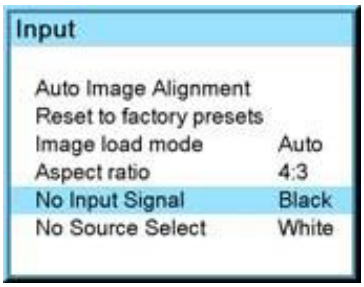


Image 6-17

6.7 No source selected

What can be done ?

When no source is selected, the output can be set to white or black.

How to toggle

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Input* and press **Enter**.

   The input selection menu opens.
3. Turn the jog dial until the second page of the input menu is displayed and turn further to select *No Source Select* and press **Enter**.

   The option is selected.
4. Press **ENTER** to toggle between *Black* or *White*.

Image 6-18

Image 6-19

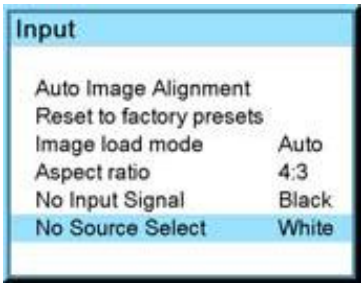


Image 6-20

7. LAMP MENU

Overview

- Overview flow
- Identification
- Status and run time overview lamps
- High altitude mode
- Lamp mode
- Lamp power

7.1 Overview flow

Overview

Level 1	Level 2	Level 3
Lamp		
	Identification	
		Serial number
		Article number
		Run time
		Remaining run time
		Number of strikes
		Version
		Status
	Overview	
	High altitude	Disabled
		Enabled
	Lamp mode	2 lamps
		4 lamps
	Lamp power	Economic
		Normal

7.2 Identification

About

The lamp identification menu gives an overview of the most important parameters of the used lamps. It starts with the first lamp. Scrolling to other lamps is possible with the jog dial.

These parameters are:

- Serial number lamp
- Article number of the used lamp
- Run time since first start up of the lamp
- Remaining run time for a safe operation of the lamp
- Number of strikes since the first start up of the lamp
- Status of the lamp

These parameters are useful when calling for a service intervention.

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Lamp* and press **Enter**.
3. Turn the jog dial to select *Identification*. and press **Enter**.

   The identification data of the first lamp is displayed.

   Turn the jog dial to display the identification screen of another lamp.

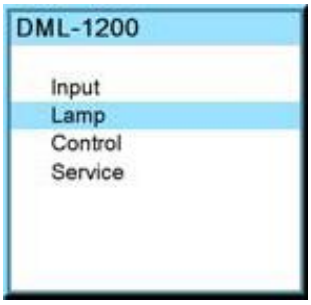


Image 7-1

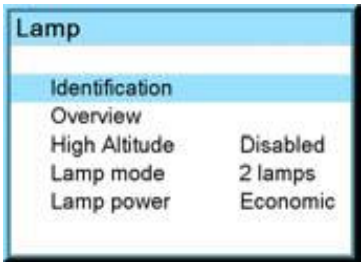


Image 7-2

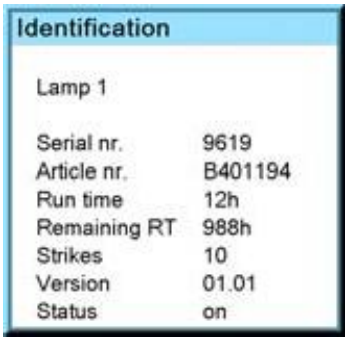


Image 7-3

7.3 Status and run time overview lamps

Overview

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Lamp* and press **Enter**.
3. Turn the jog dial to select *Overview* and press **Enter**.

   The lamp overview menu appears.

   The status and the run time for each lamp is indicated.

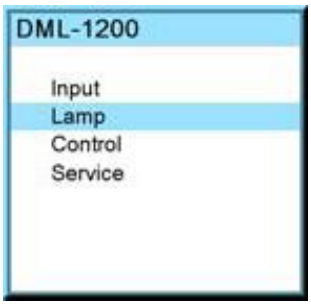


Image 7-4

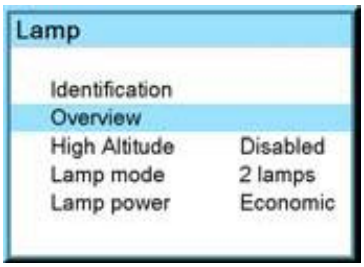


Image 7-5

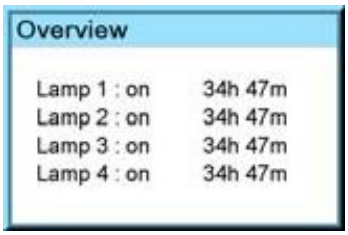


Image 7-6

About run time warnings and errors

When at least one lamp reaches 1500 hours, an warning is displayed on the local LCD to indicate the replacement of this lamp.

When all 4 lamps are running for more than 2000 hours, device will not start up anymore. Replacing all lamps is immediately necessary.

7.4 High altitude mode

What can be done ?

When using the device on a high altitude (less air density) enabling the high altitude mode will run the fans faster so that the cooling is guaranteed This mode can also be used when increased cooling is required. The speed of the cooling fans will be increased.

Switching to high altitude mode will increase the noise level of the device.

How to toggle

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Lamp* and press **Enter**.
3. Turn the jog dial to select *High altitude* and press **Enter**.

   The high altitude setting is selected.
4. Press **ENTER** to toggle between *Enabled* or *Disabled*.

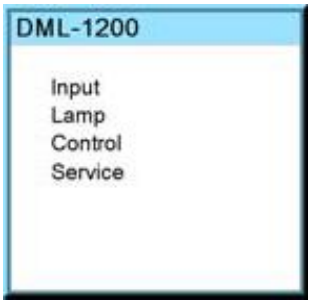


Image 7-7

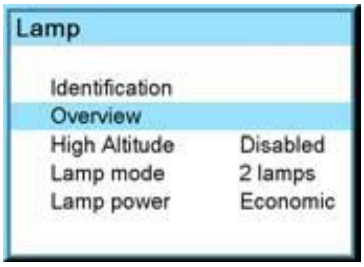


Image 7-8

Enabled	Device is running with higher settings for the cooling fans. A correct cooling is started even when the air density is less (fans are running faster)
Disabled	Device is running with normal settings for the cooling fans.

7.5 Lamp mode

What can be done ?

The projector head is equipped with 4 identical lamps. Depending on the lamp mode selection, the menu will show 4 lamps or 2 lamps when starting up the device.

In *2 lamps* mode, the projector head will always ignite lamp 1 & 4 or 2 & 3 depending on the run time. I will always use those with the lowest run time.

Switching from 4 lamps to 2 lamps is done immediately.

Switching from 2 lamps to 4 lamps is also done immediately.

But, switching from 4 lamps to 2 lamps and immediately again to 4 lamps is only done after respecting a cool down period of 2 minutes.

Using the projector in 2 lamps mode will reduce the noise level of the projector as the fan speeds are reduced.

How to toggle

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Lamp* and press **Enter**.
3. Turn the jog dial to select *Lamp mode* and press **Enter**.

   The Lamp mode setting is selected.
4. Press **ENTER** to toggle between *2 lamps* or *4 lamps*.

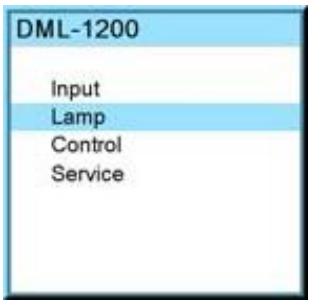


Image 7-9

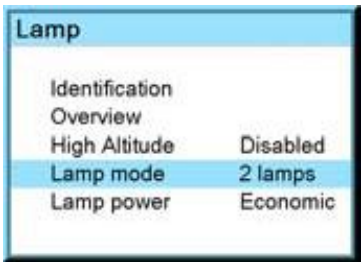


Image 7-10

2 lamps	Only 2 lamps will be ignited during start up. That can be the combination of lamp 1 & 4 or lamp 2 & 3. The selection depends on the current run time of the lamps.
4 lamps	All 4 lamps will be ignited during start up.

7.6 Lamp power

What can be done ?

The lamp power mode can be switched between *Normal* and *Economic*. When playing in economic mode, the life time of the active lamps will increase.

How to toggle

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Lamp* and press **Enter**.
3. Turn the jog dial to select *Lamp power* and press **Enter**.

   The Lamp power setting is selected.
4. Press **ENTER** to toggle between *Economic* or *Normal*.

Image 7-11

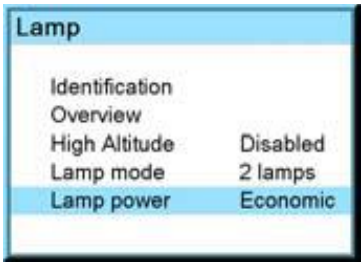


Image 7-12

Economic	A reduced wattage is fed to the lamps. Reduced light output but a longer life time for the lamps. Lamp power is reduced to 83 %.
Normal	Maximum allowed power is fed to the lamps. Maximum light output is reached in this way.

8. CONTROL MENU

Overview

- Overview flow
- Startup
- Standby
- Demo mode
- DMX data
- DMX address
- DMX universe
- Media player on - off
- LCD contrast
- Pan and Tilt encoder
- Network
- Auto shutdown
- Status LEDs
- DMX priority

8.1 Overview flow

Overview

Level 1	Level 2	Level 3
Start up		
Standby		
Demo mode		
	Demo mode	
		ON – OFF
	Demo delay	
	Demo cycles	
DMX Data		
	DMX channel 1 - 16	
DMX address		
DMX universe		
Media Player		
	On - Off	
LCD contrast		
Pan encoder		
Tilt encoder		
Network		
	Select DHCP	
	Select artnet	
	Select preset	
Auto shutdown		
	Enabled - Disabled	
Status LEDs		
	Enabled - Disabled	

Level 1	Level 2	Level 3
DMX priority		
	Enabled - Disabled	

As there are too much items for the LCD display, the menu is split up in two pages. When turning the jog dial over the menu items, the next page is displayed automatically when turning further than the last item in the list.

8.2 Startup

What happens

When the device is started up, lamps start up and waits until new commands are sent to the device.

How to start up

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *Startup* and press **Enter**.

   The device starts up and moves to the homing position.

Image 8-1

Image 8-2

When DMX data is applied to the device, it starts up but the head remains in its current position.

8.3 Standby

How to switch to standby

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *Standby* and press **Enter**.

   The device goes to standby. The fans are still running for a few minutes to cool down the head.

Image 8-3

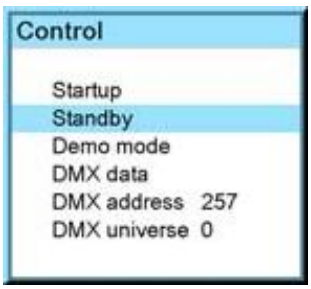


Image 8-4

8.4 Demo mode

What can be done ?

Within the DML-1200 a demo run is programmed. When the demo mode is activated, the demo run starts with an interval of x seconds. The number of times the demo run has been started is indicated in *Demo cycles*.

Practical use of the demo mode : for service purposes to verify the normal operation of the device.

Demo mode can only be started if no DMX data is applied to the device.

How to activate, deactivate the demo

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *Demo mode* and press **Enter**.

   The selection jumps to ON or OFF.
4. Turn the jog dial to select *ON* or *OFF* and press **Enter**.

ON	Demo mode starts
OFF	Demo mode stops

Image 8-5

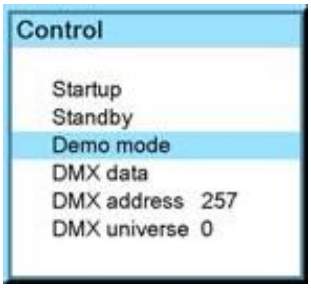


Image 8-6

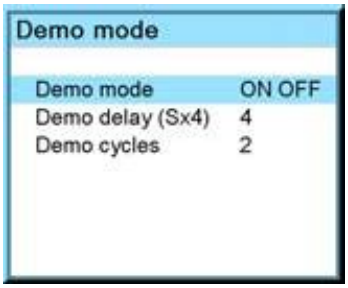


Image 8-7

How to set up the delay

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *Demo delay* and press **Enter**.

   The selection jumps to digit indication.
4. Turn the jog dial until the desired delay is obtained.

   The delay is expressed in seconds multiplied by 4.

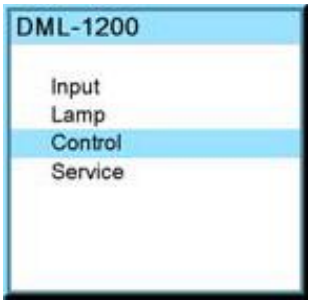


Image 8-8

Image 8-9

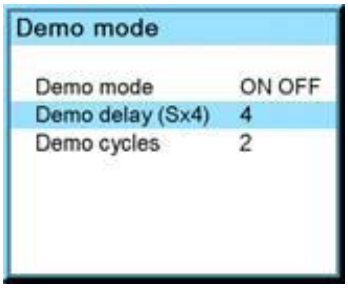


Image 8-10

8.5 DMX data

What can be done ?

The local generated DMX data can be used to control the device or to check if all functions are working properly. While changing a DMX value, the device follows immediately.

The first 16 channels can be controlled via the local generated DMX data. See see "DMX chart, Digital moving luminiere", page 153 for more information about these channels.

How to change a DMX value

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *DMX data* and press **Enter**.
4. Turn the jog dial to select a DMX channel and press Enter.

   The selection jumps to the DMX value.
5. Turn the jog dial until the desired DMX value is reached.

   While changing the value, the selected function is updated immediately.
6. Press **Enter** to return to the channel selection.

Image 8-11

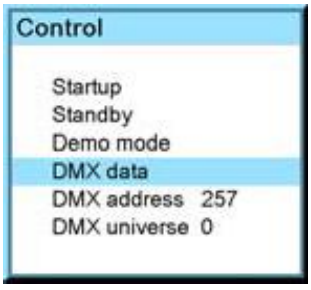


Image 8-12

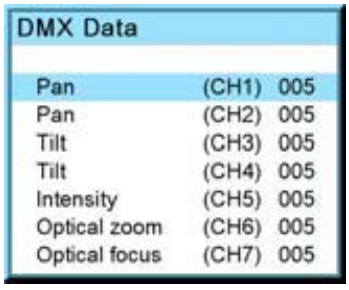


Image 8-13

8.6 DMX address

What should be done ?

Before a device can execute DMX commands, a unique address should be given to the device. That address can vary from 1 to 512.

How to set a DMX address

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *DMX address* and press **Enter**.

   The selection jumps to the numeric value. which is the DMX address.
4. Turn the jog dial until the desired address is reached.
5. Press **Enter** to record that address and to return to the menu selection.

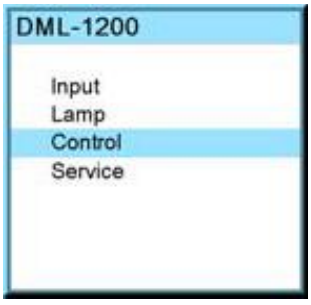


Image 8-14

Image 8-15

8.7 DMX universe

What can be done ?

One DMX universe can contain up to 4 DML-1200 devices with a Media Player and up to 10 devices without Media Player. If you have more devices to control, group them in different DMX universes.

How to set a DMX universe

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial to select *DMX universe* and press **Enter**.

   The selection jumps to the numeric value. which is the DMX universe.
4. Turn the jog dial until the desired universe is reached.
5. Press **Enter** to record that address and to return to the menu selection.

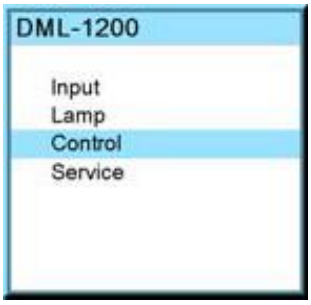


Image 8-16

Image 8-17

8.8 Media player on - off

What is possible ?

If the DML is equipped with an embedded media player, this media player can be switched on or off (enabled or disabled).

How to switch the media player

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *Media player* and press **Enter**.

   The selection jumps to on or off.
4. Press **Enter** to toggle the media player setting.
   Note: *It can take a time before the media player responds as it has to start up or closing a windows session.*

   The selection returns to the menu setting.

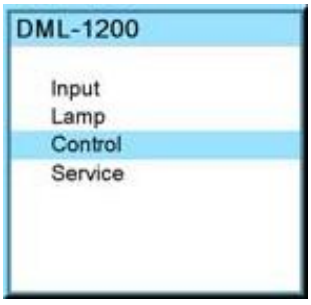


Image 8-18

Image 8-19

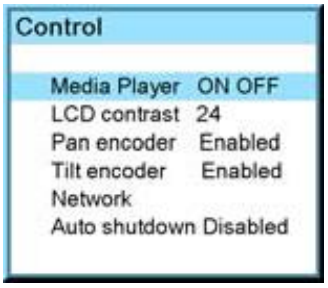


Image 8-20

8.9 LCD contrast

What is possible ?

The contrast of the local LCD can be adapted to the needs of the environment.

How to change

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *LCD contrast* and press **Enter**.
4. Turn the jog dial to adjust the local contrast and press **Enter**.

Image 8-21

Image 8-22

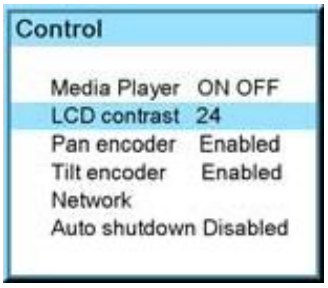


Image 8-23

8.10 Pan and Tilt encoder

What is possible ?

When the DML-1200 is panned or tilted due to an external intervention, e.g. a push, it can always return to its original position when pan and or tilt encoder is enabled.

Pan en tilt encoder can be separately enabled or disabled.

This function is handy when servicing the device. Disable pan and tilt encoder and you can turn the device manually in any desired direction.

Pan encoder

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *Pan encoder* and press **Enter**.
4. Turn the jog dial to select *Enabled* or *Disabled*.

Image 8-24

Image 8-25

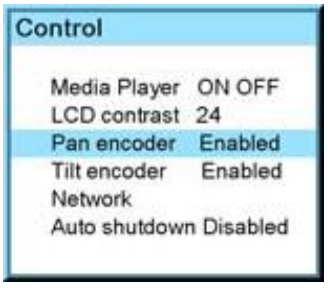


Image 8-26

Tilt encoder

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *Tilt encoder* and press **Enter**.
4. Turn the jog dial to select *Enabled* or *Disabled*.

Image 8-27

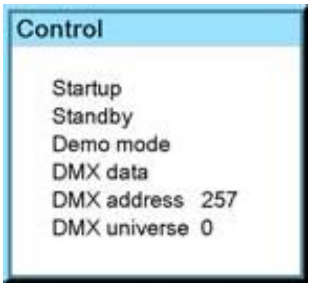


Image 8-28

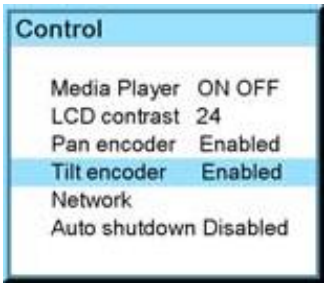


Image 8-29

8.11 Network

What is possible ?

A selection can be made how a network can be obtained, via DHCP, via Art-Net or a preset network. When a choice is made, the network settings are given in the 3 last lines.

How to make the selection

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *Network* and press **Enter**.
4. Turn the jog dial to select the desired network setting, DHCP, Art-Net or preset.

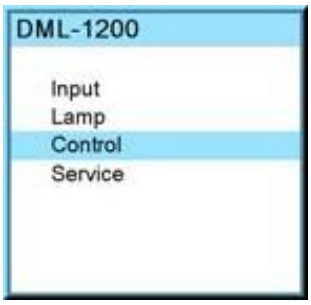


Image 8-30

Image 8-31

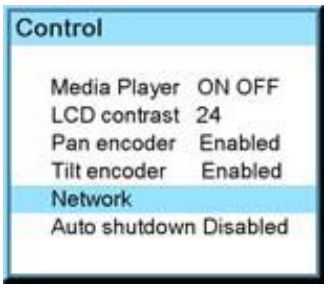


Image 8-32

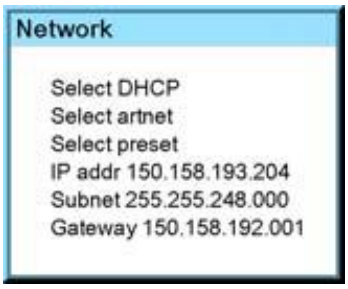


Image 8-33

About changing the IP address

When the network IP address needs to be changed to allow e.g. software upgrade, the power must be removed and reconnected again before Projector Toolset can reconnect to the device.

8.12 Auto shutdown

What can be done ?

The device can shutdown automatically after 5 minutes when no DMX is sent to its DMX input AND when it is not connected with a Projector Toolset or an Art-Net DMX device.

How to set up

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the second page of the control menu is displayed and turn further to select *Auto shutdown* and press **Enter**.

   The selection jumps to disabled or enabled
4. Press **Enter** to toggle between Disabled or Enabled.

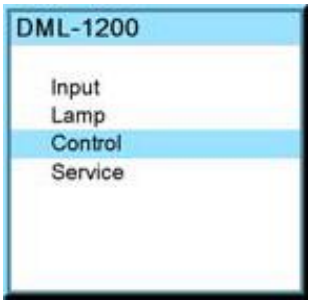


Image 8-34

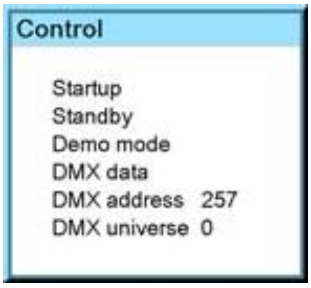


Image 8-35

Image 8-36

Enabled	Auto shutdown will happen after 5 minutes when no DMX is sent to the input AND no connection is available with a Projector Toolset or an Art-Net DMX device.
Disabled	no auto shutdown possible.

About Auto shutdown and video

If the DML should not shutdown while video is connected, then the shutdown setting should be set to *Disabled*.

8.13 Status LEDs

What can be done ?

Status LEDs for Ethernet connection and inputs can be disabled, as well as the backlight of the LCD panel. When disabled, no indication is on the status LEDs and nothing is displayed on the LCD panel.

With the status LEDs setting *enabled*, the LCD panel lights up when pressing on **Enter**. When no more action is taken on the menus, the backlight goes out after a certain time. With **Exit**, it is possible to quit the menu immediately and at the same time the backlight goes out.

How to set up

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the third page of the control menu is displayed and turn further to select *Status LEDs* and press **Enter**.

   The selection jumps to disabled or enabled
4. Press **Enter** to toggle between *Disabled* or *Enabled*.

Image 8-37

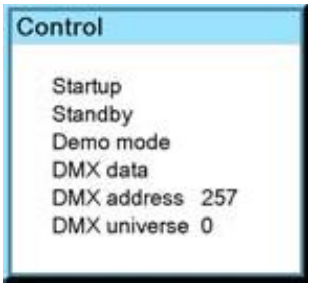


Image 8-38

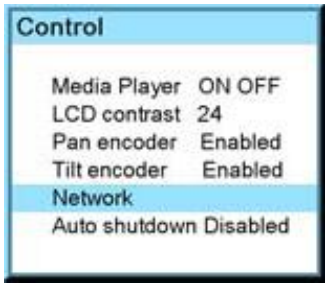


Image 8-39

Image 8-40

Enabled Status LEDs are on and LCD panel backlight can light up.

Disabled Status LEDs are out and the LCD panel backlight is out..

8.14 DMX priority

What can be done ?

DMX control via the DMX input can be set as the priority control input. When DMX priority is enabled, any DMX command sent via Projector Toolset will be overwritten when at the same time a DMX command is sent to the DMX input.

How to set up

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Control* and press **Enter**.
3. Turn the jog dial until the third page of the control menu is displayed and turn further to select *DMX priority* and press **Enter**.

   The selection jumps to disabled or enabled
4. Press **Enter** to toggle between *Disabled* or *Enabled*.

Image 8-41

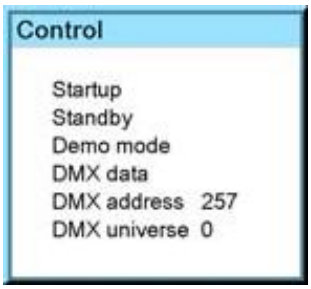


Image 8-42

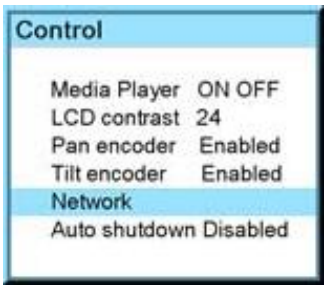


Image 8-43

Image 8-44

Enabled DMX input has the priority

Disabled No priority for the DMX input

9. SERVICE MENU

Overview

- Overview flow
- Identification
- Diagnosis
- Service patterns
- Calibration

9.1 Overview flow

Overview

Level 1	Level 2	Level 3
Service		
	Identification	IP address
	Diagnosis	
		Version table
		Voltages
		Temperatures
		Fan speeds
		Device status
		Error logging
	Service patterns	
	Calibration	
		Index delay
		Pan calibration
		Tilt calibration
		Dimmer calibration
		Zoom calibration
		Focus calibration
		Cyan calibration
		Magenta calibration
		Yellow calibration
		CTO calibration
		Aperture calibration
		IRIS calibration

9.2 Identification

What is possible

Via the identification screen, the following items can be consulted:

- IP address of the device
- Serial number of the device
- Run time since first startup
- Installed software package

How to consult

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Identification* and press **Enter**

   The device typical items are displayed.

Image 9-1

Image 9-2

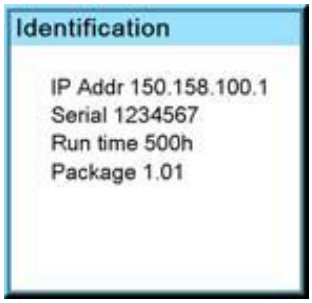


Image 9-3

9.3 Diagnosis

9.3.1 Version table

What can be displayed ?

The software version of the different components inside the device can be displayed. As the list is too long to be displayed on single LCD display, when reaching the last item in the first page turn the jog dial further in the same direction and the second page is automatically displayed on the LCD display.

The following items are given in the list:

- Main software
- Fan controller software
- Lamp info units
- FPGA
- CPLD
- Video FPGA
- Fiberlink TX and RX

How to display an overview

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Version table* and press **Enter**.

   The first page of the version table is displayed. As there are more items than space available on the LCD, when turning the jog dial further than the last item a new page will be displayed.

Image 9-4

Image 9-5

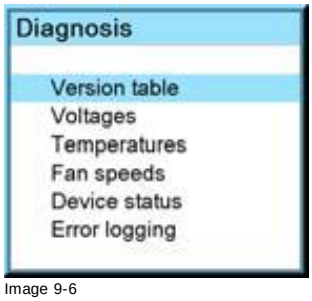


Image 9-6

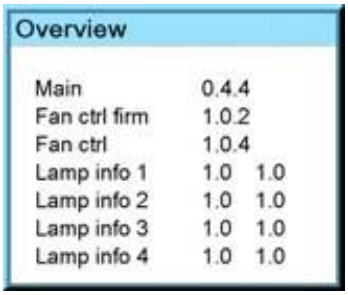


Image 9-7

9.3.2 Voltages

What can be displayed ?

The current value of the different measurement points inside the device.

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Voltages* and press **Enter**.

   The first page of the voltage table is displayed. As there are more items than space available on the LCD, when turning the jog dial further than the last item a new page will be displayed.

Image 9-8

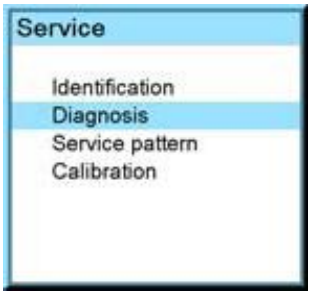


Image 9-9

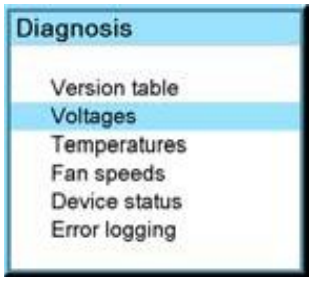


Image 9-10

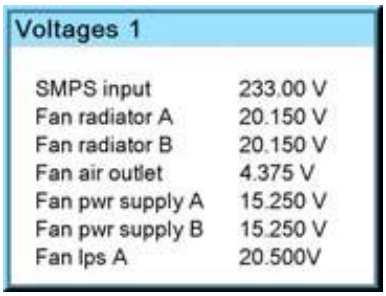


Image 9-11

9.3.3 Temperatures

What can be displayed ?

The current value of the different sensors inside the device.

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Temperatures* and press **Enter**.

The first page of the temperature table is displayed. As there are more items than space available on the LCD, when turning the jog dial further than the last item a new page will be displayed.

Image 9-12

Image 9-13

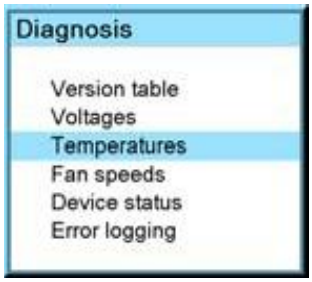


Image 9-14

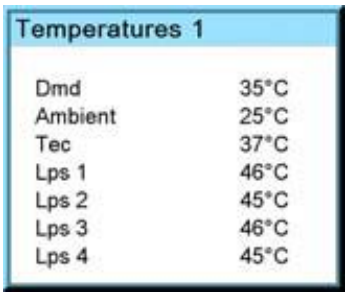


Image 9-15

9.3.4 Fan speeds

What can be displayed ?

The current speed of the different fans inside the device.

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Fan speeds* and press **Enter**.

   The first page of the fan speeds table is displayed. As there are more items than space available on the LCD, when turning the jog dial further than the last item a new page will be displayed.

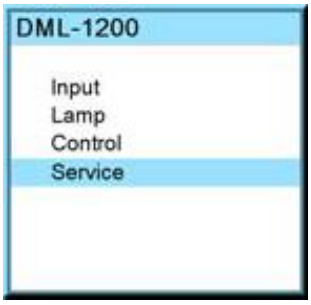


Image 9-16

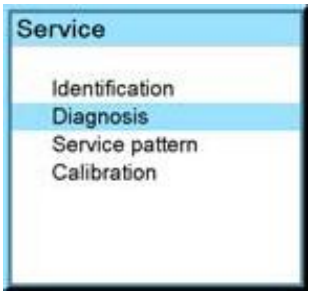


Image 9-17

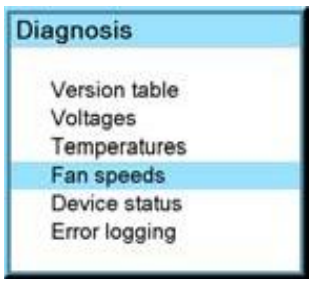


Image 9-18

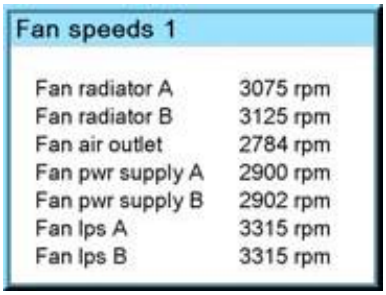


Image 9-19

9.3.5 Device status

What can be displayed ?

The status of different parts inside the device is given in a table. As the list is too long to be displayed on single LCD display, when reaching the last item in the first page turn the jog dial further in the same direction and the second page is automatically displayed on the LCD display.

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Device status* and press **Enter**.

   The first page of the device status table is displayed. As there are more items than space available on the LCD, when turning the jog dial further than the last item a new page will be displayed.

Image 9-20

Image 9-21

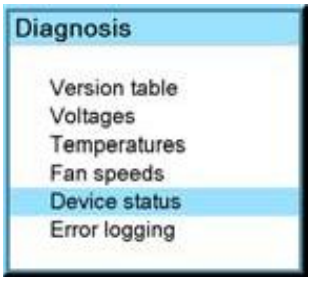


Image 9-22

Image 9-23

9.3.6 Error logging

What can be displayed ?

A full logging can be requested since the device is electrically connected. This logging contains info lines, warnings and errors. An info, warning or error is always displayed in two lines.

The structure of the logging is as follow:

First line:

- a counter number : the number starts by 1 increments each time something is logged. The counter is reset when the device is powered off.
- Type of logging : info, warning, error. An error stops the device.
- Absolute time when the logging has taken place. Absolute time is the time since the electrical startup of the device.

Second line:

- Description line: explanation about the logging. Sometimes followed by a numeric value.

```
4 Warning 7h32
```

Fcb analog warning : 57

How to display

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Diagnosis* and press **Enter**.
4. Turn the jog dial to select *Error logging* and press **Enter**.

   The first page of the error logging table is displayed. If there are more error than space available on the LCD, when turning the jog dial further than the last error a new page will be displayed.

Image 9-24

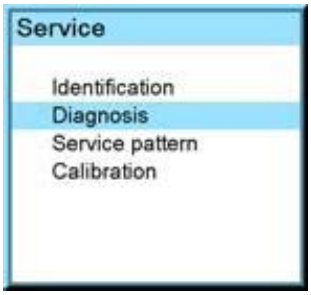


Image 9-25

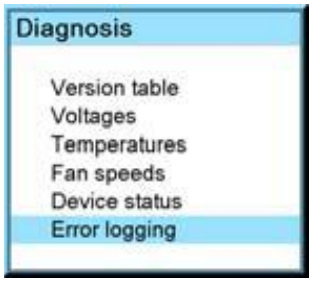


Image 9-26

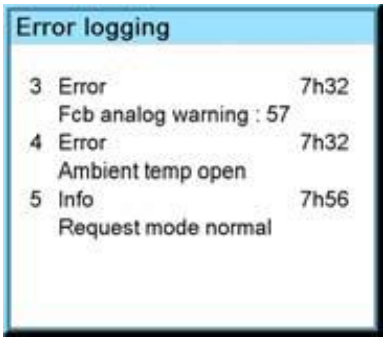


Image 9-27

9.4 Service patterns

What is possible ?

Different patterns are available for service purposes.

The service patterns:

- No pattern
- Circular on/off
- Full color
- Outline
- Horizontal sawtooth
- Vertical sawtooth
- Viewscape
- Crosshatch
- Horizontal multi burst
- Vertical multi burst
- Level 50%
- Calibration

Color patterns for the current selected service pattern

- White
- Red
- Green
- Blue
- Cyan
- Magenta
- Yellow
- Black

A color pattern can be added to each service pattern. Therefore, select first your service pattern and then your color pattern.

How to activate a pattern

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Service pattern* and press **Enter**.
4. Turn the jog dial to select a pattern and press **Enter**.

   The selected pattern or pattern color is displayed.

Image 9-28

Image 9-29

Image 9-30

9.5 Calibration

9.5.1 Index delay

Before starting

Set the DML in video mode by sending a value between 64 and 95 on DMX channel 13. See "DMX data", page 44 for more information on how to select a channel and set data

What should be done ?

The index delay value should be adjusted so that the phase of the color wheel is correctly aligned. When correctly align a monochrome red image e.g. will be correctly displayed. When there is a misalignment, this image will show color distortion (discoloration) at the top and the bottom of the image.

This setting is normally factory aligned.

Project e.g. a monochrome red image.

How to set

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Calibration* and press **Enter**.
4. Turn the jog dial to select *Index delay* and press **Enter**.
5. Turn the jog dial to change the current value and press **Enter**.

   Turn the jog dial until a monochrome red image is displayed and no color distortion (discoloration) is visible at the top and the bottom of the image.

Image 9-31

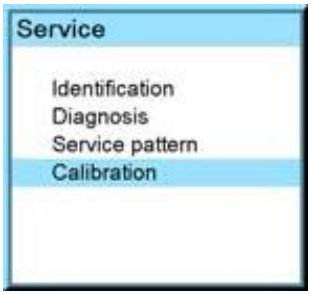


Image 9-32

Image 9-33

9.5.2 Aperture calibration

Before starting

Set the DML in light mode by sending a value between 0 and 31 on DMX channel 13 to the device. See "DMX data", page 44 for more information on how to select a channel and set data.

What should be done ?

Adjust the aperture so that the center of the aperture is in the middle of light beam.

How to check ? Adjust until the width of the de-focused area is equal on the outline of the circular projected spot.

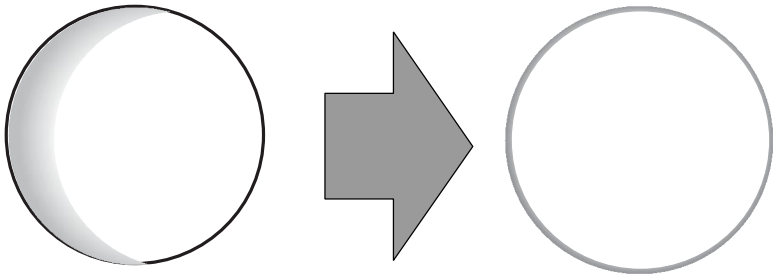


Image 9-34

How to adjust

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Calibration* and press **Enter**.
4. Turn the jog dial over the last item to open the second page.
5. Turn the jog dial to select *Aperture cal* and press **Enter**.
6. Turn the jog dial to change the current value and press **Enter**.

Image 9-35

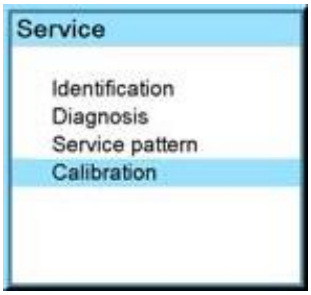


Image 9-36

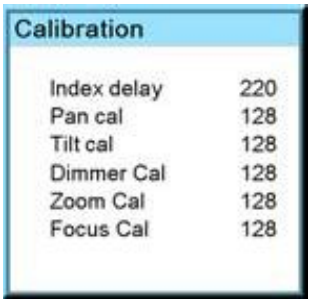


Image 9-37

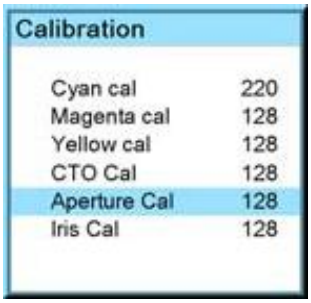


Image 9-38

9.5.3 Device calibration

What is possible ?

Via the calibration menu, it is possible to align the different items of one device with another device so that you are sure that their start position is equal.

How to calibrate an item

1. Press **Enter** to start up the main menu.
2. Turn the jog dial to select *Service* and press **Enter**.
3. Turn the jog dial to select *Calibration* and press **Enter**.
4. Turn the jog dial to select an item or turn the jog dial over the last item to open the second menu and select an item and press **Enter**.
5. Turn the jog dial to change the current value and press **Enter**.

Image 9-39

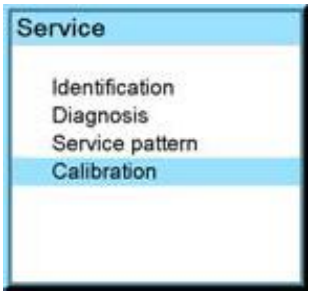


Image 9-40

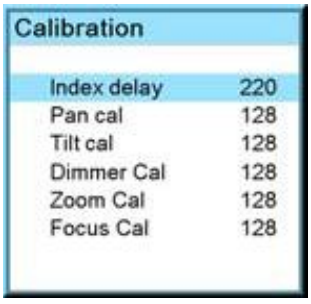


Image 9-41

10. MOVING LIGHT CONTROL VIA DMX

Overview

- Pan - Tilt
- Intensity
- Optical zoom - focus
- Shutter - Strobe
- Cyan - Magenta - Yellow
- CTO (Color temperature origin)
- Mode selection
- Iris
- Control channel

10.1 Pan - Tilt

Channels

Channel	Description	Value	Default	Action
1	Pan Coarse	0 - 255	128	Left - right movement
2	Pan Fine	0 - 255	0	
3	Tilt Coarse	0 - 255	128	Forward - backward movement
4	Tilt Fine	0 - 255	0	

10.2 Intensity

Channel 5

Adjusts the intensity between 0 and 100% when sending a value between 0 and 255.

10.3 Optical zoom - focus

Overview

Channel	Description	Value	Default	Action
6	Zoom	0 - 255	128	Changes from a wide to a narrow beam
7	Focus	0 - 255	128	Changes from close to distant focus

10.4 Shutter - Strobe

Channel 8

Value	Default	Action
0 - 31	0	Shutter open
32 - 47		Strobe from slow to fast
48 - 255		For future expansion

10.5 Cyan - Magenta - Yellow

Overview

Channel	Description	Value	Default	Action
9	Cyan	0 - 255	0	Open to full cyan
10	Magenta	0 - 255	0	Open to full magenta
11	Yellow	0 - 255	0	Open to full yellow

10.6 CTO (Color temperature origin)

Channel 12

Adjusts the color temperature origin of the projected bean so that native white light of the projection lamp can be changed to a more yellow white to imitate the light of a light bulb.

Adjustments are done between 3000°K (DMX value zero) and 6200°K (DMX value 255)..

10.7 Mode selection

About mode selection

The DML-1200 can be used in:

- Light mode : circular light beam that can change in color (monochrome video).
- Video mode circular : video image produced with a circular light beam. Content outside the circular area is cropped.
- Video mode : normal rectangular video image.

Image 10-1
Mode selection

A Light mode[1]
B Vdieo mode circular[1]
C Video mode

Channel 13

Value	Default	Action
0 - 31	0	Light mode
32 - 63		Video mode circular
64 - 95		Video mode
96 - 255		For future expansion

1. Black area represents the wall

10.8 Iris

About the Iris

When projecting images in light mode, a circular beam is used. As the device is equipped with a rectangular DMD, the corners do not produce light to create the circular beam but it was still possible that for certain contents (darker images) the corners are slightly visible and not really black. To avoid this and to create a really black area around the circular beam an iris is mounted in front of the lens.

This iris can be adjusted from fully open to almost closed (± 1 cm remains open). When the projector is on, the small opening should prevent overheating of the lens and the iris mechanism.

Channel 14

Adjusts the iris from open to almost closed.

Value	Default	Action
0 - 190	0	Adjusting the iris from open to almost closed
190 - 255		Not used

10.9 Control channel

Channel 15

Value	Default	Action
0 - 31	0	Disarmed
32 - 47		Reset (start homing sequence)
48 - 63		Homing without pan and tilt
64 - 79		Homing, pan and tilt only
80 - 95		Homing CMY only
96 - 127		Lamp on
128 - 159		Lamp off
160 - 191		For future expansion
192 - 223		EMP on/off
223 - 255		For future expansion

About EMP on/off

Before an EMP on/off command can be sent on channel 16, that channel 16 must be disarmed for at least 10 seconds.

So nothing will happens when sending e.g. combination *Lamp On* followed with *EMP on/off*. The status of the EMP will not change.

To change the status you should send the following combination : *Lamp On – Disarmed* for at least 10 seconds – *EMP on/off*.

11. IMAGE CONTROL VIA DMX

11.1 Introduction

Overview

The projected image can be controlled via DMX using channels 16 to 51.

The following functions are available

- Source selection
- Brightness
- Contrast
- Orientation
- Blanking
- Soft edge
- Warping

11.2 Source selection

Channel 16

Value	Default	Action
0 - 31	0	No source selected, default white image displayed
32 - 63		RGBHW selected
64 - 95		HD-SDI/SDI selected
96 - 127		DVI selected
128 - 159		Media player selected
160 - 191		No source selected / for future expansion
192 - 223		No source selected / for future expansion
224 - 255		No source selected / for future expansion

11.3 Brightness - Contrast - Saturation

Overview

Channel 17 adjusts the brightness between 0 and 100% when sending a value between 0 and 255.

Channel 18 adjusts the contrast between 0 and 100% when sending a value between 0 and 255.

Channel 19 adjusts the saturation between 0 and 100% when sending a value between 0 and 255.

11.4 Orientation

Channel 20

Value	Default	Action
0 - 31	0	Normal
32 - 63		Mirror
64 - 95		Flip
96 -127		Flip + Mirror
128 - 255		For future expansion

Image 11-1
Orientation

A Normal
B Flip
C Mirror
D Flip + Mirror

11.5 Blanking

Overview

Blanking can be done on the left, right, top and bottom of the image and affect only the edges of the projected image.

Each blanking adjustment is done on two channels, one for a coarse adjustment and one for a fine adjustment.

Start with the coarse adjustment until the desired blanking is almost installed and continue with the fine adjustment to exactly adjust the blanking.

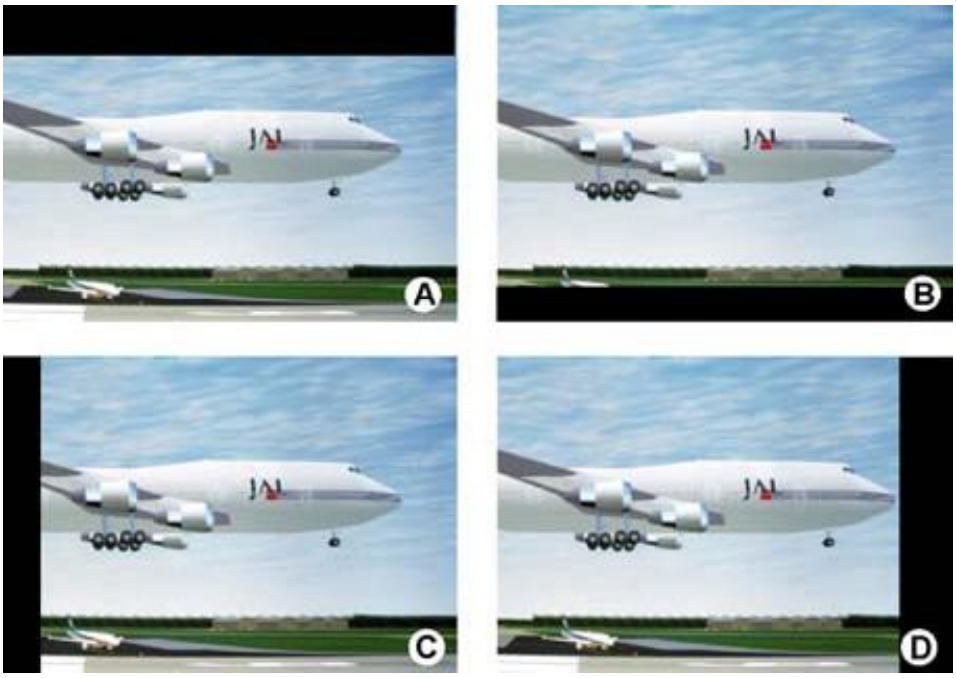


Image 11-2
Blanking adjustment

A Top blanking
B Bottom blanking
C Left blanking
D Right blanking

Channels

Channel	Description	Value	Default	Action
21	Blanking left Coarse	0 - 255	0	Adjust the left blanking
22	Blanking left Fine	0 - 255	0	

Channel	Description	Value	Default	Action
23	Blanking right Coarse	0 - 255	0	Adjust the right blanking
24	Blanking right Fine	0 - 255	0	
25	Blanking top Coarse	0 - 255	0	Adjust the top blanking
26	Blanking top Fine	0 - 255	0	
27	Blanking bottom Coarse	0 - 255	0	Adjust the bottom blanking
28	Blanking bottom Fine	0 - 255	0	

To adjust e.g. the top blanking, send first a value to channel 24 for a coarse adjustment and then send a value to channel 25 for a fine adjustment.

11.6 Soft edge

Overview

When working in a multichannel setup, soft edge possibilities enable an image blending that gives the appearance of a single image view. Without soft edge, the transition between two projected images will be visible. By adding a soft edge value, a smooth transition can be obtained.

Image 11-3

Channels

Channel	Description	Value	Default	Action
29	Soft edge left	0 - 255	0	Adjust the soft edge left side
30	Soft edge right	0 - 255	0	Adjust the soft edge right side
31	Soft edge top	0 - 255	0	Adjust the soft edge top side
32	Soft edge bottom	0 - 255	0	Adjust the soft edge bottom side

11.7 Warping

Overview

Image warping is the process of digitally manipulating an image to compensate for the distortion of the screen. Consequently, it can also be used to generate an image with irregular shape.

While an image can be transformed in various ways, pure warping doesn't affect the colors.

Some examples of warped images, using the warp geometry settings:

Image 11-4
Example 1 : distorted image

Image 11-5
Example 2 : distorted image

Hardware Warp and Hardware KeyStone are available for low latency, pixel accurate warp and keystone on any of the live sources. 15 warp files created with Projector Toolset can be recalled.

Channel 36

Warp files created with Projector Toolset can be loaded in the DML and can be called for execution via a DMX value on channel 36. 15 different files can be stored on the DML.

Value	De-fault	Action
0 - 7	0	Warp disabled
8 - 15		Load warp file 1
16 - 23		Load warp file 2
24 - 31		Load warp file 3
32 - 39		Load warp file 4
40 - 47		Load warp file 5
48 - 55		Load warp file 6
56 - 63		Load warp file 7
64 - 71		Load warp file 8
72 - 79		Load warp file 9
80 - 87		Load warp file 10
88 - 95		Load warp file 11
96 - 103		Load warp file 12
104 - 111		Load warp file 13
112 - 119		Load warp file 14
120 - 127		Load warp file 15
128 - 135		Load warp parameters
136 - 247		For future expansion
248 - 255		Warp enabled

Channel 36 and 37

Warp parameters. Reserved for future expansion.

12. EMBEDDED MEDIA PLAYER

12.1 About the media player

What is a media player ?

The media player plays video clips or still images which are stored on the internal hard disk of the media player. It contains one master layer, 1 matte and 2 media layers . Effects are possible on both media layers and on the master layer. A mask can be set on the master layer.

The embedded media player can operate in:

- Barco mode
- Hippotizer mode

By default, the Barco mode is selected. Switching to the Hippotizer mode is only possible with the Projector Toolset software. For more information about the Hippotizer mode, consult the User manual written by Green Hippo Ltd.

Media player output

The output image of the media player can be a mix of both media layers each with their effects and the manipulations.

Below an overview of each layer capabilities:

- the content of the master layer is only manipulations like keystone, warp, effects, etc.
- the content of media layer is an image or a video clip manipulated by color effects, XYZ positioning, intensity, etc. .
- the content of the matte is an internally generated image based on algoritms.

12.2 Storing images or clips

Overview

All images and clips used by the media player are stored in banks. A bank is 'virtual folder' containing clips and stills. Each bank can contain up to 256 clips or stills.

The DML-1200 can contain 256 banks where bank 0 and bank 1 are pre-loaded banks. All other banks are user defined. Use Barco's MediaManager to upload your own clips and stills.

Bank 0 is the default Barco image bank (stills).

Bank 1 is the default Barco movie bank (clips).

12.3 Controlling the Media Player with DMX

12.3.1 Image or Clip selection

Bank selection

Layer 1, channel 75 - Layer 2, channel 102

Value	Default	Action
0	0	Default Barco image bank (stills)
1		Default Barco movie bank (clips)
2 - 255		User defined banks

Image selection within a bank

Layer 1, channel 76 - Layer 2, channel 103

Value	Default	Action
0- 255		Image or clip on that specific location

12.3.2 IN frame - OUT frame

Overview

The maximum possible length of a clip is 43 minutes 41.439 seconds. Clips with a longer duration will be cut off at that point.

IN frame is the point in time from where a clip is projected.

OUT frame is the point in time to where a clip is projected. This point is calculated always starting from 43 minutes 41.439 seconds and back in time, even when the current clip has a shorter duration. DMX value 0 for both OUT frame channels is equal to 43 minutes 41.439 seconds. Higher DMX values will bring that point back into time

Only the part between IN frame and OUT frame is projected when IN frame and OUT frame are inside the clip.

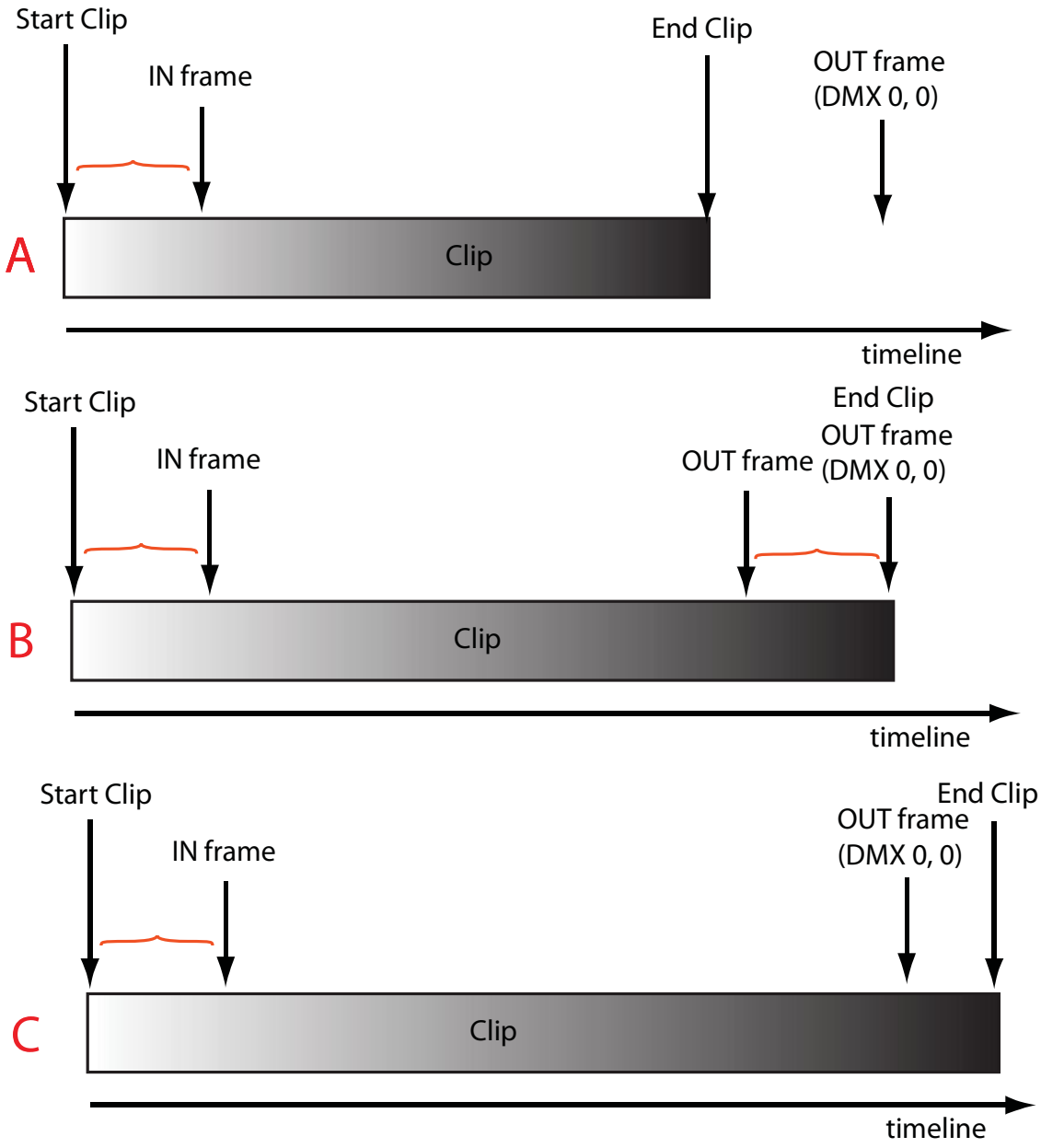


Image 12-1

Situation A : Clip duration is shorter that 43 minutes 41.439 seconds. OUT frame start point (DMX values 0 for both channels) is outside the clip. The part between the IN frame point and the end of clip is played. To reduce the clip length, bring the OUT frame point before the end of the clip by increasing the DMX values.

Situation B : Clip duration is equal to 43 minutes 41.439 seconds. OUT frame start point (DMX values 0 for both channels) is exactly the end of the clip. Any change in DMX values for OUT frame will reduce the length of effective playing part of the clip.

Situation C: Clip duration is higher that 43 minutes 41.439 seconds. OUT frame start point (DMX values 0 for both channels) is somewhere inside the clip. The complete clip cannot be played.

For IN frame : Layer 1, channel 77, 78 - Layer 2, channel 104, 105

Coarse adjustment : Channel 77 - channel 104

Value	Default	Action
0- 255		Coarse start point selection, starting from beginning of clip

Fine adjustment : Channel 78 - channel 105

Value	Default	Action
0- 255		Fine start point selection, starting from beginning of clip

Start with the coarse adjustment and continue with the fine adjustment.

For OUT frame : Layer 1, channel 79, 80 - Layer 2, channel 106, 107

Coarse adjustment : Channel 79 - channel 106

Value	Default	Action
0- 255		Coarse end point selection, starting from 43 minutes 41.439 seconds

Fine adjustment : Channel 80 - channel 107

Value	Default	Action
0- 255		Fine start point selection, starting from the position of the current coarse point.

Start with the coarse adjustment and continue with the fine adjustment.

12.3.3 Image transition

Overview transitions

An image transition is the way to switch from one image (clip) to another. Different transitions can be set for both layers.

The embedded media player uses the A/B mixer technology to realize the transitions.

Layer 1, channel 81 - Layer 2, channel 108

Value	Default	Action
0 - 1	0	Bottom to top
2 - 5		Bounce
6 - 9		Corner zoom
10 - 13		Fade
14 - 17		Iris
18 - 21		Left to right
22 -25		Multiple iris
26 - 29		Right to left
30 - 33		Rotate and zoom
34 - 37		Shear flip
38 - 41		Shutter
42 - 45		Spherical Zoom
46 - 49		Top to bottom
50 - 53		Zoom
54 - 57		SuperBall 1
58 - 61		SuperBall 2
62 - 255		For future expansion

Transition timing

Layer 1, channel 82 - Layer 2, channel 109

Value	Default	Action
0- 255		Sets time for transition between 2 images

A transition effect can only be seen when the transition time is higher than zero (0). When the transition time is zero (0), a snap will be used as transition independent the DMX value for the image transition.

12.3.4 Playback mode and speed

Playback mode

The Playback mode is the way the clips are played on that specific layer.

Default DMX value : 0 = playback forward once

Layer 1, channel 82 - Layer 2, channel 109

Value	Default	Action
0 - 3	0	Forward once
4 - 7		Forward loop
8 - 11		Reverse once
12 - 15		Reverse loop
16 - 19		Bounce (forward/reverse)
20 - 23		Pause
24 - 27		Single frame selected by IN Frame value
28 - 255		For future expansion

Playback speed

The playback speed parameter controls the speed of the selected media file's Playback mode. The playback speed for a media file is used whenever the Playback mode parameter's DMX value is assigned to any Play forward or backward.

Default DMX value : 128 = playback at normal speed.

Layer 1, channel 82 - Layer 2, channel 109

Value	Default	Action
0- 255	128	Playback speed

12.3.5 Opacity

About opacity

Adjusting an object's opacity allows one object to "show through" another. You can adjust the opacity of an individual object from completely transparent to full opacity using this parameter. Increase opacity from not visible at a value of zero to full opacity at a value of 255.

Image 12-2

A	Not transparent
B	In between
C	Fully transparent

Layer 1, channel 85 - Layer 2, channel 112

Value	Default	Action
0- 255	0	From fully blocked to clear

12.3.6 Contrast

What is contrast ?

Contrast is the difference in color and light between parts of an image.

Layer 1, channel 86 - Layer 2, channel 112

Value	Default	Action
0- 255	128	from a low to a high contrast

12.3.7 Red - Green - Blue

What can be done ?

The level of the red, green and blue color component can be adapted in the image. It can be reduced are augmented.

Layer 1, channel 87 (R), 88 (G), 89 (B) - Layer 2, channel 114 (R), 115 (G), 116 (B)

Value	Default	Action
0- 255	128	The higher the value, the more of that color is added to the image

12.3.8 Scale

Overview

With the scale function, a digital zoom on the projected image or clip can be introduced.

Default value : 128. Image files are displayed at 100%.

Higher value then the default value will enlarge the content. Lower values will reduce the content.

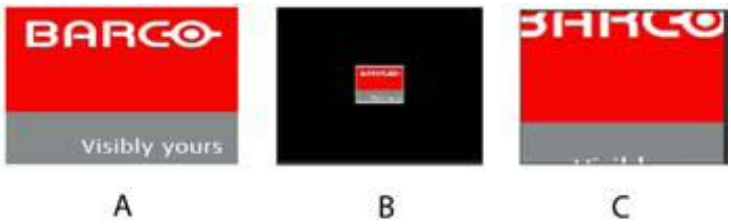


Image 12-3

A	100%, DMX value = 128
B	DMX value < 128
C	DMX value > 128

Layer 1, channel 90 - Layer 2, channel 117

Value	Default	Action
0- 255	128	

12.3.9 Object position

X position

The X parameter moves the object along the X-axis. The midpoint of the DMX value range centers the image on the X-axis. Values below the midpoint moves the object to the left, values higher than the midpoint moves the object to the right.

Default DMX value : 128 = image centered

Layer 1, channel 91 - Layer 2, channel 118

Value	Default	Action
0- 255	128	moves he image on the X-axis

Y position

The Y parameter moves the object along the Y-axis. The midpoint of the DMX value range centers the image on the Y-axis. Values below the midpoint moves the object down, values higher than the midpoint moves the object up.

Default DMX value : 128 = image centered

Layer 1, channel 92 - Layer 2, channel 119

Value	Default	Action
0- 255	128	moves he image on the Y-axis

12.3.10 Aspect ratio

Overview

The aspect ratio parameter changes the aspect ratio of the image.

Default DMX value : 128 = 1:1 . Higher values will stretch the image horizontally. Lower values will stretch the image vertically.

Image 12-4

A	1 : 1 DMX value = 128
B	DMX value > 128
C	DMX value < 128

Layer 1, channel 93 - Layer 2, channel 120

Value	Default	Action
0- 255	128	moves the image on the X-axis

12.3.11 Image rotation speed - position

Overview

Image rotation position depends on the angle how the image is projected (indexed position). This position is determined by 2 channels, one for the coarse adjustment and one for the fine adjustment.

The coarse adjustment varies between 0 and 127 while the fine adjustment varies from 0 to 255 for each position of a coarse adjustment.

Counter clock wise rotation of the projected image happens when the value for coarse channel is between 127 and 191. The value for the fine channel can be any value between 1 and 255 for each position of the coarse value. The higher the value, the faster the image will rotate.

A still image can be obtained when the value for the coarse channel is equal to 192 and the value for the fine channel is equal to 0.

Clock wise rotation of the projected image happens when the value for coarse channel is between 192 and 255. The value for the fine channel can be any value between 1 and 255 for each position of the coarse value. The higher the value, the faster the image will rotate.

Coarse adjustment, Layer 1, channel 94- Layer 2, channel 121

Value	Default	Action
0- 127	0	rotated image between -180° and 180° (indexed position)
127 - 192		continuous rotation from slow to fast in counter clock wise direction

Value	Default	Action
192		still image
192 - 255		continuous rotation from slow to fast in clock wise direction

Fine adjustment, Layer 1, channel 95- Layer 2, channel 122

Value	Default	Action
0- 255	0	fine adjustment for the selected coarse value

12.3.12 Image blur

Overview

The image blur changes a sharp image into an unfocused image. The higher the value, the more blur is added to the image.

Default DMX value : 0

Layer 1, channel 96 - Layer 2, channel 123

Value	Default	Action
0- 255	0	from a sharp image to a fully blurred image

12.3.13 Layer effects

Overview

Layer effects are a combination of an effect selection with maximum 3 effect parameters.

Layer effects can be selected for layer 1 on channel 97 and for layer 2 on channel 124.

The effect parameters are set for layer 1 on channel 98.99 and 100 and for layer 2 on channel 125, 126 and 127.

Parameter	Layer	Channel
P1	1	98
P1	2	125
P2	1	99
P2	2	126
P3	1	100
P3	2	127

12.3.13.1 No effect

Overview

This bypasses the effect engine. Always switch the effect selection to this mode when no effect is needed. The effect parameters have no effect then.

Effect selection

Value	Default	Action
0 - 1		no effect

12.3.13.2 Radial blur

Overview

Radial blur uses repetitions of the source image to achieve a rotary blur effect.

The radial blur effect is determined by 3 parameter.

Image 12-5

A	Original image
B	Radial blur level applied. P2 and P3 = 0
C	Radial blur level applied. P2 value applied, image shift in X direction P3 = 0
D	Radial blur level applied. P2 = 0 P3 = value applied, image shift in Y direction

Effect selection

Value	Default	Action
2 - 5		radial blur

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Blur amount
P2	0 - 255	Shift X direction
P3	0 - 255	Shift Y direction

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.3 Motion blur

Overview

Motion blur applies a moving blur effect that will leave outlines of the animation within a clip.

The motion blur effect is determined by one parameter, the amount of blur.

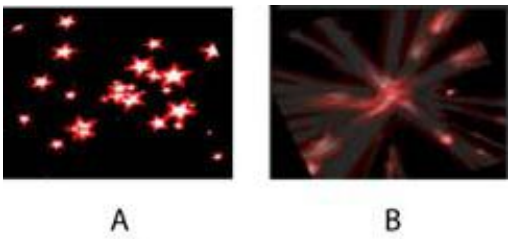


Image 12-6

A	Original image
B	Motion blur level applied.

Effect selection

Value	Default	Action
6 - 9		motion blur

Effect parameter

Value	Default	Action
0 - 255		Blur amount

12.3.13.4 Color Trafo

Overview

This effect gives control over the saturation, hue and brightness of the image.

Image 12-7

A	Original image
B	P1 = 127 P2 and P3 = 0
C	P1 = 255 P2 = 127 P3 = 0
D	P1 = 255 P2 = 255 P3 = 255

Effect selection

Value	Default	Action
10 - 13		Color trafo

Effect parameter

Value	Default	Action
0 - 255		the amount of color in the image, 0 = full color, 255 = black and white.
0 - 255		Saturation
0 - 255		Hue

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.5 MultiImage

Overview

The source image is repeated over and over similar to a multi-monitor wall. The size and aspect ratio of the repeat can be defined with parameter P2 and P3.

P1 defines the effect level as a 'glass wall' effect.

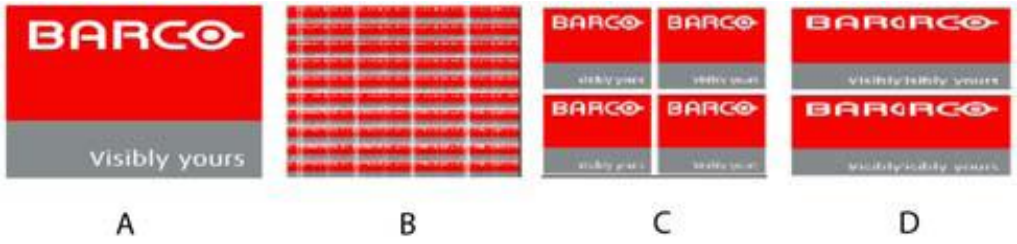


Image 12-8

A	Original image
B	P1 = 255 P2 and P3 = 0
C	P1 = 255 P2 = 127 P3 = 127
D	P1 = 64 P2 = 127 P3 = 127

Effect selection

Value	Default	Action
14 - 17		MultiImage

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, glass wall effect.
P2	0 - 255	Size of the duplicated images.
P3	0 - 255	Aspect ratio of the duplicated images

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.6 Inverted lumakey

Overview

The light areas of the image becomes transparent starting from certain threshold level. The softness of the cut-off is determined with the third parameter.

Image 12-9

A	Original image
B	P1 = 127 P2 = 127 P3 = 0

C	P1 = 127 P2 = 255 P3 = 0
D	P1 = 127 P2 = 255 P3 = 255

Effect selection

Value	Default	Action
18 - 21		Inverted LumaKey

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, sets the brightness of the image
P2	0 - 255	threshold level. Determines from which level the transparency starts.
P3	0 - 255	Softness of the cut-off.

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.7 Shifter

Overview

It moves the image around the screen through the x and the y planes, with control to adjust the movement and the speed.

Image 12-10

A	Original image
B	Shift level applied. P2 and P3 = 0, image is shifting in both directions.
C	Shift level applied P2 = 255, image shift in X direction. Scrolling with a shifted image. P3 = 0
D	Shift level applied P2 = 255 P3 = 255

Effect selection

Value	Default	Action
22 - 25		Shifter

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, shift speed

Parameter	Value	Action
P2	0 - 255	speed x, time shift x direction
P3	0 - 255	speed y, time shift y direction

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.8 Chromakey

Overview

Chromakey allows to key out certain colors. The color which is keyed out becomes transparent. When there are 2 layers, this effect can be used to reveal what is on the layer below.

Image 12-11

A	Original image layer 1
B	Original image layer 2
C	P1 = 255, on layer 1 P2 = 68, red color in image is filtered out P3 = 127, tolerance level on selected color
D	Result, layer 2 is fully visible through the places of the red color.

Effect selection

Value	Default	Action
26 - 29		Chromakey

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level
P2	0 - 255	hue, key color selection
P3	0 - 255	Tolerance, range (tolerance) of selected key color

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.9 Scroller

Overview

The layer continually scrolls across, with individual controls for direction across X and Y planes and speed.

Image 12-12

A	Original image
B	Scroller level applied. P2 and P3 = 0, scrolling in both directions from top left corner to bottom right corner.
C	Scroller level applied. P2 value applied, image shift in X direction. Scrolling with a shifted image. P3 = 0
D	Scroller level applied. P2 = 0 P3 = value applied, image shift in Y direction. Scrolling with a shifted image.

Effect selection

Value	Default	Action
30 - 33		Scroller

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Scroller amount
P2	0 - 255	X direction, move the image to the left
P3	0 - 255	Y direction, moves the image upwards

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.10 Color Studio

Overview

This effect allows to shift colors around the spectrum with additional brightness control

Level adjustment (parameter 1) which is a brightness control has only effect when one of both other parameters are higher than zero (0).

Image 12-13

A	Original image
B	Level on maximum P2 = maximum, color are shifted in cyan direction P3 = 0
C	Level on maximum P3 = 0 P3 = maximum, color are shifted in the yellow direction

Effect selection

Value	Default	Action
34 - 37		Color Studio

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Color shift effect
P2	0 - 255	Color shift A
P3	0 - 255	Color shift B

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.11 Neon

Overview

The neon effect traces the outlines of elements in the image.

Image 12-14

A	Original image
B	P1 = 255 P2 = 0, width
C	P1 = 255 P2 = 255, width

Effect selection

Value	Default	Action
38 - 41		Neon

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level
P2	0 - 255	Effect width

P2 has no effect on the image when P1 equals 0.

12.3.13.12 CTBO

Overview

This effect is color correction effect for TV and Film which applies calibrated filters to the image similar to using CTB and CTO lighting filters.

Image 12-15

A	Original image
B	P1 = 127 P2 = 255, filter option P3 = 0, brightness
C	P1 = 127 P2 = 255, filter option P3 = 255, brightness

Effect selection

Value	Default	Action
42 - 45		CTBO

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level
P2	0 - 255	Filter setup
P3	0 - 255	Brightness

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.13 DuoTone

Overview

This color effect takes the image and desaturates the original colors before allowing the user to apply their own choice of tones for the high and low tones. This allows to select a two color scheme and have all your content fit within those colors.

Image 12-16

A	Original image
B	P1 = 127 P2 and P3 = 0
C	P1 = 127 P2 = 128, replacing darks in the image with this color P3 = 0
D	P1 = 127 P2 = 0 P3 = 127, replacing whites in the image with this color

Effect selection

Value	Default	Action
46 - 49		DuoTone

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, desaturation of the current image
P2	0 - 255	First color hue replacing the darks
P3	0 - 255	Second color hue replacing the whites

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.14 Palette

Overview

This effect allows to shift each of the individual colors around the spectrum.

Image 12-17

A	Original image
B	P1 = 127 P2 and P3 = 0

C	P1 = 127 P2 = 127, red component is extra shifted P3 = 0
D	P1 = 127 P2 = 0 P3 = 127, green component is extra shifted

Effect selection

Value	Default	Action
50 - 53		Palette

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level, shifts the complete color spectrum
P2	0 - 255	Red, shifts the red component of image in the spectrum
P3	0 - 255	Green, shifts the green component of the image in the spectrum

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.15 Bloom

Overview

This effect gives the edges of any line a white glow.

Image 12-18

A	Original image
B	P1 = 127 P2 = 0
C	P1 = 127 P2 = 127, a white glow is added to the outlines

Effect selection

Value	Default	Action
54 - 57		Bloom

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level, adjusts the brightness of the image
P2	0 - 255	Bloom blur, amount of blur in the image.

P2 has no effect on the image when P1 equals 0.

12.3.13.16 Interlace

Overview

This effect creates a stripe effect with control to adjust the size and saturation of the stripes.

Image 12-19

A	Original image
B	P1 = 255 P2 = between 1 and 128 P3 = 0
C	P1 = 255 P2 = between 1 and 128 (equal to B) P3 = between 128 and 255

Effect selection

Value	Default	Action
58 - 61		Interlace

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, adjusts the darkness of the stripes
P2	0 - 255	Stripes, amount of stripes
P3	0 - 255	Saturation, saturation of the stripes, more original image visible

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.17 Noise

Overview

This effect creates a distorted pixilated effect with controls for grain size, frequency and color.

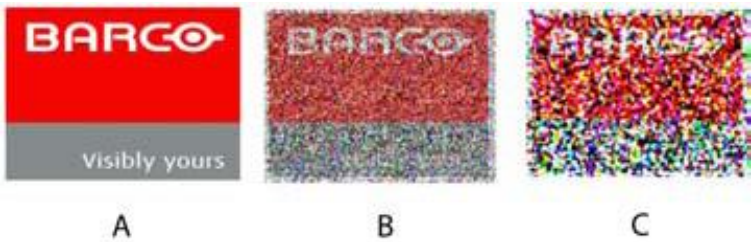


Image 12-20

A	Original image
B	P1 = 255 P2 = 0 P3 = 0
C	P1 = 255 P2 = 0 P3 = between 128 and 255

Effect selection

Value	Default	Action
62 - 65		Noise

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level, determines the intensity of the noise
P2	0 - 255	Frequency, determines the frequency of the randomization
P3	0 - 255	Grain, determines the size of the pixel in the noise

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.18 Rings

Overview

This effect creates a concentric circle break-up.

Image 12-21

A	Original image
B	P1 = 255 P2 = 0
C	P1 = 255 P2 = 128
D	P1 = 255 P2 = 255

Effect selection

Value	Default	Action
66 - 69		Rings

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level, determines the shift between the rings
P2	0 - 255	Rings, defines the number of rings visible in the image

P2 has no effect on the image when P1 equals 0.

12.3.13.19 CubeStyle

Overview

This effect is a break-up effect using moving translucent squares with a 'waterfall' style of motion.

If the size is set to 128, then image is changing between the original image and white.

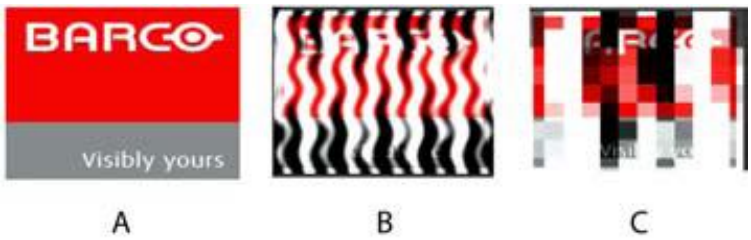


Image 12-22

A	Original image
B	P1 = 255 P2 = 0 P3 = 0
C	P1 = 255 P2 = 128 P3 = 0

Effect selection

Value	Default	Action
70 - 73		CubeStyle

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, brightness of the cubes
P2	0 - 255	Size, cube size
P3	0 - 255	Speed, speed of the moving cubes

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.20 LED

Overview

This effect creates the look of a LED wall.

Image 12-23

A	Original image
B	P1 = 128 P2 = 128 P3 = 0
C	P1 = 128 P2 = 128 P3 = 128

Effect selection

Value	Default	Action
74 - 77		LED

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, brightness of LEDs.
P2	0 - 255	Density, density, size of LEDs
P3	0 - 255	Softness, hard or soft falloff.

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.21 Pixetlate

Overview

This effect introduces visible pixels in the image.

Image 12-24

A	Original image
B	P1 = 128 P2 = 128
C	P1 = 255 P2 = 128
D	P1 = 128 P2 = 255

Effect selection

Value	Default	Action
78 - 81		Pixelate

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, brightness of pixels.
P2	0 - 255	Pixel, number of pixels.

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.22 Halftone

Overview

This effect simulates the printing quality or method of magazines and newspapers.

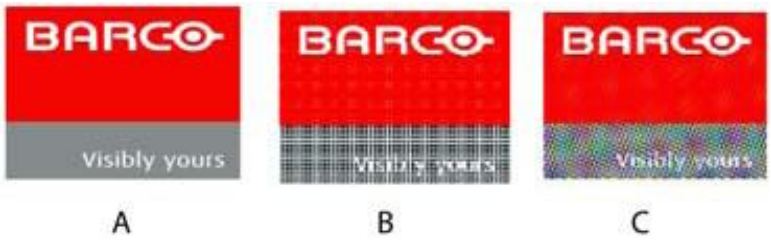


Image 12-25

A	Original image
B	P1 = 255 P2 = between 0 and 128, raster introduced P3 = 0, no angle for the pixels of the raster
C	P1 = 255 P2 = between 0 and 128 P3 = 128, pixels have an angle of 45°

Effect selection

Value	Default	Action
78 - 81		Pixelate

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, brightness of grid.
P2	0 - 255	Size, size of print grid
P3	0 - 255	Angle, determines the angle of the color dots.

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.23 Plasma

Overview

A liquid-like effect

Image 12-26

A	Original image
B	P1 = repetion level on certain value P2 = random distortion P3 = random distortion

Effect selection

Value	Default	Action
86 - 89		Plasma

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Sets the repetition frequency of the projected image.
P2	0 - 255	Random distortion
P3	0 - 255	Random distortion

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.24 Flower

Overview

This effect distorts the image into a pattern similar to the petals of a flower.

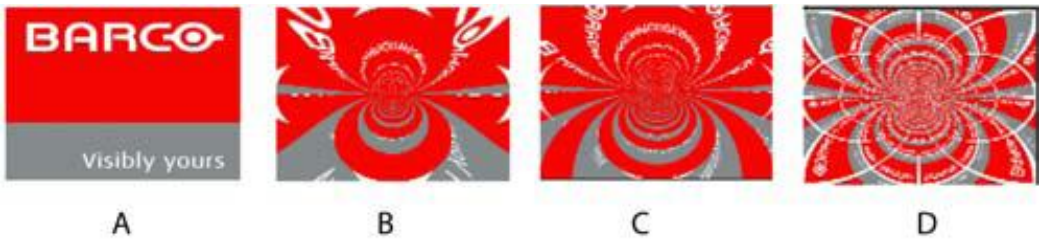


Image 12-27

A	Original image
B	P1 = 128 P2 = 128
C	P1 = 128 P2 = 255
D	P1 = 255 P2 = 255

Effect selection

Value	Default	Action
90 - 93		Flower

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Used a zoom function to enlarge or reduce the floral effect.
P2	0 - 255	Sets the amount of floral fractals.

P2 has no effect on the image when P1 equals 0.

12.3.13.25 Flip

Overview

This effect flips the image through the x and y planes.

A full flip is reached at 50% of the range.

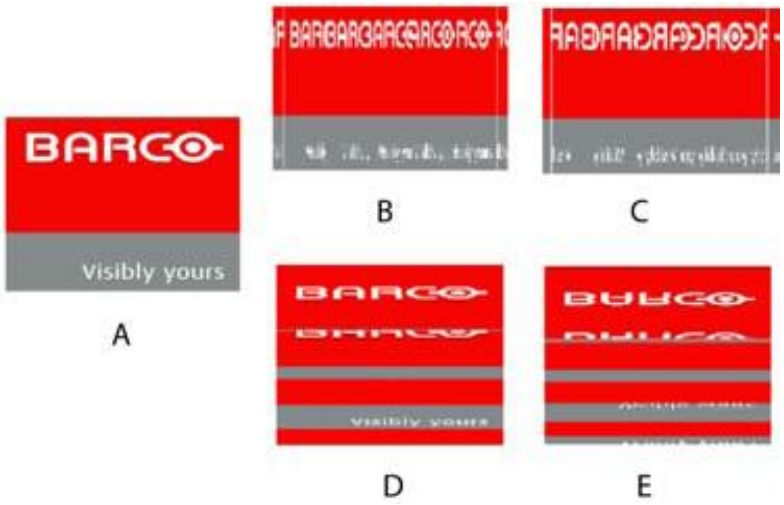


Image 12-28

A	Original image
B	P1 = 128 P2 = between 1 and 63 P3 = 0
C	P1 = 128 P2 = between 64 and 126 P3 = 0
D	P1 = 128 P2 = 0 P3 = between 1 and 63
E	P1 = 128 P2 = 0 P3 = between 64 and 128

Effect selection

Value	Default	Action
94 - 97		Flip

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Zooms the image inside an area.
P2	1 - 63	Sets the width of the repetitions in the x plane.
	64 - 126	Sets the width of the flipped image in the x plane
	127	image with the color of the left border
	128 - 190	Sets the width of the flipped image in the x plane
	191	image with the color of the left border
	192 - 254	Sets the with to the repetitions of the normal image in the x plane.
	255	Normal image
P3	1 - 63	Sets the width of the repetitions in the y plane.
	64 - 127	Sets the width of the flipped image in the x plane
	128 - 191	Sets the width of the flipped image in the y plane
	192 - 254	Sets the with to the repetitions of the normal image in the y plane.
	255	Normal image

P2 and P3 have no effect on the image when P1 equals 0.

12.3.13.26 Rotozoom

Overview

This effect is a combination of a rotation, an image zoom and a circular zoom.

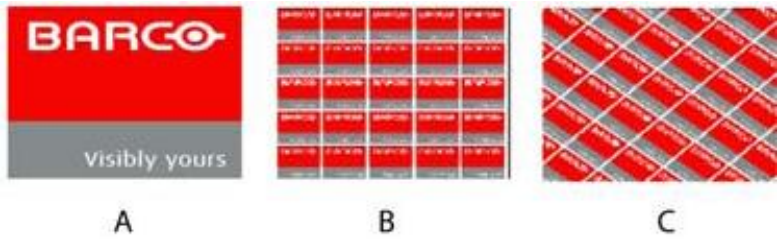


Image 12-29

A	Original image
B	P1 = between 1 and 63 P2 = between 1 and 127 P3 = 0
C	P1 = between 1 and 63 P2 = between 1 and 127 P3 = 255

Effect selection

Value	Default	Action
98 - 101		Rotozoom

Effect parameters

Parame-ter	Value	Action
P1	0 - 127	Circular zoom out. From normal image to zoomed out image with extra repetitions.
	128 - 255	Circular zoom in. From repeated image to a normal image.

Parameter	Value	Action
P2	0 - 255	Rotation angel
P3	0 - 255	Image zoom

P2 and P3 have no effect when P1 equals 0.

12.3.13.27 Glass

Overview

This effect looks like a distortion effect as if looking though a moulded glass window.

A B C

Image 12-30

A	Original image
B	P1 = 255 P2 = between 1 and 127
C	P1 = 255 P2 = 255

Effect selection

Value	Default	Action
102 - 105		Glass

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level
P2	0 - 255	Distortion level

P2 has no effect when P1 equals 0.

12.3.13.28 Aqua

Overview

This effect simulates distortions created by ripples on a water surface.

A B C D

Image 12-31

A	Original image
B	P1 = 127 P2 = 0 P3 = 0
C	P1 = 127 P2 = 127 P3 = 0
D	P1 = 127 P2 = 127 P3 = 127

Effect selection

Value	Default	Action
106 - 109		Aqua

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Distortion level
P2	0 - 255	Wave introduction on the selected distortion level
P3	0 - 255	Speed, movement of the introduced wave

P2 and P3 have no effect when P1 equals 0.

12.3.13.29 Tunnel

Overview

This effect creates a view as travelling through a 3D tunnel.

Image 12-32

A	Original image
B	P1 = 127 P2 = 0 P3 = 0
C	P1 = 127 P2 = 127 P3 = 0
D	P1 = 127 P2 = 127 P3 = 255, camera speed almost not visible

Effect selection

Value	Default	Action
110 - 113		Tunnel

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level
P2	0 - 255	Zoom into the tunnel
P3	0 - 255	Speed of camera moving through the tunnel

P2 and P3 have no effect when P1 equals 0.

12.3.13.30 Planes

Overview

This effect creates a 3D planes effect with adjustable orientation. The effect level parameter creates own effects.

Image 12-33

A	Original image
B	P1 = 127 P2 = 0 P3 = 0
C	P1 = 255 P2 = 127 P3 = 0
D	P1 = 255 P2 = 127 P3 = 127

Effect selection

Value	Default	Action
114 - 117		Planes

Effect parameters

Parameter	Value	Action
P1	0 - 255	Effect level, moves the image over the planes
P2	0 - 255	Wip, creates a wip effect of the image on the planes
P3	0 - 255	Distortion, zoom out of the image on the planes. A repetition of the image happens.

P2 and P3 have no effect when P1 equals 0.

12.3.13.31 Fluid distortion

Overview

This effect simulates distortions created by a water surface, very similar to viewing an submerged object.

Image 12-34

A	Original image
B	P1 = 127 P2 = 0 P3 = 0

Effect selection

Value	Default	Action
118 - 121		Fluid distortion

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level, zoom effect combined with a distortion and a water flaw.
P2	0 - 255	Speed of the water flaw
P3	0 - 255	Second speed of the water flaw

P2 and P3 have no effect when P1 equals 0.

12.3.13.32 Alphabet

Overview

This effect introduces characters all over the image.

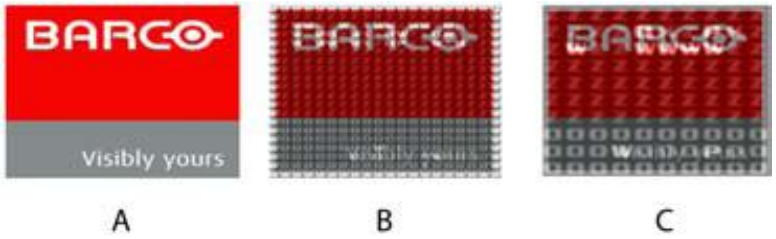


Image 12-35

A	Original image
B	P1 = 127 P2 = 127 P3 = 127
C	P1 = 127 P2 = 255 P3 = 127

Effect selection

Value	Default	Action
122 - 125		Alphabet

Effect parameters

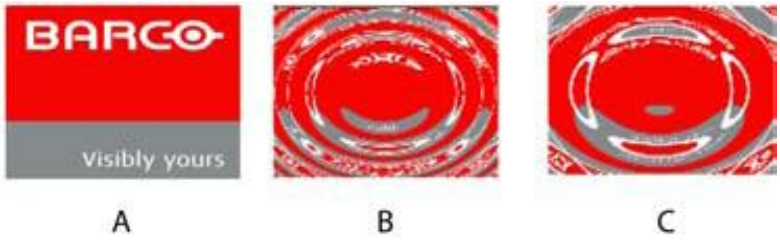
Parame-ter	Value	Action
P1	0 - 255	Effect level, adjusts the brightness of the original image from bright to dark.
P2	0 - 255	Zoom the characters
P3	0 - 255	Sets the number of characters

P2 and P3 have no effect when P1 equals 0.

12.3.13.33 Ripple

Overview

This effect creates a water ripple effect on the image with controls for the direction and the number of ripples.



A B C

Image 12-36

A	Original image
B	P1 = 127 P2 = 127 P3 = 127
C	P1 = 127 P2 = 63 P3 = 127

Effect selection

Value	Default	Action
126 - 129		Ripple

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level. Own creations possible over the full adjustment range.
P2	0 - 255	Number of ripples inserted on the image.
P3	0 - 126	Number of waves from inside to the outside
	127	No waves, image stands still
	128 - 255	Number of waves from the outside to the inside

P2 and P3 have no effect when P1 equals 0. P1 has no effect when P2 equals 0

12.3.13.34 Wave

Overview

This effect creates a sweeping wave effect which extends from the center of the image and moves outwards before moving back to the center.

A B

Image 12-37

A	Original image
B	P1 = 127 P2 = 127

Effect selection

Value	Default	Action
130 - 133		Wave

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level.
P2	0 - 255	Speed of the wave

P2 has no effect when P1 equals 0.

12.3.13.35 Jitter

Overview

This effect lets jump the image randomly in the x and y plane with defined offset and rotation, speed and zoom.

A B C

Image 12-38

A	Original image
B	P1 = 255 P2 = 0 P3 = 0
C	P1 = 255 P2 = 0 P3 = 255

Effect selection

Value	Default	Action
134 - 137		Jitter

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level. Sets the offset in the x and y plane by introducing a rotation.
P2	0 - 255	jumping speed of the image
P3	0 - 255	Image zoom. Image jumps between its zoomed position and the offset area.

P2 and P3 have no effect when P1 equals 0.

12.3.13.36 Stripes

Overview

This effect creates random stripes to reveal the image. Scaling and frequency can be set.

Image 12-39

A	Original image
B	P1 = 127 P2 = 0 P3 = 0
C	P1 = 127 P2 = 0 P3 = 127

Effect selection

Value	Default	Action
138 - 141		Stripes

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Effect level. Sets the transparency of the strips.
P2	0 - 255	Frequency of the randomization.
P3	0 - 255	Scale. Sets the size (width) of the stripes.

P2 and P3 have no effect when P1 equals 0.

12.3.13.37 Infinite Zoom

Overview

This effect continually zooms the image, overlaying each time. Both directions are possible, from the center of the image to the corners or from the corners of the image to the center.

Image 12-40

A	Original image
B	P1 = amplitude level on certain value P2 = zoom speed and direction value set

Effect selection

Value	Default	Action
142 - 145		Infinite zoom

Effect parameters

Parame-ter	Value	Action
P1	0 - 255	Sets the amplitude of the start image.
P2	0 - 126	Zoom speed and direction, from corners to center, from low high to low speed.
	127	Still image
	128 - 255	Zoom speed and direction, from center to corners, from low speed to high speed.

P2 has no effect when P1 equals 0.

12.3.13.38 Infinity

Overview

This effect continually zooms the image from a larger image to its original size. Both directions are possible, from out to in or from in to out.

Image 12-41

A	Original image
B	P1 = Brightness set on certain value P2 = zoom speed and direction value set

Effect selection

Value	Default	Action
146 - 149		Infinity

Effect parameters

Parameter	Value	Action
P1	0 - 255	Sets the brightness of the image.
P2	0 - 126	Zoom speed and direction, from out to in.
	127	Still image
	128 - 255	Zoom speed and direction, from in to out.

P2 has no effect when P1 equals 0.

12.3.13.39 Blinder

Overview

This effect creates a transparent white rectangle over the original image. The transparency of this rectangle is adjustable.

Image 12-42

Effect selection

Value	Default	Action
150 - 153		Blinder

Effect parameters

Parameter	Value	Action
P1	0 - 255	From fully transparent to full white

12.3.14 Layer combination mode

12.3.14.1 Introduction

Overview

Combination modes are an essential tool to create multi-layer compositions. Combination modes allow to control how a layer interacts with another layer. For those not versed in the art of multi-layer compositions, simply look at combination mode as a way of deciding what the transparency properties of a layer are in order to view the layer beneath it.

The combination modes explained in the next topics use two fixed images where possible. By switching the combination mode of layer 2 you get the results. The Matte layer is set to Color with DMX parameter values all to zero (0) (Matte layer is black).

Layer interaction

Layers are structured as follow:

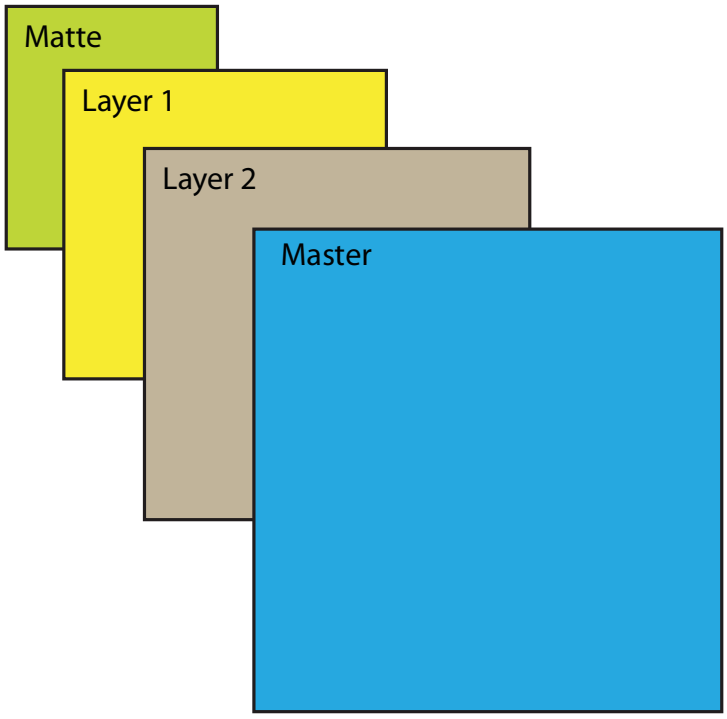


Image 12-43

From top to bottom, the order is as follow:

- Master layer
- Layer 2
- Layer 1
- Matte

Layer combinations can be set on layer 1 and layer 2. These combination are set via a DMX value on channel 101 for layer 1 and channel 128 for layer 2

The selection on layer 2 will be applied on layer 1 and the 'Matte' layer.

The selection on layer 1 will be applied on the 'Matte' layer.

12.3.14.2 Add

Overview

This adds the pixel value in both layers. This is a good way to combine non-overlapping images in two layers.

Higher pixels values represent lighter colors, adding layers with overlapping pixels lightens the image. Black areas in both layers remain black. White in either layer results in white.

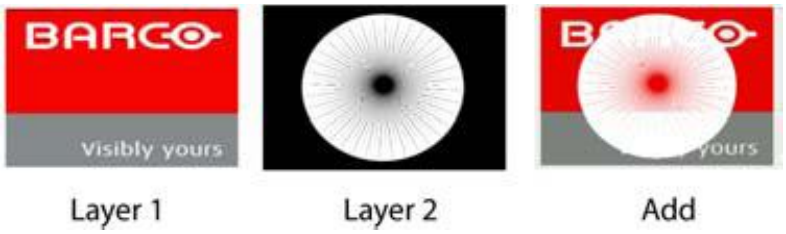


Image 12-44

Combination mode selection

Value	Default	Action
0 - 7	0	Additive dissolve

12.3.14.3 Sub

Overview

This subtracts the pixel values in layer 2 from the corresponding pixels in layer 1. Black in layer 2 has no influence in the result. White in layer 2 gives black in the result.

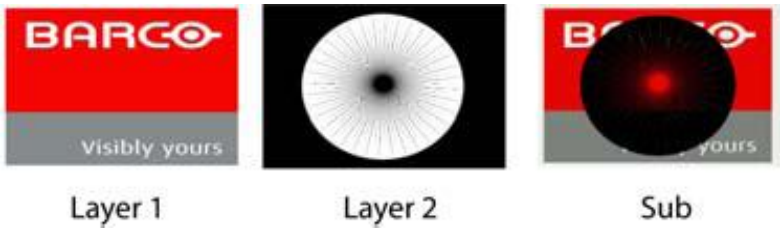


Image 12-45

Combination mode selection

Value	Default	Action
8 - 23		Subtractive dissolve

12.3.14.4 Darken

Overview

When using 'Darken' the white parts of the upper layer disappear. Anything darker than white has the potential of darkening the underlying image.

Darken mode compares the active layer to the underlying image, only allowing those areas that are darker than the underlying image to show up.

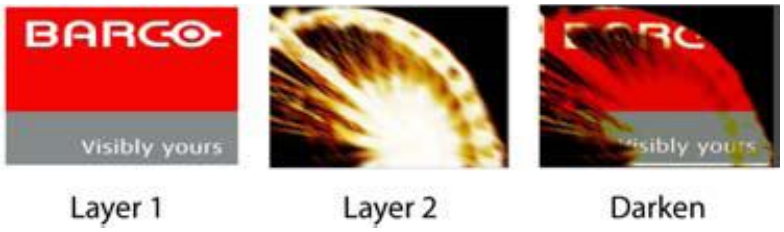


Image 12-46

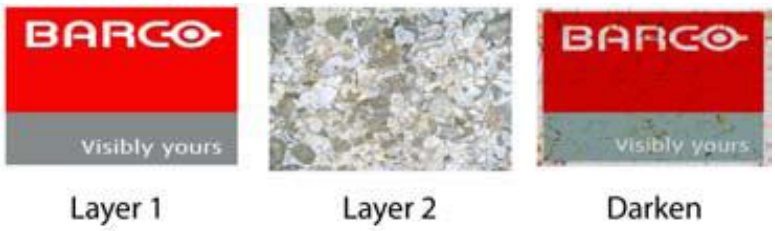


Image 12-47

Opacity value for channel 85 and channel 112 are not necessary on 100% to create the above images.

Combination mode selection

Value	Default	Action
24 - 39		Darken

12.3.14.5 Lighten

Overview

When using 'Lighten', the black parts of the upper layer disappear and anything brighter than black has the potential of lightening the underlying image.

Lighten mode compares the active layer to the underlying image only allowing those areas that are lighter than the underlying image to show up.

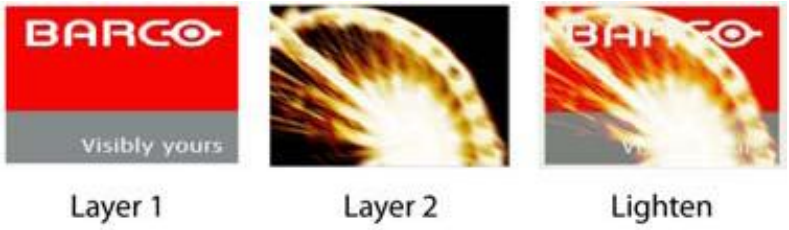


Image 12-48

Image 12-49

Combination mode selection

Value	Default	Action
40 - 55		Lighten

12.3.14.6 Softlight

Overview

If the color being applied is lighter than mid-grey, the image is lightened. If the color being applied is darker than mid-grey, the image is darkened. Depending on the image, soft ligth can also be used to produce soft shadows and highlights.

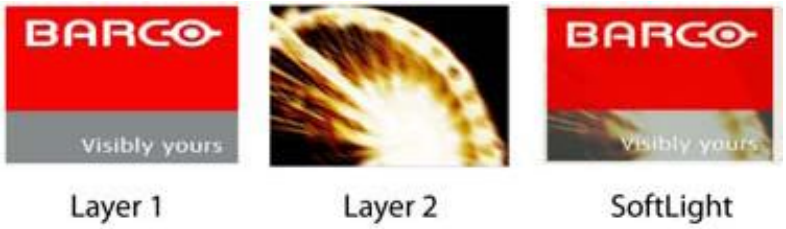


Image 12-50

Image 12-51

Combination mode selection

Value	Default	Action
56 - 71		Soft light

12.3.14.7 Softlight inverse

Overview

The same as soft light but just more intense.

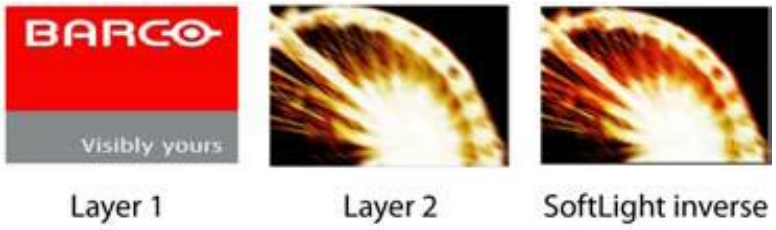


Image 12-52

Image 12-53

Combination mode selection

Value	Default	Action
72 - 87		Soft light inverse

12.3.14.8 Hardlight

Overview

If the colors being applied are lighter than mid gray, screen mode (lightens) is applied. If the colors being applied are darker than middle gray, multiply mode (darkens) is applied.

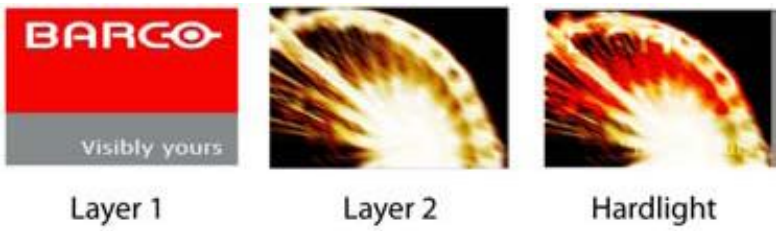


Image 12-54

Image 12-55

Combination mode selection

Value	Default	Action
88 - 103		Hard light

12.3.14.9 Overlay

Overview

Overlay uses the information on the underlying layer to change the contrast of the upper layer. It multiplies (darkens) or screens (lightens) the colors depending on the base color.

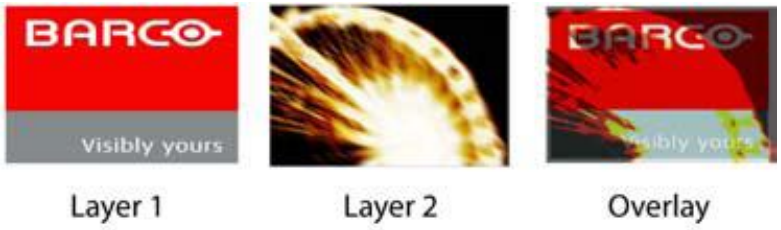


Image 12-56

Image 12-57

Combination mode selection

Value	Default	Action
104 - 119		Overlay

12.3.14.10 Difference

Overview

This combination mode looks at the two colors and subtracts the less bright from the more bright one.

Therefore, blending with white inverts the color values (the color value is subtracted from 100% and gives the inverse color). Blending with black makes no changes as you subtract 0 from the color value.

Combination mode *difference* changes the colors and not the brightness.

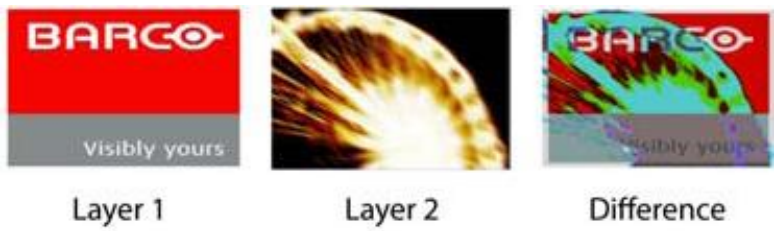


Image 12-58

Image 12-59

Combination mode selection

Value	Default	Action
120 - 135		Difference

12.3.14.11 Multiply

Overview

This combination mode allows to place an image over the layer to create a 'mask'. The lighter areas will let the image behind show through and the darker areas will cover or 'mask' the image underneath.

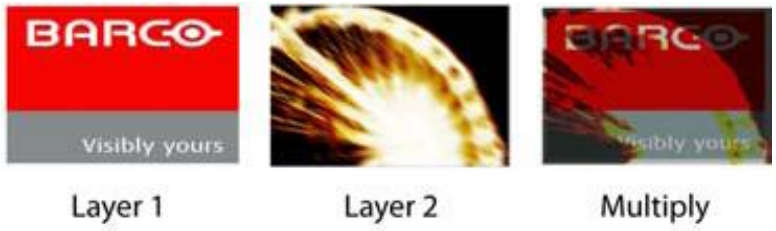


Image 12-60

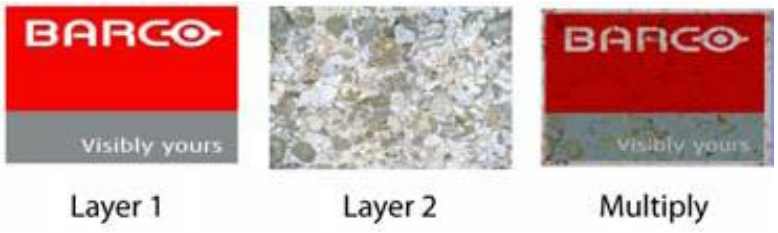


Image 12-61

Combination mode selection

Value	Default	Action
136 - 151		Multiply

12.3.14.12 Screen

Overview

Screen mode is used for highlighting, and making the layer appear lighter. Since highlights cannot be shown with black, no effect will appear by applying the Screen mode to an entirely black layer, or part of a layer.

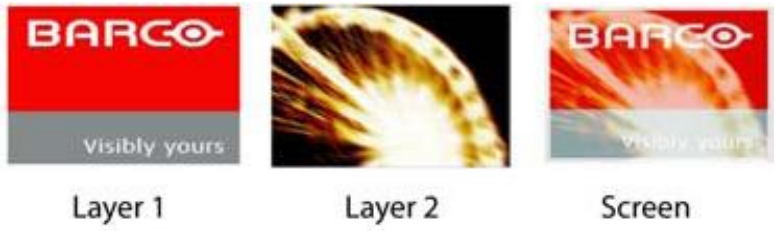


Image 12-62

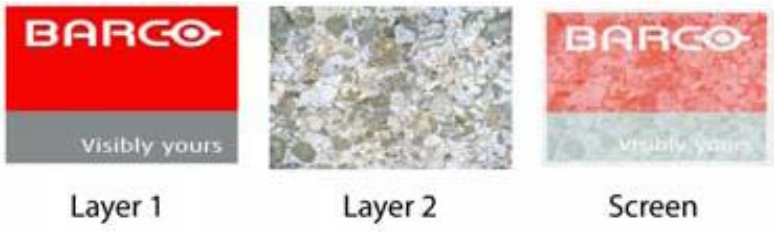


Image 12-63

Combination mode selection

Value	Default	Action
152 - 167		Screen

12.3.14.13 Opaque

Overview

Opaque takes the top layer and fully covers any layer underneath. When re-sizing the layer with the layer zoom to a value less than 100% then the underlying layer is still covered.

Image 12-64

Image 12-65

Combination mode selection

Value	Default	Action
168 - 183		Opaque

12.3.14.14 Sprite

Overview

Sprite works very similar to Opaque. It fully covers the underneath layer when zoom is 100% or more. When re-sizing the layer using the layer zoom to a value less than 100% then the underlying layer is revealed. This can be used to create a window in a window.

Image 12-66

Image 12-67

Combination mode selection

Value	Default	Action
184 - 199		Sprite

12.3.14.15 Luminance key

Overview

The luminance key uses the brightness of the layer to decide whether the underlying layer is visible or not. At 100% brightness (DMX parameter 1 = 255) of layer 2, only this layer (layer 2) is visible. When decreasing the DMX value of parameter 1 of layer 2, more and more of the underlying layer is revealed. The value of parameter 1 determines the threshold at which the luminance key works. This is useful for removing black surrounds from images and video clips.

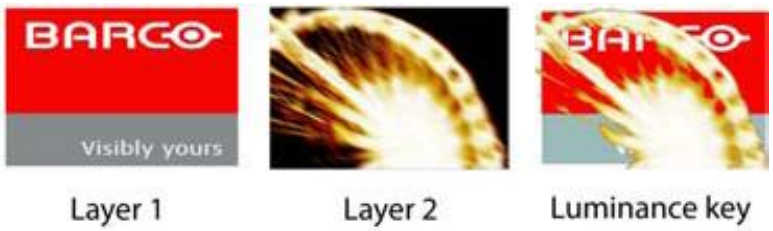


Image 12-68

Image 12-69

Combination mode selection

Value	Default	Action
200 - 215		Luminance key

12.3.14.16 Matte

Overview

When Matte is selected, the matte selection is first applied to the layer and then the combination is made with the other layer.

Combination mode selection

Value	Default	Action
216 - 231		Matte

12.3.15 Matte layer selections

Overview

- Introduction
- Color
- Rings
- Chess
- Interference (C+C)
- Interferences, Retro (C+C)
- Interferences (R+C)
- Interference, Retro (R+C)
- Interference, Retro2 (R+C)
- Interference (R+R)
- Interference Retro (R+R)
- Clouds
- Flowers
- Fog
- Rain
- Starfield
- Gradient

12.3.15.1 Introduction

Overview

The possible patterns on the Matte layer are generated images on the basis of algorithms. These algorithms generate patterns and textures using mathematics without the need to source media. Currently are included a simple color matte and some geometric shapes.

The Matte selection is done on channel 52.

The 3 parameters for the selection are set on channel 53, 54 and 55.

Channel 52

Value	FX Listing[2]	Par1 (ch53)	Par2 (ch54)	Par3 (ch55)
0 - 1	Color (RGB)	Red	Green	Blue
2 - 5	Rings	X = squeeze in X direction	Size	Anim
6 - 9	Chess	X = number of vertical bars	Y = number of horizontal bars	Edge X = amplitude in X direction
10 - 13	Interference (C+C)	Speed	Size	Color
14 - 17	Interference Retro (C+C)	Speed	Red1	Green1
18 - 21	Interference (R+C)	Speed	Size	Color
22 - 25	Interference Retro (R+C)	Speed	Size	Color
26 - 29	Interference Retro2 (R+C)	Speed	Size	Color
30 - 33	Interference (R+R)	Speed	Size	Color
34 - 37	Interference Retro (R+R)	Speed	Size	Color

2. C = concentric, R = radial

Value	FX Listing[2]	Par1 (ch53)	Par2 (ch54)	Par3 (ch55)
38 - 41	Clouds	Speed	Softness	Scale
42 - 45	Flowers	Rotspeed	Zoom	Color
46 - 49	Fog	Lightness	Speed	Brightness
50 - 53	Rain	Density	Angle	Speed
54 - 57	Starfield	Speed	Brightness	
58 - 61	Gradient	Hue1	Hue2	Speed1

12.3.15.2 Color

Overview

A specific color can be generated as Matte.

Selection

Value	Default	Action
0 - 1		Color via RGB colors values as parameters

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Amount of Red
P2	0 - 255	Amount of Green
P3	0 - 255	Amount of Blue

12.3.15.3 Rings

Overview

A circular white ring pattern generated internally where the squeeze factor for the X and the Y direction can be adapted. The roll out determines a zoom effect of the rings

When adding the ring pattern with layer 1, the following result can be obtained:

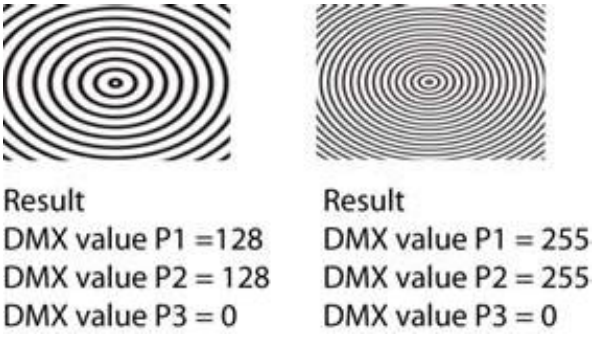


Image 12-70

Together with layer 1 and the combination mode Add:

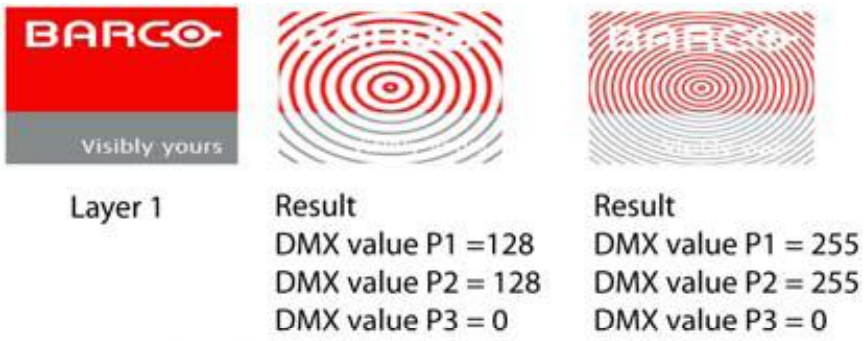


Image 12-71

Selection

Value	Default	Action
2 - 5		Rings

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	X = squeeze in X direction
P2	0 - 255	size, size of the ring
P3	0 - 255	anjmation

12.3.15.4 Chess

Overview

A white moving chessboard pattern is generate (framework of boxes). The number of vertical and horizontal bars can be selected with parameter P1 and P2. The amplitude of the moving bars can be determined by parameter P3 (zoom function for the boxes).

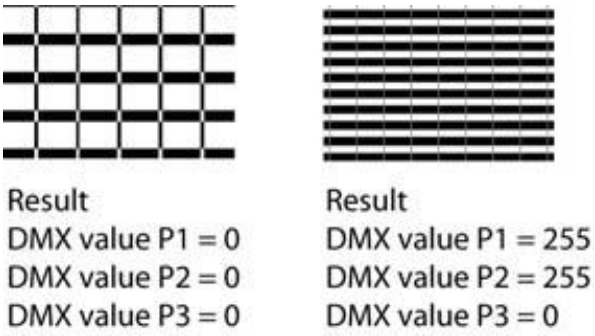


Image 12-72

Together with layer 1 and the combination mode Add:

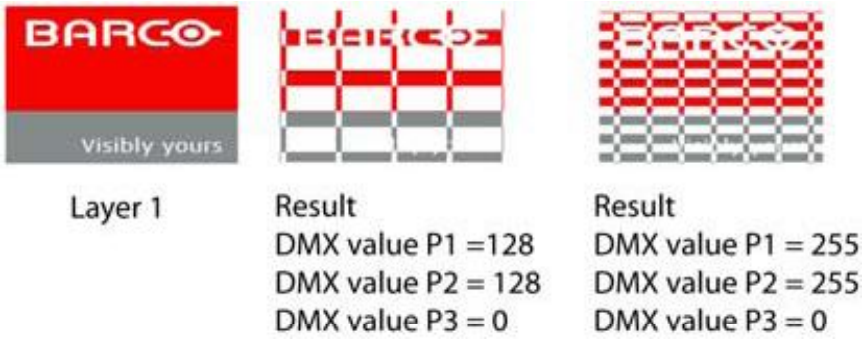


Image 12-73

Selection

Value	Default	Action
6 - 9		Chess

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	X = number of vertical bars
P2	0 - 255	Y = number of horizontal bars
P3	0 - 255	Edge X = amplitude in X direction of vertical bars

12.3.15.5 Interference (C+C)

Overview

Generates two concentric swirling circles that move around the screen. with a certain speed and color. The speed is determined by parameter P1. The size is determined by parameter P2. The color is determined by parameter P3.

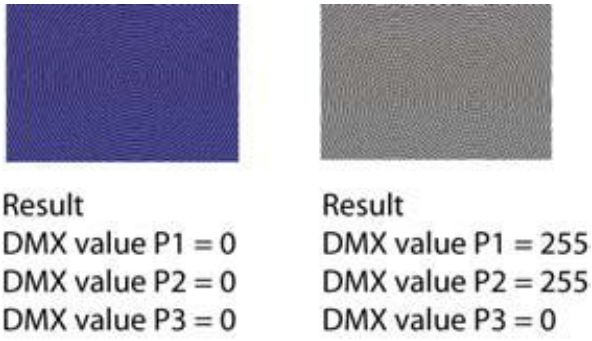


Image 12-74

Image 12-75

Selection

Value	Default	Action
10 - 13		Interference

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.6 Interferences, Retro (C+C)

Overview

Generates a tunnel like effect that swirl's around the screen whilst cascading. The speed is determined by parameter P1. The color is determined by a combination of parameter P2 and P3.

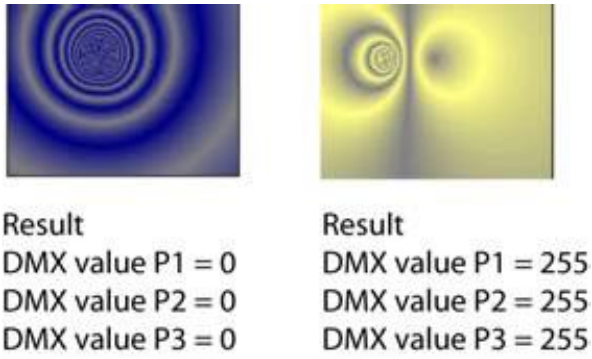


Image 12-76

Image 12-77

Selection

Value	Default	Action
14 - 17		Interference retro (C+C)

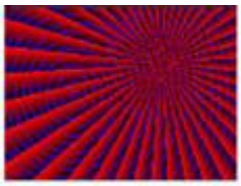
Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Red1
P3	0 - 255	Green1

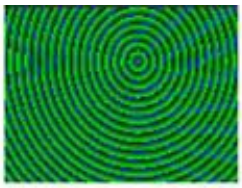
12.3.15.7 Interferences (R+C)

Overview

Generates both a set of concentric swirling rings and a radial fan that swirl around the screen.



Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 0



Result
DMX value P1 = 0
DMX value P2 = 255
DMX value P3 = 255

Image 12-78

Layer 1

Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 0

Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 255

Image 12-79

Selection

Value	Default	Action
18 - 21		Interference (R+C)

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.8 Interference, Retro (R+C)

Overview

Creates a tunnels like effect that zooms in and generates a swirling flower effect that move around the screen randomly.

Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 0

Result
DMX value P1 = 255
DMX value P2 = 127
DMX value P3 = 255

Image 12-80

Image 12-81

Selection

Value	Default	Action
22 - 25		Interference, Retro (R+C)

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.9 Interference, Retro2 (R+C)

Overview

Creates a tunnels like effect that zooms in and generates a swirling flower effect that move around the screen randomly.

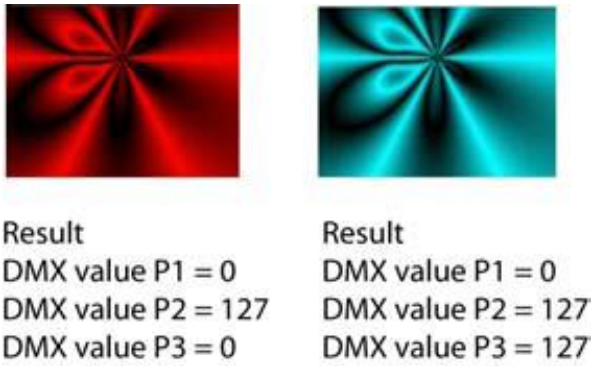


Image 12-82

Image 12-83

Selection

Value	Default	Action
26 - 29		Interference, Retro2 (R+C)

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.10 Interference (R+R)

Overview

Creates two swirling radial fans that move around the screen.

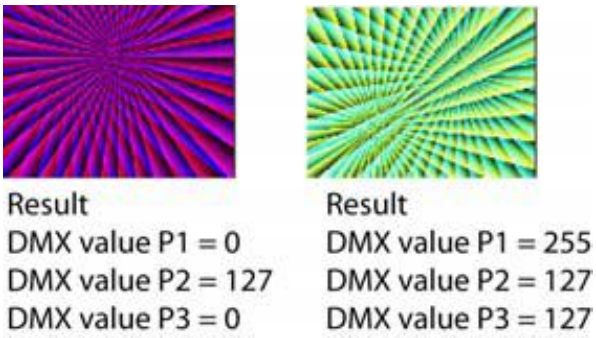


Image 12-84

Image 12-85

Selection

Value	Default	Action
30 - 33		Interference (R+R)

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.11 Interference Retro (R+R)

Overview

Generates a mirrored tunnel effect that swirls around the screen.

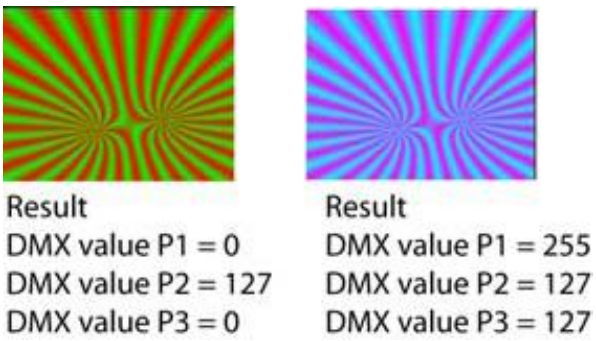


Image 12-86

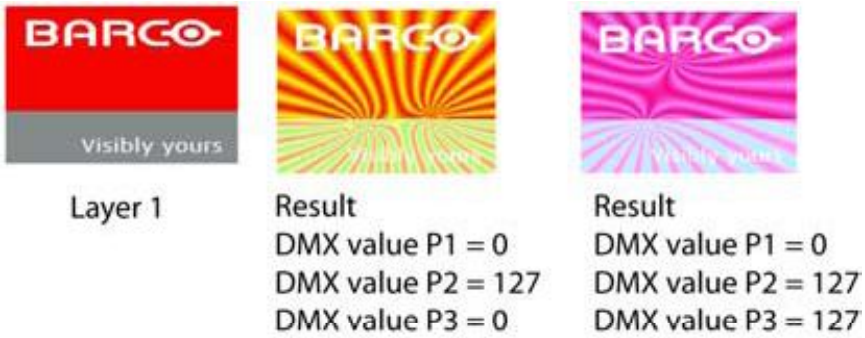


Image 12-87

Selection

Value	Default	Action
34 - 37		Interference Retro (R+R)

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Size
P3	0 - 255	Color

12.3.15.12 Clouds

Overview

Generates darker or lighter moving clouds which are scalable to create a cloudy overlay.

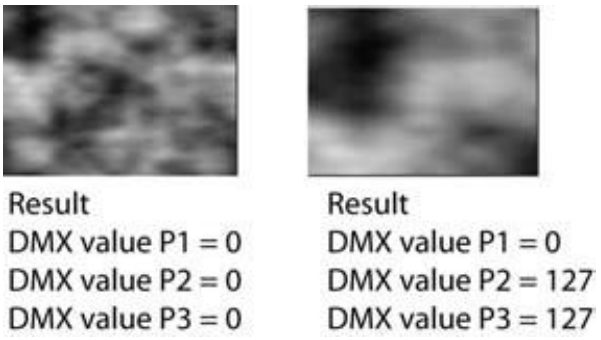


Image 12-88

Image 12-89

Selection

Value	Default	Action
38 - 41		Clouds

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Speed
P2	0 - 255	Softness
P3	0 - 255	Scale

12.3.15.13 Flowers

Overview

Generates a multi flower pattern. Each flower in the pattern can rotate clockwise or counter clockwise. Neighbor flower are turning in opposite direction. The flowers can be zoomed in or out and the color can be changed.

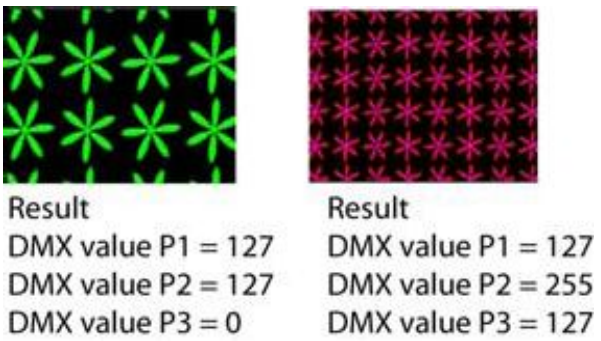


Image 12-90

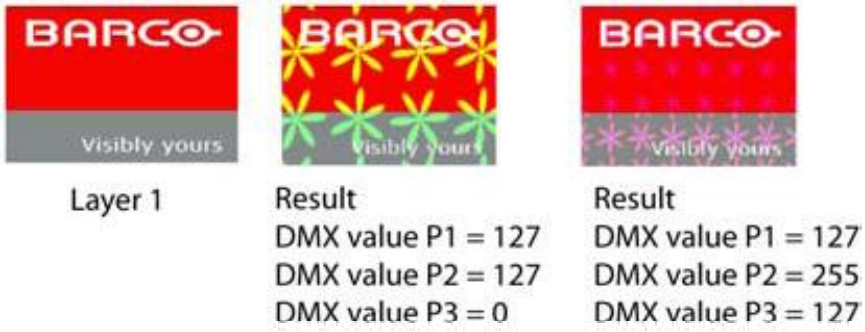


Image 12-91

Selection

Value	Default	Action
42 - 45		Flowers

Selection parameters

Parame-ter	Value	Action
P1	0 - 126	Rotation speed, direction 1
	127	stand still
	128 - 255	Rotation speed, direction 2
P2	0 - 255	Softness
P3	0 - 255	Scale

12.3.15.14 Fog

Overview

Generates a blurred cloudy fog with lighter and darker parts which can move randomly over the image.

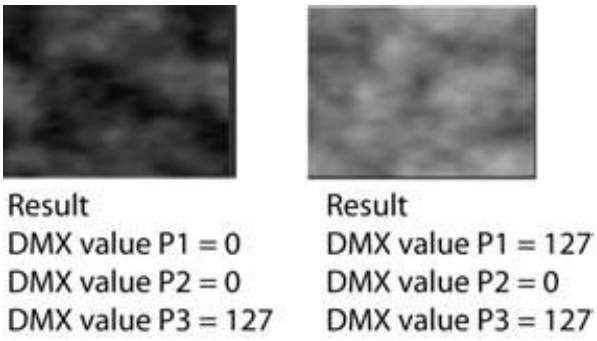


Image 12-92

Image 12-93

Selection

Value	Default	Action
46 - 49		Fog

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Lightness
P2	0 - 255	Speed
P3	0 - 255	Brightness

12.3.15.15 Rain

Overview

Generates a rain pattern which moves from top to bottom. The density of the raindrop and the falling angle is adjustable.

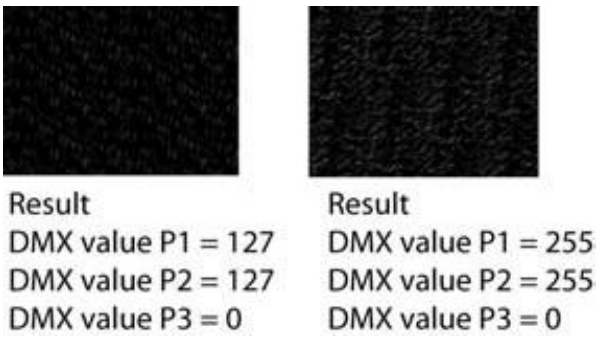


Image 12-94

Image 12-95

Selection

Value	Default	Action
50 - 53		Rain

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Density
P2	0 - 255	Angle
P3	0 - 255	Speed

12.3.15.16 Starfield

Overview

Generates a pattern of little stars moving from the middle of the image to the outsides or from the outsides to the middle of the image. The brightness of the stars is adjustable as well as the speed.

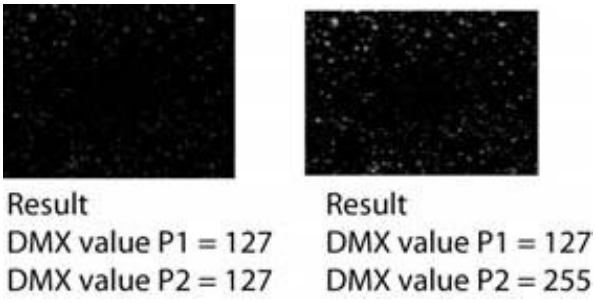


Image 12-96

Image 12-97

Selection

Value	Default	Action
54 - 57		Starfield

Selection parameters

Parame-ter	Value	Action
P1	0 - 126	Speed, moving from outside to middle
	127	Stand still
	128 - 255	Speed, moving from middle to outside
P2	0 - 255	Brightness

12.3.15.17 Gradient

Overview

Generates a top to bottom or bottom to top moving, gradually changing pattern. The color and the speed is adjustable.

Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 127

Image 12-98

Layer 1

Result
DMX value P1 = 0
DMX value P2 = 127
DMX value P3 = 127

Image 12-99

Selection

Value	Default	Action
58 - 61		Gradient

Selection parameters

Parame-ter	Value	Action
P1	0 - 255	Hue1
P2	0 - 255	Hue2
P3	0 - 255	Speed1

12.3.16 Warp selection and Warp transition

Overview

Warp allows users to adjust the output image to appear linear on non-linear surfaces or just create an effect. Softwarp is available for realtime adjustments on the Master Layer of the EMP.

Stored warp presets can be recalled and applied to the output by sending the corresponding DMX value on channel 56.

The transition between 2 warp setups can be set on channel 57.

To set up the SoftWARP files, use the EMP Manager SD on your computer OR the EMP Manager on the MediaWing.

Warp selection, channel 56

Value	Default	Action
0 - 1		Warp 0
2 - 5		Warp 1
6 - 9		Warp 2
···		Warp xx

Warp transition, channel 57

Value	Default	Action
0 - 255		transition

12.3.17 Masking

Overview

A mask is an overlay pattern on the master layer to cover some parts of the image or to create special effects.

Different masks are available and selectable on channel 58. The size, the indexed position (rotation) and the aspect ratio are controllable via channels 59, 60 and 61.

One example :

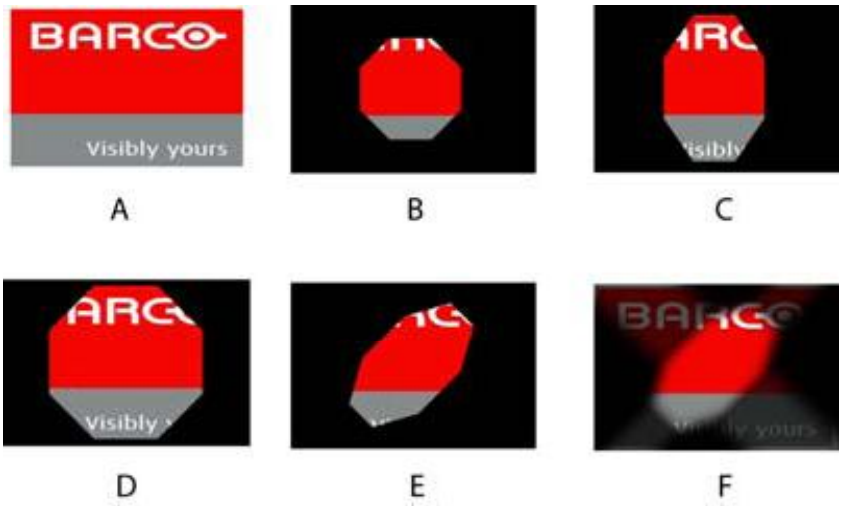


Image 12-100

A	No masking	DMX channel 58 = 0 - 1 Channel 59, 60, 61 and 62 have no influence
B	Octagon	DMX channel 58 = 16 - 19 (mask selection) DMX channel 59 = 128 (mask size) DMX channel 60 = 128 (mask indexed position) DMX channel 61 = 128 (mask aspect ratio) DMX channel 62 = 0 (mask blur)
C	Octagon	DMX channel 58 = 16 - 19 (mask selection) DMX channel 59 = 128 (mask size) DMX channel 60 = 128 (mask indexed position) DMX channel 61 = > 128 (mask aspect ratio) DMX channel 62 = 0 (mask blur)
D	Octagon	DMX channel 58 = 16 - 19 (mask selection) DMX channel 59 = > 128 (mask size) DMX channel 60 = 128 (mask indexed position) DMX channel 61 = 128 (mask aspect ratio) DMX channel 62 = 0 (mask blur)
E	Octagon	DMX channel 58 = 16 - 19 (mask selection) DMX channel 59 = 128 (mask size) DMX channel 60 = > 128 (mask indexed position) DMX channel 61 = > 128 (mask aspect ratio) DMX channel 62 = 0 (mask blur)
F	Octagon	DMX channel 58 = 16 - 19 (mask selection) DMX channel 59 = 128 (mask size) DMX channel 60 = > 128 (mask indexed position) DMX channel 61 = > 128 (mask aspect ratio) DMX channel 62 = > 0 (mask blur)

Mask selection, channel 58

Value	Default	Action
0 - 3		Open (no masking)
4 - 7		Circular
8 - 11		polygon with 16-sided
12 - 15		polygon 12-sided
16 - 19		octagon (shape with 8 sides)
20 - 23		hexagon (shape with 6-sided)

Value	Default	Action
24 - 27		rectangle (shape with 4-sided)
28 - 31		triangle (shape with 3-sided)
32 - 35		inverted triangle (shape with 3-sided, inverted)
36 - 39		inverted rectangle (shape with 4-sided, inverted)
40 - 43		inverted hexagon (shape with 6-sided, inverted)
44 - 47		inverted octagon (shape with 8-sided, inverted)
48 - 51		inverted polygon (shape with 12-sided, inverted)
52 - 55		inverted polygon (shape with 16-sided, inverted)
56 - 59		Circular, inverted
60 - 251		For future expansion
252 - 255		Polygon shutter

Mask size, channel 59

Value	Default	Action
0 - 255		From small to large

Mask indexed position, channel 60

Value	Default	Action
0 - 255		From + 90° to - 90°

Mask aspect ratio, channel 61

Value	Default	Action
0 - 127		Horizontal stretching between 300% and 100% Vertical size 100%
128		1 : 1
129 - 255		Vertical stretching between 100% and 300% horizontal size 100%

Mask blur, channel 62

Value	Default	Action
0 - 255		blur adjustment between no blur and 100% blur

12.3.18 Master effects

Overview

The effects which can be applied on the master layer are the same as those for layer 1 and layer 2.

The effect is selected on channel 63 and the parameters are set on channel 64, 65 and 66.

For more information about the separate effects, see "Layer effects", page 75.

12.3.19 Keystone - polygon adjustments

Overview

When projecting onto screens from non-perpendicular positions, the projected image will be distorted. The 8 controls, 2 per corner (channel 67 up to channel 74) allow to correct the keystone effect applied on the overall image.

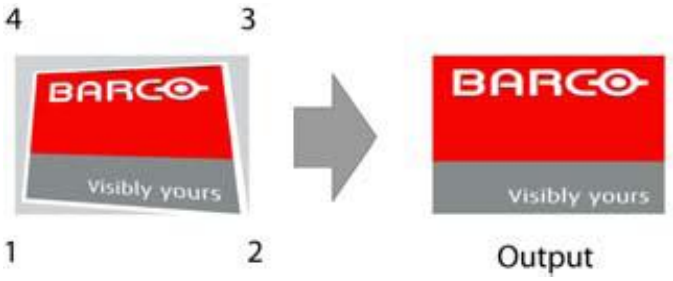


Image 12-101

Keystone selection

Channel	Value	Action
67	0 - 255	Corner 1 adjustment X direction
68	0 - 255	Corner 1 adjustment Y direction
69	0 - 255	Corner 2 adjustment X direction
70	0 - 255	Corner 2 adjustment Y direction
71	0 - 255	Corner 3 adjustment X direction
72	0 - 255	Corner 3 adjustment Y direction
73	0 - 255	Corner 4 adjustment X direction
74	0 - 255	Corner 4 adjustment Y direction

13. MAINTENANCE

About this chapter

This chapter contains detailed maintenance procedures like lens cleaning, etc. These procedures can easily be performed by the operator.

Overview

- Cleaning the lens
- Cleaning the exterior of the DML-1200
- Level check of cooling liquid
- Safety cable check

13.1 Cleaning the lens

To minimize the possibility of damage to optical coatings, or scratches to lens surfaces, we have developed recommendations for cleaning. FIRST, we recommend you try to remove any material from the lens by blowing it off with clean, dry deionized air. DO NOT use any liquid to clean the lenses.

Necessary tools

Toraysee™ cloth (delivered together with the lens kit). Order number : R379058.

How to clean the lens ?

1. Always wipe lenses with a CLEAN Toraysee™ cloth.
2. Wipe lenses in a one single direction.
   Warning: *Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.*
3. Do not leave the cleaning cloth in either an open room or lab coat pocket, as doing so can contaminate the cloth.
4. If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.

CAUTION: Do not use fabric softener when washing the cleaning cloth or softener sheets when drying the cloth.

Do not use liquid cleaners on the cloth as doing so will contaminate the cloth.

Other lenses can also be cleaned safely with this Toraysee™ cloth.

13.2 Cleaning the exterior of the DML-1200

How to clean the exterior

1. Unplug the power cord.
2. Clean the housing with a damp cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution.

13.3 Level check of cooling liquid

What should be done ?

The projector is liquid cooled. When running with a low liquid cooling level then the cooling capacity is strongly reduced which results in higher temperatures inside the projector. These higher temperatures can cause an interruption of your show as the lamps can be switched off by the software as a preventive step.

To avoid this problem, we strongly advise to check at least every 3 months the cooling level in the cooling reservoir of the projector.

WARNING: Unplug the device from the power outlet before starting the check procedure !

How to check

1. Standing at the tilt lock side, turn the head horizontally until the lens is pointing to the left.

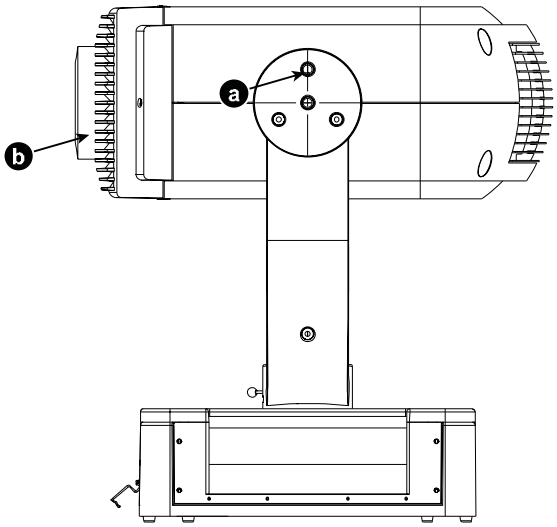


Image 13-1
Locking head

a Locking button
b Lens side

2. Loosen both captive screws.

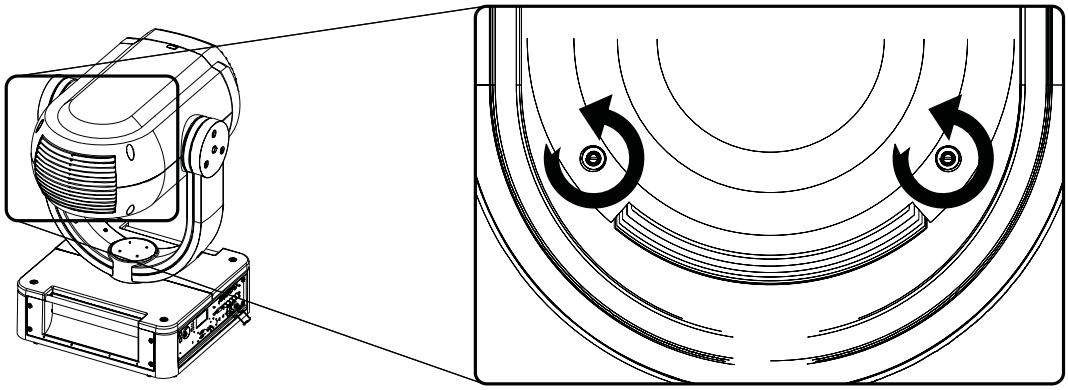


Image 13-2
Captive screws top cover

3. Gently lift up the top cover and press on the indicated part until the arm of the cover is fixed.

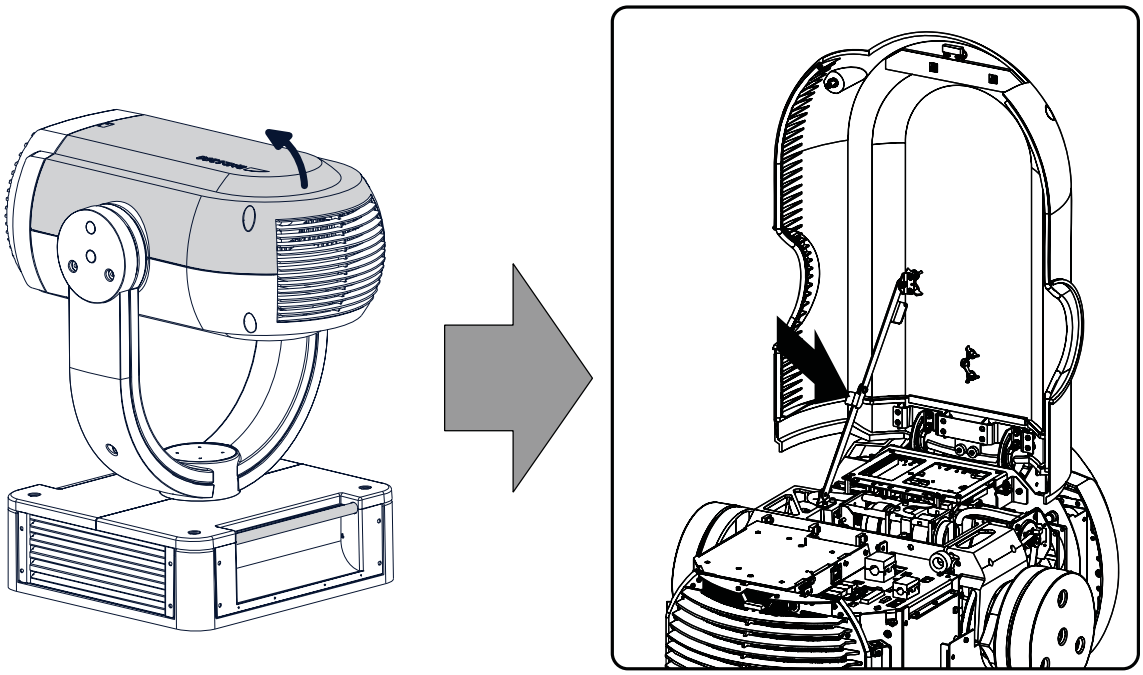


Image 13-3
Open cover

The software of the projector blocks any movement.

4. Check the cooling liquid level.

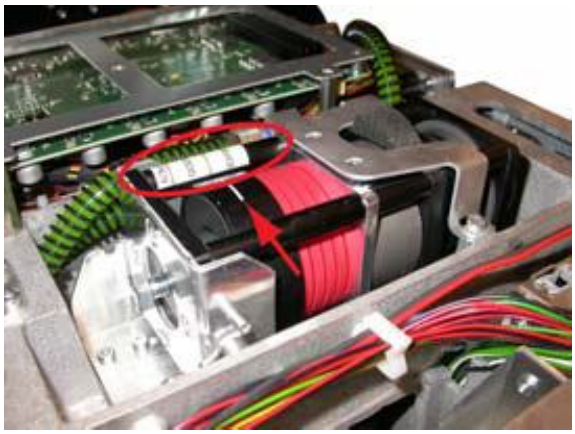


Image 13-4
Cooling liquid check

When the white indication line is in the *service* area, then the reservoir has to be topped-up again. To top-up the reservoir, see chapter "14. Servicing", "Top-up the reservoir with cooling liquid", page 148

When the white indication is in the *good* area, no corrective action should be taken. Close the top cover and fasten both captive screws.

13.4 Safety cable check

What should be done ?

2 internal safety cables are mounted inside the DML-1200 to protect the audience when some critical parts would break inside the device. To make sure that both cables are always in good condition, it is recommended to inspect these cable each time when checking the liquid cooling level (every 3 months) or at least once a year.

Check for :

- damage of the insulation around each cable.
- damage to the core of the cable. No metal fibres may be broken or visible outside the insulation.

When damage is found, contact a qualified service technician to replace the safety cable.

WARNING: Unplug the device from the power outlet before starting the check procedure !

How to check

1. Open the covers of the base unit, yoke and projector head (see chapter Service for more information on how to open the device)
2. Execute a visual inspection of the cable.
3. Use a cotton cloud to check if metal fibres are broken.
   Cable 1 starts at point 1, goes through one side of the yoke to the projector head, through the bridge and back through the other side of the yoke to make a junction in point 4.
   Cable 2 starts at point 2 and goes to the corner of the base unit (point 3).

Image 13-5
Internal safety cable, routing

1 Start safety cable 1
2 Start safety cable 2
3 End safety cable 2
4 Junction and end point of safety cable 1

14. SERVICING

About this chapter

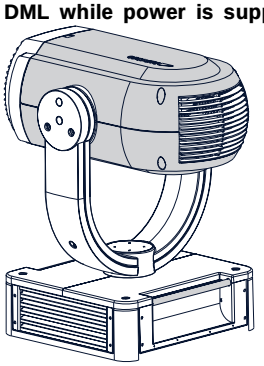
This chapter contains general servicing procedures like lamp replacement, dust filter replacement etc. Note that some of these procedures may only be performed by qualified technical service personnel. These procedure are marked with a warning.

Extra service information

Extra service information for qualified service technicians can be found on Barco's Partnerzone (URLhttps:\\my.barco.com). Registration is necessary.

If you are not yet registered, click on Partnerzone registration and follow the instructions. With the created login and password, it is possible to enter the partnerzone where you can find extra service information about the projector.

CAUTION: When opening one of the shell covers (colored in next drawing) of the projection head of the DML while power is supplied, the movement (pan and tilt) of the head will be blocked by the software.



WARNING: Before starting any service actions, unplug the power cord from the wall outlet !

HEPA

High Efficiency Particulate Absorbing

Overview

- Removal of the front cover
- Opening the top cover on the lamp units side
- Opening the top cover on the LPS box side
- Remove the yoke covers and shields
- Remove top cover of base unit
- Replacement of the dust filters on the front side
- Replacement of the dust filter at the inside of the head
- Replacement of the dust filter in the base
- Removal of a lamp unit
- Mounting a new lamp unit
- Top-up the reservoir with cooling liquid

CAUTION: All HEPA filters of the DML-1200 must be replaced on a regular basis, depending on the environment conditions of the device.

14.1 Removal of the front cover

Necessary tools

Flat screwdriver

How to remove the front cover

1. Release both captive screws on each side of the cover.

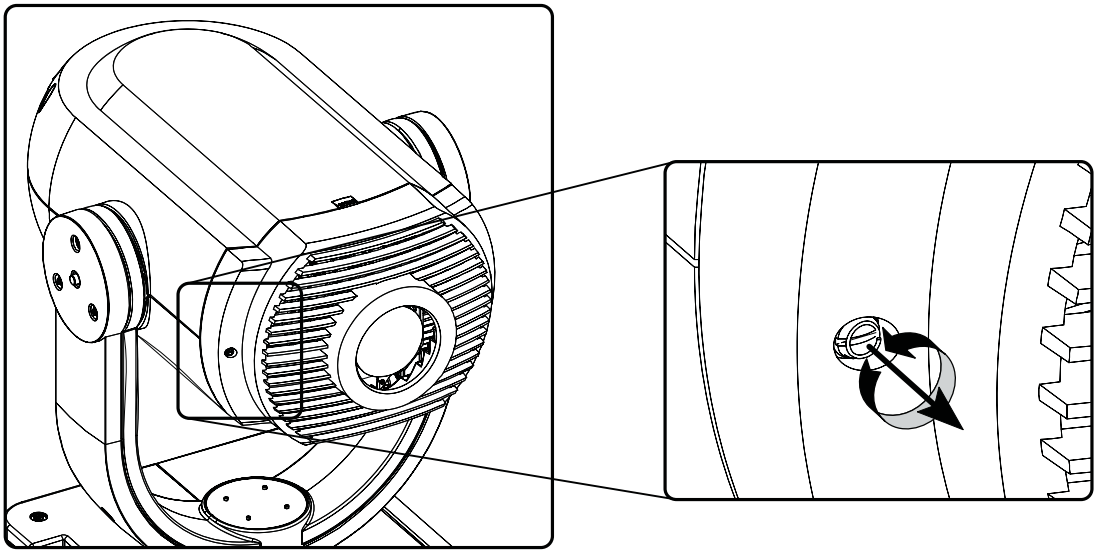


Image 14-1
Release front cover

2. Pull the front cover forward to remove from the projector.

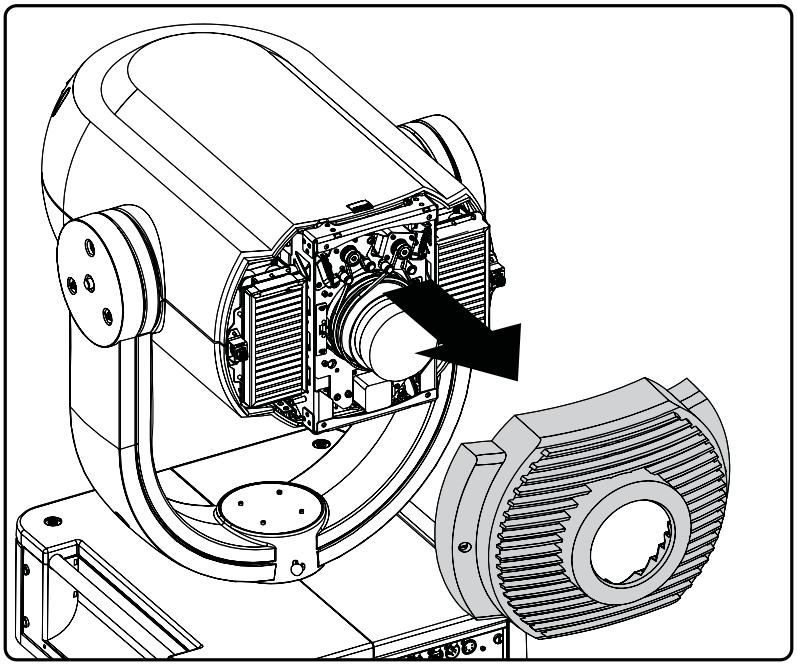


Image 14-2
Remove front cover

14.2 Opening the top cover on the lamp units side

Necessary tools

Flat screwdriver

How to open

1. Stand on the side of the locking buttons and turn the head so that the lens points to the right.

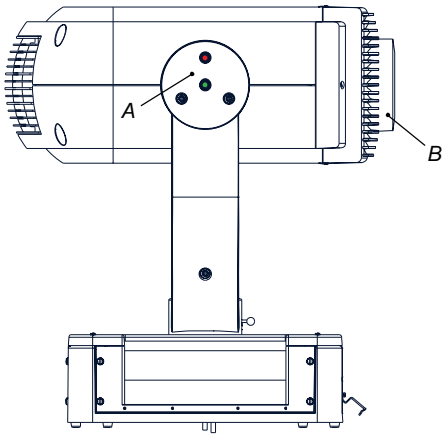


Image 14-3
Filter location

A Locking of the head
B Lens side

The upper cover can now be opened.

2. Lock the head.

3. Loosen both captive screws.

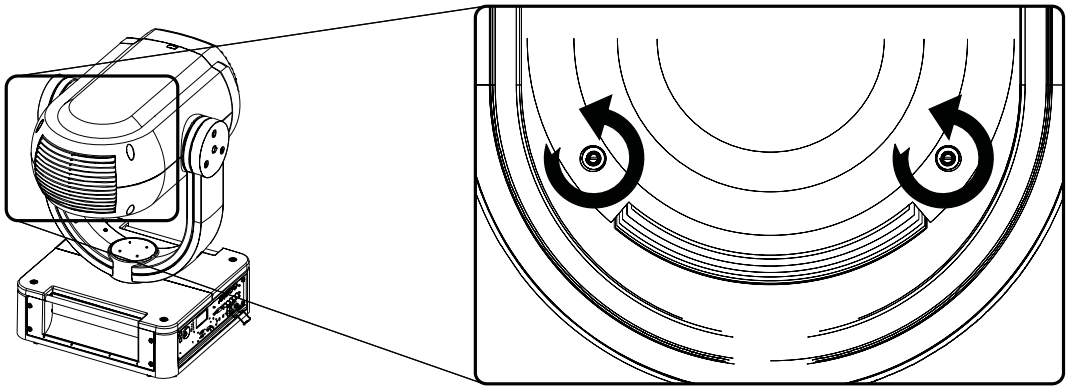


Image 14-4
Captive screws top cover

4. Lift up the top cover.

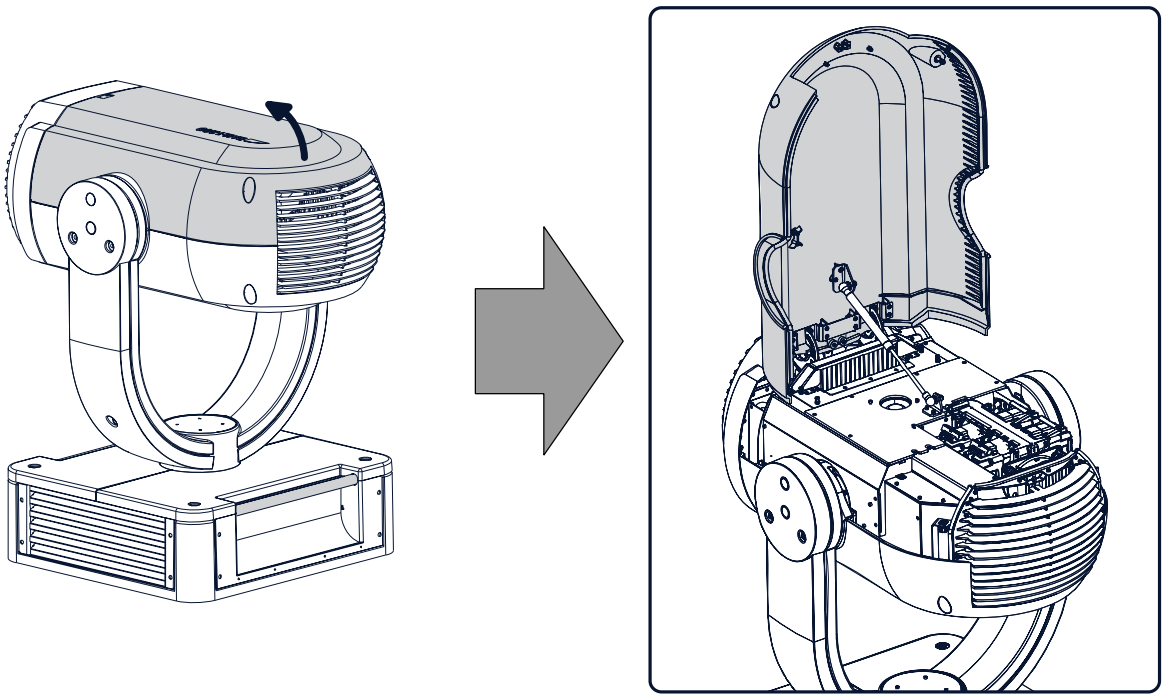


Image 14-5
Open top cover

A hydraulic arm supports the cover.

14.3 Opening the top cover on the LPS box side

Necessary tools

Flat screwdriver

How to open

1. Standing at the tilt lock side, turn the head horizontally until the lens is pointing to the left.

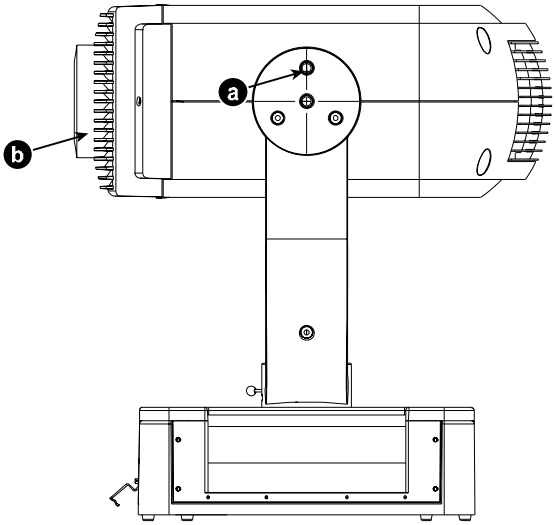


Image 14-6
Locking head

a Locking button
b Lens side

2. Loosen both captive screws.

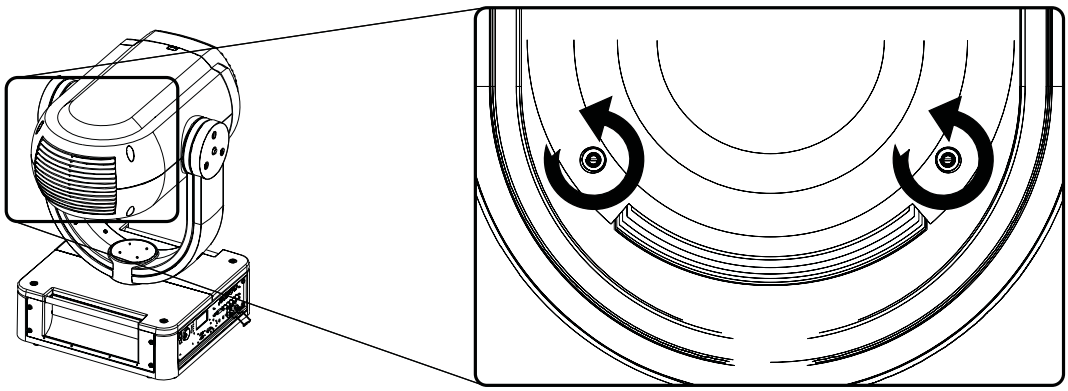


Image 14-7
Captive screws top cover

3. Gently lift up the top cover and press on the indicated part until the arm of the cover is fixed.

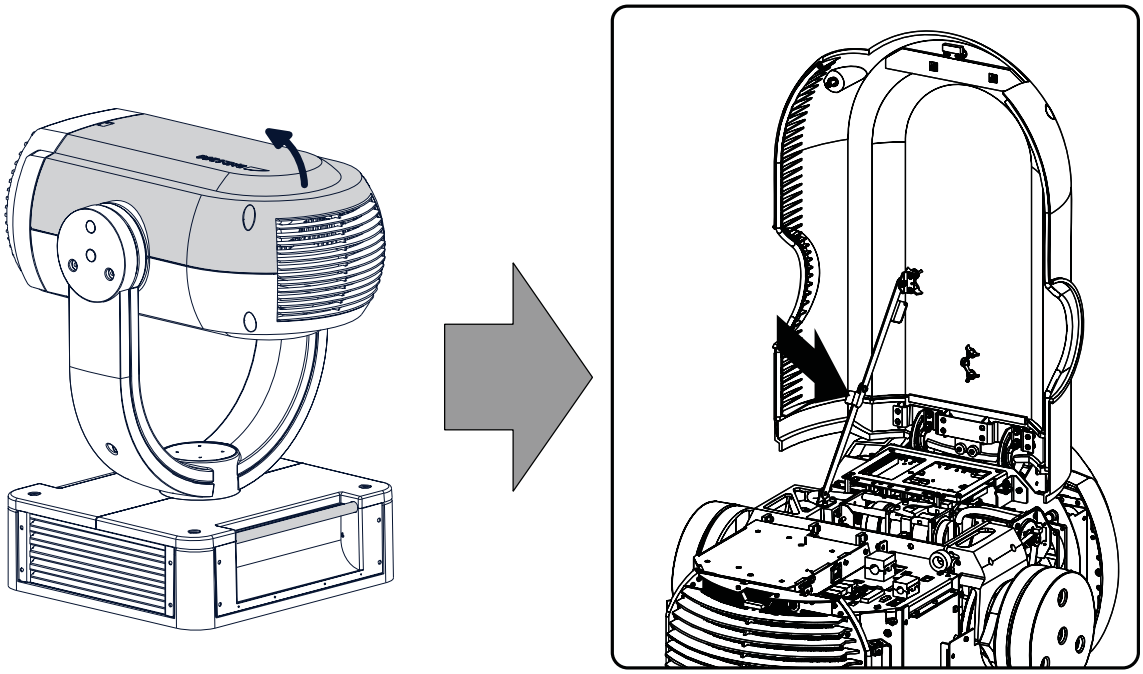


Image 14-8
Open cover

14.4 Remove the yoke covers and shields

Necessary tools

- Flat screwdriver 4 mm
- Allen key 2.5 mm

How to remove

1. Turn the 3 indicated captive screws a quarter turn counter clockwise to open the connection.

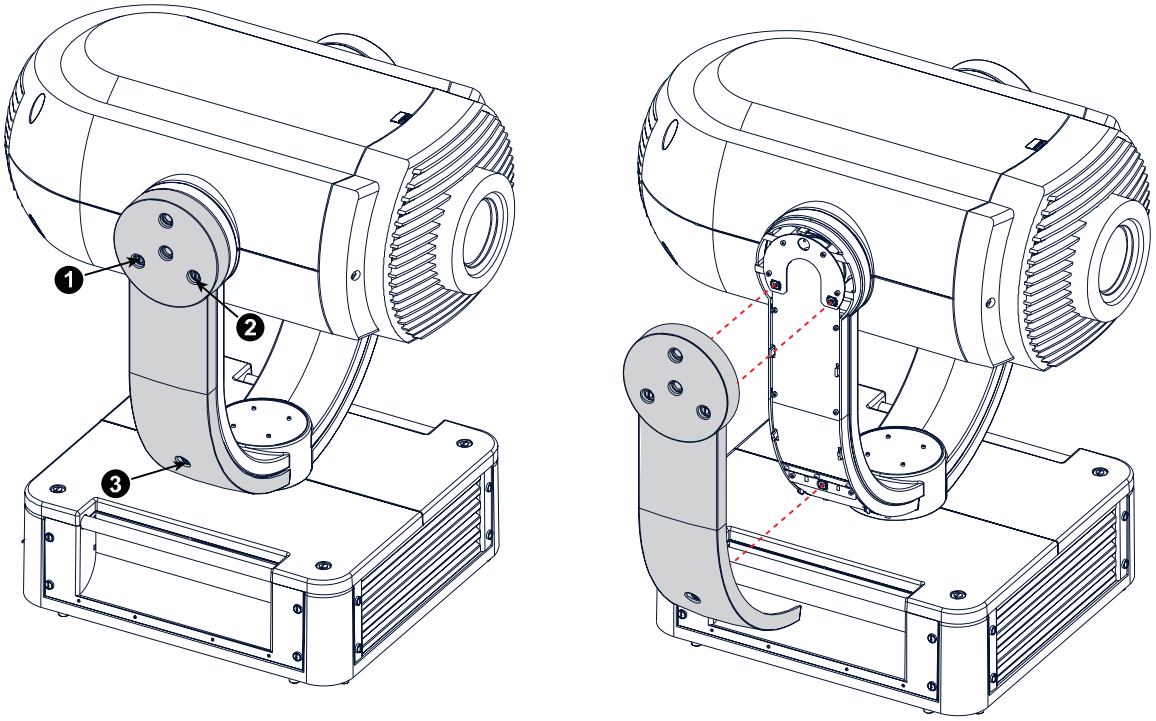


Image 14-9
Remove yoke cover

2. Pull off the yoke cover.

3. Remove the protection shields. Turn out the indicated screws.

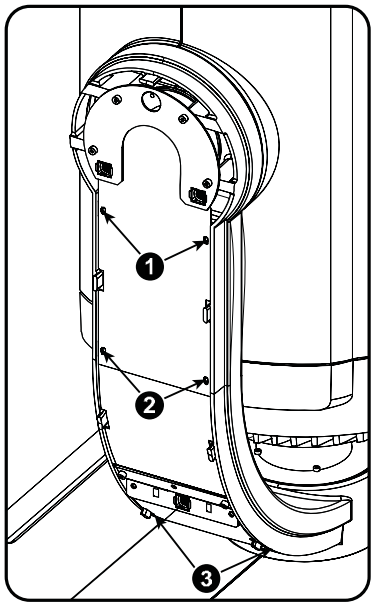


Image 14-10
Remove shielding

4. Loosen the 4 indicated screws of the yoke center.
   Turn the plate a quarter turn and take it off.

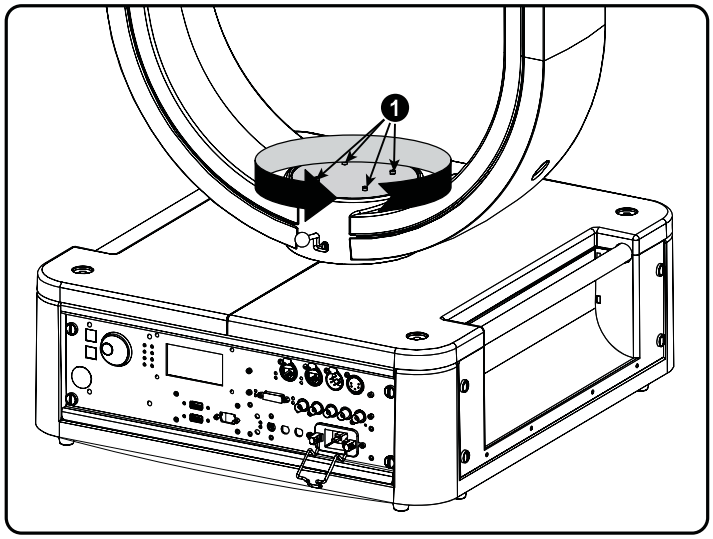
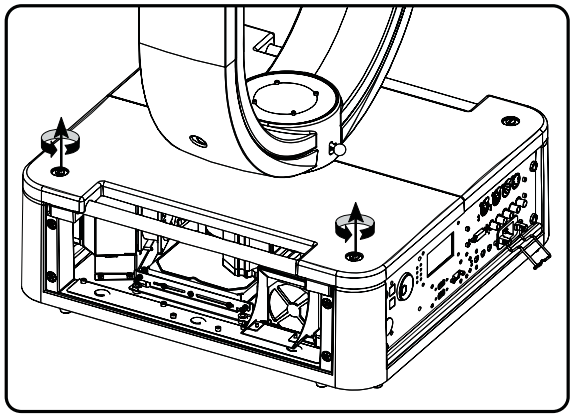


Image 14-11
Remove center cover

14.5 Remove top cover of base unit

How to remove

1. Turn the captive screws a quarter counter clockwise.



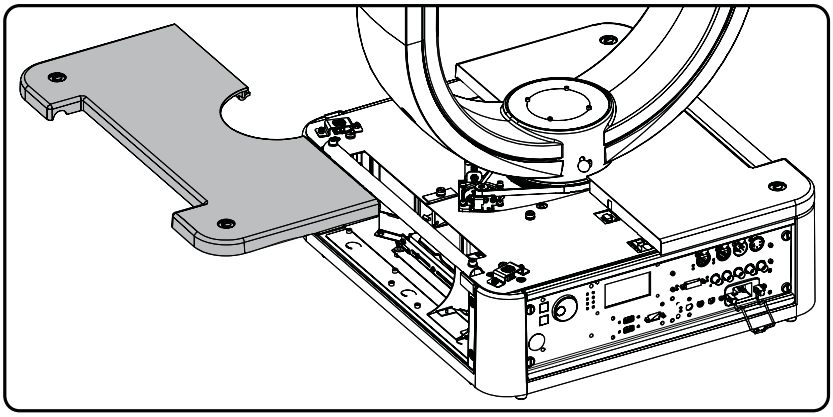


Image 14-12
Top cover, remove

2. Take off the cover.
3. Repeat both steps for the second half of the cover
4. To remove the protection cover, start with the cover near the input side and loosen the 7 captive screws (1 to 7).

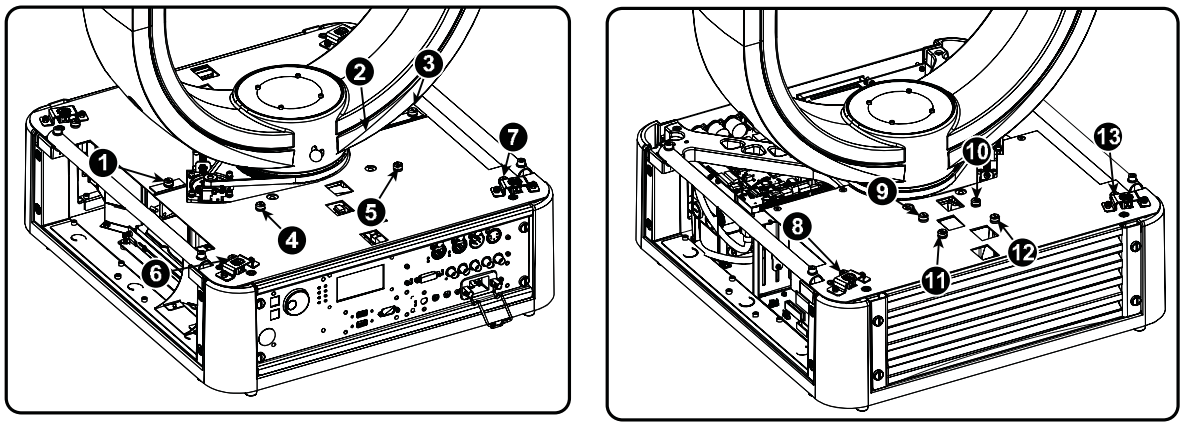


Image 14-13

5. Take off the plate.
6. Repeat for the other part of the protection cover. Loosen the 6 captive screws (8 to 13) and take off the cover.

14.6 Replacement of the dust filters on the front side

Once the front cover is removed, no tools are necessary to replace the dust filter.

Necessary parts

New HEPA dust filter

How to replace the dust filter

1. Unplug the power cord from the device.
2. Remove the front cover, see "Removal of the front cover", page 135.
3. Remove the HEPA filter on the front side by pulling the spring clamp (A) on the upper side away from the filter and then pivot the filter a little (B) and take it out (C).

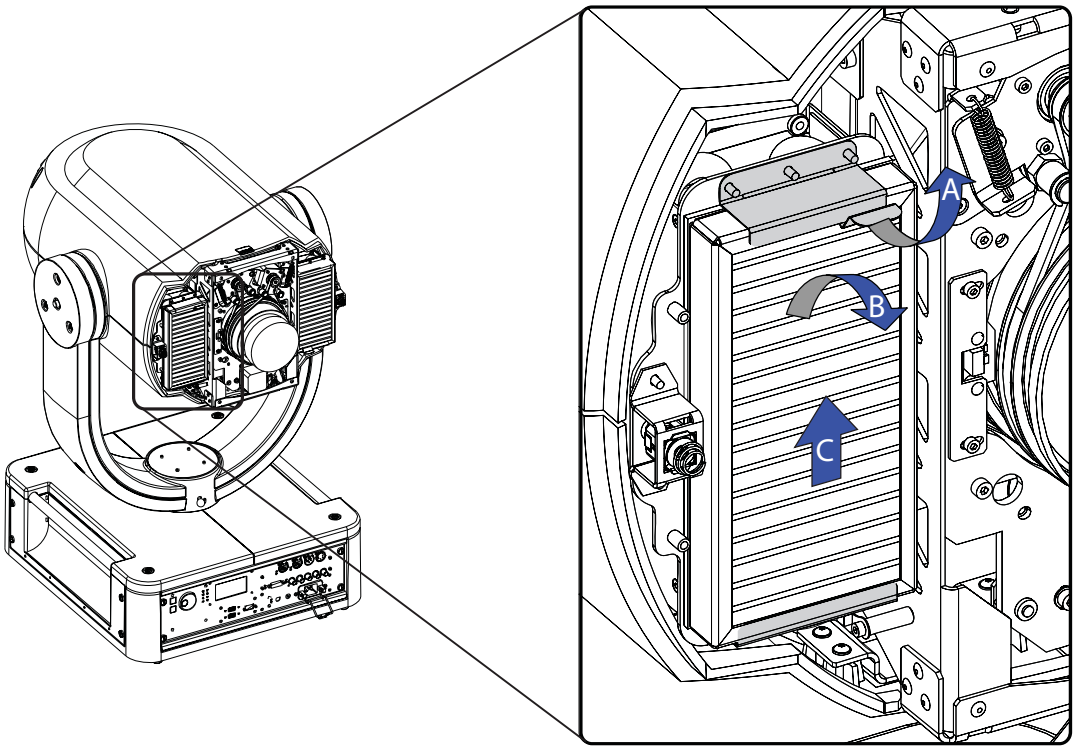


Image 14-14
Front filter replacement

4. Insert a new HEPA filter by pulling the spring clamp away and insert the filter into its position. Point the arrow on the side of the filter to inside of the head. Release the spring clamp.
5. Reinstall the front cover.

14.7 Replacement of the dust filter at the inside of the head

Necessary parts

HEPA filter

How to replace

1. Unplug the power cord from the wall outlet.
2. Open the top cover on the lamp units side, see "Opening the top cover on the lamp units side", page 136.
3. Pull out the HEPA filter.

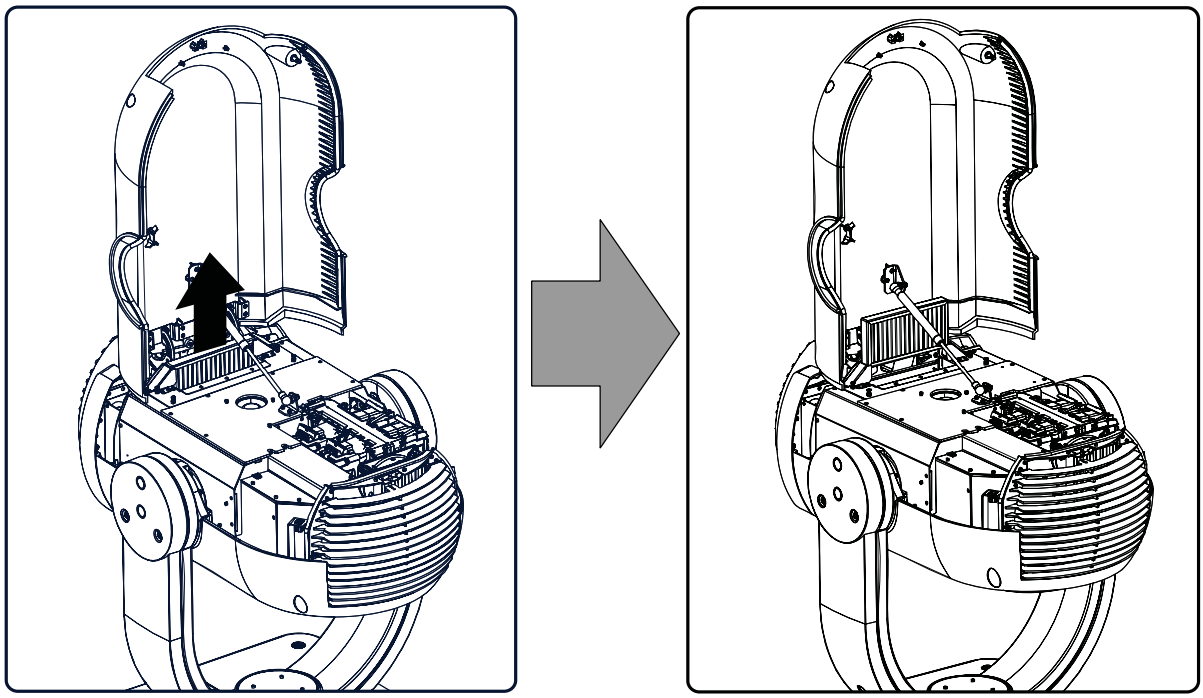


Image 14-15

4. Insert a new filter. Point the arrow on the side of the filter to inside of the head.

14.8 Replacement of the dust filter in the base

Necessary tools

Flat screwdriver

Necessary parts

New HEPA filter

How to replace

1. Loosen the 4 captive screws.

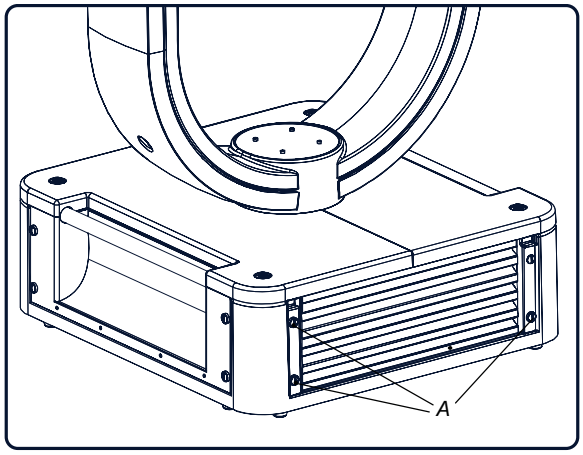


Image 14-16
Captive screws

2. Take off the side panel.

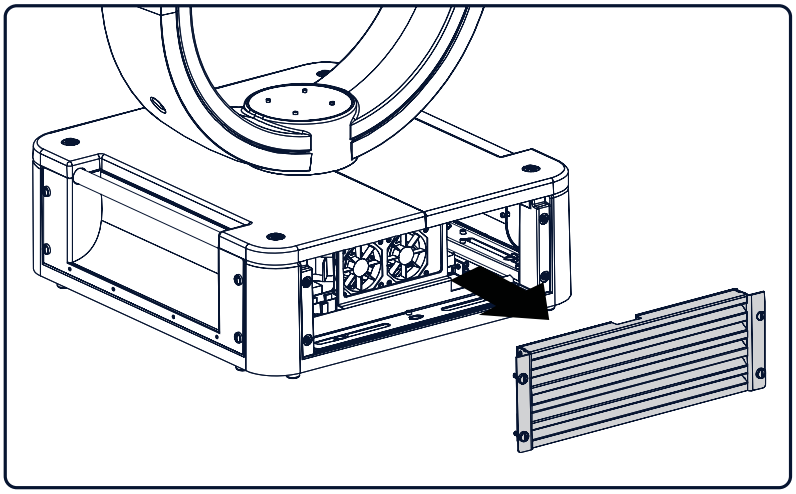


Image 14-17

The filter is mounted at the back side of this side panel.

3. Remove the HEPA filter on the side panel by pulling the spring clamp (A) away from the filter and then pivot the filter a little (B) and take it out (C).

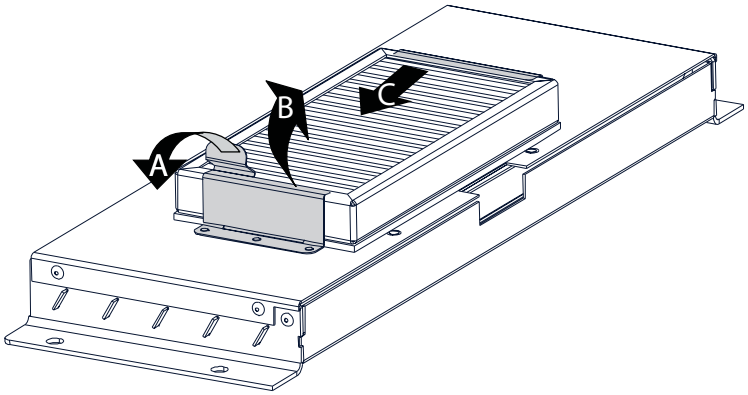


Image 14-18

4. Insert a new HEPA filter by pulling the spring clamp away and insert the filter into its position. Point the arrow on the side of the filter to outside of the plate. Release the spring clamp.
5. Reinstall the side panel of the base.

14.9 Removal of a lamp unit

WARNING: This procedure may only be performed by qualified technical service personnel.

CAUTION: Never attempt to disassemble the lamp from its housing or to dispose of it. Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled. For recycling guidelines, see "Recycling guidelines", page 8.

About the lamps

The device head contains 4 lamps, each of them in a separate lamp house. Each lamp can be individually replaced by a spare lamp. Each lamp position has a number. That number is also used in the software to identify the parameters of the corresponding lamp.

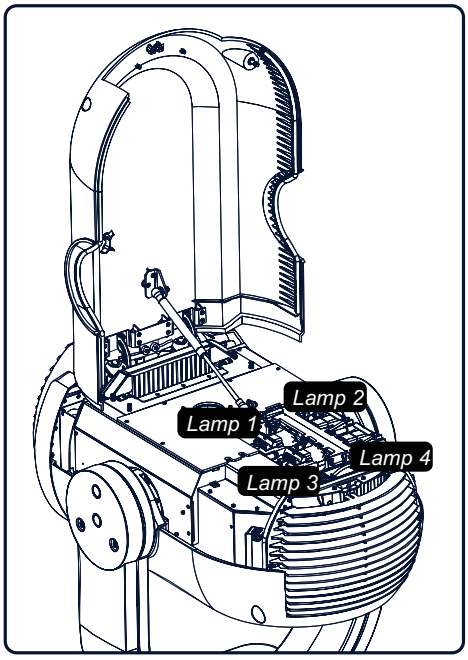


Image 14-19
Lamp position

When servicing a device with exploded lamp

Keep the following warning in mind when servicing a device with exploded lamp.

Mercury Vapor Warnings: The lamp used in the device contains mercury. In case of a lamp rupture, explosion there will be a mercury vapor emission. In order to minimize the potential risk of inhaling mercury vapors:

- Ensure the projector is installed only in ventilated rooms.
- Replace the lamp module before the end of its operational life.
- Promptly ventilate the room after a lamp rupture, explosion has occurred, evacuate the room (particularly in case of a pregnant woman).
- Seek medical attention if unusual health conditions occur after a lamp rupture, explosion, such as headache, fatigue, shortness of breath, chest-tightening coughing or nausea.

Necessary tools

No tools.

How to remove a lamp

1. Unplug the power cord from the wall outlet.
2. Open the top cover on the lamp units side, see "Opening the top cover on the lamp units side", page 136.
3. Unplug the cable of the lamp which must be removed.

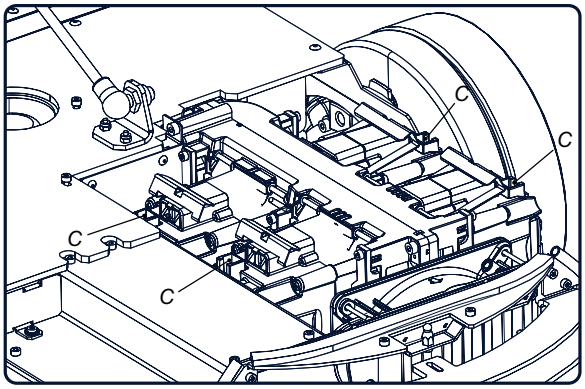


Image 14-20
Lamp cables, connection

4. Pull up the fixation handle and rotate it fully upwards.

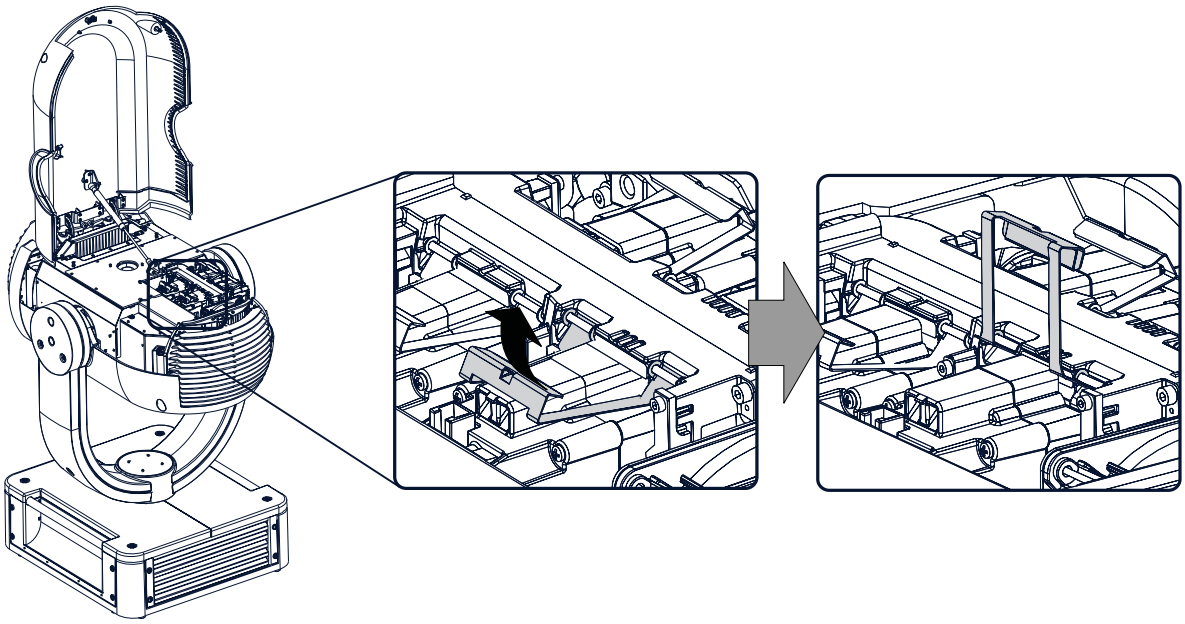


Image 14-21

5. Clasp the lamp and pull upwards.

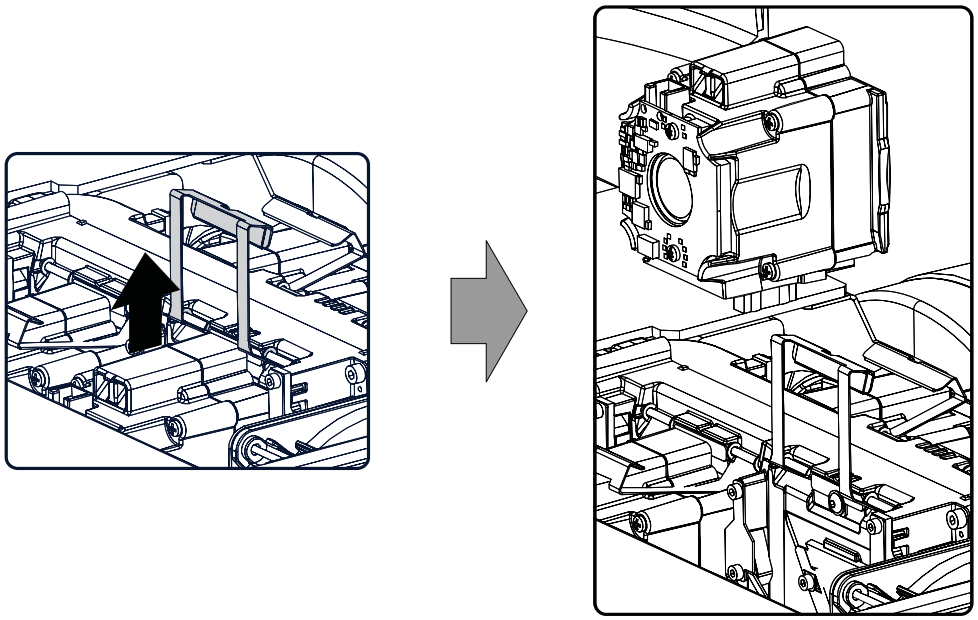


Image 14-22

For recycling guidelines of the lamp, see "Recycling guidelines", page 8.

14.10 Mounting a new lamp unit

About the lamp unit

All four lamp units are equal. A spare lamp can be inserted in any position without problems.

WARNING: This procedure may only be performed by qualified technical service personnel.

CAUTION: Never attempt to disassemble the lamp from its housing or to dispose of it. Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled. For recycling guidelines, see "Recycling guidelines", page 8.

CAUTION: Never touch the reflector or the lamp bulb with your fingers. That will reduce the lifetime of the lamp.

Never touch the UV filter when a lamp is removed.

Necessary tools

No tools.

How to insert a lamp unit

1. Insert the lamp vertically into the housing, with the front of the lamp facing the middle of the head. Insert the lamp completely.

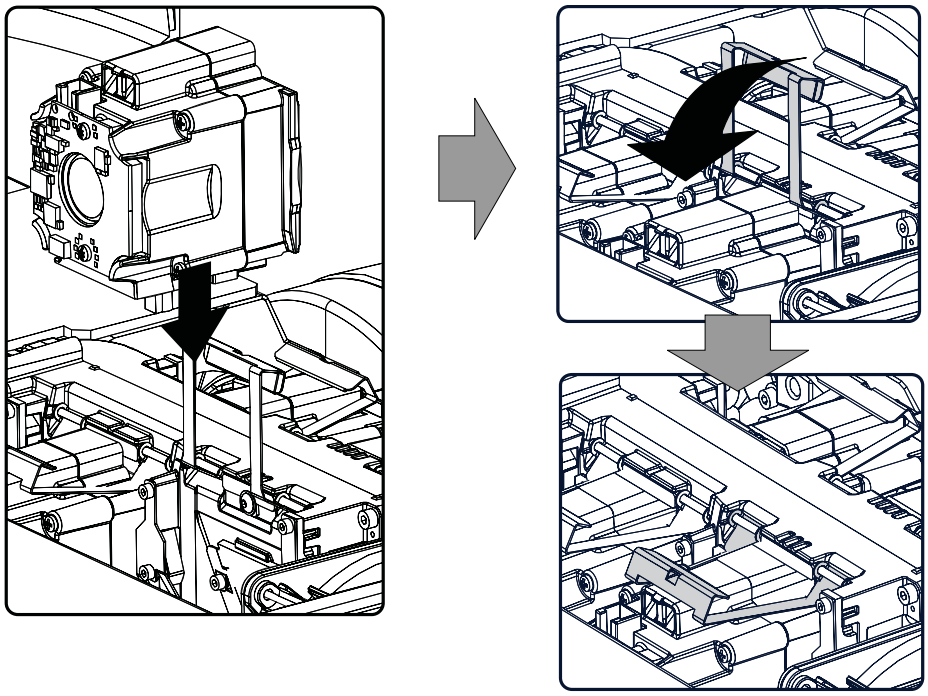


Image 14-23
Mounting a lamp

2. Rotate the fixation handle and close it. Push until it clicks.
3. Insert the cable connector into the lamp unit socket.

Starting up the lamps is only possible if all lamps are correctly mounted in the projector head.

14.11 Top-up the reservoir with cooling liquid

Access to the reservoir

1. Unplug the device from the power outlet.
2. Standing at the tilt lock side, turn the head horizontally until the lens is pointing to the left.

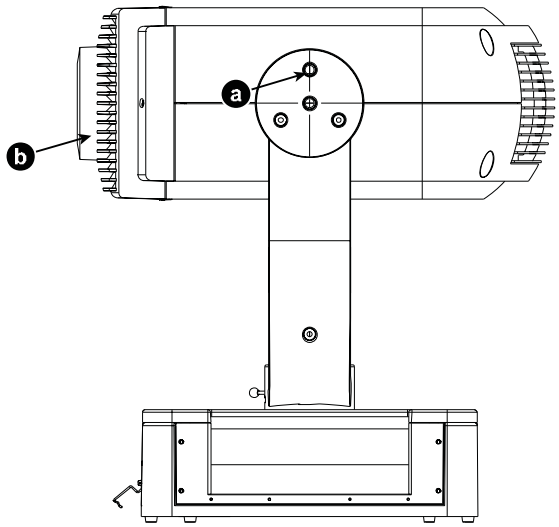


Image 14-24
Locking head

a Locking button
b Lens side

3. Loosen both captive screws.

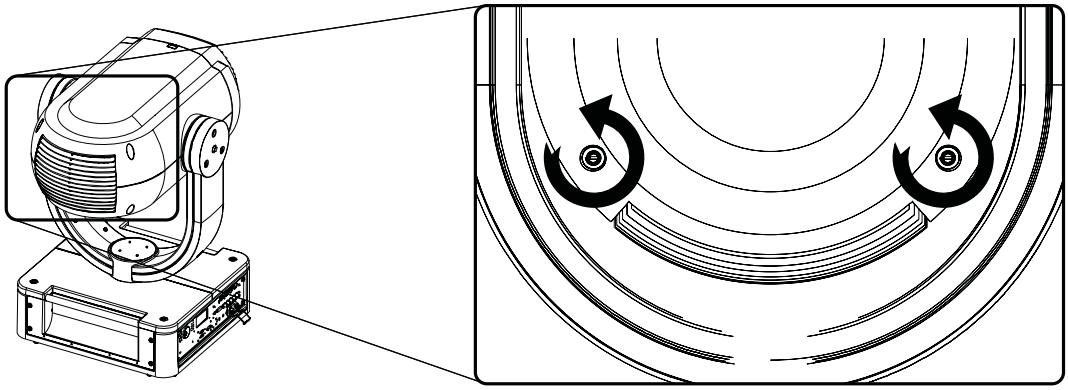


Image 14-25
Captive screws top cover

4. Gently lift up the top cover and press on the indicated part until the arm of the cover is fixed.

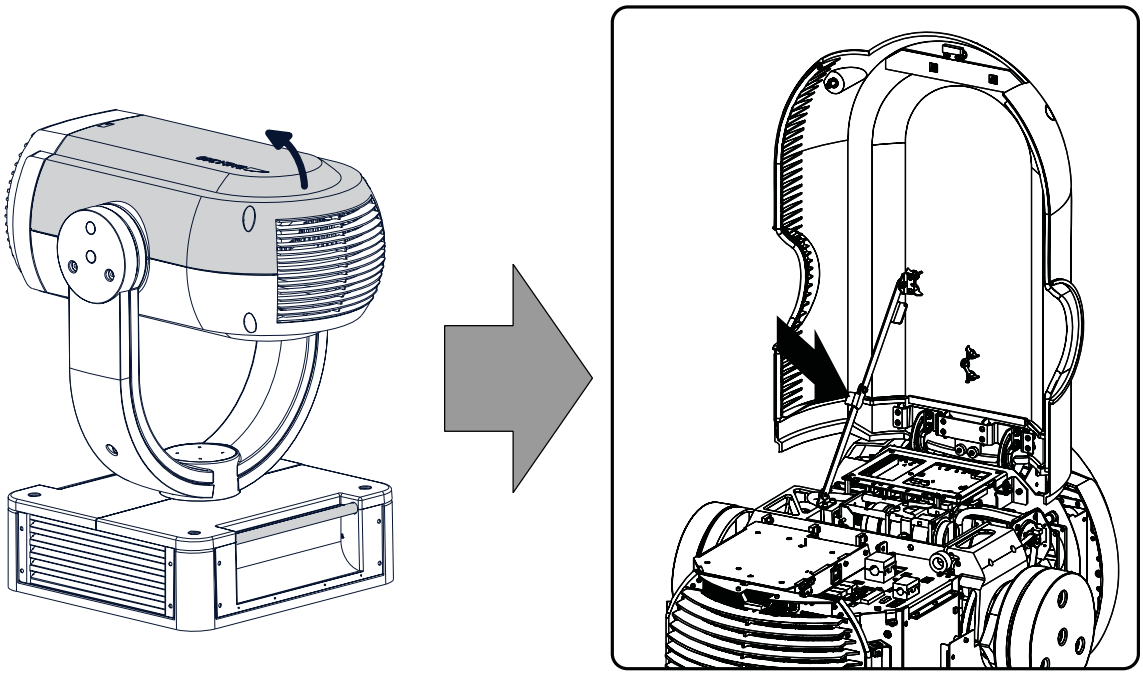


Image 14-26

The software of the projector blocks any movement.

Top-up procedure

1. Remove both reservoir holder screws and take off the reservoir holder.

Image 14-27
Reservoir holder

2. Turn the bolt to release the pressure (1) . Turn until the white indication line is in the *Open* area (membrane is at the bottom of the reservoir) or until you feel to much resistance.

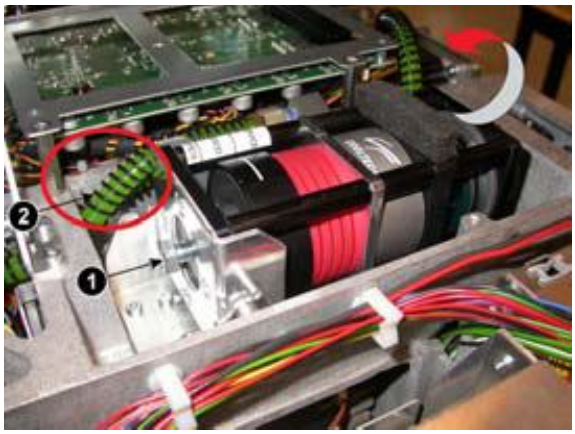


Image 14-28
Release pressure

3. If you feel to much resistance, rotate the reservoir until it is in a vertical position.

Image 14-29
Reservoir up

Note: *Be careful not to kink the tubing. If necessary, remove the cable tie around the tubing and pull on the tubes while rotating the reservoir (2 on image 14-28).*

4. Turn off the main lid on top of the reservoir (A).

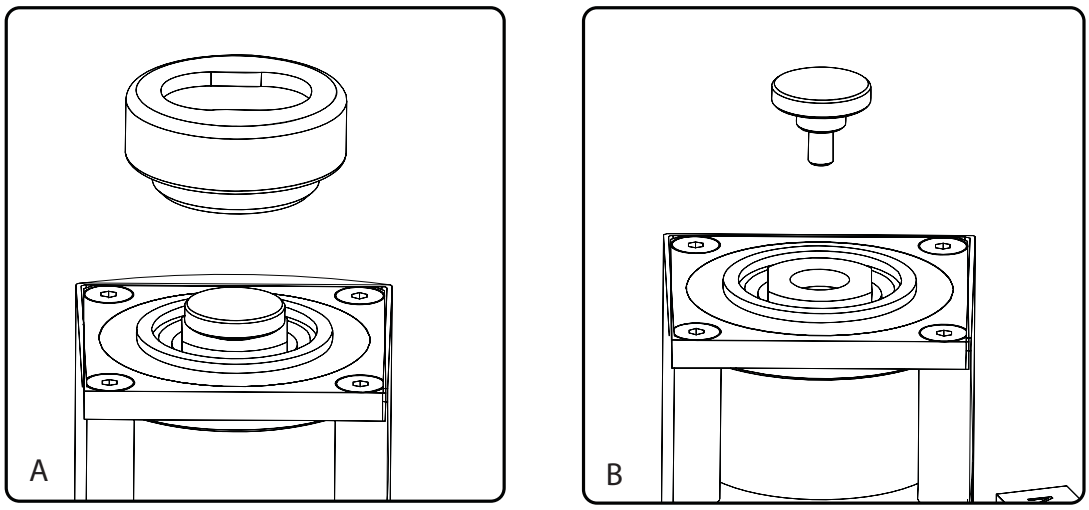


Image 14-30
Open reservoir

5. Loosen the bleed lid a little so that air can enter and close the bleed lid again. Turn the reservoir again in its horizontal position.
6. Turn on the bolt so that the white indication line is in the *Open* area (membrane is at the bottom of the reservoir).
7. Rotate the reservoir until it is in a vertical position.
   Note: *Be careful not to kink the tubing. If necessary, remove the cable tie around the tubing and pull on the tubes while rotating the reservoir.*
8. Turn the bleed lid a little and take it out (B)
9. Turn out the third lid using the back of the main lid.

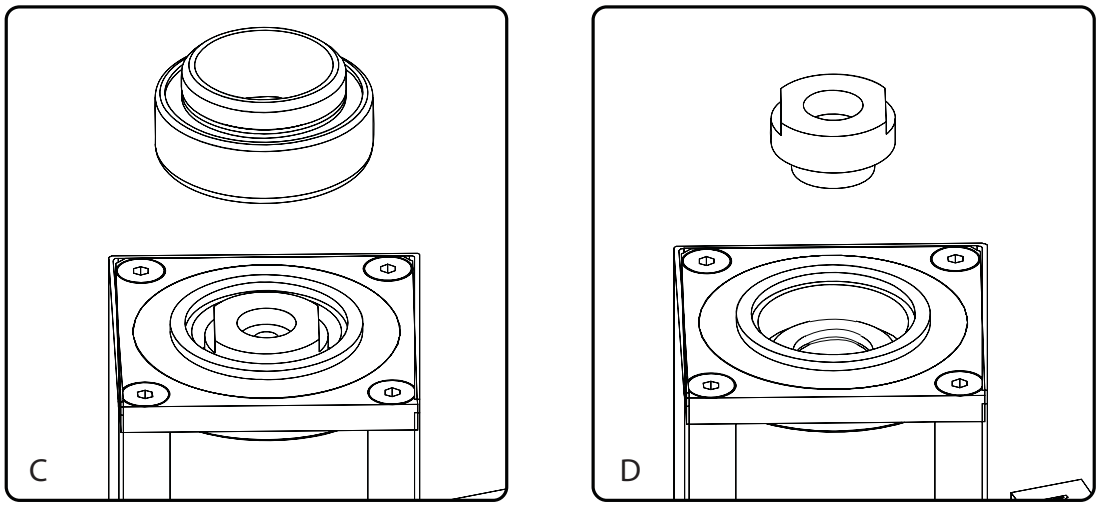


Image 14-31
Remove third lid

10. Top-up the reservoir with cooling liquid until the level is somewhat higher than the hole in the reservoir.

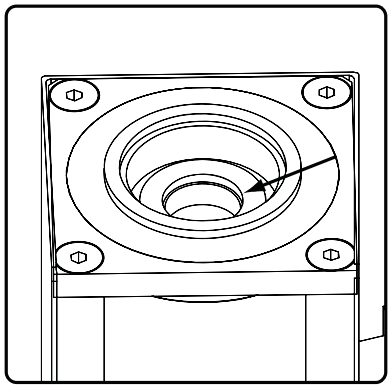


Image 14-32
Top-up reservoir

11. Close the third lid again using the back of the main lid. Use a cloth to dab the residue of cooling liquid.
    Note: *Make sure that no cooling liquid is spilled in the projector.*
12. Turn in the bleed lid.
13. Close the main lid.
14. Rotate the reservoir back on its horizontal position.
15. Pressurize the circuit by turning the bolt to the left until there is 2 cm free threat between the bolt and the bottom of the reservoir (the white indication line should be in the good area).
16. Mount the reservoir holder and turn in both screws.
17. Close the projector cover.

A. DMX CHART

A.1 DMX chart, Digital moving luminiere

Overview

Channel	Function	Type[3]	Value	Default	Action
1	Pan coarse	x	0 - 255	128	Left → right movement (rotation of yoke)
2	Pan fine	x	0 - 255	0	
3	Tilt coarse	x	0 - 255	128	Forward movement (rotation of head)
4	Tilt fine	x	0 - 255	0	
5	Intensity	x	0 - 255	0	Adjust the light output between 0 and 100%
6	Optical zoom	x	0 - 255	128	From wide to narrow beam
7	Optical focus	x	0 - 255	128	Adjust focus from near to far
8	Shutter / strobe		0 - 15		Closed
			16 - 31	16	Open
			32 - 47		Strobe, from slow to fast
			48 - 239		For future expansions
			240 - 255		Open
9	Cyan	x	0 - 255	0	Open → full cyan
10	Magenta	x	0 - 255	0	Open → full magenta
11	Yellow	x	0 - 255	0	Open → full yellow
12	CTO	x	0 - 255	0	Open → full CTO
13	Mode select		0 - 31	0	Light mode
			32 - 63		Video mode circular
			64 - 95		Video mode
			96 - 255		For future expansion
14	Iris		0 - 200		Open → close (1 cm remains open)
			201 - 255		Not used
15	Control channel		0 - 31	0	Disarmed
			32 - 47		Reset (start homing sequence)
			48 - 63		Homing without pan and tilt
			64 - 79		Homing, pan and tilt only
			80 - 95		Homing CMY only
			96 - 127		Lamp on
			128 - 159		Lamp off
			160 - 191		For future expansion
			192 - 223		EMP on/off
			224 - 255		For future expansion

3. x indicates XFade

A.2 DMX chart, Image

Overview

Channel	Function	Type[3]	Value	Default	Action
16	Source select		0 - 31	0	No source selected
			32 - 63		RGBHV selected
			64 - 95		HD-SDI/SDI selected
			96 - 127		DVI selected
			128 - 159		Media player selected
			160 - 191		No source selected / for future expansion
			192 - 223		No source selected / for future expansion
			224 - 255		No source selected / for future expansion
17	Brightness		0 - 255	128	Adjust the brightness between 0 and 100 %
18	Contrast		0 - 255	128	Adjust the contrast between 0 and 100 %
19	Saturation		0 - 255	128	Adjust the saturation between 0 and 100 %
20	Orientation		0 - 31	0	Normal
			32 - 63		Mirror
			64 - 95		Flip
			96 -127		Flip + Mirror
			128 - 255		For future expansion
21	Blanking left Coarse	x	0 - 255	0	Adjust the left blanking
22	Blanking left Fine	x	0 - 255	0	
23	Blanking right Coarse	x	0 - 255	0	Adjust the right blanking
24	Blanking right Fine	x	0 - 255	0	
25	Blanking top Coarse	x	0 - 255	0	Adjust the top blanking
26	Blanking top Fine	x	0 - 255	0	
27	Blanking bottom Coarse	x	0 - 255	0	Adjust the bottom blanking
28	Blanking bottom Fine	x	0 - 255	0	
29	Soft edge left	x	0 - 255	0	Adjust the soft edge left side
30	Soft edge right	x	0 - 255	0	Adjust the soft edge right side
31	Soft edge top	x	0 - 255	0	Adjust the soft edge top side
32	Soft edge bottom	x	0 - 255	0	Adjust the soft edge bottom side
33	Video function select		0 - 7	0	Disabled
			8 - 255		For future expansion
34	Video parameter Coarse		0 - 255	128	For future expansion
35	Video parameter Fine		0 - 255	128	

Channel	Function	Type[3]	Value	Default	Action
36	Warping function select		0 - 7	0	Warp disabled
			8 - 15		Load warp file 1
			16 - 23		Load warp file 2
			24 - 31		Load warp file 3
			32 - 39		Load warp file 4
			40 - 47		Load warp file 5
			48 - 55		Load warp file 6
			56 - 63		Load warp file 7
			64 - 71		Load warp file 8
			72 - 79		Load warp file 9
			80 - 87		Load warp file 10
			88 - 95		Load warp file 11
			96 - 103		Load warp file 12
			104 - 111		Load warp file 13
			112 - 119		Load warp file 14
			120 - 127		Load warp file 15
			128 - 135		Load warp parameters
			136 - 247		For future expansion
			248 - 255		Warp enabled
37	Warping parameter Coarse		0 - 255	128	For future expansion
38	Warping parameter Fine		0 - 255	128	
39	For future expansion				
40	For future expansion				
41	For future expansion				
42	For future expansion				
43	For future expansion				
44	For future expansion				
45	For future expansion				
46	For future expansion				
47	For future expansion				
48	For future expansion				
49	For future expansion				
50	For future expansion				
51	For future expansion				

A.3 DMX chart, EMP

Common layer

Chan-nel	Function	Type[3]	Value	Default	Action			
52	Matte layer FX							
		Num-ber	**Value**	**FX Listing**		**Par1 (ch53)**	**Par2 (ch54)**	**Par3 (ch55)**
		1	0 - 1	Color (RGB)		Red	Green	Blue
		2	2 - 5	Rings		X = squeeze in X direction	Y = squeeze in Y direction	Z = roll out
		3	6 - 9	Chess		X = number of vertical bars	Y = number of horizontal bars	Edge X = amplitude in X direction
		4	10 - 13	Interference (C+C)		Speed	Size	Color
		5	14 - 17	Interfer-ence, Retro (C+C)		Speed	Red 1	Green 1
		6	18 - 21	Interference (R+C)		Speed	Size	Color
		7	22 - 25	Interfer-ence, Retro (R+C)		Speed	Size	Color
		8	26 - 29	Interfer-ence, Retro2 (R+C)		Speed	Size	Color
		9	30 - 33	Interference (R+R)		Speed	Size	Color
		10	34 - 37	Interfer-ence, Retro (R+R)		Speed	Size	Color
		11	38 - 41	Clouds		Speed	Softness	Scale
		12	42 - 45	Flowers		Rotspeed	Zoom	Color
		13	46 - 49	Fog		Lightness	Speed	Brightness
		14	50 - 53	Rain		Density	Angle	Speed
		15	54 - 57	Starfield		Speed	Brightness	
		16	58 - 61	Gradient		Hue1	Hue2	Speed
			62 - 255	Future expansion				
53	Matte layer P1							
54	Matte layer P2							
55	Matte layer P3							
56	Warp selection		0 - 1		Warp 0			
			2 - 5		Warp 1			
			6 - 9		Warp 2			
			10 - 13		Warp 3			
			...		Warp x			
57	Warp transition							

Channel	Function	Type[3]	Value	Default	Action
58	Mask		0 - 3		Open (no masking)
			4 - 7		Circular
			8 - 11		16-sided
			12 - 15		12-sided
			16 - 19		8-sided
			20 - 23		6-sided
			24 - 27		4-sided
			28 - 31		3-sided
			32 - 35		3-sided, inverted
			36 - 39		4-sided, inverted
			40 - 43		6-sided, inverted
			44 - 47		8-sided, inverted
			48 - 51		12-sided, inverted
			52 - 55		16-sided, inverted
			56 - 59		Circular, inverted
			60 - 251		For future expansion
			252 - 255		Polygon shutter
59	Mask size	x	0 - 255	128	Small → Large
60	Mask indexed position	x	0 - 255	128	Plus / minus 90°
61	Mask aspect ratio	x	0 - 255	128	128 = 1:1 0 = horizontal stretch 300%, vertical size 100% 255 = vertical stretch 300%, horizontal size 100%
62	Mask blur	x	0 - 255		
63	Master FX select		0 - 255	0	Selects one of n FX / FX combinations

Number	Value	FX Listing		Par1 (ch64)	Par2 (ch65)	Par3 (ch66)
1	0 - 1	No effect				
2	2 - 5	Radial Blur		Level	Amount	Whirl
3	6 - 9	Motion Blur		Blur amount		
4	10 - 13	Color trafo		Level	Saturation	Hue
5	14 - 17	Multlimage		Level	Size	Aspect ratio
6	18 - 21	Inv Lumakey		Level	Threshold	Softness
7	22 - 25	Shifter		Level	Speed X	Speed Z
8	26 - 29	ChromaKey		Level	Hue	Tolerance
9	30 - 33	Scroller		Level	Speed X	Speed Y
10	34 - 37	Color Studio		Level	Color shift A	Color shift B
11	38 - 41	Neon		Level	Width	
12	42 - 45	CTBO		Level	Filter	Brightness
13	46 - 49	DuoTone		Level	Col1	Col2
14	50 - 53	Palette		Level	Red	Green
15	54 - 57	Bloom		Level	Bloom	
16	58 - 61	Interlace		Level	Stripes	Saturation
17	62 - 65	Noise		Level	Frequency	Grain
18	66 - 69	Rings		Level	Rings	
19	70 - 73	CubeStyle		Level	Size	SpeedB

Channel	Function	Type[3]	Value	Default	Action			
		20	74 - 77	LED		Level	Density	Softness
		21	78 - 81	Pixalate		Level	Pixels	
		22	82 - 85	Halftone		Level	Size	Angle
		23	86 - 89	Plasma		Level	Random distortion	Animation speed
		24	90 - 93	Flower		Level	Flora	
		25	94 - 97	Flip		Level	Flip X	Flip Y
		26	98 - 101	Rotozoom		Level	Rotation	Zoom out
		27	102 - 105	Glass		Level	Glass	
		28	106 - 109	Aqua		Level	Wave	Speed
		29	110 - 113	Tunnel		Level	Zoom	Speed camera
		30	114 - 117	Planes		Level	Wip	Distplanes
		31	118 - 121	Fluid Distortion		Level	Speed A	Speed B
		32	122 - 125	Alphabet		Level	Zoom	Digits
		33	126 - 129	Rimple		Level	Numwaves	Speed
		34	130 - 133	Wave		Level	Wave	
		35	134 - 137	Jitter		Level	Speed	Zoom
		36	138 - 141	Stripes		Level	Frequency	Scale
		37	142 - 145	Infinite Zoom		Level	Zoom speed & direction	
		38	146 - 149	Infinity		Level	Speed	
		39	150 - 153	Blinder		Level		
		40	154 - 255	Future expansion				
64	Master FX parameter 1	x	0 - 255	0	Varies w. selected FX but nom. intensity			
65	Master FX parameter 2	x	0 - 255	0	Varies w. selected FX			
66	Master FX parameter 3	x	0 - 255	0	Varies w. selected FX			
67	Keystone/Polygon A1	x	0 - 255	0				
68	Keystone/Polygon A2	x	0 - 255	0				
69	Keystone/Polygon B1	x	0 - 255	0				
70	Keystone/Polygon B2	x	0 - 255	0				
71	Keystone/Polygon C1	x	0 - 255	0				
72	Keystone/Polygon C2	x	0 - 255	0				
73	Keystone/Polygon D1	x	0 - 255	0				
74	Keystone/Polygon D2	x	0 - 255	0				

Layer 1 + Layer 2

Channel		Function	Type	Value	Default	Action			
#1	#2								
75	102	Bank select		0 - 255	0	Bank selection			
76	103	Clip select		0 - 255		Clip selection within a bank			
77	104	IN Frame Coarse		0 - 255	0	Counting from beginning of clip			
78	105	IN Frame Fine		0 - 255	0	Counting from selected coarse point			

Chan-nel		Function	Type	Value	Default	Action
#1	#2					
79	106	OUT Frame Coarse		0 - 255	0	Counting down from 00:43:41.439
80	107	OUT Frame Fine		0 - 255	0	Counting down from selected coarse point
81	108	Image transition		0 - 1	0	Bottom to top
				2 - 5		Bounce
				6 - 9		Corner zoom
				10 - 13		Fade
				14 - 17		Iris
				18 - 21		Left to right
				22 -25		Multiple iris
				26 - 29		Right to left
				30 - 33		Rotate and zoom
				34 - 37		Shear flip
				38 - 41		Shutter
				42 - 45		Spherical Zoom
				46 - 49		Top to bottom
				50 - 53		Zoom
				54 - 57		SuperBall 1
				58 - 61		SuperBall 2
				62 - 255		For future expansion
82	109	Transition timing		0 - 255		Sets time for transition
83	110	Playback mode		0 - 3	0	Forward once
				4 - 7		Forward loop
				8 - 11		Backward once
				12 - 15		Backward loop
				16 - 19		Ping Pong
				20 - 23		Random
				24 - 27		Single frame selected by IN Frame value
				28 - 31		Single frame selected by OUT Frame value
				32 - 35		Paused
				36 - 255		For future expansion
84	111	Playback speed	x	0 - 255	128	128 = normal playback speed
85	112	Opacity	x	0 - 255	0	From clear to fully opaque
86	113	Contrast	x	0 - 255	128	128 = normal contrast level
87	114	R	x	0 - 255	128	128 = normal Red level
88	115	G	x	0 - 255	128	128 = normal Green level
89	116	B	x	0 - 255	128	128 = normal Blue level
90	117	Scale (digital zoom)	x	0 - 255	128	128 = image fills 100%
91	118	Image X position	x	0 - 255	128	128 = centered
92	119	Image Y position	x	0 - 255	128	128 = centered
93	120	Aspect Ratio	x	0 - 255	128	128 = 1:1

Chan-nel		Function	Type	Value	Default	Action			
#1	#2								
94	121	Image rotation speed / position Coarse	x	0- 127	0	rotated image between -180° and 180° (indexed position)			
				127 - 192		continuous rotation from fast to slow in counter clock wise direction			
				192		still image			
				192 - 255		continuous rotation from slow to fast in clock wise direction			
95	122	Image rotation speed / position Fine	x	0 - 255		fine adjustment for the selected coarse value			
96	123	Image Blur	x	0 - 255	0	From sharp to fully blurred			
97	124	FX select		0 - 255	0	Selects one of n FX / FX combinations			
				Num-ber	**Value**	**FX Listing**		**Par1 (ch98 & 125)**	**Par2 (ch99 & 126)**	**Par3 (ch100 & 127)**
				1	0 - 1	No effect				
				2	2 - 5	Radial Blur		Level	Amount	Whirl
				3	6 - 9	Motion Blur		Blur amount		
				4	10 - 13	Color trafo		Level	Saturation	Hue
				5	14 - 17	Multlimage		Level	Size	Aspect ratio
				6	18 - 21	Inv Lumakey		Level	Threshold	Softness
				7	22 - 25	Shifter		Level	Speed X	Speed Z
				8	26 - 29	ChromaKey		Level	Hue	Tolerance
				9	30 - 33	Scroller		Level	Speed X	Speed Y
				10	34 - 37	Color Studio		Level	Color shift A	Color shift B
				11	38 - 41	Neon		Level	Width	
				12	42 - 45	CTBO		Level	Filter	Brightness
				13	46 - 49	DuoTone		Level	Col1	Col2
				14	50 - 53	Palette		Level	Red	Green
				15	54 - 57	Bloom		Level	Bloom	
				16	58 - 61	Interlace		Level	Stripes	Saturation
				17	62 - 65	Noise		Level	Frequency	Grain
				18	66 - 69	Rings		Level	Rings	
				19	70 - 73	CubeStyle		Level	Size	SpeedB
				20	74 - 77	LED		Level	Density	Softness
				21	78 - 81	Pixalate		Level	Pixels	
				22	82 - 85	Halftone		Level	Size	Angle
				23	86 - 89	Plasma		Level	Random distortion	Animation speed
				24	90 - 93	Flower		Level	Flora	
				25	94 - 97	Flip		Level	Flip X	Flip Y
				26	98 - 101	Rotozoom		Level	Rotation	Zoom out
				27	102 - 105	Glass		Level	Glass	
				28	106 - 109	Aqua		Level	Wave	Speed
				29	110 - 113	Tunnel		Level	Zoom	Speed camera
				30	114 - 117	Planes		Level	Wip	Distplanes
				31	118 - 121	Fluid Distortion		Level	Speed A	Speed B
				32	122 - 125	Alphabet		Level	Zoom	Digits
				33	126 - 129	Rimple		Level	Numwaves	Speed
				34	130 - 133	Wave		Level	Wave	

Chan-nel		Function	Type	Value	Default	Action			
#1	#2								
			35	134 - 137	Jitter		Level	Speed	Zoom
			36	138 - 141	Stripes		Level	Frequency	Scale
			37	142 - 145	Infinite Zoom		Level	Zoom speed & direction	
			38	146 - 149	Infinity		Level	Speed	
			39	150 - 153	Blinder		Level		
			40	154 - 255	Future expansion				
98	125	FX parameter 1	x	0 - 255	0	Varies w. selected FX but nom. intensity			
99	126	FX parameter 2	x	0 - 255	0	Varies w. selected FX			
100	127	FX parameter 3	x	0 - 255	0	Varies w. selected FX			
101	128	Layer 1 (2) combination mode		0 - 7	0	Additive Dissolve			
				7 - 23		Subtractive Dissolve			
				24 - 39		Darken			
				40 - 55		Lighten			
				56 - 71		Softlight			
				72 - 87		Softlight inverse			
				88 - 103		Hardlight			
				104 - 119		Overlay			
				120 - 135		Difference			
				136 - 151		Multiply			
				152 - 167		Screen			
				168 - 183		Opaque			
				184 - 199		Sprite			
				208 - 215		Luminance key			
				216 - 231		Matte			
				232 - 255		For future expansion			

B. DIMENSIONS

Overview

- Dimensions of the DML-1200
- Dimensions flight case

B.1 Dimensions of the DML-1200

Dimensions

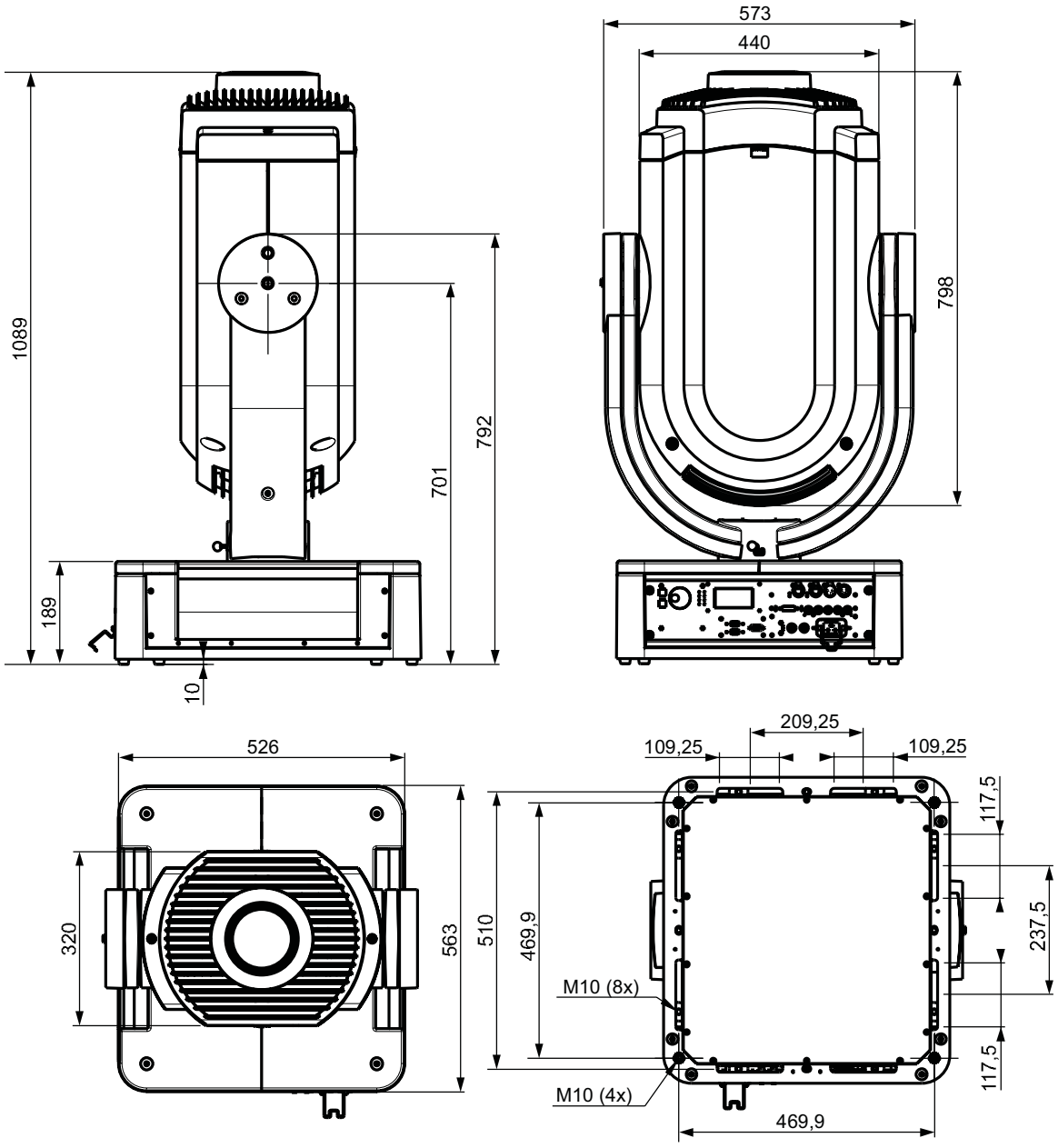


Image B-1
Dimensions given in millimeters

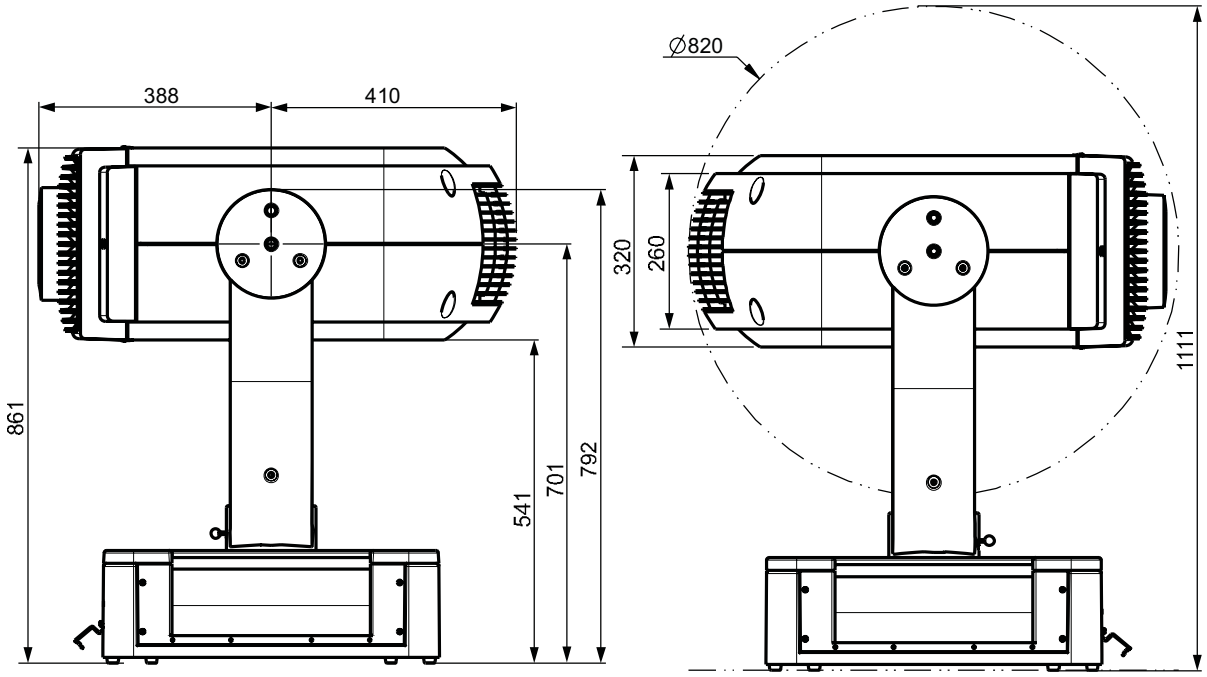


Image B-2
Dimensions, rotation

B.2 Dimensions flight case

Dimensions

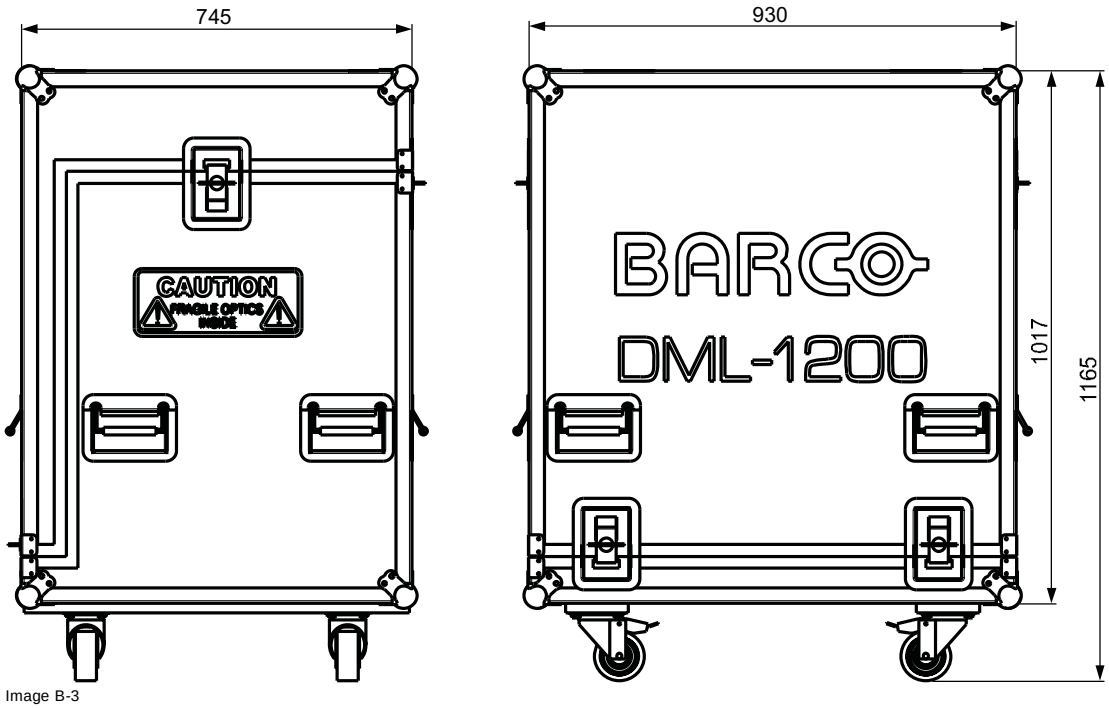


Image B-3
Dimensions in millimeters

C. TROUBLESHOOTING

C.1 Error list

Overview

Description	Type	Action
Fpga status not ok	Warning	Call qualified service technician
Fpga version not ok	Warning	Call qualified service technician
Warp status not ok	Warning	Call qualified service technician
Video fpga status not ok	Warning	Call qualified service technician
Video fpga version not ok	Warning	Call qualified service technician
Init ready	Info	No action
Lamp info status error	Warning	Call qualified service technician
Lamp x run time 2000 h	Error	Replace lamp with new one
Lamp x run time 1500 h	Warning	Indicated lamp reaches 1500 h or more, think about replacing the lamp before the projector cannot start up anymore.
Image load mode locked	Info	No action
Image load mode auto	Info	No action
Auto shutdown enabled	Info	No action
DMX media player on/off	Info	No action
Smps status error	Warning	Call qualified service technician
Fcb sets mode aftercool	Info	No action
Video fpga program OK	Info	No action
Video fpga program failed	Warning	Call qualified service technician
Ctrl fpga program OK	Info	No action
Ctrl fpga program failed	Warning	Call qualified service technician
Request mode normal	Info	No action
Request mode aftercool	Info	No action
Request mode standby	Info	No action
Fcb rs sets mode aftercool	Info	No action
Fcb rs disables formatter	Info	No action
Fcb undefined analog error	Warning	Call qualified service technician
Fcb undef. analog warning	Warning	Call qualified service technician
Fcb undef. digital error	Warning	Call qualified service technician
Fcb undef. digital warning	Warning	Call qualified service technician
Fcb undef. fan speed error	Warning	Call qualified service technician
Fcb undef. fan speed warning	Warning	Call qualified service technician
Frmt start failed	Warning	Call qualified service technician
Frmt start init failed	Warning	Software init error. Remove and apply power, retry to start. If problem persists, call a qualified service technician
Frmt power good failed	Warning	Remove and apply power, retry to start. If problem persists, call a qualified service technician
Frmt read data failed	Warning	No communication to the formatter. Call qualified service technician
Frmt color wheel failed	Warning	Color wheel does not spin or color wheel not phase locked. Retry to start. If problem persists, call a qualified service technician

Description	Type	Action
Frmt index delay failed	Warning	Retry to start If problem persists, call a qualified service technician
Frmt sequence failed	Warning	Retry to start If problem persists, call a qualified service technician
Frmt orientation failed	Warning	Retry to start If problem persists, call a qualified service technician
Frmt white peaking failed	Warning	Retry to start If problem persists, call a qualified service technician
DMD temp low (<10°C)	Warning	Turning on the lamp(s) will heat up the DMD
DMD temp low (≤10°C)	Error	Take measurements to increase the ambient temperature
DMD temp high	Warning/Error	Check if air slots are free Clean air filters Retry to start
Ambient temp high	Warning/Error	Take measurements to decrease the temperature
Cooling liquid temp high	Warning/Error	If problem persists, call a qualified service technician
Fan radiator A low	Warning/Error	If problem persists, call a qualified service technician
Fan radiator A high	Warning/Error	If problem persists, call a qualified service technician
Fan radiator B low	Warning/Error	If problem persists, call a qualified service technician
Fan radiator B high	Warning/Error	If problem persists, call a qualified service technician
Fan outlet A low	Warning/Error	If problem persists, call a qualified service technician
Fan outlet A high	Warning/Error	If problem persists, call a qualified service technician
Fan outlet B low	Warning/Error	If problem persists, call a qualified service technician
Fan outlet B high	Warning/Error	If problem persists, call a qualified service technician
Fan power supp A low	Warning/Error	If problem persists, call a qualified service technician
Fan power supp A high	Warning/Error	If problem persists, call a qualified service technician
Fan power supp A low	Warning/Error	If problem persists, call a qualified service technician
Fan power supp B high	Warning/Error	If problem persists, call a qualified service technician
Fan lps A low	Warning/Error	If problem persists, call a qualified service technician
Fan lps A high	Warning/Error	If problem persists, call a qualified service technician
Fan lps B low	Warning/Error	If problem persists, call a qualified service technician
Fan lps B high	Warning/Error	If problem persists, call a qualified service technician
Fan inlet A low	Warning/Error	If problem persists, call a qualified service technician
Fan inlet A high	Warning/Error	If problem persists, call a qualified service technician
Fan inlet B low	Warning/Error	If problem persists, call a qualified service technician
Fan inlet B high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp1 back low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp1 back high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp2 back low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp2 back high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp3 back low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp3 back high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp4 back low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp4 back high	Warning/Error	If problem persists, call a qualified service technician
Fan base speed low	Warning/Error	If problem persists, call a qualified service technician
Fan prism low	Warning/Error	If problem persists, call a qualified service technician
Fan prism high	Warning/Error	If problem persists, call a qualified service technician
Fan optics low	Warning/Error	If problem persists, call a qualified service technician

Description	Type	Action
Fan optics high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp1 front low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp1 front high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp2 front low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp2 front high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp3 front low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp3 front high	Warning/Error	If problem persists, call a qualified service technician
Fan lamp4 front low	Warning/Error	If problem persists, call a qualified service technician
Fan lamp4 front high	Warning/Error	If problem persists, call a qualified service technician
Pump speed low	Warning/Error	If problem persists, call a qualified service technician
Pump speed high	Warning/Error	If problem persists, call a qualified service technician
Smps input range	Warning/Error	Check if the mains input voltage is within the specified range.
DMD temp open	Error	Call a qualified service technician
DMD temp short	Error	Call a qualified service technician
Ambient temp open	Error	Call a qualified service technician
Ambient temp short	Error	Call a qualified service technician
Tec temp open	Error	Call a qualified service technician
Tec temp short	Error	Call a qualified service technician
FCB I2C	Warning	If problem persists, call a qualified service technician
FCB parameters	Warning	If problem persists, call a qualified service technician
FCB monitoring	Warning	If problem persists, call a qualified service technician
Housing switch open	Warning/Error	Close housing completely. If problem persists, call a qualified service technician
Undefined	Warning/Error	If problem persists, call a qualified service technician
Restore factory defaults	Info	No action
Restart artnet failed	Error	Disconnect power and reconnect power again. Restart. If problem persists, call a qualified service technician

D. SPECIFICATIONS

D.1 Specifications of the DML-1200

Overview

AC power	200 - 240 V, 10 A, 50-60 Hz, input via 2m cable without connector
Blanking	horizontal & vertical, controlled over DMX
Color change time	0.3 second, or as timed by control console
Color Reproduction System	substractive color mix (cyan, magenta, yellow) with dichroic filters
Color Temperature	native 6200°K - 3000°K with dichroic filters
Connections	5-pin XLR (in, through), 2x RJ-45 (1GB in, through), 2x USB and VGA out for media player control
Contrast ratio	min. 1,200:1 - average 1,400:1
Image generation	Single-chip DLP with 3x speed RGBW color wheel
Inputs	RGBHV - Component - HDSDI/SDI - DVI
Intensity control	Visually linear and full field operation (0-100%) combined digital mechanical
Lamp	4 x 300 W (High Pressure Mercury Lamps)
Lamp lifetime (typical)	1,500 hours
Lamp replacement	Click-in, no alignment needed
Lamp warranty	750 actual running hours (proportional refund)
Light Output	Video mode: 10,000 ANSI lumens Light mode: 12,000 field lumens
Media type	Any media type that is supported by the Hippotizer (media is converted to MPEG-2, I-frame only)
Motion range	Pan: 540° - Tilt: 270°
Motion speed	68° per second
Native image resolution	SXGA+ (1,400 x 1,050 pixels)
Noise Level	49 dB(A) (at +25°)
Number of image layers	Matte layer, layer1, layer2 (both A+B mixing), mask layer, master layer
Operating temperature	max. 40°
Operation mode selection	Video mode: Native (rectangular) or circular Light mode: Circular
Optical effects	Effects per media layer, effects on the master layer
Output image manipulation	H & V keystone, rotation (+15%), pincushion/barrel distortion, extensive freeform warping (max. 825 points)
Playback Device	Based on Hippotizer V3 technology - Developed by Green Hippo Ltd.
Position accuracy and repeatability	0.375° on encoders (error correction); <0.1° in normal movement
Power consumption	max. 1832 W
Protocol	DMX512 / Artnet
Scenergics	horizontal & vertical edge blending, controlled over DMX
Video input synchronisation	genlock through additional BNC connector
Weight	75 kg (fixture only)
Zoom range	defocused: 11°-40° - focused: 12°-38°

E. ORDER INFO

E.1 Spare part order info

Order info

This list contains only customer serviceable spare parts.

Order info	Description
R98610206	Dust filter kit, 6 pack
R986102012	Dust filter kit, 12 pack
R9861030	Lamp kit, single lamp
R9861040	Lamp kit, two lamps
R9861050	Lamp kit, four lamps

Revision Sheet

To:

Barco nv Media & Entertainment Division/Documentation
Noordlaan 5, B-8520 Kuurne
Phone: +32 56.36.89.70, Fax: +32 56.36.88.24
E-mail: service.mne@barco.com, Web: www.barco.com

From: _____

Date: _____

Please correct the following points in this documentation (**R59770209/04**):

page	wrong	correct