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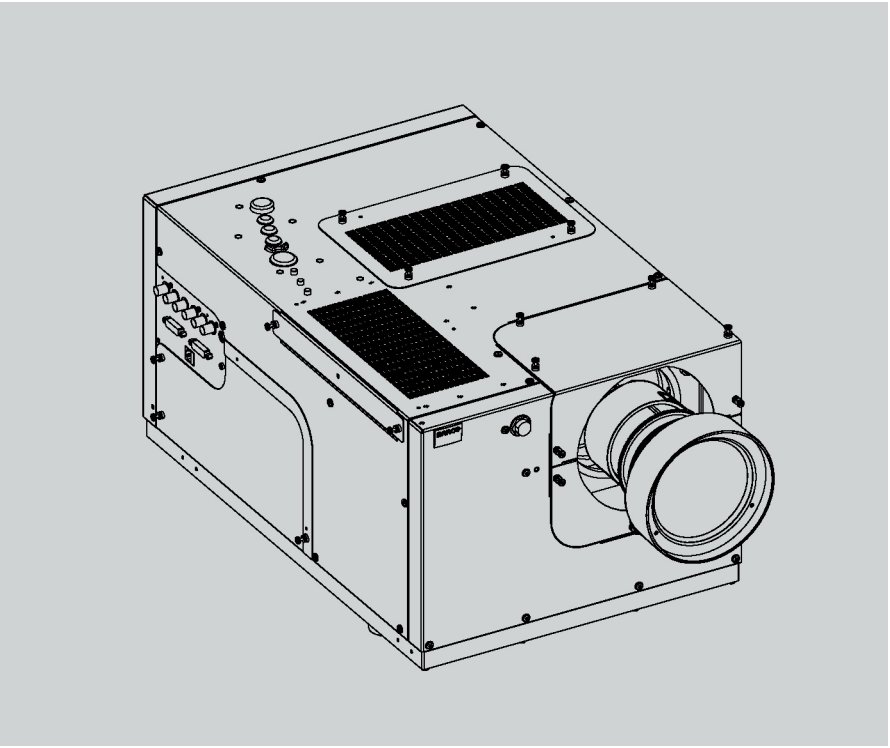
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SIM 7Q series



User Guide

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The software in this product is based in part on the work of the Independent JPEG Group.

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1. INTRODUCTION

Overview

- About the projector
- About the manual

1.1 About the projector

SIM 7Q series projectors

The SIM 7Q series projectors are LCoS (Liquid Crystal on Silicon) based high resolution projectors developed for high demanding simulation applications.



Image 1-1
SIM 7Q series: smearing reduction and blur reduction

1.2 About the manual

CAUTION: For the latest version of the product manuals, see http://www.barco.com.

Clarification of the term “SIM 7Q series” used in this document

When referring in this document to the term “SIM 7Q series” it is meant that the content is applicable for the following Barco products:

- SIM 7Q
- SIM 7Q HB
- SIM 7Q HC
- SIM 7Q HB&C

Manual overview

This manual contains 6 main chapters :

1. **Installation** : the mechanical setup of the projector.
2. **Setup** : adjusting the projection parameters in order to get the best image reproduction.
3. **Getting started** : start the projector for daily use.
4. **Advanced** : advanced operation and setup settings using the remote control and the projector’s OSD.
5. **Maintenance** : projector’s maintenance operations
6. **Service** : basic service of the projector

Related documentation

Several advanced adjustments can be set and controlled via the Barco hand held remote control unit xRACU and are covered in the dedicated System manual.

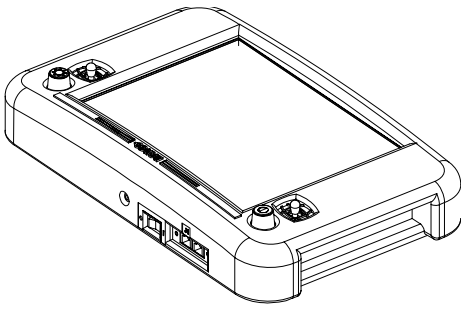


Image 1-2
RACU hand held control unit

Symbol overview

The following icons are used in the manual :

	Caution
	Warning
	Info, term definition. General info about the term.
	Note, gives extra information about the described subject.
	Tip, gives extra advice about the described subject.

Font overview

- Buttons are indicated in bold, e.g. **OK**.
- Menu items are indicated in *italic*.
- Step related notes, tips, warnings or cautions are printed in *italic*.
- Procedure related notes, tips, warnings or cautions are printed in bold between 2 lines preceded by the corresponding icon.

2. PACKAGING

Overview

- Unpacking

2.1 Unpacking

CEE7/7

European power plug to connect the power cord to the wall outlet.

NEMA5

American power plug to connect the power cord to the wall outlet.

Content

Description	Quantity
SIM 7 projector	1
Remote Control Unit (RCU) + batteries	1
Power cord CEE7	1
Power cord NEMA5	1
QSD projection lens	1
User Guide	1
Safety Manual	1
Silicagel (see image 2-1)	4

Silicagel

Four bags of silicagel are added to the packaging to keep it dry. Do not open these disposable bags



Image 2-1
Silicagel

Foam

The projector is packed in a cardboard box. To provide protection during transportation, the projector is surrounded with foam. The package is secured with banding and fastening clips.

Lens delivered

The projection lens delivered with the projector will vary depending on the product number ordered and is packed in a separate cardboard box placed inside the main cardboard box.

Retain the original shipping cardboard boxes and packing material. It will be needed if you ever have to ship the projection lens.

CAUTION: Never transport the projector with the lens mounted on it !

Always remove the lens before transporting the projector.

CAUTION: Make sure that the projection lens has the one-to-one match with the projector and please contact Barco in case of replacement of the projection lens.

How to unpack the projector ?

1. Release the cord straps.

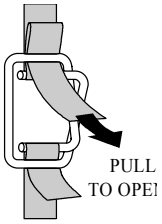


Image 2-2

2. Remove the assembly from the pallet
3. Open the outer cardboard box
4. Remove the two smaller box, which contains:
   - User guide and Safety manual
   - RCU + batteries
   - power cords
   - projection lens
5. Remove the foam parts
6. Open the inner cardboard box
7. Remove the foam parts
8. Lift the projector out of the inner cardboard box

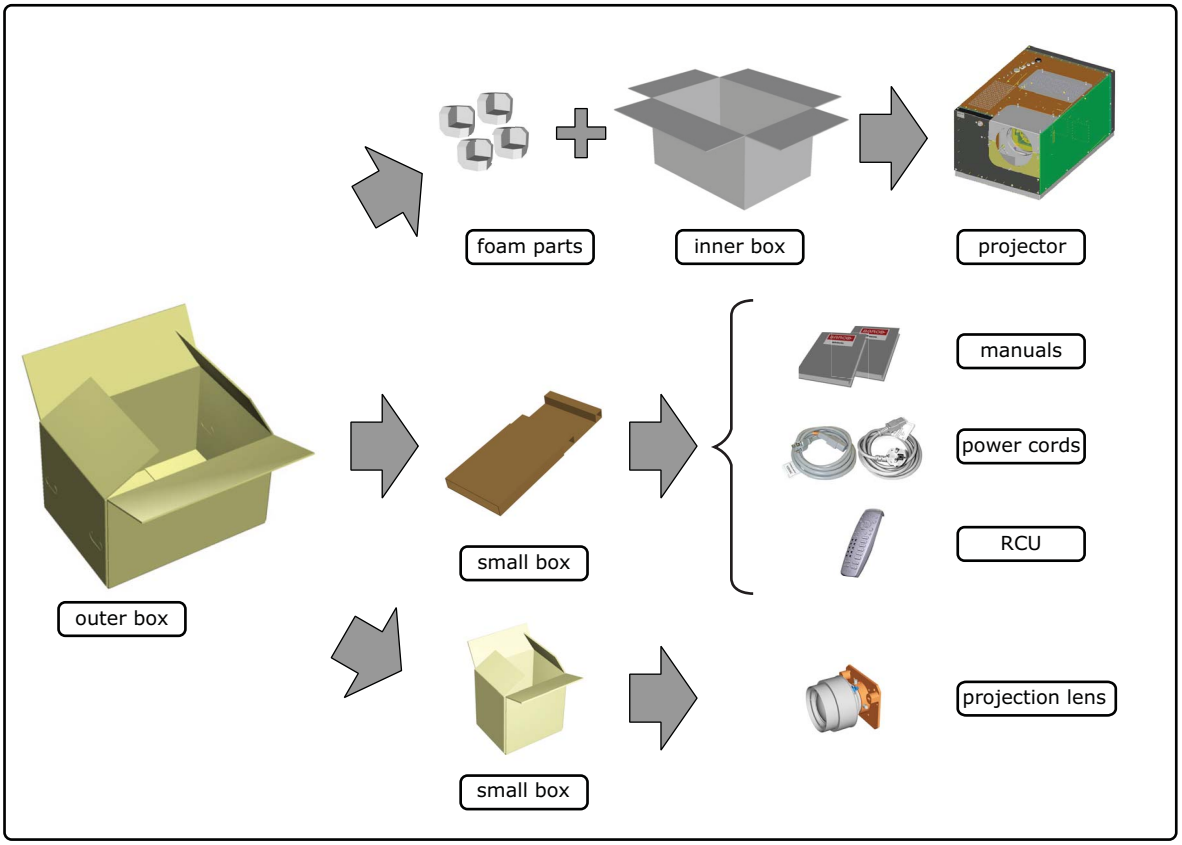


Image 2-3
Unpacking the cardboard box: exploded view

Retain the original shipping cardboard boxes and packing material. It will be needed if you ever have to ship the projector. For maximum protection, repack your projector as it was packed at the factory.

3. INSTALLATION GUIDELINES

Overview

- Safety warnings
- Installation guidelines

3.1 Safety warnings



WARNING: Before installing the projector, first read the safety instructions in the safety manual (R5975258) delivered with the projector.

Insure that the room can be easily evacuated in case of a lamp explosion.

Mercury vapor warnings

Keep the following warnings in mind when using the projector. The lamp used in the projector contains mercury. In case of a lamp rupture or lamp explosion there will be a mercury vapor emission. In order to minimize the potential risk of inhaling mercury vapors:

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

3.2 Installation guidelines

General conditions

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.

Temperature conditions

Temperature range during operation

- Min. ambient temperature : 0 °C or 32 °F
- Max. ambient temperature : 40 °C or 104 °F



The projector will not operate if ambient air temperature falls outside this range (0°C- 40°C or 32°F-104°F).

Temperature range in non-operation condition

- Min. ambient temperature : -10 °C or 14 °F
- Max. ambient temperature : 60 °C or 140 °F

Humidity conditions

Operation: 0 to 90 % RH non-condensing

Storage: 0 to 90 % RH non-condensing. Recommended RH = 50%

Environment

Do not install the projection system in a site near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity. Be aware that room heat rises to the ceiling; check that temperature near the installation site is not excessive.

Environment condition check

A projector must always be mounted in a manner which ensures the free flow of clean air into the projectors ventilation inlets as well as free flow at the ventilation outlets. The installation must also allow easy access to the consumable parts (dust filters, lamps, etc.) 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. Make sure that the projector never runs with dirty dust filters as this will dramatically reduce the lifetime of the consumables. It is advised to replace the air filters at any lamp change. Barco reserves itself the right to refuse warranty replacement of consumables if they have been used in a projector with dirty air filters. Only use the manufactures recommended cleaning kit which has been specifically designed for cleaning optical parts, never use industrial strength cleaners on a projectors optics as these will degrade optical coatings and damage sensitive optoelectronics .

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 non-effective and impracticable. Damage of this nature is under no circumstances covered under the manufactures 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 manufacture reserves the right to refuse warranty repair if a projector has been subject to wantful neglect, abandon or improper use.

What about ambient light ?

In simulation applications, the effect of any ambient light or indirect lighting will influence the contrast and brightness level of the image. Due to this the quality of the perception of the projected scene can decrease. Therefor it is most important to avoid any unwanted light or reflection. Some rules can be useful:

- switch off any light source during projection
- reflection should be avoided, e.g. by using dark wall, ceiling and floor color
- windows must be fully darkened
- only aimed spotlight should be used to illuminate small areas if really needed

It is important to carefully consider lighting conditions. Dedicated engineers or scientists can point out the necessary conditions for a good simulation system environment and should be consulted before equipping the room.

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 (x1) to a brushed aluminized screen with a gain of 10 (x10) 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.

Image size

The projector is designed for projecting an image size with a screen width from 1.00 m (3.3 ft) to 6 m (19.7 ft) with an aspect ratio of 4 to 3.

Image retention

Image retention can affect LCOS projectors, in extreme cases, permanent “burn” can occur if still/repetitive images are left on the screen for long periods of time. Such damage to the panels is NOT covered by warranty.

Please ensure that the following precautions are taken to avoid this phenomenon :

1. Use a screensaver (that moves)
2. Periodically change/alter any background images
3. Turn off the projector when not in use

Running cycle

To come to an acceptable lifetime for both lamps and panels it is necessary to turn off the projector once a day for at least one hour. In doing so the lifetime will increase considerably. However, the more time the projector is powered down each day, the better the panels can recover and the longer they will last.

4. INSTALLATION

Overview

- Dimensions
- Fixation points at the bottom of the projector
- Projector tilt
- RCU battery installation
- Lens installation
- Projector configuration
- Connections

4.1 Dimensions

Projector dimensions and weight

Dimensions are given in mm and inch (1inch = 25.4 mm)

Weight (without lens) : approx. 27 kg (59.5 lbs)

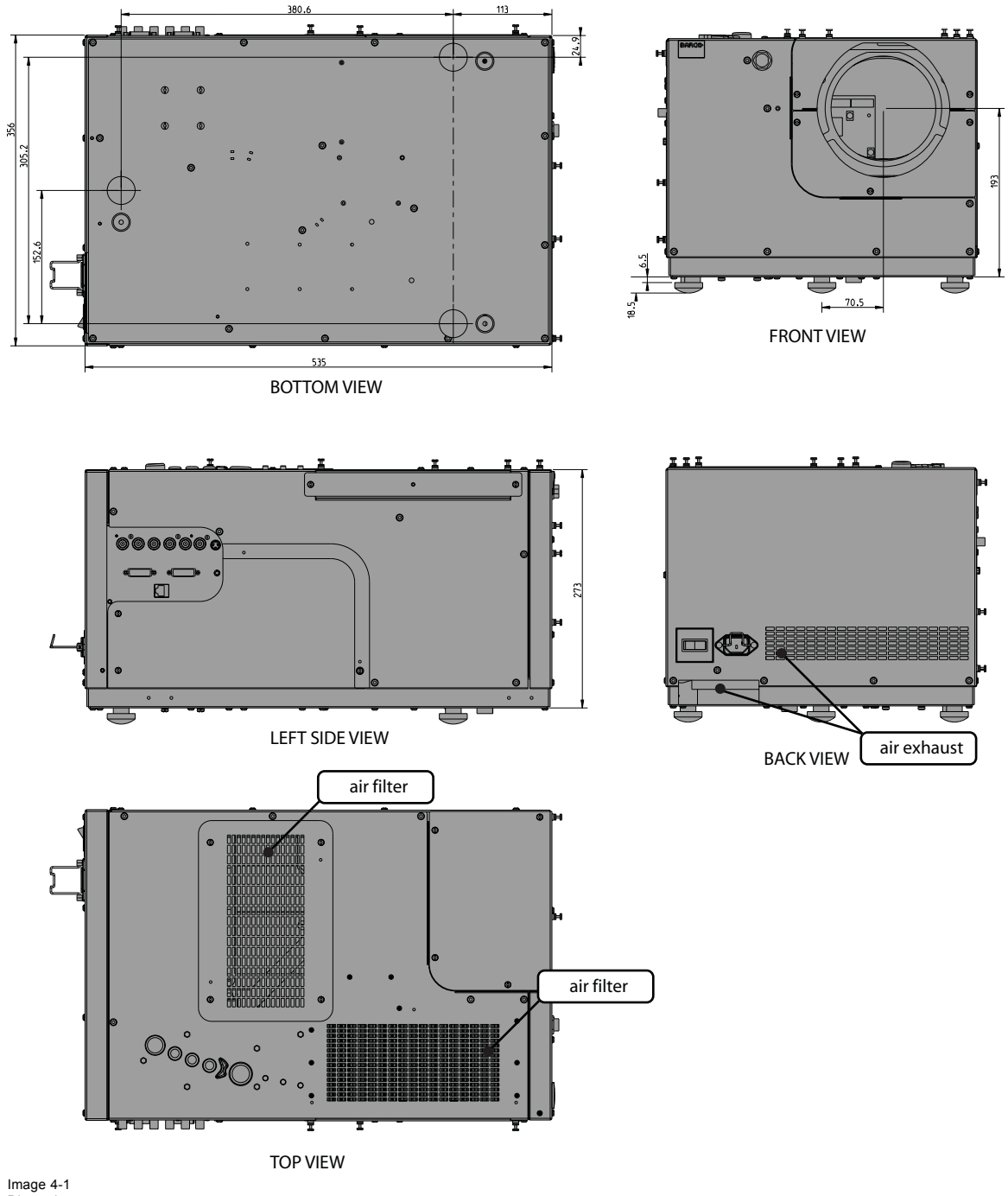


Image 4-1
Dimensions

4.2 Fixation points at the bottom of the projector

Describing the fixation points

To fix the projector to its support, three bolts can be screwed into the threaded holes at the bottom of the projector. The bolts must meet the following specifications:

- bolt type: M8x1.25
- strength class: 8.8 or higher
- preferred bolt length (bolt head not included): 25 mm < bolt length < 30 mm
- mounting torque range: 20 Nm (177 lbf.in) < torque < 23 Nm (205 lbf.in)

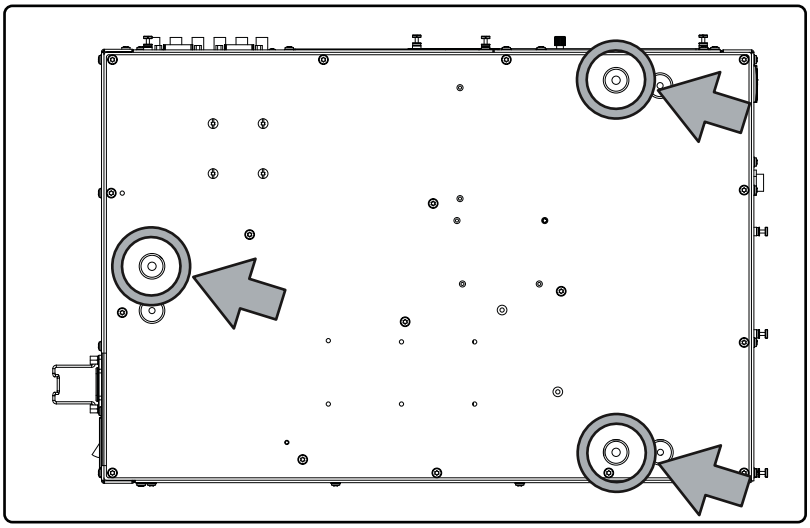


Image 4-2
Fixation points

4.3 Projector tilt

CAUTION: Not respecting the projector tilt range will cause lamp flicker or even lamp explosion.

Tilt range

The tilt range of the projector is restricted by the tilt range of the lamp. The drawings below show the maximal tilt range in both senses.

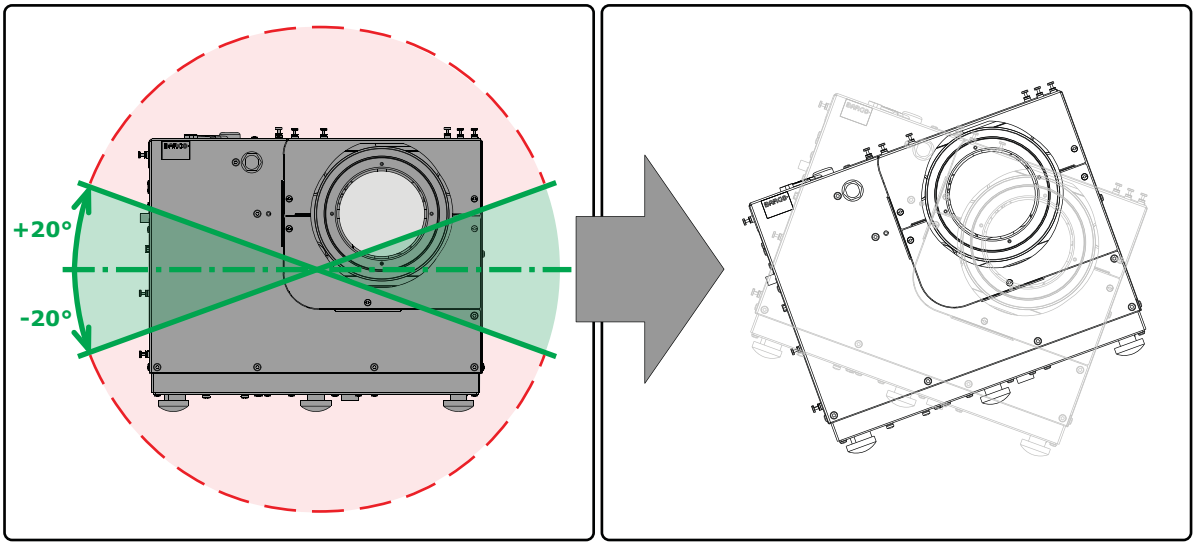


Image 4-3
Projector tilt range

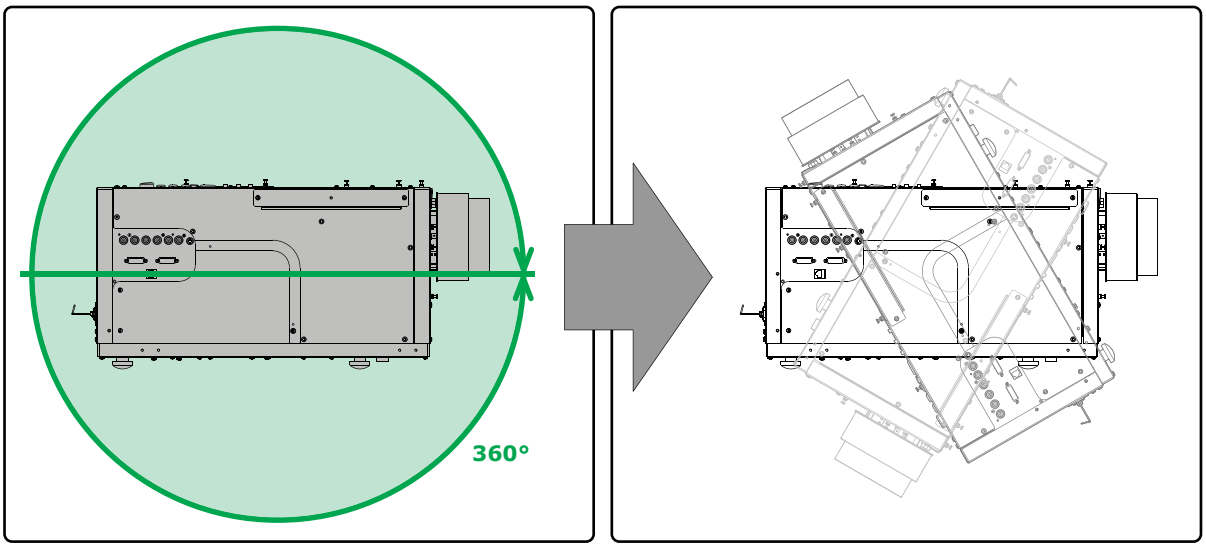


Image 4-4
Projector tilt range

4.4 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).

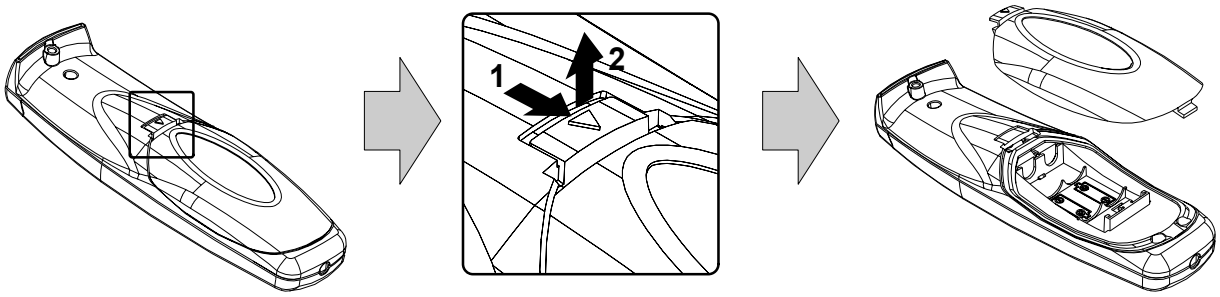


Image 4-5

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

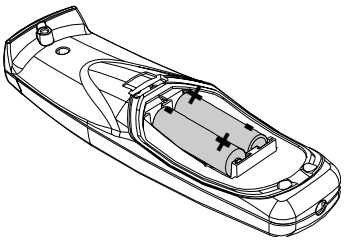


Image 4-6

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.

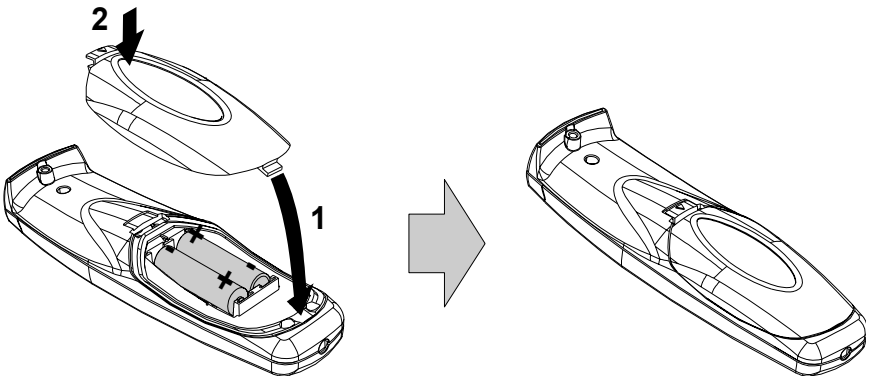


Image 4-7

CAUTION: Replace with the correct battery type. Use two AA size batteries. There is a risk of explosion if the battery is replaced with an incorrect type.

CAUTION: Replace the battery as explained above. There is a risk of explosion if the battery is incorrectly installed.

4.5 Lens installation

Overview

- Lens range
- Lens formulas
- Shift capabilities
- Installing the lens and adjusting the Scheimpflug
- Connecting the lens
- Lens Data

4.5.1 Lens range

Overview table

Lens
QSD (0.8:1)
QSD (1.0–1.4:1)
QSD (1.4–2.0:1)

See the Maintenance appendix for more information about lens cleaning.

4.5.2 Lens formulas

Projection Distance

The Projection Distance or **PD** is the perpendicular distance between the screen and the reference point on the projector, expressed in meter or inch.

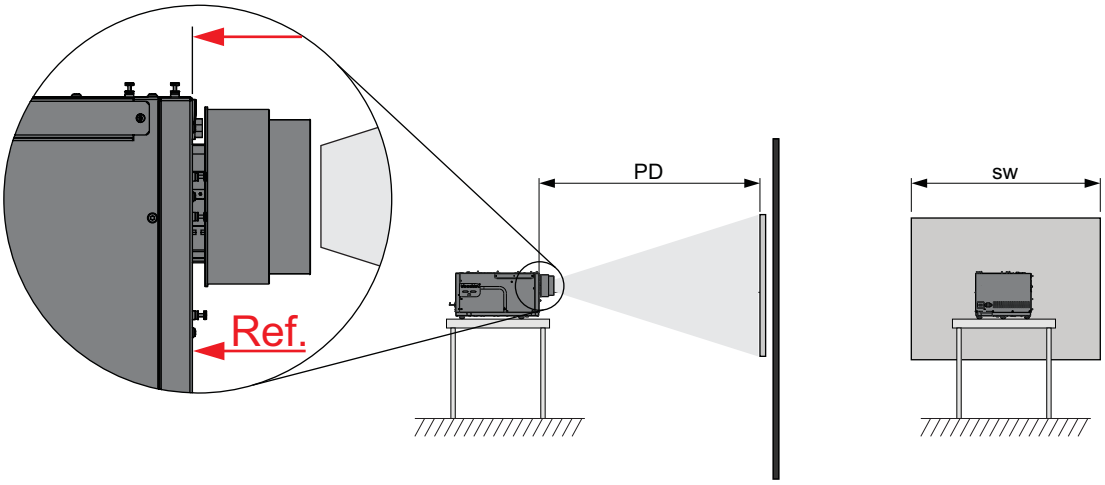


Image 4-8
Projection Distance (PD) and Screen Width (SW)

Screen width

The Screen Width or **SW** is the total **width** of the image as it is projected on the screen, expressed in meter or inch.

Formulas

Lens	Zoom status	Metric formulas (meter)	Inch formulas (inch)
QSD (0.8:1)	-	PD = 0.0679 + 0.803 x SW - 0.0121/SW	PD = 2.673228 + 0.803 x SW - 18.755/SW
QSD (1.0–1.4:1)	WA (Wide Angle)	PD_{min} = 0.0299 + 1.026 x SW + 0.0047/SW	PD_{min} = 1.177165 + 1.026 x SW + 7.285015/SW
	TP (Telephoto)	PD_{max} = 0.0341 + 1.434 x SW + 0.0030/SW	PD_{max} = 1.34252 + 1.434 x SW + 4.650009/SW
QSD (1.4–2.0:1)	WA (Wide Angle)	PD_{min} = -0.0858 + 1.471 x SW + 0.0077/SW	PD_{min} = -3.37795 + 1.471 x SW + 11.93502/SW
	TP (Telephoto)	PD_{max} = -0.0013 + 2.031 x SW - 0.0606/SW	PD_{max} = -0.05118 + 2.031 x SW - 93.9302/SW

4.5.3 Shift capabilities

Overview

Lens	Vertical shift	Horizontal shift (if vertical shift is 0%)	Horizontal shift (if vertical shift is 100%)
QSD (0.8:1)	up/down : 12.8%	-	-
QSD (1.0–1.4:1)	up/down : 100%	left/right : 70%	left/right : 20%
QSD (1.4–2.0:1)	up/down : 100%	left/right : 70%	left/right : 20%

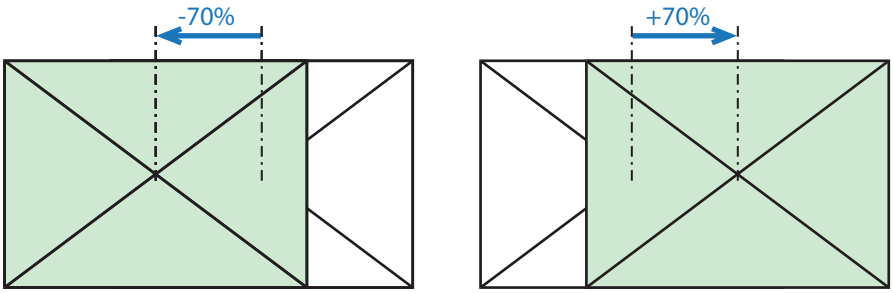


Image 4-9
Lens shift: maximum horizontal shift (vertical shift = 0)

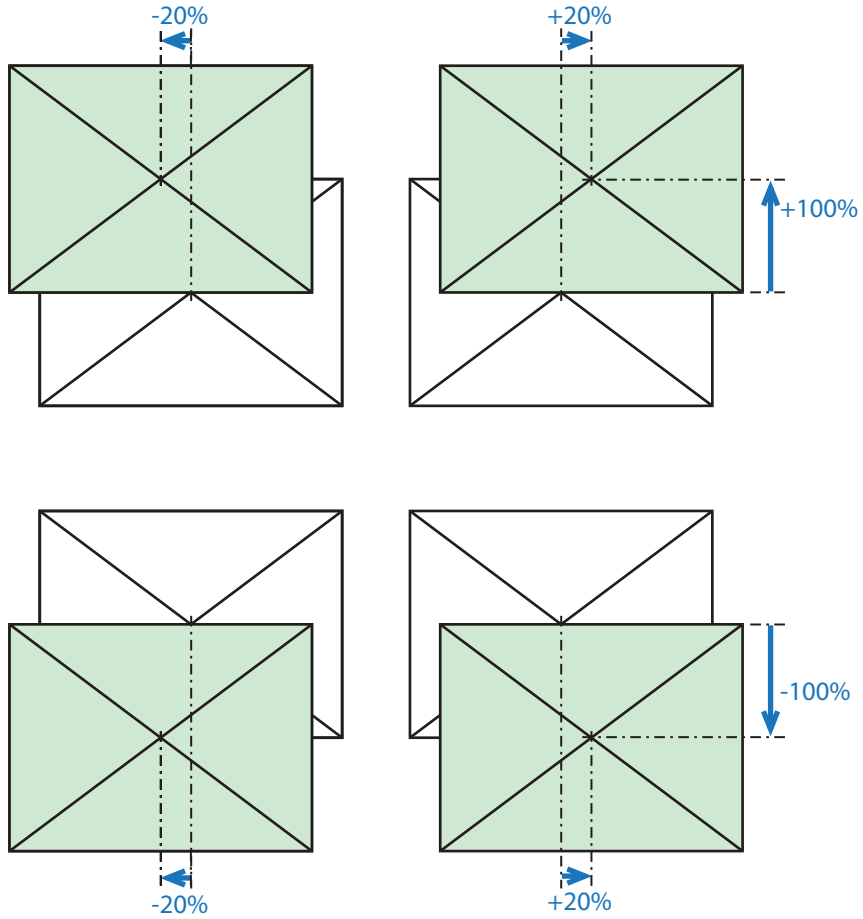


Image 4-10
Lens shift: maximum horizontal shift (vertical shift = maximum = 100%)

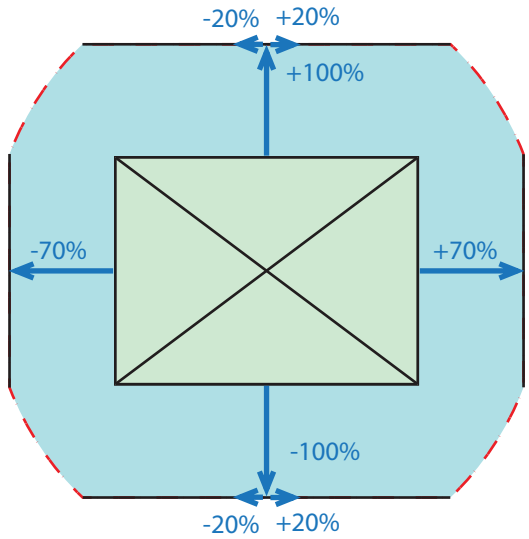


Image 4-11
Lens shift: range

The best image quality is obtained in nominal lens position (i.e. 0% shift). Shifting the image to the limit of its range starts introducing some falloff. The exact range in the area indicated by the red dashed line depends on lens type and application.

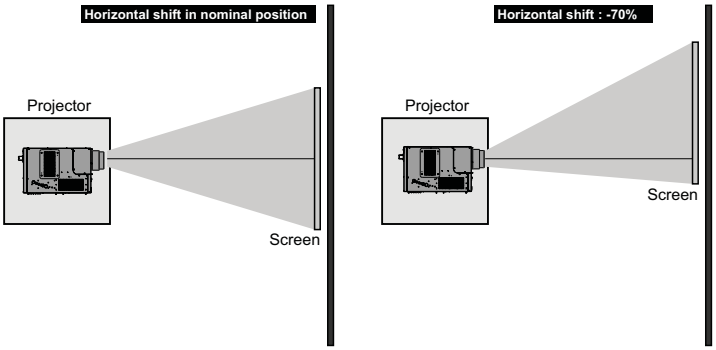


Image 4-12

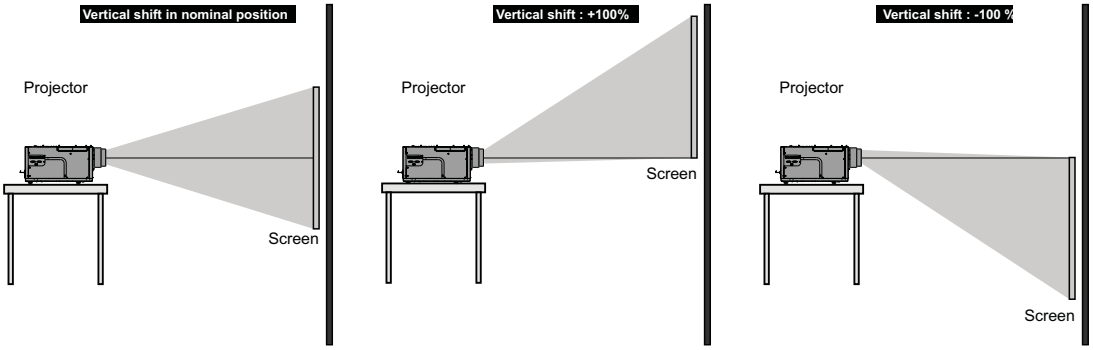


Image 4-13

4.5.4 Installing the lens and adjusting the Scheimpflug

WARNING: In case of a projector with NVG option, do not insert your fingers in the lens holder if the lens is removed. They could get hit by the smearing reduction wheel!

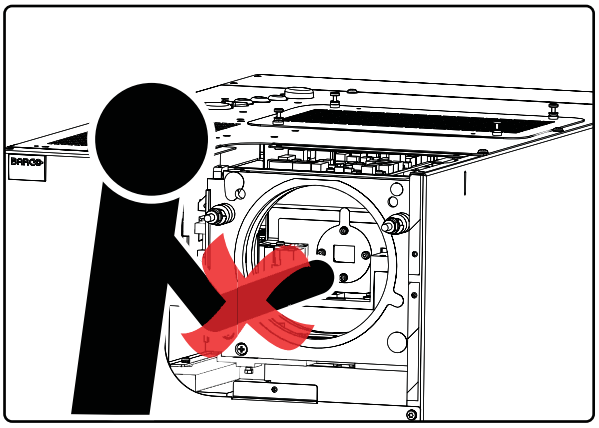


Image 4-14

CAUTION: Make sure that the projection lens and the interpolation lens are a matched set. Replacing any one of these units requires the replacement of the other.

Each of the lenses have Scheimpflug adjustment possibility!

Back focal length adjustment is also needed after the projection lens installation. See "Back focal length adjustment", page 42 for detailed procedure.

Necessary tools

- Torx screwdriver T10
- Nut spanner or socket spanner 10 mm
- Allen key 2 mm

How to prepare the projector lens?

1. Screw in 3 Allen bolts M4 into the lens flange. See image 4-15 and image 4-16
   Tip: *Make sure the bolts do not completely go through the flange.*
2. Fix a nut M4 to the Allen bolts. Do not tighten yet.

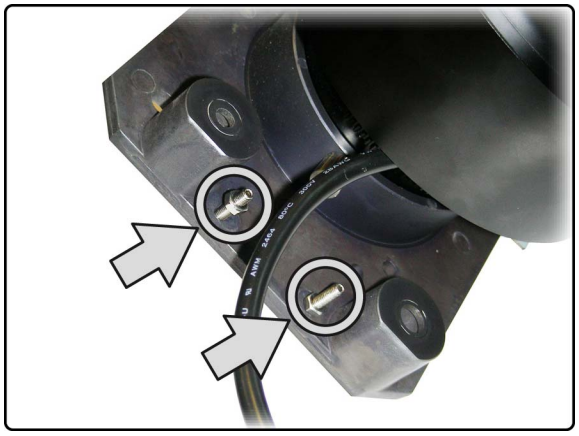


Image 4-15
Screws to lock the lens scheimpflug settings (left side)

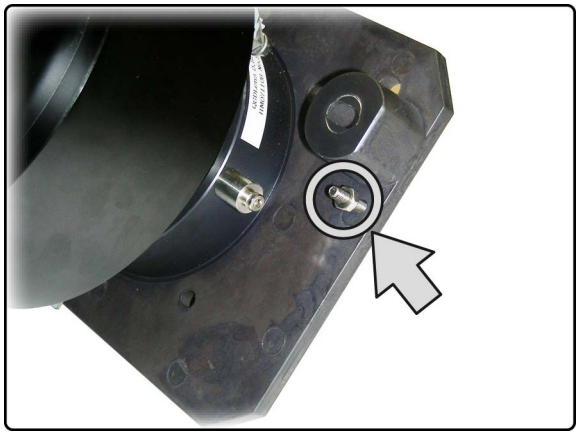


Image 4-16
Screws to lock the lens scheimpflug settings (right side)

How to mount the lens on the projector and adjust the Scheimpflug?

1. Remove the top lens cover (6 screws)

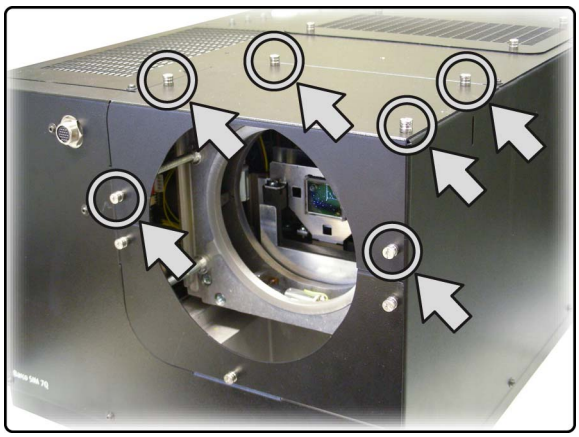


Image 4-17
Top lens cover: fixing screws

2. Remove the bottom lens cover (3 screws)

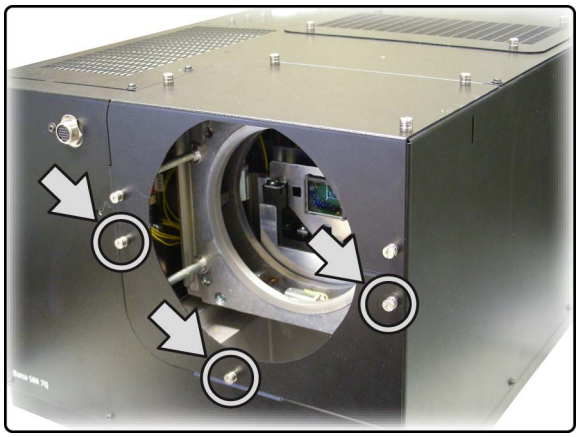


Image 4-18
Bottom lens cover: fixing screws

3. Remove the lock nuts and washers from the lens holder studs, but leave the springs on the lens holder studs

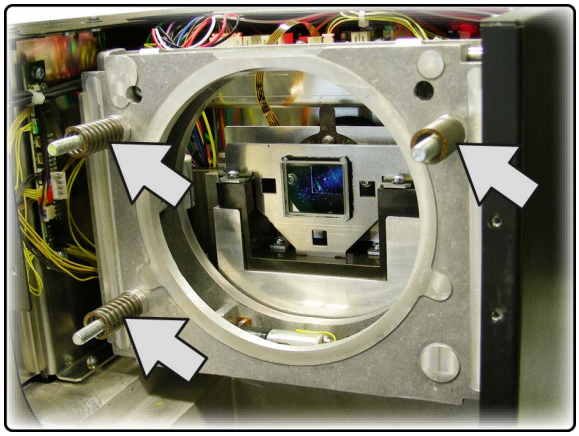


Image 4-19
Lens: scheimpflug springs

4. Slide the lens over the 3 studs

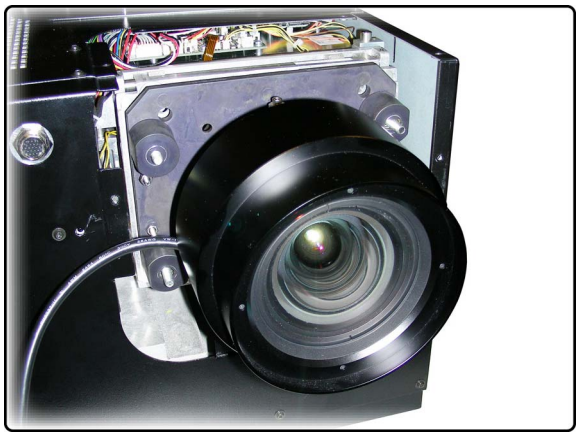


Image 4-20
Lens positioned

5. Put a washer and a lock nut on each stud

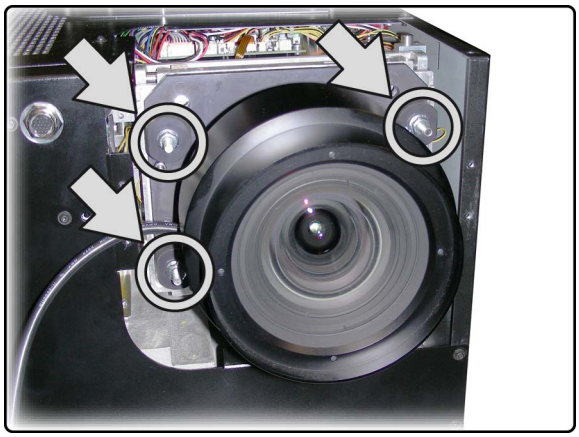


Image 4-21
Lens fixation nuts

6. Fix the lock nuts until the lens flange touches the lens holder plate at the 3 fixation points (nominal position).
7. Unscrew each lock nut 1 revolution and start adjusting the Scheimpflug by tightening or loosening these lock nuts
8. If the adjustment is done, screw in the smaller Allen bolts M4 (see “1” on image 4-22) until they are hand-tight

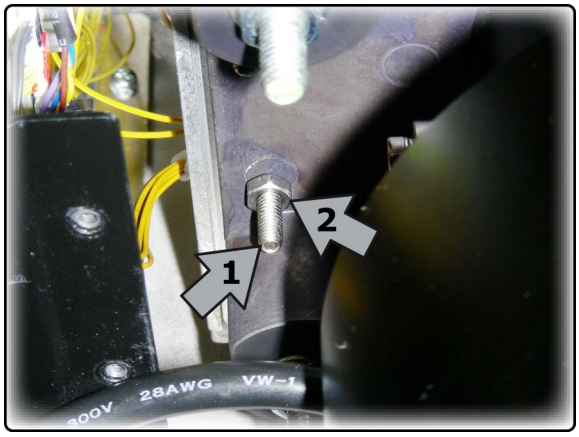


Image 4-22
Lens: Scheimpflug securing bolts and nuts

9. Secure the smaller Allen bolts M4 by tightening the nuts (see “2” on image 4-22) to the lens flange.
10. Install the bottom lens cover
11. Install the top lens cover

4.5.5 Connecting the lens

What must be done ?

The lens must be connected to the projector to allow the control of the Zoom and Focus and to allow data communication for the aperture control.

Connecting or disconnecting the lens while the projector is powered can cause **damage** to the lens aperture and may never be done. Therefore a warning is displayed if the lens is not connected and the projector is activated.

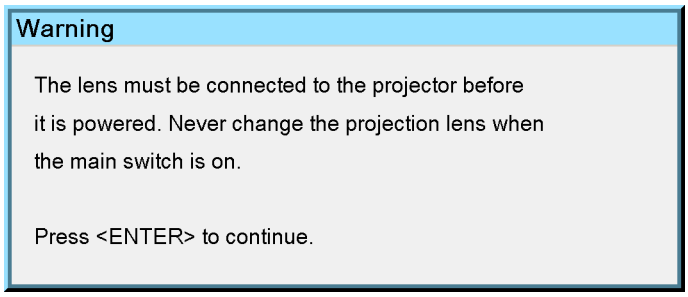


Image 4-23

How to connect the lens ?

1. Connect the male connector attached to the lens to the female connector located on the front of the projector
   Tip: *The side labeled **TOP** on the male connector must be oriented upwards.*

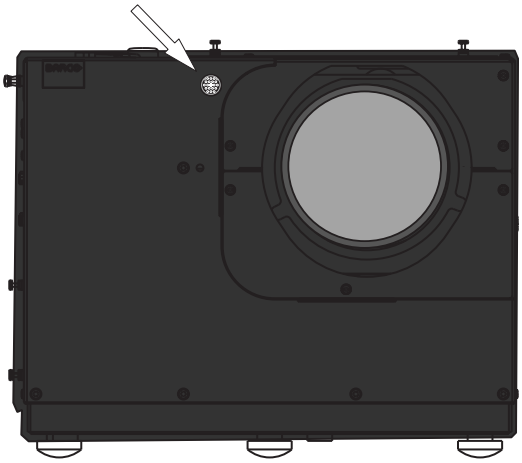


Image 4-24
Projector lens connection

2. Secure the connection by turning and fastening the locking ring

4.5.6 Lens Data

ECR

Extended Contrast ratio allows to increase the contrast of the image while the light output decreases.

ECR (Extended Contrast Ratio)

The lenses used in the projector are fitted with a non volatile memory holding the lens serial number and dynamic aperture look up tables. These look up tables allow to determine the exact opening position in function of the desired light output (determined for example by the Time of Day setting).

To make this possible the lens is connected to the front of the projector chassis through a 16-wire cable.

Connection

The connection to the projector transmits signals for the lens aperture data and the zoom and focus motor control (power).

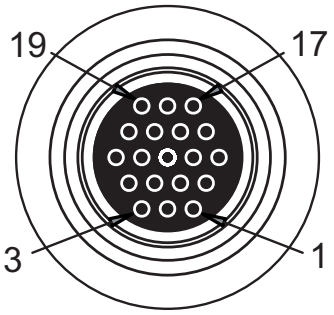


Image 4-25
Lens connector pinout

Pin number	Pin description
13,14,15,16	D1,D2,D3,D4
17	++5V
18	Sens
19	GND

Table 4-3
Pinout overview table

Also see the lens connection procedure.

4.6 Projector configuration

The different configurations

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

1. Rear/Ceiling
2. Rear/Table
3. Front/Ceiling
4. Front/Table

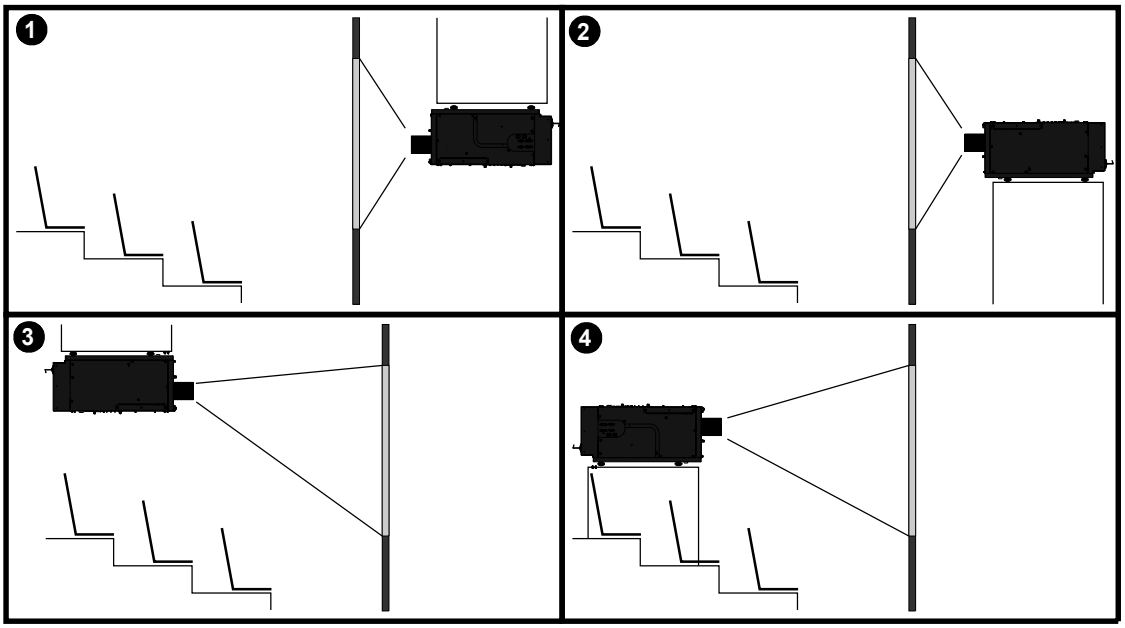


Image 4-26
Projector configurations

4.7 Connections

Overview

- Power connection
- Signal connections
- Communication

4.7.1 Power connection

Voltage, Ampere, Frequency rating

Projector type	Voltage range (AC)	Current	Frequency
SIM 7	100 – 240 V single phase	6 – 3 A	50 – 60 Hz

How to connect the power ?

1. Use the supplied power cord to connect the projector to the power outlet.
2. Plug the female power connector into the male connector at the rear of the projector

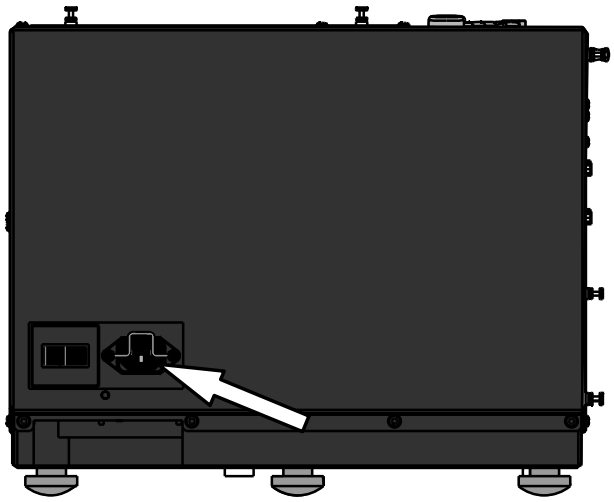


Image 4-27
Barco SIM7 Power connection

3. Secure the connection with the locking spring.

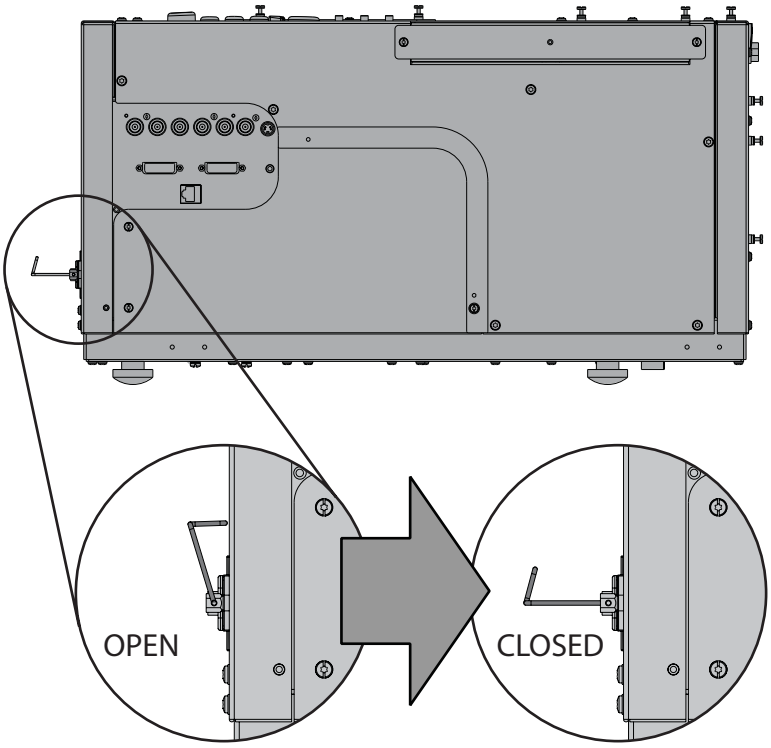


Image 4-28

CAUTION: To prevent damage to the projector always ensure that the locking spring is well engaged !

4.7.2 Signal connections

Overview

- Input section
- Input specifications
- Connecting a DVI source
- Connecting an RGB source

4.7.2.1 Input section

Overview

The input section consists of 2 input layers and a communication layer:

- input layer 1: twin dual link DVI input
- input layer 2: analog input consisting of a 5 BNC RGBHV input, a composite video input (not supported) and a S-Video input (not supported)
- communication layer: RJ45 (LAN1). This Ethernet input is connected to the image processor (PMP or Pixel Map Processor).

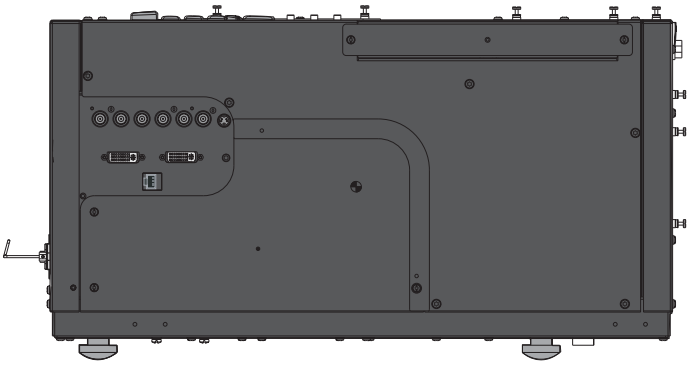


Image 4-29
Projector left side view

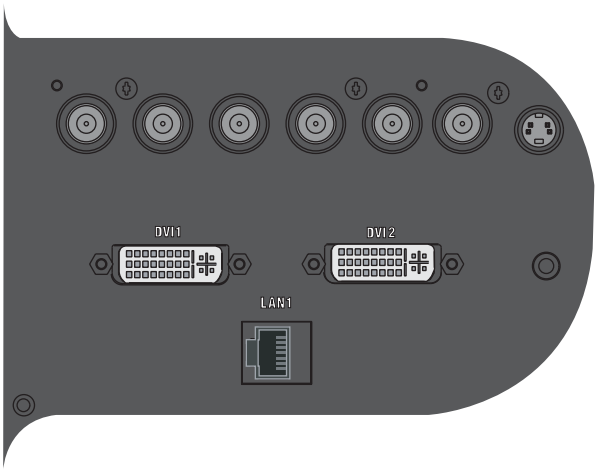


Image 4-30
Projector left side view : Input section

4.7.2.2 Input specifications

DVI input board

This board includes two DVI dual link digital inputs. These inputs can be used separately, or they can be used as a Twin Dual DVI input to receive a high bit depth signal (e.g. 16 bit).

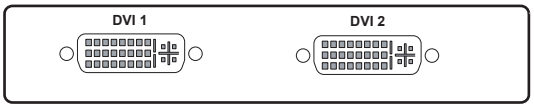


Image 4-31
Dual DVI input

Video input board

The video input board holds an RGBHV input. By default, the composite video (BNC connector) and the S-video input (mini-DIN connector) are not supported.

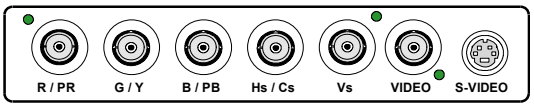


Image 4-32
Video input board

4.7.2.3 Connecting a DVI source

How to connect two single channel DVI sources ?

1. Connect each source to the projector by connecting the DVI male connector of channel 1 into the projector's DVI 1 female input connector and the DVI male connector of channel 2 in the DVI 2 female input connector

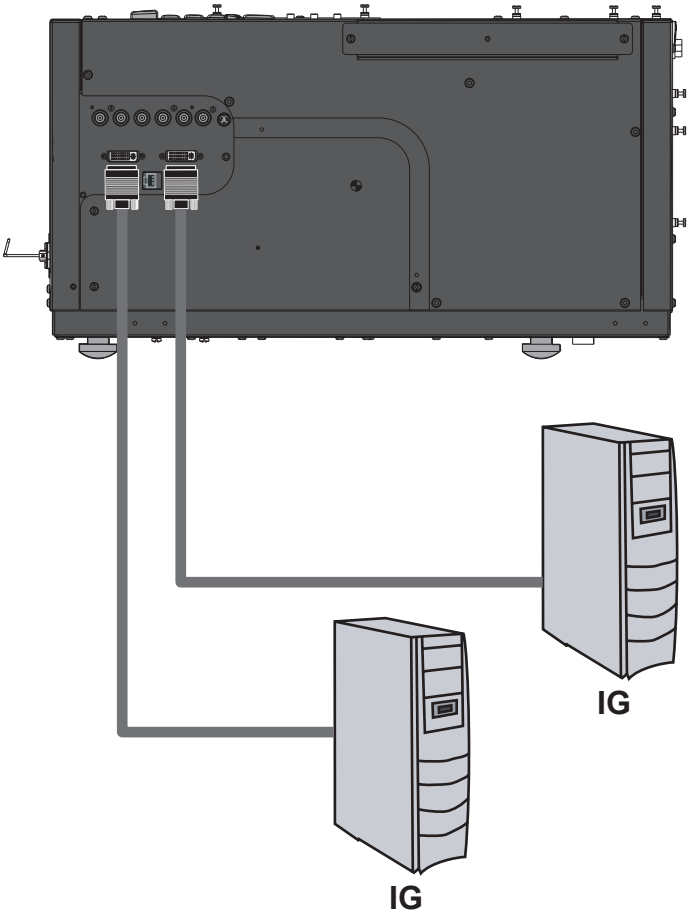


Image 4-33
Connections : connecting 2 DVI sources

How to connect a dual channel DVI source ?

1. Connect the dual channel image generator source to the projector by connecting the DVI male connector of channel 1 into the projector's DVI 1 female input connector and the DVI male connector of channel 2 in the DVI 2 female input connector

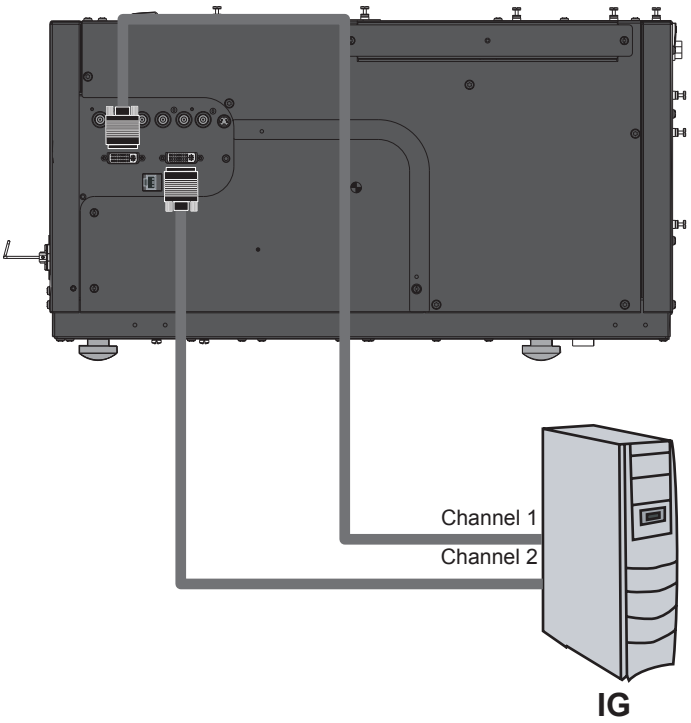


Image 4-34
Connections : connecting a dual channel DVI source

4.7.2.4 Connecting an RGB source

How to connect the RGB input ?

1. Connect the 4 or 5 BNC cables to the projector’s 5-cable input.

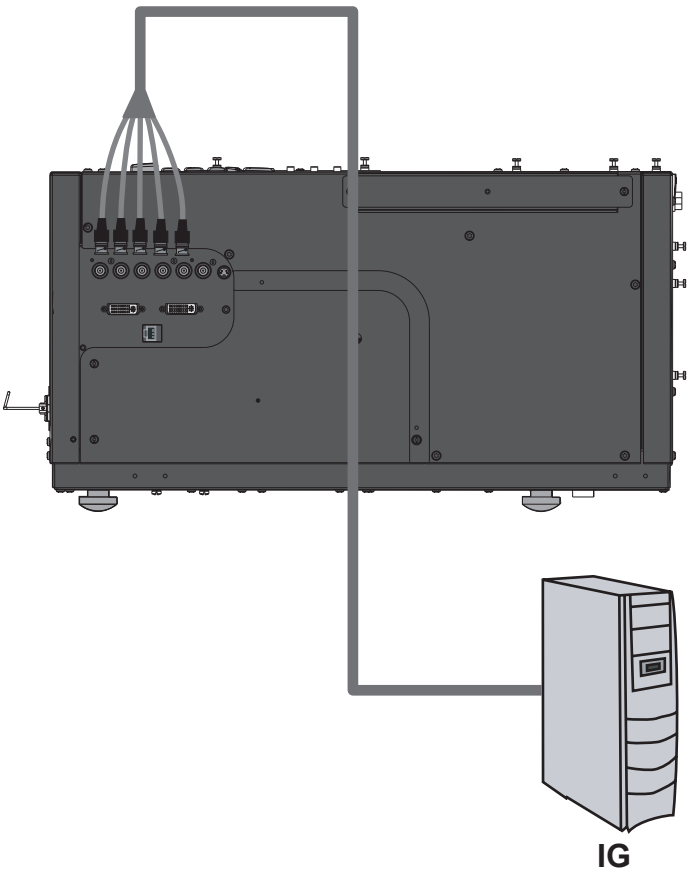


Image 4-35
Connections : connecting an RGB source

4.7.3 Communication

Overview

- Network connections
- Network settings

4.7.3.1 Network connections

What can be done ?

The projector can be connected to a network allowing it to be accessed from any connected network device. The Ethernet connection can be used to upload/download projector software and/or to set up communication (TCP-packets) with the projector. This network can be a local area network or a small dedicated network

Following operations are made possible :

- file transfer for firmware upgrade
- easy adjustment of projector
- wide range of control possibilities.
- ...

The connection to the projector can be done via a crossed cable or via a HUB on the local network (LAN).

To send commands to the projector, connection must be established to port 5401.

How to connect the projector ?

1. Connect the RJ 45 male plug to the projector's RJ 45 female connector

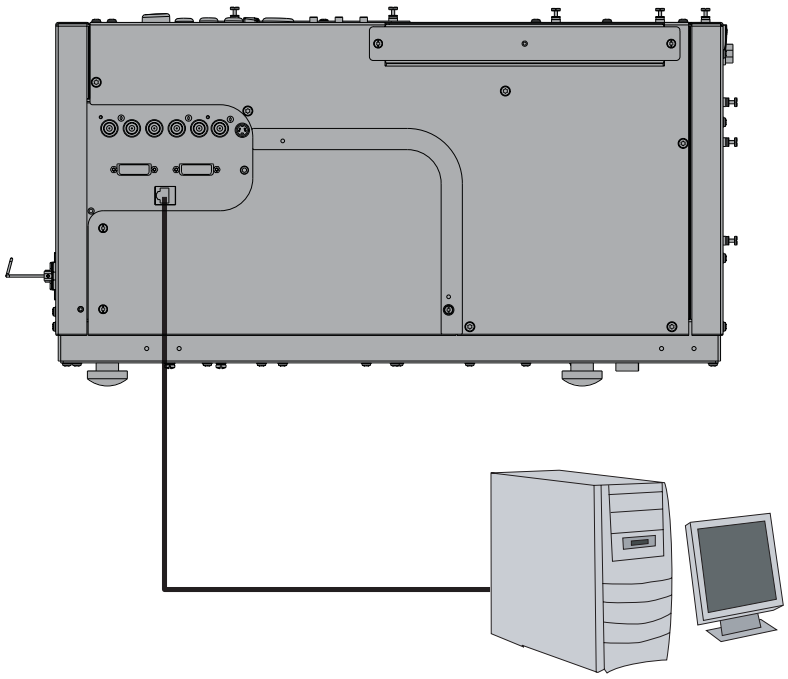


Image 4-36
Network connection via crossed cable (Null modem)

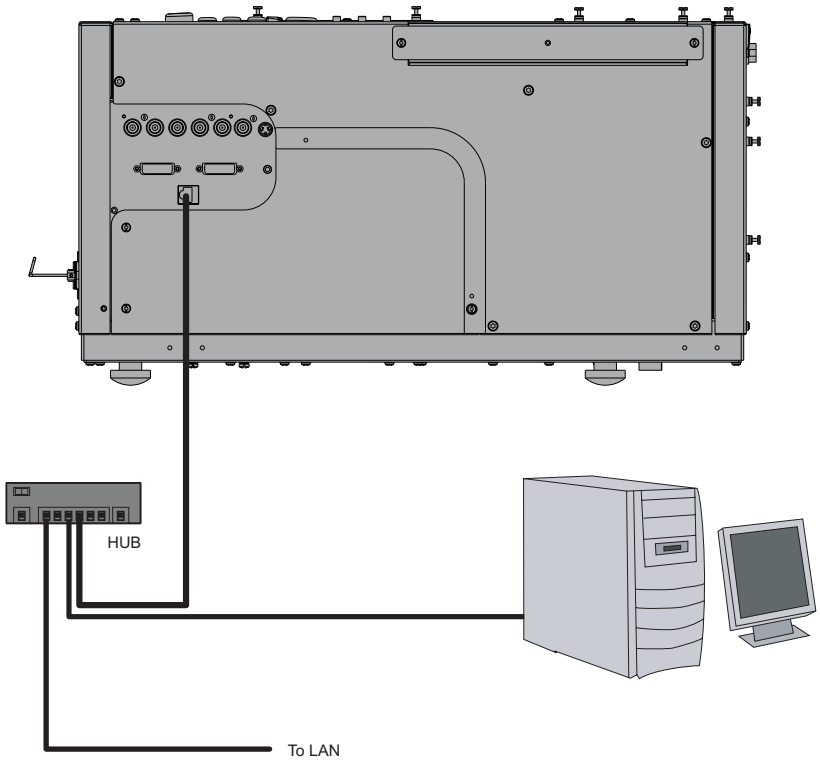


Image 4-37
Network connection through a HUB

See *Network settings* to set the communication port.

4.7.3.2 Network settings

CAUTION: Make sure that a DHCP server is available in the network and works fine.

In normal conditions, the network detection takes few seconds. This means that the total time needed to go from power ON to Standby mode is only a few seconds. This value can vary depending on the speed of the network connection.

But when the DHCP setting of the projector is set to Yes and the network does not allow the projector to obtain an IP address from the DHCP server, the startup time will be delayed by upto five minutes. After this time, a time-out occurs if the network detection fails, and the projector starts up without any network connection.

What can be done?

These settings are used to set the Ethernet Communication parameters.

Following parameters are available :

MAC Address	MAC Address of the projector (This is a non-adjustable value programmed into the Ethernet board).
IP Address (Current)	IP Address of the projector (This is a non-adjustable value).
Subnet Mask	Subnet Mask (This is a non-adjustable value)
Gateway	Gateway (This is a non-adjustable value)

DHCP	DHCP setting: • *Yes*: The projector will dynamically obtain its IP address from the DHCP server. • *No*: The IP address needs to be entered manually. Note that when selecting **Fixed IP** the IP settings fields are enabled
IP Address	Fixed IP Address of the projector : this field can be edited when Fixed IP is selected
Subnet Mask	Subnet Mask : this field can be edited when Fixed IP is selected
Gateway	Gateway : this field can be edited when Fixed IP is selected
Hostname	Hostname : this field can be edited when DHCP is selected

How to set up the network settings ?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation* in the menu bar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Network settings* and press **ENTER** to select.

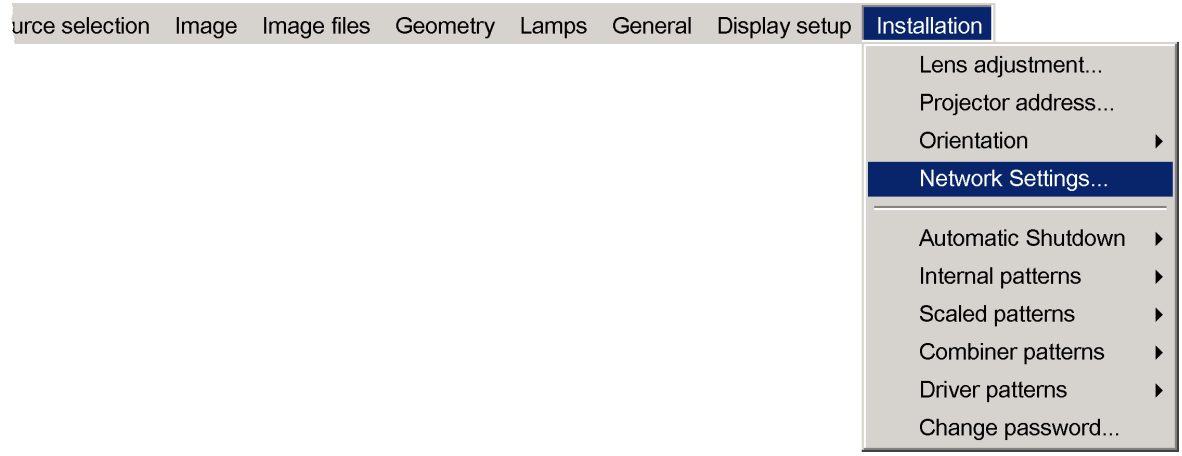


Image 4-38

A dialog box will be displayed.

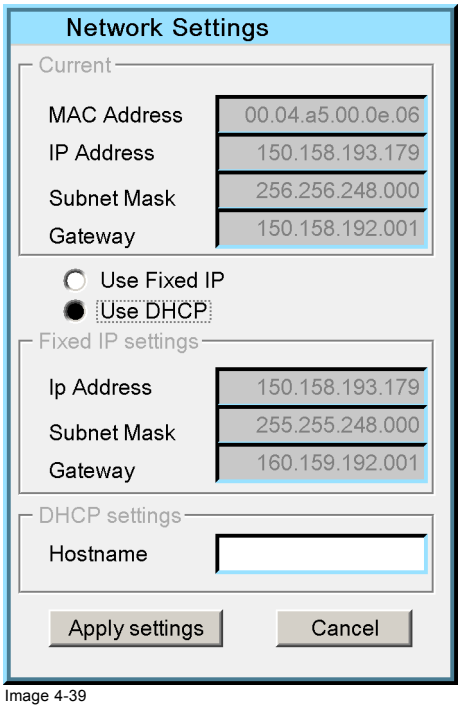


Image 4-39

5. Push the cursor key ↑ or ↓ to highlight the desired parameter.
6. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to edit and change the values.

7. Press **Apply settings** to apply the changes

   A dialog box is shown. The different executed operations are shown with a checkbox. The last operation *Restarting network* takes a few seconds more.

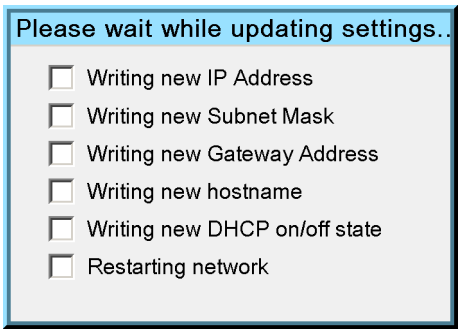


Image 4-40

5. SETUP

Overview

- Warranty: continuous mode / automatic shutdown mode
- Recommendation to extend lamp life time
- Powering the SIM 7 projector
- Setting the RCU address
- Starting the projector
- Setting the projector address (only if necessary)
- Setting the orientation
- Lens adjustments

5.1 Warranty: continuous mode / automatic shutdown mode



CAUTION: Continuous active mode of the projector for more than 24 hours leads to expiring of the lamp warranty!

Activating the projector for the first time

When the projector is activated for the first time, a dialog box appears: you can choose to operate the projector in continuous mode or you can prefer to operate it in automatic shutdown mode. See below for details.

The reason why this selection has to be made is that the technology of the projector's lamp requires some time to recover after every 24 hours of active mode. This means that the projector must be switched to OFF after every 24 hours of non-stop active mode. If this rule is not followed, i.e. if the projector is ON and active for more than 24 hours continuously, then the warranty of the actual lamp expires.

It is possible to cancel the dialog box. At that time the behavior of the projector is the same as if the *continuous mode* had been selected. The next time that the projector is activated, the dialog box appears again and it will continue to be that way until you have made a selection.

Automatic shutdown mode

If this mode is selected, the projector will display a **warning** on the projected image after 24 hours of continuous active mode saying that the projector will **automatically switch off** in four minutes. A counter will count back from 4 minutes to zero. At that time the projector will switch off. In this mode **warranty of the lamp remains**.

Continuous mode

If continuous mode is selected the projector can reside in active state for more than 24 hours continuously. **No warning** will be displayed at any time, but once the 24 hours non-stop active mode is reached, **warranty of the actual lamp expires**. A specific hexadecimal code will be generated and added to the lamp history of the actual lamp.

Changing the runtime mode

Whatever the selection of runtime mode was, it is possible to change to the other mode through the *Installation* menu at any time. However if the warranty had expired, it stays that way.

5.2 Recommendation to extend lamp life time

Respect uninterrupted lamp on time of 30 minutes

Once the lamp is ignited the lamp should remain on for at least 30 minutes. This minimum on time is needed for optimal recovering of the lamp. Neglecting this will cause stress on the lamp bulb, so the chance on early failures is increased

Always complete lamp cooling down cycle

After switching of the lamp wait a few minutes until the projector has finished with the built-in lamp cooling down cycle. Only remove power from the projector once the lamp cooling down cycle is completed. Neglecting this will cause stress on the lamp bulb, so the chance on early failures is increased.

Limit total lamp run time in pre-installation

As long as the projector is not installed in its final orientation the total lamp run time should be kept to a minimum (a few hours max.). A reorientation of a lamp which has run a long time in another orientation can shorten the lamp life time.

5.3 Powering the SIM 7 projector

CAUTION: This projection product contains several optical elements which require a certain warm up time in order to reproduce initial adjustments. If the environment (e.g. ambient temperature of the surrounding) is stable, the product will typically reproduce functional performance within 30 minutes and achieve optimal performance after 45 minutes (advised for multichannel display systems). It should be noted that the heat dissipation of the product itself might influence its environment; if not monitored and corrected via external responsive temperature controls, this might affect the typical settle time required.

How to power the projector ?

1. Switch the power switch to **1.**

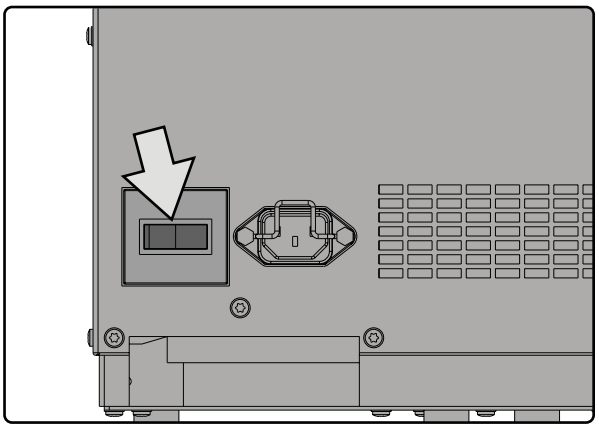
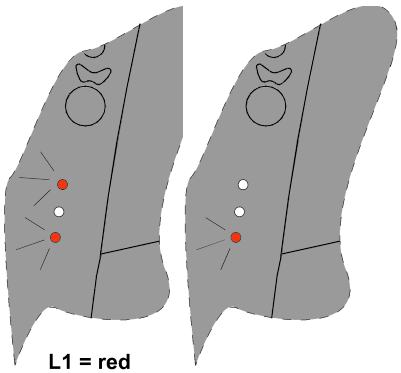


Image 5-1
Barco SIM7 : Power switch

L3 and L1 light up red. After the initialization period L1 turns off.



L1 = red
L3 = red
Image 5-2

Image 5-3
Standby state : L3 is red

5.4 Setting the RCU address

What has to be done ?

To allow the communication between the RCU and the projector the RCU has to be programmed with the same address as the projector.

This address must be in the range 0–9.

To know the address of the projector, one can visualize it in projection mode (on screen) as well as in standby mode (shown with the LED's on top cover of the projector).

For more info on addresses see the appendix

At this stage the image projected may happen to be upside down or mirrored, this can be set in the *Installation* menu under *Projector orientation* (see further setting up the projector's orientation).

Displaying the Projector Address in Standby mode

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

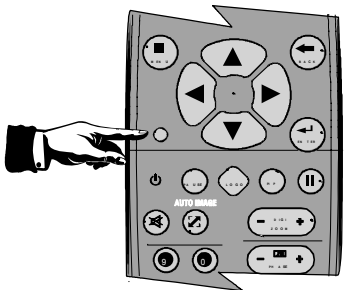


Image 5-4

All the LED's (3) on the top cover of the projector go out.

Then LED1 starts blinking green the number of hundreds. After that LED2 starts blinking the number of tens. Finally LED3 starts blinking green the number of units. If this is done, the original status of the LED's is restored.

Displaying the Projector Address in projection mode

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

   The projector's address will be displayed on the screen in a text box

Programming the RCU

1. Push the address key If the address is not entered within 5 seconds, the RCU returns to its default address (zero address) and controls then all projectors in the room.
2. Enter the same address with the digit buttons **within 5 seconds** after pushing the address key.

   The projector can now be controlled with the RCU.

For example : if the projector address is 3, then press "3" on the RCU to set the RCU's address to match the projector's address.

Common address/Projector address : Beside the projector address, the projector disposes also of a Common address which can be set to "0" or "1" (by default "0").

In other words, an RCU set to address "0" will always control a projector regardless of its projector address (since it uses the common address).

5.5 Starting the projector

Activating the projector is only possible after the initialization period i.e. when LED1 is off.

How to start up the projector ?

1. Press the **Standby** button on the RCU or on the local keypad.

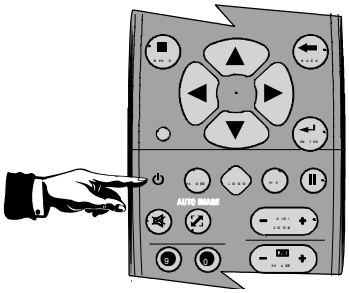


Image 5-5

The last selected source is displayed.

If the address setting is wrong the projector will not respond to the RCU, see the next step to set the address.

5.6 Setting the projector address (only if necessary)

What can be done ?

The projector is shipped with projector address set to ”0”

In some cases the projector address must be changed, for example if an unique RCU is used to control 2 or more projectors (independently).

In the OSD menu *Projector Address*, the following addresses can be programmed :

- Projector address: address defined by the user, may be from 0 to 255
  0-9 is used for RCU communication
- Common address : address may be 0 or 1

How to change the projector’s address ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Installation*
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Projector address*

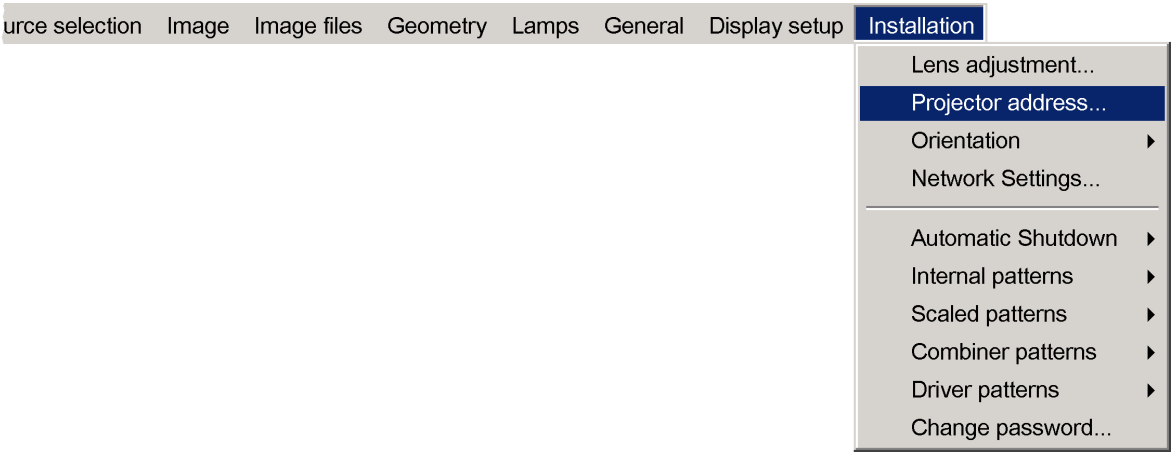


Image 5-6

5. Press **ENTER**

A dialog box appears on the screen

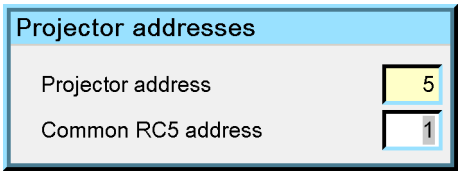


Image 5-7

6. Enter the new projector address with the digit keys on the RCU, the local keypad or the cursor keys.

How to change the common address ?

1. Proceed in the same way as for the projector address

5.7 Setting the orientation

What must be done ?

Depending on the mechanical orientation of the projector (see **Projector configuration** in the Installation section), the projector's internal settings have to be adapted.

The projector is shipped (default) with a table/front orientation.

How to set the orientation ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Installation* item
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Orientation*

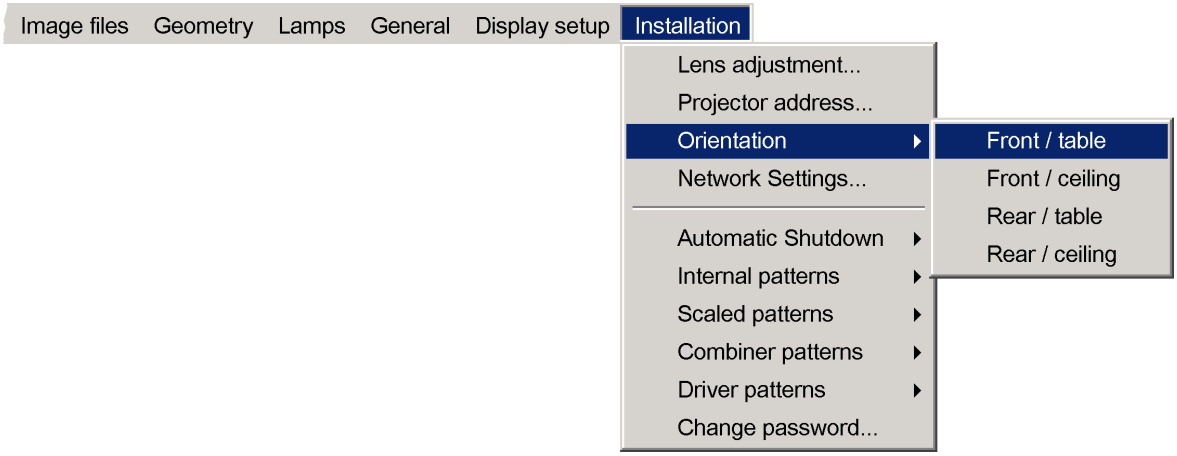


Image 5-8

5. Press → to pull down the menu
6. Use ↓ or ↑ to select the desired orientation
7. Press **ENTER**

   The projection is adapted and a bullet shows the active configuration.

5.8 Lens adjustments

Overview

- Locking the lens holder (rugged option)
- Locking / unlocking the zoom ring and the focus ring of the lens
- Back focal length adjustment
- Adjusting the lens

If the lens locking option (= rugged option) is installed on the projector, a warning will be displayed before the execution of any lens shift adjustment.

5.8.1 Locking the lens holder (rugged option)

The lens locking system is an option (rugged option) and is not available on standard projectors.

Necessary tools

- Torx screwdriver T10
- Allen key 2 mm (hexadecimal key)
- Allen key 3 mm (hexadecimal key)

How to lock the lens holder?

1. Make sure the lens is in the correct position
2. Remove the top lens cover

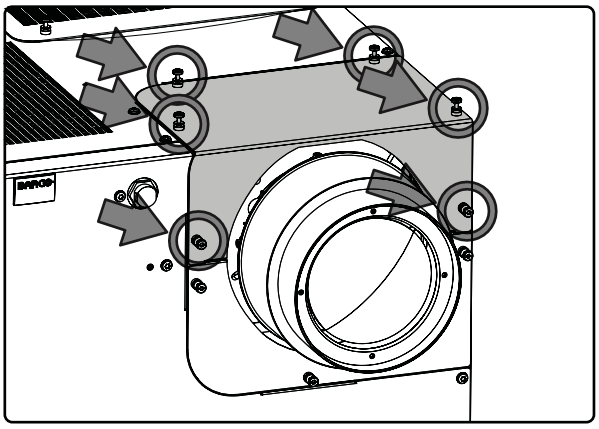


Image 5-9
Lens top cover: fixing screws

3. Slide both fixation blocks for the horizontal shift away from each other until they hit the lens holder frame

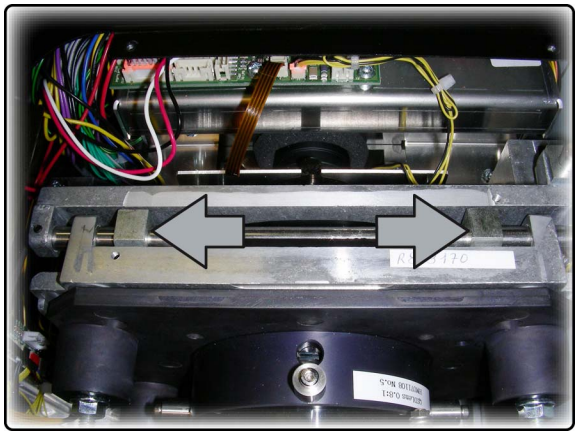


Image 5-10
Horizontal shift: free

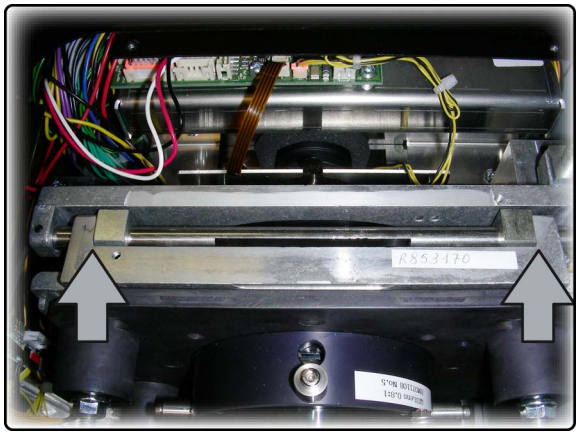


Image 5-11
Horizontal shift: blocked

4. Fix these blocks by tightening the front bolts

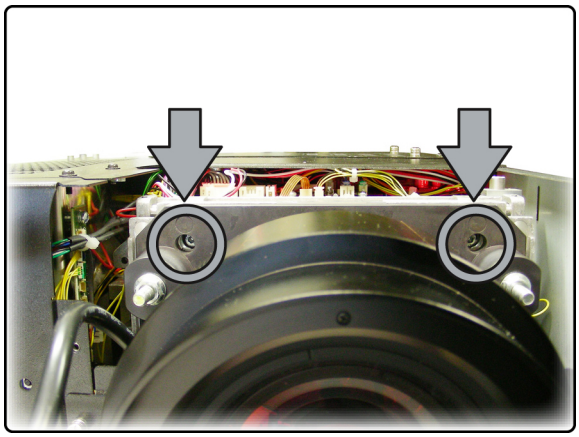


Image 5-12
Fixation screws for horizontal lens shift locking system

5. Block the vertical shift by tightening the bolt which can be reached through the small slot at the left side of the projector (seen from the rear of it)

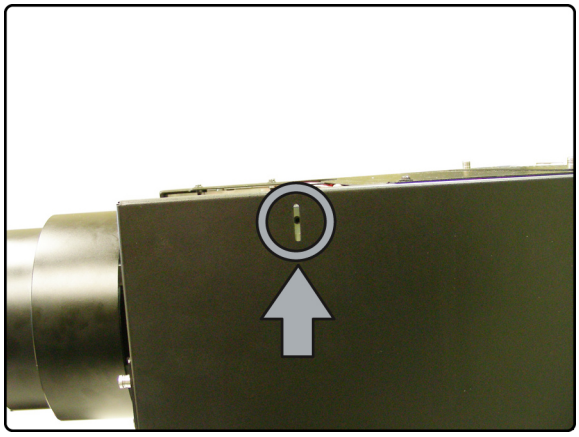


Image 5-13
Fixation screw for vertical lens shift locking system

6. Reinstall the top lens cover

CAUTION: The shift motors will be damaged if lens shift is activated while the blocking system is tightened!

5.8.2 Locking / unlocking the zoom ring and the focus ring of the lens

Description

In very demanding applications (e.g. motion based systems), a small focus drift or zoom drift may occur. In order to avoid this, the zoom ring and the focus ring of the lens can be locked mechanically on some of the lenses.

Depending on the lens article number, the zoom and focus locking system will be available or not.

CAUTION: Make sure to unlock the zoom and focus ring before adjusting the zoom/focus!

Necessary tools

No tools.

How to lock the zoom ring and the focus ring of the lens?

Both zoom ring and focus ring are locked at the same time.

1. Install the lens and switch the projector to active state.
2. Wait for the lens to be fully heated up (i.e. after 15 minutes of projection)
3. Adjust the zoom and the focus of the lens
4. Tighten (i.e. clockwise) the zoom/focus locking knob until it is hand-tight

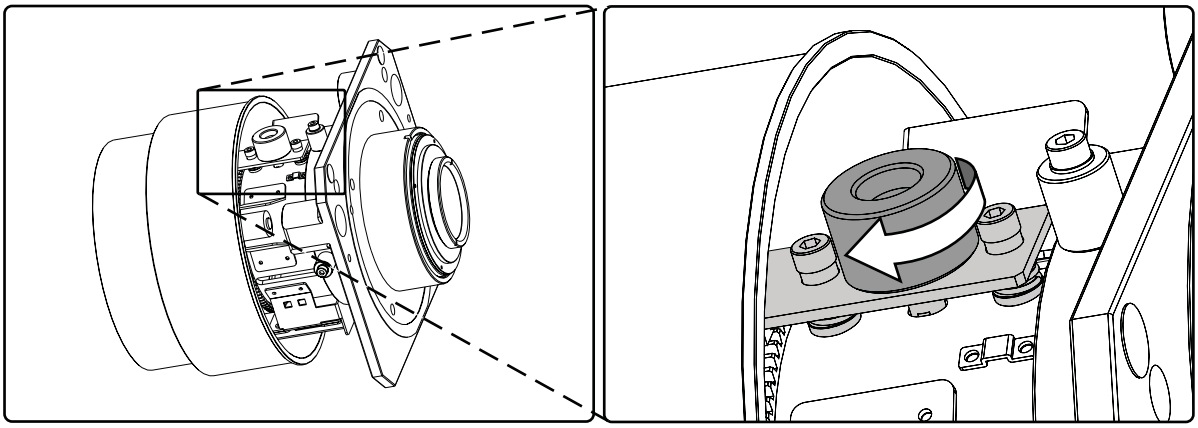


Image 5-14
Engaging the zoom/focus locking system

How to unlock the zoom ring and the focus ring of the lens?

Both zoom ring and focus ring are unlocked at the same time.

1. Release (i.e. counterclockwise) the zoom/focus locking knob until no resistance is felt anymore

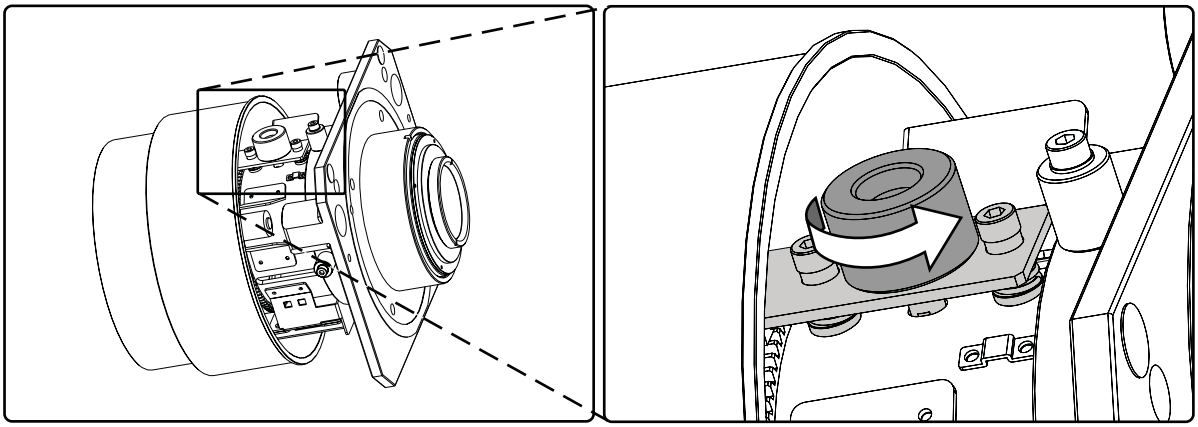


Image 5-15
Unlocking the zoom/focus locking system

2. Now the zoom and focus can be adjusted

5.8.3 Back focal length adjustment

BFL

Back Focal Length

What can be done ?

The position of the projector lens in relation to the interpolation lens can be adjusted. The lens can be shifted towards or away from the projector chassis . By doing so, the back focal length is adjusted and the focus is set to an optimal value. This adjustment will allow to benefit from the largest adjustment range for the lens focus (motorized lens focus).

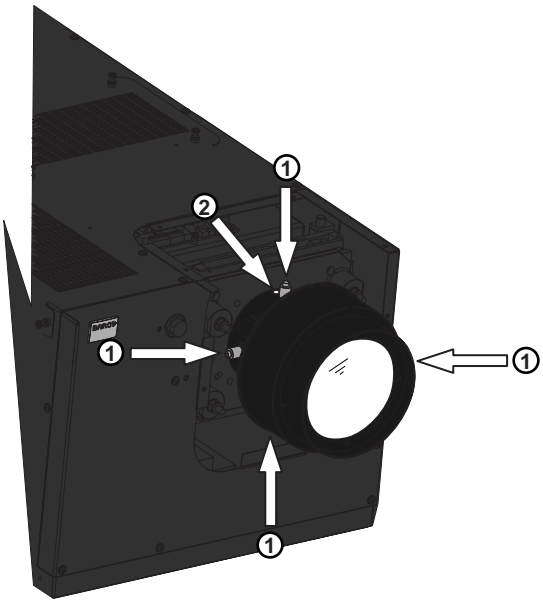


Image 5-16
Back Focal length adjustment.

1 Locking screws
2 Adjustment hole

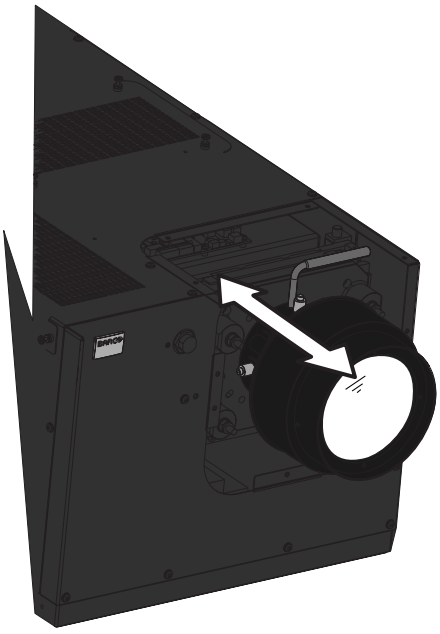


Image 5-17

A wrong back focal length adjustment will not allow optimal focus throughout the full zoom range.

Necessary tools

- BFL adjustment tool
- Allen key 2.5 mm (hexagonal key)

How to adjust ?

1. Loosen the 4 screws along the outline of the lens (top, bottom, left, right)
   Tip: *Only loosen these screws a bit. Just enough to allow the lens to be shifted forward and backward.*

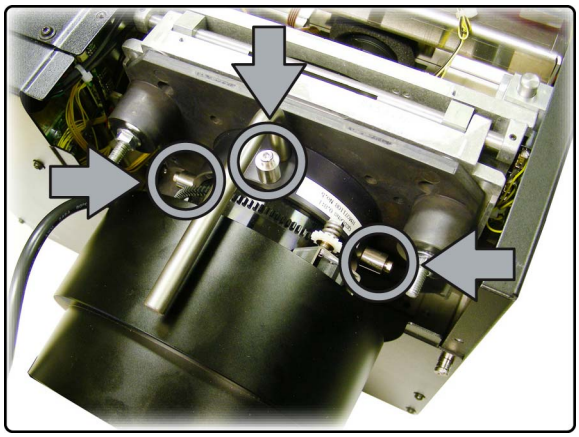


Image 5-18
Back focal length: fixation screws

Note: *The fourth screw is located underneath the lens*

2. Put the BFL tool in the adjustment hole

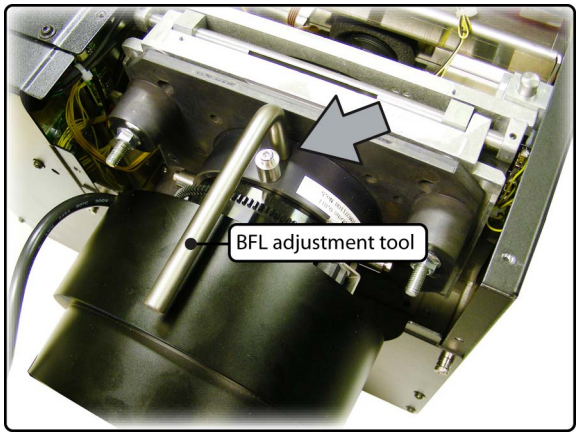


Image 5-19
Back focal length adjustment tool

3. Zoom the lens to wide position
4. Focus the image on the screen using the BFL tool

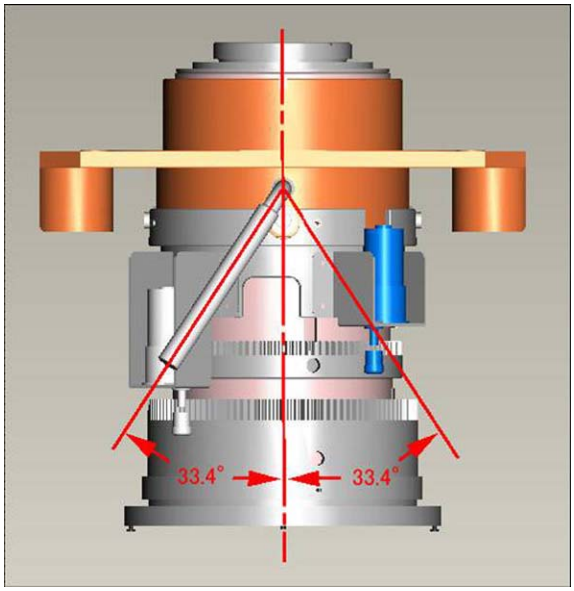


Image 5-20
Back focal length adjustment range

5. Zoom the lens to tele position
6. Focus the image on the screen using the remote control

7. Repeat step 3 to step 6 until the image stays in focus regardless to the zoom position
8. Fix the 4 screws

5.8.4 Adjusting the lens

Description

The shift adjustment is done during the Installation phase.

The other adjustments possible on the lenses are:

- Motorized zoom
- Motorized focus : should be done during the installation phase
- ECR (Extended Contrast Ratio) : ECR is done through automatic adjustment of the lens opening (aperture). This is done during for example *Time of Day* adjustment

See the dedicated system manual for more information

CAUTION: Make sure to unlock the focus ring and the zoom ring before adjusting the zoom or focus of the lens!

CAUTION: In case of a projector with rugged option, make sure to unlock the lens holder before shifting it up / down or left / right.

How to adjust the lens using the direct keys on the RCU?

1. Use one of the following keys on the RCU:
   - Lens shift (↑ or ↓): to shift down or up
   - Lens zoom (- or +): to zoom out or in
   - Lens focus (- or +): to adjust the focus

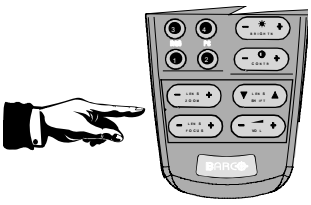


Image 5-21

How to shift using the OSD in combination with the RCU (or local keypad)?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Installation*
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Lens adjustments...*

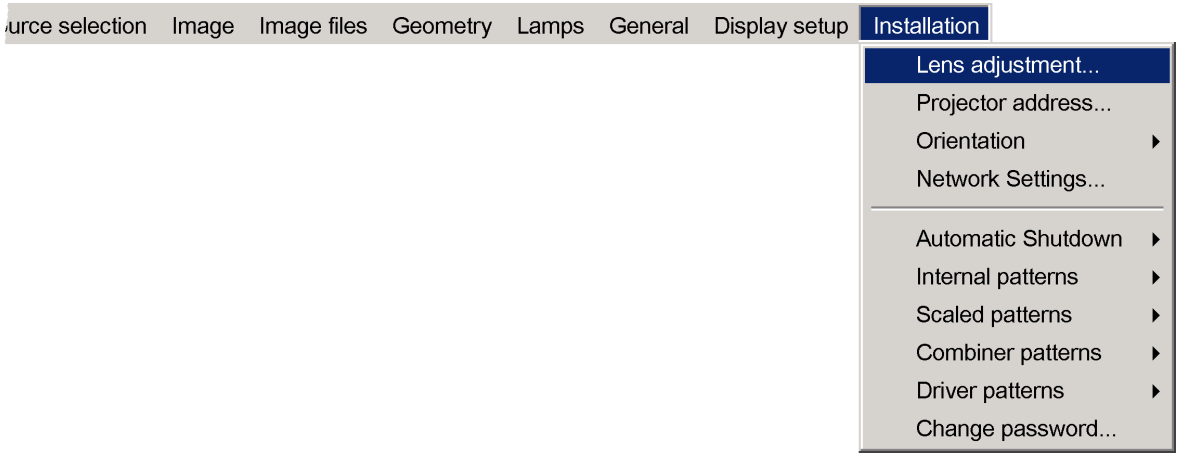


Image 5-22

5. Press **ENTER**

   A text box appears on the screen, follow the instructions.

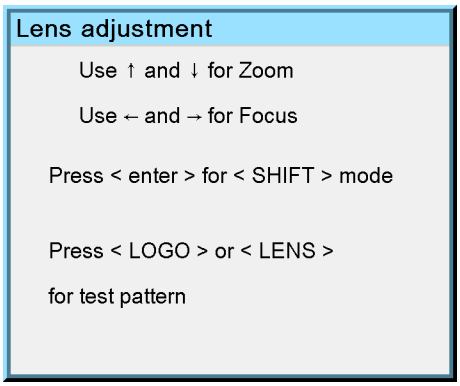


Image 5-23

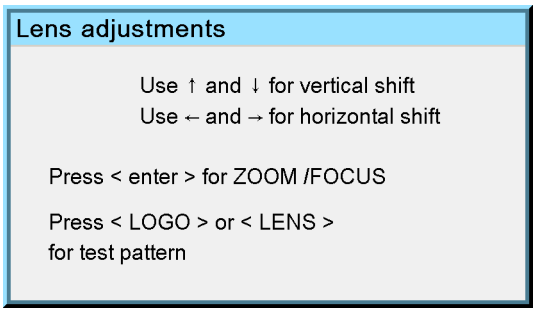


Image 5-24

6. Use the keys on the RCU to perform the desired action

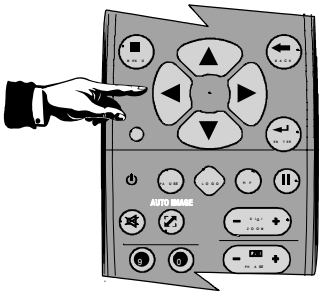


Image 5-25

How to adjust the zoom / focus using the OSD?

1. Press **MENU** to activate the Tool bar
2. Press ← or → to select the *Installation*
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Lens adjustments...*

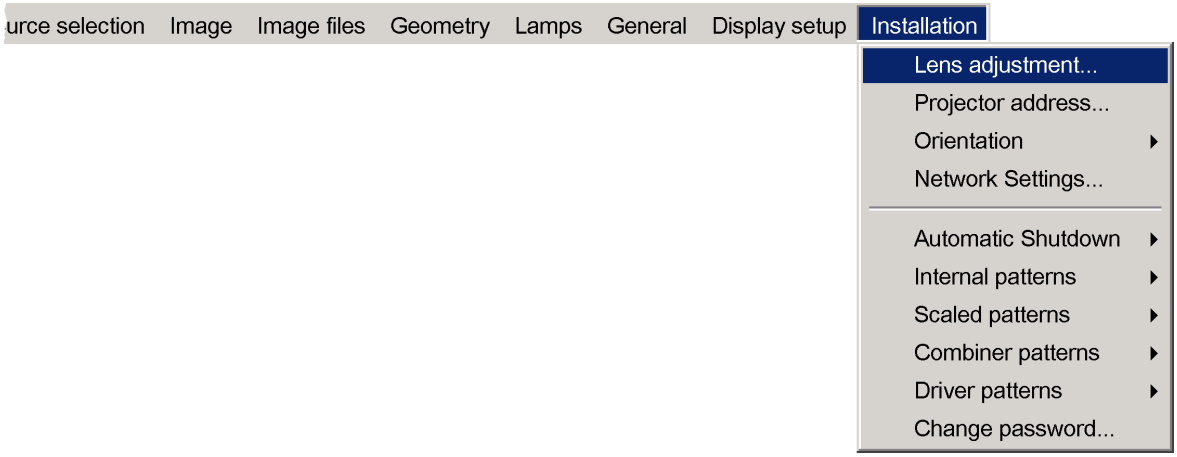


Image 5-26

5. Press **ENTER**

   A text box appears on the screen, follow the instructions.

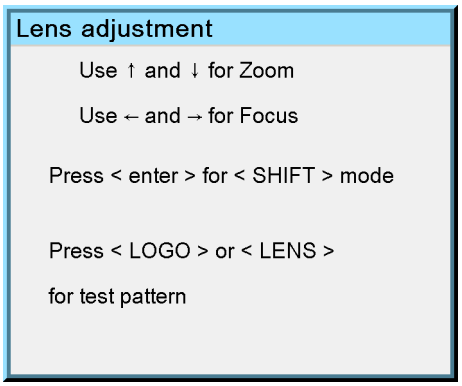


Image 5-27

6. Use the keys on the RCU to perform the desired action

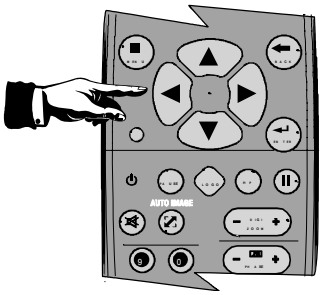


Image 5-28

The use of a sheet of paper held in front of the screen can be useful to determine the focus plane (position for best focus)

Unsharp corners in the image can be adjusted with the Scheimpflug adjustment (3 adjustment screws on the lens holder), see the Lens installation section

Before adjusting the lens focus, insure that the Back Focal Length is correctly adjusted, "Back focal length adjustment", page 42

6. GETTING STARTED

Overview

- Starting up the projector
- Selecting a source
- Adjusting the image
- Switching the projector to standby

6.1 Starting up the projector

How to start up the projectors via the RCU ?

1. Switch the mains power switch to **ON**
2. Press the **Standby** button on the RCU or the local keypad

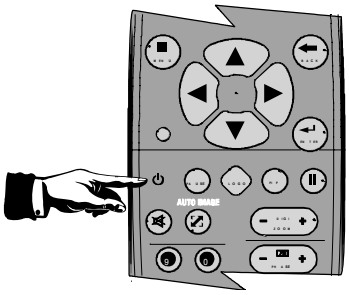


Image 6-1

How to start up the projectors via XDS RACU ?

1. See dedicated User guide R59770508.

6.2 Selecting a source

How to select a source using the RCU?

A source must be connected and available to be able to display it.

1. Press one of the following keys to display a source:
   - press **1** on the RCU to display the source connected to the BNC connectors
   - press **5** on the RCU to display the source to the DVI connector
   - press **8** on the RCU to hide any source

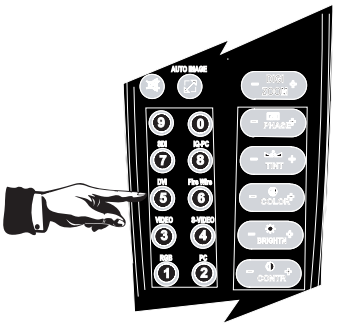


Image 6-2

Note: *Pressing **5** a multiple times, cycles between both DVI connectors*

6.3 Adjusting the image

How to adjust the image ?

1. Use the Image setting buttons on the RCU

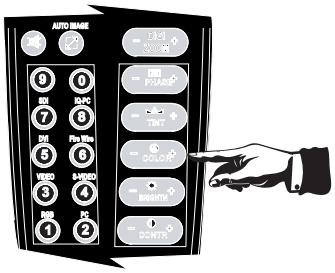


Image 6-3

6.4 Switching the projector to standby

Introduction

If the projector is not to be used for a period of time (hours, days), it is advised to switch it to **standby** to save energy or it can be fully powered off after the cooling cycle. The advantage of standby mode compared to power off mode is the time to get it back to active state (i.e. lamp on).

After switching the projector to standby, the lamp is switched off and the **cooling cycle** is started (two minutes). Do not power off the projector during the cooling cycle since doing so reduces the lamp life time.

In case of SIM 7Q HB or SIM 7Q HB&C, the projector cannot be switched from active state to standby state within the first two minutes after it has been activated. Trying to do so pops up an alert message and the command is only executed after the two minutes period has expired.

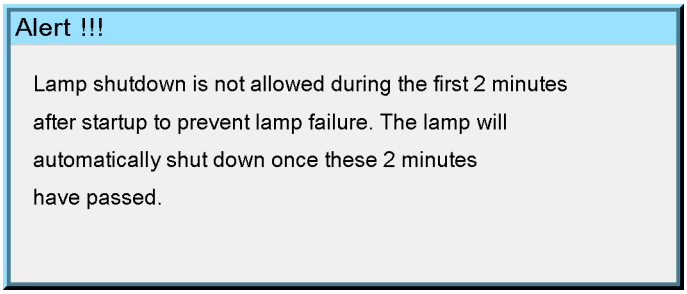


Image 6-4

Switching to standby

1. While the projector is in active state, keep the **Standby** button on the RCU or on the local keypad pressed for two seconds.
2. The lamp is switched off and the two minute cooling cycle is started.

7. ADVANCED

Overview

- Using the Dialog boxes
- Source selection
- Image
- Image files
- Geometry
- Lamp
- General
- Display setup
- Installation

7.1 Using the Dialog boxes

How to use the dialog boxes ?

Some parameters are modified by means of a dialog box, where selections can be made and/or values can be entered.

The values can be entered in several ways:

Entering numeric values using the numeric keys on the remote control

1. Press **ENTER** to activate the input field.

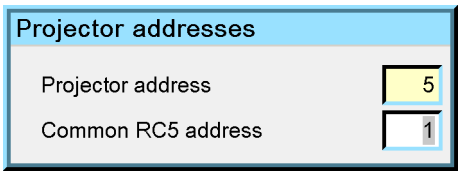


Image 7-1

2. Key in the desired value.

Entering numeric values using the arrow keys on the remote control

1. Press **ENTER** to activate the input field.
2. Press ← or → to select the digit to be changed.

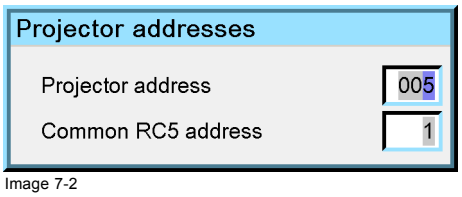


Image 7-2

3. Press ↓ or ↑ to increase or decrease the value.

Entering numeric values using the arrow keys on the local keypad

1. Press **ENTER** to activate the input field.
2. Press ← or → to select the digit to be changed.
3. Press ↓ or ↑ to increase or decrease the value.

To confirm the changes always press ENTER.

Use ↓ or ↑ to browse between the different fields.

In some cases an alphanumeric value (file name, ...) has to be entered. Use ↑ or ↓ to scroll through the character values once the input field is activated.

Following characters can be browsed in this particular order:

Decimal scroll list: 0123456789

Signed decimal scroll list: 0123456789-

ASCII scrolllist:ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789+-*/&@#.;.abcdefghijklmnopqrstuvwxyz

7.2 Source selection

Overview

- Selecting a DVI source
- Selecting an RGB source

7.2.1 Selecting a DVI source

How to select the L2 DVI-1 source ?

1. Press **MENU** to activate the Tool bar
2. Press ↓ to Pull down the Source Selection menu
3. Use ↑ or ↓ to select *L2 DVI-1*

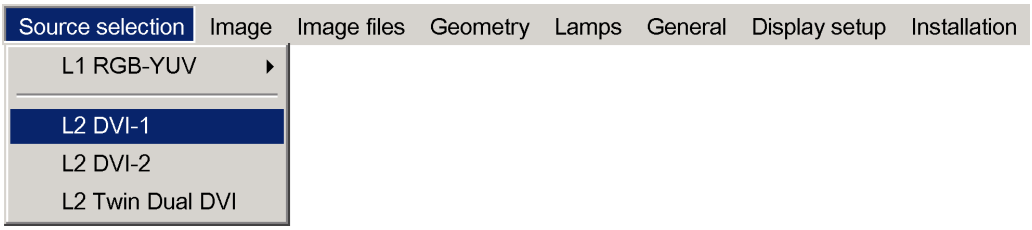


Image 7-3

4. Press **ENTER** to confirm your choice

   A bullet indicates the selected source which now appears on the screen.

Adjustments on the L2 DVI-1 source

The digital nature of this signal eliminates the need for adjustments.

In the same way, the following sources can be selected and adjusted: L2 DVI-2 and L2 Twin Dual DVI

7.2.2 Selecting an RGB source

How to select the L1 RGB source ?

1. Press **MENU** to activate the Tool bar
2. Press ↓ to Pull down the Source Selection menu
3. Press → to open the *L1 RGB-YUV* menu
4. Use ↑ or ↓ to select *RGB*

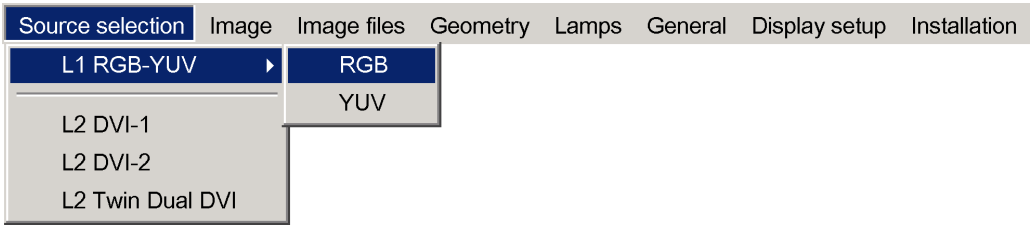


Image 7-4

5. Press **ENTER** to confirm your choice

   A bullet indicates the selected source which now appears on the screen.

Adjustments on an RGB signal

The projector allows different adjustments on an RGB signal :

- Contrast
- Brightness
- Phase
- Input balance
- Auto Image : or manual edit of the image file settings

In the same way, a YUV source can be selected and adjusted.

7.3 Image

Overview

- Introduction
- Image settings
- Scaling
- Time of Day (TOD)
- Input balance (RGB signals only)

7.3.1 Introduction

What can be done ?

Correct image adjustments are important to achieve a good image reproduction. The image adjustments (like image settings ,...) are generally made through a dialog box with a scroll bar. Minimal, maximal and actual values are indicated. These settings can also be changed directly via the RCU's dedicated buttons.

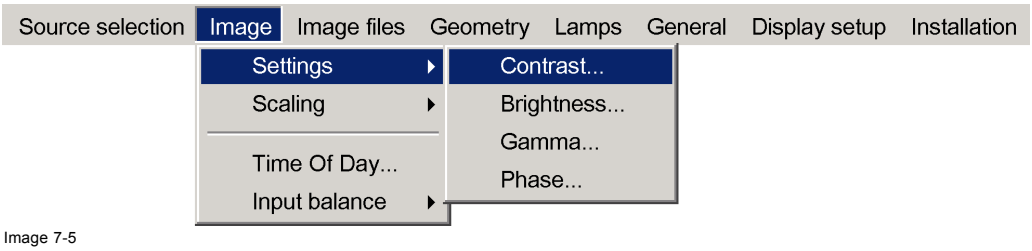


Image 7-5

The adjustments done in the *Image* menu are saved in the corresponding image file and only affect the active source, whereas adjustments done in the *Display settings* are applied to all sources.

7.3.2 Image settings

Overview

- Setting the Contrast
- Setting the Brightness
- Gamma
- Phase (RGB signals only)

7.3.2.1 Setting the Contrast

Contrast adjustments

Adjust the contrast to “brighten” the white parts of the image.

It is recommended to adjust the brightness before adjusting the contrast.

How to change the Contrast

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *settings*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *Contrast*
7. Press **ENTER**

   On the screen appears now a slider box

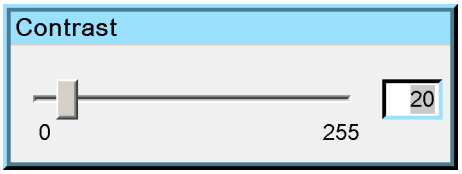


Image 7-6

8. Use ←or → , the numeric keys on the remote, or the keypad to change the contrast

7.3.2.2 Setting the Brightness

Brightness adjustment

Adjusting the brightness will affect the dark areas of the image. Increase the brightness to “lighten” up the parts that are too dark.

How to change the Brightness

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *settings*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *Brightness*
7. Press **ENTER**

On the screen appears now a slider box

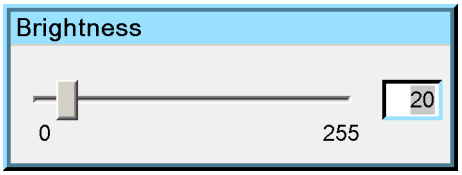


Image 7-7

8. Use ←or → , the numeric keys on the remote, or the keypad to change the brightness

7.3.2.3 Gamma

Gamma adjustment

The gamma parameter determines the way your encoded (luminance) signal is transformed into brightness at the output of the projector. A correct gamma setting will allow the use of a maximum of gradations (brightness levels) in the projected image. Changing the gamma mainly changes the midtones of the image.

How to adjust the Gamma

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *settings*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *Gamma*
7. Press **ENTER**

   On the screen appears now a slider box

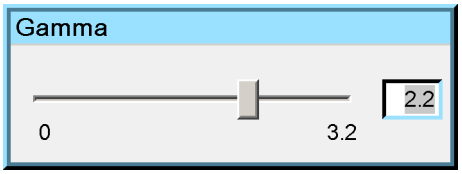


Image 7-8

8. Use ←or → , the numeric keys on the remote, or the keypad to change the Gamma

7.3.2.4 Phase (RGB signals only)

Phase adjustment

A bad phase adjustment will result in bad transitions and sometimes noise. (for example text will not be clear).

How to adjust the Phase

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *settings*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *Phase*
7. Press **ENTER**

On the screen appears now a slider box

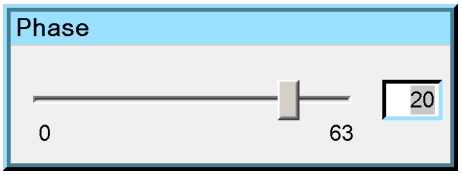


Image 7-9

8. Use ←or → , the numeric keys on the remote, or the keypad to change the Phase

7.3.3 Scaling

What can be done?

The scaling of the source image can be chosen from three presets. Depending on the setting, the source signal will be displayed in a different size and will possibly be stretched in one way or another.

- None: the source image will be shown in native resolution of the source
- Best Fit: the source image will be scaled to the biggest possible size without being distorted (e.g. stretched in one direction)
- Full-screen: the source image will be scaled and stretched in order to fill the full native resolution of the projector. This can lead to an distorted image (e.g. stretched in one direction or the other)

How to scale the image?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *Scaling*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select the desired way of scaling

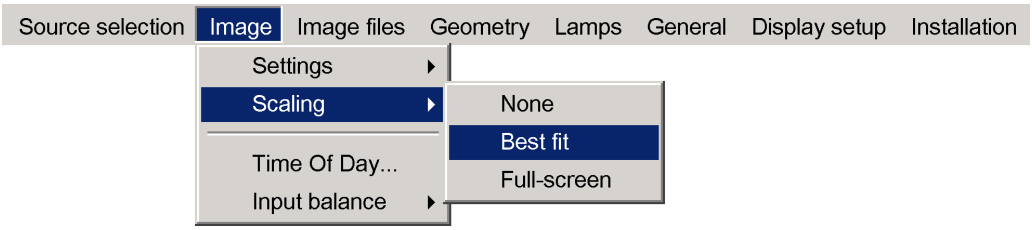


Image 7-10

7.3.4 Time of Day (TOD)

CCD

Constant Contrast Dimming

ECR

Extended Contrast Ratio

What can be done ?

The projector can be set to display typical scenes by performing an optimal adjustment of the dimmer (CCD) and the lens diaphragm (ECR).

Following presets can be selected via the hand held RACU interface :

- Day
- Dusk
- Night

The OSD allows to set a custom value for the Time of Day (TOD) : 10000 corresponds to maximum light output (Day)

In practice, if the TOD value is lowered starting from 10000 (100%) to 0 (0%), the following sequence will be followed:

1. In a first phase, the dimming will be (mainly) done by the ECR (Enhanced Contrast Ratio)
2. When the ECR is at its minimum value, the CCD (Constant Contrast Dimmer) starts further dimming the light output until it is 0

For the High Contrast (HC) versions, the minimum ECR value is calibrated in the projector to coincide with a lens aperture of approximately f/6.4, which leaves a light transmission of around 25%.

Motorized dimming (at different stages in the projector) insures a better dynamic behavior through ECR (Extended Contrast Ratio) and CCD (Constant Contrast Dimming) by enabling the possibility to adjust the light output level of the projector and preserving the dynamic range.

In projectors having the NVG option, the dimming process is controlled in a different way. See the concerning Appendix.

Each time the projector is restarted, the Time Of Day (TOD) is automatically set to Day mode to get full light output, thus avoiding the menu being invisible due to low light output!

How to adjust the Time of Day (TOD)?

1. Press **MENU** to activate the Tool bar
2. Press → to select the Image item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *Time of Day*

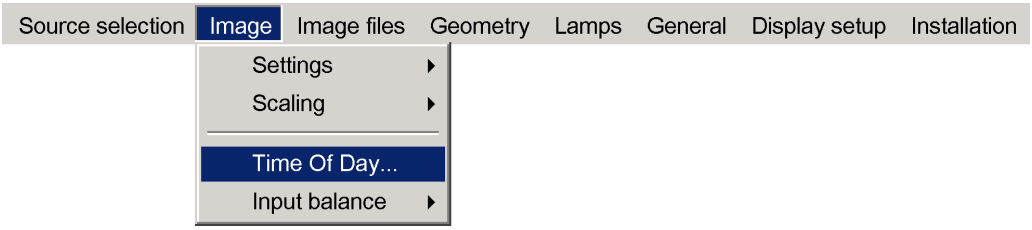


Image 7-11

5. Press **ENTER**

   A dialog box is displayed

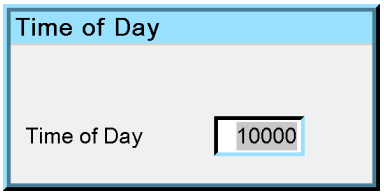


Image 7-12

6. Use ←or → , the numeric keys on the remote, or the keypad to change the Time of Day

7.3.5 Input balance (RGB signals only)

Introduction: Unbalanced color signals

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

The alterations of the three color signals will happen independently i.e. the colors will end to be unbalanced.

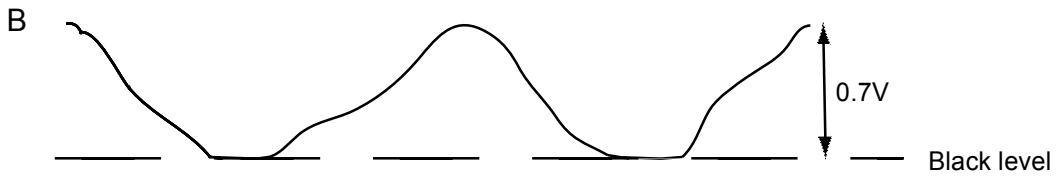


Image 7-13

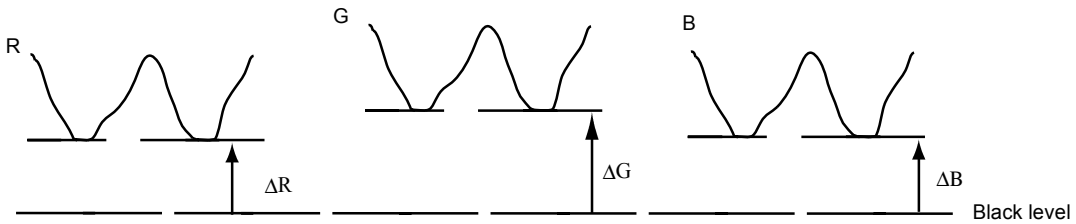


Image 7-14

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 allows 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 also explains why each input balance setting is linked to a particular source and thus saved in the image file).

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 considered source must be able to generate a white signal, ideally a 100% white (background) full screen pattern
2. the considered source must be able to generate a black signal, ideally a 100 % black (background) full screen pattern

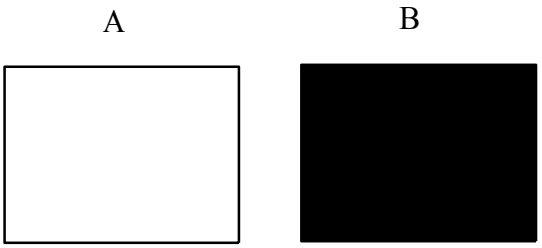


Image 7-15

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 black balance can be done automatically with *Automatic Black level*.

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 a black-and-white checkerboard pattern where the white blocks will be used for white balance and the black blocks for black balance.

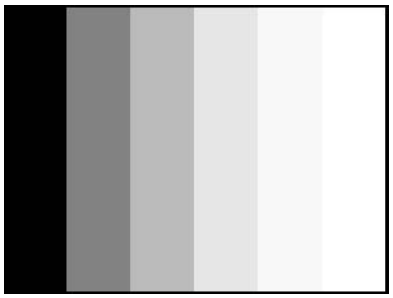


Image 7-16

How to set Automatic Black level ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image* item
3. Press ↓ to Pull down the *Image* menu
4. Use ↑ or ↓ to select *Input balance*
5. Press → to pull down the menu
6. Use ↓ or ↑ to select *Automatic Black level...*
7. Press ↓ to pull down the menu
8. Use ↑ or ↓ to enable (*ON*) or to disable (*OFF*) *Automatic Black level*

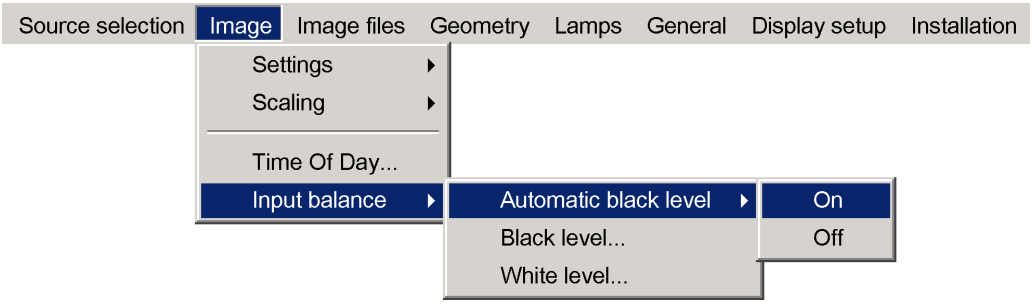


Image 7-17

9. Press **ENTER** to confirm

   A white bullet shows the active setting

Performing Black input balance

1. Select a black pattern (or gray scale as alternative)
2. Press **MENU** to activate the Tool bar
3. Press → to select the *Image* item
4. Press ↓ to Pull down the *Image* menu
5. Use ↑ or ↓ to select *Input balance*
6. Press → to pull down the menu
7. Use ↓ or ↑ to select *Black level...*

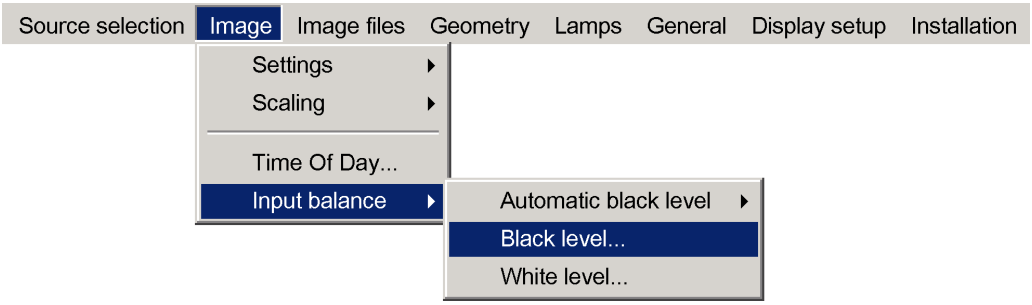


Image 7-18

8. Press **ENTER**

   A dialog box is displayed

9. Adjust the red black level on a minimal value

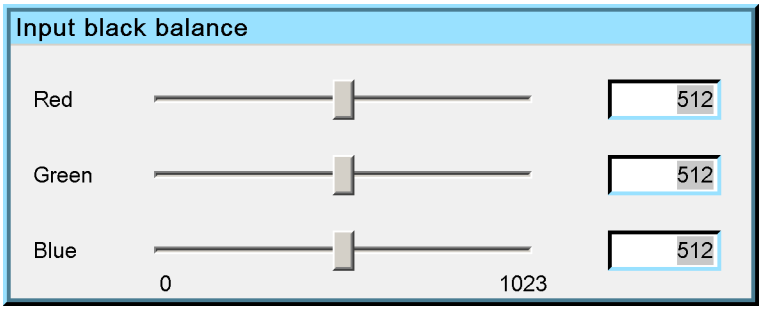


Image 7-19

10. Adjust the blue black level to 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. Adjust the Green black level until bright spots appear on the black part of the image

12. Adjust the Blue black level until bright spots appear on the black part of the image

13. Adjust the Red black level until bright spots appear on the black part of the image

    The projected image should now be noisy neutral grey.

If one uses a checkerboard pattern, the bright spots should appear in the black blocks.

Black Level... **is greyed out if** ***Automatic Black level*** **is enabled (ON).**

Performing White input balance

1. Select a white pattern (or gray scale as alternative)
2. Press **MENU** to activate the Tool bar
3. Press → to select the *Image* item
4. Press ↓ to Pull down the *Image* menu
5. Use ↑ or ↓ to select *Input balance*
6. Press → to pull down the menu
7. Use ↓ or ↑ to select *White level...*

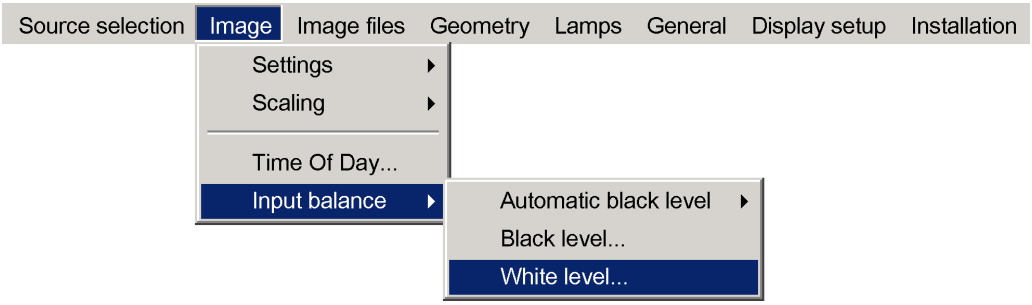


Image 7-20

8. Press **ENTER**

   A dialog box is displayed

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

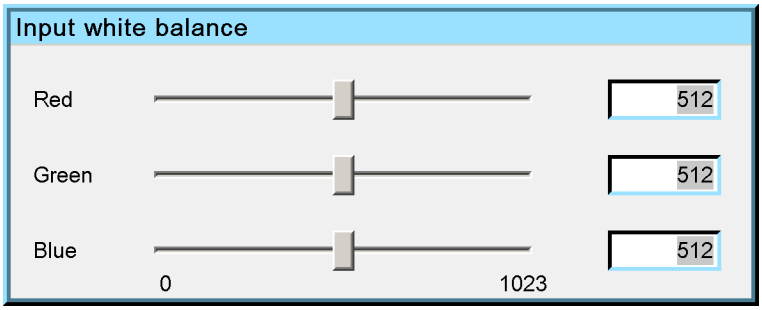


Image 7-21

10. Adjust the blue white level (gain) to 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. Adjust the Green white level (gain) until bright spots appear on the white part of the image

12. Adjust the Blue white level (gain) until bright spots appear on the white part of the image

13. Adjust the Red white level (gain) until bright spots appear on the white part of the image

    The projected image should now be noisy neutral grey.

If one uses a checkerboard pattern, the bright spots should appear in the white blocks.

The input balance settings are stored in the image file, each source has its own input balance.

7.4 Image files

Overview

- Load file
- Auto Image
- Edit file
- Save as (create a custom file)
- Rename file
- Copy
- Delete
- Forced file load

7.4.1 Load file

When to load a file ?

In some cases the user wants a particular file to be used for the display of a particular source. In this case the user should load the desired file from the image files menu. The load file option will allow the user to choose between several files corresponding more or less to the active source specifications.

In normal operation the file selection (load) will be done automatically by Auto Image.

How to load a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Load*

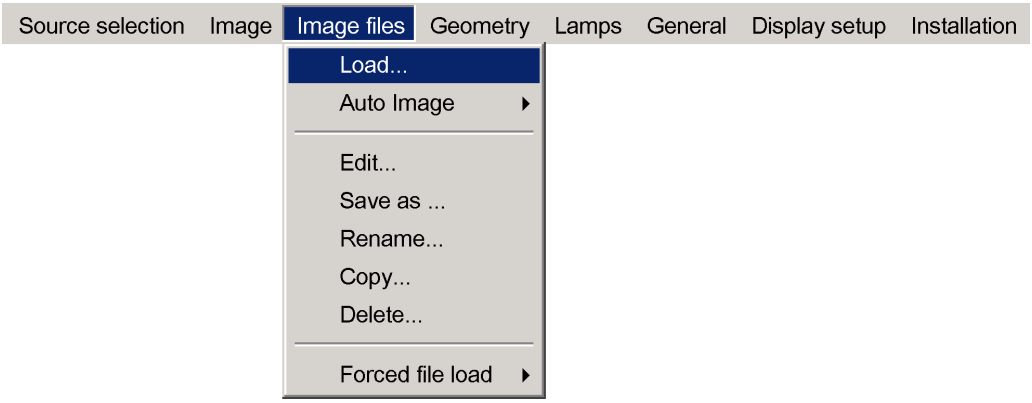


Image 7-22

5. Press **ENTER**
   A dialog box is displayed

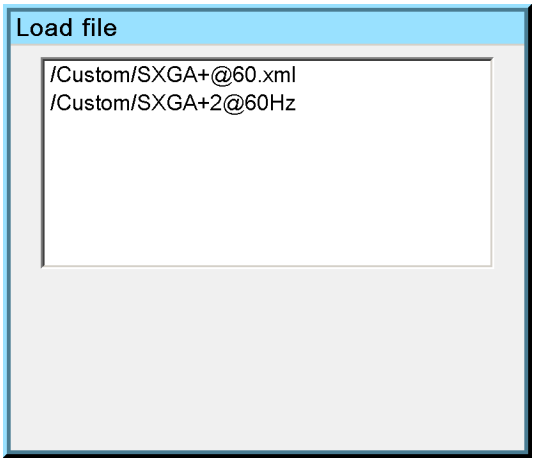


Image 7-23

6. Use ↑ or ↓ to select the desired file
   Tip: *For more information (specifications) on the image files see the Appendix section*
7. Press **ENTER**

   The file is loaded and the image is adapted.

What to do if the image is not perfect ?

If the displayed image is not correct after Auto Image or after selecting the best fitting file, go to the Edit menu, select the active file and change the settings.

7.4.2 Auto Image

What can be done ?

Auto Image creates the best suited image file for the connected source.

It calculates/measures several source parameters :

- Total pixels per line
- Start pixel
- Phase
- Contrast/Brightness levels

Auto Image only works for data images.

The measure of the total number of pixels per line can be done through 2 methods

- Limited scan: a windowing system is used to allow fast tracking.
  The operation takes about 20 seconds (depending on file)
- Full scan: tracking is done over the full range.
  The operation takes about 1.5 minutes (depending on file)

How to launch Auto Image?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Auto Image*
5. Press → to open the menu
6. Use ↑ or ↓ to select the desired file scan method

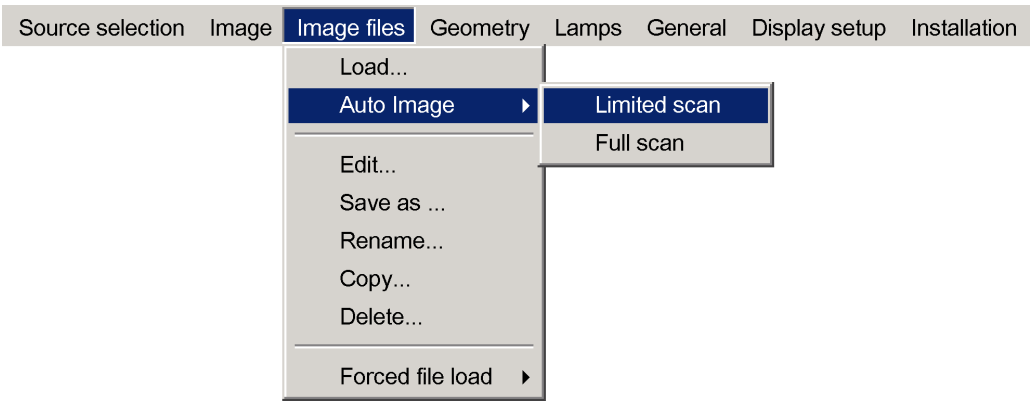


Image 7-24

7. Press **ENTER**

Auto Image acts on the active window. The image in the window may move and change in aspect during the Auto Image process.

Auto Image can also be launched via the RCU with the dedicated Auto Image key.

7.4.3 Edit file

What can be done with the Edit file menu ?

The Edit file menu makes it possible to change the settings of the file according to the real settings of the connected source. Consult the source specifications before entering the data.

In this case a DVI source is used. A DVI source does not need any image file setting. All the fields are therefore greyed out. See the dialog box below.

How to edit a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Edit*

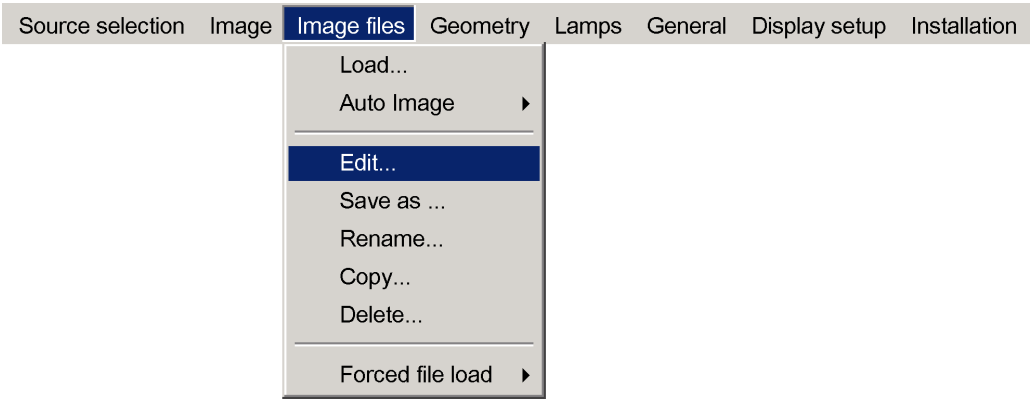


Image 7-25

5. Press **ENTER**
   A dialog box containing the active file is displayed

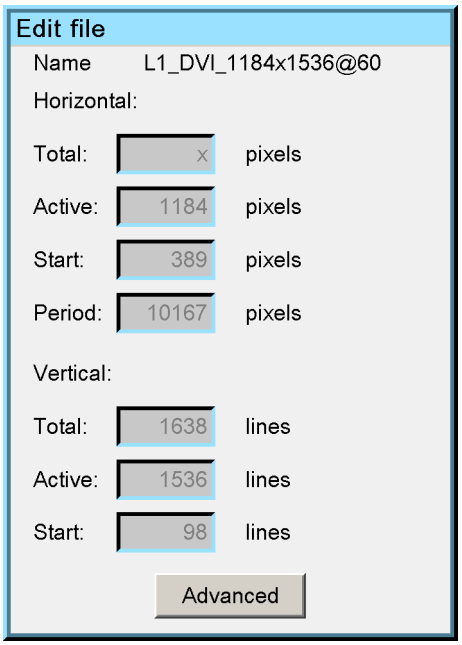


Image 7-26

6. Use ←or →, the numeric keys on the remote, or the keypad to edit and change the values, confirm with ENTER
   Note: *greyed out fields can not be updated*

Advanced settings for Analog Data sources (e.g. RGB HS/VS)

The **advanced** button enables the advanced settings for analog data sources.

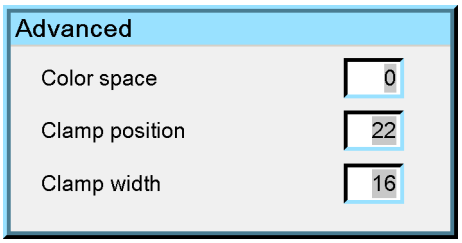


Image 7-27

- *Color space* : allows to select between 5 different color spaces
  - RGB
  - ITU_BT_709
  - SMPTE_240M
  - ITU_BT_601
  - EBU
- *Clamp position* : allows to set the clamp pulse position in the clamping circuit
- *Clamp width* : allows to set the width of clamp pulse in the clamping circuit

It is recommended to use the default values.

Advanced settings for Digital Data sources (DVI)

The **advanced** button enables the advanced settings for digital data sources.

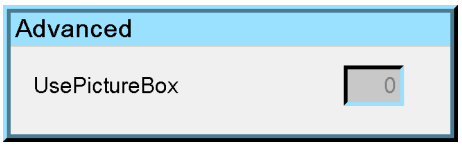


Image 7-28

UsePictureBox can be disabled (**0**) or enabled (**1**). By default, it is disabled which means that only few timings can be changed. In case of a DVI source this is not a problem.

In very specific situations however (e.g. iBlend), more changes to the timings may be needed, such as the setting of the *Start pixels, Active pixels, Start lines, Active lines*. In that case, hit **Enter** and change the slider to position **1**, thus enabling more settings in the *Edit file* menu.

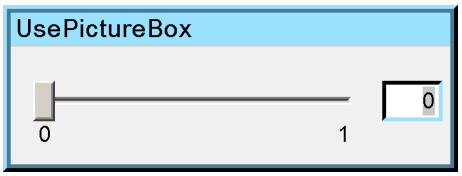


Image 7-29

7.4.4 Save as (create a custom file)

Creating a custom file

When the loaded file is a standard file there is a possibility of saving it as a custom file (= creating a custom file) , this is done with the save as function. The saved file will always be a custom file (saved in the custom directory)

For sources that are often used, a custom file should be created. This custom file will then be loaded automatically and will prevent the Auto Image from being launched.

How to save a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Save as...*

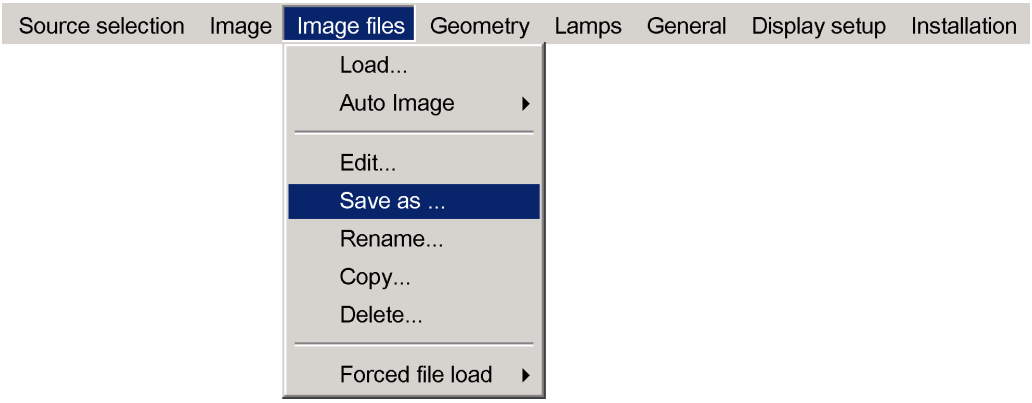


Image 7-30

5. Press **ENTER**
   A dialog box is displayed
   Use ←or →, ↓ or ↑ the numeric keys on the remote, or the keypad to edit and change the file name, confirm with ENTER.



Image 7-31

7.4.5 Rename file

How to rename a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Rename*

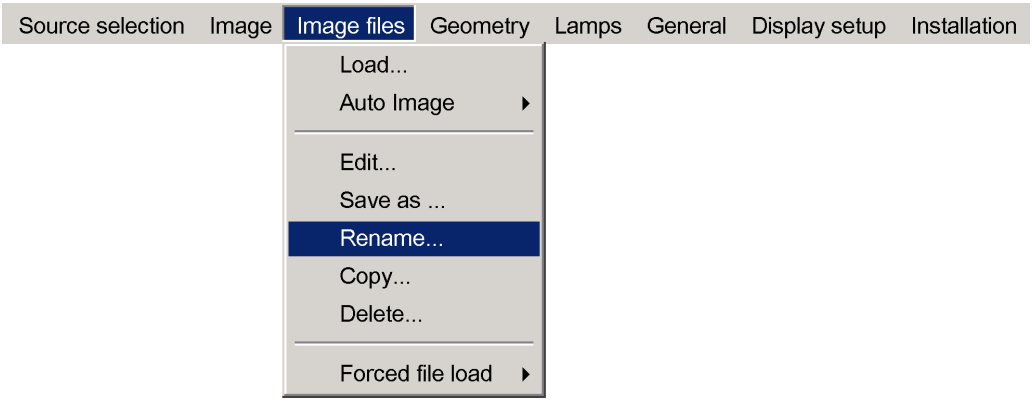


Image 7-32

5. Press **ENTER**
   A dialog box is displayed
   Use ←or →, ↓ or ↑ the numeric keys on the remote, or the keypad to edit and change the values, confirm with ENTER.

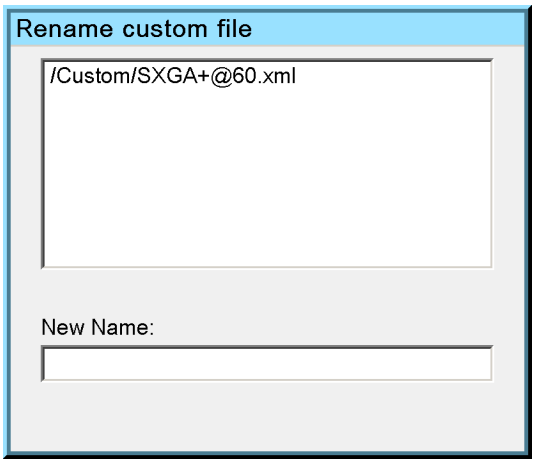


Image 7-33

7.4.6 Copy

Copy a file

The copy function allows to copy a file (standard or custom) to a custom file (to the custom directory).

How to copy a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *copy*

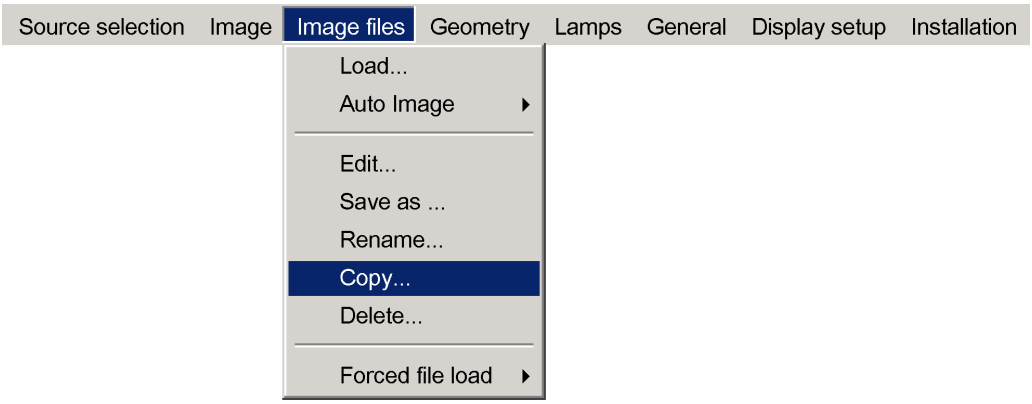


Image 7-34

5. Press **ENTER**
   A dialog box is displayed

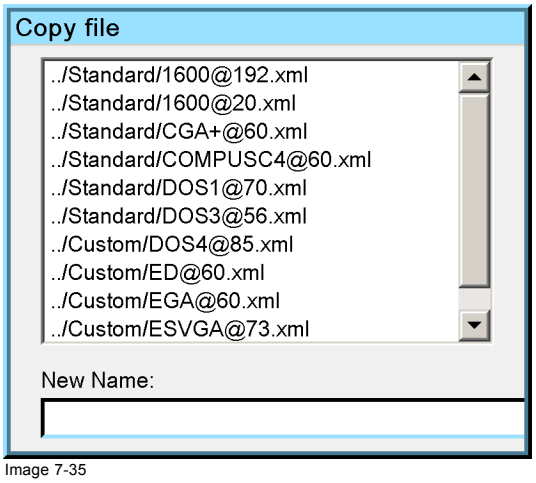


Image 7-35

6. Use ↑ or ↓ to select the file to be copied
7. Press **ENTER**

   The file name is copied in the edit field
8. Use the keys on the remote to change the name of the destination file

7.4.7 Delete

How to delete a file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *delete*

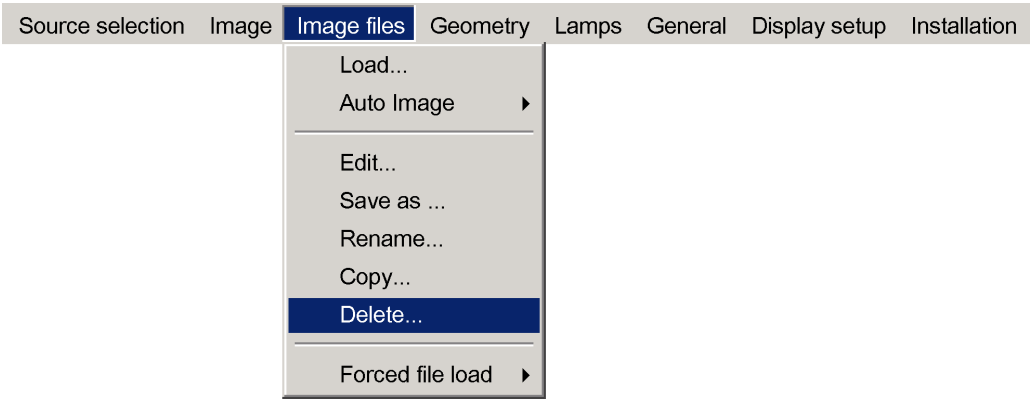


Image 7-36

5. Press **ENTER**
   A dialog box is displayed

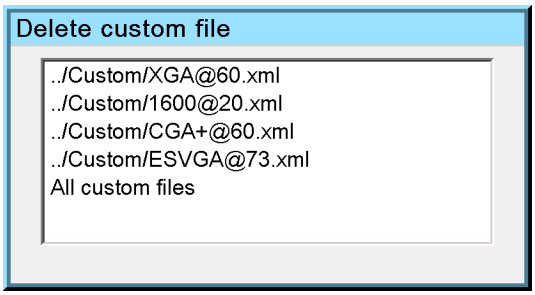


Image 7-37

6. Use ↑ or ↓ to select the desired file
7. Press **ENTER**

   The selected file is deleted and is removed from the list

7.4.8 Forced file load

Forced file load

In some cases the user wants only one particular file to be loaded for a particular input (source) i.e. to prevent the (automatic) load of an inadequate file.

One can link a file to every possible input of each layer.

If a file is already selected (forced) to that particular input it will be indicated in the menu.

How to force a file to be loaded ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Image files* item
3. Press ↓ to Pull down the *Image files* menu
4. Use ↑ or ↓ to select *Forced file load*

5. Press → to open the menu
6. Use ↑ or ↓ to select the desired layer (for example Layer 1)
7. Use ↑ or ↓ to select the desired input (for example Data on BNC)

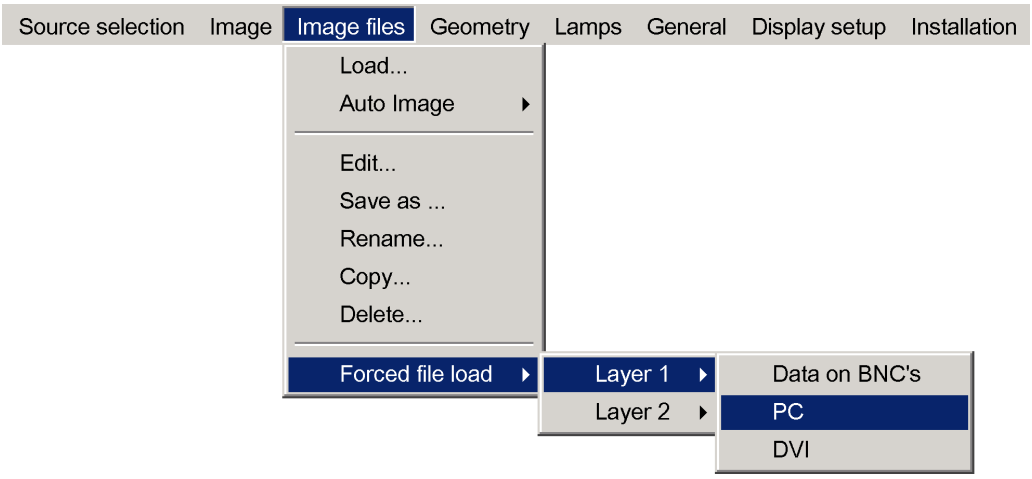


Image 7-38

Note: *Inputs that are not hardware compatible with this layer are greyed out.*

Note: *if a file is already forced for that input it will be shown on the right.*

8. Press **ENTER**
   The *Load* dialog box is displayed
9. Use ↑ or ↓ to select the desired file (for example **/Standard/SXGA+@60.xml**)
10. Press **ENTER**

    The file is selected and will be loaded in the future.

To delete the forced file, go to the desired input and press ENTER.

7.5 Geometry

Overview

- Introduction
- Geometry files
- Accessing the Geometry menu
- Geometry distortions
- Load
- Edit
- Rename a Geometry File
- Copy a Geometry File
- Delete a Geometry File

7.5.1 Introduction

What can be done ?

With the geometry corrections, this projector can be used in a wide variety of curved and flat-screen applications, ranging from flat or straightforward cylindrical displays to the wildest shapes that can be imagined: by pre-distorting the image inside the projector, a correct geometry can be achieved on curved screens, without requiring additional computational power on the IG's side.

7.5.2 Geometry files

Description

A geometry file contains the geometry corrections. The projector's memory contains a list of files created for demo purposes e.g. to demonstrate the warping capabilities of the projector. These files are called standard files.

The active file can always be edited in order to fit exactly the screen shape. Editing a standard file will automatically create a custom file.

The file notation in the *Geometry files* menu describes a file path.

For example : **/Standard/Dist_file1.xml**

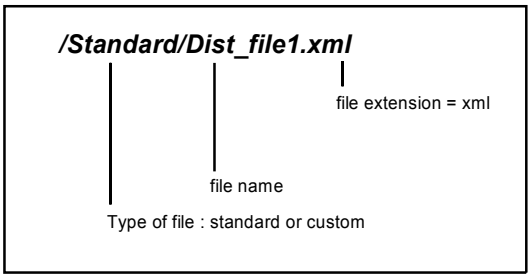


Image 7-39
Geometry file notation

Standard	file directory, also the type of file : Custom or Standard
Dist_file1	file name
xml	file extension

Available Geometry operations

- Load : loads an existing standard or custom geometry file
- Edit : allows to edit a custom geometry file
- Rename : allows to rename the geometry file
- Copy : allows to copy the geometry file
- Delete : allows to delete the geometry file

7.5.3 Accessing the Geometry menu

How to access the Geometry menu ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *Geometry*
3. Press ↓ to Pull down the Geometry menu

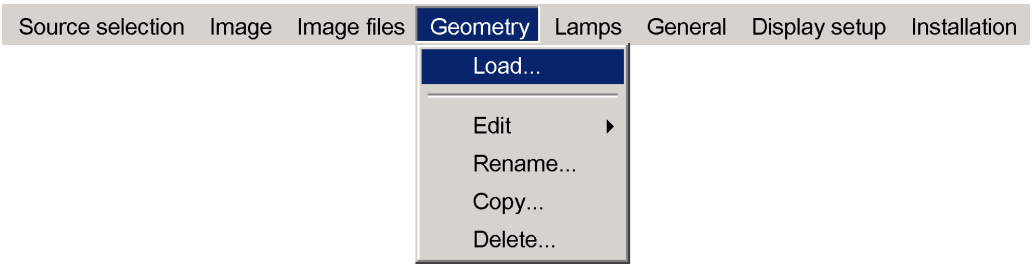


Image 7-40

7.5.4 Geometry distortions

What can be done ?

The geometry adjustment consists of the entire image divided in **33x33** regions that can be shifted to the desired location.

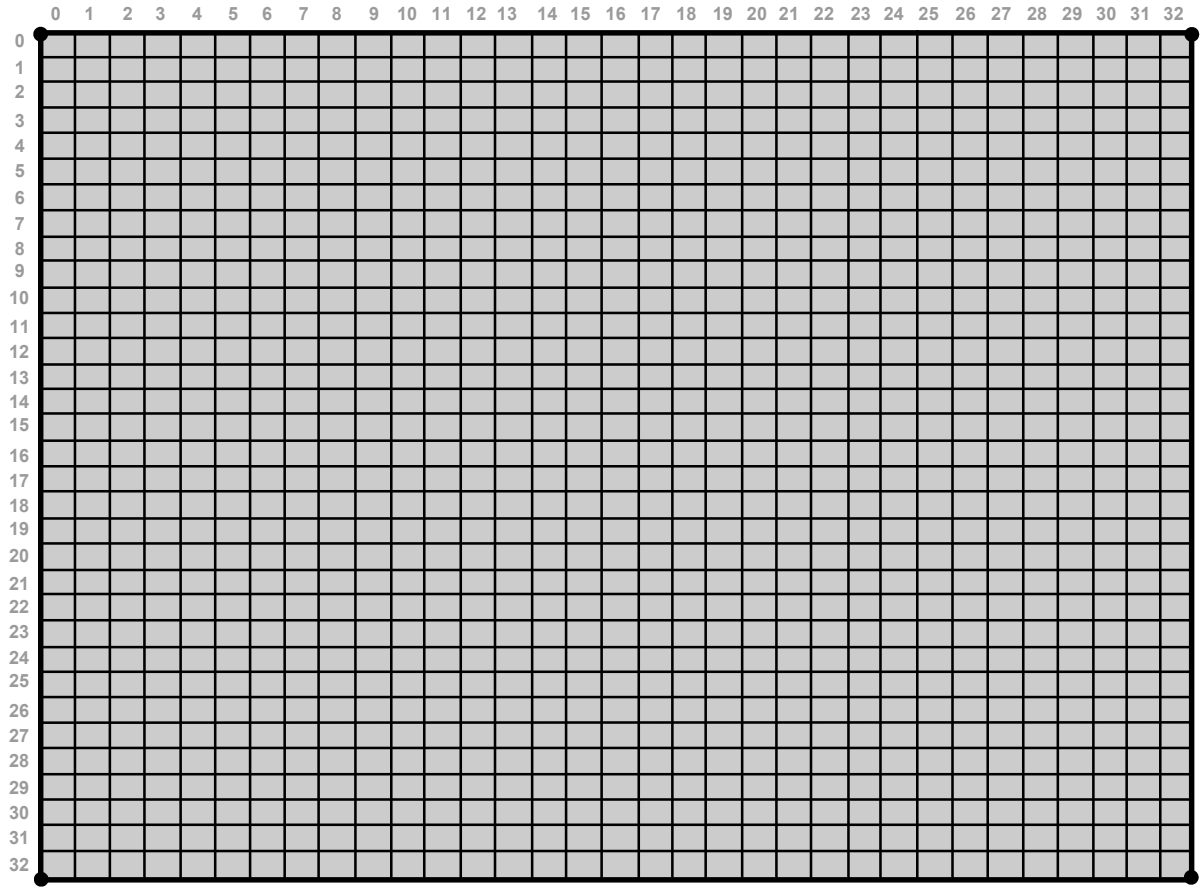


Image 7-41
The screen is divided in 33x33 regions

Modes and Levels

The geometry adjustment is divided in 6 groups or modes :

- 2x2
- 3x3
- 5x5
- 9x9
- 17x17
- 33x33

These modes represent 21 levels, each level represents a group of points (or zones). Each level will interact with other levels, adjusting a point on a certain level will affect points in the levels underneath.

The level of the adjustment gives a measure of this impact. A level 1 adjustment happens on the 4 corners of the image and will thus affect the whole image whereas a level 21 will only affect the adjusted point (called local points).



This interaction is also visible in the edit menu (see Geometry Edit wizard)

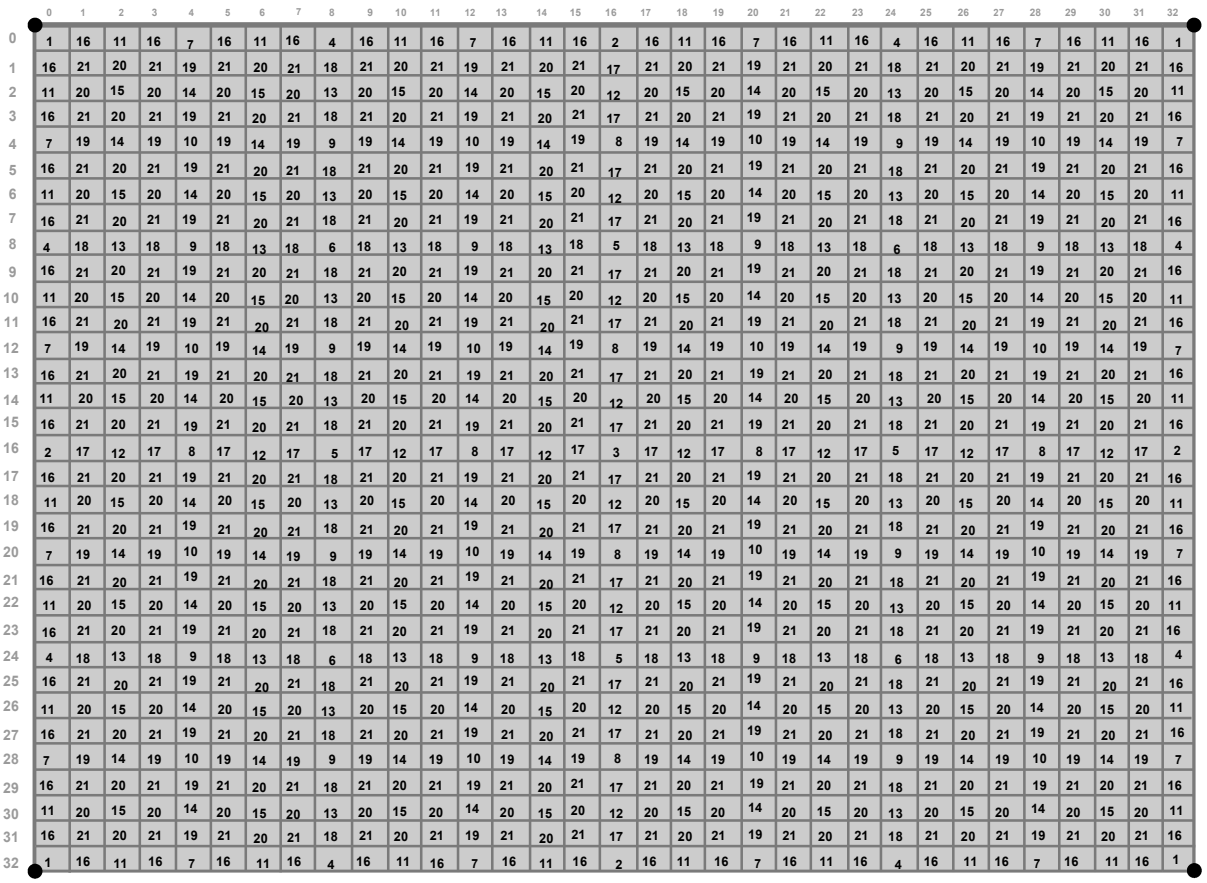


Image 7-42
Geometry levels

Level Hierarchy

The fact that the adjustment affects other points means that a certain hierarchy must be respected when adjusting the geometry.

The hierarchy or levels are indicated in the following image

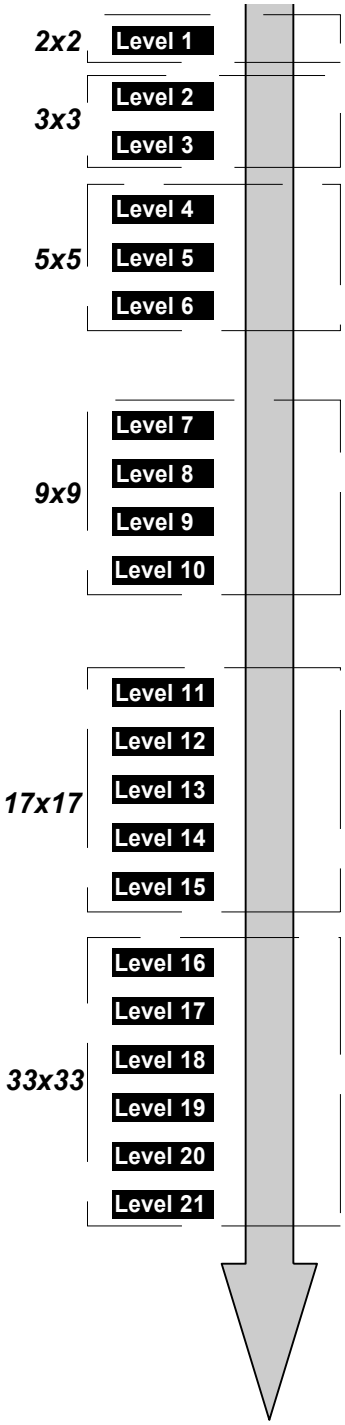


Image 7-43
Geometry level hierarchy

On top of this hierarchy, the *2x2* points. Adjusting points on level 1 will affect level 2 till 21.

At the bottom of the structure we find the *33x33* points adjustment, adjusting grid points on level 21 will not affect any other points, these are called local points.

7.5.5 Load

How to load a geometry file ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *Geometry*
3. Press ↓ to Pull down the Geometry menu
4. Press ↓ to select *Load*

5. Press **ENTER**

   A dialog box is displayed

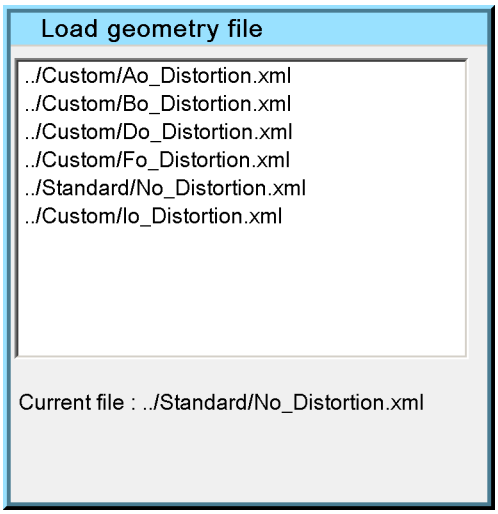


Image 7-44

6. Use the cursor key ↑ and ↓ to select the desired geometry file
7. Press **ENTER**
   Tip: *When starting a new geometry setup it is advised to select the "No_Distortion" file.*

   The file is loaded and the geometry settings are adapted.

7.5.6 Edit

The images below show adjustments performed on a hatch pattern generated internally by the projector (see internal patterns).

Overview

- Accessing the Geometry Edit menu
- Geometry Edit wizard
- Geometry Edit Modes
- Editing a geometry file
- Axis link
- Shift Adjustment
- Transport Delay
- Sharpness
- Geometry Reset

7.5.6.1 Accessing the Geometry Edit menu

How to access the Geometry Edit menu ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *Geometry*
3. Press ↓ to Pull down the Geometry menu
4. Press ↓or ↑ to select *Edit*
5. Press → to open the Edit menu

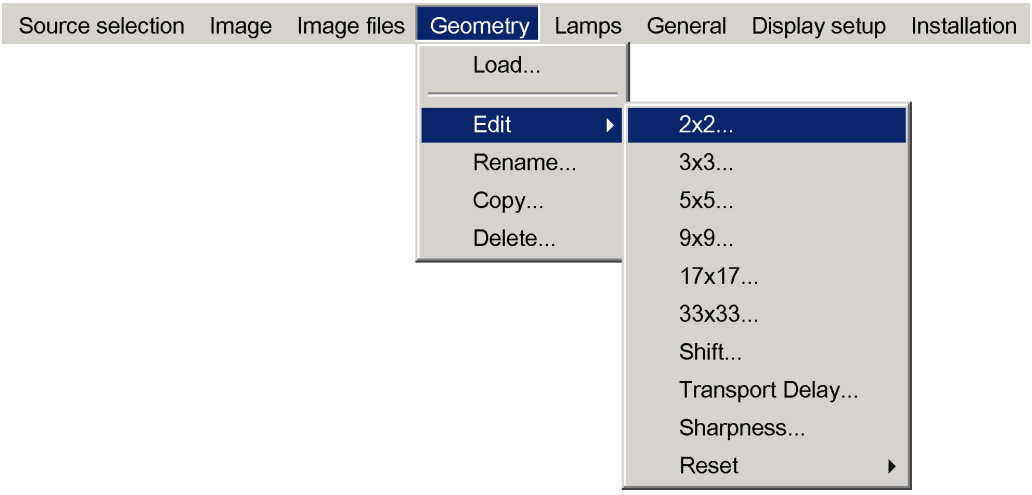


Image 7-45

7.5.6.2 Geometry Edit wizard

The geometry wizard

When entering the *Edit* mode, the *Edit* dialog box is displayed. When selecting a point in a certain adjustment, a yellow box shows the selection and a blue dotted box is placed around the selected grid point, indicating the interaction zone.

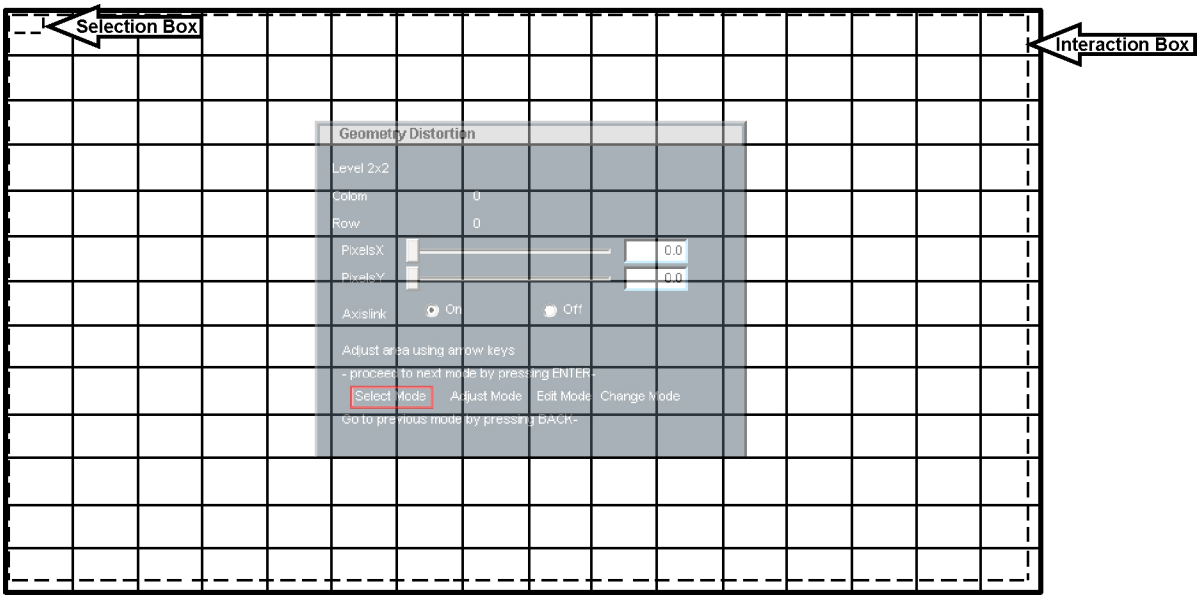


Image 7-46

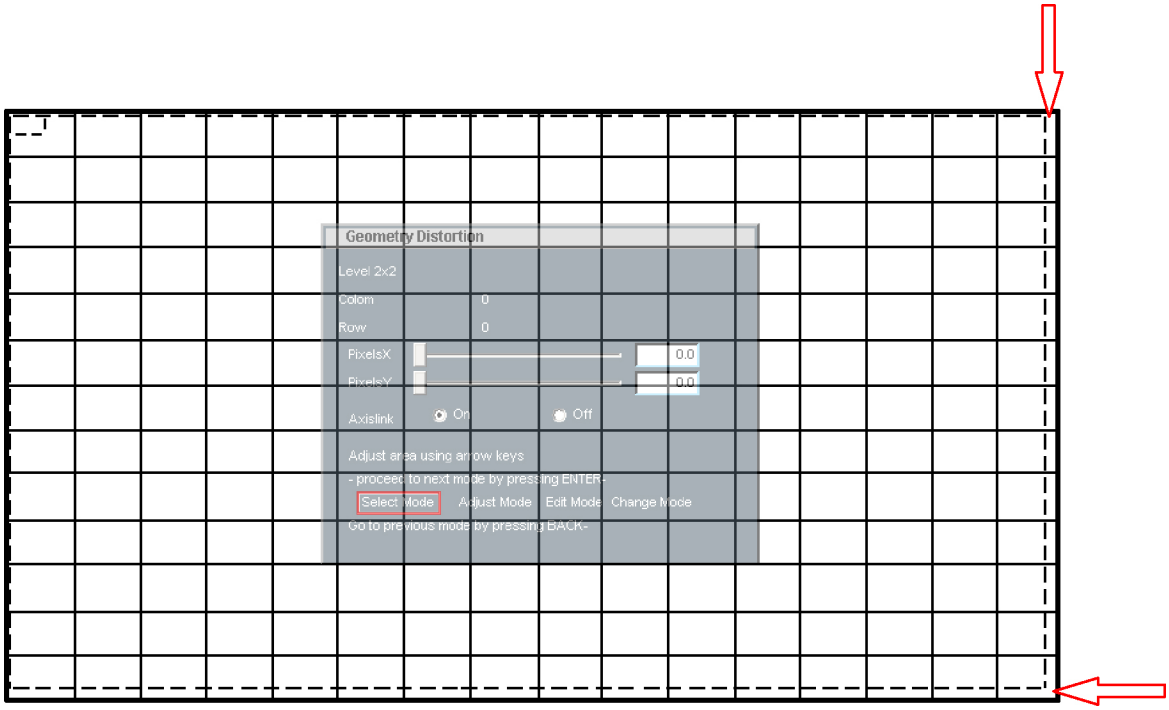


Image 7-47

Note that the dialog box is transparent so as to allow the preview of the adjustment over the whole screen during the adjustment (the image to be adjusted is not hidden by the dialog box)

Description of the Edit dialog box

An intuitive user interface is used to perform all the geometry corrections. This gives the user real-time access to the distortion characteristics. Each individual point can be selected and shifted to the desired location in real time.

Depending on the geometry mode, the dialog box may slightly differ, the dialog box below is for a *2x2* mode adjustment.

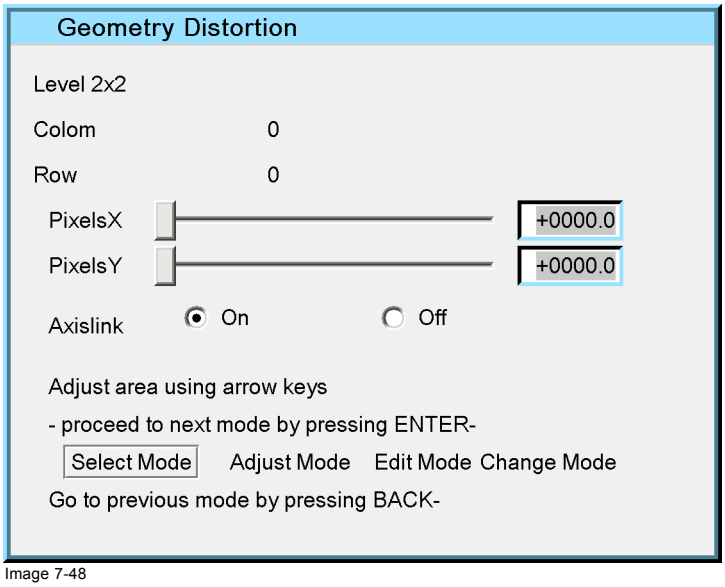


Image 7-48

Field /adjustment	Description	Notes
Level 2x2	gives the selected geometry adjustment. In this case, a 2x2 adjustment	

Field /adjustment	Description	Notes
Colom	column corresponding to the selected point	in a 2x2 adjustment column will be between 0 and 32 (steps of 32)
Row	row corresponding to the selected point	in a 2x2 adjustment row will be between 0 and 32 (steps of 32)
PixelX	this slider box adjusts the new position of the point along the x axis	High values can introduce some clipping effects
PixelY	this slider box adjusts the new position of the point along the y axis	High values can introduce some clipping effects
edit box PixelX	this edit box allows to edit the position of the point along the x axis	
edit box PixelY	this edit box allows to edit the position of the point along the y axis	
Axislink	see 'Axislink'	
Modes	see 'Geometry Edit Modes'	

Table 7-2
dialog box legend

When applying a distortion to the image this may take a certain time. During this operation, a text box is shown.

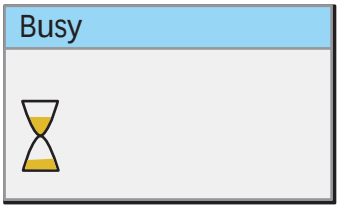


Image 7-49
Busy message

7.5.6.3 Geometry Edit Modes

The geometry Edit Modes

- Select mode : allows to select the desired area on the screen using the arrows. From 0 to 32 along the x and y axis.
- Adjust mode : allows to perform the correction (in real time) using the arrows. The adjustment is done in small steps of 0.1 pixels.
- Edit mode : allows to select the desired control (edit box, ...) in the dialog box.
- Change mode : allows to change the values in the controls (edit box, radio buttons, ...) of the dialog box.

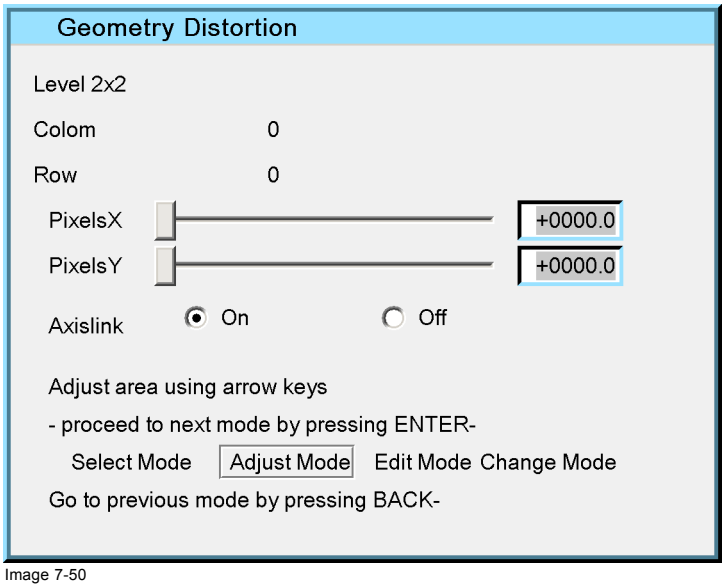


Image 7-50

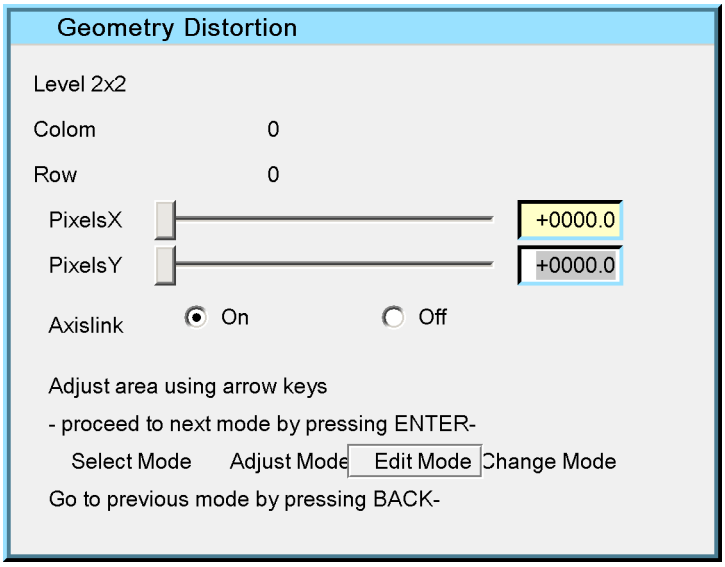


Image 7-51

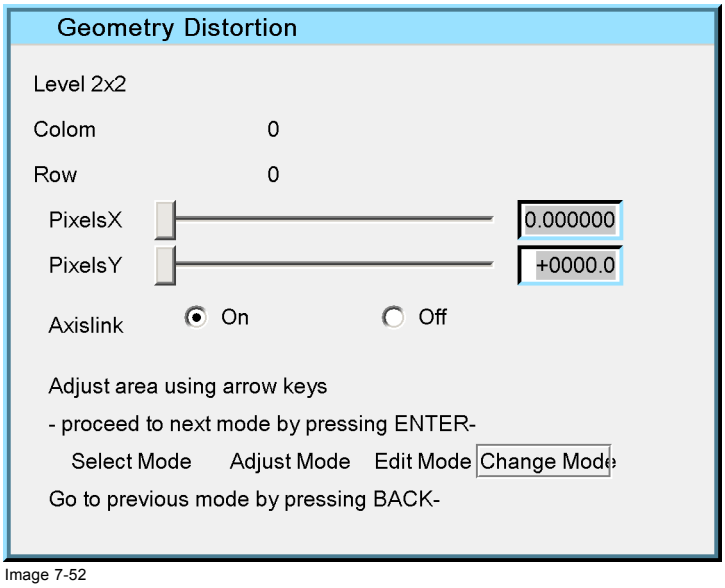


Image 7-52

How to select an Edit Mode ?

1. When the *Edit* dialog box is displayed, the *Select* mode is selected by default.
2. To go to the next mode (go to the right) press **ENTER**.
3. To return to a previous mode (go to the left) use **BACK**

7.5.6.4 Editing a geometry file

Introduction

The following procedures are written for a **2x2** mode adjustment. This adjustment involves the adjustment of the 4 corner points of the image. This is a **level 1** adjustment and will affect the whole image.

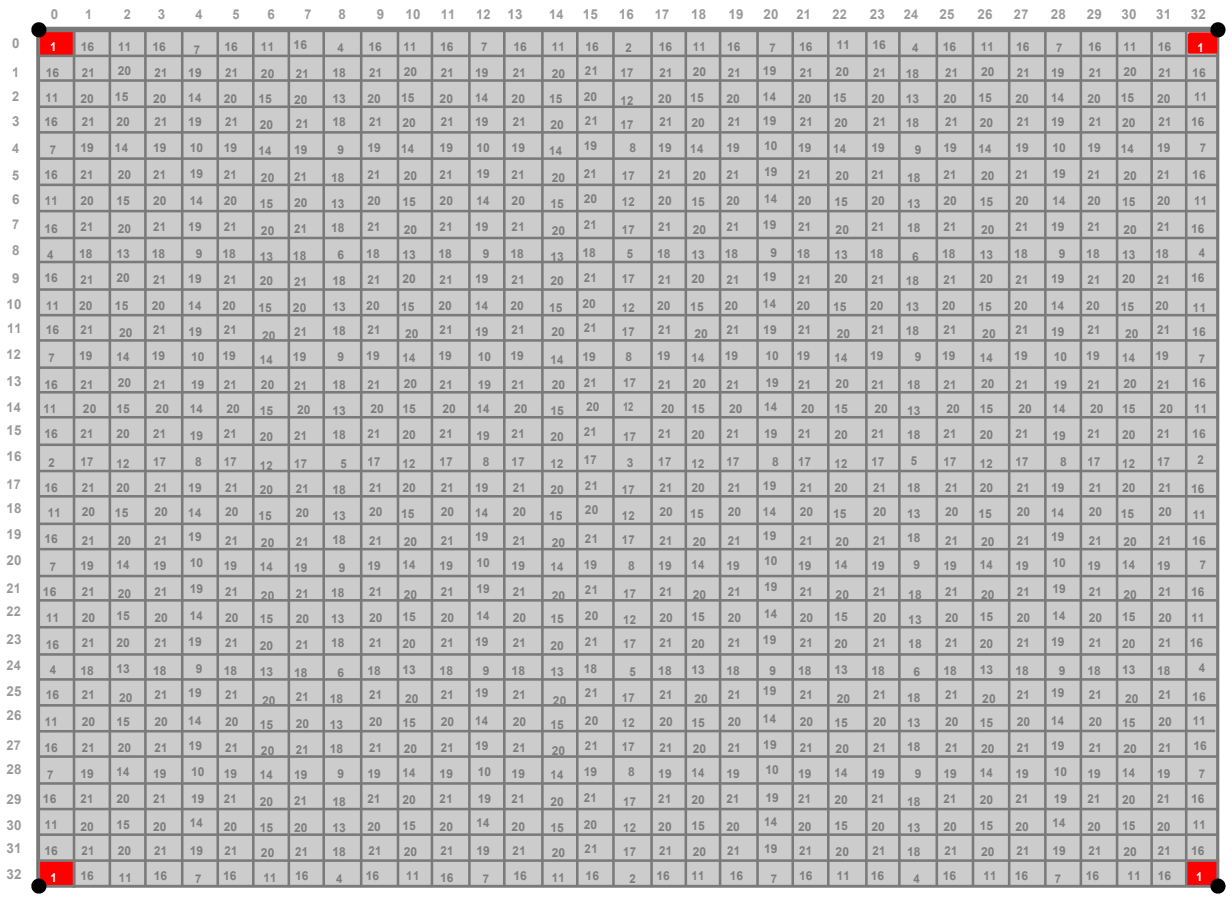


Image 7-53

The adjustment procedure is similar for all the modes. The only thing to keep in mind is the order in which the points will be adjusted i.e. always start with the lowest level points and end with the highest level zones (see **Geometry distortions/level hierarchy**) .

A **3x3** mode adjustment gives the following new points to be adjusted (the 4 points of the 2x2 mode being already adjusted : they are therefore left out of the grid). Note that in this mode, 2 levels are involved, the **level 2** and the **level 3**.

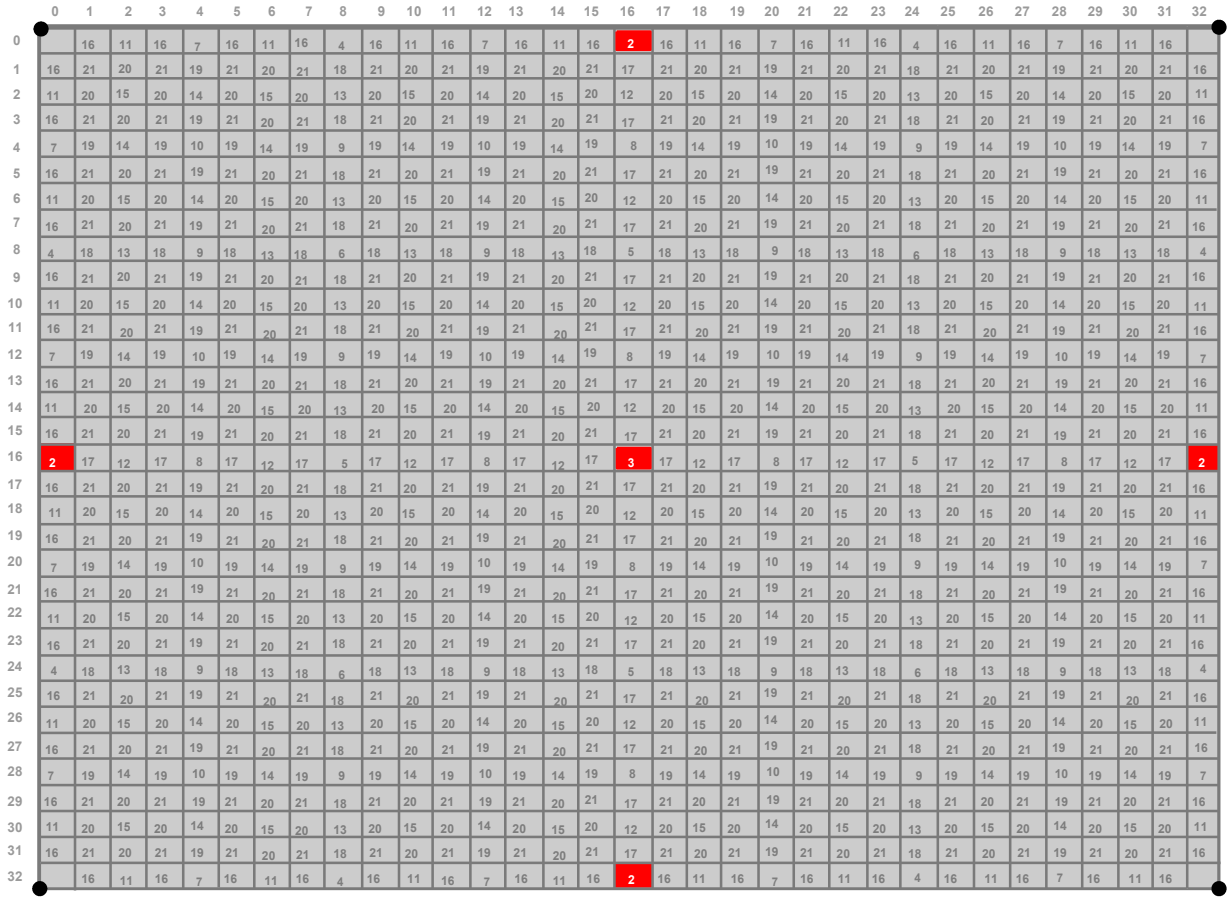


Image 7-54

A **5x5** mode adjustment gives the following new points to be adjusted. Note that in this mode 3 levels are involved, **level 4, 5** and **level 6** (previous adjusted points are left out).

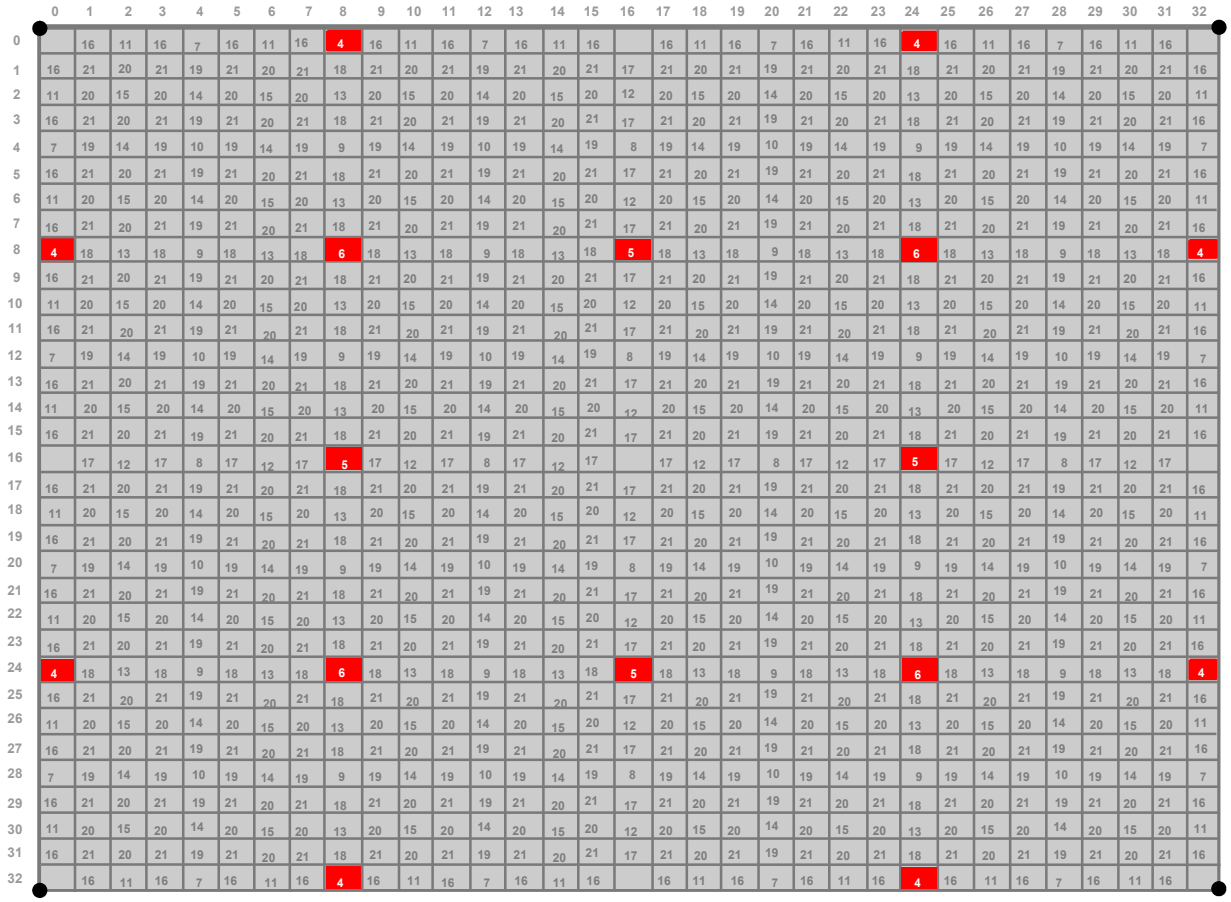


Image 7-55

...

How to start up the geometry edit ?

1. Start up the Geometry *Edit* menu
2. Press ↓ to select *2x2...*
3. Press **ENTER**

A dialog box is displayed. The *Select* mode is enabled and the top/left (row = 0 ; colom = 0) corner is selected

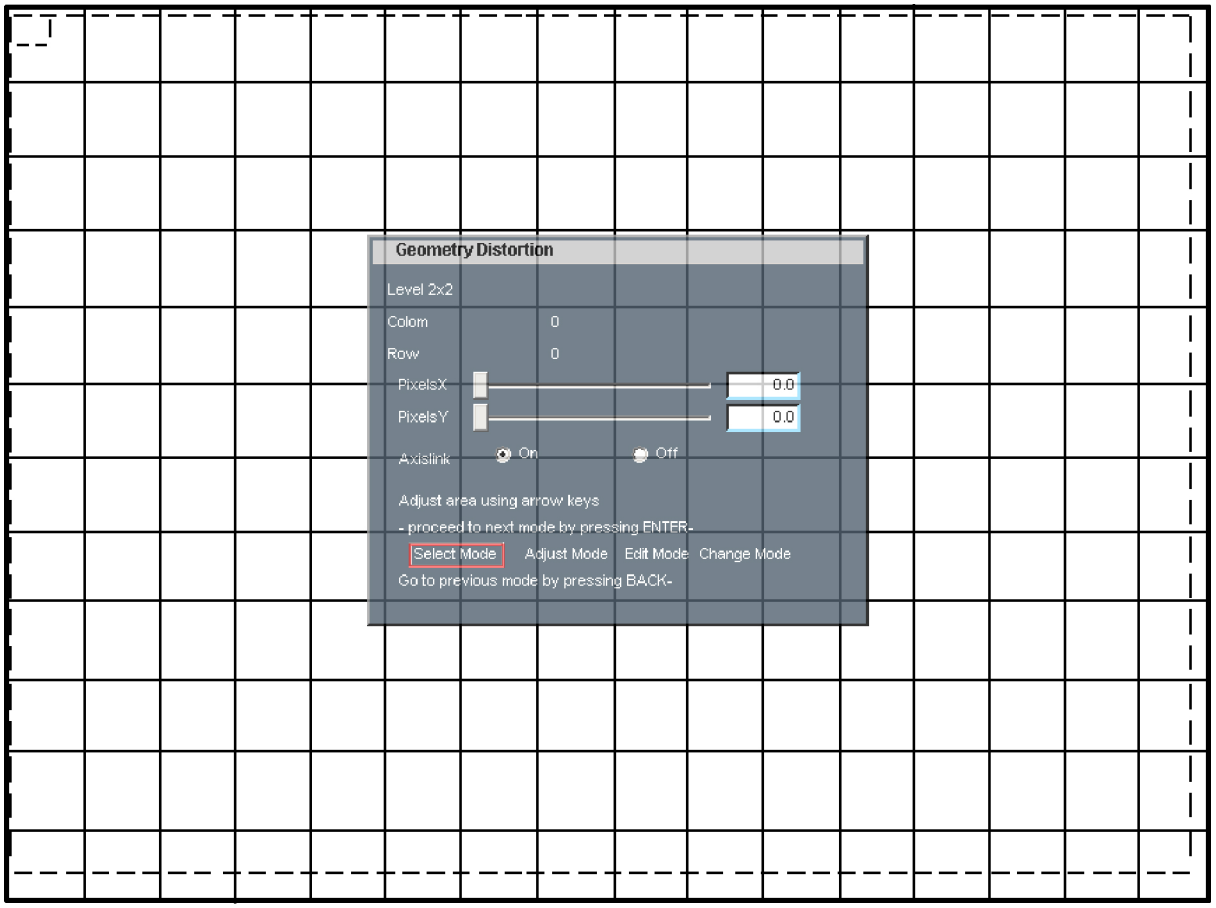


Image 7-56

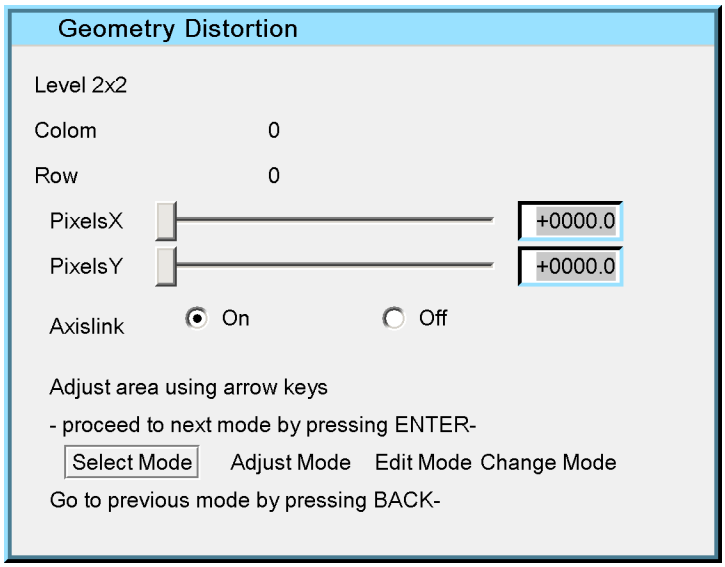


Image 7-57

How to select another point ?

1. Press → to select the next adjustment point

The column is adapted to 32

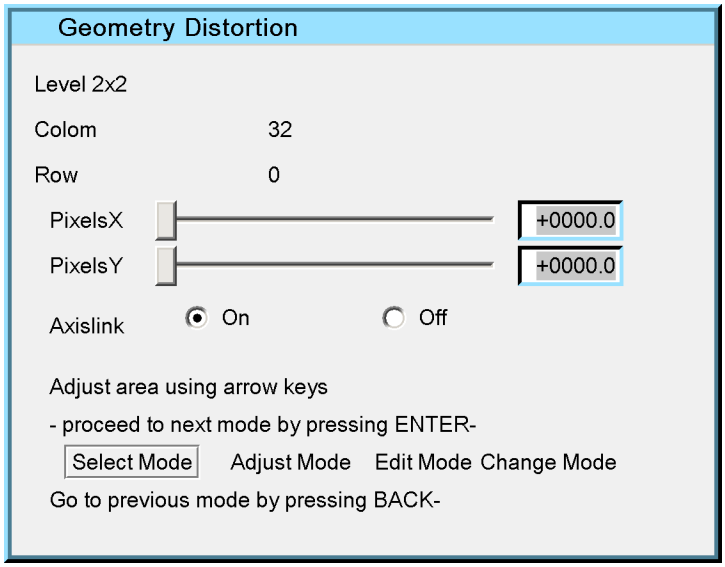


Image 7-58

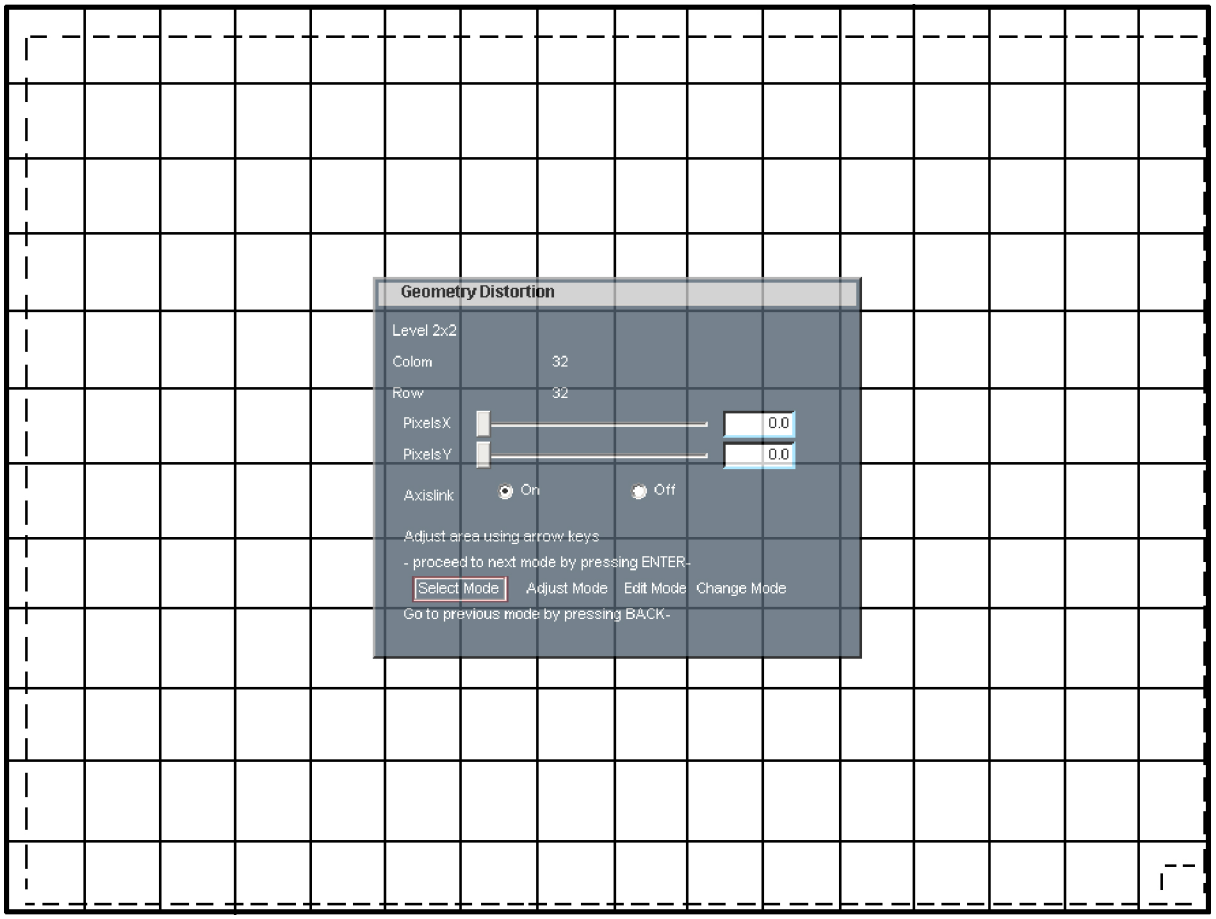


Image 7-59

2. Press ↓ to select the next adjustment point

The row is adapted to 32

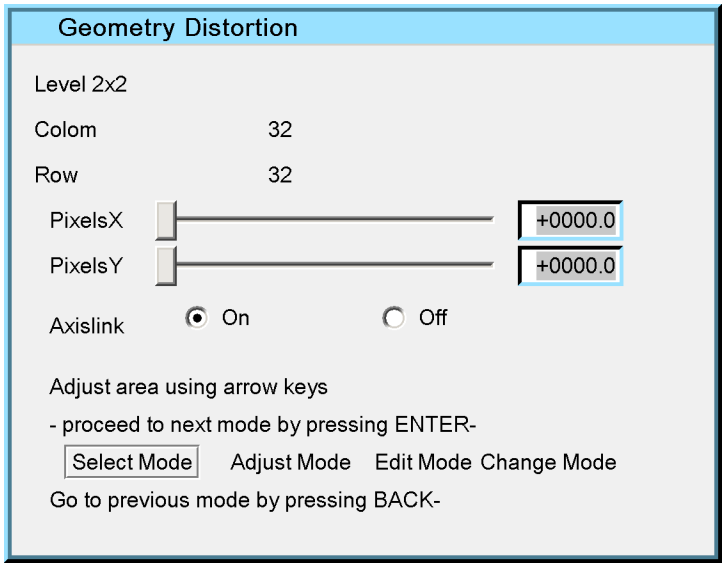


Image 7-60

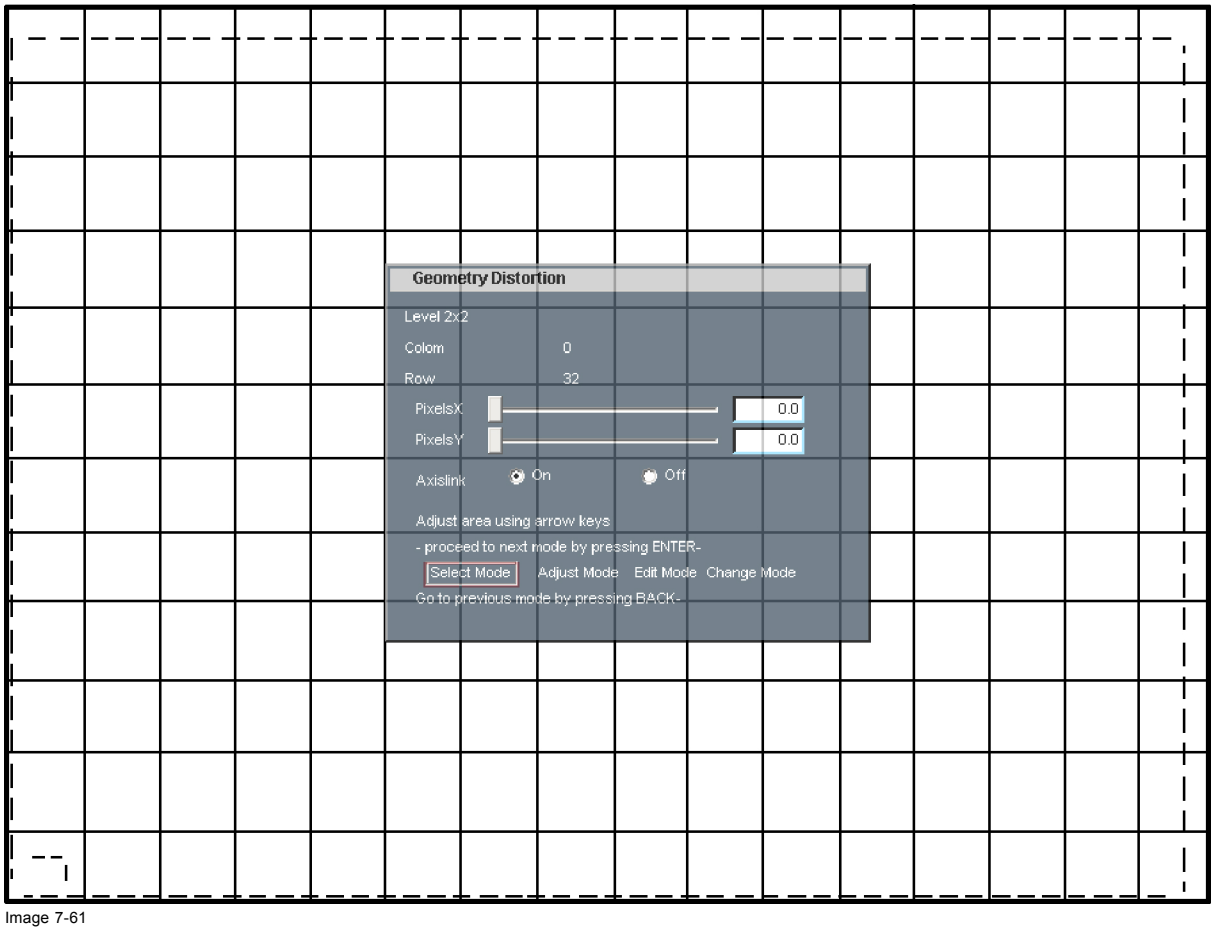


Image 7-61

3. Press ← to select the next adjustment point

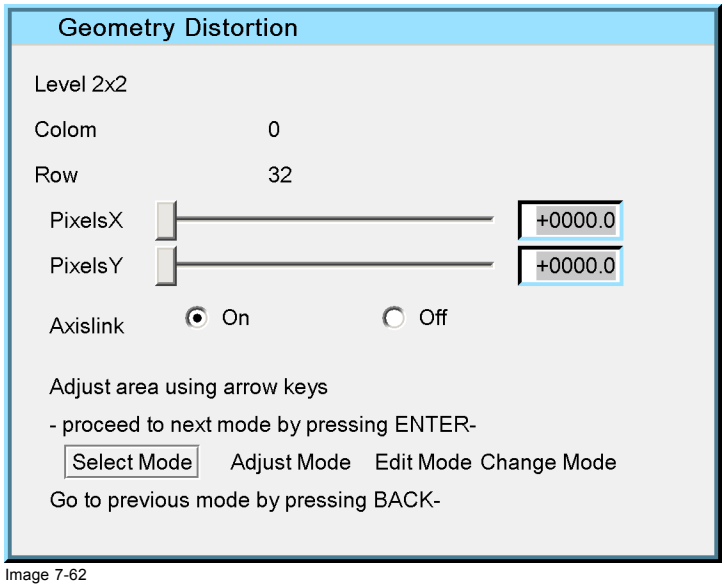


Image 7-62

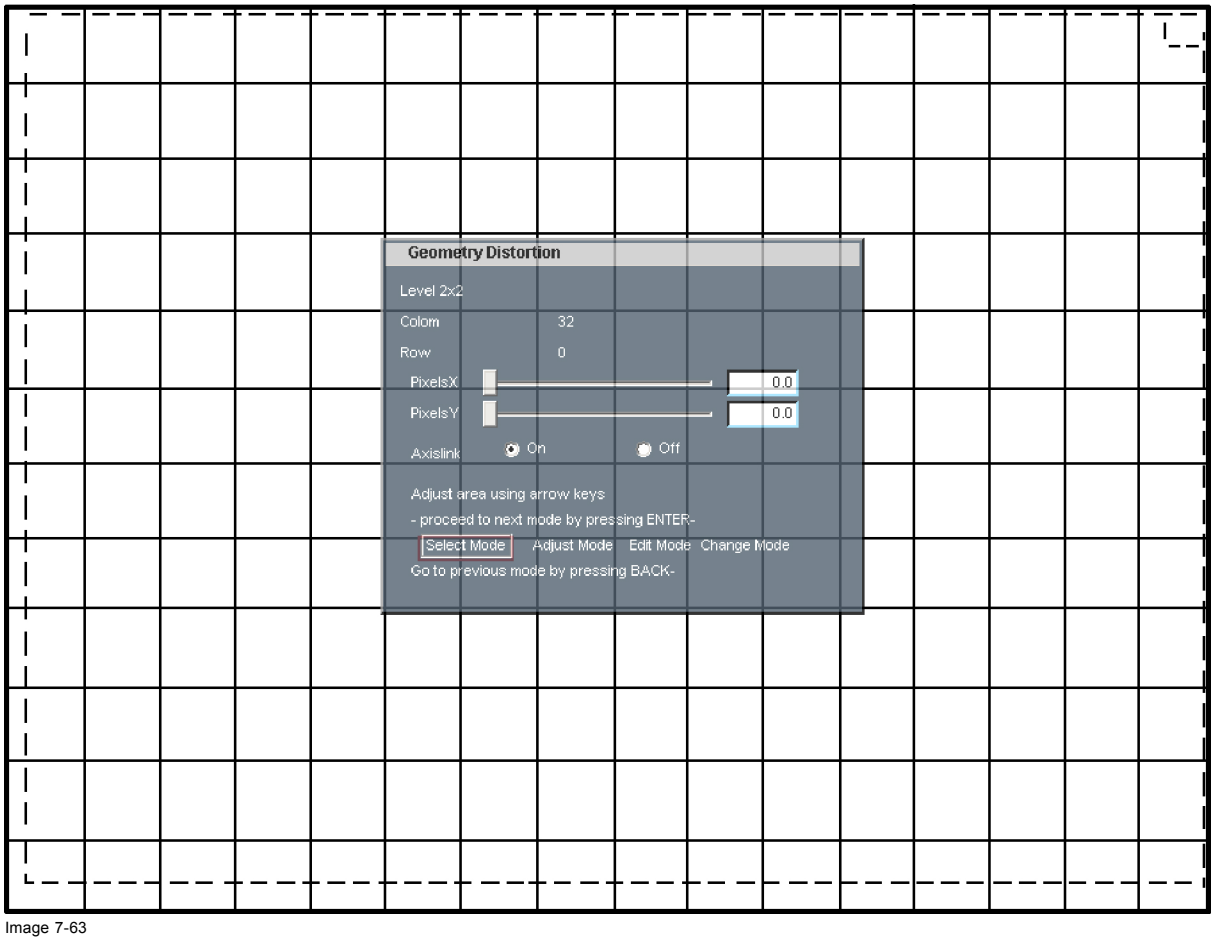


Image 7-63

How to adjust using the Adjust mode ?

Adjusting point (row =0 ; column =0) by 100 (pixels) along the x axis in the *2x2* mode

1. Press **ENTER** to go to the *Adjust Mode*

The *Adjust mode* is selected

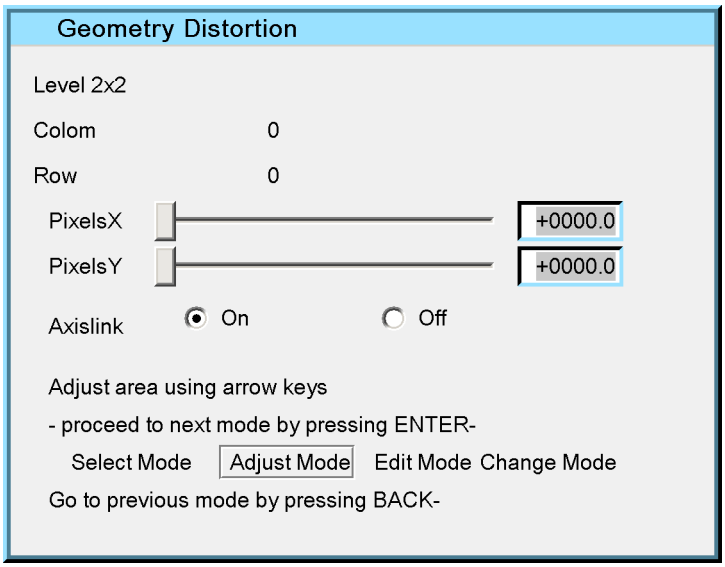


Image 7-64

2. Use ← and → to adapt the value of *PixelsX*
   Tip: *Use ↑ and ↓ to adapt the value of PixelsY*

   The image is distorted along the X axis. Notice the unaffected regions.

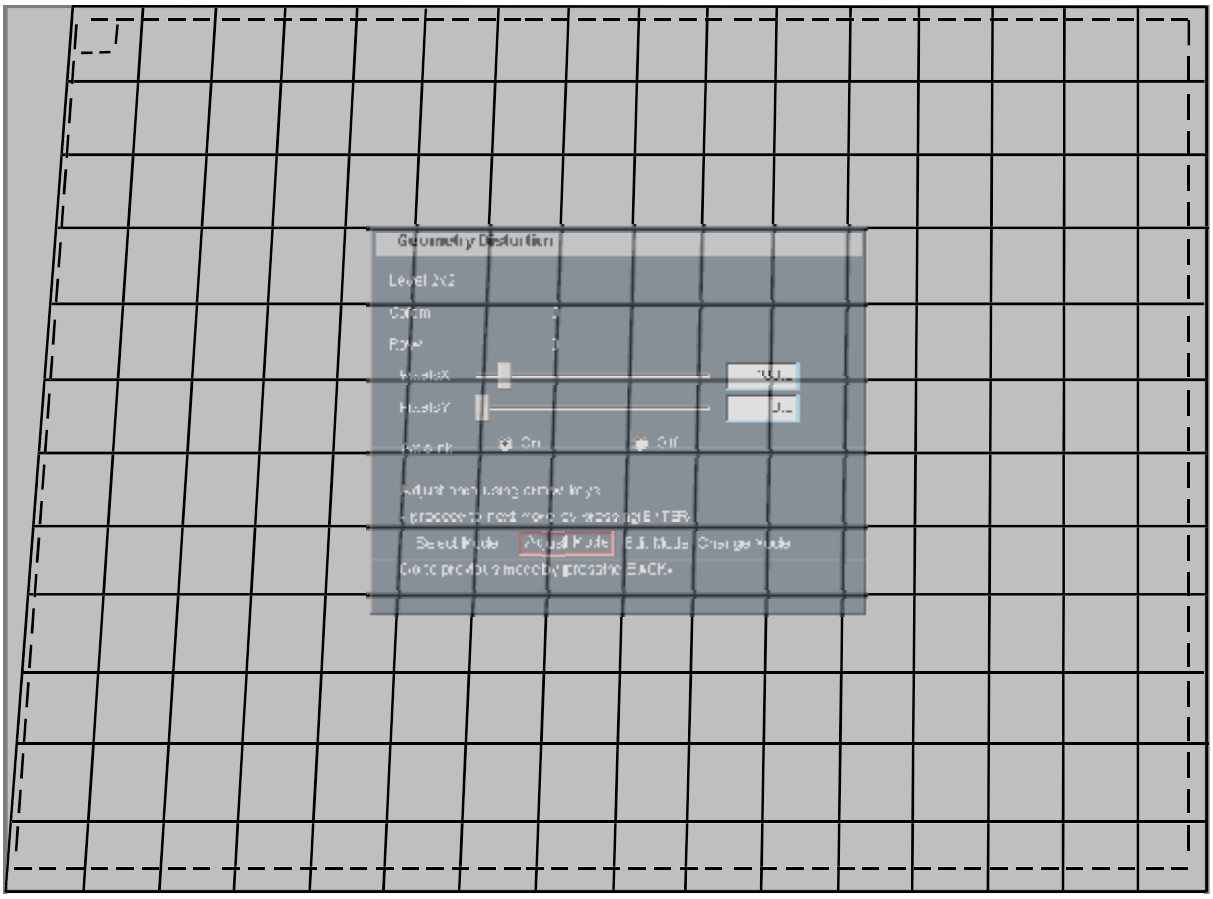


Image 7-65

The adjustment is done in small steps. Adjusting for instance from 0 to 100 using the *Adjust mode* is not the ideal method. The use of the *Edit* and *Change mode* is more appropriate.

How to adjust using the Edit and Change mode ?

Adjusting point (row =0 ; column =0) by 100 (pixels) along the x axis in the 2x2 mode

1. Press 2 times **ENTER** to go to the *Edit Mode*

   The *Edit mode* is selected

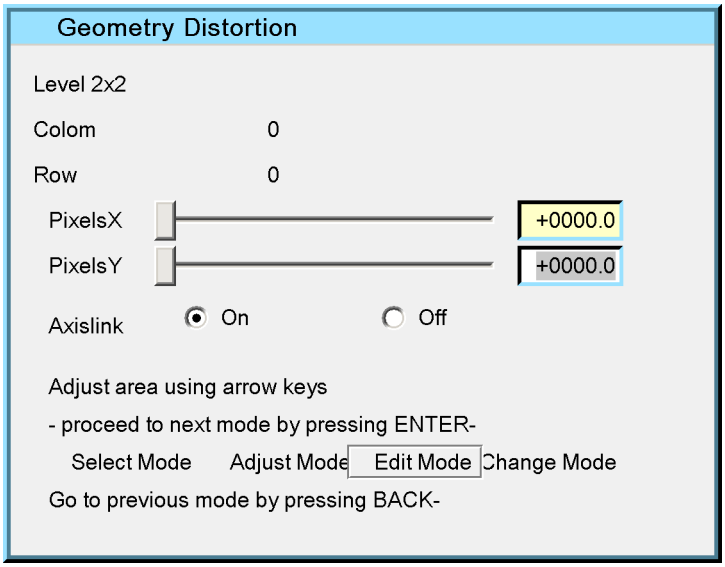


Image 7-66

2. Use ↑ and ↓ to select the *PixelsX* edit box

   The *PixelsX* edit box is focused

3. Press **ENTER**

   The *PixelsX* edit box is put in edit mode

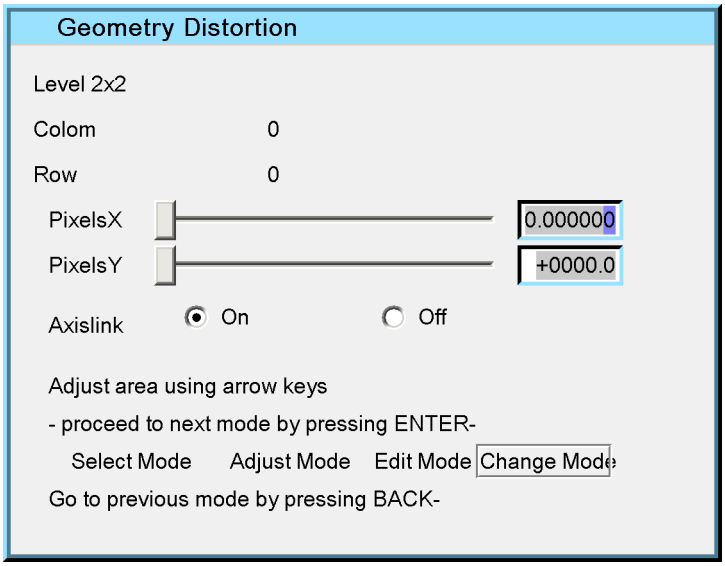


Image 7-67

4. Use ← and → to select the digit and use ↑ and ↓ to increment/decrement the digit
   Tip: *One can also use the numeric digits to fill in the desired value ?*

   The image is distorted along the X axis. Notice the unaffected regions.

7.5.6.5 Axis link

What is AxisLink ?

When *AxisLink* is set to *On*, the adjustment coordinate system will coincide with the edges of the distorted image.

Following example will show a basic *2x2* adjustment with *AxisLink* set *On* and *Off*.

1. Start with a non distorted image, assume the left top corner is selected.

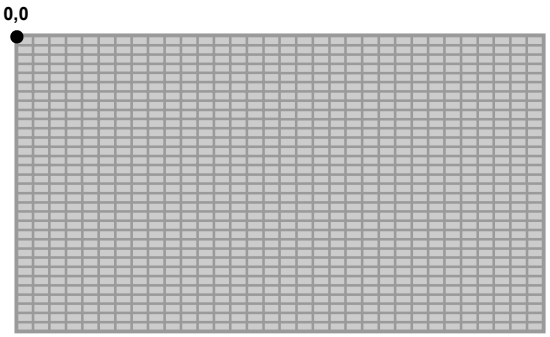


Image 7-68

2. Shift the left top corner +300 pixels to the left.

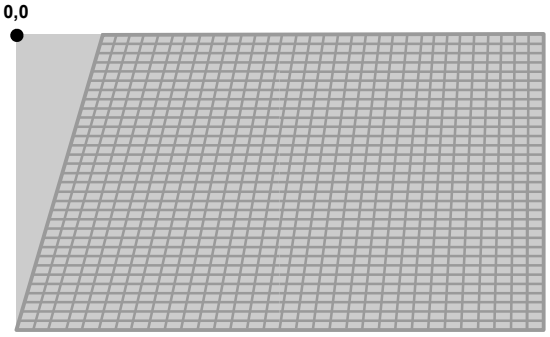


Image 7-69

3. Shift the left corner +300 pixels downwards.

AxisLink = ON	The coordinate system used for the adjustment will coincide with the edges of the distorted image, this will result in a quick adjustment when dealing with complex setups.
AxisLink = OFF	The coordinate system used for the adjustment is absolute.

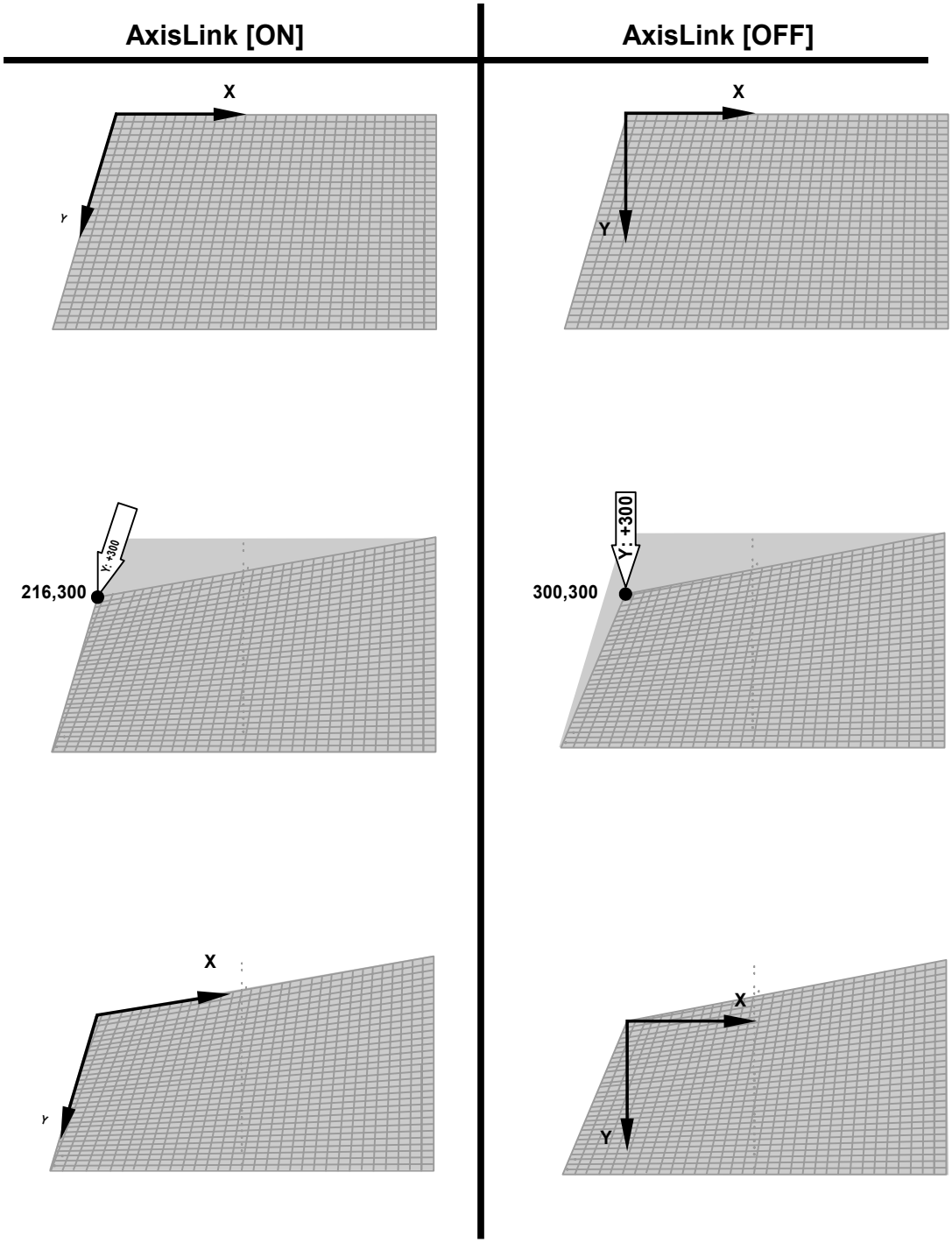


Image 7-70

How to set AxisLink ON ?

1. Start up the *Geometry Edit* menu
2. The *Edit mode* is selected

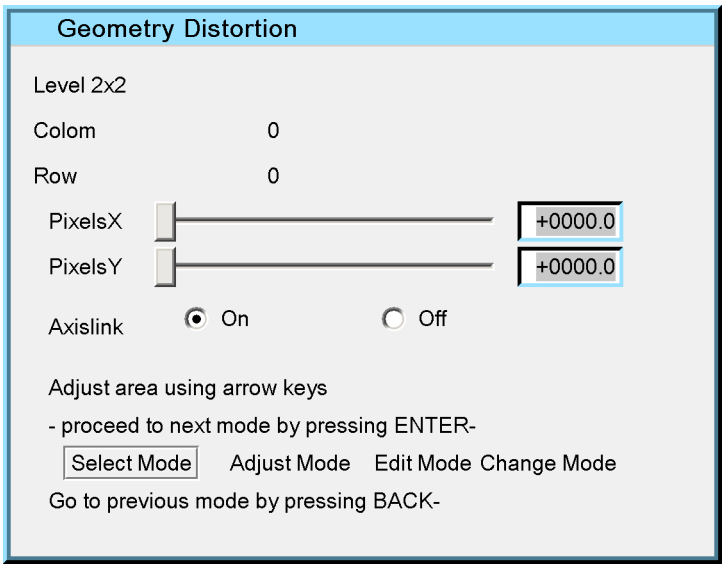


Image 7-71

3. Use ↑ and ↓ to select the *AxisLink* radio buttons

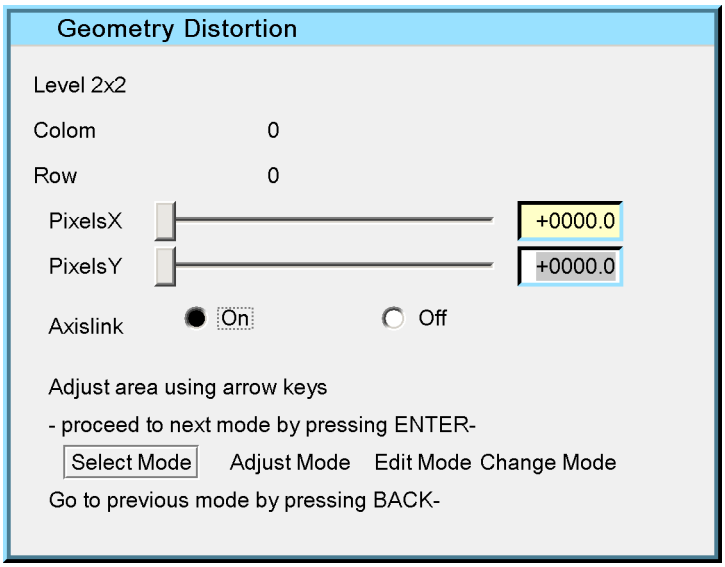


Image 7-72

4. Use ← and → to select the *ON* or *OFF* radio buttons
5. Press **ENTER** to enable/disable the selected radio button
6. Press **BACK** to return to the *Geometry Edit* menu.

7.5.6.6 Shift Adjustment

What can be done with the Shift adjustment ?

With the Shift adjustment it is possible to shift the whole image. This is considered as a displacement of the 4 corner points of the *2x2* mode. The same dialog box is used as for the geometry edit.

How to use the Shift adjustment?

1. Start up the Geometry *Edit* menu
2. Press ↓ to select *Shift ....*
3. Press **ENTER**

   A dialog box is displayed. Note that In the shift adjustment, the *Adjust* mode is selected by default (instead of the *Select* mode for the other geometry adjustments).
4. Press **ENTER** to go to the *Edit Mode*

The *Edit mode* is selected

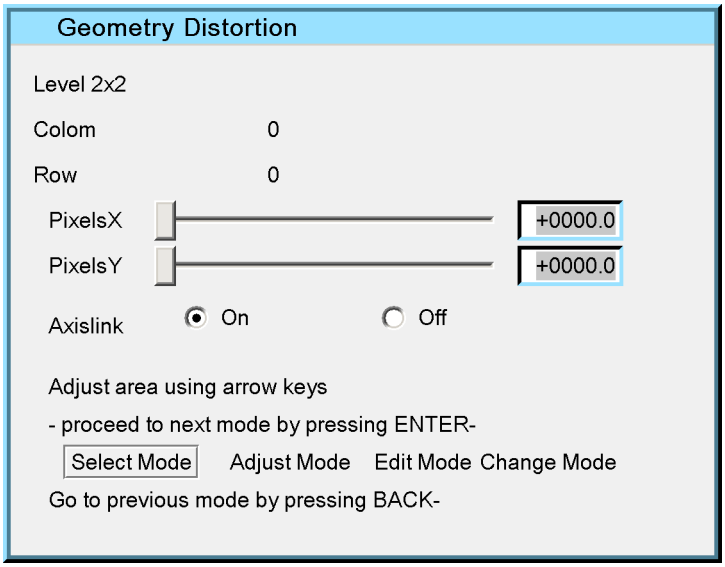


Image 7-73

5. Use ↑ and ↓ to select the *PixelsX* edit box

The *PixelsX* edit box is focused

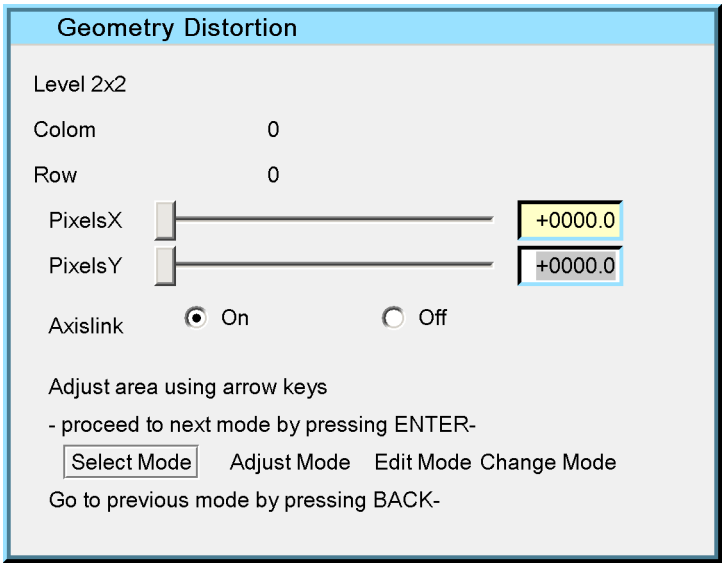


Image 7-74

6. Press **ENTER**

The *PixelsX* edit box is put in edit mode

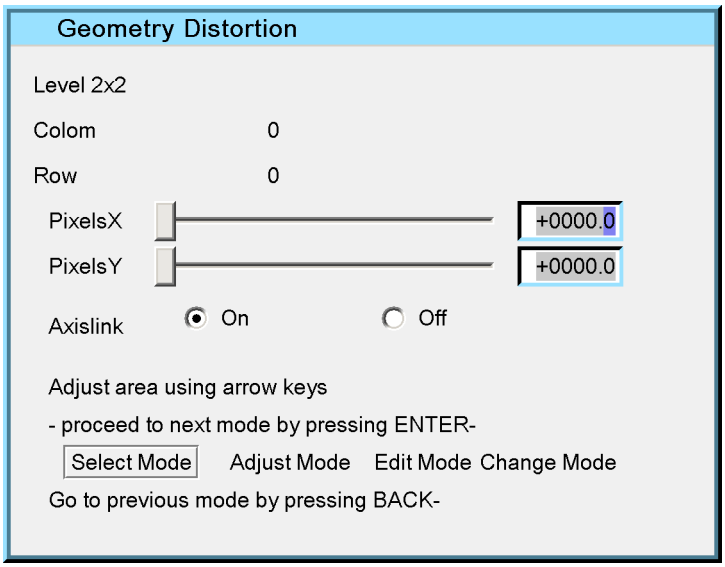


Image 7-75

7. Use ← and → to select the digit and use ↑ and ↓ to increment/decrement the digit
   Tip: *One can also use the numeric digits to fill in the desired value ?*

   The image is shifted along the X axis.

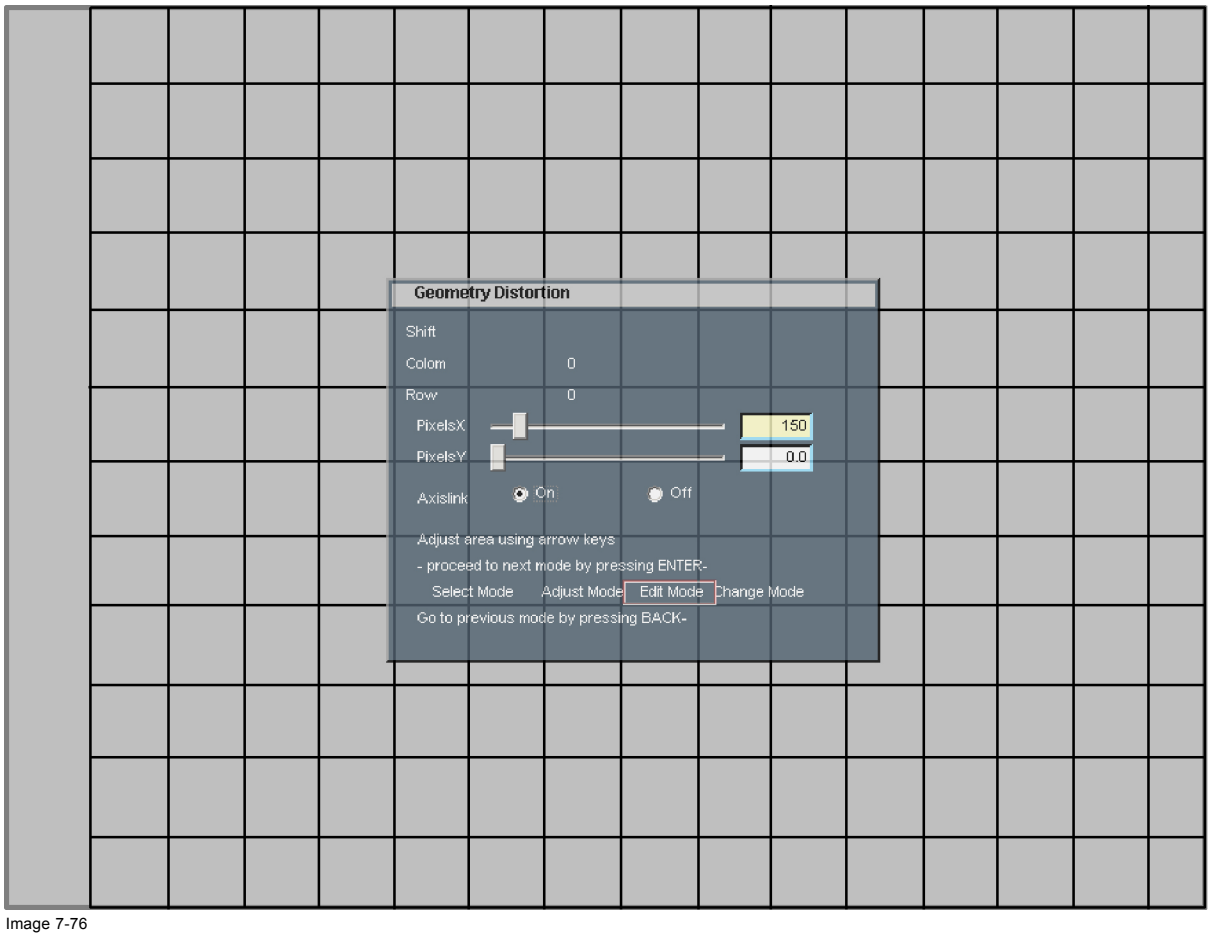


Image 7-76

8. Press **BACK** to return to the *Geometry Edit* menu.

7.5.6.7 Transport Delay

What is Transport Delay ?

The Transport Delay is the interval between the time at which an image frame is received from the first FPGA of the PMP and the time at which the processing of this frame starts in the second FPGA of the PMP.

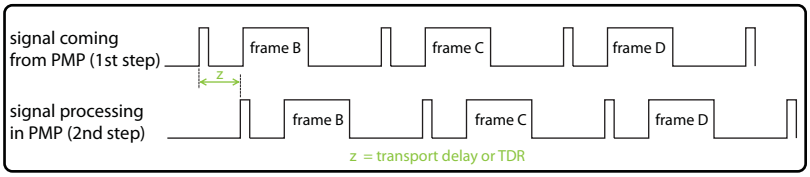


Image 7-77
Transport delay

During this delay all image information is stored in a memory block on the PMP.

A Transport Delay set to the maximum value of 1023, corresponds with a delay of 16 ms.

What can be done with the Transport Delay ?

The data flow of any frame starts with pixel 1 of line 1 of this frame and is processed line by line.

In the example of a top side bow distortion, the first pixel to be displayed is not pixel 1 of the original line 1, but pixel x (>1) of the original line 1. This means that every pixel which comes before pixel x in the original line 1 must be stored in a temporary memory, before the processing of the frame can start.

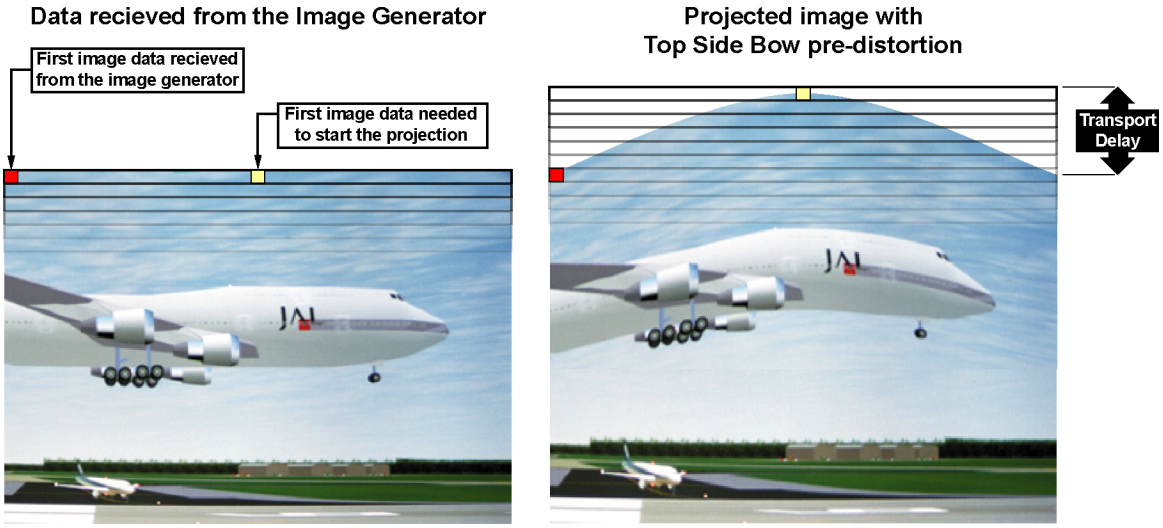


Image 7-78
Transport Delay basic principle

The Transport delay can be adjusted manually or can be set to automatic.

A short Transport delay creates a small delay with respect to the source, but a large delay is needed in case extremely distorted images are needed (extremely curved screens).

A delay set too short may introduce 'clipping' phenomenons in the image.

How to set Transport Delay to manual or automatic ?

1. Start up the Geometry *Edit* menu
2. Push the cursor key ↑ or ↓ to highlight *Transport Delay...* and press **ENTER** to select.

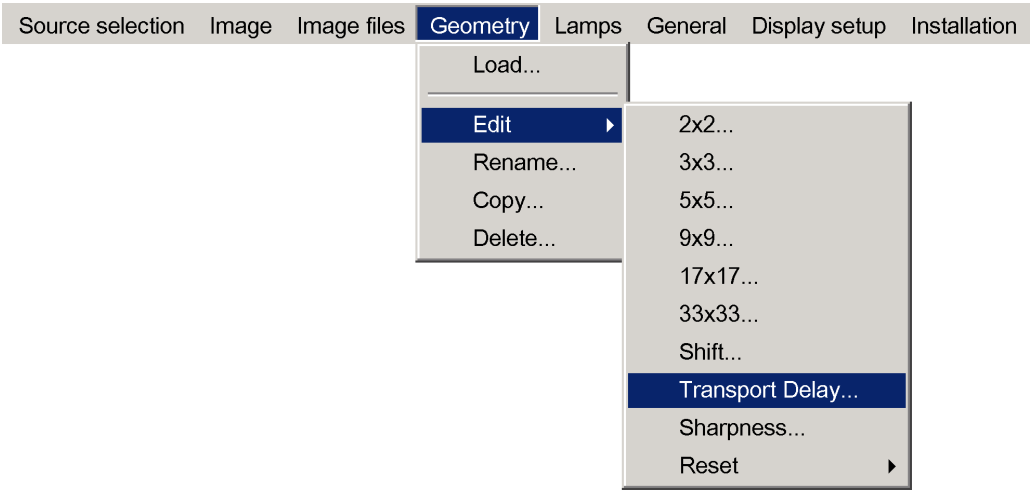


Image 7-79

The *Transport Delay* dialog box will be displayed.

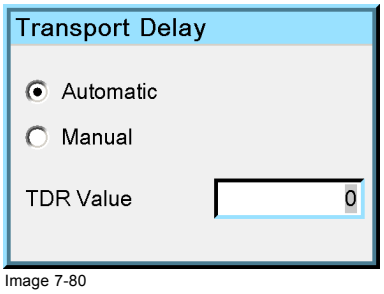


Image 7-80

3. Push the cursor key ↑ or ↓ to select the radio buttons
4. Press **ENTER** to check the desired radio button
5. Press **BACK** to return to the *Geometry Edit* menu.

How to adjust the Transport Delay manually?

1. Display the *Transport Delay* dialog box (see procedure above)

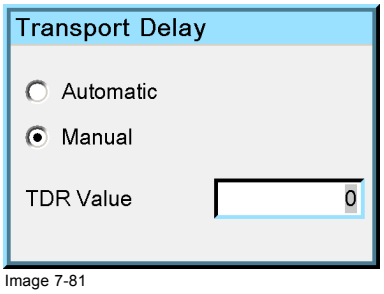


Image 7-81

2. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to edit and change the value of the Transport Delay.
   Note: *The Transport Delay is by default set to 200.*

   The Transport Delay Range can be set from 0 to 1023.

   Tip: *When the transport delay needs to be adjusted In a multi channel setup, first adjust the transport delay of all projectors one by one, leave the projector with the maximum value, then set all other projectors to this maximum value.*
3. Press **BACK** to return to the *Geometry Edit* menu.

7.5.6.8 Sharpness

What can be done ?

In some extreme warping conditions digital noise may appear in the warped regions. The sharpness adjustment in the Geometry menu allows to get rid of these perturbations.

How to adjust the geometry Sharpness ?

1. Start up the Geometry *Edit* menu
2. Push the cursor key ↑ or ↓ to highlight *Sharpness...* and press **ENTER** to select.

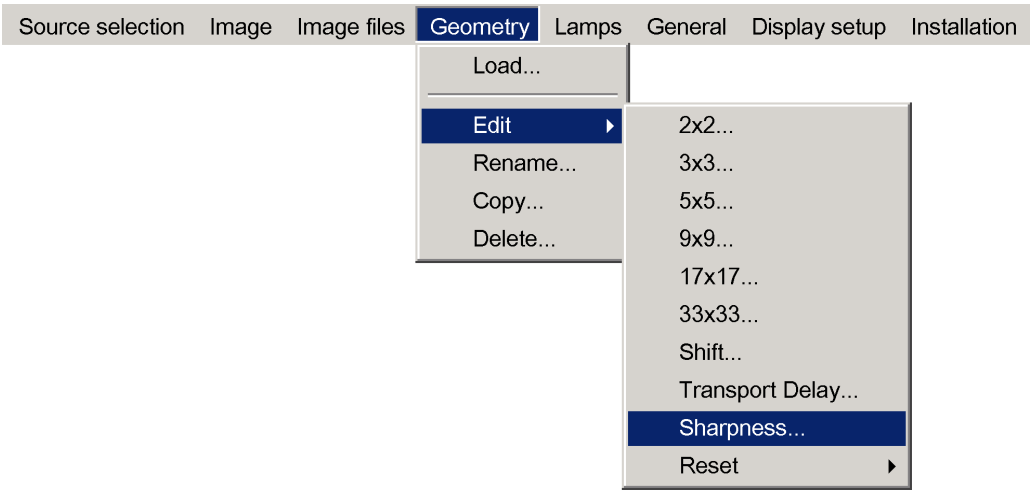


Image 7-82

The *Sharpness* dialog box will be displayed.



Image 7-83

3. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to edit and change the value of the Sharpness.
   Note: *The Sharpness can be set from –8 to +8.*
4. Press **BACK** to return to the *Geometry Edit* menu.

7.5.6.9 Geometry Reset

Overview

- Reset all levels
- Restore to a level

7.5.6.9.1 Reset all levels

How to reset all levels?

1. Start the Geometry *Edit* menu
2. Push ↓ or ↑ to select *Reset*
3. Push the → key to pull down the menu.
4. Push ↓ or ↑ to highlight *Reset all levels....*

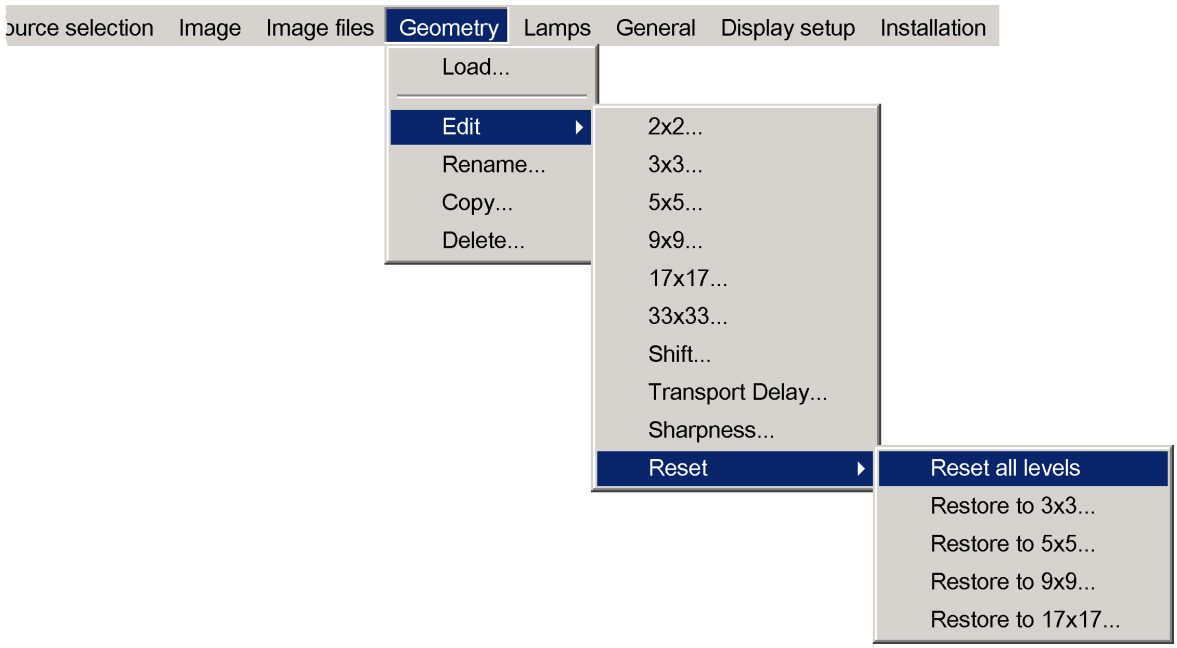


Image 7-84

All the levels are reset. If these levels contained geometry corrections, this will be noticed in the image by a jump.

5. Press **BACK** to return to the *Geometry Edit* menu.

7.5.6.9.2 Restore to a level

What can be done ?

Restore to a level means that all the higher level geometry corrections are reset (all geometry correction values are set to 0). The correction values of the level and all the lower levels are kept.

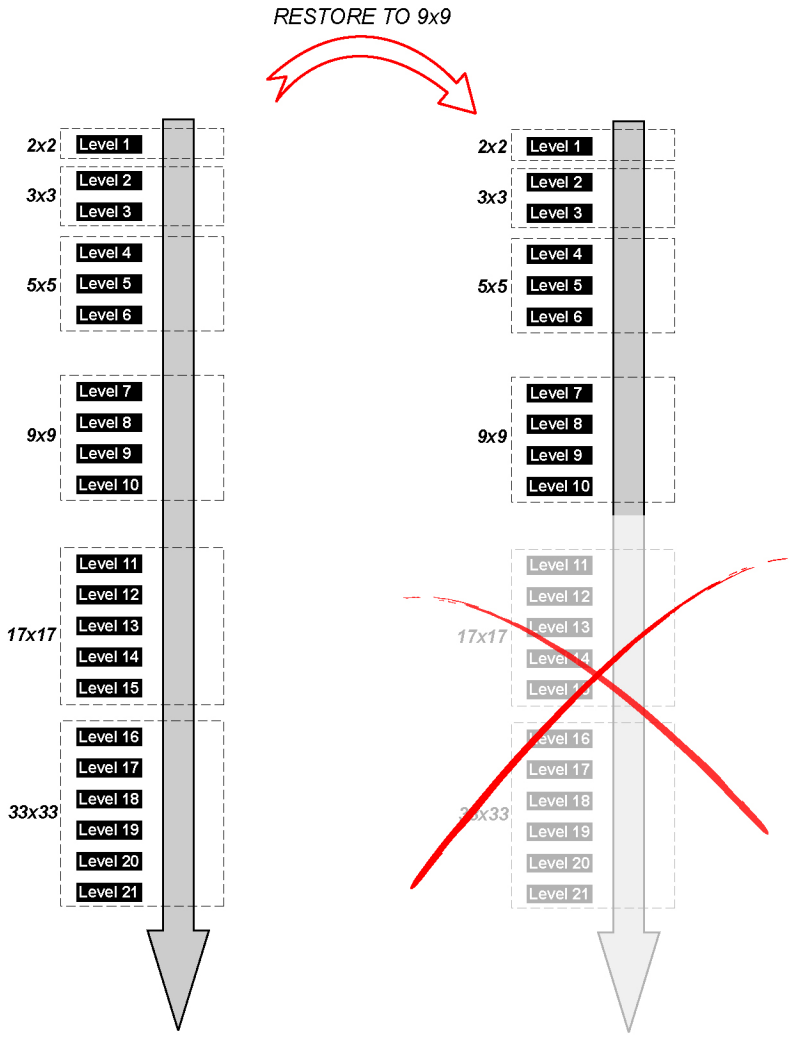


Image 7-85
Geometry Restore example : restoring to a 9x9 level

How to restore to a level ?

1. Start the Geometry *Edit* menu
2. Push ↓ or ↑ to select *Reset*
3. Push the → key to pull down the menu.
4. Push ↓ or ↑ to highlight the desired level to restore, *Restore to ....*

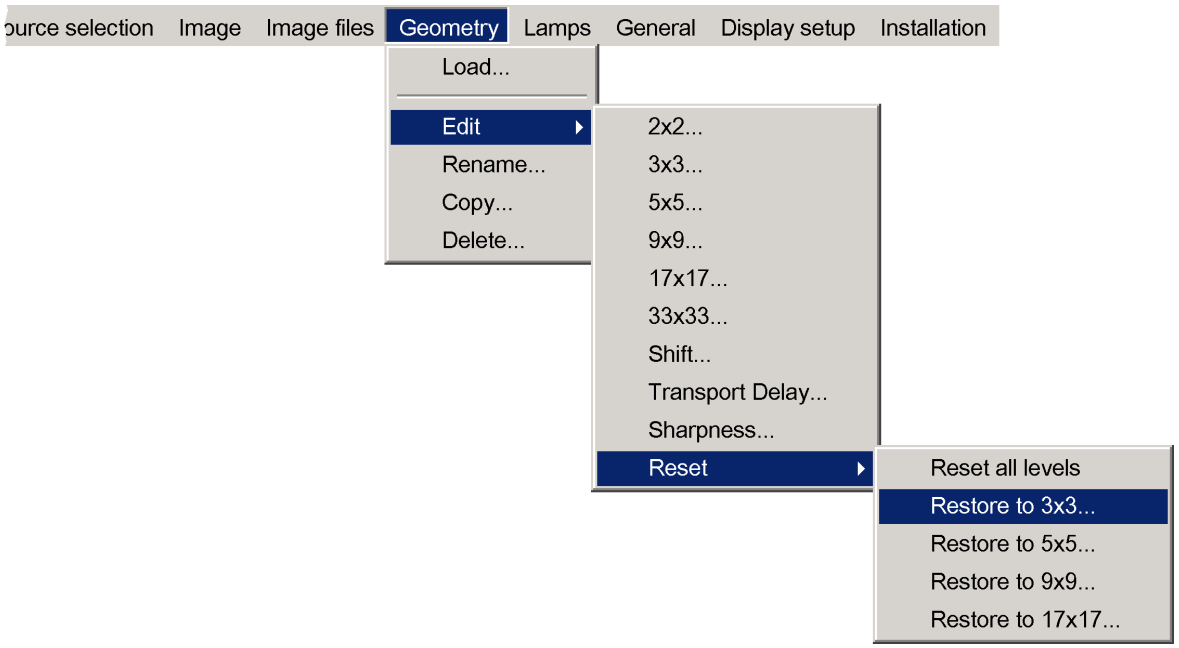


Image 7-86

The higher levels are reset. If these levels contained geometry corrections, this will be noticed in the image by a more or less accentuated jump.

5. Press **BACK** to return to the *Geometry Edit* menu.

7.5.7 Rename a Geometry File

How to rename a geometry file ?

1. Start up the Geometry menu
2. Press ↓ to select *Rename*

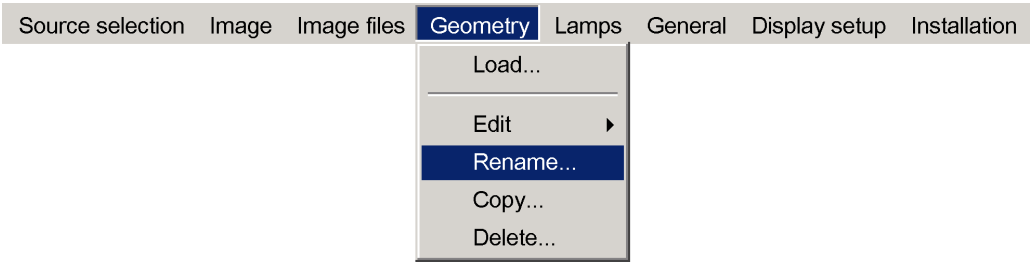


Image 7-87

3. Press **ENTER**

A dialog box is displayed

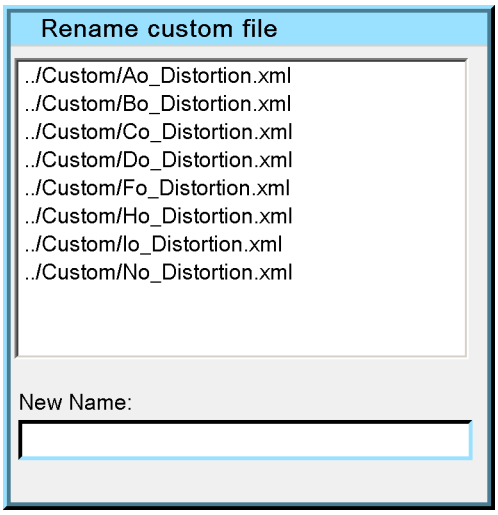


Image 7-88

4. Use the cursor key ← or → to go to the next or previous characters and use ↓ or ↑ to browse through the characters
5. Press **ENTER**

   The file is renamed.
6. Press **BACK** to return to the *Geometry Edit* menu

7.5.8 Copy a Geometry File

How to Copy a Geometry File?

1. Start up the Geometry menu
2. Press ↓ to select *Copy*

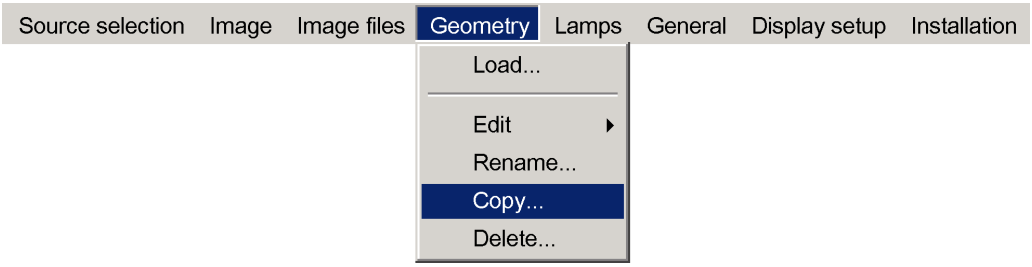


Image 7-89

3. Press **ENTER**

A dialog box is displayed

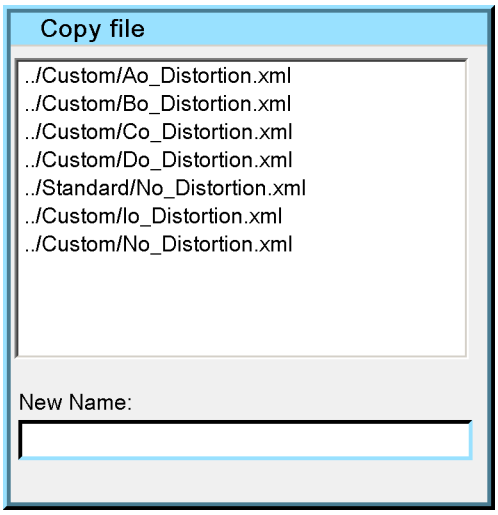


Image 7-90

4. Use the cursor key ↑ and ↓ to select the desired geometry file
5. Press **ENTER** to select.
6. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to edit and change the values, confirm with **ENTER**.
7. Press **BACK** to return to the *Geometry Edit* menu.

7.5.9 Delete a Geometry File

How to Delete a Geometry File?

1. Start up the Geometry menu
2. Press ↓ to select *Delete*

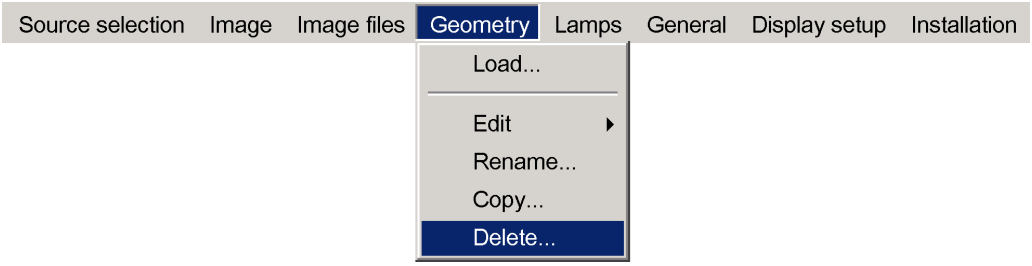


Image 7-91

3. Press **ENTER**

A dialog box is displayed

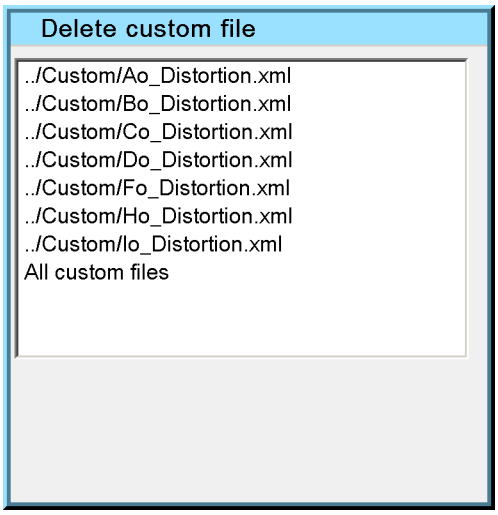


Image 7-92

4. Use the cursor key ↑ and ↓ to select the desired geometry file and press **ENTER** to select.

   A message will be displayed.

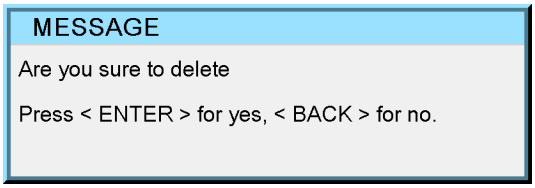


Image 7-93

5. Press **ENTER** to confirm.

   The selected file is deleted and removed from the list.

6. Press **BACK** to return to the *Geometry Edit* menu.

7.6 Lamp

CAUTION: Read the section about the warranty of lamps in relation to the runtime mode on "Warranty: continuous mode / automatic shutdown mode", page 35.

Overview

- Runtimes
- Lamp runtime warning
- History
- Reset lamp Runtime
- Lamp power mode (only for SIM 7Q & SIM 7Q HC)
- CLO Mode

7.6.1 Runtimes

Typical runtime

The lamp for this projector has its typical runtime. It must be replaced when the runtime is reached.

When this runtime is reached, a warning will be displayed on the projected image and the warranty will have expired. The warning message can be removed from the image by pressing the **Back** key on the RCU, but it will pop-up again every time the projector is switched to the active state, until the lamp has been replaced.

How to display the runtimes ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps* item
3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *Runtimes*

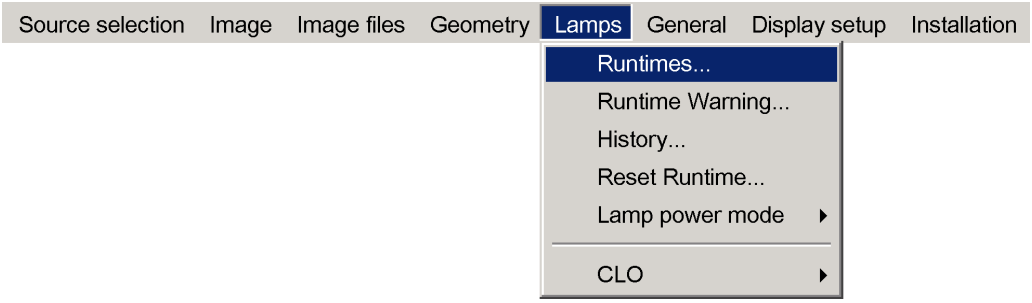


Image 7-94

5. Press **ENTER**

   A text box is displayed

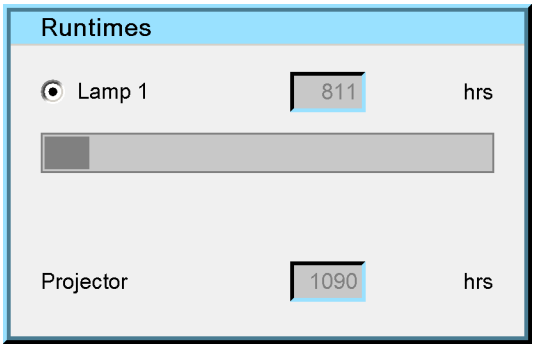


Image 7-95

7.6.2 Lamp runtime warning

What can be done ?

When the lamp has reached a predetermined runtime , a warning message will be displayed on the screen. The lamp runtime warning can be set in a range from 30 to 200 hours. The runtime warning is displayed by default at 30 hours before end of lamp lifetime. This warning message can be removed by hitting **Back** on the RCU.

When the *Warning messages* are disabled in the hidden *Service* menu, the lamp runtime warning will only be displayed at the next startup of the projector, not during a session. Enabling or disabling *TextBox* does not affect the display of the lamp runtime warning.

How to set the lamp runtime warning ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps* item
3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *Runtime warning...*

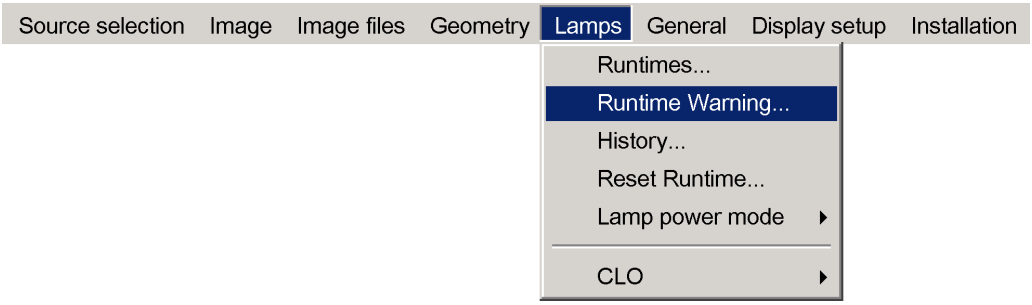


Image 7-96

5. Press **ENTER**

   A dialog box is displayed

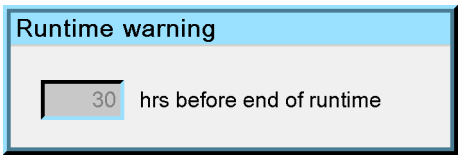


Image 7-97

6. Use ←or →, the numeric keys on the remote, or the keypad to change the runtime warning setting.

7.6.3 History

How to view the history ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps* item
3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *History*

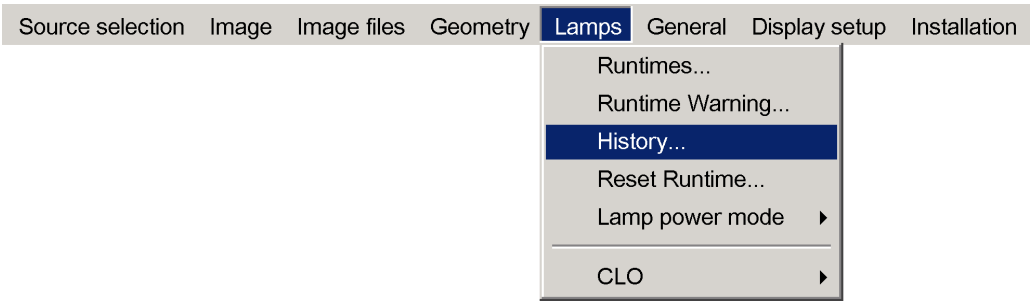


Image 7-98

5. Press **ENTER**

   A text box is displayed

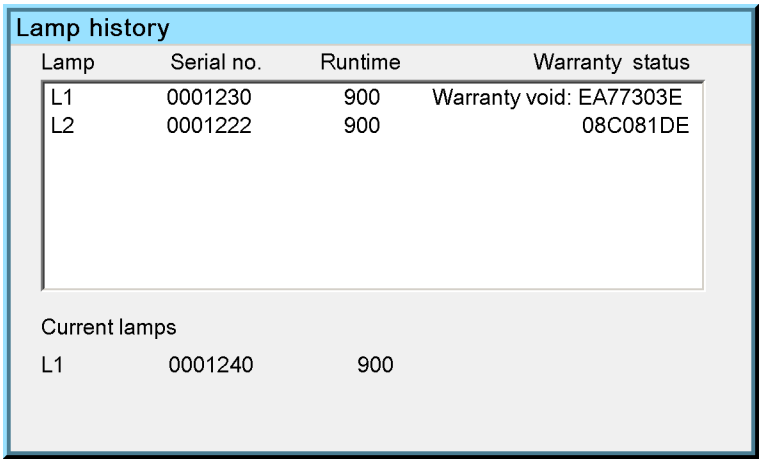


Image 7-99

7.6.4 Reset lamp Runtime

When to reset the lamp runtime ?

Reset the lamp runtime whenever you replace a lamp

WARNING: Lamp runtime reset as well as the lamp replacement can only be done by a Barco authorized technician.

How to reset the lamp runtime ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps*item
3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *Reset runtime*

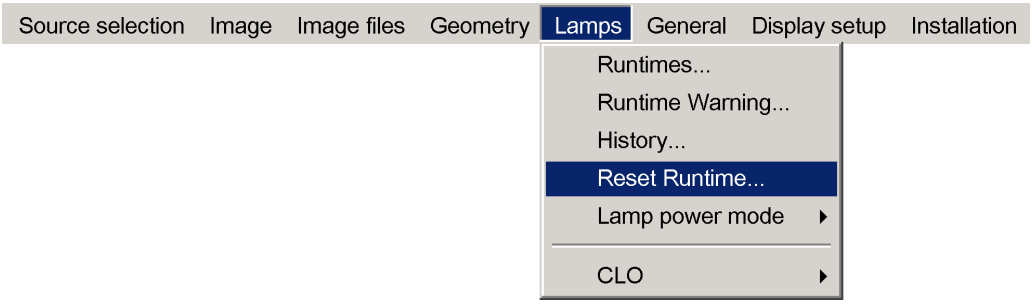


Image 7-100

5. Press → to pull down the menu
6. Use ↑ or ↓ to select the lamp to be reset
7. Press **ENTER**

   A dialog box is displayed

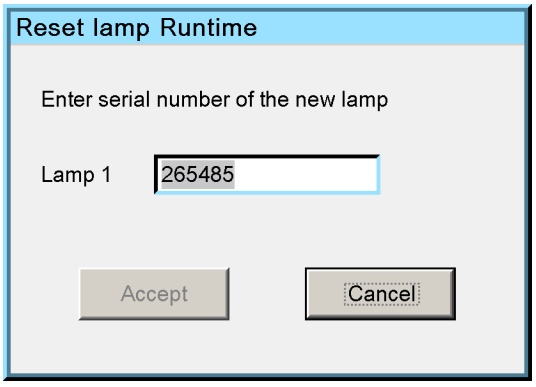


Image 7-101

8. Use ←or →, the numeric keys on the remote, or the keypad to enter the serial number of the new lamp (serial number 000000 will not be accepted).

7.6.5 Lamp power mode (only for SIM 7Q & SIM 7Q HC)

Description

The lamp can be set to *Normal* or *Economic* mode:

- *Normal*: full lamp power of 280W is set (generation 2 lamp)
- *Economic*: the lamp power is reduced to 250W (generation 2 lamp) and the light output is decreasing accordingly.

SIM 7Q HB & SIM 7Q HB&C only run in *Normal* lamp power mode and have no *Economic* lamp power mode available.

CAUTION: Switching between Normal lamp mode and Economic lamp mode can only be done 6 times and only within the first 100 hours of the lamp life! On each switch a dialog box indicates the actual amount of performed lamp power mode switches and asks for confirmation.

Once the lamp life time has exceeded 100 hours, the menu will be disabled.

How to set the lamp power mode ?

1. In the OSD, browser to *Lamps* > *Lamp power mode* > *Normal* or *Economic*.

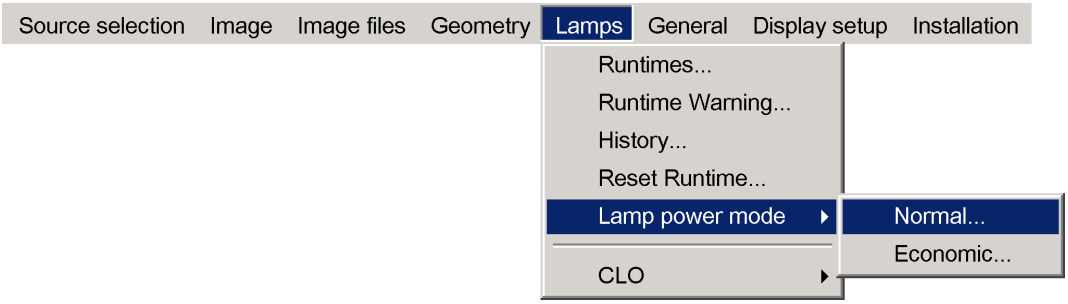


Image 7-102

2. Press **ENTER** to confirm.

   A dialog box appears:

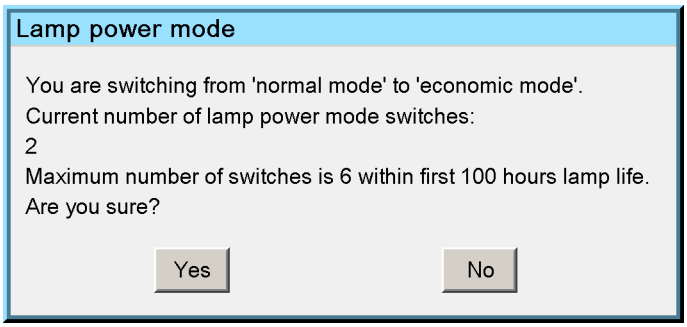


Image 7-103

3. Confirm by selecting *Yes* .

   A drop or rise in light output is noticed.

7.6.6 CLO Mode

The adjustment and calibration of the CLO is done via the hand held control unit RACU. For more information, see the dedicated system manual.

7.6.6.1 Constant Light Output (CLO)

When activating the projector with CLO enabled, the CLO will only become active after 3 minutes.

What can be done?

Constant Light Output allows to force a constant light output (set in the *CLO Target ...* menu) of the projector over a certain period. This will eliminate uncontrolled light output drop caused by natural aging of the lamp. The CLO is done by automatically adjusting the Dimmer.

How to set the CLO On or Off ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps* item

3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *CLO Mode*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *CLO*
7. Press → to pull down the menu
8. Use ↑ or ↓ to select *ON* or *OFF*

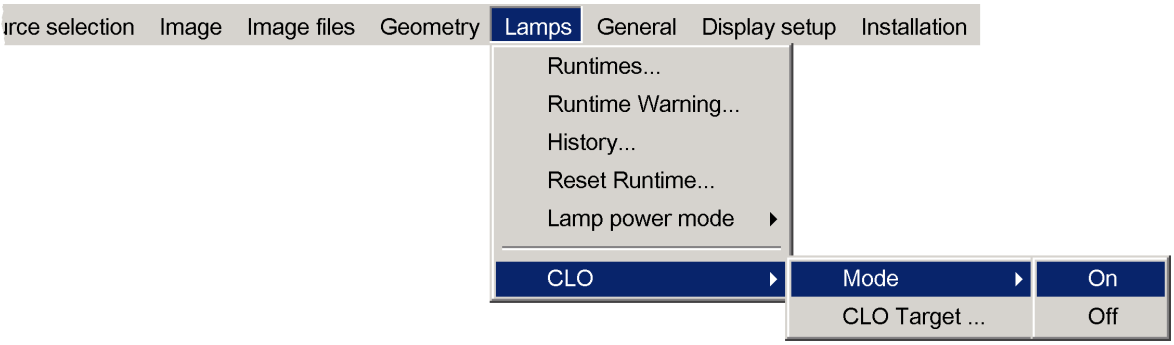


Image 7-104

9. Press **ENTER**

   A bullet shows the active setting

7.6.6.2 CLO Target

What must be done?

The light output target for the CLO is set in this menu. This value is forced on the projector provided the CLO has been set *ON* and the target can be met.

The CLO target can be set in the range 200 .. 30000 for SIM 7Q & SIM 7Q HC. This range is extended to 200 .. 40000 for SIM 7Q HB & SIM 7Q HB&C.

How to set the CLO target ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Lamps*item
3. Press ↓ to pull down the *Lamps* menu
4. Use ↑ or ↓ to select *CLO*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select *Target ...*

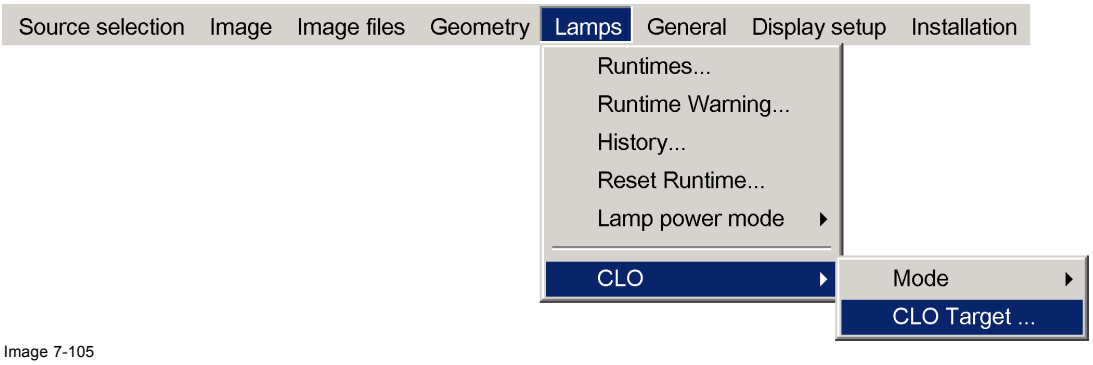


Image 7-105

7. Press **ENTER**

A dialog box is displayed

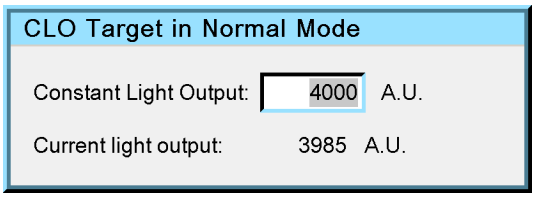


Image 7-106

8. Use ←or →, the numeric keys on the remote, or the keypad to change the target value.

7.7 General

Overview

- Pause
- Freeze
- Identification

7.7.1 Pause

Pause

The Pause function allows to interrupt the image display. The dimmer and lens opening are set to minimal position, the projector remains with full power (lamp is on) for immediate restart.

How to pause the image display ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *General*
3. Press ↓ to Pull down the General menu
4. Use ↑ or ↓ to select *Pause*

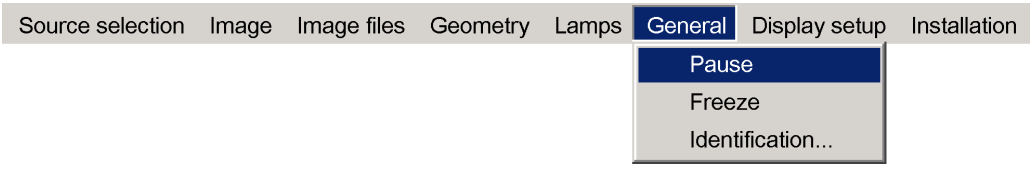


Image 7-107

5. Press **ENTER**

   The image display is stopped



The projection can also be interrupted using the PAUSE key on the RCU. To restart the image projection press PAUSE

7.7.2 Freeze

Freezing the image

With the Freeze function, the image can be frozen. To restart the image, reuse the Freeze function or press the **FREEZE** button on the remote.

How to freeze the image ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *General*
3. Press ↓ to Pull down the General menu
4. Use ↑ or ↓ to select *Freeze*

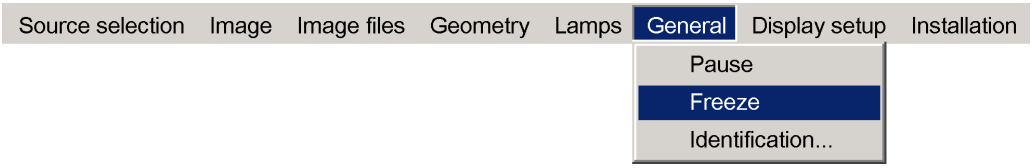


Image 7-108

5. Press **ENTER** to activate the Freeze function

The image can also be frozen using the FREEZE key on the RCU

7.7.3 Identification

The projector's identification screen

The identification screen displays the projector's main characteristics. The software version for the Master as well as for the Slave is displayed (the first version is the master software version, both versions are separated with a "–").

How to display the identification screen ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *General*
3. Press ↓ to Pull down the General menu
4. Use ↑ or ↓ to select *Identification*

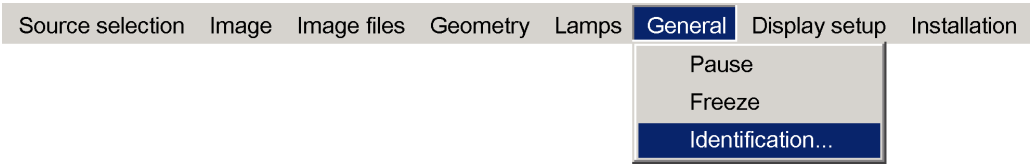


Image 7-109

5. Press **ENTER**

   On the screen appears a text box.

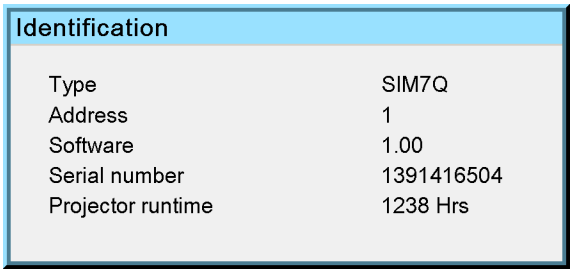


Image 7-110

6. Press **MENU** or **BACK** to exit or to go back to the previous menu

7.8 Display setup

Overview

- Textbox
- Menu bar position
- Slider box position
- Sync variance limit
- Soft edge
- Auto Image Setup
- Smearing reduction (Optional)
- True motion reproduction
- Color temperature
- Dynacolor
- Gray Level Definition
- Convergence

7.8.1 Textbox

What can be done ?

The Text box function allows to choose whether the different text boxes are displayed or not.

How to enable/disable the Textbox ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Textbox*
5. Press → to pull down the menu
6. Use ↓ or ↑ to enable (*ON*) or disable (*OFF*) the textbox

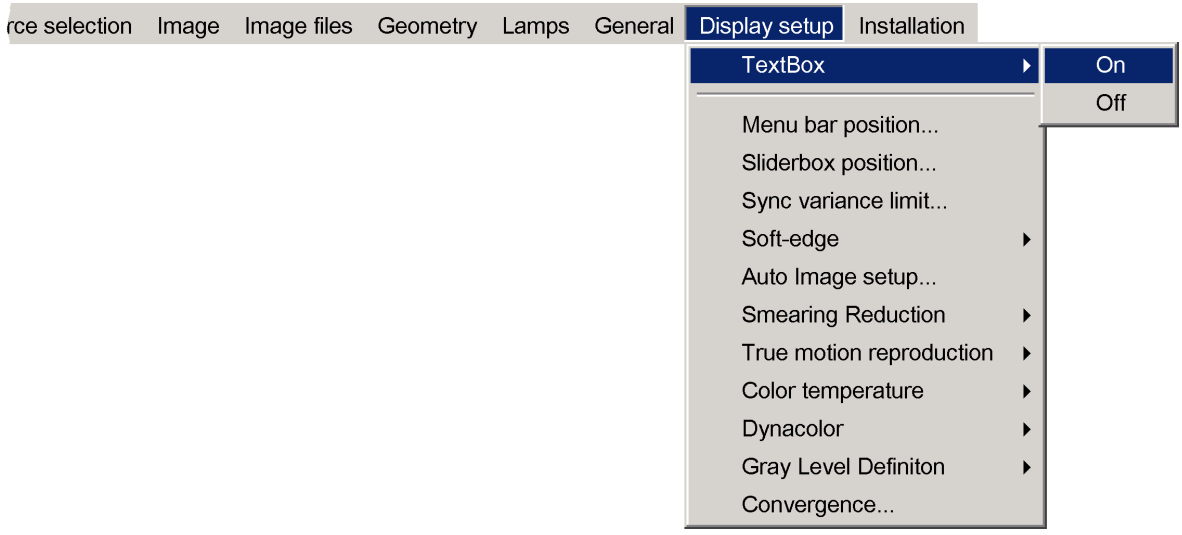


Image 7-111

7. Press **ENTER**

   A white bullet shows the active setting

7.8.2 Menu bar position

What can be done ?

The menu tool bar can be centered vertically , the range being from top of the screen to the middle of the screen. This can be useful in applications where the top image content is not displayed (soft edge region).

How to center the menu ?

1. Press **MENU** to activate the tool bar

2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Menu bar position menu*
5. Press **ENTER**

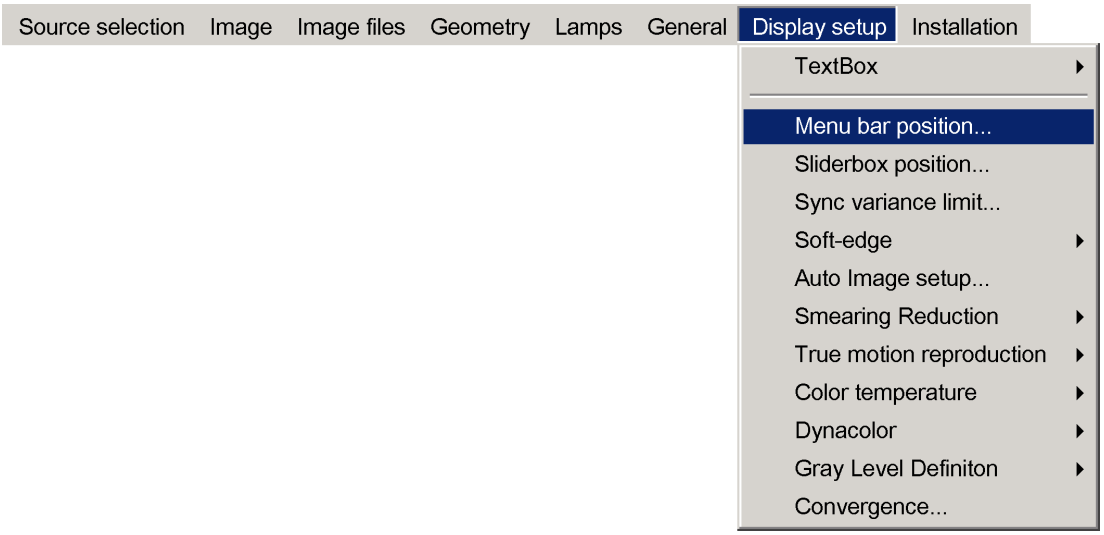


Image 7-112

6. Use ↑ or ↓ to position the Menu bar

7.8.3 Slider box position

What can be done ?

The slider box function allows to display or hide the different boxes used for instance for picture settings (contrast, ...).

How to reposition the slider box?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Slider box position*

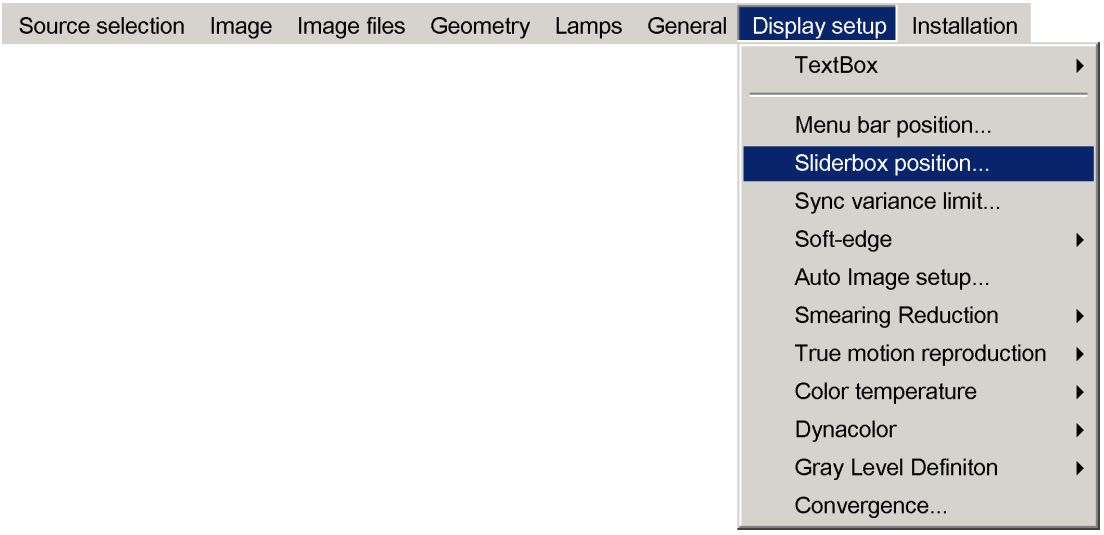


Image 7-113

5. Press **ENTER**

   A slider box is displayed. Use the 4 arrow keys to drag the box to the desired position.

There is a coarse and a fine adjustment of the position, use ENTER (when slider box is displayed) to switch between the two.

7.8.4 Sync variance limit

What can be done ?

The sync variance limit allows to generate a certain delay between the incoming signal and the processing of it. It is expressed in microseconds.

The reason why this delay is needed is because the signal processing in the projector is faster than the source signal itself.

If the sync variance limit value is set too low, the previous frame will be processed. This implies that the delay between incoming signal and display of it will be large (16 ms). No image distortion will occur however.

If the sync variance limit value is only just high enough (= critical value), it might be possible that sometimes the actual frame is processed and sometimes the previous frame is processed. This will lead to a *jumping* image or frame tearing (= image distortion).

The best value for the sync variance limit is about 200 microseconds higher than the critical range. This guarantees the display of the actual frame without distortion and with minimum delay.

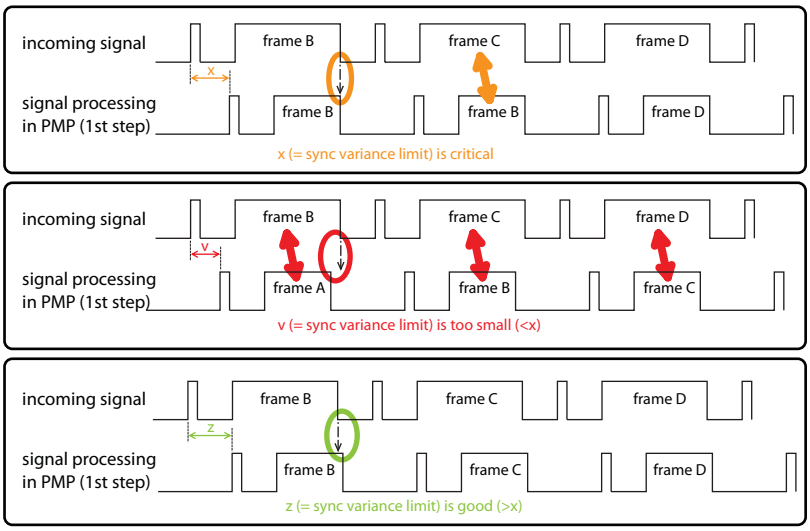


Image 7-114
Sync variance limit

How to adjust the Sync variance limit ?

1. Make sure the required geometry file is active and select the scaled pattern *Moving hatch*
2. Press **MENU** to activate the Tool bar
3. Press → to select the *Display setup* item
4. Press ↓ to Pull down the *Display setup* menu
5. Use ↑ or ↓ to select *Sync variance limit...*
6. Press **ENTER**

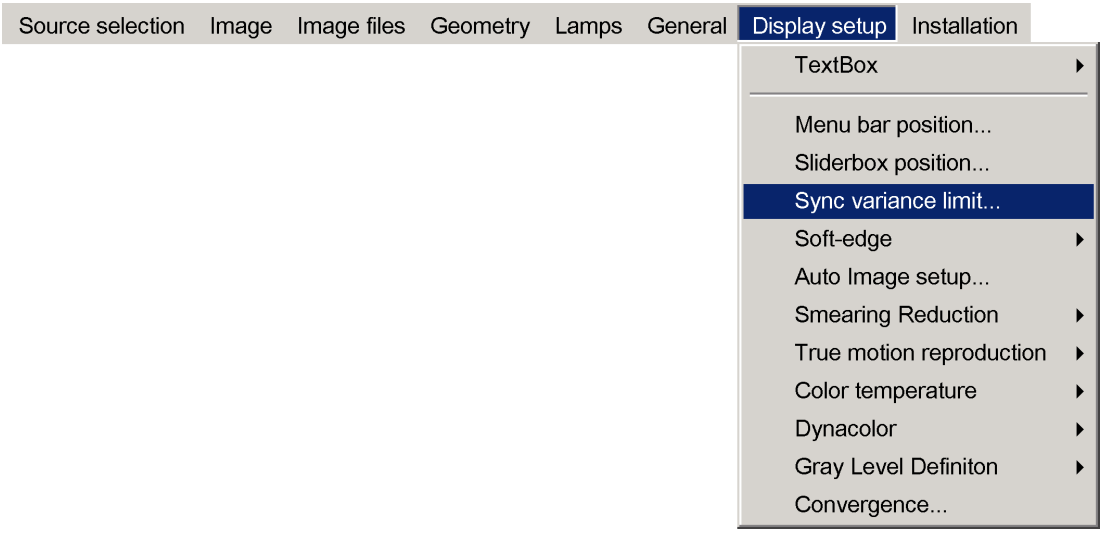


Image 7-115

A dialog box is displayed

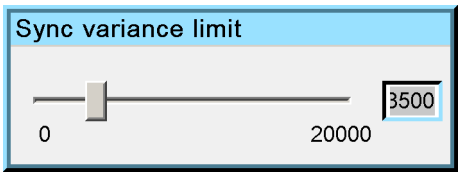


Image 7-116

7. Starting at the lowest value, increase the value in steps of 100 until you get to the range where frame tearing is clearly visible
   Tip: *Use the arrow keys, the numeric keys on the remote, or the keypad to change the Sync variance limit*
8. Further increase the value until this frame tearing disappears again
9. Increase the actual value by 100 or 200

7.8.5 Soft edge

Overview

- Introduction
- Accessing the Soft edge menu
- Soft edge edit
- Black level
- Blanking

The soft edge adjustment can be done on the hand held remote control unit RACU as well.

7.8.5.1 Introduction

What can be done?

When working in a multichannel setup the Soft edge feature enables an image blending that gives the appearance of a single image, thus achieving realistic immersion for the majority of simulation and virtual reality applications.

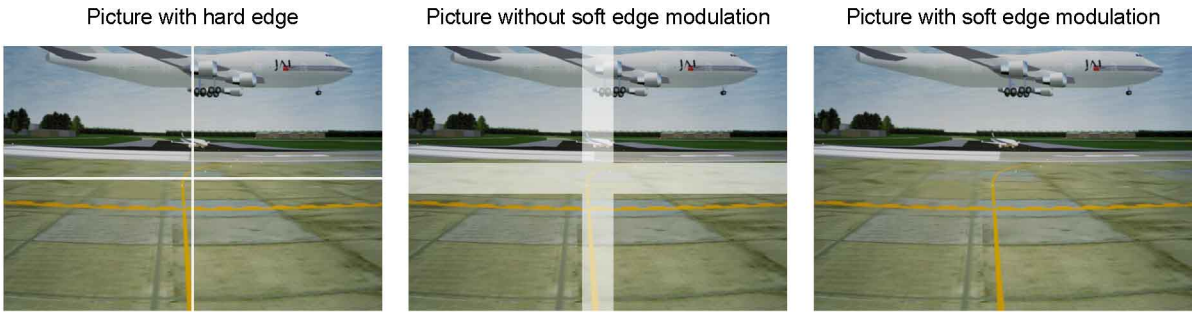


Image 7-117
Soft edge : purpose

What is the Basic Principal of (electronic) Soft Edge ?

The principle of edge blending is achieved 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.

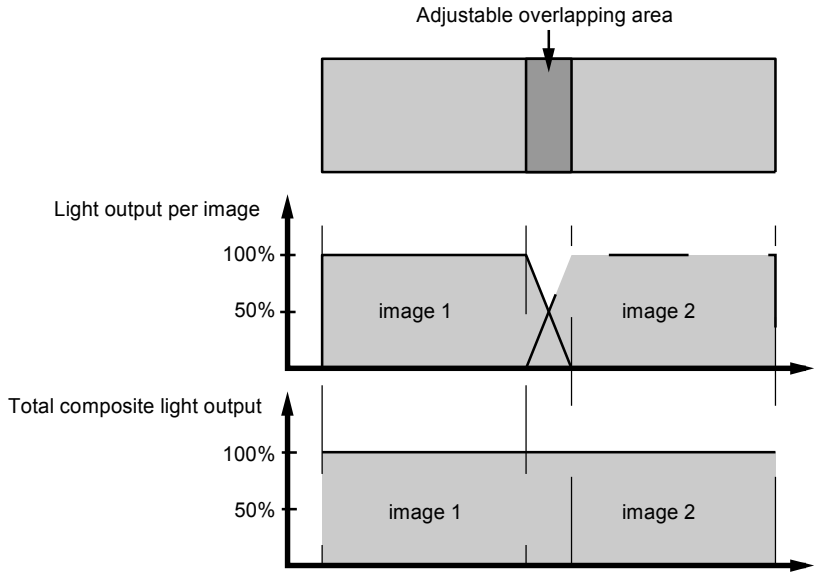


Image 7-118
Soft Edge Basic Principle

Internal versus external (Alpha planes)

The projector offers 2 methods to achieve soft edging :

1. Internal soft edges : the contour and shape can be adjusted in the projector using the soft edge edit wizard
2. External Alpha planes : An external file is sent to the projector and is memorized. This file contains data corresponding to the shape contour of the soft edge

Soft Edge Preparations

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

- Geometry
- Color Matching (Input Balance, Dynacolor ...)

When projecting on a cylindrical screen, the adjustments mentioned above can be done by using the projector adjustments in combination with Polaris.

Polaris is a Test Pattern Generator software that can generate a user-defined test pattern that is used to align projection systems. It also has the ability to generate predefined patterns for standardized projection systems. The software is developed to run on IRIX (Order numbers for Polaris: R9898300 for a 6 months license, R9893301 for a full license).

Note that the soft edges are placed on the distorted image i.e. it surrounds the limits of the distorted image.

7.8.5.2 Accessing the Soft edge menu

How to access the Soft edge menu ?

1. Press **MENU** to activate the Tool bar
2. Press → to select *Display setup*
3. Press ↓ to pull down the menu
4. Push ↓or ↑ to select *Soft edge*
5. Push the → key to pull down the menu.

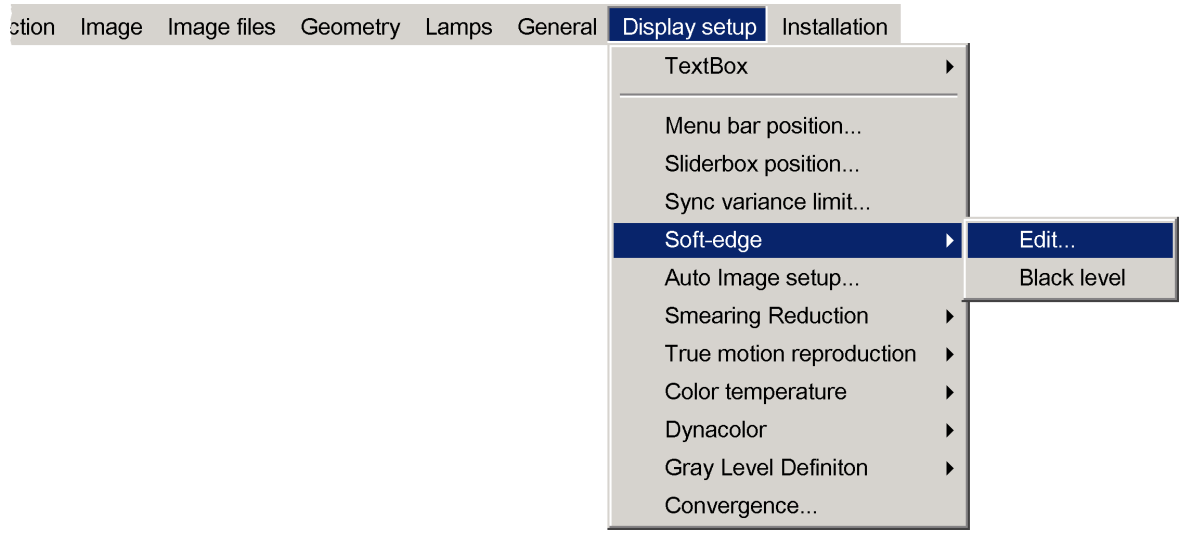


Image 7-119

7.8.5.3 Soft edge edit

Overview

- The soft edge edit wizard
- The soft edge edit modes
- Creating/editing a soft edge
- Alpha planes

7.8.5.3.1 The soft edge edit wizard

The geometry wizard

When entering the *Edit* mode, the *Edit* dialog box is displayed.

Description of the Edit dialog box

An intuitive user interface is used to perform all the Soft edge adjustments.

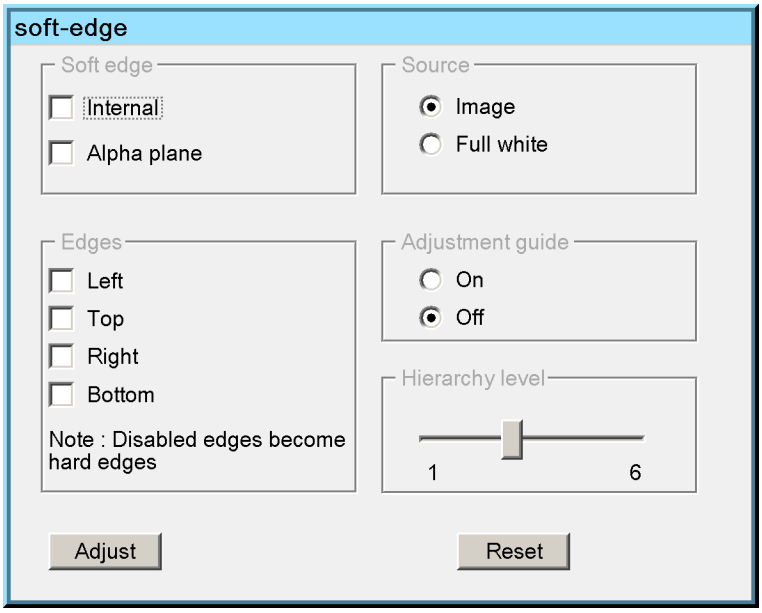


Image 7-120

Field /adjustment	Description	Notes
Planes	Allows to select the type of soft edges : - internal soft edge - Alpha-Beta planes	
Edges	It is possible to select one or more of the 4 edges of the image: Left/Top/Right/Bottom	A Disabled edge is a hard edge. Adjusting a hard edge results in a blanking adjustment. See blanking
Source	The background image on which the soft edge adjustment is applied can be the source or a full white image (pattern)	The procedures in this manual are explained using a full white background
Adjustment guide	An adjustment guide consisting of a 4 brightness graduated bars can be applied on the background image during the soft edge adjustment	
Hierarchy level	Allows to select the level of the adjustment.	
Reset	The soft edge shape is set to default settings.	Soft edge shape follows geometry settings, the shape of the soft edge is set to 12.5%, enabled edges stay enabled, disabled edges stay disabled

Table 7-4
dialog box legend

7.8.5.3.2 The soft edge edit modes

The Edit Modes

- Select mode : allows to select the desired point using the ←and→ arrows or to select the desired level or edge using the ↓and ↑ arrows.
- Adjust mode : allows to perform the correction (in real time) using the arrows.
- Edit mode : allows to select the desired control (edit box, ...) in the dialog box.
- Change mode : allows to change the values in the edit boxes of the dialog box.

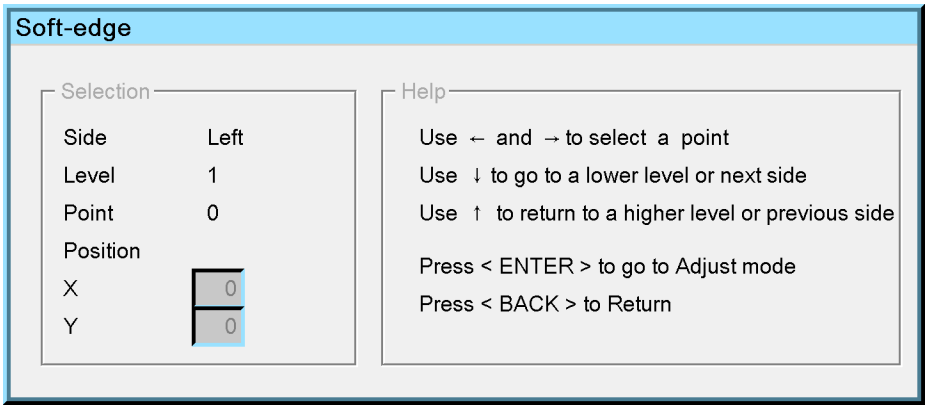


Image 7-121

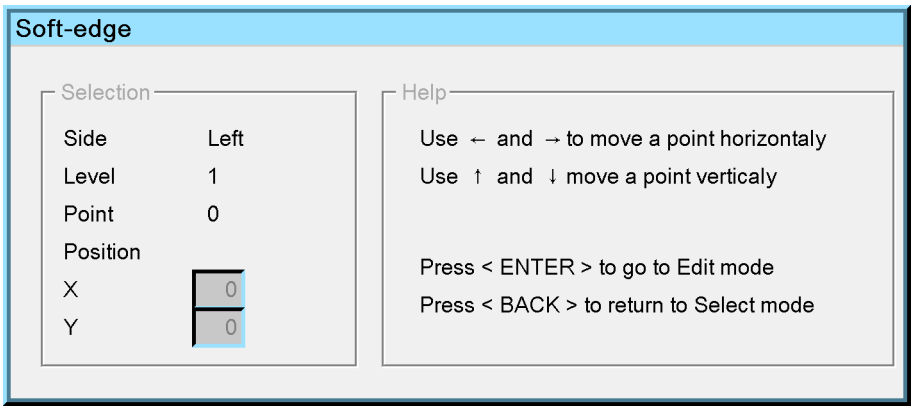


Image 7-122

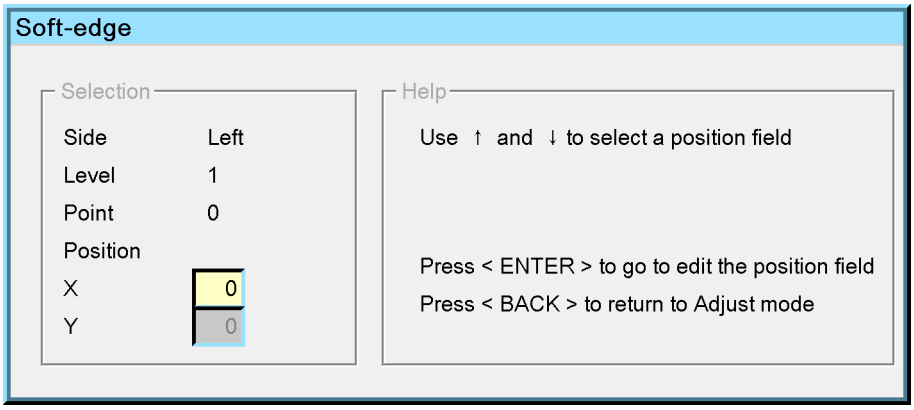


Image 7-123

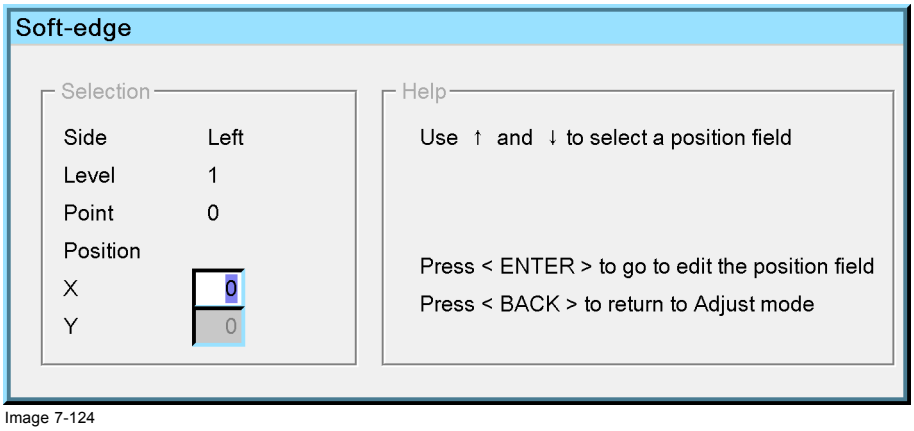


Image 7-124

How to select an Edit Mode ?

1. When the *Edit* dialog box is displayed, the *Select* mode is selected by default.
2. To go to the next mode press **ENTER**.
3. To return to a previous mode use **BACK**

7.8.5.3.3 Creating/editing a soft edge

Description

In this example we will create an internal soft edge where we will adjust the left side zone (displace one point along the x axis).

How to start up the edit dialog box ?

1. Press the **MENU** key to activate the Tool bar.
2. Push the cursor key ← or → to highlight *Display setup*
3. Push the ↓ key to pull down the menu.
4. Push ↓or ↑ to select *Soft edge*
5. Push the → key to pull down the menu.
6. Push the cursor key ← or → to highlight *Edit...*

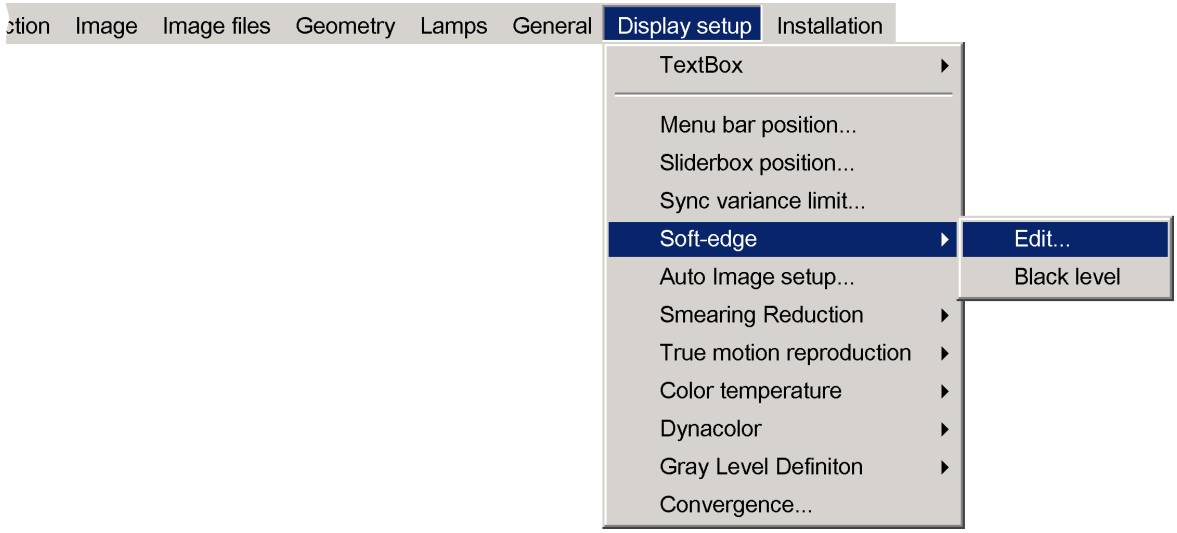


Image 7-125

7. Press **ENTER**

   The soft edge dialog box will be displayed.

How to select the soft edge type ?

The internal soft edge type is selected by default

1. Push ↓or ↑ to select the *Internal* check box

The item is focused

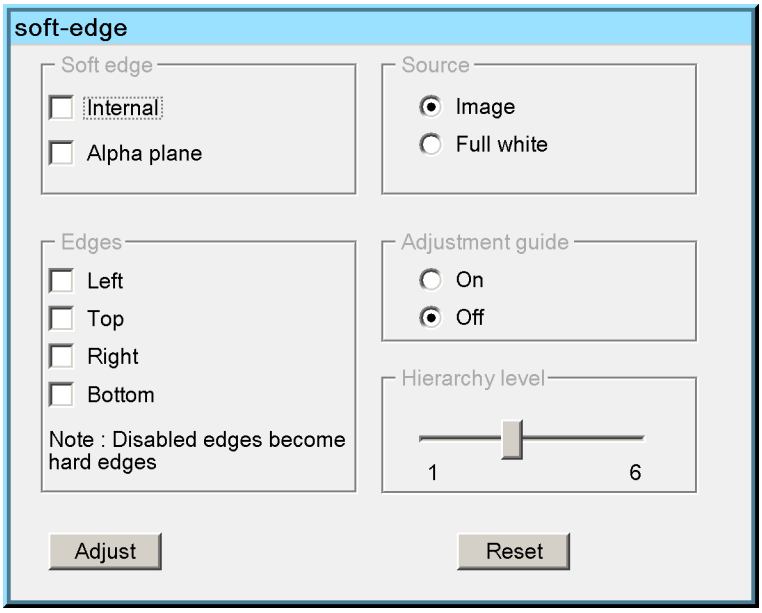


Image 7-126

2. Press **ENTER**

The internal soft edge is selected

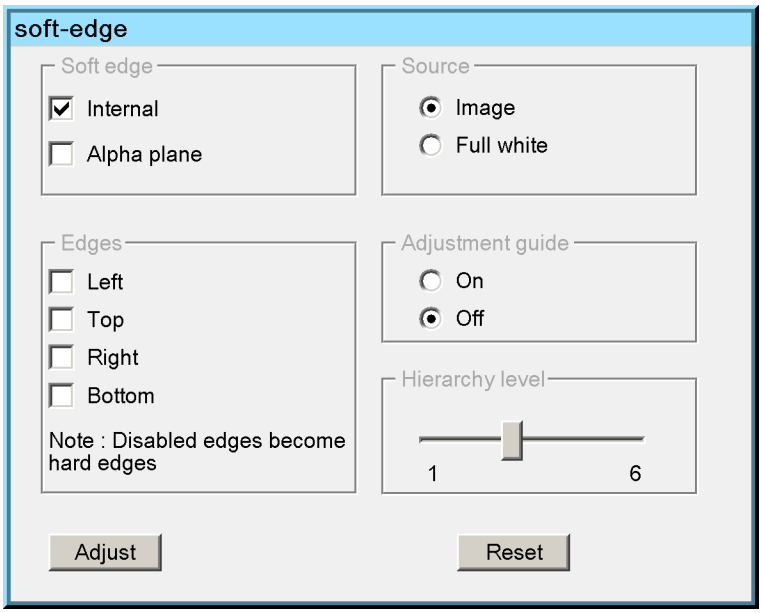


Image 7-127

How to enable the soft edges ?

1. Push ↓or ↑ to select the desired *Edges* check box

The item is focused

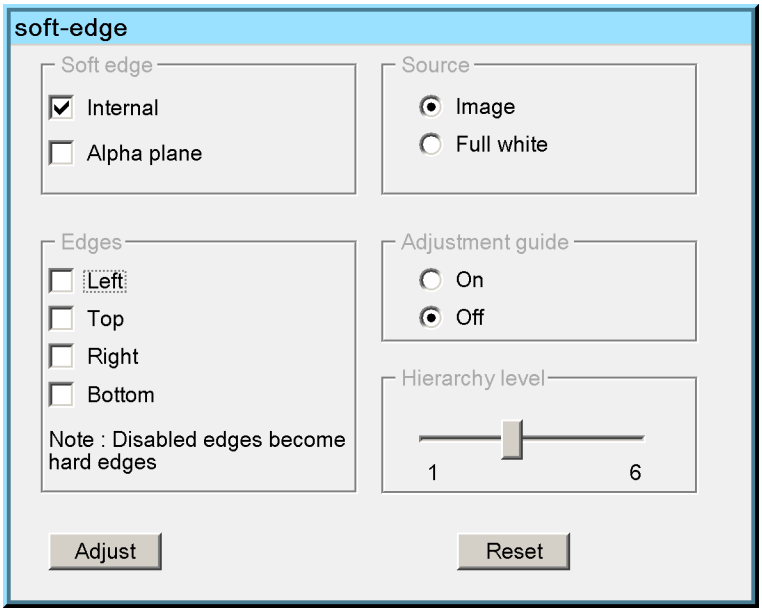


Image 7-128

2. Press **ENTER**

The selected check boxes are checked

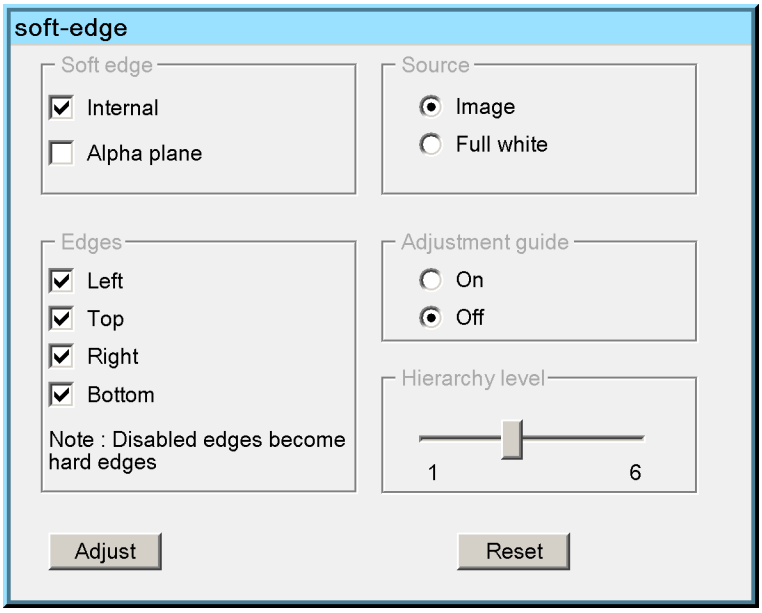


Image 7-129

3. Do the same for the other desired edges

The default soft edge is applied on the selected edges

How to select the source (background) ?

1. Push ↓or ↑ to select the desired *Source* check box. in this case we will perform the adjustment on a Full white background.

The item is focused

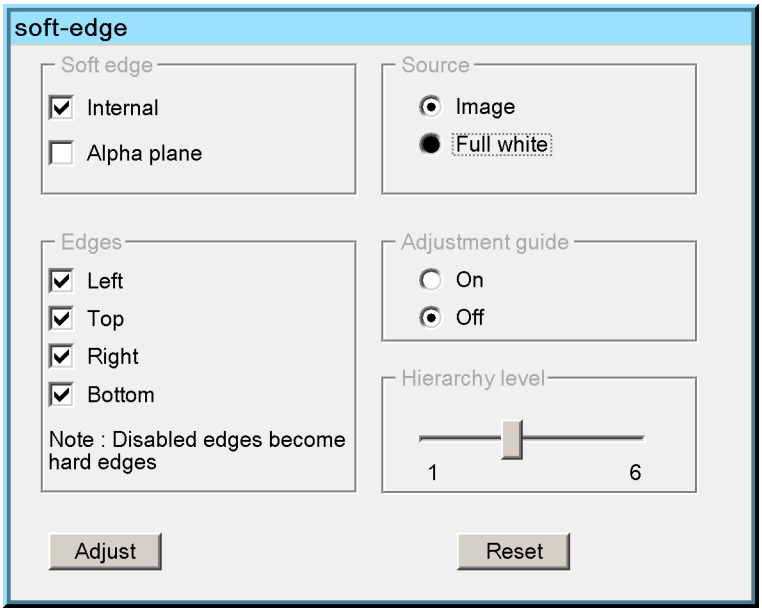


Image 7-130

2. Press **ENTER**

The selected check box is checked and a full white image is displayed with the soft edges on the 4 sides

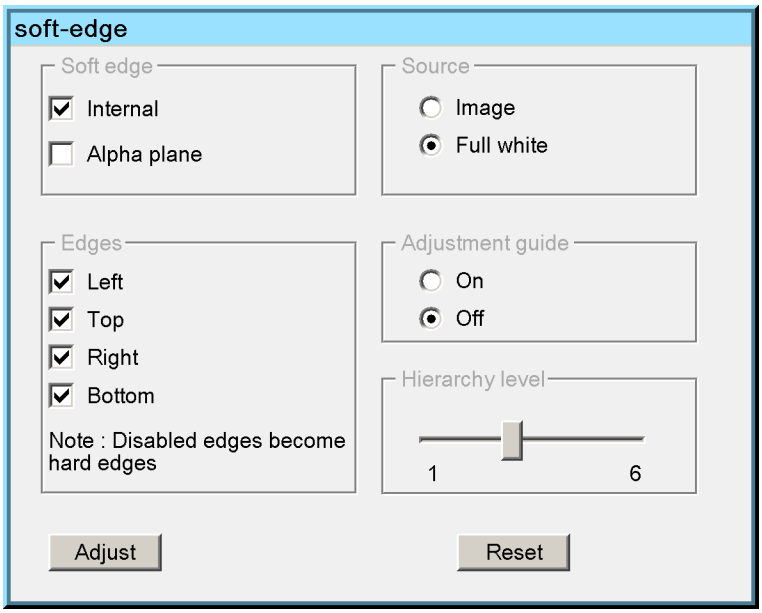


Image 7-131

How to enable the adjustment guide ?

1. Push ↓or ↑ to select the check box ON to enable the adjustment guide

The item is focused

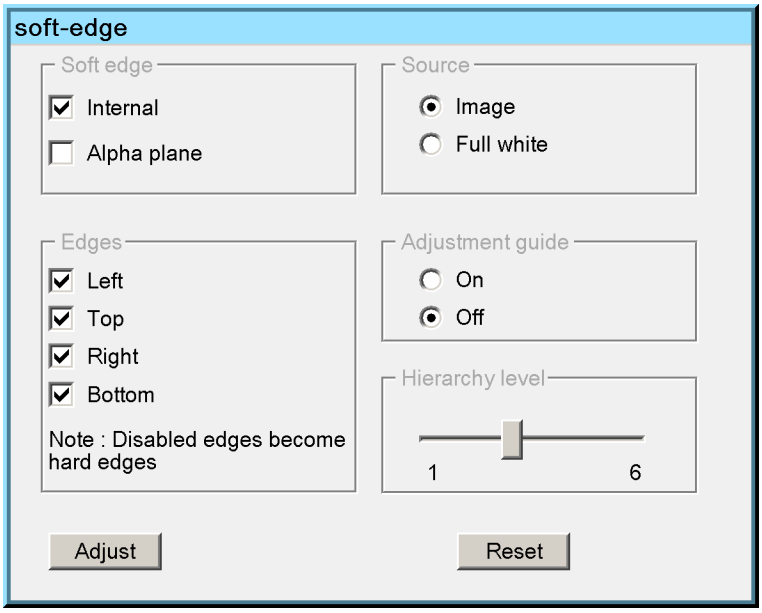


Image 7-132

2. Press **ENTER**

The selected check box is checked and the guide is displayed (vertical and horizontal grey scale bars)

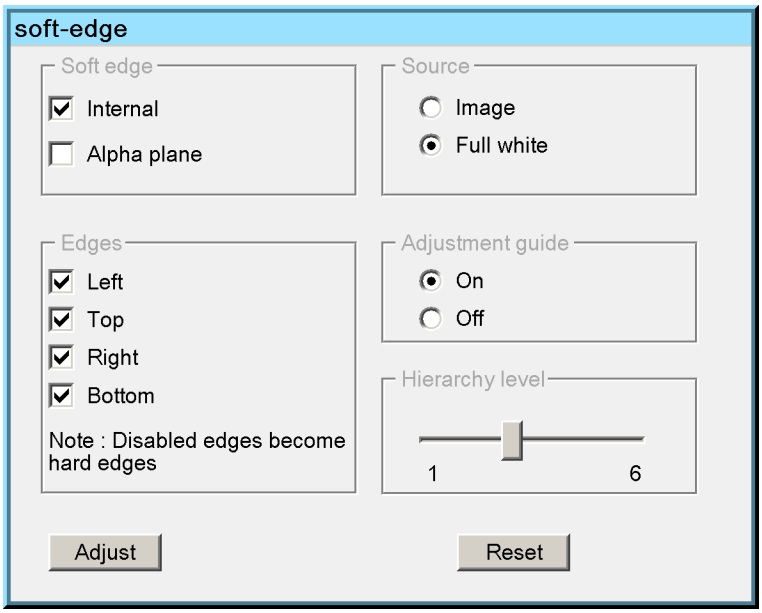


Image 7-133

How to set the hierarchy level ?

1. Push ↓or ↑ to select the hierarchy level slider box

The item is focused

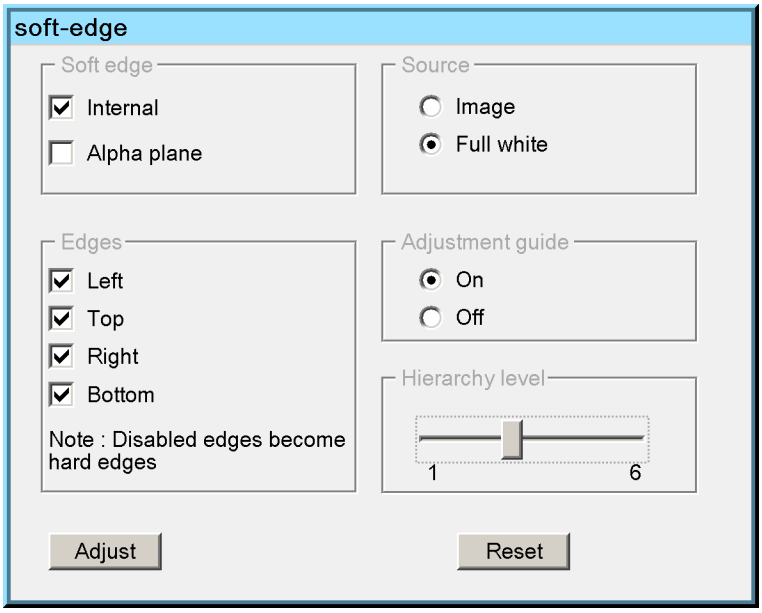


Image 7-134

2. Use the ← and → to select the level (from 1 to 6)

How to adjust the soft edge ?

1. Press **Adjust**

   An Edit dialog box is displayed and the left side soft edge zone is selected. The default level is level 1.

2. Use the ← and → to select a point within the same level and side to be displaced
   Note: *The ↑ and ↓ can be used to switch to another level or to another side of the image.*

3. Press **ENTER** to go to the Edit mode

4. Use the ↑ and ↓ arrows to select the desired field

5. Press **ENTER** to edit the field

   The edit field is put in the edit mode

6. Use the arrows or the digits to fill in the desired *x* position of the selected point (in this case the left top point of level 1)

7. Press **ENTER** to confirm

   The selected point is displaced to the new position (x=100 ; Y=0).

8. Press **BACK** to exit

   A dialog box is displayed. Press **ENTER** to confirm

All the points of the higher levels (level 2, ...) are altered by this adjustment. The points that belong to the same level (level 1) remain in the same position (anchors).

7.8.5.3.4 Alpha planes

Alpha plane specification

An alpha plane is a bitmap file which will be applied to the image in order to obtain a desired soft edge. The file must be a *.TIFF* file and it must have the same resolution as the projector's native resolution.

Uploading an alpha plane file

Alpha planes must be uploaded in the following projector directory (accessible via FTP) :

/D/display/Softedge

The file must be named as follows :

alpha.tiff

The alpha plane will only be applied if it has been activated in the *Edit...* menu's dialog box (see procedure above)

How to activate an alpha plane ?

1. Press the **MENU** key to activate the Tool bar.
2. Push the cursor key ← or → to highlight *Display setup*
3. Push the ↓ key to pull down the menu.
4. Push ↓or ↑ to select *Soft edge*
5. Push the → key to pull down the menu.
6. Push the cursor key ← or → to highlight *Edit...*

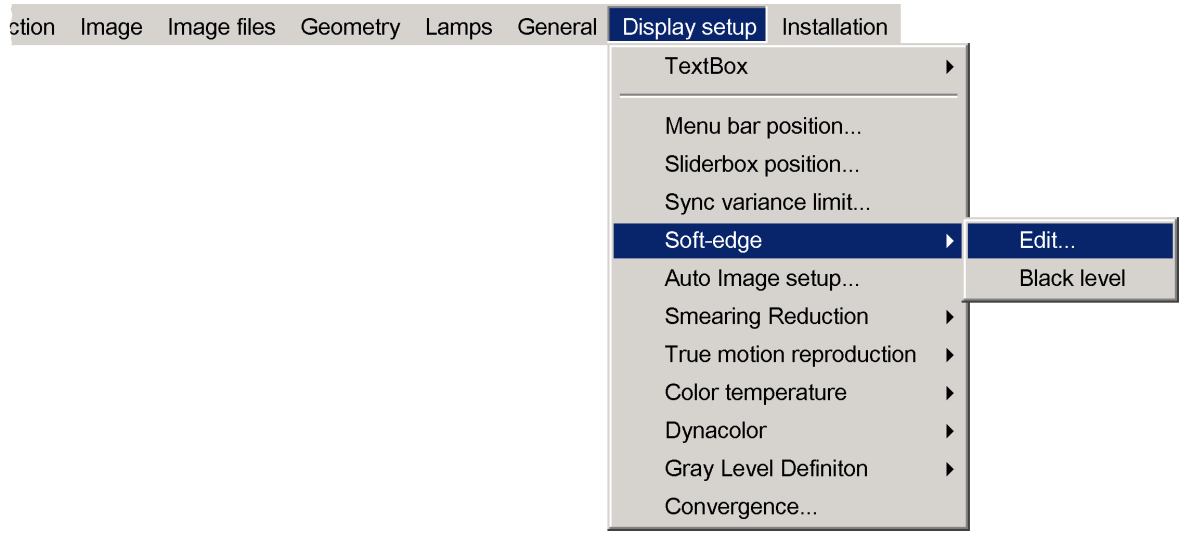


Image 7-135

7. Press **ENTER**

   A dialog box will be displayed.

8. Use the arrows to select the *Alpha planes* check box and press **ENTER**

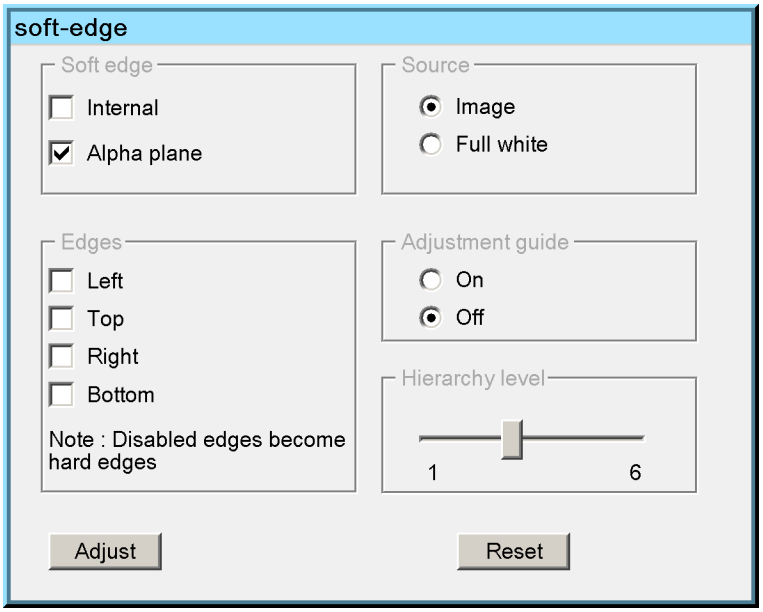


Image 7-136

Note: *It takes some time for the alpha plane to be applied*

7.8.5.4 Black level

Overview

- Introduction
- Internal black level
- Beta planes

7.8.5.4.1 Introduction

Brightness uniformity

In a multi channel system the brightness can vary over the different channels/projectors. The brightness level can be matched using :

1. CLO: in this case the light power is matched over the different projectors, see *CLO* in the *Lamps* section
2. Black level : this will act on the brightness of the “black” color of the image part situated outside the soft edge zones.

Internal black level versus Beta Planes

In the same way as for the soft edge adjustment (Internal vs Alpha planes) this black level adjustment can be fixed **internally** by using a dialog box or externally by uploading a user defined **Beta plane**. This beta plane will contain the values for the brightness *offset* to be applied to the image.

Both methods will allow to compensate for the typical double brightness phenomenon in the soft edge zones by increasing the brightness of the rest of the image.

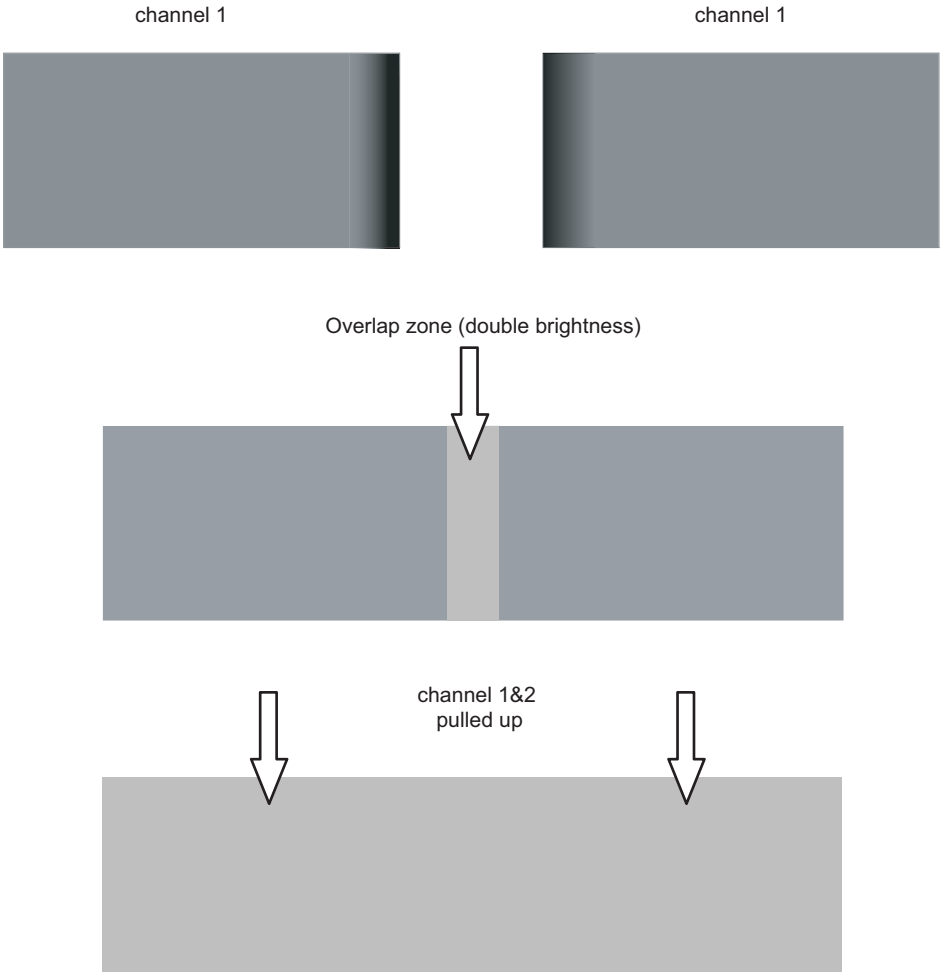


Image 7-137
Black level : double brightness compensation

It is worth noting however, that (internal) black level (via the dialog box) is to be used for simple linear soft edge zones (like in the illustration above). Curved soft edge zone should be done using (external) beta planes.

The Black level adjustment has to be done for all the channels (projectors)

7.8.5.4.2 Internal black level

What can be done ?

Internal black level can be adjusted via the projector's software using a dialog box. The dialog box allows to add an offset to the black level of the image in the zones outside the soft edge zones. The range goes from 0 to 255.

How to adjust the internal black level ?

1. Press the **MENU** key to activate the Tool bar.
2. Push the cursor key ← or → to highlight *Display setup*
3. Push the ↓ key to pull down the menu.
4. Push ↓or ↑ to select *Soft edge and alpha beta planes*
5. Push the → key to pull down the menu.
6. Push the cursor key ← or → to highlight *Black level...*

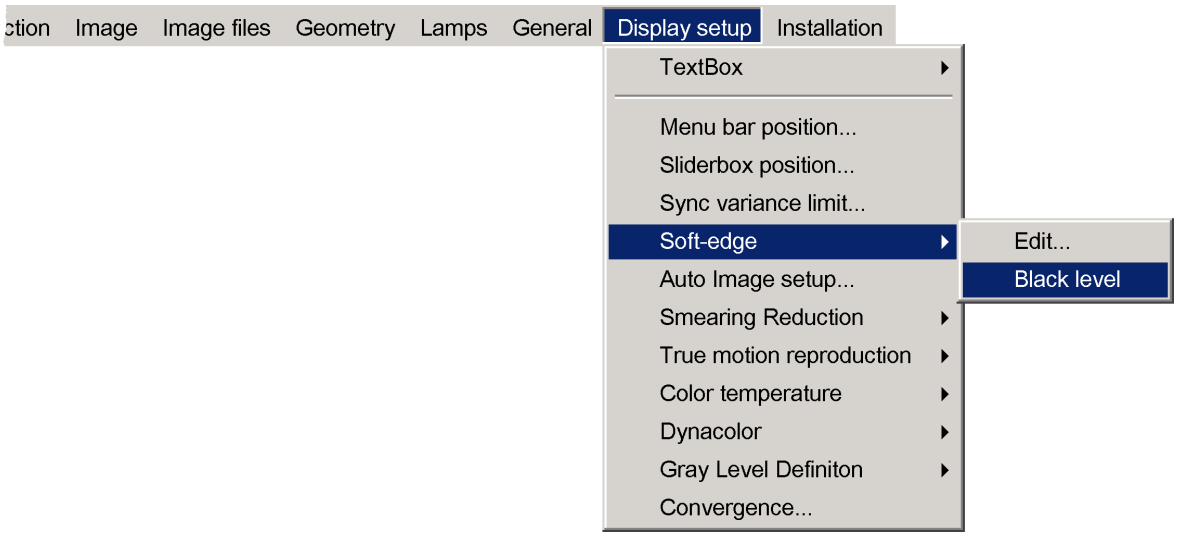


Image 7-138

7. Press **ENTER**

   A dialog box will be displayed.



Image 7-139

8. Use the arrows to select the *Internal* check box and press **ENTER**
   Note: *It will take a certain time for the internal black level to be applied*
9. Use the arrows or digits to fill in the desired values for the black level.

7.8.5.4.3 Beta planes

Beta plane specification

A beta plane is a bitmap file which will be applied to the image (outside the soft edge zones) in order to obtain a desired brightness level. The file must be a *.TIFF* file and it must have the same resolution as the projector's native resolution. It may be compressed.

Uploading a Beta plane file

Beta planes must be uploaded in the following projector directory (accessible via FTP) :

/D/display/Softedge

The file must be named as follows :

beta.tiff

The free storage capacity on the D-drive is about 8 MB. it is needed to store the image files, geometry files, factory backup, Alpha planes and Beta planes. Practically, about **6 MB** will be available for the Alpha + Beta plane.

The Beta plane will only be applied if it has been activated in the *Black level...* menu's dialog box (see procedure below)

How to activate a beta plane ?

1. Press the **MENU** key to activate the Tool bar.
2. Push the cursor key ← or → to highlight *Display setup*
3. Push the ↓ key to pull down the menu.
4. Push ↓or ↑ to select *Soft edge*
5. Push the → key to pull down the menu.
6. Push the cursor key ← or → to highlight *Black level...*

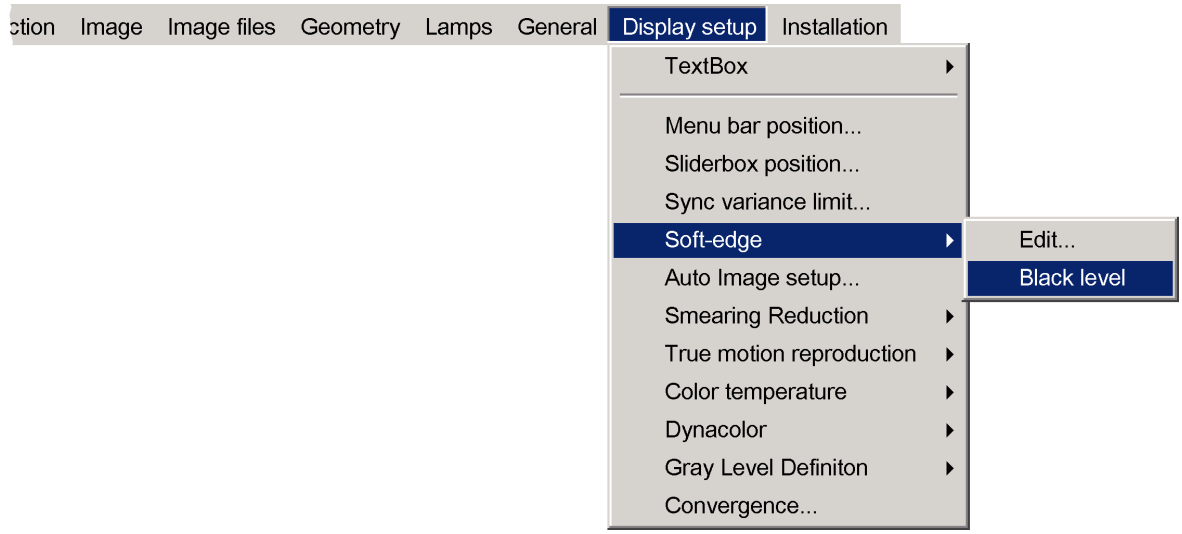


Image 7-140

7. Press **ENTER**

   A dialog box will be displayed.



Image 7-141

8. Use the arrows to select the *Beta planes* check box and press **ENTER**
   Note: *It will take a certain time for the beta plane to be applied*

7.8.5.5 Blanking

What can be done?

Blanking or hard edging affects only the edges of the image and is used to frame the projected image on the screen and to hide unwanted image information (or noise) or to put two images next to each other without overlap (soft edge).

The adjustment of hard edges is done in the same menu as the soft edge with the *Edges* disabled (unchecked).

How to setup a hard edge shape ?

1. Press the **MENU** key to activate the Tool bar.
2. Push the cursor key ← or → to highlight *Display setup*
3. Push the ↓ key to pull down the menu
4. Push ↓or ↑ to select *Soft edge*
5. Push the → key to pull down the menu.
6. Push the cursor key ← or → to highlight *Edit left...*

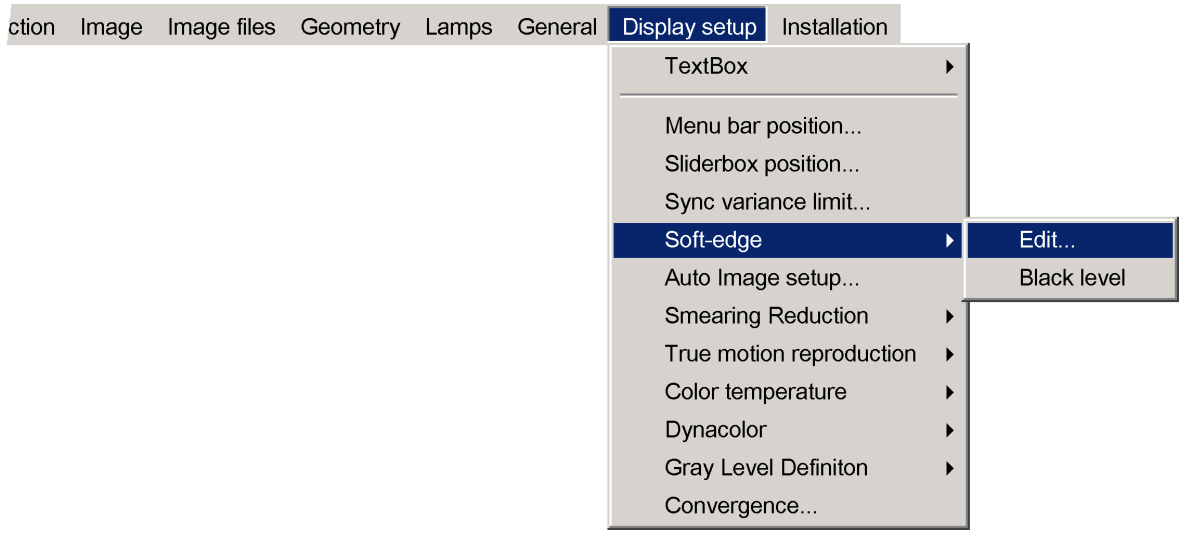


Image 7-142

7. Press **ENTER**

   The soft edge dialog box will be displayed.
8. Uncheck all the edges
9. Adjust the soft edge as desired (same procedure as above)
10. Press **BACK** to return to the *Display setup* menu.

7.8.6 Auto Image Setup

What can be done ?

Auto Image allows to detect automatically the characteristics of the source (total pixels per line,...) and uses this information to adapt the image to the display.

Auto Image can adapt the image based on following data :

- Total pixels/ lines
- Start pixel/lines
- Phase
- Contrast/brightness levels

Auto Image works only for data signals.

To launch Auto Image, see *Auto Image* in the *Image files* menu

How to set up Auto Image?

1. Press **MENU** to activate the Tool bar

2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Auto Image setup*

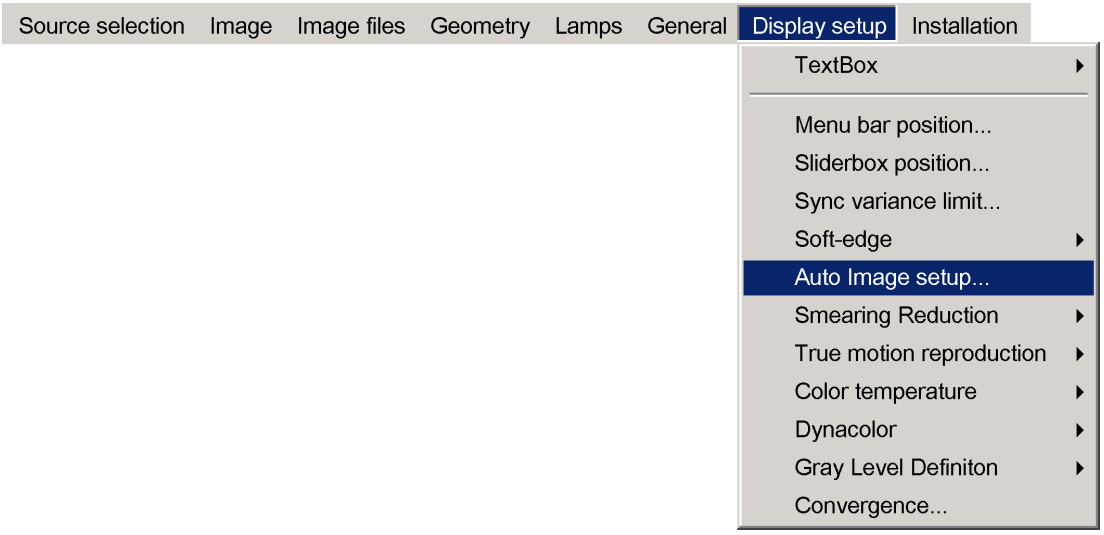


Image 7-143

5. Press **ENTER**

   A dialog box is displayed.

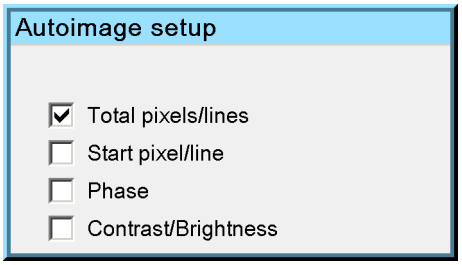


Image 7-144

6. Use the arrow keys to select the desired check box and press **ENTER** to activate or deactivate the item.

7.8.7 Smearing reduction (Optional)

Overview

- Introduction
- Enabling Smearing reduction
- Adjusting the phase

7.8.7.1 Introduction

Smearing

Smearing is a 'trail' effect produced by fast moving objects in a displayed image. Any fast moving object will look blurred or smeared along the direction of relative motion.

What can be done ?

Because of its inherent characteristics (LC response time), liquid crystal based display devices are subject to smearing on fast moving images. Because of its fast response time and refresh rate, LCoS displays are less sensitive to smearing than other comparable raster scanning devices. However in order to decrease the smearing effect even more, a smearing reduction system is installed in this projector. This smearing reduction system will reduce the 'trail' effect in fast moving objects.



Image 7-145
With smearing (Smearing reduction off)



Image 7-146
Without smearing (Smearing reduction on)

WARNING: During the switch off of the smearing reduction system the image will present a flicker.

Some people may have seizures or blackouts triggered by light flashes or patterns.

Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should consult a doctor before using the projector with the smearing system enabled!

Stop looking to the image and consult a doctor if you have any of the following symptoms:

Convulsions Eye or muscle twitching, Loss of awareness, Altered vision, Involuntary movements, Disorientation.

7.8.7.2 Enabling Smearing reduction

When activating this function a drop in light output and a noticeable flicker is inevitable.

How to enable the Smearing reduction (if the option is installed) ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Smearing reduction*
5. Press → to pull down the menu
6. Use ↓ or ↑ to enable (ON) or disable (OFF) the Smearing reduction

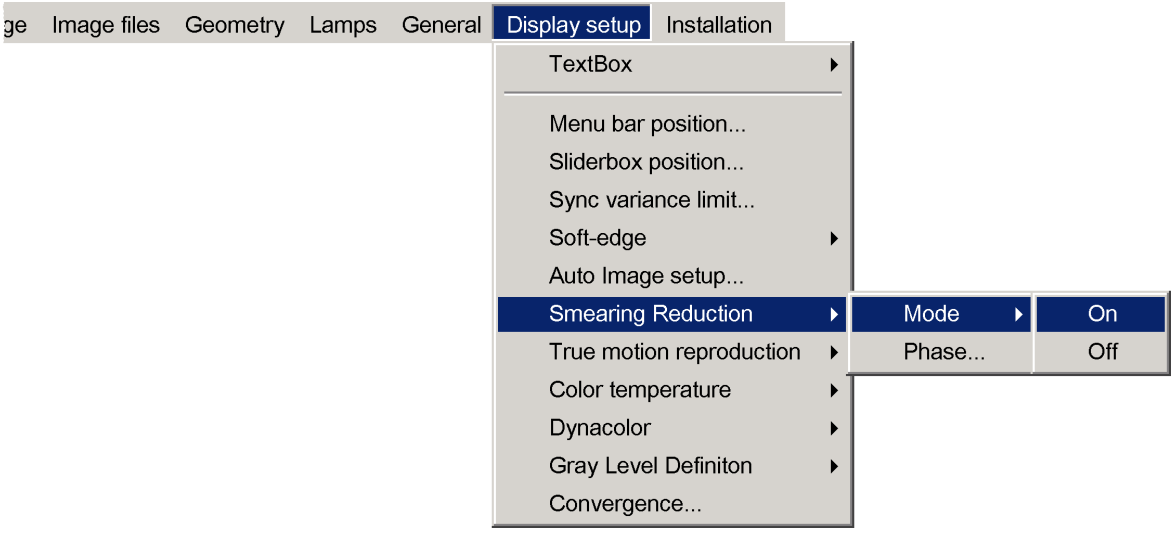


Image 7-147

7. Press **ENTER**

When disabling (OFF) the Smearing reduction the flicker will be noticeable (frequency will decrease noticeably). See warning above.

When disabling the Smearing reduction, the projector will try to get the full image displayed. This can take up to one minute!

7.8.7.3 Adjusting the phase

What can be done?

The timing of the Smearing reduction in relation to the vertical refresh rate of the displayed image can be set by changing the phase.

Bad alignment of the phase leads to motion artefacts such as a doubled image or worse smearing appearance.

How to adjust the Smearing reduction phase?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Smearing reduction*
5. Press → to select the *Smearing reduction* item
6. Use ↓ to select *Phase...*
7. Press **ENTER**

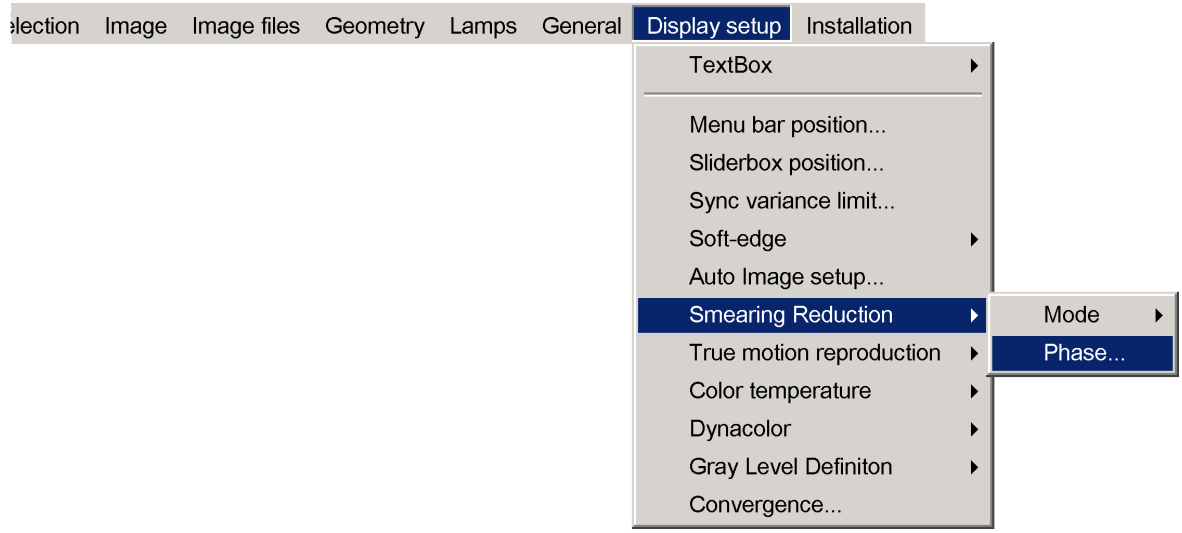


Image 7-148

Tip: *Smearing reduction must be enabled to make this selection possible.*

A dialog box is displayed



Image 7-149

8. Use the arrow keys, the numeric keys on the remote, or the keypad to change the Smearing reduction phase

Tip: *A correct setting is the value where no double image and no or minimal smearing is visible on an image with fast moving objects.*

7.8.8 True motion reproduction

What can be done?

Some visible artefacts on moving images can be avoided by switching on True motion reproduction.

How to enable/disable True motion reproduction?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *True motion reproduction*
5. Press → to pull down the menu
6. Use ↓ or ↑ to enable (ON) or disable (OFF) True motion reproduction

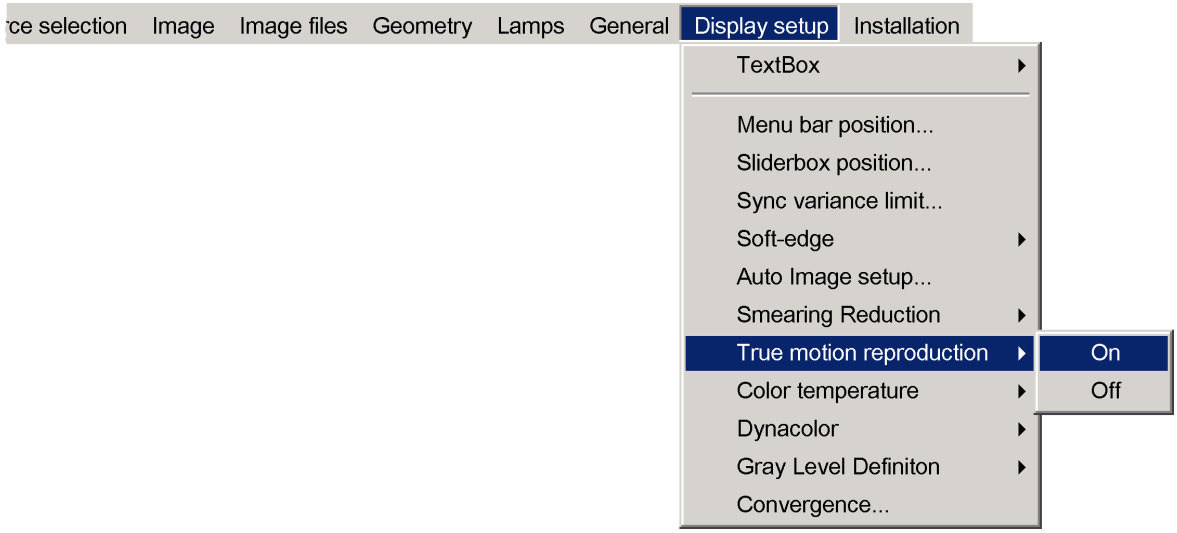


Image 7-150

7. Press **ENTER** to activate the selection

7.8.9 Color temperature

What can be done ?

Changing the *Color temperature* changes the coordinates of the white point of the projector. The color temperature can be selected according to the type of source: next to *Projector white,* which is brightest white point that can be produced by the projector, 5 different presets are available:

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

These calibrated presets can be selected and will provide optimum color tracking. The projector however allows the setting of a personal color temperature: this is done by changing the white point coordinates in Dynacolor.

Changing the color temperature while Dynacolor is enabled, will change the coordinates of the desired value of the white point in the Dynacolor user interface.

If Dynacolor is enabled and the white point coordinates have been changed there, then the color temperature will be set to *Dynacolor white* and the value will match the coordinates of the white point in the desired values of the Dynacolor user interface.

How to select a preset color temperature ?

1. Press **MENU** to activate the tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Color temperature*
5. Press → to pull down the menu
6. Use ↓ or ↑ to select the desired preset color temperature

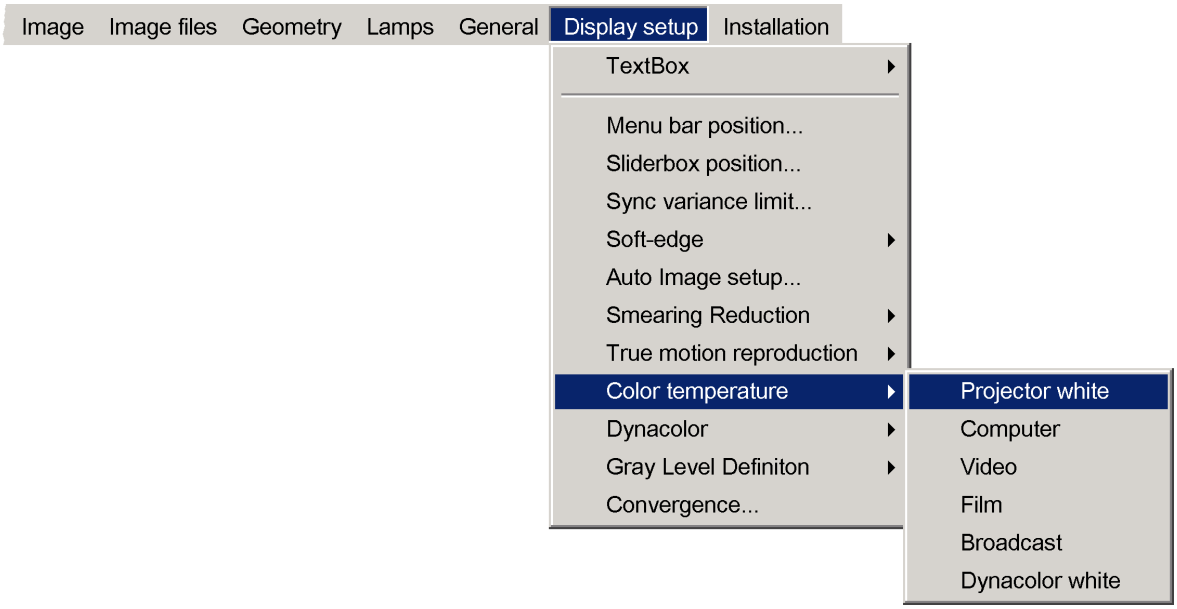


Image 7-151

7. Press **ENTER**

   The color temperature of the image is adapted and a bullet shows the active setting.

How to set a custom color temperature ?

1. Change the coordinates of the white point in the Dynacolor user interface

7.8.10 Dynacolor

Overview

- Introduction
- Enabling DynaColor
- Dynacolor adjustment
- Black color matching
- CLO-TOD color tracking

7.8.10.1 Introduction

What can be done?

DynaColor™ will eliminate channel-to-channel color variations or, in case of a single projector, force a desired color reproduction.

How to define color?

The CIE chromaticity diagram is one way to plot the colors the human eye can see.

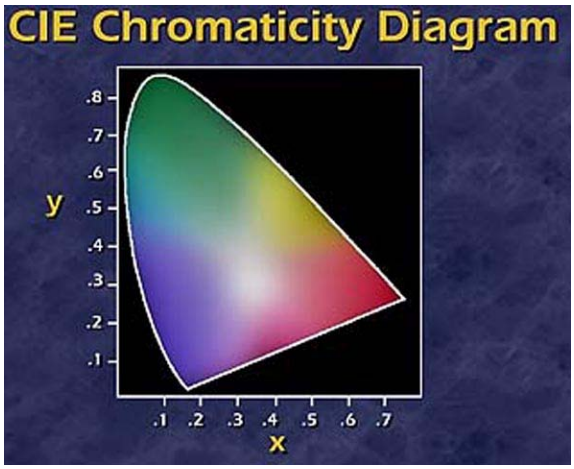


Image 7-152
The CIE chromaticity diagram

A projector can only reproduce a certain color gamut within this diagram. This color gamut is defined by the triangle formed by the x, y coordinates of Red Green and Blue. These parameters are used by the DynaColor™ adjustment in the projector.

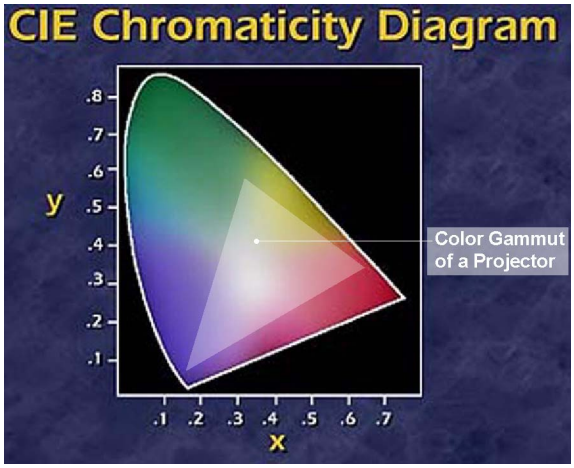


Image 7-153
The projector color gamut is defined by the triangle formed by the x, y coordinates of Red Green and Blue

Due to the tolerance on optical components the x, y values of this color gamut of each projector will differ.

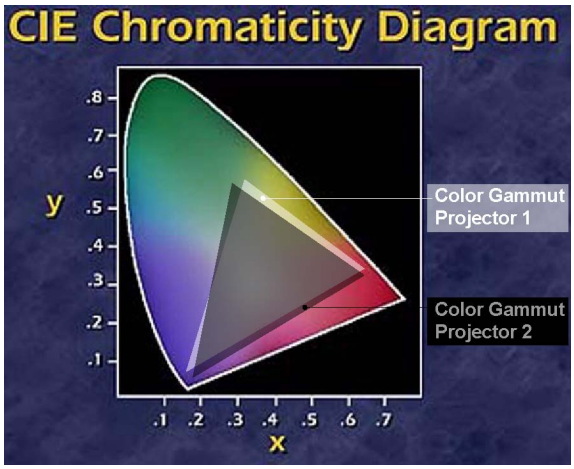


Image 7-154
The color gamut of each projector will differ

When working with a multichannel setup, these color differences between different projectors can be smooth out by matching the color gamuts of the different projectors to a Common Color Gamut.

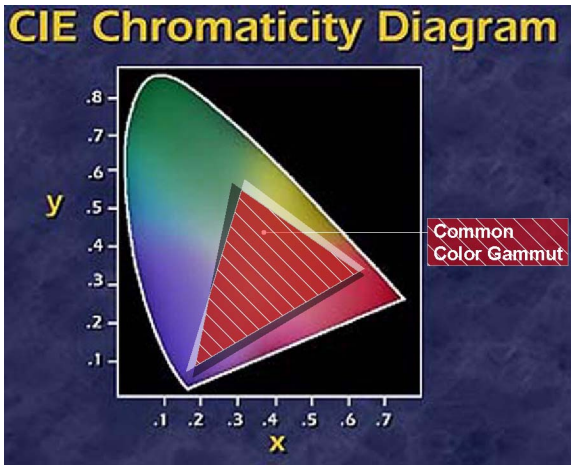


Image 7-155
Common Color Gamut

The Common Color Gamut

In a basic setup with 2 projectors, the perimeter of the Common Color Gamut is described by the 3 points of intersection of the 2 separate color gamuts.

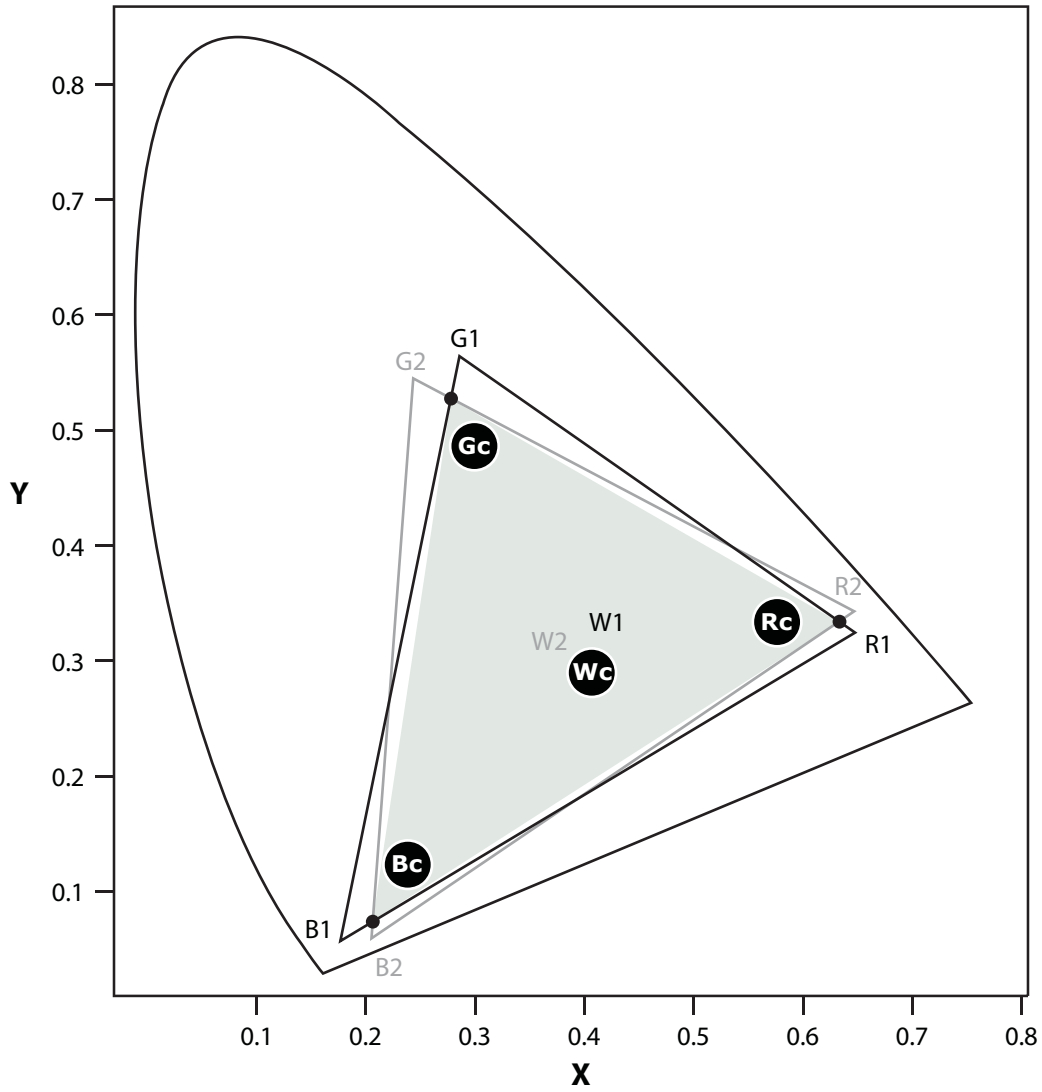


Image 7-156
R1 Red projector 1
R2 Red projector 2
G1 Green Projector 1
G2 Green Projector 2
B1 Blue Projector 1
B2 Blue Projector 2
W1 White Projector 1

W2 White Projector 2
Rc Red Common Color Gamut
Gc Green Common Color Gamut
Bc Blue Common Color Gamut
Wc White Common Color Gamut

The following parameters can be adjusted within DynaColor™:

- the x, y coordinates and L (Light Output) of the 6 Common Color Gamut perimeter points.
- the x, y coordinates and L (Light Output) of the White point of the Common Color Gamut.

The Dynacolor™ Interface

Field / item	Description
Measured values	The coordinates in the CIE Chromaticity diagram and luminance of the **native primary colors** of the projector as they have been measured in ideal conditions in the factory. **Only Barco engineers may change these values.**
X and Y coordinates	Coordinates in the CIE Chromaticity diagram
Red, Green, Blue, White	Native primary colors and native white of the projector
L value	Luminance (relative value)
White L	White luminance = Red + Blue + Green luminance (relative value)

Desired values	Description
Desired values	The coordinates in the CIE Chromaticity diagram and luminance of the **desired primary and secondary colors** of the projector. **Only Barco engineers may change these values to force a common color triangle; Barco trained and qualified engineers may also change the X and Y coordinates of the white point to fine tune the colors.**
X and Y coordinates	Coordinates in the CIE Chromaticity diagram
Red, Green, Blue, White	Desired primary colors and desired white of the projector
Cyan, Yellow, Magenta	Desired secondary colors of the projector
L value	Luminance (relative value)
Lmax value	Maximum available luminance (relative value)

Button	Description
Default desired	Uses the Measured parameters to calculate and fill out the Desired values. In case of SIM 7Q HB or SIM 7Q HB&C, this command also sets the white point to the default white point (x = 0.306, y = 0.382) to avoid the greenish perception of the projector's native white point.
Factory Preset	Overwrites the Measured parameters by the factory measured values.
Maximum white	(only available in case of SIM 7Q HB or SIM 7Q HB&C) Uses the Measured parameters to calculate the Desired values without correction for the white point. In this state, the white point is slightly greenish.
Calibration	Starts the native primary color and native white color calibration procedure. **Only Barco engineers may perform a calibration.** A professional spectrometer and ideal measurement conditions are required to achieve a good calibration. Improper calibration seriously affects the performance of the projector. See the SIM 7 service manual for the detailed calibration procedure.

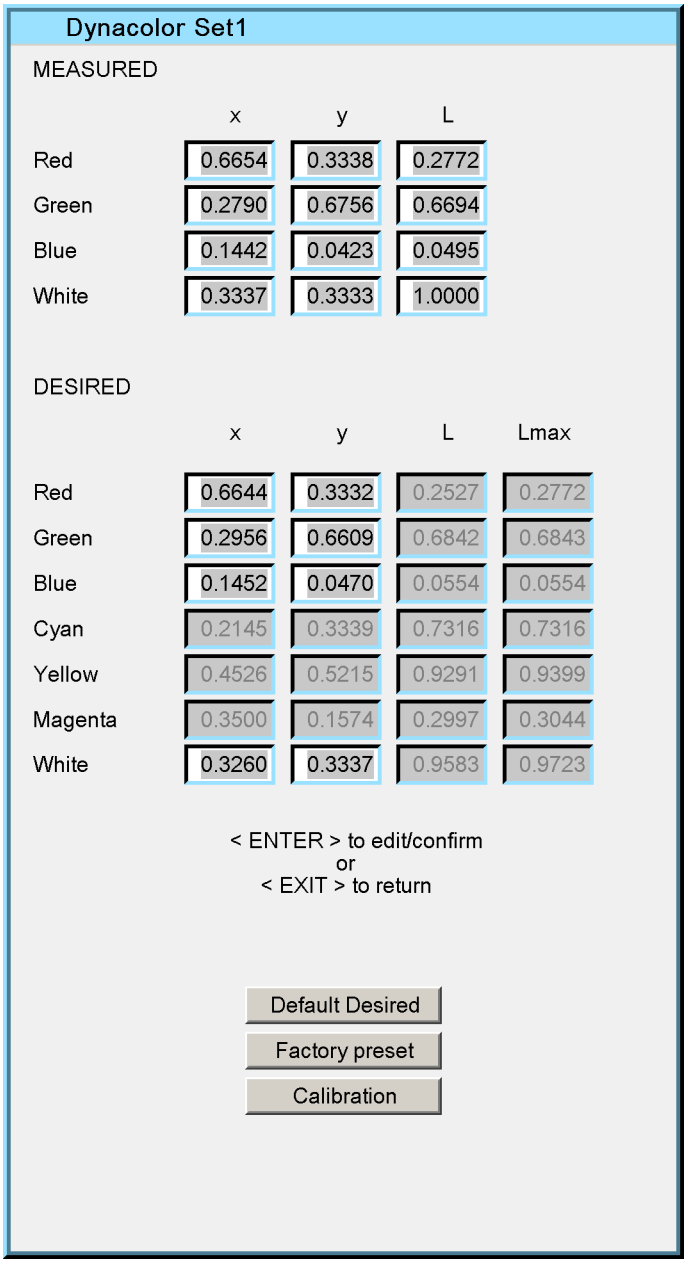

Dynacolor Set1
MEASURED
x
y
L
Red
0.6654
0.3338
0.2772
Green
0.2790
0.6756
0.6694
Blue
0.1442
0.0423
0.0495
White
0.3337
0.3333
1.0000
DESIRED
x
y
L
Lmax
Red
0.6644
0.3332
0.2527
0.2772
Green
0.2956
0.6609
0.6842
0.6843
Blue
0.1452
0.0470
0.0554
0.0554
Cyan
0.2145
0.3339
0.7316
0.7316
Yellow
0.4526
0.5215
0.9291
0.9399
Magenta
0.3500
0.1574
0.2997
0.3044
White
0.3260
0.3337
0.9583
0.9723
< ENTER > to edit/confirm
or
< EXIT > to return
Default Desired
Factory preset
Calibration

Image 7-157

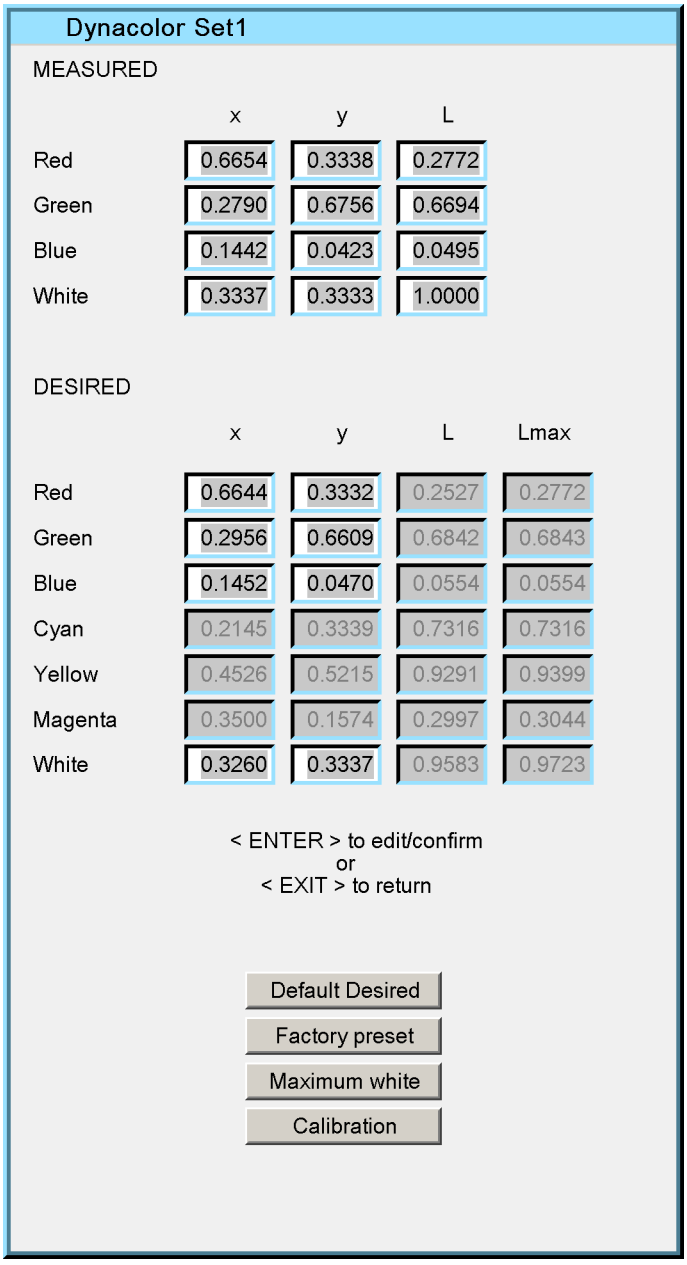


Image 7-158

Dynacolor sets

Depending on the projection mode, projector type, software version and availability of options, different Dynacolor sets can and will be used (if the Dynacolor feature is enabled):

- Standard Dynacolor set
- Dynacolor set with advanced color tracking through CLO
- Dynacolor set with advanced color tracking through NVG

Only the Standard Dynacolor set can be calibrated without the use of an additional device and software (XDS RACU).

7.8.10.2 Enabling DynaColor

Enabling DynaColor can be done by the operator.

What can be done ?

Enabling DynaColor changes the projector's native color range to the color range as specified in the active DynaColor set. Disabling DynaColor will keep the original colors determined by the source and the projector's optical path.

How to enable Dynacolor?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Dynacolor*
5. Press → to open the menu
6. Use ↑ or ↓ to select *Enable*
7. Press → to open the menu
8. Use ↑ or ↓ to select *ON*

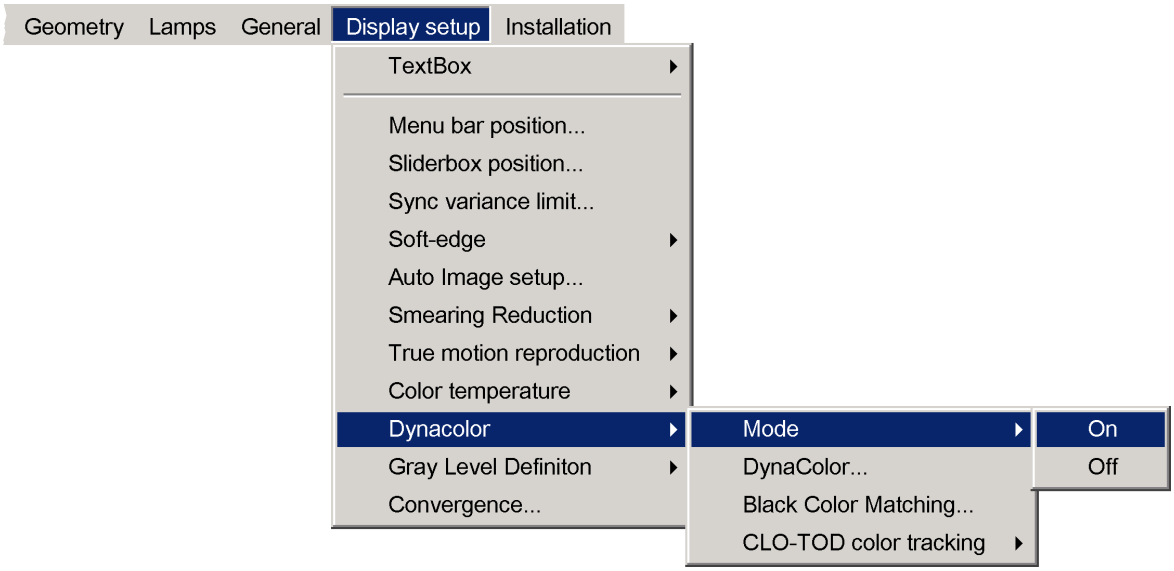


Image 7-159

9. Press **ENTER**

   A white bullet indicates the active setting

7.8.10.3 Dynacolor adjustment

Overview

- Introduction
- Calibration (for multiple projectors)
- Common color values
- Factory preset

7.8.10.3.1 Introduction

In multiple channel setup, it might be needed to align the colors of every projector in order to match the colors of the others in a prefect way. Only this case where multiple projector have to be color matched is covered in the procedure below.

Dynacolor adjustment versus Dynacolor calibration

- Single channel setup: each projector is color calibrated during production. This means that projectors in single channel setup do not need to be calibrated anymore. Only specific color requests from the user may require some DynaColor adjustment. This can be easily done by SLIGHTLY changing the desired values.
- Multiple channel setup: in multiple channel setup, it might be needed to align the colors of every projector in order to match the colors of the other projectors in a prefect way. Only this case where multiple projector have to be color matched may require a calibration.

Dynacolor adjustment

To adjust the Dynacolor settings, it is sufficient to change the values in the field *Desired* of the user interface.

Make sure that the new x and y coordinates are within the projectors default color triangle.

E.g. If you increase the x-value of the white point in the desired values from 0.3260 to 0.3560, the white point will shift towards the red region and the overall look of the image will be more reddish.

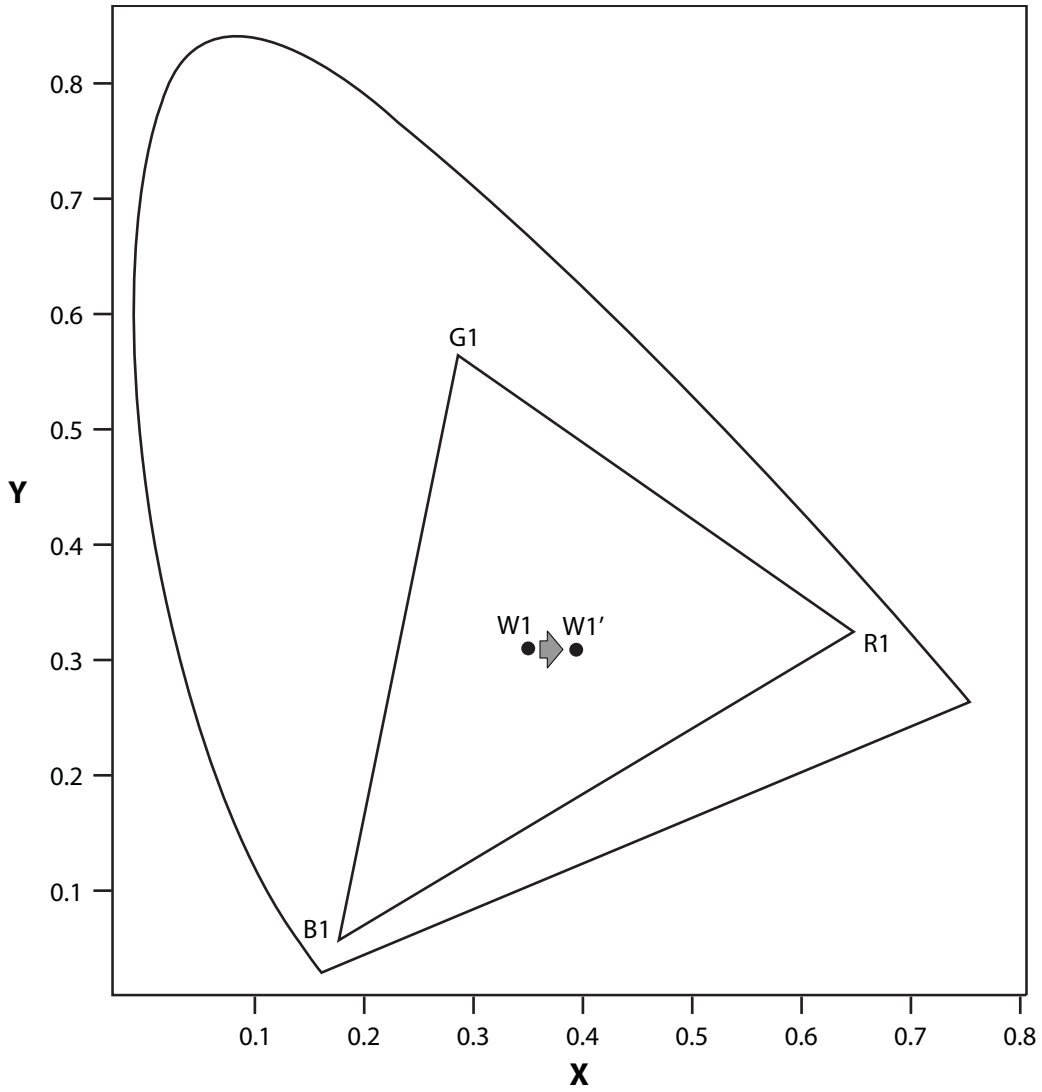


Image 7-160

Dynacolor recalibration/adjustment procedure (multiple projectors)

The adjustment of Dynacolor:

1. Measuring the color values for each projector (Calibration procedure)
2. Calculating the common values and entering them in the desired values of every projector

The recalibration/adjustment is explained in the procedure below.

7.8.10.3.2 Calibration (for multiple projectors)

What has to be done ?

The calibration of Dynacolor consists of measuring the color values of each projector. The measurements have to be done in a dark environment. Make sure all external lights are off (even a PC screen can produce too much unwanted light). Use a light meter (PR655, LMT, …) and at a fixed position during the entire measurement. In the procedure below we consider a system of 2 projectors.

CAUTION: Only to be done by Barco trained and qualified engineers ! Never change the values if not needed. Altered color values will not guarantee optimal image reproduction.

How to calibrate Dynacolor for projector 1 ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Dynacolor*
5. Press → to open the menu
6. Use ↑ or ↓ to select *Adjust...*
7. Press **ENTER**

   A dialog box is displayed

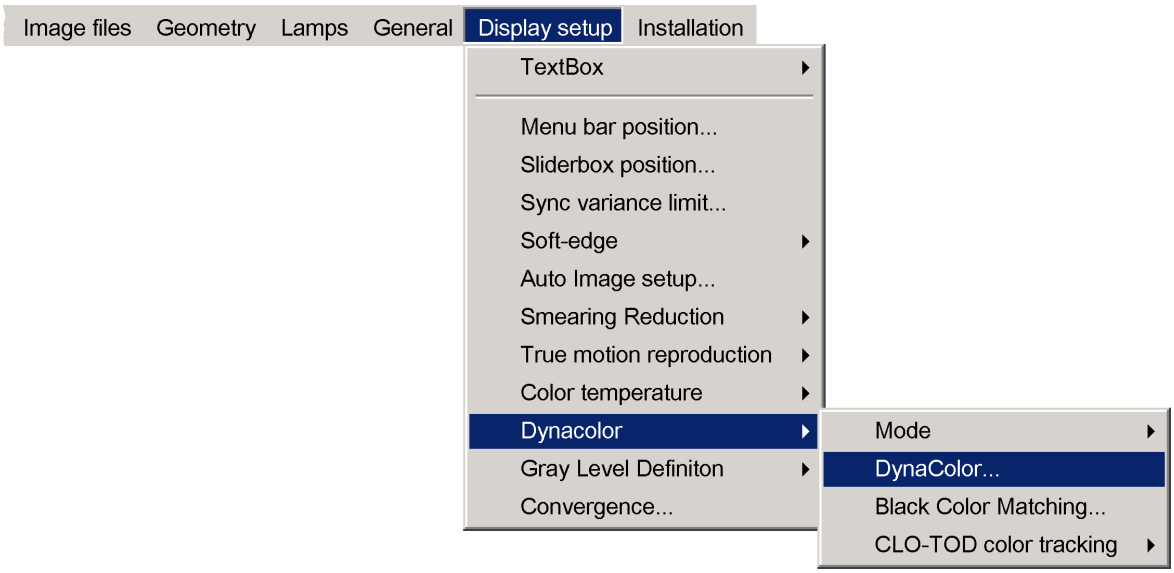


Image 7-161

8. Press **Calibrate** in the Dialog box

   A red full screen test pattern is displayed.
9. Press **ENTER**

A dialog box is displayed for the Red color

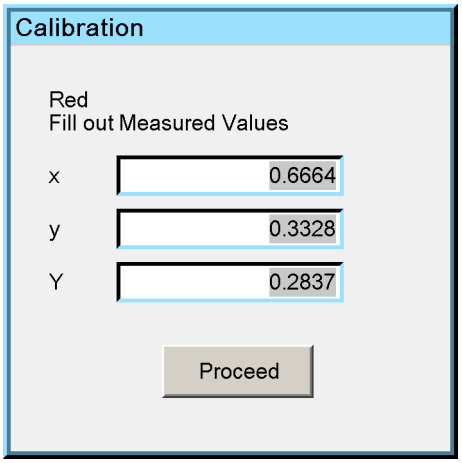


Image 7-162

10. Fill in the measured x and y and coordinates and the Y value
    Note: *the Y value will be transformed in a L value by the projector*
11. Press **Proceed**

    A Green test pattern is displayed
12. Proceed in the same way for Green, Blue and White as for the Red color
13. The values are finally updated in the measured values of the Dynacolor dialog box.
14. Press **Default desired** to copy the measured values for Red, Green, Blue and White and to calculate the secondary colors Cyan, Yellow and Magenta.

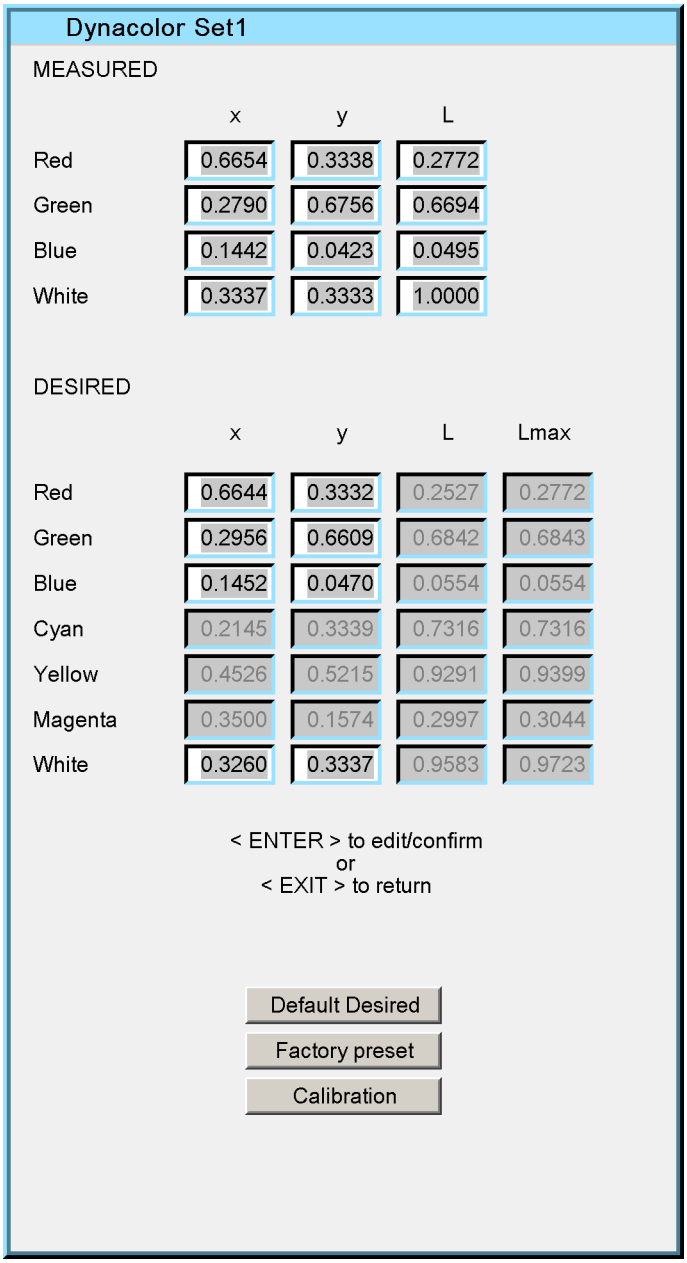


Image 7-163

How to calibrate Dynacolor for projector 2

1. Proceed in the same way as for projector 1

   The values will slightly differ form the ones of the first projector.

7.8.10.3.3 Common color values

What can be done ?

The common color values can be determined manually.

Calculating the common color values

1. Calculate the common values and enter them in the *Desired values* of both projectors.

   Both projectors will now operate within the same color gamut.

7.8.10.3.4 Factory preset

Description

During factory calibration of the projector, the projector's native colors are measured in ideal conditions and entered as measured values in the projector. If at any time the Dynacolor parameters are changed and a bad color reproduction is observed, you can easily return to the factory settings by clicking **Factory preset** in the *Dynacolor* dialog. A warning message is displayed.

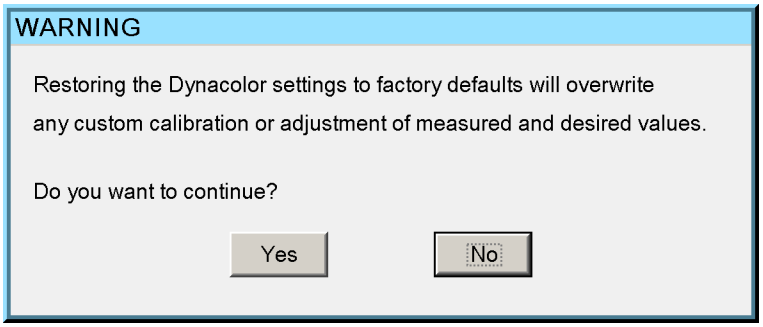


Image 7-164

7.8.10.4 Black color matching

Overview

- Introduction
- Black Color adjustment

7.8.10.4.1 Introduction

Black Color uniformity

In a multi channel system, the color of "black" can differ over the different channels/projectors. This can be matched using the Black color matching function. This function allows to adjust the Red, Green and Blue contribution to the black color produced.

The procedure has to be done for all the channels (projectors)

7.8.10.4.2 Black Color adjustment

How to adjust black color ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the *Display setup* menu
4. Use ↑ or ↓ to select *Dynacolor*
5. Press → to open the menu
6. Use ↑ or ↓ to select *Black Color matching...*

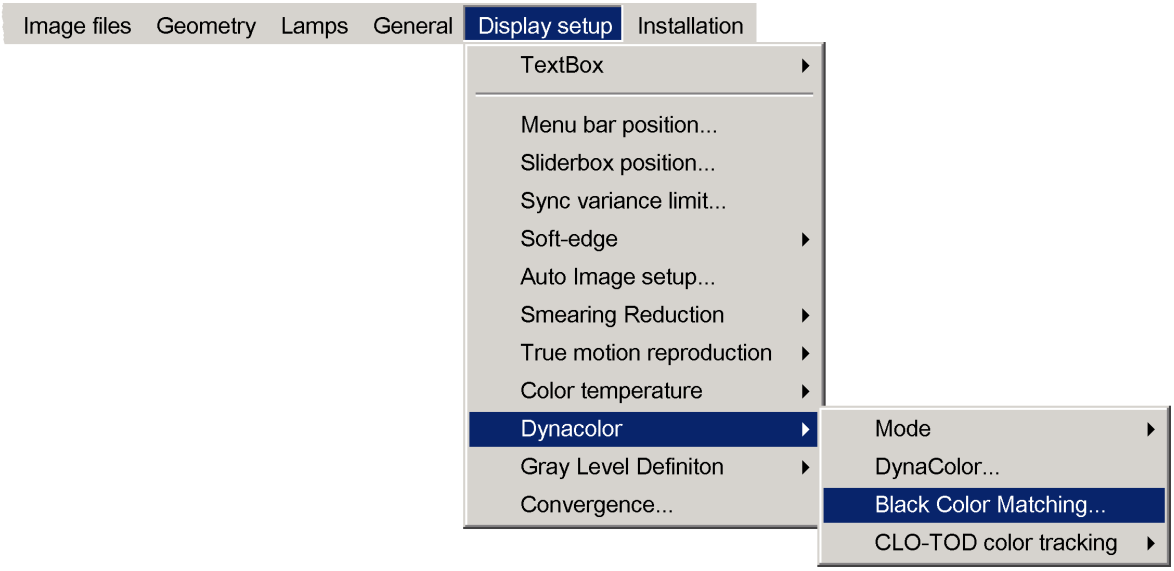


Image 7-165

7. Press **ENTER**

   A dialog box is displayed

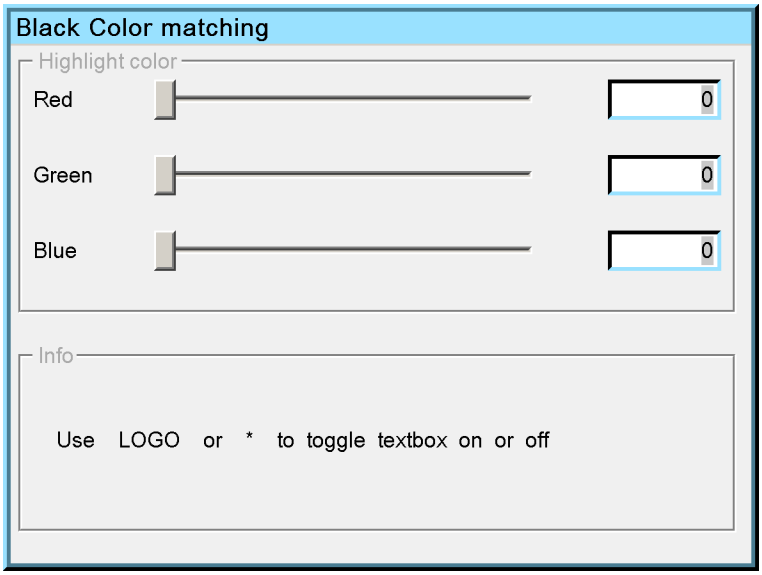


Image 7-166

8. Use ←or →, the numeric keys on the remote, or the keypad to change the settings.

7.8.10.5 CLO-TOD color tracking

Description

CLO-TOD color tracking is used to compensate for color variation caused by changing the dimmer transmission. By default CLO-TOD color tracking is enabled.

It is however possible to disable CLO-TOD color tracking. In this case, the color variation amongst different dimmer transmissions (i.e. different TOD settings) is not compensated.

Disabling CLO-TOD color tracking

1. In the OSD, browse to *Display setup* > *Dynacolor* > *CLO-TOD color tracking* > *Off*.
2. Press **Enter** to confirm.

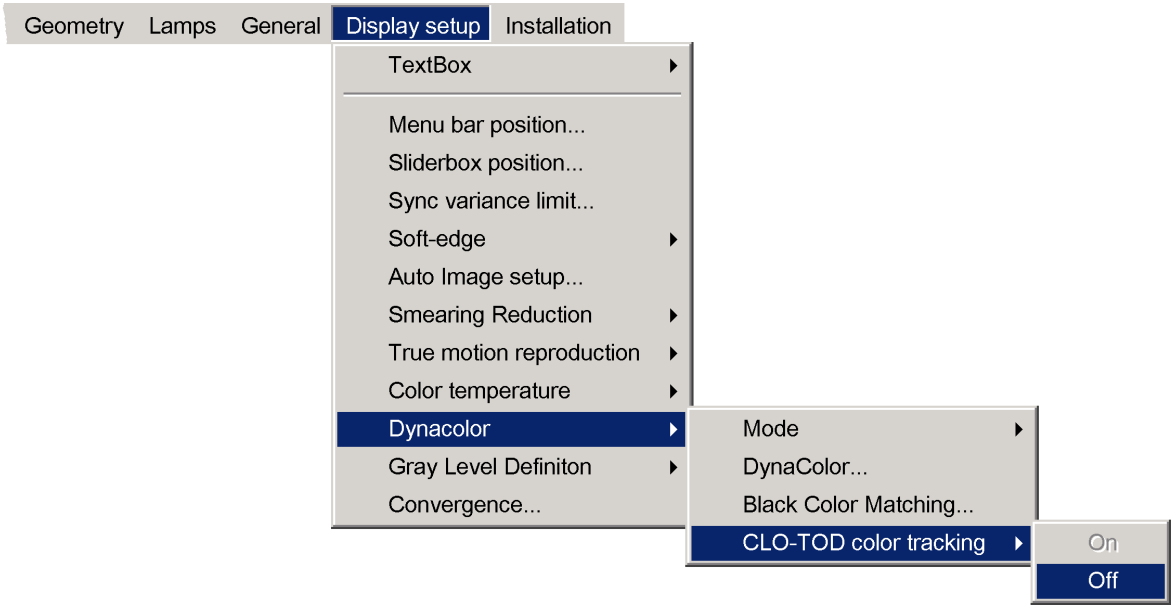


Image 7-167

Enabling CLO-TOD color tracking

1. In the OSD, browse to *Display setup* > *Dynacolor* > *CLO-TOD color tracking* > *On*.
2. Press **Enter** to confirm.

7.8.11 Gray Level Definition

GLD

Gray Level Definition

GLC

Gray Level Correction

The GLD alignment can be used to optimize the black to white tracking. If there are no issues with the color setup of a multi channel display system, it is not necessary to perform this procedure.

Overview

- Description
- Illustrating the influence of GLD correction
- GLD correction

7.8.11.1 Description

What is Gray Level Definition?

When matching multi channel systems, the **white level** can be matched using *Dynacolor* and the **black levels** can be tweaked using *Black Color Matching*. When comparing the gray levels of certain projector platforms there can be a significant difference in the primary color distribution on different gray levels. This is typically the case for LCD and LCoS projectors; especially when they reach a certain age they are more sensitive to this artifact.

GLD adjustment allows correcting the gray levels by tweaking the contribution of the primary colors to each gray level (i.e. color balancing).

How does Gray Level Definition work?

GLD allows you to adjust the contribution of the primary colors to different gray levels — or zones — to match different display channels to a reference channel.

Applying a correction in a certain zone also influences the adjacent zones.

The hierarchical levels are selected in a way that the first hierarchy level influences the entire transition from black to white (0% to 100%) with the main correction done at 25%. Below you can find the table of the hierarchy levels and their influence zone.

Hierarchy level (value 1–4)	Hierarchy level (%)	Gray level range
1	25.0%	0.0% - 100.0%
2	6.3%	0.0% - 25.0%
	56.3%	25.0% - 100.0%
3	1.6%	0.0% - 6.3%
	14.1%	3.6% - 25.0%
	39.1%	25.0% - 56.3%
	76.6%	56.3% -100.0%
4	0.4%	0.0% - 1.6%
	3.5%	1.6% - 6.3%
	9.8%	6.3% - 14.1%
	19.1%	14.1% - 25.0%
	31.6%	25.0% - 39.1%
	47.3%	39.1% - 56.3%
	66.0%	56.3% - 76.6%
	87.9%	76.6% - 100.0%

The % values in the table indicate measurable brightness on the screen.

7.8.11.2 Illustrating the influence of GLD correction

Illustrating GLD correction

Without performing GLD correction, we have a linear response[1] from black to white. This is shown as a green dashed line in the graph below, where we the horizontal axis represents the signal strength (0% to 100%) and the vertical axis the intensity.

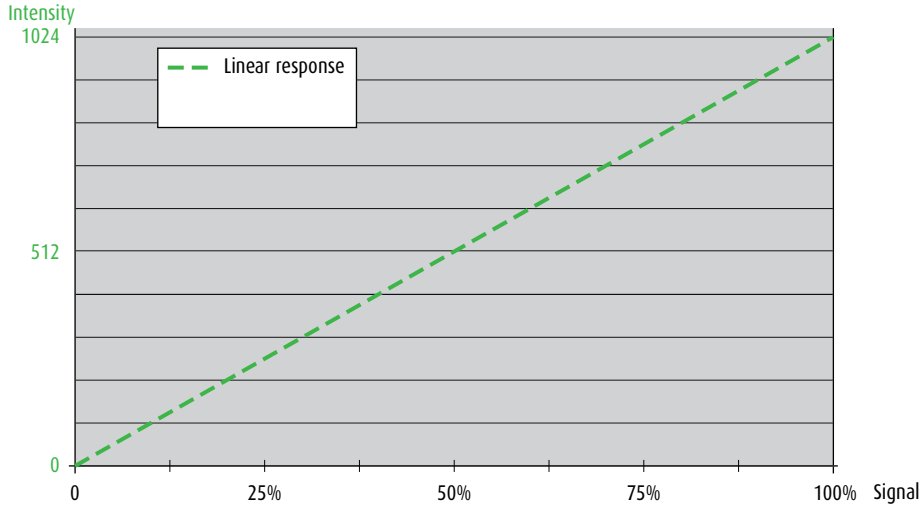


Image 7-168
GLD: response curve

The following topics give you an overview of the outcome of the GLD corrections done at different levels.

1. To be fully correct, we will have the gamma response curve instead of a linear response curve. In this explanation, we consider it to be linear however.

GLD correction on Hierarchy level 1

When a correction is applied to Hierarchy level 1 (blue line), its main influence is visible on 25% level. The sum of the adjustment and the linear transition results in a transition as it is presented by the dash-dotted red line in the graph below.

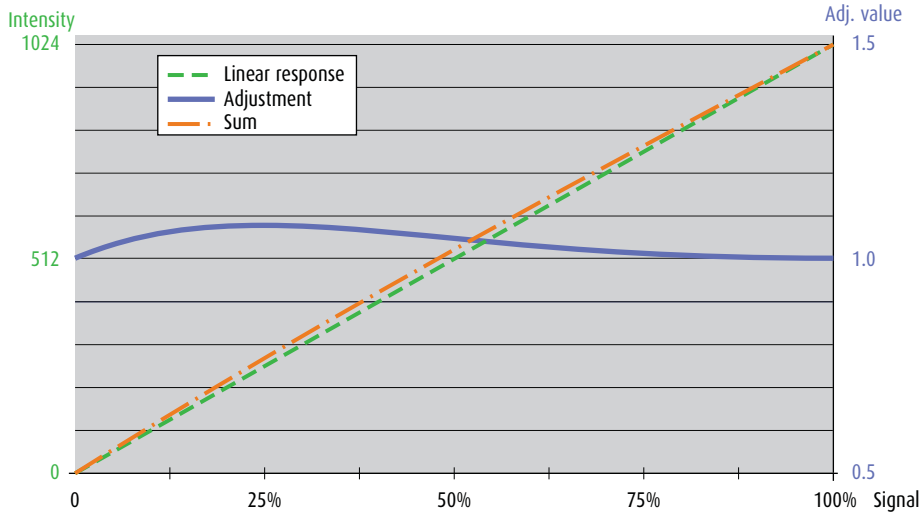


Image 7-169
GLD correction on Level 1

GLD correction on Hierarchy level 3

Following graph illustrates the same correction done on Hierarchy level 3.

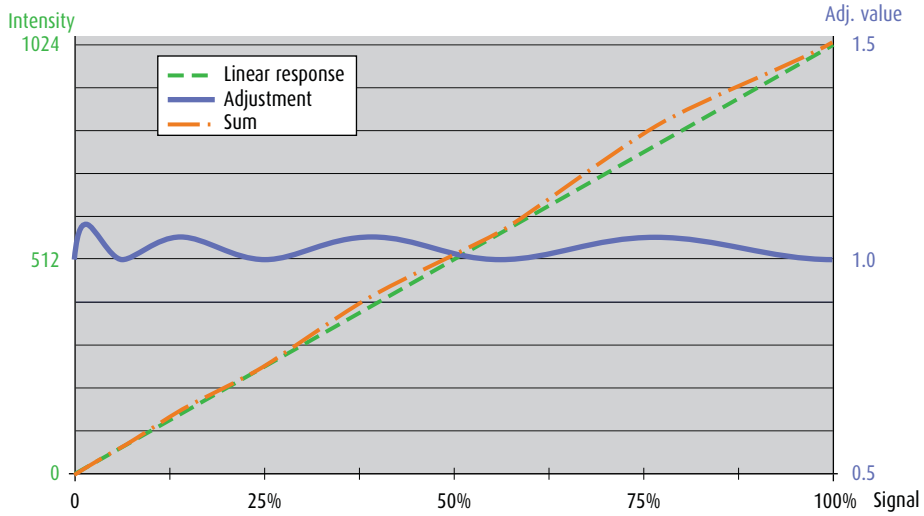


Image 7-170
GLD correction on Level 3

From the graph, you can clearly see the correction that has been done at:

- 1.6% with influence from 0% to 6.3%
- 14,1% with influence from 3.6% to 25%
- 39.1% with influence from 25% to 56.3%
- 76.6% with influence from 56.3% to 100%

GLD correction on Hierarchy levels 1 and 3

Performing corrections on multiple hierarchies result in the sum of the different corrections. From the hierarchy 1 and hierarchy 3 corrections of the example above, the following final GLD correction is obtained.

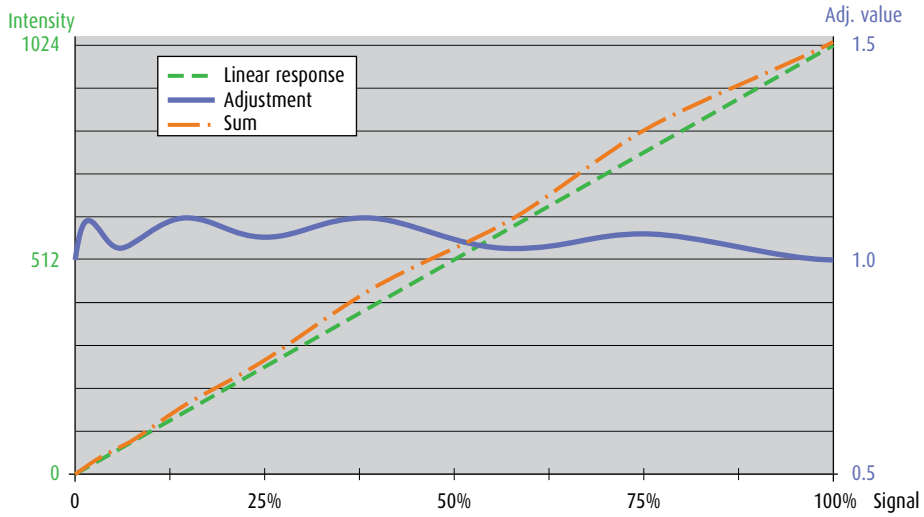


Image 7-171
GLD correction on Level 1 and 3

It is very important to perform the GLD alignment starting from Hierarchical level 1 and going up to Hierarchy level 4.

7.8.11.3 GLD correction

Overview

- Preparing the GLD correction
- Performing GLD correction

7.8.11.3.1 Preparing the GLD correction

Preparing the GLD correction

1. Switch on all projectors in the system for at least 30 minutes prior to starting this procedure to ensure they are at nominal operating temperature
2. Align input balance in case of analog source signals
3. Perform Gray Level Correction (GLC) if required
4. Set Gamma at projector side (2.2) and/or IG side to the desired level
5. Turn off all lights and avoid all stray light: the system surroundings must be fully dark
6. Match the Light output (CLO)
7. Perform Dynacolor alignment
8. Perform Black Color Matching if required

Suitable test patterns

Several test patterns can be used for the GLD alignment:

- internal gray level, which can be set to be automatically generated during the alignment procedure (advised!)
- external gray scale pattern
- full gray pattern generated by a test image generator (e.g. Polaris)

The gray level that needs to be used to correct the selected gray range during the different alignment steps depends on the gamma you set for the projector in use (See Appendix B).

7.8.11.3.2 Performing GLD correction

Enabling Gray Level Definition

1. In the OSD menu of the projector, browse to *Display setup* > *Gray Level Definition* > *Mode* > *On*

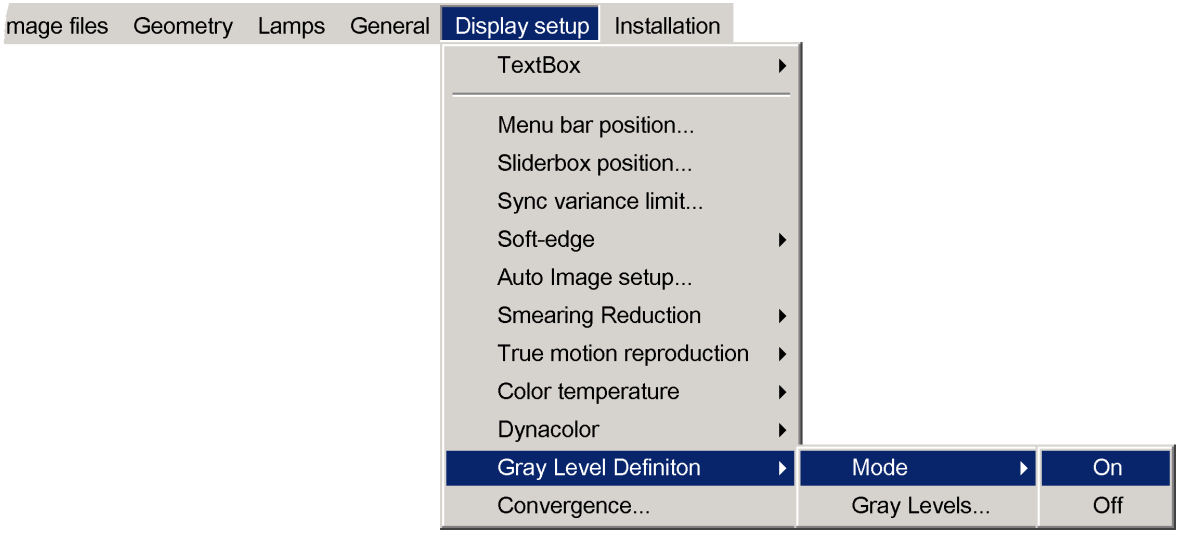


Image 7-172

2. Press **ENTER** to enable GLD

Setting the GLD user interface

1. Browse to *Display setup* > *Gray Level Definition* > *Gray Levels...* and press **ENTER** to open the Gray Level Definition user interface

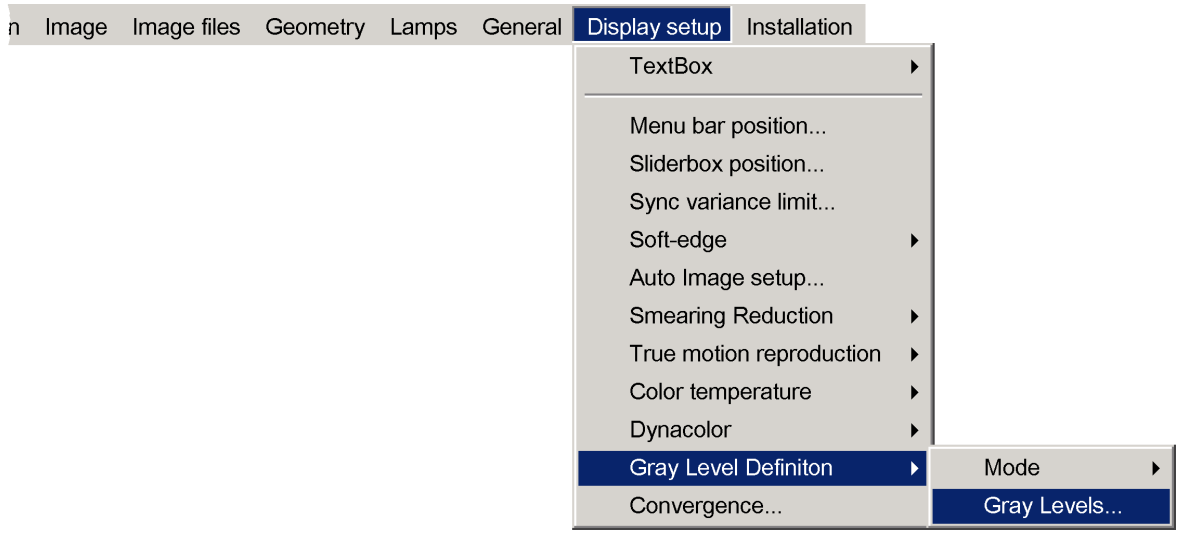


Image 7-173

2. Use the arrows on the Remote Control Unit (RCU) to highlight *Gray Level* or *Image* in the *Source* section and confirm by pressing **ENTER**
   - *Gray Level* is used to use the internal gray level patterns (advised!)
   - *Source* must be selected to use patterns generated by an external source (different gray level required per gray range)

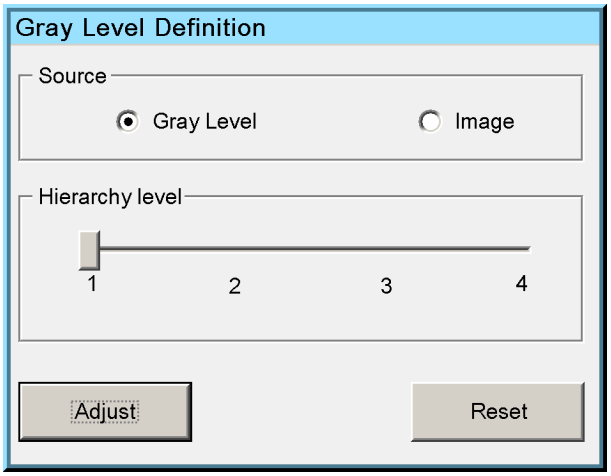


Image 7-174

How to perform the GLD correction?

1. Use the arrows to select the Hierarchy level and confirm by pressing **ENTER**

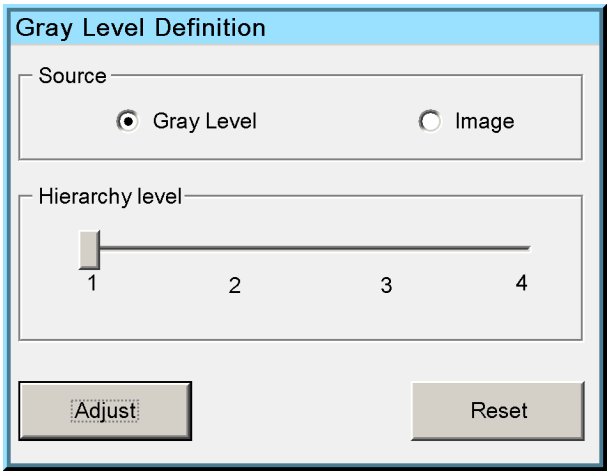


Image 7-175

Warning: *To perform GLD correction, you must start at Hierarchy level 1, then go to level 2, then level 3 to end at level 4.*

2. Highlight *Adjust* and confirm by pressing **Enter** to open the alignment user interface

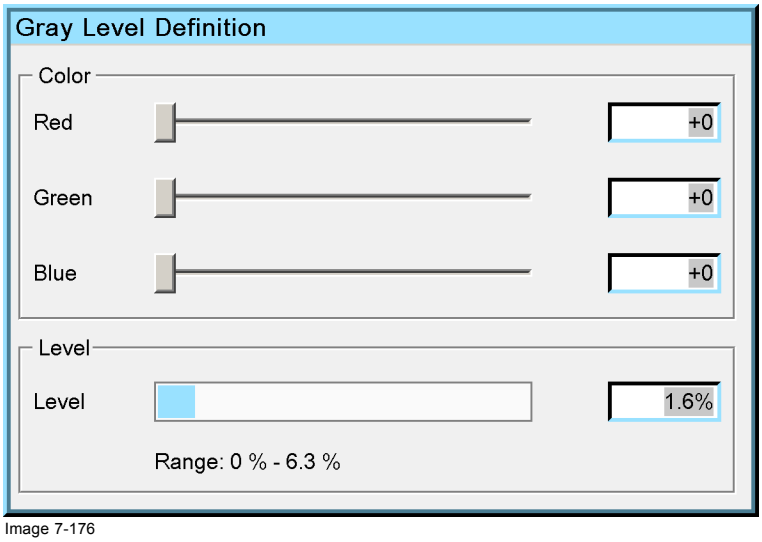


Image 7-176

3. In the alignment user interface, highlight the edit box in the *Level* section.
4. Use the arrows ← or → to select the range to be adjusted
   Warning: *To perform GLD correction, you must start at the lowest range and go though all ranges to end with the highest range.*

5. In case of external patterns, make sure that the correct test pattern is active
   Warning: *This external pattern must meet the selected gray range (see the edit box in the Level section) and it must take into account the correct gamma setting. See Appendix B.*
6. Use the arrows ↑ or ↓ to select the color of which the intensity need to be changed
7. Use the arrows ← or → to adjust the intensity of the selected color or enter a new value in the corresponding edit box
8. In the *Level* section, move to the next range and repeat steps 5 to 7
9. Repeat this procedure for all remaining Hierarchy levels (2, then 3, ending with 4)until all the intermediate grays are matched

How to reset the gray levels?

1. In the Gray Level Definition user interface, highlight *Reset*

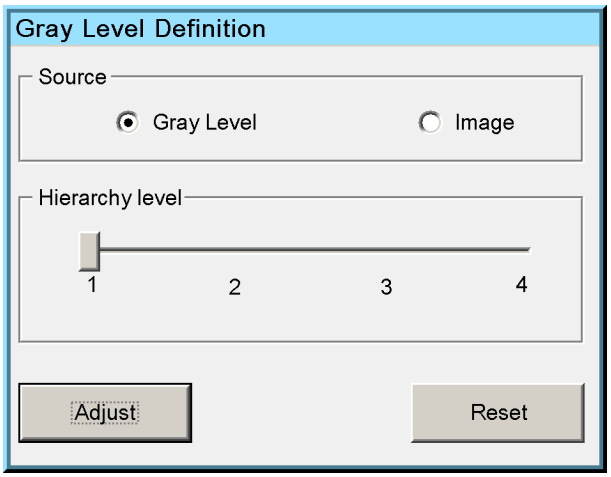


Image 7-177

2. Press **Enter**

7.8.12 Convergence

What can be done ?

The convergence (alignment of the red image, the green image and the blue image with respect to each other) can slightly drift in time due to external factors (temperature, ...).

The convergence menu allows to reduce this misalignment. The 3 main colors can be adjusted separately.

Necessary tools

No tools.

How to adjust the convergence ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Display setup* item
3. Press ↓ to Pull down the Display setup menu
4. Use ↑ or ↓ to select *Convergence ...*

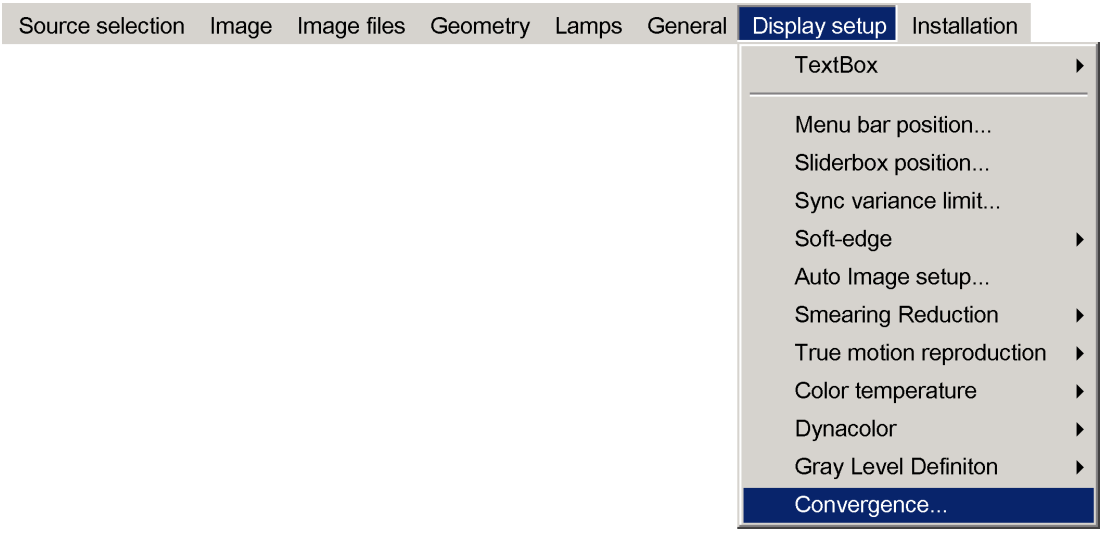


Image 7-178

5. Press **ENTER**

   A dialog box is displayed

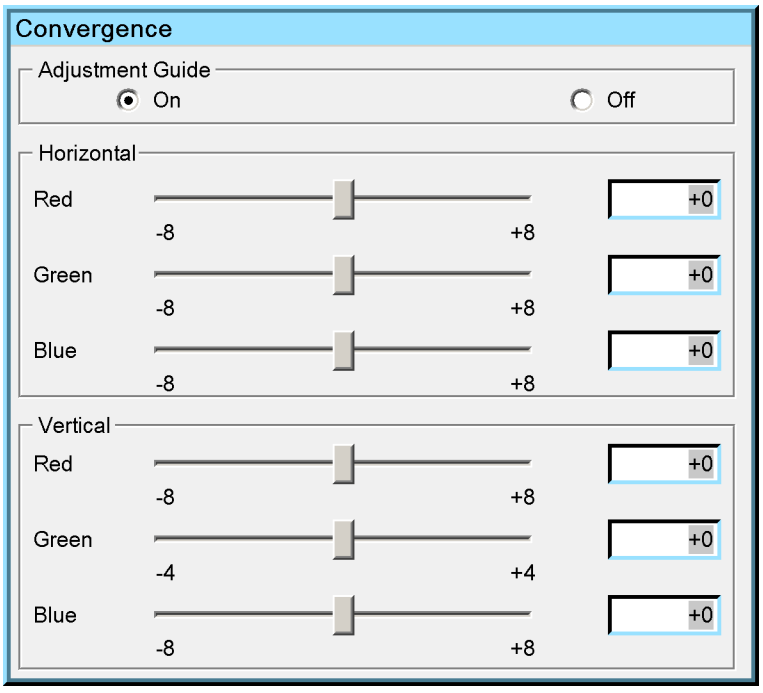


Image 7-179

6. Use ←or → , the numeric keys on the remote, or the keypad to change the values

   Note: *The range of the vertical adjustment for green is only -4 to +4 (in pixels), whereas all other adjustment ranges are from -8 to +8 pixels.*

   Note: *No image lines or columns are lost by changing these convergence settings.*

7.9 Installation

Overview

- Lens adjustments
- Projector address
- Orientation
- Network settings
- Automatic shutdown
- Internal Patterns
- Scaled Patterns
- Combiner Patterns
- Driver Patterns
- Change password

7.9.1 Lens adjustments

How to adjust the lens ?

1. See the *Setup* section.

7.9.2 Projector address

How to change the projector address ?

1. See the *Setup* section.

7.9.3 Orientation

How to set up the orientation ?

1. See the *Setup* section.

7.9.4 Network settings

How to set the network ?

1. See the *Communications* section.

7.9.5 Automatic shutdown

How to switch to Automatic Shutdown mode?

1. Press **MENU** to activate the Menu bar
2. Press → to select the *Installation* item
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Automatic Shutdown*
5. Press → to select the *Automatic Shutdown* item
6. Press ↑ or ↓ to select *On* or *Off*

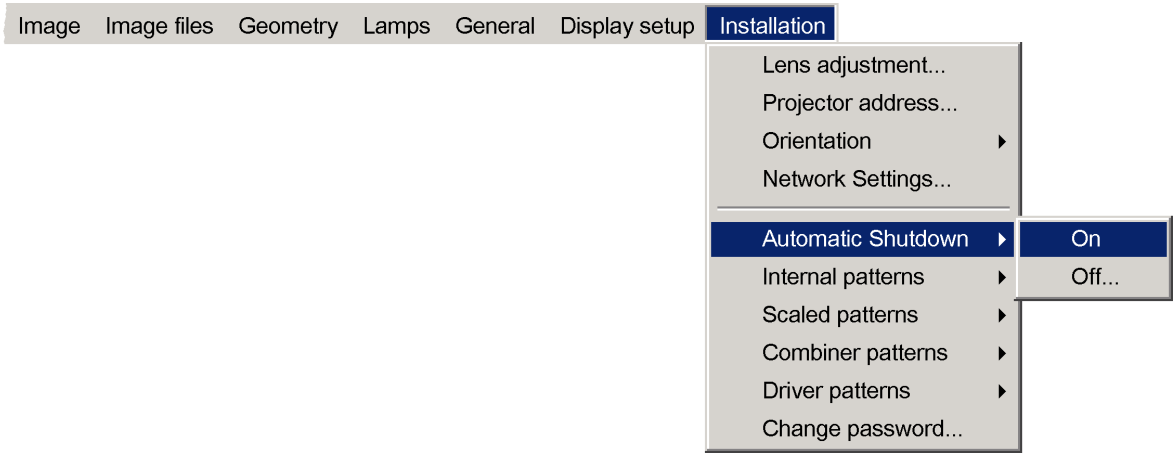


Image 7-180

7. Press **ENTER**

In case *Off* has been selected, a warning will be displayed to make sure that the operator is fully aware of the fact that the lamp warranty will expire when the projector stays in active mode for over 24 hours continuously. A confirmation is asked for. The operator can then choose to agree (**Yes**) or to go back to Automatic Shutdown mode (**No**)

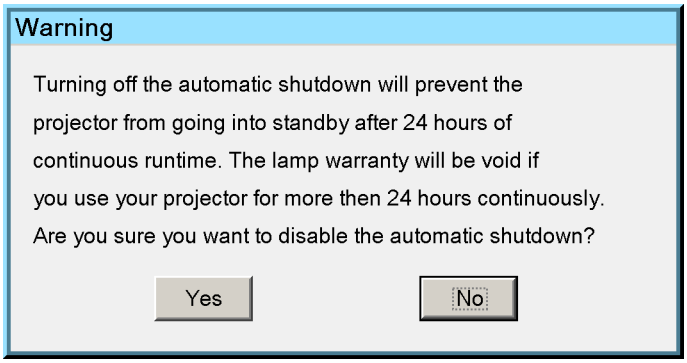


Image 7-181

7.9.6 Internal Patterns

What can be done?

The projector is equipped with different internal patterns which can be used for adjustment purposes.

Geometry adjustments can not be used on these internal patterns.

Some of the patterns can be inverted by hitting ENTER on the RCU while the pattern is displayed and some patterns can be changed to another color by hitting Color – or Color + on the RCU.

Available Internal Patterns

- Outline

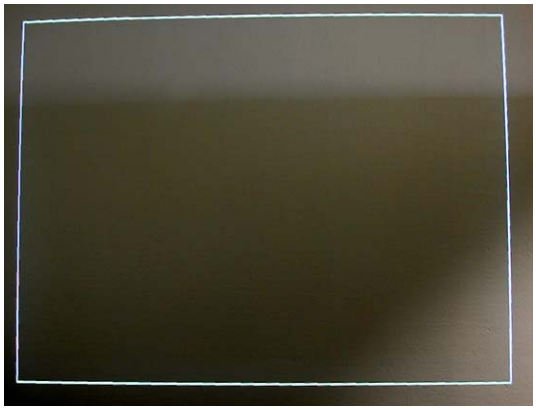


Image 7-182
Internal Outline pattern

- Hatch

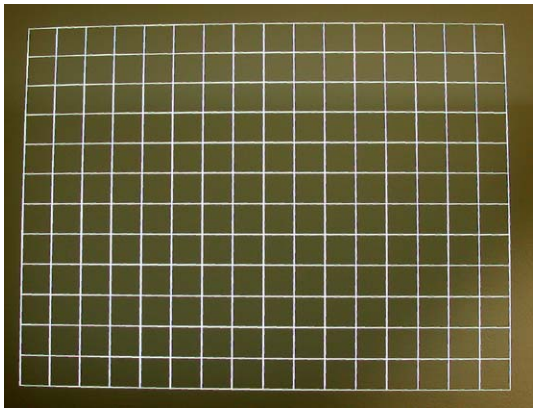


Image 7-183
Internal Hatch pattern

- Color Bars

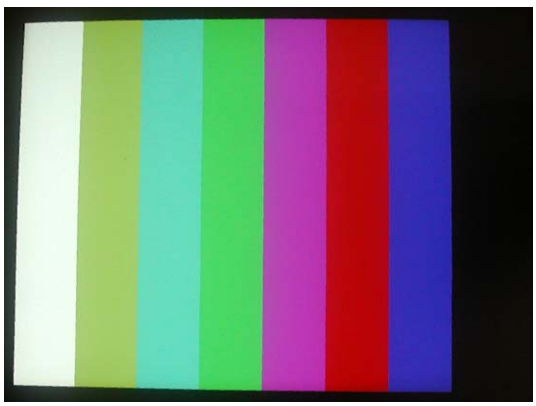


Image 7-184
Internal Color Bars pattern

- Checkerboard

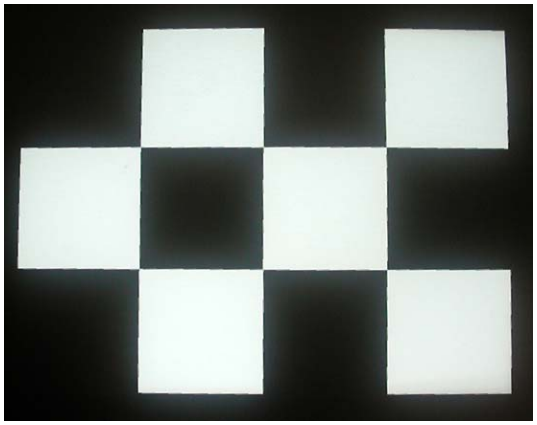


Image 7-185
Internal Checkerboard pattern

- Full White

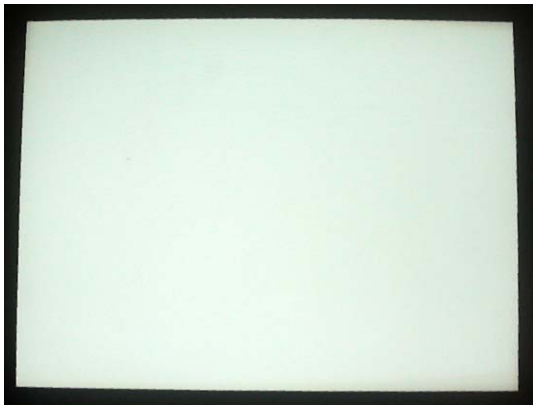


Image 7-186
Internal Full White pattern

- HGBWS



Image 7-187
Internal HGBWS pattern

- Character Set

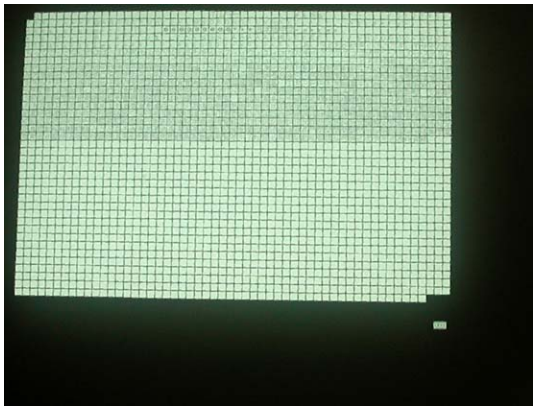


Image 7-188
Internal Character Set pattern

- H-pattern



Image 7-189
Internal H-pattern

- Convergence

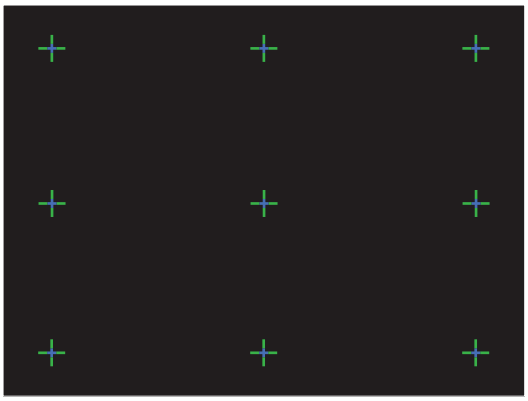


Image 7-190
Convergence pattern

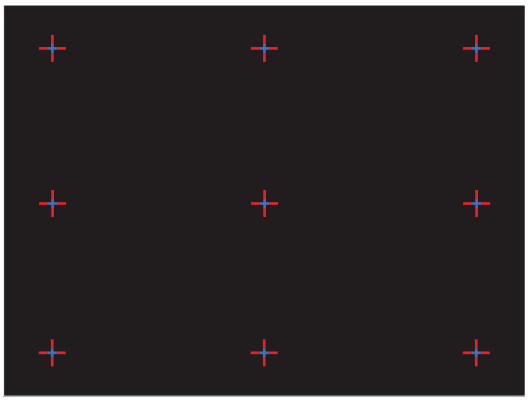


Image 7-191
Convergence pattern

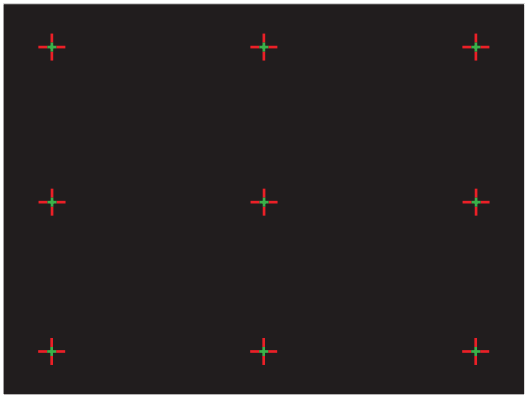


Image 7-192
Convergence pattern

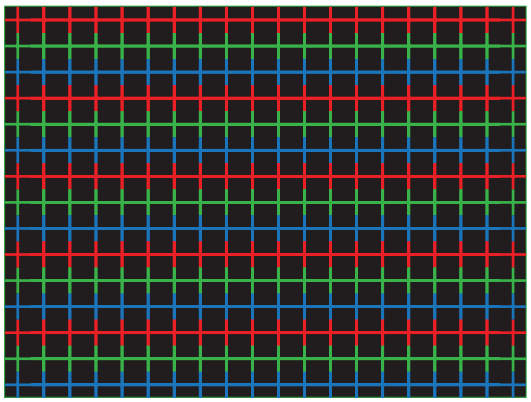


Image 7-193
Convergence pattern

- ANSI: which indicated the exact measure positions to do a ANSI lumen measurement

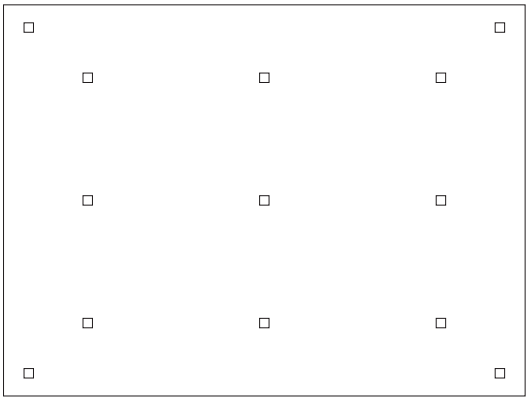


Image 7-194
ANSI pattern

- Focus

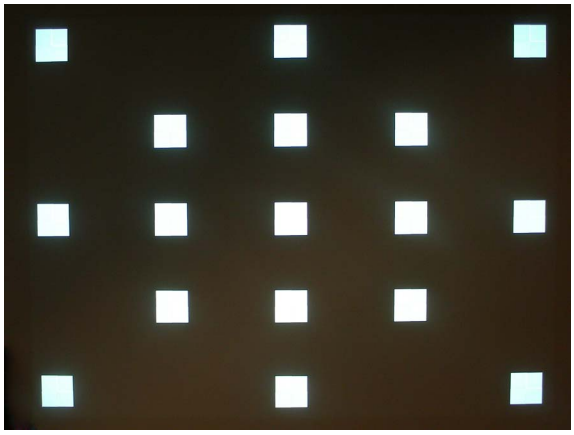


Image 7-195
Internal focus pattern

- Fine Res H Layout

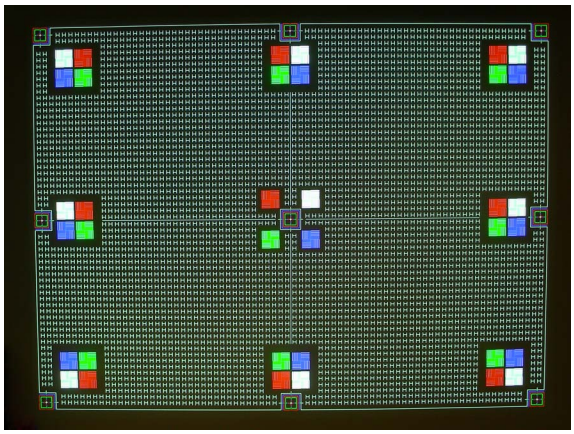


Image 7-196
Internal Fine Res H Layout pattern

- Purity

Purity Pattern

This allows the user to check the gradual transition between the different color levels (=Purity).

These colors are generated by the projector.

Following dialog box is displayed when the internal purity pattern is selected, use the buttons to change the transition level:

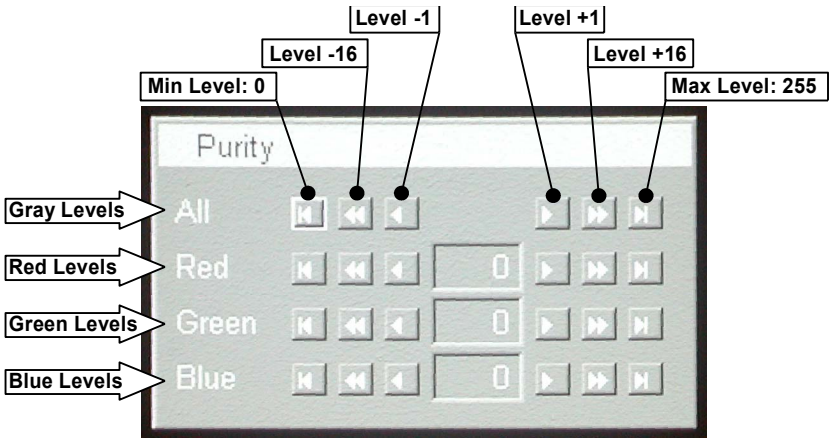


Image 7-197
Internal Purity Dialog Box

How to display an Internal Pattern?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation* in the menu bar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Internal Pattern*.
5. Push the → key to pull down the *Internal Pattern* menu.
6. Push the cursor key ↑ or ↓ to highlight the desired Internal Pattern

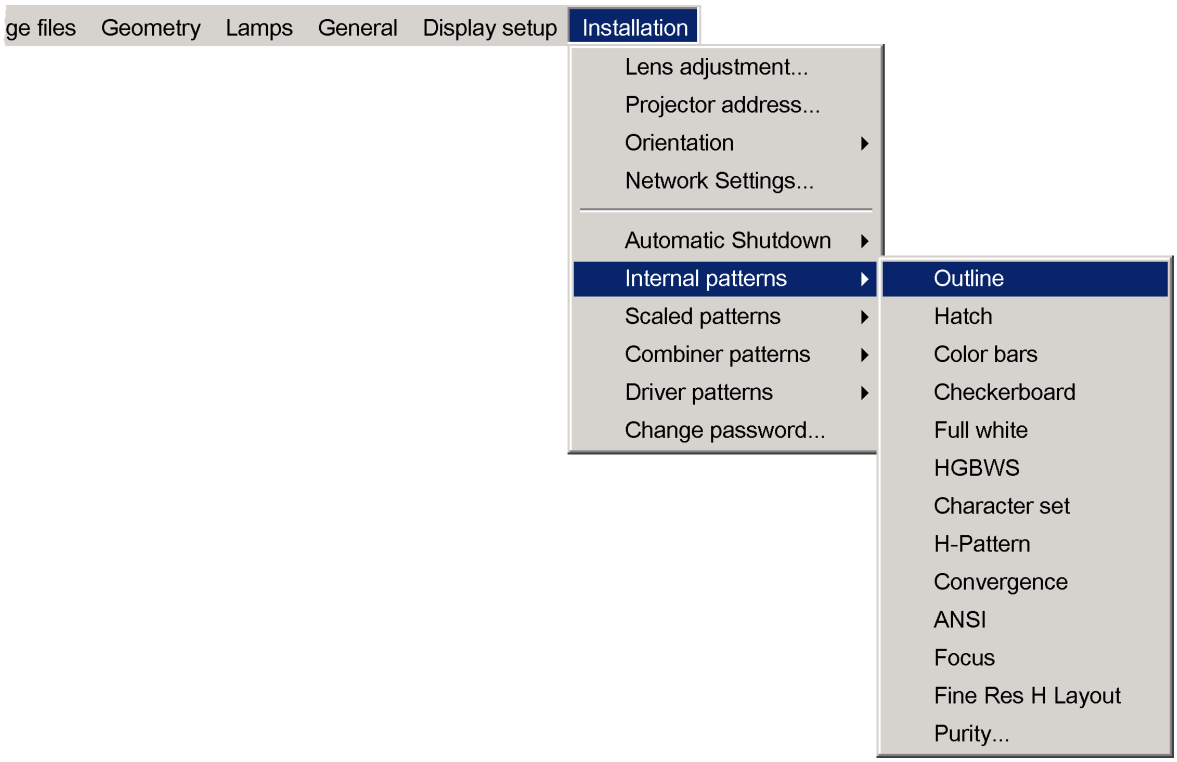


Image 7-198

7. Press **ENTER** to confirm

   The Internal Pattern will be displayed.

8. Press **BACK** to return to the *Installation* menu.

7.9.7 Scaled Patterns

What can be done?

These Scaled Patterns can be used for measurement purposes, unlike the Internal Pattern, the Scaled Patterns will be distorted according to the active Geometry File.

Available Scaled Patterns

Following pictures show the available Scaled Patterns with an active zenith geometry file.

For all scaled patterns, the contribution of each of the primary colors can be set. The user interface to do so is the same as the one which is used in the internal purity pattern.

- None
- Geometry
- Graylevels
- Moving hatch

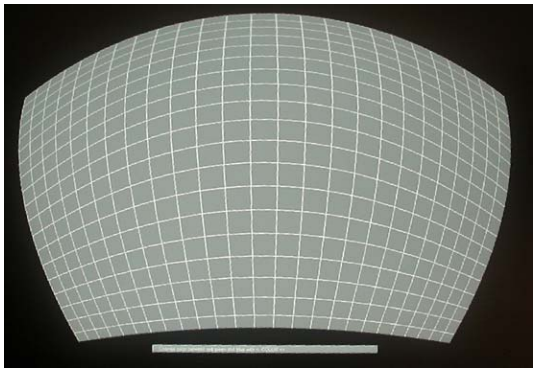


Image 7-199

- Stereo pattern
- Purity

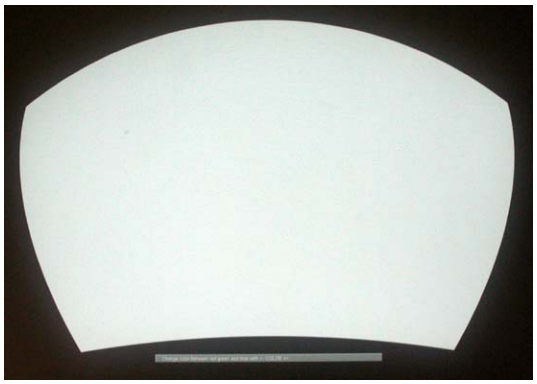


Image 7-200
Scaled Purity pattern

How to display a Scaled Pattern?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation*
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Scaled Pattern*.
5. Push the → key to pull down the *Scaled Pattern* menu.
6. Push the cursor key ↑ or ↓ to highlight the desired Scaled Pattern

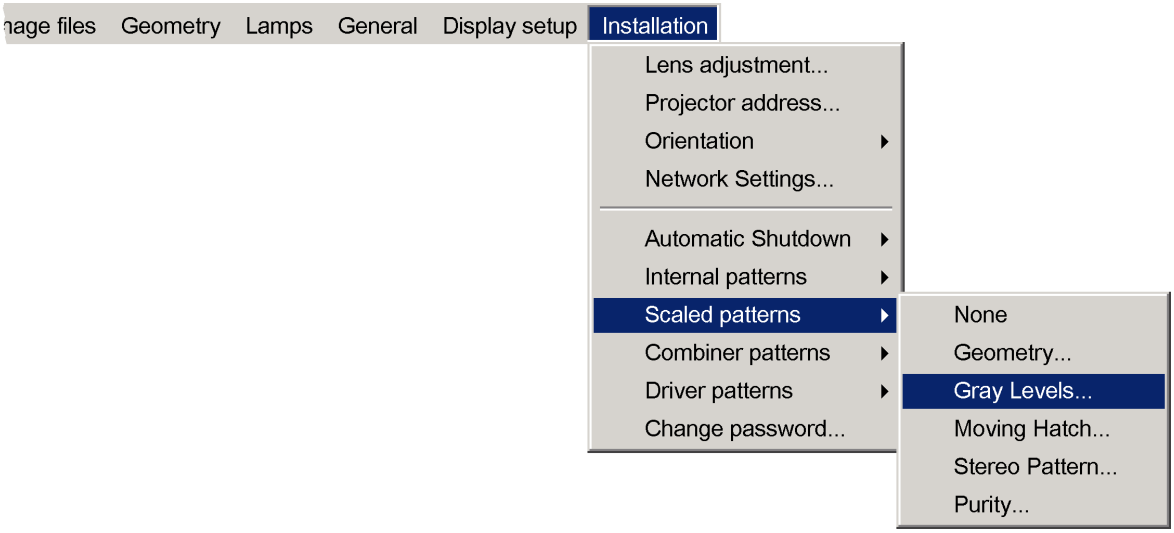


Image 7-201

7. Press **ENTER** to confirm.

   The selected Scaled Pattern is displayed.

8. Use the dialog box to adapt the colors Red, Green and Blue.
9. Press **BACK** to return to the *Installation* menu.

7.9.8 Combiner Patterns

What can be done?

The projector is equipped with different combiner patterns which can be used for adjustment purposes.

Geometry adjustments can not be used on these combiner patterns.

Some of the patterns can be inverted by hitting ENTER on the RCU while the pattern is displayed and some patterns can be changed to another color by hitting Color – or Color + on the RCU.

Available Combiner Patterns

- Composite
- Alternating checkerboard
- Gray levels

How to display a Combiner Pattern?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation* in the menu bar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Combiner Pattern*.
5. Push the → key to pull down the *Combiner Pattern* menu.
6. Push the cursor key ↑ or ↓ to highlight the desired Combiner Pattern

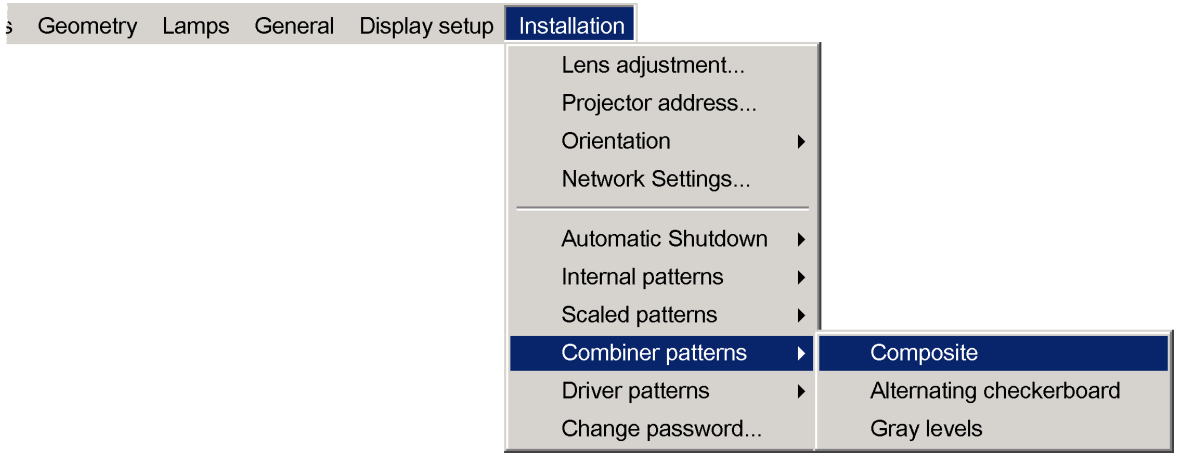


Image 7-202

7. Press **ENTER** to confirm

   The Internal Pattern will be displayed.

8. Press **BACK** to return to the *Installation* menu.

7.9.9 Driver Patterns

What can be done?

The projector is equipped with different driver patterns which can be used for adjustment purposes.

Geometry adjustments can not be used on these driver patterns.

Some of the patterns can be inverted by hitting ENTER on the RCU while the pattern is displayed and some patterns can be changed to another color by hitting Color – or Color + on the RCU.

Available Driver Patterns

- Diagonal
- Hatch
- Color bars
- Gray levels

How to display a Driver Pattern?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation* in the menu bar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Driver pattern*.
5. Push the → key to pull down the *Driver Pattern* menu.
6. Push the cursor key ↑ or ↓ to highlight the desired Driver Pattern

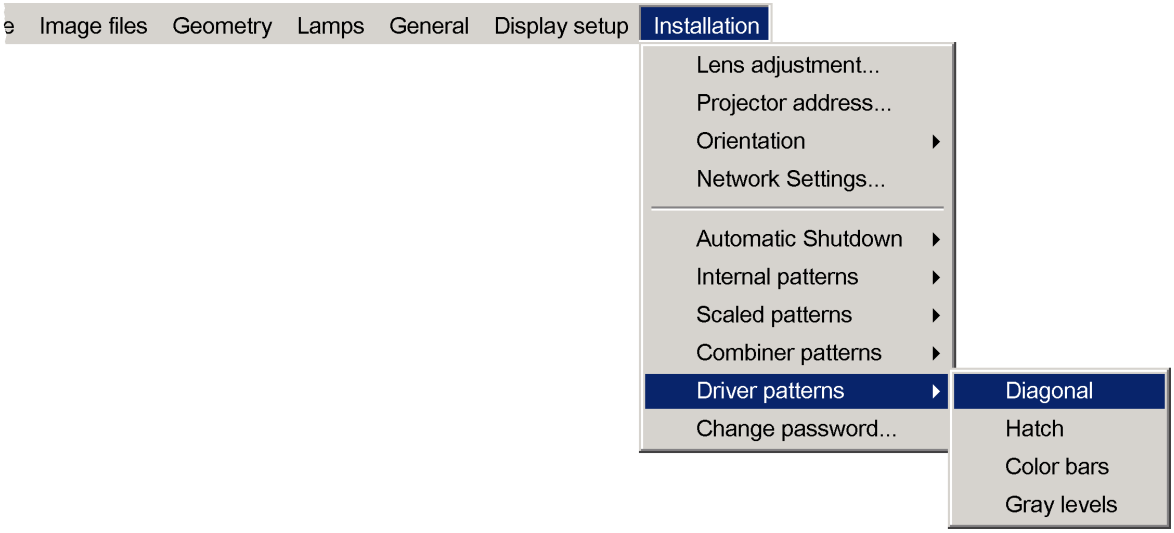


Image 7-203

7. Press **ENTER** to confirm

   The Internal Pattern will be displayed.

8. Press **BACK** to return to the *Installation* menu.

7.9.10 Change password

What can be done ?

The OSD advanced items under *More* ...can be protected by a password. The items are by default protected by the password '0000'. This password can reprogrammed.

How to change the password ?

1. Press **MENU** to activate the Tool bar
2. Press → to select the *Installation* item
3. Press ↓ to Pull down the *Installation* menu
4. Use ↑ or ↓ to select *Change password...*

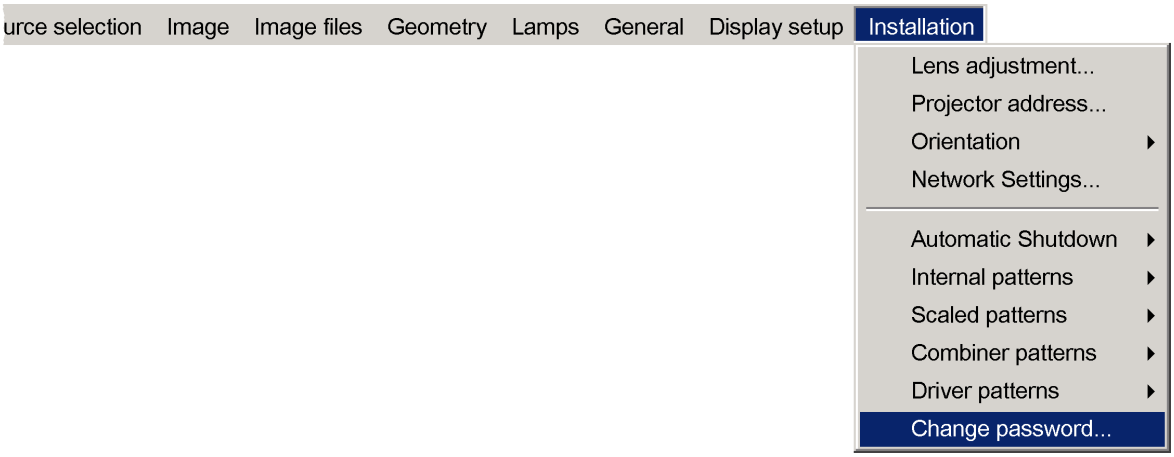


Image 7-204

5. Press **ENTER**

A dialog box is displayed.

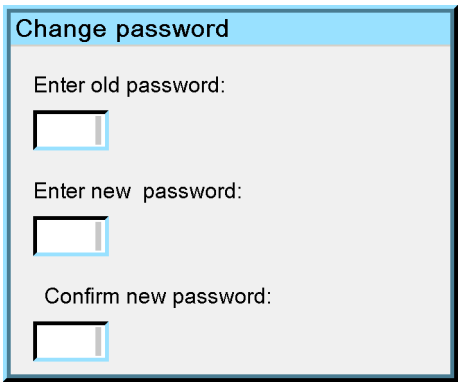


Image 7-205

6. Use ← or → , the numeric keys on the remote , or the keypad to enter the old password and to enter and confirm the new password.

   Each character is displayed as an asterisk.

The new password is accepted if the new password and the confirmed password are a 100% match.

If the password is forgotten contact a Barco authorized technician.

8. MAINTENANCE

About this chapter

This chapter contains the lamp replacement procedure, which can be done by a trained operator. Next to that, some information about air filter replacement is available. The air filter replacement itself can only be performed by Barco qualified service technicians, since a 'hidden' menu item is needed to reset the air filter runtime.

Maintenance procedures like lens cleaning, etc are also explained. These procedures can easily be performed by the operator or owner of the projector.

Advanced service information

Advanced service information for qualified service technicians (e.g. Service manual) can be found on https://my.barco.com/default.asp. Registration is needed.

Overview

- Cleaning the lens
- Cleaning the exterior of the projector
- Air filter replacement
- Lamp replacement

8.1 Cleaning the lens



To minimize the possibility of damage to optical coatings, or scratches to lens surfaces follow the cleaning procedure as described here precisely.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any water-based lens cleaner)

How to clean the lens?

1. Blow off dust with clean compressed air (or pressurized air cans[2]) .
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes in one single direction.
   Warning: *Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.*
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.



If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.

8.2 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. Pressurized air cans are not efficient if there is too much dust on the surface, the pressure is too low

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.

8.3 Air filter replacement

CAUTION: Extreme care must be taken to avoid dust intrusion in or dust infection of the projector.

WARNING: The air filters must always be present and mounted in a correct way!

Description

Two air filters are used to prevent dust from entering the projector. These air filters must be checked and replaced **on a regular basis**, depending on the environment conditions of the projector.

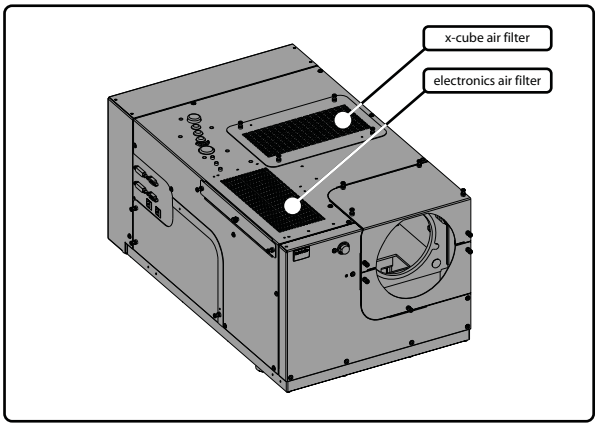


Image 8-1
Air filters: location

A good practice in a clean environment is to check/replace both air filters **on each lamp replacement**. In dusty conditions, the air filters must be checked **at least once a month**.

The two different air filters used in this projector are:

- x–cube air filter: filter with a thicker seal



Image 8-2
x-cube air filter (thicker seal)

- electronics air filter: filter with a thinner seal



Image 8-3
electronics air filter (thinner seal)

Overview

- Removing the x-cube filter
- Installing the x-cube filter
- Removing the electronics filter
- Installing the electronics filter

8.3.1 Removing the x-cube filter

Necessary tools

Torx screwdriver T10

How to remove the x-cube filter?

1. Loosen the four screws fixing the x-cube filter cover
   Tip: *These screws are fixed to the x-cube filter cover and can not drop.*

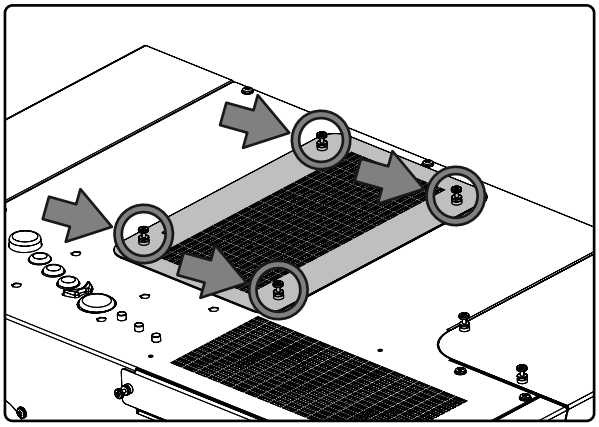


Image 8-4
X-cube filter cover: fixation screws

2. Lift the x-cube filter cover to remove it

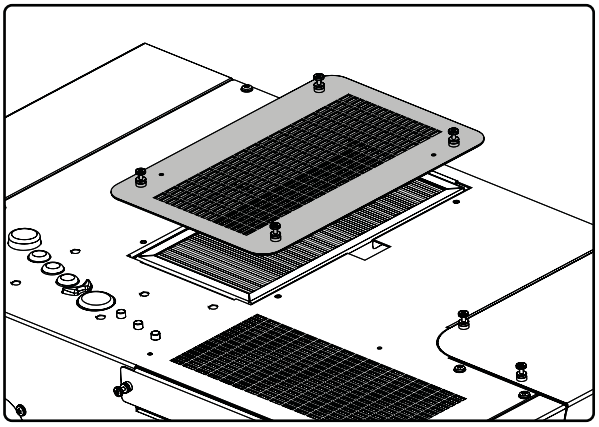


Image 8-5
X-cube filter cover: lift to remove

3. Take out the x-cube filter

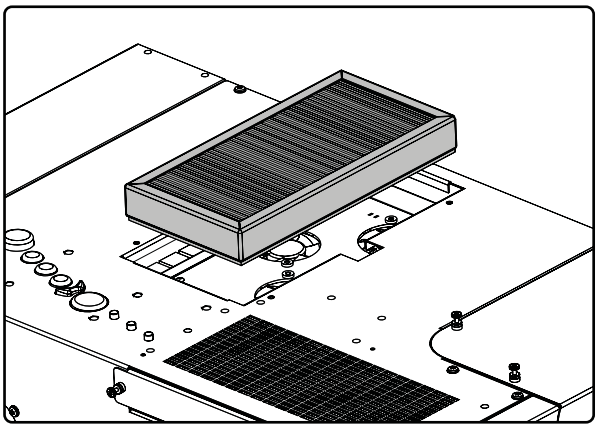


Image 8-6
X-cube filter: lift it to remove

Caution: *Keep the air filter in horizontal position while moving it away from the projector, so that no dust falls off.*

Caution: *Never put the air filter upside down! Always place it with the seal pointing to the surface where you place it.*

8.3.2 Installing the x-cube filter

Necessary tools

Torx screwdriver T10

How to install the x-cube filter?

1. Place the x-cube filter in its housing

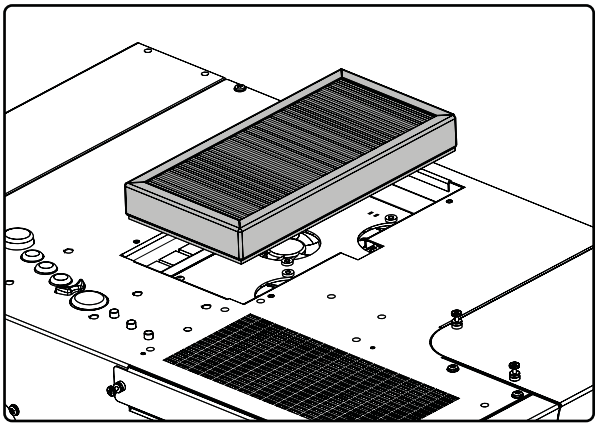


Image 8-7
X-cube filter: place it in its housing

Note: *The seal of the air filter must point down!*

2. Place the x-cube filter cover in the right position

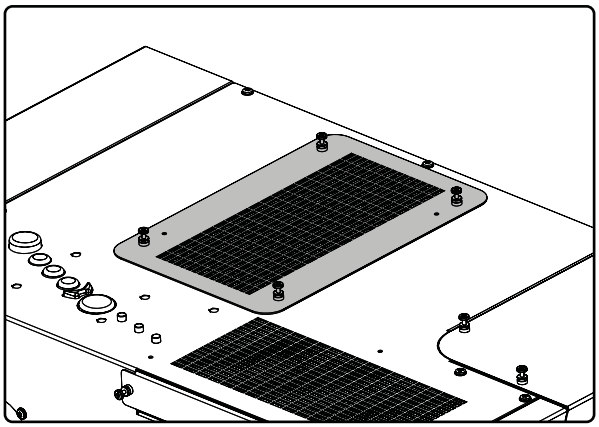


Image 8-8
X-cube filter: put the cover in the right position

3. Tighten the four screws to fix the x-cube filter cover

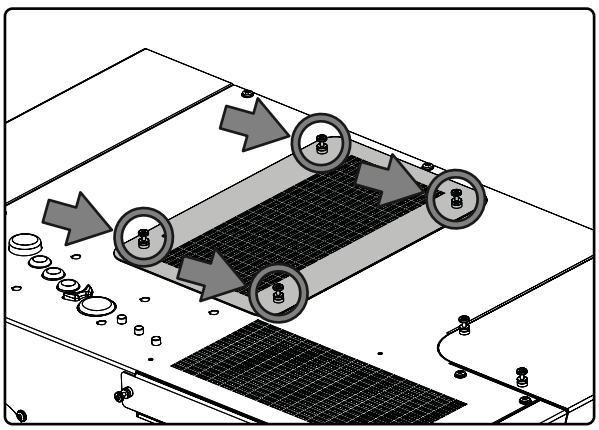


Image 8-9
X-cube filter cover: fixation screws

4. Register the air filter replacement in the *Service book*

8.3.3 Removing the electronics filter

Necessary tools

Torx screwdriver T10

How to remove the electronics filter?

1. Loosen the two screws fixing the filter cover
   Tip: *These screws are fixed to the electronics filter cover and can not drop.*

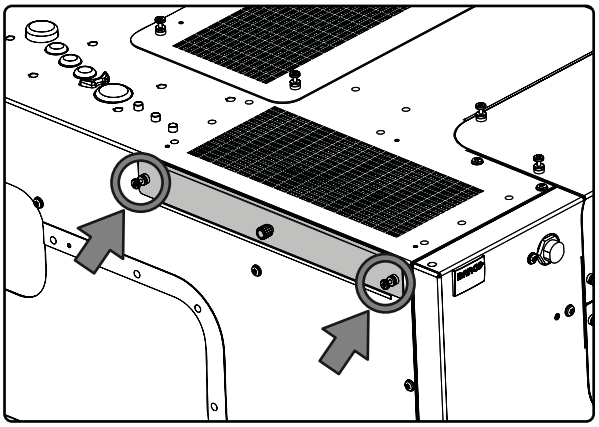


Image 8-10
Electronics filter cover: fixation screws

2. Use the handle on the electronics filter cover to pull out the filter a few centimeters

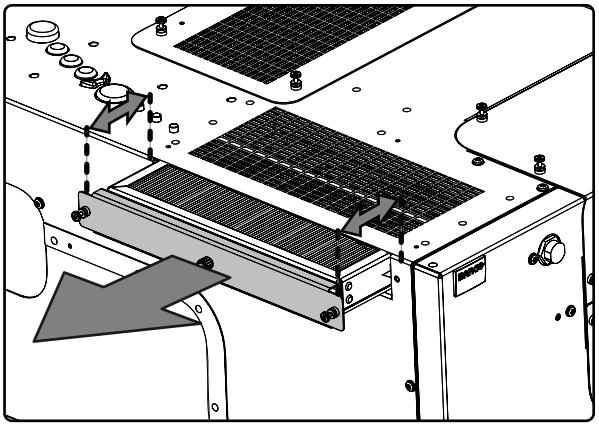


Image 8-11
Electronics filter: pull it out a few centimeters

3. Release the electronics filter cover from the filter by moving it first downward, then forward

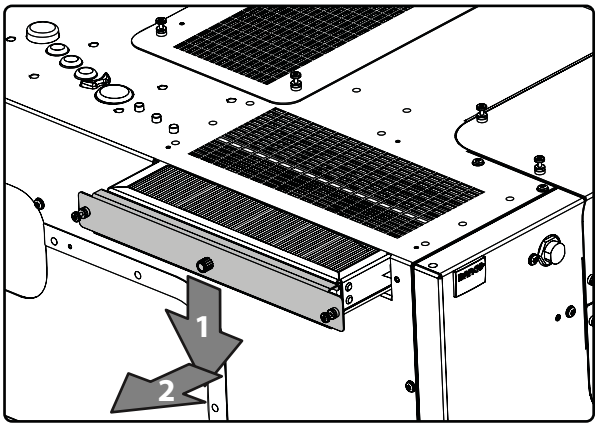


Image 8-12
Electronics filter: release the side filter cover

4. Pull out the electronics filter

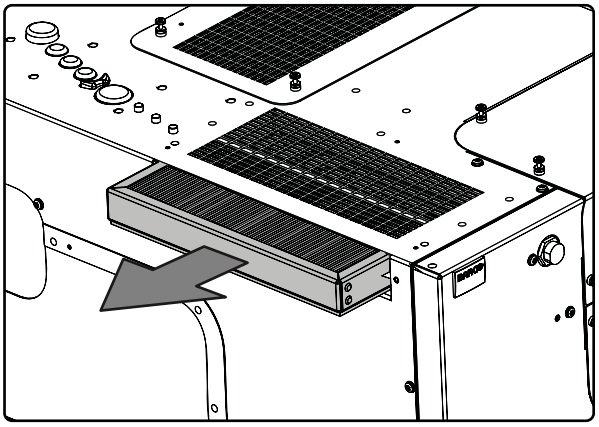


Image 8-13
Electronics filter: removing

8.3.4 Installing the electronics filter

Necessary tools

Torx screwdriver T10

How to install the electronics filter?

1. Insert the electronics filter in its housing until it sticks out only a few centimeters

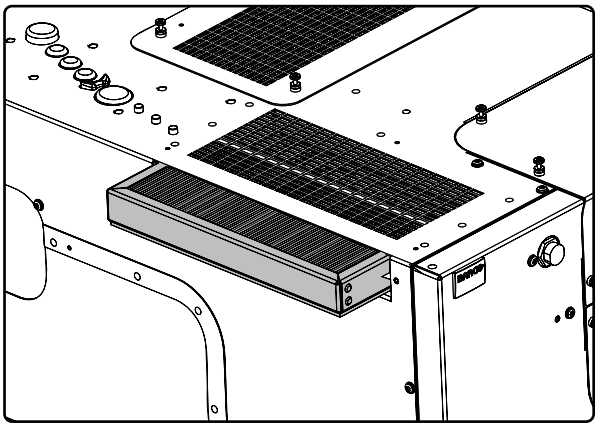


Image 8-14
Electronics filter: install

Note: *The seal of the air filter must point down!*

Note: *The obliged air flow direction is indicated by an arrow on the label at the edge of the air filter.*

2. Place the electronics filter cover against the electronics filter

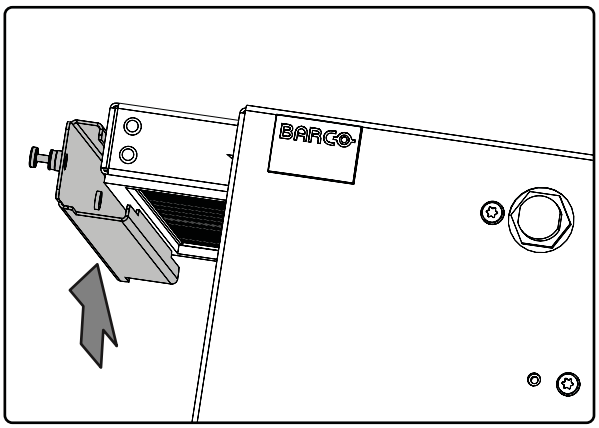


Image 8-15
Electronics filter cover: mounting

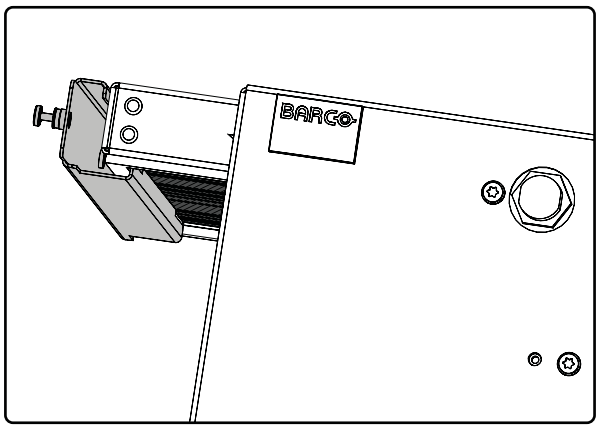


Image 8-16
Exact position of the cover against the electronics filter

3. Push the electronics filter completely in its housing

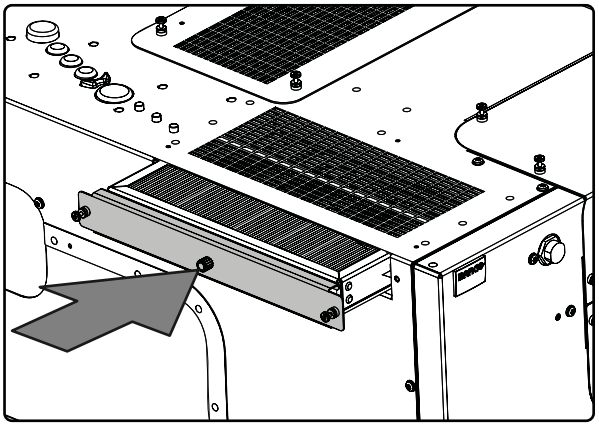


Image 8-17
Electronics filter: push it in.

4. Tighten the two screws to fix the electronics filter cover

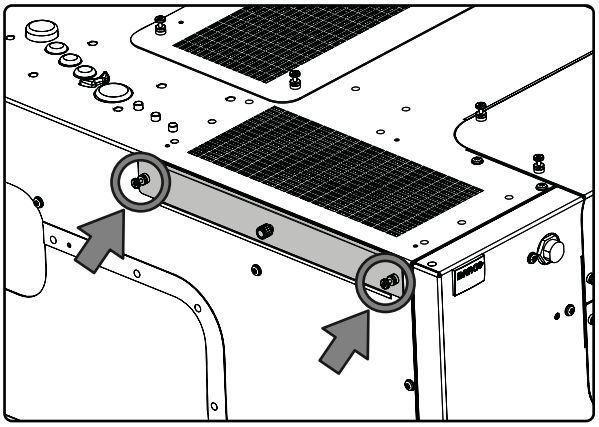


Image 8-18
Electronics filter cover: fixation screws

5. Register the air filter replacement in the *Service book*

8.4 Lamp replacement

Description

The projector lamp must be replaced at the end of its **lifetime**. When the end of lifetime comes near, a warning dialog is displayed. The time when it pops up for the first time can be set.

At the end of the lamp lifetime we generally observe considerably **reduced light output** (inherent to lamp aging) and **lamp startup failures**. In the HB version and inherent to its technology another phenomenon can be lamp crack, due to which glass particles can come off. In that case it is required to remove the failing lamp, vacuum clean the lamp area in the projector to remove all glass particles and install the new lamp.



WARNING: The lamp removal and lamp installation procedures may only be performed by Barco trained and qualified service technicians.



WARNING: Risk of burns: make sure the projector is fully cooled down (> 15 minutes) before starting the lamp removal or installation procedure.



WARNING: Risk of electrical shock: make sure the projector is switched off, powered down and that the power cord is unplugged from the projector before starting the lamp removal or installation procedure.

CAUTION: Risk of explosion: the lamp contains gas under pressure. Handle it with extreme care.

Overview

- Lamp removal
- Lamp installation
- Resetting the lamp runtime

8.4.1 Lamp removal

Necessary tools

Torx screwdriver T10

Removing the lamp

1. Loosen the three fixation screws on the lamp cover (1).

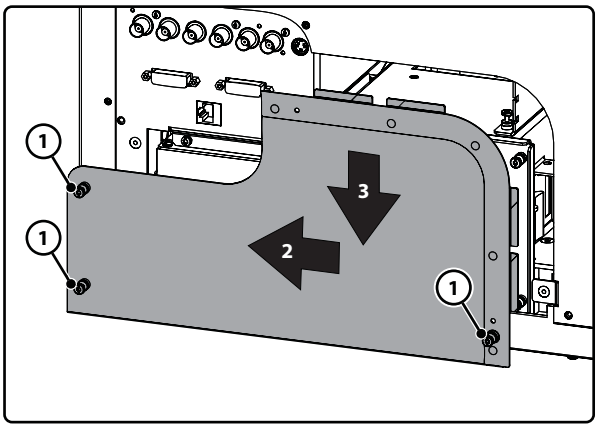


Image 8-19
Lamp cover removal

2. Slide the lamp cover to the rear side of the projector (2) and down (3) to release and remove it. See image 8-19.
3. In case of SIM 7Q & SIM 7Q HC, unplug the lamp power connector.

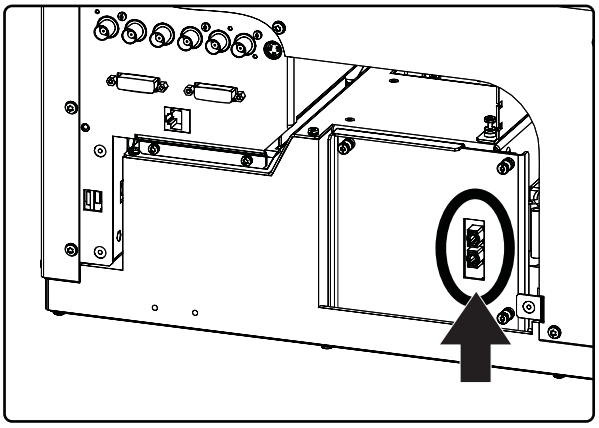


Image 8-20
Lamp power connector (SIM 7Q & SIM 7Q HC)

4. Release the three fixing screws (1) of the lamp door and remove it (2).

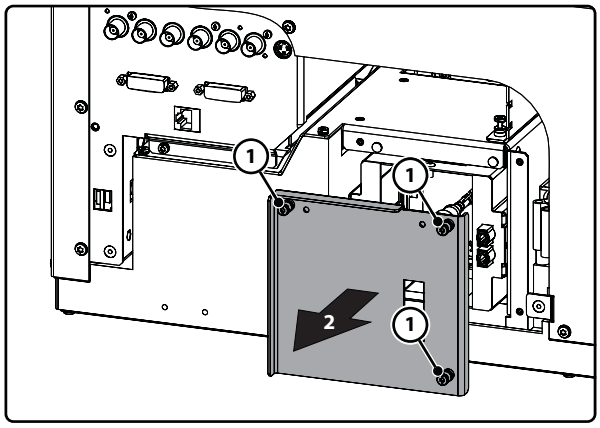


Image 8-21
Lamp door removal (SIM 7Q & SIM 7Q HC)

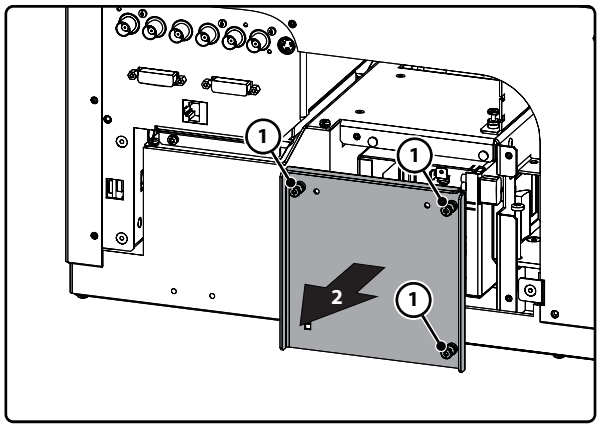


Image 8-22
Lamp door removal (SIM 7Q HB & SIM 7Q HB&C)

5. In case of SIM 7Q HB & SIM 7Q HB&C, unplug the lamp power connector.

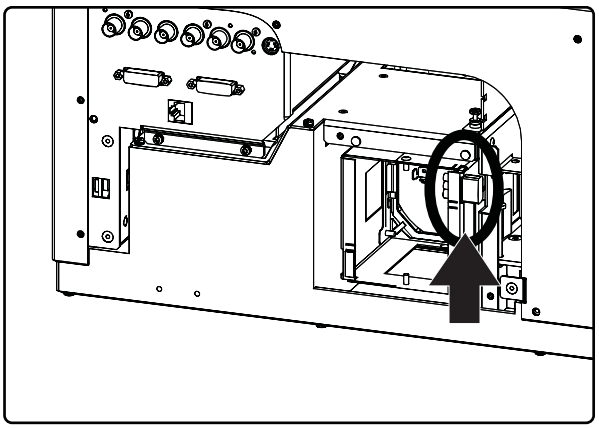


Image 8-23
Lamp power connector (SIM 7Q HB & SIM 7Q HB&C)

6. Lift the lamp locking handle (1), then pull out the lamp in a straight way (2).

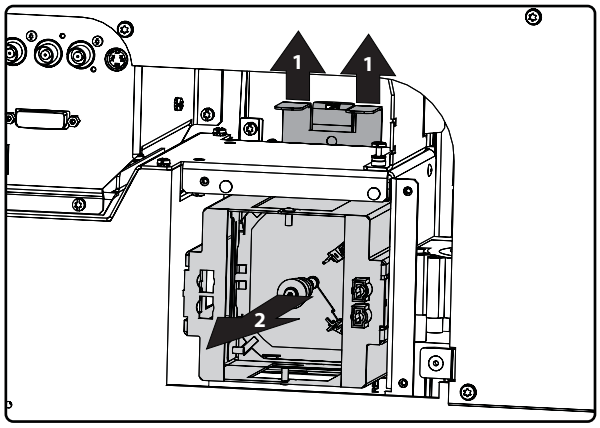


Image 8-24
Releasing and removing the lamp (SIM 7Q & SIM 7Q HC)

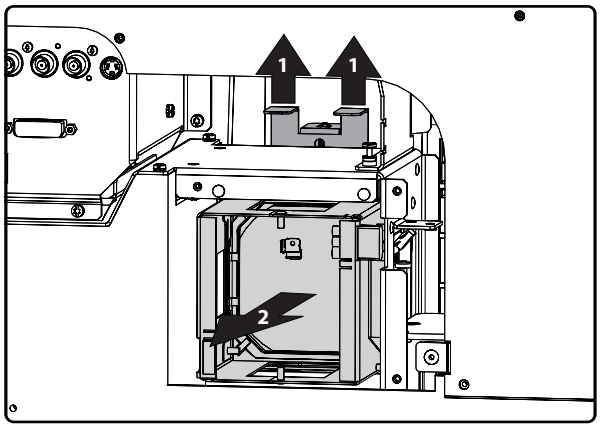


Image 8-25
Releasing and removing the lamp (SIM 7Q HB & SIM 7Q HB&C)

8.4.2 Lamp installation

Necessary tools

Torx screwdriver T10

Installing the lamp

1. Open the lamp locking system by lifting the handle.

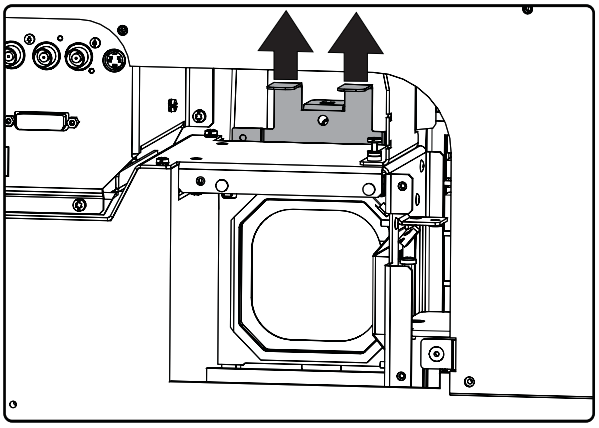


Image 8-26
Open lamp locking system

2. Slide the lamp in the projector in the correct orientation: the connector towards the projector's front side.

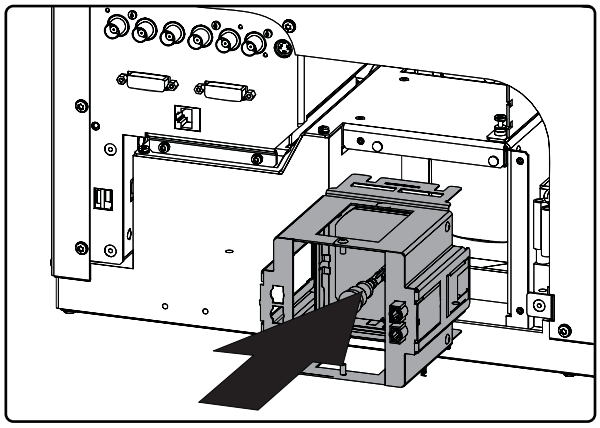


Image 8-27
Lamp insertion (SIM 7Q & SIM 7Q HC)

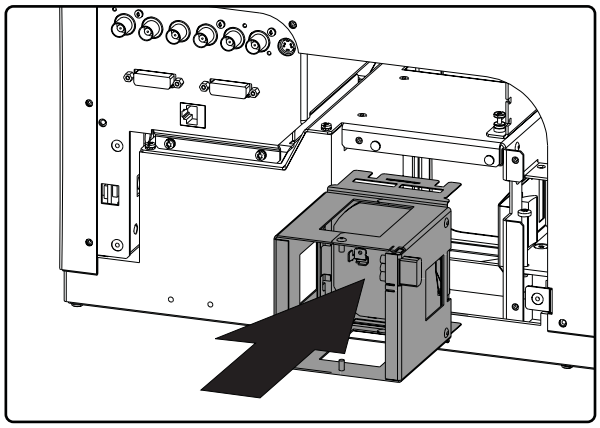


Image 8-28
Lamp insertion (SIM 7Q HB & SIM 7Q HB&C)

3. Release the lamp locking handle and firmly push the bottom side of the lamp (1) until it is locked (“click”).

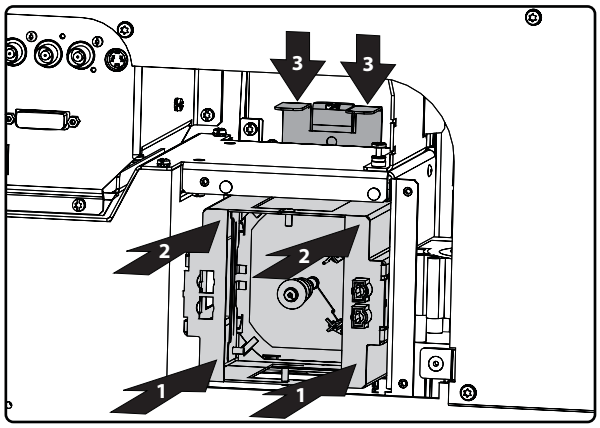


Image 8-29
Lamp fixation (SIM 7Q & SIM 7Q HC)

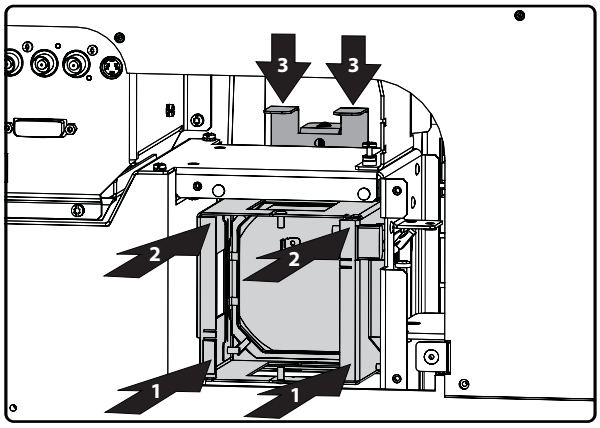


Image 8-30
Lamp fixation (SIM 7Q HB & SIM 7Q HB&C)

4. Then firmly push the top side of the lamp (2), while carefully pushing the lamp locking handle down (3). See image 8-29 and image 8-30.
5. Check the fixation of the lamp by trying to move it left-right and up-down: it should not move!
6. In case of SIM 7Q HB & SIM 7Q HB&C, plug in the lamp power connector.

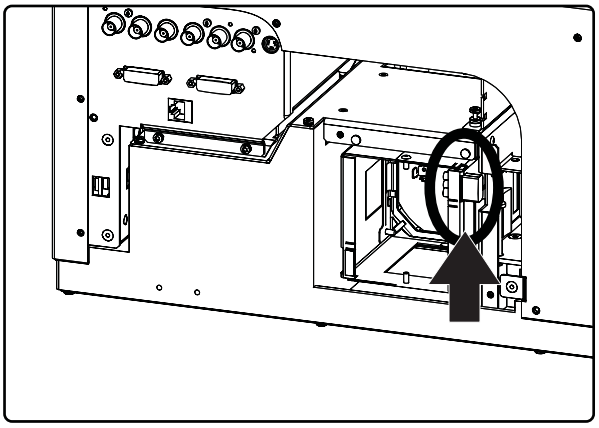


Image 8-31
Lamp power connector (SIM 7Q HB & SIM 7Q HB&C)

7. Install the lamp door (1) and tighten the three screws (2). Mind the positioning pins and holes.

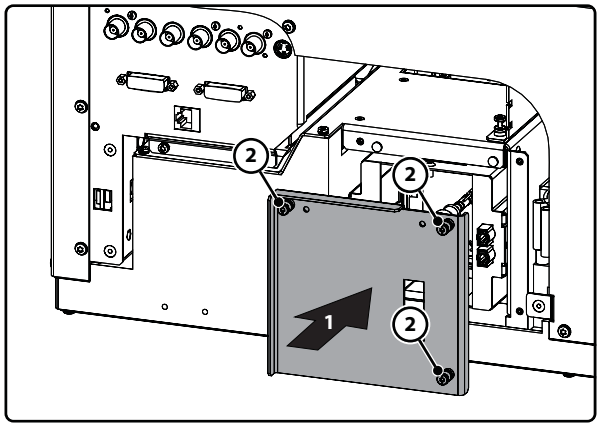


Image 8-32
Lamp door installation (SIM 7Q & SIM 7Q HC)

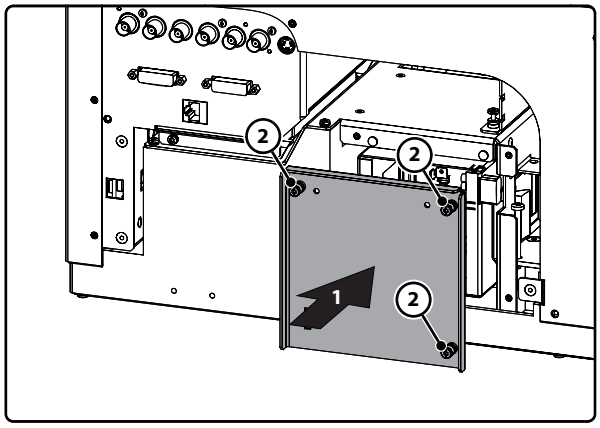


Image 8-33
Lamp door installation (SIM 7Q HB & SIM 7Q HB&C)

8. In case of SIM 7Q & SIM 7Q HC, connect the lamp power connector.

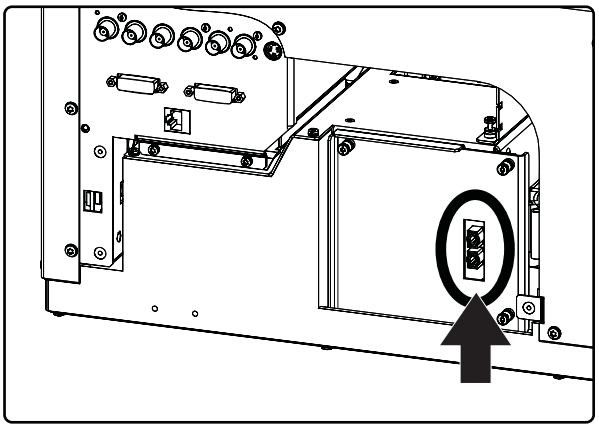


Image 8-34
Lamp power connector (SIM 7Q & SIM 7Q HC)

9. Install and fix the lamp cover: slide it up (1), then towards the front side of the projector (2) and tighten the screws (3).

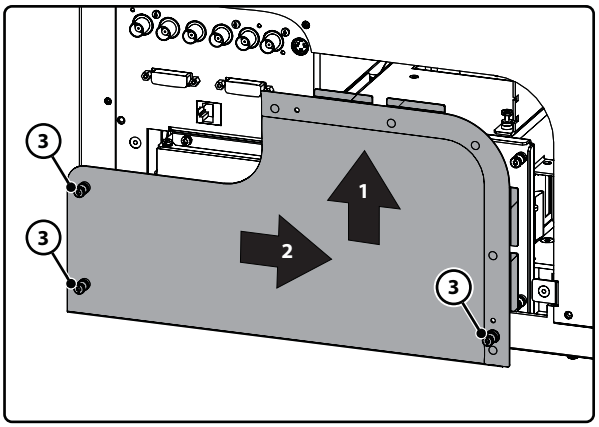


Image 8-35
Lamp cover installation

8.4.3 Resetting the lamp runtime

Necessary tools

No tools.

Description

The lamp runtime must be reset whenever a lamp is replaced by a new one.

WARNING: Both lamp runtime reset and lamp replacement can only be done by Barco trained and qualified service technicians.

Resetting the lamp runtime

1. In the projector's OSD, browse to *Lamps* > *Reset runtime*.

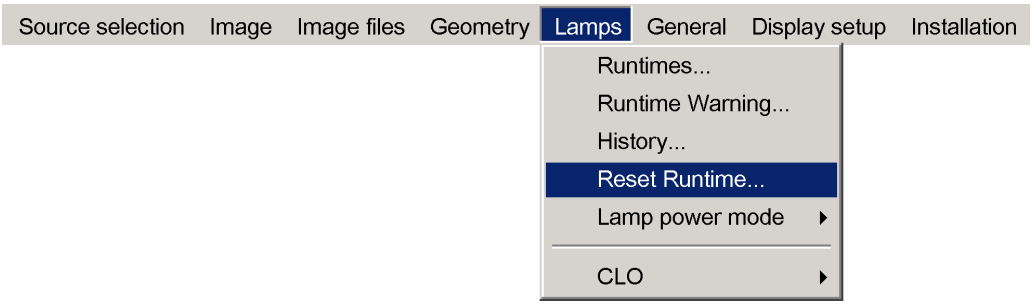


Image 8-36

2. Press **ENTER** to confirm.
   A dialog box is displayed

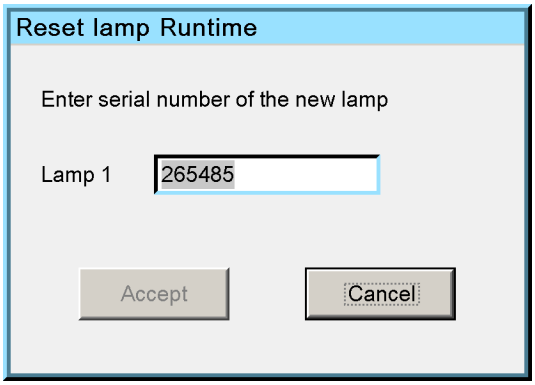


Image 8-37

3. Enter the serial number of the new lamp.
4. Press **ACCEPT** to confirm the serial number.

   The lamp runtime is now set to zero.
5. Exit the menu.

9. TROUBLESHOOTING

Overview

- Diagnostic LEDs
- Basic troubleshooting guide

9.1 Diagnostic LEDs

Position of the diagnostic LEDs

The diagnostic LEDs can be found near the local keypad of the projector.

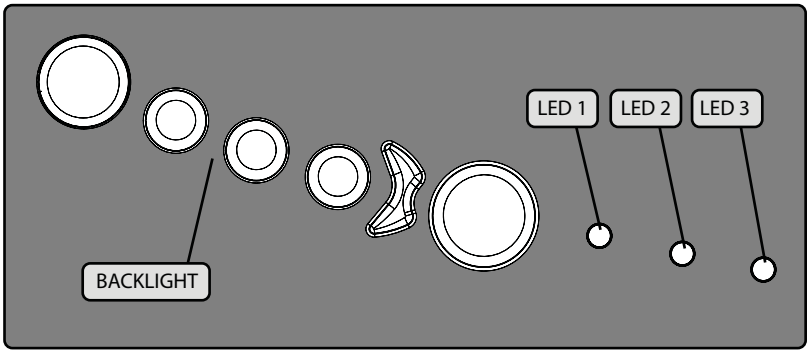


Image 9-1
SIM 7: LEDs

Description of the diagnostic LEDs

Technically each LED consists of a red LED and a green LED. If both are ON, the visible color is orange.

LED	Green	Orange	Red
LED 1	Cool down sequence: blinks 2 minutes after switching to standby[3]	Upgrading	Rescue program (Software error)
LED 2	Not used	Not used	Hardware error
LED 3	IR acknowledgement: blinks	Not used	Standby Status
Backlight	Not used	Not used	Keypad activation

9.2 Basic troubleshooting guide

About this chapter

In this section we start from the symptoms that can be seen in case of an unusual situation to come to a possible cause and solution or to detect which module is causing the problem. It is a **first level tool** which implies that it will not be possible to come to a solution at all times. If no solution can be found by using this troubleshooting guide, please contact **your dealer**.

3. Projector cannot be restarted during this period

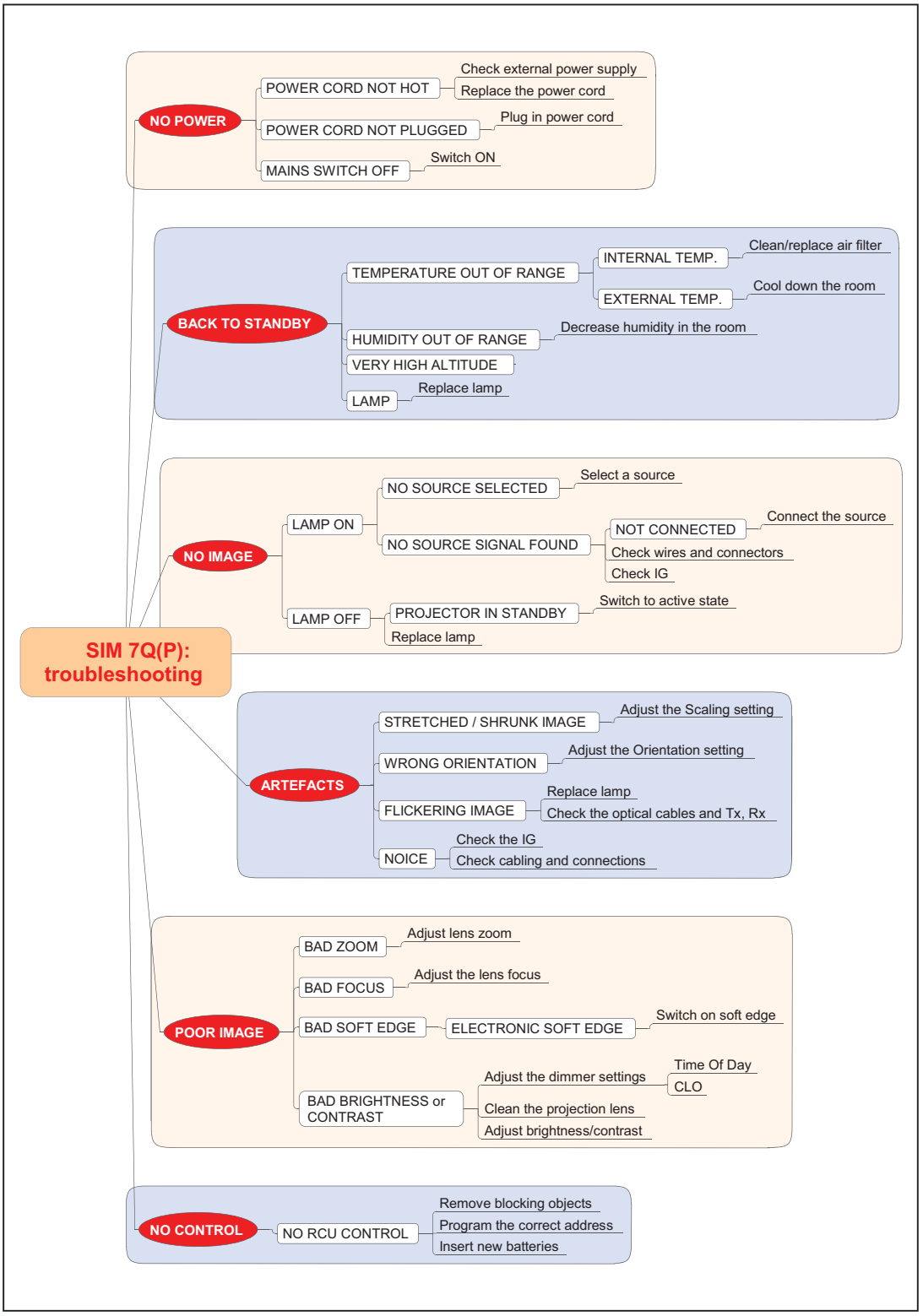

SIM 7Q(P): troubleshooting
NO POWER
POWER CORD NOT HOT
Check external power supply
Replace the power cord
POWER CORD NOT PLUGGED
Plug in power cord
MAINS SWITCH OFF
Switch ON
BACK TO STANDBY
TEMPERATURE OUT OF RANGE
INTERNAL TEMP.
Clean/replace air filter
EXTERNAL TEMP.
Cool down the room
HUMIDITY OUT OF RANGE
Decrease humidity in the room
VERY HIGH ALTITUDE
LAMP
Replace lamp
NO IMAGE
LAMP ON
NO SOURCE SELECTED
Select a source
NO SOURCE SIGNAL FOUND
NOT CONNECTED
Connect the source
Check wires and connectors
Check IG
LAMP OFF
PROJECTOR IN STANDBY
Switch to active state
Replace lamp
ARTEFACTS
STRETCHED / SHRUNK IMAGE
Adjust the Scaling setting
WRONG ORIENTATION
Adjust the Orientation setting
FLICKERING IMAGE
Replace lamp
Check the optical cables and Tx, Rx
NOICE
Check the IG
Check cabling and connections
POOR IMAGE
BAD ZOOM
Adjust lens zoom
BAD FOCUS
Adjust the lens focus
BAD SOFT EDGE
ELECTRONIC SOFT EDGE
Switch on soft edge
BAD BRIGHTNESS or CONTRAST
Adjust the dimmer settings
Time Of Day
CLO
Clean the projection lens
Adjust brightness/contrast
NO CONTROL
NO RCU CONTROL
Remove blocking objects
Program the correct address
Insert new batteries

Image 9-2

10. ENVIRONMENTAL INFORMATION

Overview

- Disposal information
- Rohs compliance
- Hazards
- Production address
- Importers contact information
- Technical Regulations

10.1 Disposal information

Disposal Information

Waste Electrical and Electronic Equipment



This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service.

For details, please visit the Barco website at: http://www.barco.com/en/AboutBarco/weee

Disposal of batteries in the product



This product contains batteries covered by the Directive 2006/66/EC which must be collected and disposed of separately from municipal waste.

If the battery contains more than the specified values of lead (Pb), mercury (Hg) or cadmium (Cd), these chemical symbols will appear below the crossed-out wheeled bin symbol.

By participating in separate collection of batteries, you will help to ensure proper disposal and to prevent potential negative effects on the environment and human health.

10.2 Rohs compliance

中国大陆 RoHS (Chinese Mainland RoHS)

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆RoHS)，以下部分列出了Barco产品中可能包含的有毒和/或有害物质的名称和含量。中国大陆RoHS指令包含在中国信息产业部MCV标准："电子信息产品中有毒物质的限量要求"中。

According to the "China Administration on Control of Pollution Caused by Electronic Information Products" (Also called RoHS of Chinese Mainland), the table below lists the names and contents of toxic and/or hazardous substances that Barco's product may contain. The RoHS of Chinese Mainland is included in the MCV standard of the Ministry of Information Industry of China, in the section "Limit Requirements of toxic substances in Electronic Information Products".

零件项目(名称) Component Name	有毒有害物质或元素 Hazardous Substances or Elements					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯醚 PBDE
印制电路配件 Printed Circuit Assemblies	X	O	O	O	O	O

零件项目(名称) **Component Name**	**有毒有害物质或元素** **Hazardous Substances or Elements**					
	铅 **Pb**	**汞** **Hg**	**镉** **Cd**	**六价铬** **Cr6+**	**多溴联苯** **PBB**	**多溴二苯醚** **PBDE**
外接电(线)缆 External Cables	X	O	O	O	O	O
内部线路 Internal wiring	O	O	O	O	O	O
散热片(器) Heatsinks	O	O	O	O	O	O
光学镜头 Optical lenses	X	O	X	O	O	O
镜头支架 Lensholder	X	O	O	O	O	O
燈泡 Lamp	O	X	O	O	O	O
底架 Chassis	O	O	O	O	O	O
外壳 Enclosure	O	O	O	O	O	O
电机 Motor	X	O	O	O	O	O
电源供应器 Power Supply Unit	X	O	O	O	O	O
风扇 Fan	X	O	O	O	O	O
附電池遙控器 Remote control	X	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下. O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求. X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006						

在中国大陆销售的相应电子信息产品(EIP)都必须遵照中国大陆《电子信息产品污染控制标识要求》标准贴上环保使用期限(EFUP)标签。Barco产品所采用的EFUP标签(请参阅实例，徽标内部的编号使用于制定产品)基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the “Electronic Information Products Pollution Control Labeling Standard” of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the “Standard of Electronic Information Products Environmental Friendly Use Period” of Chinese Mainland.



Turkey RoHS compliance

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

[Republic of Turkey: In conformity with the WEEE Regulation]

10.3 Hazards

Mercury Notice

LAMP CONTAINS MERCURY, DISPOSE ACCORDING TO STATE/LOCAL LAW.

This Barco product consists of materials that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. See www.lamprecycle.org for disposal information.

For more information on safe handling procedures, the measures to be taken in case of accidental breakage, and safe disposal options visit: http://www.ec.gc.ca/mercure-mercury.

Within this system, the lamp in the projector contains mercury.

The lamp and the projector are carefully designed to minimize the probability of lamp rupture, although the lamp may break while operating and small amounts of mercury vapor may be emitted from the projector. As a general precaution, secure good ventilation in the room when operating the projector. If lamp rupture occurs, evacuate the room and secure good ventilation.

10.4 Production address

Factories

Barco NV

Noordlaan 5, B-8520 Kuurne (BELGIUM)

Made in information

The made in country is indicated on the product ID label on the product itself.

Production date

The month and year of production is indicated on the product ID label on the product itself.

10.5 Importers contact information

Contact

To find your local importer, contact Barco directly or one of Barco's regional offices via the contact information given on Barco's web site, www.barco.com.

10.6 Technical Regulations

Certificates

Image 10-1
EAC mark

Image 10-2
Rohs

Image 10-3
Rohs OK

Image 10-4
CE mark

A. NVG OPTION (FOR SIM 7Q)

Overview

- Description
- Description of a full dimming cycle

A.1 Description

NVG option modes

The **NVG (Night Vision Goggles)** is an option at order time, that can be implemented during production on a SIM 7 to ensure a realistic night vision simulation, fully compatible with night vision goggles. This technology offers improved contrast, deep black levels and subtle gray shading.

Two different NVG options can be ordered, but they are mutually exclusive:

- **IR enhanced**: the image is displayed with the nature-like ratio between visual and IR light. This allows the use to see a realistic night scenery both with and without night vision goggles, without changing any setting to the projector
- **IR only**: the image is displayed with IR light only. It can only be seen through night vision goggles.

Technology

This technology is based on dedicated optical filters that automatically move into the light path from a certain TOD (Time Of Day) setting on. In practice, this optical filter comes in **when TOD drops below a value of 1001**. At the same time, Dynacolor (if enabled) switches over to a NVG set (i.e. Set 3), to improve the quality level of the displayed night scenery. As soon as the TOD value raises above 1000, the NVG filter moves out and Dynacolor switches over to set 2, being the set with advanced color tracking through CLO.

During the NVG mode of the **IR only** option, the input signal available on the **Green channel** only is processed. The input signals for Red and Blue are omitted. The Green input signal is converted to red and processing is done by the Red channel of the projector. During the NVG mode of **IR enhanced**, the full color signal (R, G and B) is processed.



The Lamp Runtime counting is doubled when the NVG filter is moved into the light path (i.e. if TOD drops below 1000).

A.2 Description of a full dimming cycle

Introduction

The operator does not have to perform any action other than lowering the TOD value. This can be done through the projector's OSD or by sending commands using the API protocol (e.g. through the IG).

Dimming from full light transmission to a TOD value lower than 1000

Assume that we want to dim the light output, **starting from a TOD of 10000 and end up with a TOD value of 100**. The following sequence will be followed:

1. First phase (TOD value is lowered, but has not reached 1001 yet): **ECR** is dimming the light output until it comes to its minimum, being 40%
2. Second phase (TOD value is further lowered to 1001): **CCD** starts further dimming the light output
3. Third phase (TOD is set to 1000):
   - **NVG filter** moves into the light path
   - ECR returns to full transmission
   - CCD returns to full transmission
   - NVG Dynacolor set is enabled
4. Fourth phase (TOD drops further below 1000): **ECR** is dimming the light output until it comes to its minimum, being 40%
5. Fifth phase (TOD value is further lowered to 100): **CCD** starts further dimming the light output

Increasing the light transmission from a TOD value below 1000 to full transmission

Assume that we want to go back **from a TOD value of 100 to full light transmission, ending up with a TOD value of 10000**. The following sequence will be followed:

1. First phase (TOD value is increased from 100 on): **CCD** is moving to higher transmission until is has reached full transmission
2. Second phase (TOD value is increased until 1000): **ECR** is moving to full transmission
3. Third phase (TOD is set to 1001):
   - **NVG filter** moves out of the light path
   - ECR returns to its minimum, being 40%
   - CCD returns to the position that meets the TOD setting of 1001
   - CLO-TOD tracking Dynacolor set is enabled
4. Fourth phase (TOD value is further increased): **CCD** is moving to higher transmission until is has reached full transmission
5. Fifth phase (TOD value is further increased to 10000): **ECR** is moving to full transmission

B. NVG OPTION (FOR SIM 7Q HC)

Overview

- Description
- Description of a full dimming cycle

B.1 Description

NVG option modes

The **NVG (Night Vision Goggles)** is an option at order time, that can be implemented during production on a SIM 7 to ensure a realistic night vision simulation, fully compatible with night vision goggles. This technology offers improved contrast, deep black levels and subtle gray shading.

With the **IR enhanced** technology, the image is displayed with the nature-like ratio between visual and IR light. This allows the use to see a realistic night scenery both with and without night vision goggles, without changing any setting to the projector.

Technology

This technology is based on dedicated optical filters that automatically move into the light path from a certain TOD (Time Of Day) setting on. In practice, this optical filter comes in **when TOD drops below a value of 1001**. At the same time, Dynacolor (if enabled) switches over to a NVG set (i.e. Set 3), to improve the quality level of the displayed night scenery. As soon as the TOD value raises above 1000, the NVG filter moves out and Dynacolor switches over to set 2, being the set with advanced color tracking through CLO.



The Lamp Runtime counting is doubled when the NVG filter is moved into the light path (i.e. if TOD drops below 1000).

B.2 Description of a full dimming cycle

Introduction

The operator does not have to perform any action other than lowering the TOD value. This can be done through the projector's OSD or by sending commands using the API protocol (e.g. through the IG).

Dimming from full light transmission to a TOD value lower than 1000

Assume that we want to dim the light output, **starting from a TOD of 10000 and end up with a TOD value of 100**. The following sequence will be followed:

1. First phase (TOD value is lowered, but has not reached 1001 yet): **ECR** is dimming the light output until it comes to its minimum, being 25%
2. Second phase (TOD value is further lowered to 1001): **CCD** starts further dimming the light output (down to about 40%)
3. Third phase (TOD is set to 1000):
   - **NVG filter** moves into the light path
   - ECR remains at 25%, keeping the Contrast Ration at the same level
   - CCD returns to full transmission
   - NVG Dynacolor set is enabled
4. Fourth phase (TOD value is further lowered to 100): **CCD** starts further dimming the light output

Increasing the light transmission from a TOD value below 1000 to full transmission

Assume that we want to go back **from a TOD value of 100 to full light transmission, ending up with a TOD value of 10000**. The following sequence will be followed:

1. First phase (TOD value is increased from 100 till 1000): **CCD** is moving to higher transmission until is has reached ± full transmission
2. Second phase (TOD is set to 1001):
   - **NVG filter** moves out of the light path
   - ECR is still at its minimum, being 25%
   - CCD closes to the position of around 40% (to meet the TOD value of 1001)
   - CLO-TOD tracking Dynacolor set is enabled
3. Third phase (TOD value is further increased): **CCD** is moving to higher transmission until is has reached full transmission
4. Fourth phase (TOD value is further increased to 10000): **ECR** is moving to full transmission

C. GLD ALIGNMENT

Overview

- Gamma values

C.1 Gamma values

Description

This is the reference value to be used for the gray pattern in a scale from black (0) to white (255) depending on the gamma you select to use on the system.

Gamma		1,2	1,4	1,6	1,8	2	2,2	2,4	2,6	2,8	3	3,2
Hierarchy level (1-4)	Hierarchy level (%)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)	Value (0–255)
1	25%	80	95	107	118	127	135	143	150	155	161	165
2	6,30%	25	35	45	55	64	72	80	88	95	101	107
	56,30%	158	169	178	185	191	196	201	204	208	210	213
3	1,60%	8	13	19	25	32	38	45	51	58	64	69
	14,10%	50	63	75	86	96	104	113	120	127	133	138
	39,10%	116	130	142	151	159	166	172	178	182	186	190
	76,60%	204	210	216	220	223	226	228	230	232	233	235
4	0,40%	2	5	8	12	16	20	25	30	35	40	45
	3,50%	16	23	31	40	48	56	63	70	77	83	90
	9,80%	37	48	60	70	80	89	97	104	111	117	123
	19,10%	64	78	91	102	112	120	128	135	141	147	152
	31,60%	98	112	124	135	143	151	158	164	169	174	178
	47,30%	137	149	160	168	175	181	187	191	195	199	202
	66%	180	189	197	202	207	211	214	217	220	222	224
	87,90%	229	232	235	237	239	240	242	243	243	244	245

D. IMAGE FILES

Overview

- Image files

D.1 Image files

Overview of the image files

The standard image files mentioned in the table below are pre-programmed in the projector.

Only the 60Hz sources will be shown synchronous on the projector. Sources with other vertical refresh rates are not displayed synchronous and will show artefacts on moving images.

Name[4]	Resolution[5]	Fvert Hz[6]	FHor kHz[7]	Fpix MHz[8]	Ptot[9]	Pact[10]	Ltot[11]	Lact[12]
DOS3@56.xml	640x400	56	24.64	20.895	848	640	440	400
VGA@75.xml	640x480	75	37.5	31.5	840	640	500	480
VGA1@85.xml	640x480	85	43.265	35.996	832	640	509	480
VGA@73.xml	640x480	73	37.96	31.583	832	640	520	480
NTSC_LIMO_X2 @60.xml	834x482	60	31.2	31.949	1024	834	520	482
VGA@60.xml	640x480	60	31.5	25.2	800	640	525	480
PAL_LIMO_X2 @50.xml	834x574	50	31	31.744	1024	834	620	574
SVGA@75.xml	800x600	75	46.875	49.5	1056	800	625	600
SVGA@56.xml	800x600	56	35	35.84	1024	800	625	600
SVGA@60.xml	800x600	60	37.68	39.79	1056	800	628	600
SVGA@85.xml	800x600	85	53.635	56.209	1048	800	631	600
ESVGA@73.xml	832x624	73	48.18	53.962	1120	832	660	624
SVGA_1@72.xml	800x600	72	47.952	49.87	1040	800	666	600
SG_60_3@60.xml	960x680	60	43.2	54.432	1260	960	720	680
HD_60P@60.xml	1280x720	60	45	74.25	1650	1280	750	720
XGA_1@75.xml	1024x768	75	60	78.72	1312	1024	800	768
XGA_GS@75.xml	1024x768	75	60.075	79.78	1328	1024	801	768
XGA_1@70.xml	1024x768	70	56.42	74.926	1328	1024	806	768
XGA@60.xml	1024x768	60	48.36	64.996	1344	1024	806	768
XGA@85.xml	1024x768	85	68.68	94.504	1376	1024	808	768
XGA@72.xml	1024x768	72	58.176	80.05	1376	1024	808	768

4. Name: name of file, contains the settings.
5. Resolution: image resolution, when followed by ..i means interlaced.
6. Fvert Hz: vertical frame frequency of the source
7. FHor kHz: horizontal frequency of the source
8. Fpix MHz: pixel frequency
9. Ptot : total pixels on one horizontal line.
10. Pact: active pixels on one horizontal line.
11. Ltot: total lines in one field
12. Lact: active lines in one field.

Name[4]	Resolution[5]	Fvert Hz[6]	FHor kHz[7]	Fpix MHz[8]	Ptot[9]	Pact[10]	Ltot[11]	Lact[12]
XGA_2@70.xml	1024x768	70	57.05	78.044	1368	1024	815	768
EXGA@60.xml	1152x864	60	53.7	81.624	1520	1152	895	864
EXGA@85.xml	1152x864	85	77.095	121.502	1576	1152	907	864
EXGA1@70.xml	1152x864	70	63.84	97.483	1480	1152	912	864
MXGA@100.xml	1152x864	100	93	145.824	1568	1152	930	864
1600@60.xml	1600x900	60	55.92	118.998	2128	1600	932	900
EXGA2@70.xml	1152x864	70	66.15	100.019	1512	1152	945	864
EXGA@80.xml	1152x864	80	76.64	110.362	1440	1152	958	864
SXGA2@60.xml	1280x960	60	60	108	1800	1280	1000	960
EXGA2@75.xml	1152x864	75	75.15	110.02	1464	1152	1002	864
SXGA2@85.xml	1280x960	85	85.935	148.496	1728	1280	1011	960
SXGA_L@60.xml	1280x1024	60	62.46	83.946	1344	1280	1041	1024
SXGA@50.xml	1280x1024	50	52.35	87.948	1680	1280	1047	1024
WSXGA@60.xml	1600x1024	60	63.6	136.358	2144	1600	1060	1024
SXGA_1@72.xml	1280x1024	72	76.392	128.339	1680	1280	1061	1024
SXGA@76.xml	1280x1024	76	81.016	134.811	1644	1280	1066	1024
SXGA@75.xml	1280x1024	75	79.95	134.956	1688	1280	1066	1024
SXGA@60.xml	1280x1024	60	63.96	107.964	1688	1280	1066	1024
SXGA+_1@60.xml	1400x1050	60	63.96	107.964	1688	1400	1066	1050
SXGA_2@72.xml	1280x1024	72	76.968	130.076	1690	1280	1069	1024
SXGA@85.xml	1280x1024	85	91.12	157.455	1728	1280	1072	1024
SXGA+_2@60.xml	1400x1050	60	65.34	121.794	1864	1400	1089	1050
HD_1080P@60.xml	1920x1080	60	67.08	172.798	2576	1920	1118	1080
HD_30P@30.xml	1920x1080	30	33.75	74.25	2200	1920	1125	1080
HD_25P@25.xml	1920x1080	25	28.125	74.25	2640	1920	1125	1080
HD_24P@24.xml	1920x1080	24	27	74.25	2750	1920	1125	1080
WUXGA@60.xml	1920x1200	60	74.7	193.622	2592	1920	1245	1200
UXGA@85.xml	1600x1200	85	106.25	229.5	2160	1600	1250	1200
UXGA@75.xml	1600x1200	75	93.75	202.5	2160	1600	1250	1200
UXGA@70.xml	1600x1200	70	87.5	189	2160	1600	1250	1200
UXGA@60.xml	1600x1200	60	75	162	2160	1600	1250	1200
SG_50@50.xml	1600x1200	50	62.5	130.313	2085	1600	1250	1200
WSXGA+@60.xml	1680x1050	60	78.24	177.761	2272	1680	1304	1050
SXGAP2@60.xml	1024x1280	60	79.5	110.664	1392	1024	1325	1280
SXGAP@70.xml	1024x1280	70	92.82	133.661	1440	1024	1326	1280
S1600@67.xml	1600x1280	67	89.378	200.207	2240	1600	1334	1280
WUXGA_2@60.xml	1920x1200	60	89.4	234.586	2624	1920	1490	1200
1920x1440@60.xml	1920x1440	60	90	234	2600	1920	1500	1440
QXGA@56.xml	2048x1536	56	88.816	247.264	2784	2048	1586	1536
QXGA@60.xml	2048x1536	60	95.34	266.952	2800	2048	1589	1536

Name[4]	**Resolution**[5]	**Fvert Hz**[6]	**FHor kHz**[7]	**Fpix MHz**[8]	**Ptot**[9]	**Pact**[10]	**Ltot**[11]	**Lact**[12]
UXGAP1@59.xml	1200x1600	59	95.58	119.666	1252	1200	1620	1600
UXGAP2@60.xml	1200x1600	60	99.36	163.745	1648	1200	1656	1600
WUXGA@50.xml	1920x1200	50	61.9	158.464	2560	1920	1238	1200
SGI@96.xml	1280x1024	96	102.048	172.257	1688	1280	1063	1024
SGI@108.xml	1280x1024	108	112.428	164.145	1460	1280	1041	1024
SGI@110.xml	1280x1024	110	114.18	167.16	1464	1280	1038	1024
HP@100.xml	1280x1024	100	108.5	187.488	1728	1280	1085	1024
EWS@110.xml	1280x1024	110	116.16	200.724	1728	1280	1056	1024

GLOSSARY

BFL

Back Focal Length

CCD

Constant Contrast Dimming

CEE7/7

European power plug to connect the power cord to the wall outlet.

ECR

Extended Contrast Ratio

Extended Contrast ratio allows to increase the contrast of the image while the light output decreases.

GLC

Gray Level Correction

GLD

Gray Level Definition

NEMA5

American power plug to connect the power cord to the wall outlet.

Smearing

Smearing is a ’trail’ effect produced by fast moving objects in a displayed image. Any fast moving object will look blurred or smeared along the direction of relative motion.

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