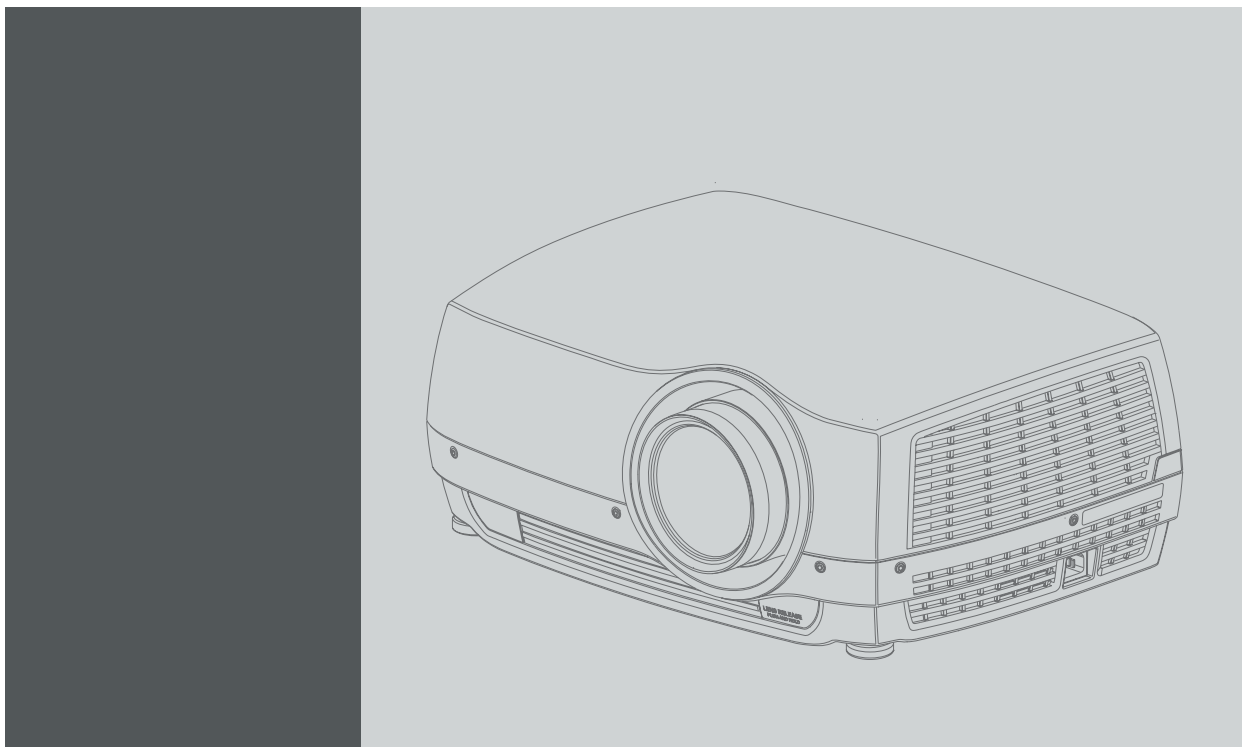


F35



User and Installation Manual

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Federal Communications Commission (FCC Statement)

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

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Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults. Barco must be informed immediately in writing of any complaints.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of complaint, Barco can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other services provided by Barco, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of Barco.

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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.

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1. INTRODUCTION

Welcome

Congratulations on your purchase of a Barco F35 projector! The F35 projectors are part of a proud tradition of quality projectors built for superior performance, and feature compact footprint, high performance optics and lenses, Active Stereo 3D capabilities, built-in frame-lock synchronization and are warranted for 24/7 operation.

1.1 About this manual

General

We recommend you read this user manual before setting up and operating your projector for the first time. Familiarizing yourself with the projectors' features and functions, as well as its safety and maintenance features, will help ensure you enjoy many years of hassle-free projection.

Following is a brief overview of how information in the manual is organized and presented.

The content in this manual is systematized primarily by function, and then topic.

On the first page of each chapter is an overview of the chapter contents.

A menu path is expressed in the following manner: *Main Menu — Sub Menu — Sub sub menu*. For example, *Main Menu — Installation — Synchronization*

All physical measurement units given in this manual are according to the International Standard of Units (SI units). Conversion from this to other measurement units is the responsibility of the user.

Illustrations used in the manual are for general reference only, and may differ from your product.

2. SAFETY

About this chapter

Read this chapter thoroughly before attempting to install or operate the projector.

To prevent personal injury to users or physical damage to the projector while installing and using your projector, ensure that you understand and follow all safety guidelines, instructions and warnings included in this chapter and this manual.

Overview

- General Considerations
- Important safety instructions
- Product safety labels

2.1 General Considerations

General safety instructions

- Before operating this equipment please read this manual thoroughly and retain it for future reference.
- All warnings on the projector and in the documentation manuals shall be adhered to.
- All instructions for operating and use of this equipment shall be followed precisely.
- All local installation codes shall be adhered to.

Owner's record

The part number and serial number are printed on a label which is stuck on the respective part. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Barco dealer regarding this product.

Product article number	
Product serial number	
Dealer	

General conditions for use

- Use only the cables and cords supplied with the projector or original replacement cables. Using other cables or cords may lead to malfunction and permanent damage to the unit.
- Always use a grounded (3-pronged) power cord to ensure proper grounding of the unit. Never use 2-pronged power cords, as this is dangerous and could lead to electrical shock.
- Do not attempt to open the projector unit. The projector contains no user serviceable parts. Refer all repairs to qualified personnel only. Make sure that no objects enter into the vents and openings of the chassis.
- Do not spill any liquids on the projector or into the vents or openings of the unit.
- Always remove the lens cap before switching on the projector. If the lens cap is not removed, it may melt due to the high energy light emitted through the lens. Melting the lens cap may permanently damage the surface of the projection lens.
- Only place the projector on a stable surface, or mount it securely using an approved ceiling-mount.
- Always operate the projector according to the rotation guidelines. Operating the unit in other positions may reduce lamp life significantly, and may lead to overheating, resulting in malfunctioning.
- Always allow ample airflow through the projector. Never block any of the air vents. Never cover the unit in any way while running. Allow for sufficient distance to walls and ceilings to avoid overheating.
- Minimum safety (clearance) distance to the sides and rear of the unit is 50cm / 20" in any direction (15 cm/ 6" to ceiling).
- Hot air is exhausted from the rear vent. Do not place objects that are sensitive to heat nearer than 50cm / 20" to the exhaust vent.
- The projector is designed for indoor use only. Never operate the unit outdoors.
- Do not operate the projector outside its temperature and humidity specifications, as this may result in overheating and malfunctioning.
- Only connect the projector to signal sources and voltages as described in the technical specification. Connecting to unspecified signal sources or voltages may lead to malfunction and permanent damage of the unit.
- Wherever possible, use main power supply with surge protection to prevent damage to the projector caused by unscheduled power surges.

- Allow lamp to cool down for at least 60 minutes before changing. USE ONLY ORIGINAL LAMPS.
- Connecting sources to a powered projector may result in product failure. It is recommended that the power cable connector (projector-end) or the mains power socket is accessible whilst the product is in use to enable mains power to be disconnected or switched off when connecting source devices. This should be considered during product installation.

2.2 Important safety instructions

To prevent the risk of electrical shock

- This projector should be operated from an AC power source. Ensure that the mains voltage and capacity matches the projector electrical ratings. If you are unable to install the AC requirements, contact your electrician. Do not defeat the purpose of the grounding.
- Installation according to the local electrical code and regulations by qualified technical personnel only.
- A readily accessible disconnect device must be incorporated externally to the equipment for removal of the power to the projector cord.
- Warning: High leakage current. Earth connection essential before connecting supply.
- Do not allow anything to rest on the power cord. Do not locate this projector where persons will walk on the cord.
- Do not operate the projector with a damaged cord or if the projector has been dropped or damaged - until it has been examined and approved for operation by a qualified service technician.
- Position the cord so that it will not be tripped over, pulled, or contact hot surfaces.
- If an extension cord is necessary, a cord with a current rating at least equal to that of the projector should be used. A cord rated for less amperage than the projector may overheat.
- Never push objects of any kind into this projector through cabinet slots as they may touch dangerous voltage points or short circuit parts that could result in a risk of fire or electrical shock.
- Do not expose this projector to rain or moisture.
- Do not immerse or expose this projector in water or other liquids.
- Do not spill liquid of any kind on this projector.
- Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Do not disassemble this projector, always take it to a trained service person when service or repair work is required.
- Do not use an accessory attachment which is not recommended by the manufacturer.
- Lightning - For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, remove all power from the projector. This will prevent damage to the projector due to lightning and AC power-line surges.

To prevent personal injury

- Isolate electrically before replacing the lamp or lamp house. Caution: Hot lamp (house).
- Caution: High pressure lamp may explode if improperly handled. Refer servicing to qualified service personnel.
- To prevent injury and physical damage, always read this manual and all labels on the system before inserting the lamp casing, powering the projector or adjusting the projector.
- To prevent injury, ensure that the lens and all cover plates are correctly installed. See installation procedures.
- Warning: high intensity light beam. NEVER look into the lens ! High luminance could result in damage to the eye.
- **Warning: extremely high brightness lamps:** This projector uses extremely high brightness lamps. Never attempt to look directly into the lens or at the lamp. If the projection distance is less than 6 meter, any person needs to be at least 4 meters away from the projected image. Avoid close range reflection of the projected image on any reflecting surface (such as glass, metal, ...) . When operating the projector, we strongly recommend wearing suitable safety glasses.
- Before attempting to remove any of the projector's covers, disconnect the projector power cord for removal of all power from the projector.
- When required to remove all power from the projector, to access parts inside, always disconnect the projector power cord for removal of all power from the projector.
- Do not place this equipment on an unstable cart, stand, or table. The product may fall, causing serious damage to it and possible injury to the user.
- It is hazardous to operate without lens or shield. Lenses, shields or ultra violet screens shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired. For example by cracks or deep scratches.
- **Warning: Protection from ultraviolet radiation:** Do not look directly in the light beam. The lamp contained in this product is an intense source of light and heat. One component of the light emitted from this lamp is ultraviolet light. Potential eye and skin hazards are present when the lamp is energized due to ultraviolet radiation. Avoid unnecessary exposure. Protect yourself and your employees by making them aware of the hazards and how to protect themselves. Protecting the skin can be accomplished by wearing tightly woven garments and gloves. Protecting the eyes from UV can be accomplished by wearing safety glasses that are designed to provide UV protection. In addition to the UV, the visible light from the lamp is intense and should also be considered when choosing protective eye wear.

- **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.
- **Exposure to UV radiation:** Some medications are known to make individuals extra sensitive to UV radiation. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends occupational UV exposure for an 8-hour day to be less than 0,1 micro-watts per square centimeters of effective UV radiation. An evaluation of the workplace is advised to assure employees are not exposed to cumulative radiation levels exceeding these government guidelines.



WARNING: This product contains chemicals, including lead, known to the State of California to cause birth defects or other reproductive harm. Recycle properly, do not dispose of in ordinary waste!



WARNING: Service personnel must use eye and skin protection during servicing.

To prevent fire hazard

- Do not place flammable or combustible materials near the projector!
- Barco large screen projection products are designed and manufactured to meet the most stringent safety regulations. This projector radiates heat on its external surfaces and from ventilation ducts during normal operation, which is both normal and safe. Exposing flammable or combustible materials into close proximity of this projector could result in the spontaneous ignition of that material, resulting in a fire. For this reason, it is absolutely necessary to leave an "exclusion zone" around all external surfaces of the projector whereby no flammable or combustible materials are present. The exclusion zone must be not less than 40 cm (16") for all DLP Cinema projectors. The exclusion zone on the lens side must be at least 5 m. Do not cover the projector or the lens with any material while the projector is in operation. Keep flammable and combustible materials away from the projector at all times. Mount the projector in a well ventilated area away from sources of ignition and out of direct sun light. Never expose the projector to rain or moisture. In the event of fire, use sand, CO₂ or dry powder fire extinguishers. Never use water on an electrical fire. Always have service performed on this projector by authorized Barco service personnel. Always insist on genuine Barco replacement parts. Never use non-Barco replacement parts as they may degrade the safety of this projector.
- Slots and openings in this equipment are provided for ventilation. To ensure reliable operation of the projector and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the projector too close to walls, or other similar surface. This projector should never be placed near or over a radiator or heat register. This projector should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Projection rooms must be well ventilated or cooled in order to avoid build up of heat. It is necessary to vent hot exhaust air from console to the outside of the building.
- Let the projector cool completely before storing. Remove cord from the projector when storing.
- Heat sensitive materials should not be placed in the path of the exhaust air or on the lamp house.

To prevent projector damage

- This projector has been designed for use with a specific lamp (house) type. See installation instructions for its correct type.
- The air filters of the projector must be cleaned or replaced on a regular basis (a "clean" booth would be monthly-minimum). Neglecting this could result in disrupting the air flow inside the projector, causing overheating. Overheating may lead to the projector shutting down during operation.
- The projector must always be installed in a manner which ensures free flow of air into its air inlets.
- In order to ensure that correct airflow is maintained, and that the projector complies with Electromagnetic Compatibility (EMC) and safety requirements, it should always be operated with all of its covers in place.
- Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. The device should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Ensure that nothing can be spilled on, or dropped inside the projector. If this does happen, switch off and remove all power from the projector. Do not operate the projector again until it has been checked by qualified service personnel.
- Do not block the projector cooling fans or free air movement around the projector. Loose papers or other objects may not be nearer to the projector than 10 cm (4") on any side.
- Do not use this equipment near water.
- Proper operation of the projector can only be guaranteed in table mounting. It is not permitted to use the projector in another position. See installation procedure for correct installation. A ceiling mount will be supported in the future.

2. Safety

- **Special care for Laser Beams:** Special care should be used when DLP projectors are used in the same room as high power laser equipment. Direct or indirect hitting of a laser beam on to the lens can severely damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Never place the projector in direct sunlight. Sunlight on the lens can severely damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Save the original shipping carton and packing material. They will come in handy if you ever have to ship your equipment. For maximum protection, repack your set as it was originally packed at the factory.
- Disconnect the power to the projector before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning. Never use strong solvents, such as thinner or benzine, or, petrol, or abrasive cleaners, since these will damage the cabinet. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution.
- To ensure the highest optical performance and resolution, the projection lenses are specially treated with an anti-reflective coating, therefore, avoid touching the lens. To remove dust on the lens, use a soft dry cloth. Do not use a damp cloth, detergent solution, or thinner.
- Rated maximum ambient temperature, $t_a = 35^{\circ}\text{C}$ (95°F).
- The lamp house shall be replaced if it has become damaged or thermally deformed.

On servicing


- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage potentials and risk of electric shock.
- Refer all servicing to qualified service personnel.
- Attempts to alter the factory-set internal controls or to change other control settings not specially discussed in this manual can lead to permanent damage to the projector and cancellation of the warranty.
- Remove all power from the projector and refer servicing to qualified service technicians under the following conditions:
 - When the power cord or plug is damaged or frayed.
 - If liquid has been spilled into the equipment.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of the other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - If the product has been dropped or the cabinet has been damaged.
 - If the product exhibits a distinct change in performance, indicating a need for service.
- Replacement parts: When replacement parts are required, be sure the service technician has used original Barco replacement parts or authorized replacement parts which have the same characteristics as the Barco original part. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or other hazards. Unauthorized substitutions may void warranty.
- Safety check: Upon completion of any service or repairs to this projector, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- Possible explosion hazard: Always keep in mind the caution below:






To prevent battery explosion

- Danger of explosion if battery is incorrectly installed.
- Replace only with the same or equivalent type recommended by the manufacturer.
- For disposal of used batteries, always consult federal, state, local and provincial hazardous waste disposal rules and regulations to ensure proper disposal.

2.3 Product safety labels

Product safety labels

Label image	Label description
	The Lamp House is very hot after operation. To avoid burns, let the lamp house cool down for at least 60 minutes before proceeding to handle it.

Label image	Label description
	General Warning Hazard
	Electric Voltage Hazard
	Hot Surface Hazard
	UV Hazard
	Hazardous moving parts. Keep away from moving fan blades. Keep fingers and other body parts away.

3. GET TO KNOW THE PROJECTOR

About

This chapter describes the main features and components of the projector, including available accessories.

Overview

- Introducing the F35
- Main components
- Accessories and peripherals

3.1 Introducing the F35

Superior performance for professional applications

The F35 is the ideal projector for applications that demand high level performance, reliability and functionality, with standard features including:

- Fail safe dual UHP-lamp architecture with hot-swap capabilities
- Easy monitoring of projector status via LCD status screen, LED status indicator, and LED lamp status indicators
- Built in smear reduction processing (SRP)
- DLP® technology for perfect colors and ultimate reliability
- Motorized lens operation (shift, zoom, focus, iris)
- Dual opto-mechanical iris optimizes brightness and contrast control
- Real time clock (RTC) for programming functions
- BrilliantColor™ technology for better color matching and display
- Compatible with the EN1X and EN4X lens ranges
- Warranted for 24/7 operation
- Minimal maintenance and low total cost of ownership (TCO)

User access levels

The projector's software platform uses access levels to define what each user can do.

There are three user access levels:

User level	Scope
Standard	Functions that relate to set-up and adjustments for various signal sources such as PC's, video equipment etc. These functions are available directly with the remote control, unless the PIN (Personal Identity Number) code function is activated.
Power	Advanced functions that relate to automation and adaptation of the projector in custom environments. Power User code must be input into the Service menu to activate additional functionality.
Service	Specialist functions related to tuning, service and repair. Service User code must be input into the Service menu to activate additional functionality.

Projector service (LFM)

The F35 has no user-serviceable parts. The projector fans and color wheels require service or replacement, typically after 8000 operating hours (colorwheels) and 16000 hrs (fans). Both of these service tasks must only be carried out by the manufacturer or a manufacturer-authorized service technician. The On Screen Display (OSD) will generate a Service Reminder when a Low Frequency Maintenance (LFM) check is required.

Projector Consumables

The projector lamps have a normal lifetime of approximately 2000 running hours, though this is dependent on the lamp mode used. Experienced users can replace the projector lamp. See "Change the projector lamp", page 77 for details of this procedure.

The projector remote control is powered with two (2) non-rechargeable AA batteries.



CAUTION: Disposal of the projector lamp modules and remote control batteries shall be carried out properly, and in full accordance with the relevant national legislation.

3.2 Main components

Projector components

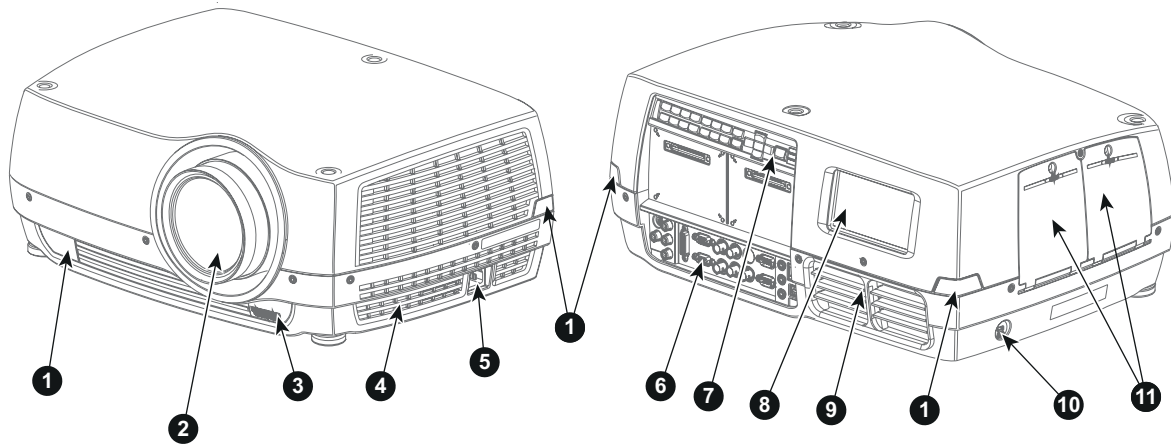


Image 3-1

- 1 IR Receivers
- 2 Lens
- 3 Lens release button
- 4 Ventilation
- 5 Mains power input
- 6 Connection panel
- 7 Local keypad
- 8 LCD status screen
- 9 Exhaust
- 10 Kensington™ Lock
- 11 UHP lamphouse 1,2

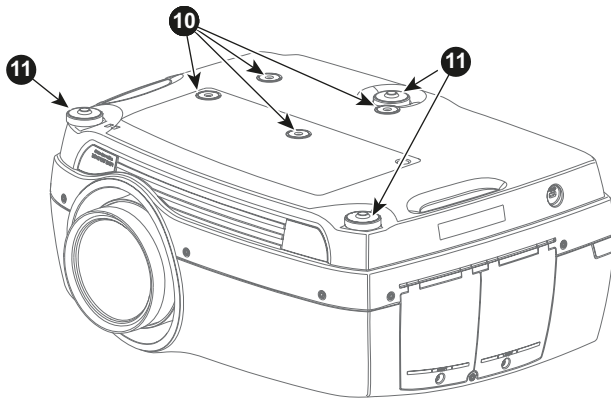


Image 3-2

- 10 Ceiling mounts (M4)
- 11 Adjustable feet

3.3 Accessories and peripherals

Exhaust air kit

Installing the exhaust air kit is recommended for longer term ceiling-mounted installations. The kit is custom designed for the F35 and works both to direct the exhaust air from the projector and to reduce the operating noise level.

Installation and removal of the kit is quick, and requires no specialist tools.

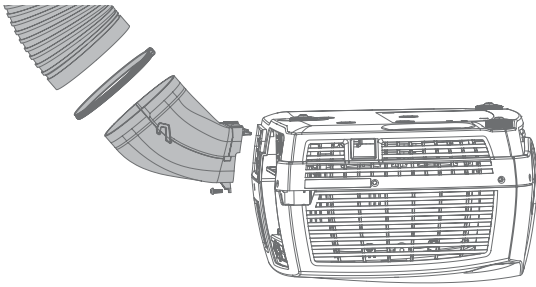


Image 3-3

Item number	Description
R9801376	Exhaust kit (white)
R9801377	Exhaust kit (black)

External multi-image processor

The Barco image processing engine range offers increased control of warp and blend (WB) operations.

Features of the WB range include:

- Camera-based AutoAlign
- Real time warp
- Support for third party camera based AutoAlign
- Barco's patented Black Level Matching
- Sub-Pixel Level Matching
- User-selectable filtering
- Compatible with all projector makes, models and brands

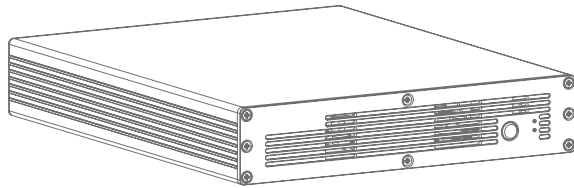


Image 3-4

Item number	Description
R9801223	WB1920 Image Processor
R9801224	WB2560 Image Processor

Cable cover

The cable cover can be mounted on the projector to conceal the interface cables and power cord when the unit is ceiling mounted.

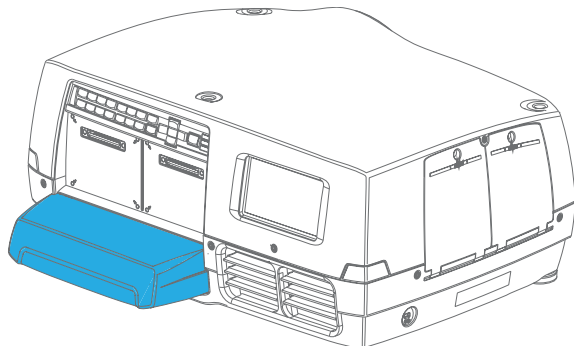


Image 3-5

Item number	Description
R9801283	Ceiling cover, pearl white
R9801281	Ceiling cover, black

3. Get to know the projector

Projector Toolset

Projector Toolset software is Barco's proprietary projector management software that allows you to manage your Barco projector easily and quickly from one central location, via a LAN or RS232 connection. Comprising various tools for brightness settings, diagnostics, image adjustment, picture-in-picture and image control, the Projector Toolset is an indispensable tool for efficient visualization management. Projector Toolset is available for Linux, Mac OS X, and Windows.

For more information or to download the Projector Toolset software and user guide, visit the Barco website.



Image 3-6

4. LENSES

About this chapter

This chapter details the available lenses for the F35, and their technical specifications.

The procedure for replacing a lens, shifting the lens, and adjusting zoom, focus and iris (where applicable) is also described in this chapter.

The projector lens shift and offset matrix is given in user manual section, "Lens shift", page 28.

Overview

- Lens range
- Lens monitoring
- Replacing a lens
- Lens shift
- Adjust zoom, focus and iris

4.1 Lens range



CAUTION: Always remove the lens from the lens holder before moving or transporting the projector. Failure to do this may cause damage to the lens holder and prism.

Available lenses — WUXGA

The FLD lens range is custom-engineered for WUXGA and 1080 projectors.

The electrical connection to the lens motors is via a spring probe contact (pogo) pin array on the bayonet mount.

The projector will automatically detect and identify the lens when it is installed. Automatic detection is not available for 3rd party lenses.

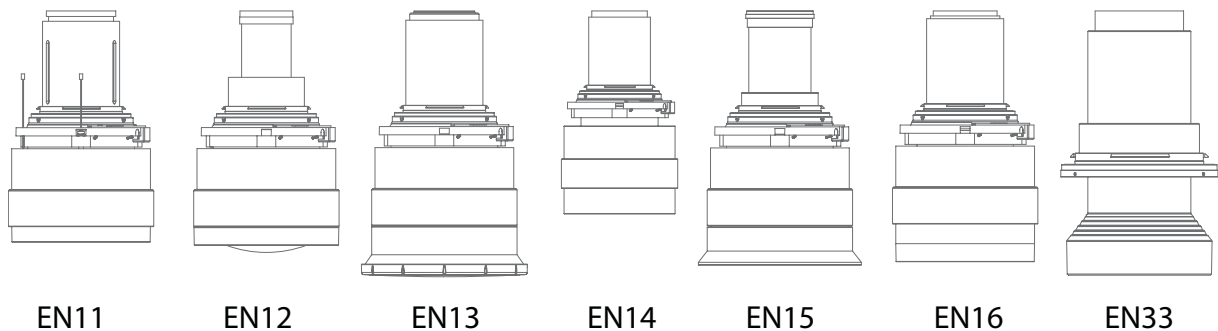


Image 4-1

Name	Description	Part number	Weight
FLD Lens 1.6 - 2.32 : 1 (EN11)	1.6-2.32 : 1 (WUXGA)	R9801214	2.2 kg
FLD Lens 0.74 : 1 (EN12)	0.74:1 (WUXGA)	R9801218	1.9 kg
FLD Lens 1.24 - 1.6 : 1 (EN13)	1.24 - 1.6 : 1 (WUXGA)	R9801228	2.6 kg
FLD Lens 2.37 - 3.79 : 1 (EN14)	2.37 - 3.79 : 1 (WUXGA)	R9801209	2.5 kg
FLD Lens 1.16:1 (EN15)	1.16 : 1 (WUXGA)	R9801225	2.4 kg
FLD Lens 3.80 - 6.50 : 1 (EN16)	3.8 - 6.5 : 1 (WUXGA)	R9801249	2.5 kg
FLD Lens 0.92: 1 (EN33)	0.92 : 1 (WUXGA)	R9801227	0.9 kg

4. Lenses

Name	Working F#	Iris / Iris F#	Zoom Ratio	Focal Length (mm)	Focus Range (m)
FLD Lens 1.6 - 2.32 : 1 (EN11)	2.1-2.52	Yes 2.1-6.5	1.45	33.2-48.1	2.0-15
FLD Lens 0.74 : 1 (EN12)	2.1	Yes 2.1-6.5	-	16.35	0.5-5
FLD Lens 1.24 - 1.6 : 1 (EN13)	2.1-2.22	Yes 2.1-6.5	1.3	25.59-33.24	1.0-15
FLD Lens 2.37 - 3.79 : 1 (EN14)	2.1-2.72	Yes 2.1-6.5	1.6	49.1-78.6	3.0-30
FLD Lens 1.16:1 (EN15)	2.1	Yes 2.1-6.5	-	23.98	1.5-15
FLD Lens 3.80 - 6.50 : 1 (EN16)	2.1-2.66	Yes 2.1-6.5	1.74	78.3-136.2	4.0-40
FLD Lens 0.92: 1 (EN33)	2.6	No	-	19.7	1.0 — 10

Available lenses — 4K, WUXGA, WQXGA

The FLD+ (EN4X) lens range is custom-engineered for WQXGA projectors.

The electrical connection to the lens motors is via a spring probe contact (pogo) pin array on the bayonet mount. The projector will automatically detect and identify the lens when it is installed. Automatic detection is not available for 3rd party lenses.

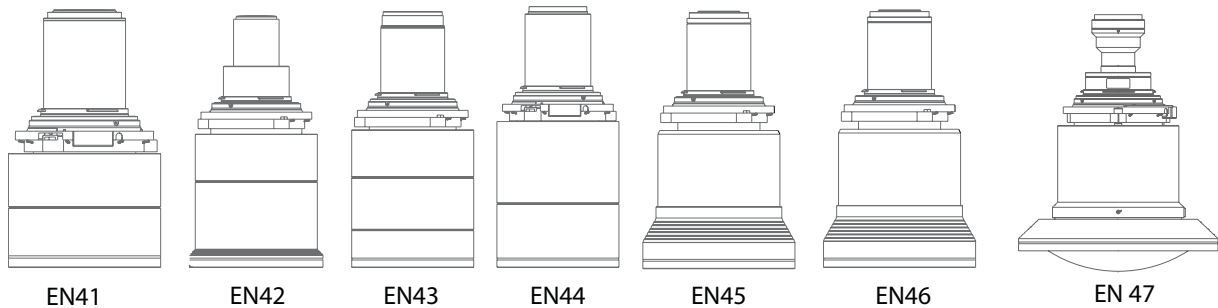


Image 4-2

Name	Description	Part number	Weight
FLD+ Lens 1.7 - 2.5 : 1 (EN41)	1.58 - 2.33 : 1 (WUXGA) / 1.7 - 2.5 : 1 (WQXGA)	R9801216	2.54 kg
FLD+ NV Lens 1.7 - 2.5 : 1 (NV41)	IR Optimized, 1.58 - 2.33 : 1 (WUXGA) / 1.7 - 2.5 : 1 (WQXGA)	R9801216	2.54 kg
FLD+ Lens 0.8 : 1 (EN42)	0.75 : 1 (WUXGA) / 0.8 : 1 (WQXGA)	R9801226	2.7 kg
FLD+ Lens 1.2 - 1.7 : 1 (EN43)	1.12 - 1.58 : 1 (WUXGA) / 1.2 - 1.7 : 1 (WQXGA)	R9801230	2.84 kg
FLD+ NV Lens 1.2 - 1.7 : 1 (NV43)	IR Optimized, 1.12 - 1.58 : 1 (WUXGA) / 1.2 - 1.7 : 1 (WQXGA)	R9801286	2.84 kg
FLD+ Lens 2.5 - 4.6 : 1 (EN44)	2.33 - 4.3 : 1 (WUXGA) / 2.5 - 4.6 : 1 (WQXGA)	R9801211	3.08 kg
FLD+ Lens 0.75 - 1.13 : 1 (EN45)	0.75 - 1.13 : 1 (WUXGA) / 0.8 - 1.21 : 1 (WQXGA)	R9801220	3.04 kg
FLD+ Lens 0.75 - 1.13 : 1 (EN46)	0.75 - 1.13 : 1 (WUXGA) / 0.8 - 1.21 : 1 (WQXGA)	R9801221	3.14 kg
FLD+ NV Lens 0.8 - 1.21 : 1 (NV46)	IR Optimized, 0.75 - 1.13 : 1 (WUXGA) / 0.8 - 1.21 : 1 (WQXGA)	R9801287	3.14 kg
FLD+ Lens 0.65 : 1 (EN47)	0.61 : 1 (WUXGA) / 0.65 : 1 (WQXGA)	R9801295	5.4 kg

Name	Working F#	Iris / Iris F#	Zoom Ratio	Focal Length (mm)	Focus Range (m)
FLD+ Lens 1.7 - 2.5 : 1 (EN41)	2.1-2.5	Yes 2.1-6.5	1.47	33.70-49.54	1.5 - 15
FLD+ NV Lens 1.7 - 2.5 : 1 (NV41)	2.1-2.5	Yes 2.1-6.5	1.47	33.70-49.54	1.5 - 15
FLD+ Lens 0.8 : 1 (EN42)	2.1	Yes 2.1-6.5	-	16.12	0.7 - 7

Name	Working F#	Iris / Iris F#	Zoom Ratio	Focal Length (mm)	Focus Range (m)
FLD+ Lens 1.2 - 1.7 : 1 (EN43)	2.4-2.7	Yes 2.4-6.5	1.42	23.95-34.02	1.5 - 15
FLD+ NV Lens 1.2 - 1.7 : 1 (NV43)	2.4-2.7	Yes 2.4-6.5	1.42	23.95-34.02	1.5 - 15
FLD+ Lens 2.5 - 4.6 : 1 (EN44)	2.1-2.93	Yes 2.1-6.5	1.85	49.52-91.60	2.5-25
FLD+ Lens 0.75 - 1.13 : 1 (EN45)	2.4-3.29	Yes 2.4-6.5	1.51	15.85-23.93	5.0 - 30
FLD+ Lens 0.75 - 1.13 : 1 (EN46)	2.4-3.29	Yes 2.4-6.5	1.51	15.98-23.99	0.7 - 7
FLD+ NV Lens 0.8 - 1.21 : 1 (NV46)	2.4-3.29	Yes 2.4-6.5	1.51	15.98-23.99	0.7 - 7
FLD+ Lens 0.65 : 1 (EN47)	2.1	Yes 2.1-6.0	-	12.6	0.5 - 4.0

4.2 Lens monitoring

Using 3rd party lenses with the F35

The F35 features an automatic lens monitoring functionality that identifies when a lens is installed or removed and automatically opens the lens shutter and realigns the DMD.

The bayonet mount is fitted with a spring probe contact (pogo) pin array that detects standard Barco FLD/FLD+ lenses. When an FLD/FLD+ lens is installed, the projector detects this and opens the mechanical lens shutter and moves the DMD to the 'On' position. The reverse happens when a lens is removed.

Non standard or passive lenses, such as the EN33, the HR95 and 3rd party lenses, do not facilitate automatic lens monitoring. In these instances, Lens Monitoring must be disabled and the lens shutter manually opened and closed.

Disabling the Lens Monitor function can be done:

- Via the OSD, *Main menu* — *Settings* — *Service* — *Lens Monitor*
- Via the RS-232 control interface
- Via the Barco GP3 Lens Monitoring app, available for download from the product website



You must have Power or Service User rights to enable or disable lens monitoring.

Once Lens Monitoring is disabled, use the SHUTTER function on the wireless remote control, local keypad or via your RS-232 control interface to manually open and close the lens shutter.

4.3 Replacing a lens



CAUTION: When changing projection lens, exercise great care when inserting or extracting the lens to prevent damage to the 'pogo' pins in the bayonet mount.

Install a lens

1. Remove the lens mount protection cap on the projector.
2. Remove the lens cap at the bayonet end of the lens.
3. Align the lens so that the red line on the lens bayonet is pointing towards the top of the projector cabinet.
4. Insert the lens bayonet into the lens mount and turn clockwise until the pogo pins engage and the lens clicks into position.

Caution: *The lens is fragile. Do not try to force the lens into position. If there is any resistance, remove the lens from the projector and then try again.*

4. Lenses

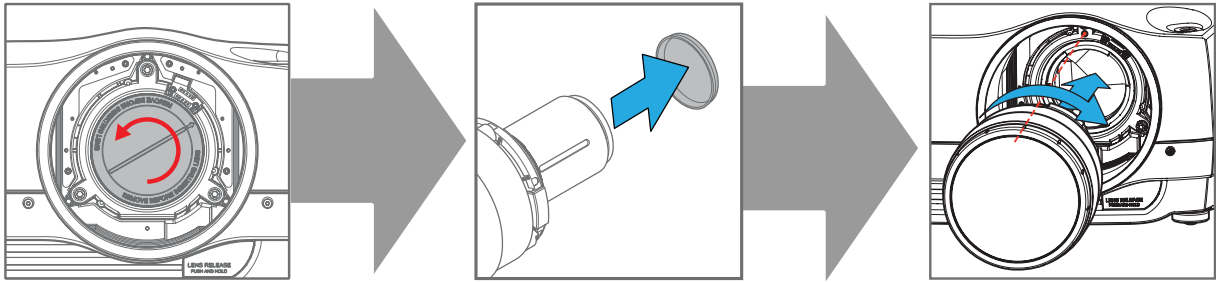


Image 4-3

Remove a lens

1. Depress and hold the lens release button.
2. Turn the lens anticlockwise until the bayonet is free of the lens mount.
3. Pull the lens straight out of the lens mount.

Note: To prevent damage to the lens or dust contamination in the projector light processor, always replace the lens bayonet cap, lens cap and projector lens cap (if applicable) immediately after removing the lens.

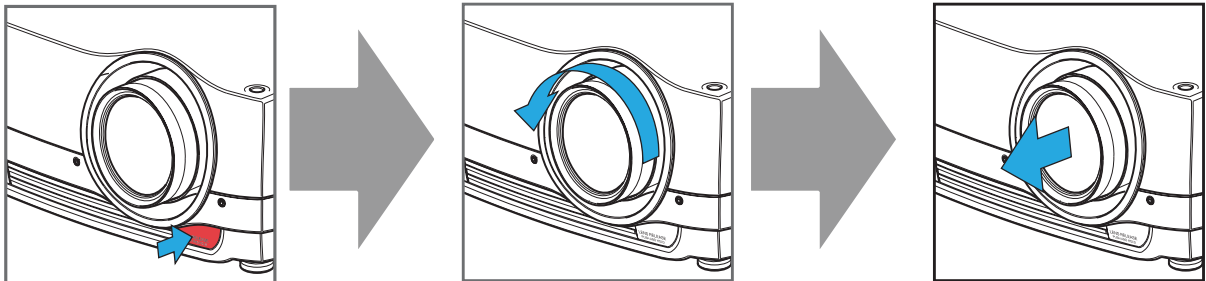


Image 4-4

4.4 Lens shift

General

This section describes how to shift the lens using the projector keypad and the remote control.

For information on the available shift and offset values for each lens, see "Lens shift", page 28.



All F35 lenses have limited downwards shift.

Lens shift can also be carried out via the RS232 communication interface. See the ASCII Commands Protocol for more details.

Shift the lens using the keypad

1. Press **SHIFT** to activate lens shift
2. Use the arrow keys to move the lens up, down, left, and right.

Shift the lens using the remote control

1. Press the **SHIFT** button to activate lens shift.
2. Use the navigation arrows to move the lens up, down, left and right.

4.5 Adjust zoom, focus and iris

General

Zoom controls the size of the projected image.

Focus controls the sharpness of the projected image.

Iris controls the contrast and focus depth of the image. Decreasing the iris stop will increase contrast and image depth, at the same time as it decreases brightness.

Lens zoom, focus and iris adjustments are motorized. You can use the remote control, local keypad, OSD and/or RS-232 commands to adjust the lens zoom, focus and iris positions.



Not all lenses have zoom or iris control. The matrix below shows what controls are available per lens.

	EN11	EN12	EN13	EN14	EN15	EN16	EN33	EN41	EN42	EN43	EN44	EN45	EN46	EN47
Iris	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
Zoom	✓	✗	✓	✓	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗
Focus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For best results, lens adjustments should be done in the following order: zoom, focus and then iris (where applicable).

5. INSTALLATION

General

This chapter explains how to physically install the projector, and what considerations you should take when designing and setting up the projection installation. Each projector installation is unique, and as such the information in this chapter is only provided as a guideline. Likewise, any images or graphical representations shown here are for illustrative purposes only.

If you require further information and assistance during the installation process, contact a qualified projection technician or your local support office for advice.

For information on setting up multi-channel installations, see user manual chapter "Setup a multichannel installation", page 63.

Overview

- Installing the projector
- Installation conditions
- Initial inspection
- Positioning the projector
- Mount the projector on a flat surface
- Mount the projector on the ceiling
- Throw distance
- Lens shift
- Offset Matrix
- Scheimpflug (Boresight) adjustment
- Scheimpflug adjustment procedure

5.1 Installing the projector

Installation sequence

1. Verify the installation area meets the physical and environmental requirements of the projector as outlined in "Installation conditions", page 21.
2. Decide where the projector will be mounted. See "Positioning the projector", page 23 for guidelines and advice on determining the best physical location.
3. Unpack the projector, and check that all equipment is present and in good working order. See "Initial inspection", page 23.
4. Mount the projector. The projector can be mounted on a flat surface, see "Mount the projector on a flat surface", page 24 or using a ceiling-mount, see "Mount the projector on the ceiling", page 25.
5. Connect the video and/or data sources. See "Connector Panel", page 38 for more information and specifications.
6. Install the projector lens. See "Replacing a lens", page 17.
7. Connect the projector to the mains power net. The projector will go through the initialization process. Progress will be displayed on the LCD screen.
8. Once the initialization progress is complete, the projector status indicator will turn to steady orange. See section "Projector status indicator", page 34 for more information on the projector status indicator.
9. Press the power button on the keypad or remote control to start the warm up process. The status indicator will turn to steady green when the projector is warmed up and ready for use.
10. Select the display source. Read more about sources, including technical specifications, in the User Manual chapter "Input and Communication", page 33.
11. Adjust the projected image on the screen. Read chapter "Set up the picture", page 49 for more information.

5.2 Installation conditions

General

This section contains important physical and environmental information that will help you determine the optimal installation position and conditions for your projector.



Barco projectors are manufactured according to specific design standards, which also include environmental conditions. Failing to follow the terms and conditions outlined in this chapter can result in loss of product warranty.

Environmental conditions

The table below summarizes the physical environment in which the projector may be safely operated or stored.

Environment	Operating	Non-Operating
Ambient Temperature @ 1500 m	10 °C (50 °F) to 40 °C (104 °F)	-20 °C (-4 °F) to 60 °C (140 °F)
Ambient Temperature @ 3000 m	10 °C (50 °F) to 35 °C (95 °F)	-20 °C (-4 °F) to 60 °C (140 °F)
Air cleanliness	Clean office environment	n.a.
Relative Humidity (RH)	20% to 80% RH Non-condensed	10% to 90% RH Non-Condensed

Mains power requirements

Projector	Power requirements
F35	100 — 240 V, 50 — 60 Hz, 16 A @ 240 V

To protect operating personnel, the National Electrical Manufacturers Association (NEMA) recommends that the instrument panel and cabinet be grounded. In no event shall this projector be operated without an adequate cabinet ground connection.

The AC supply must be installed by a qualified electrician in conformance to local codes. Hardware, wire sizes and conduit types must comply with local codes.

Ventilation

The projector is fan cooled and must be installed with sufficient space around the projector to ensure sufficient air flow.

Ventilation inlets are located on the left side of the projector. Hot air is exhausted from the rear vent, see image 5-1.

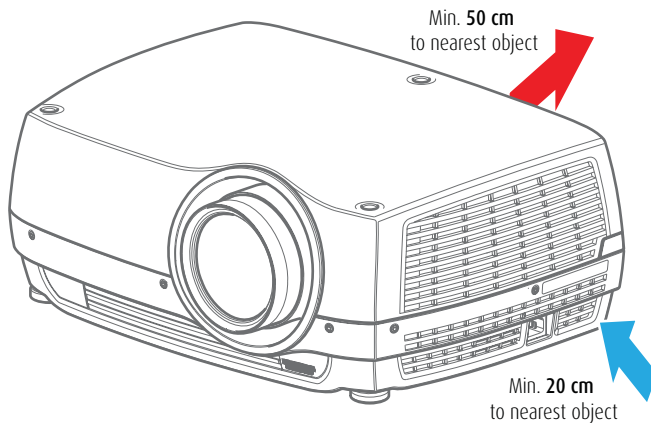
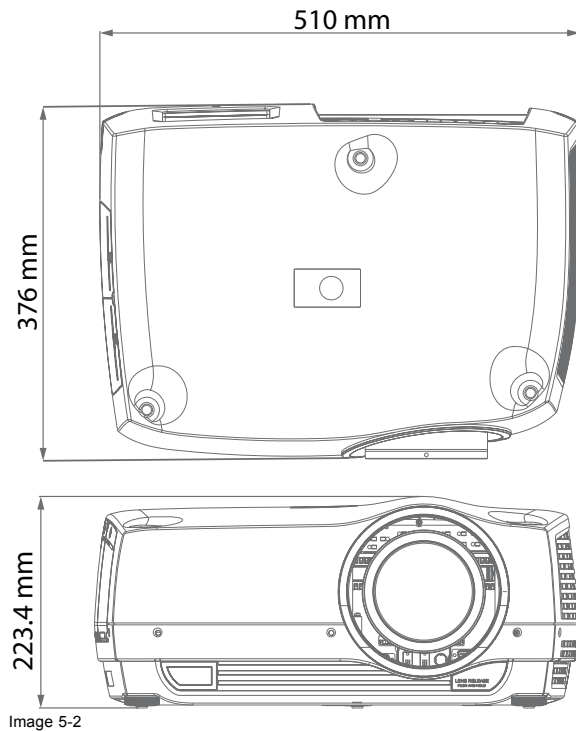


Image 5-1

Projector weight and footprint

Weight: 13 kg (exclusive of lens)



5.3 Initial inspection

General

Each projector is inspected and rigorously tested at our production facility to ensure that it is free from any mechanical or electrical defects.

Upon receipt of the projector, we recommend that customers inspect the projector for any signs of damage that may have occurred in transit. If damage is found, file a claim with the shipping carrier immediately. Notify the Barco Sales and Service office, or your preferred Barco agent, of the damage as soon as possible.

Box Contents

Your projector box should contain the following:

- Projector unit
- Power cord (suitable for region)
- Quick start guide
- Safety manual
- Remote Control



The projector lens is delivered in a separate box.

5.4 Positioning the projector

General guidelines

Proper positioning of the projector will ensure a better image on screen and may lessen the time needed to adjust and align the image on screen.



Focus and sharpness of the image can be adversely affected if the lens axis is not fully perpendicular to the projection surface.

5. Installation

The following guidelines can help you determine the best physical location for the projector.

- The ambient air temperature of the room or enclosure should not be greater than 40 °C (at 1500 m altitude), and there must be sufficient ventilation area around the projector. See section "Installation conditions", page 21 for more detailed information.
- Use the throw ratio of the installed lens as a guideline for determining the projector's physical distance from the screen. See "Throw distance", page 25 for more information.
- Ensure that the source signal interface and cable lengths are matched to the installation. In general:
 - 3G-SDI are long-haul interfaces and suitable for bespoke installations using relatively long cables
 - DP, HDMI, DVI and VGA are short-haul interfaces using pre-assembled cables with limited cable lengths. Using extended cable lengths may result in reduced image quality as well as loss of control information such as EDID (Extended Display Information Data).
- Wherever possible, the projector lens surface should be positioned so that it is perfectly perpendicular to the center of the screen. Offset (lens shift), rather than physical angling, should be used primarily to correct any off-center positioning.
- Installing the projector on a tilt is not recommended as it may impact negatively on lamp and image performance. If it is absolutely necessary to install the projector on an angle, ensure that it is within the guidelines illustrated in image 5-3

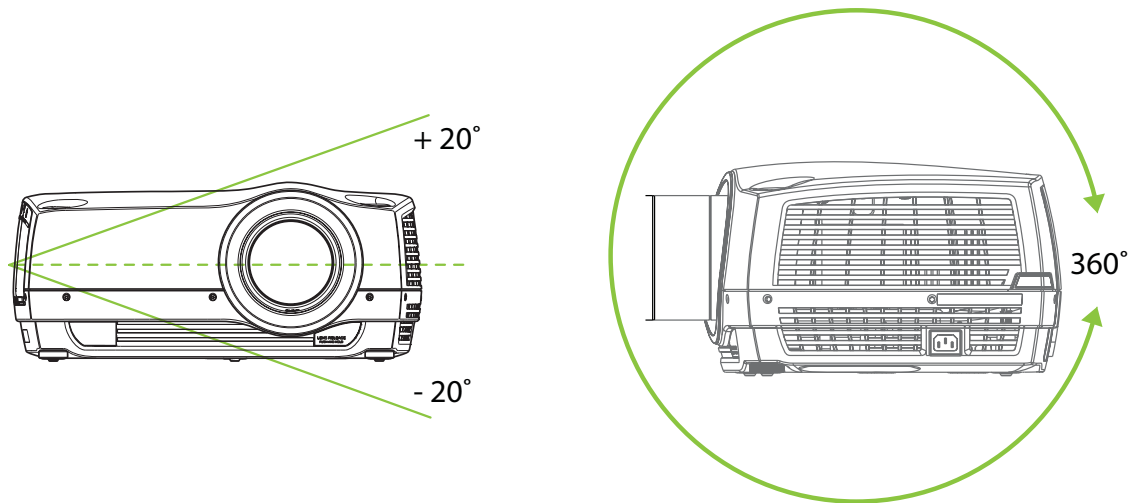


Image 5-3

5.5 Mount the projector on a flat surface

Suggested procedure

1. Place the projector on a pedestal or similar, sturdy object. Make sure that all three projector feet are in contact with the surface of the installation area.
2. Adjust the projector legs so that so that the projector is completely level. To do this, turn the collar on each foot clockwise or anti-clockwise until the correct level is achieved.

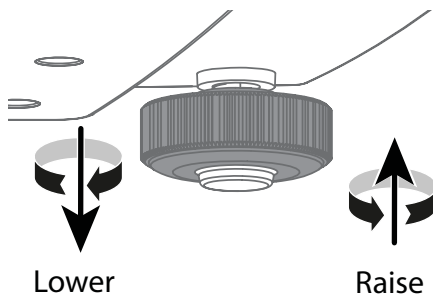


Image 5-4

3. In an ideal installation, the projector lens surface is centered with and parallel to the screen. This orientation helps to ensure optimized lens performance with minimal offset. If this position is not possible (such as when the projector is significantly higher than the center of the screen), it is better to rely on offset (lens shift) rather than extra tilt. If tilt is required, make sure that it does not exceed 20 degrees on the side-to-side axis, as illustrated in image 5-3.

5.6 Mount the projector on the ceiling

Necessary tools

Screwdriver, type dependent on screws used.

Necessary parts

- Ceiling mount or rig frame
- 4x M4 screws, user supplied. See procedure below for information on sizing.

Suggested procedure

1. Confirm that the physical conditions of the proposed installation area complies with the projector installation requirements.
2. In an ideal installation, the projector lens surface is centered with and parallel to the screen. This orientation helps to ensure optimized lens performance with minimal offset. If this position is not possible (such as when the projector is significantly higher than the center of the screen), it is better to rely on offset (lens shift) rather than extra tilt. If tilt is required, make sure that it does not exceed 20 degrees on the side-to-side axis, see "Positioning the projector", page 23.
3. There are four (4) mount holes that are used to install the projector onto a ceiling mount or rig frame. See image 5-5.

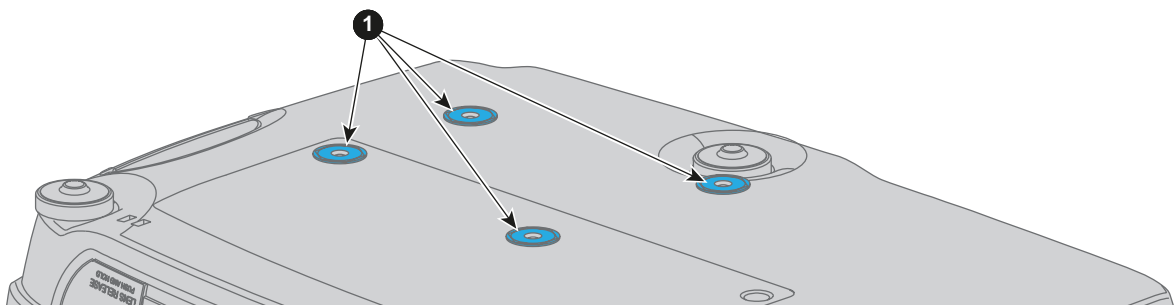


Image 5-5

4. Installation screws are not supplied by the manufacturer. The length of the screw is dependent on the dimensions of the ceiling mount or frame you are using. The screw should not protrude more than 15 mm into the projector chassis.
Caution: *Correct screw length is extremely important. Failing to observe these limitations may cause damage to your projector.*
5. Install the projector to the ceiling mount or rig frame using the four screws. Do not overtighten!

5.7 Throw distance

Calculate the installation throw distance

Throw is the distance (D) measured from your projector lens to the screen. To calculate the throw distance for an installation, you will need two pieces of data: the selected lens throw ratio (L) and the horizontal width (W) of the screen. For example, if the screen width (W) is 2.4 meters and the projector lens has a throw ratio (L) of 0.99:1, then the throw distance (D) will be 2.38 meters.

Calculation: $2.4 \times 0.99 = 2.38$

The following graphs illustrate the image size (W) and projection distance (D) for each of the projector lenses.



Tolerances are typically +/- 5% due to optical (lens) variation.

Throw distance, FLD WUXGA

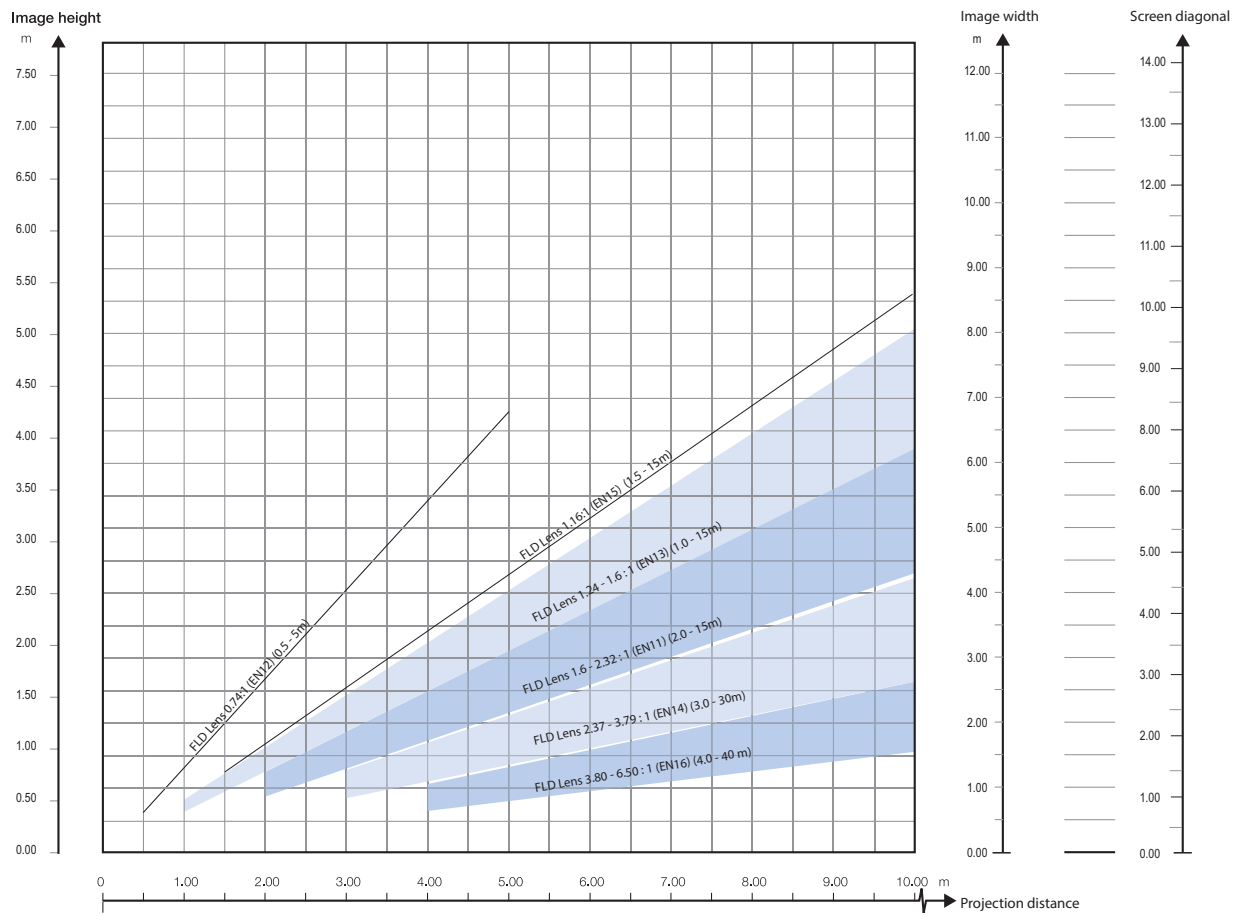


Image 5-6

Throw distance, FLD+ WQXGA

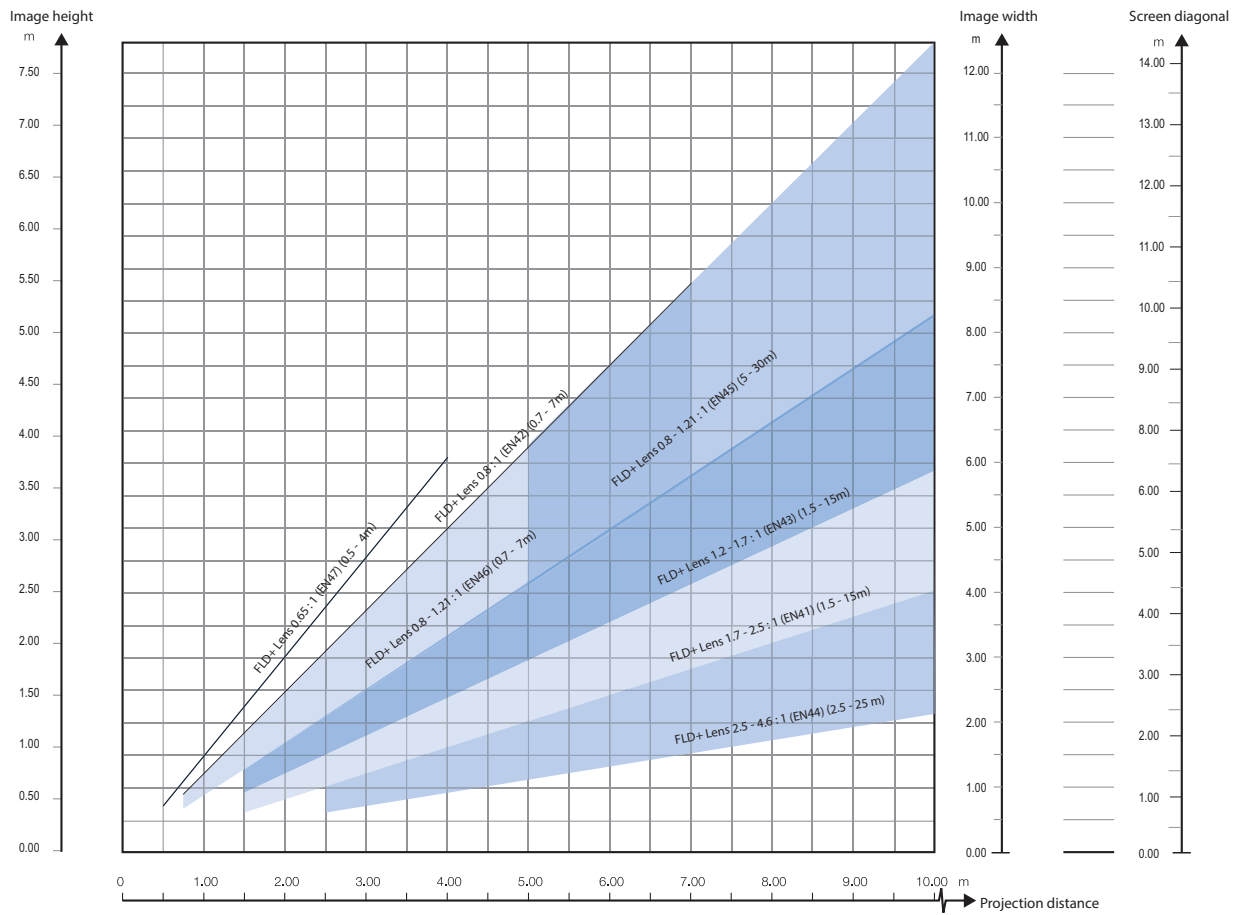


Image 5-7

Throw distance, FLD+ WUXGA

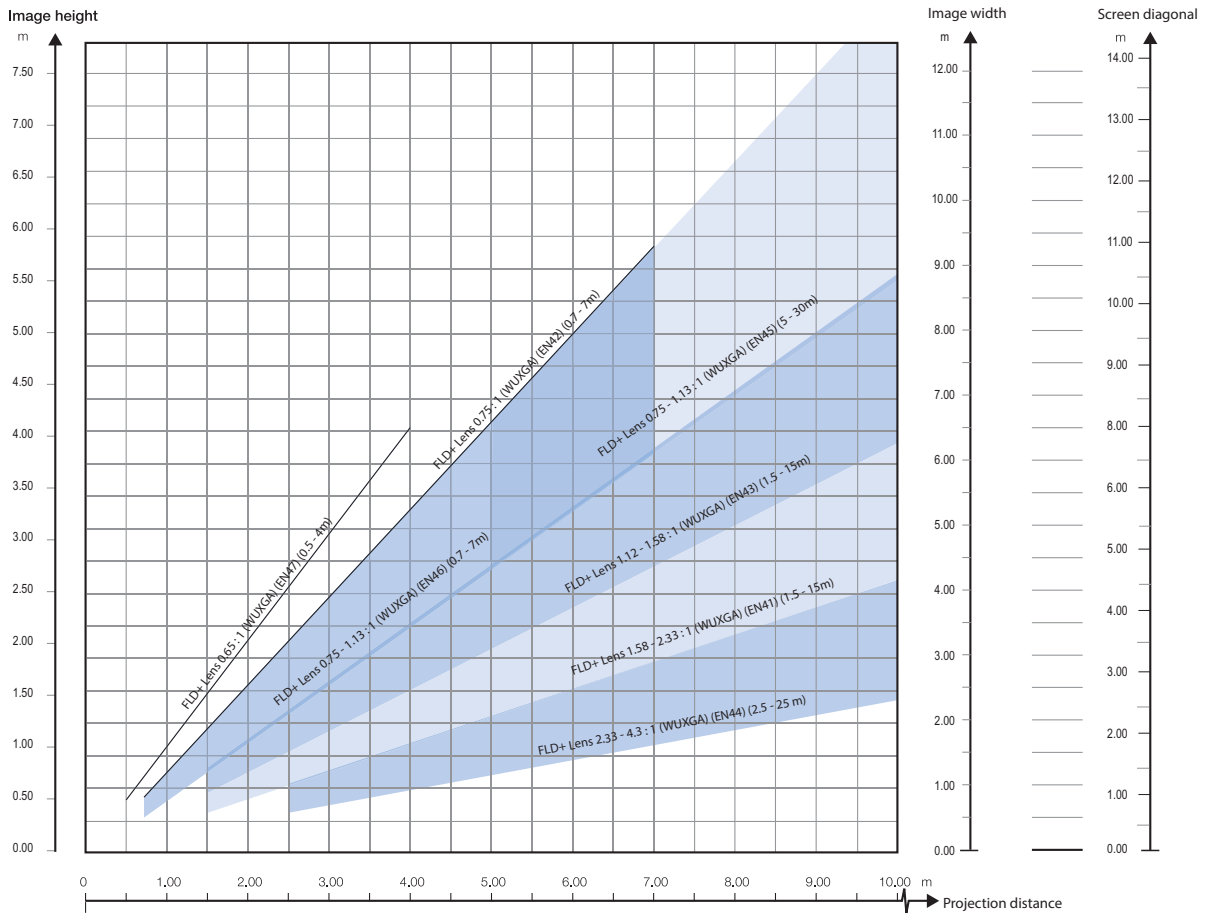


Image 5-8

5.8 Lens shift

Adjusting the horizontal and vertical position of the image

Ideally in any installation the projector is positioned totally perpendicular to the screen to ensure a wholly rectangular image. However, physical limitations mean that this is not always possible to do and the result is a trapezoidal effect upon the displayed image. One way to correct this is by adjusting, or shifting, the vertical or horizontal position of the image.

The amount of available vertical or horizontal offset is dependent on what type of lens is installed in the projector and the projector resolution, see image 5-9 which illustrates the vertical offset values of an image. The same theory applies to horizontal shift. The middle of the image is the optical axis (0%), i.e. no shift. 100% shift equals half of the image height.

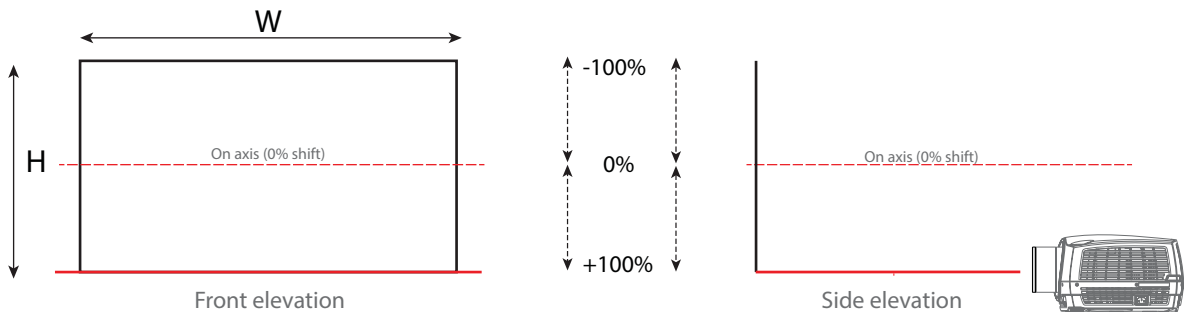


Image 5-9



0% Lens Shift equals on axis (i.e. no shift). 100% Lens Shift equals half of image height / width.

Vertical lens shift formula

Vertical shift = Screen Height x (Max. Lens Shift Vertical (%) ÷ 2) ÷ 100

If the screen is 1.2 meters high and the vertical lens offset value is +120% to +150% (min/max), then the vertical lens shift will be 75% (0.9 meters). This means that the (centre of the) image can be shifted up or down a maximum of 90 centimeters.

Calculation: $1.2 * (150 \div 2 = 75) 75 \div 100 = 0.9$

Horizontal lens shift formula

Horizontal shift = Screen Width x (Max Lens Offset Horizontal (%) ÷ 2) ÷ 100

If the screen is 4.2 meters wide and the horizontal lens maximum offset value is +42%, then the horizontal lens shift will be 21% (0.89 meters). This means that the (centre of the) image can be shifted left or right by a maximum of 89¹ centimeters.

Calculation: $4.2 * (42 \div 2 = 21) 21 \div 100 = .882$

Motorized lens shift

The F35 lens shift function is fully motorized and can be controlled via the projector keypad, wireless remote control, or wired control interface e.g. RS-232.

To activate lens shift, press the SHIFT button on the keypad or remote control. Use the corresponding arrows to move the lens up, down, right and left.

For information on using the RS-232 or LAN control interfaces, please refer to the relevant ASCII Commands Protocol available for download at www.barco.com.

5.9 Offset Matrix

F35 offset matrix

	EN11	EN12	EN13	EN14	EN15	EN16	EN33
	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)
1080							
Vertical	150	20	150	150	150	150	84
Horizontal	68	6	68	68	68	68	32
SXGA+							
Vertical	120	10	120	120	120	120	60
Horizontal	80	6	80	80	80	80	38
WUXGA							
Vertical	134	8	134	134	134	134	66
Horizontal	68	4	68	68	68	68	30

	EN41	EN42	EN43	EN44	EN45	EN46	EN47
	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)
1080							
Vertical	146	0	114	146	50	50	72
Horizontal	60	0	48	60	18	18	28
SXGA+							
Vertical	106	0	84	106	30	30	50
Horizontal	70	0	52	70	20	20	30
WUXGA							
Vertical	120	0	100	120	34	34	60
Horizontal	60	0	44	60	14	14	26
Panorama							
Vertical	212	52	21	212	130	130	164

1. rounded up to two decimal points

5. Installation

	EN41	EN42	EN43	EN44	EN45	EN46	EN47
	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)	+/- (%)
Horizontal	78	10	78	78	32	32	42
WQXGA							
Vertical	146	0	116	144	50	50	80
Horizontal	70	0	56	70	24	24	36

5.10 Scheimpflug (Boresight) adjustment

What is Scheimpflug?

The lens holder has to be adjusted so that the "sharp focus plane" of the projected image falls together with the plane of the screen (Fp1→Fp2). This is achieved by changing the distance between the DMD plane and the lens plane (Lp1→Lp2). The closer the lens plane comes to the DMD plane the further the sharp focus plane will be. It can occur that you won't be able to get a complete focused image on the screen due to a tilt (or swing) of the lens plane with respect to the DMD plane. This is also known as Scheimpflug's law. To solve this the lens plane must be placed parallel with the DMD plane. This can be achieved by turning the lens holder to remove the tilt (or swing) between lens plane and DMD plane (Lp3→Lp4).

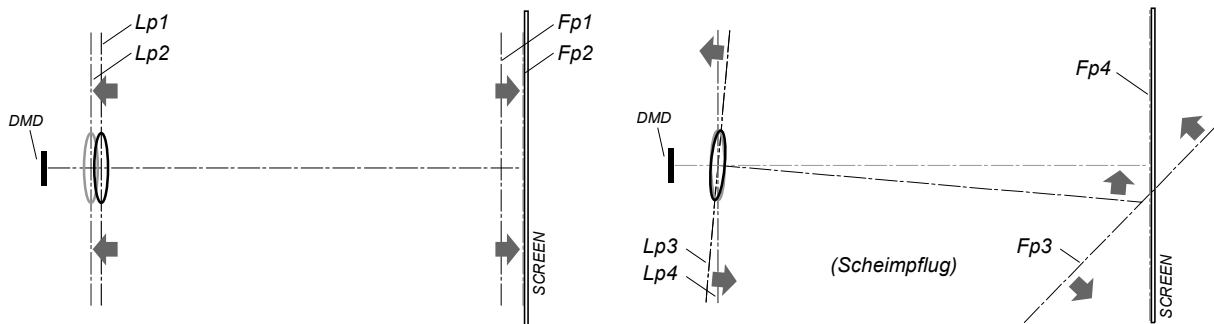


Image 5-10
Scheimpflug principle



Scheimpflug principle

The "plane of sharp focus" can be changed so that any plane can be brought into sharp focus. When the DMD plane and lens plane are parallel, the plane of sharp focus will also be parallel to these two planes. If, however, the lens plane is tilted with respect to the DMD plane, the plane of sharp focus will also be tilted according to geometrical and optical properties. The DMD plane, the principal lens plane and the sharp focus plane will intersect in a line below the projector for downward lens tilt.

Scheimpflug adjustment points

Scheimpflug adjustment points are located on the lens mount. The F35 has three (3) set screws and three (3) adjustment screws.

When to apply Scheimpflug?



Scheimpflug correction procedures may only be carried out by suitably trained and experienced technicians.

A Scheimpflug correction should only be applied when the overall focus of the projected image is not equally sharp (for example, if the projector is **NOT in parallel** with the screen or as a result of a previously misaligned Scheimpflug). Be aware that the consequence of applying Scheimpflug correction upon a screen not in parallel with the projector is that the projected image differs from the rectangle shaped image. In other words "distortion" of the projected image occurs. **Masking** will be required to solve the distortion.

The disadvantage of Masking is loss of content. Therefore it is **strongly recommended** to place the projector **in parallel** with the projection screen and use the **SHIFT** functionality of the Lens Holder to match the projected image with the projection screen. If the SHIFT range is not sufficient then the projector can be tilted and Scheimpflug can be applied.

5.11 Scheimpflug adjustment procedure

Necessary tools

- Scheimpflug tool, size 4 hex
- Projector screen
- Focus plane / Scheimpflug test pattern

Preparation

1. Prepare the test area. Barco recommends a projector-screen distance of 2 metres be used for all Scheimpflug adjustments; this ensures continuity. Verify that the throw ratio of the installed lens matches the requirements of the installation area (projection distance and screen size).
2. Check that the lens is correctly installed, and lens shift is in centre position.
3. Project the chosen test image on the screen.
4. Zoom the lens to its widest opening (maximum image size on the screen).

Apply a Scheimpflug adjustment

1. Loosen the three set screws (reference 1, 2, 3).

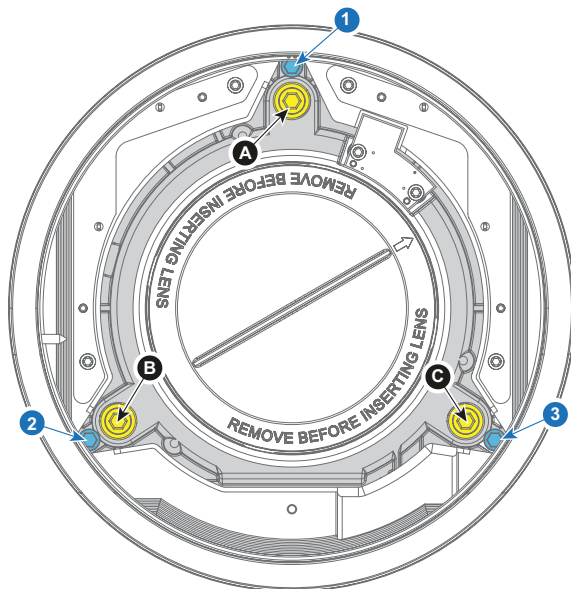


Image 5-11

2. Adjust the top inner Scheimpflug adjustment screw (reference A) until the test image at the lower center of the screen is in focus.

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

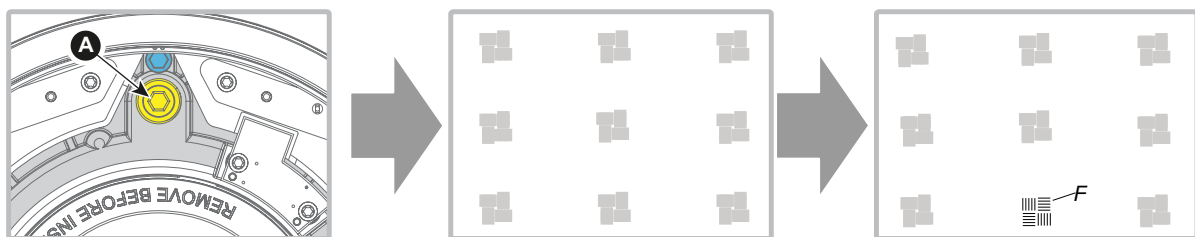


Image 5-12

3. Adjust the bottom left side Scheimpflug adjustment screw (reference B) until the test image in the top right side of the screen is in focus.

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

5. Installation

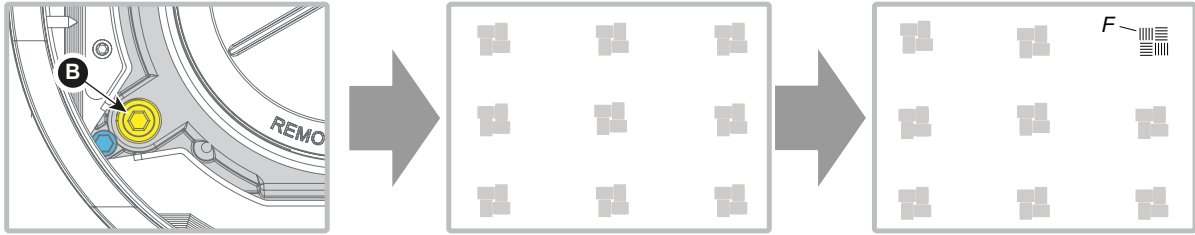


Image 5-13

- Adjust the bottom right side Scheimpflug adjustment screw (reference C) until the test image in the top left side of the screen is in focus.

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

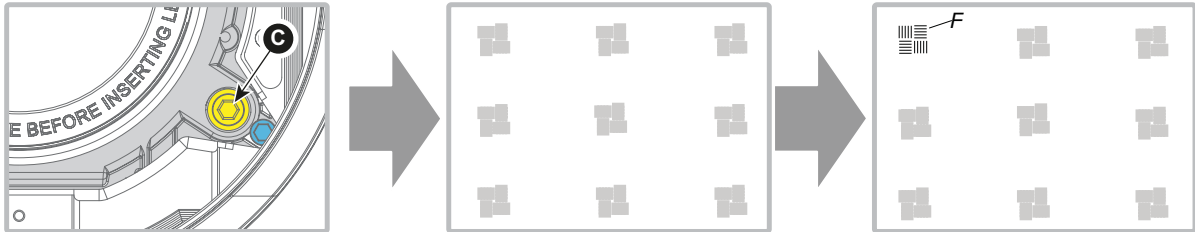


Image 5-14

- Continue fine-tuning of the adjustment screws (a, b, c) one at a time until the test image is uniformly sharp across all areas of the display.
- Test the focus by zooming out (minimum image size on screen) and then zooming in again. Verify the image is sharp for all zoom positions. If there are any deviations to sharpness in one or more areas, repeat steps 2 to 6 until the image is uniformly sharp.
- Tighten the three set screws in the following order: 1, 2, 3.



Regarding Scheimpflug adjustment in combination with the lenses EN 12, 13, 15, 42, 43 and 45.

There is a small possibility that these lenses can interfere with the shutter function. This can occur when the adjustment screws for the scheimpflug are adjusted to the end positions. Therefore, after scheimpflug adjustment, always verify normal shutter operation.

If normal operation is not obtained, readjust the scheimpflug, and avoid adjusting to the end position of the adjustment screws.

6. INPUT AND COMMUNICATION

About this chapter

This chapter describes the functionality of the projector keypad, status indicators, LCD panel, wireless remote control and connector panel, as well as details the technical specifications of the input source connections.



Source/input compatibility is dependant on projector configuration.

For information about RS-232 communications, download the Communication Protocol guide from the product website.

Overview

- Local keypad
- Projector status indicator
- Lamp status indicators
- LCD Panel
- Turn the LCD screen and LED indicators ON or OFF
- Wireless remote control
- Connector Panel
- Connect to a source
- LAN
- 3D SYNC
- RS-232
- Sync In / Out
- Dual link DVI
- VGA
- YPbPr
- HDMI
- Wired IR
- Triggers
- USB A
- USB B

6.1 Local keypad

About

The projector keypad is located at the back of the projector, directly above the connector panel. The keypad can be used to:

- navigate the menu system
- scroll the information in the LCD panel
- directly select input sources
- enter pin code (when enabled)
- power on/down the projector
- adjust basic lens settings including shift, zoom, iris and focus

Keypad backlight

The keypad is illuminated for operation in dark environments. Available functions are illuminated in yellow. Active (selected) functions are illuminated in green. Functions that are not available are not illuminated.

The keypad backlight will automatically extinguish after a set period of inactivity (default: 30 seconds). Pressing any button will re-illuminate the backlight.

Users can set the time-out period from the *OSD Main Menu — Settings — Backlight timeout*.



The backlight time-out settings include Always On and Always Off.

Connector panel light

The light key (reference 1) on the local keypad will turn the connector panel side light ON and OFF.

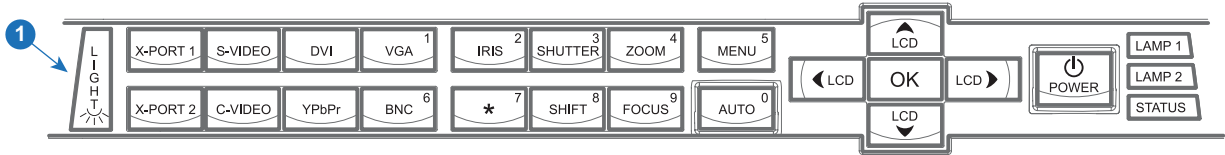


Image 6-1

Keypad functions

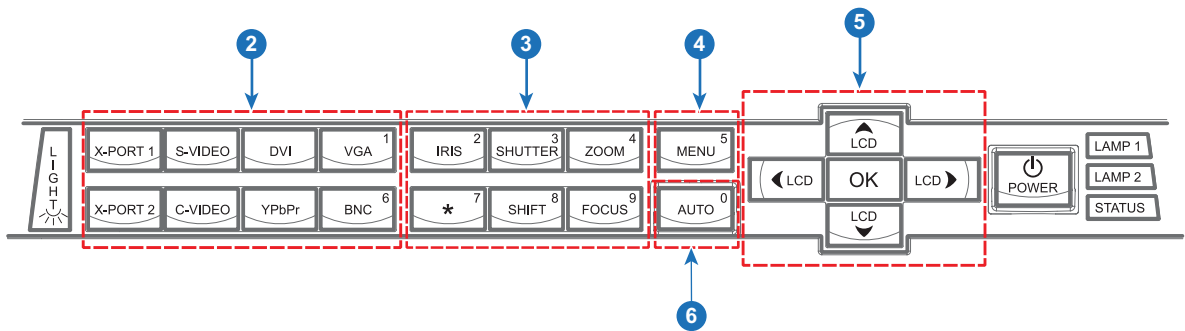


Image 6-2

Item No.	Description
2	Direct source selection. Numeric input (1,6) for PIN entry.
3	Lens functions. Numeric input (2,3,4,7,8,9) for PIN entry.
4	Show or hide OSD menu. Numeric input (5) for PIN entry.
5	Navigation keys: can be used for navigation of Lens Shift, LCD display, and OSD.
6	Reacquire the current source; auto-correct source phase and frequency. Numeric input (0) for PIN entry.

6.2 Projector status indicator

About

The projector status indicator (reference 9) is located on the projector keypad.

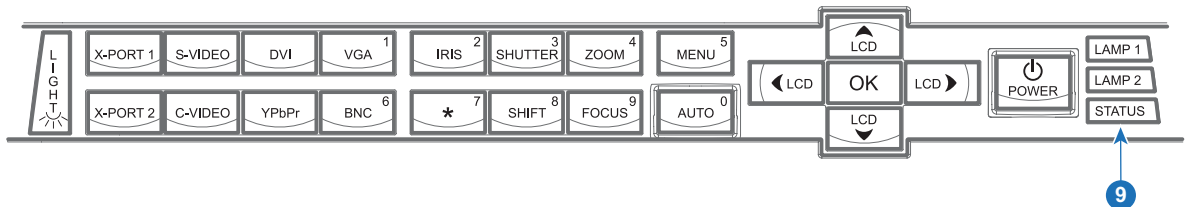


Image 6-3

The indicator shows the current status of the projector and can be used to troubleshoot operating issues.

Indicator	Description	Action required
Green (steady)	Normal operation	None.
Yellow (steady)	Standby (off)	Press the power button to bring the projector out of standby or sleep mode. If the projector entered standby from DPMS, it will automatically power on when a valid source is connected.

Indicator	Description	Action required
Yellow (flashing (60FPM))	Please wait	Wait for the projector to warm up after power connection (20–30 seconds) or to go into standby mode (45 seconds).
Yellow (pulsing (180FPM))	Flash in progress	Wait for the flash procedure to finalize.
Red (flashing (60FPM))	Internal temperature	<p>Upon generation of this critical warning, the projector will automatically go to standby mode, and attempt to cool down internal parts.</p> <p>Remove the power supply after five (5) minutes.</p> <p>Verify that room's environmental conditions meet requirements. See "Installation conditions", page 21.</p> <p>Check that the projector exhaust system is unobstructed and working correctly.</p> <p>Contact the service technician.</p>

6.3 Lamp status indicators

About

Directly above the projector status indicator are the two lamp status indicators (reference 8), one for each lamp.

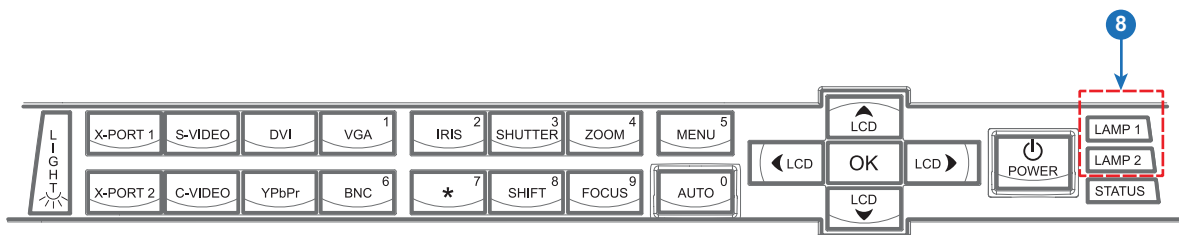


Image 6-4

The indicators show the current status of each of the lamps, and can be used to troubleshoot operating issues.

Indicator	Description	Comments
Green steady	Normal operation	None.
Yellow steady	Lamp is off	The projector system is in standby, or the lamp is disabled in the OSD menu.
Red steady	Lamp error	Lamp life has expired (less than 50 hours remaining), no lamp installed, or lamp is not igniting.
Red steady	Lamp door	Lamp door is open.
Yellow flashing (1 flash per second / 60FPM)	Lamp is cooling down	Do NOT remove mains power from the projector while lamp is cooling down. Total cool down time: approximately 45 seconds.
No indicator.	Lamp cage is not inserted	Insert a new lamp cage.



CAUTION: Failure to use genuine lamp replacement parts may void your projector warranty.

6.4 LCD Panel

About

Active projector settings and status information is displayed on the LCD panel (reference 1) at the rear of the projector.

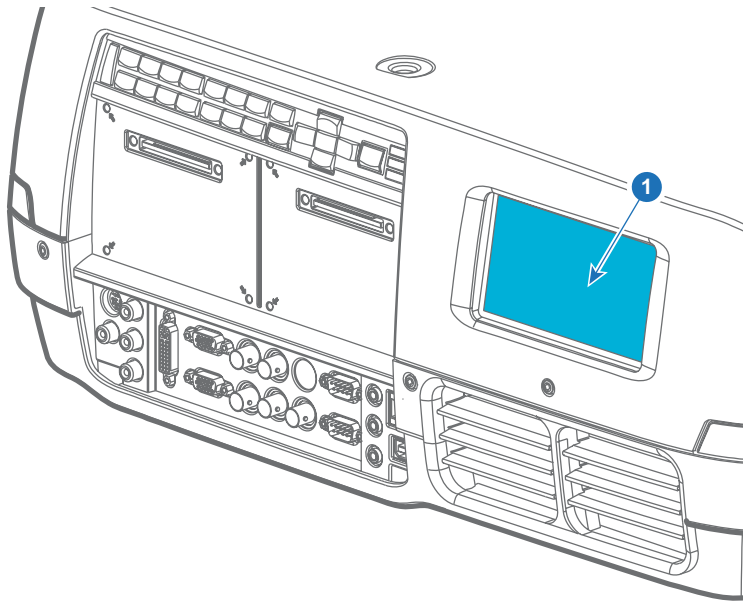


Image 6-5

The following information is displayed on the LCD panel when the projector is running normally:

- Active source
- Format
- Brightness
- Contrast
- Aspect ratio
- Color temperature (RealColor)
- Gamma
- Lamp 1 status
- Lamp 1 run time
- Lamp 1 remaining run time
- Lamp 2 status
- Lamp 2 run time
- Lamp 2 remaining run time
- Shutter position (open/closed)
- Lens mounted
- Network (LAN) information
- Software version currently installed
- Total operating time
- Serial number
- Part number

6.5 Turn the LCD screen and LED indicators ON or OFF

About

Main Menu — Settings — LED Indicators Mute

During normal operations, the LED indicators will glow to indicate the current status of the projector. If the LED indicators are enabled, the time out period can be set in the menu under *Main Menu — Settings — Backlight Timeout*.

The indicator lights and LCD status screen can be turned off (muted) to eliminate light pollution in totally dark installations from the OSD *Main Menu — Settings — LED Indicators Mute*.



Selecting this option will mute the status indicators and the LCD screen display. Critical error (red) indications will still display when the LED indicators are muted.

To turn the indicators and LCD screen display ON, go to *Main Menu — Settings — LED Indicators Mute* and deselect the checkbox.

6.6 Wireless remote control

General

The projector remote control is a full feature wireless remote control, powered by two (2) standard AA batteries. The battery compartment is on the back side of the remote control.

The remote control is backlit for use in dark environments. It also has a data-jack that allows for wired connection to the projector. When the wire is connected, the IR beam and internal batteries are switched off.

The projector has 3 IR receivers, one at the front and two at the rear, which are used to receive signals from the wireless remote control.



Source/input compatibility is dependant on projector configuration. The OSD will display “Not available” when an unsupported source or input is selected.

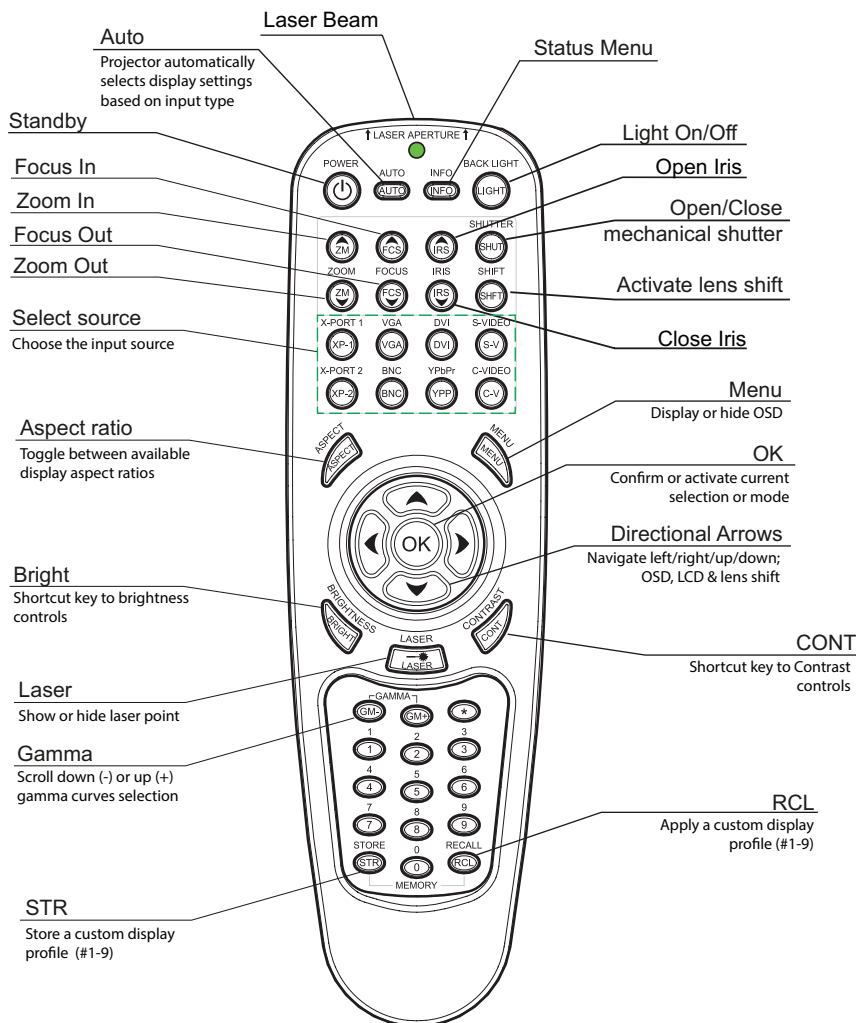


Image 6-6



WARNING: Laser radiation class II product; wavelength 670nm; maximum output 1mW.

Remote control complies with applicable requirements of 21 CFR 1040.10 and 1040.11.

Remote control complies with applicable requirements of EN/IEC 60825-1/2014.

Specifications

Parameter	Value
Type	IR, NEC protocol
Sensors	2
Carrier	38 kHz

6. Input and Communication

Parameter	Value
Range	7m
Laser	1 mW, 670nm

6.7 Connector Panel



CAUTION: The projector must be powered off before connecting or disconnecting any signal or control cables to the connector panel.

General

All source and control connections are made via the connector panel located on the rear cover. There are 13 available interfaces (7 source, 6 control), each of them is labelled for easy identification.

Technical specifications for each of the sources is given in the following pages.

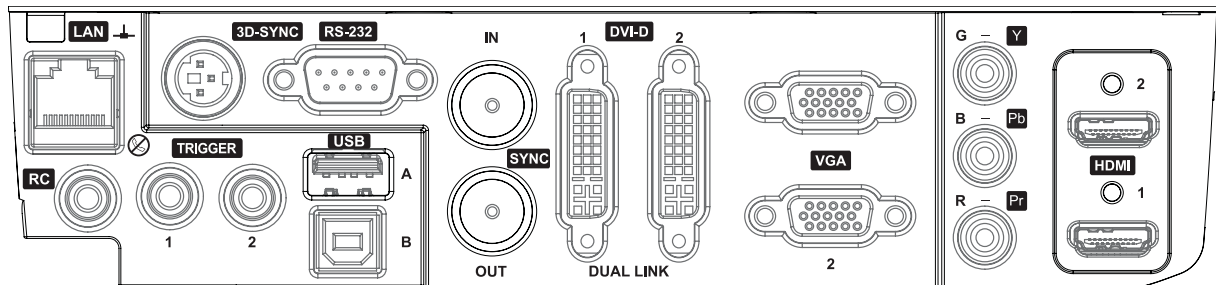


Image 6-7

6.8 Connect to a source



CAUTION: The projector must be powered off before connecting or disconnecting any signal or control cables to the connector panel.

General

Choice of connectivity depends on the installation requirements as well as the sources connected. Generally, digital interfaces are preferred over analog. Multiple signals can be connected in parallel to allow for a selection of sources to be viewed in sequence.

To connect to a video or data source, simply plug the required interface in to the IO panel. Once a source is connected, plug the projector mains power cord in and use select the source using the keypad or wireless remote control.

Current (active) source information is displayed on the LCD panel and in the OSD Status menu, *Main Menu — Status*.



Using poor quality or excessively long cables can distort signal quality. For best results always take cable quality and cable length limitations into consideration when setting up the installation.

Connect a video source

For best quality video, connect a digital video source using the HDMI 1.3a interface. The HDMI input is HDCP copy protection compliant. The projector can support cable lengths of up to 20 metres, dependant on the quality of cable used.

Connect a computer source

The projector may be connected to up to six computer sources simultaneously, using the HDMI (O), DVI-D (J) or VGA (K) interfaces. The digital interfaces (DVI/HDMI) will yield a projected image with very low noise. Both DVI and HDMI are HDCP compliant with sources up to 1920x1200@ 60 Hz (single link source up to 165 Mhz).

Additional functionality may be achieved using the X-PORT modules.

Connect command and control interfaces

The projector uses ASCII based protocols to support RS-232 and LAN command and control interfaces.



Always plug in the control/command source cables before plugging in the projector mains power cord.

Source scan

Main Menu — Installation — Source Scan

When Source Scan is on, the projector automatically scans the input connectors for a valid signal each time the projector is turned on and, if one is found, automatically sets up the image. The default setting for Source Scan is disabled.

To activate Source Scan go to *Main Menu — Installation — Source Scan*.

6.9 LAN

Specifications

Parameter	Value
Ethernet connector	1 x RJ45 Connector for projector control (not content)
Protocols	DHCP, TCP/IP, UDP/IP
Speed	10/100 MBit

6.10 3D SYNC

Specifications

Parameter	Value
3D sync connector	1 x 3 pin mini-DIN connector
Protocols	VESA stereo

6.11 RS-232

Specifications

Parameter	Value
RS-232 connector	1 x female DB9 connector (RS232-in) for projector control

6.12 Sync In / Out

Specifications

Parameter	Value
Sync In	BNC connector
Sync Out	BNC connector

6.13 Dual link DVI

Specifications

Parameter	Value
Connector	DVI-I female digital RGB
Signal characteristics	DVI 1.0, Digital, TMDS
Max. pixel rate	330 MHz (dual link), 165 Mhz (single link)
Scan format	Interlaced or progressive
Max input data resolution	2560x1600 (dual link), 1920x1200 (single link)
EDID	Supported
HDCP (High speed Digital Content Protection)	HDCP 1.1

6.14 VGA

Specifications

Parameter	Value
Connector	VGA 15 pin female HD-DSUB analog RGBHV
Horizontal frequency range	10 — 150 kHz
Vertical frequency range	50 — 110 kHz
Sync signals	Separate horizontal and vertical; Composite sync on H-sync Input; Sync on green (SoG)
Scan format	Interlaced or progressive
Maximum input data resolution	1920x1200 @ 60Hz
Nominal sync impedance	Selectable 75 ohms or 2k2 ohms (applies to RGBHV only)

6.15 YPbPr

Specifications

Parameter	Value
Connector	Component video female 3 x RCA/phono (RGB)
Signal formats	Y/Pb/Pr (Sync-on-Y), RGB (Sync-on-GreHDTV/EDTV/SDTV standards: 1080p, 1080i, 720p, 480p/i, 576p/ien)
Nominal sync impedance	75 Ω
Return loss (VSWR)	20 dB min (1.2:1 max) @ 6 MHz
Component-Video Y-with sync	1.0 Vp-p \pm 2 dB
U,V	0.7 Vp-p \pm 2 dB
Bandwidth (Component Video)	75 MHz

6.16 HDMI

Specifications

Parameter	Value
Connector	Standard HDMI
Signal characteristics	HDMI 1.3 (video only); Digital, TMDS
Max pixel rate	165 MHz
Scan format	Interlaced or progressive

Parameter	Value
Max input data resolution	1920x1200
EDID	Supported
HDCP (High speed Digital Content Protection)	HDCP 1.1

6.17 Wired IR

Specifications

Parameter	Value
Wired IR connector	1 x 3.5 mm stereo jack (in)
Power	Tip 5VDC, max 100 mA power to external Ring IR (in), demodulated NEC protocol Stem GND

6.18 Triggers

Specifications

Parameter	Value
External Trigger connection	3.5mm stereo jack (out)
Power	Tip 12V, max 100mA (out) Ring NC Stem GND

6.19 USB A

Specifications

Parameter	Value
USB connector	Type A
Function	Firmware upgrade using USB sticks.

6.20 USB B

Specifications

Parameter	Value
USB connector	Type B
Function	NOT IN USE.

7. CHANGE PROJECTOR SETTINGS

About this chapter

In this chapter, we discuss how to set up and personalize the projector user interface (On Screen Display), as well as review and change basic system settings.

Overview

- Select a power mode
- Use RTC to set projector ON/OFF programs
- Control screens with triggers
- Lock the projector
- Customize the On Screen Display (OSD)
- Review and change network settings
- Review system status
- Revert to factory settings

7.1 Select a power mode

Power on/standby

Switch the projector ON using the POWER button on the keypad or wireless remote control. The LCD screen will display the message 'Warming Up' while the projector boots up, which takes approximately 10 — 20 seconds. Once the projector is warmed up and ready for normal operation, the LCD screen will become blank and the status indicator will show a steady green light.

To put the projector into STANDBY mode, press the POWER button twice in succession. The LED status light will flash yellow while the projector is cooling down (approximately 45 seconds) and then turn to a steady yellow indicator when the projector has achieved STANDBY mode.



CAUTION: Do NOT remove mains power supply from the projector until the projector has entered STANDBY mode. Removing power supply before the projector has properly cooled down may negatively impact upon lamp life time and performance.

DPMS

When activated, the Display Power Management Signalling (DPMS) system automatically puts the projector in standby mode after a source is removed. If the projector is powered down in DPMS power save, it will automatically power back on when a valid source is acquired. DPMS default setting is disabled. To turn on, go to *Main menu — Settings — DPMS*.

The default time-out value for DPMS, when activated, is 30 minutes. Users can change the time-out value at *Main menu — Settings — DPMS timeout*.

7.2 Use RTC to set projector ON/OFF programs

About

The projector uses a real time clock (RTC) application to deliver ON/OFF timer capabilities. Current date and time are set at *Main Menu — Settings — Set date and time*.

Once the time and date are set, the RTC timer application, *Main Menu — Settings — Timer*, can be used to define and implement up to ten (10) power ON or OFF programs.

7. Change projector settings

Program number	1
Weekdays(s)	Monday - Friday
Execute time	08:00
Action	Turn on
Startup source	VGA
Status	Enabled

Image 7-1

Example:

You want the projector to turn ON at 08:00 in the morning (8 am) and OFF at 20:00 (8 pm) on weekdays (Monday through Friday). On weekends (Saturdays and Sundays), it should turn on at 10:00 (10 am) and off at 18:00 (6 pm).

The VGA source input should be used for all programs.

To do this, you will need to set up four (4) programs; two ON and two OFF.

1. Go to *Main Menu — Settings — Timer*
2. Use the arrow keys on the keypad or remote to tab through the various options
3. Use the numeric entry keys on the keypad or remote to input the **Execute Time**
4. Once all variables are selected, activate the program by changing the **Status** from Disabled (default setting) to Enabled

7.3 Control screens with triggers

About

The projector has two programmable triggers with 3.5 mm mini-jack (stereo) connectors, that are used to enable or disable screens, curtains or other peripheral equipment.

The triggers are located on the right side of the projector connector panel (reference 1).

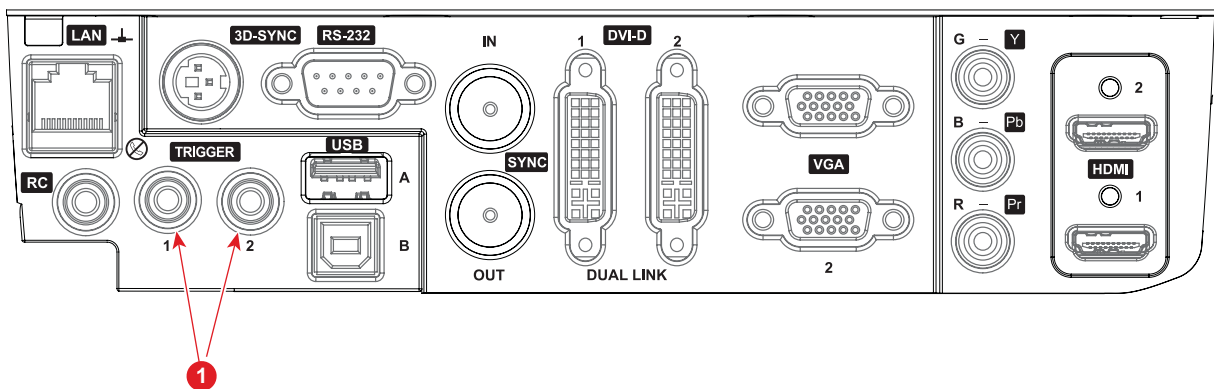


Image 7-2

Definition of trigger behavior is done from *Main menu — Installation — Trigger*. There are four available settings for each trigger:

- Aspect — control of the screen is dependant on the aspect ratio of active source.
- Screen — control of the screen is dependant on whether projector is powered on or not.
- On — Trigger is active and will control regardless of other parameter.
- Off — Trigger is disabled.

Default settings for the triggers are as follows:

- Trigger 1: Screen
- Trigger 2: Aspect.

When Aspect is selected, use the submenu *Main menu — Installation — Trigger — Aspect trigger behavior* to select which aspect ratios will work as the trigger.

Parameter	Value
External trigger connection	3.5 mm stereo jack (out)
Power	Tip: 12V, max 100 mA (out)
	Ring: NC
	Stem: GND

7.4 Lock the projector

PIN code

Main Menu — Settings — Pin code

Projector access and operation can be regulated using a 4 digit PIN code.

The default setting for the PIN is DISABLED. The factory set PIN code is '1234'.

Users can set their own PIN code. To do this, go to *Main Menu — Settings — PIN code — Change PIN code*.

The system will issue a prompt for the current PIN code. Once this is successfully entered, it will prompt the user to enter and then confirm a new 4 digit code. When this is done, click **OK** to set the code and exit the submenu.



Users have three attempts to correctly enter the PIN. After 3 consecutive failed attempts, the projector will automatically be locked and a PUK code will be needed to unlock the projector.

If the PUK code is entered incorrectly 3 consecutive times, the projector will be locked and can only be unlocked by an authorized Barco service partner. Proof of purchase will be required to unlock the projector.



The PUK code for each projector is individual and cannot be used with other projectors. Your projector PUK code is provided with your original packaging.

Kensington Lock

A lock slot (reference 1) is located on the left side of the projector for use with the Kensington®™ Lock Slot (K-Slot) security system.

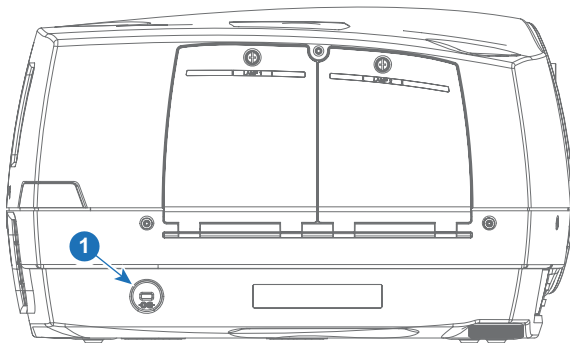


Image 7-3

7.5 Customize the On Screen Display (OSD)

Change the display language

Main Menu — Language

The default language for the projector menu system is English. To select a new display language, go to the Language submenu and scroll down the list until you reach the desired language. Click **OK** to activate the highlighted language. The menu language will change immediately.

There are currently 11 menu display languages available:

7. Change projector settings

- Chinese Simplified
- Chinese Traditional
- English
- French
- German
- Italian
- Japanese
- Korean
- Norwegian
- Portuguese
- Russian
- Spanish
- Swedish

Define OSD behavior

Main Menu — Installation — OSD Enable

On Screen Display (OSD) messages are used to prompt and confirm projector menu actions and functions. There are three modes of OSD behavior:

Mode	Description
On	All messages, warnings and information is displayed.
Off	No messages are shown.
Only warnings	Only critical warning messages, for example temperature overheating, are displayed.

Change OSD time-out value

Main Menu — Settings — Menu Timeout

The OSD menu will automatically close after it has been inactive for a given period of time.

The default time-out period is 30 seconds. This value can be regulated from 5 to 60 seconds. Selecting **Never** will disable the time-out function.

Set background color

Main Menu — Settings — Background

A solid, colored background is displayed whenever the projector is searching for a source. Use this menu to change the background between black, white and gray.

Change the splash screen

Main Menu — Settings — Splash

By default, the manufacturer's logo will appear during projector startup. This can be changed to a solid colored screen, if desired.

7.6 Review and change network settings

General

The projector uses Dynamic Host Configuration Protocol (DHCP) to enable better identification and control of the projector when connected to the Local Area Network (LAN).

DHCP is enabled by default. It can be disabled from *Main Menu — Settings — Network — Change LAN settings*

When DHCP is enabled, current network settings are automatically displayed at *Main Menu — Settings — Network*.

When DHCP is disabled, users can set a fixed IP address for the projector at *Main Menu — Settings — Network — Change LAN settings*.

7.7 Review system status

Projector status menu

Main Menu — Status

The following system status information can be reviewed at any time by pressing the **Info** button the remote control, or by going into the OSD *Main Menu — Status*

- Part number
- Serial number
- Year/week of manufacture
- Current software version
- Lamp runtime and remaining hours
- Projector operating hours (total)
- Network information
- Active source(s)

Detailed source information

Detailed source information is available in the OSD, *Main Menu — Status — Source Information*

Source timing information and other source analysis data can be reviewed at *Main Menu — Status — Source Information — Advanced*.

7.8 Revert to factory settings

About

Main menu — Settings — Factory reset

Performing a factory reset will return the selected setting(s) to the values set when the projector left the factory. Users with advanced rights (power users) can define whether a factory reset will be 'full' or 'limited'. For normal access users, the factory reset default is set to 'limited'.

The following projector settings can be individually selected or deselected for inclusion in the reset:

- Picture
- 3D
- Communication
- Real Color



Picture profiles (Main Menu — Profiles) are not reset during a factory reset.

8. SET UP THE PICTURE

About

This chapter describes how to set up and adjust the picture display in order to get the best possible image on screen.

For best results, picture adjustments should be carried out whenever the source, signal type and/or format is changed. General settings out of the box are standardized to meet accepted industry standard signal levels. Signal levels deviating from these standards will need proper calibration before the output matches the desired result.

Wherever possible, we recommend you use customized test images during picture adjustments.

In general, the following order is recommended when adjusting the picture display:

1. Contrast
2. Gamma
3. Brightness
4. Saturation

Overview

- Select the image orientation
- Use test images
- Apply a display profile
- Adjust lamp power
- Use gamma curves
- Adjust brightness, saturation and contrast
- Choose an aspect ratio

8.1 Select the image orientation

About

Main Menu — Installation — Image Orientation

The projector supports the following installation orientations:

- Desktop front (default)
- Ceiling front
- Desktop rear
- Ceiling rear

8.2 Use test images

About

Main Menu — Installation — Test Image

Built-in test images can be used to check and refine display aspect and focus on the screen when installing the projector or a new lens.

Use the arrow keys to navigate to the required aspect ratio. The display will change dynamically.

Available test images:

- Off
- 4:3
- 16:9
- 16:10
- 1.85:1
- 2.35:1
- 5:4
- Combined (displays all available aspect ratios simultaneously)
- Focus

8.3 Apply a display profile

About

Main Menu — Profiles

Customized picture profiles can be used to optimize the projector setup procedure.

From the profile menu, *Main menu — Profiles*, users can save and apply up to nine (9) user profiles. These user profiles are stored independently of the projector's picture or installation settings and will not be affected during a factory reset (full or limited). To overwrite a profile, simply select the relevant number (1 - 9) when prompted in the **Store settings** popup window.

Settings that can be stored in a profile are:

- Picture: Brightness, contrast, saturation, aspect
- Picture: Advanced picture
- Picture: Advanced picture source selection
- Picture: Calibration RealColor Measured values
- Picture: RealColor: Color Management, DICOM
- 3D: Stereo mode, Stereo glasses type, IR glasses delay.
- Installation: Infitec
- Installation: Lamp settings, Lamp 1 dim, Lamp 2 dim

To set up a profile simply apply the changes, as required, in the Picture, 3D and/or Installation menus and then go to the Profiles menu and select **Store settings**. A popup window will prompt for a profile number (1 - 9) to store the changes under.



Any existing profile settings will be overwritten without warning when that number is selected to store the profile settings.

To apply a custom profile, go to the Profiles menu and select **Recall settings** and then input the relevant number (1 - 9) when prompted in the popup window.

8.4 Adjust lamp power

Adjust lamp power settings

Main Menu — Installation — Lamp

Running the projector lamps at different power levels will alter the brightness of the image on the screen. Higher levels give higher brightness and shorter lamp life time. Lower levels save energy, extend lifetime and reduce brightness.

In ECO mode (*Main Menu — Installation — Lamp — ECO mode*) both lamps are dimmed to the minimum level (250 W) and fan speed is reduced to the lowest possible level. Running the lamps in this mode will increase lamp lifetime from 2000 hours to 2500 hours (approximately). ECO mode is disabled by default.

The Lamp mode sub menu (*Main Menu — Installation — Lamp — Lamp mode*) enables users to apply one of the following power modes:

- Single 1 — only lamp 1 is on
- Single 2 — only lamp 2 is on
- Dual — both lamps are on
- Auto switch

Alternatively, users can set a specific value to each of the lamps, *Main Menu — Installation — Lamp — Lamp 1 Power* or *Main Menu — Installation — Lamp — Lamp 2 Power*. Permissible range is 250 W to 300 W; each step is equal to 5 W. The default value is 300 W. Lamp lifetime (relative) increases linearly as the lamp is dimmed from 2000 hours (300 W) to 2500 hours (250 W).



ECO mode must be disabled for this feature to work.

8.5 Use gamma curves

About

Main menu — Picture — Gamma

Gamma compensation, or gamma correction, is a way of adjusting the signal input to light output characteristics of a display or projector in order to suit the eye's sensitivity to different light levels and to compensate for non-linearities in displays. Without gamma compensation, images may look too dark or too bright, lack detail or depth. By adjusting the amount of gamma compensation changes, you can change not only the perceived brightness levels, but also the ratios of red to green to blue.

Different types of displays have different gamma factors that need to be corrected in order to look and be perceived the same. For example, an MS Windows generated image displayed on a CRT monitor will require a gamma correction value of about 2.5 to avoid color bleaching and burning.

The gamma curve correction formula is based on $\text{output level} \propto \text{input level}^\gamma$.

Gamma curves

The projector has a range of built-in gamma curves, available at *Main menu — Picture — Gamma*.

The name of the curve, for example, Computer 1, describes the recommended use.

Some curves are reserved for Advanced or Service users, and will only be viewable after the access code is input.



Using any of the computer curves for video applications will result in significant image noise.

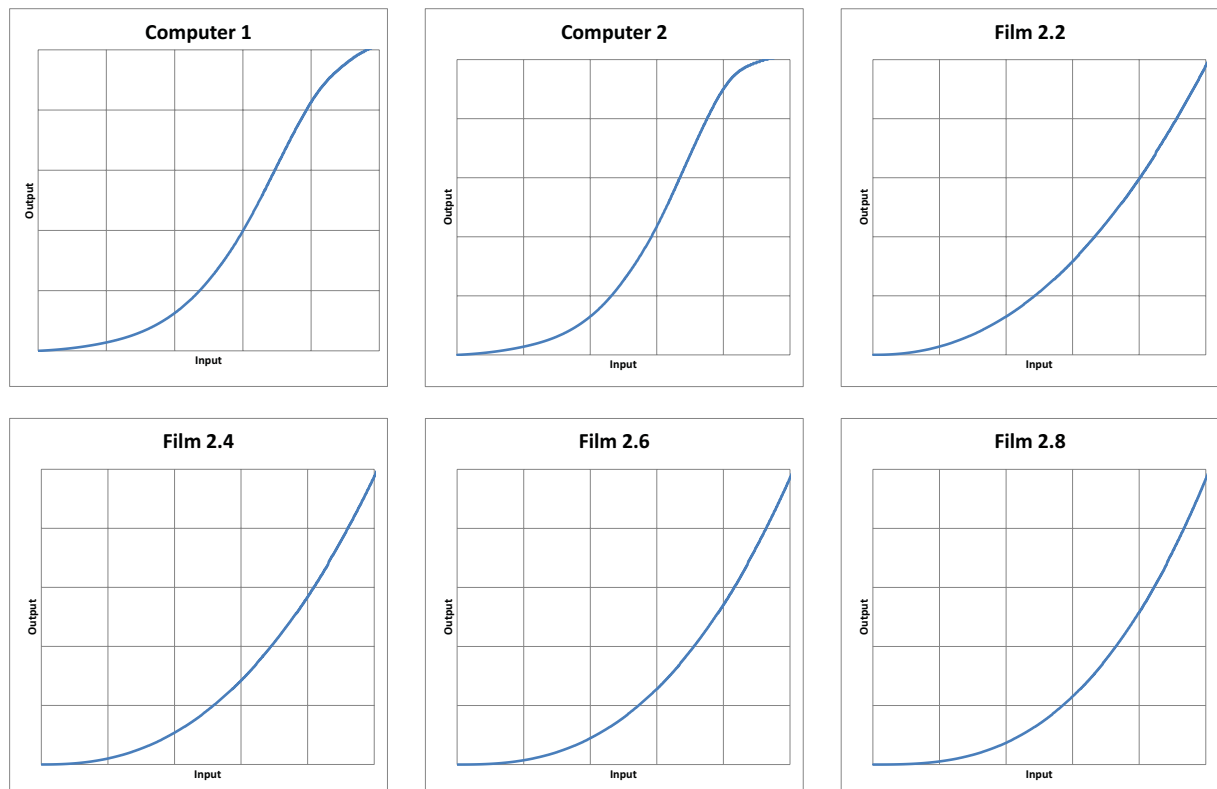


Image 8-1

8. Set up the picture

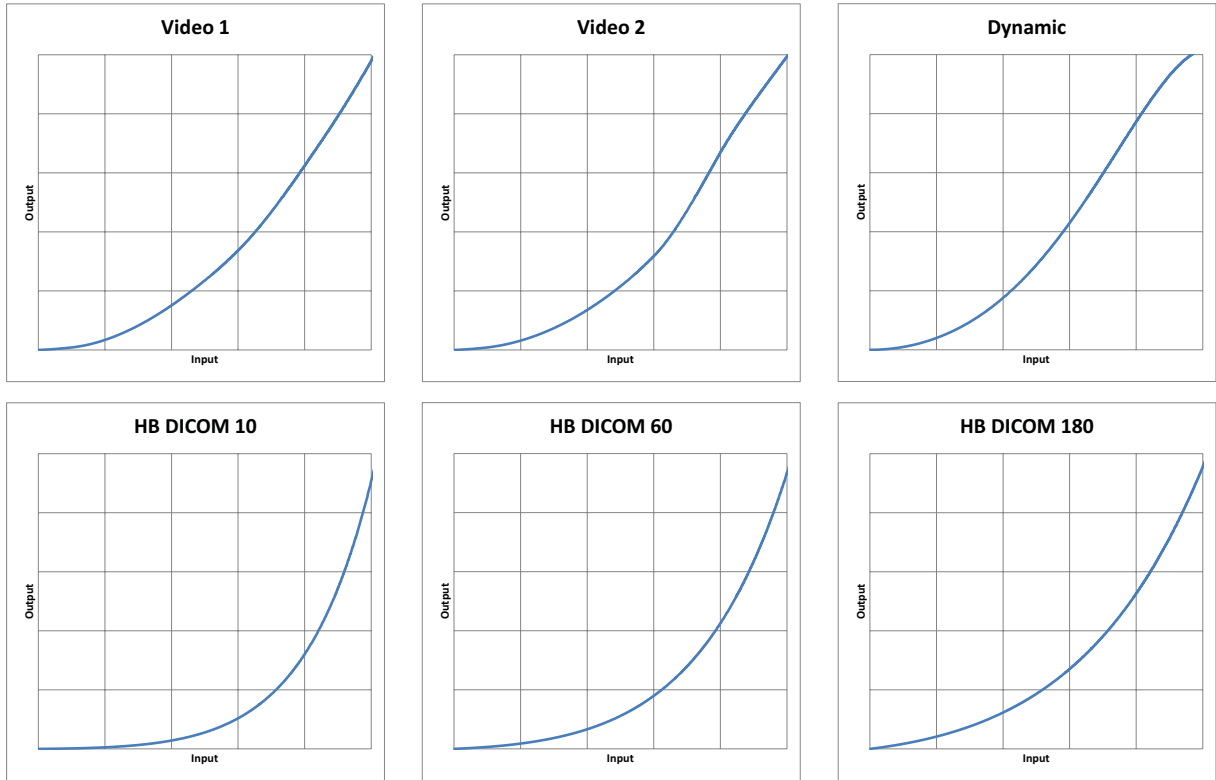


Image 8-2

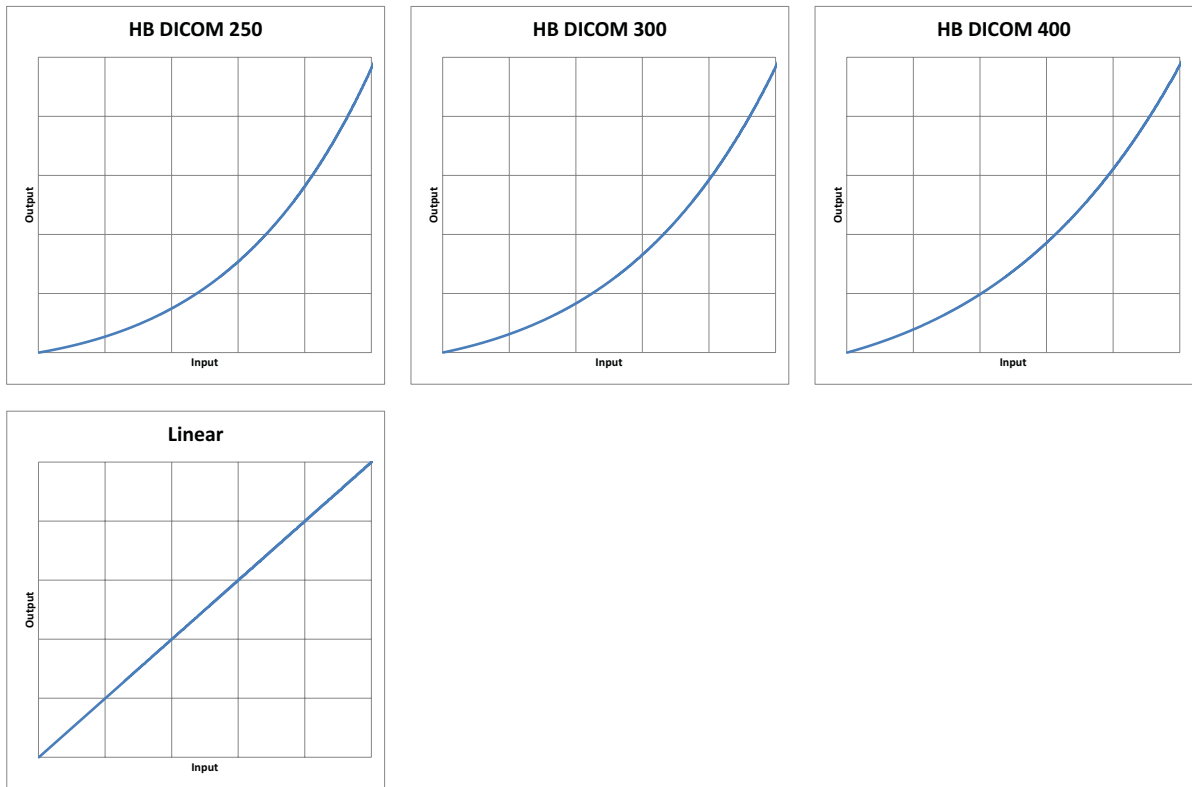


Image 8-3

8.6 Adjust brightness, saturation and contrast

About

The brightness, contrast and saturation levels of an image can be adjusted in any display profile. Any changes to these values will automatically be saved to the active profile when you exit the OSD menu.

In general, it is recommended to adjust image contrast first, then brightness and finally saturation.

For best results, use a proper test image to adjust all picture settings.

Brightness

Main Menu — Picture — Brightness

Brightness levels define the black levels and detail shown in the darkest parts in an image; the higher the value, the brighter the image.

All adjustments (-50 to +50) are dynamic. Any changes will be saved to the active display profile when you exit the OSD menu.



Brightness levels can dramatically impact upon an image; important shadow detail may be lost with incorrect brightness levels.

Contrast

Main Menu — Picture — Contrast

Contrast is the difference in brightness between the brightest and darkest parts in an image; the higher the value, the greater the contrast.

All adjustments (-50 to +50) are dynamic. Any changes will be saved to the active display profile when you exit the OSD menu.

Saturation

Main Menu — Picture — Saturation

Saturation levels impact on the white levels and the intensity of the color display; the higher the value, the more vivid the color display will be.

All adjustments (-50 to +50) are dynamic. Any changes will be saved to the active display profile when you exit the OSD menu.

8.7 Choose an aspect ratio

About

Main menu — Picture — Aspect

This menu option allows you to select the best aspect ratio to display your image:

Aspect ratio	Description
Fill aspect ratio	Fills the imaging device in horizontal and/or vertical direction to maintain the source image aspect ratio.
Fill all	Fills the entire imaging device regardless of the input aspect ratio and resolution.
Fill 16:9	Displays the image with a 16:9 (widescreen) aspect ratio (scaled) image regardless of input aspect ratio and resolution.
Fill 4:3	Displays the image with a 4:3 aspect ratio (scaled) image regardless of the input aspect ratio and resolution.
One to one	Turns off all scaling; projects the input image mapped pixel-by-pixel without scaling.

9. ADVANCED SETUP AND PICTURE ADJUSTMENT

About this chapter

This chapter focuses on reviewing and controlling source signal characteristics to optimize the image display. Successful application of this type of adjustment requires, as a minimum, a fundamental understanding of signal characteristics and processing theory.

Overview

- Set up dual head input
- Adjust VGA input signal
- Apply source corrections

9.1 Set up dual head input

About

Main menu — Installation — Dual head

Dual head input mode enables the left and right half of the image to be connected to the DVI 1 / DVI 2 or HDMI 1 / HDMI 2 interfaces, respectively.

There are some conditions to enabling dual head input mode, specifically:

- The resolution must be exactly the same on both connectors.
- The two connected sources must have identical timing. Any drift will result in a visible rift in the center of the image.
- Connections can only be made on the DVI (1/2) and HDMI (1/2) interfaces.
- Only side-by-side setup can be used.

For example, a dual head setup for a WUXGA (1920 x 1200) 120 Hz source would require two 960 x 1200 120 Hz source resolutions. See image 9-1.



Some graphic cards have problems with detecting the change from single head to dual head mode. If problems occur, disconnect both signal cables and then attempt to enable or disable dual head mode via the OSD or RS-232 control interface.

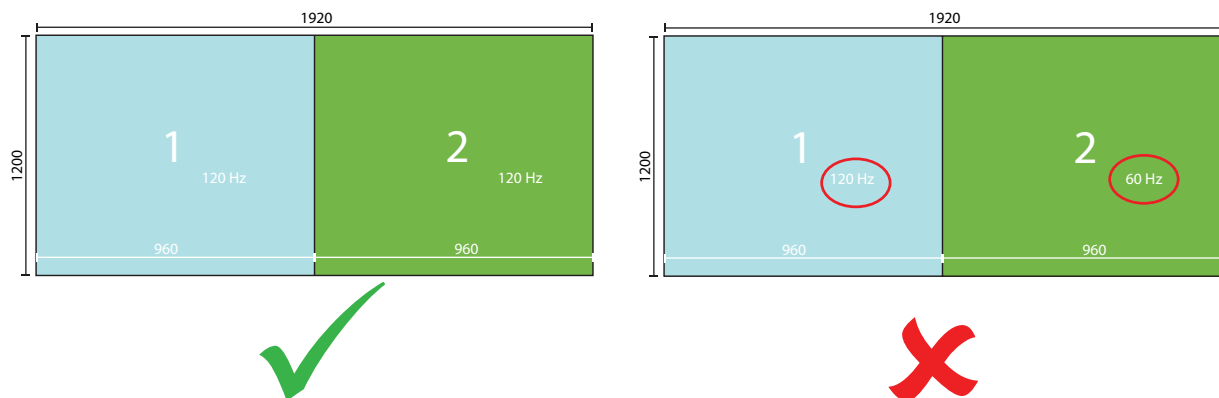


Image 9-1

9.2 Adjust VGA input signal

About

Typically, the projector will automatically adjust source signals to get the best picture on the screen. However analog signals such as VGA may require manual adjustment to eliminate artefacts or disturbances. This can be done via the advanced picture sub menu.

The VGA signal can be adjusted in four (4) ways:

9. Advanced setup and picture adjustment

- Phase
- Frequency
- Horizontal position
- Vertical position



Pressing the 'Auto' setting button on the remote control will auto-correct the source phase and frequency.

Symptom	Action
Image is jittery or displays artefacts	Adjust the source phase to gain a more stable image
Image has vertical bands or displays artefacts	Adjust the source frequency to eliminate bands or manually adjust the width of the image
Image is misaligned or poorly positioned (left or right)	Adjust the horizontal position (left, right) of the image on the screen
Image is misaligned or poorly positioned (up or down)	Adjust the vertical position (up, down) of the image on the screen

9.3 Apply source corrections

About

Whenever a source is detected, the projector uses metadata provided by the source to automatically define:

- Input source type (computer or video)
- Color space (RGB, YCbCr 601, YCbCr 709)
- Input levels (contrast and brightness levels)

In almost all cases, the projector will automatically read and interpret the metadata correctly and display the image properly. However, in some cases the source metadata can be corrupted or the projector may be unable to read the encrypted file correctly, which can lead to the image displaying incorrectly. The following table describes the most common symptoms and solutions for source anomalies.

Symptom	Action	Menu path
Black and white areas of the image display are washed-out or oversaturated	Manually define an alternate input source type (computer / video)	<i>Main menu — Picture — Advanced — Input level</i>
Unnatural colors in image display, for example, green skin tone	Manually apply an alternative color space to the image (RGB, YCbCr 601, YCbCr 709)	<i>Main menu — Picture — Advanced — Color space</i>
Unnatural tint (warm or cold) to image; degraded image detail	Manually adjust each of the contrast and brightness levels	<i>Main menu — Picture — Advanced — Source Correction</i>

10. COLOR CALIBRATION

About this chapter

All F-series projectors are calibrated for maximum color and brightness performance at the factory. Measurements are made on a full white screen with zero gain, no ambient light, and using state of the art measuring tools. This ensures users have a highly accurate base for setting white point and color coordinates.

For many applications the factory calibration will be adequate. However, in those installations where color matching is of the utmost importance, color calibration will be necessary to neutralize any changes in the projected image that may be caused by altering any or all of the following: lamp type, lamp output power, ambient lighting, lens type, screen type.

This chapter discusses the various color and color calibration tools available to the user, as well as gives recommendations for how to calibrate the projector.

Overview

- RealColor™
- BrilliantColor™
- Color calibration best practice
- Calibrate projector color

10.1 RealColor™

About RealColor™

All Barco projectors are measured and calibrated for maximum color and brightness before leaving the factory, however external factors may impact on the accuracy of the projector's color settings. RealColor is a proprietary color management suite developed to give users better, faster and more accurate control of projector color display. This feature is particularly useful in multi-channel installations where precise color reproduction is a necessity.

The basis of RealColor is a unique measurement and characterization process that each projector goes through before it leaves the factory. The results of the procedures, the measured optical and electrical characteristics, are input into the projector and stored as system settings. This data is then used by the projector as a reference point for all future alterations. All projectors are hand calibrated to D65² before leaving the factory.

Use RealColor™ to manage the color display

All colors visible to the eye are defined by the CIE XYZ Chart, ref. image 10-1. The boundary of the colors the projector can display is called the system color gamut.

Changing the system color gamut may be useful to:

- Color match multiple projectors
- Meet defined color standards, e.g. REC 709
- Create a certain 'look' to the image

The RealColor™ menu, Main Menu — Picture — RealColor, provides users with advanced color calibration functions including:

- Apply a BrilliantColor™ mode
- Select a different gamma profile
- Apply or remove automatic color correction
- Calibrate the color display using color temperature and/or color coordinates (x,y)



The system color gamut cannot be expanded outside of the projector's native color gamut.

2. CIE Standard Illuminant D65.

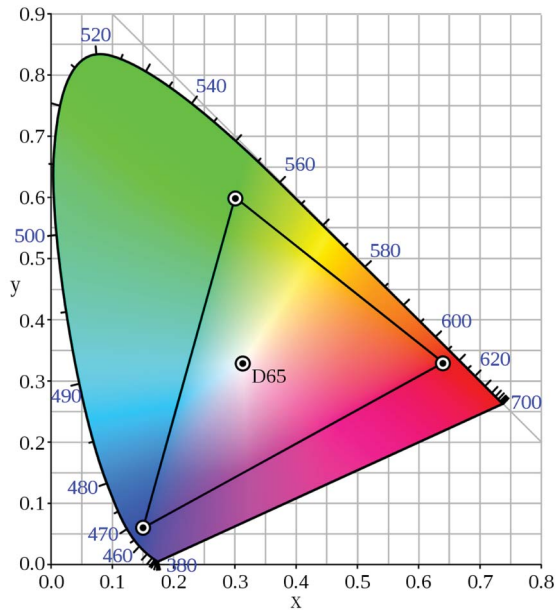


Image 10-1

10.2 BrilliantColor™

About BrilliantColor™

The F35 features Texas Instruments DLP® BrilliantColor™ technology designed to improve the optical efficiency of DLP display engines. For UHP lamps, this technology is able to achieve up to 50% improvement in brightness over traditional three color solutions. BrilliantColor technology offers up to six-color processing enabling a wide color gamut and making it possible to produce over one billion colors. The wide color gamut is better suited to accurately display colors found in nature, giving the viewer a truly life-like image.

BrilliantColor mode availability and display is dependant on the type of color wheel installed in the projector, see next section for details.

BrilliantColor™ modes

Main menu — Picture — RealColor — BrilliantColor

Mode	Description	Color wheel effect	Color Wheel compatibility
Off	No mode is selected.	Only primary colors are on. Spokes are off.	All.
Color	Primary and secondary color gamut is maximized. RGB color replication is prioritized.	All colors are on. Spokes are also on.	High Brightness MKIII color wheel only.
Bright	Primary and secondary color gamut is maximized. Brightness is prioritized.	All colors are on. Spokes are also on.	High Brightness MKIII color wheel only.
Com-puter	Primary and secondary color gamut is maximized. Brightness is prioritized.	All colors are on. Spokes are also on.	All, except High Brightness MKIII color wheel. Native and balanced variants.
Video	Primary and secondary color gamut is maximized. RGB is prioritized.	All colors are on. Spokes are off.	All, except High Brightness MKIII color wheel. Native and balanced variants.
SRP Full	Temporal blanking solution incorporating dark time (K) into the frame to reduce smear in high motion imagery. Only available for 60 Hz video sources.	Blanking pattern is (per frame) RGBRGB — KKKKKK.	VizSim and VizSim bright color wheels only.
SRP Half	Temporal blanking solution incorporating dark time (K) into the frame to reduce smear in high motion imagery. Only available for 60 Hz video sources.	Blanking pattern is (per frame) RGB — KKK — RGB — KKK.	VizSim and VizSim bright color wheels only.

10.3 Color calibration best practice

General

Best practice is to perform the calibration in the same environment as the projector will be used. If this is not possible due to the nature of the installation, calibration should be performed in a controlled light environment (dark room). Too much ambient light falling onto the screen can make it impossible to get exact results.

It is important to do all measurements from the same place in the room, at the same place on the screen. Use a tripod for the chroma meter if possible. The test images should fill the screen and be measured one at a time.

Always calibrate using test images from the same source that is to be used with the projector in the installation.

10.4 Calibrate projector color

Necessary tools

- Calibrated Chroma Meter
- Tripod
- Image source capable of generating pure Red, Green, Blue and White (optionally Cyan, Yellow and Magenta) images

About

The following procedure is applicable for F35 1080, WUXGA and WQXGA projectors fitted with VizSim and VizSim Bright color wheels. For information on the calibration process for projectors using Graphics or High Brightness color wheels, read the ProNet user documentation.

All monitors and displays change over time. Correctly calibrating your projector balances the brightness levels in all three colors (RGB) and establishes the correct white point (D65) which in turn yields a more balanced and controlled level of brightness in your imagery.



The internal temperature of the projector can affect calibration. For best results, allow the projector to warm up for at least 10 minutes before starting the color calibration process.

Procedure

1. Perform a factory reset of the projector. *Main menu — Settings — Factory Reset*
2. Set the BrilliantColor mode to Computer Native. *Main menu — Picture — RealColor — BrilliantColor — Computer native*
3. Set lamp power as it will be set during normal operation. *Main Menu — Installation — Lamp Power*
4. Perform an A/D Calibration if you are using an analogue source (picture | advanced | source correction | AD calibration) with the proper AD calibration image (black to white; grey scale).
5. Deselect (turn off) the Color Correction checkbox. *Main menu — Picture — RealColor — Color Correction*
6. Project the test images. Use the Chroma Meter to measure the projectors color coordinates (x,y) and brightness (any type of brightness value is ok; Foot-Lambert, Candela, Lux, etc) in pure Red, Green, Blue and White.
7. Use the arrow keys to page through the White, Red, Green & Blue test images. Record the X,Y and luminance values for each image. Where necessary, round up the last digit so that there are only 3 digits past the decimal point, e.g. 0.605 instead of 0.6049
8. Input the measured values into the RealColor calibration menu: *Main Menu — Picture — RealColor — Measured Values*.
9. Normalize the brightness values (gain) for red, green, and blue relative to white.

Note: *The luminance value of White (B) acts as the normalizer. To calculate the normalized luminance values (V) for each of the other colors (A), divide each individual luminance value by the white luminance.*

For example: If the luminance value of White (B) is measured as 794, and the Red luminance value (A) is 205, then the normalized value of Red will be 0.26L (205L/794L=0.26L).
10. Input the normalized values into the projector's measured values for luminance: *Main Menu — Picture — Calibration — Measured Values*.

Verify the calibration

1. Turn on color correction. *Main menu — Picture — RealColor — Color Correction*
2. Go to *Main Menu — Picture — RealColor* and select RealColor mode **Coordinate x,y**
3. Set up a full white test image and measure the coordinates (x,y).
4. Verify that the values are within the accepted range. Depending on the accuracy of the Chroma Meter used, the measured coordinates should be close to the following values:

10. Color calibration

- $x = 0.312$
 - $y = 0.329$
5. If the measured coordinates are not within the accepted range (\pm tolerance range), do the following:
- Check that the values input in the OSD are correct
 - Perform the calibration procedure again (see "Color calibration best practice", page 59)

Note: *The calibration tolerance margin will change depending on the type of color wheel installed.*

11. COLOR WHEELS

General

DLP™ technology creates projected images by presenting colors in a sequential format, using the primary colors red, green, and blue to create and reproduce any computer or video generated color or combination of colors. Sequential color display works by displaying only one single color at the time, for very short periods, so that the eye and brain interprets the resulting image as a full color one. The process of creating full color images by switching between the primary colors happens incredibly fast and is imperceptible to almost all viewers. Using a specific color wheel enables projectors to be tailored to specific requirements and applications, such as pure black and white imaging, wide color gamut simulation and visualization, general graphics display, medical imaging, and so forth.

The F35 is available with three color wheel options. Each color wheel option gives slightly different performance characteristics, enabling a perfect match to the desired application. Color wheels can be changed by certified service personnel, either in the field or at Barcoapproved service centres.

Overview

- VizSim
- VizSim Bright
- High Brightness MKIII

11.1 VizSim

About

VizSim is a pure RGB color wheel that delivers great depth of color and a broad gamut, without raw brightness.

Typical applications: post production and home theatre..

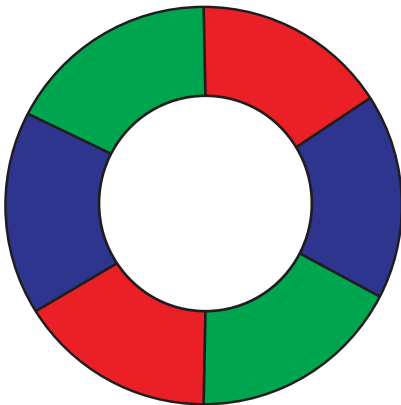


Image 11-1

11.2 VizSim Bright

About

VizSim Bright is perfectly suited to larger venues where brightness and color are of equal importance. The color wheel arrangement enables faster processing and less artefacts than a standard three segment color wheel. In addition, improved coating and higher transmission rates ensure highly accurate colors, making it the recommended choice for multi-channel installations.

Typical applications: simulation, visualization, collaboration room, visitor attraction and multi-channel applications.

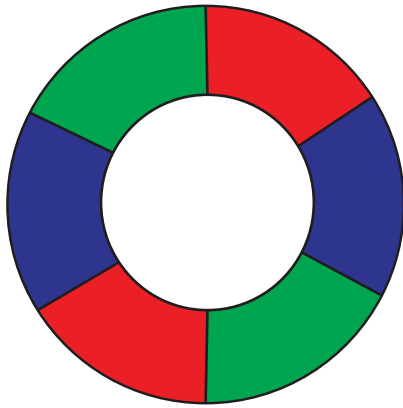


Image 11-2

11.3 High Brightness MKIII

About

High Brightness MKIII delivers on average 17.5%³ more brightness (lumens) than the High Brightness MKII color wheel. When using a High Brightness Color wheel some picture adjustment functions, for example Smear Reduction Processing, are not available.



Color wheels with white segments can cause artefacts when used in conjunction with digital blending. Use of the VizSim or VizSim Bright color wheel is recommended for digitally blended multi-channel applications.

Typical applications: digital signage, education, meeting rooms and large venues.

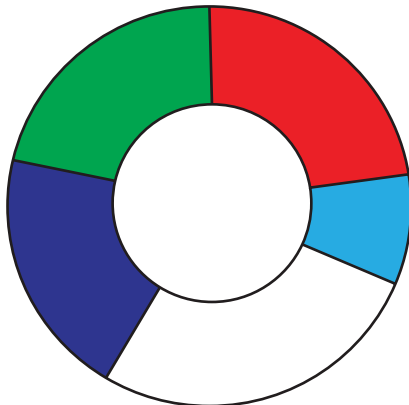


Image 11-3

3. Average figure, actual performance is dependent on product resolution

12. SETUP A MULTICHANNEL INSTALLATION

About this chapter

This chapter describes the main functionality and parameters of the projector when setting up a 2D or passive 3D multichannel installation, that is, an installation comprising several projectors projecting images simultaneously across one or more screens.



Implementing a successful multi-channel installation is a highly technical and demanding task that requires significant theoretical understanding of projection techniques. Barco recommends that all multi-channel installations be carried out by, or in close association with, qualified and experienced projectionists.

Overview

- Synchronization best practice
- The Installation - Synchronization menu
- Dual Head Mode
- Synchronization menu (2D)
- Synchronization menu (3D)
- Troubleshoot source sync issues

12.1 Synchronization best practice

Projector requirements

- Use projectors and lenses that are of the same make and model
- Illumination systems (UHP lamps or LED) should be of the same type and age; lamp/LED power settings should be identical for all projectors
- All projector settings, including current software version, should be identical

Physical setup

- Always align the projectors precisely
- Allow an overlap of 10% of the total image size

General

Wherever possible, synchronization in multi-channel installations should be done at the image generator (IG) level rather than at the projector level.

Consider the setup shown in image 12-1. This is a typical dual head setup where each projector channel is driven by two individual Image Generators (IG). The problem is that the IG are not in sync with each other. Each projector will synchronize its projected image with the DP1 input. Frame rate conversion will be applied to the other input as necessary, but the two projectors will not be in sync with each other.

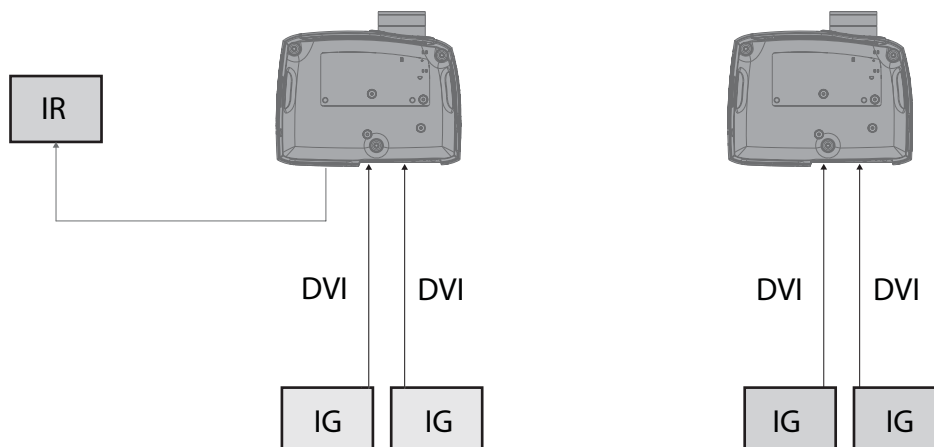


Image 12-1

Synchronizing the IG is the only way all image artifacts may be eliminated from the resulting image and is true for all projector brands; not only Barco projectors. If, for some reason, this is not possible, extra synchronization must be performed by the projectors, which will generate motion artifacts in the resulting image.

12.2 The Installation - Synchronization menu

About

The synchronization menu, *Main menu — Installation — Synchronization*, is divided in two parts: the top part is used for 2D setups and the bottom part is for 3D setup. For complex systems it is possible to have completely different setups for 2D and 3D.

12.3 Dual Head Mode

Dual head mode

Main menu — Installation — Dual Head

Use this radiobox to activate or deactivate dual head mode.

12.4 Synchronization menu (2D)

Synchronization menu

Main menu — Installation — Synchronization

The synchronization menu is divided in two parts: the top part is used for 2D setups and the bottom part is for 3D setup. For complex systems it is possible to have completely different setups for 2D and 3D.

The Synchronization menu is used to define source precedence and sync out signal content. This is used when daisy-chaining projectors; the signal is sent to one projector in the lineup and this projector then emits the same signal on another sync connector to the next projector and so on.

Troubleshooting multichannel synchronization issues can be done using the Status menu. See section "Troubleshoot source sync issues", page 65 for more information.

2D frame lock

Main menu — Installation — Synchronization — 2D frame lock

Used to define which display source will be used for synchronization signal.

See table below for more information:

Menu option	Description
Source	Determine the order of the input frames from the source itself.
BNC Sync-In	Use the signal on the BNC sync-in to determine the order of the input frames.

2D BNC sync out signal

Main menu — Installation — Synchronization — 2D BNC sync-out signal

Used to define which signal source will be sent out on the BNC.

See table below for more information:

Menu option	Description
Off	No signal
Frame lock	Use the same signal as specified for frame lock.
Pass through	Pass on whatever signal is present on the BNC sync-in connector. This is useful to daisy chain multiple projectors and have the same signal sent to all.

12.5 Synchronization menu (3D)

L/R eye sync

Main menu — Installation — Synchronization — 3D L/R sync

This menu is used to define which input source will be used to determine the order of the input frames.

Menu option functionality differs slightly depending on which 3D mode is selected:

- In frame sequential, it tells the projector how to interpret the sequence of input frames; which frame is the left eye frame and which frame is the right eye frame.
- In side-by-side 3D mode, it tells the projector how to synchronize the projected image.

See table below for more information:

Menu option	Frame sequential mode	Side by side mode
Source	The source will determine the order of the input frames. Accurate only with DP sources with inband sync. For other sources this will only be correct 50% of the times and the 3D menu option, Swap eyes, must be used to correct the problem.	Synchronize the projected image to the source; both in terms of V-sync and L/R sync.
BNC sync-in	Use the signal on the BNC sync-in to determine the order of the input frames. A 3D sync signal must be connected between the IG and the BNC sync-in connector on the projector.	Use a 3D display sync from the BNC sync-in connector as the display sync source. The signal must come from another projector's BNC sync-out. That projector must be configured to have the 3D BNC sync-out signal set to 3D display sync.

Sync out signal

Main menu — Installation — Synchronization — BNC sync out signal

This menu is used to select which signal the projector sends out on the BNC sync-out connector.

See table below for more information:

Menu option	Description
Off	No signal
Passthrough	Pass on whatever signal is present on the BNC sync-in connector. This is useful to daisy chain multiple projectors and have the same signal sent to all.
3D display sync	Send a sync signal that other projectors can use to synchronize their display to this projector.
3D glass sync	Send a signal that is used to synchronize the shutter glasses. Connect this signal to the IR or RF emitter.

12.6 Troubleshoot source sync issues

About

The source synchronization status menu, *Main menu — Status — Source Synchronization* can be used to troubleshoot synchronization issues for both 2D and 3D installations.

Status information is provided for 2D and 3D source signals.



This is a status (information) menu only. No browsing or changes to values can be made from this menu.

Setting	Value	Description	Comment
3D	OFF	AS3D mode is not active. 2D projection only.	
	Side by side	AS3D mode is active. Side by side source setup selected.	
	Frame sequential	AS3D mode is active. Frame sequential source setup selected.	
2D frame lock	Source / BNC Sync In	Frame lock source information.	
[2D] frequency	XX Hz	Current frequency (Hz)	
	Unstable	Frequency of display and source signals is not synchronized.	Lack of synchronization between display and source signal frequency may prevent projector processing and displaying image properly, or at all.

12. Setup a multichannel installation

Setting	Value	Description	Comment
[2D] status	Locked	Display and source signals are synchronized.	
	Free running	Display and source signals are not synchronized.	Asynchronous display and source signal may prevent projector processing and displaying image properly, or at all.
3D left/right sync	Source / BNC Sync In	Frame order (L/R) sync information.	
[3D] frequency	XX Hz	Current frequency (Hz)	
	Unstable	Frequency of display and source signals is not synchronized.	Lack of synchronization between display and source signal frequency may prevent projector processing and displaying image properly, or at all.
[3D] duty cycle	XX%	50% duty cycle is required to successfully display picture.	+/- 5% tolerance. Values greater than 55 or less than 45 can prevent projector from displaying image properly, or at all.
[3D] status	Locked	Display and source signals are synchronized.	
	Drifting, free running		
	Free running	Display and source signals are not synchronized.	

13. STEREOSCOPIC MULTICHANNEL SETUP

About

The projector is capable of displaying both active stereo 3D (AS3D) and passive stereo 3D (passive 3D) imagery.

Setup of an 3D Multichannel installation, in particular AS3D, is a technically and practically demanding task that requires advanced theoretical understanding of projection techniques as well as significant practical experience.

In this setup, it is crucial that the projected images are perfectly synchronized to ensure that all projectors project the left eye image at the same time and the right eye image at the same time.

This chapter discusses some of the theory and practicalities involved in setting up an AS3D multichannel installation with the projector.

Overview

- AS3D modes
- The 3D menu
- Synchronous frame sequential
- Asynchronous frame sequential
- Synchronous side by side
- Asynchronous side by side

13.1 AS3D modes

About

When operating as a standalone unit, the F35 supports frame sequential mode as standard. There are two different 3D modes; frame sequential and side-by-side. On its own, the F(L)35 projectors support frame sequential mode with the additional requirement that the input source must have a V-sync frequency between 96 and 121 Hz. Using the DCC120 X-PORT™ module, this requirement is removed and additional support for side-by-side 3D is added.

In **frame sequential 3D** every other frame is interpreted as the left eye frame and the other input frame is interpreted as the right eye frame. To ensure that the projector chooses the correct frames as the left eye and right eye frames, a 3D sync signal should be connected from the IG's display adapter BNC connector to the projector's sync-in connector⁴. The input source must have a V-sync frequency between 90 and 121 Hz. If this signal information is not present then the projector will choose the first input frame as the left eye frame and the next input frame as the right eye frame. This will be wrong half the times the signal is acquired.

When the X-PORT DCC120 module (optional accessory) is installed, the projector also supports side-by-side mode.

In **side-by-side 3D** each input frame is divided in half and the left half of the frame is used as the left eye frame and the right half of the input frame is used as the right eye frame. This makes the output width become half of the input width. If, for example, the input is 1920x1200 @ 60Hz, the output will be 960 x 1200 @ 120Hz⁵. Side-by-side is only available using the X-PORT DCC120.

The projector also supports "passive to active 3D conversion".

To achieve this, **dual head** functionality is enabled and 3D mode is set to **side-by-side**. The projector will take the left half of this combined image, which is in fact the source on DVI1, and use it as the left eye source. Similarly, DVI2 will be used as the right eye source.



In a dual head installation, the two sources need to have the same resolution. For example, if both inputs are 1920x1200 @ 60Hz, the combined dual head source will be seen by the projector as a single 3840x1200 @ 60Hz source.

AS3D Synchronization best practice

The system complexity increases further when the installation consists of multiple channels. If the system is not designed correctly or the individual system components are not configured correctly, image artifacts will occur; or the image might not be displayed at all. A very important aspect of planning any multi-channel installation is how to synchronize the projected channels. When in AS3D it is impossible to obtain realistic 3D imagery if the projectors and projected images are not perfectly synchronized as the left eye information and the right eye information will be slightly different.

4. To make the projector utilize this signal, the Installation -> Synchronization -> 3D L/R sync must be set to BNC sync-in

5. The image may be stretched to fill the projected image by changing the Picture -> Aspect menu setting

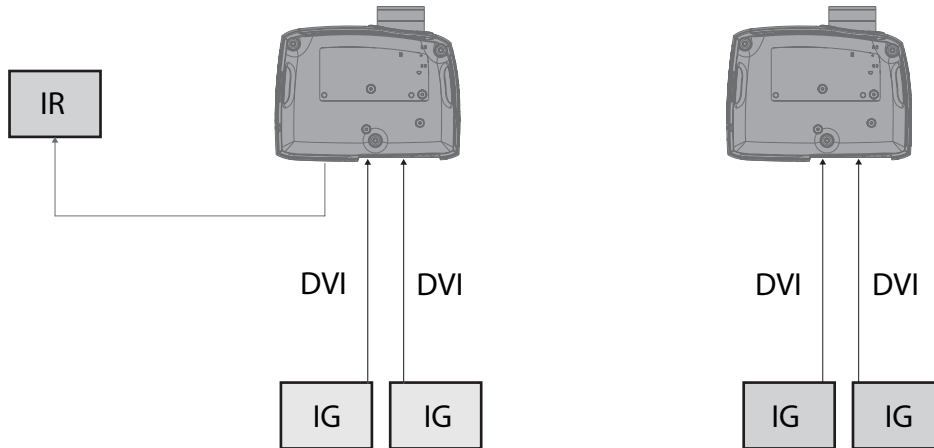


Image 13-1

Consider the setup shown above. This is a typical dual head 3D setup where each projector channel is driven by two individual Image Generators (IG). The problem is that the IG are not in sync with each other. Each projector will synchronize its projected image with one of the DVI inputs. Frame rate conversion will be applied to the other input as necessary but the two projectors will not be in sync with each other. The preferred way to synchronize the projected images is to synchronize the IG. This is the only way all image artifacts may be eliminated from the resulting image and is true for all projector brands; not only Barco projectors.

If, for some reason, one chooses to have asynchronous IG then extra synchronization must be performed by the projectors and while an excellent 3D experience is obtained this way, there will be motion artifacts in the resulting image.

Troubleshooting AS3D multichannel installation issues, and in particular source synchronization issues, can be done using the Status menu. See section "Troubleshoot source sync issues", page 65 for more information.

13.2 The 3D menu

3D Glasses type

Use this menu option to select the type of 3D glasses used in the installation.

Type	Description
IR	Active shutter glasses using an external IR (or RF) emitter.
IR High Brightness	Active shutter glasses using an external IR (or RF) emitter. The time between the left and the right eye image is minimized to increase the brightness of the projected image.
DLP Link™	Active shutter glasses which are synchronized by an embedded light pulse in the projected image.

3D

Main Menu — 3D — 3D

This menu is used for setting the 3D mode.



Menu functionality changes when the X-PORT DCC120 is installed and enabled.

When the X-PORT DCC120 is not installed/enabled, the 3D mode selection is a checkbox (OFF/ON).

With the X-PORT DCC120 installed and enabled, the menu choice extends to three possible values: OFF, Frame Sequential and Side-by-Side.

Mode	X-PORT DCC120 enabled	Description
Off (checkbox unchecked)	No	3D is off. Standard 2D projection. The X-PORT™ DCC120 module is, if attached, disabled.
On (checkbox checked)	No	Source frame inputs are interpreted as left eye frame, right eye frame, left eye frame, right eye frame, ad infinitum. Correct 50% of the time. Use 'Swap eyes' menu option to correct.
Off	Yes	3D is off. Standard 2D projection. The X-PORT™ DCC120 module is, if attached, disabled.

Mode	X-PORT DCC120 enabled	Description
Frame sequential	Yes	Source frame inputs are interpreted as left eye frame, right eye frame, left eye frame, right eye frame, ad infinitum. Correct 50% of the time. Use 'Swap eyes' menu option to correct.
Side by side ⁶	Yes	Each input frame is divided in half; the left half of the frame is used as the left eye frame and the right half of the input frame is used as the right eye frame.
Side by side (dual head mode enabled) ⁷	Yes	The projector will combine the signals from DVI1 and DVI2 (or HDMI1 and HDMI2), place them beside each other and interpret it as a single source. The projector will then take the left half of this combined image, which is in fact the source on DVI1, and use it as the left eye source. Similarly, the right hand side of the image will be generated from DVI2 input.

3D Glass sync delay

Main Menu — 3D — 3D Glass sync delay

Some shutter glasses may need the synchronization pulse to be shifted in time to correct ghosting occurring between the left and the right eye.

This menu option enables the user to set this delay (0–179°) in increments of 1° until crosstalk between the eyes is eliminated.



When using DLP Link™ glasses, this menu option has no effect.

Swap eyes

Main Menu — 3D — Swap eyes

Use this checkbox to swap the order of the eyes (L/R) for 3D glass synchronization.

13.3 Synchronous frame sequential

About

A typical synchronous frame sequential 3D setup is illustrated in image 13-2. In this setup the IGs are synchronized and that the 3D sync from the source is connected from the DIN connector on the IG to the BNC sync-in connector. The source 3D sync is then sent to every projector in the setup.

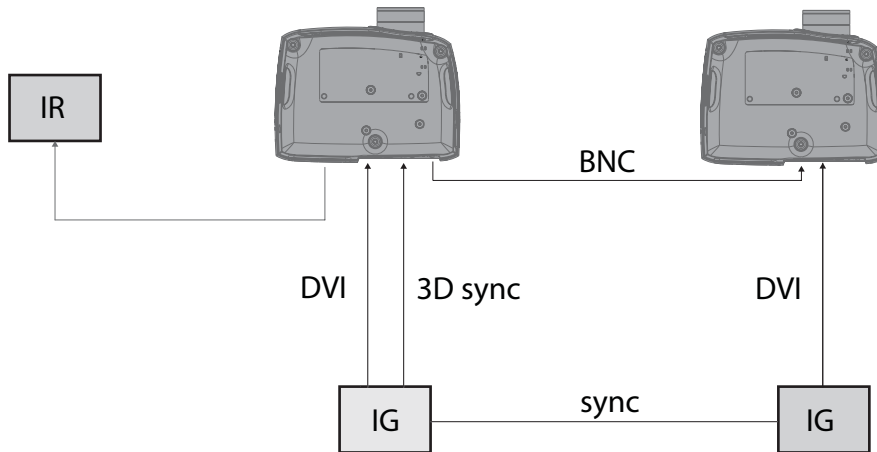


Image 13-2

Setting	Projector 1	Projector 2
3D	Frame sequential	Frame sequential
3D L/R sync	BNC sync-in	BNC sync-in
3D BNC sync out signal display sync	Passthrough ⁹	Passthrough ⁹

6. Side-by-side mode is only available using the X-PORT DCC120 module.

7. Dual Head mode must be enabled from the Installation menu, Main men – Installation – Dual Head

13.4 Asynchronous frame sequential

About

The projector is not capable of displaying asynchronous frame sequential 3D.

13.5 Synchronous side by side

About

In this setup, the IG are synchronized and the projector SYNC connectors are utilized to distribute a system wide display sync.

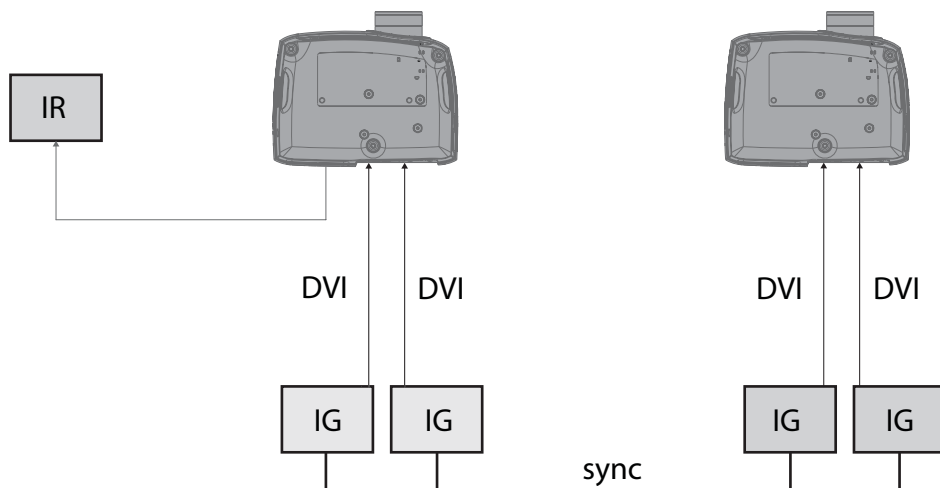


Image 13-3

Setting	Projector 1	Projector 2
3D	Side by side	Side by side
3D L/R sync	Source	Source
3D BNC sync out signal display sync	NA ⁸	NA ⁸

13.6 Asynchronous side by side

About

In asynchronous side-by-side 3D, the projector utilizes the BNC sync-in and sync-out connectors to distribute a system wide display sync. This display sync is used by all projectors to perform frame rate conversion on the input signals if necessary.

In this setup the projectors need the following settings to send/utilize the display sync correctly:

8. The 3D BNC sync-out signal is not used in this scenario but it could for instance be used to drive an IR emitter in which case this setting must be set to 3D glass sync.

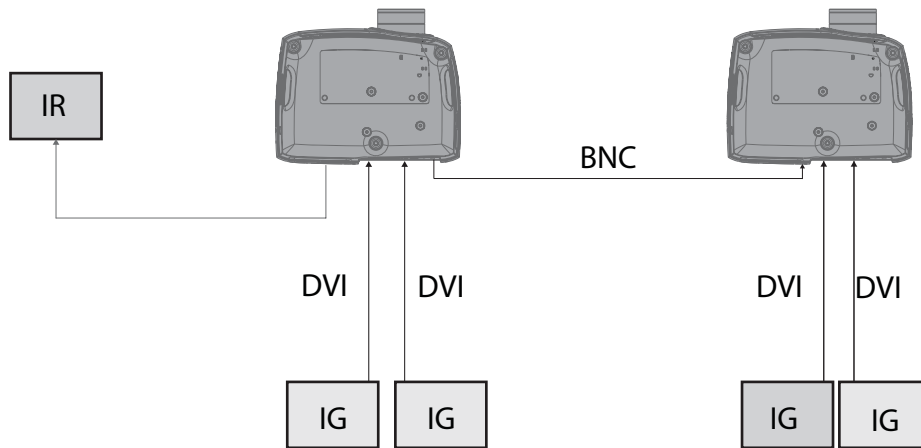


Image 13-4

Setting	Projector 1	Projector 2
3D	Side-by-side	Side-by-side
3D L/R sync	Source	BNC-sync in
3D BNC sync-out signal	3D display L/R sync ⁹	Passthrough ⁹

9. The choice of 3D BNC sync-out on the last projector in the sync chain is irrelevant, but setting it to passthrough is the recommended best practice.

14. X-PORT

About

X-PORT is a module-based post-processing system designed to deliver extended 3D connectivity, such as 3G-SDI and HDMI 3D, as well as additional 3D format support, such as Blu-Ray frame packed, dual input sources, and double flash 3D.

The F35 has two X-PORT interfaces: X-PORT 1 and X-PORT 2.

- X-PORT 1 provides additional image processing options
- X-PORT 2 enables additional input connector options

Overview

- X-PORT Installation
- X-PORT DCC 120
- X-PORT 3G-SDI

14.1 X-PORT Installation

Guidelines for installation



Before installing the X-PORT module, ensure that the mains power supply to both the projector and the source are disconnected and switched off. Failure to do this may damage both the projector and the X-PORT module.

The X-PORT interfaces are at the rear of the projector in the area directly above the connection panel, see image 14-1. Each X-PORT module is designed for a specific interface, X-PORT 1 or X-PORT 2. Should the module be installed to the wrong interface, the projector will not work correctly and the module must be removed and reinstalled before the projector can be used.

Each X-PORT module is physically marked with whether it is an X-PORT 1 or X-PORT 2 module. The projector is also marked with "X-PORT 1" and "X-PORT 2" on the rear cover behind the X-PORT cover plate.

The installation process for each X-PORT module is given in the Quick Start Guide supplied with the module.

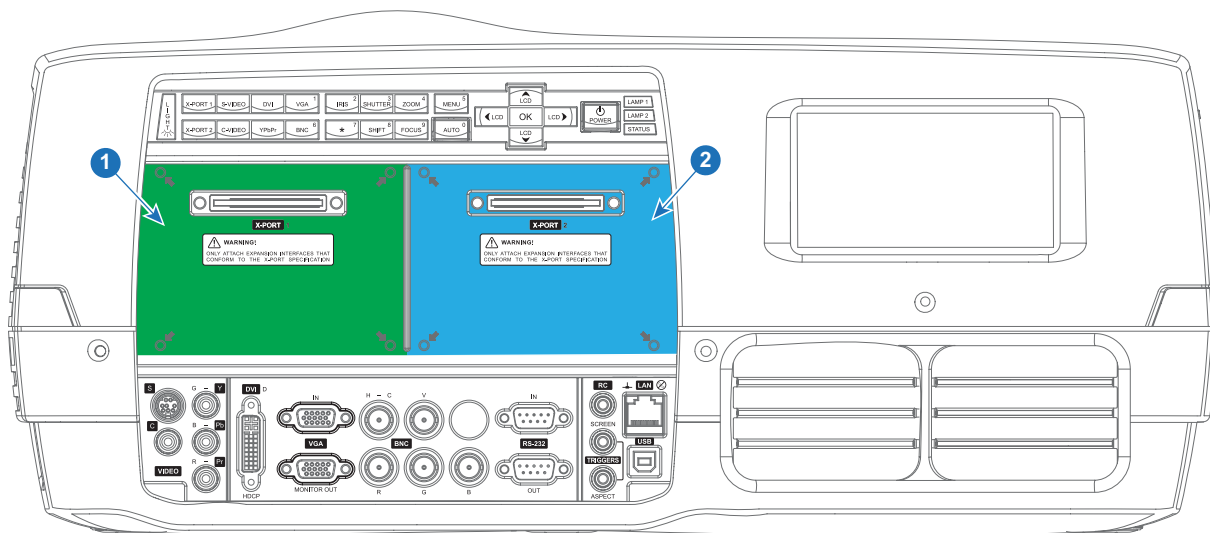


Image 14-1

14.2 X-PORT DCC 120

Functionality and limitations

The X-PORT DCC120:

- Converts any dual head signal from DVI-D and HDMI into one sequential stream of up to 120Hz.
- Performs frame rate conversion for all 3D Stereoscopic sources.
- Minimizes cost of new or existing input-infrastructure.

The module is designed to support dual input 3D (left and right eye in separate cables) and double flash 3D.

Dual input 3D with left and right eye information is supported for HDMI or DVI-D signals.

For double flash 3D, sequential 3D is supported between 48 and 60 Hz (24 to 30 Hz per eye) on a single input connector. The input signal will then be converted to a standard 3D feed between 96 and 120 Hz..

The X-PORT DCC120 is designed for installation to the projector's X-PORT 1 interface. The module has no input connectors. Sources are connected directly to the projector source connector panel (see "Connector Panel", page 38 for more details).

Supported 3D formats for DCC120

Format	Description
Dual head	When dual head mode is enabled, the projector will combine the signals from DVI1 and DVI2 (or HDMI1 and HDMI2), place them beside each other and interpret it as a single source. The two sources need to have the same resolution. For example, if both inputs are 1920x1200 @ 60Hz, the combined dual head source will be seen by the projector as a single 3840x1200 @ 60Hz source. If, now, 3D mode is set to side-by-side, the projector will take the left half of this combined image, which is in fact the source on DVI1, and use it as the left eye source. Information for the right half of the image will be generated from DVI2.
Side-by-side	In side-by-side 3D, each input frame is divided in half and the left half of the frame is used as the left eye frame and the right half of the input frame is used as the right eye frame. This makes the output width become half of the input width. If, for example, the input is 1920x1200 @ 60Hz, the output will be 960 x 1200 @ 120Hz.
Frame sequential	In frame sequential 3D, every other frame is interpreted as the left eye frame and the other input frame is interpreted as the right eye frame. To ensure that the projector chooses the correct frames as the left eye and right eye frames, a 3D sync signal should be connected from the IG's display adapter DIN connector to the projector's BNC sync-in connector. If such a signal isn't present, the projector will choose the first input frame as the left eye frame and the next input frame as the right eye frame. This will be wrong half the times the signal is acquired.

Status Indicator

When the X-PORT DCC120 is operating, the status indicator will glow green.

14.3 X-PORT 3G-SDI

Functionality and limitations

The X-PORT 3G-SDI supports all SDI, HD-SDI and 3G-SDI formats. The module can also support stereo 3D sources when used in combination with X-PORT DCC120. Cable lengths up to 100 metres¹⁰ are supported on 3G-SDI sources.

The module has four (4) BNC-F connectors — Input A (primary, secondary) and Input B (primary, secondary). In general, it is recommended to use Input B for redundancy only.

The X-PORT 3G-SDI module is designed for installation to the projector's X-PORT 2 interface.

Connectivity

Parameter	Description
Main connectors	2xBNC-F: Input A1, Input B1
Secondary connectors	2xBNC-F: Input A2, Input B2
Video formats	SDI (SMPTE 259M, up to 360 Mbps) HD-SDI (SMPTE 292M, up to 1.485 Gbps) 3G-SDI (SMPTE 424M/425M, up to 3.0 Gbps)
Nominal impedance	75 Ω
Scan format	Interlaced or progressive
Return loss	<-15 dB, DC @ 1 MHz to 1.5 GHz
Clock rate	Up to 3 Gbit/s (3G-SDI)
Maximum resolution	1920x1080p @ 60Hz

¹⁰. Allowable length is dependant on cable quality

Supported 3D formats for X-PORT 3G SDI

Format	Supported
480 59.94i	Yes
576 50i	Yes
720 59.94p	Yes
720 60p	Yes
720 50p	Yes
720 23.98p	No
720 24p	No
1035 59.94i	No
1035 60i	No
1080 23.98p	Yes
1080 23.98sF	Yes
1080 24p	Yes
1080 24sF	Yes
1080 25p	Yes
1080 29.97p	Yes
1080 30p	Yes
1080 50i	Yes
1080 59.94i	Yes
1080 60i	Yes
1080 60p	Yes

Status Indicator

The status indicators will glow Green when an active source is detected. In installations where both a primary (input A) and secondary (input B) source are connected, the LED indicator above the active connector will be illuminated.

15. USER MAINTENANCE

About

The F35 is designed with no user-serviceable parts.

The projector Low Frequency Maintenance (LFM) program will generate an OSD message when a scheduled service is required.

The following consumables and accessories — projector lamps, remote control batteries and projector software — may be replaced or updated by the user.

Overview

- Change the projector lamp
- Update the projector firmware

15.1 Change the projector lamp

Necessary tools

Flat iron or Philips head screwdriver

General

The F35 supports hot swapping of the individual lamp modules, enabling the projector to continue operating during a lamp change. An electronic switch is installed on each of the lamp doors; opening the door will activate the switch and remove power supply to the lamp module (approximately 60 seconds).

Each lamp module is fitted with an electronic lamp timer that tracks the life time of the lamp. Remaining lamp time can be checked in the OSD at any time by going to *Main Menu — Status* or by pressing the Info button on the remote control.

The lamp indicator light on the keypad will turn RED when lamp life is expired. The lamp must be changed within 50 operating hours of the lamp life expiring.

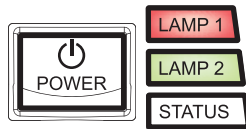


Image 15-1



WARNING: In the unlikely event of a lamp rupture, a limited amount of mercury vapor may be emitted into the room. To avoid inhaling potentially toxic mercury vapor the room should be thoroughly ventilated for at least 30 minutes.



CAUTION: Do not touch the protective glass when replacing the lamp. Touching the protective glass may cause it to overheat and break while in use.



CAUTION: Be extremely careful when removing the lamp module. In the unlikely event that the bulb ruptures, small glass fragments may be generated. The lamp module is designed to contain these fragments, but use caution when removing the lamp module.



CAUTION: Failure to use genuine replacement parts will void your product warranty.

Replace the projector lamp

1. Loosen and remove the relevant lamp door holding screw.

2. Open the lamp door (downwards rotation), and allow to rest on its hinges.

Warning: Residual electrical current can remain in the lamp modules for up to 60 seconds.

Warning: The lamp module will be very hot to touch at this time. Wait for at least 5 minutes before attempting to continue the procedure.

15. User Maintenance

- Once the lamp cage is sufficiently cooled, loosen the three lamp module captive screws by turning them a quarter turn anticlockwise.
- Pull the expired lamp module out and discard.

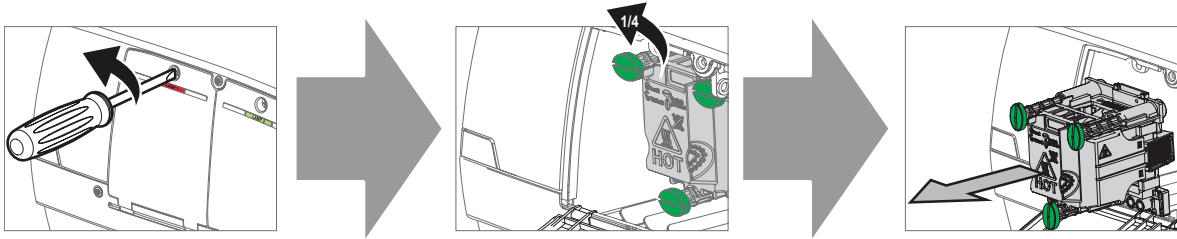


Image 15-2

Note: The projector lamp contains mercury and must be disposed of in accordance with local regulations. Contact your local waste facility or qualified recycling company for information on the recycling program for High Intensity Discharge (HID) lamps in your area.

- Insert the new lamp module, making sure it meets the guide pins properly.
- Install the three captive screws; apply a quarter clockwise turn to fasten.
- Close the lamp door, and install the lamp door holding screw.

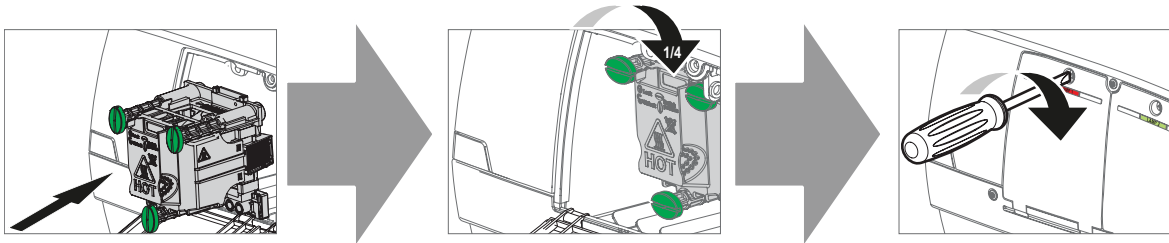


Image 15-3

15.2 Update the projector firmware

Necessary tools

USB memory stick with FAT-file system



Once initiated, the flash procedure can take up to 20 minutes to complete.

Flash procedure

- Go to www.barco.com and select your product. All available software and hardware downloads are filed under the Technical Downloads tab of the product page.
- Download and unzip the firmware .zip file. Extract and save the <version>.tar file to a USB stick with FAT-file system. Use the eject function on your PC to safely remove the device.
- Place the projector in Standby mode.
- Insert the USB stick into the projector's USB port.
- The LCD screen will indicate that an upgrade file is detected and copy the .tar file to the projector memory.
Tip: If the projector has not detected the upgrade file on the USB within 30 seconds, remove and reinsert the USB stick.
Note: If the upgrade file is corrupt or invalid, an "upgrade not valid" message will be displayed on the LCD screen. The upgrade will not be installed in this instance, and the upgrade process must be restarted with a full and correct file.
- Remove the USB stick when instructed by the LCD display. You will have 10 seconds to do this.
Note: The upgrade procedure cannot continue until the USB stick is removed.
- After reboot, the projector will extract and validate the upgrade file. Once the file is verified, the upgrade process will begin. The flash progress is displayed on the LCD status screen.
Note: Do not turn off, power down or remove power to the projector when an upgrade is in progress.
- The projector may restart several times during the upgrade.

9. When the upgrade is completed successfully, the projector will return to Standby mode and the LCD status screen will display the normal projector status window.

16. TECHNICAL SPECIFICATIONS

Overview

- F35
- F35 WQXGA
- F35 Panorama

16.1 F35

Technical Specifications

Technology	single chip DLP® projector LVDS DMD™ with DarkChip3™
Concept	single chip, powered lens shift system
3D capability	INFITEC EX® 3D and Active Stereo
3D glasses compatibility	IR, RF models, DLPLink™
Color wheel	High Brightness / VizSim Bright / VizSim
Resolution	WQXGA (2,560 x 1,600), Panorama (2,560 x 1,080), WUXGA (1,920 x 1,200), 1080p (1,920 x 1,080)
Brightness	Up to 7,500 lumens (typical brightness, this can vary depending on the used color wheel and lens)
Contrast	Up to 8,000 : 1 (Contrast varies based on settings, color wheels, and lens)
Aspect ratio	16:10 (WQXGA), 21 : 9 (2.37 : 1) (panorama), 16:10 (WUXGA), 16:9 (1080p)
Display colors	30-bit RGB
Latency	~19 ms
Computer graphics formats	Up to 2,560 x 1,600 pixels input on all models. Output resolution depends on native resolution. AS3D compatible with WUXGA and 1080p models only.
Horizontal scan frequencies	10 - 150kHz
Vertical scan frequencies	48 - 190 Hz (resolution dependant)
Video formats	HDTV (1080p, 1080i, 720p), EDTV (576p, 480p), SDTV (576i, 480i), NTSC, PAL, SECAM, progressive scan
Lens operation	Motorized zoom, Focus, Shift, Iris and Mechanical shutter
Image width	0.5 - 10 m
Light source	2 x 300W UHP VIDI
Lamp lifetime	Up to 2,000 hours (Full power) / Up to 2,500 hours (Eco mode)
Computer inputs	2 x DVI-I, 2 x HDMI 1.3a, 2 x VGA
Video Input	1 x Component, 1 x S-video
Control possibilities	1 x RJ-45 TCP/IP, 1 x 9-pin D-SUB RS232, 2 x 12V programmable trigger (3.5mm mini jack), 1 x Wired Remote 3.5mm mini jack, 2 x USB
Dimensions	510 x 223 x 376 mm (WxHxD)
Weight	12.7 kg
Shipping Dimensions	780 x 370 x 520 mm (WxHxD)
Shipping Weight from Factory	20 kg
Power requirements	8.4A ~100-240V 50-60Hz, typical consumption: Max 815W@100V
Conformances	CCC, cNus, FCC Class A, cUL, UL and CE
Operating temperature	10 - 40 °C
Storage temperature	-20 - 60 °C
Operating humidity	20 - 80% RH
Storage humidity	10 - 90% RH
Color	Black metallic

16. Technical Specifications

Warranty	3 years, 500 hours or 90 days on lamp (whichever comes first). Up to 5 years total warranty available: Conditions apply.
24-7 documentation	This projector is designed and warranted for heavy duty 24/7 operation. Specific measures and design considerations have been made in order for it to comply with stringent requirements in challenging applications.
MTBF	34,662 hours
BTU per hour	less than 3,109

16.2 F35 WQXGA

Technical Specifications

Projector type	single-chip DLP projector
Technology	LVDC DMD™ with DarkChip3™
Resolution	2,560 x 1,600 (WQXGA)
Brightness	7,000 ANSI lumens
Contrast ratio	6,500:1
Brightness uniformity	>90%
Aspect ratio	16:10
Lens type	All glass lenses
Lenses	wide angle lens EN42 (0.8:1), ultra wide zoom lens EN46 (0.8-1.21:1), wide angle lens EN43 (1.2-1.7:1), standard zoom EN41 (1.7-2.5:1), long throw zoom EN44 (2.50-4.60 :1), ultra wide fixed EN47 (0.65 : 1)
Optical lens shift	Vertical: -144% to +144%; Horizontal: -70% to +70% (on zoom lenses)
Color correction	RealColor™
Lamps	2 x 300W UHP Vidi
Lamp lifetime	Up to 2,000 hours (full power) / Up to 2,500 hours (eco mode)
Lamp house, quick replace	yes
Lamp warranty	500 hours or 90 days
Sealed DLP™ core	Yes
Orientation	table - ceiling
Inputs	2 x DVI-I; 2 x HDMI 1.3a; 2 x VGA; Video inputs; 1 x component; 1 x S-video
Input resolutions	Up to 2,560 x 1,600 pixels input on all models. Output resolution depends on native resolution; HDTV (1080p, 1080i, 720p); EDTV (576p, 480p); SDTV (576i, 480i); NTSC, PAL, SECAM; progressive scan
Software tools	Projector Toolset, ProNet
Control	1 x RJ-45 TCP/IP; 1 x 9-pin D-SUB RS232; 2 x 12V programmable trigger (3.5mm mini jack); 1 x Wired Remote 3.5mm mini jack; 2 x USB
Network connection	10/100 base-T, RJ-45 connection
Power requirements	100-240V / 50-60Hz
Power consumption	912W
Noise Level	34 dB
Operational ambient temperature	10-40°C / 50°-104°F
Operational humidity	20-80% RH
Dissipation BTU	max 3,109 BTU/h
Dimensions (WxLxH)	510 x 376 x 233 mm / 20.08 x 14.80 x 9.17 inches
Weight	12.7 kg (28.0 lbs)
Standard accessories	Power cord, wireless remote control
Certifications	Compliant with FCC, part 15 Class A and CCC, cCSAus, cUL, UL and CE
Warranty	Limited 3 years parts and labor. Extendable up to 5.

16.3 F35 Panorama

Technical Specifications

Projector type	Single-chip DLP projector
Technology	LVDC DMD™ with DarkChip3™
Resolution	2,560 x 1,080 (Panorama)
Brightness	5,500 ANSI lumens
Contrast ratio	6,500:1
Brightness uniformity	>90%
Aspect ratio	21:9
Lens type	All pure glass lenses
Lenses	wide angle lens EN42 (0.8:1), ultra wide zoom lens EN46 (0.8-1.21:1), wide angle lens EN43 (1.2-1.7:1), standard zoom EN41 (1.7-2.5:1), long throw zoom EN44 (2.50-4.60 :1), ultra wide fixed EN47 (0.65 : 1)
Optical lens shift	Vertical: -222% to +222%; horizontal: -78% to +78% (on zoom lenses)
Color correction	RealColor™
Lamps	2 x 300W UHP Vidi
Lamp lifetime	Up to 2,000 hours (full power) / Up to 2,500 hours (eco mode)
Lamp house, quick replace	yes
Lamp warranty	500 hours or 90 days
Sealed DLP™ core	Yes
Orientation	table - ceiling
Inputs	2 x DVI-I; 2 x HDMI 1.3a; 2 x VGA; Video inputs; 1 x component; 1 x S-video
Input resolutions	Up to 2,560 x 1,600 pixels input on all models. Output resolution depends on native resolution; HDTV (1080p, 1080i, 720p); EDTV (576p, 480p); SDTV (576i, 480i); NTSC, PAL, SECAM; progressive scan
Software tools	Projector Toolset, ProNet
Control	1 x RJ-45 TCP/IP; 1 x 9-pin D-SUB RS232; 2 x 12V programmable trigger (3.5mm mini jack); 1 x Wired Remote 3.5mm mini jack; 2 x USB
Network connection	10/100 base-T, RJ-45 connection
Power requirements	100-240V / 50-60Hz
Power consumption	912W
Noise Level	34 dB
Operational ambient temperature	10-40°C / 50°-104°F
Operational humidity	20-80% RH
Dissipation BTU	max 3,109 BTU/h
Dimensions (WxLxH)	510 x 376 x 233 mm / 20.08 x 14.80 x 9.17 inches
Weight	12.7 kg (28.0 lbs)
Standard accessories	Power cord, wireless remote control
Certifications	Compliant with FCC, part 15 Class A and CCC, cCSAus, cUL, UL and CE
Warranty	Limited 3 years parts and labor. Extendable up to 5.

17. ENVIRONMENTAL INFORMATION

Overview

- Disposal information
- RoHS compliance
- Production address

17.1 Disposal information

Disposal Information

Waste Electrical and Electronic Equipment



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

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

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

Disposal of batteries in the product



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

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

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

17.2 RoHS compliance

中国大陆 RoHS Chinese Mainland RoHS

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

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

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

17. Environmental information

内部线路 Internal wiring	O	O	O	O	O	O
散热片(器) Heatsinks	O	O	O	O	O	O
光学镜头 Optical lenses	X	O	X	O	O	O
镜头支架 Lensholder	X	O	O	O	O	O
灯泡 Lamp	O	X	O	O	O	O
底架 Chassis	O	O	O	O	O	O
外壳 Enclosure	O	O	O	O	O	O
电机 Motor	X	O	O	O	O	O
电源供应器 Power Supply Unit	X	O	O	O	O	O
风扇 Fan	X	O	O	O	O	O
附電池遙控器 Remote control	X	O	O	O	O	O

这个表被制备按照规定 SJ/T 11364

This table is prepared in accordance with the provisions of SJ/T 11364.

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。

O: Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求。

X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

Turkey RoHS compliance



■ Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

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

17.3 Production address

Factory

Barco Fredrikstad AS

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