User's manual

OV-D2 SERIES

R59770138

User's manual OV-D2 series, Current Version

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	main issue	update
chapter 1		
chapter 2		
chapter 3	add	
chapter 4	add	
chapter 5	add	
chapter 6	add	
chapter 7	add	
chapter 8		
chapter 9		

new: The corresponding chapters are new or completely revised.
corr.: Passages of the corresponding chapter were corrected; see modification bars.
add.: Passages of the corresponding chapter were added; see modification bars.

Document History

Modifications, which result in a new version, are indicated by a vertical bar.

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The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

Revision sheet

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Please correct the following points in this documentation (**R59770138**):

page	wrong	correct

Contents

1 Introduction

This chapter explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of devices from Barco.

1.1 How this manual is organized

This section explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of computer systems from BARCO.

- **Introduction**
  gives an overview about styles and symbols and gives safety instructions.
- **Preliminary remarks**
  describes the use of video walls and shortly introduces the OV-D2 series.
- **Projection technology**
  explains the principle of the projection technology employed in OV-D2 series and its qualities.
- **Modular rear projection systems**
  lists the components of a rear projections systems and explains the core components
- **Sense6**
  describes the challenge of color and brightness uniformity and how this challenge has bee solved with OV-D2.
- **Operating OV-D2**
  gives a short overview where to find instructions on operating an OV-D2 video wall.
- **Maintenance**
  gives instructions how to replace filter and lamps in OV-D2 systems.
- **Technical data**
  lists mechanical, optical and electrical data of the OV-D2 system as well as the allowed timings for the connected sources.
- **Troubleshooting**
  explains the LCD messages and inhibit times and how to reset errors. Hotline information can also be found there.

1.2 Styles and Symbols

The typographic styles and the symbols used in this document have the following meaning:

Bold	Labels, menus and buttons are printed in **Bold** font.
Condensed	Links to both other chapters of this manual and to sites in the Internet are printed condensed. In the on-line version of this manual all hyperlinks appear teal.
`Courier`	Names of files and parts from programs are printed in the `Courier` font.
`Courier bold`	Inputs you are supposed to do from the keyboard are printed in **`Courier bold`** font.

If you do not heed instructions indicated by this symbol there is a risk of damage to the equipment!

If you do not heed instructions indicated by this symbol there is a risk of electrical shock and danger to personal health!

If you do not heed instructions indicated by this symbol there is a risk of damage to parts, which are sensitive towared electrostatic charge!

If you do not heed instructions indicated by this symbol there is a risk to get harmed by sharp objects!

If you do not heed instructions indicated by this symbol there is a risk that parts may explode!

If you do not heed instructions indicated by this symbol there is a risk that hot parts impact persons or objects!

The sheet icon indicates additional notes.

Next to this icon you find further information.

This arrow marks tips.

Next to this icon you find important notes.

1.3 Safety Instructions

This section describes safety precautions, which must be observed when installing and operating a product from BARCO.

1.3.1 Standards

Safety Regulations

OV-D2 is built in accordance with the requirements of the international safety standard IEC-60950-1, UL60950-1 and CSA C22.2 No. 60950-1-06, which are the safety standards of information technology equipment including electrical business equipment.

These safety standards impose important requirements on the use of safety critical components, materials and isolation, in order to protect the user or operator against the risk of electric shock and energy hazard, and having access to live parts.

Safety standards also impose requirements to the internal and external temperature variations, radiation levels, mechanical stability and strength, enclosure construction and protection against risk of fire.

Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment's normal operation fails.

Electromagnetic Interference

Electromagnetic emission of OV-D2 complies with EN55022, EN61000-3-2, EN61000-3-3 and the limits for a class A digital device, pursuant to Part 15 of the FCC Rules.

Electromagnetic immunity of OV-D2 complies with EN55024.

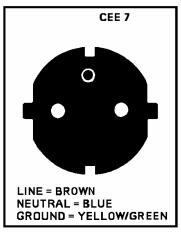
1.3.2 Precautions

For your own protection, observe the following safety precautions when installing, operating and servicing your device:

- Before operating the units please read this manual thoroughly and retain it for future reference!
- Observe all warnings and instructions printed on the devices!
- Servicing not explicitly mentioned in this manual should never be carried out by unauthorized personnel! Never open the case of the unit without first disconnecting the power supply cord!
- To prevent fire or electrical shock hazard, do not expose this unit to rain or moisture!
- This product should be operated from an AC power source!
- This unit may be connected to an IT power system!
- Check that the voltage and frequency of your power supply match those printed on the device label with the rated electrical values!
- If you are not sure of the type of AC power available, consult your dealer or local power company!
- This product is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug!
- This equipment must be grounded (earthen) via the supplied 3 conductor AC power cable. (If the supplied power cable is not the correct on, consult your dealer.)

Mains lead (AC Power cord) with CEE 7 plug:

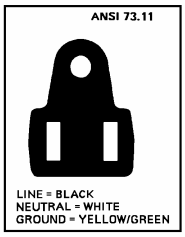
The wires of the mains lead are colored in accordance with the following code:



yellow + green	Earth (Ground)
blue	Neutral
brown	Line (Live)

Power cord with NEMA 5-15 plug:

The wires of the power cord are colored in accordance with the following code.



Green or Green/Yellow:	Earth (Ground)
White or Blue:	Neutral
Black or Brown:	Line (Live)

- The cord set must be UL-approved and CSA-certified.
- The minimum specification for the flexible cord is No. 18 AWG Type SVT or SJT, 3-conductor.
- The cord set must have a rated current capacity of at least 10A.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.
- Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Lightning - For extra protection for this video product during a lightning storm or when it is lift unattended and unused for a long period of time, unplug it from the wall outlet. This will prevent damage to the unit due to lightning and AC power-line surges.

1.3.3 Unpacking of Devices

Note advises on the packaging for unpacking!

1.3.4 Installation

- Use only the power cord supplied with your unit. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the unit. For a replacement power cord, contact your dealer.
- The location of the video wall must be nearly dust-free and have an appropriate climate controlled environment. The control room must have an acceptable dust class of 100000 or better. (100000 particles of 0.5µm or larger per cubic feet, comparable with clean desk room). The temperature in the room must be kept between 0° and 35° Celsius. It is advantageous to supply fresh air via ventilation shafts in the floor. The openings should be equipped with replaceable dust filters for longer operation time of the built-in filters.
- Ventilation shafts, electrical outlets, etc. are not permitted in the area (15 cm) around the feet and the floor fixation brackets. Also, the area around the feet shall be sufficiently strong enough to support the load of the video walll.
- For the proper operation of the video wall there must be sufficient service area. The exact dimensions for your project result from the installation drawings. Note, that there may be laws concerning safety standards in your country!
- The installation surface area must be sufficiently level and of sufficient load bearing capacity. Under the load of the video wall; it must not bend or sag by more than 1 millimeter. Possibilities for the finished floor are concrete, wood, and false floors or platforms. The supporting floor surface area shall provide enough resistance in lateral movements that in case of light shaking movements it prevents the system from moving.

1.3.5 Servicing

Mechanical or electrical modifications others than described in this manual must not be made to the devices. Barco is not liable for damages resulting from modified devices.

Only authorized personnel should carry out other maintenance work not explicitly mentioned in this manual!

Never open the case of the device without first disconnecting all power supply cords! Measurements and tests with the opened device may be carried out only in the factory or by specially trained personnel, due to the dangers of electrical shock.

1.3.6 Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. See section Cleaning the screens for a cleaning instruction!

1.3.7 Re-Packing

Keep the original shipping carton and packing material; they will come in handy if you ever have to ship your unit. For maximum protection, repack your set as it was originally packed at the factory.

2 Preliminary remarks

2.1 Video walls

Video walls are used in a wide range of control room and studio environment, from process control centers to broadcast environments where they are increasingly used as interactive element to present information on the TV. Depending on the field of application, the requirements to be fulfilled by a video wall system are manifold.

Next to best optical properties for high-quality presentation of information, the simple integration into higher-level systems, redundancy on operation, resolution and size are, ergonomics and economics are also criteria.

2.2 OV-D2 series

OV-D2 video modules have been designed to meet basically any requirements in any field of application. They combine flexibility in size and resolution with the highest possible image quality and approx. 100% availability.

Outstanding image quality

Based on DLP technology, the OV-D2 series show high fidelity and accurate images with vivid and saturated colors.

Size and resolution

The video modules range from 50" to 120" and from XGA to SXGA+. Virtually unlimited number of video modules can be lined up and stack for video walls of any size. The mechanical connection of the video modules allows setting up linear or curved video walls.

Brightness and on-screen contrast

The video displays feature optimized brightness and high on-screen contrast. Lamp modules with 120W, 132W, 180W allow balancing overall brightness and operation costs. High-contrast projection units combined with anti-glare screens provide excellent legibility on the video wall.

Redundancy

The illumination unit is designed as a dual lamp system and employs two lamps, one of them illuminating the optics, the other one as backup lamp.

In 24/7 mission critical applications the lamps are operated in hot standby mode which means that also the backup lamp is continuously on to immediately take over in case of a lamp failure.

In cold standby mode the backup lamp is off to save power and lamp lifetime. In case the active lamp fails, the backup lamp is automatically ignited and activated to illuminate the optics. Thus it takes only some seconds for the image being displayed as perfect as before.

Since actually only one lamp is on, this mode is the most economical operation mode while providing about 100% availability.

Redundancy on content is guaranteed by two independent DVI inputs. Either the video wall employs both, a controller and a redundant controller, or the second input is directly connected to a source, ready to be shown in case of a controller failure. A switching logic allows setting the behavior on signal loss.

Data processing

The system features two independent DVI inputs and supports frame rates in the range of 40Hz to 62Hz for all resolutions. Both DVI inputs feature loop-through to a DVI output. This loop-through functionality allows providing one source on multiple video modules by chaining the modules. This source then can be displayed multiple times on the chained modules, or every system crops and scales a part of the source to display one video covering a matrix of video modules.

Sense6

All color and brightness parameters are controlled and continuously adjusted for a homogeneous color and brightness distribution on the entire video wall and to provide the best conditions for the human eye.

Operation

The projection systems are configured, controlled and operated either via their web interface or via the Barco Wall Control Manager Software .

This manual describes design and maintenance of the OV-D2 series. Operating the projection modules is explained in the respective software manuals:

For the use of the web interface, please refer to R59770139.

For the use of the Barco Wall Control Manager software, please refer to R5990102

3 Projection technology

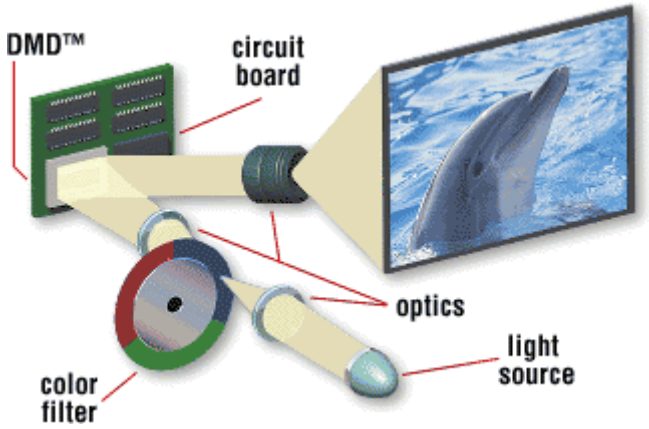
3.1 Principle of DLP™ technology

The technology used in OV-D2 is based on the latest DLP technology. DLP stands for Digital light Processing and is a projection technology developed by Texas Instruments and based on their proprietary DMD™ chip.

The Digital Micromirror Device (DMD) is an array of tiny, tiltable mirrors, each of which corresponds to an individual pixel. The mirrors are orientated by applying an electrical signal and can take up alternatively two positions: tilted in positive or negative directions.

If they are in tilted in positive direction light is reflected to the screen, otherwise it is reflected away. The tilting angle as well as the dimensions of the DMD chip and the number of active mirrors depends on resolution.

The DMD is sequentially illuminated with the three primary colors, red, green, and blue (RGB).



Principle of a single-chip DLP projection system

A condenser lens collects the light, which is imaged onto the surface of a transmissive color wheel. A second lens collects the light that passes through the color wheel and evenly illuminates the surface of the DMD. Depending on the rotational state of the mirror (positive direction or negative direction) the light is directed either into the pupil of the projection lens (on) or away from the pupil of the projection lens (off). The projection lens has two functions: (1) to collect the light from each on-state mirror, and (2) to project an enlarged image of the mirror surface to a projection screen.

The example shows a color wheel with three segments red, green, and blue. It is also possible that the segments for the primaries exist twice (RGBRGB), or that a white segment is added (RGBW).

DMD is a trademark of Texas Instruments Incorporated.

3.2 Qualities of DLP technology

The tiny tiltable mirrors in DLP projection systems can reflect pixels in up to 1024 shades of gray and in 16.7 million colors. These properties make DLP systems the first choice to display video: the image shows outstanding vivid colors and has high contrast.

Using the latest DMD technology which provides increased switching speed of the mirrors the video performance again has been enhanced and does not show any contouring artifacts.

The digital projection technology and its direct digital control ensure a largely flicker free display. No aging or deteriorating elements are used thus keeping high video quality constant over time.

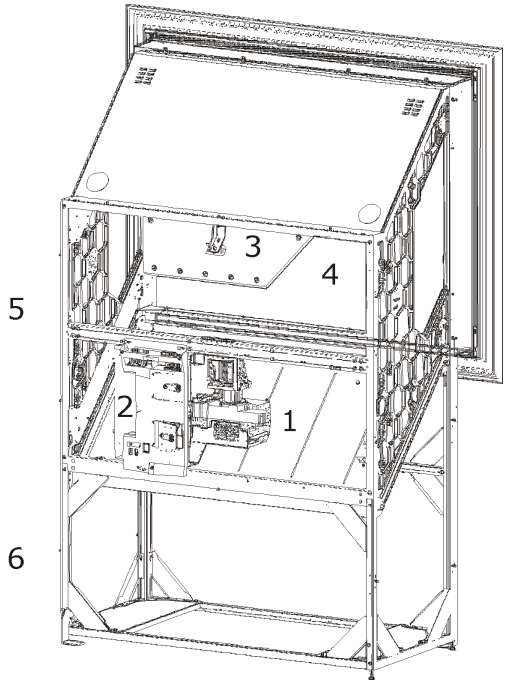
4 Modular rear projection systems

4.1 General

A modular rear projection system comprises mechanics (the structure), the image generator (projection unit, illumination unit), the mirror and the screen.

The mechanics houses the image generator which receives and processes data and displays them via a mirror onto the rear side of the screen.

The picture shows an OV-D2 projection module without rear shieldings to allow looking inside from the rear.



Number	Description
1	Projection unit
2	Illumination unit (dual lamp system) with fan module
3	Mirror
4	Screen
5	Mechanics: Darkbox
6	Mechanics: Support

Since the entire image is generated „in the box“ ambient light has no impact on contrast. Also the image on the screen can never be interfered by obstacles in the projection path.

Every module is a complete projection system. Multiple modules can be lined up and stacked for video walls of virtually any size. Since every unit features its own brightness and color distribution a video wall has to be adjusted to homogeneous brightness and color. This initial adjustment is subject to statistic ageing effects of the lamps. This influence is measured and controlled by sophisticated hardware and software which ensures that the entire video wall always looks as if it were one single image generator.

Please find below a short introduction of the components.

Mechanics

The mechanics houses the image generator. Carefully designed and constructed it allows combining modules in horizontal and vertical direction while guaranteeing stability. Besides the number of modules, the distance between the floor and the lower edge of the display (height of support), the arrangement of adjacent modules (angle of connection) as well as the display size (size of the screen diagonal) of a module are the features which define the physical dimensions of a video wall. With OV-D2 every feature is available in multiple standard versions, and all features can be freely combined.

The components can be easily accessed for the convenient exchange of consumables (filter, lamps). The majority of the OV-D2 systems are rear access systems; with 70" also a front access system is available. Whereas rear access systems can be stacked up to 6 modules in height, front access systems are restricted in height to one module.

Besides the position of the image generator inside the structure, rear access systems basically do not differ from front access systems.

The mechanics has been designed for minimal installation depth and is available from 50" to 120", thus meeting any requirement with respect to the size of the control room..

Image generator

The image generator basically includes the projection unit and the illumination unit. Within the specification of a projection module or a video wall, respectively, the projection unit defines resolution and aspect ratio:. OV-D2 is available in XGA (1024x768 pixels, 4:3), SXGA (1280x1024 pixels, 5:4), SXGA+ (1400x1050 pixels, 4:3).

Each projection unit can be mounted in any mechanics designed for OV-D2 provided the aspect ratio of the resolution matches the aspect ratio of the screen size. Currently SXGA projection units which feature a native 5:4 aspect ratio are only available with screen diagonals of 50″ and 70″.

The illumination unit is designed as a dual lamp system to provide approx. 100% availability of the video wall: It is always one lamp which is used for projection. This lamp is called active lamp. The second lamp is the backup lamp. In case the active lamp fails, the system automatically activates the backup lamp.

The illumination unit is available with lamps of different power to perfectly meet any requirements on the overall brightness of the video wall.

Screen

The image is generated in the screen.

The screen consists of a Fresnel lens and a Front Element Screen. The Fresnel lens deflects the light coming from the projection lens system such that it falls perpendicularly onto the front element screen.

The front element screen guarantees that the light is distributed horizontally and vertically, while maintaining a high contrast. It is the front element which specifies the gain of the screen as well as the horizontal and vertical half gain viewing angles.

The surface of the screen has a special non-glare texture. This texture minimizes the direct reflection of the light of the surrounding and contributes also to the high contrast of the screen.

The gap between adjacent screens depends on the screen type: for the stitched screen and for the ZeroGap seamless screen the gap is zero, with screen modules there is a gap < 0.8mm which compensates for the expansion of the screen due to temperature and humidity changes. But the mullion is always zero: not a single pixel of the displayed image is lost.

Sense6

Sense6 is a sophisticated software tool which locks all projection modules to the same brightness and color. Thus brightness and color distribution is constant over time.

The following sections give details about the design of the core components. The information provided in these sections is not required to operate an OV-D2 video wall.

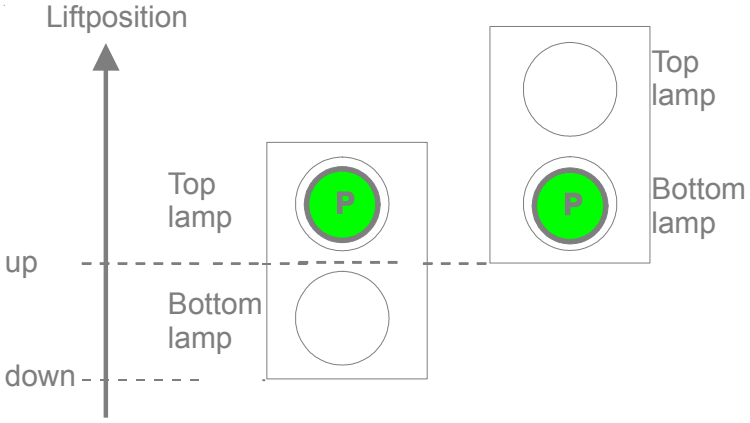
4.2 Illumination unit

The illumination unit has been designed as a dual lamp system for approx. 100% availability of the video wall. The active lamp illuminates the optics, the backup lamp takes over in case of a failure of the active lamp.

This concept is realized by a so-called lamp lift. The lamp lift has two „cabins“ on top of each other, each of them housing a lamp module. In case the top lamp is the active lamp, the upper cabin is positioned in the light path. Moving the lift up will position the bottom lamp in the light path.

Switching the active lamp (either manually on purpose or automatically in case of a lamp failure) means moving the lift.

The following picture illustrates the lift moving. The lamp used for projection is indicated by **P**.



The lamp lift not only moves the lamps in vertical direction but also optimizes the coupling by moving the lamp in horizontal direction thus focusing the light arc to the optics.

The dual lamp system can be run into two operation modes: hot standby (both lamps on) or cold standby.

In cold standby mode the backup lamp gets only ignited when it changes its status to be the active lamp. Since it takes about 5 minutes from ignition to stable operation, when switching the active lamp in cold standby mode the displayed image will first be rather dark and then gradually become brighter. In hot standby mode the impact on image quality is much smaller. In less than 1.5 seconds 50% of the former brightness is reached.

The following picture shows a photo of the illumination unit. The numbered items are explained below.

Number	Description	Explanation
1	Lamp door of top lamp with glass window (3)	The lamp door gives access to the lamp. Via a glass window in the door the state of the lamp is visible (on/off). The lamps are of type UHP. Each of the two lamps has its own lamp driver board which provides the required high voltage for ignition as well as the operating voltage.
2	Lamp door of bottom lamp with glass window (3)	
3	glass window in lamp door	
4	Filter pad	The air sucked in for cooling the system is filtered. The filter is of type F7 and has to be changed once a year.
5	Power switch	The power switch connects the system to the mains (ON) and disconnects it from the mains (OFF).
6	Standby switch / reset switch	This switch changes the status of the system from standby to on or from on to standby, respectively. It is also used for manually resetting errors, see Switches.
7	Active lamp selection switch	The active lamp selection switch allows manually switching the active lamp from top lamp to bottom lamp and vice versa.
8	LC Display	The LC Displays shows valuable information about the system, see LCD indications.
9	"Light interface" to projection unit	Light, air and data have to be exchanged between the illumination unit and the projection unit, the two core components of the image generator.
10	"Air interface" to projection unit	
11	"Communication interface" to projection unit	
12	Power connection	Plug for the power cable to connect the OV-D2 to the mains of the control room.

4.3 Projection unit

Except for the lamps, the projection unit houses the entire optical platform as well as the electronic platform to receive, process and display data.

The optical platform comprises the optical dimmer, the color wheel, the color sensor, the DMD chip, and the optics. Please refer to Optical platform.

The electronic platform provides two DVI IN interfaces with loop-through to DVI OUT and features improved self diagnostics capabilities. Whereas the received data is sent onto the video module, the self diagnostics information is displayed on the LC display of the illumination unit.

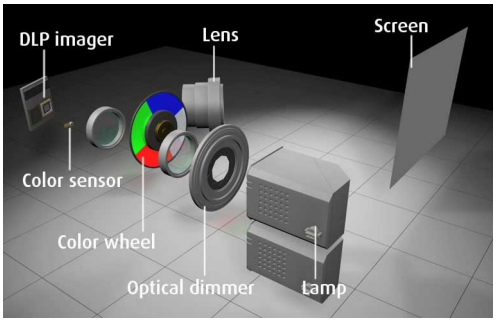
The projection unit has a sealed optics core to prevent soil or dust from entering the optical system. This design requires a cooling concept not based on air (which cannot enter due to the sealing) but based on heat exchanger to transports the heat dissipated by the dimmer.

The following photo shows the projection unit

Number	Description	Explanation
1	DVI IN1 with loop-through to DVI OUT1	The two independent DVI interfaces allows the connection of two sources for e.g. redundancy on content. The loop-through of the DVI input to the output allows connecting one source to multiple projection modules via connecting the DVI OUT of the previous module to the DVI IN of the following projection module. Together with the scaling and cropping capabilities this chaining of modules gives multiple possibilities on displaying data, see Data processing.
2	DVI IN2 with loop-through to DVI OUT2	
3	LAN interface	OV-D2 projection modules are controlled by web applications and accessed over the LAN
4	"Communication interface" to illumination unit	The projection unit has e.g. to communicate all data to be displayed on the LC display to the illumination unit
5	Projection lens	The projection lens displays the image on the rear of the screen.
6	Sealed optics core	The optics is sealed to ensure that the sensitive components are not affected by dust.
7	Electronic platform	The electronic platform does all data processing and checks and evaluates in regular intervals system critical data

4.3.1 Optical platform

The implementation of the DLP projection technology in OV-D2 combines all the benefits of standard DLP technology with a sophisticated concept of measuring and controlling color and brightness.



The light to illuminate the DMD is provided by the dual lamp illumination system. The lamps employed are of type UHP and feature long lifetime with only small brightness decay.

The illumination optics has been designed for high uniformity.

A dimmer wheel in the light path allows adjusting the brightness between 35% and 100% of the lamp output.

The color wheel has 4 segments R, G, B, W and is air bearing for increased lifetime.

A color sensor measures the actual color location of the spectral components of the light. The result of the measurement triggers a correction algorithm to ensure constant brightness and color over time.

The DLP imager chipset features vivid and saturated colors. The micromirrors addressed on the DMD depend on the resolution of the system and always matches the number of pixels (XGA: 1024x768 pixels, SXGA: 1280x1024 pixels, SXGA+: 1400x1050 pixels). This approach results in square pixels.

(Using special electronics it is also possible addressing half the amount of micromirrors as related to the resolution. This is called wobulation and results in pixels with a diamond shape.)

The projection lens is a mini-zoom lens system which is equipped with adjustment screws for geometry adjustment. It has been especially developed for easy adjustment of the displayed picture while eliminating the need for adjusting the position of the projection unit.

The anti-glare screen provides high on-screen contrast and avoids direct reflections. The screens are carefully selected for gain and large half gain angles. The attachment of the screen to the mechanical structure is a patented proprietary development.

The color sensor and the optical dimmer are core components of Sense6, Barco's unique sensor technology that provides brightness and color stability over time and across the entire video wall.

4.3.2 Data processing

Video walls used in control room environments usually receive their data from a video wall controller. Every projection module is connected to one graphic channel and displays this data AS IS. In case up scaling or down-scaling is required this is done by the graphical controller.

The OV-D2 series feature built in scaling and cropping functionalities.

4.3.2.1 Scaling

Scaling is a feature which requires licensing! In case of a missing license file, the source is always displayed in orginal (native) resolution

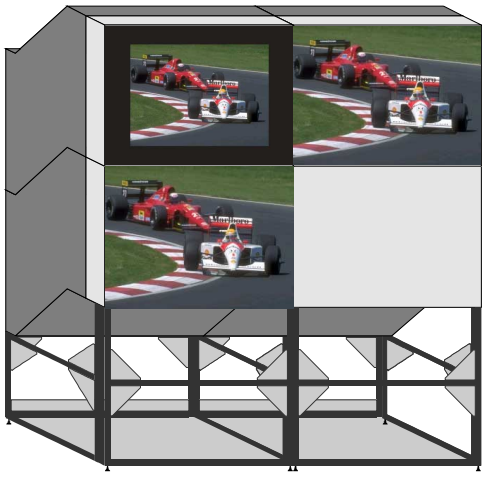
The display mode (scaling parameter) can be set to original, stretch to full screen, maintain aspect ratio.

Setting	Description
Original	show input resolution unscaled on center of display resolution
Maintain aspect ratio	show input resolution scaled to display resolution, but keep aspect ratio: scaling factor identical for horizontal and vertical pixels
Stretch to Full Screen	auto-scale input resolution to full display resolution: in case the aspect ratio of the source differs from the aspect ratio of the display, the scaling factors for horizontal pixels and vertical pixels are not identical:

The default setting is stretch to Full Screen. In case the license file is missing, the image is displayed in original resolution.

In case the aspect ratio of the source is equal the aspect ratio of the display, the settings "Stretch to full screen" and "Maintain aspect ratio" feature the same result.

Aspect ratio of source: 4:3
Aspect ratio of display: 4:3

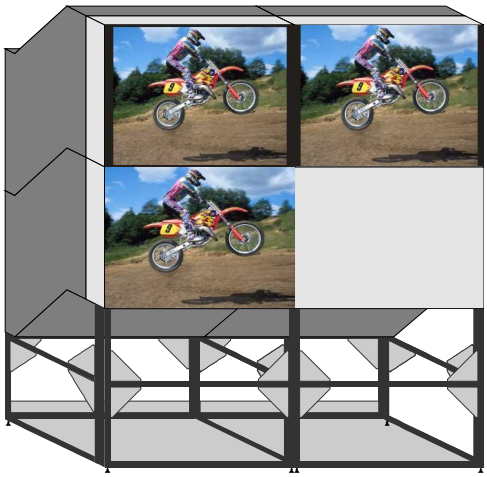


Top row, left module: Original (4 black borders)
Top row, right module: Maintain Aspect Ratio
Bottom row, left module: Stretch to full screen

Original:
Since the resolution of the display is greater than the resolution of the source, the image is displayed with black borders.

Maintain Aspect Ratio, Stretch to full screen:
Since the aspect ratio of the source is equal the aspect ratio of the display, these two settings have the same result: the pixel of the source are upscaled to match the display resolution; the scaling factor in horizontal and in vertical direction is the same, the aspect ratio is preserved.

Aspect ratio of source: 5:4
Aspect ratio of display: 4:3



Top row, left module: Original
Top row, right module: Maintain Aspect Ratio (
Bottom row, left module: Stretch to full screen

Original:
Since the resolution of the display is greater than the resolution of the source, the image is displayed with black borders.

Maintain Aspect Ratio:
the pixels of the source are upscaled until the pixels in one direction match the respective pixels of the display (in this case the vertical pixels). Since the aspect ratio of the source differs from the aspect ratio of the display, the upscaled image shows black borders on the left and on the right

Stretch to Full Screen:
the pixels of the source in horizontal direction are upscaled until they match the horizontal pixels of the display, those in vertical direction until they match the vertical pixels of the display. The horizontal and the vertical scaling factors are not identical, the source is displayed with distortion.

In case the aspect ratio of the source is equal the aspect ratio of the display, the settings "Stretch to full screen" and "Maintain aspect ratio" feature the same result.

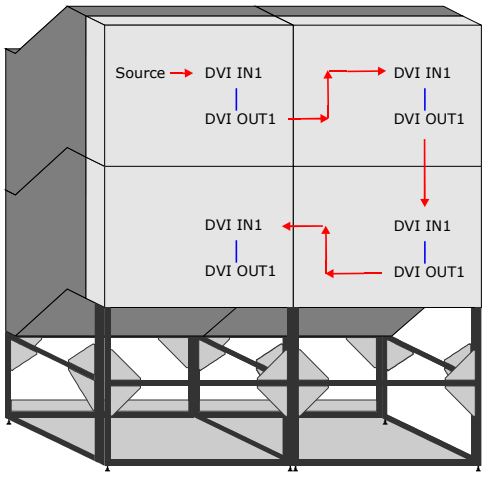
4.3.2.2 Loop-through and cropping

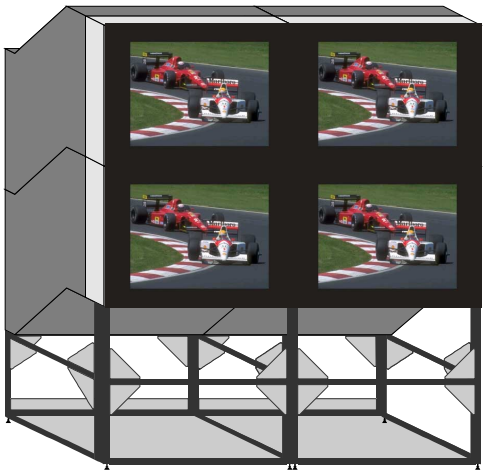
DVI IN1 has loop-through to DVI OUT1, DVI IN2 has loop-through to DVI OUT2.

A source connected to DVI IN of any projection module can be displayed on multiple modules. The DVI OUT of the previous module has to be connected to the DVI IN of the following module, see schematics.

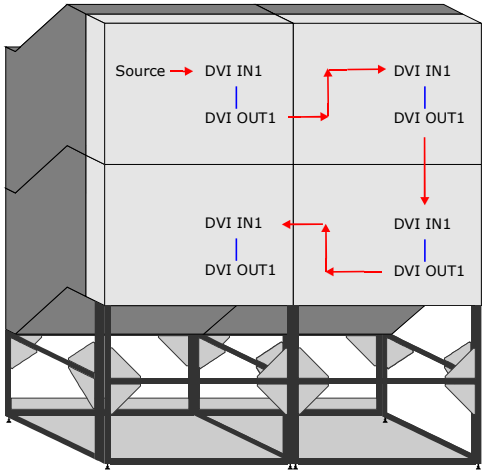
Auto mode

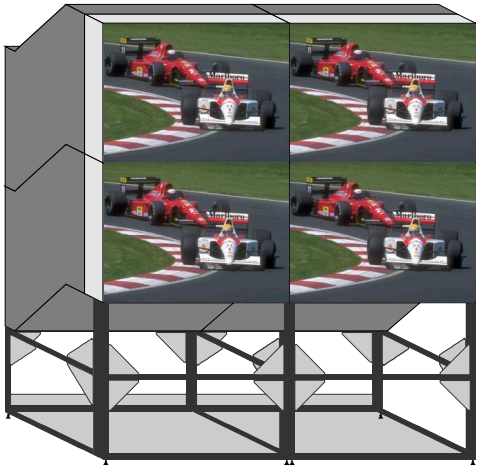
In **Auto** mode all projection modules display the entire source. The display mode can be **Original**, **Stretch to Full Screen**, or **Maintain Aspect Ratio** (in case the license file is missing, the source is displayed in original size)





Loop-through of a source, Auto mode, display mode set to Original





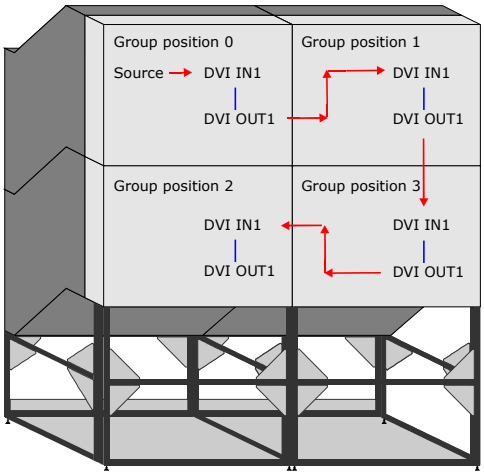
Loop through of a source, Auto mode, display mode set to Stretch to Full Screen

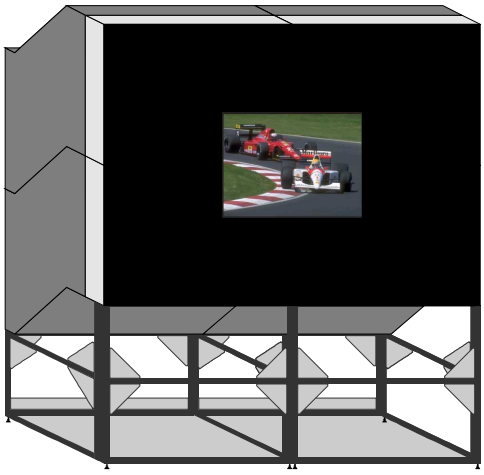
Custom

In Custom mode every projection module displays a part of the source. Which part of the pixels have to be displayed by which module is defined via the **Group Size** (the area the source has to be displayed) and the position of the projection module in this group.

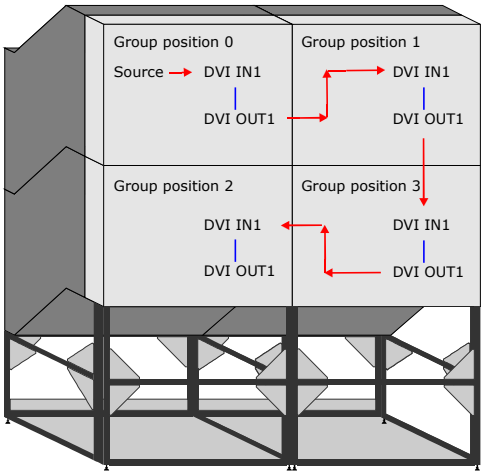
The position of the module within the group is independent from its order in the chain, i.e. the cabling!
The position numbering starts with zero at the left module on the top row, and is inccreased by one within the row. In the row belows the numbering continues from the previous row and also goes from left to right (seen from front)

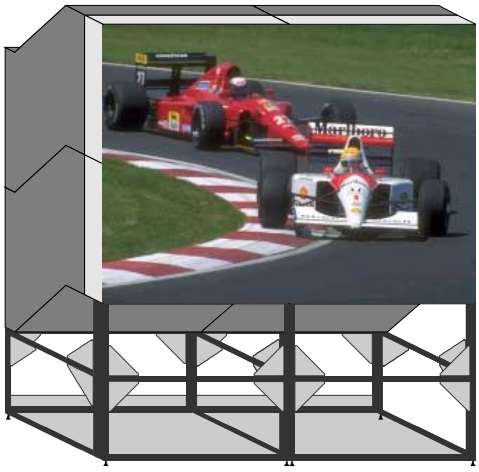
The display mode can be **Original**, **Stretch to Full Screen**, or **Maintain Aspect Ratio** (in case the license file is missing, the source is displayed in original size)





Loop through of a source, Custom mode with group size 2x2, display mode set to Original





Loop through of a source, Custom mode with group size 2x2, display mode set to Stretch to Full Screen

1x2 XGA

This setting is a special case of the Custom mode: the group size is 1x2, and the source connected to the DVI IN of one of the engaged projection modules has a dual XGA timing, i.e. 1024x1536 pixels.

This setting is only available for OV-D2 systems with XGA resolution and does not require a license file!

Summary

The two independent DVI IN interfaces with loop-through to DVI OUT combined with the scaling and cropping functionalities offer a variety of user scenarios to display a source. For tested configurations and timings, please see Input timings.

5 Sense6

Sense 6 is Barco's unique sensor technology which provides brightness and color stability over time and across the entire video wall.

The system actively measures in the background and compensates for any changes of color and brightness.

5.1 Theory

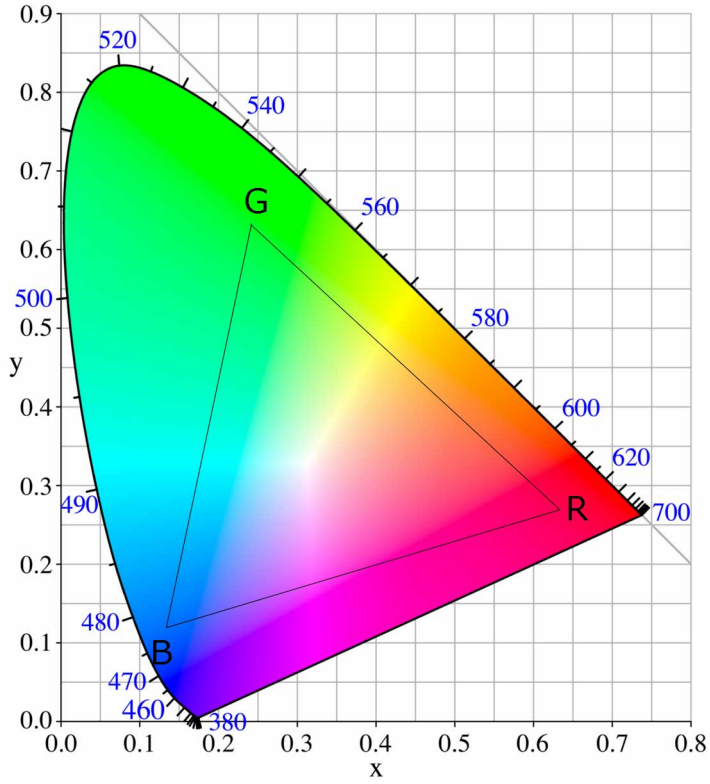
The concept of color can be divided into two parts: brightness and chromaticity.

In the CIE XYZ color space chromaticity of a color is specified by x and y.

The "horse shoe-shape" visualizes all colors.

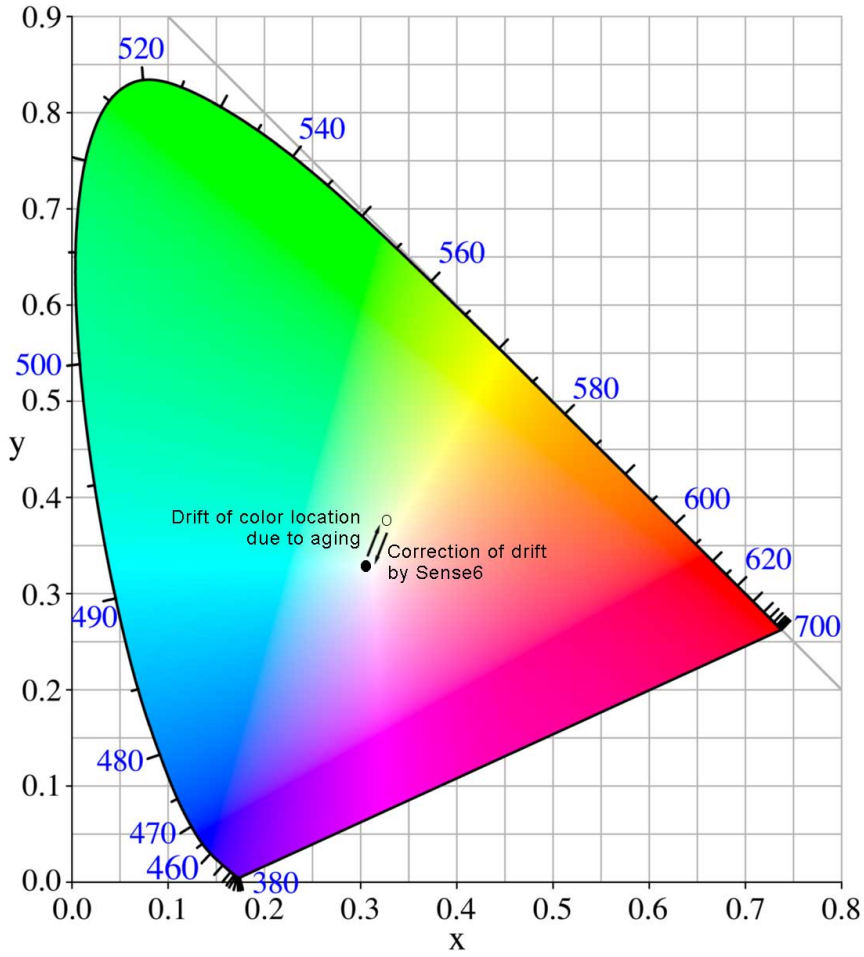
The range of colors that can be reproduced with a given color reproduction system lies within this horse-shoe shape.

Usually **Red**, **Green**, and **Blue** are selected colors placed at the corner (**R**, **G**, **B**). These colors are called primaries. The triangle is called the gamut and represents all the colors of the respective system .

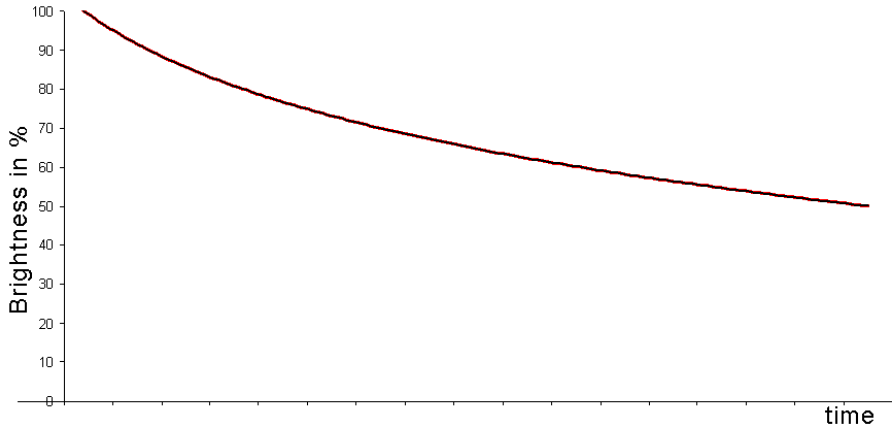


5.2 Principle of color locking and brightness locking

Due to aging effects the color location changes over time. To keep color constant, this drift has to be measured and compensated (color lock).



Also brightness decreases due to aging.

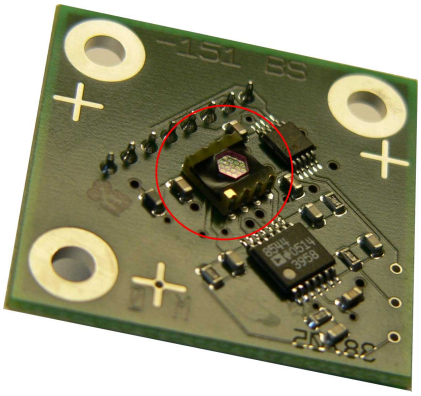


To keep brightness constant, the change in brightness has to be measured and compensated (brightness lock).

5.3 Color sensor

OV-D2 employs a color sensor which responsiveness comes close to the human eyes. It measures the light illuminating the DMD chip. The current values are used as input for a dynamic feedback loop which keeps the color location for white and the brightness for white constant.

The reliability of the sensor is the indispensable condition for providing brightness and color stability over time and across the entire display.



5.4 iLamp

The iLamp employs a chip to store all relevant lamp data like manufacturer, serial number, runtime, spectral information.

It is also used for recalibrating the sensor.

5.5 Color & Brightness Modes

Color and brightness uniformity is a big challenge for video walls. Due to tolerances, every projection system has its own brightness and color spectrum.

Barco's unique sensor technology compensates for the differences of individual projection systems and results in a video wall with a common brightness and color distribution constant over time.

A video wall can be operated in three different modes, **Uncalibrated**, **Brightness Locked**, **Sense6**.

5.5.1 Uncalibrated

Leaving production, all projection systems are uncalibrated and feature their individual brightness and color spectrum. The colors are defined by the optical components, by means of a dimmer the brightness can be set relative between 35% and 100%.

Within a video wall, it is not recommended to operate the projection systems with its native characteristics. However all correction algorithms for adjusting the systems to a common brightness and color targets are based on the uncalibrated properties.

Therefore when calibrating a video wall, it has to be set into the uncalibrated mode.

5.5.2 Brightness Locked

This operating mode features locked brightness and a static color correction. The color gamut is set to a fixed target which can be reached by every projection system in the video wall. Brightness is set to an absolute brightness value (this target has been determined and set taking into account all projection systems). The sensor is used to read the actual brightness Y, the control loop adjusts the dimmer accordingly to always reach this target.

5.5.3 Sense6

This operating mode requires a valid icense file!

Sense6 locks the projection systems of a video wall to a common brightness and color location constant over time and across the entire video wall.

By means of a sensor always the current brightness and the actual color location for white are calculated. An active feedback loop adjusts the current values of all projection systems to the target values of the video wall. Thus aging of lamps has no longer impact on the uniformity of a video wall.

6 Operating OV-D2

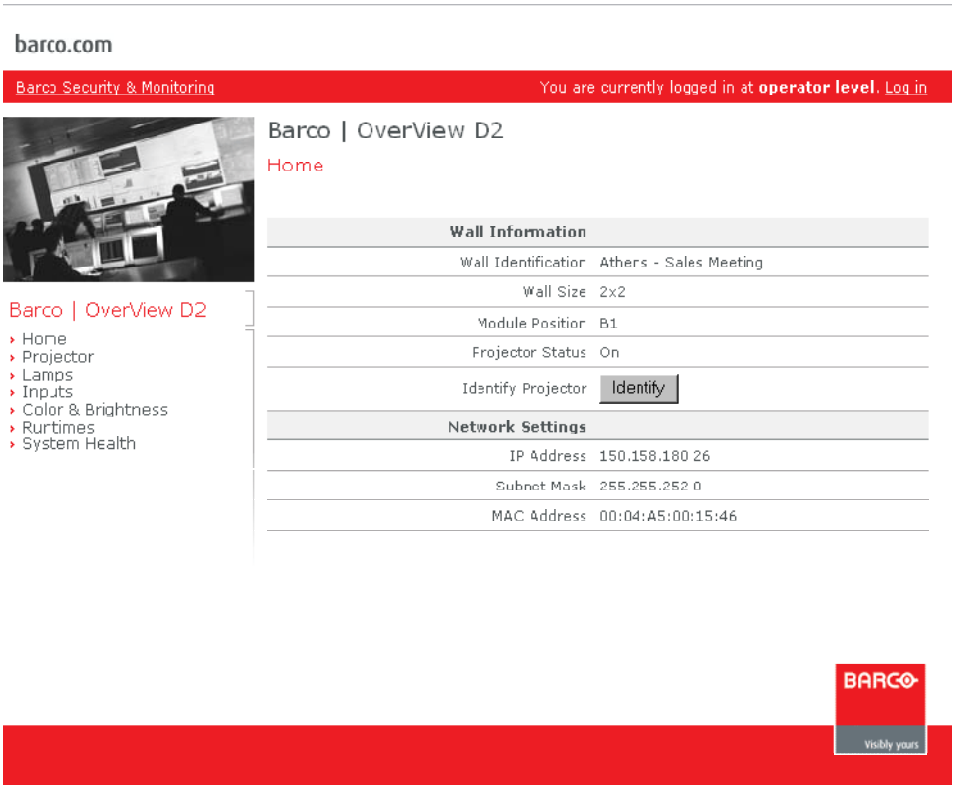
Projection modules of the OV-D2 series are controlled and operated via a Web interface and Barco Wall Control Manager software

6.1 Web interface

The projection modules have a LAN interface and leave production with a default IP address. During installation and setup of the video wall, every projection module gets its own unique IP address, and all projection modules of a video wall can be addressed using any web browser in the sub net.

The web interface mainly serves for configuring the individual projection modules.

The web interface is explained in the user's manual R59770139 OV-D2 Web Interface.



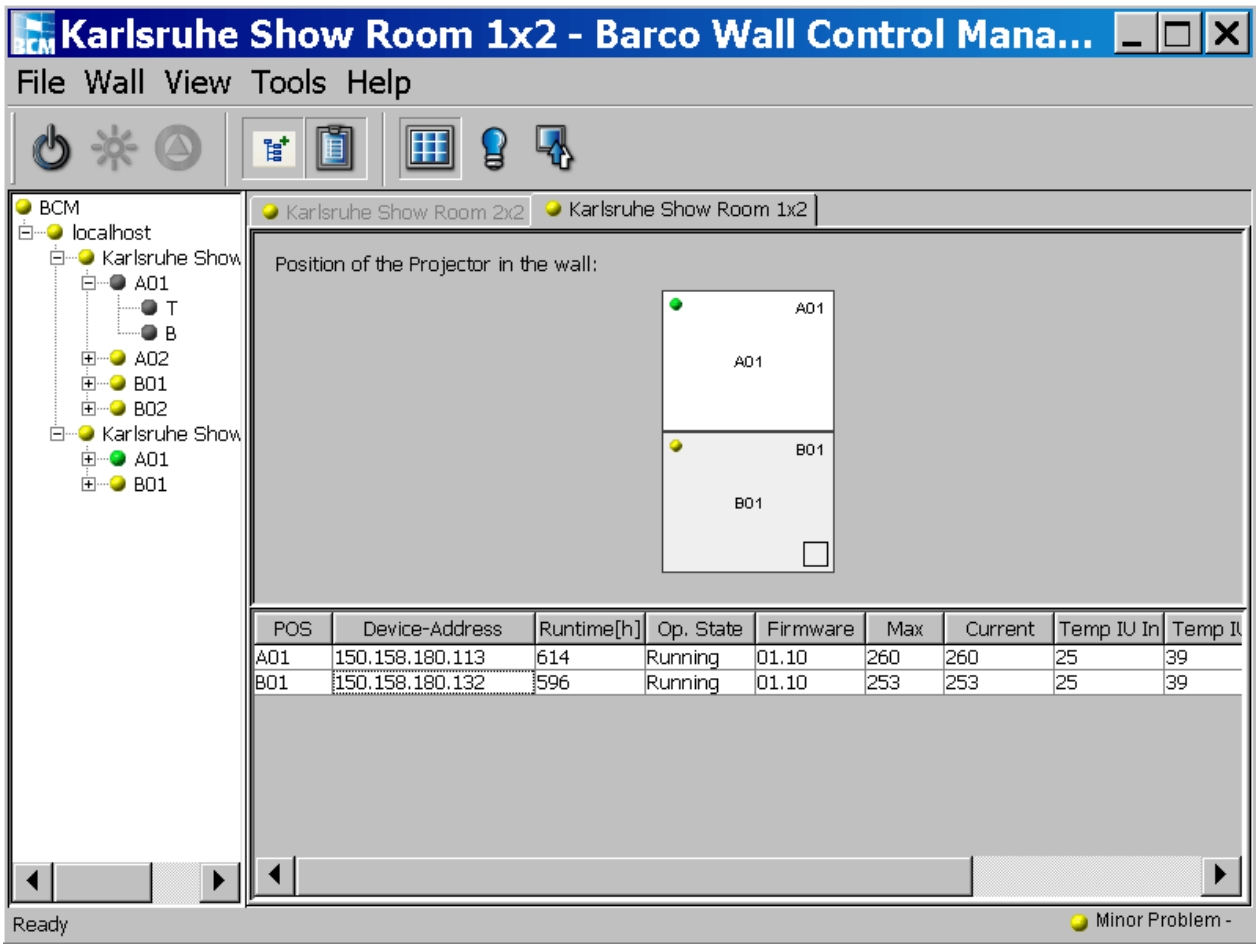
6.2 Barco Wall Control Manager Software

The Barco Wall Control Manager Software allows addressing all projection modules of a video wall at one time and thus sending commands which are processed simultaneously by the entire wall.

The Barco Wall Control Manager Software client application can be installed on any Windows XP workstation in the sub net. Sending commands however are reserved for authorized personnel only, the rich set of functions is only available after entering valid credentials.

The software provides a user interface shaped to the skills of the user.

Barco Wall Control Manager is explained in detail in the user's manual R5990102 Barco Wall Control Manager for OV-D2.


Karlsruhe Show Room 1x2 - Barco Wall Control Mana...
File Wall View Tools Help
BCM
localhost
Karlsruhe Show
A01
T
B
A02
B01
B02
Karlsruhe Show
A01
B01
Karlsruhe Show Room 2x2
Karlsruhe Show Room 1x2
Position of the Projector in the wall:
A01
A01
B01
B01
POS
Device-Address
Runtime[h]
Op. State
Firmware
Max
Current
Temp IU In
Temp IU
A01
150.158.180.113
614
Running
01.10
260
260
25
39
B01
150.158.180.132
596
Running
01.10
253
253
25
39
Ready
Minor Problem -

7 Maintenance

This chapter describes maintenance and servicing of projection modules of the OV-D2 series..

Only trained and authorized personnel shall access the rear side of a video wall!

Depending on the operation mode and the type of lamp the surface of the lamp doors is at high temperature (>70deg).

Never open the case of OV-D2 without first disconnecting the power supply cord! Measurements and tests with the opened device may be carried out only in the factory or by specially trained personnel, due to the dangers of electrical shock.

7.1 Cleaning the screens

Screens consist of single or double screen elements. Each screen element has a delicate optical screen surface structure dedicated to its functionality. The optical surface can easily be damaged if the screen is handled incorrectly. Only handle screens while wearing gloves with a soft texture (e. g. cotton gloves).

Avoid touching the rear beaded surface unnecessarily. It is easily damaged.

The screen is a high-precision optical component. It is made of plastic and is not scratch-proof. Only use a soft, damp cloth when cleaning.

If the screen is only slightly dusty or is showing particles, a vacuum cleaner with a soft bristle or a feather duster is recommended. Clean compresses air can be used, but it makes the screen statically charged, attracting airborne particles. The brushing direction should always be along the optical structures in the screen if existing.

If the dirt on the screen is heavier, possibly from fingerprints, soft lint-free cloth or paper towel can be used. If required the screen may be cleaned with lukewarm distilled water containing mild soap. Never apply cleaning solution directly onto the screen surface. Instead, add cleaning agent to the cloth or towel, then wipe the surface. It is important that the screen should be completely dry after treatment.

Never use cleaning agents with solvents as these may destroy the screen. Also, never rub hard or persistently on the screen in order to remove stains, as this will cause deformations in the surface which will appear as stains.

Don’t store screens at temperatures exceeding 40ºC (104ºF)

7.2 Replacing the filter pad

Replacement of a filter pad is restricted to trained and authorized personnel!

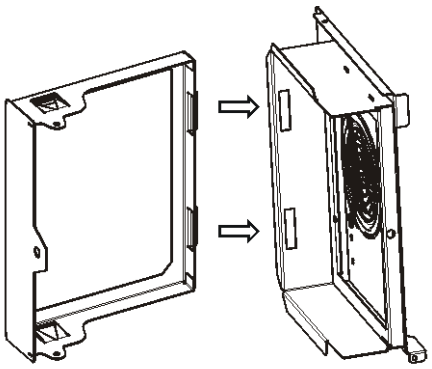
When replaceing the frame with the filter pad module take care about the lamp doors: they might be very hot (>70deg)!

The filter pad module has to be replaced in regular intervals (recommended: once a year). Since the projection unit has a sealed optics core where no air is entering even replacing the filter pad can be done without shutting down the projector. However it is recommended to replace the filter when the projector has been shut down, e.g. during the annual maintenance cycle.

With front access systems replacement is done from the front, with rear access systems from the rear side of a projection system. The procedure to replace a filter is the same.

The filter pad module is located next to illumination unit. You can see it when looking into the ventiduct (air shaft, see arrow). It is kept in place by means of a frame which is pushed into its position and then locked via a bolt (circled).

The connection between the frame of the filter pad module and the cover of the fan inside the illumination unit is not only provided by the bolt but also by a hinge: two "noses" of the frame are positioned into the respective recesses of the fan cover in the illumination unit.



frame filter pad module Fan cover

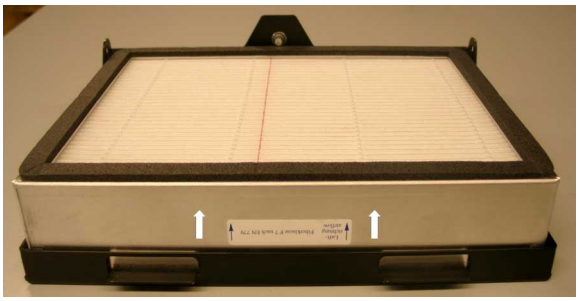
To change the filter pad, the entire frame housing the filter pad module is removed from the illumination unit.

To remove the filter pad module, proceed as follows:

- slightly press the entire frame with the filter pad module towards the illumination unit.
- Pull the bolt by simultaneously pivoting it left until the "noses" of the frame are outside the recesses of the fan cover of the illumination unit.
- Pull out the frame with the filter pad module.

Put the frame with the filter pad module on a desk with its planar side down (= the bolt showing to the ceiling)

On the long side opposite to the side with the bolt you can see a label indicating the direction of the air flow. Disconnect the filter pad module from the frame by pulling the filter pad module in the direction indicated by the air flow arrows.

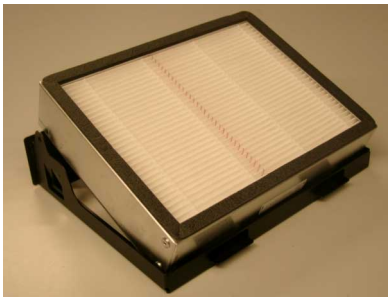


Take care not to push against a used filter pad: the trapped dust particles will be released.
The used filter pad has to be recycled according the local laws.

Take the fresh filter pad and put it onto the frame. The position is defined by the indicators of the air flow direction (pointing to the ceiling) and the position of this label (opposite to the bolt, see picture above).

Press the filter pad module into the frame until the complete unit has a flat surface

:



Insert the frame with the fresh filter pad into the illumination unit.

When pushing it back into its place apply a bit of force towards the left to allow the "noses" to slip into the respective recesses.

The frame with the filter pad module has reached its perfect position when the bolt closes properly.

7.3 Replacing a lamp module

Replacing lamp modules is restricted to trained and authorized personnel!

Depending on the operation mode the lamp door surfaces are very hot (>70degs). Wear protective gloves!

Before replacing a broken lamp it is recommended to try if it is really broken or if it has been shut down due to a voltage error.

Therefore first reset the error, either by means of the reset switch on the illumination unit or via the web interface of the OV-D2, cf. user manual OV-D2Web Interface.

In **hot standby** mode, after resetting the error, the lamp is ignited. If ignition is successful and the lamp has been switched on, the lift can be moved again. If ignition is a failure, the lamp error is set again and the lift remains locked.

In **cold standby** mode, since the replaced lamp is the inactive lamp, after resetting the error, there is no lamp check, and the lamp remains switched off. The lift can be moved again. If then the system changes the active lamp by means of the lift, the new lamp is tried to be lighted. If this is not possible, the error flag is set again, and within about 5 seconds, the projector switches back to the lamp which has been the active one. Then the lift is locked again.

During operation, when opening a lamp door for replacing a lamp, your hands are exposed to UV radiation.

During typical maintenance work (5-10min) this does not harm.

For heat protection and to avoid finger prints we recommend to wear protective gloves. These gloves will also shield your hands from UV radiation.

OV-D2 has been designed as a dual lamp system for max. availability of the video wall. When a lamp is known to be broken it is recommended to replace it in order to maintain redundancy.

In case there is no new lamp available do not remove the broken lamp. For cooling purposes it is preferable to have both lamp housings equipped with lamps.

To replace a broken lamp, proceed as follows:

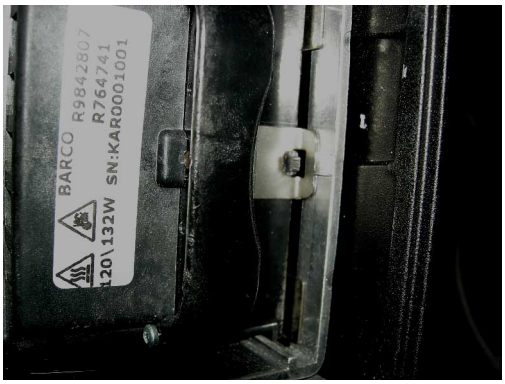
The lamp module and especially the metal spring get very hot during operation. If a lamp fails, wait at least 10-20 minutes for cooling down..

If the projector is running, the active lamp will heat the broken lamp module. We strongly recommend wearing protective gloves in order not to burn your fingers!

Use a small coin (e.g. 2 Eurocent) to open the lamp door.

The lamp door must not be open for more than 15 minutes.

The lamp is fixed and kept in position by a metal spring. Take the lamp by its handle and press the metal spring inside and to the left to release the lamp module.



The metal spring might be very hot!

Carefully draw it back. It first will need more effort until the lamp connectors are disconnected from their plugs.

Note that there may be laws concerning disposal and recycling of burnt-out lamps in your country! Please contact your local authorities to get further information!

Take a new lamp module by its handle and push it into the lamp housing. Carefully but steadily push it back until the connectors click into their plugs (audible noise).

Make sure that the metal spring is in its correct position!

If you accidentally made any fingerprints on the glass top of the reflector, clean the glass top with alcohol before inserting the lamp module!

Carefully check the lamp module: in case there are any small remains of the polystyrene, take a paintbrush and remove them!

8 Technical data

8.1 Illumination Unit 120W

characteristic	specification
Lamp	2x120 Watt UHP™ lamp, nominal lifetime 2x10000 hours
AC power supply	100-240 V
Mains frequency	60/50 Hz
Power consumption hot standby	<390 W
Power consumption cold standby	<250 W

8.2 Illumination Unit 132W

characteristic	specification
Lamp	2x132 Watt UHP™ lamp, nominal lifetime 2x6000 hours
AC power supply	100-240 V
Mains frequency	60/50 Hz
Power consumption hot standby	<430 W
Power consumption cold standby	<275 W

8.3 Projection Unit XGA

characteristic	specification
Resolution	XGA resolution (1024×768 pixels)
Colors	16.7 millions
Brightness uniformity	> 95% (ANSI 13), >97% (ANSI 9)
Luminous flux @ 6500K	875 lm
Contrast	1600:1

8.4 Projection Unit SXGA/SXGA+

characteristic	specification
Resolution	SXGA+ resolution (1400×1050 pixels)
Colors	16.7 millions
Brightness uniformity	> 95% (ANSI 13), >97% (ANSI 9)
Luminous flux @ 6500K (SXGA)	857 lumens
Luminous flux @ 6500K (SXGA+)	1000 lumens
Contrast	1700:1

8.5 Screens

Screen	Gain	Horizontal half gain angle	Vertical half gain angle
HVA screen (50", 70", 80")	1	35°	35°
HVM screen (50", 70") (cross prism)	1.9	35°	27°
HVX screen (50", 70") (single prism)	4.7	35°	10°
HVA II screen (80")	1.7	35°	35°

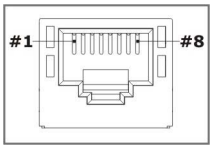
8.6 Operating conditions

characteristic	specification
Humidity	Up to 80%, non-condensing*)
Temperature	0-40°C | 32°F – 105°F*)
	*) for OV-D2 series with stitched screens temperature range and humidity depending on the overall configuration

8.7 Interfaces

8.7.1 Communication

1xRJ45 connector



Pin	Signal Assignment	Pin	Signal Assignment
1	TD+	5	-
2	TD-	6	RD-
3	RD+	7	-
4	-	8	-

8.7.2 Data

2xDVI IN with loop-through to DVI OUT

Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS Data 2-	**13**	**-**
2	TMDS Data 2+	**14**	-
3	TMDS Data 2 Shield	**15**	Ground (+5, Analog /V Sync)
4	**-**	**16**	-
5	**-**	**17**	TMDS Data 0-
6	**DDC Clock**	**18**	TMDS Data 0+
7	DDC Data	**19**	TMDS Data 0 Shield
8	**-**	**20**	-
9	TMDS Data 1-	**21**	-
10	TMDS Data 1+	**22**	TMDS Clock Shield
11	TMDS Data 1 Shield	**23**	TMDS Clock +
12	-	**24**	TMDS Clock -

8.8 Input timings

All input frame rates from 40Hz to 62Hz (for all resolutions) and up to 75Hz (for resolutions up to SXGA+) are supported. For timings from 49Hz to 61Hz also Genlock is supported, frame rate conversion for timings outside this frequency range. The max. pixelclock is 165 MHz.

The following table lists the tested configurations and timings of OV-D2, firmware 1.1 build 73 and higher.

Input resolution	VGA			SVGA			XGA			HD 720P			SXGA			SXGA+			UXGA			HD 1080P			dual XGA
active pixels	640x480			800x600			1024x768			720x1280			1280x1024			1400x1050			1600x1200			1920x1080			DMT2060
quantum data timing name	SMT0660			DMT0860			DTM1060			720P60			DMT1260G			CVT1460			DMT1660			1080P60			1024x1536
shown in web interface as	VGA			SVGA			XGA			720p			SXGA			SXGA+			UXGA			1080p			1x2 XGA
Genlock in 50Hz-60Hz range	yes			yes			yes			yes			yes			yes			yes			yes			yes
OV-D2	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA	SXGA	SXGA+	XGA
Mode and group size																									
auto	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 1x1 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 1x1 original	ok	ok	ok	ok	ok	ok	ok	ok	ok	-	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 1x1 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	-	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	-
custom 2x1 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 2x1 original	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 2x1 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	-	ok	ok	-	-	ok	-	-	-	-	-	-	-
custom 1x2 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 1x2 original	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 1x2 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	-	ok	ok	-	ok	ok	-	-	ok	-	-	-	-	-	-	ok
custom 2x2 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 2x2 original	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 2x2 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 3x2 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 3x2 original	*)	*)	*)	*)	*)	*)	*)	*)	*)	ok	*)	*)	ok	*)	*)	ok	ok	*)	ok	ok	ok	ok	ok	ok	*)
custom 3x2 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	*)
custom 2x3 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 2x3 original	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	ok	*)	*)	ok	ok	*)	ok	ok	ok	ok	ok	ok	ok
custom 2x3 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 3x3 stretch	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
custom 3x3 original	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	*)	ok	*)	*)	ok	ok	*)	ok	ok	ok	ok	ok	ok	*)
custom 3x3 aspect	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok

*) ok after manual reset
-: not supported

stretch: auto-scale input resolution to full display resolution
original: show input resolution unscaled on center of display resolution
aspect: show input resolution scaled to display resolution, but keep aspect ratio
auto: = stretch in case scaling license present, = original in case scaling license is not present

8.9 Projection modules

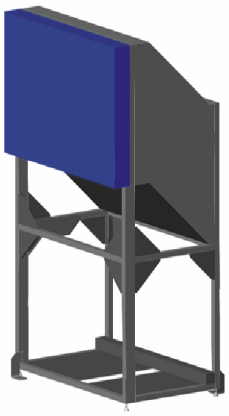
OV-D2 is available XGA, SXGA and SXGA+ resolution. The name of the versions indicates the screen size and the resolution.

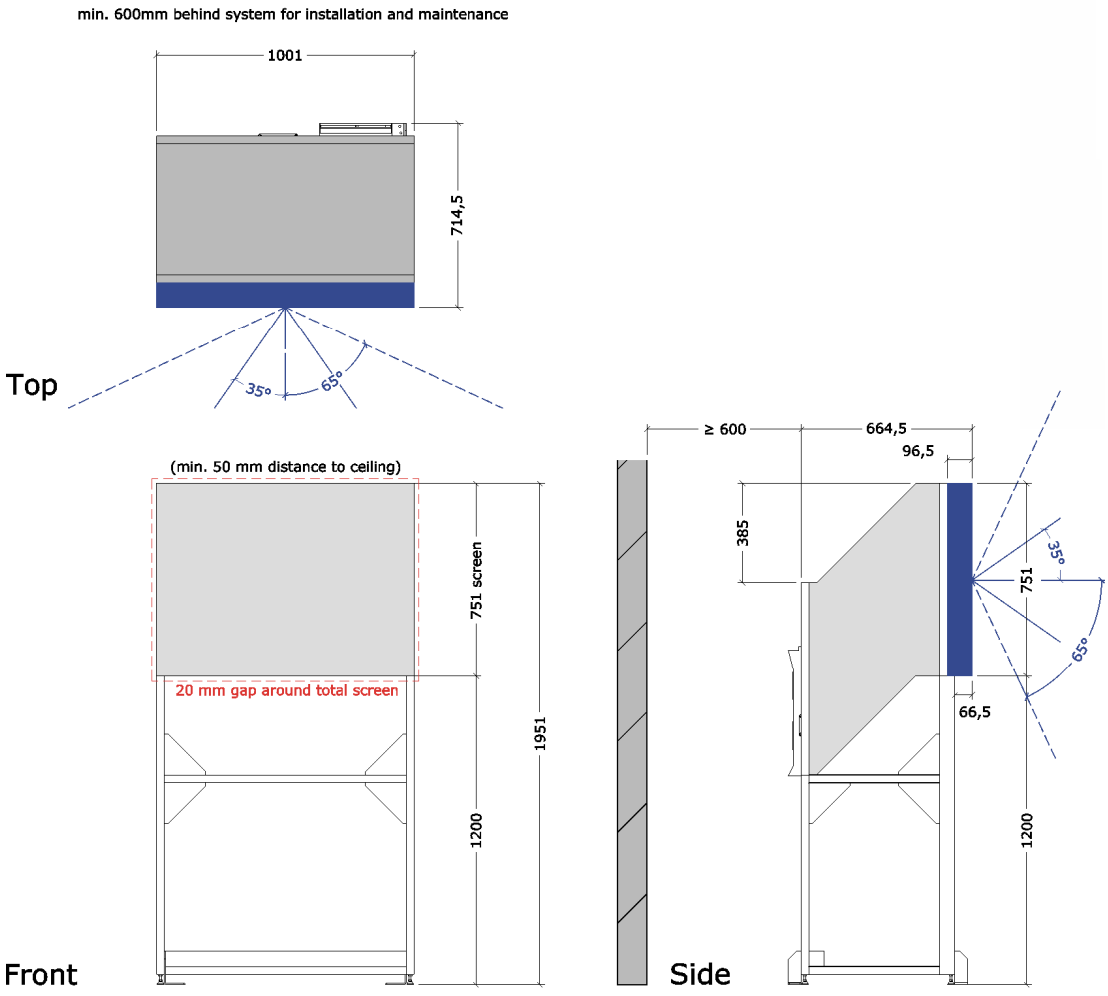
8.9.1 OV-508, OV-515

OV-508 is a projection module with a screen diagonal of 50" and XGA resolution (1024x768 pixels).
OV-515 is a projection module with a screen diagonal of 50" and SXGA+ resolution (1400x1050 pixels).

Since both resolutions have an aspect ration of 4:3, the two systems are built by the same mechanical components. The dimensions are included in the drawing below.

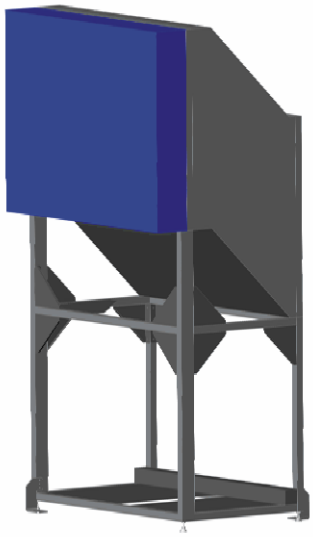
The projection modules are available with standard supports in 875mm, 1000mm, 1200mm in height and can be combined straight or curved. Standard angles for curved setup are 3°, 5°, 8°.





8.9.2 OV-513

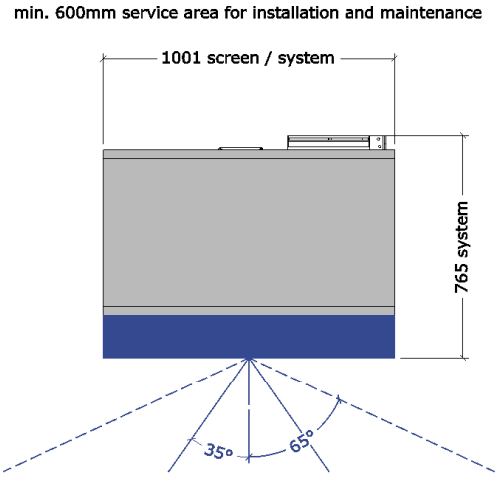
OV-513is a projection module with a screen diagonal of 50" and SXGA resolution (1240x1024 pixels).



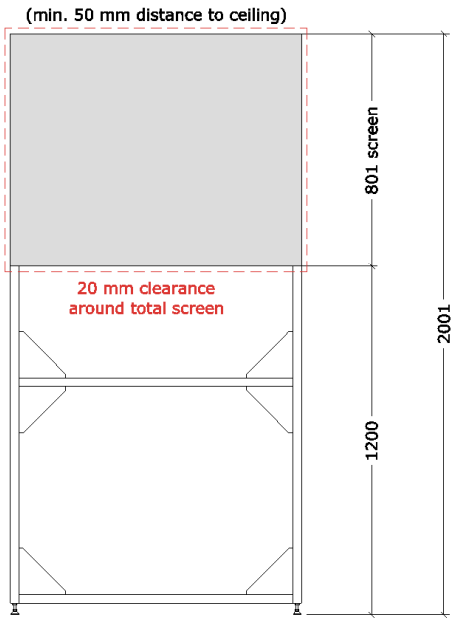
The aspect ratio is 5:4. The dimensions of the mechanics are included in the drawing below.

The projection modules are available with standard supports in 875mm, 1000mm, 1200mm in height and can be combined straight or curved. Standard angles for curved setup are 3°, 5°, 8°.

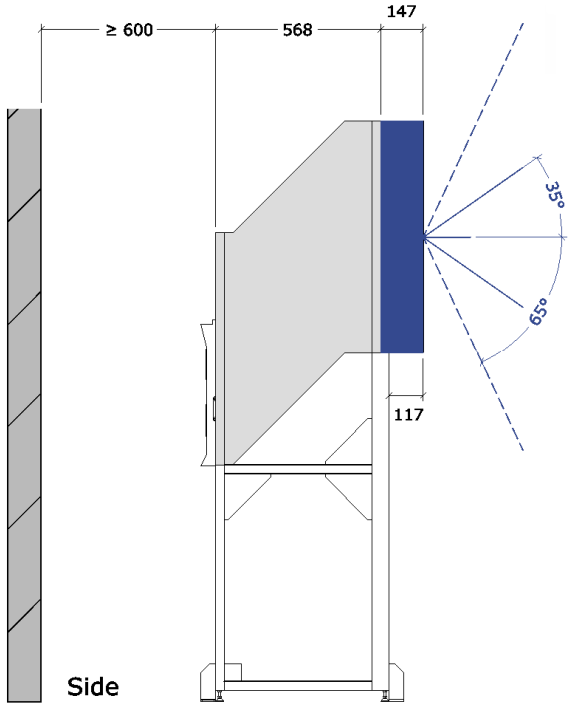
Top



Front



Side

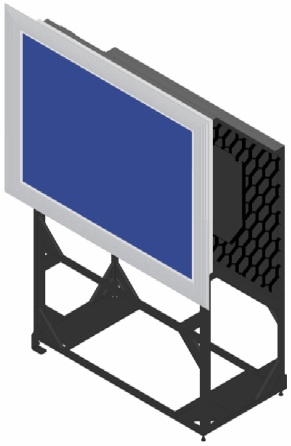


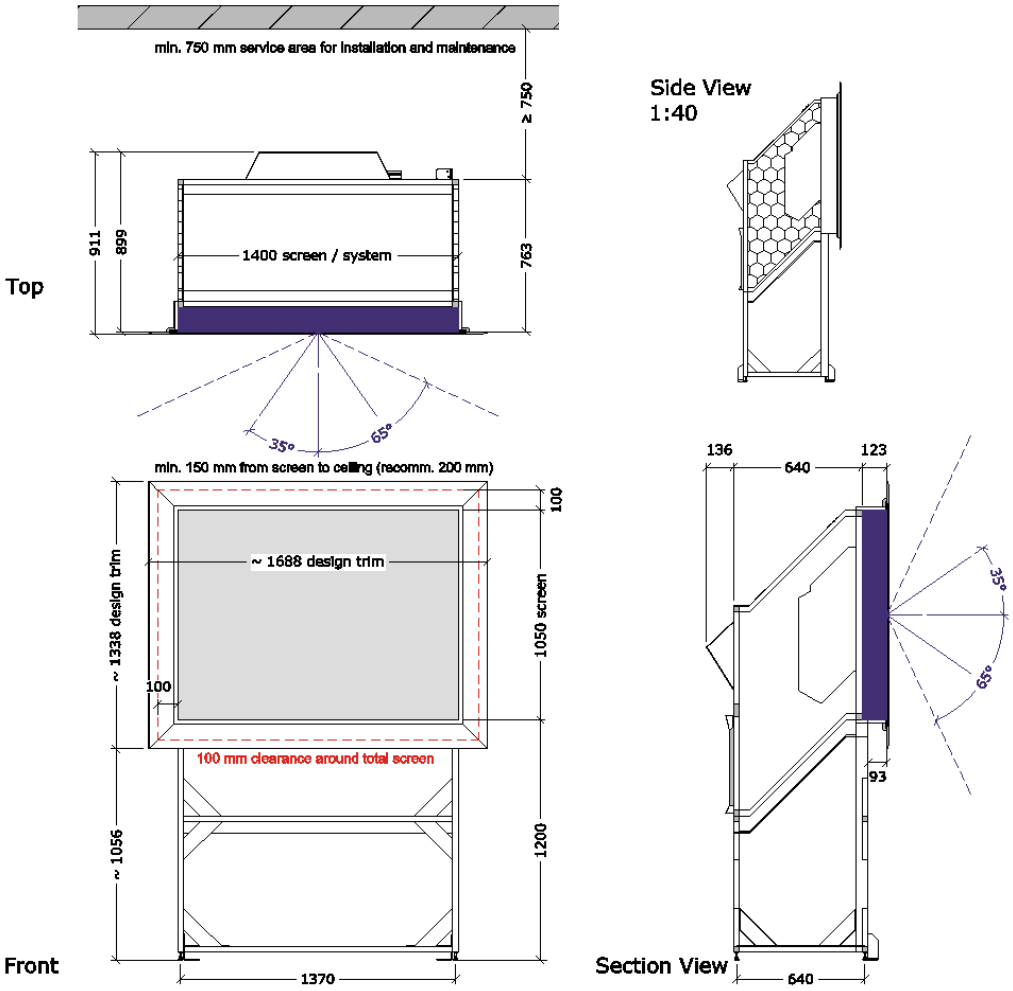
8.9.3 OV-708, OV-715

OV-708 is a projection module with a screen diagonal of 70" and XGA resolution (1024x768 pixels).
OV-715 is a projection module with a screen diagonal of 70" and SXGA+ resolution (1400x1050 pixels).

Since both resolutions have an aspect ration of 4:3, the two systems are built by the same mechanical components. The dimensions are included in the drawing below.

The projection modules are available with standard supports in 875mm, 1000mm, 1200mm in height and can be combined straight or curved. Standard angles for curved setup are 3°, 5°, 8°.



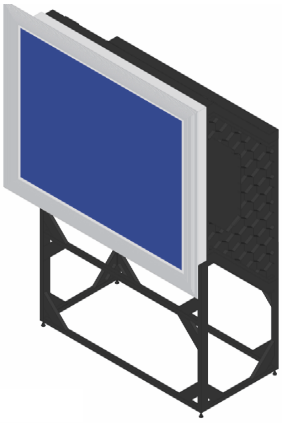


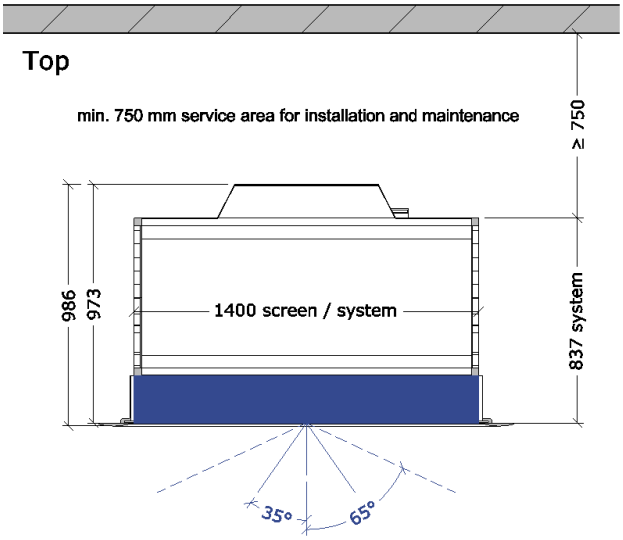
8.9.4 OV-713

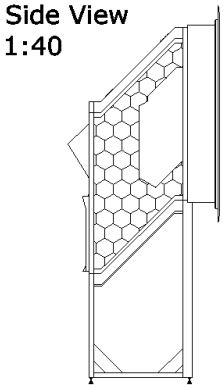
OV-713is a projection module with a screen diagonal of 70" and SXGA resolution (1240x1024 pixels).

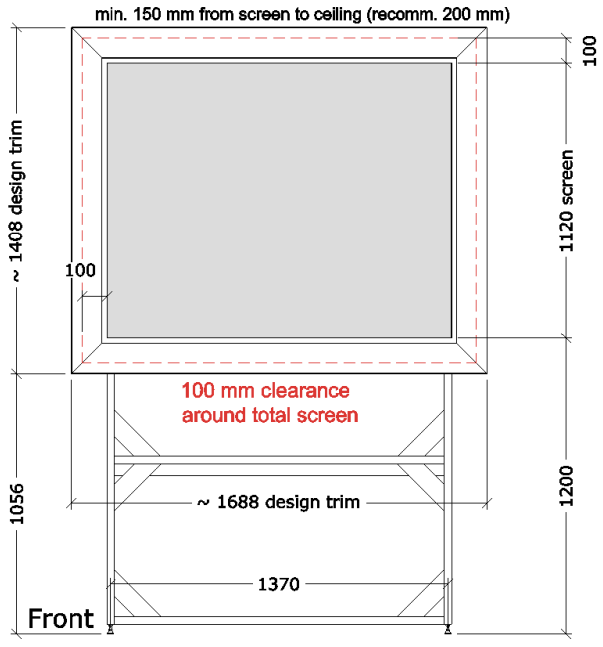
The aspect ratio is 5:4. The dimensions of the mechanics are included in the drawing below.

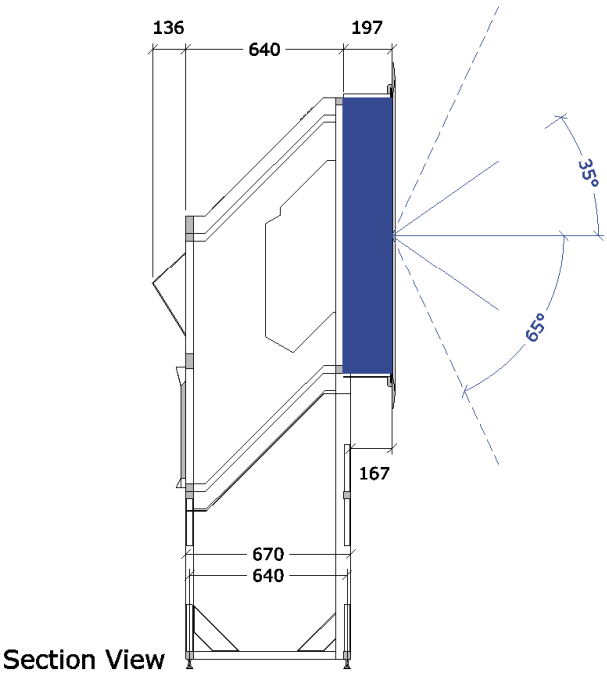
The projection modules are available with standard supports in 875mm, 1000mm, 1200mm in height and can be combined straight or curved. Standard angles for curved setup are 3°, 5°, 8°.











8.10 Scope of delivery

Article number	Description	Comment
50" Systems		
R9842980	OV-508	Projection module 50", XGA
R9842981	OV-515	Projection module 50", SXGA+
R9842982	OV-513	Projection module 50", SXGA
CGP-HVA-50	OV D 50": HVA Screen	Option: HVA screen for 50", ordered per cube
CGP-HVM-50	OV D 50": HVM Screen	Option: HVM screen for 50", ordered per cube
CGP-HVX-50	OV D 50": HVX Screen	Option: HXM screen for 50", ordered per cube
CGP-SMLSCR-50	OV D 50": HVA ZeroGap Screen	Option: Seamless screen for 50" 4:3 (XGA, SXGA+) only, ordered per cube
CGP-SUP0-5D2	OV D2 50": Support min	Option: no support, feet only, lower screen edge at 455mm, ordered per column
CGP-SUP875-5D2	OV D2 50": Support 875mm	Option: support 875mm, ordered per column
CGP-SUP1000-5D2	OV D2 50": Support 1000mm	Option: support 1000mm, ordered per column
CGP-SUP1200-5D2	OV D2 50": Support 1200mm	Option: support 1200mm, ordered per column
CGP-CUR0-5D2	OV D2 50": Linear Setup	Option: linear setup, ordered per cube
CGP-CUR3-5D2	OV D2 50": Curved Setup 3deg	Option: curved setup 3°, ordered per cube
CGP-CUR5-5D2	OV D2 50": Curved Setup 5deg	Option: curved setup 5°, ordered per cube
CGP-CUR8-5D2	OV D2 50": Curved setup 8deg	Option: curved setup 8°, ordered per cube
CGP-IU132-OVD2	OV D2: Illumination Unit 132W	Option: Illumination unit 132W, ordered per cube
CGP-IU120-OVD2	OV D2: Illumination Unit 120W	Option: Illumination unit 120W, ordered per cube
70" Systems		
R9842901	OV-708	Projection module 70", XGA
R9842903	OV-715	Projection module 70", SXGA+
R9842902	OV-713	Projection module 70", SXGA
CGP-HVA-70	OV D 70": HVA Screen	Option: HVA screen for 70", ordered per cube
CGP-HVM-70	OV D 70": HVM Screen	Option: HVM screen for 70",ordered per cube
CGP-HVX-70	OV D 70": HVX Screen	Option: HVX screen for 70",ordered per cube
CGP-SUP0-7D2	OV D2 70": Support min	Option: no support, feet only, lower screen edge at 550mm, ordered per column
CGP-SUP875-7D2	OV D2 70": Support 875mm	Option: support 875mm, ordered per column
CGP-SUP1000-7D2	OV D2 70": Support 1000mm	Option: support 1000mm, ordered per column
CGP-SUP1200-7D2	OV D2 70": Support 1200mm	Option: support 1200mm, ordered per column
CGP-CUR0-7D2	OV D2 70": Linear Setup	Option: linear setup, ordered per cube
CGP-CUR3-7D2	OV D2 70": Curved Setup 3deg	Option: curved setup 3°, ordered per cube
CGP-CUR5-7D2	OV D2 70": Curved Setup 5deg	Option: curved setup 5°, ordered per cube
CGP-CUR8-7D2	OV D2 70": Curved Setup 8deg	Option: curved setup 8°, ordered per cube
CGP-IU132-OVD2	OV D2: Illumination Unit 132W	Option: Illumination unit 132W, ordered per cube
CGP-IU120-OVD2	OV D2: Illumination Unit 120W	Option: Illumination unit 120W, ordered per cube

Article number	Description	Comment
80" Systems		
R9842906	OV-808	Projection module 80", XGA
R9842907	OV-815	Projection module 80", SXGA+
CGP-HVA-80	OV D 80": HVA Screen	Option: HVA screen for 80", ordered per cube
CGP-HVAII-80	OV D 80": HVAII Screen	Option: HVAII screen for 80", ordered per cube
CGP-SUP0-8D2	OV D2 80": Support min	Option: no support, feet only, lower screen edge at 550mm, ordered per column
CGP-SUP875-8D2	OV D2 80": Support 875mm	Option: support 875mm, ordered per column
CGP-SUP1000-8D2	OV D2 80": Support 1000mm	Option: support 1000mm, ordered per column
CGP-SUP1200-8D2	OV D2 80": Support 1200mm	Option: support 1200mm, ordered per column
CGP-CUR0-8D2	OV D2 80": Linear Setup	Option: linear setup, ordered per cube
CGP-CUR3-8D2	OV D2 80": Curved Setup 3deg	Option: curved setup 3°, ordered per cube
CGP-CUR5-8D2	OV D2 80": Curved Setup 5deg	Option: curved setup 5°, ordered per cube
CGP-CUR8-8D2	OV D2 80": Curved Setup 8deg	Option: curved setup 8°, ordered per cube
CGP-IU132-OVD2	OV D2: Illumination Unit 132W	Option: Illumination unit 132W, ordered per cube
CGP-IU120-OVD2	OV D2: Illumination Unit 120W	Option: Illumination unit 120W, ordered per cube
Software		
R9842796	OV D2: SW Lic Sense6	Brightness & Color Locking
R9842797	OV D2: SW Lic Scaling	Scaling/Cropping/Loop-Through
Consumables		
R9842807	OV D2: Lamp module 120W/132W	Lamp module 120W/132W
R9842800	OV: Filter pad	Filter pad
Recommended spare parts		
R9842803	OV D2: Projection Unit XGA	Projection unit XGA
R9842804	OV D2: Projection Unit SXGA/SXGA+	Projection unit SXGA/SXGA+
R9842805	OV D2: Illumination Unit 120W/132W	Illumination unit 120W/132W
R9842809	OV D2: Spare Color Wheel	Spare part for all OV-D2 models

9 Troubleshooting

9.1 LCD indications

The small LC display on the illumination unit informs about the status of the system. It shows messages in two rows. The message on top row informs about the projector status and related lamp settings, the bottom row shows the IP address, or an error message or status messages during firmware upgrade.

The following list shows the possible messages of the top row:

Message	Explanation
BOOTING	The projector is booting.
STANDBY	The projector is in standby.
STARTING	The projector is starting.
ON top cold	The projector is on, the active lamp is the top lamp, and lamp operating mode is cold standby.
On bottom cold	The projector is on, the active lamp is the bottom lamp, and lamp operating mode is cold standby
ON top hot	The projector is on, the active lamp is the top lamp, and lamp operating mode is hot standby.
On bottom hot	The projector is on, the active lamp is the bottom lamp, and lamp operating mode is hot standby.
STOPPING	The projector is switched form on to standby.
FMW UPGRADE	On the projector a firmware upgrade is performed.

These are the messages of the bottom row:

Message	Explanation	How to clear the message
xxx.xxx.xxx.xxxs	IP Address, the last digit **s** indicates that it is a static IP address. This message is continuously displayed until an error or a firmware upgrade takes place.	Press the on/res switch for 4-8sec to toggles between IP address and error messages
xxx.xxx.xxx.xxxd	IP Address, the last digit **d** indicates that it is a dynamic IP address. This message is continuously displayed until an error or a firmware upgrade takes place.	Press the on/res switch for 4-8sec to toggles between IP address and error messages
no error	This message is shown if the on/reset switch is pressed for 4-8 sec and no error is present or all errors have disappeared.	Press the on/res switch for 4-8sec to toggle between IP address and error messages
top lamp err	This message is shown when a lamp error on the top lamp has occurred.	Press the on/res switch >10 sec. or reset the error via the web interface
bottom lamp err	This message is shown when a lamp error on the bottom lamp has occurred.	Press the on/res switch > 10 sec. or reset the error via the web interface
fan err	This message is shown when one of the fans work below their minimum rotation.	This error cannot be reset manually. The system polls for the error, if it no longer exists, the message will be cleared.

Message	Explanation	How to clear the message
temperature err	This message is shown when a temperature error has occurred.	This error cannot be reset manually. The system polls for the error, if it no longer exists, the message will be cleared.
lamp door open	This message is shown when one or two of the lamp doors are open.	Press the on/res switch >10 sec or close the door.
IU-PU comm err	This message is shown when there is a communication error between the illumination unit and the projection unit.	Reboot the projector. This will – hopefully – solve the problem.
multiple err	This message is shown when multiple errors occurred.	This error cannot be reset manually. The system polls for the error, if the error no longer exists, the message will be cleared.
FMW UPGRADE OK	This message is shown after a successful firmware update.	After a successful firmware upgrade, the projector reboots. This will clear the message.
FMW UPGRADE ERR	This message is shown when during firmware upgrade an error occurs.	This message will be overwritten by the next attempt to upgrade firmware.

9.2 Inhibit times

During operating OV-D2 there are several situations when some actions cannot be performed due to internal system constraints. For example when switching a lamp off it cannot be immediately switched on again: first the cooling cycle has to be completed

The following table lists the action which involve an inhibit time.

In case the system does not react, please check e.g. on the LC display if one of the below mentioned situations have occurred.

Action	Effect on	Waiting time
Switching on lamp	switching off lamp	None. The lamp will be immediately switched off upon receiving the switching off command. In case of an internal data saving there will be a delay of approx. 15 seconds.
	Optimize coupling	To optimize coupling the lamp has to burn in a stable condition. Therefore after switching the lamp on, you have to wait for 2 minutes until the optimize coupling procedure can be performed.
	Sense6	The sensor measurements starts after 2 minutes (= when the lamp burns in a stable condition). However the control loop and thus brightness and color adjustment starts only 5 minutes after switching on the lamp.
Change of active lamp	Change back of active lamp in cold standby	In cold standby the backup lamp is off. Therefore when switching the active lamp, the other lamp is cooling down which takes about 2 minutes. When the cooling cycle has been completed, the lamp can be changed back again to become the active lamp.
	Change back of active lamp in hot standby	In hot standby the backup lamp is on. Thus only the time for lift cooling is needed before another changing of the active lamp is possible. This is approx. 20 seconds.
Opening lamp door	Lamp state	For security reasons, when opening a lamp door the corresponding lamp is switched off by hardware circuits. When you open the lamp door of the active lamp, the lamp is switched off and its cooling cycle starts. This cycle lasts 2 minutes. If you open the lamp door of the backup lamp in hot standby, the behavior is the same. If you open the lamp door of the backup lamp in cold standby, nothing happens (please mind that you are exposed to UV radiation!)
Switching off lamp	Lamp switching on again	After switching off the lamp the cooling cycle starts. This lasts 2 minutes. Only after the cooling cycle has been completed the lamp can be switched on again.
Overtemperature error		In case the overtemperature error persists 5 minutes, the projector will switch to standby. The system continuously polls for the error. If it does not longer exist, the error bit is reset, and the projector stays on. Please note: Overtemperature errors only occur if overtemperature protection has not been disabled! To protect your system, make sure that overtemperture protection is enabled! (Go to the home page of the system, log in as service, navigate to Projector and check/adjust the setting)

Action	Effect on	Waiting time
Fan error	Operating state of the projector	A fan error can be caused by the main fan of the illumination unit or by the two fans cooling the lamps. A fan error occurs of at least one of the fans has too low rotations. The system continuously checks the rotations and automatically resets the error if the speed has increased again. In case the error is caused by the main fan of the illumination unit, and it persists more than 5 minutes, the projector switches to standby. In case it is caused by one of the lamp fans, and persists more than 5 minutes, a lamp error is triggered, and the lamp is switched off. Thus in case of hot standby, and in case of a fan error of both lamp fans, the projector switches to standby.

9.3 Switches

The switches of the illumination unit serve multiple purposes.

Please see the table below about the actions triggered by pressing the respective switch. Please note that the action depends on how long the switch is pressed.

Switch	Action	Push time	Function
Active Lamp Selection Switch	Up		Top lamp becomes active, lift is going down
	Down		Bottom lamp becomes active, lift is going up
On/res switch	Up	0-3 sec	The projector is switched on (from Standby)
	Up	4-8 sec	Toggle between IP address line and error message in LC display
	Up	>10 sec	Reset lamp error
Standby switch	Down	1-3 sec	Switching the projector to standby
	Down	4-8 sec	Reserved for future use
	Down	>10sec	Self diagnostics of illumination unit

9.4 Hot line

Feel free to contact us if you have any further questions!

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