BARCO

HOME CINEMA

CINEVERSUM 60/70

INSTALLATION MANUAL

Changes

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This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is encouraged to try to correct the interference by one or more of the following measures.

Introduction to the user :

If this equipment does cause interference to radio or television reception, the user may try to correct the interference by one or more of the following measures :

• Re-orientation of the receiving antenna for the radio or television.

• Relocate the equipment with respect to the receiver.

• Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.

• Fasten cables connectors to the equipment by mounting screws.

The use of shielded cables is required to comply within the limits of Part 15 of FCC rules and EN55022.

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1. PACKAGING AND DIMENSIONS

Overview

- Box content
- Projector Packaging
- Dimensions

1.1 Box content

> **CEE7**
>
> European power plug to connect the power cord to the wall outlet.

> **ANSI 73.11**
>
> American power plug to connect the power cord to the wall outlet.

Content

- 1 CineVERSUM 60 or CineVERSUM 70 projector
- 1 remote control unit RCU + 2 batteries.
- 2 power cables with outlet plug type CEE7 and ANSI 73.11.
- 1 spanner to shift the lens
- 1 owners manual European languages (English, French, German, Italian, Spanish)
- 1 owners manual Asian languages (Chinese, Japanese)
- 1 installation manual
- 1 safety manual multilingual

1.2 Projector Packaging

Way of Packaging

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

To unpack

1. Pull off the adhesive tape or cut the adhesive tape but take care not to insert the knife too deep otherwise the projector can be damaged.

2. Take the projector out of its shipping carton, remove the foam rubber and place it on a table. (image 1-1)

Image 1-1
Projector packaging

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

1.3 Dimensions

Left side view
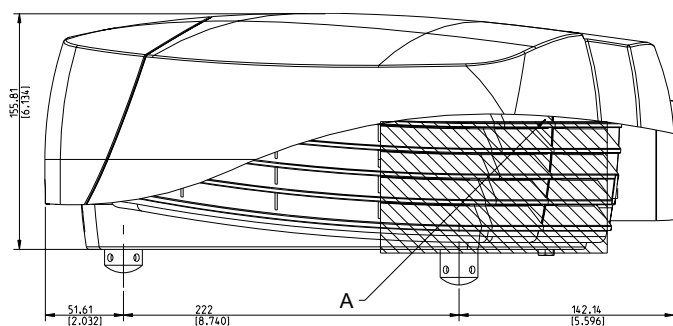
Image 1-2
Left side view

A   Air outlet

Right side view
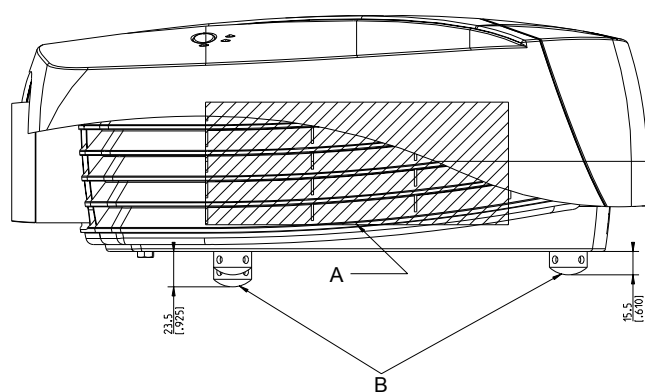
Image 1-3
Right side view

A Air inlet
B Adjustable feet

Front view
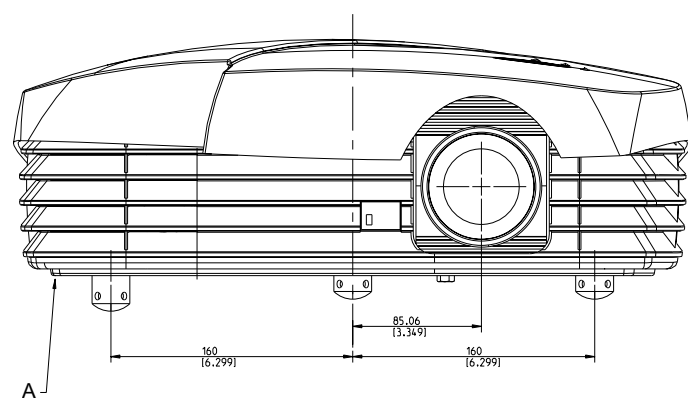
Image 1-4
Front view

A Air outlet

Bottom view
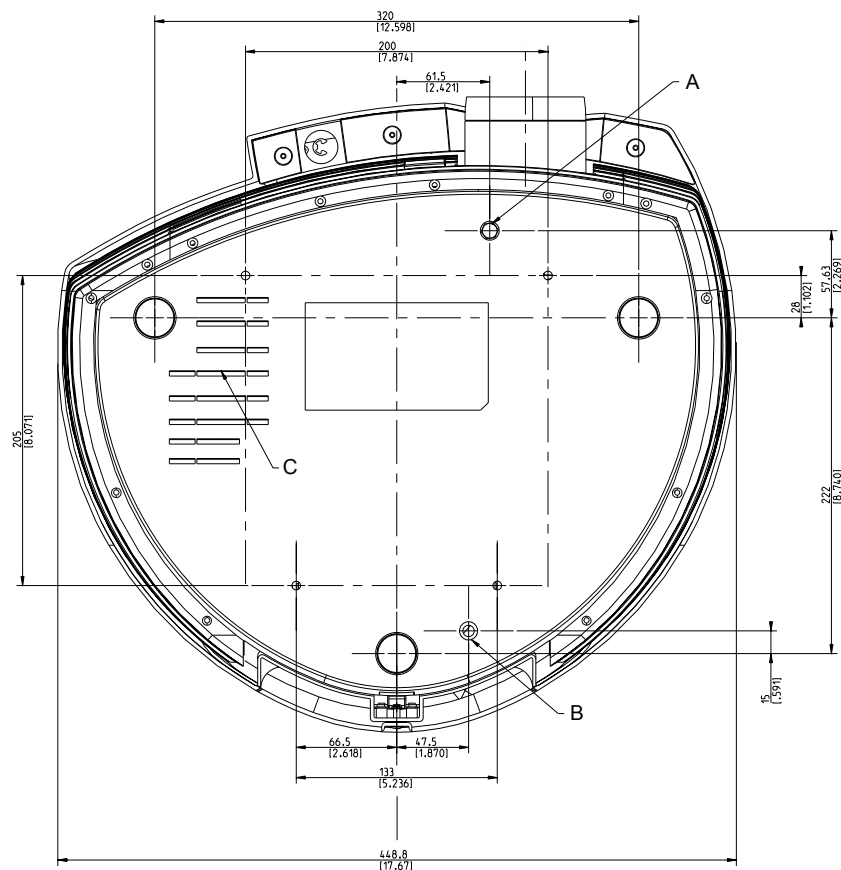
Image 1-5
Bottom view

A   Vertical lens shift bolt
B   M8 bolt for security chain when ceiling mounted
C   Air inlet

2. INSTALLATION GUIDELINES

Overview

- Safety Warnings
- General
- Projector Configuration and Position
- Safety Area around projector
- Cleaning the lens
- Vertical lens shift
- Battery Insertion in the Remote Control
- Ceiling Mount assembly

> **Before installing the projector, read first the safety instructions in the safety manual delivered with the projector and also the safety pages in this manual.**

2.1 Safety Warnings

Mercury Vapor Warnings

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

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

2.2 General

Ambient Temperature 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.

Max. ambient temperature : 40°C or 104 °F

Min. ambient temperature : 10 °C or 50 °F

The projector will not operate if ambient air temperature falls outside this range (10°C- 40°C or 50°F-104°F).

Storage temperature: -35°C to +65°C (-31°F to 149°F)

Humidity Conditions

Storage: 0 to 98 % RH Non-condensing

Operation: 0 to 95 % RH Non-condensing

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

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

Special Care for Laser Beams

Special care should be used when DLP projectors are used in the same room as performant laser equipment. Direct or indirect hitting of a laser beam on to the lens can severely damage the Digital MicroMirror Devices™ in which case there is a loss of warranty

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.

What image size? How big should the image be?

The projector is designed for an optimum screen width of :

- For CineVERSUM 60 : min 1.30 m (52") to max 1.78 m (70")
- For CineVERSUM 70 : min 1.55 m (61") to max 1.98 m (78")

(depending on the ambient light conditions), with an aspect ratio of 16 to 9.

Depending on the used lens, the minimum and maximum diagonal screen sizes are :

For CineVERSUM 70

R9010080	Short throw lens (1.4 - 1.8)	Min : 0.80 m (32")	Max. 6.35 m (250")
R9010081	Long throw lens (1.8 - 2.4)	Min : Wide : 1 m (40")	Max : Wide : 7.60 m (300")
		Min : Tele : 0.76 m(30")	Max : Tele : 5.60 m (222")

For CineVERSUM 60

R9002460	Short throw lens (1.7 - 2.25)	Min : 1 m (39")	Max. 5 m (200")
R9002461	Long throw lens (2.25 – 3)	Min : Wide : 0.8 m (32")	Max : Wide : 6.0 m (240")
		Min : Tele : 0.60 m(24")	Max : Tele : 4.50 m (178")

2.3 Projector Configuration and Position

Which configuration can be used?

The projector can be installed to project images in four different configurations:
- Front/table
- Rear/table
- Front/ceiling
- Rear/ceiling

Positioning the projector

- The projector should be installed perpendicular with the screen on a distance PD and water leveled in both directions. The mounting positions in the following image is shown for a nominal lens position.
- Position the screen so that it is not in direct sunlight or room light. Light falling directly onto the screen washes out the colors, making viewing difficult . Close the curtains and dim the lights when setting up the screen in a sunny or bright room.
- The projector lens should be centered horizontally in the middle of the screen.

> **Try to avoid an inclination of the projector (forwards, backwards, to the left or to the right) as this will result in a keystone deformation of the image. This deformation can be corrected with the keystone function but with a loss of resolution as result.**

The drawing is given for a table mounted projector. The same is valid for a ceiling mounted projector.
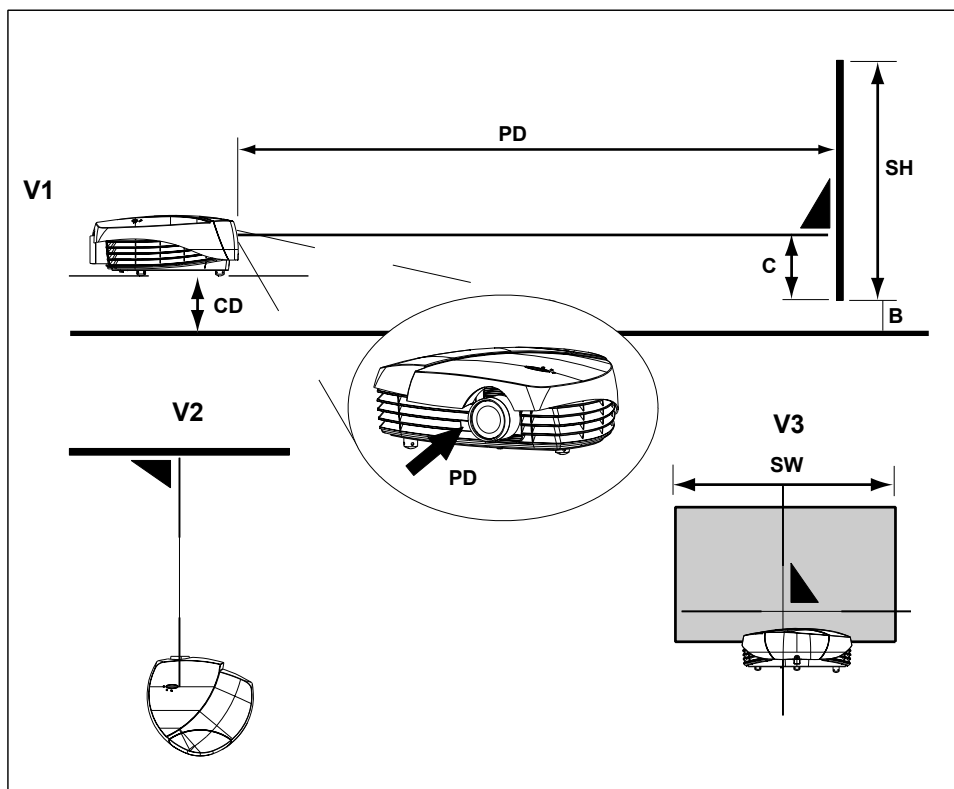
Image 2-1
Table mounted configuration

V1 Side view
V2 Top view
V3 Back view
PD Distance projector - screen
CD Distance bottom side projector - floor
SH Screen height
B   Distance bottom side screen - floor
C   Distance bottom side projector - perpendicular light axes
SW Screen width

For CineVERSUM 70:

Lens	PD	CD
1.4 - 1.8	Wide : PD = 1.4 x SW Tele : PD = 1.8 x SW	CD = B + C - 5.9cm
1.8 - 2.4	Wide : PD = 1.8 x SW Tele : PD = 2.8 x SW	CD = B + C - 5.9cm

With C = 0.25 x SH

For CineVERSUM 60:

Lens	PD	CD
1.7 - 2.25	Wide : PD = 1.7 x SW Tele : PD = 2.25 x SW	CD = B + C - 5.9cm
2.25 - 3	Wide : PD = 2.25 x SW Tele : PD = 3 x SW	CD = B + C - 5.9cm

With C = 0.23 x SH

2.4 Safety Area around projector

Safety area

Make sure the projector is located so that the air inlets and outlets for the cooling system are not obstructed. Leave at least 50 cm between the projector and an object next to the projector.
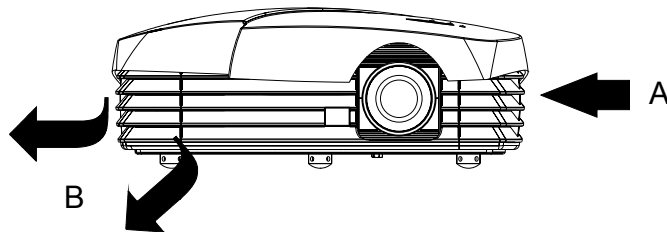
Image 2-2

Do not place inflammable materials within the safety area.

2.5 Cleaning the lens

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

Necessary tools

Toraysee™ cloth, order number : R379058.

How to clean the lens ?

Proceed as follow :

1. Always wipe lenses with a CLEAN Toraysee™ cloth.

2. Always wipe lenses in a single direction.
   Warning: *Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.*

3. Do not leave cleaning cloth in either an open room or lab coat pocket, as doing so can contaminate the cloth.

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

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

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

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

2.6 Vertical lens shift

What can be done ?

The image can be shifted in a vertical way to position the image correctly on the screen.

Necessary tools

Spanner delivered in the package

How to shift the lens ?

1. Turn the lens shift bolt on the bottom side of the projector, just below the lens, until the desired image position is obtained. (image 2-3)

   When table mounted, turning to the left (clockwise) will shift the image upwards. Turning to the right (counter clockwise), will shift the image downwards.
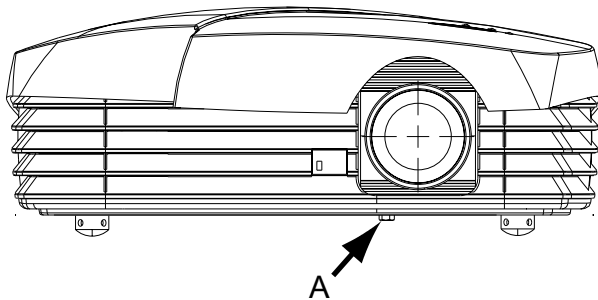
Image 2-3
Vertical lens shift bolt

A   Lens shift bolt

Vertical lens shift ranges
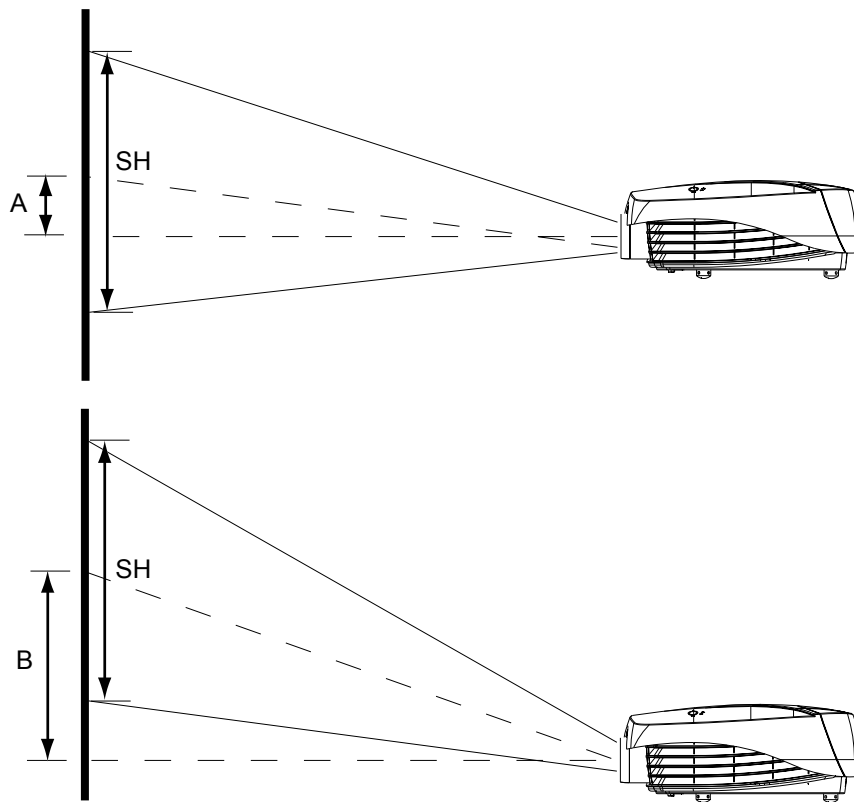
Image 2-4
Vertical lens shift

The distance between the middle of the projected image and the perpendicular line from the projector.

For CineVERSUM 60 :
*   A = 0.275 x SH
*   B = 0.86 x SH

For CineVERSUM 70 :
*   A = 0.24 x SH
*   B = 0.625 x SH

2.7 Battery Insertion in the Remote Control

Where to find the batteries

The batteries are not placed in the remote control to avoid remote control operation in its package, resulting in a shorter battery life time.

How to install the batteries

1. Push the cover tab (A) with the fingernail a little backwards and pull upwards the cover top (B). (image 2-5)

2. Slide the cover forwards to remove. (image 2-6)

3. Push the battery body towards the spring and lift it up to remove. (image 2-7)

4. Insert two AA size batteries, making sure the polarities match the + and – marks inside the battery compartment (image 2-7).

5. Insert the lower tab of the battery cover in the gap at the bottom of the remote control, and press the cover until it clicks in place (image 2-6).

Image 2-5
Battery cover unlock

Image 2-6
Battery cover removal

Image 2-7
Battery removal

2.8 Ceiling Mount assembly

Overview

A ceiling mount is available to mount the projector to the ceiling. Always use this ceiling mount.

Order number : R9852060

For a more detailed description on how to mount the ceiling mount, consult the ceiling mount installation manual (R5976750) which can be found in the box of the ceiling mount assembly or separately ordered by Barco.

3. CONNECTIONS

Overview

- Removing the Connector cover
- Power Connection
- Input facilities
- S-Video input
- Composite Video input
- 5-Cable input
- Component Input
- Digital Visual Interface (DVI) input
- Computer input (RGB analog)
- RS232-422 IN connection
- Trigger outputs

3.1 Removing the Connector cover

What is behind this cover ?

The power connector and all inputs are situated behind this cover.

How to remove the cover ?

1. Loosen the locking screw. (image 3-1)

2. Left up at the bottom and pull on the cover to loose.

   The cover makes a loud 'snap' when removed. This is normal and does not damage the cover.
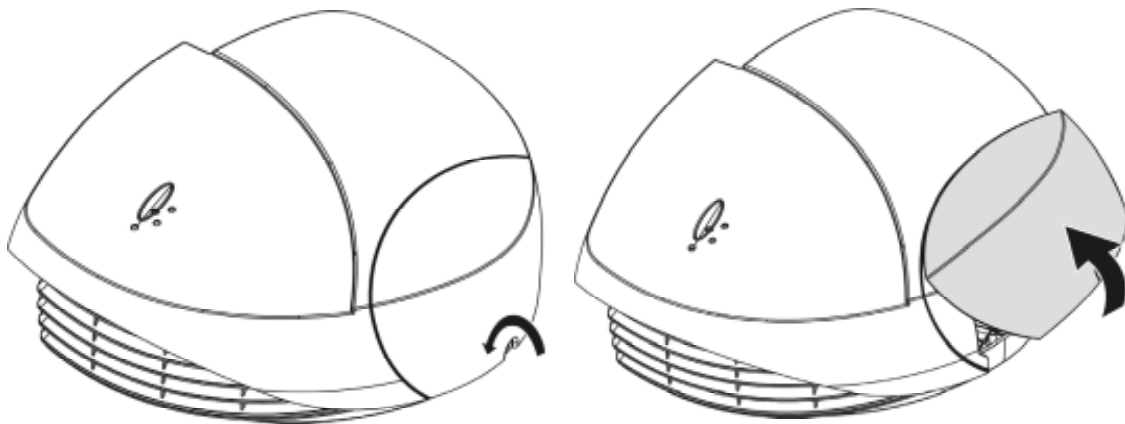
Image 3-1
Removing the input cover

When all connections are done, close the cover again and fix the locking screw.

3.2 Power Connection

AC Power (mains) cord connection

Use the supplied power cord to connect your projector to the wall outlet.

Plug the female power connector into the male connector at the back of the projector.

Plug the male connector into wall outlet.
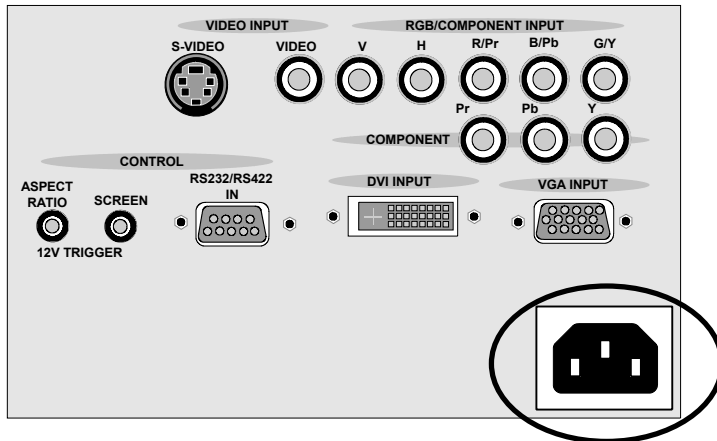
Image 3-2

| | The power input is auto-ranging from 90 to 240 VAC. |

About the power cord

Mains lead (AC Power cord) with CEE 7 plug up to 16 A

The colors of the mains lead are colored in accordance with the following code:

- Green-and-yellow: Earth (safety earth)
- Blue: Neutral
- Brown: Line

3.3 Input facilities

Overview

- S-Video
- Video
- 5 cable input on RCA
  - RGBS
  - RGBHV
  - Component video (Pr/Y/Pb)
- Component input on 3 RCA
- DVI input
- VGA input (=analog RGB)
- Communication connections
  - RS232/RS422
  - Aspect ratio

3.4 S-Video input

Input location
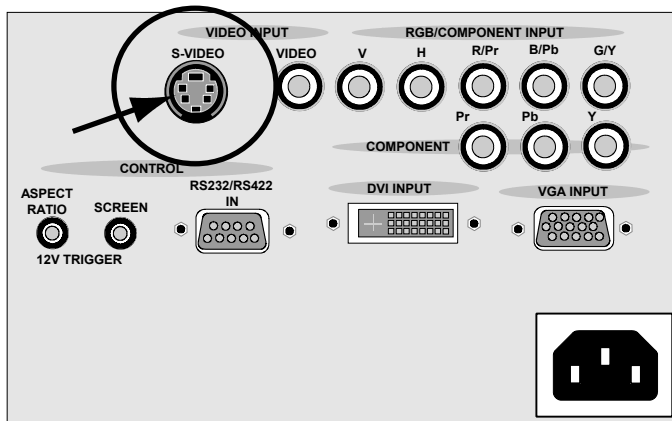
Image 3-3
S-Video location

Pin configuration 4 pin connector
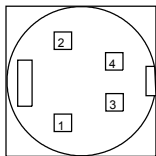
Image 3-4

For S-Video

pin 1 : earth (ground) luminance

pin 2 : earth (ground) chrominance

pin 3 : luminance signal (Y) 1Vpp ±3dB

pin 4 : chrominance signal (C) 300mVpp

Chrominance

The color component of a video signal that includes information about tint and saturation.

Luminance

The component of a video signal that includes information about its brightness.

Which signal can be connected ?

Standard S-Video (S-VHS) with separate Y (luma) and C (chroma) signals.

How to select the S-Video input ?

1. Press **4** on the RCU.
   Note: *Another way of selecting S-Video is entering the Main menu and selecting SVideo.*

3.5 Composite Video input

Composite Video

Luminance and chrominance are combined along with the timing reference "sync" information using one of the coding standards--NTSC, PAL or SECAM--to make composite video. Most televisions and VCRs have composite video connectors, which are usually colored yellow.

Input specifications and location

The composite video input is made of 1 RCA input terminal. Connect composite video signals from a VCR, OFF air signal decoder, etc..

1.0Vpp ±3dB

75 Ω terminated

No loop through
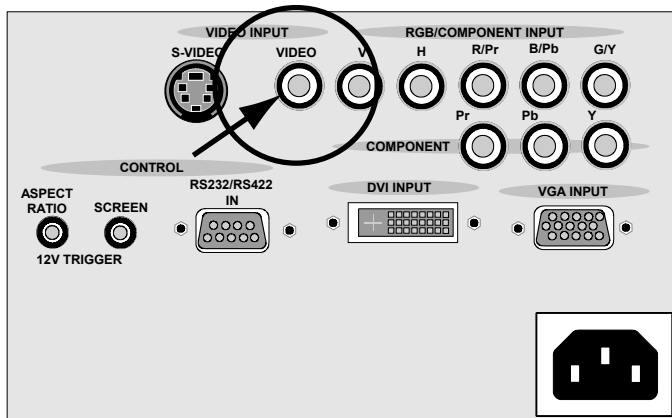
Image 3-5
Video input indication

How to select a composite video input ?

1. Press **5** on the RCU.
   Note: Another way of selecting Video is entering the Main menu and selecting Video.

3.6 5-Cable input

Component video

A video system containing three separate color component signals, either red/green/blue (RGB) or chroma/color difference (YCbCr, YPbPr, YUV), in analog or digital form.

Input specifications and location

The 5-cable input section is made of 5 RCA input terminals.

0.7Vpp ± 3dB

75 Ω terminated
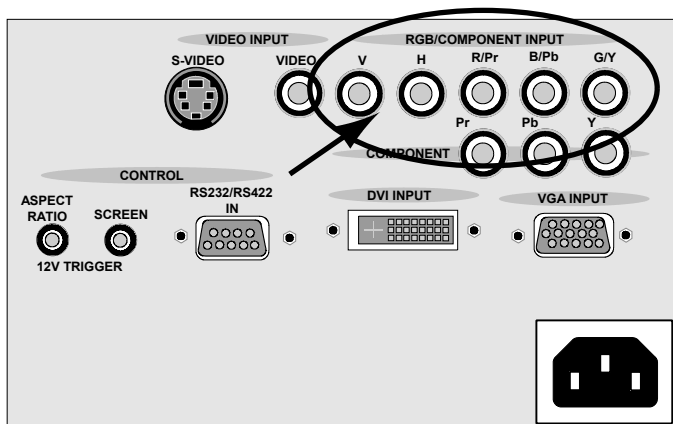
Image 3-6
5-cable input

ℹ️ **Component Video**

In Component Video the term component describes a number of elements that are needed to make up the video picture, these components are PR/Y/PB. A composite video signal on the other hand contains all the information needed for the color picture in a single channel of information

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Which signals can be connected ?

Signals/Input RCA	V	H	R	B	G
RGBHV[1]	V	H	R	B	G
RG$_s$B	-	-	R	B	G$_s$
RGBS[1]		CS	R	B	G
Component	-	-	PR	PB	Y$_s$
RGB+Video (SCART)		Video	R	B	G

How to select a source on the 5-cable input ?

1. Press **2** on the RCU.
   Note: Another way of selecting the 5-cable input is entering the Main menu and selecting RGB/component.

---

1. Sync signals are TTL level

How to configure the 5-cable input ?

1. Press **ADJ** or **ENTER** to open the Main menu. (menu 3-1)

2. Push the cursor key ↑ or ↓ to select *Installation* and press **ENTER**.

   The installation menu will be displayed. (menu 3-2)

3. Push the cursor key ↑ or ↓ to select *Input slots* and press **ENTER**.

   The input slots menu will be displayed. (menu 3-3)

4. Select 5 RCA and toggle **ENTER** to switch between *YUV*, *RGB* and *SCART*.
   Select *RGB* for the following source types:
   - RGBHV
   - RGBS
   - RGsB

   Select *YUV* for the following source types:
   - Component sources

   Select *SCART* for the following source types:
   - RGB+Video

```
          Main Menu

Image settings
Advanced settings
Installation
Service

  1. PC
  2. RGB/Component
  3. DVI
  4. SVideo
* 5. Video
  6. Component

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Menu 3-1

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          Installation

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H-Keystone
Global keystone
Orientations

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Menu 3-2

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       YUV
Reset single slot
       PC
  RGB/Component
       DVI
    SVideo
    Video
  Component
Reset all slots
  All input slots

Back
```

Menu 3-3

3.7 Component Input

Input specifications and locations

The component input section is made of 3 RCA input terminals.

Input signals : Pr, Pb, Ys

0.7Vpp ± 3dB

75 Ω terminated
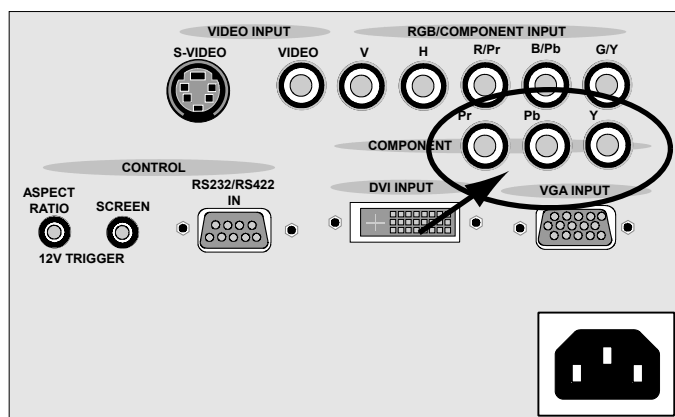
Image 3-7
Component input

How to select the component input ?

1. Press **6** on the RCU.
   Note: *Another way of selecting the component input is entering the Main menu and selecting Component.*

3.8   Digital Visual Interface (DVI) input

DVI

Digital Visual Interface is a display interface developed in response to the proliferation of digital flat panel displays.

The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video. This standard uses TMDS (Transition Minimized Differential Signal) from Silicon Image and DDC (Display Data Channel) from VESA (Video Electronics Standards Association).

DVI can be single or dual link.

Input specifications

Single link DVI

Differential input voltage: 200 mV - 800 mV
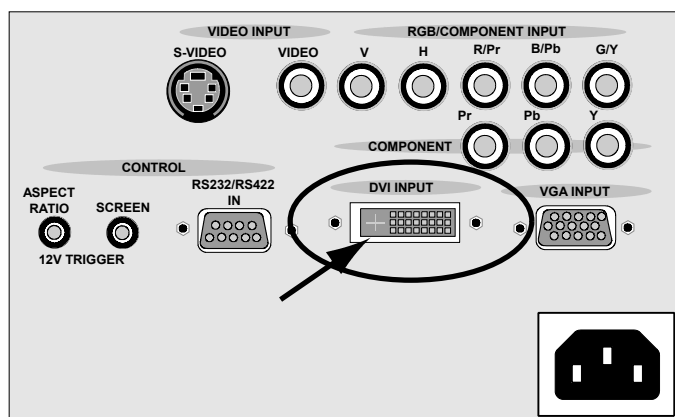
Image 3-8
DVI input

Pin assignment for the DVI connector.

Pin 1	TMDS DATA2-	Pin 13	TMDS DATA3+
Pin 2	TMDS DATA2+	Pin 14	+5 Power
Pin 3	TMDS DATA2/4 Shield	Pin 15	Ground (for +5V)
Pin 4	TMDS DATA4-	Pin 16	Hot Plug Detect
Pin 5	TMDS DATA4+	Pin 17	TMDS DATA0-
Pin 6	DDC Clock	Pin 18	TMDS DATA0+
Pin 7	DDC Data	Pin 19	TMDS DATA0/5 Shield
Pin 8	Not connected	Pin 20	TMDS DATA5-
Pin 9	TMDS DATA1-	Pin 21	TMDS DATA5+
Pin 10	TMDS DATA1+	Pin 22	TMDS Clock Shield
Pin 11	TMDS DATA1/3 Shield	Pin 23	TMDS Clock+
Pin 12	TMDS DATA3-	Pin 24	TMDS Clock-

How to select the DVI Input ?

1. Press **3** on the RCU
   Note: *Another way of selecting the DVI input is entering the Main menu and selecting DVI.*

3.9 Computer input (RGB analog)

Input specification and location

TTL sync input : U $_{min}$ = 2.0 V

RGB input = 0.7 V$_{pp}$ ± 3dB
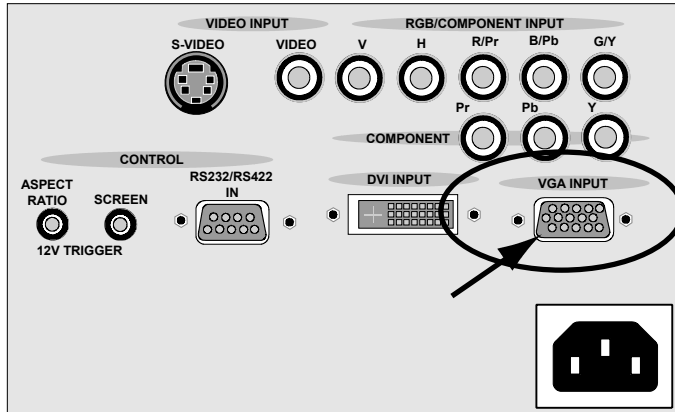
Image 3-9
Computer input

What can be connected ?

• RGBHV

• RG$_S$B

(note icon)	**Composite sync only possible on Green**

How to select a computer input ?

1. Press **1** on the RCU
   Note: Another way of selecting the Computer (VGA) input is entering the Main menu and selecting PC.

3.10 RS232-422 IN connection

What can be connected to the RS232 IN connection ?

The RS232 IN connection allows the projector to communicate with a computer e.g. IBM PC or Apple Macintosh.
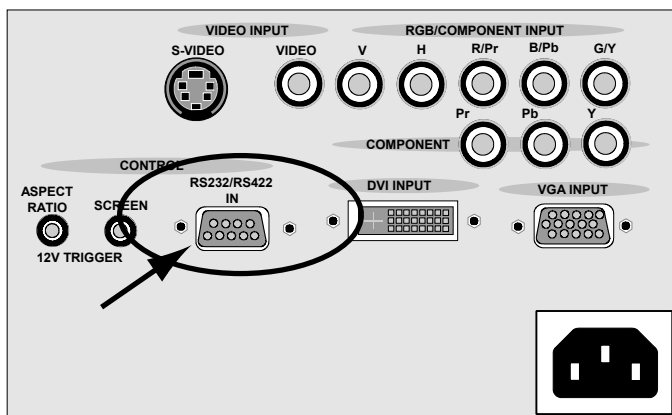
Image 3-10
RS232/RS422 input

Applications of the RS232/RS422 connection

Remote control:

- easy adjustment of projector via IBM PC (or compatible) or MAC connection.
- address range : 0 and 1.
- allow storage of multiple projector configurations and set ups.
- wide range of control possibilities.

Data communication: sending data to the projector or copying the data from the projector to the computer.

> **To set up the baud rate of the projector, see "Baudrate setup", page 74.**

3.11 Trigger outputs

Location
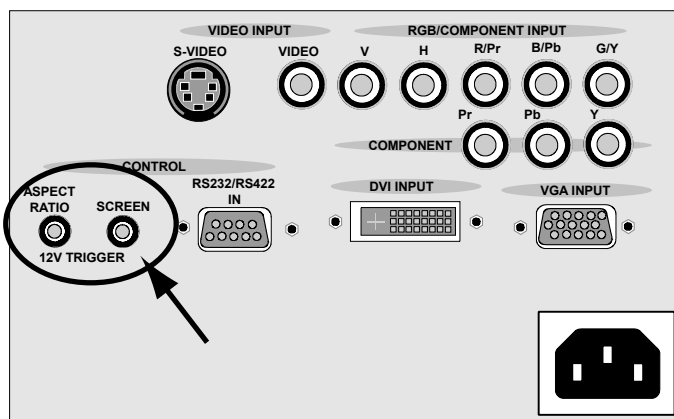
Image 3-11
Trigger outputs

Aspect ratio

When the internal projector aspect ratio is switched to 4 by 3 or 5 by 4 a 12 V DC voltage will set on the Aspect Ratio output. In all other cases the is no voltage available on that output.

This 12 V voltage can be used to trigger e.g. the curtains next to the screen when switching from wide image to a small image.

Screen

When the projector is in operational mode, a 12 V DC voltage is set on the Screen output. When the projector is in standby, there is no voltage at the output.

This 12 V voltage can be used to trigger e.g. a motor which rolls out the screen when starting up the projector.

4. GETTING STARTED

Overview

- Terminology overview
- Switching on
- Lamp runtime
- Switching from operational mode to standby
- Switching off the projector
- Temperature error DMD
- Using the RCU
- Projector Address
- Controlling the projector

4.1 Terminology overview

On projector

The controls are situated on the top cover of the projector.
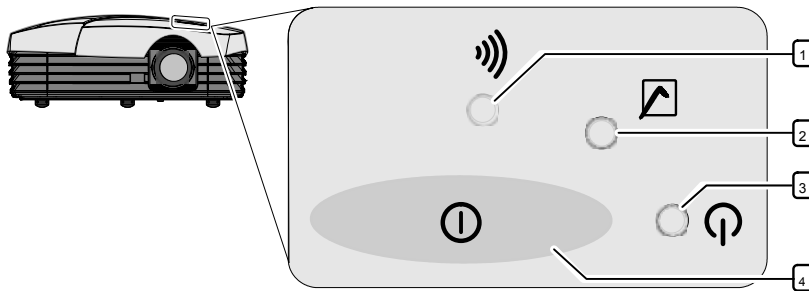
Image 4-1

Ref.	Function	Description
1	Infra red receiver	Infra red reception diode for IR signals coming from the Remote control (RCU
2	IR reception indication	Lights up when a valid IR signal is captured.
3	Stand by led	• projector in operational mode: Lights up continuously • projector in standby mode: LED, 0.5 sec on, 2 sec off. • projector in cooling down mode: LED, 1 sec on, 1 sec off.
4	Main power switch	When pressed, the projector starts in stand by mode.

On Remote control
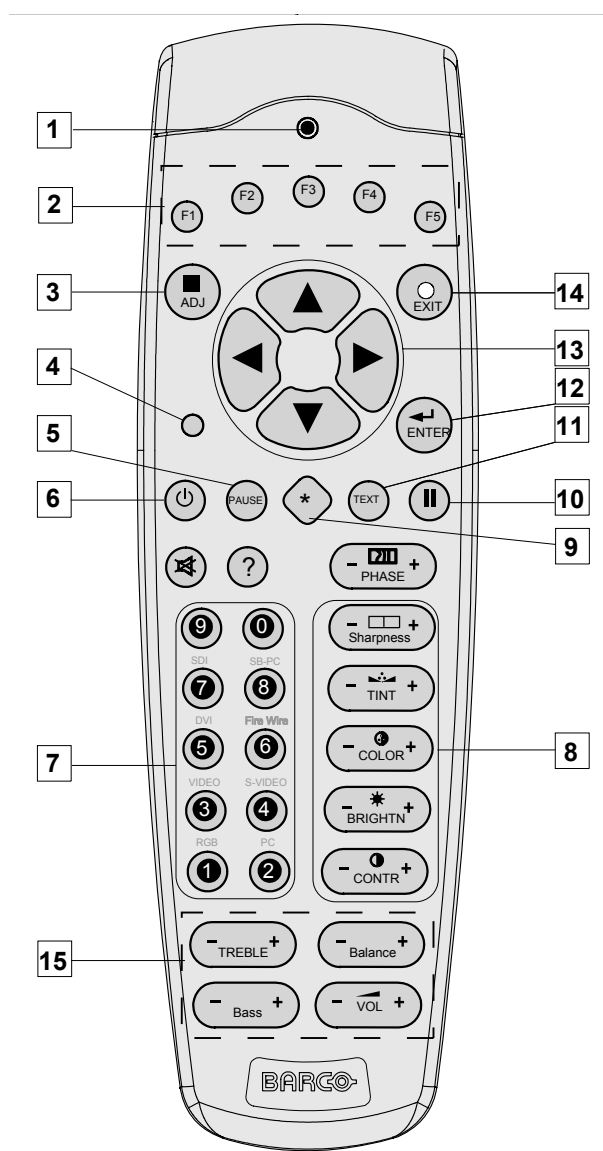
Image 4-2
Remote control

No.	Key name	Description
1	RC operating indication	lights up when a button on the remote control is pressed. (This is a visual indicator to check the operation of the remote control)
2	Function keys	not yet implemented
3	ADJ	Adjust key, to enter or exit the menus.
4	Address key	(recessed key), to enter the address of the projector (between 0 and 9). Press the recessed address key with a pencil, followed by pressing one digit button between 0 and 9.
5	PAUSE	to stop projection for a short time, press 'PAUSE'. The image disappears but full power is retained for immediate restarting.
6	STBY	standby button, to start projector when the power switch is switched on and to switch off the projector without switching off the power switch. **Attention : Switching to Standby. When the projector is running and you want to go to standby, press the standby key for 2 seconds.**
7	Digit buttons	direct input selection.
8	Picture controls	use these buttons to obtain the desired picture analog level.

No.	Key name	Description
9	*	Aspect ratio button. Opens the selection menu for the aspect ratio.
10	FREEZE	press to freeze the projected image.
11	TEXT	to des-activate or activate the on screen slide bars.
12	ENTER	to confirm an adjustment or selection in a menu.. Entering the adjustment mode is also possible.
13	Cursor keys	Cursor Keys on RCU : to make item selections in a menu box or to adjust a function when a slide bar is vissible.
14	EXIT	to leave the selected menu box or item (go upwards to previous menu).
15	Audio controls	not implemented

4.2 Switching on

How to switch on

1. Press the main power switch on the projector

   The projector goes to stand by mode. The stand by LED blinks.

Start image projection

1. Press **Standby** key once on the RCU.
   Note: *It may take about 60 seconds before image projection, i.e. no projection until the completion of several operations (software initialization,...).*

   The projector scans the inputs and displays the first found active source.

2. To switch to the desired source, press the corresponding digit on the RCU.

4.3 Lamp runtime

Lamp runtime indication while running

When the total runtime of the lamp is 1400 hours or more, a warning message will be displayed : "Lamp Runtime : 1400 hours".

When the total runtime of the lamp is 1500 hours or more, a second message will be displayed : "Lamp Runtime limit reached : 1500 hours".

This warning message will be repeated at next start up. Press **EXIT** to remove this message.

Contact a qualified service technician to replace the lamp.

The total life time of the lamp for a safe operation is 1500 hours. Do not use it longer as the lamp could explode.

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

4.4 Switching from operational mode to standby

How to switch to standby

1. Press the standby button on the remote control for 2 seconds.

   A message : "Power down appears".

   Projector goes into standby. Standby LED blinks. After a while, the fans stop blowing and the projector switch off automatically.

4.5 Switching off the projector

How to switch to off

1. Press the standby button on the remote control for 2 seconds.

   A message : Power down appears.

   Projector goes into standby. Standby LED blinks. After a while, the fans stop blowing and the projector switch off automatically.

2. Press the main power switch on the projector.

4.6 Temperature error DMD

Overview

When the temperature of the DMD is too low or too high, the projector will switch automatically to standby. The LED on the projector flashes 8 times and an automatic shutdown is activated.

4.7 Using the RCU

Pointing to reflective screen

Point the front of the RCU to the reflective screen surface.
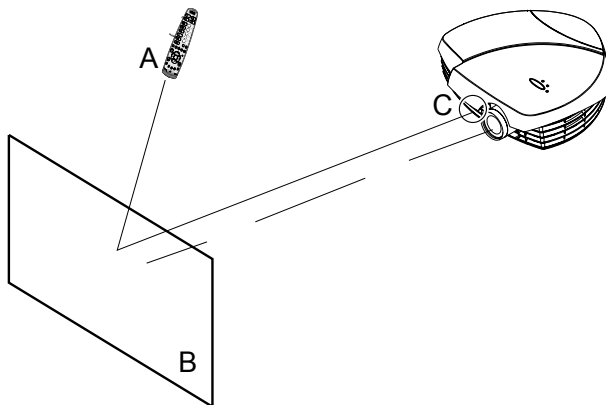
Image 4-3
Via reflective screen

Direct pointing to the IR sensors

Point the RCU to any of the remote sensors, located on the front, top and the rear of the projector. The remote control can be used up to 9 meters from the projector and within a 45 degree angle with respect to the sensors.
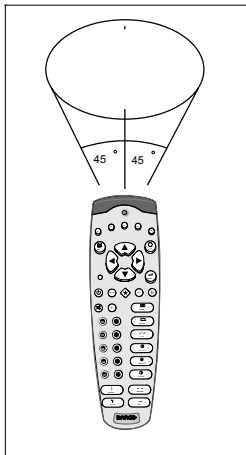
Image 4-4
Direct using of the RCU
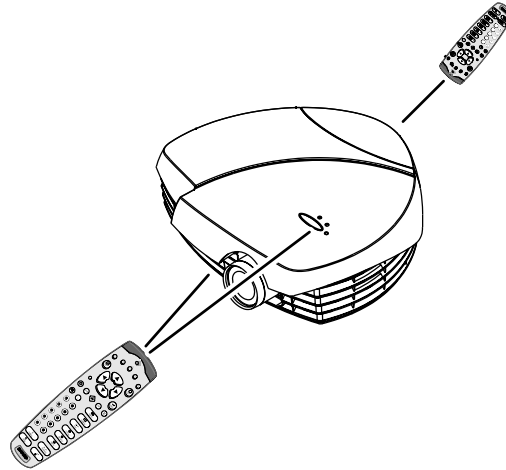
Backlighting

When a button is pressed on the RCU, backlight is activated automatically. That allows the user to operate the remote control in a dark room. Backlight is turned off automatically a few seconds after the last button is pressed.

4.8 Projector Address

ⓘ **Projector address**

Address installed in the projector to be individually controlled.

Overview

The projector address can be set to any value between 0 and 9.

Why a projector address ?

As more than one projector or device which is remote controlled can be installed in a room, the separate projector or device should be separately addressable with an RCU.

When the projector and another device have the same address, during controlling, interference is possible. To avoid that, set the projector address on a not used address in the room.

How to set the projector address ?

1. Press The **Address** key (recessed key) with a pencil.

   The projector displays a message box to announce that you can enter an address between 0 and 9.

2. Enter the address by pressing a digit key between 0 and 9.

   The projector address and the address of the RCU will be changed to the new entered address.

3. Press **EXIT** to return to operational mode.

4.9 Controlling the projector

Input Selection

Key in the corresponding input with the digit keys on the RCU. The selected source will be displayed.

When an source is displayed and more sources are connected and switched on:
- press ↑ key to display the previous source.
- press ↓ key to display the next source.

When no previous or next source, the projector returns to the actual source (only when *Auto search* is on).

The following key numbers are valid :

1. PC source
2. RGB/Component source (5 RCA input)
3. DVI
4. S-Video
5. Video
6. Component (3 RCA)

Picture Controls

When an image control is pressed, a text box with a bar scale and function name of the control, e.g. 'brightness...' appears on the screen (only if *Barscale status* is *Yes*). The length of the bar scale and the value of the numeric indication indicate the current memorized setting for this source. The bar scale changes as the arrows on the RCU are pressed or the + or - buttons on the local keypad.

The picture settings are saved in the image file.

Brightness	Use the + button for a higher brightness.
	Use the - button for a lower brightness.
Contrast	Use the + button for a higher contrast.
	Use the - button for lower contrast.
Color	Use the + button for richer colors.
	Use the - button for lighter colors.
Tint (Hue)	Tint is only active for Video and S-Video when using a 60 Hz source (like NTSC 4.43 or NTSC 3.58).
	Use the + button
	Use the - button.
Sharpness	Use the + button for a sharper picture.
	Use the - button for a softer picture.
Freeze	Press **Freeze** to freeze the displayed image.

The Pause Key

When the Pause key is pressed, the image projection is stopped, the image is removed from the screen.

To restart the image projection:

• Press **PAUSE** key

5. GETTING USED TO THE MENU STRUCTURE

Overview

- •   How to start up the menus
- •   How to use the menus
- •   How to make an adjustment
- •   Access Control via a password

5.1   How to start up the menus

Box like menu structure

The menu structure is built up with boxes which allow easy access to different parameters for setting up the projector.

A menu box item can generate at its turn a menu box or it can generate an adjustment box such as a slide bar.

How to activate the menu structure

1. Press **ADJ** or **ENTER** on the RCU.

   The Main menu box will be displayed. (menu 5-1)

```
              Main Menu

   Image settings
   Advanced settings
   Installation
   Service

      1. PC
      2. RGB/Component
      3. DVI
      4. SVideo
   *  5. Video
      6. Component

   Shutdown

   Back


```
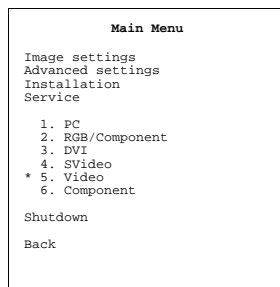
Menu 5-1

5.2   How to use the menus

How to select an item

1. Use the ↑ or ↓ keys to highlight the desired item. (menu 5-2)

2. Press **ENTER** to select.

   If the selected item has sub menus, this sub menu will open.

   If the selected item is an adjustment or selection, the adjustment or selection will be executed.

3. Use the **EXIT** key to close an adjustment or to return to the previous menu.
   Note: The menu will be closed automatically when there is no action on the menu detected about 5 seconds.

4. Use **ADJ** to quit the menu structure completely from anywhere in the menu tree.

```
              Main Menu

   Image settings
   Advanced settings
   Installation
   Service

      1. PC
      2. RGB/Component
      3. DVI
      4. SVideo
   *  5. Video
      6. Component

   Shutdown

   Back


```
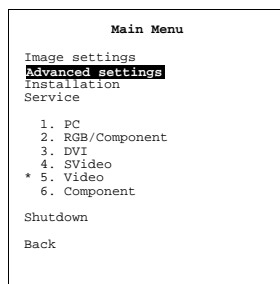
Menu 5-2

> When no action is taken within a few seconds while a menu box or slide bar is displayed, the projector quits the menu structure or slide bar (adjustment).

> The menus inserted in this manual are always full menus: all the items are visible.

> Greyed out menu items are not available for the current selected source or current software version.

5.3 How to make an adjustment

How to perform ?

1. Use the arrow keys to adjust the selected control.
   The following keys are mostly combined:
   - The ↑ and → key perform an adjustment in the positive direction (or to the right, or upwards).
   - The ↓ and ← key perform an adjustment in the negative direction (or to the left, or downwards).

5.4 Access Control via a password

Password protection

Some items (Advanced settings, installation and service) in the Main menu can be password protected. This password protects the user against misalignment of the projector. Only the daily necessary items are available for non experienced users.

This password protection can be enabled or disabled in the service menu. Once the password protection is set, this password will be necessary to disable it again.

The customer is allowed to create his own password.

How to get access ?

1. Select a item which is password protected.

   The *Enter password* box appears with the first position highlighted.

2. Use the ↑ or ↓ keys to select first character.

   The characters can be alphanumeric (from 0 to 9 and from a to z).

3. Press **ENTER** to accept.

   The second character will be highlighted.

4. Select the second character and press **ENTER** to accept.

5. Select the third character and press **ENTER** to continue in the adjustment mode.

6. SOURCE SELECTION

Overview

•   Selecting a source

6.1 Selecting a source

How to select

1. Press **ADJ** or **ENTER** to start up the Main menu. (menu 6-1)

    An asterisk (*) is displayed before the actual selected source.

2. Push the cursor key ↑ or ↓ to highlight the desired source, e.g. 4. SVideo.

3. Press **ENTER** to select.

    When the source is available, it will be selected. A dialog box appears with the message "Calibrating input ..."

```
              Main Menu

  Image settings
  Advanced settings
  Installation
  Service

     1. PC
     2. RGB/Component
     3. DVI
     4. SVideo
  *  5. Video
     6. Component

  Shutdown

  Back
```
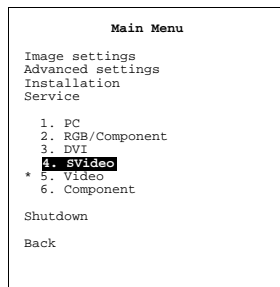
Menu 6-1

7. IMAGE SETTINGS MENU

Overview

- Image settings menu overview
- Starting the Image settings menu
- Brightness
- Contrast
- Saturation
- Tint (hue)
- Sharpness
- Gamma
- Color Temperature
- White peak

7.1 Image settings menu overview

Overview

- Brightness
- Contrast
- Saturation
- Tint
- Sharpness
- Gamma
- Color Temperature
    - Predefined color temperatures
    - Custom color balance
    - Color standard
- White peak

7.2 Starting the Image settings menu

How to start up ?

1. Press **ADJ** or **ENTER** to start up menus. (menu 7-1)

2. Push the cursor key ↑ or ↓ to highlight *Image settings*.

3. Press **ENTER** to select.

   The *Image settings* menu will be displayed. (menu 7-2)

```
          Main Menu

Image settings
Advanced settings
Installation
Service

  1. PC
  2. RGB/Component
  3. DVI
  4. SVideo
* 5. Video
  6. Component

Shutdown

Back
```

Menu 7-1

```
         Image settings

Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back
```
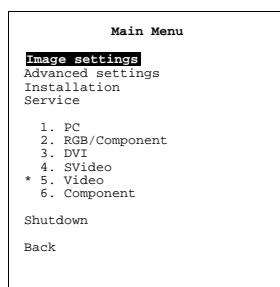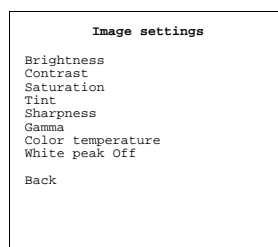
Menu 7-2

7.3   Brightness

About brightness

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

How to change the brightness ?

1. Push the cursor key ↑ or ↓ to highlight *Brightness.* (menu 7-3)

2. Press **ENTER** to select.

   A slider box appears.

3. Use the cursor keys to adjust the brightness setting.

   ↑ or → key for higher brightness (higher values).

   ↓ or ← key for lower brightness (lower values).

```
          Image settings

 Brightness
 Contrast
 Saturation
 Tint
 Sharpness
 Gamma
 Color temperature
 White peak Off

 Back
```
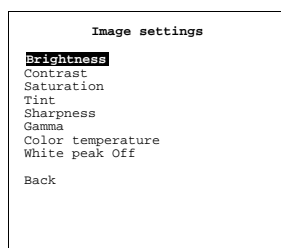
Menu 7-3

7.4   Contrast

About contrast

The contrast function is used to adjust the contrast between the light and dark areas of the displayed image. A correct 'contrast' setting is important for good image reproduction.

How to change the contrast ?

1. Push the cursor key ↑ or ↓ to highlight *Contrast.* (menu 7-4)

2. Press **ENTER** to select.

   A slider box appears.

3. Use the cursor keys to adjust the contrast setting.

   ↑ or → key for higher contrast (higher values).

   ↓ or ← key for lower contrast (lower values).

```
          Image settings

 Brightness
 Contrast
 Saturation
 Tint
 Sharpness
 Gamma
 Color temperature
 White peak Off

 Back
```

Menu 7-4

7.5   Saturation

About saturation

The saturation function is used to adjust the color saturation levels for Video, S-Video and component input signals.

How to change the saturation ?

1. Push the cursor key ↑ or ↓ to highlight *Saturation.* (menu 7-5)

2. Press **ENTER** to select.

    A slider box appears.

3. Use the cursor keys to adjust the saturation setting.

    ↑ or → key for richer colors (higher values).

    ↓ or ← key for lighter colors (lower values).

```
              Image settings
    Brightness
    Contrast
    Saturation
    Tint
    Sharpness
    Gamma
    Color temperature
    White peak Off

    Back
```
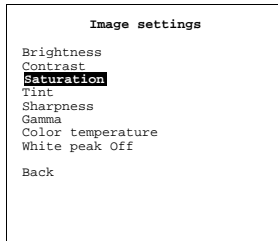
Menu 7-5

7.6 Tint (hue)

About tint

The tint function is used to adjust color hue to obtain true color reproduction and is only active for 60 Hz sources like NTSC signals. For PAL and SECAM sources, the tint is greyed out.

NTSC

National television system committee. The organization that developed the analog television standard currently in use in the U.S., Canada, and Japan. Now generally used to refer to that standard. The NTSC standard combines blue, red, and green signals modulated as an AM signal with an FM signal for audio.

PAL

Phase alternate line. The television broadcast standard throughout Europe (except in France and Eastern Europe, where SECAM is the standard). This standard broadcasts 625 lines of resolution, nearly 20 percent more than the U.S. standard, NTSC, of 525.

SECAM

Sequential couleur avec mémoire. The television broadcast standard in France, the Middle East, and most of Eastern Europe, SECAM provides for sequential color transmission and storage in the receiver. The signals used to transmit the color are not transmitted simultaneously but sequentially line for line. SECAM processes 625 lines, a maximum of 833 pixels per line and 50 Hz picture frequency. SECAM is used as a transmission standard and not a production standard (PAL is typically used).

How to change the tint ?

1. Push the cursor key ↑ or ↓ to highlight *Tint.* (menu 7-6)

2. Press **ENTER** to select.

   A slider box appears.

3. Use the cursor keys to adjust the tint setting.

   ↑ or → key for higher tint (higher values).

   ↓ or ← key for lower tint (lower values).

```
            Image settings
Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back

```
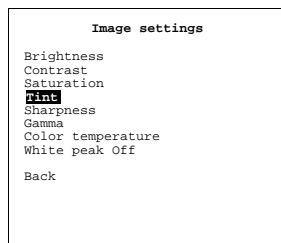
Menu 7-6

7.7 Sharpness

About Sharpness

The sharpness function is used to adjust the image sharpness of a video, S-Video and interlaced component input signal.

How to change the sharpness ?

1. Push the cursor key ↑ or ↓ to highlight *Sharpness.* (menu 7-7)

2. Press **ENTER** to select.

   A slider box appears.

3. Use the cursor keys to adjust the brightness setting.

   ↑ or → key for higher brightness (higher values).
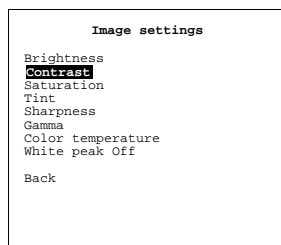
   ↓ or ← key for lower brightness (lower values).

```
            Image settings
Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back

```
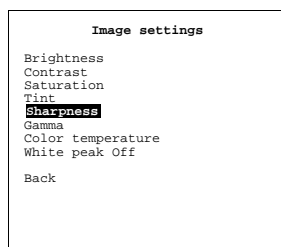
Menu 7-7

7.8 Gamma

About Gamma

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

How to change the Gamma ?

1. Push the cursor key ↑ or ↓ to highlight *Gamma*. (menu 7-8)

2. Press **ENTER** to select.

   The gamma selection menu appears. (menu 7-9)

   The actual active gamma value is indicated by an asterisk (*).

   The default value is 2.2.

3. Push the cursor key ↑ or ↓ to highlight the desired gamma value.

4. Press **ENTER** to select.

   The new selected gamma value becomes active.

```
        Image settings                          Gamma

Brightness                              1.0
Contrast                                1.3
Saturation                              1.6
Tint                                    1.9
Sharpness                            *  2.2
Gamma                                   2.5
Color temperature                       2.8
White peak Off                          3.1

Back                                    Back
```
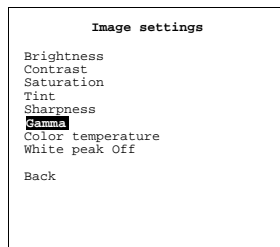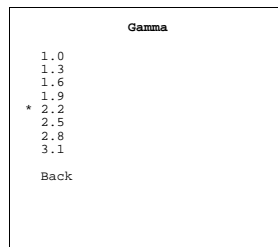
Menu 7-8   Menu 7-9

7.9 Color Temperature

Color temperature

Color temperature is measured in degrees Kelvin. If a TV has a color temperature of 8,000 degrees Kelvin, that means the whites have the same shade as a piece of pure carbon heated to that temperature. Low color temperatures have a shift towards red; high color temperatures have a shift towards blue.

What can be done ?

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

There are 5 different preset color temperatures:

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

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

Next to the color temperature, the color standard can be set up.

7.9.1 Predefined Color Temperature

Display white will provide maximum projector light output.

How to select a preset color temperature ?

1. Push the cursor key ↑ or ↓ to highlight *Color temperature*. (menu 7-10)

   The color temperature menu will appear. (menu 7-11)

   An asterisk (*) indicates the actual selected color temperature.

2. Push the cursor key ↑ or ↓ to highlight the desired color temperature.

3. Press **ENTER** to select.

   The selected color temperature of the image is adapted

```
        Image settings
Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back
```

```
       Color temperature
  Display white
  Computer 9300K
* Video 6500K
  Film 5400K
  Broadcast 3200K
  Custom balance
  Color temp. type: EBU

Back
```

Menu 7-10   Menu 7-11

7.9.2   Custom Color Balance

How to select and adjust the custom color balance ?

1. Push the cursor key ↑ or ↓ to highlight *Color temperature*. (menu 7-12)

   The color temperature menu will appear. (menu 7-13)

   An asterisk (*) indicates the actual selected color temperature.

2. Push the cursor key ↑ or ↓ to highlight *Custom balance*.

   The *Custom balance* menu will be displayed. (menu 7-14)

   The color temperature of the image will change to the actual stored custom balance.

3. Push the cursor key ↑ or ↓ to highlight *x-white*.

4. Press **ENTER** to select.

   A bar scale will be displayed.

5. Press the ↑ or ↓ to change the x-white value.

   Adjust until the desired value is almost reached. Release the button and wait a few seconds. The color of the image will be adapted. Fine tune with the ↑ or ↓ keys until the correct value is reached.

6. Press **EXIT** to return to the Custom balance menu.

7. Repeat from step 3 by highlighting y-white and adjust in the same way.

```
        Image settings
Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back
```

```
       Color temperature
  Display white
  Computer 9300K
* Video 6500K
  Film 5400K
  Broadcast 3200K
  Custom balance
  Color temp. type: EBU

Back
```

```
        Custom balance
x-white
y-white

Back
```
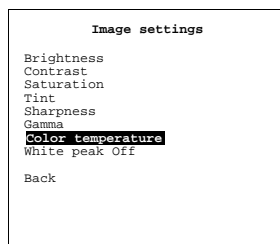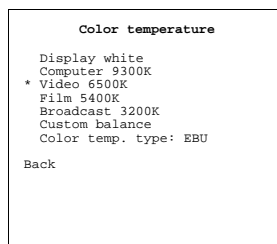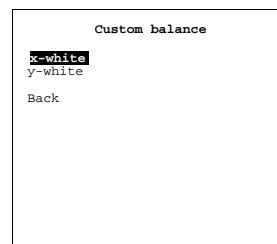
Menu 7-12   Menu 7-13   Menu 7-14

7.9.3   Color standard

Color reproduction

The reproduced colors are all situated within a specific color triangle (gamut) based on the basic colors red, green and blue. Depending on the used standard, the triangle can be slightly different so that the reproduced colors are slightly different.
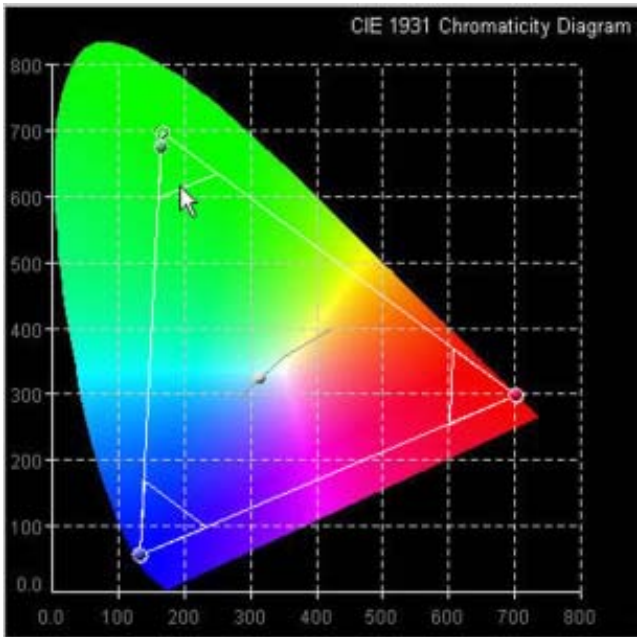
Image 7-1
Color gamut

The projector contains 2 international standards, EBU and ANSI, and its own color triangle (gamut) determined by the lamp and all optical components of the projector. Colors outside this triangle cannot be displayed.

EBU

European Broadcasting Union. An organization of European broadcasters that, among other activities, produces technical statements and recommendations for the 625/50 line television system.

ANSI

American National Standards Institute

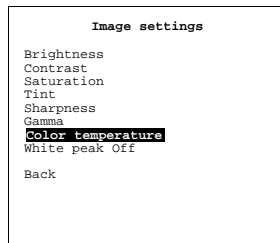
Selecting the color standard

1. Push the cursor key ↑ or ↓ to highlight *Color temperature*. (menu 7-15)
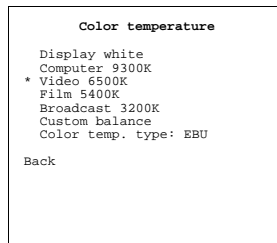
   The color temperature menu will appear. (menu 7-16)

   An asterisk (*) indicates the actual selected color temperature.

2. Push the cursor key ↑ or ↓ to highlight *Color Temp. type*.

3. Press **ENTER** to toggle between EBU, ANSI or PROJ.

EBU	European color standard. Use this standard for PAL and SECAM video images.
ANSI	American color standard. Use this standard for NTSC video images.
PROJ	Internal projector color system.


```
       Image settings
Brightness
Contrast
Saturation
Tint
Sharpness
Gamma
Color temperature
White peak Off

Back
```

Menu 7-15

```
      Color temperature
  Display white
  Computer 9300K
* Video 6500K
  Film 5400K
  Broadcast 3200K
  Custom balance
  Color temp. type: EBU

  Back
```
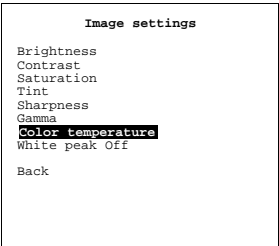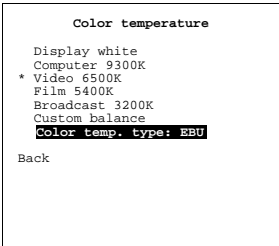
Menu 7-16

7.10 White peak

About white peak

In video centric applications true color reproduction is generally a priority over brightness. To achieve this a typical design will not utilize a white segment of the color wheel. This has the side effect of reducing the amount of light allowed through the color wheel, which reduces the overall brightness. To compensate for this a technique can applied called Spoke Light Capture (SLR). The spokes are defined to be the time between colors. The DMD is normally kept in the "off" state during this time preventing any light from getting to the screen. If the light is passed trough the spokes, the average over time across them is made up of a mixture of the two adjacent colors. This will result in a secondary color. If these spokes are taken three at a time, over time they will sum up to white light. This "virtual white segment" is the basic principal of SLR and can yield a substantial boost to system brightness.

White peak "off" is the best solution for video images while white peak "on" can be used with success for data images.

How to select ?

1. Push the cursor key ↑ or ↓ to highlight *Color temperature*. (menu 7-17)

2. Press **ENTER** to toggle between *ON* and *OFF*.

      On   White parts in the image are boosted. Use this for data images.

      Off   No boosting of white parts. Use this for video images.

3. Press **EXIT** to return.

```
            Image settings
    Brightness
    Contrast
    Saturation
    Tint
    Sharpness
    Gamma
    Color temperature
    White peak Off

    Back
```
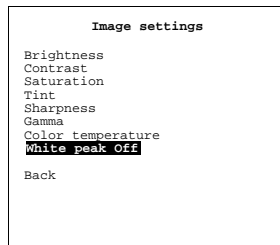
Menu 7-17

8. ADVANCED SETTINGS

Overview

- • Advanced settings menu overview
- • Start up the Advanced settings
- • Aspect Ratio
- • Image Position
- • Blanking
- • Input Balance

8.1 Advanced settings menu overview

Overview

- • Aspect ratio
  - - 16:9
  - - 4:3
  - - 5:4
  - - 2.35
  - - 1.88
  - - 1.78
  - - Letterbox
- • Position
  - - Horizontal shift
  - - Horizontal size
  - - Vertical shift
  - - Vertical size
- • PiP configuration
- • Blanking
- • Input Balance

8.2 Start up the Advanced settings

How to start up ?

1. Press **ADJ** or **ENTER** to start up menus. (menu 8-1)

2. Push the cursor key ↑ or ↓ to highlight *Advanced settings*.

3. Press **ENTER** to select.

   The *Advanced settings* menu will be displayed. (menu 8-2)

```
          Main Menu

Image settings
Advanced settings
Installation
Service

  1. PC
  2. RGB/Component
  3. DVI
  4. SVideo
* 5. Video
  6. Component

Shutdown

Back
```

Menu 8-1

```
       Advanced settings

Aspect Ratio
Position
PiP Configuration
Blanking
Input Balance

Back
```
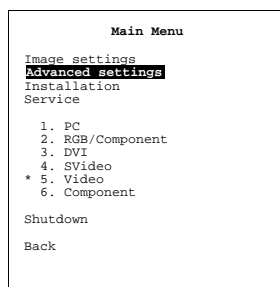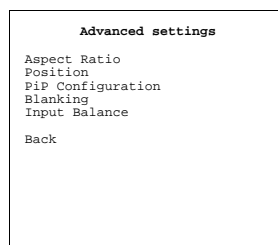
Menu 8-2

8.3 Aspect Ratio

Aspect ratio

horizontal & vertical dimension in which the window will be displayed, e.g. 4 by 3 or 16 by 9.

What can be done ?

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

Aspect ratio	Description
16:9	Wide screen television format / anamorphic format
4:3	Standard television format
5:4	Workstation format
2.35	Panavision or Cinemascope format
1.88	Cinema format
1.78	Wide screen television format / anamorphic format
Letterbox	To display standard television format with 16:9 image information. The letter format of the signal is forced into the native panel resolution.

Some examples:

The first column shows the aspect ratios for a standard television signal with 4:3 image information. The only correct aspect ratio is 4:3. In all other cases the image is transformed.

The second column shows the aspect ratios for a standard television signal with 16:9 image information. The only correct aspect ratio is "Letterbox". In all other cases the image is transformed.

Image 8-1
Different views for some typical input signals

(1) Standard television signal with 4:3 image information
(2) Standard television signal with 16:9 image information

When displaying DVD images stored as 4:3 anamorphic, select aspect ratio *Letterbox*.

When displaying DVD images stored as 16:9, select aspect ratio 16:9.

How to change the aspect ratio ?

1. Push the cursor key ↑ or ↓ to highlight *Aspect Ratio*. (menu 8-3)

2. Press **ENTER** to select.

   The *Aspect ratio* menu will be displayed. (menu 8-4)

   An asterisk (*) shows the actual selected aspect ratio.

3. Push the cursor key ↑ or ↓ to highlight the desired aspect ratio.

4. Press **ENTER** to select.

   The image changes accordingly.

```
        Advanced settings
  ┌─────────────────────────────┐
  │ Aspect Ratio                │
  │ Position                    │
  │ PiP Configuration           │
  │ Blanking                    │
  │ Input Balance               │
  │                             │
  │ Back                        │
  │                             │
  │                             │
  │                             │
  └─────────────────────────────┘
```
Menu 8-3

```
            Aspect ratio
  ┌─────────────────────────────┐
  │ * 16:9                      │
  │   4:3                       │
  │   5:4                       │
  │   2.35                      │
  │   1.88                      │
  │   1.78                      │
  │   Letterbox                 │
  │                             │
  │   Back                      │
  │                             │
  └─────────────────────────────┘
```
Menu 8-4

8.4 Image Position

Overview

• Horizontal shift
• Horizontal size
• Vertical shift
• Vertical size

When used ?

The controls can be used to exactly match the image on the screen after that all mechanical alignments are correctly done.

8.4.1 Horizontal shift

What can be done ?

The image can be shifted in a horizontal direction.
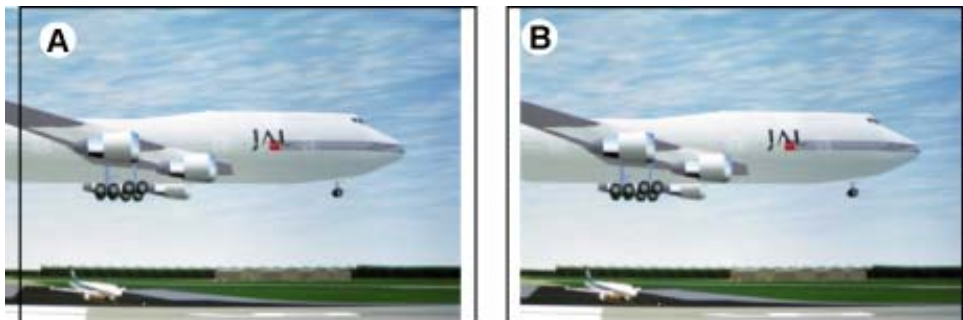
Image 8-2
Horizontal shift

A   Shift to the left
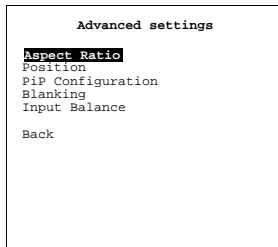B   Shift to the right

How to shift the image ?

1. Push the cursor key ↑ or ↓ to highlight *Position*. (menu 8-5)

2. Press **ENTER** to select.

   The *Position* menu will be displayed. (menu 8-6)

3. Push the cursor key ↑ or ↓ to highlight *Horizontal shift*.

   A slide bar will be displayed.

4. Use the cursor keys to shift the image horizontally.

   When shifting to the left, the value will be negative.

   When shifting to the right, the value will be positive.

   The adjustment range can vary from - 255 to + 255. 0 is the nominal position.

```
        Advanced settings
Aspect Ratio
Position
PiP Configuration
Blanking
Input Balance

Back
```

Menu 8-5

```
            Position
Horizontal shift
Horizontal size
Vertical shift
Vertical size

Back
```
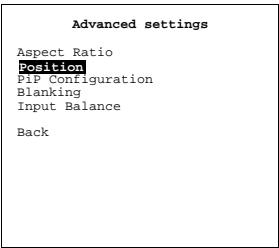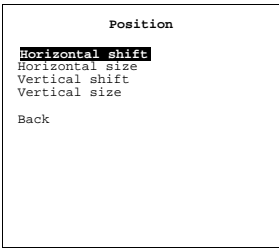
Menu 8-6

8.4.2   Horizontal size

What can be done ?

The size of the image can be adjusted in horizontal direction. The left side of the image is fixed and only right side can be moved until the exact size is reached.

Image 8-3
Horizontal size

How to size the image ?

1. Push the cursor key ↑ or ↓ to highlight *Position*. (menu 8-7)

2. Press **ENTER** to select.

   The *Position* menu will be displayed. (menu 8-8)

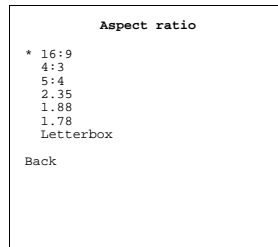3. Push the cursor key ↑ or ↓ to highlight *Horizontal size*.

   A slide bar will be displayed.

4. Use the cursor keys to resize the image horizontally.

   When the value is negative the image becomes smaller.

   When the value is positive the image becomes wider.

   The adjustment range can vary from - 255 to + 255. 0 is the nominal position.

```
        Advanced settings              Position

Aspect Ratio                  Horizontal shift
Position                      Horizontal size
PiP Configuration             Vertical shift
Blanking                      Vertical size
Input Balance
                              Back
Back
```

Menu 8-7   Menu 8-8

8.4.3   Vertical shift

What can be done ?

The image can be shifted in a vertical direction.

Image 8-4
Vertical shift

C   Shift upwards
D   Shift downwards

How to shift the image ?

1. Push the cursor key ↑ or ↓ to highlight *Position*. (menu 8-9)

2. Press **ENTER** to select.

   The *Position* menu will be displayed. (menu 8-10)

3. Push the cursor key ↑ or ↓ to highlight *Vertical shift*.

   A slide bar will be displayed.

4. Use the cursor keys to shift the image vertically.

   When shifting downwards, the value will be negative.

   When shifting upwards, the value will be positive.

   The adjustment range can vary from - 255 to + 255. 0 is the nominal position.

```
        Advanced settings
Aspect Ratio
Position
PiP Configuration
Blanking
Input Balance

Back
```

Menu 8-9

```
            Position
Horizontal shift
Horizontal size
Vertical shift
Vertical size

Back
```
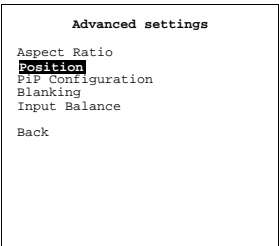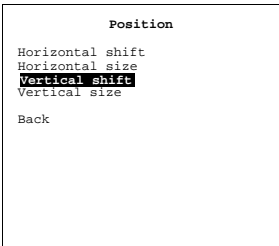
Menu 8-10

8.4.4   Vertical size

What can be done ?

The size of the image can be adjusted in vertical direction. The upper side of the image is fixed and only bottom side can be moved until the exact size is reached.

Image 8-5
Horizontal size

How to size the image ?

1. Push the cursor key ↑ or ↓ to highlight *Position*. (menu 8-11)

2. Press **ENTER** to select.

   The *Position* menu will be displayed. (menu 8-12)

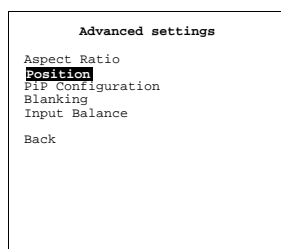3. Push the cursor key ↑ or ↓ to highlight *Vertical size*.

   A slide bar will be displayed.

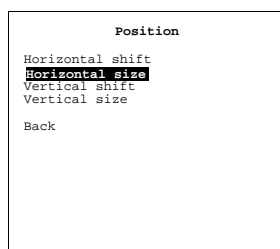4. Use the cursor keys to resize the image vertically.

   When the value is negative the image becomes less high.

   When the value is positive the image becomes higher.

   The adjustment range can vary from - 255 to + 255. 0 is the nominal position.

```
        Advanced settings                         Position

Aspect Ratio                      Horizontal shift
Position                          Horizontal size
PiP Configuration                 Vertical shift
Blanking                          Vertical size
Input Balance
                                  Back
Back
```
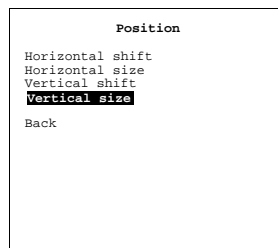
Menu 8-11   Menu 8-12

8.5 Blanking

What can be done ?

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

Which blanking adjustments are available ?

- top blanking
- bottom blanking
- left blanking
- right blanking
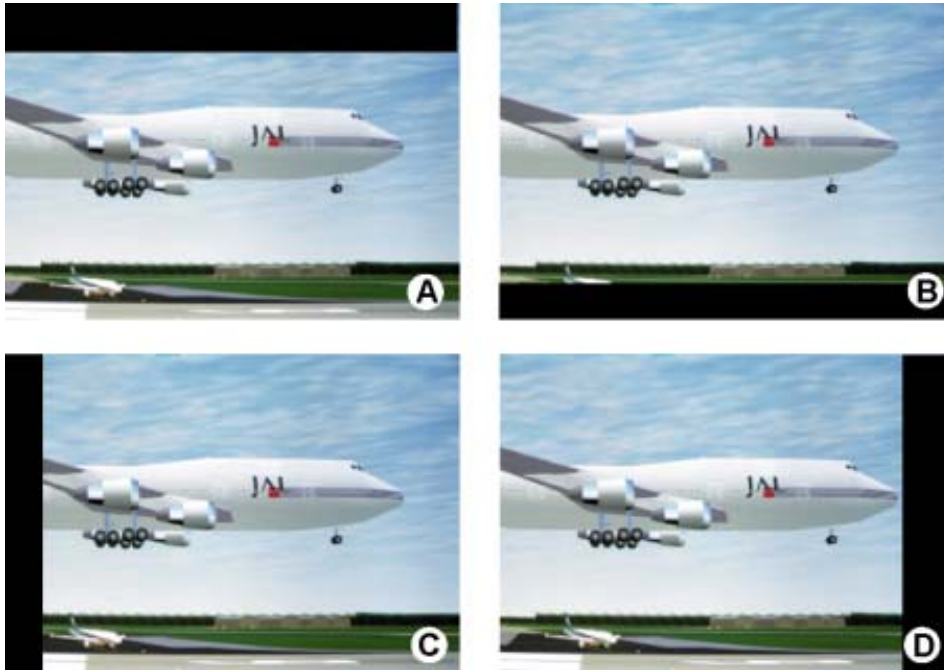
Image 8-6
Blanking

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

Adjusting the blanking

1. Push the cursor key ↑ or ↓ to highlight *Blanking*. (menu 8-13)

2. Press **ENTER** to select.

    The *Blanking* menu will be displayed. (menu 8-14)
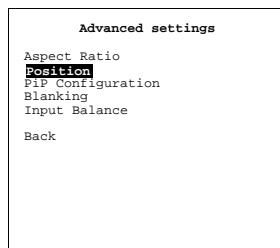
3. Push the cursor key ↑ or ↓ to highlight the desired blanking

4. Press **ENTER** to start up the chosen blanking.

5. Use the cursor keys to adjust the blanking.

```
        Advanced settings              Blanking

 Aspect Ratio                  Top
 Position                      Bottom
 PiP Configuration             Left
 Blanking                      Right
 Input Balance
                               Back
 Back
```
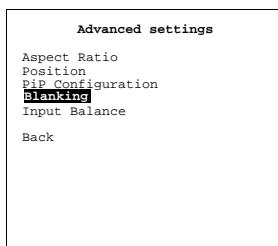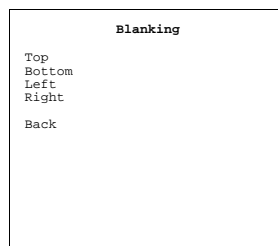
Menu 8-13   Menu 8-14

8.6 Input Balance

Overview

*   Introduction to Input Balance
*   Adjusting the Input Balance for RGB signals
*   Input balance for YUV signals
*   Returning to the factory defaults

8.6.1 Introduction to Input Balance

Introduction: Unbalanced color signals

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

In case of information contained in the amplitude of the signals which is the case of data color signals (R, G, B),image 8-7 , we are quite sure that the amplitude of these color signals is subject to alterations.

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

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

The alterations of the three color signals will happen independently i.e. the colors will end to be unbalanced, image 8-8

B

0.7V

Black leve

Image 8-7

R

G

B

ΔR

ΔG

ΔB

Black leve
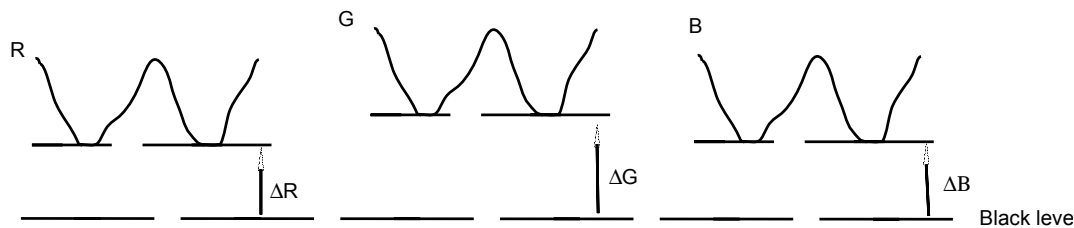
Image 8-8

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

Analog Digital Conversion

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

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

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

ADC

R

255

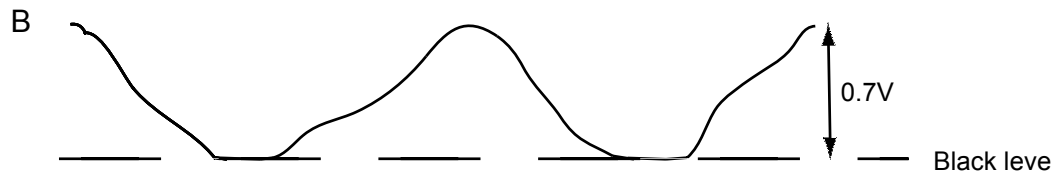i2 : video information

Δ

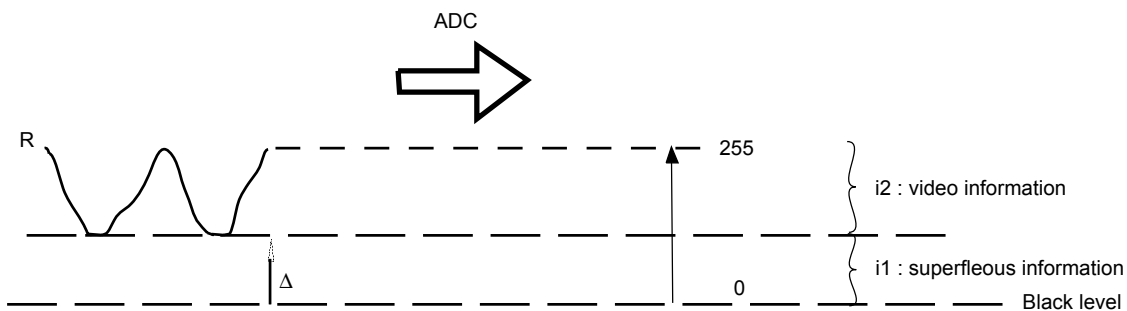0

i1 : superfleous information

Black level

Image 8-9

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

The objective of input balancing

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

> **Black level setting : brightness**
>
> **White level setting : contrast**

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

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

8.6.2 Adjusting the Input Balance for RGB signals

How can it be done ?

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

1. The source in question must be able to generate a white signal, ideally a 100% white (background) full screen pattern
2. The source in question must be able to generate a black signal, ideally a 100% black (background) full screen pattern
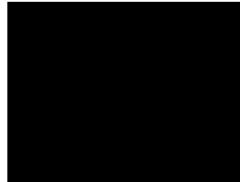
Image 8-10

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

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

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

> **An alternative to a full screen White/black pattern is the standard gray scale pattern, the white bar will be used for white balance and the black bar for black balance.**
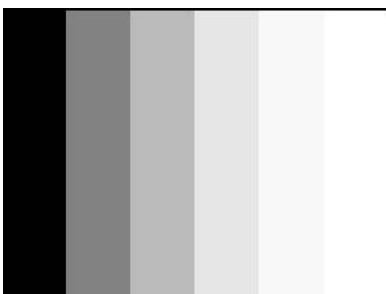
Image 8-11

Black balance

1. Push the cursor key ↑ or ↓ to highlight *Input Balance*. (menu 8-15)
2. Press **ENTER** to select.

   The *Input balance* menu will be displayed. (menu 8-16)
3. Push the cursor key ↑ or ↓ to highlight *Black balance*.

4. Press **ENTER** to select.

   The black balance menu will be displayed. (menu 8-17)

5. Adjust the Brightness to a maximum value until there is just no green noise visible in the black areas.

6. Push the cursor key ↑ or ↓ to highlight *Black level red*.

7. Press **ENTER** to select.

8. Adjust with the cursor keys until there is no red noise visible in the black areas.

9. Repeat from step 6 but select *Black level blue* and adjust until no blue noise is visible in the black areas.

10. Set the brightness back to its normal value.

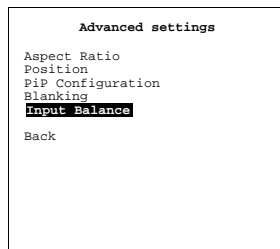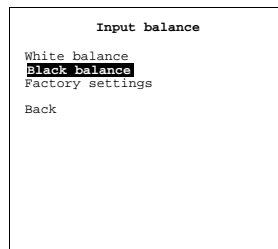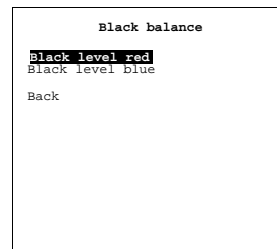```
    Advanced settings   Input balance   Black balance
Aspect Ratio   White balance   Black level red
Position   Black balance   Black level blue
PiP Configuration   Factory settings
Blanking   Back
Input Balance   Back

Back
```

Menu 8-15                       Menu 8-16                       Menu 8-17

## White balance

1. Push the cursor key ↑ or ↓ to highlight *Input Balance*. (menu 8-18)

2. Press **ENTER** to select.

   The *Input balance* menu will be displayed. (menu 8-19)

3. Push the cursor key ↑ or ↓ to highlight *White balance*.

4. Press **ENTER** to select.

   The white balance menu will be displayed. (menu 8-20)

5. Select gain red and put it on its lowest value. Do the same for gain blue.
   Adjust contrast to a maximum value until the green noise becomes visible in the white areas and return one step.

6. Select Gain red and adjust with the cursor keys until the red noise becomes visible in the white areas and return one step.

7. Select Blue red and adjust with the cursor keys until the blue noise becomes visible in the white areas and return one step.

8. Put the contrast back on its normal value.

```
    Advanced settings             Input balance                White balance
Aspect Ratio              White balance             Gain red
Position                  Black balance             Gain blue
PiP Configuration         Factory settings
Blanking                                            Back
Input Balance             Back

Back
```

Menu 8-18   Menu 8-19   Menu 8-20

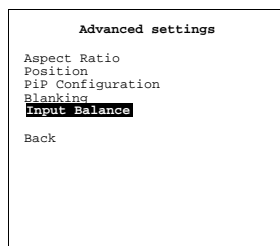### 8.6.3 Input balance for YUV signals

How to adjust ?

1. Push the cursor key ↑ or ↓ to highlight *Input Balance*. (menu 8-21)

2. Press **ENTER** to select.

   The *Input balance* menu will be displayed. (menu 8-22)
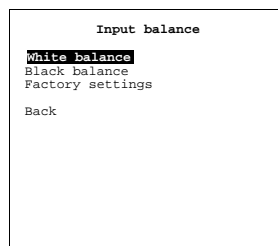
3. Decrease the brightness a lot.

4. Push the cursor key ↑ or ↓ to highlight *Black balance*.

5. Press **ENTER** to select.
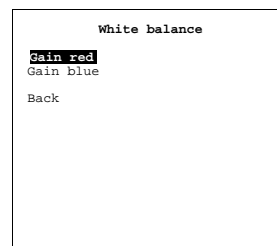
   The black balance menu will be displayed. (menu 8-23)

6. Select Black level red and adjust the red balance with the cursor keys until the red noise becomes visible in the black areas.

7. Select now Black level blue and adjust the blue balance with the cursor keys until the blue noise becomes visible in black areas.

8. Increase the brightness until the black areas displays approximately 50% white noise.

9. Correct Red and Blue Black balance adjustment in such a way the blue and red noise are just visible and a small brightness increase maintain a grey color.

```
        Advanced settings

Aspect Ratio
Position
PiP Configuration
Blanking
Input Balance

Back
```

```
        Input balance

White balance
Black balance
Factory settings

Back
```

```
        Black balance

Black level red
Black level blue

Back
```
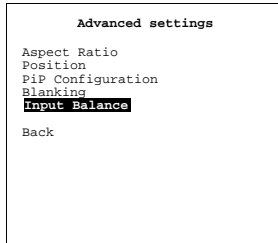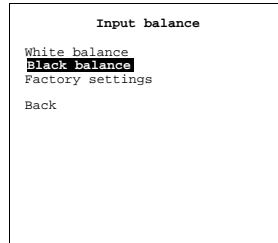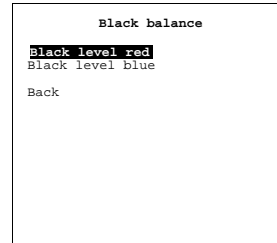
Menu 8-21   Menu 8-22   Menu 8-23

Checking the white balance

There is no adjustment procedure for the white balance.

8.6.4 Returning to the factory defaults

How to return ?

1. Push the cursor key ↑ or ↓ to highlight *Factory settings*. (menu 8-24)

2. Press **ENTER** to select.

   The factory settings will be loaded.

```
        Input balance

White balance
Black balance
Factory settings

Back
```
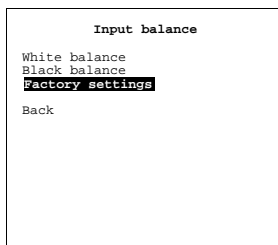
Menu 8-24

9. INSTALLATION MENU

Overview

- Installation menu overview
- Start up the Installation menu
- Input Slots
- File service
- Internal pattern
- When no signal
- Source transition
- On Screen Display Configuration
- Language support
- Vertical keystone
- Horizontal keystone
- Global keystone
- Orientation

9.1 Installation menu overview

Overview

- Input slots
- File service
  - Auto search
  - Film mode
  - Color space
- Internal patterns
- When no signal
- Source transition
- OSD configuration
- Language
- V-keystone
- H-keystone
- Global keystone
- Orientations

9.2 Start up the Installation menu

The installation menu can be password protected when the password protection is set to on.

Start up

1. Press **ADJ** or **ENTER** to start up the Main menu. (menu 9-1)

2. Push the cursor key ↑ or ↓ to select *Installation*.

3. Press **ENTER** to select.

   The *Installation* menu will be displayed. (menu 9-2)

```
            Main Menu

Image settings
Advanced settings
Installation
Service

  1. PC
  2. RGB/Component
  3. DVI
  4. SVideo
* 5. Video
  6. Component

Shutdown

Back
```

Menu 9-1

```
           Installation

Input slots
File service
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When no signal
Source transition
OSD configuration
Language
V-Keystone
H-Keystone
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```
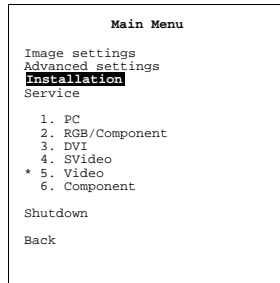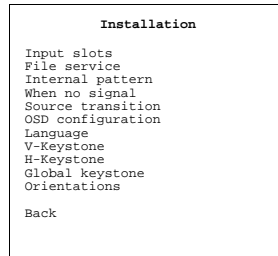
Menu 9-2

9.3 Input Slots

Overview

- •   5 RCA input selection (RGB/component input)
- •   Reset a single input
- •   Reset all inputs

9.3.1   5 RCA input selection (RGB/component input)

What can be done ?

The 5 RCA input can accept RGB signals as well as Component signals. Therefor, this input must be configured for the correct signal input.

How to configure ?

1. Push the cursor key ↑ or ↓ to highlight *Input slots.* (menu 9-3)

2. Press **ENTER** to select.

   The input slots menu will be displayed. (menu 9-4)

3. Push the cursor key ↑ or ↓ to highlight the 5 RCA selection.

4. Press **ENTER** to toggle between *RGB*, *YUV or SCART*.

   RGB   Input is configured to accept RGB signals.

   YUV   Input is configured to accept component signals

   SCART   Input is configured to accept RGB signals with Video as sync on the Hs input.

```
           Installation

Input slots
File service
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Source transition
OSD configuration
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```

Menu 9-3

```
           Input slots

5 RCA
             YUV
Reset single slot
       PC
  RGB/Component
       DVI
    SVideo
     Video
   Component
Reset all slots
   All input slots

Back
```
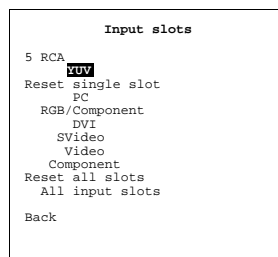
Menu 9-4

9.3.2 Reset a single input

What can be done ?

Via Image settings and Advanced settings the image can be modified as desired. But when some misalignments are discovered, it sometimes not so easy to return to the standard settings. Therefore, with a *Reset a single input*, it is possible to return to source factory defaults.
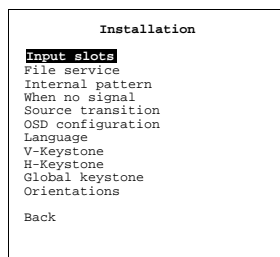
How to reset a single input ?

1. Push the cursor key ↑ or ↓ to highlight *Input slots*. (menu 9-5)

2. Press **ENTER** to select.

   The input slots menu will be displayed. (menu 9-6)

3. Push the cursor key ↑ or ↓ to highlight the input slot which must be reset. (e.g. Video)
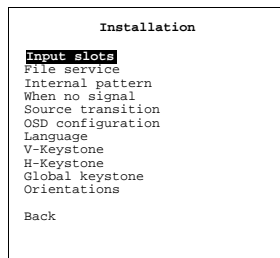
4. Press **ENTER** to select.

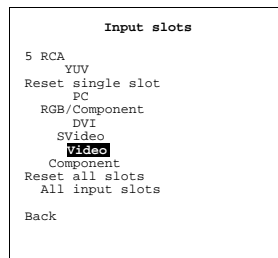   The specific reset menu will be displayed. (menu 9-7)

5. Push the cursor key ↑ or ↓ to select the corresponding source type. (e.g. PAL source).

6. Press **ENTER** to reset.

   If the selected source corresponds with the input signal, the projector will load the source default.
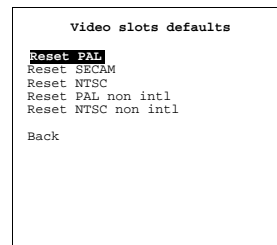
   If the selected source does not correspond, nothing will happen.

```
        Installation
  Input slots
  File service
  Internal pattern
  When no signal
  Source transition
  OSD configuration
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  H-Keystone
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```
Menu 9-5

```
        Input slots
  5 RCA
       YUV
  Reset single slot
     PC
    RGB/Component
       DVI
       SVideo
       Video
     Component
  Reset all slots
    All input slots

  Back
```
Menu 9-6

```
     Video slots defaults
  Reset PAL
  Reset SECAM
  Reset NTSC
  Reset PAL non intl
  Reset NTSC non intl

  Back
```
Menu 9-7

The reset be executed without confirmation warning.

9.3.3 Reset all inputs

What can be done ?

All settings of all inputs can be reset to the default values.

How to reset all inputs ?

1. Push the cursor key ↑ or ↓ to highlight *Input slots*. (menu 9-8)

2. Press **ENTER** to select.

   The input slots menu will be displayed. (menu 9-9)

3. Push the cursor key ↑ or ↓ to highlight *All input slots*.

   All input will be reset to the default values.

```
        Installation
  Input slots
  File service
  Internal pattern
  When no signal
  Source transition
  OSD configuration
  Language
  V-Keystone
  H-Keystone
  Global keystone
  Orientations

  Back
```
Menu 9-8
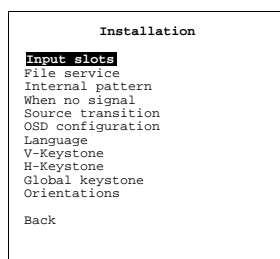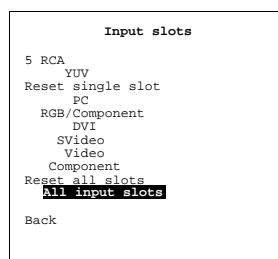
```
        Input slots
  5 RCA
       YUV
  Reset single slot
     PC
    RGB/Component
       DVI
       SVideo
       Video
     Component
  Reset all slots
    All input slots

  Back
```
Menu 9-9

The reset be executed without confirmation warning.

9.4 File service

Overview

• Auto search
• Film mode
• Color Space

9.4.1 Auto search

What can be done ?

When a not active input is selected, the projector can scan automatically the inputs and display the first active source. When auto search is off, the projector stays on the selected source and waits until a signal is available.
During the scanning the projector follows priority :

1. PC
2. DVI
3. Video
4. S-Video
5. 5 RCA
6. 3 RCA

How to set up ?

1. Push the cursor key ↑ or ↓ to highlight *File service*. (menu 9-10)

2. Press **ENTER** to select.

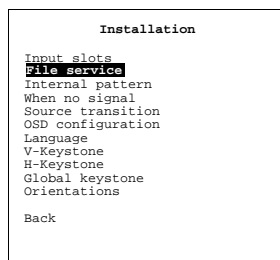   The *File service* menu will be displayed. (menu 9-11)

3. Push the cursor key ↑ or ↓ to highlight *Auto search*.

4. Press **ENTER** to toggle between *ON* and *OFF*.

   ON   Projector scans for an active source

   OFF   Projector stays on the selected input

```
        Installation
Input slots
File service
Internal pattern
When no signal
Source transition
OSD configuration
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Back
```

Menu 9-10

```
        File service
Auto search  ON
Film mode    ON
Color space

Back
```

Menu 9-11

9.4.2 Film mode

What can be done ?

Some sources like common DVD material are derived from cinema 24 Hz sources (2/2 or 3/2 pull down method).

The film mode detection insures that these converted signals are shown without artefacts.

> **This function may cause undesired effects on standard sources, therefore it can be disabled (OFF) at any time**

2:2 pull-down

The process of transferring 24-frames/sec film format into video by repeating each frame (used for PAL DVD's) as two video fields. (AD)

3:2 pull-down

Method used to map the 24 fps of film onto the 30 fps (60 fields) or 25 fps (50 fields), so that one film frame occupies three video fields, the next two, etc. It means the two fields of every other video frame come from different film frames making operations such as rotoscoping impossible, and requiring care in editing. Some sophisticated equipment can unravel the 3:2 sequence to allow frame-by-frame treatment and subsequently re-compose 3:2. The 3:2 sequence repeats every five video frames and four film frames, the latter identified as A-D. Only film frame A is fully on a video frame and so exists at one time code only, making it the editable point of the video sequence.

Artefacts

Undesirable elements or defects in a video picture. These may occur naturally in the video process and must be eliminated in order to achieve a high-quality picture. Most common in analog are cross color and cross luminance. Most common in digital are macroblocks, which resemble pixelation of the video image.

Enabling/disabling the film mode detection

1. Push the cursor key ↑ or ↓ to highlight *File service*. (menu 9-12)

2. Press **ENTER** to select.

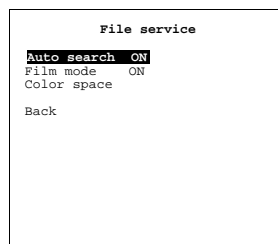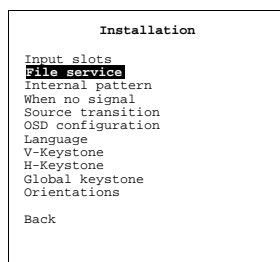   The *File service* menu will be displayed. (menu 9-13)

3. Press **ENTER** to toggle between *ON* and *OFF*.

   ON   Film mode is enabled.

   OFF   Film mode is disabled.

```
          Installation

   Input slots
   File service
   Internal pattern
   When no signal
   Source transition
   OSD configuration
   Language
   V-Keystone
   H-Keystone
   Global keystone
   Orientations

   Back
```

Menu 9-12

```
          File service

   Auto search  ON
   Film mode    ON
   Color space

   Back
```

Menu 9-13

9.4.3 Color Space

Color Space

The color range between specified references. Typically references are quoted in television: RGB, Y, R-Y, B-Y, YIQ, YUV and Hue Saturation and Luminance (HSL). In print, Cyan, Magenta, Yellow and Black (CMYK) are used. Moving pictures between these is possible but requires careful attention to the accuracy of processing involved. Operating across the media--print, film and TV, as well as between computers and TV equipment--will require conversions in color space.

About color space

Color space selection is only active for progressive component video signals on the 5-cable (5 RCA) or the *Component* (3 RCA) input.

It is possible to change the values of the color matrix with predefined values so that the result color changes.

Progressive scan

A video scanning system that displays all lines of a frame in one pass.

Color space

1. Push the cursor key ↑ or ↓ to highlight *File service.* (menu 9-14)

2. Press **ENTER** to select.

   The *File service* menu will be displayed. (menu 9-15)

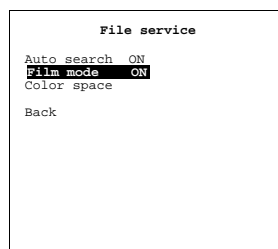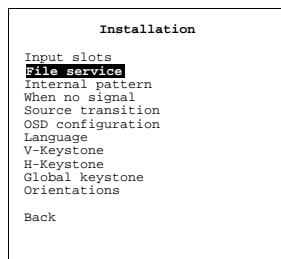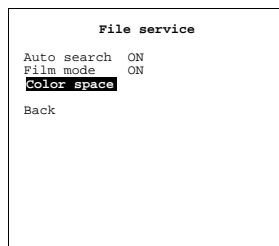3. Push the cursor key ↑ or ↓ to highlight *Color space*.

4. Press **ENTER** to toggle between *YCbCr*, *YPbPr* or *SMPTE240*.

```
        Installation
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File service
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```

Menu 9-14

```
        File service
Auto search  ON
Film mode    ON
Color space

Back
```

Menu 9-15

9.5 Internal pattern

What can be done ?

To check to alignment of the projector, different internal patterns are built-in. Once a pattern is selected and displayed, a second pattern of the same type can be displayed by pressing **ENTER**.
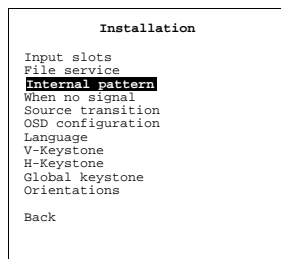
How to display an internal pattern ?

1. Push the cursor key ↑ or ↓ to highlight *Internal pattern*. (menu 9-16)

2. Press **ENTER** to select.

   The *Internal pattern* selection menu will be displayed. (menu 9-17)

3. Push the cursor key ↑ or ↓ to highlight the desired pattern.
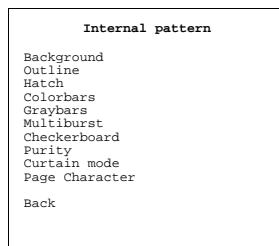
4. Press **ENTER** to select.

   The selected pattern will be displayed.

5. Press **ENTER** to scroll through the different patterns available for that type. When the last one is displayed and **ENTER** is pressed, the internal pattern selection box appears.

   A new pattern can be selected in the same ways as the previous one or **EXIT** can be pressed and the projector returns to last displayed source.

```
        Installation
Input slots
File service
Internal pattern
When no signal
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OSD configuration
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```

Menu 9-16

```
       Internal pattern
Background
Outline
Hatch
Colorbars
Graybars
Multiburst
Checkerboard
Purity
Curtain mode
Page Character

Back
```

Menu 9-17

The curtain mode displays the system uncorrected colors (red, green, blue and white). This pattern can be used to measure the x-y color coordinates of the system (can be used to optimize the projector after lamp replacement). The displayed color is unaffected by the chosen color temperature.

9.6 When no signal

What can be done ?

When the projector does not detect an input source, it can be set up to switch automatically to stand by after a certain time which can be set up during installation.

'When no signal' set up.

1. Push the cursor key ↑ or ↓ to highlight *When no signal*. (menu 9-18)

2. Press **ENTER** to select.

   The *When no signal* menu appears. (menu 9-19)

3. Push the cursor key ↑ or ↓ to highlight *Shutdown*.

4. Press **ENTER** to toggle between *ON* and *OFF*.

   ON   The projector shuts down after a certain delay. The delay menu item becomes active and can be set up.
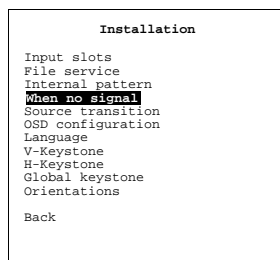
   OFF   The projector remains active and waits until an input signal is back.

5. Is *Shutdown* set to *ON*?
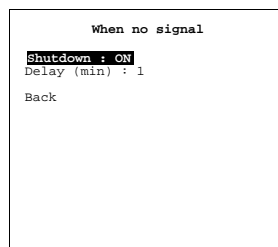   If yes, Push the cursor key ↑ or ↓ to highlight *Delay (min)*.

   The Modify delay window opens. (menu 9-20)

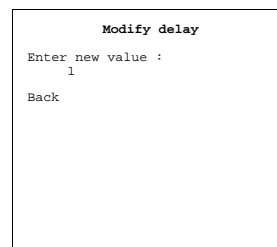6. Use the ↑ or ↓ key to enter a new value.

   The delay can be between 1 and 10 minutes.

```
           Installation
  Input slots
  File service
  Internal pattern
  When no signal
  Source transition
  OSD configuration
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```

Menu 9-18

```
          When no signal
  Shutdown : ON
  Delay (min) : 1

  Back
```

Menu 9-19

```
           Modify delay
  Enter new value :
       1

  Back
```

Menu 9-20

9.7 Source transition

What can be done ?

While switching from one source to another, the time between (transition time) can be filled up with a typical background color.

Available colors:
- Black
- Green
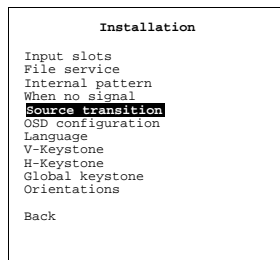- Blue

How to set up a source transition ?

1. Push the cursor key ↑ or ↓ to highlight *Source transition*. (menu 9-21)

2. Press **ENTER** to select.

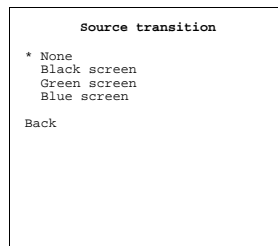   The *Source transition* menu will be displayed. (menu 9-22)

   An asterisk (*) indicates the actual set up.

3. Push the cursor key ↑ or ↓ to highlight the desired transition.

4. Press **ENTER** to select.

   The asterisk jumps to the selected item.

```
          Installation
   Input slots
   File service
   Internal pattern
   When no signal
   Source transition
   OSD configuration
   Language
   V-Keystone
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   Back
```

Menu 9-21

```
          Source transition

   * None
     Black screen
     Green screen
     Blue screen

   Back
```

Menu 9-22

9.8 On Screen Display Configuration

> **OSD**
>
> On screen display

Overview

- Menu position
- Bar scale status
- Bar scale position
- Message status

9.8.1 Menu position

What can be done ?

When a menu is called, it can be displayed in nine different places of the active image.

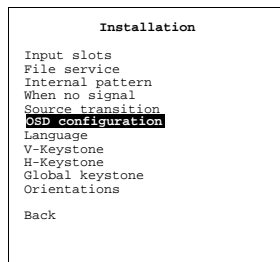### How to position the menu ?

1. Push the cursor key ↑ or ↓ to highlight *OSD configuration*. (menu 9-23)

2. Press **ENTER** to select.

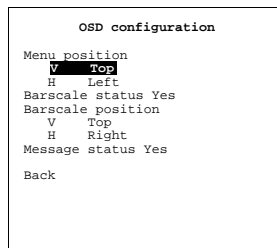   The OSD configuration menu will be displayed. (menu 9-24)

3. Push the cursor key ↑ or ↓ to highlight *V* just below *Menu position*.

4. Press **ENTER** to toggle between *Top*, *Bottom* and *Center*.

   Toggle until the desired vertical position is obtained.

5. Push the cursor key ↑ or ↓ to highlight *H* below *Menu position*.

6. Press **ENTER** to toggle between *Left*, *Center* and *Right*.

   Toggle until the desired horizontal position is obtained.

```
        Installation
Input slots
File service
Internal pattern
When no signal
Source transition
OSD configuration
Language
V-Keystone
H-Keystone
Global keystone
Orientations

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```

Menu 9-23

```
        OSD configuration
Menu position
     V    Top
     H    Left
Barscale status Yes
Barscale position
     V    Top
     H    Right
Message status Yes

Back
```
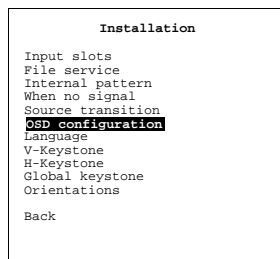
Menu 9-24

9.8.2 Bar scale status

What can be done ?

The bar scale which appears during some image adjustment such as brightness control, etc. can be disabled. The adjustment can still be done but no bar scale appears on the screen. E.g., this is sometimes handy when adjusting an image setting during a film.
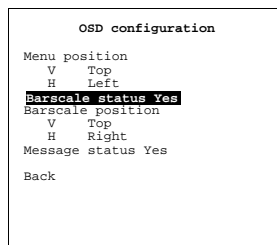
Enabling/disabling the bar scale

1. Push the cursor key ↑ or ↓ to highlight *OSD configuration*. (menu 9-25)

2. Press **ENTER** to select.

   The OSD configuration menu will be displayed. (menu 9-26)

3. Press **ENTER** to toggle between *Yes* and *No*.

   Yes   The bar scale will be displayed each time an image adjustment is called.

   No   No bar scale will be displayed during an image adjustment.

```
        Installation
Input slots
File service
Internal pattern
When no signal
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OSD configuration
Language
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```

Menu 9-25

```
        OSD configuration
Menu position
     V    Top
     H    Left
Barscale status Yes
Barscale position
     V    Top
     H    Right
Message status Yes

Back
```

Menu 9-26

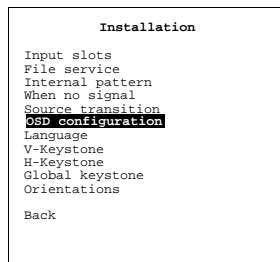### 9.8.3 Bar scale position

What can be done ?

When a function with bar scale adjustment is called, this bar scale can be displayed on nine different places of the active image.
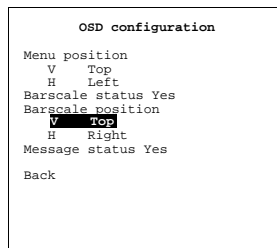
How to position the menu ?

1. Push the cursor key ↑ or ↓ to highlight *OSD configuration*. (menu 9-27)

2. Press **ENTER** to select.

   The OSD configuration menu will be displayed. (menu 9-28)

3. Push the cursor key ↑ or ↓ to highlight *V* just below *Barscale position*.

4. Press **ENTER** to toggle between *Top*, *Bottom* and *Center*.

   Toggle until the desired vertical position is obtained.

5. Push the cursor key ↑ or ↓ to highlight *H* below *Barscale position*.

6. Press **ENTER** to toggle between *Left*, *Center* and *Right*.

   Toggle until the desired horizontal position is obtained.

```
        Installation
Input slots
File service
Internal pattern
When no signal
Source transition
OSD configuration
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Back
```

Menu 9-27

```
        OSD configuration
Menu position
   V    Top
   H    Left
Barscale status Yes
Barscale position
   V    Top
   H    Right
Message status Yes

Back
```

Menu 9-28

9.8.4 Message status

What can be done ?

Messages generated by the projector to inform the user about e.g. shutdown, etc. can be disabled.
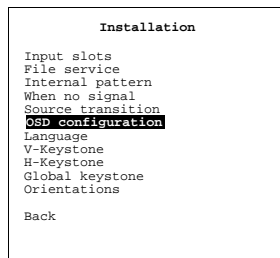
Enabling/disabling messages

1. Push the cursor key ↑ or ↓ to highlight *OSD configuration*. (menu 9-29)

2. Press **ENTER** to select.

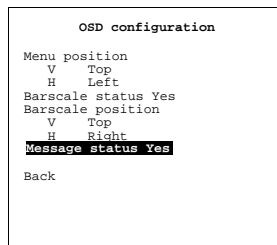   The OSD configuration menu will be displayed. (menu 9-30)

3. Press **ENTER** to toggle between *Yes* and *No*.

   Yes   The messages, when generate by the projector will be displayed.

   No   No messages will be displayed.

```
        Installation
Input slots
File service
Internal pattern
When no signal
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OSD configuration
Language
V-Keystone
H-Keystone
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```

Menu 9-29

```
        OSD configuration
Menu position
   V    Top
   H    Left
Barscale status Yes
Barscale position
   V    Top
   H    Right
Message status Yes

Back
```

Menu 9-30

9.9 Language support

What is possible ?

The language of the OSD can be changed to some predefined languages.

The following languages are available:
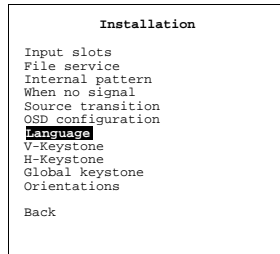- English
- German
- French
- Chinese

How to change the language ?

1. Push the cursor key ↑ or ↓ to highlight *OSD configuration*. (menu 9-31)

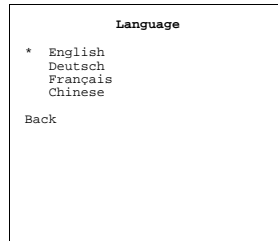2. Press **ENTER** to select.

   The *Language* selection menu will be displayed. (menu 9-32)

3. Push the cursor key ↑ or ↓ to highlight the desired language.

4. Press **ENTER** to select.

   The OSD language changes to the selected language.

```
              Installation
Input slots
File service
Internal pattern
When no signal
Source transition
OSD configuration
Language
V-Keystone
H-Keystone
Global keystone
Orientations

Back
```

Menu 9-31

```
                Language

 *   English
     Deutsch
     Français
     Chinese

 Back
```

Menu 9-32

9.10 Vertical keystone

What can be done ?

The Vertical Keystone adjustment is used to align the image geometry, this can be necessary when projecting under a non standard angle.
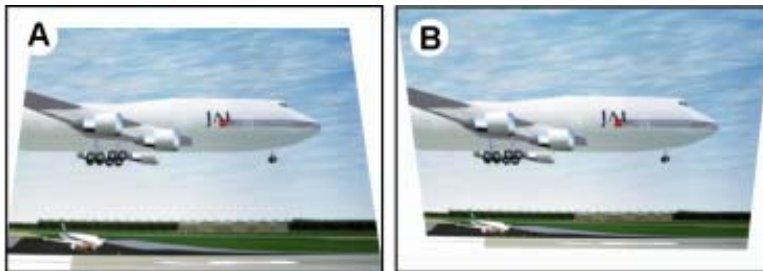

Image 9-1
Vertical keystone correction
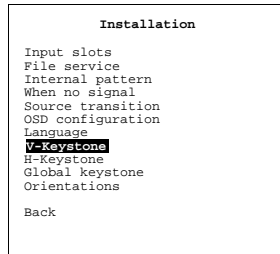
A   Vertical keystone top
B   Vertical keystone bottom

> **Depending on the Global keystone setting, the vertical keystone adjustment is source specific or is global for all sources.**

> **Avoid using the vertical keystone function as this result in a loss of resolution. The reason for this keystone is the inclination of the projector. Check first if it is possible to correct that physically.**

How to adjust the Vertical keystone ?

1. Push the cursor key ↑ or ↓ to highlight *V-Keystone*. (menu 9-33)

2. Press **ENTER** to select.

   A bar scale will be displayed.

3. Push the cursor key ↑ or ↓ to adjust the vertical keystone.

   Adjust until the left and right vertical lines are straight.

```
            Installation

Input slots
File service
Internal pattern
When no signal
Source transition
OSD configuration
Language
V-Keystone
H-Keystone
Global keystone
Orientations

Back
```

Menu 9-33

9.11 Horizontal keystone

What can be done ?

The Horizontal Keystone adjustment is used to align the image geometry, this can be necessary when projecting under a non standard angle.
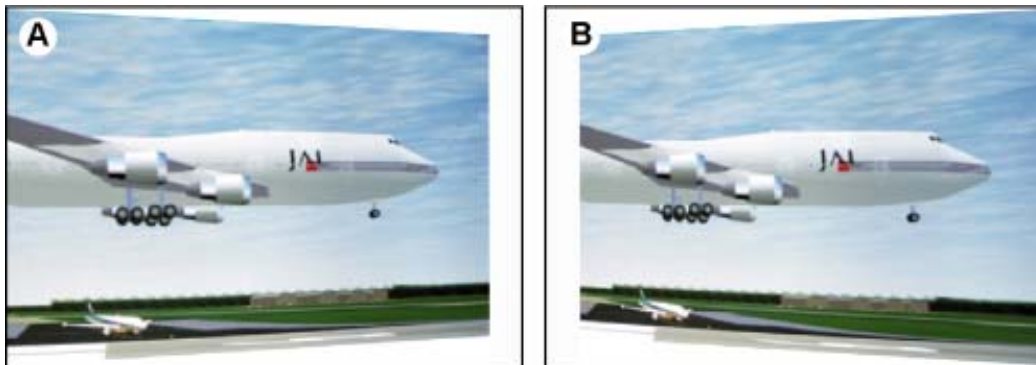

Image 9-2
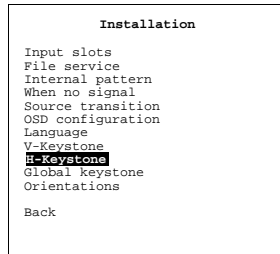Horizontal keystone adjustment

A   Right keystone
B   Left keystone

> **Depending on the Global keystone setting, the horizontal keystone adjustment is source specific or is global for all sources.**

> **Avoid using the horizontal keystone function as this result in a loss of resolution. The reason for this keystone is the inclination of the projector. Check first if it is possible to correct that physically.**

How to adjust the Horizontal keystone ?

1. Push the cursor key ↑ or ↓ to highlight *H-Keystone*. (menu 9-34)

2. Press **ENTER** to select.

   A bar scale will be displayed.

3. Push the cursor key ↑ or ↓ to adjust the horizontal keystone.

   Adjust until the top and bottom horizontal lines are straight.

```
                    Installation
        Input slots
        File service
        Internal pattern
        When no signal
        Source transition
        OSD configuration
        Language
        V-Keystone
        H-Keystone
        Global keystone
        Orientations

        Back
```

Menu 9-34

9.12 Global keystone

What can be done ?

When global keystone is set to Yes, the actual vertical and horizontal keystone settings will be applied to all sources.
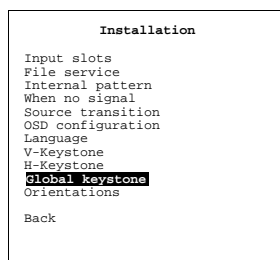
When global keystone is set to No, the actual vertical and horizontal keystone settings will be applied only to the actual source.
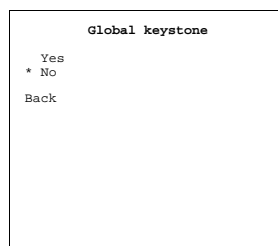
How to set up ?

1. Push the cursor key ↑ or ↓ to highlight *Global keystone*. (menu 9-35)

2. Press **ENTER** to select.

   The global keystone menu will be displayed. (menu 9-36)

   An asterisk (*) indicates the actual setting.

3. Push the cursor key ↑ or ↓ to highlight the desired global keystone setting.

   Yes   Keystone adjustment is global.

   No   Keystone adjustment is only for the active source.

4. Press **ENTER** to select.

```
                    Installation
        Input slots
        File service
        Internal pattern
        When no signal
        Source transition
        OSD configuration
        Language
        V-Keystone
        H-Keystone
        Global keystone
        Orientations

        Back
```

```
                   Global keystone
          Yes
        * No

        Back
```

Menu 9-35

Menu 9-36

9.13 Orientation

Projector orientation

Depending on how the projector is oriented, the projector's internal settings have to be adapted.
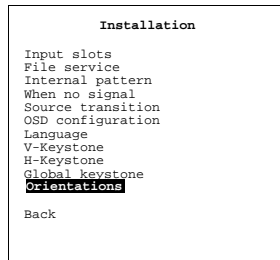
How to set up ?

1. Push the cursor key ↑ or ↓ to highlight *Orientation*. (menu 9-37)

2. Press **ENTER** to select.

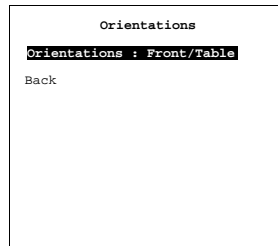   The orientation menu will be displayed. (menu 9-38)

3. Press **ENTER** to toggle the orientation.
   Possible orientations :
   - Front/table : used when the projector is placed in front of the screen on a table.
   - Front/ceiling : used when the projector is placed in front of the screen but mounted on the ceiling.
   - Rear/table : used when the projector is placed behind the screen on a table.
   - Rear/ceiling : used when the projector is placed behind the screen but mounted on the ceiling.

```
            Installation
  Input slots
  File service
  Internal pattern
  When no signal
  Source transition
  OSD configuration
  Language
  V-Keystone
  H-Keystone
  Global keystone
  Orientations

  Back
```

Menu 9-37

```
            Orientations
  Orientations : Front/Table

  Back
```

Menu 9-38

10. SERVICE MENUS

Overview

- Service menu overview
- Start up the Service menu
- Identification screen
- Password
- IR address
- RS232 address
- Serial communication
- Thermal Diagnosis
- I2C Diagnosis

10.1 Service menu overview

Overview

- Identification
- Password
- IR address : 000
- RS232 address : 000
- Serial communication
- Thermal diagnosis
- I2C diagnosis

10.2 Start up the Service menu

The service menu can be password protected when the password protection is set to on.

How to start up ?

1. Press **ADJ** or **ENTER** to start up the main menu. (menu 10-1)

2. Push the cursor key ↑ or ↓ to highlight *Service*.

3. Press **ENTER** to select.

   The *Service* menu will be displayed. (menu 10-2)

```
          Main Menu

Image settings
Advanced settings
Installation
Service

   1. PC
   2. RGB/Component
   3. DVI
   4. SVideo
 * 5. Video
   6. Component

Shutdown

Back
```

Menu 10-1

```
            Service

Identification
Password
IR address : 000
RS232 address : 000
Serial communication
Thermal diagnosis
I2C diagnosis

Back
```
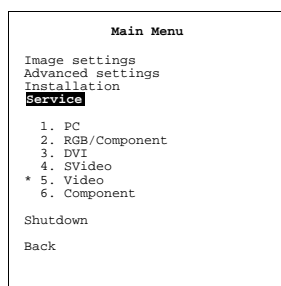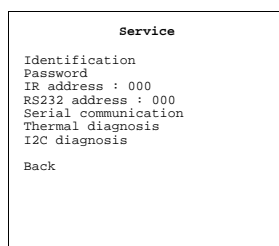
Menu 10-2

10.3 Identification screen

What can be seen on the identification screen?

The identification screen shows the general information of the projector.
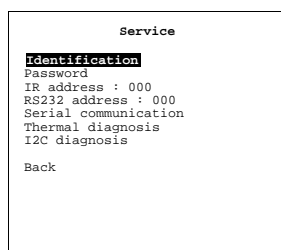
The following items will be displayed:
- Type of projector: CineVERSUM 70
- IR address = address used for the remote control
- RS address = address used with RS232/422 serial communication
- Software version
- Baud rate: transfer speed for communication through RS232/RS422 with an external device or computer. The baud rate of the projector must be the same as the baud rate of the connected computer or external device.
- Projector Serial number: indicates the fabrication number of the projector. This number can be useful when calling for technical assistance.
- Lamp Run Time: gives the total run time since the first start up of this lamp.
- Manufacturing date

How to display the identification window ?

1. Push the cursor key ↑ or ↓ to highlight *Identification*. (menu 10-3)

2. Press **ENTER** to select.

   The Identification window appears. (menu 10-4)

```
          Service                          Identification

Identification                       CineVERSUM 70
Password                             IR address : 000
IR address : 000                     RS address : 000
RS232 address : 000                  Soft. version : 07A00F22Z
Serial communication                 Baudrate PC : 19200
Thermal diagnosis                    Serial number : 6002316
I2C diagnosis                        Lamp runtime : 28h
                                     Manuf. Date : Apr. 14 2004
Back
                                     Back
```
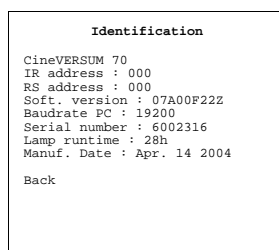
Menu 10-3   Menu 10-4

10.4 Password

Overview

- Enable-disable password
- Modify password

10.4.1 Enable-disable password

Why password ?

With a password it is possible to protect all settings in *Advanced Settings*, *Installation* and *Service*.
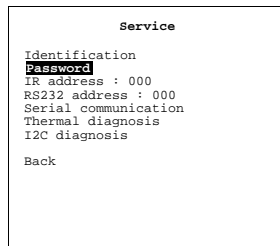
When the password is enabled, only person who knows the password can get in.
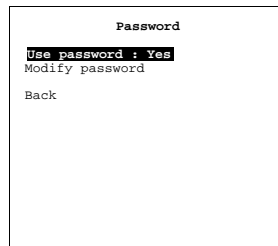
Enable/disable password

1. Push the cursor key ↑ or ↓ to highlight *Password*. (menu 10-5)

2. Press **ENTER** to select.

   The password menu will be displayed. (menu 10-6)

3. Push the cursor key ↑ or ↓ to highlight *Use password*.

4. Press **ENTER** to toggle between *Yes* or *No*.

   Yes   Password is enabled

   No   Password is disabled. Free access to all menus.


```
        Service                          Password

Identification                   Use password : Yes
Password                         Modify password
IR address : 000
RS232 address : 000              Back
Serial communication
Thermal diagnosis
I2C diagnosis

Back
```

Menu 10-5   Menu 10-6

10.4.2 Modify password

How to modify

1. Push the cursor key ↑ or ↓ to highlight *Password*. (menu 10-7)

2. Press **ENTER** to select.

   The password menu will be displayed. (menu 10-8)

3. Push the cursor key ↑ or ↓ to highlight *Modify password*.

4. Press **ENTER** to select.

   The password modification menu will be displayed. (menu 10-9)

   The first digit will be highlighted.

5. Push the cursor key ↑ or ↓ to change the value.

   An alphanumeric value can be entered. The following characters can be browsed:

   digital scroll list : 0123456789

   ASCII scroll list : abcdefghijklmnopqrstuvwxyz

6. Press **ENTER** to accept this first character.

   The second character will be highlighted.

7. Enter in the same way.

8. Press **ENTER** to accept this second character.

   The third character will be highlighted.

9. Enter in the same way.

10. Press **ENTER** to accept this third character.
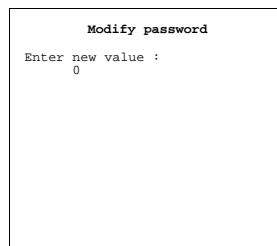
   The new password is entered.

   It becomes valid after a reboot of the projector. Switch off the projector and switch on again.

```
         Service                      Password                Modify password

Identification              Use password : Yes          Enter new value :
Password                    Modify password                       0
IR address : 000
RS232 address : 000         Back
Serial communication
Thermal diagnosis
I2C diagnosis

Back
```
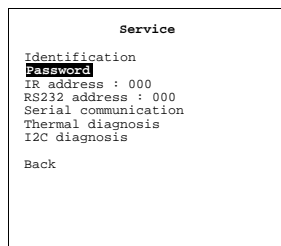
Menu 10-7   Menu 10-8   Menu 10-9

10.5 IR address

Overview

An overview of the IR address is given.

To change the IR address, see "Projector Address", page 29.

10.6 RS232 address

How to change ?

1. Push the cursor key ↑ or ↓ to highlight *RS232 address*. (menu 10-10)

2. Press **ENTER** to toggle between *000* and *001*.

```
         Service

Identification
Password
IR address : 000
RS232 address : 000
Serial communication
Thermal diagnosis
I2C diagnosis

Back
```
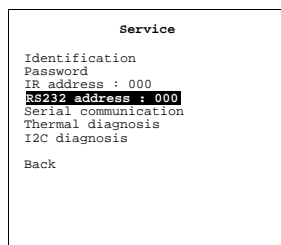
Menu 10-10

10.7 Serial communication

Overview

- Baudrate setup
- Serial communication interface selection

10.7.1 Baudrate setup

About Baudrate

The baudrate is the communications speed used for communication between the projector and the external computer. The baudrate setting of the projector must be the same as those of the computer.

How to setup

1. Push the cursor key ↑ or ↓ to highlight *Serial Communication*. (menu 10-11)

2. Press **ENTER** to select.

   The Serial communication menu will be displayed. (menu 10-12)

3. Push the cursor key ↑ or ↓ to highlight *Baudrate PC*.

4. Press **ENTER** to toggle between the different possible baudrates.
   The following baudrates are available :
   - 1200
   - 4800
   - 9600
   - 19200

```
            Service

Identification
Password
IR address : 000
RS232 address : 000
Serial communication
Thermal diagnosis
I2C diagnosis

Back
```

```
       Serial communication

Baudrate PC : 19200
Interface : RS232

Back
```
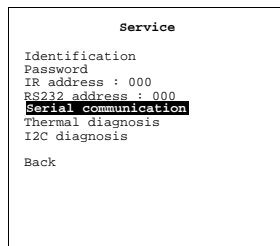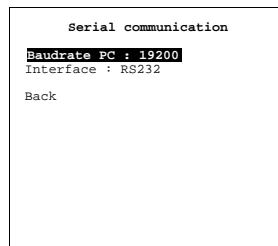
Menu 10-11   Menu 10-12

10.7.2 Serial communication interface selection

About interface selection

The serial port of the projector can accept serial communication via the RS232 protocol or via the RS422 protocol. The protocol type must be setup.

RS232

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

RS422

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

How to set up ?

1. Push the cursor key ↑ or ↓ to highlight *Serial Communication*. (menu 10-13)

2. Press **ENTER** to select.

   The Serial communication menu will be displayed. (menu 10-14)

3. Press **ENTER** to toggle between *RS232* and *RS422*.

```
            Service
    Identification
    Password
    IR address : 000
    RS232 address : 000
    Serial communication
    Thermal diagnosis
    I2C diagnosis

    Back
```

```
        Serial communication
    Baudrate PC : 19200
    Interface : RS232

    Back
```

Menu 10-13   Menu 10-14

10.8 Thermal Diagnosis

About thermal diagnosis

This menu gives an overview of the fan speeds and if they work normal.

It gives also the internal ambient temperature and the temperature of the DMD.

How to get an overview ?

1. Push the cursor key ↑ or ↓ to highlight *Thermal diagnosis*. (menu 10-15)

2. Press **ENTER** to select.

   The *Thermal diagnosis* menu will be displayed. (menu 10-16)

```
            Service
    Identification
    Password
    IR address : 000
    RS232 address : 000
    Serial communication
    Thermal diagnosis
    I2C diagnosis

    Back
```

```
         Thermal diagnosis
    Fan 1   1687 RPM
    Fan 2   1028 RPM
    Fan 3   1687 RPM
    Fan 4   Normal
    Fan 5   Normal
    Fan 6   Normal
    T_amb   39°C
    T_DMD   45°C

    Back
```

Menu 10-15   Menu 10-16

10.9 I2C Diagnosis

How to display ?

1. Push the cursor key ↑ or ↓ to highlight *I2C diagnosis*. (menu 10-17)

2. Press **ENTER** to select.

   The *I2C diagnosis* menu will be displayed. (menu 10-18)

```
            Service
    Identification
    Password
    IR address : 000
    RS232 address : 000
    Serial communication
    Thermal diagnosis
    I2C diagnosis

    Back
```

```
          I2C diagnosis
    DDP1010 0x34    - + +
    Thermal 0x5A    + + +
    Thermal 0x58    + + +
    ADC 0x9A        + + +
    Deiter 0x64      + + +
    VDC 0x42         + + +

    Back
```

Menu 10-17   Menu 10-18

A. SPECIFICATIONS

A.1 Specifications for CineVERSUM 60

Overview

Optimium screen diagonal	60" to 80"
Optimium screen width	132 to 177cm
Technology	single chip DLP™
DLP resolution	1024 x 576
Single cable digital link	No
Chip format	16:9 true widescreen
Chip Type	ED2
Lamp	250 W UHP
Lamp Arc Length	1,3 mm
Lifetime	> 1500 hours (on average)
Light Output	typical 900 ANSI lumens
Contrast Ratio	(full On/Off) > 2000 : 1
Brightness uniformity	> 90%
Color Temperature	8500 K
Lenses	1.70 - 2.25 : 1 (Standard)
	2.25 - 3.0 : 1 (Long throw)
Lens Zoom and Focus	Manual
Lens Shift	Manual
Vertical Shift	50 to 160 % off Axis
Horizontal Shift	No (on Axis)
Maximum screen size (diagonal)	Standard lens: 200" Optional lens: 240" (wide) 178" (tele)
Color Wheel	6 segment (RGBRGB)
CineVersum Master	Not mandatory
Inputs	1 Composite Video (RCA connector)
	1 S-Video (4 pin mini DIN)
	1 Component Video (3 x RCA connectors)
	1 RGBHV or Component (5 x RCA connectors)
	1 RGBHV (D15 VGA connector)
	1 DVI input (HDCP)
Control	1 RS232 (D-sub9 connector)
12V Trigger	2 (power/masking)
Acoustic Noise	< 30 dBA
Main Voltage Range	90-230V AC/ 50-60 Hz
Weight	6 kg (13.2 lbs)

Width	449 mm / 17.7"
Height	156 mm / 6.2"
Depth	420 mm / 16.6"
Article Number	R9002460 CineVERSUM 60 standard throw
	R9002461 CineVERSUM 60 long throw
Color Refresh	5x (NTSC) / 6x (PAL)

A.2 Specifications for CineVERSUM 70

Overview

Optimium screen diagonal	70" to 90"
Optimium screen width	155 to 200cm
Technology	single chip DLP™
DLP resolution	1280 x 720
Single cable digital link	No
Lenses	1.80 - 2.40 : 1 (Standard)
	1.40 - 1.80 : 1 (Short throw)
Article Number	R9010080 CineVERSUM 70 standard
	R9010081 CineVERSUM 70 short throw
Chip format	16:9 true widescreen
Chip Type	HD2+
Lamp	250 W UHP
Lamp Arc Length	1,3 mm
Lifetime	> 1500 hours (on average)
Light Output	Typical 1000 ANSI lumens
Contrast Ratio	> 2700 : 1
Brightness uniformity	> 90%
Color Temperature	8500 K
Lens Zoom and Focus	Manual
Lens Shift	Manual
Vertical Shift	50% to 120% off Axis
Horizontal Shift	No (on Axis)
Maximum screen size (diagonal)	Standard lens: 300" (wide) 220" (tele) Short throw: 250"
Color Wheel	6 segment (RGBRGB)
Color Refresh	5x (NTSC) / 6x (PAL)

Inputs	1 Composite Video (RCA connector)
	1 S-Video (4 pin mini DIN)
	1 Component Video (3 x RCA connectors)
	1 RGBHV or Component (5 x RCA connectors)
	1 RGBHV (D15 VGA connector)
	1 DVI/HDCP input
Control	RS232 Control
12V Trigger	2 (power/masking)
Acoustic Noise	< 30 dBA
Main Voltage Range	90-230V AC / 50-60 Hz
Width	449 mm / 17.7"
Height	156 mm / 6.2"
Depth	420 mm / 16.6"
Weight	7.9 kg (17.4 lbs)
CineVersum Master	Not mandatory

B. MAINTENANCE

B.1 Error reporting via the LEDs

Legend of the used code

Blue : LED is on with blue color

Green : LED is on with green color

– : LED is out

No blinking : LED is out for a longer time

Over temperature

Blinking sequence of standby LED:

Blue – Blue – Blue – No blinking – Green – No blinking

The sequence repeats.

Lamp error

Blinking sequence of standby LED:

Blue – Blue – Blue – Blue – Blue – No blinking – Green – No blinking

The sequence repeats.

Fan error

Fan 1 : Blue – Blue – Blue – Blue – Blue – Blue – No blinking – Green – No blinking

Fan 2 : Blue – Blue – Blue – Blue – Blue – Blue – No blinking – Green – Green – No blinking

Fan 3 : Blue – Blue – Blue – Blue – Blue – Blue – No blinking – Green – Green – Green – No blinking

Fan 4 : Blue – Blue – Blue – Blue – Blue – Blue – No blinking – Green – Green – Green – Green – No blinking

Fan 4 : Blue – Blue – Blue – Blue – Blue – Blue – No blinking – Green – Green – Green – Green – Green – No blinking

DMD error

Blue – Blue – Blue – no blinking – Green – Green – Green – No blinking

GLOSSARY

2:2 pull-down

The process of transferring 24-frames/sec film format into video by repeating each frame (used for PAL DVD's) as two video fields. (AD)

3:2 pull-down

Method used to map the 24 fps of film onto the 30 fps (60 fields) or 25 fps (50 fields), so that one film frame occupies three video fields, the next two, etc. It means the two fields of every other video frame come from different film frames making operations such as rotoscoping impossible, and requiring care in editing. Some sophisticated equipment can unravel the 3:2 sequence to allow frame-by-frame treatment and subsequently re-compose 3:2. The 3:2 sequence repeats every five video frames and four film frames, the latter identified as A-D. Only film frame A is fully on a video frame and so exists at one time code only, making it the editable point of the video sequence.

ANSI

American National Standards Institute

ANSI 73.11

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

Artefacts

Undesirable elements or defects in a video picture. These may occur naturally in the video process and must be eliminated in order to achieve a high-quality picture. Most common in analog are cross color and cross luminance. Most common in digital are macroblocks, which resemble pixelation of the video image.

Aspect ratio

horizontal & vertical dimension in which the window will be displayed, e.g. 4 by 3 or 16 by 9.

CEE7

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

Chrominance

The color component of a video signal that includes information about tint and saturation.

Color Space

The color range between specified references. Typically references are quoted in television: RGB, Y, R-Y, B-Y, YIQ, YUV and Hue Saturation and Luminance (HSL). In print, Cyan, Magenta, Yellow and Black (CMYK) are used. Moving pictures between these is possible but requires careful attention to the accuracy of processing involved. Operating across the media--print, film and TV, as well as between computers and TV equipment--will require conversions in color space.

Color temperature

Color temperature is measured in degrees Kelvin. If a TV has a color temperature of 8,000 degrees Kelvin, that means the whites have the same shade as a piece of pure carbon heated to that temperature. Low color temperatures have a shift towards red; high color temperatures have a shift towards blue.

Component video

A video system containing three separate color component signals, either red/green/blue (RGB) or chroma/color difference (YCbCr, YPbPr, YUV), in analog or digital form.

Component Video

In Component Video the term component describes a number of elements that are needed to make up the video picture, these components are PR/Y/PB. A composite video signal on the other hand contains all the information needed for the color picture in a single channel of information

Composite Video

Luminance and chrominance are combined along with the timing reference "sync" information using one of the coding standards-- NTSC, PAL or SECAM--to make composite video. Most televisions and VCRs have composite video connectors, which are usually colored yellow.

DVI

Digital Visual Interface is a display interface developed in response to the proliferation of digital flat panel displays.

The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video. This standard uses TMDS (Transition Minimized Differential Signal) from Silicon Image and DDC (Display Data Channel) from VESA (Video Electronics Standards Association).

DVI can be single or dual link.

EBU

European Broadcasting Union. An organization of European broadcasters that, among other activities, produces technical statements and recommendations for the 625/50 line television system.

Gamma

The transfer characteristics of most cameras and displays are nonlinear. For a display, a small change in amplitude when the signal level is small produces a change in the display brightness level, but the same change in amplitude at a high level will not produce the same magnitude of brightness change. This nonlinearity is known as gamma.

Luminance

The component of a video signal that includes information about its brightness.

NTSC

National television system committee. The organization that developed the analog television standard currently in use in the U.S., Canada, and Japan. Now generally used to refer to that standard. The NTSC standard combines blue, red, and green signals modulated as an AM signal with an FM signal for audio.

OSD

On screen display

PAL

Phase alternate line. The television broadcast standard throughout Europe (except in France and Eastern Europe, where SECAM is the standard). This standard broadcasts 625 lines of resolution, nearly 20 percent more than the U.S. standard, NTSC, of 525.

Progressive scan

A video scanning system that displays all lines of a frame in one pass.

Projector address

Address installed in the projector to be individually controlled.

RS232

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

RS422

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

SECAM

Sequential couleur avec mémoire. The television broadcast standard in France, the Middle East, and most of Eastern Europe, SECAM provides for sequential color transmission and storage in the receiver. The signals used to transmit the color are not transmitted simultaneously but sequentially line for line. SECAM processes 625 lines, a maximum of 833 pixels per line and 50 Hz picture frequency. SECAM is used as a transmission standard and not a production standard (PAL is typically used).

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Revision Sheet

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