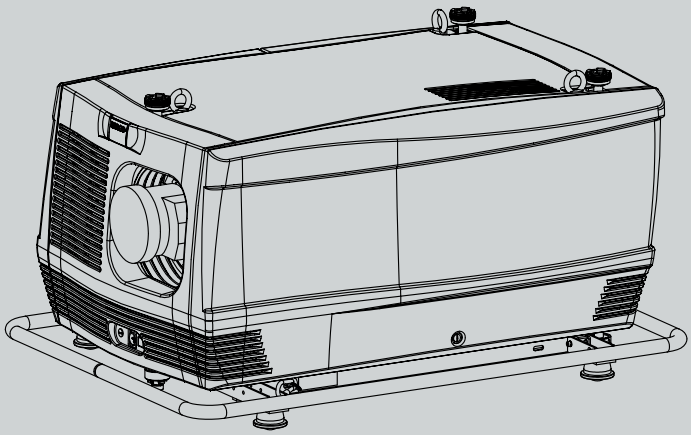
# FLM R20+ Performer



## Users manual

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BARCO

Visibly yours

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# 1. SAFETY

### About this chapter

Read this chapter attentively. It contains important information to prevent personal injury while installing and using an FLM R20+ Performer projector. Furthermore, it includes several cautions to prevent damage to the FLM R20+ Performer. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before installing your FLM projector. After this chapter, additional “warnings” and “cautions” are given depending on the installation procedure. Read and follow these “warnings” and “cautions” as well.

### Overview

- General
- Important safety instructions
- Important warnings concerning FLM flight cases

## 1.1 General

### Notice on safety

This equipment is built in accordance with the requirements of the international safety standards IEC60950-1, EN60950-1, UL60950-1 and CAN/CSA C22.2 No.60950-1, which are the safety standards of information technology equipment including electrical business equipment. These safety standards impose important requirements on the use of safety critical components, materials and insulation, in order to protect the user or operator against risk of electric shock and energy hazard, and having access to live parts. Safety standards also impose limits to the internal and external temperature rises, radiation levels, mechanical stability and strength, enclosure construction and protection against the risk of fire. Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment’s normal operation fails.

### Restricted access location

The FLM R20+ Performer may only be installed in a restricted access location, due to the temperature rise of parts of the equipment (air outlet).

**Restricted access location**

A location for equipment where both of the following paragraphs apply:

**1)** Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restriction applied to the location and about the precautions that shall be taken.

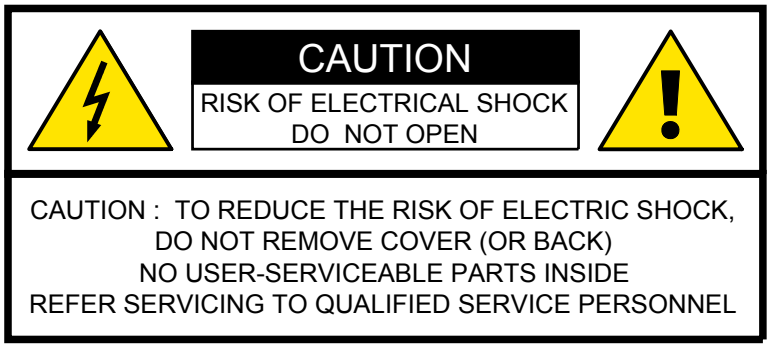
**2)** Access is through the use of the tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

### Installation instructions

- Before operating this equipment please read this manual thoroughly, and retain it for future reference.
- Installation and preliminary adjustments should be performed by qualified Barco personnel or by authorized Barco service dealers.
- All warnings on the projector and in the documentation manuals should be adhered to.
- All instructions for operating and use of this equipment must be followed precisely.

### Safety indication on the product

Risk of electrical shock. Do not open. To reduce the risk of electrical shock, do not remove the projector’s covers. No user-serviceable parts inside. Refer servicing to qualified service personnel.



- The lightning flash with an arrowhead within a triangle is intended to tell the user that parts inside this product may cause a risk of electrical shock to persons.
- The exclamation point within a triangle is intended to tell the user that important operating and/or servicing instructions are included in the technical documentation for this equipment.

**Definition of “qualified service technicians” or ”qualified technicians”: Persons having appropriate technical training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures to minimize the danger to themselves or other persons.**

### Owners record

The part number and serial number are located at the right side of the projector. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Barco dealer regarding this product.

| | |
|---|---|
| Product article number | |
| Product serial number | |
| Dealer | |

## 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 VAC, 50–60 Hz, 16 amps at 230 VAC
- The power cord of the FLM R20+ Performer is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type EN60-309 power outlet. This is a safety feature. Mains power cord with EN60-309 plug:

EN60-309

**Warning:** This apparatus must be grounded (earthed) via the supplied 3 conductor AC power cable. If the supplied power cable is not the correct one, consult your dealer.
If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
The wires of the power cord are colored in accordance with the following code:

| **International plug 32 ampere:** | **North American plug 30 ampere:** |
|---|---|
| Green/Yellow: ground. | Green/Yellow or Green: ground. |
| Blue: neutral. | Blue or White: neutral. |
| Brown: line (live) | Brown or Black: line (live) |

- 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 projector. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the projector. 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 projector due to lightning and AC power-line surges.

## To prevent personal injury

- Caution: High pressure lamp may explode if improperly handled. Refer servicing to qualified service personnel. The customer should never attempt to disassemble the lamp casing or to dispose of the lamp casing other than by returning it to Barco.
- 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 4 persons are needed to carry the projector.
- 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 damage to the eye.
- Before attempting to remove any of the projector's covers, you must turn off the projector and disconnect from the wall outlet.
- When performing setup work to a ceiling mounted projector, 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 projector from a structure not intended for that use. Always ensure that the working load limit of the structure can handle the load of the projector.
- Never stack more than two (2) FLM projectors in a hanging configuration (truss) and never stack more than three (3) FLM projectors in a base stand configuration (table mount).
- The power input at the projector side is considered as the disconnect device. When required to switch off the projector, to access parts inside, always disconnect the power cord at the projector side. In case the power input at the projector side is not accessible (e.g. ceiling mount), the socket outlet supplying the projector shall be installed nearby the projector 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 projector to the ceiling or to a rigging system, always mount security chains.
- **Warning: Protection from ultraviolet radiation**: Do not look directly in the light beam. The lamp contained in this product is an intense source of light and heat. One component of the light emitted from this lamp is ultraviolet light. Potential eye and skin hazards are present when the lamp is energized due to ultraviolet radiation. Avoid unnecessary exposure. Protect yourself and your employees by making them aware of the hazards and how to protect themselves. Protecting the skin can be accomplished by wearing tightly woven garments and gloves. Protecting the eyes from UV can be accomplished by wearing safety glasses that are designed to provide UV protection. In addition to the UV, the visible light from the lamp is intense and should also be considered when choosing protective eye wear.
- **Exposure to UV radiation**: Some medications are known to make individuals extra sensitive to UV radiation. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends occupational UV exposure for an-8hour day to be less than 0.1 microwatts per square centimeters of effective UV radiation. An evaluation of the workplace is advised to assure employees are not exposed to cumulative radiation levels exceeding these government guidelines.

## To prevent projector damage

- If the Air Filters are not regularly replaced, the air flow inside the projector could be disrupted, causing overheating. Overheating may lead to the projector shutting down during operation.
- In order to ensure that correct airflow is maintained, and that the projector complies with electromagnetic compatibility (EMC) 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 projector should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Do not block the projector cooling fans or free air movement under and around the projector. Loose papers or other objects may not be nearer to the projector than 10 cm (4") on any side.
- The projector 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 1 meter (40") at the rear of the projector.
- Ensure that nothing can be spilled on, or dropped inside the projector. If this does happen, switch off and unplug the mains supply immediately. Do not operate the projector again until it has been checked by qualified service technicians.
- Consult a professional structural engineer prior to suspending the ceiling mount from a structure not intended for that use. Always ensure the working load limit of the structure supporting the projector.
- Do not use this equipment near water.
- 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.
- Save the original shipping carton and 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.

### 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

- Warning "Risk of fire". Do not place flammable or combustible materials near the projector !
  This projector 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. The exclusion zone must be not less than 40 cm (16") for all Barco DLP projectors. The exclusion zone on the lens side must be at least 2 meter (80").
- Do not cover the projector or the lens with any material while the projector is in operation.
- To reduce the lamp heat of the projector, switch the projector first to standby and let the projector lamp cool down for at least 5 minutes. Then the projector may be switched off with the power switch.
- Mount the projector in a well ventilated area away from sources of ignition and out of direct sun light.
- Never expose the projector 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 projector should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Projection rooms 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" sings. 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 or authorized replacement parts which have the same characteristics as the Barco original part. 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 projector, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

## 1.3 Important warnings concerning FLM flight cases

### Important warnings concerning stacking/transporting FLM rental flight cases

- Stack maximum two (2) FLM rental flight cases high. Never higher.
- Surface on which 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 four 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.

# 2. GENERAL

### About this chapter

Read this chapter before installing your FLM R20+ Performer. It contains important information concerning installation requirements for the FLM R20+ Performer, such as minimum and maximum allowed ambient temperature, humidity conditions, required safety area around the installed projector, required power net, compatible signal sources, etc.

Furthermore, careful consideration of things such as image size, ambient light level, projector placement and type of screen to use are critical to the optimum use of the projection system.

### Overview

- Installation requirements
- Unpacking the projector
- Box content
- FLM flight case
- Projector configurations
- Projector air inlets and outlets
- Free download of Projector Toolset

## 2.1 Installation requirements

### Ambient temperature conditions

The maximum allowed ambient temperature for an operating Barco FLM R20+ Performer may not exceeds +40 ºC (+104 ºF).

The minimum allowed ambient temperature for an operating Barco FLM R20+ Performer 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.

### Projector weight

Do not underestimate the weight of one Barco FLM R20+ Performer, which is about ±100 kg (±225 lb.). Be sure that the table or truss installation on which the projector(s) has to be installed is capable of handling five (5) times the complete load of the complete system.

### Power requirements

One Barco FLM R20+ Performer requires 200-240 VAC, 50–60 Hz, 16 amps at 230 VAC.

### Clean air environment

A projector 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.

### Which screen type ?

There are two major categories of screens used for projection equipment. Those used for front projected images and those for rear projection applications.

Screens are rated by how much light they reflect (or transmit in the case of rear projection systems) given a determined amount of light projected toward them. The 'GAIN' of a screen is the term used. Front and rear screens are both rated in terms of gain. The gain of screens range from a white matte screen with a gain of 1 (x 1) to a brushed aluminized screen with a gain of 10 (x 10) or more. The choice between higher and lower gain screens is largely a matter of personal preference and another consideration called the viewing angle. In considering the type of screen to choose, determine where the viewers will be located and go for the highest gain screen possible. A high gain screen will provide a brighter picture but reduce the viewing angle. For more information about screens, contact your local screen supplier.

### What image size? How big should the image be?

The projector is designed for projecting an image size : minimum 1 meter (3.3 ft.) to maximum 18 meter (59 ft.) (depending on the ambient light conditions), with an aspect ratio of 4 to 3 (recommended between 1 m (3.3ft) - 12 m (39.4ft)).

## 2.2 Unpacking the projector

### What has to be done ?

At delivery the projector is packed in a carton box upon a wooden pallet and secured with banding and fastening clips. Furthermore, to provide protection during transportation, the projector is surrounded with foam. Once the projector is arrived at the installation site, it has to be removed from the carton box and wooden pallet in a safe manner without damaging the projector.

### Necessary tools

- Side cutter.
- 8 mm Allen key.

### How to unpack the projector ?

1. Remove the banding around the carton box, by releasing the fastening clips as illustrated, and remove the top cover.

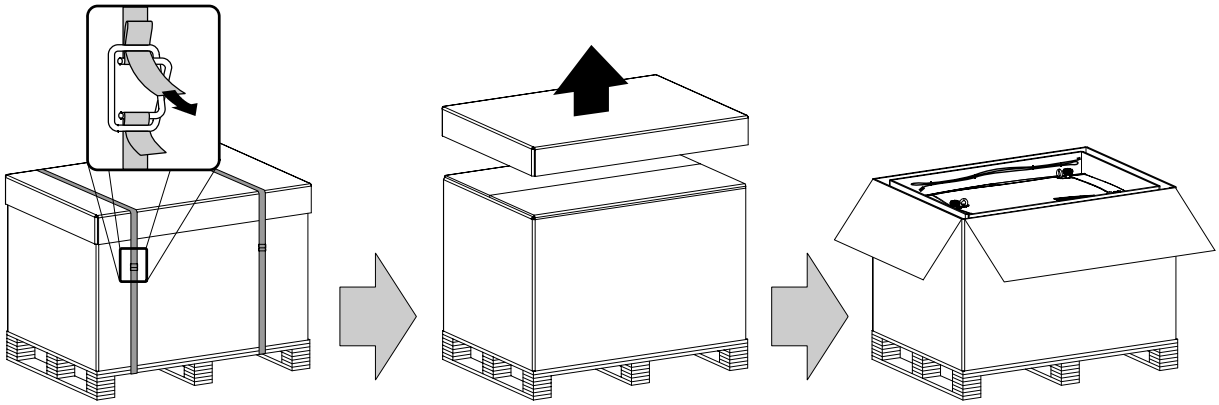


Image 2-1

2. Remove the power cord, which is attached to the packaging with a cable ties, and the two smaller carton boxes, located between the inner carton sleeve and outer carton box.
   ***Note:*** *The two smaller carton boxes contain the manuals, the remote control unit (RCU), two standard batteries size AA and four rigging clamps for projector suspension.*

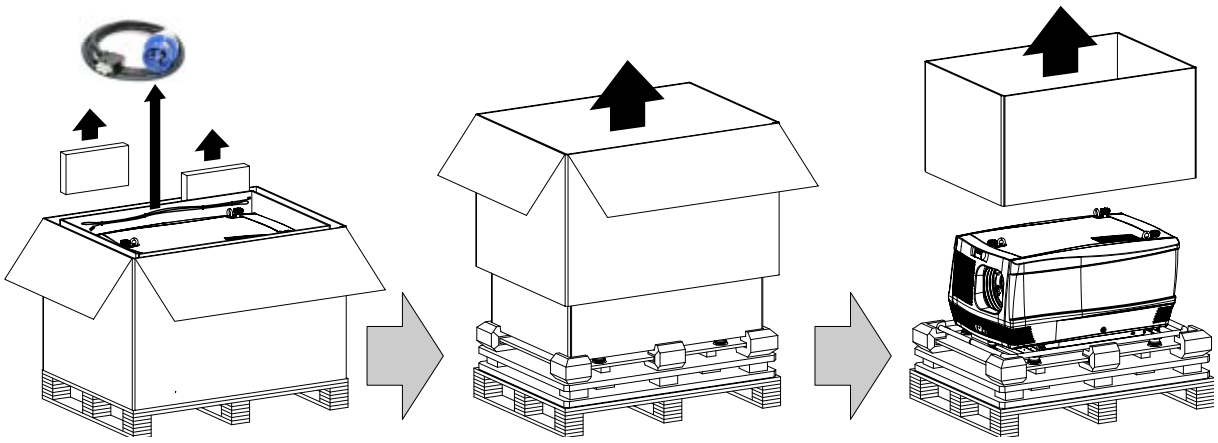


Image 2-2

3. Remove the carton box, the inner carton sleeve and the foam around the projector. See image 2-2.
   ***Note:*** *The projector is still attached to a wooden plate, which is detached from the below pallet.*
4. Gently turn the projector upside down to gain access to the four bolts, which secure the projector. Note that this wooden plate is detached from the pallet.
   ***Tip:*** *Lay a blanket (or the earlier removed foam) on the floor to protect the projector housing form scratches while turning.*

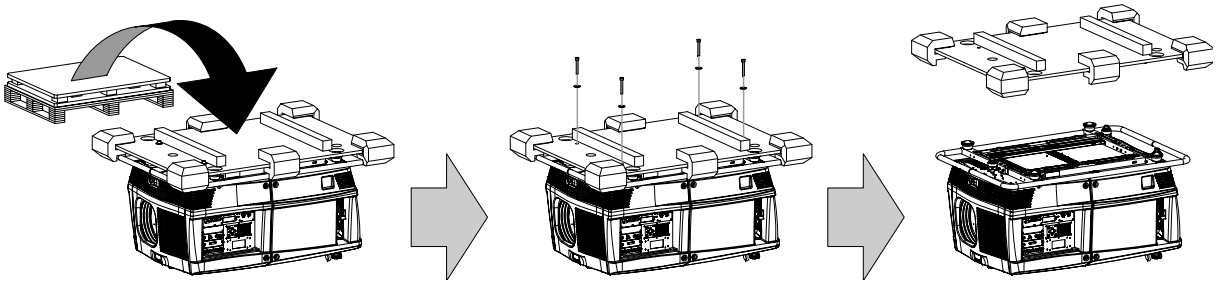


Image 2-3

5. Remove the wooden plate from the projector bottom, by releasing the four bolts. Use an 8 mm Allen key. See image 2-3.
6. Gently turn the projector back on its feet.
7. Remove the foam rubber around the carrying handle.

**Save the original shipping carton and packing material, they will be necessary if you ever have to ship your projector. For maximum protection, repack your projector as it was originally packed at the factory.**

**A rubber foam inside a plastic bag is placed into the lens opening of the projector. It's recommended to reuse this foam and plastic back each time you transport the projector. This to prevent intrusion of dust and foreign particles.**

## 2.3 Box content

### Content

- One Barco FLM R20+ Performer, weight ±100 kg (±225 lb.).
- One Remote Control Unit (RCU).
- Two AA size batteries for the RCU.
- One power cord of 2,5 meter with EN60-309 plug.
- Four rigging clamps for projector suspension.
- One user manual.

### Initial inspection

Before shipment, the projector was inspected and found to be free of mechanical and electrical defects. As soon as the projector is unpacked, inspect for any damage that may have occurred in transit. Save all packing material until the inspection is completed. If damaged is found, file claim with carrier immediately. The Barco sales and service office should be notified as soon as possible.

**The packaging of the FLM R20+ Performer is provided with a shock-watch label. If this shock-watch label was triggered (red colored at arrival) during transport, indicates that the package was possibly roughly handled by the transport company. In this case, the instructions mentioned on the label, should be followed, which are: adding a note on the "bill of lading" and informing the transport company and the Barco sales and service office as soon as possible.**

### Mechanical check

This check should confirm that there are no broken knobs or connectors, that the cabinet and panel surfaces are free of dents and scratches, and that the meter face and operating panel are not scratched of cracked. The Barco sales and service office should be notified as soon as possible.

## 2.4 FLM flight case

### Introduction of the FLM flight case

The FLM flight case is designed to transport the FLM R20+ Performer in a safe and secure manner. The four caster wheels, provided with breaks, and the eight handles make the FLM flight case easy to handle. The floor of the flight case wagon is equipped with two small covered compartments to store the remote control and the rigging clamps. Furthermore, three Velcro strips are attached to the bottom for fastening the power cord of the projector.

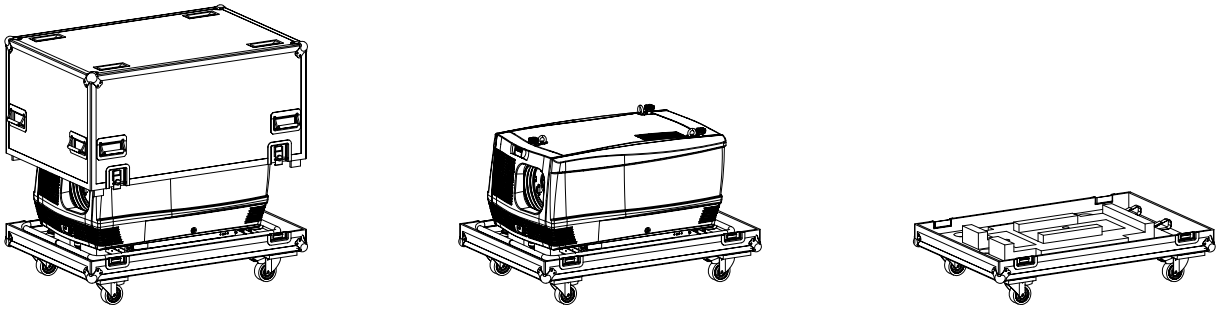


Image 2-4
FLM flight case (**R9854510**).

The dimensions of the FLM flight case are optimal for maximum utilization of the floor area of a truck. The cover of the FLM flight case has four stacking dishes, which allows to stack the flight cases.

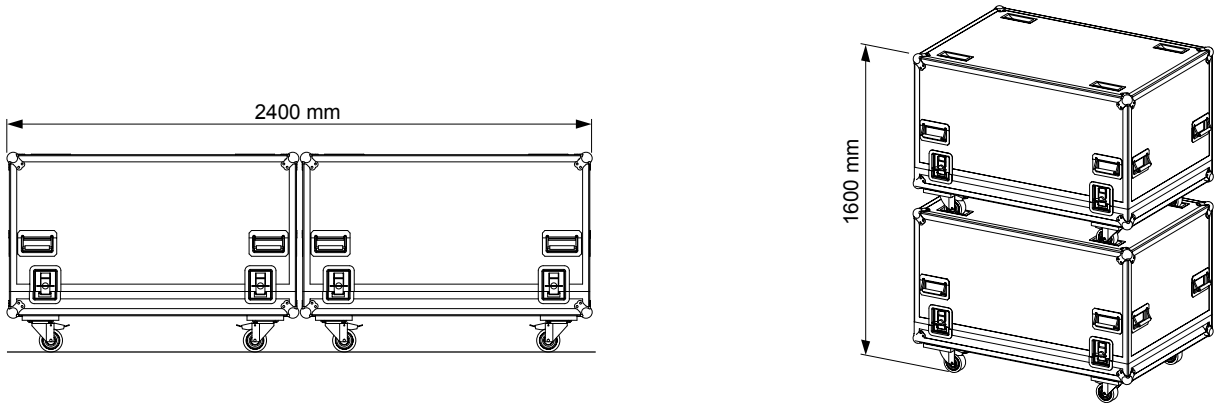



Image 2-5

**WARNING: Maximum stack two (2) FLM flight cases high. Never higher.**

**CAUTION: Prior to inserting projector in flight case turn in the adjustable feet and interlocking adapters fully.**

## 2.5 Projector configurations

### The different configurations

Depending on the installation the projector can be mounted in different ways, the 4 different configurations are:

1. Front / Table (F/T)
2. Front / Ceiling (F/C)
3. Rear / Table (R/T)
4. Rear / Ceiling (R/C)

### Front projection

The projector is installed, either in a table mount or ceiling mount configuration, at the same side of the screen as the audience.

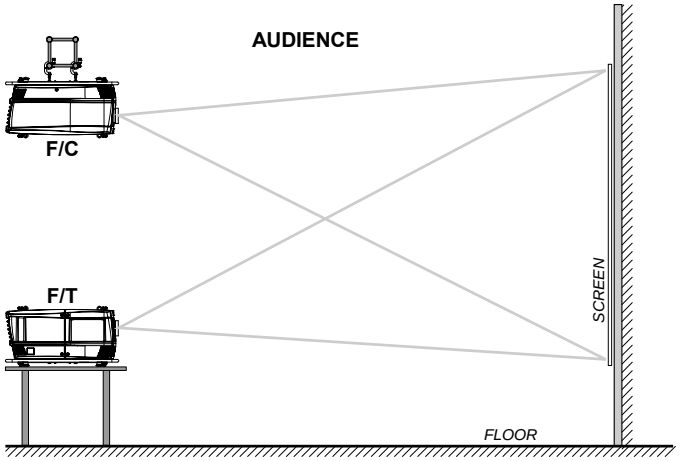



Image 2-6

## Rear projection

The projector is installed, either in a table mount or ceiling mount configuration, at the other side of the screen opposite the audience.

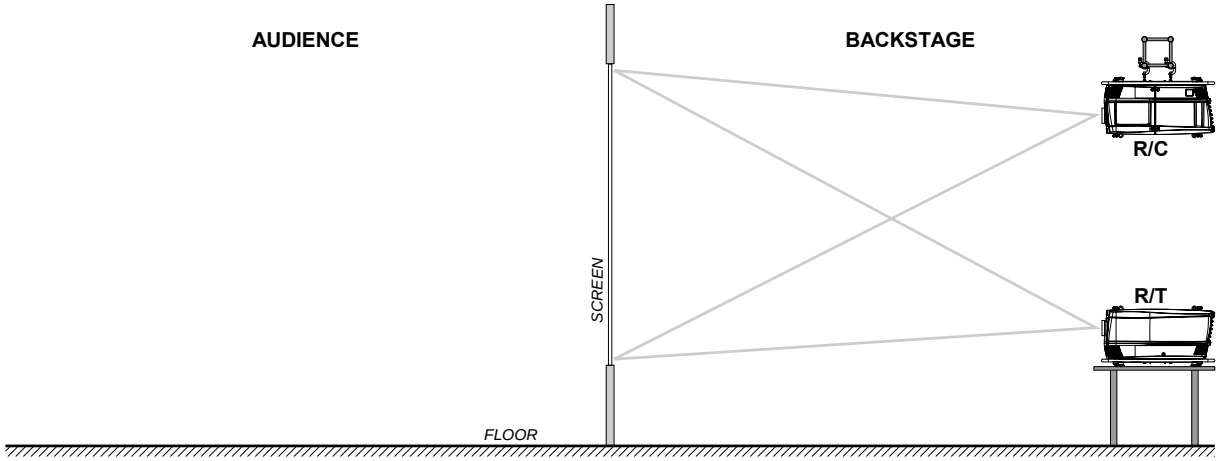



Image 2-7

## Positioning the projector

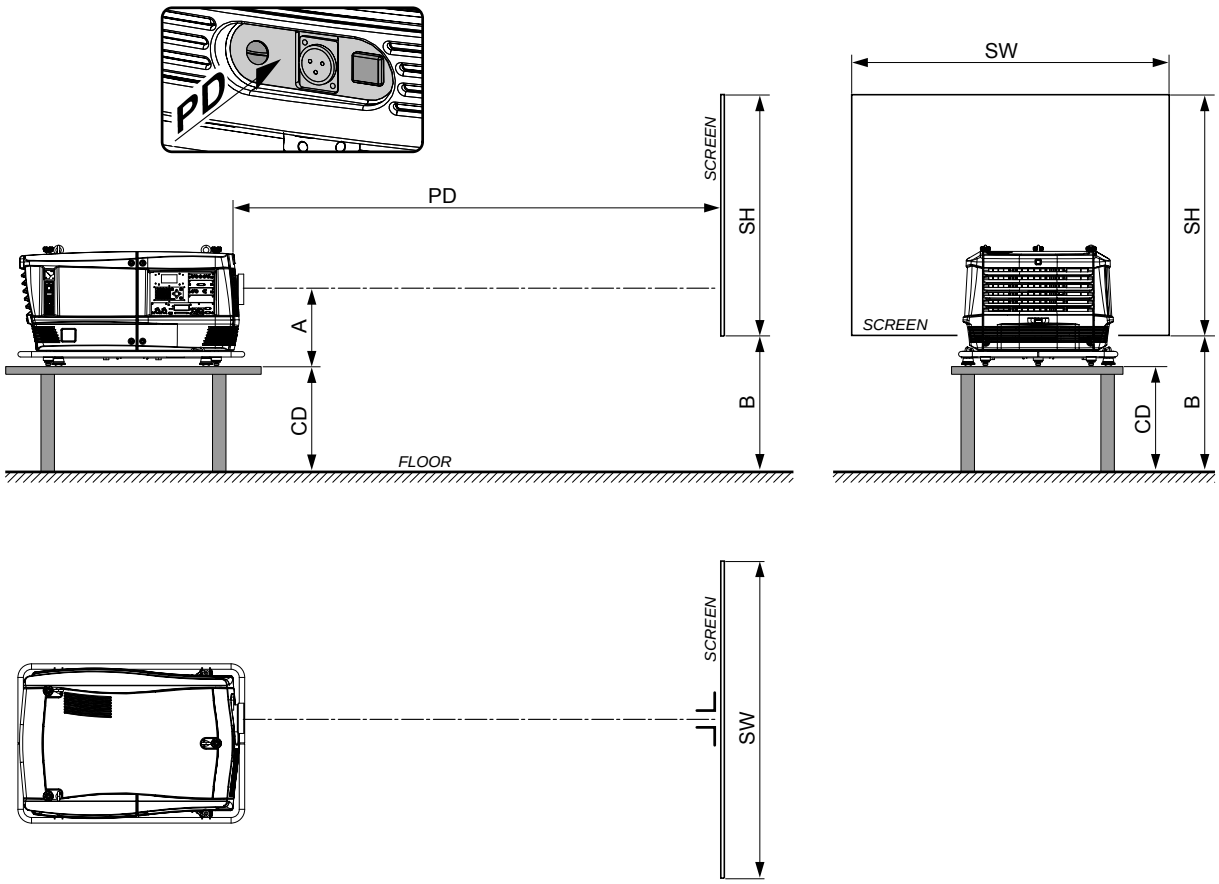



Image 2-8

The projector should be installed at right angles (horizontally and vertically) to the screen at a distance PD. Note the distance (A) between lens centre and table surface is slightly variable. This distance (A) is nominal 35 cm in case all feet are turned in completely and the vertical lens shift is set to zero (0).

## On-Axis / Off-Axis projection

The position of the projector with reference to the screen may also be different depending on the installation. Basically the projector can be positioned in On-Axis or Off-Axis configuration. On-Axis configuration means that the projector is positioned so as to have the centre of the lens coinciding with the centre of the screen. Off-Axis projection is obtained by shifting the lens up, down, left or right. Several parameters can be calculated determining the position in any installation.

Formula to calculate the distance CD for On-Axis projection: `CD = SH/2 + B - A`

## Shift range

The lens can be shifted with respect to the DMD (P) which result in a shifted image on the screen (Off-Axis). A 100% shift means that the centre point of the projected image is shifted by half the screen size. In other words, the centre point of the projected image falls together with the outline of the image in an On-Axis projection. Due to mechanical and optical limitations it's recommended to keep the shift values within the field of view (F) as illustrated below. Within these shift ranges the projector and lens perform excellently. Configuring the projector outside these shift ranges will result in a slight decline of image quality.

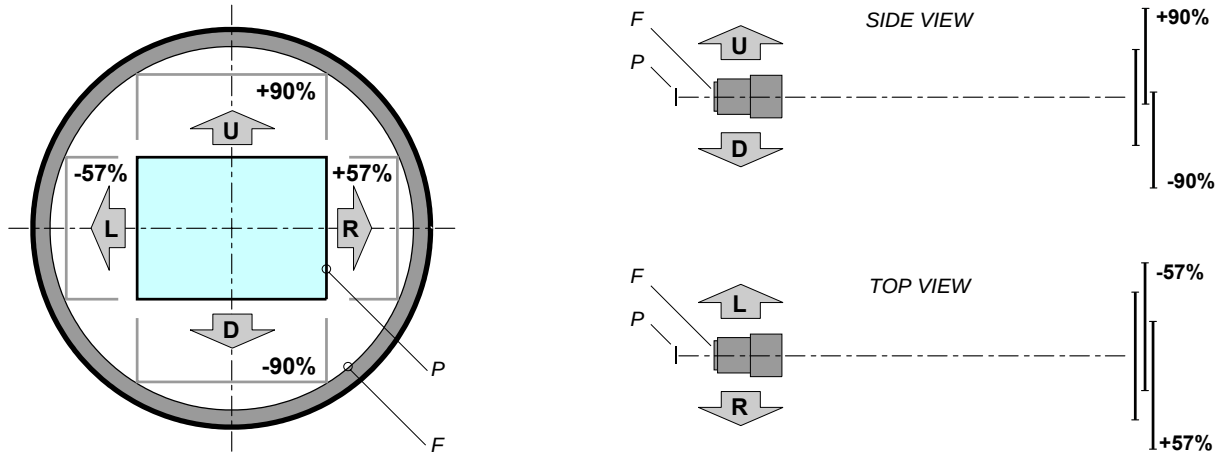



Image 2-9
P DMD.
F Field of view.

**It's mechanical possible to shift outside the recommended field of view (±100% UP/DOWN and ±70% LEFT/RIGHT), but this will result in a slightly decline of image quality depending on the used lens and the zoom position of the used lens. Furthermore, shifting too much in both directions will result in a blurred image corner.**

**Best image quality is projected in the On-Axis configuration.**

## Horizontal and vertical projector tilt ranges

The projector can be rotated and mounted at any vertical angle. In other words, you can tilt the lens side of the projector as much as desired for your application. Side to side tile, however, must not exceed 15°. This limit ensures that the lamp in the projector operates properly and safely.

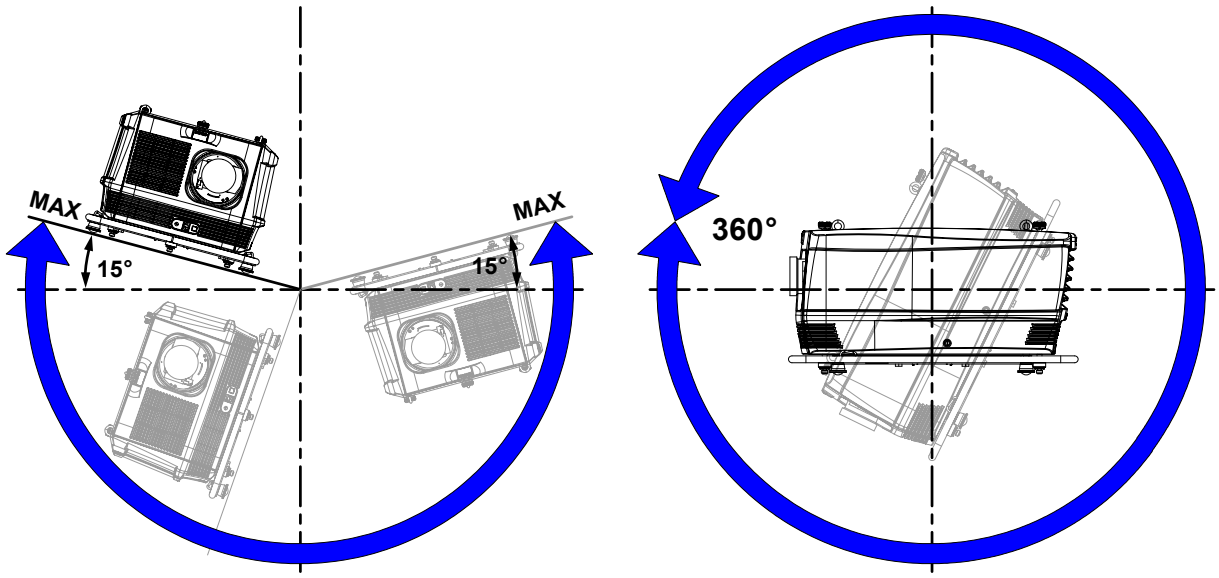



Image 2-10

**CAUTION: Always respect the allowed tilt range of the projector. Neglecting this will result in lamp flicker, which reduces the light output and the life span of the lamp substantially. Furthermore, in the long term, the possibility exist that the lamp explodes.**

## 2.6 Projector air inlets and outlets

### Air inlets and outlets

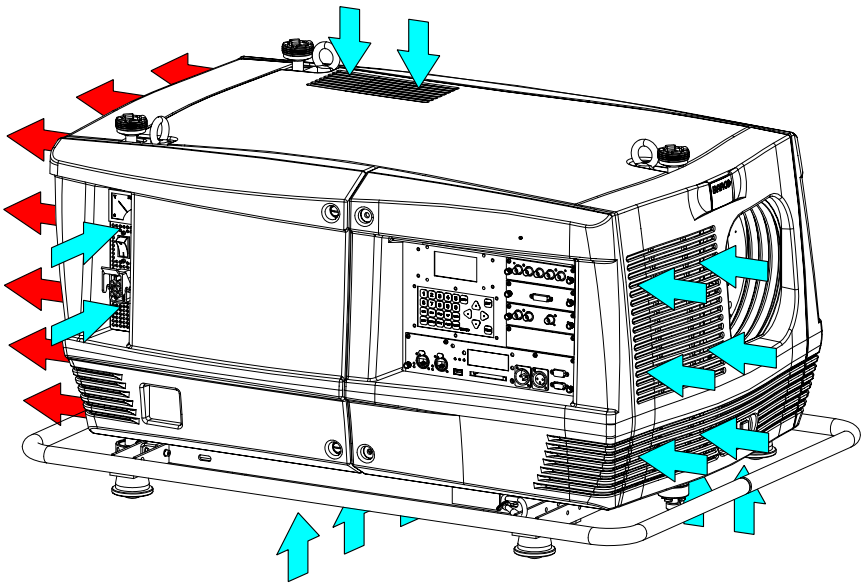


Image 2-11

The FLM R20+ Performer has 5 air inlet channels and one air outlet. The air outlet is located at the rear of the projector. The air inlets are located at the front, bottom, top and right side of the projector.

## 2.7 Free download of Projector Toolset

### About Projector Toolset

Projector Toolset is a software tool to set up, configure, manage and control Barco projectors.

The concept of this Projector Toolset software is modular. The basic package can be extended with several optional device plug-in modules, now and in the future available.

The Projector Toolset software works with configurations that can be loaded. Within a configuration, different snapshots can be take. A snapshot represents a current state of a configuration and can be reloaded to return to this typical state. These terms will be used through the complete software.

Projector Toolset is a stand-alone application that runs on a Java Virtual Machine and that does not require extra services to run.

Several configurations can be controlled simultaneously. Even when the configurations are connected via different ways.

**Projector Toolset is only available in a download version, no CD can be ordered.**

### Where to find the download file(s)

The program and all necessary plug-ins, as well as the Reference manual can be downloaded for free from Barco's Partnerzone, (URL: www.partnerzone.events.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 download the Projector Toolset software and the device plug-in updates as well as the corresponding reference manual.

When downloading the complete Projector Toolset, this software contains already the latest device plug-ins. When you already have the latest core version of Projector Toolset, it is possible to download only device plug-in updates from the same web site location.

As Projector Toolset is a stand alone application, it is not necessary to install any other software. A Java virtual machine is included with this download.

### Installation

Download first the reference manual (Part number: R5976924) and follow the installation instructions as written in this manual.

# 3. PHYSICAL INSTALLATION

### About this chapter

This chapter explains how to install and set up your FLM projector. If you are familiar with the projector and want to quickly set it up for temporary use, follow the “Quick setup” instructions below. For a more complete setup, follow the instructions and guides covered in the remaining subsections.

### Quick setup

The following steps describe briefly how to setup your FLM projector in a table mount front projection. Note that each step refers to a corresponding procedure, which is more detailed and illustrated.

1. Install the batteries of the remote control, see "RCU battery installation", page 18.
2. Place the projector on a solid table in front of the screen at the expected throw distance. Ensure that the projector is installed at right angles (horizontally and vertically) with the screen.
3. Select and install an appropriate lens, which covers the throw ratio ( = screen size / projector screen distance). For more details see "Lens selection", page 22, and "Lens installation", page 22.
4. Connect the projector with the local power net, see "Power connection", page 35.
5. Connect your source to the appropriate input module, see "Input source connections", page 37.
6. Switch ON the projector, see procedure"Switching on", page 45.
7. Select the input slot at which your source is connected with. Do this by pressing the numeric key “1”, “2”, “3” or “4” on the remote control unit or on the local keypad, see chapter "Source selection", page 52.
8. Zoom and shift the lens until the image is properly projected on the screen, Do this by using the “ZOOM” and “FOCUS” key on the remote control unit or on the local keypad, see"Quick Lens Adjustment via LENS key", page 49 or "Direct Lens Adjustment (RCU)", page 50. If necessary, level the projector from side to side by turning the adjustable feet in or out, see "Alignment of a table mount FLM projector", page 25.

### Overview

- Remote control unit (RCU)
- Lenses
- Alignment of a table mount FLM projector
- Alignment of a ceiling mount FLM projector
- Suspension of the FLM projector with rigging clamps

## 3.1 Remote control unit (RCU)

### Introduction

The remote control unit (A) of the FLM projector is equipped with a rugged case (B) and an XLR adaptor (C). The remote control unit can be used wired via mini-jack or via rugged XLR. Note that the backlight, of the remote control unit, illuminate continuously when wire connected.

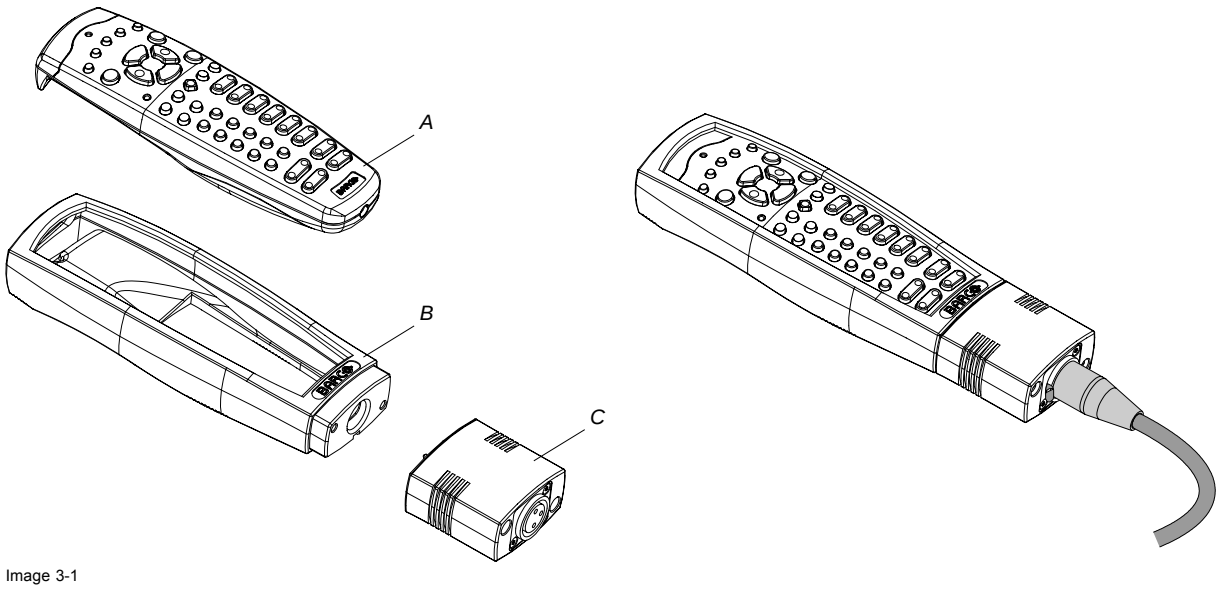



Image 3-1
A Remote control unit (RCU).

B Rugged case.
C XLR adaptor.

### Overview

- RCU battery installation
- RCU rugged case installation
- RCU XLR adaptor installation
- Using the XLR adaptor of the RCU
- RCU usage possibilities

## 3.1.1 RCU battery installation

### Where to find the batteries for the remote control ?

The batteries are not placed in the remote control unit to avoid control operation in its package, resulting in a shorter battery life time. At delivery the batteries can be found in a separated bag attached to the remote control unit. Before using your remote control, install the batteries first.

### How to install the batteries in the remote control ?

1. Push the battery cover tab with the fingernail a little backwards (1) and pull, at the same time, the cover upwards (2).

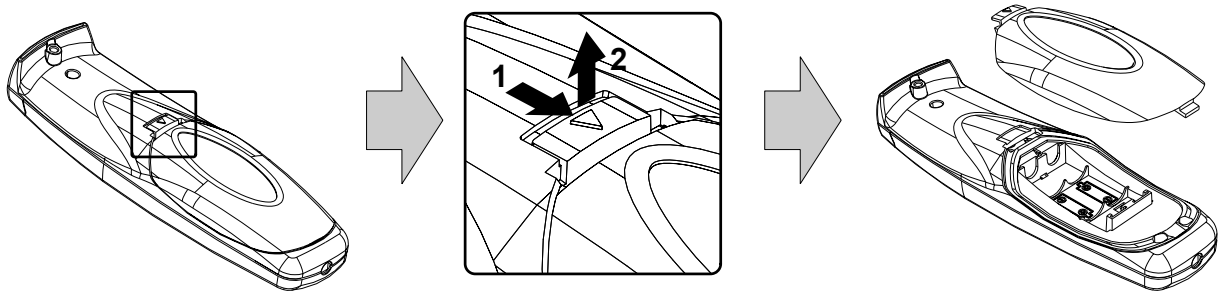



Image 3-2

2. Insert the two AA size batteries, making sure the polarities match the + and - marks inside the battery compartment.

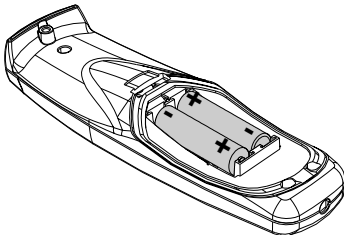


Image 3-3

3. Insert (1) the lower tab of the battery cover in the gap at the bottom of the remote control, and press (2) the cover until it clicks in place.

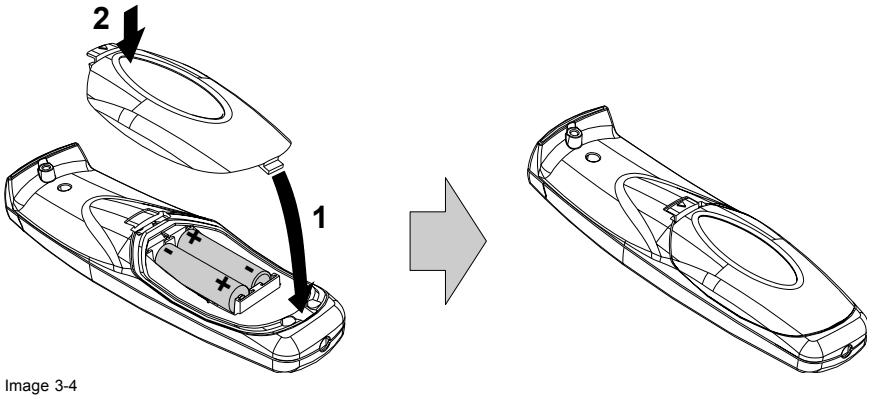



Image 3-4

### 3.1.2 RCU rugged case installation

#### How to install the rugged case of the remote control ?

1. Slide the bottom of the RCU into the rugged case and then pull the top of the rugged case over the top of the RCU as illustrated.

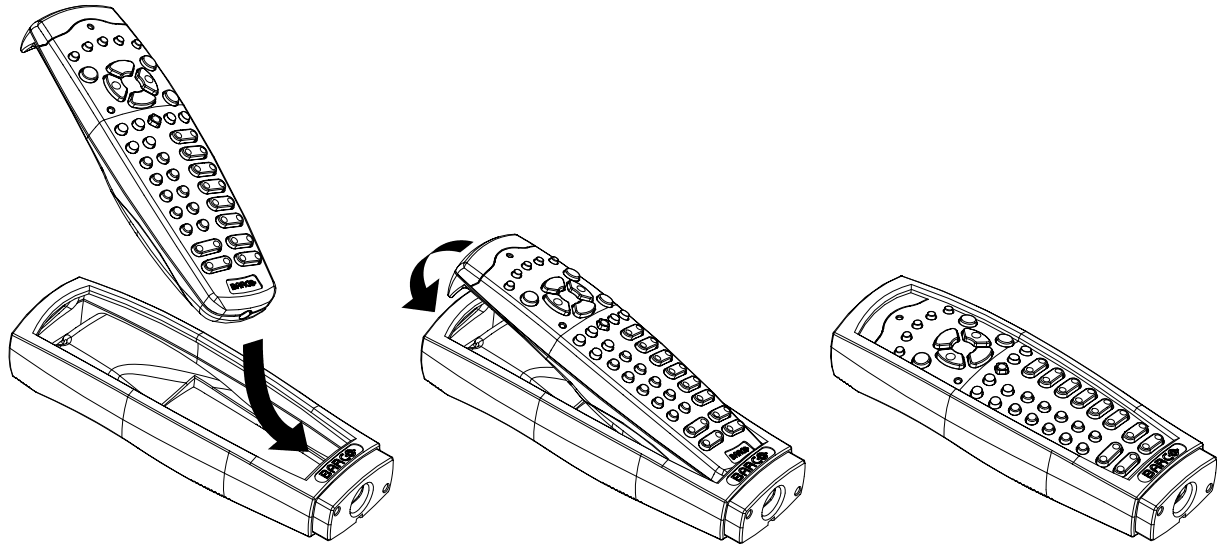


Image 3-5

### 3.1.3 RCU XLR adaptor installation

**Install the rugged case before installing the XLR adaptor. Vice-versa, remove the XLR adaptor before removing the rugged case from the RCU.**

#### Necessary tools

5 mm flat screw driver.

#### How to install the XLR adaptor of the remote control unit ?

1. Push the XLR adaptor (C) upon the rugged case of the remote control unit as illustrated.
   ***Note:*** *Ensure that the text of the XLR adaptor is on top.*

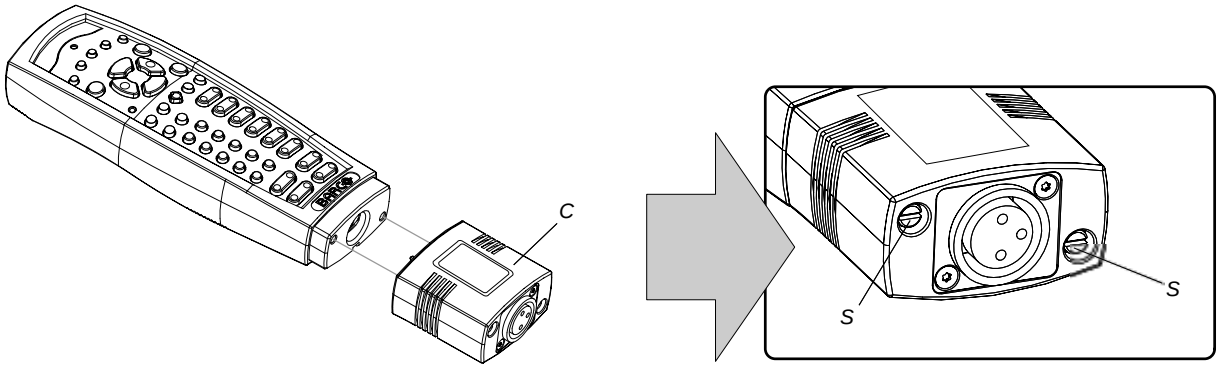



Image 3-6

2. Fasten the two screws (S) of the XLR adaptor. Turn each screw repeatedly one or two turns until both screws are tight.

### 3.1.4 Using the XLR adaptor of the RCU

#### How to use the XLR adaptor of the remote control unit ?

1. Connect a cable with XLR plug into the XLR adaptor.
2. Connect the other end of the cable with your FLM R20+ Performer.
3. Push the XLR adaptor completely against the rugged case of the remote control unit, as illustrated in the left image below, for wired communication. Pull out the XLR adaptor (about 8 mm) to switch over to wireless communication.

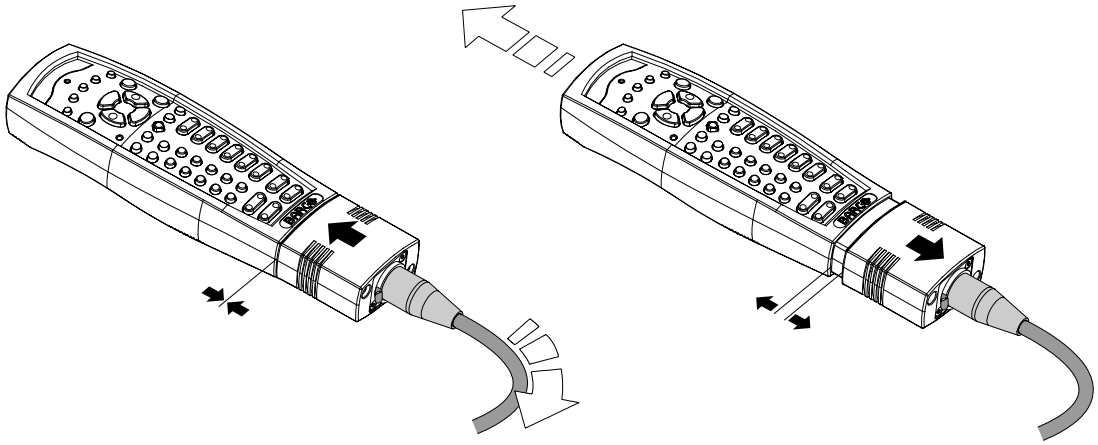


Image 3-7

### 3.1.5 RCU usage possibilities

#### Summarized possibilities

| Ref. | Possibility description | Comment |
|---|---|---|
| **a.** | RCU not wired | |
| **b.** | RCU wired (mini-jack) | Backlight illuminates continuously when wire is connected. Infra red disabled. |
| **c.** | RCU with rugged case not wired | |
| **d.** | RCU with rugged case wired (mini-jack) | Backlight illuminates continuously when wire is connected. Infra red disabled. |
| **e.** | RCU with rugged case and XLR adaptor pulled out “REMOTE” and not wired | The XLR adaptor must be in the pulled out position “REMOTE”, otherwise the RCU will not function. |
| **f.** | RCU with rugged case and XLR adaptor pulled out “REMOTE” and wired | The RCU will send the commands via infra red to the projector. |
| **g.** | RCU with rugged case and XLR adaptor pushed in “WIRED” and wired | The RCU will send the commands via the cable connected with the XLR adaptor to the projector. Backlight illuminates continuously when wire is connected. Infra red disabled. |

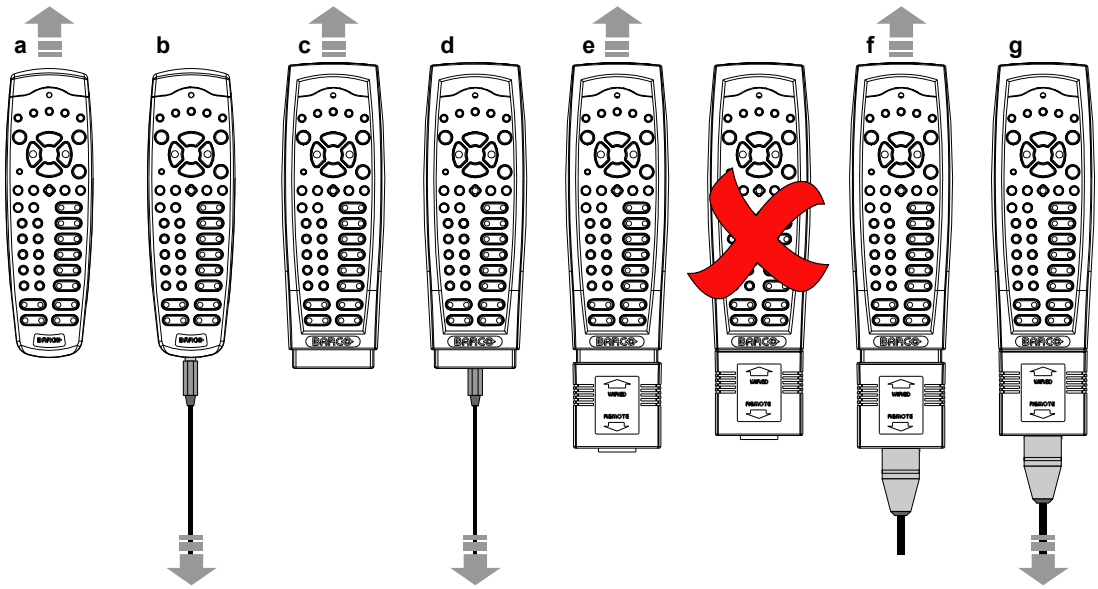



Image 3-8

## 3.2 Lenses

### Overview

- Available lenses
- Lens selection
- Lens formulas
- Lens installation
- Lens removal

### 3.2.1 Available lenses

#### Available lenses for the FLM R20+ Performer

The TLD and the TLD HB (High Brightness) lens series can be used on the FLM R20+ Performer. Note that there is no physical difference on the outside between the TLD and the TLD HB lenses with corresponding focal length. The TLD HB lenses are recommended on the FLM R20+ Performer. Note that the classical TLD lenses have approximately 20% less light output compared to the TLD HB lenses, but 25% more contrast.

Image 3-9
**R9840900**: TLD fixed lens (0.8 : 1);
**R9842040**: TLD HB fixed lens (0.8 : 1)

Image 3-10
**R9840770**: TLD fixed lens (1.2 : 1)

Image 3-11
**R9840775**: TLD+ (1.2 : 1) fixed lens

Image 3-12
**R9840670**: TLD zoom lens (1.6 - 2.0 : 1) ;
**R9842060**: TLD HB zoom lens (1.6 - 2.0 : 1)

Image 3-13
**R9840680**: TLD zoom lens (2.0 - 2.8 : 1) ;
**R9842080**: TLD HB zoom lens (2.0 - 2.8 : 1)

Image 3-14
**R9840690**: TLD zoom lens (2.8 - 5.0 : 1) ;
**R9842100**: TLD HB zoom lens (2.8 - 5.0 : 1)

Image 3-15
**R9840910**: TLD zoom lens (5.0 - 8.0 : 1) ;
**R9842120**: TLD HB zoom lens (5.0 - 8.0 : 1)

### 3.2.2 Lens selection

#### How to select the right lens for your application ?

1. Determine the required screen width (SW).
2. Determine the position of the projector in the projection room with regard to the screen and measure the projector-screen distance (PD).
3. Use the lens formulas (see "Lens formulas", page 22) to find the best corresponding PD with regard to the measured projector-screen distance for the required screen width SW.
   ***Tip:*** *Divide PD by SW to determine the approximately required throw ratio. Choose a lens, which captures the calculated throw ratio. Use the lens formula of the chosen lens to recalculate exactly.*

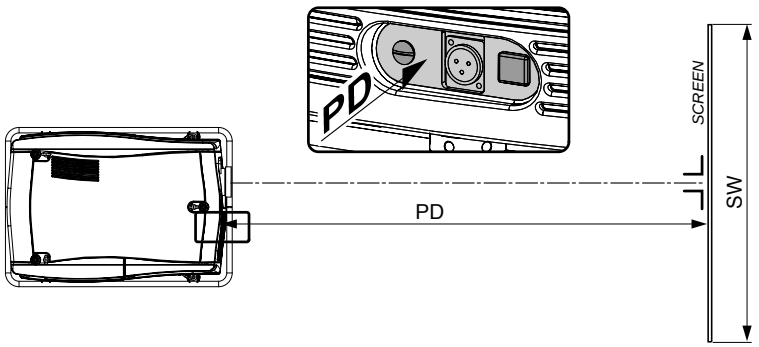



Image 3-16

### 3.2.3 Lens formulas

#### Formulas

| Lens | Throw ratio for FLM | Metric formulas (meter) | Inch formulas (inch) |
|---|---|---|---|
| TLD (0.8 : 1)<br>TLD HB (0.8 : 1) | 0.75 | PD = (0.77 x SW ) + 0.05 | PD = (0.77 x SW ) + 1.97 |
| TLD (1.2 : 1) | 1.1 | PD = (1.11 x SW ) - 0.01 | PD = (1.11 x SW ) - 0.39 |
| TLD+(1.2:1) | 1.2 | PD= (1.23 x SW) + 0.11 | PD = (1.23 x SW) + 4.33 |
| TLD (1.6 – 2.0 : 1)<br>TLD HB (1.6 – 2.0 : 1) | 1.45 – 1.85 | $PD_{min}$ = (1.47 x SW ) - 0.09<br>$PD_{max}$ = (1.85 x SW ) - 0.13 | $PD_{min}$ = (1.47 x SW ) - 3.54<br>$PD_{max}$ = (1.85 x SW ) - 5.12 |
| TLD (2.0 – 2.8 : 1)<br>TLD HB (2.0 – 2.8 : 1) | 1.82 – 2.55 | $PD_{min}$ = (1.85 x SW ) - 0.17<br>$PD_{max}$ = (2.62 x SW ) - 0.24 | $PD_{min}$ = (1.85 x SW ) - 6.69<br>$PD_{max}$ = (2.62 x SW ) - 9.45 |
| TLD (2.8 – 5.0 : 1)<br>TLD HB (2.8 – 5.0 : 1) | 2.55 – 4.55 | $PD_{min}$ = (2.58 x SW ) - 0.16<br>$PD_{max}$ = (4.71 x SW ) - 0.38 | $PD_{min}$ = (2.58 x SW ) - 6.30<br>$PD_{max}$ = (4.71 x SW ) - 14.96 |
| TLD (5.0 – 8.0 : 1)<br>TLD HB (5.0 – 8.0 : 1) | 4.55 – 7.3 | $PD_{min}$ = (4.52 x SW ) - 0.01<br>$PD_{max}$ = (7.53 x SW ) - 0.29 | $PD_{min}$ = (4.52 x SW ) - 0.39<br>$PD_{max}$ = (7.53 x SW ) - 11.42 |

**The throw ratio of TLD (HB) lenses is slightly reduced when used on FLM projectors. The reason of this decrease is the larger active field of the SXGA+ DMD chip set used in the FLM projector.**

### 3.2.4 Lens installation

#### How to install a lens into the projector lens holder ?

1. Remove the foam rubber in the opening of the lens holder if not removed yet.
2. Take the lens assembly out of its packing material and remove the lens caps on both sides.

3. Place the lens holder in the “unlocked” position by moving the lens lock handle (A) towards the lens power supply socket (B) as illustrated.

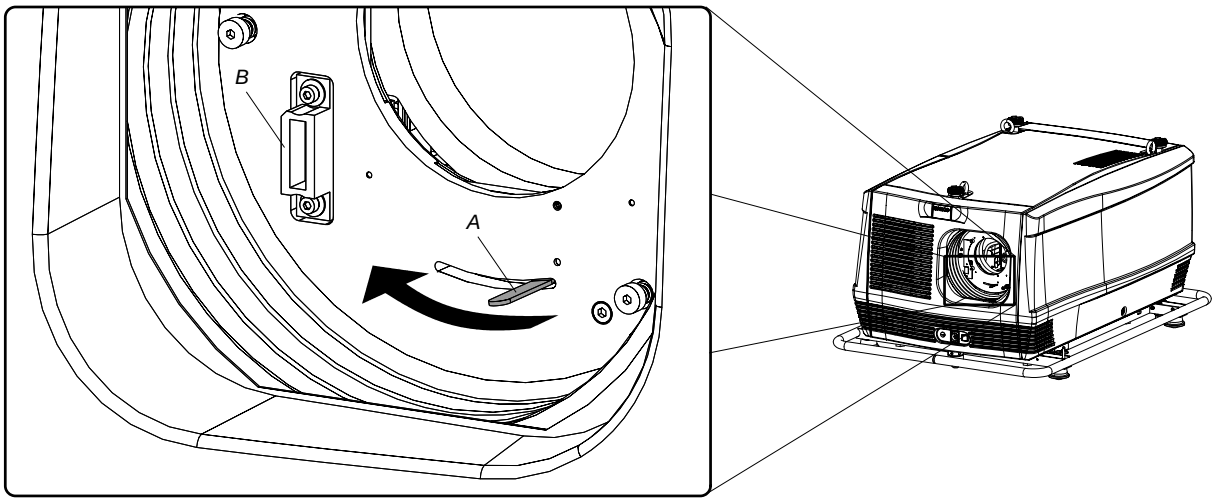



Image 3-17

4. Ensure that the lens holder stands in the On-Axis position (horizontal and vertical mid position).
   ***Note:*** *The lens holder is placed default in the On-Axis position at factory.*

5. Gently insert the lens in such a way that the lens connector matches the socket (B).

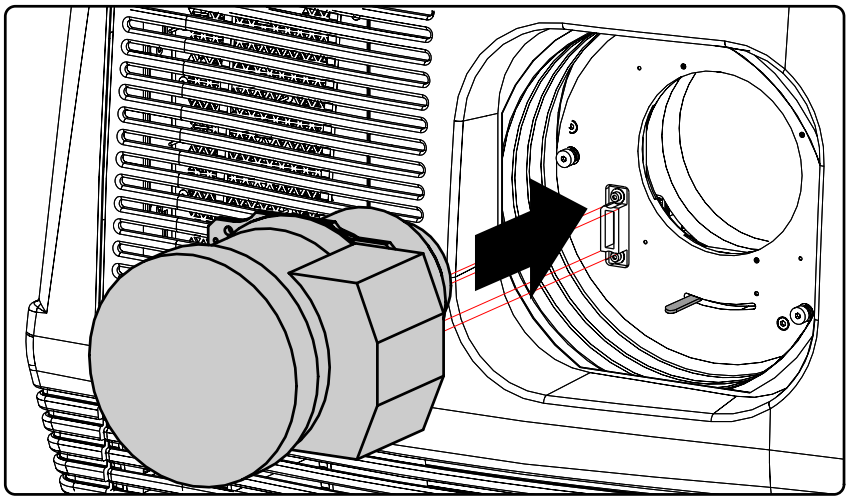


Image 3-18

6. Insert the lens until the connector seats into the socket.
   ***Warning:*** *Do not release the lens yet, as the lens may fall out of the lens holder.*

7. Secure the lens in the lens holder by sliding the lens lock handle into the “locked” position, which is away from the lens power supply socket. Ensure the lens touches the front plate of the lens holder.

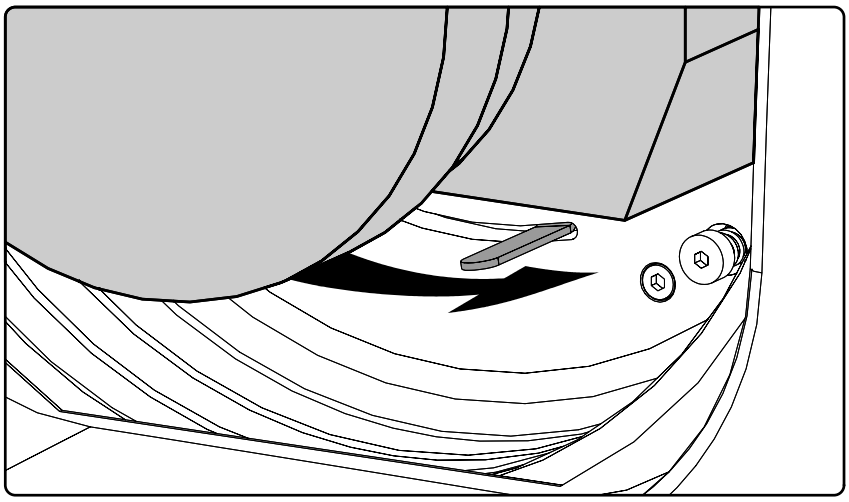


Image 3-19

8. Check if the lens is really secured by trying to pull the lens out of the lens holder.

**CAUTION: Never transport the FLM R20+ Performer with a lens mounted in the lens holder. Always remove the lens before transporting the projector. Neglecting this can damage the lens holder and prism.**

### 3.2.5 Lens removal

#### How to remove a lens from the projector lens holder ?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle towards the “unlocked” position as illustrated.

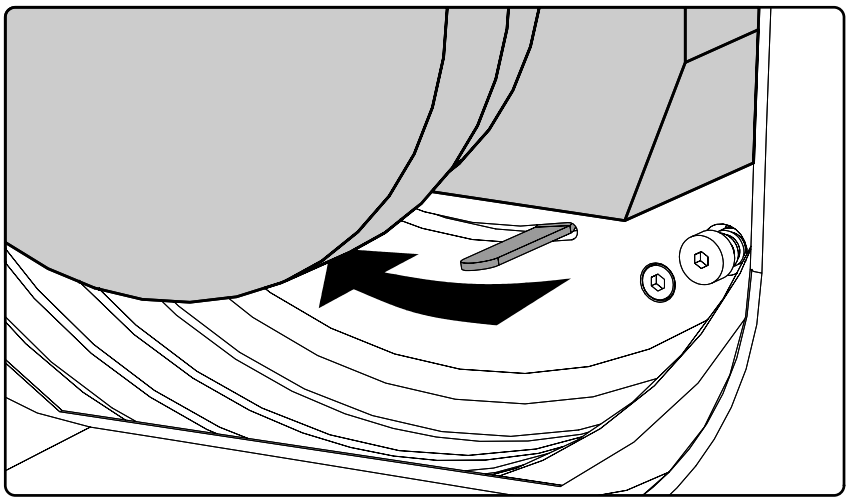


Image 3-20

2. Gently pull the lens out of the lens holder.

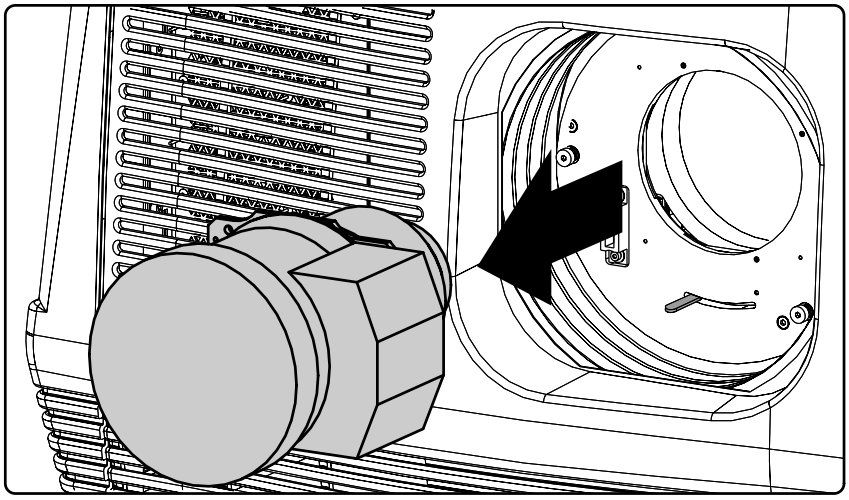


Image 3-21

**It's recommended to place the lens caps of the original lens packaging, back on both sides of the removed lens to protect the lens.**

**It's recommended to place the foam rubber of the original projector packaging, back in the lens opening to prevent intrusion of dust. Note that this foam rubber is packed in a plastic bag to prevent that dust, emitted by the foam, enters the projector.**

## 3.3 Alignment of a table mount FLM projector

### How to align a table mount FLM projector ?

1. Place the projector in the desired location. Take into account the zoom range of the used lens and the size of the screen.
2. Project one of the internal hatch patterns on the screen.
3. Turn the adjustable feet in or out until the projected hatch pattern is perfectly rectangle shaped and leveled.

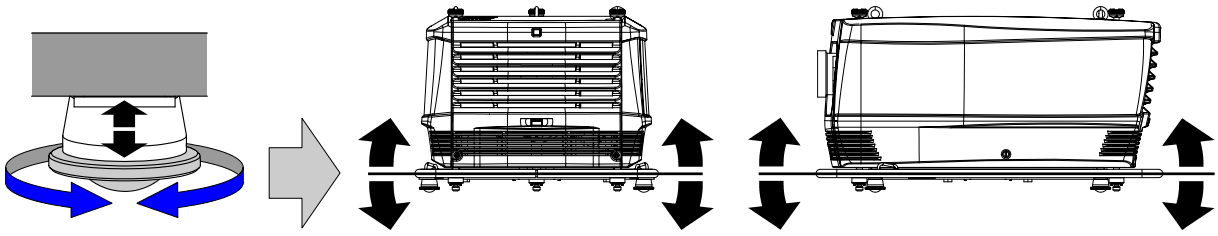


Image 3-22

When this is achieved, the projector is set horizontal and vertical at right angles to the screen.

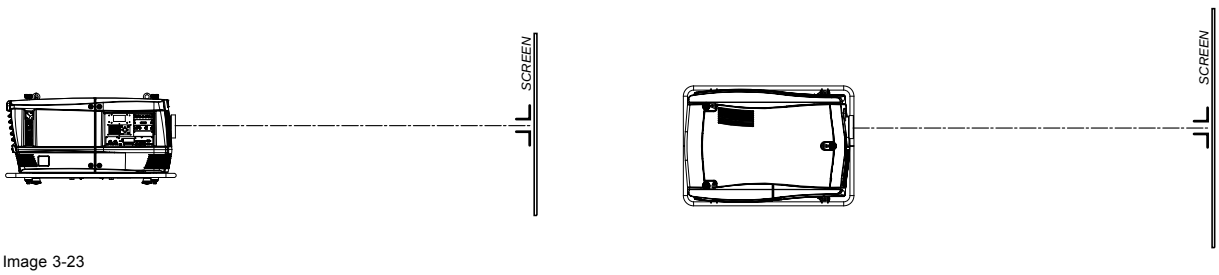



Image 3-23

## 3.4 Alignment of a ceiling mount FLM projector

### Necessary tools

17 mm open ended spanner.

### How to align a ceiling mount FLM projector ?

1. Install the projector in the desired location. See installation procedure "Suspension of the FLM projector with rigging clamps", page 26. Take into account the zoom range of the used lens and the size of the screen.
2. Project one of the internal hatch patterns on the screen.
3. Release the lock nut (ref B image 3-24) of the rigging clamps.
4. Adjust the height of the rigging clamps with respect to the projector, until the projected hatch pattern is perfectly rectangle shaped and leveled.

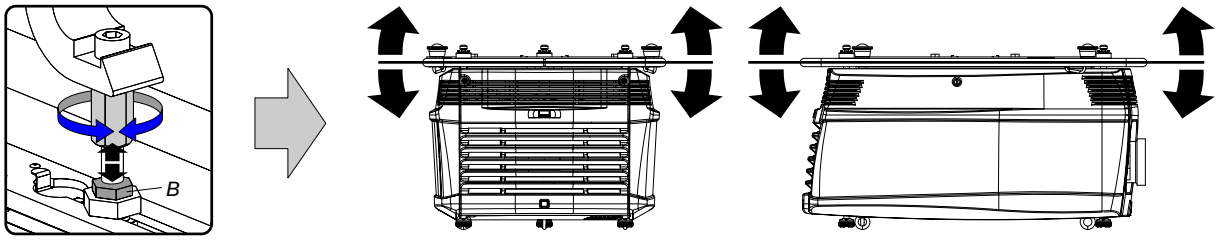



Image 3-24

When this is achieved, the projector is set horizontal and vertical at right angles to the screen.

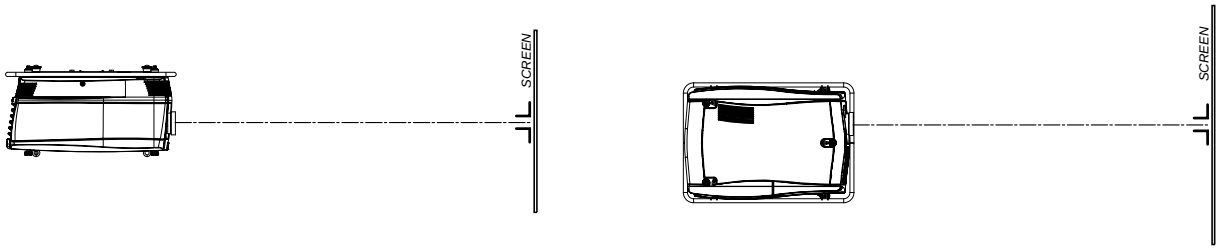



Image 3-25

5. Fasten the lock nut (B) of the rigging clamps.

## 3.5 Suspension of the FLM projector with rigging clamps

### Rigging points and rigging clamps

The carrying handle, at the bottom side of the projector, is provided with eight slots. 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 projector in a hanging configuration.

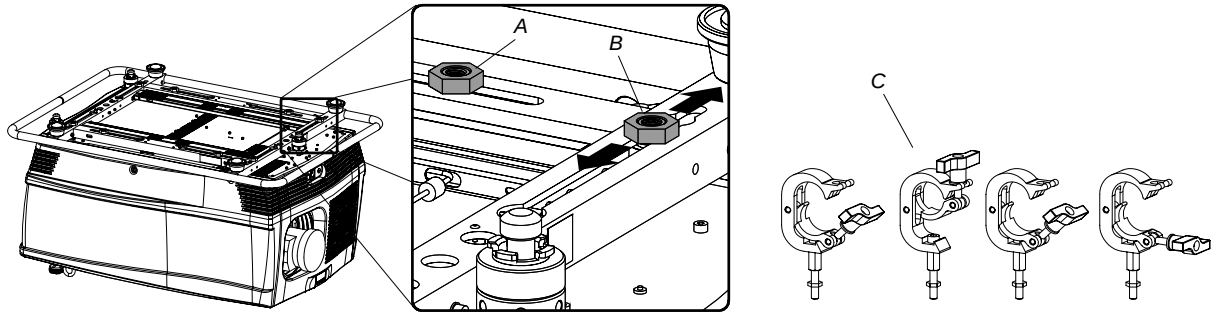



Image 3-26

### Necessary tools

- 24 mm open ended spanner.
- 17 mm open ended spanner.

### Necessary parts

- Four rigging clamps (R820411).
- Safety chains.

### How to install and to use the rigging clamps ?

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

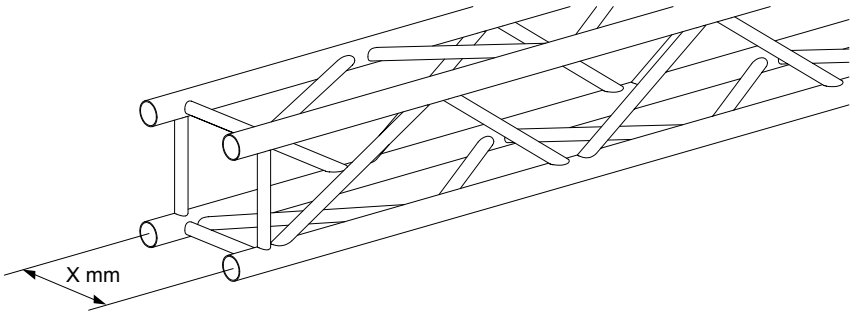



Image 3-27

2. Turn the projector upside down and slide the rigging points on there place in the slots, according the measured distance and secure this position. To release the nuts of the rigging points use a 24 mm open ended spanner. Ensure that the rigging points are symmetrically lined up, so that the projector will hang in balance.
   ***Warning:*** *Be careful while working with heavy loads.*

   ***Warning:*** *Always secure the rigging points after adjustment.*

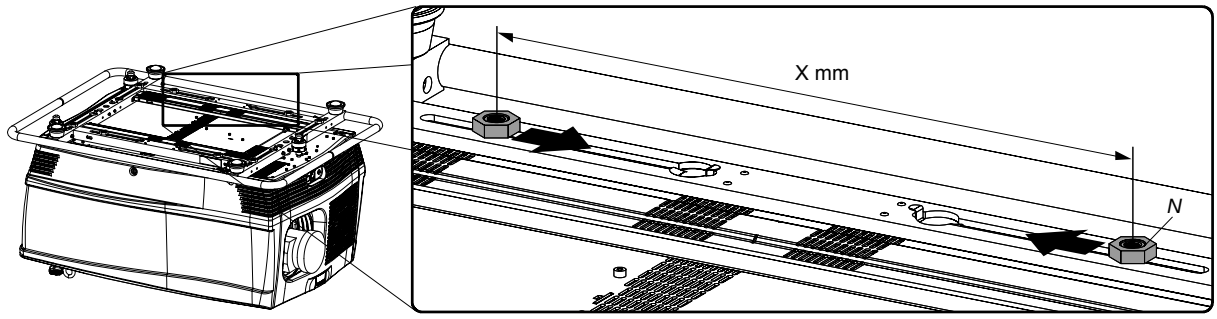



Image 3-28

3. Turn in the rigging clamps (A) into the rigging points using a 17 mm open ended spanner and secure the rigging clamps by turning the safety nut (B) on the rigging clamp against the rigging point using a 17 mm open ended spanner.
   ***Warning:*** *Always use four (4) rigging points, equally spread, to suspend the projector.*

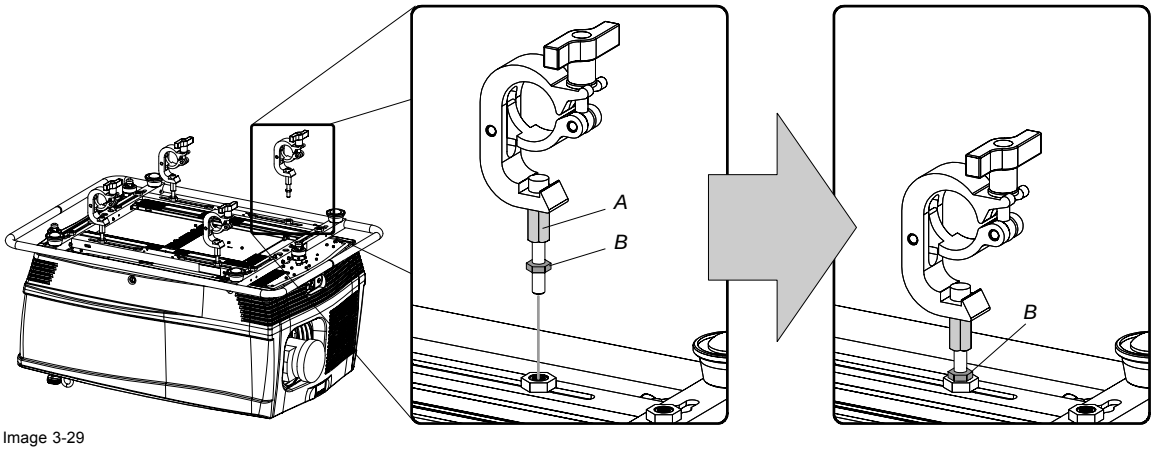



Image 3-29

4. Place all four rigging clamps in open position as illustrated.

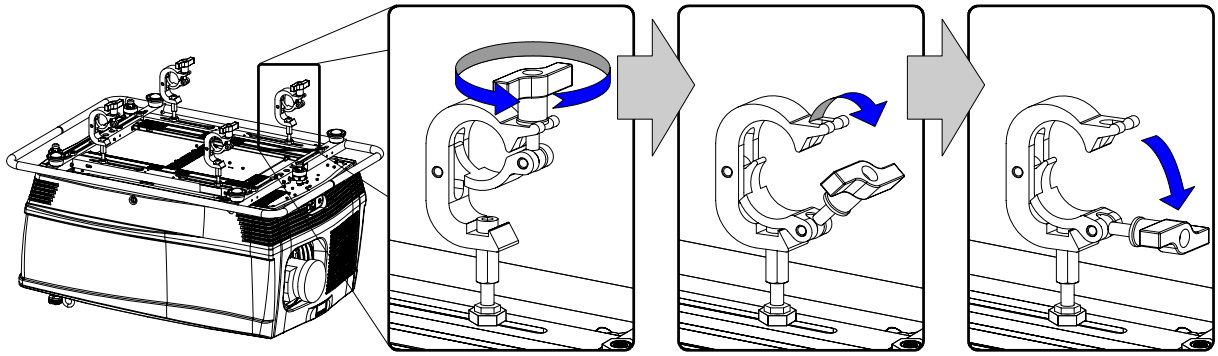


Image 3-30

5. Place the projector (upside down) under the truss installation and lower the truss until the support bars of the truss are nearby the rigging clamps mounted on the projector.

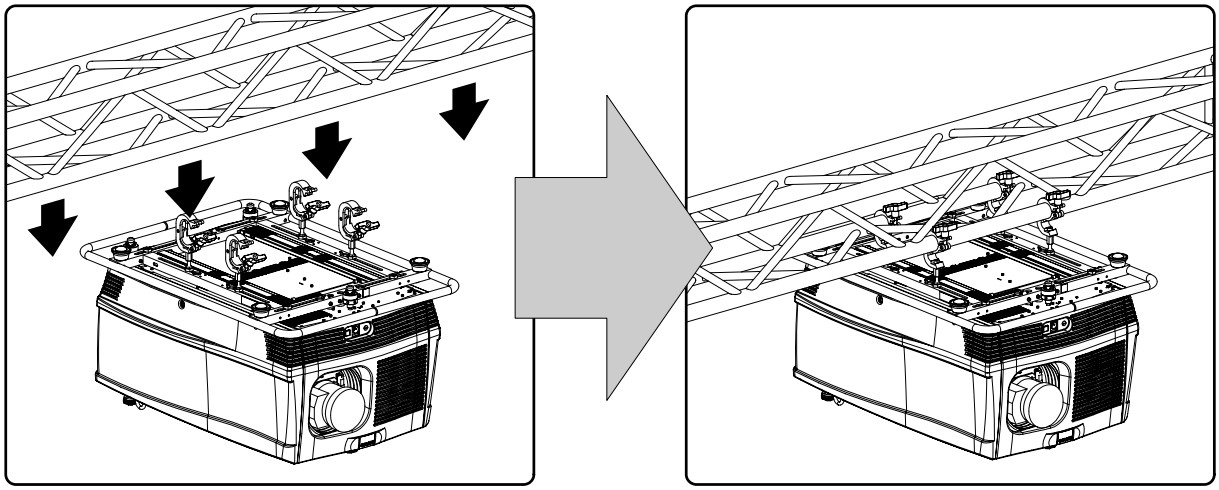


Image 3-31

6. Lift up the projector and hook the four rigging clamps over the support bars of the truss.
7. Lock all four rigging clamps.
8. Install a safety chain (S) around both sides of the carrying handle and around the truss.

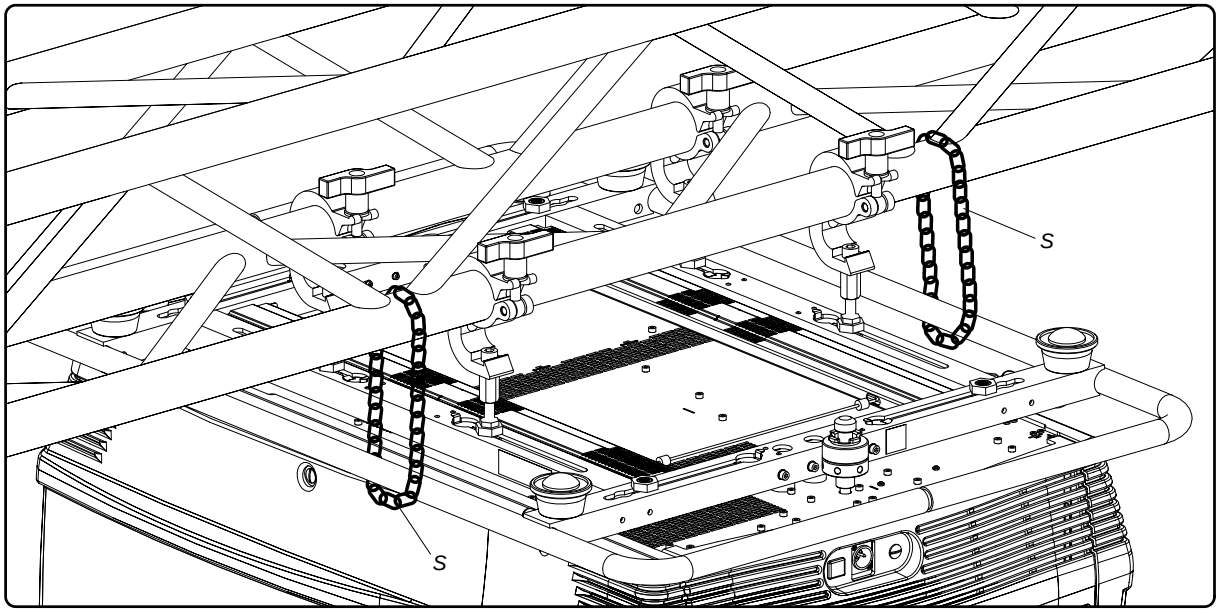



Image 3-32

9. Lift up the truss with attached projector to the desired height.

**Proceed with the alignment procedure, see "Alignment of a ceiling mount FLM projector", page 26.**

# 4. STACKING FLM PROJECTORS

### General

Three interlocking adapters at the top and at the bottom of the FLM projector allows an easy and fast stacking without using extra tools or accessories.

**WARNING: Maximum stack three (3) FLM projectors in a table mount configuration.**

**Maximum stack two (2) FLM projectors in a ceiling mount configuration.**

### Overview

- Stacking FLM projectors
- Aligning stacked FLM projectors

## 4.1 Stacking FLM projectors

### How to stack FLM projectors ?

1. Turn in the four feet of the projector you want to stack.
2. Place the projectors on top of each other. Ensure that all three interlocking pins (A) match with their corresponding interlocking sockets (B).
   ***Tip:*** *In case of stacking projectors for a ceiling mount configuration, first turn the projectors upside down before placing the projectors on top of each other.*

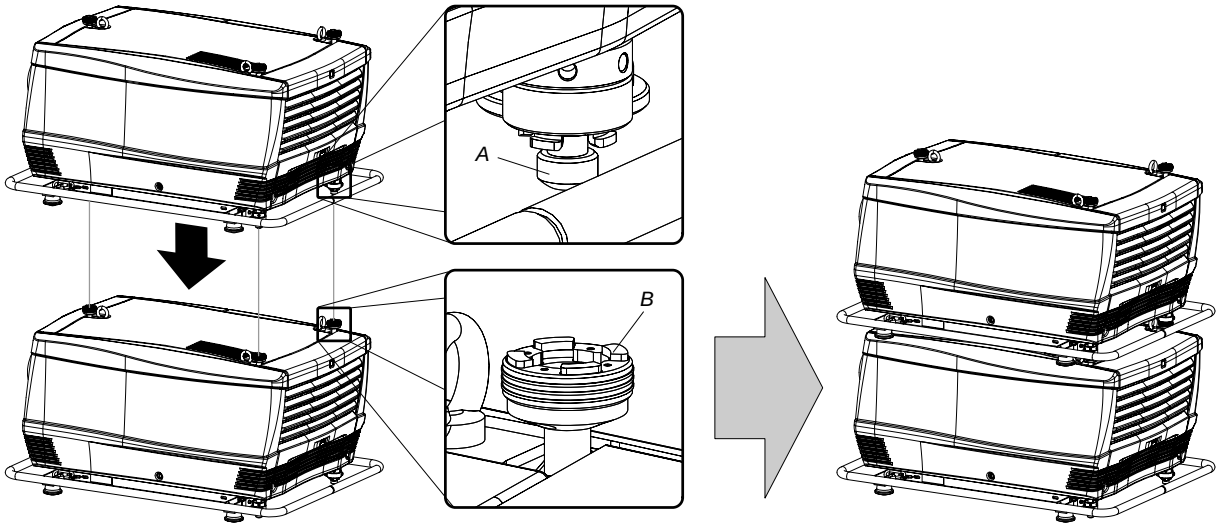



Image 4-1

3. Attach the two projectors together by closing all three interlocking adapters as illustrated.

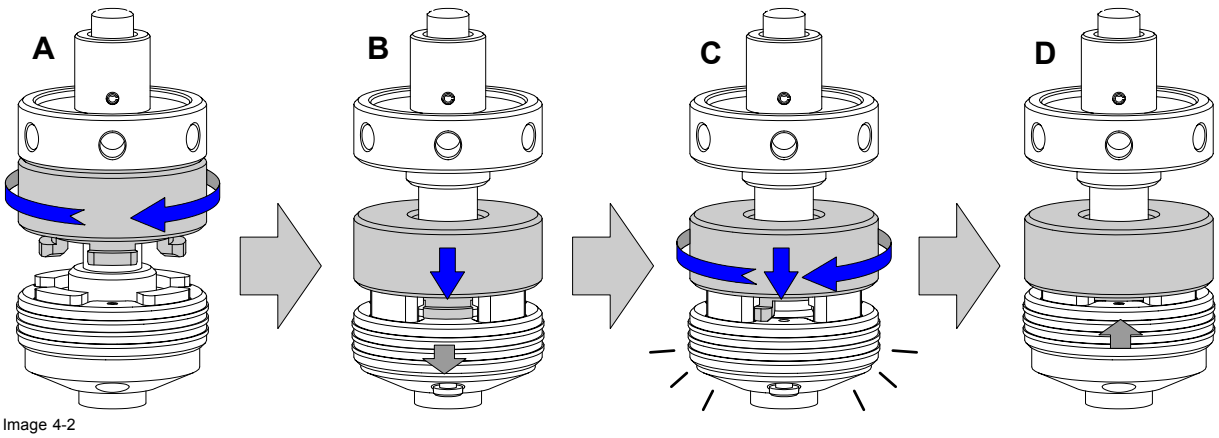



Image 4-2

4. Are these projectors stacked for a ceiling mount configuration?
   If yes, secure the projectors with safety chains as follows:
   a) Release the safety hook (H) at both sides of the lowest projector and guide the safety cable around its carrying handle (C) as illustrated.

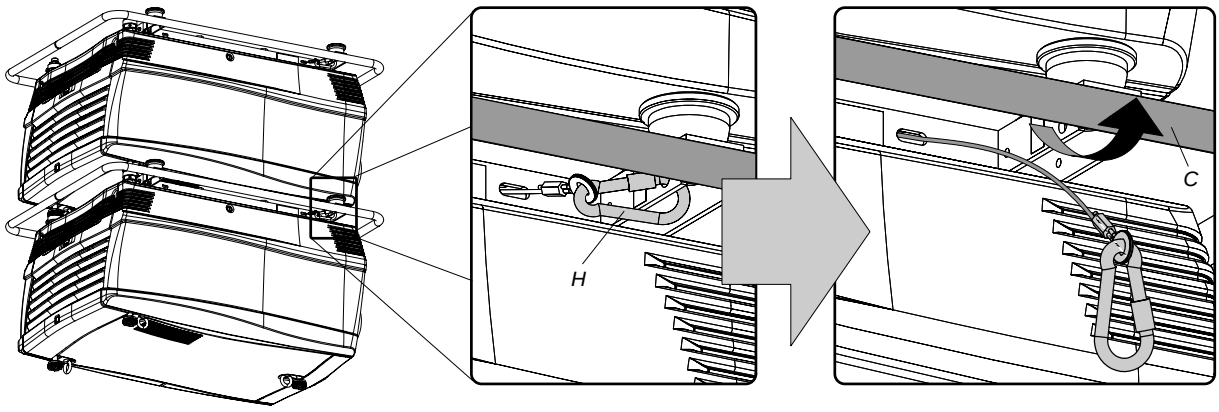



Image 4-3

   b) Guide the safety cable around the carrying handle of the projector above and clasp the safety hook around the safety cable as illustrated.

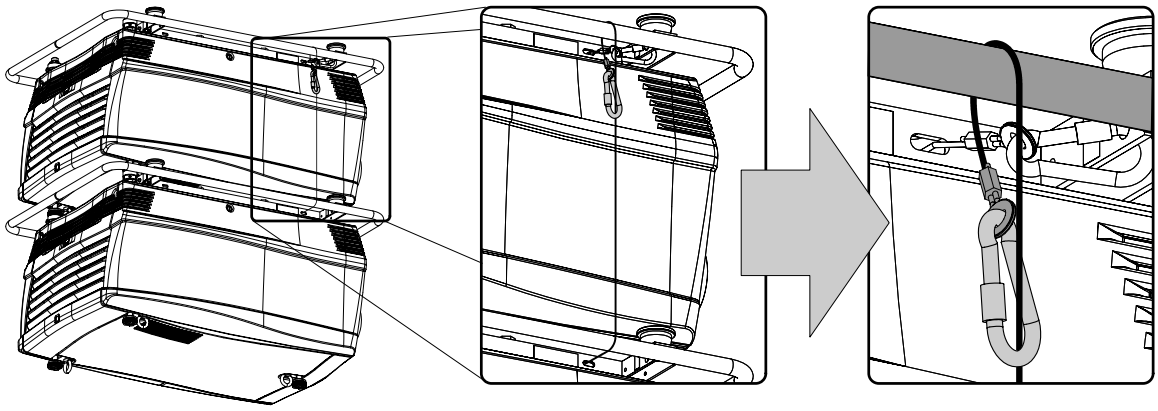


Image 4-4

**WARNING: Always use both safety cables of the lowest projector to secure a stacked projector in a ceiling mount configuration.**

## How to open an interlocking adapter ?

1. Open an interlocking adaptor as illustrated.

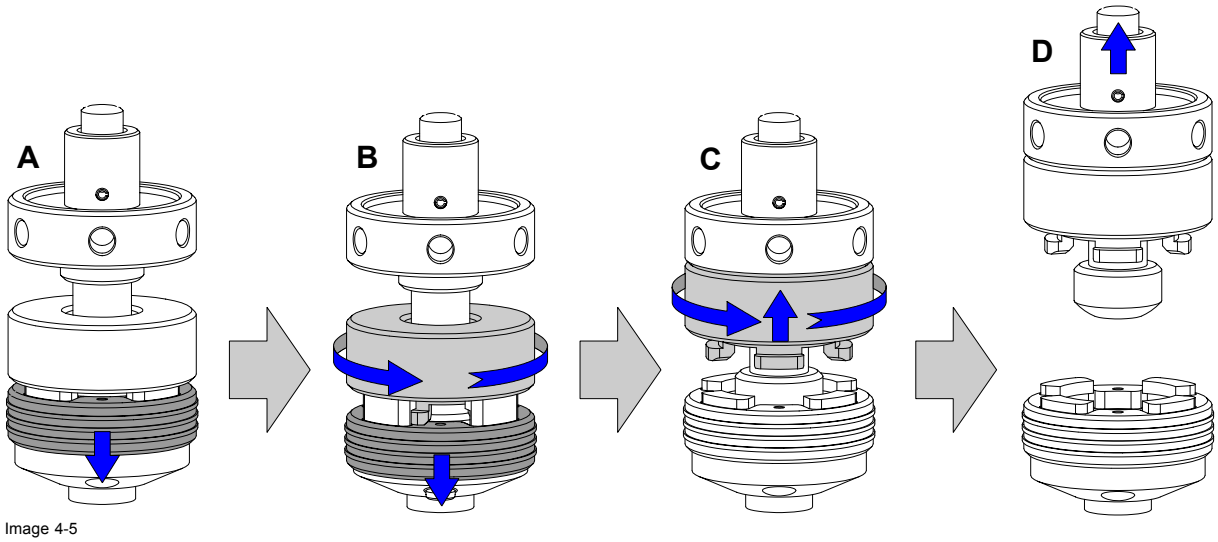



Image 4-5

**WARNING: Never open an interlocking adapter of a stacked projector which is still suspended. First place the stacked projectors on the floor.**

## 4.2 Aligning stacked FLM projectors

### Necessary tools

8 mm Allen key.

### How to align two stacked FLM projectors ?

1. Make sure that the internal hatch pattern projected by the reference projector is sharp and has a perfect rectangle outline. If this is not the case, readjust the reference projector before aligning the other stacked projector(s) with the reference hatch pattern.
   ***Note:*** *The reference projector in a stacked configuration is the lowest projector in case of table mount and the uppermost projector in case of ceiling mount.*
2. Project with the stacked projector the same internal hatch pattern as the reference projector.
   ***Tip:*** *Use a white colored hatch pattern for the reference projector and e.g. green colored for the stacked projector. This makes it easier to see the different between both hatch patterns projected.*
3. If necessary, adjust the rotation of the stacked projector with respect to the reference projector by turning in or out the height adjustment ring of the interlocking adaptors at the rear of the stacked projector. Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.
   ***Tip:*** *You can increase leverage by using a screw driver in the holes of the adjustment ring*

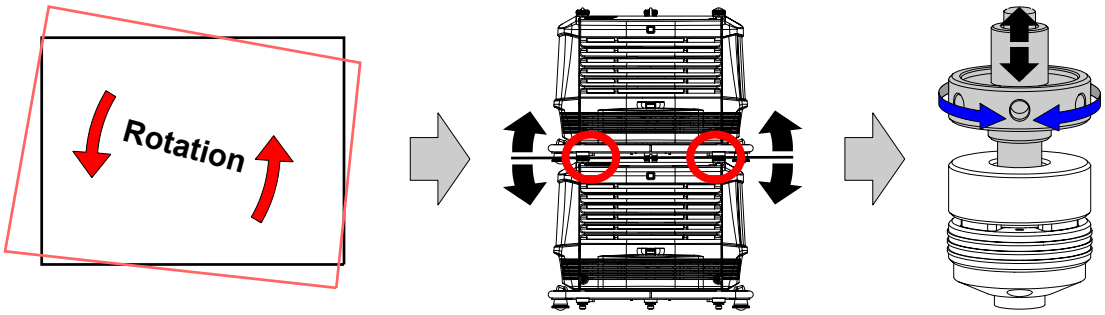



Image 4-6

4. If necessary, adjust the inclination of the stacked projector with respect to the reference projector by turning the height adjustment ring of the interlocking adaptor at the front of the stacked projector in or out. Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.

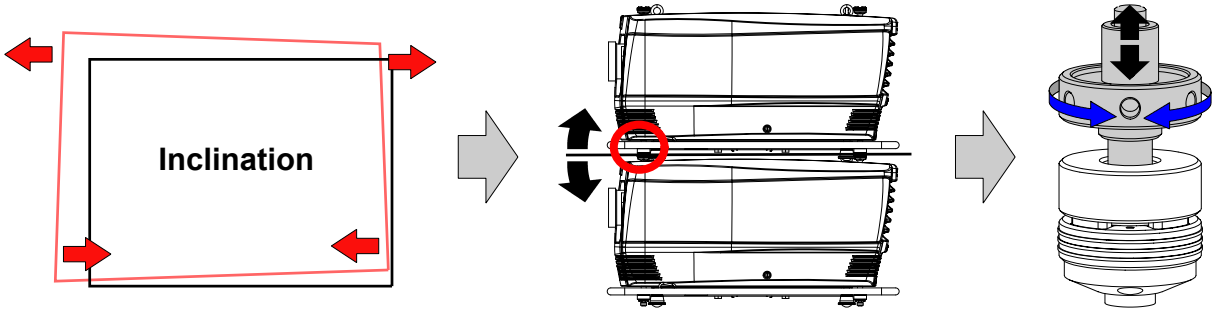



Image 4-7

5. If necessary, adjust the skew of the stacked projector with respect to the reference projector by turning the screw Q in or out using a 8 mm Allen key. The screw Q is located behind the cover of the lamp, just above the volt meter. Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.
   ***Note:*** *See procedure "Removal of the lamp cover", page 161, to access the skew adjustment screw Q.*

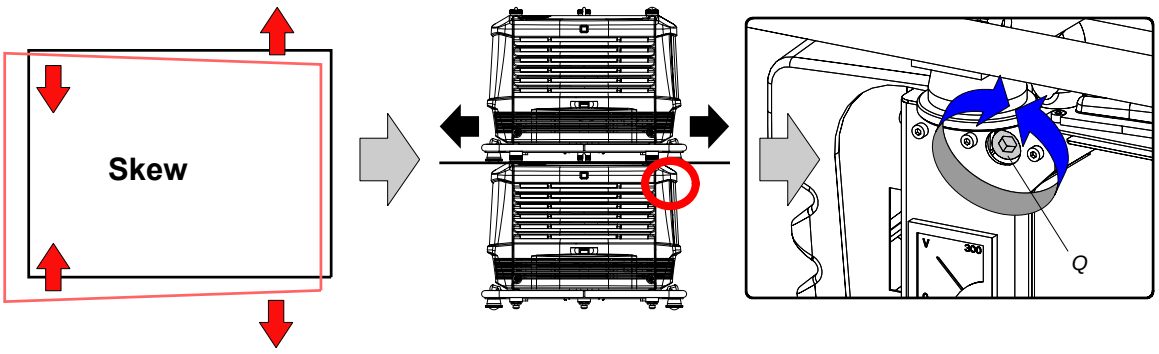



Image 4-8

6. Shift the hatch pattern horizontally and vertically until the outline of the hatch pattern is most symmetrically placed with respect to the reference hatch pattern.
   ***Note:*** *Note that the "Shift" function is motorized, which means that you have to access the projector software, via the local keypad or remote control unit, to operate the "Shift" function.*

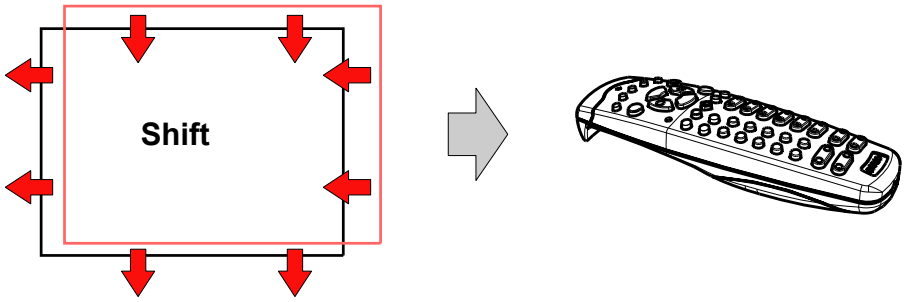



Image 4-9

7. Zoom the hatch pattern in or out until the outline of the hatch pattern matches exactly the outline of the reference hatch pattern.
   ***Note:*** *Note that the "Zoom" function is motorized, which means that you have to access the projector software, via the local keypad or remote control unit, to operate the "Zoom" function.*

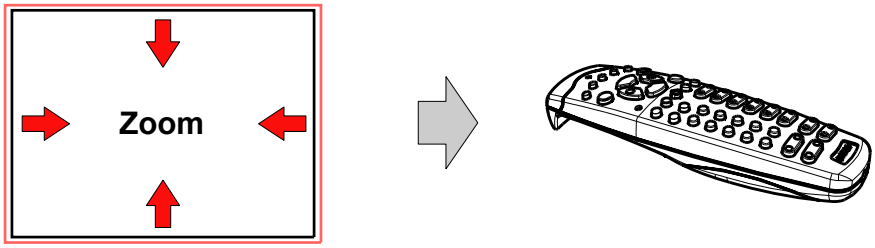



Image 4-10

8. If necessary, repeat from step 2 until the hatch pattern of the stacked projector is perfectly aligned with the hatch pattern of the reference projector.

**In case of a triple stacked table mount projector configuration adjust and align first the bottommost projector (reference), than the projector in the middle and finally the uppermost projector.**

# 5. CONNECTIONS

### About this chapter

This chapter describes more in detail the power (P), the input source (S) and the communication (C) connections of the FLM R20+ Performer.

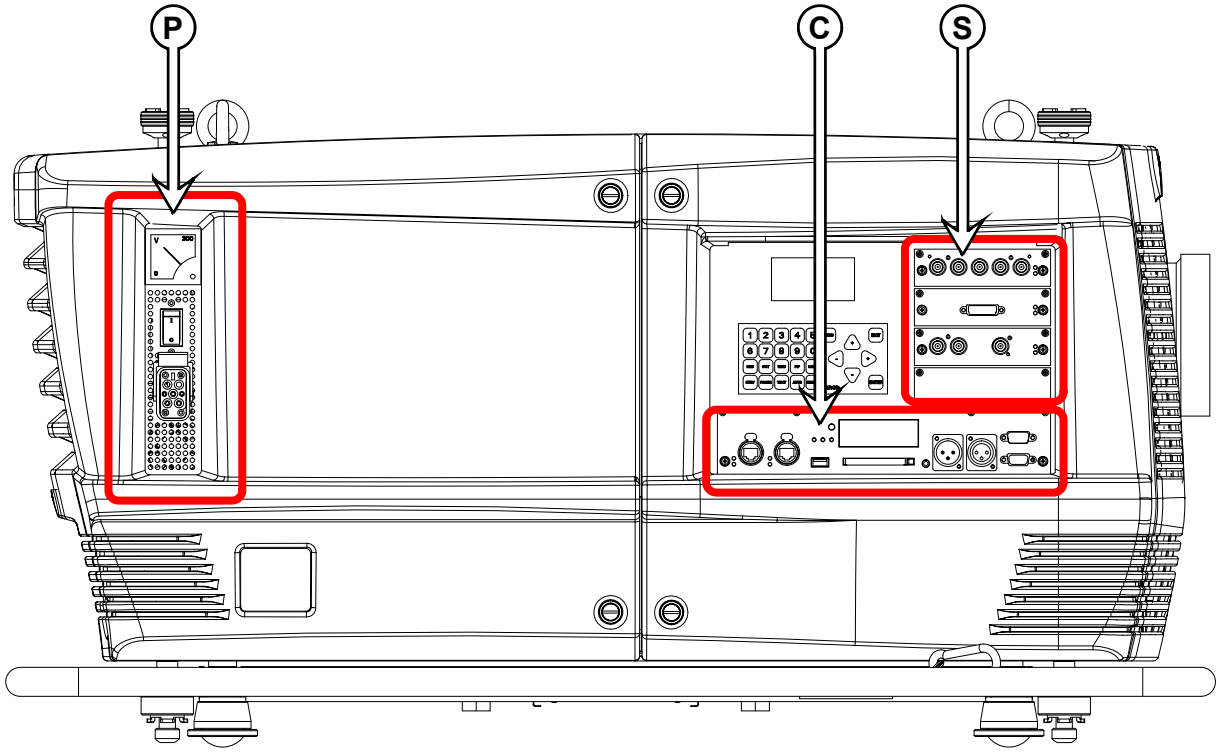



Image 5-1

### Overview

- Power connection
- Input source connections
- Communication connections

## 5.1 Power connection

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

### How to connect your projector with the local power net ?

1. Ensure that the power switch (S) stands in the “0” (OFF) position.
2. Connect the power cord (P) with the power input socket of the projector as illustrated below.
3. Secure the power plug by locking the plug holder clamp (H).
4. Connect the other end of the power cord with the local power net.
   ***Caution:*** *Ensure that the power net meets the power requirements of the projector, which are: 200-240 VAC, 50–60 Hz, 16 amps at 230 VAC.*

The voltmeter (M) will immediately indicate the value of the mains voltage as soon as the projector is connected with the power net.

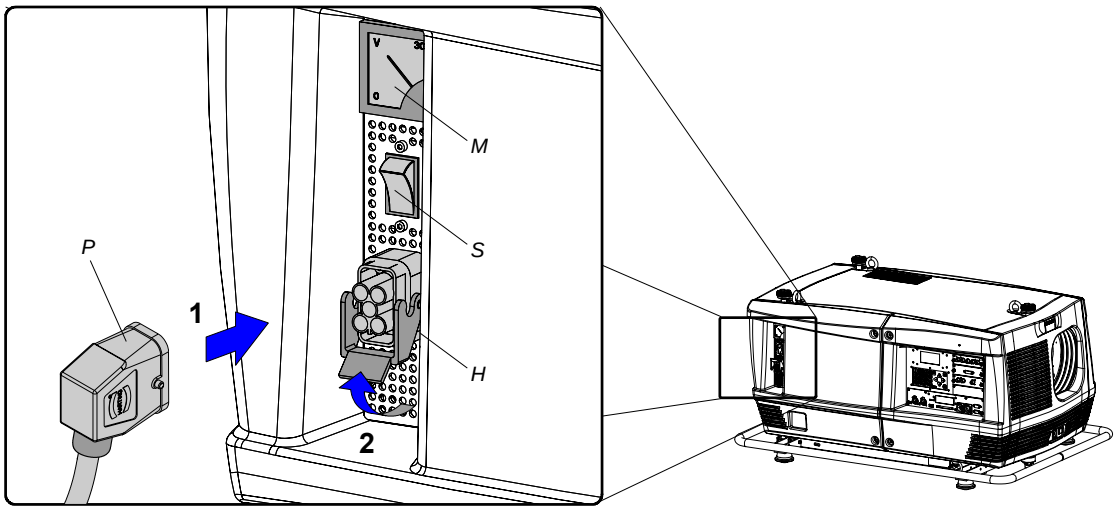



Image 5-2

**WARNING: Do not attempt operation if the AC supply and cord are not within the specified voltage and power range.**

**CAUTION: Once the projector is switched to standby, the lamp cooling fans will continue to run for approximately five minutes to ensure that the projector and lamp have sufficiently cooled, at which point the fans will automatically decrease to standby. To avoid thermal stress that can lead to premature lamp failure, never unplug the line cord while the lamp cooling fans are running, and never unplug to power down.**

## Fuses

The projector is protected with an automatic circuit breaker of 35 A which is built in into the power switch.

## Volt meter

After starting up the projector (lamp ignition) check if the value indicated by the volt meter is still within the specified power range of the projector. Note that in case the power net drops significantly during start up, the lamp will fail the ignite. If this is the case, take the necessary measures to reinforce the power net to the projector before starting up the projector again.

## Spare power plug

The projector is delivered with a spare power plug. This spare power plug is attached behind the nameplate of the projector. Remove the cover of the lamp first to access this spare power plug, see "Removal of the lamp cover", page 161. Note that only qualified technical personnel may install a new power plug.

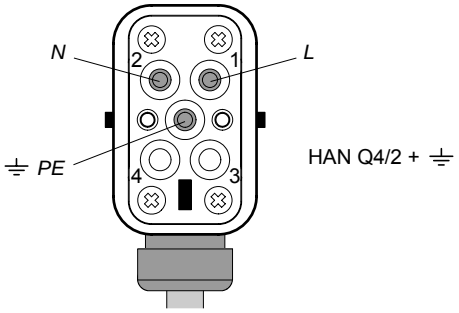



Image 5-3
Pin configuration power plug HAN Q4/2 + PE.

## 5.2 Input source connections

### General

The input and communication unit is equipped with four input slots, which accept any type of input module designed for the FLM projector. The modularity of the input modules makes the FLM projector very flexible regarding input source connectivity. Note that the slot numbering is done from top to bottom. So, the uppermost slot is slot number “1”, the second is slot number “2”... etc. All input modules have two status LED’s. The green LED lights up if the input module is selected as the active input module. The yellow LED lights up if the input module has detected valid input syncs.

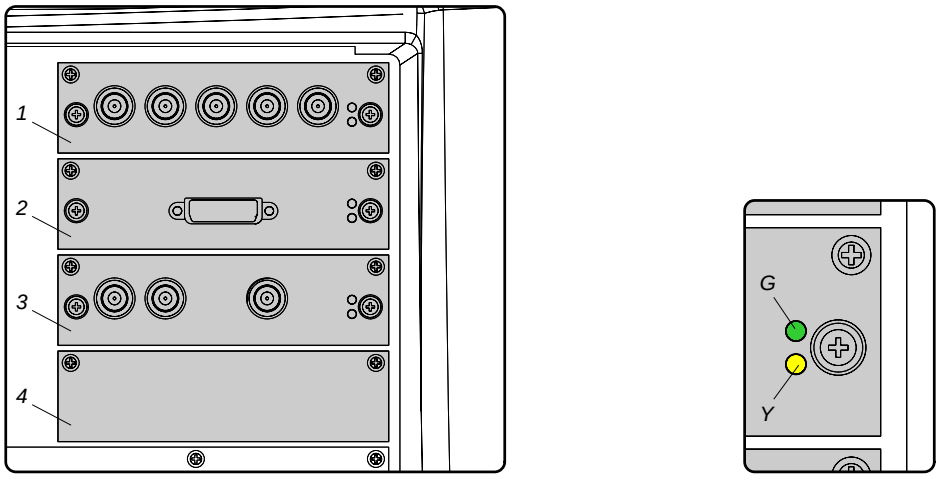



Image 5-4

**CAUTION: Always install a cover plate on an unused input slot. This to prevent dust intrusion into the projector.**

### Available input modules

Image 5-5
5 Cable input (Multi purpose) (**R9854430**).

Image 5-6
High bandwidth data input (RGB) (**R9854440**).

Image 5-7
HDSDI - SDI input (**R9854450**).

Image 5-8
DVI input (**R9854460**).

Image 5-9
Cover plate for unused input slot (**R848607**).

**The FLM R20+ Performer is standard equipped with one 5 cable input module, one HDSDI - SDI input module and one DVI input module. Input slot number 4 (lowermost) is covered with a input cover plate.**

**For more information about the FLM input modules see chapter “Specifications”.**

## 5.3 Communication connections

### Communication interface

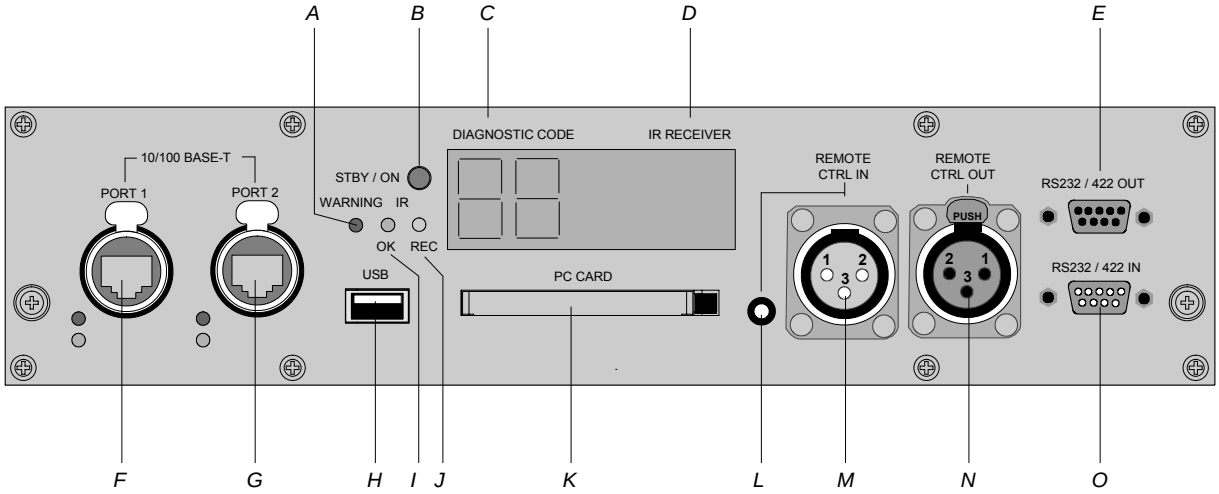



Image 5-10

A Warning LED.
B Projector status LED.
C Two digit LED display for diagnostic code.
D IR-receiver (side).
E RS232/422 loop through output port.
F Ethernet port 1.
G Ethernet port 2.
H USB port.
I IR signal received LED.
J IR signal acknowledged LED.
K PCMCIA card-bus (slot).
L Mini-jack input port for remote control.
M XLR input port for remote control.
N XLR output port for remote control.
O RS232/422 input port.

### Projector status

The projector “status” LED (B) lights up green while in operation. The same LED lights up red when the projector is switched to standby.

Besides the projector status LED (B) the communication interface has also a “warning” LED (A) which blinks in case the projector encounters an internal problem concerning fan speed, temperature, supply voltages, ... etc. These type of problems still allows the projector to operate (the show can go on) but an action will be required within a short time period. More information about the involved problem is given on the local LCD display of the projector.

A two character 7-segment display (C) shows, during normal operation, the selected input slot number. If an error has occurred then an error code appears on this two digit LED display.

### IR communication (RC5)

An IR receiver (D) is mounted on the communication interface. Note that there is also an IR receiver mounted at the front and at the rear of the projector. When using the remote control unit (wired or wireless), the “IR REC” (I) and the “IR OK” (J) LED’s will light up indicating an IR signal was received and recognized.

## Wired remote control

If desired the remote control unit can be wired and plugged in into the 3,5 mm mini jack socket (L) or, when using a rugged wire with XLR plugs, plugged in into the male XLR port (M) on the communication interface. Besides the XLR input port a female XLR connector (N) for wired RC5 output is provided. This connector creates a buffered RC5 signal, available for the next projector in the daisy chain. Whenever the projector has no power, a passive loop through is created from the remote control input port to the female XLR output port (N). So, the following projector in the daisy chain will still receive his RC5 code. Note that the RC5 in/out signals are without carrier.

| Mini jack plug | |
|---|---|
| **Pin** | **Description** |
| S | GND |
| T | RC5 in |
| R | n.c. or GND |

| XLR – Remote CTRL in | |
|---|---|
| **Pin** | **Description** |
| 1 | GND |
| 2 | RC5 in |
| 3 | XLR present sense |

| XLR – Remote CTRL out | |
|---|---|
| **Pin** | **Description** |
| 1 | GND |
| 2 | RC5 out |
| 3 | XLR present sense |

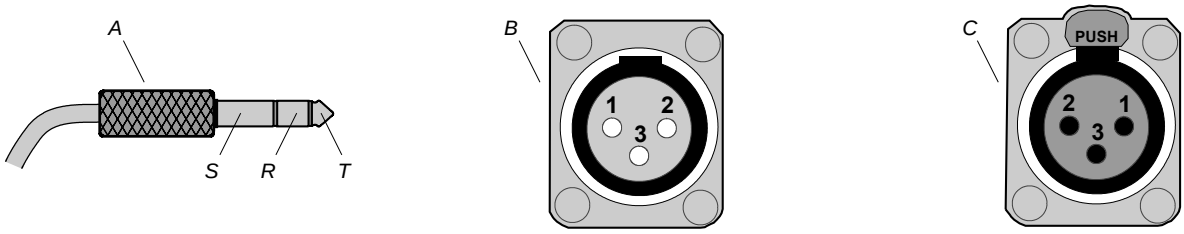



Image 5-11

A Mini stereo jack plug.

- S : SLeeve (shield)
- R : Ring
- T : Tip

B Male XLR socket.
C Female XLR socket.

## RS232/422 serial communication

The communication interface of the FLM R20+ Performer supports RS232 and RS422 serial communication. You can use the RS232/RS422 input port (O) to connect a local PC to your FLM projector. This way you can configure and control your FLM projector from your local PC.

**Do not forget to set the projector's baud rate (default = 115200) to match that of the computer.**

The communication interface has also an active RS232/RS422 loop through output port (E). Whenever the projector has no power, a passive loop through is created from the RS232/RS422 input port (O) to the RS232/RS422 output port (E). So, the following projector in the daisy chain will still receive his RS232/RS422 commands.

Advantages of using RS232/RS422 serial communication:

- easy adjustment of the projector via PC (or MAC).
- allow storage of multiple projector configurations and set ups.
- wide range of control possibilities.
- address range from 0 to 255.
- sending data to the projector (update).
- copying data from the projector (backup).

| RS232/422 input port | |
|---|---|
| **Pin** | **Description** |
| 1 | DCD : Data Carrier Detect |
| 2 | RXD- : Receive Data |
| 3 | TXD- : Transmitted Data |

| RS232/422 output port | |
|---|---|
| **Pin** | **Description** |
| 1 | — (not connected) — |
| 2 | RXD- : Receive Data |
| 3 | TXD- : Transmitted Data |

| RS232/422 input port | |
|---|---|
| **Pin** | **Description** |
| 4 | DTR : Data Terminal Ready [RS232]<br>TXD+ : Transmitted Data [RS422] |
| 5 | GND : Ground |
| 6 | DSR : Data Set Ready [RS232]<br>RXD+ : Received Data [RS422] |
| 7 | — (not connected) — |
| 8 | CTS : Clear To Send |
| 9 | RI : Ring Indicator |

| RS232/422 output port | |
|---|---|
| **Pin** | **Description** |
| 4 | DTR : Data Terminal Ready [RS232]<br>TXD+ : Transmitted Data [RS422] |
| 5 | GND : Ground |
| 6 | DSR : Data Set Ready [RS232]<br>RXD+ : Received Data [RS422] |
| 7 | — (not connected) — |
| 8 | — (not connected) — |
| 9 | — (not connected) — |


Image 5-12
A Pin numbering male DB–9 connector.
B Pin numbering female DB-9 connector.

**RS232**

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is > + 3V, Logical '1' is < - 3V. The range between -3V and +3V is a the transition zone.

**RS422**

An EIA serial digital interface standard that specifies the electrical characteristics of balanced (differential) voltage, digital interface circuits. This standard is usable over longer distances than RS-232. This signal governs the asynchronous transmission of computer data at speeds of up to 920,000 bits per second. It is also used as the serial port standard for Macintosh computers. When the difference between the 2 lines is < - 0.2V that equals with a logical '0'. When the difference is > +0.2V that equals to a logical '1'..

## Ethernet network communication

The FLM projector can be connected to a LAN (local area network) using port 1 (F) or port 2 (G) on the communication interface. Once connected to the LAN, users are capable of accessing the projector from any location, inside or outside (if allowed) their company network using the FLM control software: Projector Toolset. This toolset locates the projector 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.

As there is a need to daisy chain projectors when they are in Ethernet network, an Ethernet switch is build in. the incoming network is hereby available for the internal PC and for the next device in the chain. In this way a 'star' network interconnection can be avoid. The switch used is a stand alone 10/100Mbit Ethernet switch. This assures no influence on the network speed. Whenever a slow (10Mbit) device is connected the speed between the 100Mbit devices remains 100Mbit.

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

**The connectors used for both Ethernet ports (F & G) 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. The 2 ports are functionally identical. Both ports are connected via the projector hub (Auto sensing enabled).**

| 10/100 Base-T — RJ45 port | |
|---|---|
| **Pin** | **Description** |
| 1 | TXD+ |
| 2 | TXD- |
| 3 | RXD+ |
| 4 | — |
| 5 | — |
| 6 | RXD- |
| 7 | — |
| 8 | — |

## USB port

The communication interface is equipped with a master USB port, type “A” connector (H). This USB port will simplify the service procedures for software updates or for taking backup files from the projector without network connection. An USB-stick is plugged into the USB port and files can be transferred from or to the projector using the local or remote control unit. Note that the USB-stick has to be Linux FAT16 compatible.

## Card bus connector (PCMCIA)

This card bus connector (type II) allows you to connect your FLM projector with your LAN, using a wireless-LAN card supported by Barco.

# 6. GETTING STARTED

### About this chapter

This chapter describes the functions on the remote control and local keypad and gives an overview how to start up the projector. If gives also a brief overview of the direct adjustment possible with these controls.

### Overview

- RCU & Local keypad
- Terminology overview
- Operating the projector
- Using the RCU
- Quick setup adjustments
- Projector Address
- Source selection
- Controlling the Projector

## 6.1 RCU & Local keypad

### How controlling the projector ?

The projector can be controlled by the local keypad or by the remote control unit.

### Location of the local keypad ?

The local keypad is located on the input side of the projector.

### Remote control functions.

This remote control includes a battery powered infrared (IR) transmitter that allows the user to control the projector remotely. This remote control is used for source selection, control, adaptation and set up.

Other functions of the remote control are :

- switching between stand by and operational mode.
- switching to "pause" (blanked picture, full power for immediate restarting)
- direct access to all connected sources.

## 6.2 Terminology overview

### Overview

The following table gives an overview of the different functionality of the keys.

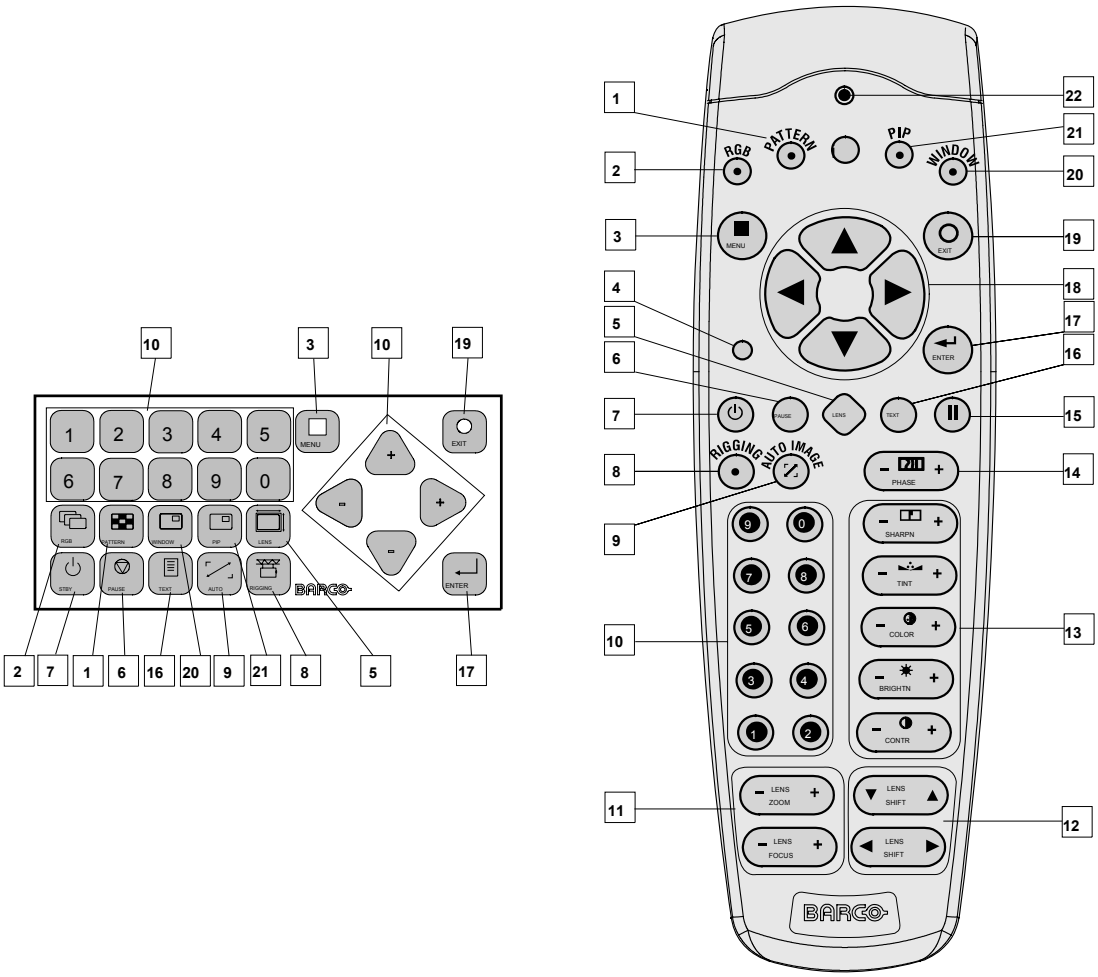



Image 6-1
Local keypad & remote control

| Ind. | Key name | Description |
|---|---|---|
| 1 | Pattern key | Direct access key to the internal pattern selection menu. |
| 2 | RGB | Toggle key to enable and disable colors in the adjustment mode. Toggle between red, green, blue and full RGB. |
| 3 | MENU | Access key to the menu structure and key to quickly quit the adjustment menus. |
| 4 | Address key | (recessed key), to enter the address of the projector (between 0 and 9) in the remote control. Press the recessed address key with a pencil, followed by pressing one digit button between 0 and 9. |
| 5 | LENS | Direct access key to the lens adjustment menus. Toggling this key will change the projected pattern. |
| 6 | PAUSE | To stop projection for a short time, press 'PAUSE'. The image disappears but full power is retained for immediate restarting. Shutter is closed. |
| 7 | STBY | Standby function switch off the lamp and lamp electronics. The lamp cooling fans remain active for about 5 minutes. The speed of the other fans is reduced. |
| 8 | Rigging | Direct access key to the rigging adjustment menus (optional). |
| 9 | Auto image | Direct access key to automatically project the correct image. |
| 10 | Digit buttons | Direct input selection or numeric entries |
| 11 | Lens zoom/focus | Zoom and focus controls of the lens |
| 12 | Lens shift | Shift control of the lens, to shift the lens up/down or left/right |

| Ind. | Key name | Description |
|---|---|---|
| 13 | Picture controls | Use these buttons to obtain the desired picture level. |
| 14 | PHASE | Used to remove the horizontal instability of the image (usually for RGB source). It adjusts the phase of the pixel sampling clock relative to the incoming signal. |
| 15 | FREEZ | To freeze the actual projected image. |
| 16 | TEXT | Toggle key to activate or deactivate on screen text boxes while adjusting a setting.<br>When adjusting one of the image controls, e.g.during a meeting, the normally displayed bar scale can be deactivated by pressing 'TEXT' key first. To re-display the bar scale on the screen, press 'TEXT' key again. When TEXT is 'off', no adjustment menu's will be displayed on the screen when entering the adjustment mode. All menus and adjustments remain active on the local LCD panel. |
| 17 | ENTER | Key to confirm an adjustment or selection in the adjustment mode. |
| 18 | Cursor keys | To make menu selections when in the adjustment mode |
| 19 | EXIT | Key to go one menu stage higher than the actual position when in the adjustment mode. |
| 20 | WINDOW | Selection of the active window, also in PIP mode. |
| 21 | PIP | Direct access key for picture in picture selection. |
| 22 | RC Operating indication | Lights up when a button on the remote control is pressed. (This is a visual indicator to check the operation of the remote control) |

Table 6-1

## 6.3 Operating the projector

### Overview

- Switching on
- Errors, warnings and messages during start up
- Switching to standby
- Switching off

### 6.3.1 Switching on

#### How to switch on.

1. Press the power switch to switch on the projector.

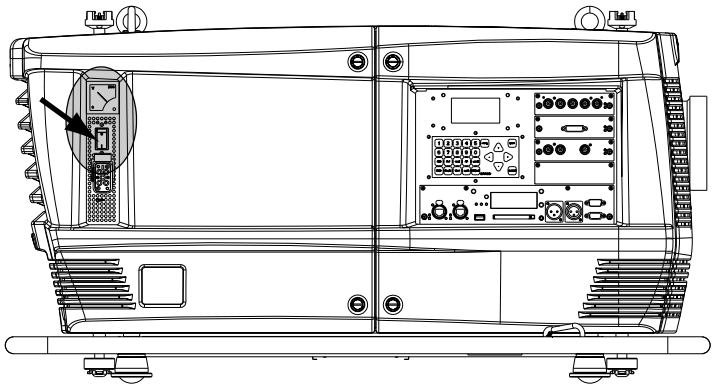


Image 6-2
Switching on

- When '0' is visible, the projector is switched off.
- When '1' is visible, the projector is switched on.

The projector starts up in standby. The menus are accessible via the local LCD panel.

To display an image, the standby key must be pressed once.

**The actual input voltage is indicated on the voltmeter just above the power switch.**

### Starting image projection via the standby key.

1. Press **Stand by** key once on the local keypad or on the remote control.

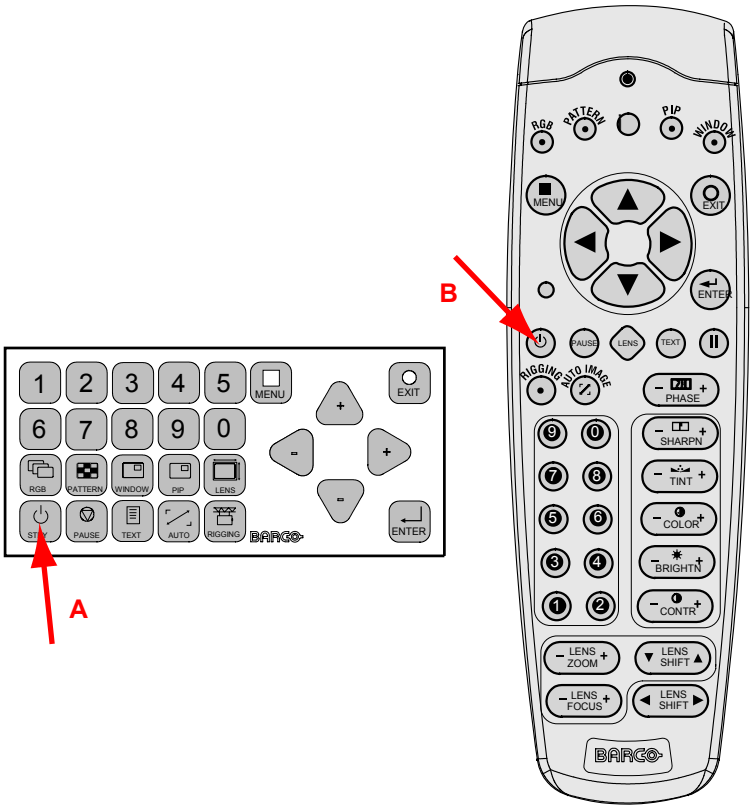



Image 6-3
Stand by indication

A Stand by indication on local keypad
B Stand by indication on remote control

The projector status LED lights up.

The projector starts up on the last saved source.

Some lamp and runtime warnings can be displayed when an image is displayed after a start up.

## 6.3.2 Errors, warnings and messages during start up

### Temperature error DMD

When the temperature of one of the DMD's is too low or too high the projector is switched automatically to standby. An error code will be displayed on the local LCD panel. For a list of possible error codes, see "Error codes", page 173.

## 6.3.3 Switching to standby

### How to switch to standby?

1. Press **Standby** to switch the projector to standby.

**Switching to Standby. When the projector is running and you want to go to standby, press the standby key for 2 seconds. Do not press any longer on the standby key otherwise the projector will restart.**

**All custom settings are written to the internal backup device. A message 'Save data ...' indicates this process. Never switch off the projector while this message is displayed.**

### 6.3.4 Switching off

#### How to switch off the projector?

1. Press first **Standby**.
2. Let cool down the projector until the fans decrease, at least 5 min.
3. Switch off the projector with the power switch.

**CAUTION: Never switch off the projector while the message 'Save data ... ' is displayed !**

## 6.4 Using the RCU

#### Pointing to the reflective screen

1. Point the front of the RCU to the reflective screen surface.

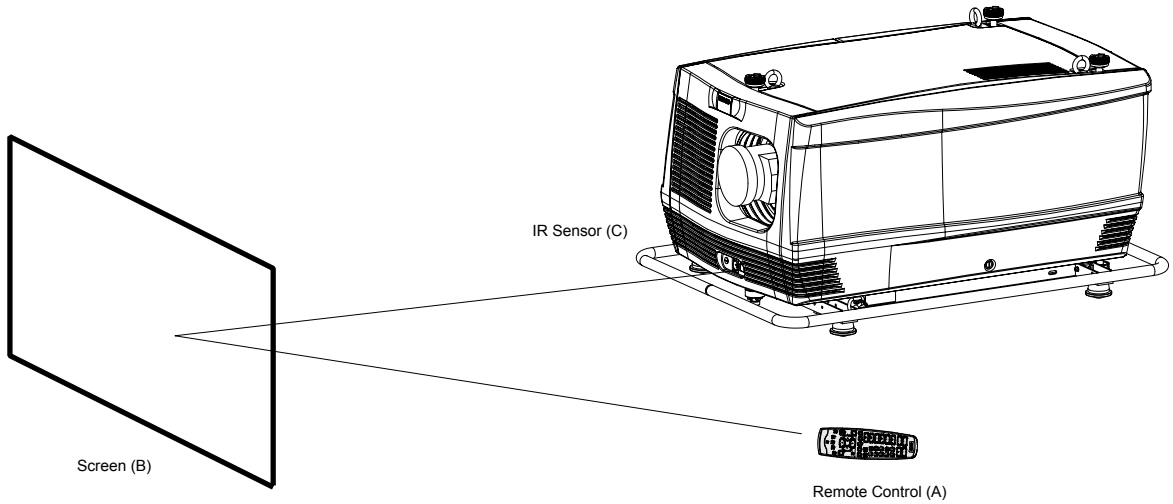



Image 6-4
IR control via the reflective screen

A Remote control
B Screen
C Front IR-sensor

#### Hardwired Remote Input

1. Plug one end of the remote cable in the connector on the bottom of the RCU.

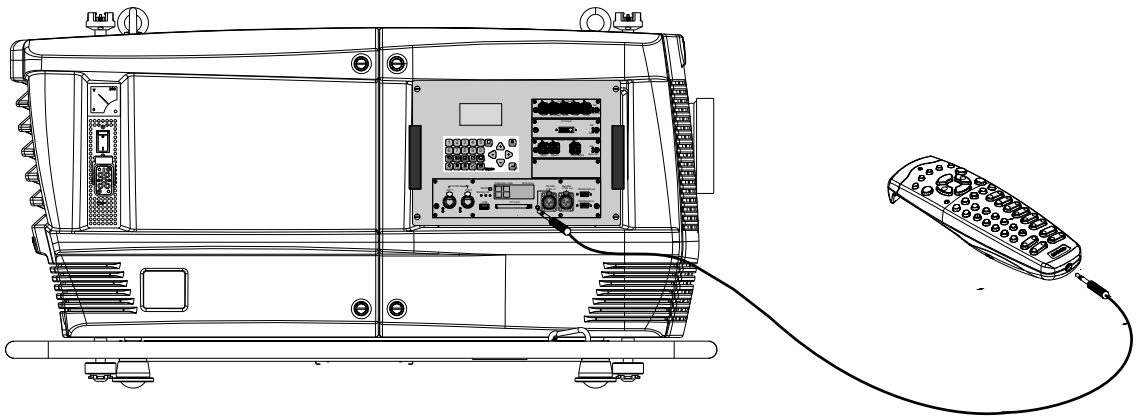


Image 6-5

2. Plug the other end in the small connector in the input panel of the projector labeled ***Remote CTRL in***.

**The Remote connection uses a standard two wire cable terminated on each end with a 3.5 mm male (mono/stereo) phone jack.**

**This cable is not delivered but is available in most electronic or audio shops.**

## Hardwired to the XLR input

1. Plug one end of the remote cable in the connector on the bottom of the RCU
2. Plug the other end in the big connector in the input panel of the projector labelled ***Remote CTRL in***.

## Directly to one of the IR sensors

When using the wireless remote control, make sure you are within the effective operating distance (30m, 100ft in a straight line). The remote control unit will not function properly if strong light strikes the sensor window or if there are obstacles between the remote control unit and the projector IR sensor.

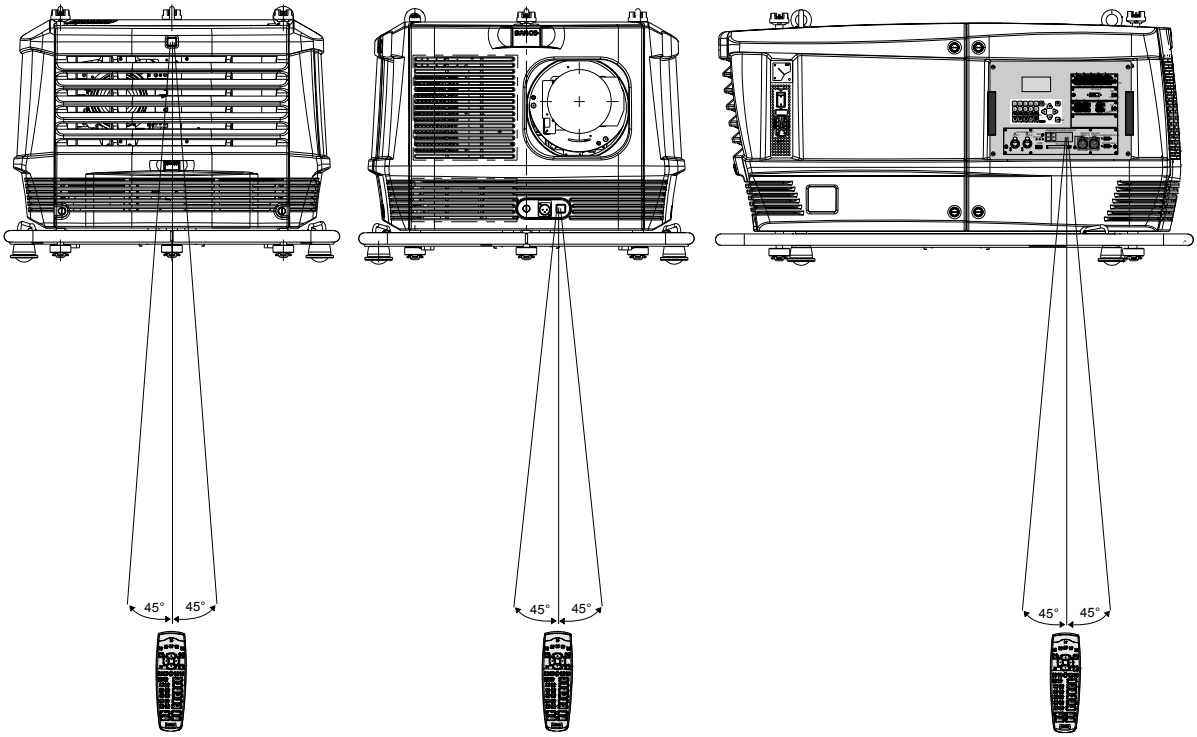



Image 6-6
RCU to one of the IR sensors

## 6.5 Quick setup adjustments

### Overview

- Text boxes ON or OFF
- Quick Lens Adjustment
- Quick picture in picture

### 6.5.1 Text boxes ON or OFF

#### Text toggle function

The on-screen text boxes can be switched OFF so that an adjustment during the operation of the projector are not visible on the screen. The adjustment indication remains visible on the local LCD screen.

To toggle Text ON or OFF, press the **TEXT** key on the remote control or local keypad.

### 6.5.2 Quick Lens Adjustment

#### 6.5.2.1 Quick Lens Adjustment via LENS key

#### Quick zoom/focus adjustment

1. Press the **LENS** key on the remote control or local keypad.

   The zoom/focus menu will be displayed.

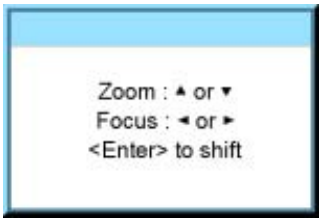



Image 6-7

2. Push the cursor key ▲ or ▼ to zoom and ◄ or ► to focus the image.
3. When finished, press **EXIT** key to return or **ENTER** to continue to the shift adjustment.

**Press the LENS key to switch to another pattern. Different patterns are available.**

#### Quick shift adjustment

1. Press the **LENS** key on the remote control or local keypad.

   The zoom/focus menu will be displayed.

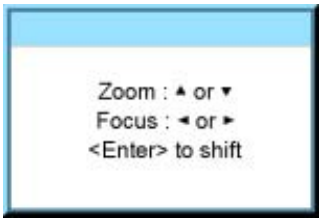



Image 6-8

2. Press **ENTER**.

The shift menu will be displayed.

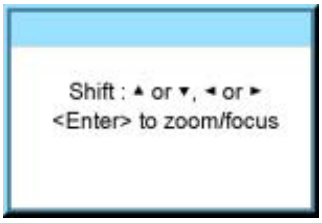



Image 6-9

3. Push the cursor key ▲ or ▼ to shift the image up or down and ◄ or ► to shift the image left or right.
4. When finished, press **EXIT** key to return or **ENTER** to continue to zoom/focus.

**Press the LENS key to switch to another pattern. Different patterns are available.**

### 6.5.2.2 Direct Lens Adjustment (RCU)

#### Lens adjustment buttons on the Remote Control

On the Remote Control four buttons with double action are provided, allowing direct alignment for lens ZOOM, FOCUS, HORIZONTAL SHIFT and VERTICAL SHIFT.

1. Press **LENS ZOOM** button [-] or [+] (A) for correct image size on the screen.

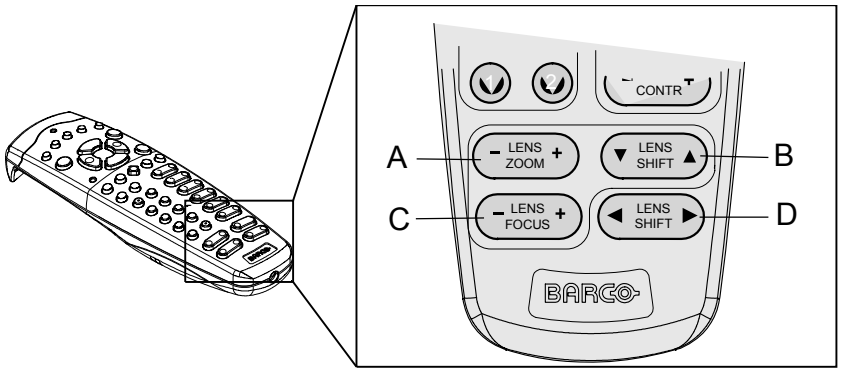



Image 6-10
Direct lens adjustment keys

A Zoom
B Vertical shift
C Focus
D Horizontal shift

2. Press **LENS FOCUS** button [-] or [+] (C) for an overall focus of the image.
3. Press ▲ **LENS SHIFT** ▼ button for correct vertical position of the image on the screen.
4. Press ◄ **LENS SHIFT** ► button for correct horizontal position of the image on the screen.

### 6.5.3 Quick picture in picture

#### Quick On - Off

Press on the **PIP** key on the remote control or the local keypad to activate the Load layout window.

Use the ▲ ▼ key to scroll to the desired layout and press **ENTER** to activate.

**Select *Main full screen* to switch off PIP.**

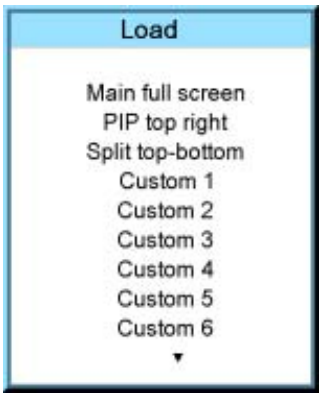



Image 6-11

## 6.6 Projector Address

### 6.6.1 Displaying and Programming addresses

#### Displaying the Projector Address on the Screen.

1. Press **Address** key (recessed key on the RCU) with a pencil.

   The projector's address is displayed as first item in the Identification screen.


Image 6-12

**To continue using the RCU with that specific address, it is necessary to enter the same address with the digit buttons (address between 0 and 9) within 5 seconds after pushing the address key. For example : if the Address key displays projector address 003, then press "3" digit button on the RCU to set the RCU's address to match the projector's address. Do not press 003 digits. This will address the remote control to '0' and control all projectors in the room. If the address is not entered within 5 seconds, the RCU returns to its default address (zero address) and control all projectors in the room.**

#### How to Program an Address into the RCU?

1. Press the **Address** key (recessed key on the RCU) with a pencil.
2. Enter the address with the digit buttons within 5 seconds after pushing the address key.
   ***Note:*** *That address can be any digit between 0 and 9.*

**The LED on the remote control must lit up while pressing a digit key. Otherwise the address is not entered in the remote control.**

### 6.6.2 Controlling the projector

**Projector address**

Address installed in the projector to be individually controlled.

**Common address**

Projector will always execute the command coming from a RCU programmed with that common address.

#### Why a projector address ?

As more than one projector can be installed in a room, each projector should be separately addressable with an RCU or computer. Therefore each projector has its own address.

#### Set up an individual Projector Address.

The set up of a projector address can be done via the software. See xxx in chapter 'Projector Control'.

#### Projector controlling.

Every projector requires an individual address between 0 and 255 which can be set in the Service mode.

When the address is set, the projector can be controlled now:

- RCU for addresses between 0 and 9.
- computer, e.g. IBM PC (or compatible), Apple MAC, etc. for addresses between 0 and 255.

#### Common Address

Every projector has a common address '0' or '1'. The choice between '0' and '1' can be selected in xxx.

## 6.7 Source selection

#### Source selection when no picture in picture is active

Use the digit keys on the remote control or local keypad to active the desired source.

#### Source selection when picture in picture is active

Use the **Window** button on the remote control or the local keypad to select the main window or the picture in picture (PiP) window.

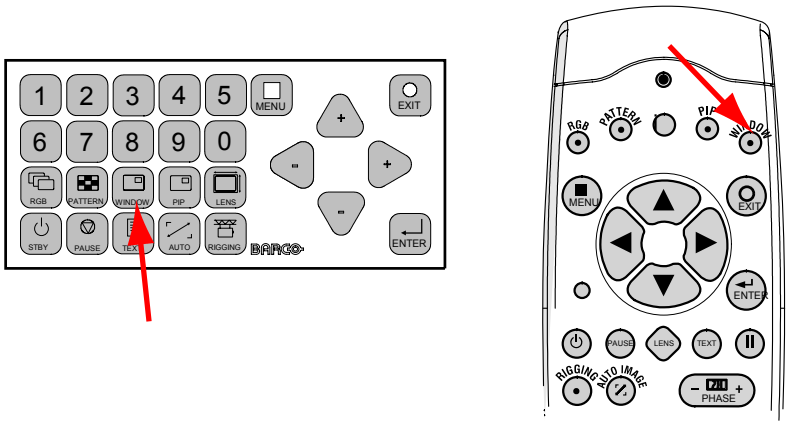



Image 6-13
Window selection button

The outline of the selected window gets a colored rectangle to indicate the selection. For the main window, the color is blue. For the picture in picture window, the color is orange.

Once the desired window is activated (main window or picture in picture window) all keys on the remote control or local keypad can now control that selected window.

To select the source for the picture in picture window, press Window button until PiP window is activated and then select the desired source with the digit keys.

To select the source for the main window, press Window button until the main window is activated and then select the desired source with the digit keys.

## 6.8 Controlling the Projector

### Picture Controls

When an image control is pressed, a text box with a bar scale, icon and function name of the control, e.g. 'brightness...' appears on the screen (only if text is ON). See example screen. The length of the bar scale and the value of the numeric indication indicate the current memorized setting for this source. The bar scale changes as the control buttons on the RCU are pressed.

| | |
|---|---|
| Brightness | A correct 'brightness' setting is important for good image reproduction.<br>Use the + button for a higher brightness.<br>Use the - button for a lower brightness. |
| Contrast | A correct 'contrast' setting is important for good image reproduction. Adjust the contrast to the level you prefer, according to room lighting conditions.<br>Use the + button for a higher contrast.<br>Use the - button for lower contrast. |
| Color | Color saturation is only active for all type of video sources, such as Video, S-Video, SDI, HDSDI. Adjust the color intensity of the picture.<br>Use the + button for richer colors.<br>Use the - button for lighter colors. |
| Tint | Tint is only active for Video and S-Video when using the NTSC 4.43 or NTSC 3.58 system.<br>Use the + button for more tint<br>Use the - button for less tint. |
| Sharpness | The sharpness function is used to adjust the image sharpness of video signals.<br>Use the + button for more sharpness<br>Use the - button for less sharpness |
| Phase | Use the + or - side of the phase control button to adjust the phase. |

### The Pause Key

When the Pause key is pressed, the image projection is stopped, a black screen will be displayed and the projector remains with full power for immediate restart. The 7-segment display on the projector will show a "P". The shutter is closed.

To restart the image, press one of the following keys:

- Press **Pause** key.
- Select a source number.

### The Stand-by Key

When the Stand-by key is pressed, the image projection is stopped and the projector goes to stand-by. This situation is used when a projection stop is planned for a longer period. All custom settings are saved to an internal backup device. A message 'Save data ...' is displayed during this backup operation.

# 7. START UP OF THE ADJUSTMENT MODE

### Overview

- About the adjustment mode
- About the use of the remote control and the local keypad
- Start up the adjustment mode
- Navigation and adjustments
- On screen menus versus LCD display menus

## 7.1 About the adjustment mode

### Overview

As the adjustment mode is the central place to control and align the projector, 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.
- Layout adjustment: set up of the main window and the picture in picture window.
- Lamp: manage the lamp mode, the lamp use, lamp type and history
- Alignment: groups all controls necessary during the setup of the projector onto a screen.
- Projector control: contains the accessibility settings of the projector, such as address and communication setup.
- Service: contains information about how the projector is performing. This information will be useful when calling for a service intervention.

## 7.2 About the use of the remote control and the local keypad

### Overview

All navigations and adjustments can be done either with the remote control or with the local keypad.

Almost all the keys on the remote control have an equivalent on the local keypad.

Exceptions:

- ▲ on the remote control corresponds with the up + key on the local keypad.
- ▼ on the remote control corresponds with the down - key on the local keypad.
- ◄ on the remote control corresponds with the left - key on the local keypad
- ► on the remote control corresponds with the right + key on the local keypad

## 7.3 Start up the adjustment mode

### Start up tools

To start up the adjustment mode, use the remote control or the local keypad.

### How to start up?

1. Press **Menu** on the remote control (RCU) or on the local keypad to start up the *Adjustment* mode.

The main menu of the adjustment mode opens.


Image 7-1

## 7.4 Navigation and adjustments

### How to navigate in the menu structure?

Once in the menu structure, use the ▲ or ▼ keys on the remote control (or the ▲ or ▼ (+ or -) key on the local keypad) 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**.

When on a submenu, to return one step to the parent menu, press **EXIT**.

To escape the menu structure when on a menu, press **MENU**.

### How to make an adjustment?

With the remote control, press the ▲ or ▼ keys until the desired value (setup) is reached. Press **ENTER** to finalize the adjustment.

With the local keypad, press the ▲ or ▼ (+ or -) keys until the desired value (setup) is reached. Press **ENTER** to finalize the adjustment.

All adjustments will be indicated with an on-screen box with the name of the adjustment in the title bar, the length of the progress bar indicates the actual value. The value at the start and at the end of the progress bar indicates the adjustment ranges.

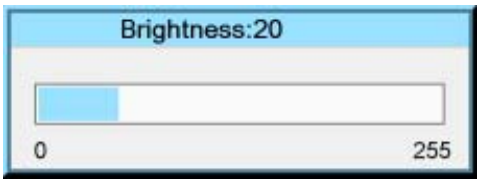



Image 7-2

## 7.5 On screen menus versus LCD display menus

### Overview

As the projector is equipped with an 8 lines LCD panel, the on-screen menus are also displayed on that LCD panel in the same structure as the on screen menus. These menus can be used in the same way as the on-screen menus.

The menus on the LCD panel are still reachable even when the projector lamp is not activated and when Text is in the off mode.

# 8. INPUT MENU

### Overview

- Overview flow
- Slot module type
- Input locking
- Minimum delay
- Native resolution
- Source switching
- No signal

## 8.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 |
|---|---|---|
| Input | | |
| | Slot module type | 5-cable |
| | | HD-SDI - SDI |
| | | DVI |
| | | HBW DATA |
| | Input locking | None |
| | | Automatic |
| | | Input 1 to 4 |
| | Minimum delay [On/Off] | |
| | Native resolution [On/Off] | |
| | Source switching | Effect |
| | | Transition time |
| | No signal | Color [black/blue] |
| | | Shutdown [Off/On] |
| | | Shutdown time |

## 8.2 Slot module type

### Overview

- About Input Setup
- Input configuration

### 8.2.1 About Input Setup

### Overview

Each input module must be configured before these module can be used. This configuration is necessary so that the projector knows which type of signal is connected to its input.

The projector has 4 input slots and these slots can be filled up in a random order with the available modules. Identical modules are allowed.

For more information about the available input modules and how to install, see "Input source connections", page 37.

**CAUTION: Always install a cover plate on an unused input slot. This to prevent dust intrusion into the projector.**

### 8.2.2 Input configuration

#### How to change?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Slot module type* and press **ENTER**.

   The slot overview window is displayed with the actual situation filled out.
4. Use the ▲ or ▼ key to select a slot.
   Toggle with **ENTER** until the correct setting is displayed between the brackets (except for DVI).

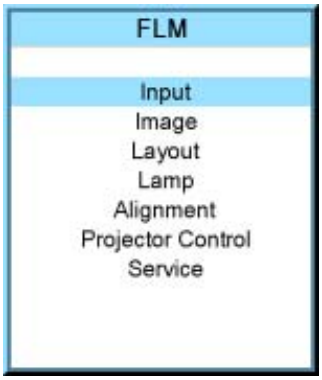


Image 8-1

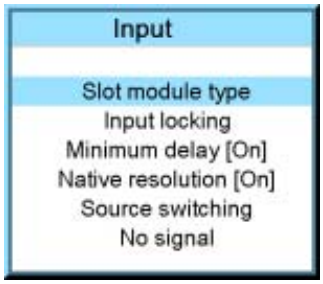


Image 8-2

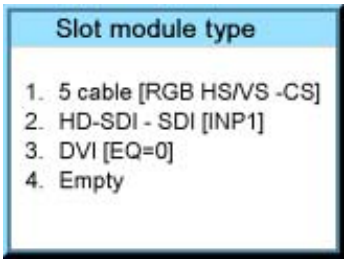


Image 8-3

#### Possible results.

| Input module | Indication | Description |
|---|---|---|
| 5 cable | RGB HS/VS - CS | RGB input with separate horizontal and vertical sync or separate composite sync. |
| | RGB CV | RGB input with composite video as sync signal |
| | RGB SOG | RGB input with sync on green |
| | YUV HS/VS - CS | Component video with separate horizontal and vertical sync or separate composite sync. |
| | YUV CV | Component video with composite video as sync signal |
| | YUV SOY | Component video with sync on Y |
| | CVBS | Composite video |
| | S-Video | Super video |
| HBW Data | RGB HS/VS - CS | RGB input with separate horizontal and vertical sync or separate composite sync. |
| | RGB SOG | RGB input with sync on green |
| | YUV HS/VS - CS | Component video with separate horizontal and vertical sync or separate composite sync. |
| | YUV SOY | Component video with sync on Y |

| Input module | Indication | Description |
|---|---|---|
| HD-SDI - SDI | INP1 | Input 1 selected |
| | INP 2 | Input 2 selected |

### DVI equalization

When a DVI module is selected, press **ENTER** to go in edit mode. Use ◄ or ► to key to change the equalization value.

Default value = 13.

For non DVI-compliant transmitter, stronger equalization may be necessary even for shorter cables.

For longer cables adjust between 0 and 13 (more equalization).

For shorter cables adjust between 13 and 15 (least equalization).

## 8.3 Input locking

### What is possible?

The output signal can be locked on an internal sync signal or on the sync signal of one of the input sources. Input locking can avoid that some windows in the output signal are slowly moving or trembling.

When automatic is selected, the lock will be set on the input signal of the main window.

### How to set up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Input locking* and press **ENTER**.

   The input locking window is displayed. The actual selected locking method is indicated by an arrow.
4. Use the ▲ or ▼ key to select the desired locking and press **ENTER**.

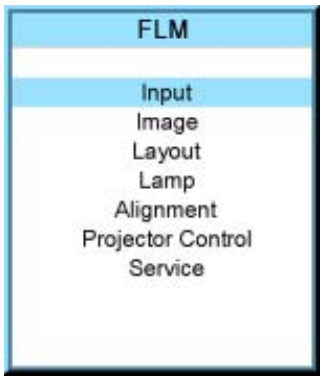


Image 8-4

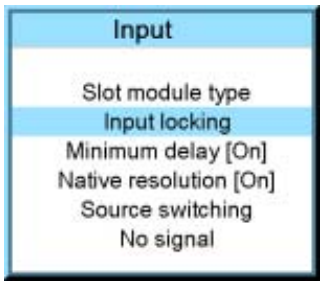


Image 8-5

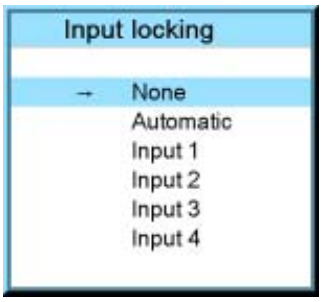


Image 8-6

When:

| | |
|---|---|
| None | Output is locked on an internal sync (60 Hz) |
| Automatic | Output is locked on the selected input for the main window |
| Input 1 | Output is locked on source 1 |
| Input 2 | Output is locked on source 2 |
| Input 3 | Output is locked on source 3 |
| Input 4 | Output is locked on source 4 |

## 8.4 Minimum delay

### Purpose

In normal mode, the processing (scaling and de-interlacing) in DLP projectors introduces a few frames delay (from input to screen). Setting the option *Minimum Delay* to "ON" disables all scaling and de-interlacing in the processing and reduces frame delay of the projector (from input to screen) to ONE frame, caused by the formatter board (DLP technology restriction). The intended use of this option is to apply native and progressive data to the projector and displaying it with minimum delay, using the full resolution of the projector. Other formats will be displayed either unscaled and/or interlaced.

This feature can be used if additional delay in the projector is not acceptable. For instance if a projector is showing the DVI loop out of another DLP or if an external scaler/de-interlacer does the processing.

### How to toggle the delay?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Minimum delay* and press **ENTER** to toggle between [On] and [Off].

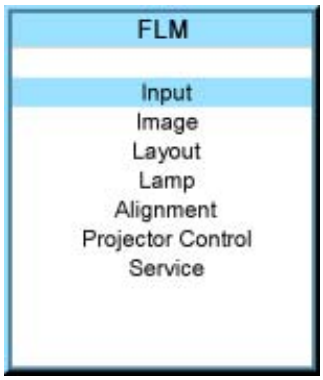



Image 8-7

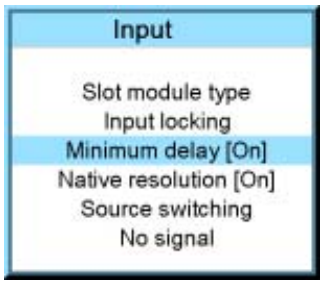



Image 8-8

## 8.5 Native resolution

### What can be done

The aim here is to always show the resolution of the source independently of the resolution of the DMD panels.

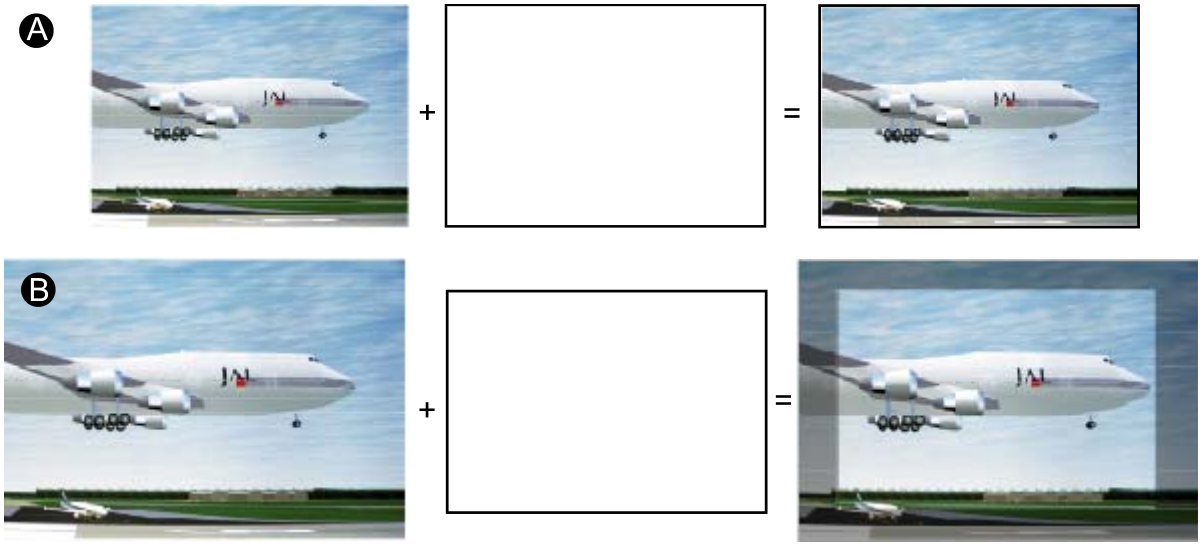



Image 8-9

When the *show native resolution* function is in the ON position, the projector handles the source as follows:

| Source | | | Projected image | | |
|---|---|---|---|---|---|
| Name | Ratio | Resolution | Ratio | Resolution | |
| XGA | 4:3 | 1024x768 | 4:3 | 1024x768 | image projected with black borders |
| SXGA | 5:4 | 1280x1024 | 5:4 | 1280x1024 | image projected with black borders |
| SXGA+ | 4:3 | 1400x1050 | 4:3 | 1400x1050 | normal image projected |
| UXGA | 4:3 | 1600x1200 | 4:3 | 1600x1200 | part of the image displayed, image scroll possible |

### How to toggle to native resolution?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Native resolution* and press **ENTER** to toggle between [On] and [Off].

   [On] : images displayed in native resolution

   [Off] : images scaled to fill the complete screen

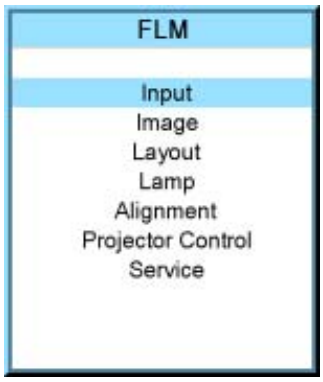



Image 8-10

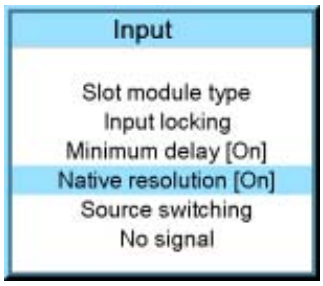



Image 8-11

**When native resolution is on, some other menus such as *Aspect ratio*, *timings* are greyed out.**

## 8.6 Source switching

### Switching from one source to another

To minimize undesired effects when switching from one source to another one can use the seamless switching mode, using the fade effect.

Image 8-12
Example of fade effect

### Switching mode set up

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Source switching* and press **ENTER**.

The Source switching menu is displayed.

4. Use the ▲ or ▼ key to select *Effect* and press **ENTER** to toggle between *No transition* and *Fade*.

| | |
|---|---|
| No transition | No source switching effect is activated. |
| Fade | Fade in, fade out effect is activated. Transition time can be set up. |

5. Use the ▲ or ▼ key to select *Transition time* and press **ENTER**.
6. Enter the desired time with the digit keys
   Or,
   use the ▲ or ▼ key to scroll until the desired time is reached. Press **ENTER** to activate.

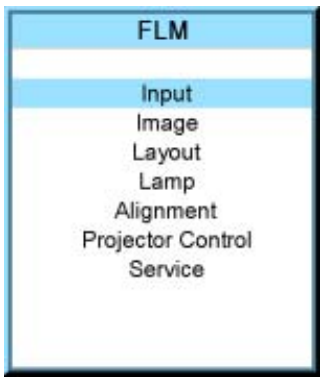


Image 8-13

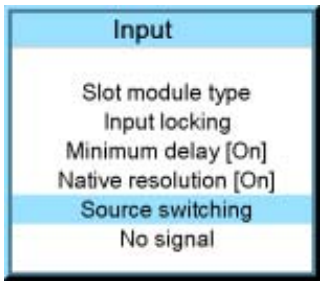


Image 8-14

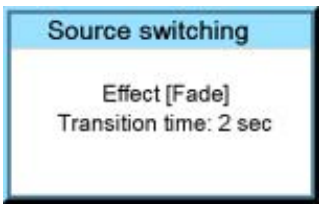


Image 8-15

## 8.7 No signal

### Overview

- Background color
- Shutdown setting
- Shutdown retarding time

### What can happen when no signal

When no signal available, a blue or black background color can be displayed or the projector can be shutdown with a certain retarding time.

### 8.7.1 Background color

### How to change the color

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *No signal* and press **ENTER** to toggle between [Black] and [Blue].

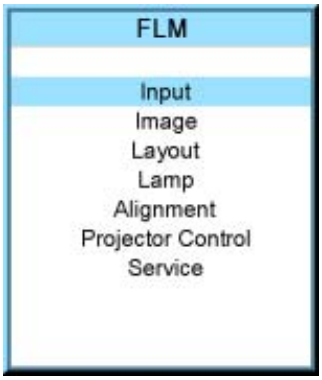


Image 8-16

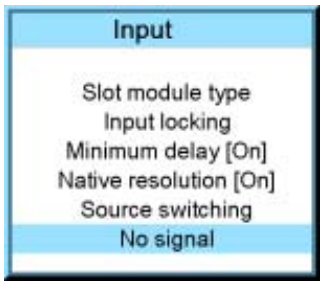


Image 8-17

Image 8-18

### 8.7.2 Shutdown setting

#### How to change the shutdown setting

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Shutdown* and press **ENTER** to toggle between [On] and [Off].

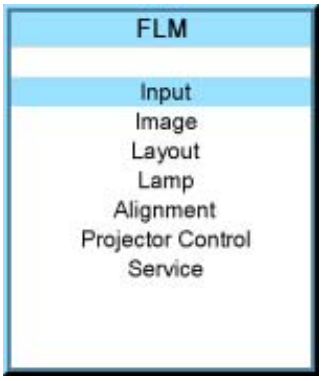


Image 8-19

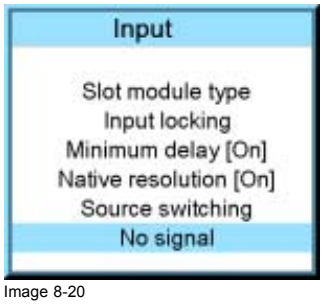


Image 8-20

Image 8-21

### 8.7.3 Shutdown retarding time

**Only accessible when *Shutdown* is set to [On].**

#### How to set the retarding time?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Input* and press **ENTER**.

   The Input menu is displayed.
3. Use the ▲ or ▼ key to select *Shutdown time* and press **ENTER**.
4. Use the ▲ or ▼ key to change the value.

Or,
enter the desired value with the keyboard.

When trying to exceed the maximum allowed value, the system will set it back to the maximum value.

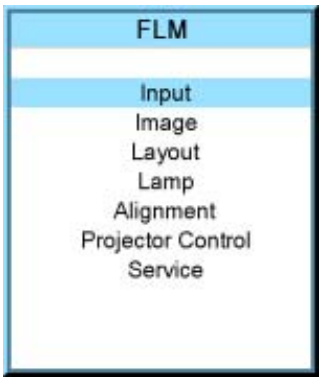


Image 8-22

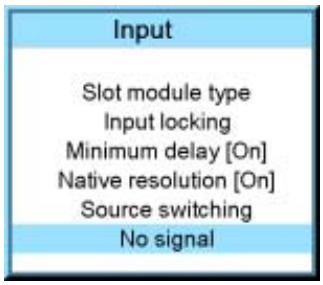


Image 8-23

Image 8-24

# 9. IMAGE MENU

### Overview

- Overview flow
- How to select the image adjustments?
- Image Settings
- Aspect ratio
- Timings
- Image files services
- Save custom settings

## 9.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| Image | | | |
| | Image settings | | |
| | | Contrast | |
| | | Brightness | |
| | | Saturation | |
| | | Tint | |
| | | Phase | |
| | | Sharpness | |
| | | Noise reduction | |
| | | Color temperature | |
| | | | Projector white |
| | | | Computer 9300K |
| | | | Video 6500K |
| | | | Film 5400K |
| | | | Broadcast 3200K |
| | | | Custom balance |
| | | Input balance | |
| | Aspect ratio | | |
| | | 4/3 | |
| | | 16/9 | |
| | | 5/4 | |
| | | 2.35 | |
| | | 1.88 | |
| | | 1.78 | |
| | | Custom | |
| | Timings | | |

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | | Total pixels | |
| | | Active pixels | |
| | | Horizontal start | |
| | | Period | |
| | | Total lines | |
| | | Active lines | |
| | | Vertical start | |
| | | Advanced settings | Clamp delay |
| | | | Clamp width |
| | | | Field polarity |
| | Image file services | | |
| | | Manual load | |
| | | Delete | |
| | | Delete all | |
| | | Rename | |
| | | Options | |
| | | | Load file |
| | Save custom settings | | |

## 9.2 How to select the image adjustments?

### Start up

1. Use the ▲ or ▼ key to select *Image*.
2. Press **ENTER** to select.

   The *Image* menu opens.

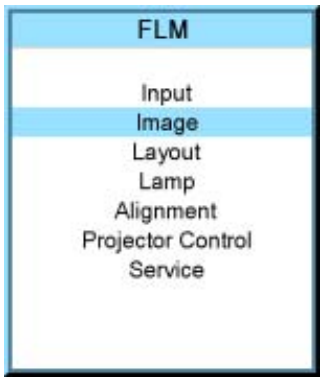



Image 9-1


Image 9-2

## 9.3 Image Settings

### Overview

- Contrast
- Brightness
- Saturation
- Tint (hue)
- Phase
- Sharpness
- Noise reduction
- Color temperature
- Input balance

### 9.3.1 Contrast

#### About Contrast

The contrast function is used to adjust the contrast between the light and dark areas of the displayed image.

#### How to change the contrast?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.

   The Contrast progress bar appears.
4. Use the ▲ or ▼ key to select *Contrast* and press **ENTER**.

   The Contrast progress bar appears.
5. Use ◄ or ► to change the contrast.

   The higher the value, the higher the contrast.

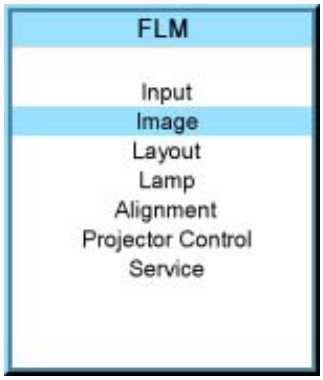


Image 9-3

Image 9-4

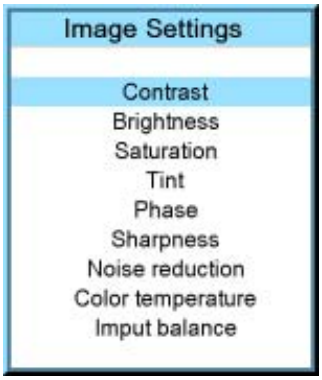


Image 9-5

Image 9-6

### 9.3.2 Brightness

#### About Brightness

The Brightness function is used to adjust the overall light output.

### How to change the brightness?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Brightness* and press **ENTER**.

   The Brightness progress bar appears.
5. Use ◄ or ► to change the brightness.

   The higher the value, the higher the brightness.

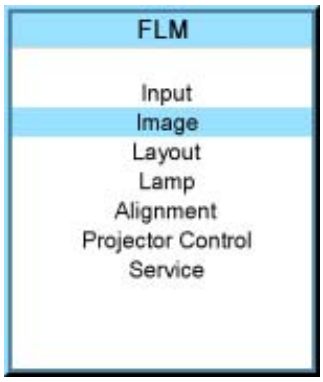


Image 9-7

Image 9-8

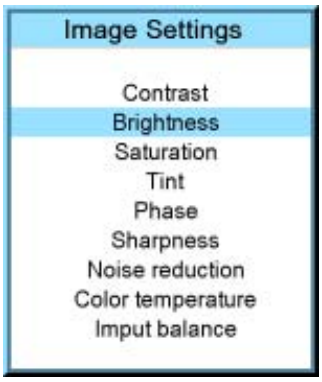


Image 9-9

Image 9-10

## 9.3.3 Saturation

### About (color) saturation

The color function is used to adjust the color saturation levels.

### How to change the saturation?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Saturation* and press **ENTER**.

   The Saturation progress bar appears.
5. Use ◄ or ► to change the color saturation.

The higher the value, the higher the color saturation.

Image 9-11

Image 9-12

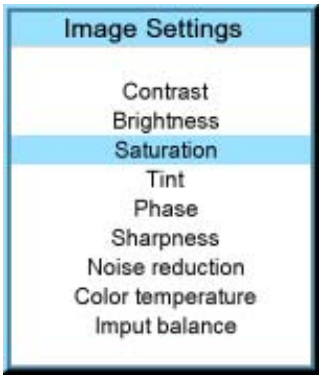


Image 9-13

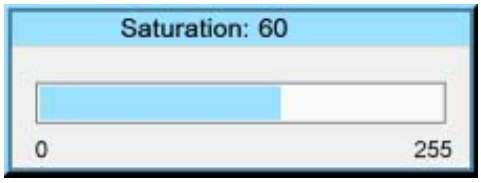


Image 9-14

### 9.3.4 Tint (hue)

#### About Tint

The Tint function is used to adjust color hue to obtain true color reproduction and is only active for Video and S-Video when the NTSC color system is used. For PAL and SECAM sources, Tint is not accessible.

#### How to change the saturation?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Tint* and press **ENTER**.

   The Tint progress bar appears.
5. Use ◄ or ► to change the tint.

The higher the value, the higher the tint.

Image 9-15

Image 9-16

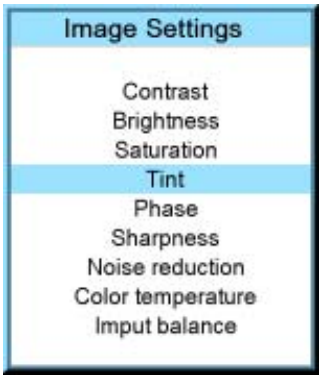


Image 9-17

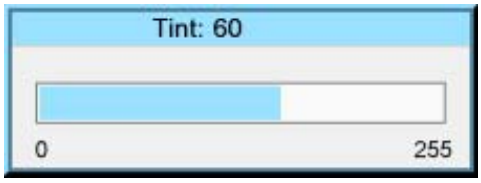


Image 9-18

### 9.3.5 Phase

#### About Phase adjustment

When displaying computer patterns or graphics (RGB or YUV signals) which are very detailed (tilting, vertical stripes, etc. ), jitter in picture (mis-sampling) may occur, causing horizontal stripes in portions of the screen. When this jitter occurs, adjust 'Phase' for optimum image.

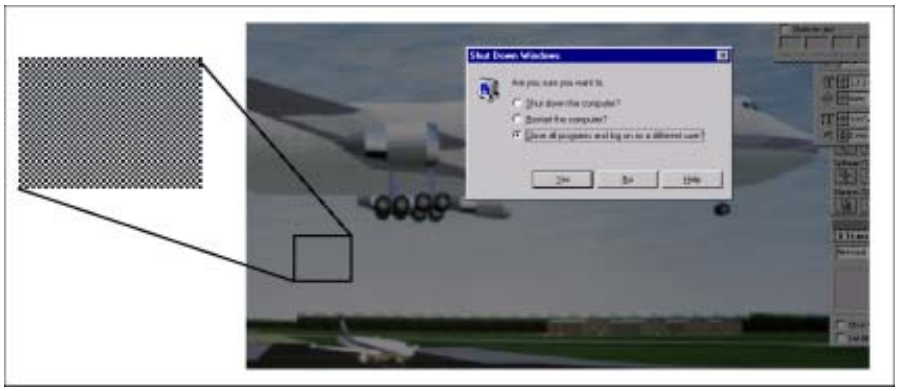


Image 9-19
Jittering on image

#### How to change the phase?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Phase* and press **ENTER**.

   The Phase progress bar appears.
5. Use ◄ or ► to change the phase and refine the jitter.
   ***Note:*** *Don't mix up with wrong number of total pixels. If the jitter doesn't disappear with the phase adjustment, check the total number of pixels. (Best image = pixel on pixel off pattern. For example: shut down screen of a PC)*

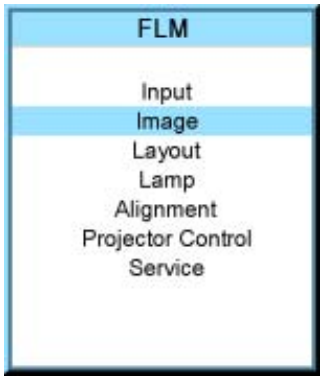


Image 9-20

Image 9-21

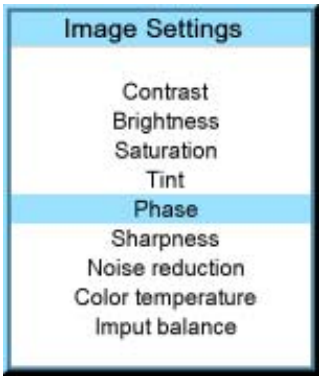


Image 9-22

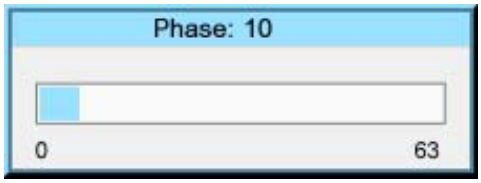


Image 9-23

### 9.3.6 Sharpness

#### About Sharpness

The sharpness function is used to adjust the image sharpness of video signals.

#### How to change the sharpness?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Sharpness* and press **ENTER**.

   The Sharpness progress bar appears.
5. Use ◄ or ► to change the sharpness.

   The higher the value, the higher the sharpness.

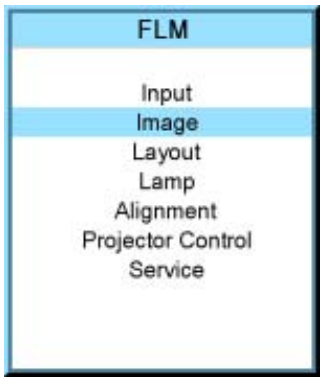


Image 9-24

Image 9-25

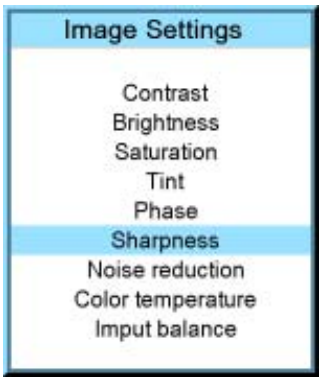


Image 9-26

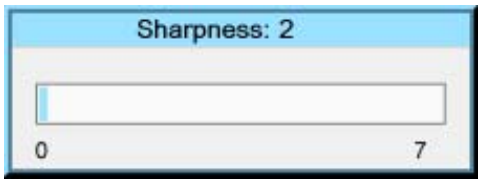


Image 9-27

### 9.3.7 Noise reduction

#### About Noise reduction

Reduces noise and pixel jitter in all video sources.

#### How to change?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Noise reduction* and press **ENTER**.

   The Noise reduction progress bar appears.
5. Use ◄ or ► to change the noise reduction.

   The higher the value, the higher the noise reduction.

Image 9-28

Image 9-29

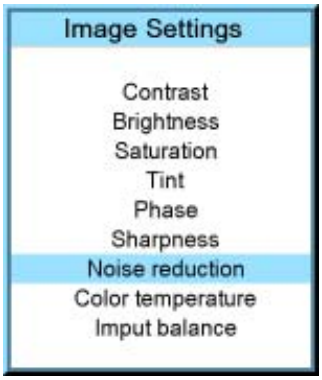


Image 9-30

Image 9-31

### 9.3.8 Color temperature

#### What can be done ?

The color temperature can be selected according to the type of source:

There are 5 different preset color temperatures:

- Projector white
- computer : 9300 K
- Video : 6500 K
- Film : 5400 K
- Broadcast : 3200 K

These calibrated presets can be selected and will provide optimum color tracking, the projector allows however the setting of a personal color temperature, this is done in *custom balance*

#### 9.3.8.1 Predefined color temperature

**Projector white will provide maximum projector light output. The calibrated 'Broadcast', 'Film', 'Video' and 'Computer' presets will provide optimum color tracking.**

### How to select?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Color temperature* and press **ENTER**.
5. Use the ▲ or ▼ key to select a predefined color temperature value, e.g. Video, and press **ENTER**.

   The colors of the image is switched to the selected value.

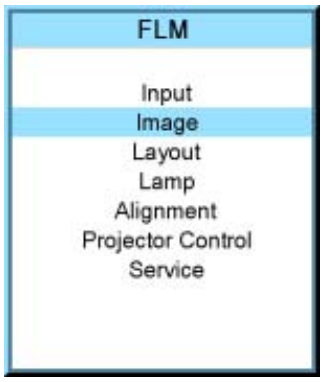



Image 9-32


Image 9-33

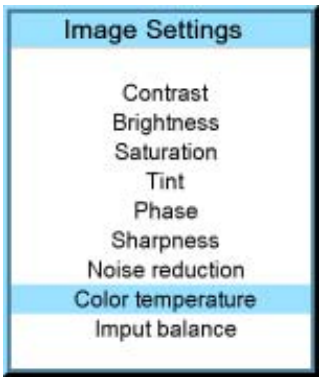



Image 9-34

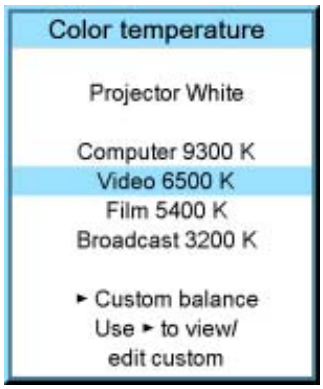



Image 9-35

## 9.3.8.2 Set a custom color temperature

### How to enter a custom value?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Color temperature* and press **ENTER**.
5. Use the ▲ or ▼ key to select *Custom balance* and press ►.

   The Custom balance menu is displayed.
6. Use the ▲ or ▼ key to select *Gain red* and press **ENTER**.
7. Adjust gain red with ◄ or ► key. When finished press **ENTER**.
8. Adjust gain blue in the same way as gain red.

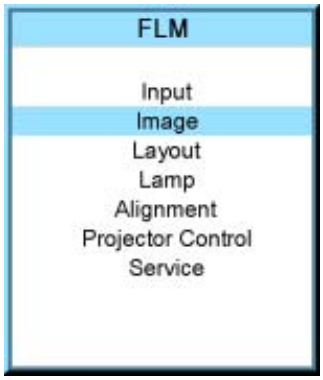


Image 9-36

Image 9-37

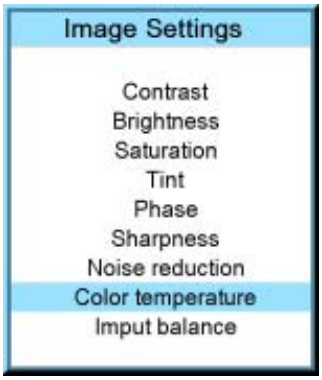


Image 9-38

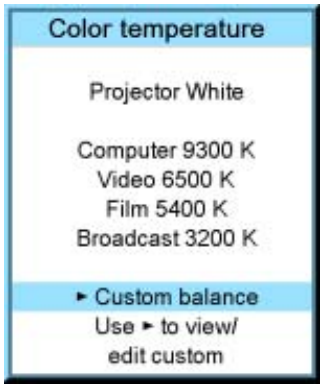


Image 9-39

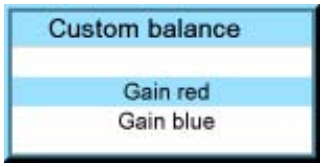


Image 9-40

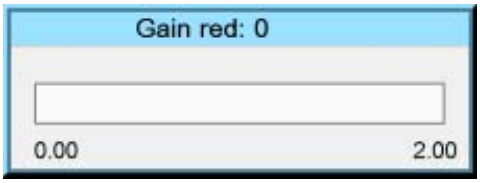


Image 9-41

## 9.3.9 Input balance

### Overview

- Introduction to Input Balance
- Adjusting the input balance

### 9.3.9.1 Introduction to Input Balance

#### Introduction: Unbalanced color signals

When transporting signals, there is always a risk of deterioration of the information contained in the signals.

In case of information contained in the amplitude of the signals which is the case of data color signals (R, G, B),image 9-42 , we are quite sure that the amplitude of these color signals is subject to alterations.

An example of alteration may be a DC component added to the signal, in the form of a DC offset repositioning the black level, since this **black level** (**“brightness”**) will become crucial later on (clamping circuit) it will result in “black not being black”.

Another value that is subject to alteration is the amplitude of the signal, resulting in an altered “Gain” of the signal (**“white level”** or **contrast**).

The alterations of the three color signals will happen independently i.e. the colors will end to be unbalanced, image 9-43

Image 9-42

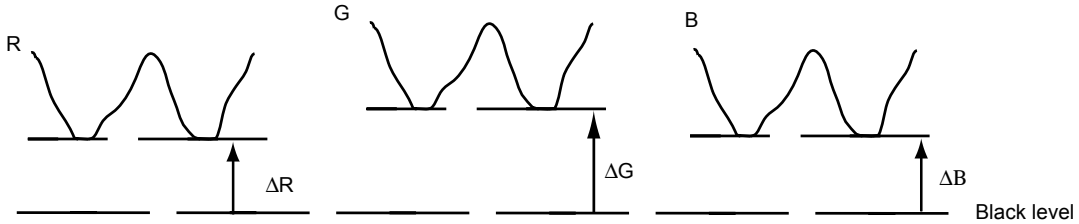



Image 9-43

**One can conclude here that a good color tracking can only be met by using three previously (input) balanced color signals**

### Analog Digital Conversion

The analog color signals must pass through an Analog/Digital conversion circuit prior to any digital processing in the PMP.

A typical ADC transforms the analog value into an 8 bit coded digital signal.

The graphic shows that when converting a signal containing a DC offset component the range of the converter is not optimally used.

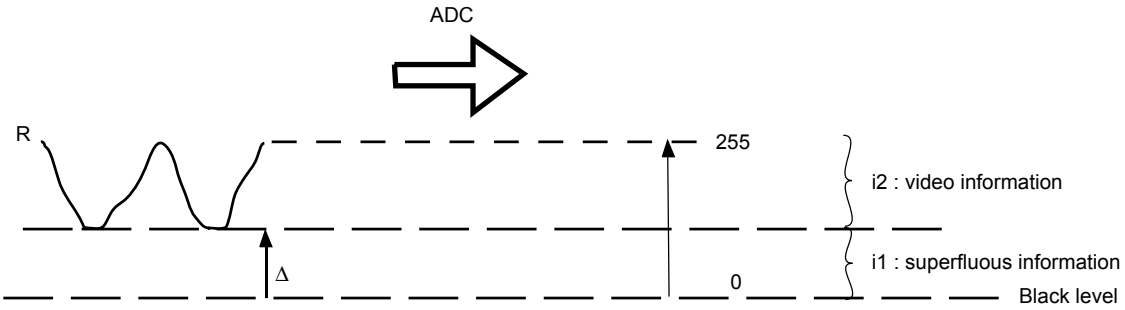



Image 9-44

**One can conclude here that a good data conversion can only be met by using three previously (input) balanced color signals**

### The objective of input balancing

The objective in input balancing is to “set” the same black level and the same white level for the three colors of a particular input source.

**Black level setting : brightness**

**White level setting : contrast**

The same absolute black and white level for the three colors allow the same reference for Brightness and contrast control of the picture !

These two references also set the range in which the ADC will work for that particular source (this explains also why each input balance setting is linked to a particular source and thus saved in the image file).

## 9.3.9.2 Adjusting the input balance

### How can it be done ?

To balance the three color signals of a particular source there are conditions; in fact we must know the black and the white level of the source i.e. :

1. The source in question must be able to generate a white signal, ideally a 100% white (background) full screen pattern
2. The source in question must be able to generate a black signal, ideally a 100% black (background) full screen pattern

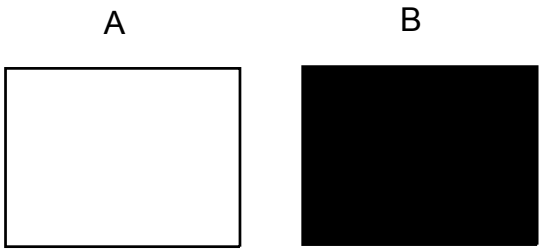



Image 9-45

White balance : In the projector, we will set the contrast for each color until we get a 100% light output picture when projecting a 100% white image (image A)

Black balance : In the projector, we will set the brightness for each color until we get a 0% light output picture when projecting a 100% black image (image B).

**The changeover from min to max is indicated by the apparition of bright spots also called “digital noise”**

**An alternative to a full screen White/black pattern is the standard gray scale pattern, the white bar will be used for white balance and the black bar for black balance.**

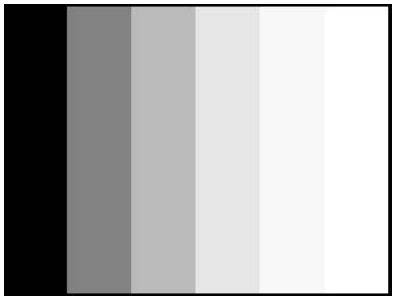


**Image 9-46**

## Black balance

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Input balance* and press **ENTER**.
5. Use the ▲ or ▼ key to select *Black balance* and press **ENTER**.
6. To start, use the ▲ or ▼ key to select *Black balance red* and press **ENTER**.

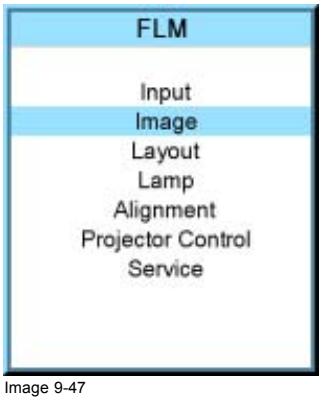



Image 9-47


Image 9-48


Image 9-49

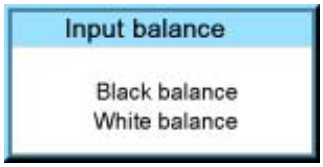


Image 9-50

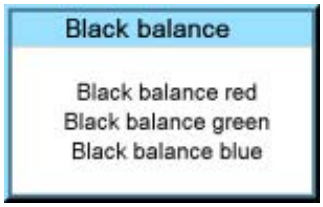


Image 9-51

7. Adjust the red black level on a minimal value
8. Select Black balance blue and adjust the blue black level on a minimal value.
   ***Note:*** *This minimal value is not necessary , provided that the 2 other colors are not influencing too much the color to be adjusted, in fact the aim is to minimize the effect of the two other colors since there is a risk of reaching too soon the 50% transition due to the contribution of these two other colors signals.*
9. Select Black balance green and adjust the Green black level until bright spots appear on the screen.
10. Select Black balance blue adjust the Blue black level until bright spots appear on the screen.
11. Select Black balance red adjust the Red black level until bright spots appear on the screen.

    The projected image should now be noisy full black

**If one uses a gray scale pattern, the bright spots should appear in the black bar.**

## Performing White input balance

1. Connect the source you want to project.
2. Select a white pattern (or gray scale as alternative).
3. Press **MENU** to activate the menus.
4. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
5. Use the ▲ or ▼ key to select *Image settings* and press **ENTER**.
6. Use the ▲ or ▼ key to select *Input balance* and press **ENTER**.
7. Use the ▲ or ▼ key to select *White balance* and press **ENTER**.
8. To start, use the ▲ or ▼ key to select *White balance red* and press **ENTER**.

Image 9-52

Image 9-53

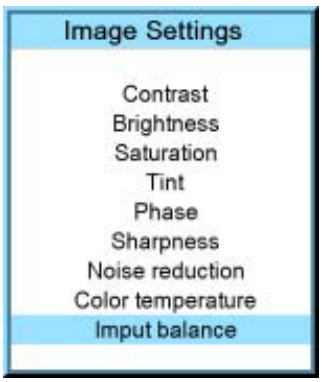


Image 9-54

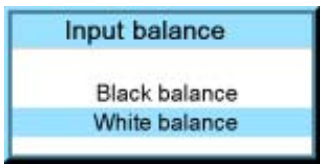


Image 9-55

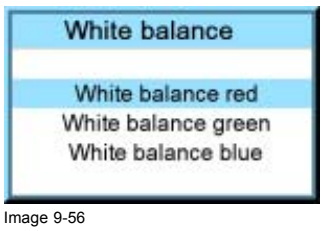


Image 9-56

9. Adjust the red white level (gain) on a minimal value

10. Select White balance blue and adjust the blue white level (gain) on a minimal value.
    ***Note:*** *This minimal value is not necessary , provided that the 2 other colors are not influencing too much the color to be adjusted, in fact the aim is to minimize the effect of the two other colors since there is a risk of reaching too soon the transition (bright spots) due to the contribution of these two other colors signals.*
11. Select White balance green and adjust the Green white level (gain) until bright spots appear on the screen.
12. Select White balance blue adjust the Blue white level (gain) until bright spots appear on the screen.
13. Select White balance red adjust the Red white level (gain) until bright spots appear on the screen.

    The projected image should now be noisy neutral gray

## 9.4 Aspect ratio

### What can be done?

The aspect ratio setting forces the projector 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 |
| 2.35 | Film format |
| 1.88 | |
| 1.78 | Wide screen television format / anamorphic format |
| Custom | Any custom format can be set up |

Type of input signal is indicated above each image row. The image row shows how the image will be projected in the different aspect ratio settings.

| 4/3 | 5/4 | 16/9 |
|---|---|---|

**Video Signal Pal/Secam**

**Video Signal NTSC**

**Video Signal 16/9**

**4/3 RGB Signal**

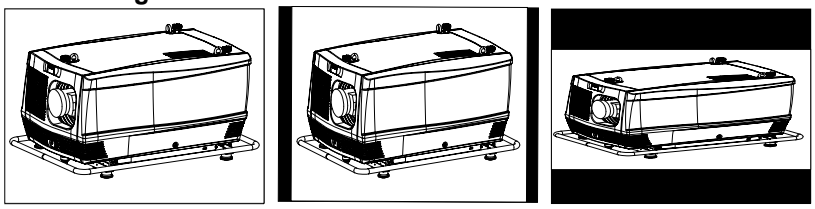


Image 9-57
Some examples for aspect ratio

## How to select an Aspect ratio?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Aspect ratio* and press **ENTER**.

   The aspect ratio menu will be displayed.
4. Use the ▲ or ▼ key to select the desired aspect ratio and press **ENTER**.

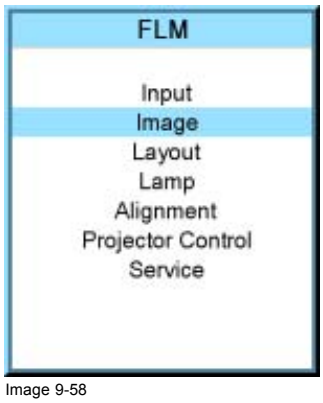



Image 9-58


Image 9-59

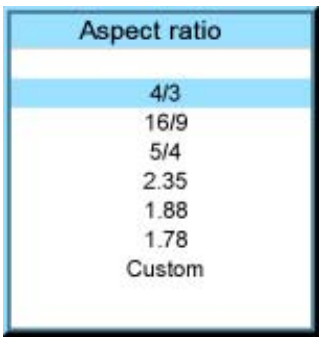



Image 9-60

### How to set up a custom aspect ratio?

1. Select first *Custom* and press **ENTER** to activate.

   The *Custom aspect ratio* dialog box opens.

2. Use the ▲ or ▼ key to adjust the vertical size of the image.
   Use the ► or ◄ key to adjust the horizontal size of the image.
   When the desired aspect ratio is obtained, press **EXIT**.

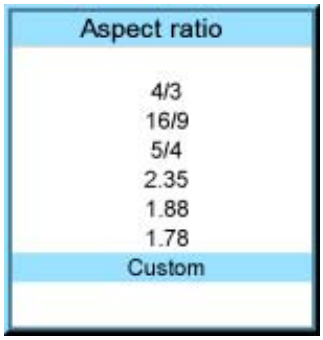


Image 9-61

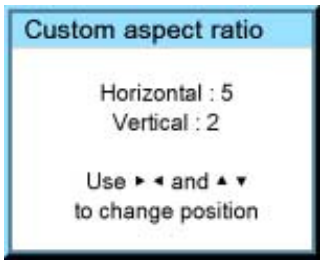


Image 9-62

## 9.5 Timings

### 9.5.1 Source timings

### Adjustable items

- Horizontal start in pixels : number of pixels between the beginning of the input signal and the start of the video information in the signal.
- Width = Active horizontal pixels : determine the width of the window on the screen. This value is normally given in the source specifications. If not, adjust until full image is displayed (no missing pixels).
- Vertical start in lines : number of lines between the start of the input signal and start of the image on the screen.
- Height = Active vertical lines : number of horizontal lines determining the height of the projected image. this value is normally given in the specification of the source. If not, adjust until full image height is displayed (no missing lines).
- Total pixels: Total horizontal pixels in the source. If the value is wrong, sampling mistakes (small vertical bars in the projected image) will be seen in the image.
- Total lines: Total vertical lines in the source.

### How to start up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Timings* and press **ENTER**.

   The timings menu will be displayed.

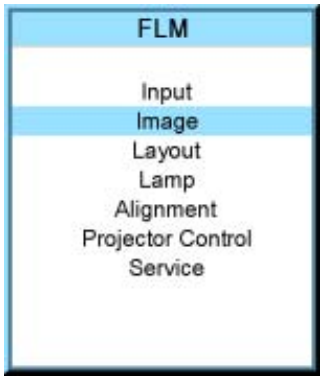


Image 9-63

Image 9-64

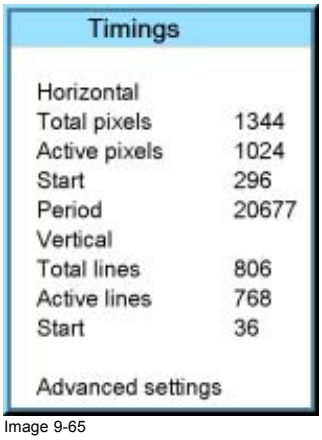


Image 9-65

4. To change a setting, use the ▲ or ▼ key to select and press **ENTER**.

   The corresponding adjustment box is displayed. E.g. Horizontal total pixels.

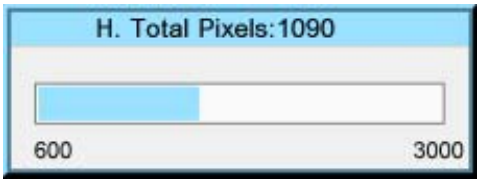



Image 9-66

5. Use the ▲ or ▼ key (or ◄ or ► key) to change the value.
6. Press **ENTER** to activate the new value.
7. If necessary to change other settings, repeat from step 4.

## 9.5.2 Advanced settings

### About the advanced settings

| | |
|---|---|
| Clamp delay | The time between the leading edge of the clamp pulse and the locked edge of the sync pulse. Can be any value between 0 and 255. |
| Clamp width | The width of the clamp pulse can be any value between 0 and 255. |

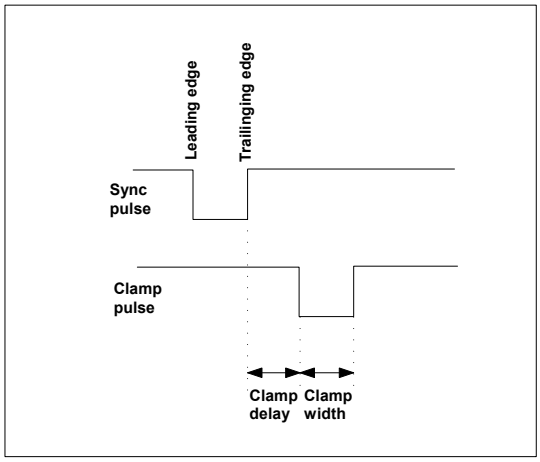



Image 9-67

| | |
|---|---|
| Field polarity | The field polarity function is used for interlaced images. Both rasters of the image could be shifted in a wrong way (double lines are visible in the image). This can be corrected by forcing the field polarity to [neg] or [pos]. |

### How to change the clamp delay - clamp width?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Timings* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Advanced settings* and press **ENTER**.

   The Advanced settings menu is displayed.
5. Use the ▲ or ▼ key to select *Clamp delay* or *Clamp width* and press **ENTER**.

   A progress bar appears.
6. Use the ▲ or ▼ key to change the setting.

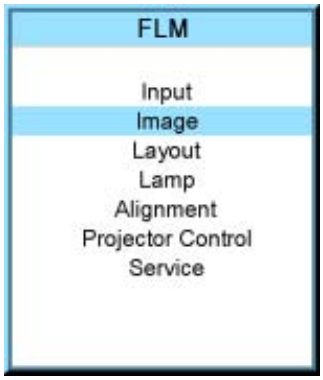


Image 9-68

Image 9-69

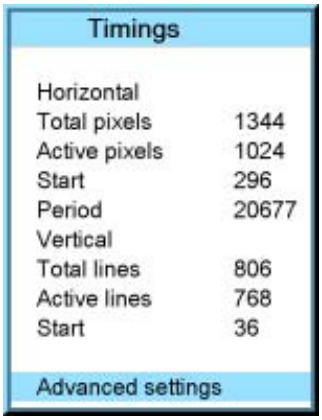


Image 9-70

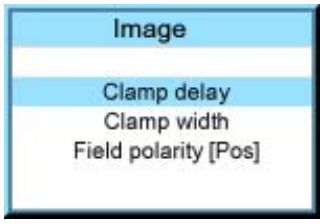


Image 9-71

### How to change the field polarity?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Advanced settings* and press **ENTER**.

   The Advanced settings menu is displayed.
4. Use the ▲ or ▼ key to select *Field polarity* and press **ENTER** to toggle between [neg] or [pos].

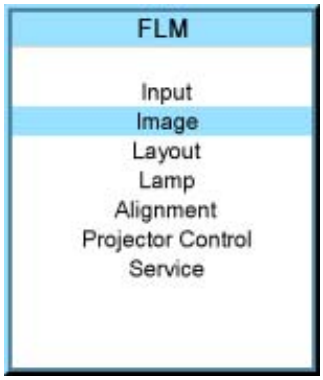


Image 9-72

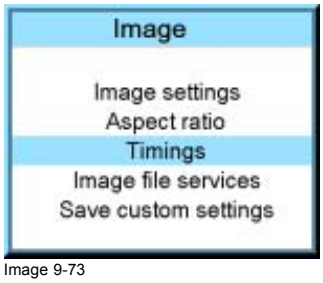


Image 9-73

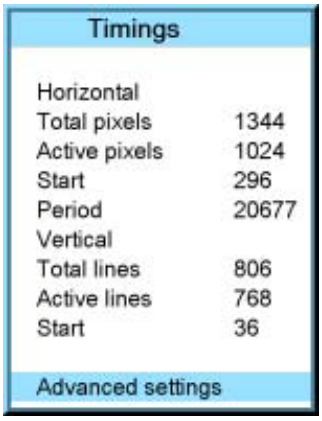


Image 9-74

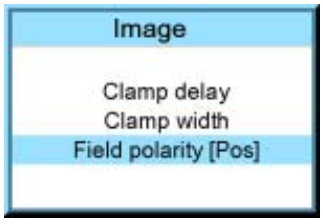


Image 9-75

## 9.6 Image files services

### Overview

- Files and file manipulations
- Manual Load file
- Delete file
- Delete all custom files
- Rename a file
- File options

### 9.6.1 Files and file manipulations

#### Connecting a new source.

Before using a new source, a correct file has to be installed. The projector's memory contains a list of files corresponding to the most used sources. When the new source corresponds with one of these files, the file can be loaded and saved for future use. When there is a little difference, the file can also be loaded and then edited until the source specs are reached.

VESA standards and video standards are pre-programmed.

#### Possible file Manipulations

The following file manipulations are possible :

- Load : installation of a file for a new source.
- Rename : renaming a file.
- Delete : deleting a file (only custom files)
- Delete all : delete all custom files
- Options : way of loading a file when a source is selected.

A loaded file can be edited via the Timings menu. Once a file is edited, it will be saved with the same name as the original file, followed by sequence number between rounded brackets.

### 9.6.2 Manual Load file

#### How to load?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *File services* and press **ENTER**.

   The File service menu is displayed.
4. Use the ▲ or ▼ key to select *Manual load* and press **ENTER**.

The manual load window opens.

Image 9-76

Image 9-77

Image 9-78

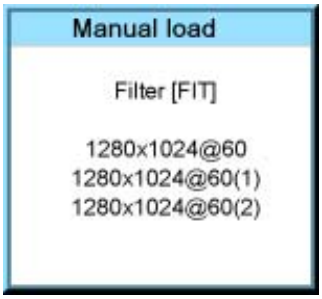


Image 9-79

Depending on the filter setup, the following is displayed:

- Fit: only fitting files for the selected source will be in the list
- All: all files in the system will be in the list.

5. Do you want to see only the fitting file in the manual load menu?
   If yes, Select *Filter* and use ► till [FIT] is on the menu.
   If no, Select *Filter* and use ► till [ALL] is on the menu.
6. Use the ▲ or ▼ key to select the appropriate file.
7. Press **ENTER** to select.

   The selected file is loaded.

### The image is not perfect?

If the displayed image is not correct after selecting the best fitting file, go to the *Timings* menu and change the file settings.

## 9.6.3 Delete file

### How to delete?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *File services* and press **ENTER**.

   The File service menu is displayed.
4. Use the ▲ or ▼ key to select *Delete* and press **ENTER**.

   The delete window opens.
5. Use the ▲ or ▼ key to select the file which must be deleted.
   ***Note:*** *Only custom files can be deleted.*
6. Press **ENTER** to delete the selected file.

Image 9-80

Image 9-81

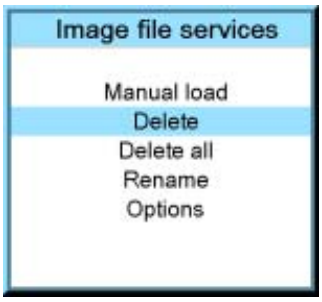


Image 9-82

Image 9-83

**No recovery possible !**

### 9.6.4 Delete all custom files

#### How to delete?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *File services* and press **ENTER**.

   The File service menu is displayed.
4. Use the ▲ or ▼ key to select *Delete all* and press **ENTER**.

   A delete all confirmation window opens.
5. Use the ▲ or ▼ key to select *Yes* if you are sure to delete all custom files.

Image 9-84

Image 9-85

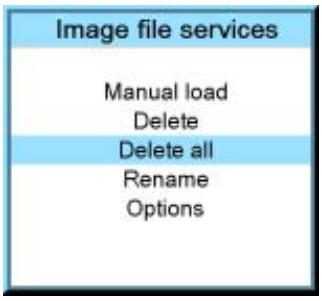


Image 9-86


Image 9-87

Or,
if you are not sure to delete all custom files, select *No*.

### 9.6.5 Rename a file

#### How to rename?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *File services* and press **ENTER**.

   The File service menu is displayed.
4. Use the ▲ or ▼ key to select *Rename* and press **ENTER**.

   The rename window opens.
5. Use the ▲ or ▼ key to select the file which must be renamed.
   ***Note:*** *Only custom files can be renamed.*
6. Press **ENTER** to select.

   The rename window opens. The first character is selected.
7. Use the ▲ or ▼ key to change the selected character.
   Use the ◄ or ► key to selected another character.
   ***Note:*** *Digits can be entered with the digit keys on the remote control or on the local keypad. When a digit is entered in that way, the next character will be selected automatically.*
8. Press **ENTER** to finalize the rename action.

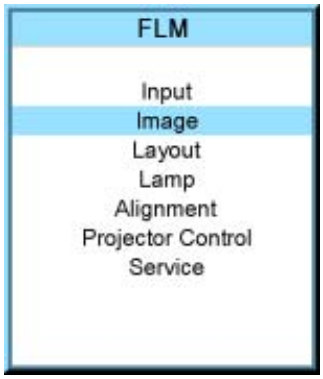



Image 9-88


Image 9-89

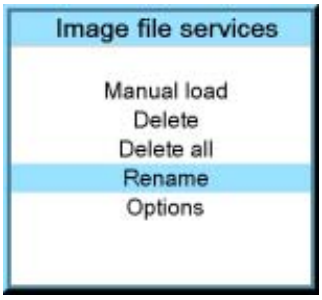



Image 9-90

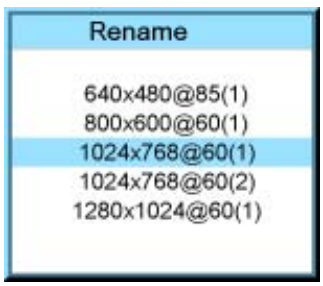



Image 9-91


Image 9-92

### 9.6.6 File options

#### How to set the options?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Image services* and press **ENTER**.

   The Image service menu is displayed.
4. Use the ▲ or ▼ key to select *Options* and press **ENTER**.

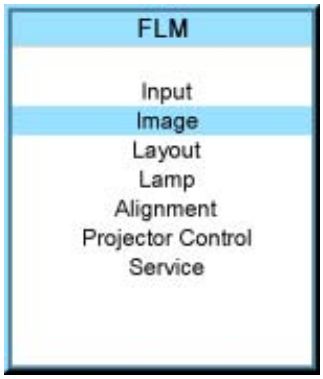



Image 9-93


Image 9-94


Image 9-95

The options window opens.

5. Use the ▲ or ▼ key to select Load file and press **ENTER** to toggle between [Automatic], [Manual] and [Custom only].
   - [Automatic]: correct file will be loaded automatically.
   - [Manual]: correct file has to be loaded manually.
   - [Custom only]: correct file will be loaded automatically out of the available custom files.

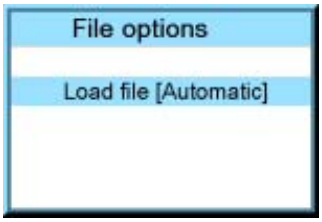



Image 9-96

## 9.7 Save custom settings

#### What is done?

The current custom settings can be saved to the internal backup device in the same way as it would be done when the projector was switched to standby.

#### How to save

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Image* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Save custom settings* and press **ENTER**.

The custom settings are written to the internal backup device. A message menu “Save data ...” is displayed during the save operation.

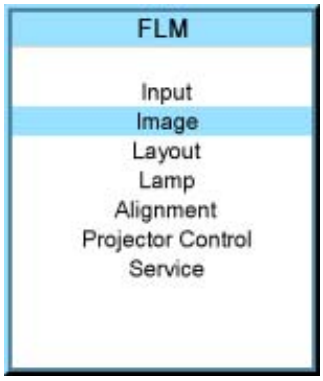



Image 9-97

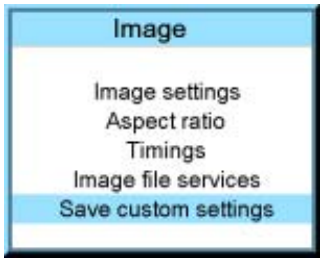



Image 9-98

# 10. LAYOUT MENU

### Overview

- Overview flow
- Main window
- PIP window
- Layout file services

## 10.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| Layout | | | |
| | Main window | | |
| | | Size | |
| | | Position | |
| | PIP window | | |
| | | PIP window [ON/OFF] | |
| | | Size | |
| | | Position | |
| | Layout file services | | |
| | | Load | |
| | | | Main full screen |
| | | | PIP top right |
| | | | Split top bottom |
| | | Rename | |
| | | Delete | |
| | | Copy / Save as | |

## 10.2 Main window

### Overview

- Size adjustment
- Position adjustment

### When active layout is read only

When the active layout is a read only layout, the projector will ask to create a new layout.

Use the ▲ or ▼ key to select *Yes or No* and press **ENTER**.

If *Yes* is selected an *Enter layout name* window opens.

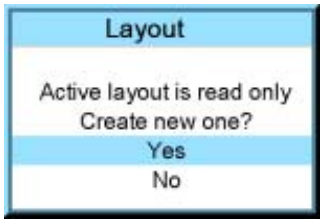



Image 10-1

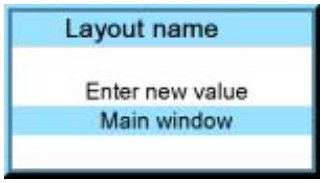



Image 10-2

The first character is highlighted. Use the ▲ or ▼ key to select the desired character and press ◄ or ► key to select the next character in the name.

Press **EXIT** to return. The new file is generated.

### 10.2.1 Size adjustment

#### What can be done?

The size of the main window can be adjusted until the desired window dimensions are reached.

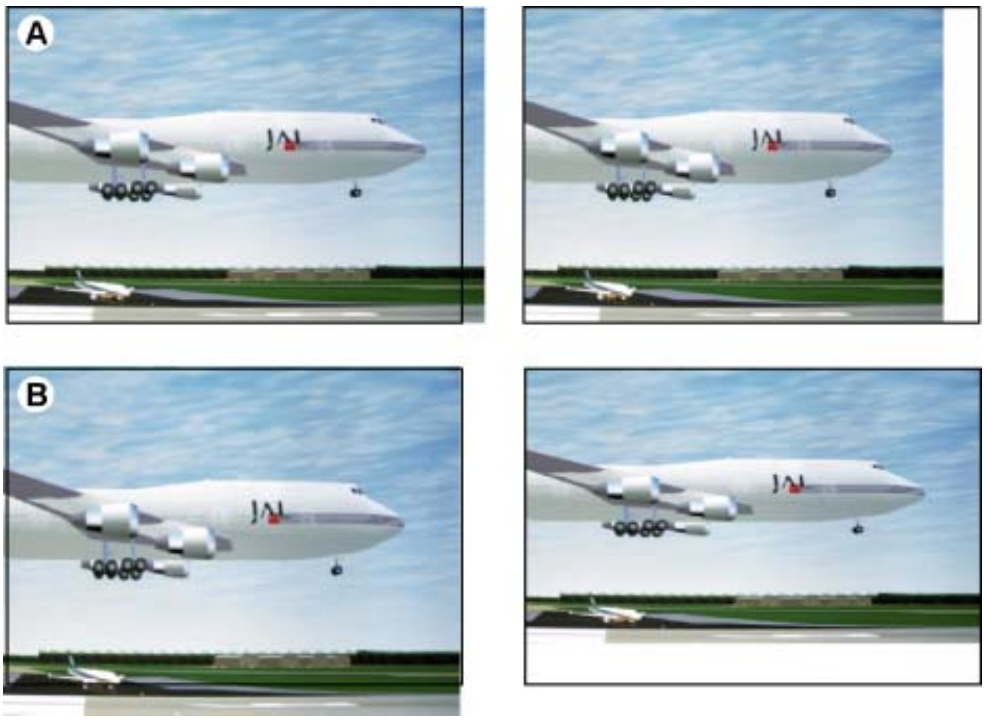



Image 10-3
Size adjustment main window

A width adjustment
B height adjustment

The size can be changed with respect to the original aspect ratio.

#### How to adjust with respect to the original aspect ratio?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Main Window* and press **ENTER**.

   The main window opens.
4. Use the ▲ or ▼ key to select *Size* and press **ENTER**.

The size adjustment window opens.

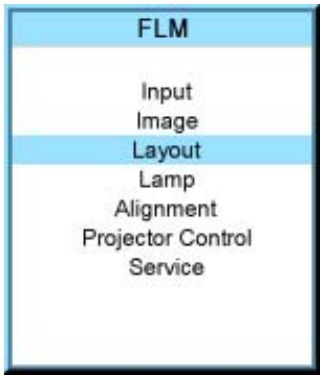



Image 10-4

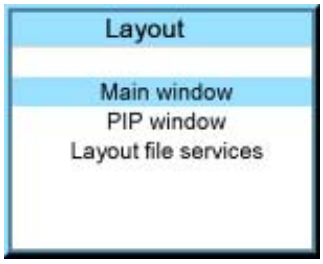



Image 10-5

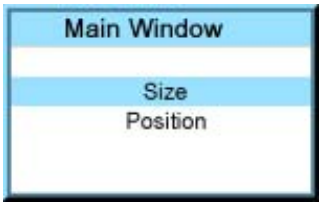



Image 10-6

5. Toggle with **ENTER** till Lock is set to [x].


Image 10-7

[ ] = no lock between height and width.

[x] = width and height are locked.

6. Use ► ◄ or▲ ▼ to adjust the size with respect to the original aspect ratio.
When the desired size is reached, press **EXIT**.

A Save window opens.

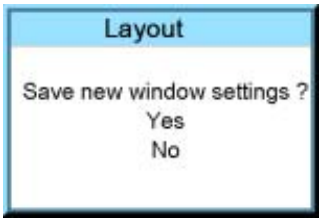



Image 10-8

## How to adjust height and width separately?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Main Window* and press **ENTER**.

   The main window opens.
4. Use the ▲ or ▼ key to select *Size* and press **ENTER**.

The size adjustment window opens.

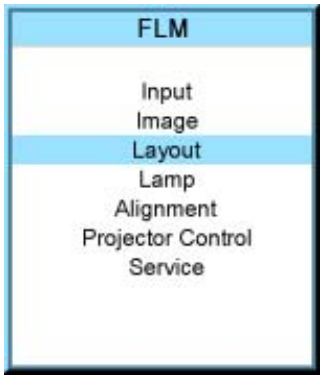



Image 10-9

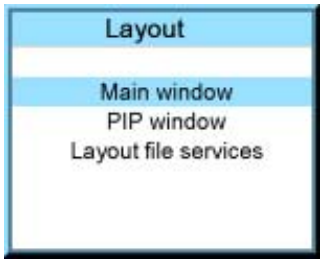



Image 10-10

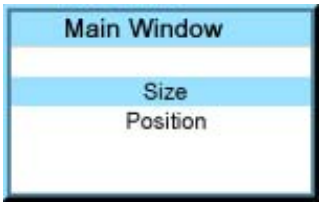



Image 10-11

5. Toggle with **ENTER** till Lock is set to [ ].


Image 10-12

[ ] = no lock between height and width.

[x] = width and height are locked.

6. Use the ▲ or ▼ key to adjust the height.
   Use the ◄ or ► key to adjust the width.
   When the desired size is reached, press **EXIT**.

   A Save window opens.

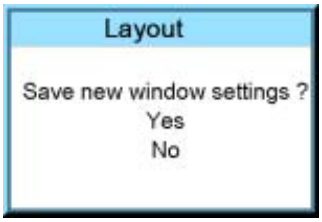



Image 10-13

7. Select with the ▲ or ▼ key *Yes* and press **ENTER**.
   Select with the ▲ or ▼ key *No*, when no save is desired and press **ENTER**.

### 10.2.2 Position adjustment

#### What can be done?

The main window can be repositioned on the screen. The upper left corner is the reference.

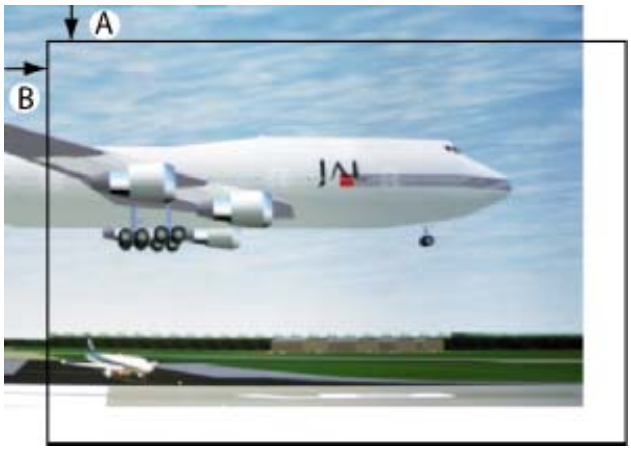



Image 10-14
Positioning the window

## How to position?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Main Window* and press **ENTER**.

   The main window opens.
4. Use the ▲ or ▼ key to select *Position* and press **ENTER**.

   The position adjustment window opens.
5. Use the ▲ or ▼ key to adjust top start point.
   Use the ◄ or ► key to adjust left start point.
   When the desired size is reached, press **EXIT**.

   A Save window opens.

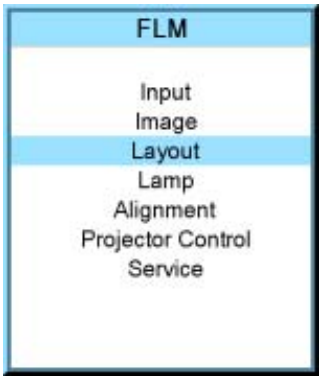



Image 10-15

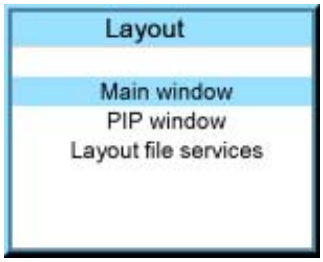



Image 10-16

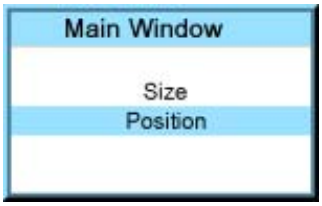



Image 10-17

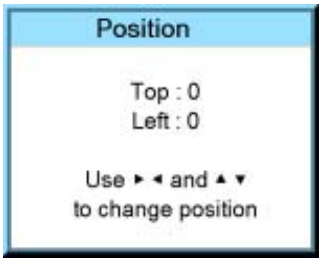



Image 10-18

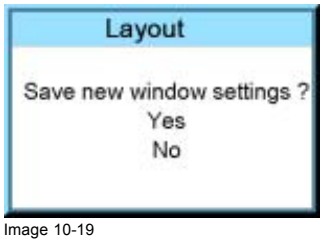



Image 10-19

6. Select with the ▲ or ▼ key *Save* and press **ENTER**.
   Select with the ▲ or ▼ key *Delete*, when no save is desired and press **ENTER**.

## 10.3 PIP window

### Overview

- Introduction to PIP
- Picture in Picture activation
- Picture in Picture size of the window
- Picture in Picture, position window

### 10.3.1 Introduction to PIP

**PiP**

PiP stands for "Picture in Picture" and allows to display multiple windows containing each of them an image. The windows may be of the video or data type.

### What are the different possibilities within the PiP mode ?

The input section of the projector allows a combinations of different input signals which may be projected in the 2 windows of the PiP screen. The PiP window can be placed anywhere, with any dimensions, on the screen by changing its position and its size.

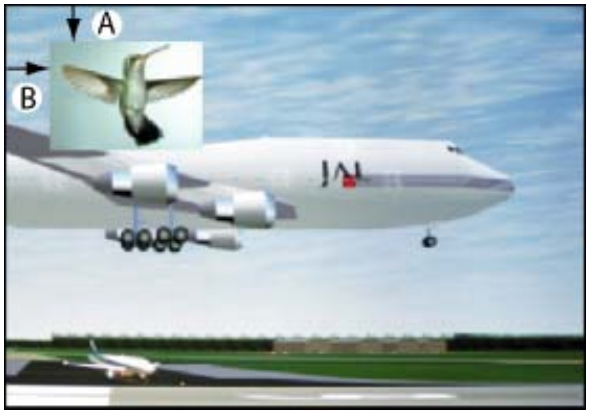



Image 10-20
Position of PiP

A Top position
B Left position

### 10.3.2 Picture in Picture activation

### How to activate PIP?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.
3. Use the ▲ or ▼ key to select *PIP Window* and press **ENTER**.

   The PIP window opens.
4. Use the ▲ or ▼ key to select *On* or *Off* and press **ENTER** toggle between [On] and [Off].

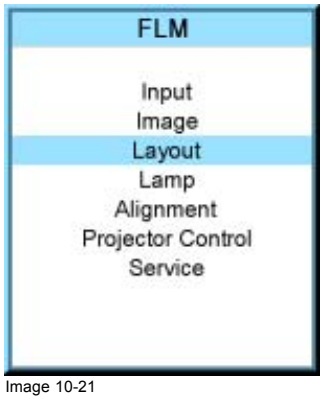



Image 10-21

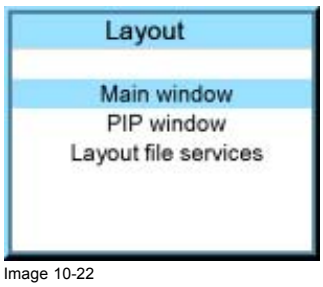



Image 10-22

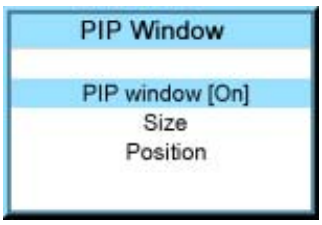



Image 10-23

5. Press **EXIT** to quit the menu.

**When PIP is activated (ON state), the PIP window becomes the active window. Switching to the main window is still possible with the window button on the RCU.**

### 10.3.3 Picture in Picture size of the window

#### What can be done?

The width and height of the picture in picture window can be changed till the desired dimensions are obtained.

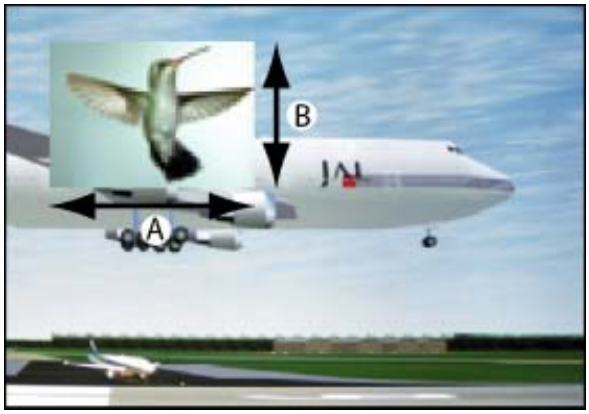



Image 10-24
Size PIP window

A Width PIP window
B Height PIP window

The size of the picture in picture window can be changed with respect to the original aspect ratio of the PIP image.

Remark: when the e.g. the PIP window is a 4 by 3 window and the projected image has a 16 by 9 format, then it is possible that image jumps inside the PIP window during a re-scaling. Due to the fact that the re-scale is done on the vertical dimensions of the PIP window and the image inside it will be re-scaled so that the aspect ratio is still correct.

Image 10-25
Size PIP window remark

#### How to change the size with respect to the aspect ratio?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *PIP Window* and press **ENTER**.

   The main window opens.
4. Use the ▲ or ▼ key to select *Size* and press **ENTER**.

The size adjustment window opens.

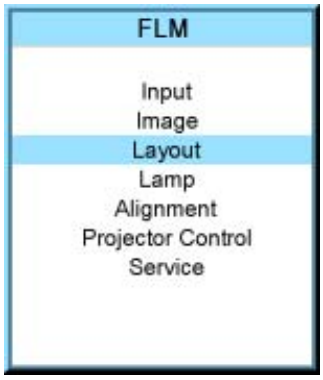



Image 10-26

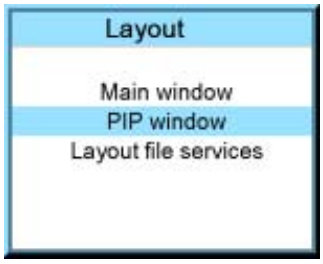



Image 10-27

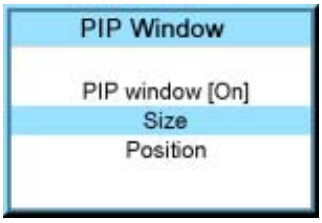



Image 10-28

5. Toggle with **ENTER** till Lock is set to [x]].


Image 10-29

[ ] = no lock between height and width.

[x] = width and height are locked.

6. Use the ▲ ▼ or ◄ ►key to adjust the size with respect to the aspect ratio.
When the desired size is reached, press **EXIT**.

A Save window opens.

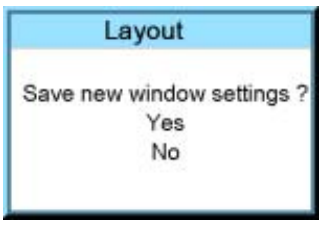



Image 10-30

7. Select with the ▲ or ▼ key *Yes* and press **ENTER**.
Select with the ▲ or ▼ key *No*, when no save is desired and press **ENTER**.

## How to change the height and width separately?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *PIP Window* and press **ENTER**.

The main window opens.

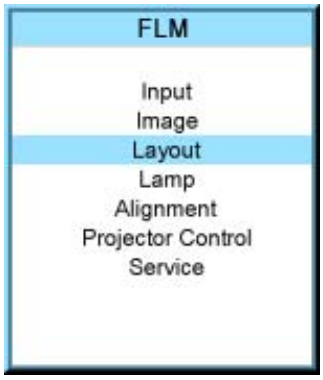



Image 10-31

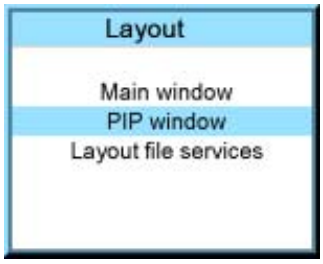



Image 10-32

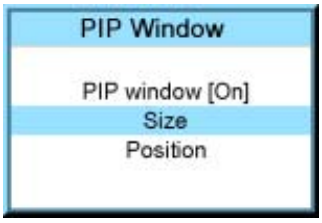



Image 10-33

4. Use the ▲ or ▼ key to select *Size* and press **ENTER**.

   The size adjustment window opens.

5. Toggle with **ENTER** till Lock is set to [ ].

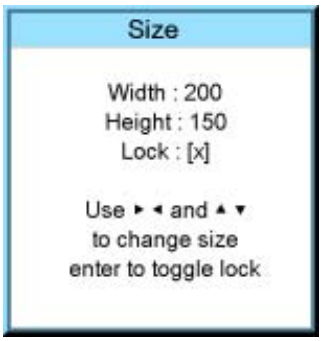



Image 10-34

[ ] = no lock between height and width.

[x] = width and height are locked.

6. Use the ▲ or ▼ key to adjust the height.
   Use the ◄ or ► key to adjust the width.
   When the desired size is reached, press **EXIT**.

   A Save window opens.

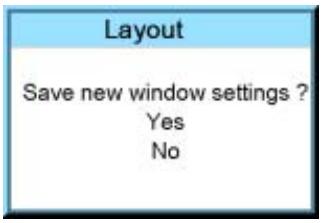



Image 10-35

7. Select with the ▲ or ▼ key *Save* and press **ENTER**.
   Select with the ▲ or ▼ key *Delete*, when no save is desired and press **ENTER**.

### 10.3.4 Picture in Picture, position window

#### What can be done?

The picture in picture window can be position on any place on the display just by changing its start coordinates. The reference is the upper left corner of the window.

#### How to position?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *PIP Window* and press **ENTER**.

The PIP window opens.

4. Use the ▲ or ▼ key to select *Position* and press **ENTER**.

   The size adjustment window opens.

5. Use the ▲ or ▼ key to adjust Top
   Use the ◄ or ► key to adjust Left
   When the desired position is reached, press **EXIT**.

   A Save window opens.

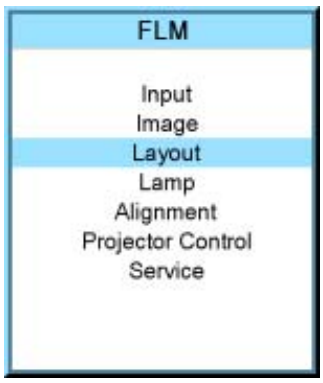


Image 10-36

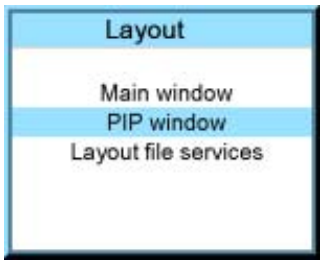


Image 10-37

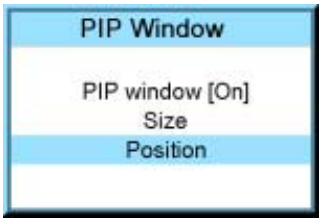


Image 10-38

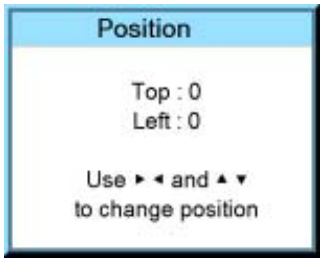


Image 10-39

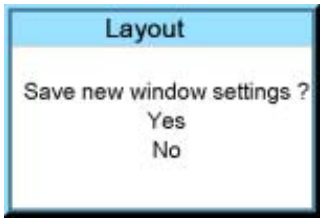


Image 10-40

6. Select with the ▲ or ▼ key *Save* and press **ENTER**.
   Select with the ▲ or ▼ key *Delete*, when no save is desired and press **ENTER**.

## 10.4 Layout file services

### Overview

- Load layout
- Rename a layout
- Delete a layout
- Copy / Save as a layout

### 10.4.1 Load layout

**When loading a layout which required two sources, the *PIP window On/Off* setting will be switched to ON.**

### How to load?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.

   The layout services window opens.

4. Use the ▲ or ▼ key to select *Load* and press **ENTER**.

The load layout window opens.

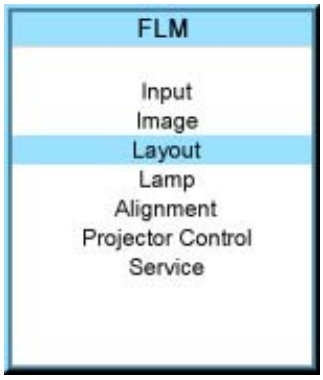



Image 10-41

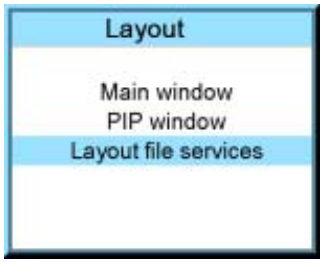



Image 10-42

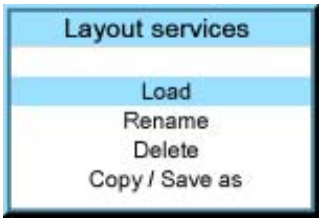



Image 10-43

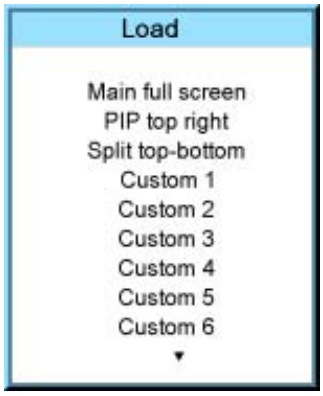



Image 10-44

5. Use the ▲ or ▼ key to select the desired layout and press **ENTER** to select.

   The first 3 layouts are default layouts, all others are customer created layouts. The menu shows only the first 10 layouts, but use the ▼ to scroll through the rest of the layouts until the desired layout is found.

### 10.4.2 Rename a layout

**Only custom created layouts can be renamed.**

#### How to rename?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.

   The layout services window opens.
4. Use the ▲ or ▼ key to select *Rename* and press **ENTER**.

   The Rename layout location window opens.
5. Use the ▲ or ▼ key to select the layout to rename and press **ENTER**.

   The edit layout name window opens. The first character is selected.
6. Use the ▲ or ▼ key to change the selected character.
   Use the ◄ or ► key to selected another character.
   ***Note:*** *Digits can be entered with the digit keys on the remote control or on the local keypad. When a digit is entered in that way, the next character is selected automatically.*
7. Press **ENTER** to save the new name.

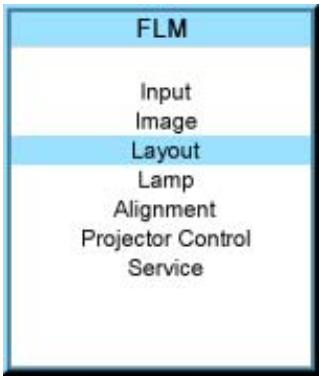



Image 10-45

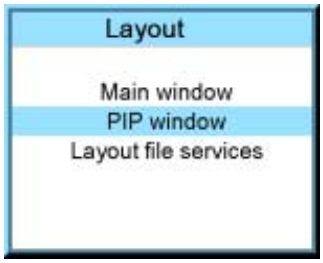



Image 10-46

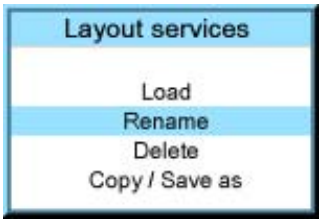



Image 10-47


Image 10-48

### 10.4.3 Delete a layout

#### What is possible?

Custom created layouts can be removed from the projector memory.

#### How to delete?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Layout services* and press **ENTER**.
   The layout services window opens.
4. Use the ▲ or ▼ key to select *Delete* and press **ENTER**.

The Delete window opens.

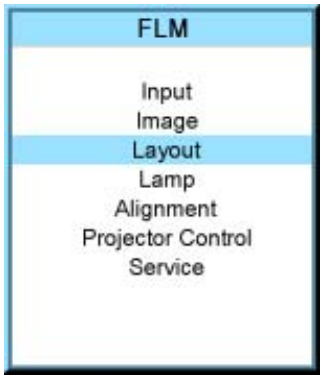



Image 10-49

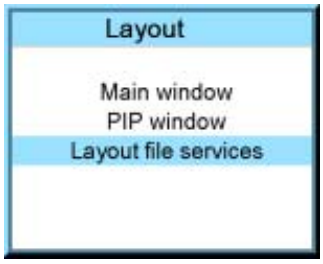



Image 10-50

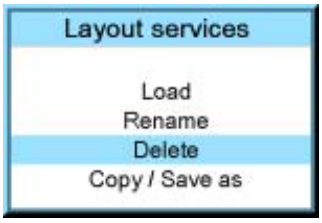



Image 10-51

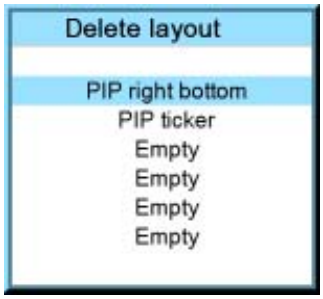



Image 10-52

The first 3 layouts are default layouts and cannot be delete.

5. Use the ▲ or ▼ key to select the layout that must be deleted.
6. Press **ENTER** to finalize the delete operation.

### 10.4.4 Copy / Save as a layout

#### What is possible,

An existing layout, system layout or custom created layout, can be copied into a new file.

#### How to copy / save as?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Window* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Layout* and press **ENTER**.

   The layout services window opens.
4. Use the ▲ or ▼ key to select *Copy/Save as* and press **ENTER**.

   The Save layout location window opens.
5. Use the ▲ or ▼ key to select the layout to copy/save as and press **ENTER**.

   The edit layout name window opens. The first character is selected.
6. Use the ▲ or ▼ key to change the selected character.
   Use the ◄ or ► key to selected another character.
   ***Note:*** *Digits can be entered with the digit keys on the remote control or on the local keypad. When a digit is entered in that way, the next character is selected automatically.*
7. Press **ENTER** to copy to the new name.
   The new layout will be added to the list of layouts.

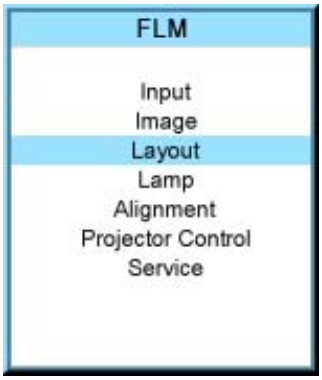



Image 10-53

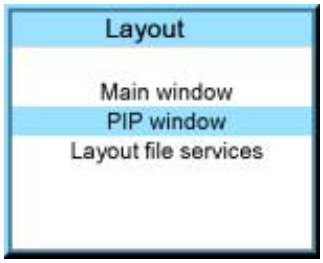



Image 10-54


Image 10-55


Image 10-56

# 11. LAMP MENU

### Overview

- Overview flow
- Lamp power mode
- Dimming
- Lamp Identification
- Z-axis adjustment

## 11.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| Lamp | | | |
| | Power | | |
| | | Mode | |
| | | | Normal |
| | | | Economic |
| | | Dimming | |
| | Identification | | |
| | | Serial number | |
| | | Article number | |
| | | Run time | |
| | | Remaining run time | |
| | | Strikes | |
| | | Version | |
| | Z-axis | | |

## 11.2 Lamp power mode

### What can be done?

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

Normal : maximum allowed powers is fed to the lamp. Maximum light output is reached in this way.

Economic : a reduced wattage is fed to the lamp. Reduced light output but a longer life time for the lamp.

### How to switch?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Lamp* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Power* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Mode*.
5. Press **ENTER** to toggle between *[Normal]* and *[Economic]*.

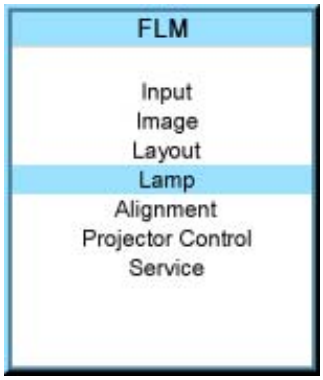


Image 11-1

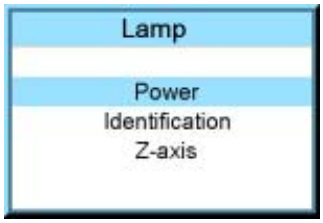


Image 11-2

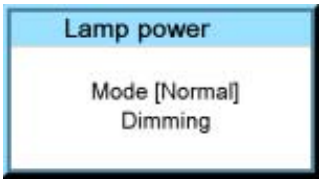


Image 11-3

## 11.3 Dimming

### What can be done?

Within a certain power mode, the light output of the lamp can be reduced.

### How to dim?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Lamp* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Power* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Dimming* and press **ENTER**.
5. Use the ▲ or ▼ key to change the dimming.

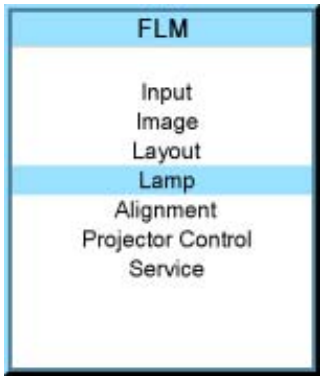


Image 11-4

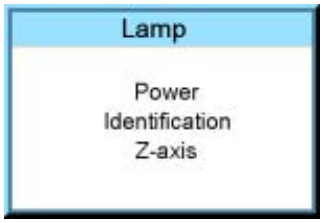


Image 11-5

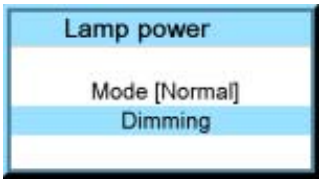


Image 11-6

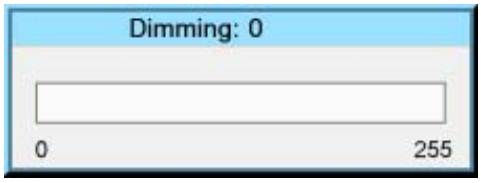


Image 11-7

## 11.4 Lamp Identification

### About

The lamp identification menu gives an overview of the most important parameters of the used lamp.

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

**These parameters are useful when calling for a service intervention.**

### How to display?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Lamp* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Identification* and press **ENTER**.

   The identification overview is displayed.

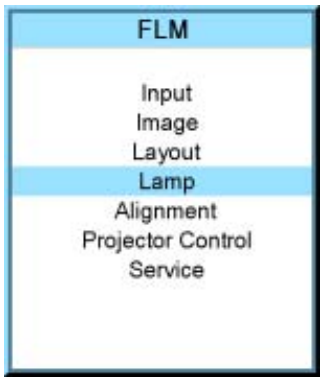



Image 11-8

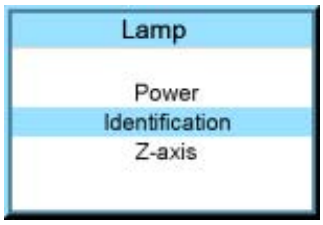



Image 11-9

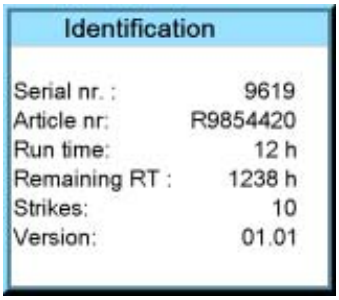



Image 11-10

## 11.5 Z-axis adjustment

### What can be done?

This menu item gives the current light output of the projector. This light output indication can be used to readjust the lamp position in the lamp casing (also called Z-axis adjustment of the lamp). With higher run times, the light output of the lamp will decrease, which results in a lower light output on the screen. This light output decrease can be compensated by readjusting the position of the lamp. For the realignment procedure, see "Realignment of the lamp in its reflector", page 157.

### How to display the light output

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Lamp* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Z-axis* and press **ENTER**.

The Z-axis dialog box is display and indicates the current light output..

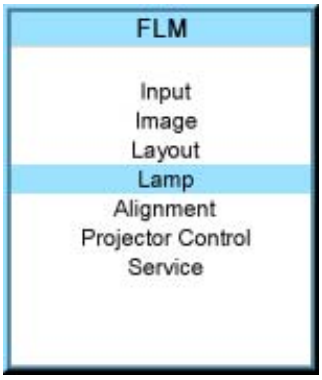



Image 11-11

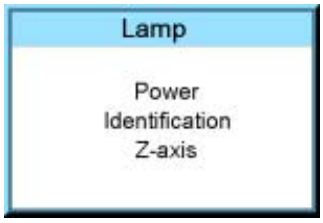



Image 11-12

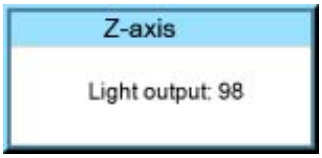



Image 11-13

# 12. ALIGNMENT MENU

### About this chapter

This chapter describes the alignment of the projector once the physical installation is finished. Via the software, the image will be perfectly aligned on the screen.

### Overview

- Overview flow
- Orientation
- Lens adjustment
- Side keystone
- Contrast enhancement
- Blanking
- Gamma
- Internal pattern
- Color space
- ScenergiX

## 12.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 |
|---|---|---|
| Alignment | | |
| | Orientation | |
| | | Front Table |
| | | Front Ceiling |
| | | Rear Table |
| | | Rear Ceiling |
| | Lens | |
| | | Zoom/Focus |
| | | Shift |
| | | Mid position |
| | Side keystone | |
| | Blanking | |
| | | Top |
| | | Bottom |
| | | Left |
| | | Right |
| | | Reset |
| | Contrast enhancement | |
| | Gamma | |
| | Internal patterns | |
| | | Checker board |

| Level 1 | Level 2 | Level 3 |
|---|---|---|
| | | Color bars |
| | | Convergence |
| | | Focus |
| | | Full screen black |
| | | Full screen blue |
| | | Full screen green |
| | | Full screen red |
| | | Full screen white |
| | | Hatch |
| | | Outline |
| | Color space | |
| | | Projector |
| | | EBU |
| | | SMPTE |
| | | Custom |
| | ScenergiX | |
| | | Status |
| | | Top |
| | | Bottom |
| | | Left |
| | | Right |
| | | Black level |

## 12.2 Orientation

### What can be done?

The way of physical installation of the projector can be defined to the projector.

The following installation are possible:

- front/table
- front/ceiling
- rear/table
- rear/ceiling

### Set up the correct orientation

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Orientation* and press **ENTER**.
4. Use the ▲ or ▼ key to select the correct orientation and press **ENTER**.

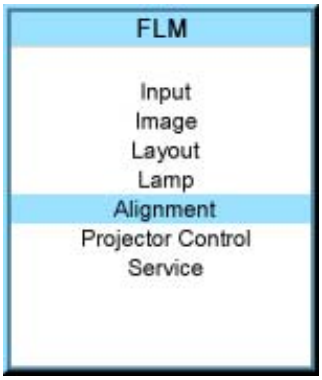


Image 12-1

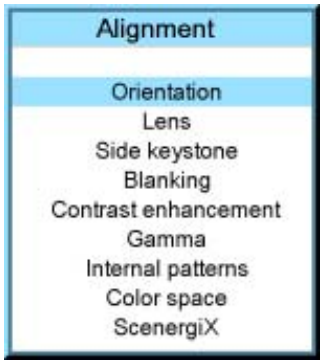


Image 12-2

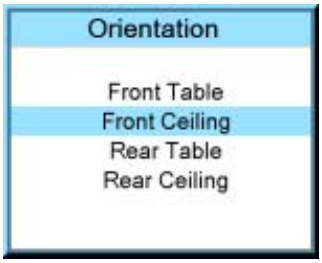


Image 12-3

**For more information about the physical installation, see chapter “General”, “Projector configurations”..**

## 12.3 Lens adjustment

**Quick way to enter the lens adjustment setting; press the lens button on the local keypad or the remote control.**

### Access to the lens adjustments

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Lens* and press **ENTER**.

   The lens adjustment menu is displayed.

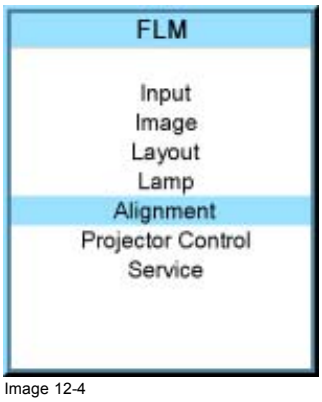


Image 12-4

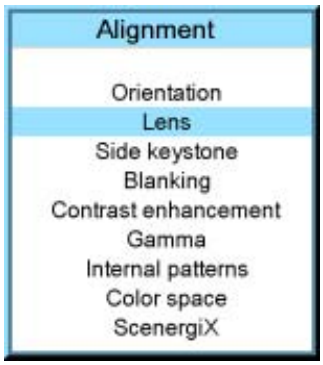


Image 12-5

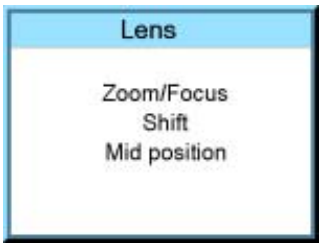


Image 12-6

### Zoom/focus the lens

1. Use the ▲ or ▼ key to select *Zoom/Focus* and press **ENTER**.

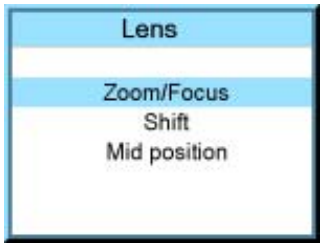


Image 12-7

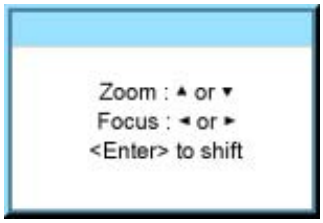


Image 12-8

2. Use the ▲ or ▼ key to zoom the lens.
   Use the ◄ or ► key to focus the lens.
3. Press **ENTER** to go to the shift adjustments.

### Lens shift

1. Use the ▲ or ▼ key to select *Shift* and press **ENTER** or when in the Zoom/Focus menu press **ENTER** to toggle to the Shift menu.

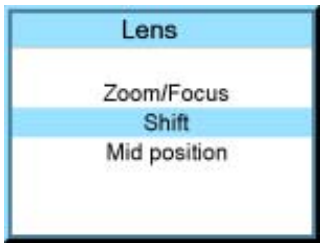


Image 12-9

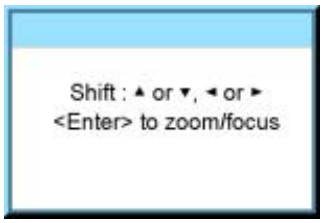


Image 12-10

2. Use the ▲ or ▼ key to shift the lens upwards or downwards.
   Use the ◄ or ► key to shift the lens to the left or to the right.

### Mid position

1. Use the ▲ or ▼ key to select *Mid position* and press **ENTER**.

   The lens will move to its mid position. During this operation, a message is displayed: “Motor running ...”.

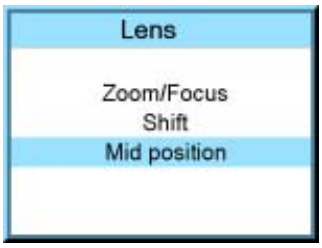


Image 12-11

## 12.4 Side keystone

### What can be done?

The side keystone adjustment is used to align the image if the projector is mounted at a non standard projection angle.

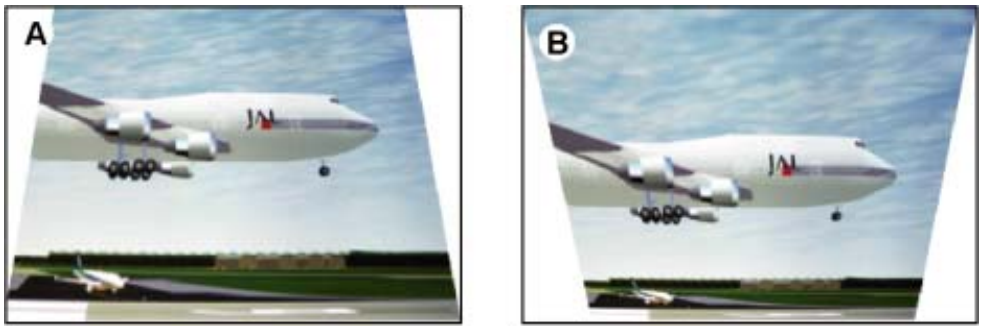



Image 12-12
Side keystone

A Keystone adjustment with positive values
B Keystone adjustment with negative values

### Side keystone adjustment

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Side keystone* and press **ENTER**.

   The keystone dialog box appears.
4. Use the ◄ or ► key to adjust the keystone of the image.

   When the upper part of the image is wider than the lower part of the image, push the ◄ key. The value below the bar scale will be negative.

   When the upper part of the image is smaller than the lower part of the image, push the ► key. The value below the bar scale will be positive.

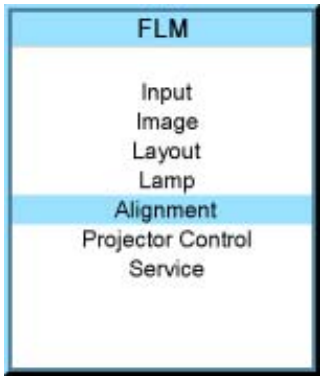



Image 12-13

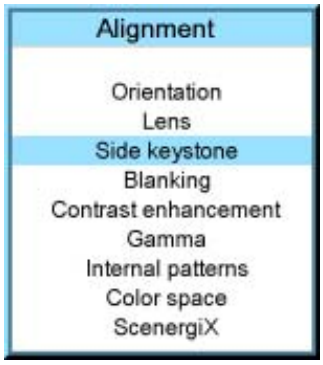



Image 12-14

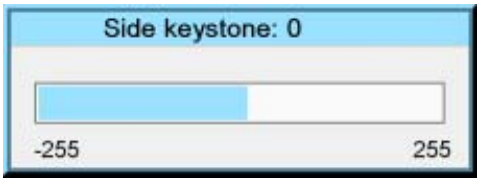



Image 12-15

## 12.5 Contrast enhancement

### Purpose

Increase the contrast for all video and data sources.

### How to change

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Contrast enhancement* and press **ENTER**.

   The current selected contrast setting is indicated with an arrow.
4. Use the ▲ or ▼ key to select the desired setting and press **ENTER**.

The following settings are possible:

Normal contrast

High contrast

Custom any value between normal and high contrast can be selected.

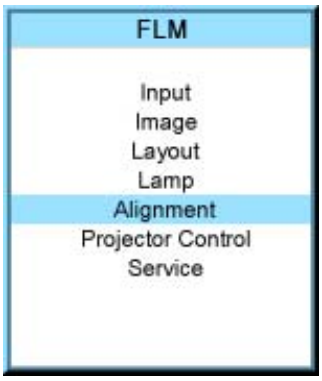



Image 12-16

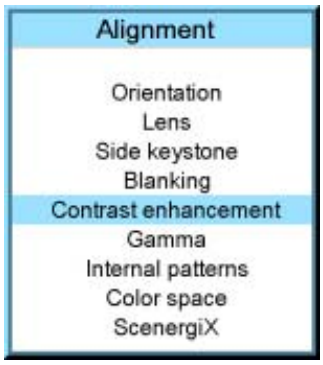



Image 12-17


Image 12-18

5. When *Custom* is selected, the contrast menu is displayed.
6. Use the ▲ or ▼ key to select the desired adjustment and press **ENTER**. Press **EXIT** to return.


Image 12-19

## 12.6 Blanking

### What can be done ?

Blanking adjustments affect only the edges of the projected image and are used to frame the projected image on to the screen and to hide or black out unwanted information (or noise). A ’0’ on the bar scale indicates no blanking.

### Which blanking adjustments are available ?

- top blanking
- bottom blanking
- left blanking
- right blanking

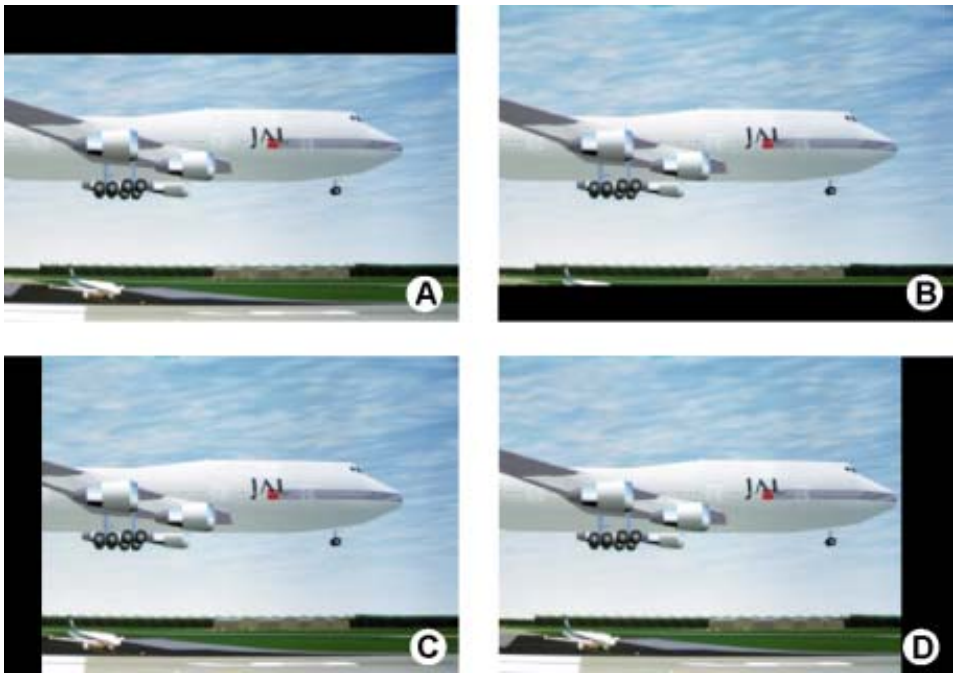



Image 12-20
Blanking

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

The reset function brings all blanking settings back to zero.

### How to adjust the blanking?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Blanking* and press **ENTER**.
4. Use the ▲ or ▼ key to select the desired blanking adjustment and press **ENTER**.
5. Use the ▲ or ▼ key to adjust until the desired blanking is reached.
6. Press **EXIT** to return.

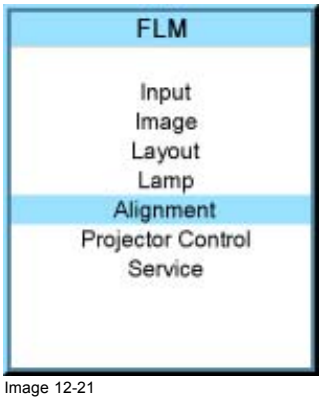



Image 12-21

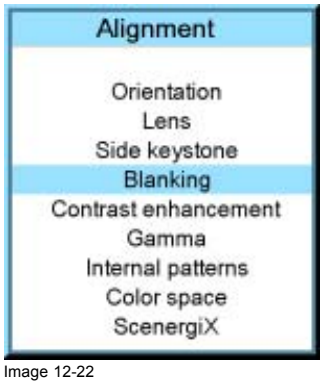



Image 12-22


Image 12-23

## 12.7 Gamma

### About Gamma

Gamma is an image quality enhancement function that offers a richer image by brightening the already darker portions of the image without altering the brightness of the brighter portions (contrast feeling enhanced).

### How to adjust gamma?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Gamma* and press **ENTER**.

   The Gamma progress bar appears.
4. Use ◄ or ► key to change the gamma setting and press **EXIT**.
   Gamma can be set to one of the 8 available steps.

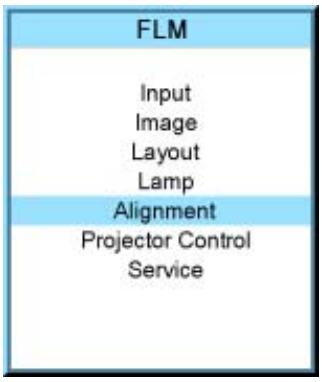



Image 12-24

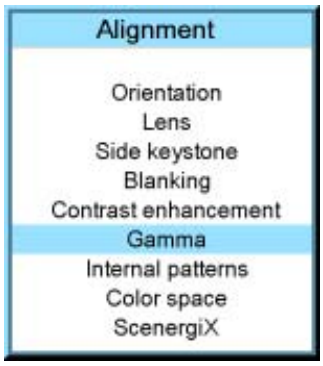



Image 12-25

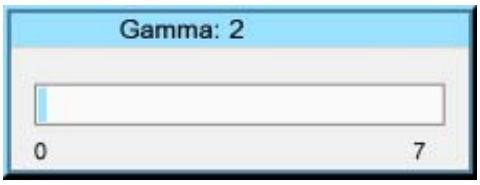



Image 12-26

## 12.8 Internal pattern

### What can be done with these patterns?

The projector is equipped with different internal patterns which can be used for measurement and alignment purposes.

### How to select?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Internal patterns* and press **ENTER**.

   The internal patterns menu is displayed.
4. Use the ▲ or ▼ key to scroll through the possible selection and press **ENTER** to activate the selected pattern.
   Select ▲ or ▼ in the menu to display the previous or next page with possible internal patterns.

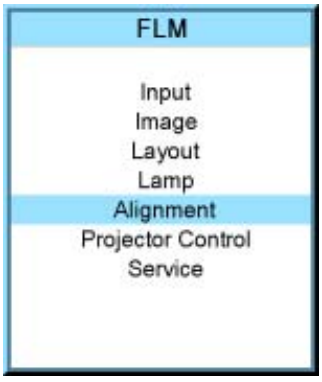



Image 12-27


Image 12-28

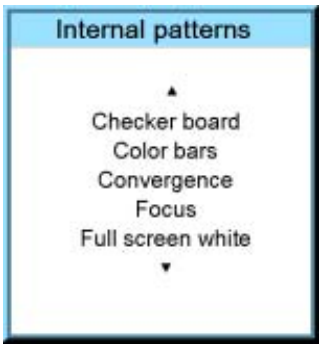



Image 12-29

The selected pattern is displayed.
The following patterns are available:

- Checker board
- Color bars
- Convergence
- Focus
- Full screen black
- Full screen blue
- Full screen green
- Full screen red
- Full screen white
- Hatch
- Outline

## 12.9 Color space

**Color space**

A color space or color standard is a mathematical representation for a color. For example the RGB color space is based on a Cartesian coordinate system.

### What can be adjusted ?

The color space (gamut), the collection of colors which can be reproduced by the projector, can be adjusted to 4 predefined stored values (one projector specific, 2 international standards and one custom preset). A temporary custom adjustment is possible. The maximum color space which can be displayed is the projector color space. This color space is measured at the factory and stored inside the projector.

### How to select a color standard?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Color space* and press **ENTER**.
4. Use the ▲ or ▼ key to select the [On] or [Off] selection and **ENTER** to toggle color space on or off.
5. When color space is [On], use the ▲ or ▼ key to select the desired color standard and press **ENTER** to activate. Use the ► key to view the details or to edit the details when Custom is selected.

| | |
|---|---|
| Projector | Maximum color space |
| EBU | European Broadcasting Union. This organization defines a European standard. |
| SMPTE | American standard. |
| Custom | The user can define the x and y coordinates for red, green and blue which forms the corners of the color space. By changing the coordinates, the color reproduction can be changed. |

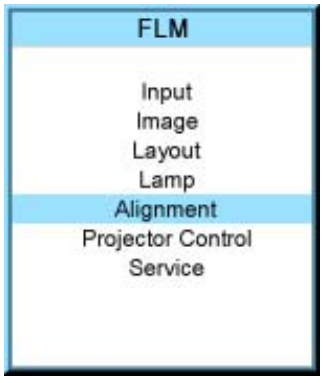


Image 12-30

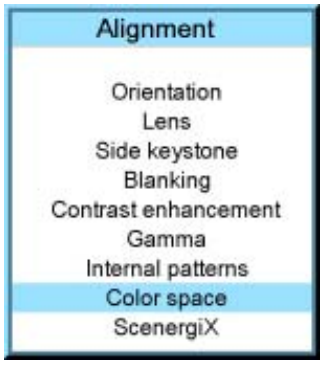


Image 12-31

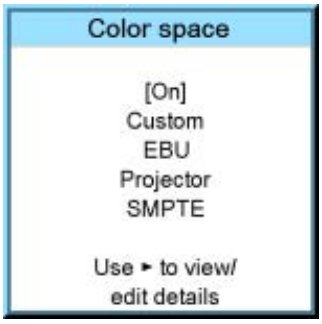


Image 12-32

6. When custom is selected, use the ► key to view the details. To adjust the custom values, select the desired color point using the ▲ or ▼ key and change the value with ◄ or ► key until the desired value is reached. When finished, press **EXIT** to return.

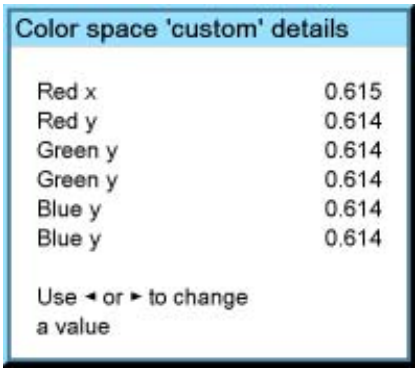



Image 12-33

## 12.10 ScenergiX

### Overview

- Introduction
- Preparations
- ScenergiX activation
- ScenergiX overlap zone (horizontal ScenergiX)
- ScenergiX overlap zone (vertical ScenergiX)
- ScenergiX size adjustment
- Adjusting the black level of the images

### 12.10.1 Introduction

#### Why ScenergiX ?

When working in a multichannel setup the Projector Toolset and its Soft Edge possibilities enable an image blending that gives the appearance of a single view, thus achieving realistic immersion for the majority of wide screen applications.

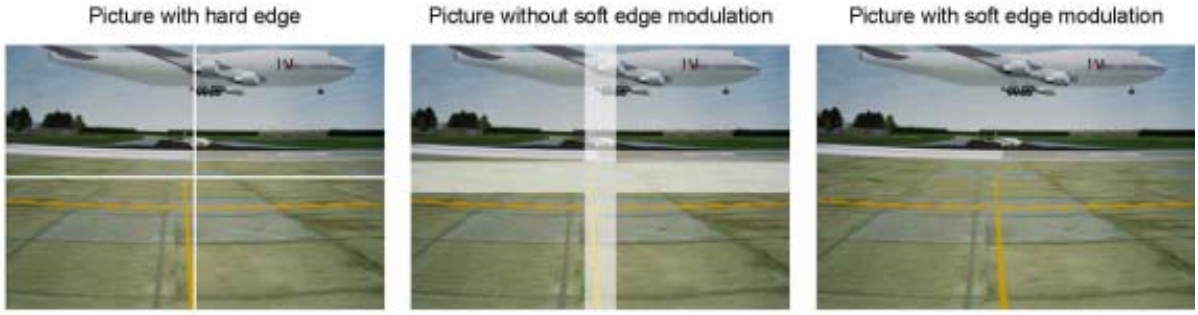



Image 12-34
Why Soft Edge?

#### What is the Basic Principal of ScenergiX ?

The principle of edge blending is archived by linear modulation of the light output in the overlap zone so that the light output in that zone equals the light output of the rest of the image.

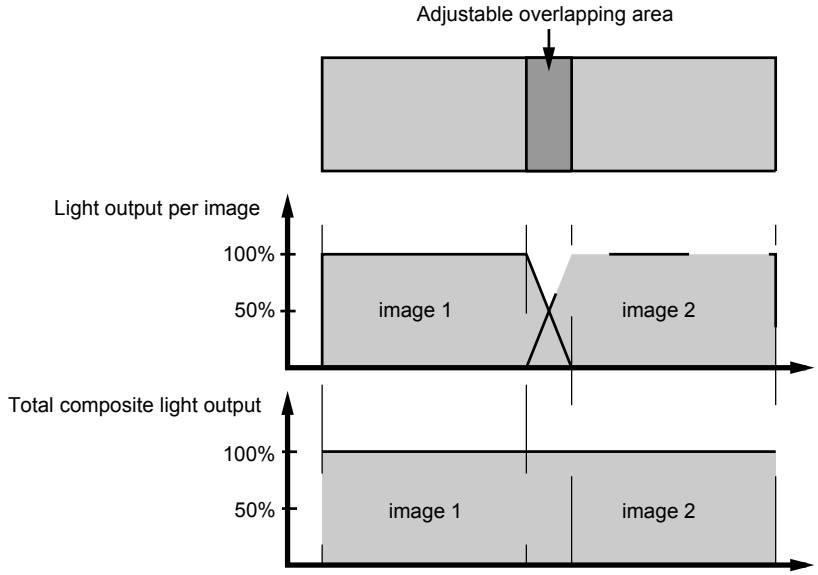



Image 12-35
ScenergiX Basic Principle

## 12.10.2 Preparations

### ScenergiX Preparations

To ensure proper ScenergiX adjustment, be sure that the following adjustments are done perfectly on all projectors:

- Convergence
- Geometry
- Color Matching (Color Temperature, Color Standard, Input Balance, Gamma)

## 12.10.3 ScenergiX activation

### How to activate?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *ScenergiX* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Status* and press **ENTER** to toggle between [On] and [Off].

| | |
|---|---|
| On | ScenergiX is active |
| Off | ScenergiX is not active |

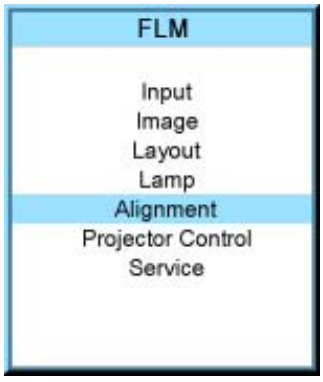



Image 12-36

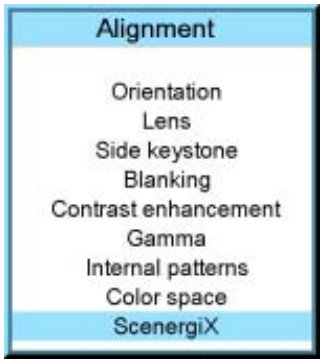



Image 12-37

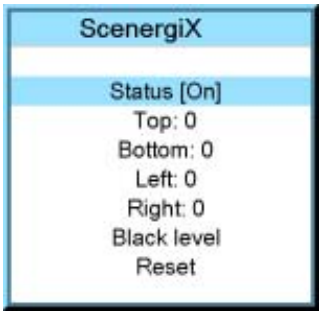



Image 12-38

### 12.10.4 ScenergiX overlap zone (horizontal ScenergiX)

#### Definitions

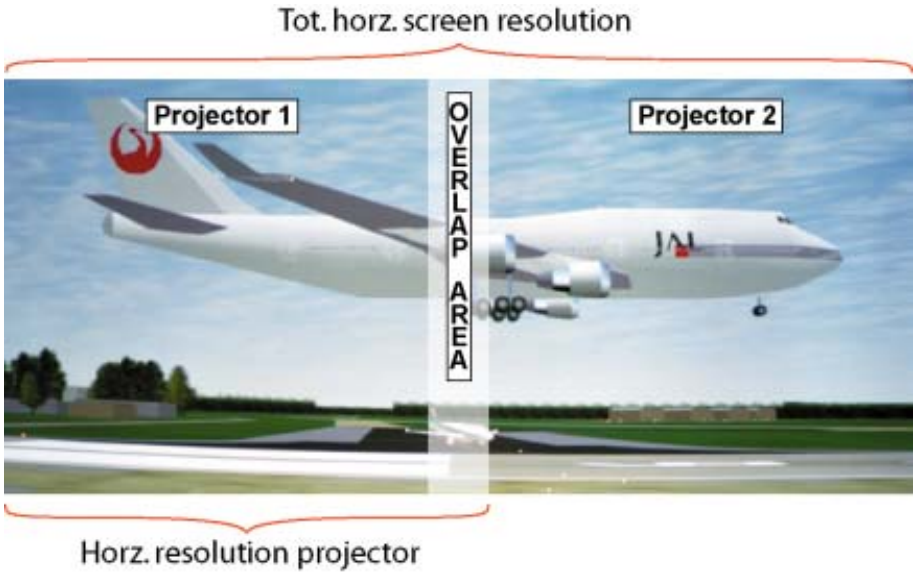



Image 12-39
ScenergiX set up

Overlap : number of pixels that overlap

Horizontal resolution of 1 projector : 1024 for Graphics versions, 1280 for Reality versions, 1400 for SXGA projectors.

Total horizontal screen resolution : [(horizontal resolution of 1 projector) x 2] minus overlap.

Horizontal Resolution source : number of active pixels of the source.

#### Adjustment of Active pixels of the first projector

1. Go to Image –> Timings menu of first projector.

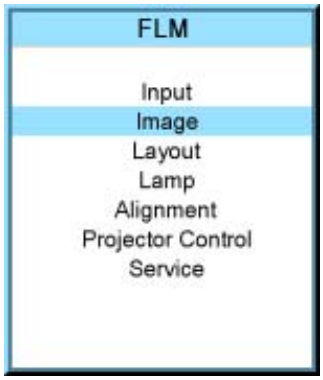



Image 12-40


Image 12-41

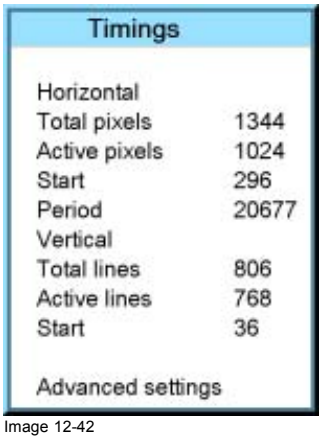



Image 12-42

2. Enter value for horizontal active as follows :
   Horz. active= [(Horz. resolution of 1 projector)/(Total horz. screen resolution)] x (horz. resolution source)
3. Horizontal start remains the same.

#### Adjustment of Active pixels (Pact) of second projector

1. Go to Image –> Timings menu of second projector.


Image 12-43


Image 12-44

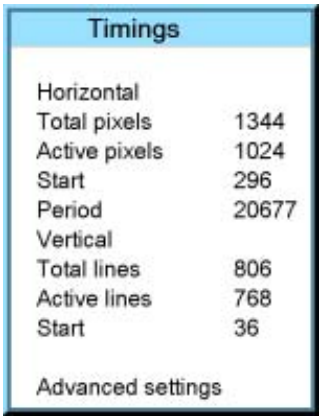



Image 12-45

2. Enter value for horizontal active as follows :
   Horz. active= [(Horz. resolution of 1 projector)/(Total horz. screen resolution)] x (horz. resolution source)
3. Horizontal start = original start + [(Horz. resolution source) minus (newly calculated Horz. active)]

### Example

Horizontal resolution source : 1600 pixels

horizontal resolution projector 1 & 2 : 1024 pixels

Overlap : 100 pixels

Total horizontal screen size in pixels : 1948 pixels

Horz; active projector 1 = [(1024 / 1948)] x 1600 = 841 pixels

Horz. active projector 2 = [(1024 / 1948)] x 1600 = 841 pixels

Horz. start projector 2 = Horz. start projector 1 + (1600 – 841)

## 12.10.5 ScenergiX overlap zone (vertical ScenergiX)

### Definitions

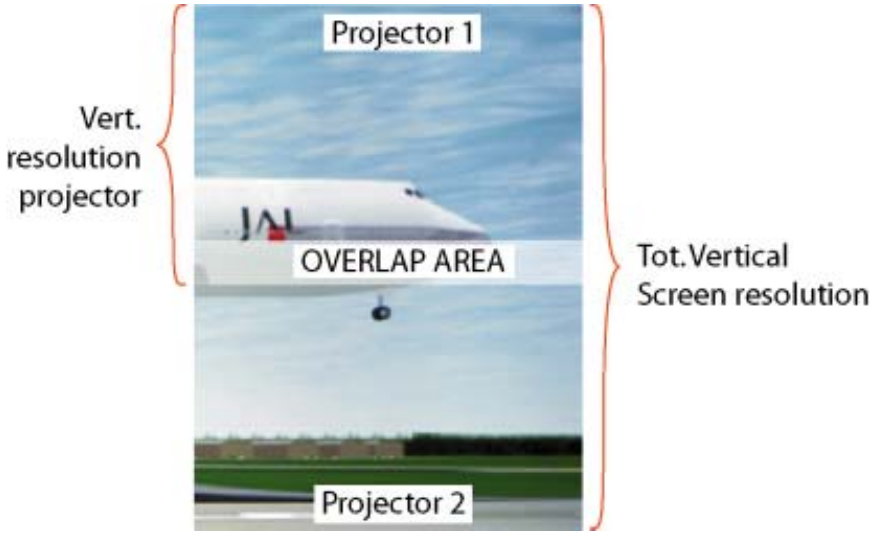



Image 12-46
Scenergix overlap zone vertical

Overlap : number of pixels that overlap

Vertical resolution of 1 projector : 768 for Graphics versions, 1024 for Reality versions, 1050 for SXGA projectors.

Total vertical screen resolution : [(Vertical resolution of 1 projector) x 2] minus (overlap)

Vertical Resolution source : number of active lines of the source

### Adjustment of Active lines (Lact) of the first projector

1. Go to Image –> Timings menu of first projector.

Image 12-47

Image 12-48

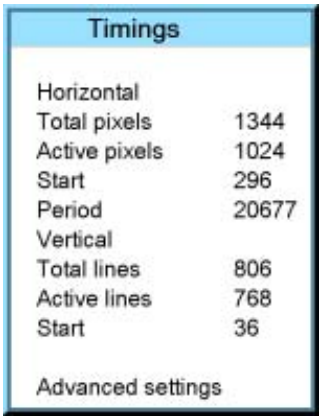


Image 12-49

2. Enter value for vertical active (= Lact) as follows :
   Lact = [(vert.. resolution of 1 projector)/(Total Vert. screen resolution)] x (Vert. resolution source)
3. Vertical start (= Lstart) remains the same.

### Adjustment of Active lines (Lact) of second projector

1. Go to Image –> Timings menu of first projector.

Image 12-50

Image 12-51

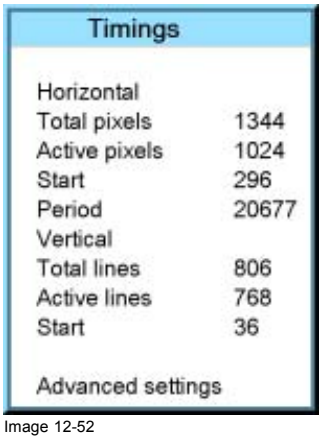


Image 12-52

2. Enter value for vertical active (= Lact) as follows :
   Lact = [(vert.. resolution of 1 projector)/(Total Vert. screen resolution)] x (Vert. resolution source)
3. Vertical start (= Lstart) = original start + [(Vert. resolution source) minus (newly calculated Lact)]

### Example

Vertical resolution source : 1200 lines

Vertical resolution projector 1 & 2: 768 lines

Overlap : 50 lines

Total vertical screen size : 1486 lines

Lact projector 1 = (768 / 1486) x 1200 = 620 lines

Lact projector 2 = (768 / 1486/) x 1200 = 620 lines

Lstart projector 2 = Lstart projector 1 + (1200 – 620)

## 12.10.6 ScenergiX size adjustment

### What can be done with the size menu?

The Top, bottom, left or right item set the blending zone.

**The ScenergiX menu items are only accessible when status is [On].**

## How to set the blending zone?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *ScenergiX* and press **ENTER**.
4. Use the ▲ or ▼ key to select one of the four size adjustments and press **ENTER**.

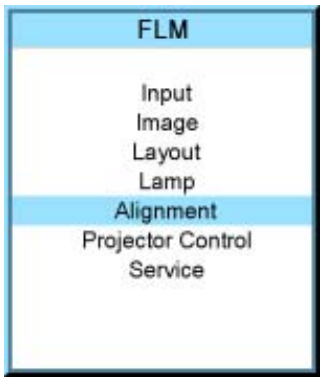



Image 12-53

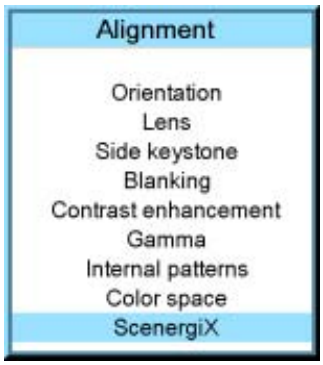



Image 12-54

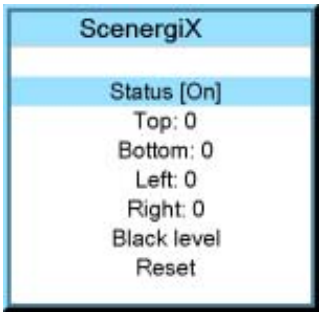



Image 12-55

A pattern with the different areas is displayed.

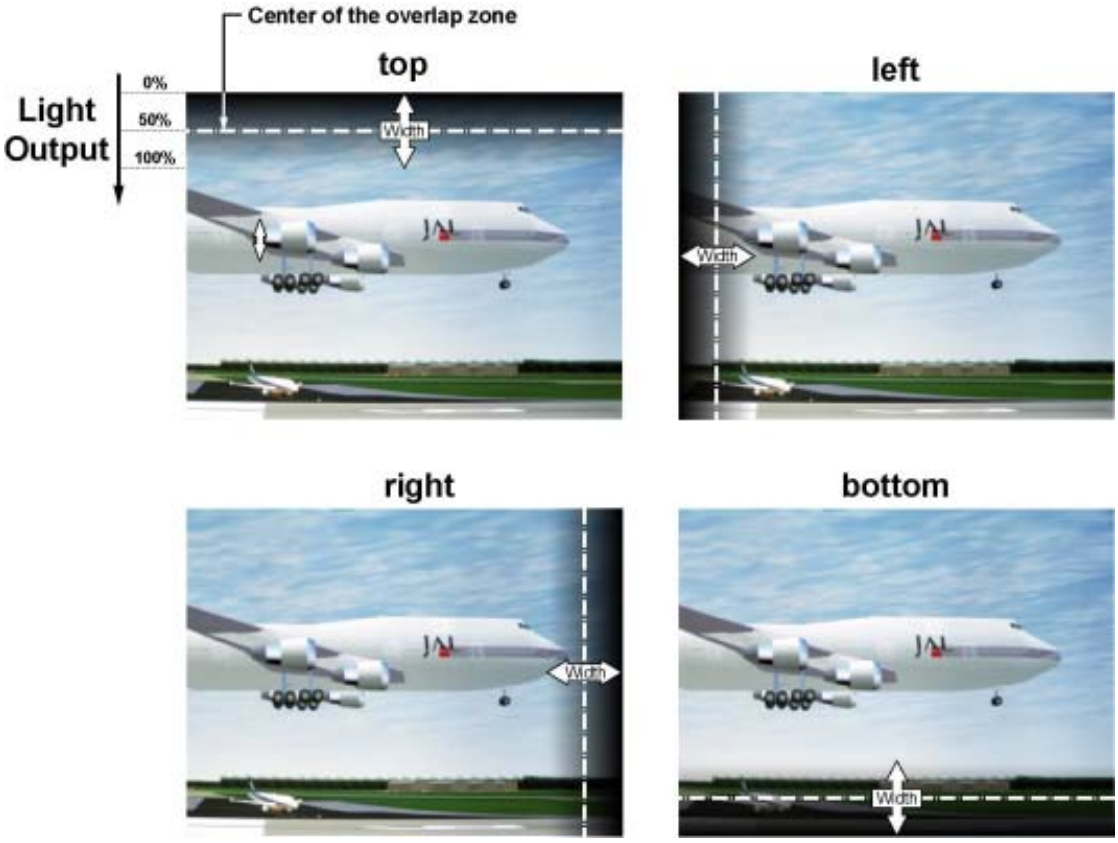



Image 12-56
Width selections

5. Use the cursor keys to move the border of the overlap area to the desired position (value between 0 and 255). Set first the width for the first projector and repeat for the second one.

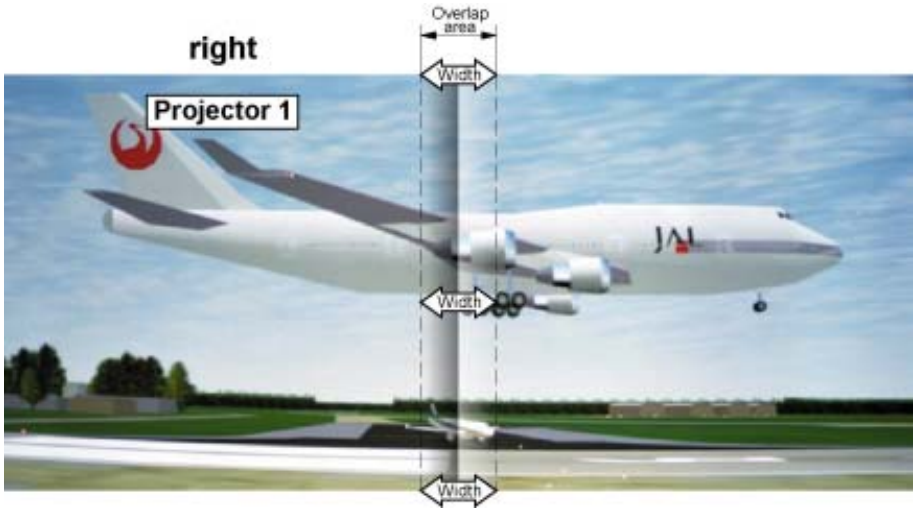



Image 12-57
Width set up for projector 1

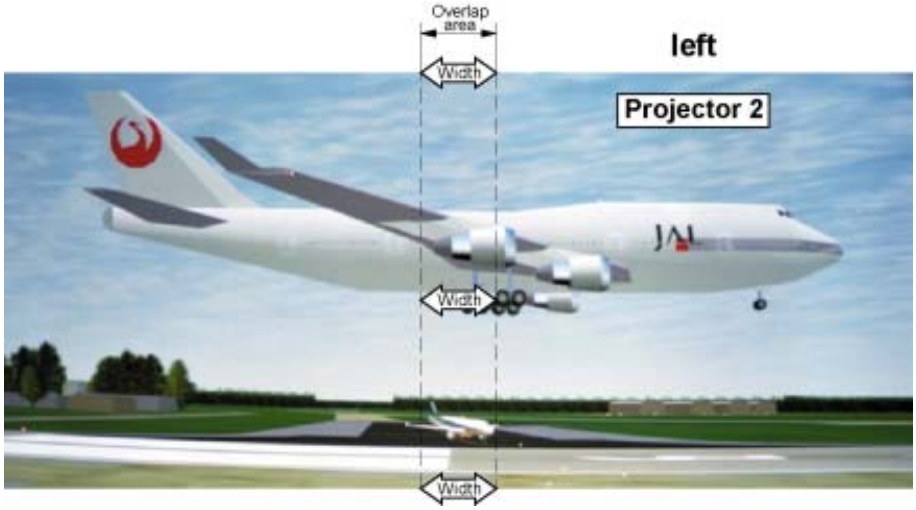



Image 12-58
Width set up for projector 2

### 12.10.7 Adjusting the black level of the images

#### Why black level adjustment

For dark images, the overlap zone will be brighter then the rest of the images. Therefore we can rise the black level of the remaining image (excluding the overlap zone).

#### How to adjust

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Alignment* and press **ENTER**.
3. Use the ▲ or ▼ key to select *ScenergiX* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Black level* and press **ENTER**.

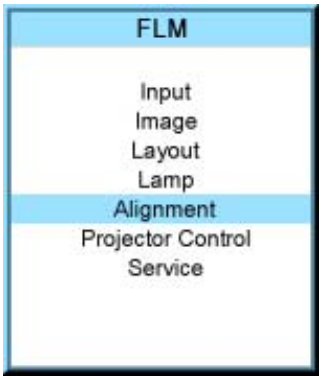



Image 12-59

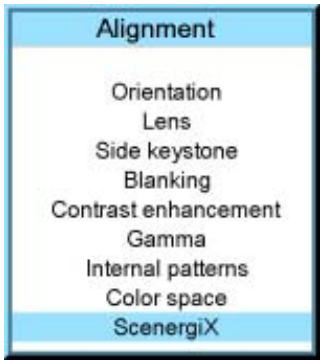



Image 12-60

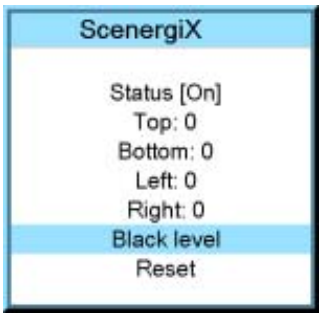



Image 12-61

5. Adjust the black level of area A until the black level of area A, B and C are equal.

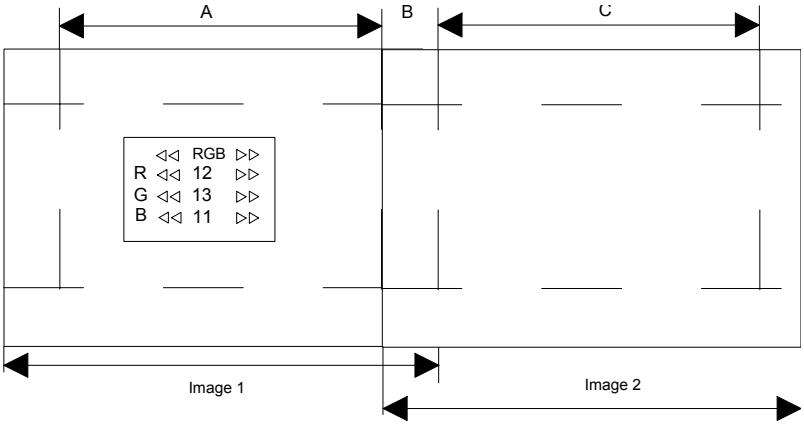



Image 12-62
Black level adjustment

**Use the *Reset* function to bring all ScenergiX settings back to zero.**

# 13. PROJECTOR CONTROL

### About this chapter

This chapter explains the setup of the control part of the software such as projector address and all types of communication with the external world.

### Overview

- Overview flow
- Projector address
- Serial communication
- Network
- IR control switching
- Local LCD contrast

## 13.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 |
|---|---|---|
| Projector control | | |
| | Projector address | |
| | | Projector address |
| | | Common address |
| | Serial communication | |
| | | Baud rate [115200] |
| | | Interface standard [RS232/RS422] |
| | | RS422 termination [Off/On] |
| | Network | |
| | | DHCP [ON/OFF] |
| | | IP-address |
| | | Subnet mask |
| | | Default gateway |
| | IR control | |
| | | IR Front [On/Off] |
| | | IR Back [On/Off] |
| | | IR Side [On/Off] |
| | Local LCD contrast | |

## 13.2 Projector address

### Overview

- Individual projector address
- Common address

### 13.2.1 Individual projector address

#### About individual projector address

Before a projector, and only this projector, can be controlled via a remote control, an individual address must be entered in the projector.

This individual projector address can then be used to control the projector via remote control or via a serial connection.

Next to an individual projector address, each projector has also a common address for group control.

#### How to set an individual address?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Projector address* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Projector Address* and press **ENTER**.

   The edit projector address window opens.
5. Use the ▲ or ▼ key to select a new value
   Or,
   enter a new value with the digit keys on the remote control or local keypad.
6. Use the ◄ or ► key to select the next digit and repeat step 5.
7. When the desired address is entered, press **ENTER** to store that address.

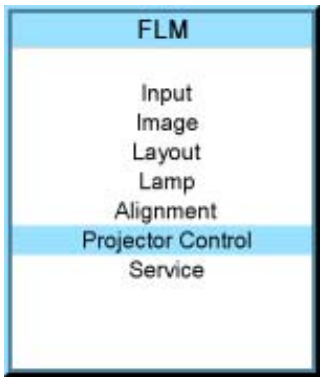


Image 13-1

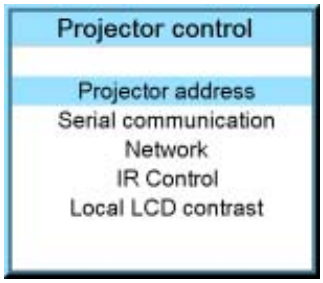


Image 13-2

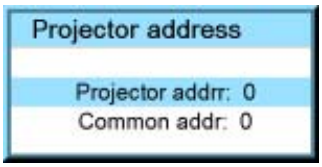


Image 13-3

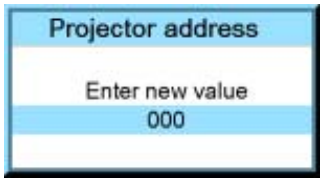


Image 13-4

### 13.2.2 Common address

#### About common address

A common address can be ’0’ or ’1’.

Any command coming from a remote control programmed with that common address will be executed.

#### How to change the common address?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Projector address* and press **ENTER**.
4. Use the ▲ or ▼ key to select *Common address* and press **ENTER**.

   The edit common address window opens.
5. Use the ▲ or ▼ key to select ’0’ or ’1’

Or,
enter ’0’ or ’1’ with the digit keys on the remote control or local keypad.

6. When the desired address is entered, press **ENTER** to store that address.

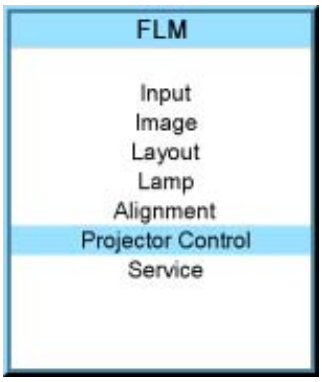


Image 13-5

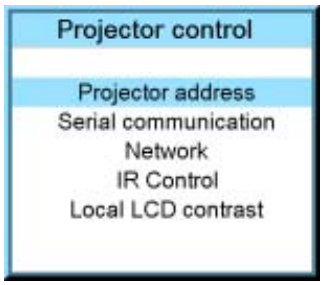


Image 13-6

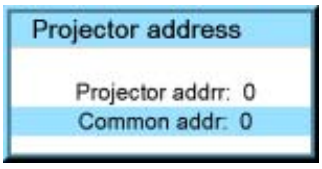


Image 13-7

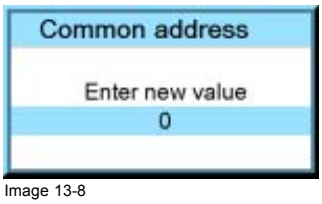


Image 13-8

## 13.3 Serial communication

### Overview

- Baud rate setup
- Interface standard
- RS422 termination

### 13.3.1 Baud rate setup

#### What can be done?

The baudrate for a serial connection with a computer can be set up.

#### How to set up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Serial communication* and press **ENTER**.

   The serial communication menu opens.
4. Use the ▲ or ▼ key to select *Baudrate* and press **ENTER** to toggle between the available baud rates.
   The following baud rates can be selected:
   - 9600
   - 19200
   - 38400
   - 57600
   - 115200
5. Press **EXIT** to return.

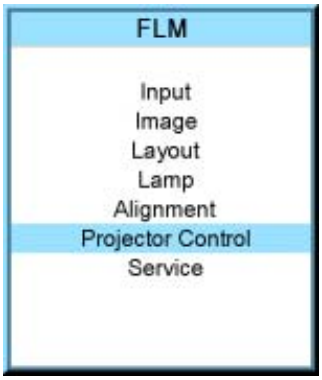


Image 13-9

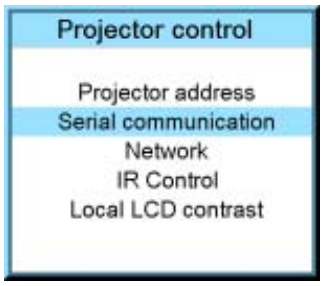


Image 13-10

Image 13-11

### 13.3.2 Interface standard

#### What can be done?

The communication protocol for the communication between the projector and a computer can be set to RS232 or RS422.

#### How to set up

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Serial communication* and press **ENTER**.

   The serial communication menu opens.
4. Use the ▲ or ▼ key to select *Interface standard* and press **ENTER** to toggle between [RS232] or [RS422]..

   Default: [RS232]

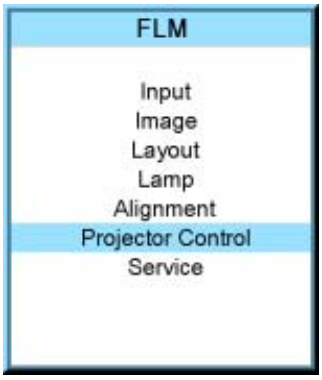


Image 13-12

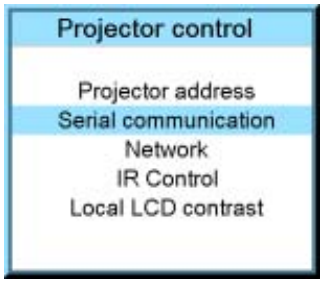


Image 13-13

Image 13-14

### 13.3.3 RS422 termination

#### What can be done?

When the interface standard is set to RS422, the last projector in a line should be RS422 terminated (ON position). All others in the line should be in the OFF position.

#### How to set

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Serial communication* and press **ENTER**.

   The serial communication menu opens.
4. Use the ▲ or ▼ key to select *RS422 termination* and press **ENTER** to toggle between [On] or [Off].

Default: [On]

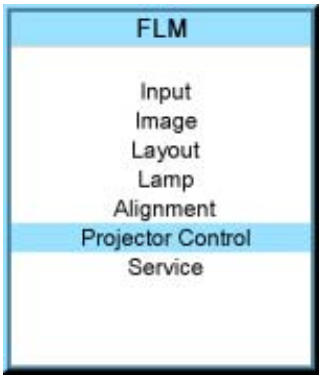


Image 13-15

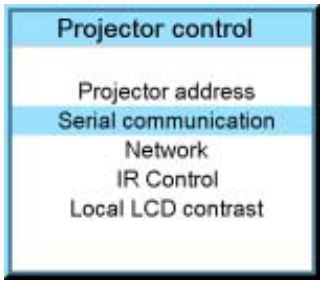


Image 13-16

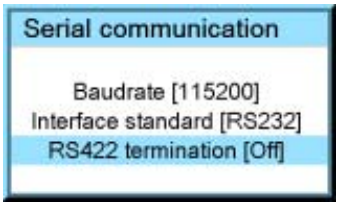


Image 13-17

## 13.4 Network

### Overview

- Introduction to an Network connection
- DHCP setup
- IP-address set up
- Subnet-mask set up
- Default Gateway set up

### 13.4.1 Introduction to an Network connection

**DHCP**

Dynamic host configuration protocol. DHCP is a communications protocol that lets network administrators manage centrally and automate the assignment of IP addresses in an organization's network. Using the Internet Protocol, each machine that can connect to the Internet needs a unique IP address. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each machine. Without DHCP, the IP address must be entered manually at each computer and, if computers move to another location in another part of the network, a new IP address must be entered. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network.

**IP**

Internet Protocol. The network layer of TCP/IP. Required for communication with the internet.

**Subnet mask**

A number that is used to identify a subnetwork so that IP addresses can be shared on a local area network.

**Default Gateway**

A router that serves as an entry point into and exit point out of a network. For example, a local network (LAN) may need a gateway to connect it to a wide area network (WAN) or to the Internet.

**MAC address**

Media Access Control address. Unique hardware number, used in combination with the IP-address to connect to the network (LAN or WAN).

### What should be set up for an Ethernet address?

2 ways can be used to assign an address:

- use the DHCP setting so that an automatic address will be assigned.
- Assign manually an IP address, Net-mask (subnet-mask), (default) gateway address.
  - Set the IP-Address field to the desired value. This must NOT be 0.0.0.0 for static IP-Address assignment. The IP address identifies a projector's location on the network in the same way a street address identifies a house on a city block. Just as a street address must identify a unique residence, an IP address must be globally unique and have a uniform format.
  - Set the Subnet-Mask as appropriate for the local subnet.
  - Set the Default-Gateway to the IP-Address of the local router (MUST be on the local subnet!) on the same network as this projector that is used to forward traffic to destinations beyond the local network. This must not be 0.0.0.0. If there is no router on the projector's local subnet then just set this field to any IP-Address on the subnet.

## 13.4.2 DHCP setup

### How to switch DHCP setting?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Ethernet* and press **ENTER**.

   The Ethernet menu opens.
4. Use the ▲ or ▼ key to select *DHCP*.
5. Press **ENTER** to toggle the DHCP setting.

   [ON] = DHCP is activated. Automatic assigning of an address is activated.

   [OFF ] = DHCP is deactivated. A fixed address will be used.

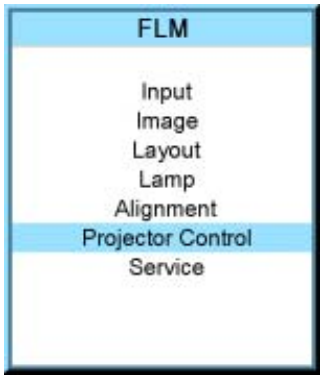


Image 13-18

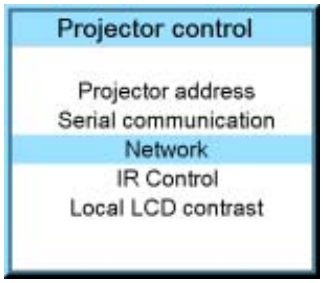


Image 13-19

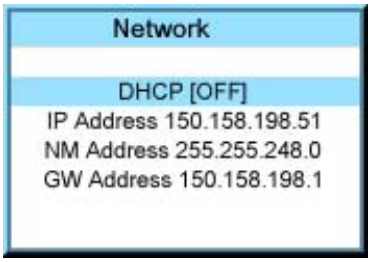


Image 13-20

## 13.4.3 IP-address set up

### How to set up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Network* and press **ENTER**.

   The Network menu opens.
4. Use the ▲ or ▼ key to select *IP-address* and press **ENTER** to select.
   ***Note:*** *An address contains 4 octets with a maximum value of 255.*

   *This must NOT be 0.0.0.0 for static IP-Address assignment.*
5. Use the ▲ or ▼ key to select the desired digit and press ◄ or ► key to select the next digit in the address.
   Or,
   enter the value with the digit keys on the remote control or local keypad. The next digit in the address will be selected automatically.
6. Press **EXIT** to return.

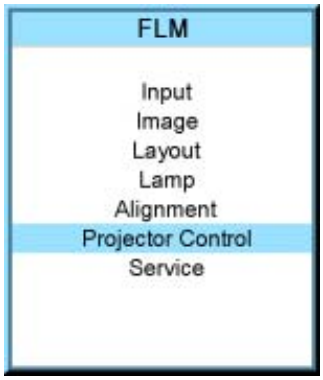


Image 13-21

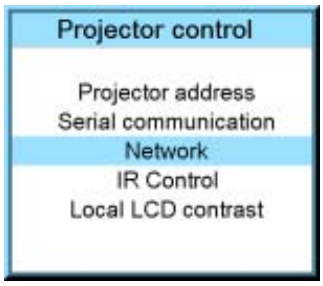


Image 13-22

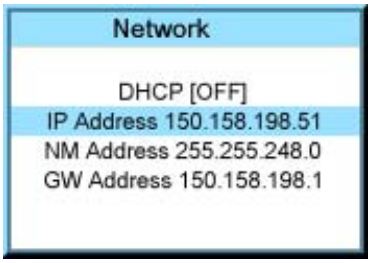


Image 13-23

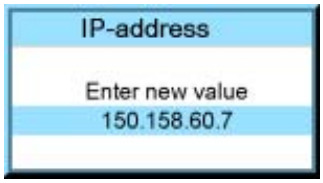


Image 13-24

### 13.4.4 Subnet-mask set up

#### How to set up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Network* and press **ENTER**.

   The Ethernet menu opens.
4. Use the ▲ or ▼ key to select *Subnet mask* and press **ENTER** to select.
   ***Note:*** *An address contains 4 octets with a maximum value of 255.*

   Fill out the 4 fields as appropriate for the local subnet.
5. Use the ▲ or ▼ key to select the desired digit and press ◄ or ► key to select the next digit in the address.
   Or,
   enter the value with the digit keys on the remote control or local keypad. The next digit in the address will be selected automatically.
6. Press **EXIT** to return.

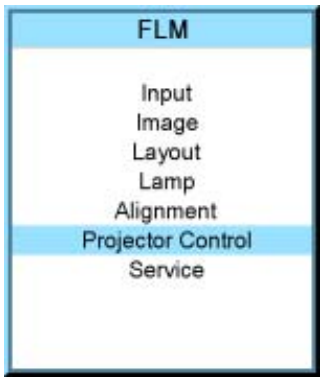


Image 13-25

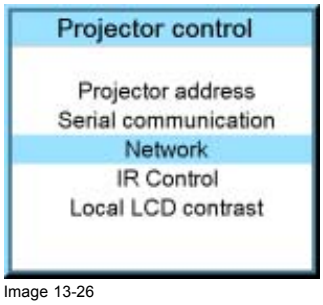


Image 13-26

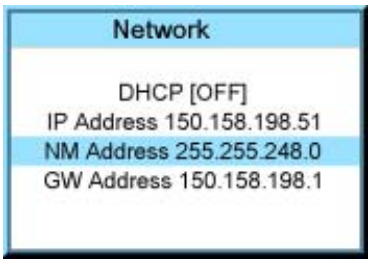


Image 13-27

Image 13-28

### 13.4.5 Default Gateway set up

#### How to set up?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Network* and press **ENTER**.

   The Ethernet menu opens.
4. Use the ▲ or ▼ key to select *Default Gateway* and press **ENTER** to select.
   ***Note:*** *An address contains 4 octets with a maximum value of 255.*

   Set the default gateway to the IP-address of the router (MUST be on the local subnet!). If there is no router on the projector's local subnet then just set this field to any IP-address on the subnet.
5. Use the ▲ or ▼ key to select the desired digit and press ◄ or ► key to select the next digit in the address.
   Or,
   enter the value with the digit keys on the remote control or local keypad. The next digit in the address will be selected automatically.
   ***Note:*** *This must NOT be 0.0.0.0*

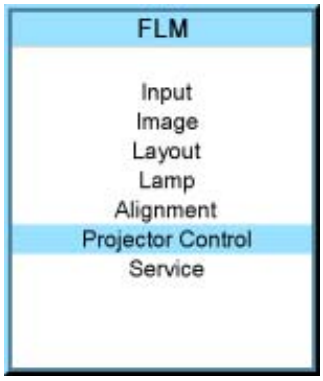


Image 13-29

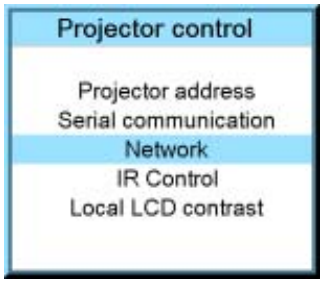


Image 13-30

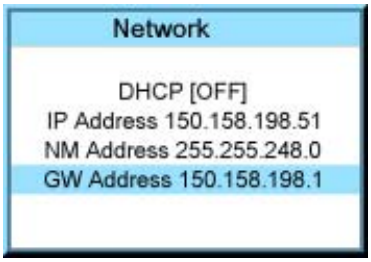


Image 13-31

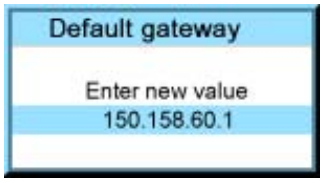


Image 13-32

6. Press **EXIT** to return.

## 13.5 IR control switching

#### What can be done?

Each IR receiver inside the projector can be activated or deactivated. When an IR receiver is deactivated, no IR signal send to this IR receiver will be processed.

#### How to switch

1. Press **MENU** to activate the menus.

2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *IR Control* and press **ENTER**.
4. Use the ▲ or ▼ key to select the desired IR receiver and press **ENTER** to toggle this receiver [on] or [off].

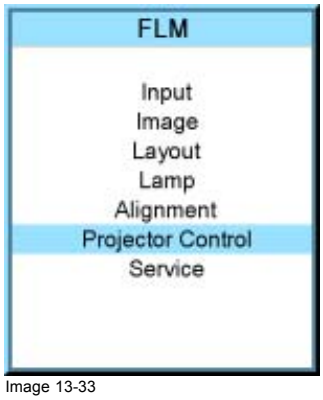


Image 13-33

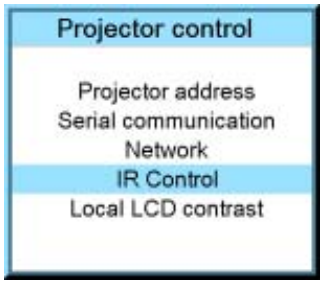


Image 13-34

Image 13-35

## 13.6 Local LCD contrast

### What is possible?

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

### How to change?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Projector control* and press **ENTER**.
3. Use the ▲ or ▼ key to select *Local LCD contrast* and press **ENTER**.
4. Use the ▲ or ▼ key to adjust the local contrast.

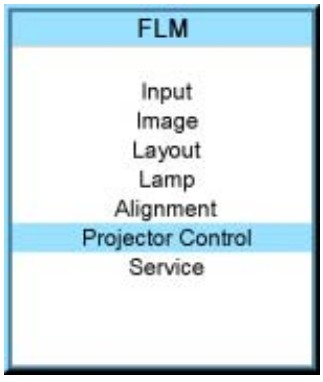


Image 13-36

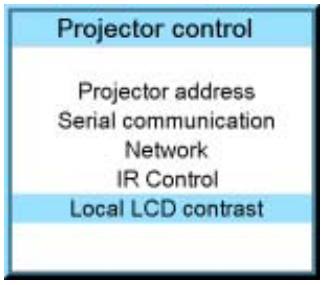


Image 13-37

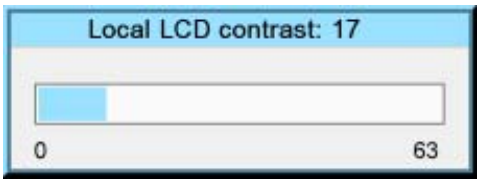


Image 13-38

# 14. SERVICE MENU

### About this chapter

This chapter refers to the Service menu in which the customer can find valuable information when calling the Barco help desk.

### Overview

- Overview flow
- Identification
- Diagnosis
- Convergence
- Internal service patterns
- Restore factory defaults
- Reset formatter
- Save custom settings
- Refill mode

## 14.1 Overview flow

### Overview

| Level 1 | Level 2 | Level 3 |
|---|---|---|
| Service | | |
| | Identification | |
| | Diagnosis | |
| | | Version |
| | | Voltages |
| | | Temperatures |
| | | Fan speeds |
| | | Error logging |
| | Convergence | |
| | Internal service patterns | |
| | | PNP IN |
| | | OSD |
| | | PMP OUT |
| | | FIB |
| | | Formatter |
| | Restore factory defaults | |
| | Reset formatter | |
| | Save custom settings | |
| | Refill mode | |

## 14.2 Identification

### What can be seen on the identification screen?

The identification screen shows the general information about the projector.

The following items will be displayed:

- Projector address
- Type of projector
- Package
- Configuration
- Baud rate
- IP address
- MAC address
- Text
- Serial number of projector: this number can be useful when calling for technical assistance.
- Runtime
- Lamp runtime
- Customer ID

### How to display the screen?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Identification* and press **ENTER**.

   The identification screen is displayed.

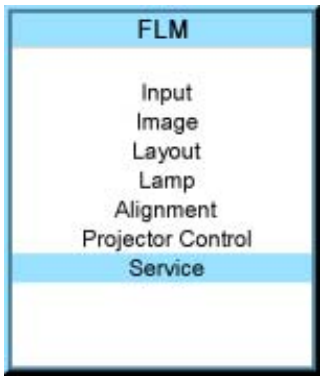



Image 14-1

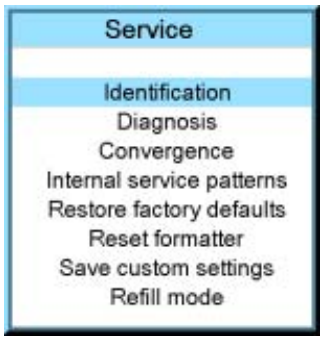



Image 14-2

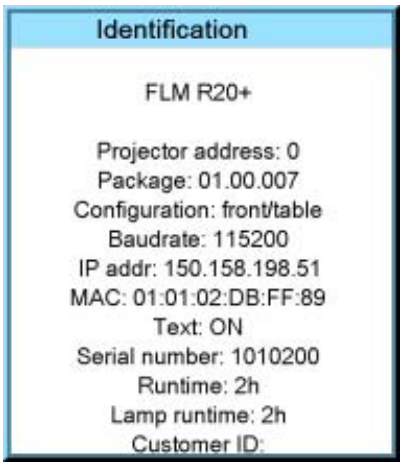



Image 14-3

### Add a customer ID to identification window

When on the identification window:

1. Use the ▲ or ▼ key to select *Customer ID* and press **ENTER**.

   The Customer ID input window opens.


Image 14-4

2. Use the ▲ or ▼ key to change the selected character.
   Use the ◄ or ► key to selected another character.
   ***Note:*** *Digits can be entered with the digit keys on the remote control or on the local keypad. When a digit is entered in that way, the next character will be selected automatically.*

## 14.3 Diagnosis

### What can be seen?

The diagnosis menu gives the possibility to get an overview of the working of the projector.

### 14.3.1 How to start up the diagnosis?

#### Start up

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen will be displayed.

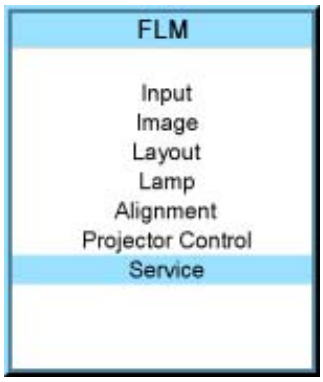



Image 14-5

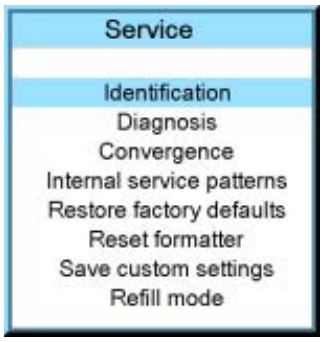



Image 14-6

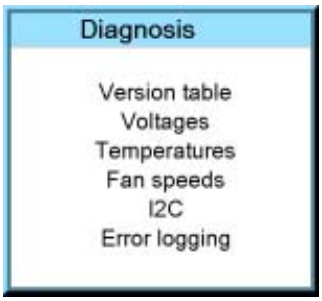



Image 14-7

### 14.3.2 Versions

#### How to display an overview?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen is displayed.
4. Use the ▲ or ▼ key to select *Versions* and press **ENTER**.

The Versions overview is displayed.

Image 14-8

Image 14-9

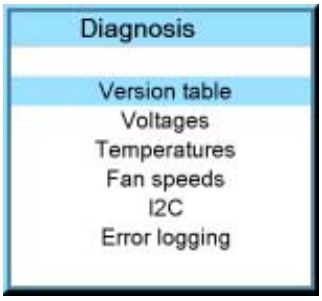


Image 14-10

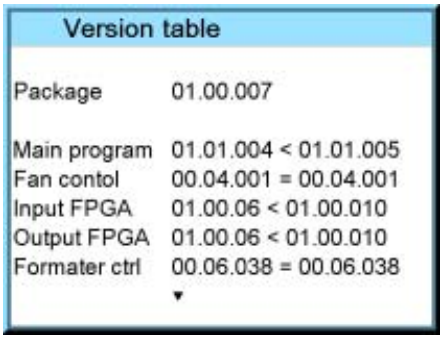


Image 14-11

**Use the ▲ or ▼ item in the menu to select the previous or next page with information.**

### 14.3.3 Voltages

#### How to display an overview?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen will be displayed.
4. Use the ▲ or ▼ key to select *Voltages* and press **ENTER**.

The Voltage overview menu will be displayed.


Image 14-12


Image 14-13

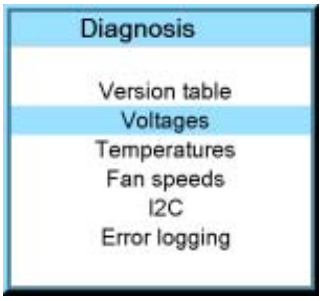



Image 14-14

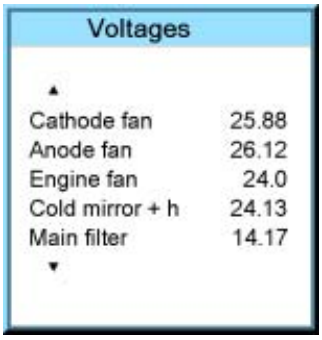



Image 14-15

**Use the ▲ or ▼ item in the menu to select the previous or next page with information.**

### 14.3.4 I²C diagnosis

#### How to select?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen is displayed.
4. Use the ▲ or ▼ key to select *I2C* and press **ENTER**.

The I²C diagnosis overview is displayed.

Image 14-16

Image 14-17

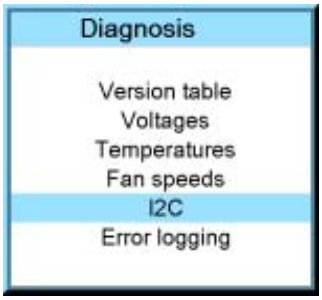


Image 14-18

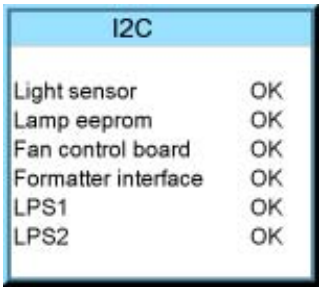


Image 14-19

### 14.3.5 Temperatures

#### How to get an overview?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen will be displayed.
4. Use the ▲ or ▼ key to select *Temperatures* and press **ENTER**.

The Temperature overview menu will be displayed.


Image 14-20


Image 14-21

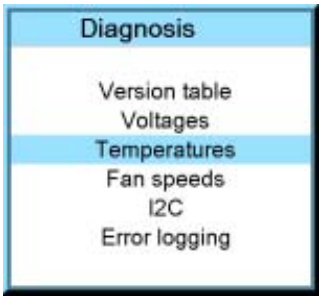



Image 14-22

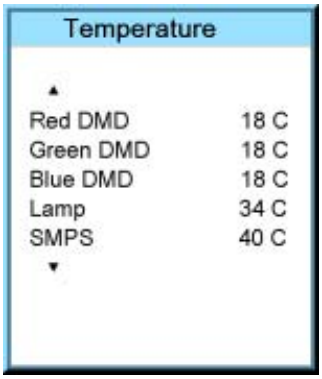



Image 14-23

**Use the ▲ or ▼ item in the menu to select the previous or next page with information.**

### 14.3.6 Fan speeds overview

#### How to get an overview?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.
   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.
   The diagnosis screen will be displayed.
4. Use the ▲ or ▼ key to select *Fan speeds* and press **ENTER**.

The Fan speeds overview menu will be displayed.


Image 14-24


Image 14-25

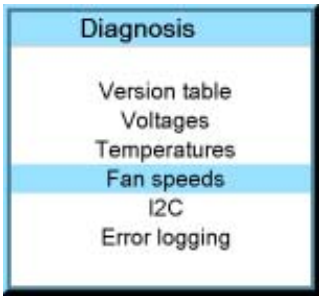



Image 14-26

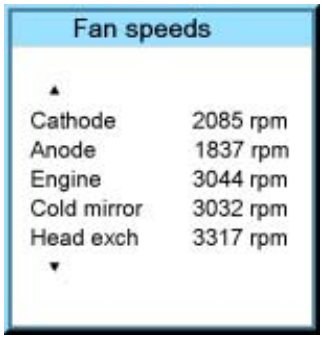



Image 14-27

**Use the ▲ or ▼ item in the menu to select the previous or next page with information.**

### 14.3.7 Error logging overview

#### How to get an overview?

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Diagnosis* and press **ENTER**.

   The diagnosis screen will be displayed.
4. Use the ▲ or ▼ key to select *Error logging* and press **ENTER**.

The Error logging overview menu is displayed.

For more explanation about the stored error message, see chapter "C. Troubleshooting", "Error codes", page 173.

Image 14-28

Image 14-29

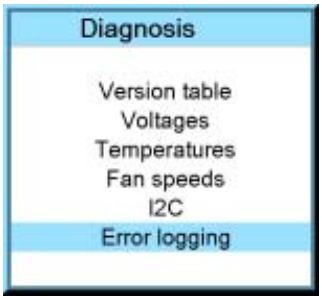


Image 14-30

## 14.4 Convergence

### What can be done?

The convergence patterns can be used to check the convergence alignment of red, green and blue.

Realignment of the convergence can only be done by a qualified service technician.

### How to display the convergence patterns

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Convergence* and press **ENTER**.

   The convergence pattern is displayed. Press **ENTER** to toggle to another pattern. Press **EXIT** to return to the menu.

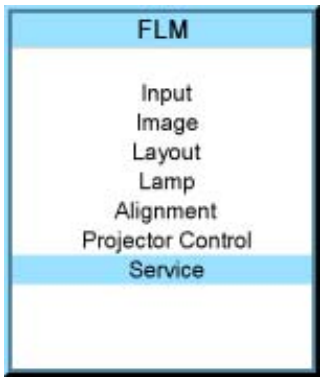


Image 14-31

Image 14-32

## 14.5 Internal service patterns

### How to select

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Internal service patterns* and press **ENTER**.

   The internal service pattern window opens.

4. Use the ▲ or ▼ key to select the desired patterns and press **ENTER**.

   When a pattern is selected, press **ENTER** to toggle to other patterns of the selected type. Press **EXIT** to return to the internal service pattern menu.

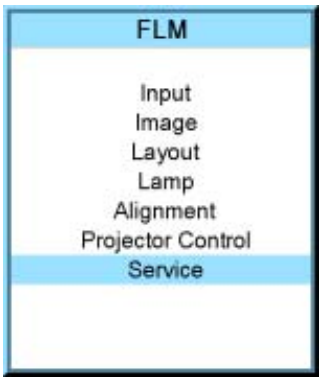


Image 14-33

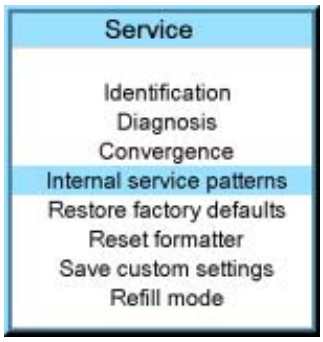


Image 14-34

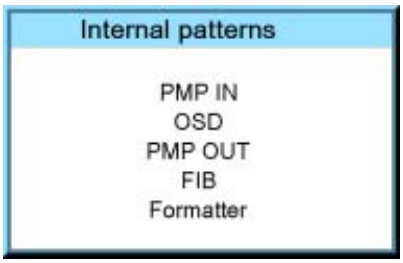


Image 14-35

## 14.6 Restore factory defaults

### What can be done?

All settings of the projector will be set to the original factory settings. All user settings are erased with this operation.

### How to return to the default settings

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Restore factory defaults* and press **ENTER**.

   The factory defaults confirmation window opens.
4. Use the ▲ or ▼ key to select *Yes* or *No* and press **ENTER**.

   If you are sure to restore the factory defaults and to erase the custom settings, select *Yes*.

   If you are not sure, select *No*.

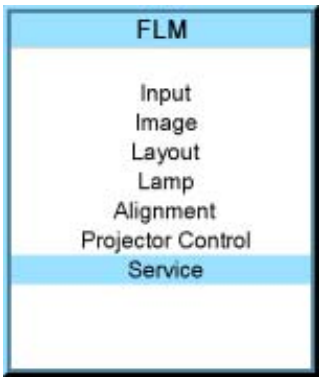


Image 14-36

Image 14-37

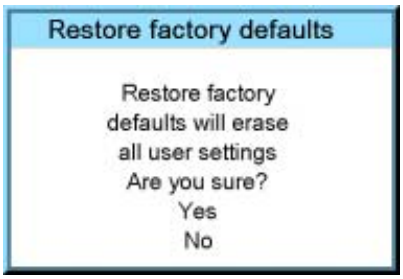


Image 14-38

## 14.7 Reset formatter

### How to reset

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.

3. Use the ▲ or ▼ key to select *Reset formatter* and press **ENTER**.

   The formater reset confirmation window opens.

4. Use the ▲ or ▼ key to select *Yes* or *No* and press **ENTER**.

   If you to reset the formatter, select *Yes*.

   If you do not want to reset the formatter, select *No*.


Image 14-39


Image 14-40

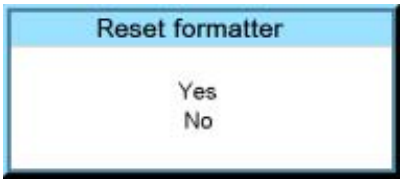



Image 14-41

## 14.8 Save custom settings

### What is done?

The current custom settings can be saved to the internal backup device in the same way as it would be done when the projector was switched to standby.

### How to save

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.

3. Use the ▲ or ▼ key to select *Save custom settings* and press **ENTER**.

   The custom settings are written to the internal backup device. A message menu “Save data ...” is displayed during the save operation.

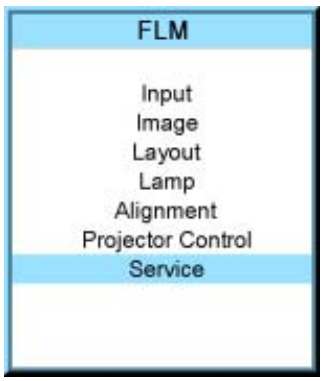



Image 14-42

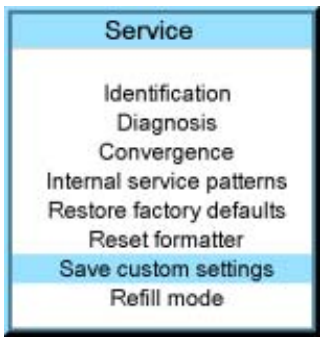



Image 14-43

## 14.9 Refill mode

**Before selecting Refill mode, take first all preparations necessary to refill the cooling circuit.**

### What can be done?

When all preparations are taken, the refill mode will automatically activate the refill process.

### How to start the refill mode

1. Press **MENU** to activate the menus.
2. Use the ▲ or ▼ key to select *Service* and press **ENTER**.

   The service window opens.
3. Use the ▲ or ▼ key to select *Refill mode* and press **ENTER**.

   A refill confirmation message is displayed.
4. Use the ▲ or ▼ key to select *Yes or No* and press **ENTER**.

   Yes will switch the projector in refill mode.

   When No is selected, the projector stays in normal mode.


Image 14-44


Image 14-45

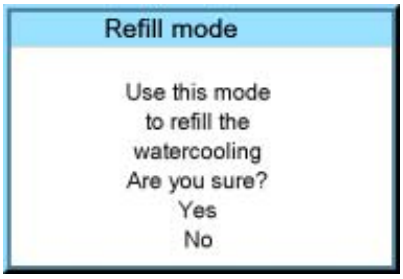



Image 14-46

**CAUTION: Restart of the projector is necessary to terminate the refill mode. Before restarting, switch off the projector and reinstall first the cooling circuit.**

# 15. MAINTENANCE

## About this chapter

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

**CAUTION: All HEPA filters of the FLM R20+ Performer projector must be replaced on a regular basis, depending on the environment conditions of the projector.**

**The top air filter must be cleaned regularly, depending on the environment conditions of the projector.**

**CAUTION: The pressure of the liquid cooling circuit should be checked regularly. This pressure, indicated on the internal manometer, should be between 0,5 and 1 bar. If not, corrective action should be taken by qualified technical service personnel.**

**HEPA**

High Efficiency Particulate Absorbing

## Overview

- Replacement of the dust filter on the front side
- Replacement of the dust filter on the bottom side
- Replacement of the dust filter on the top side
- Pressure verification of the liquid cooling circuit
- Cleaning the lens
- Cleaning the exterior of the projector

# 15.1 Replacement of the dust filter on the front side

## Necessary parts

New HEPA dust filter for the front side (R9854470).

## How to replace the HEPA dust filter on the front side of the projector ?

1. Remove the front cover of the projector, see "Removal of the front cover", page 159.
2. Remove the HEPA dust filter on the front side by pulling the two spring clamps away from the filter and then moving the filter forwards.

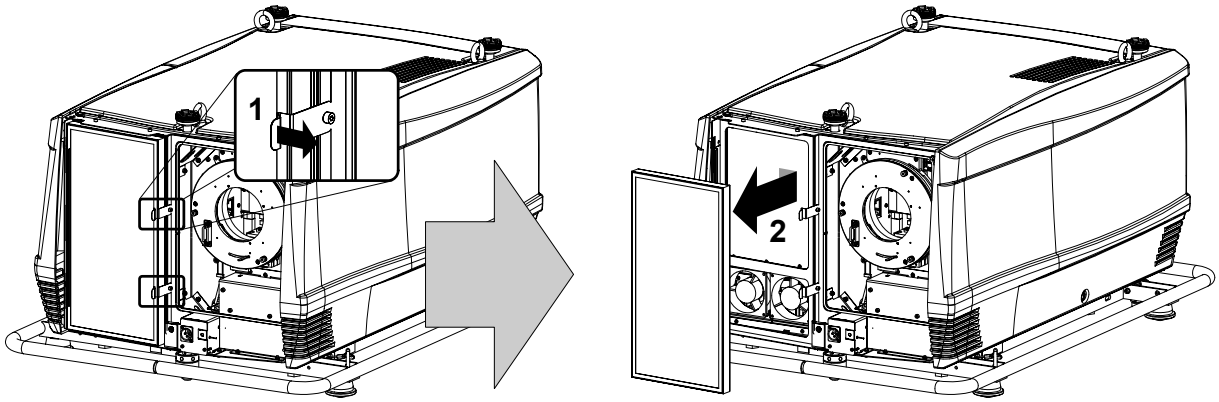



Image 15-1

3. Insert a new HEPA[1] filter by pulling the two spring clamps away and move the filter into position.
4. Reinstall the front cover of the projector, see "Installation of the front cover", page 162.

1. High Efficiency Particulate Arrestant

**CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.**

## 15.2 Replacement of the dust filter on the bottom side

### Necessary parts

- New HEPA dust filter for the bottom side (R9854480).
- 2.5 mm Allen key.

### How to replace the HEPA dust filter on the bottom side of the projector ?

1. Remove the side cover of the projector, see "Removal of the side cover", page 160.
2. Release (not remove) the two wedge lock screws (A) using a 2.5 mm Allen key as illustrated.

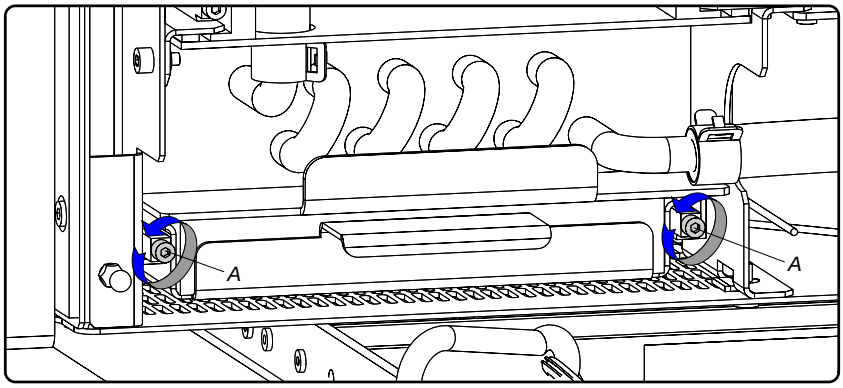



Image 15-2

3. Remove the filter (F) on the bottom side by pulling out the filter holder (H) as illustrated.

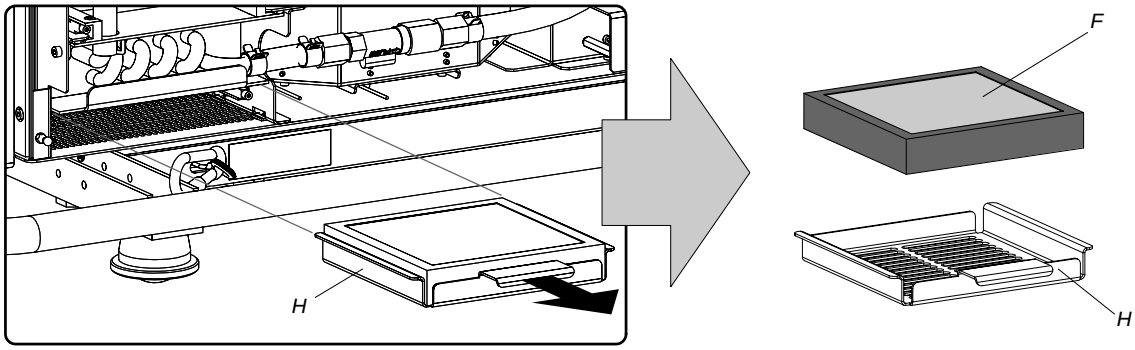



Image 15-3

4. Place a new HEPA dust filter in the filter holder.
5. Reinstall the filter holder containing the new HEPA filter.
6. Fasten the two wedge lock screws (A) using a 2.5 mm Allen key as illustrated.

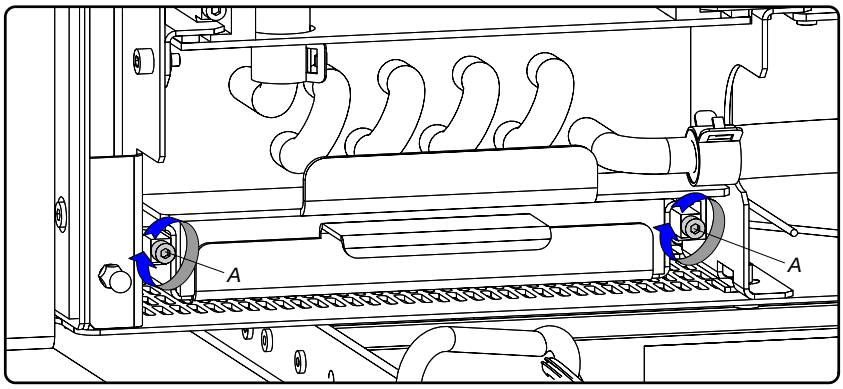



Image 15-4

7. Reinstall the side cover of the projector, see "Installation of the side cover", page 163.

**CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.**

## 15.3 Replacement of the dust filter on the top side

### Necessary parts

New HEPA dust filter for the top side (R9854480).

### How to replace the HEPA dust filter on the top side of the projector ?

1. Remove the side cover of the projector, see "Removal of the side cover", page 160.
2. Remove the filter (F) on the bottom side by pulling out the filter holder (H) as illustrated.

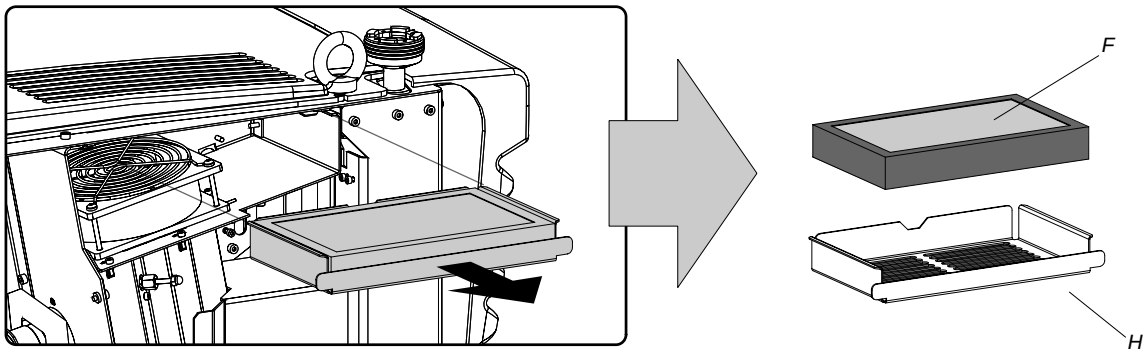



Image 15-5

3. Place a new HEPA dust filter in the filter holder.
4. Reinstall the filter holder containing the new HEPA filter.
5. Reinstall the side cover of the projector, see "Installation of the side cover", page 163.

**CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.**

## 15.4 Pressure verification of the liquid cooling circuit

### How to check the pressure of the liquid cooling circuit inside the projector ?

1. Remove the side cover of the projector, see "Removal of the side cover", page 160.
2. Check the pressure indicated on the internal manometer of the liquid cooling circuit.

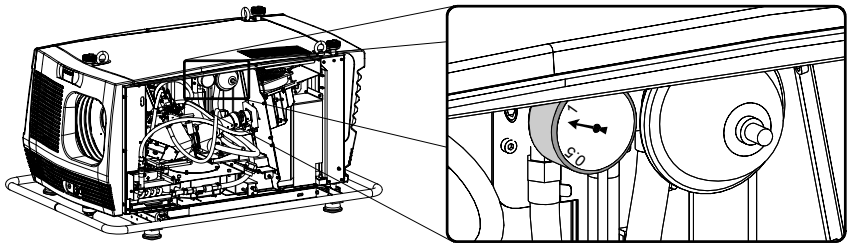


Image 15-6

3. This pressure should be between 0,5 and 1 bar. If the pressure, indicated on the manometer, is out of range, inform the responsible and qualified technicians, so they may take necessary corrective action.
4. Reinstall the side cover of the projector, see "Installation of the side cover", page 163.

## 15.5 Cleaning the lens

**To minimize the possibility of damage to optical coatings, or scratches to lens surfaces, we have developed recommendations for clean. 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 ?

Proceed as follow :

1. Always wipe lenses with a CLEAN Toraysee™ cloth.
2. Always wipe lenses in a 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 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.**

## 15.6 Cleaning the exterior of the projector

### How to clean the exterior of the projector ?

1. Switch off the projector and unplug the power cord at the projector side.
2. Clean the housing of the projector with a damp cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution.

# 16. SERVICING

## About this chapter

This chapter contains general servicing procedures like lamp replacement, input unit replacement etc. Note that some of these procedures may only be performed by qualified technical service personnel.

## Overview

- Removal of the lamp house
- Removal of the input & communication unit
- Removal of an input module
- Installation of the lamp house
- Installation of the input & communication unit
- Installation of an input module
- Realignment of the lamp in its reflector

## Extra service information

Extra service information for qualified service technicians can be found on Barco's Partnerzone (URL:www.partner-zone.events.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.

# 16.1 Removal of the lamp house

**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. Return it to Barco. Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.**

## Necessary tools

7 mm flat screw driver.

## How to remove the lamp house of the projector ?

1. Switch off the projector and unplug the power cord at the projector side. See procedure "Switching off", page 47.
2. Remove the lamp cover, see "Removal of the lamp cover", page 161.
3. Release the three spring lock screws of the lamp house as illustrated.

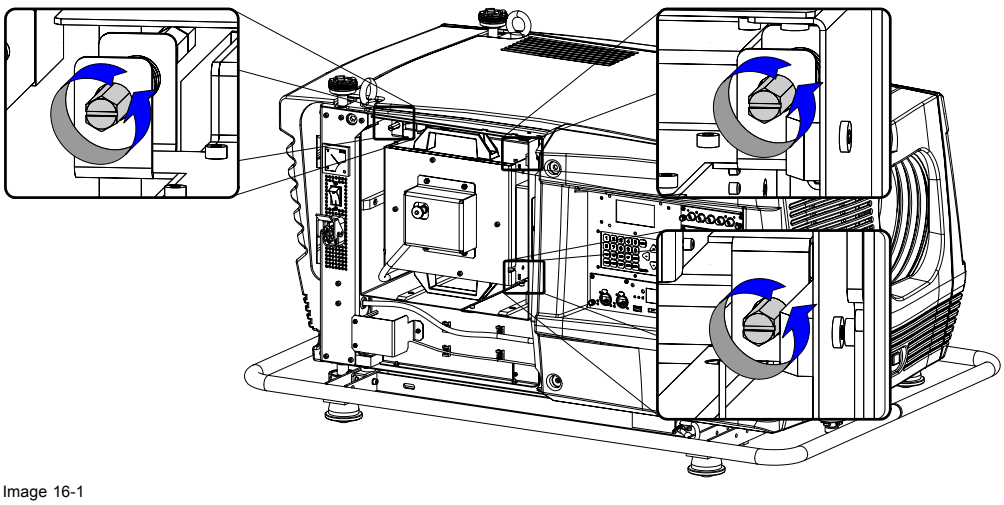


Image 16-1

4. Clasp the lamp house by the handles and pull the lamp house out of the projector.

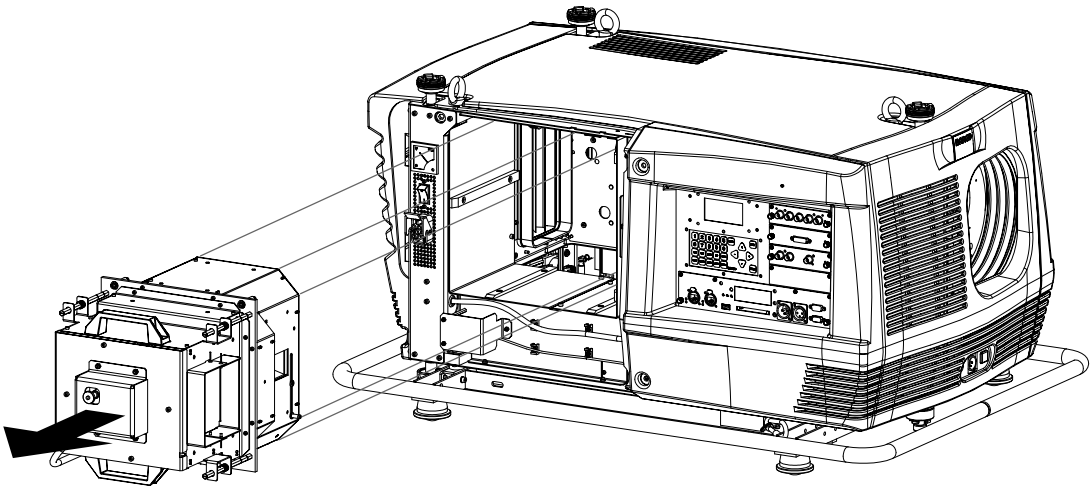


Image 16-2

**While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.**

## 16.2 Removal of the input & communication unit

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

### Necessary tools

7 mm flat screw driver.

### How to remove the input & communication unit from the projector ?

1. Switch off the projector and unplug the power cord at the projector side. See procedure "Switching off", page 47.
2. Ensure that no cables are connected to one of the ports of the input & communication unit.
3. Remove the input cover, see "Removal of the input cover", page 161.
4. Release the four captive screws in the corners of the input and communication unit as illustrated.

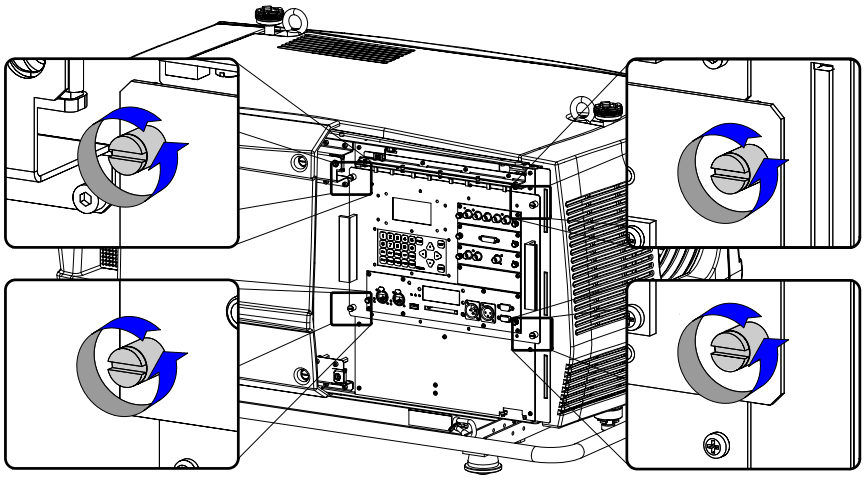


Image 16-3

5. Pull the input & communication unit out of its compartment, using the side handles provided.

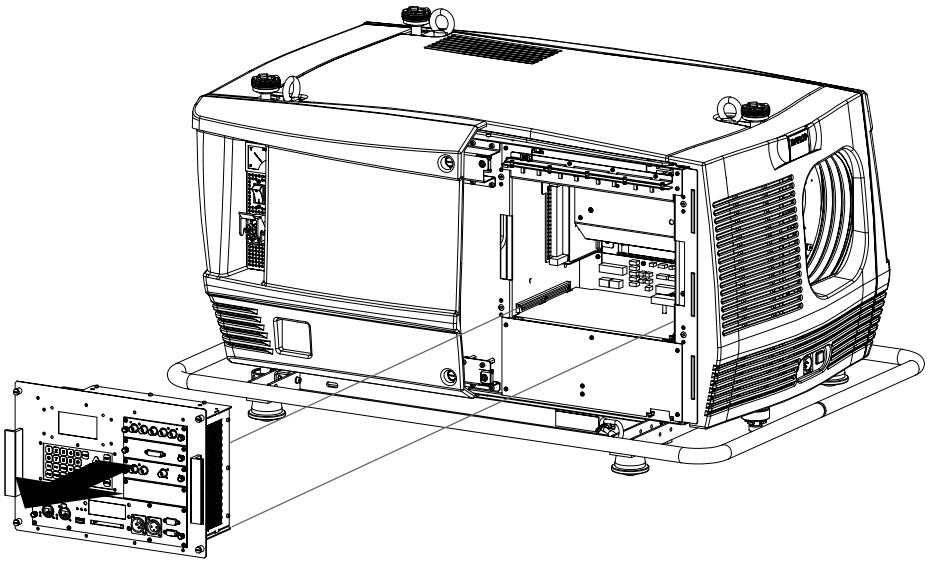


Image 16-4

## 16.3 Removal of an input module

**The procedure below is applicable to all input modules of the input & communication unit of the projector.**

### Necessary tools

Phillips screw driver PH1.

### How to remove an input module out of the input & communication unit of the projector ?

1. Switch off the projector and unplug the power cord at the projector side. See procedure "Switching off", page 47.
2. Release the two captive screws of the input module using a Phillips screw driver PH1.

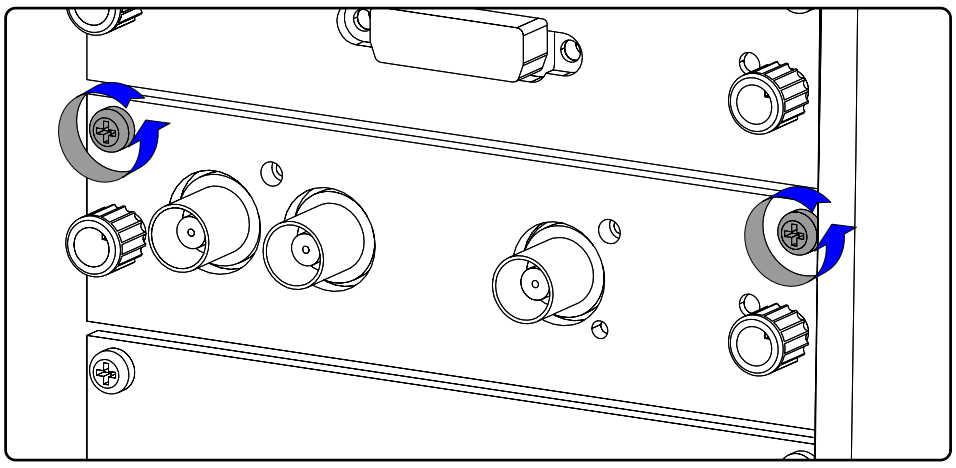


Image 16-5

3. Pull the input module out of the input & communication unit, via the two knobs provided.

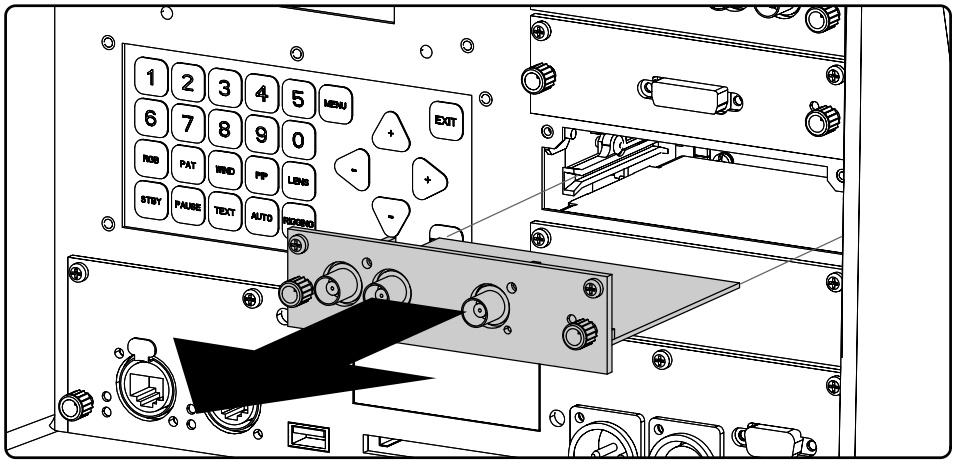



Image 16-6

**CAUTION: Ensure that all unused input slots of the input & communication unit are always covered with a dummy front plate. After removing one of the input modules, immediately replace with an other one or install a dummy front cover on the unused input slot.**

## 16.4 Installation of the lamp house

**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. Return it to Barco. Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.**

### Necessary tools

7 mm flat screw driver.

### How to install the lamp house of the projector ?

1. Ensure the projector is switched off and the power cord at the projector side is unplugged.
2. Remove the lamp cover, if not removed yet. See "Removal of the lamp cover", page 161.
3. Clasp the lamp house by its handles and gently slide the lamp house into its socket. Note that the compartment is provided with guides (G) to position the lamp house correctly.

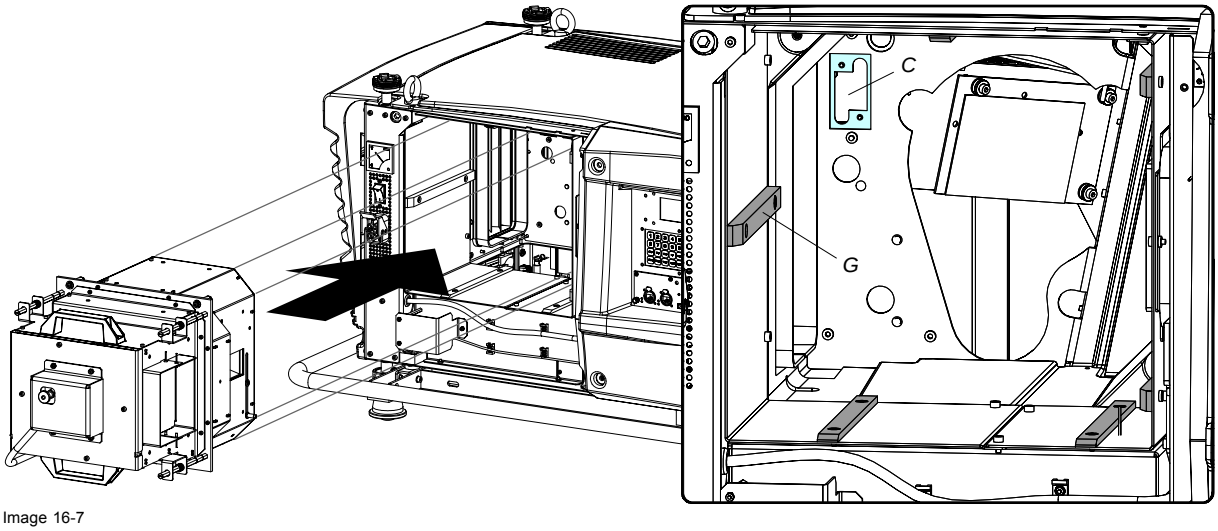



Image 16-7

4. Push the lamp house forward until it slides fully into the projector.
5. Secure the correct position of the lamp house by tightening all three spring lock screws as illustrated.

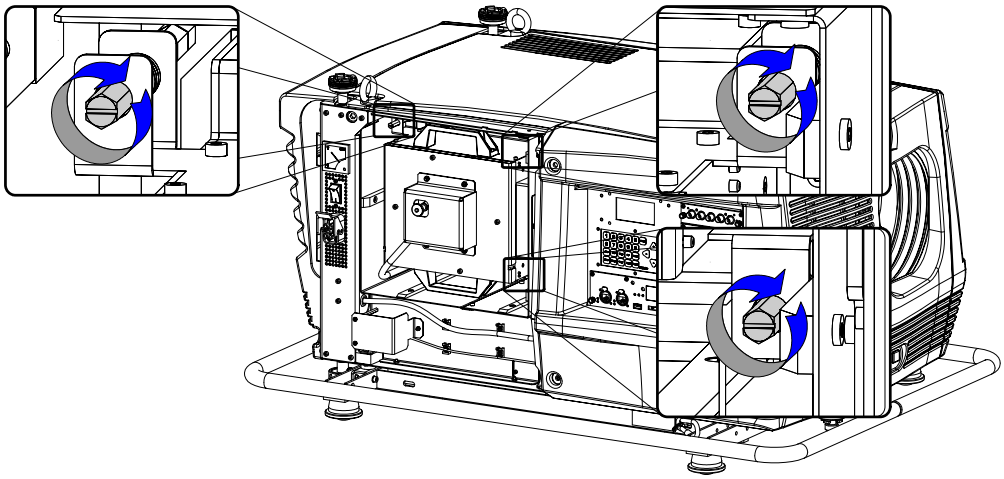


Image 16-8

6. Reinstall the lamp cover of the projector, see "Installation of the lamp cover", page 164.

**While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.**

## 16.5 Installation of the input & communication unit

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

### Necessary tools

7 mm flat screw driver.

### How to install the input & communication unit of the projector ?

1. Ensure that the projector is switched off and the power cord at the projector side is unplugged.
2. Remove the input cover, if not removed yet. See "Removal of the input cover", page 161.
3. Hold the input & communication unit by its handles and gently slide the unit into the guides at the bottom of the input & communication socket inside the projector.

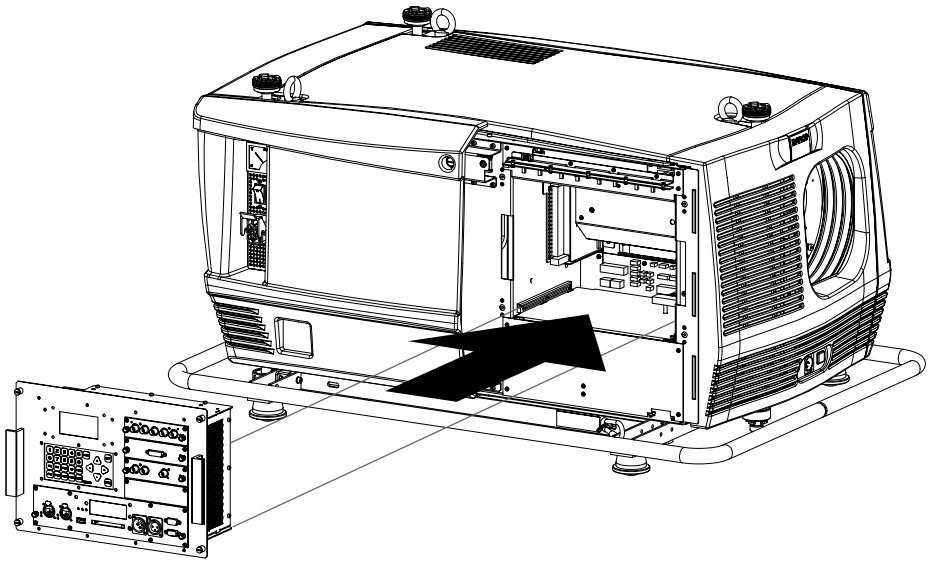


Image 16-9

4. Push the input & communication unit forward until you feel the connectors of the unit fit in their sockets. The back of the front plate of the unit must touch the chassis of the projector.
5. Secure the input & communication unit by fastening the four captive screws in the corners of the unit.

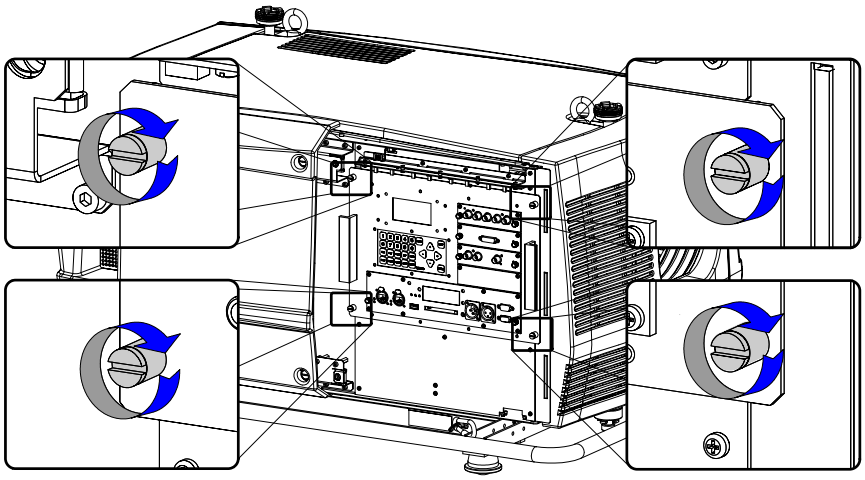


Image 16-10

## 16.6 Installation of an input module

**The procedure below is applicable to all input modules of the input & communication unit of the projector.**

### Necessary tools

Phillips screw driver PH1.

### How to install an input module into the input & communication unit of the projector ?

1. Switch off the projector and unplug the power cord at the projector side. See procedure "Switching off", page 47.
2. Slide the input module into the guides of the input slot.

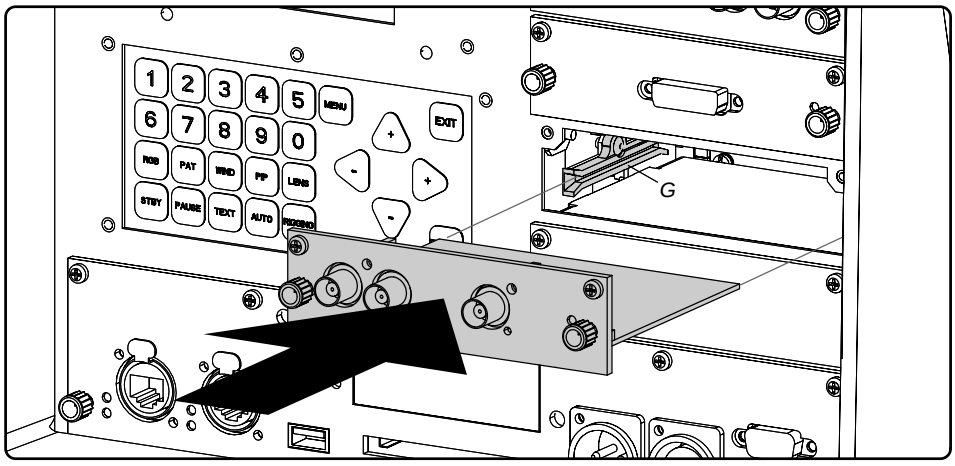



Image 16-11

3. Push the input module forward until you feel that the connector of the input module fit in the socket of the input slot. The back of the front plate of the module must touch the front plate of the input & communication unit.
4. Secure the input module by fastening both captive screws in the top corners of the module.

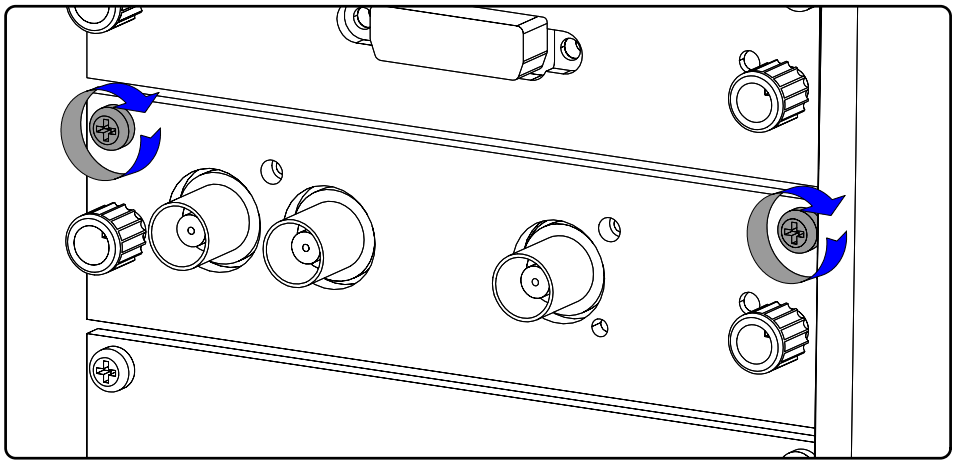


Image 16-12

## 16.7 Realignment of the lamp in its reflector

### Why realigning the lamp ?

With longer run times, the light output of the lamp will decrease, which results in a lower light output on the screen. This light output decrease can be compensated by readjusting the Z-position of the lamp.

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

### How to realign the lamp in its reflector ?

1. Remove the cover of the lamp, see "Removal of the lamp cover", page 161.
2. Connect the projector to the local power net, see "Power connection", page 35.
3. Start up the projector, enter the menu structure and select Lamp / Z-axis (for more explanation, see "Z-axis adjustment", page 105)
4. Carefully turn the thumb screw (A) at the rear of the lamp house clockwise for maximum light output. Once over the maximum, turn slightly counterclockwise to reach the maximum light output again.

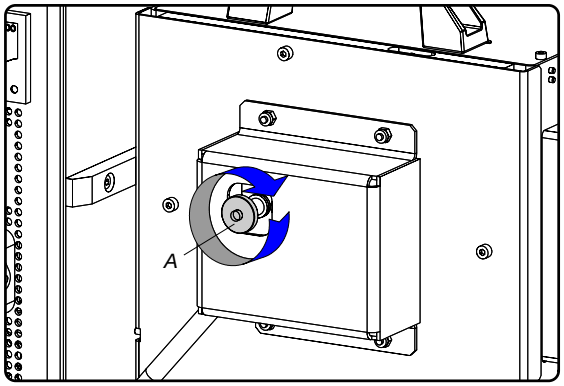



Image 16-13

5. Switch off the projector, wait five minutes and unplug the power cord at the projector side.
6. Reinstall the cover of the lamp, see "Installation of the lamp cover", page 164.

# 17. REMOVAL OF THE PROJECTOR COVERS

### About this chapter

Most maintenance and servicing procedures demand removing one or more of the projector covers to gain access to the parts to maintain or to service. To avoid redundancy, all procedures about cover removing or installing are grouped together in this chapter. The maintenance and servicing procedures also refer to this chapter if required. The procedures in this chapter describe, with detailed step by step actions and illustrations, how to remove or install the projector covers. Note that some covers may only be removed by qualified service personnel, see remarks above each procedure.

**WARNING: Always switch off the projector and unplug the power cord at the projector side before removing one of the covers.**

### Overview

- Removal of the front cover
- Removal of the side cover
- Removal of the lamp cover
- Removal of the input cover
- Installation of the front cover
- Installation of the side cover
- Installation of the lamp cover
- Installation of the input cover

## 17.1 Removal of the front cover

### Necessary tools

7 mm flat screw driver.

### How to remove the front cover of the projector ?

1. Remove the lens. See chapter "Lens removal", page 24.
2. Remove the rubber dust ring from the lens holder. See image 17-1.
3. Release the captive screw at the middle bottom of the front cover, using a flat screw driver.

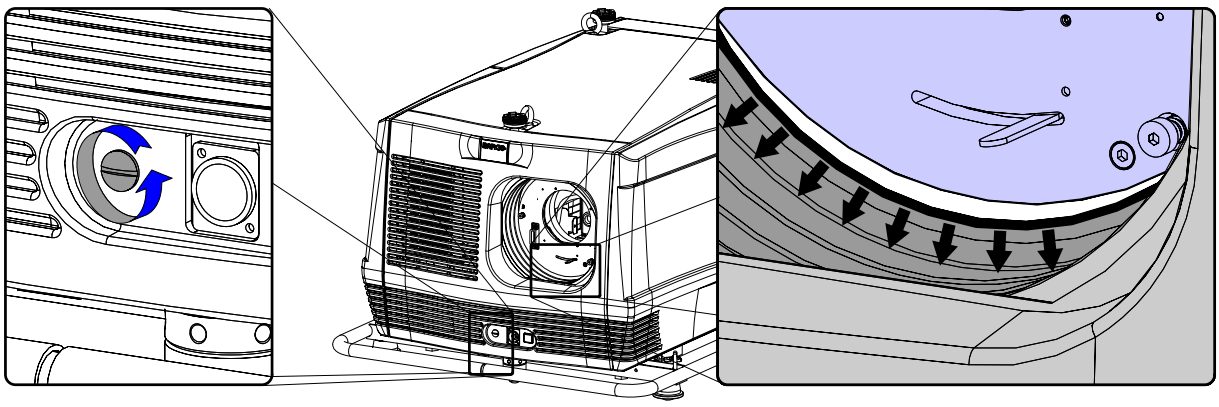


Image 17-1

4. Remove the front cover from the projector doing the following:
   a) standing in front of the projector, pull the right side of the front cover toward you until the latches release (left side is hinged)
   b) then slide the front cover to the right to release it from the hinging points.

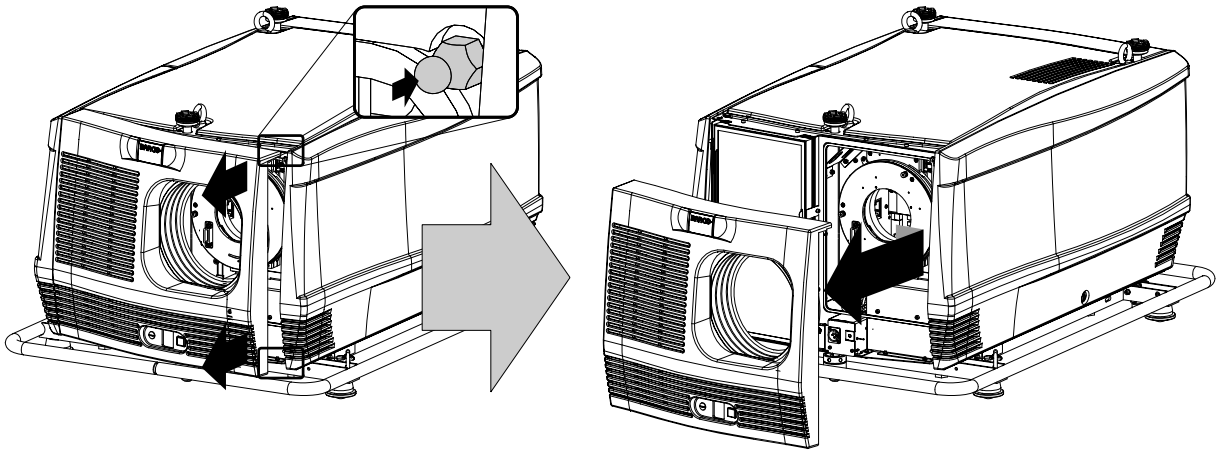


Image 17-2

## 17.2 Removal of the side cover

**CAUTION: Remove the side cover of the FLM R20+ Performer projector only in a clean and dust free area. Never remove the side cover in an area which is subject to airborne contaminants such as that produced by smoke machines or similar.**

### Necessary tools

7 mm flat screw driver.

### How to remove the side cover of the projector ?

1. Release the captive screw at the middle bottom of the side cover, using a flat screw driver.

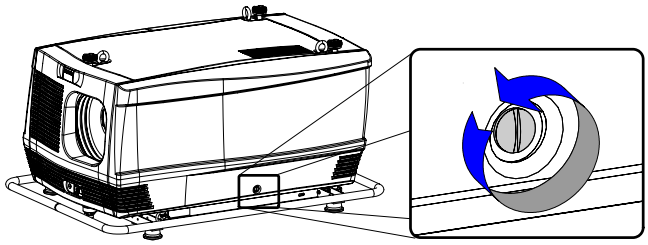


Image 17-3

2. Remove the side cover from the projector doing the following:
   a) gently pull out the bottom corners (A) of the side cover,
   b) then gently pull out the top corners (B) of the side cover,
   c) then move the side cover away from the projector (C).

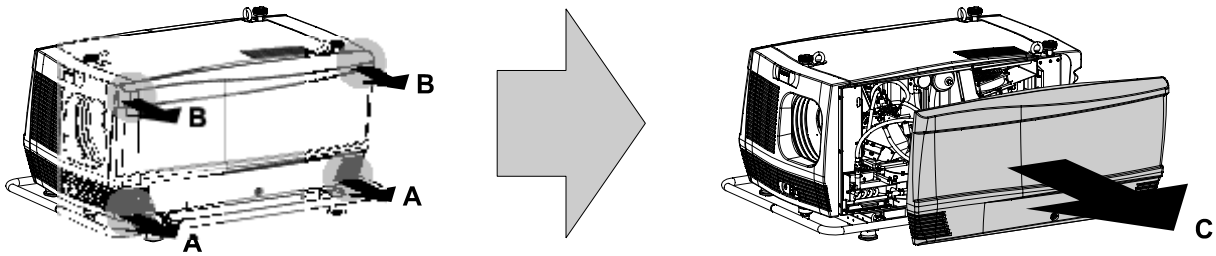



Image 17-4

## 17.3 Removal of the lamp cover

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

### Necessary tools

7 mm flat screw driver.

### How to remove the lamp cover of the projector ?

1. Release the two captive screws at the top and bottom right side of the lamp cover, using a flat screw driver.

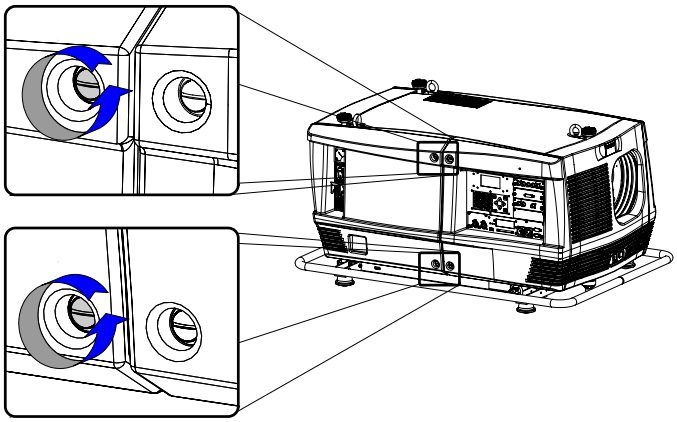


Image 17-5

2. Remove the lamp cover from the projector doing the following:
   a) gently pull out the left bottom corner (A) of the lamp cover,
   b) then gently pull out the left top corner (B) of the lamp cover,
   c) then move the lamp cover away from the projector (C).

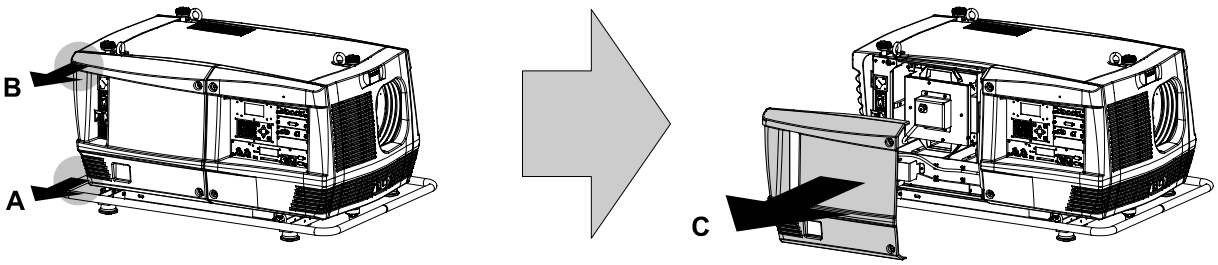



Image 17-6

## 17.4 Removal of the input cover

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

### Necessary tools

7 mm flat screw driver.

### How to remove the input cover of the projector ?

1. Release the two captive screws at the top and bottom left side of the input cover, using a flat screw driver.

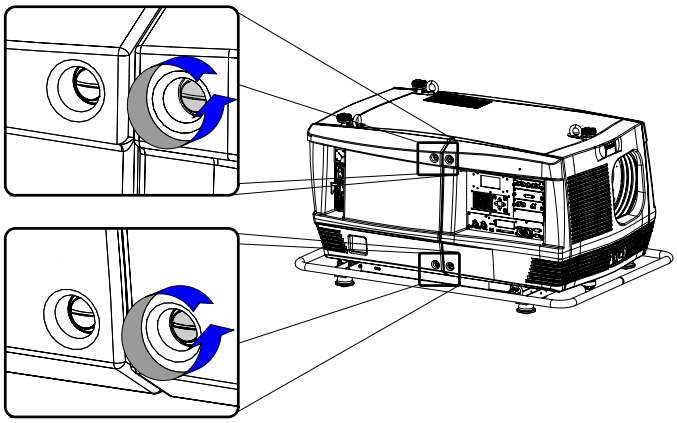


Image 17-7

2. Remove the input cover from the projector doing the following:
   a) gently pull out the right bottom corner (A) of the input cover,
   b) then gently pull out the right top corner (B) of the input cover,
   c) then move the input cover away from the projector (C).

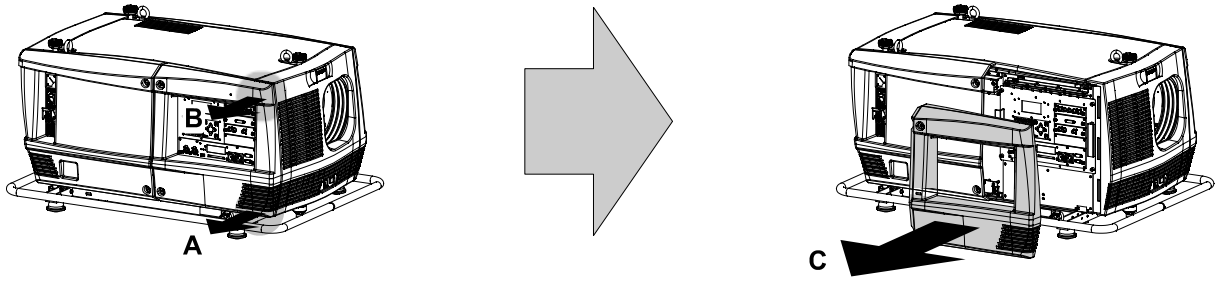



Image 17-8

## 17.5 Installation of the front cover

### Necessary tools

7 mm flat screw driver.

### How to install the front cover of the projector ?

1. Check if the front filter is present.
2. Ensure that no lens is mounted.
3. Install the front cover of the projector doing the following:
   a) first hook in the side of the front cover at the front filter,
   b) then gently push the other side of the front cover into position,
   c) ensure that the locking studs in the corners click into their receivers.

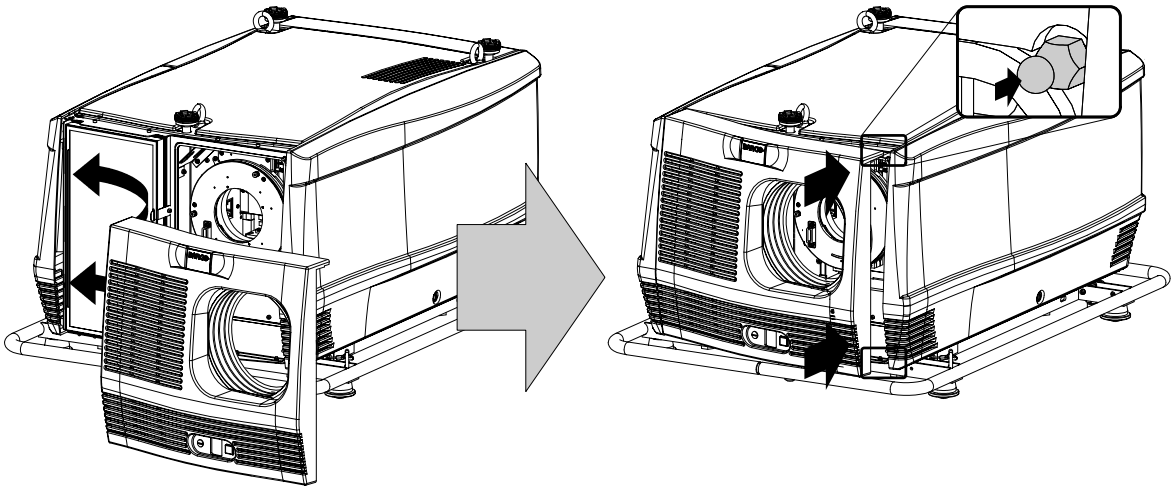


Image 17-9

4. Secure the front cover by locking the captive screw in the middle at the bottom of the front cover.

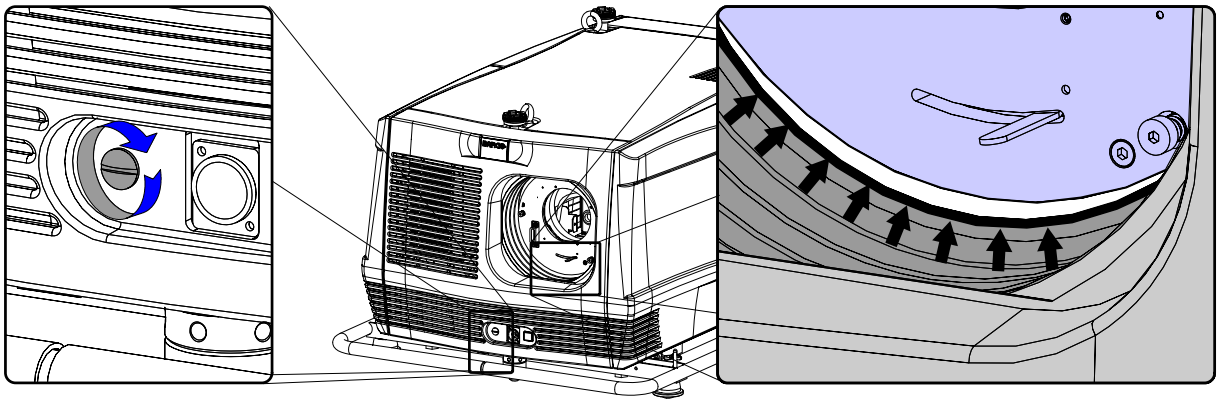


Image 17-10

5. Reinstall the rubber dust ring around the lens holder. See image 17-10.

## 17.6 Installation of the side cover

### Necessary tools

7 mm flat screw driver.

### How to install the side cover of the projector ?

1. Check if the bottom and top filters are present.
2. Check the pressure indicated on the internal manometer of the liquid cooling circuit. This pressure should be between 0,5 and 1 bar. If the pressure is out of range, inform the responsible and qualified technician, so he may take necessary corrective action.

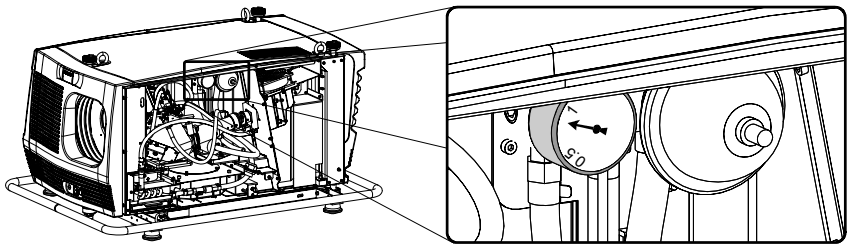


Image 17-11

3. Install the side cover of the projector doing the following:
   a) Bring the side cover towards its final position (A),
   b) then gently push the locking studs of the top corners (B) into their receivers,
   c) then gently push the locking studs of the bottom corners (C) into their receivers.

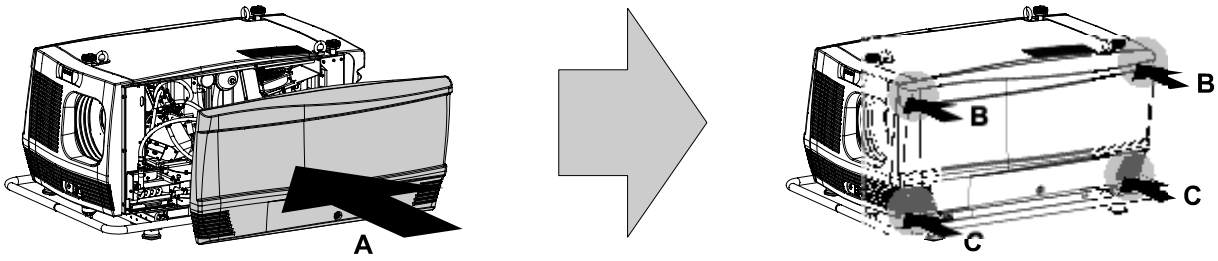



Image 17-12

4. Secure the side cover by locking the captive screw in the middle at the bottom of the side cover.

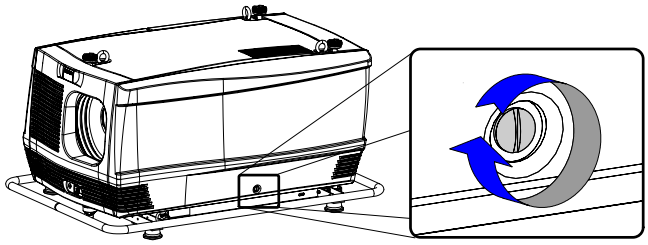


Image 17-13

## 17.7 Installation of the lamp cover

### Necessary tools

7 mm flat screw driver.

### How to install the lamp cover of the projector ?

1. Install the lamp cover of the projector doing the following:
   a) Bring the lamp cover towards its final position (A),
   b) then gently push the locking stud at the left top corner (B) into its receiver,
   c) then gently push the locking stud at the left bottom corner (C) into its receiver.

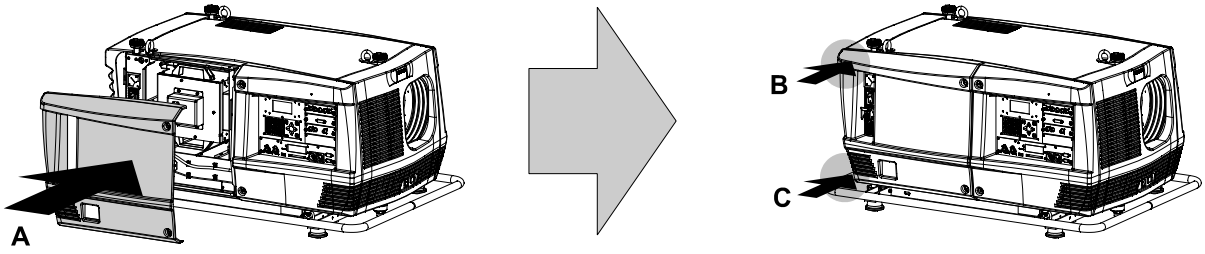



Image 17-14

2. Secure the lamp cover by locking the two captive screws at the right side of the lamp cover.

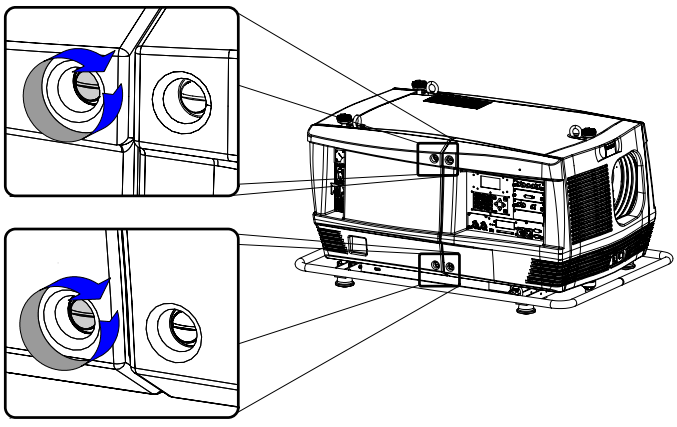


Image 17-15

## 17.8 Installation of the input cover

### Necessary tools

7 mm flat screw driver.

### How to install the input cover of the projector ?

1. Install the input cover of the projector doing the following:
   a) Bring the input cover towards its final position (A),
   b) then gently push the locking stud at the right top corner (B) into its receiver,
   c) then gently push the locking stud at the right bottom corner (C) into its receiver.

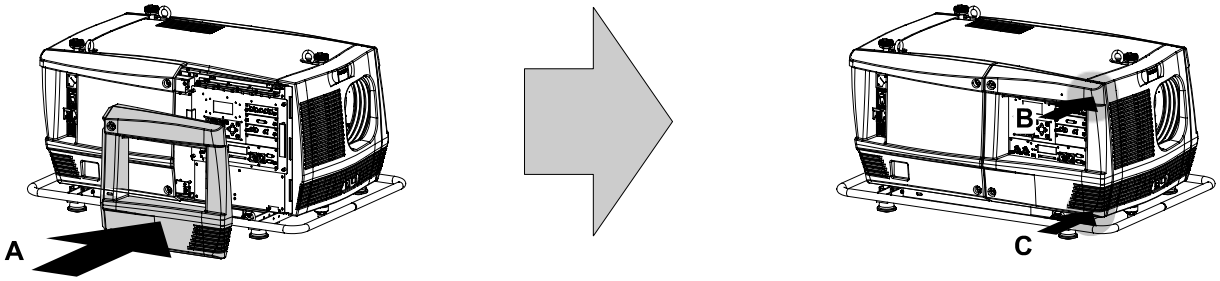



Image 17-16

2. Secure the input cover by locking the two captive screws at the left side of the input cover.

# A. DIMENSIONS

### Overview

- Dimensions of the FLM R20+ Performer
- Dimensions of the FLM flight case
- Dimensions of the rigging clamps

## A.1 Dimensions of the FLM R20+ Performer

### Dimensions

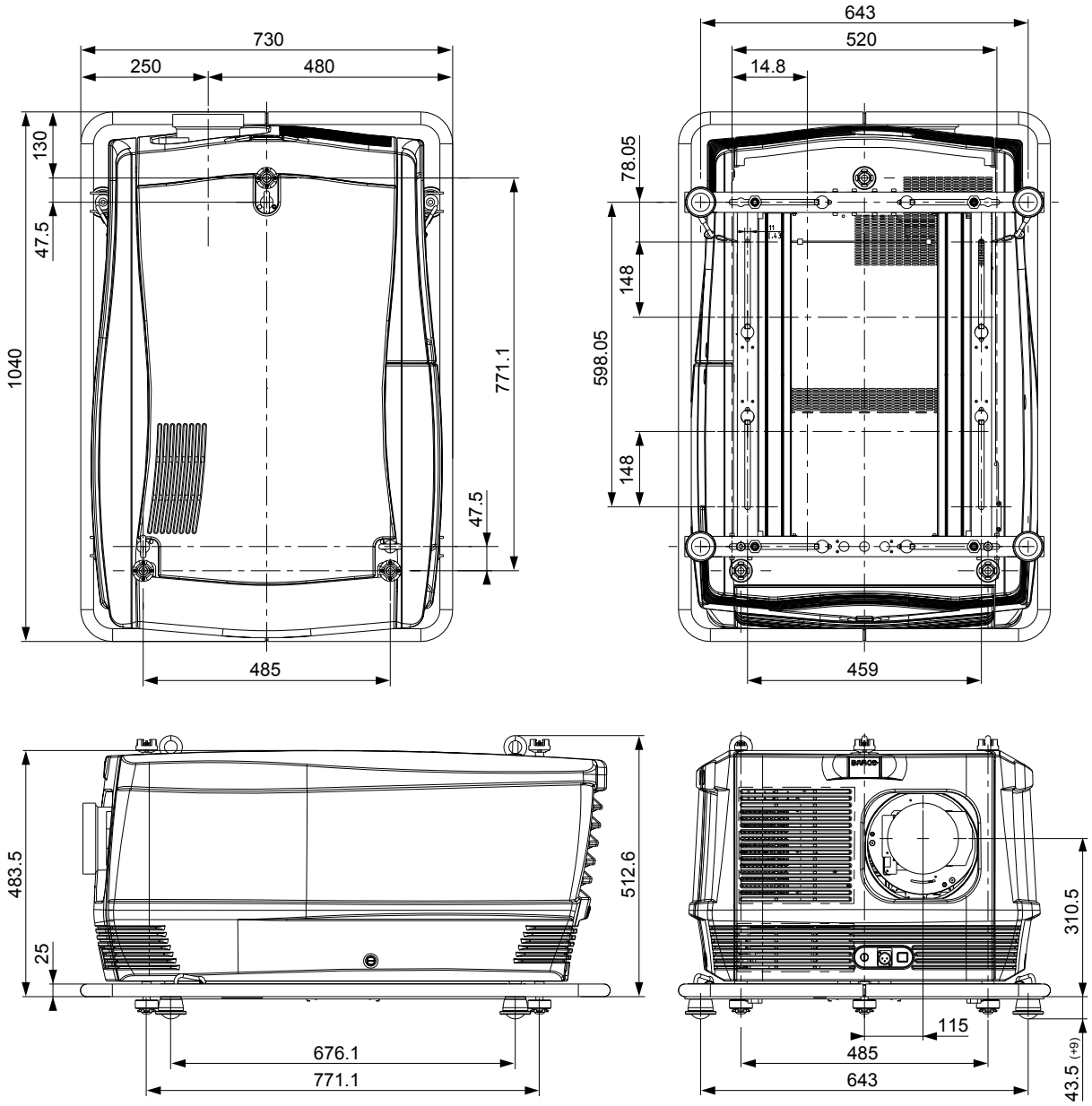



Image A-1
Dimensions given in millimeters.

### Point of gravity

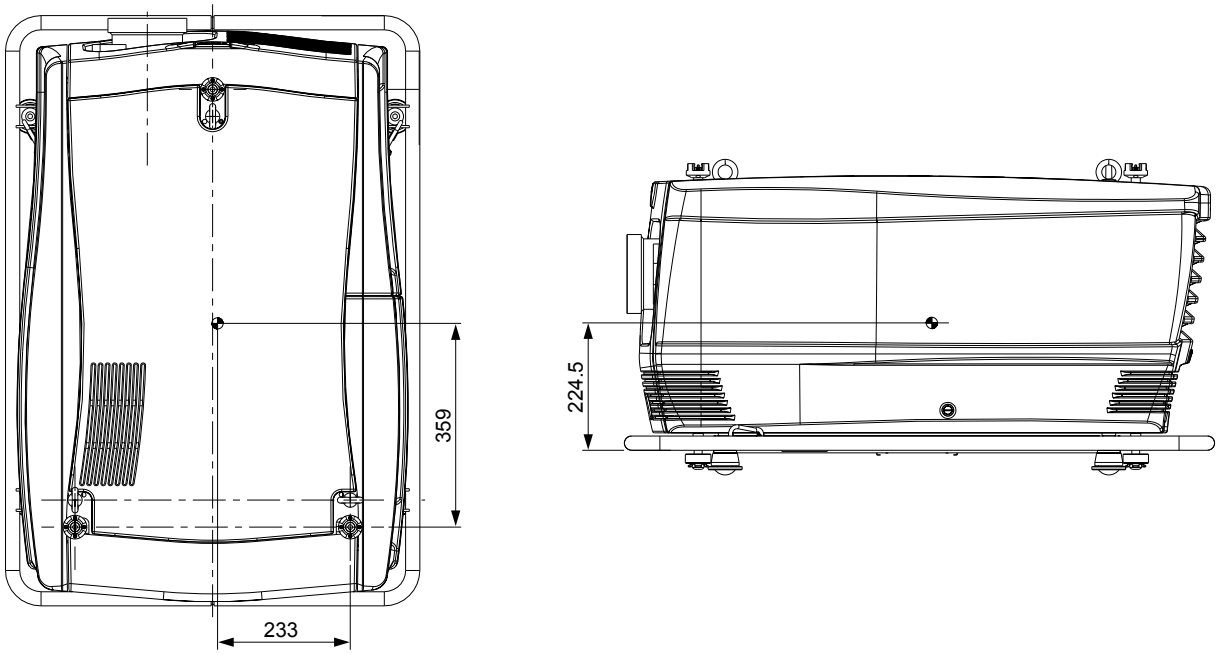



Image A-2
Dimensions given in millimeters.

## A.2 Dimensions of the FLM flight case

### Dimensions

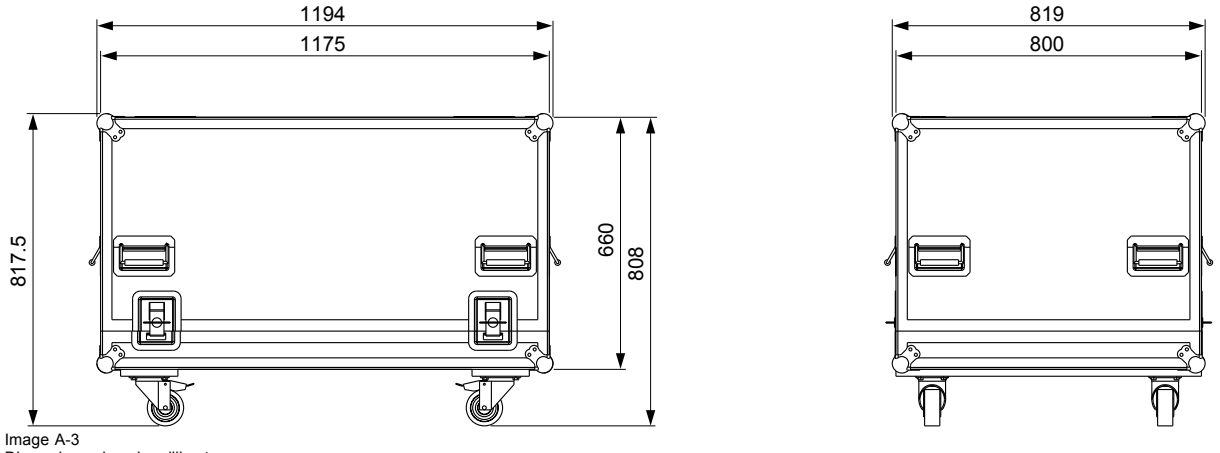



Image A-3
Dimensions given in millimeters.

## A.3 Dimensions of the rigging clamps

### Dimensions

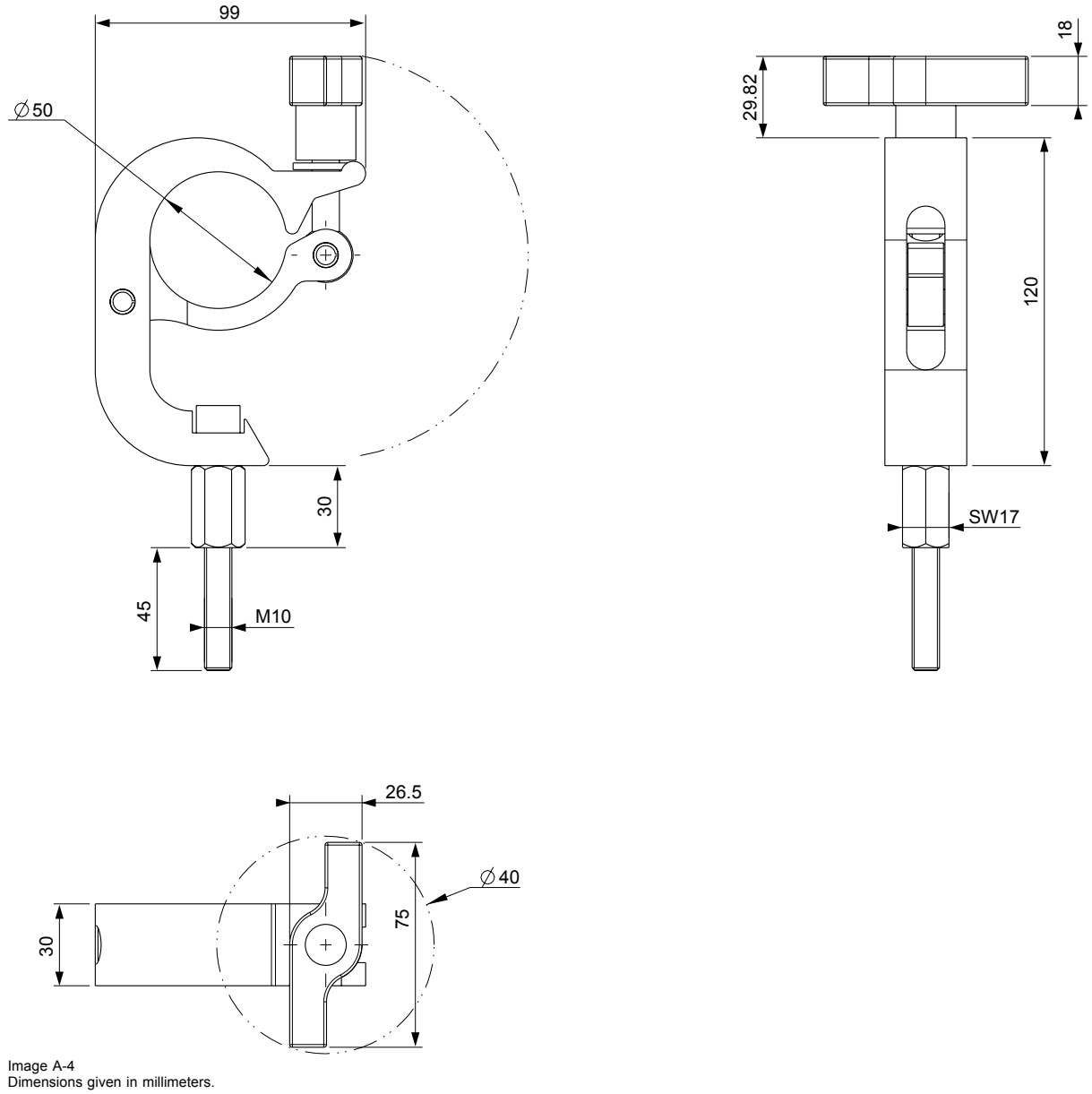



Image A-4
Dimensions given in millimeters.

# B. STANDARD SOURCE FILES

## B.1 Table overview

### Table overview

The following standard image files are pre-programmed in the projector.

| Name[2] | Fvert Hz[3] | FHor kHz[4] | Fpix MHz[5] | Ptot[6] | Pact[7] | Ltot[8] | Lact[9] |
|---|---|---|---|---|---|---|---|
| 640x350@85 | 85,079 | 37,860 | 31,500 | 832 | 640 | 445 | 350 |
| 640x400@85 | 85,079 | 37,860 | 31,500 | 832 | 640 | 445 | 400 |
| 640x480@60 | 59,940 | 31,668 | 25,175 | 800 | 640 | 525 | 480 |
| 640x480@72 | 72,888 | 30,288 | 19,687 | 832 | 640 | 520 | 480 |
| 640x480@75 | 74,999 | 37,500 | 31,500 | 840 | 640 | 500 | 480 |
| 640x480@85 | 85,009 | 43,270 | 36,000 | 832 | 640 | 509 | 480 |
| 720x400@85 | 85,040 | 37,928 | 35,500 | 936 | 720 | 446 | 400 |
| 800x600@56 | 56,251 | 35,157 | 36,001 | 1024 | 800 | 625 | 600 |
| 800x600@60 | 60,317 | 37,879 | 40,000 | 1056 | 800 | 628 | 600 |
| 800x600@72 | 72,188 | 48,077 | 50,000 | 1040 | 800 | 666 | 600 |
| 800x600@75 | 75,001 | 46,876 | 49,501 | 1056 | 800 | 625 | 600 |
| 800x600@85 | 85,062 | 53,674 | 56,250 | 1048 | 800 | 631 | 600 |
| 848x480@60 | 60,000 | 31,020 | 33,750 | 1088 | 848 | 517 | 480 |
| 1024x768@60 | 60,004 | 48,363 | 65,000 | 1344 | 1024 | 806 | 768 |
| 1024x768@70 | 70.068 | 56,475 | 74,999 | 1328 | 1024 | 806 | 768 |
| 1024x768@75 | 75,030 | 60,024 | 78,751 | 1312 | 1024 | 800 | 768 |
| 1024x768@85 | 84,996 | 68,677 | 94,499 | 1376 | 1024 | 808 | 768 |
| 1152x864@75 | 74,999 | 67,499 | 107,999 | 1600 | 1152 | 900 | 864 |
| 1280x768@60 | 59,870 | 47,776 | 79,499 | 1664 | 1280 | 798 | 768 |
| 1280x768@75 | 74,992 | 60,288 | 102,249 | 1696 | 1280 | 805 | 768 |
| 1280x768@85 | 84,838 | 68,634 | 117,502 | 1712 | 1280 | 809 | 768 |
| 1280x768RB@60 | 59,994 | 47,396 | 68,250 | 1440 | 1280 | 790 | 768 |
| 1280x960@60 | 59,999 | 59,999 | 107,998 | 1800 | 1280 | 1000 | 960 |
| 1280x960@85 | 85,005 | 85,940 | 128,505 | 1728 | 1280 | 1011 | 960 |
| 1280x1024@60 | 60,018 | 63,980 | 107,997 | 1688 | 1280 | 1066 | 1024 |
| 1280x1024@75 | 75,023 | 79,974 | 134,997 | 1688 | 1280 | 1066 | 1024 |

2. Name: name of file, contains the settings.
3. Fvert Hz: vertical frame frequency of the source
4. FHor kHz: horizontal frequency of the source
5. Fpix MHz: pixel frequency
6. Ptot : total pixels on one horizontal line.
7. Pact: active pixels on one horizontal line.
8. Ltot: total lines in one field
9. Lact: active lines in one field.

| Name[2] | Fvert Hz[3] | FHor kHz[4] | Fpix MHz[5] | Ptot[6] | Pact[7] | Ltot[8] | Lact[9] |
|---|---|---|---|---|---|---|---|
| 1280x1024@85 | 85,027 | 91,149 | 157,506 | 1728 | 1280 | 1072 | 1024 |
| 1360x768@60 | 59,898 | 47,619 | 85,333 | 1792 | 1360 | 795 | 768 |
| 1400x1050@50 | 50,015 | 54,517 | 94,641 | 1736 | 1400 | 1090 | 1050 |
| 1400x1050@60 | 59,979 | 65,317 | 121,751 | 1864 | 1400 | 1089 | 1050 |
| 1400x1050@75 | 74,866 | 82,277 | 155,998 | 1896 | 1400 | 1099 | 1050 |
| 1400x1050@85 | 84,958 | 93,879 | 179,497 | 1912 | 1400 | 1105 | 1050 |
| 1400x1050RB@60 | 59,946 | 64,742 | 100,997 | 1560 | 1400 | 1080 | 1050 |
| 1600x1200@60 | 60,001 | 75,002 | 162,004 | 2160 | 1600 | 1250 | 1200 |
| 1600x1200@65 | 64,998 | 81,248 | 175,496 | 2160 | 1600 | 1250 | 1200 |
| 1600x1200@70 | 69,997 | 87,497 | 188,993 | 2160 | 1600 | 1250 | 1200 |
| 1600x1200@75 | 74,998 | 93,747 | 202,414 | 2160 | 1600 | 1250 | 1200 |
| 1600x1200@85 | 84,998 | 106,247 | 229,494 | 2160 | 1600 | 1250 | 1200 |
| 1792x1344@60 | 60,000 | 83,640 | 204,751 | 2448 | 1792 | 1394 | 1344 |
| 1792x1344@75 | 74,996 | 106,270 | 260,999 | 2456 | 1792 | 1417 | 1344 |
| 1856x1392@60 | 59,995 | 86,333 | 218,251 | 2528 | 1856 | 1439 | 1392 |
| 1920x1140@60 | 60,001 | 90,001 | 234,002 | 2600 | 1920 | 1500 | 1140 |
| 1920x1200@60 | 59,883 | 74,555 | 193,235 | 2592 | 1920 | 1245 | 1200 |
| 1920x1200RB@60 | 59,952 | 74,041 | 154,006 | 2080 | 1920 | 1235 | 1200 |
| 1920x1440@60 | 60,001 | 90,001 | 234,002 | 2600 | 1920 | 1500 | 1200 |
| hd-1280x720@60p | 60,001 | 45,000 | 74,251 | 1650 | 1280 | 750 | 720 |
| hd-1920x1035@30i | 60,000 | 33,720 | 74,184 | 2200 | 1920 | 562 | 517 |
| hd-1920x1080@24p | 24,000 | 27,000 | 74,250 | 2750 | 1920 | 1125 | 1080 |
| hd-1920x1080@24sf | 48,001 | 54,002 | 148,504 | 2750 | 1920 | 1125 | 1080 |
| hd-1920x1080@25i | 50,044 | 28,125 | 74,249 | 2640 | 1920 | 562 | 540 |
| hd-1920x1080@25p | 25,000 | 28,125 | 74,249 | 2640 | 1920 | 1125 | 1080 |
| hd-1920x1080@30i | 60,000 | 33,720 | 74,184 | 2200 | 1920 | 562 | 540 |
| hd-1920x1080@30p | 30,000 | 33,750 | 74,249 | 2200 | 1920 | 1125 | 1080 |
| hd-1920x1080@60p | 60,011 | 67,513 | 148,528 | 2200 | 1920 | 1125 | 1080 |
| VIDEO525 | 62,437 | 15,734 | 13,500 | 858 | 712 | 252 | 242 |
| VIDEO525p | 59,940 | 31,468 | 27,000 | 858 | 712 | 525 | 484 |
| VIDEO625 | 50,080 | 15,625 | 13,500 | 864 | 702 | 312 | 287 |
| VIDEO625p | 50,080 | 31,250 | 27,000 | 864 | 702 | 625 | 574 |
| no-signal | 100,00 | 20,000 | 8,000 | 400 | 300 | 200 | 100 |
| no-signal-i | 100,00 | 20,000 | 8,000 | 400 | 300 | 200 | 100 |

Table B-1

# C. TROUBLESHOOTING

## C.1 Error codes

### Overview

When the error code is preceded by a '-' sign, then the error means a real error for the projector.

When the error code is preceded by a '+' sign, then the error code means a warning. The projector does not fail yet, but take care for the warning and try to resolve the problem. A warning state can turn into an error state.

Not all error codes can have two states. When the state is available, it is indicated by a Yes in the overview table. When the state is not available, it is indicated by a No.

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 1000<br>↓<br>1017 | Wrong lamp parameters | Yes | - | Wrong lamp/ no communication with lamp | Check lamp type<br>Call a qualified service engineer |
| 1499 | | | | | |
| 1498 | | | | | |
| 1699 | Formatter busy | | | | |
| 1698 | Formatter address | | | | |
| 1697 | Formatter init failed | Yes | - | no communication with formatter ctrl | Call a qualified service engineer |
| 1696 | Formatter ctrl init failed | Yes | - | no communication with formatter ctrl | Call a qualified service engineer |
| 1695 | Red form. start failed | Yes | - | no communication with red formatter | Call a qualified service engineer |
| 1694 | Green form. start failed | Yes | - | no communication with green formatter | Call a qualified service engineer |
| 1693 | Blue form. start failed | Yes | - | no communication with blue formatter | Call a qualified service engineer |
| 1692 | Form. PWRGood | Yes | - | formatter 'Power Good' signal not OK | Call a qualified service engineer |
| 2000 | No lps detected | Yes | - | no communication with lamp power supply | Call a qualified service engineer |
| 2001 | Mains voltage too low | Yes | - | mains voltage too low | |
| 2002 | Lamp start failed | Yes | - | Hot restrike<br>Lamp with many strikes<br>maximum run time exceeded<br>Lamp or LPS or SPG failed | Let cool down the lamp for at least 5 minutes. Retry a few times.<br>Replace the lamp with a new one<br>Replace LPS or SPG or cabling. |
| 2003 | Main voltage too high | Yes | - | mains voltage too high | |
| 2004 | Lamp goes out | Yes | - | | Call qualified service engineer |
| 2005 | Lamp stop failed | Yes | - | | Call qualified service engineer |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 2201 | PFC start failed | Yes | - | LPS (address 0x20) | Replace LPS |
| 2501 | PFC start failed | Yes | - | LPS (address 0x22) | Replace LPS |
| 2801 | PFC start failed | Yes | - | LPS (address 0x28) | Replace LPS |
| 2202 | LPS start failed | Yes | - | LPS (address 0x20) | Replace LPS |
| 2502 | LPS start failed | Yes | - | LPS (address 0x22) | Replace LPS |
| 2802 | LPS start failed | Yes | - | LPS (address 0x28) | Replace LPS |
| 2203 | BOOST start failed | Yes | - | LPS (address 0x20) | Replace LPS |
| 2503 | BOOST start failed | Yes | - | LPS (address 0x22) | Replace LPS |
| 2803 | BOOST start failed | Yes | - | LPS (address 0x28) | Replace LPS |
| 2206 | Lamp ignition failed | Yes | - | hot restrike,<br>lamp with many strikes, maximum run time exceeded | Let cool down the lamp for at least 3 minutes. Replace the lamp or SPG with a new one If problem persists, call a qualified service engineer |
| 2506 | Lamp ignition failed | Yes | - | hot restrike,<br>lamp with many strikes, maximum run time exceeded | Let cool down the lamp for at least 3 minutes. Replace the lamp or SPG with a new one If problem persists, call a qualified service engineer |
| 2806 | Lamp ignition failed | Yes | - | hot restrike,<br>lamp with many strikes, maximum run time exceeded | Let cool down the lamp for at least 3 minutes. Replace the lamp or SPG with a new one If problem persists, call a qualified service engineer |
| 2207 | Lamp voltage range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 2507 | Lamp voltage range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 2807 | Lamp voltage range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 2208 | Lamp power range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 2508 | Lamp power range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 2808 | Lamp power range | Yes | - | lamp voltage too high or too low | Replace lamp |
| 4000 | Incompatible hardware | Yes | No | Incompatible hardware used | Change to correct hardware |
| 4199 | FIB reset failed | Yes | - | no communication with FIB | Call a qualified service engineer |
| 5098 | Flash full | Yes | - | Internal Backup device has reached its maximum capacity | Call a qualified service engineer |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 5097 | Flash management full | Yes | - | Internal Backup device has reached its maximum capacity | Call a qualified service engineer |
| 5096 | Storing unsuccessful | Yes | - | Storing the custom settings into internal backup device has failed | If problem persists, call a qualified service engineer |
| 5095 | Restoring unsuccessful | Yes | - | Restoring the custom settings from internal backup device has failed | If problem persists, call a qualified service engineer |
| 6099 | | | | | |
| 6098 | | | | | |
| 7698 | Light pipe temp high | Yes | Yes | High temperature on light pipe entry | If problem persists, call a qualified service engineer |
| 7697 | Light pipe temp open | Yes | Yes | Temperature sensor on light pipe not connected | Call a qualified service engineer |
| 7696 | Light pipe temp short | Yes | Yes | Temperature sensor on light pipe shorted | Call a qualified service engineer |
| 7695 | Red front DMD temp low | No | Yes | Low temperature on red DMD | Switching on the lamp will heat up the DMD |
| 7694 | Red front DMD temp high | Yes | Yes | High temperature on red DMD | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7693 | Red front DMD temp open | Yes | Yes | Temperature sensor on Red DMD not connected | Call a qualified service engineer |
| 7692 | Red front DMD temp short | Yes | Yes | Temperature sensor on Red DMD shorted | Call a qualified service engineer |
| 7691 | Green front DMD temp low | No | Yes | Low temperature on green DMD | Switching on the lamp will heat up the DMD |
| 7690 | Green front DMD temp high | Yes | Yes | High temperature on green DMD | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7689 | Green front DMD temp open | Yes | Yes | Temperature sensor on green DMD not connected | Call a qualified service engineer |
| 7888 | Green front DMD temp short | Yes | Yes | Temperature sensor on green DMD shorted | Call a qualified service engineer |
| 7687 | Blue front DMD temp low | Yes | - | Low temperature on blue DMD | Switching on the lamp will heat up the DMD |
| 7686 | Blue front DMD temp high | Yes | Yes | High temperature on blue DMD | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7685 | Blue front DMD temp open | Yes | Yes | Temperature sensor on blue DMD not connected | Call a qualified service engineer |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 7684 | Blue front DMD temp short | Yes | Yes | Temperature sensor on blue DMD shorted | Call a qualified service engineer |
| 7676 | Front block temp high | Yes | Yes | High temperature on front DMD cooling block | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7675 | Front block temp open | Yes | Yes | Temperature sensor on front cooling block not connected | Call a qualified service engineer |
| 7674 | Front block temp short | Yes | Yes | Temperature sensor on front cooling block shorted | Call a qualified service engineer |
| 7672 | Red block temp high | Yes | Yes | High temperature on red DMD cooling block | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7671 | Red block temp open | Yes | Yes | Temperature sensor on red DMD cooling block not connected | Call a qualified service engineer |
| 7670 | Red block temp short | Yes | Yes | Temperature sensor on red DMD cooling block shorted | Call a qualified service engineer |
| 7668 | Green block temp high | Yes | Yes | High temperature on green DMD cooling block | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7667 | Green block temp open | Yes | Yes | Temperature sensor on green DMD cooling block not connected | Call a qualified service engineer |
| 7666 | Green block temp short | Yes | Yes | Temperature sensor on green DMD cooling block shorted | Call a qualified service engineer |
| 7664 | Blue block temp high | Yes | Yes | High temperature on blue DMD cooling block | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7663 | Blue block temp open | Yes | Yes | Temperature sensor on blue DMD cooling block not connected | Call a qualified service engineer |
| 7662 | Blue block temp short | Yes | Yes | Temperature sensor on blue DMD cooling block shorted | Call a qualified service engineer |
| 7660 | Engine air temp high | Yes | Yes | High temperature on engine | Check if air slots are free.<br>Clean air filters.<br>If problem persists, call a qualified service engineer |
| 7659 | Engine air temp open | Yes | Yes | Temperature sensor on engine not connected | Call a qualified service engineer |
| 7658 | Engine air temp short | Yes | Yes | Temperature sensor on engine shorted | Call a qualified service engineer |
| 7999 | Fan speed cathode too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7998 | Fan speed cathode high | - | Yes | | |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 7997 | Fan speed anode too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7996 | Fan speed anode high | - | Yes | | |
| 7995 | Fan speed engine too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7994 | Fan speed engine high | - | Yes | | |
| 7993 | Fan speed cold mirror too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7992 | Fan speed cold mirror high | | | | |
| 7991 | Fan speed heat ex. too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7990 | Fan speed heat ex. high | - | Yes | | |
| 7989 | Fan speed smps 1 too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7987 | Fan speed smps 2 too low | Yes | Yes | fan is running too slow or not at all | If problem persists, call a qualified service engineer |
| 7985 | Red DMD temp low | No | Yes | low temperature on dmd | turning on the lamp will heat up the dmd |
| 7984 | Red DMD temp high | Yes | Yes | high temperature on dmd | check if air slot are free; clean air filters<br>If problem persists, call a qualified service engineer |
| 7983 | Green DMD temp low | No | Yes | low temperature on dmd | turning on the lamp will heat up the dmd |
| 7982 | Green DMD temp high | Yes | Yes | high temperature on dmd | check if air slot are free; clean air filters<br>If problem persists, call a qualified service engineer |
| 7981 | Blue DMD temp low | No | Yes | low temperature on dmd | turning on the lamp will heat up the dmd |
| 7980 | Blue DMD temp high | Yes | Yes | high temperature on dmd | check if air slot are free; clean air filters<br>If problem persists, call a qualified service engineer |
| 7978 | Lamp temp high | Yes | Yes | high temperature lamp | check if air slot are free; clean air filters If problem persists, call a qualified service engineer |
| 7976 | SMPS HS temp high | Yes | Yes | high temperature on smps | check if air slot are free; clean air filters If problem persists, call a qualified service engineer |
| 7974 | Ambient temp high | Yes | Yes | ambient temperature above specification | check ambient conditions<br>check if air slot are free; clean air filters |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 7973 | Fan 1 voltage low | Yes | Yes | voltage on fan group 1 too low (= cathode fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7972 | Fan 1 voltage high | - | Yes | voltage on fan group 1 too high | Hardware problem in Fan control board, call a qualified service engineer |
| 7971 | Fan 2 voltage low | Yes | Yes | voltage on fan group 2 too low (= anode fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7970 | Fan 2 voltage high | - | Yes | voltage on fan group 2 too high | Hardware problem in Fan control board, call a qualified service engineer |
| 7969 | Fan 3 voltage low | Yes | Yes | voltage on fan group 3 too low (= engine fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7968 | Fan 3 voltage high | - | Yes | voltage on fan group 3 too high | Hardware problem in Fan control board, call a qualified service engineer |
| 7967 | Fan 4 voltage low | Yes | Yes | voltage on fan group 4 too low (= cold mirror + head ex. fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7966 | Fan 4 voltage high | - | Yes | voltage on fan group 4 too high (= cold mirror + head ex. fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7965 | Fan 5 voltage low | Yes | Yes | voltage on fan group 5 too low (= mains input fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7964 | Fan 5 voltage high | - | Yes | voltage on fan group 5 too high mains input fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7963 | Fan 6 voltage low | Yes | Yes | voltage on fan group 6 too low (= smps fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7962 | Fan 6 voltage high | - | Yes | voltage on fan group 6 too low (= smps fan) | Hardware problem in Fan control board, call a qualified service engineer |
| 7959 | Pump voltage low | Yes | Yes | voltage on pump too low | If problem persists, call a qualified service engineer |
| 7958 | Pump voltage high | - | Yes | voltage on pump too high | If problem persists, call a qualified service engineer |
| 7957 | 30V voltage low | No | Yes | supply voltage for fans too low | If problem persists, call a qualified service engineer |
| 7956 | 30V voltage high | No | Yes | supply voltage for fans too high | If problem persists, call a qualified service engineer |
| 7955 | VTEC voltage low | No | Yes | supply voltage for DMD cooling too low | If problem persists, call a qualified service engineer |
| 7954 | VTEC voltage high | No | Yes | supply voltage for DMD cooling too high | If problem persists, call a qualified service engineer |
| 7953 | VMTR voltage low | No | Yes | supply voltage for motors too low | If problem persists, call a qualified service engineer |
| 7952 | VMTR voltage high | No | Yes | supply voltage for motors too high | If problem persists, call a qualified service engineer |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 7945 | 5V voltage low | No | Yes | supply voltage for electronics too low | If problem persists, call a qualified service engineer |
| 7944 | 5V voltage high | No | Yes | supply voltage for electronics too high | If problem persists, call a qualified service engineer |
| 7943 | 5V FIB voltage low | No | Yes | supply voltage for engine electronics too low | If problem persists, call a qualified service engineer |
| 7942 | 5V FIB voltage high | No | Yes | supply voltage for engine electronics too high | If problem persists, call a qualified service engineer |
| 7941 | 5V PMP voltage low | No | Yes | supply voltage for drawer electronics too low | If problem persists, call a qualified service engineer |
| 7940 | 5V PMP voltage high | No | Yes | supply voltage for drawer electronics too high | If problem persists, call a qualified service engineer |
| 7939 | Prism | No | Yes | projection lens to close to prism | move lens away from prism (up and/or right) |
| 7938 | Lamp not inserted well | Yes | No | lamp module not correctly inserted | reinsert lamp module and screw firmly |
| 7937 | Waterflow | Yes | No | bad or no water flow in cooling circuit | If problem persists, call a qualified service engineer |
| 7936 | Tilt | No | Yes | tilt angle is out of specifications | Correct projection installation.<br>Change the tilting so that the tilt angle becomes within the specifications. |
| 7935 | Engine not well inserted | Yes | No | engine is not correctly inserted | If problem persists, call a qualified service engineer |
| 7934 | FIB not inserted well | Yes | No | formatter interface board is not correctly inserted | If problem persists, call a qualified service engineer |
| 7931 | PFC HS high temp | Yes | Yes | high temperature on smps | check if air slot are free; clean air filters If problem persists, call a qualified service engineer |
| 7929 | SMPS HS high temp | Yes | Yes | high temperature on smps | check if air slot are free; clean air filters If problem persists, call a qualified service engineer |
| 7928 | Overtemp | Yes | No | extreme overheating of dmd's or lamp | If problem persists, call a qualified service engineer |
| 7927 | fan speed mains input too low | Yes | Yes | fan is not running or is running too slow | If problem persists, call a qualified service engineer |
| 7926 | fan speed mains input high | - | Yes | | |
| 8000 | Opening shutter failed | No | Yes | | If problem persists, call a qualified service engineer |
| 8001 | Closing shutter failed | No | Yes | | If problem persists, call a qualified service engineer |
| 8002 | Lamp EEPROM | No | Yes | | If problem persists, call a qualified service engineer |
| 9000 | Scaler unit failed | Yes | - | Initialization of the scaler failed | If problem persists, call a qualified service engineer |
| 9198 | Scaler pixel clock too high | Yes | - | BW or refresh rate of input source too high | |

| Error code | Description | Error | Warn-ing | Caused by | Action |
|---|---|---|---|---|---|
| 9398 | Maximum image files reached | Yes | No | Reaching the maximum allowed number of files | Delete some unnecessary files |
| 10498 | Unsupported module | Yes | No | Module with obsolete firmware | Call a qualified service engineer |

# D. SPECIFICATIONS

### Overview

- Specifications FLM R20+ Performer
- Specifications FLM 5 cable input (multi purpose)
- Specifications FLM High bandwidth data input (RGB)
- Specifications FLM HDSDI – SDI input
- Specifications FLM DVI input

## D.1 Specifications FLM R20+ Performer

### Overview

| | |
|---|---|
| **Light Output** | 18.000 ANSI Lumen<br>20.000 Center Lumen |
| **Resolution** | 1400 x 1050 (native) |
| **Contrast ratio** | 1800 : 1 (full field)<br>High contrast mode:<br>2400 : 1 (full field) |
| **Lamp** | 3 kW Xenon<br>Warranty universal lamphouse: 750 Hrs |
| **Ambient temperature** | Max 40°C (104°F) |
| **Power consumption** | 3600 W |
| **Mains Voltage** | 200 - 240 V |
| **Weight** | 99 kg (220 lbs) |
| **Dimensions** | WxLxH<br>707 x 1025 x 548 mm<br>(27.8 x 40.3 x 21.5 inch)<br>incl. carrying handle + rigging points |
| **Noise Level** | 56 dBA (at 40°C) |
| **ScenergiX** | Standard horizontal and vertical electronic edge blending |
| **Network connection** | 10/100 base-T |
| **Picture-in-picture** | 2 sources simultaneous |
| **Input source compatibility** | Max. input: up to QXGA (2048 x 1536) |
| **Inputs** | **Modular Inputs:**<br>• Configurable 5 cable (BNC)<br>• DVI<br>• (HD)SDI (+ loop through) |

| | |
|---|---|
| **Throw Ratio** | **Lens Throw ratio**<br>TLD (HB) (0.8) 0.75<br>TLD (HB) (1.2) 1.1<br>TLD (HB) (1.6 - 2.0) 1.45 - 1.85<br>TLD (HB) (2.0 - 2.8) 1.85 - 2.55<br>TLD (HB) (2.8 - 5.0) 2.55 - 4.55<br>TLD (HB) (5.0 - 8.0) 4.55 - 7.3 |
| **Dust filters** | Dense, high quality microfilters available as spare kit, in a 6-pack & 24-pack |
| **Order Information** | Projector: R9004430<br>Spare lamp (universal lamp house): R9854420<br>6-pack dust filters: R9454470<br>24-pack dust filters: R9454480<br>RGB HV module: R9854440<br>FLM/SLM adaptor plate: R9854490<br>FLM rigging kit: R9854500<br>FLM flight case: R9854510 |
| **Brightness uniformity** | > 90% for the total screen |
| **Display** | 3 Chip DLP SXGA+ (resolution of 1400 x 1050 pixels (aspect ratio 4:3)). |
| **Lens Shift** | Vertical: -10% to +110%<br>Horizontal: -50% to +50%<br>(small differences occur per lens type)<br>(short throw lenses have less shift) |
| **On board display server** | Ethernet control standard<br>remote control projector over ethernet via Projector Toolset |
| **Outputs** | HDSDI/ SDI loop out |
| **Communication** | • 1x RS-232C IN (D-9 connector)<br>• 1x RS-232C OUT (D-9 connector)<br>• 1x RS-232C IN (XLR connector)<br>• 2x prop. protocol (RJ45 connector)<br>• mini-jack for wired remote control |
| **Compatibility** | • All current video sources (PAL, SECAM, NTSC) in Composite, S-VHS, Component or RGB formats<br>• All currently proposed HDTV, extended and improved television standards (1080i, 720p)<br>• All computer graphics formats from VGA, SVGA, XGA, SXGA, full HD, UXGA to QXGA<br>• Most Macintosh computers<br>• Electronic workstations with a resolution up to QXGA (2048 x 1050 pixels at 60 Hz)<br>• Most computer sources with a pixel clock up to 300 MHz<br>• DVI sources up to DC2K (2048x1080) |
| **Power Dissipation** | max 11953BTU/h |

| | |
|---|---|
| **Features** | • Picture in picture<br>• Seamless switching with effects<br>• Standard light shutter<br>• Rigging point<br>• Carrying handle<br>• High contrast mode<br>• P7 color processing |
| **Screen size** | From 1-12m / 3-39ft.recomended |
| **Scan Frequencies** | Pixel clock >162Mhz (QXGA 60hz) |
| **Lens encoders** | On zoom and focus (with TLD lenses) |
| **Safety Regulations** | Compliant with UL1950 and EN60950 |
| **Electromagnetic Interference** | Complies with FCC rules & regulations, part 15 Class A and CE EN55022 Class A |
| **Lenses** | **Lens Order nr**<br>TLD (HB) 0.8 R9842040<br>TLD (HB) 1.2 R9840770<br>TLD (HB) 1.6 - 2.0 R9842060<br>TLD (HB) 2.0 - 2.8 R9842080<br>TLD (HB) 2.8 - 5.0 R9842100<br>TLD (HB) 5.0 - 8.0 R9842120 |
| **Sealed DLP™ core** | Standard |

## D.2 Specifications FLM 5 cable input (multi purpose)

### Front view 5 cable input

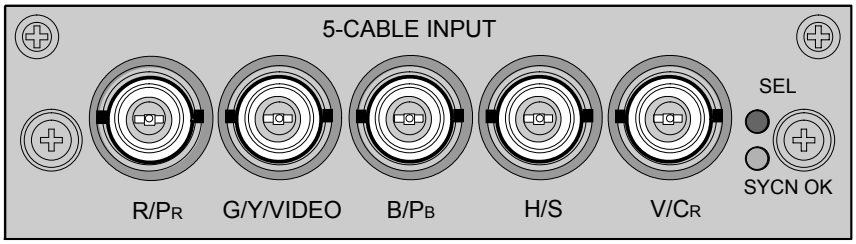



Image D-1

### Signal connectivity

| Input signal | R / $P_R$ | G / Y / VIDEO | B / $P_B$ | H / S | V / $C_R$ |
|---|---|---|---|---|---|
| RGBHV | R | G | B | H | V |
| RGBS | R | G | B | S<br>composite sync or VIDEO as sync | — |
| RGsB | R | Gs<br>sync on green | B | — | — |
| Composite Video | — | VIDEO | — | — | — |
| Super Video | — | Y<br>Luma | — | — | C<br>Chroma |

| Input signal | R / $P_R$ | G / Y / VIDEO | B / $P_B$ | H / S | V / $C_R$ |
|---|---|---|---|---|---|
| Component Video - SS | $P_R$ / (R - Y) | Y | $P_B$ / (B - Y) | S<br>composite sync or VIDEO as sync | — |
| Component Video - SOY | $P_R$ / (R - Y) | Ys | $P_B$ / (B - Y) | — | — |

### Specifications

- Data and HD sources RGB and YUV [HS/VS, CS or SOG(Y)]:
  - Pixel clock maximum 275 MHz
  - 8 bit digital output
- Video sources CVBS, S-VIDEO, RGB and YUV [CS, CV or SOG(Y)]:
  - PAL B/D/I/G/H, PAL60, PAL M, PAL N, PAL Nc
  - NTSC M/J, NTSC 4.43
  - SECAM B/D/G/K/L
  - 525i, 625i, 525p, 625p
  - Macrovision copy protection robust
  - 10 bit digital output
  - Standard images “video525” and “video625”
- Automatic detection of sync inputs but with manual override:
  - automatic modes : RGB, YUV, VIDEO
  - manual modes : RGB HS/VS - CS, RGB CV, RGB SOG, YUV HS/VS - CS, YUV CV, YUV SOY, CVBS, S-VIDEO
- Possible to disconnect 75 Ohm terminations on HS and VS (TTL sync level selection)
- Signal requirements:
  - Component Video (BNC)
    - R-Y : 0,7Vpp ±3dB 75 Ohm termination.
    - Ys : 1Vpp ±3dB (0,7V Luma +0,3V Sync) 75 Ohm termination.
    - B-Y : 0,7Vpp ±3dB 75 Ohm termination.
  - 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.
- Diagnostic LED’s on front panel:
  - Green LED: Lights up in case input module is selected
  - Yellow LED: Lights up in case sync detected

## D.3 Specifications FLM High bandwidth data input (RGB)

### Input front view

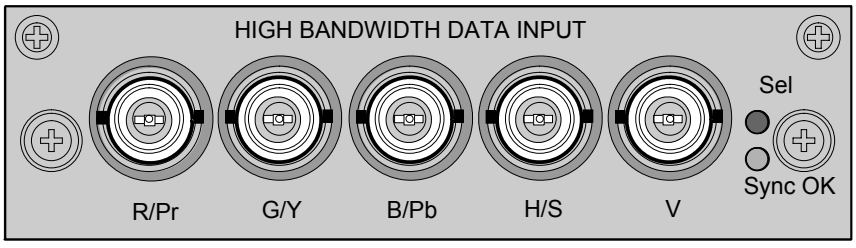



Image D-2

### Signal connectivity

| Input signal | R / $P_R$ | G / Y | B / $P_B$ | H / S | V |
|---|---|---|---|---|---|
| RGBHV | R | G | B | H | V |

| Input signal | R / $P_R$ | G / Y | B / $P_B$ | H / S | V |
|---|---|---|---|---|---|
| RGBS | R | G | B | S<br>composite sync | — |
| RGsB | R | Gs<br>sync on green | B | — | — |
| Component Video - SS | $P_R$ / (R - Y) | Y | $P_B$ / (B - Y) | S<br>composite sync | — |
| Component Video - SOY | $P_R$ / (R - Y) | Ys | $P_B$ / (B - Y) | — | — |

### Specifications

- Data and HD sources RGB and YUV [HS/VS, CS or SOG(Y)]:
  - pixelclock maximum 275MHz
  - 8 bit digital output
- Mode configurations:
  - RGB HS/VS - CS, RGB SOG
  - YUV HS/VS - CS, YUV SOY
- Possible to disconnect 75 Ohm terminations on HS and VS (TTL sync level selection)
- Signal requirements:
  - Component Video (BNC)
    - R-Y : 0,7Vpp ±3dB 75 Ohm termination.
    - Ys : 1Vpp ±3dB (0,7V Luma +0,3V Sync) 75 Ohm termination.
    - B-Y : 0,7Vpp ±3dB 75 Ohm termination.
  - 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.
- Diagnostic LED's on front panel:
  - Green LED: Lights up in case input module is selected
  - Yellow LED: Lights up in case sync detected

## D.4 Specifications FLM HDSDI – SDI input

### Input front view HDSDI – SDI input

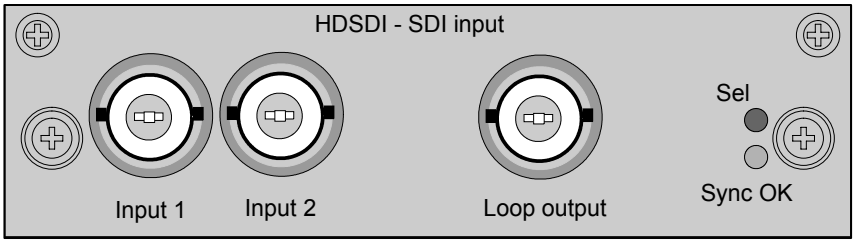



Image D-3

### Specifications

- SD SMPTE 259M-C and HD SMPTE 292M input data
- 2 inputs (BNC), 1 active loop-through output (BNC) of selected input
- Automatic selection of active input with manual override
- 10 bit digital output
- Diagnostic LED's on front panel:
  - Green LED: Lights up in case input module is selected
  - Yellow LED: Lights up in case sync detected
- SDI: 270 Mbit/s transmission (SMPTE 259M-C).
- 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)

## D.5 Specifications FLM DVI input

### Input front view

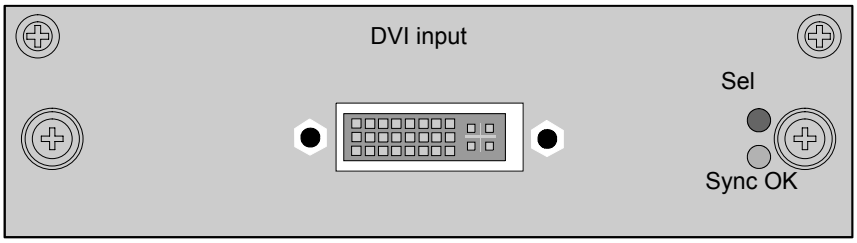



Image D-4

### Specifications

- DVI type: DVI-I (DVI-Integrated), but the analog signals are not supported. Single-link configuration.
- Single link dvi for pixelclocks up to 165MHz
- Vertical frequencies: 24 - 75 Hz
- Horizontal frequencies: 20 - 90 kHz
- Supported resolutions: up to UXGA (1600 x 1200) at 60 Hz.
- Cable lengths: up to 3 meter at UXGA speed.
- Compliance: DDC2B support according to VESA EDID Version 1.2
- Diagnostic LED's on front panel:
  - Green LED: Lights up in case input module is selected
  - Yellow LED: Lights up in case sync detected

# E. ORDER INFO

## E.1 Spare part order info

**Order info:**

| Order info | Description |
|---|---|
| R9854490 | FLM/SLM adaptor plate (for stacking an SLM projector upon an FLM projector). |
| R9854420 | FLM lamp house (3kW lamp included). |
| R9854520 | FLM lamp house refurbish (3kW lamp included). |
| R9854430 | 5 Cable input module. |
| R9854440 | High bandwidth data input module (RGB). |
| R9854450 | HDSDI - SDI input module. |
| R9854460 | DVI input module. |
| R848607 | Cover plate for unused input slot. |
| R9854470 | FLM front, top and bottom filters (6 pieces each). |
| R9854480 | FLM front, top and bottom filters (24 pieces each). |
| R9854510 | FLM flight case. |
| R764988 | FLM remote control unit (RCU) |
| R820411 | One rigging clamp for truss installations. |
| Z3499178 | FLM power cord. |
| R9840900 | TLD fixed lens (0.8 : 1) |
| R9840770 | TLD fixed lens (1.2 : 1) |
| R9840775 | TLD+ (1.2:1) fixed lens |
| R9840670 | TLD zoom lens (1.6 - 2.0 : 1) |
| R9840680 | TLD zoom lens (2.0 - 2.8 : 1) |
| R9840690 | TLD zoom lens (2.8 - 5.0 : 1) |
| R9840910 | TLD zoom lens (5.0 - 8.0 : 1) |
| R9842040 | TLD HB fixed lens (0.8 : 1) |
| R9842060 | TLD HB zoom lens (1.6 - 2.0 : 1) |
| R9842080 | TLD HB zoom lens (2.0 - 2.8 : 1) |
| R9842100 | TLD HB zoom lens (2.8 - 5.0 : 1) |
| R9842120 | TLD HB zoom lens (5.0 - 8.0 : 1) |

# GLOSSARY

**Color space**

A color space or color standard is a mathematical representation for a color. For example the RGB color space is based on a Cartesian coordinate system.

**Common address**

Projector will always execute the command coming from a RCU programmed with that common address.

**Default Gateway**

A router that serves as an entry point into and exit point out of a network. For example, a local network (LAN) may need a gateway to connect it to a wide area network (WAN) or to the Internet.

**DHCP**

Dynamic host configuration protocol. DHCP is a communications protocol that lets network administrators manage centrally and automate the assignment of IP addresses in an organization's network. Using the Internet Protocol, each machine that can connect to the Internet needs a unique IP address. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each machine. Without DHCP, the IP address must be entered manually at each computer and, if computers move to another location in another part of the network, a new IP address must be entered. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network.

**HEPA**

High Efficiency Particulate Absorbing

**IP**

Internet Protocol. The network layer of TCP/IP. Required for communication with the internet.

**MAC address**

Media Access Control address. Unique hardware number, used in combination with the IP-address to connect to the network (LAN or WAN).

**PiP**

PiP stands for "Picture in Picture" and allows to display multiple windows containing each of them an image. The windows may be of the video or data type.

**Projector address**

Address installed in the projector to be individually controlled.

**Restricted access location**

A location for equipment where both of the following paragraphs apply:

**1)** Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restriction applied to the location and about the precautions that shall be taken.

**2)** Access is through the use of the tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

**RS232**

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is > + 3V, Logical '1' is < - 3V. The range between -3V and +3V is a the transition zone.

**RS422**

An EIA serial digital interface standard that specifies the electrical characteristics of balanced (differential) voltage, digital interface circuits. This standard is usable over longer distances than RS-232. This signal governs the asynchronous transmission of computer data at speeds of up to 920,000 bits per second. It is also used as the serial port standard for Macintosh computers. When the difference between the 2 lines is < - 0.2V that equals with a logical '0'. When the difference is > +0.2V that equals to a logical '1'..

**Subnet mask**

A number that is used to identify a subnetwork so that IP addresses can be shared on a local area network.

# INDEX

## S



## T



## U



## V



## W



## Z

## Revision Sheet

To:

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From: _____

Date: _____

Please correct the following points in this documentation (**R5976921/04**):

| page | wrong | correct |
|---|---|---|
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