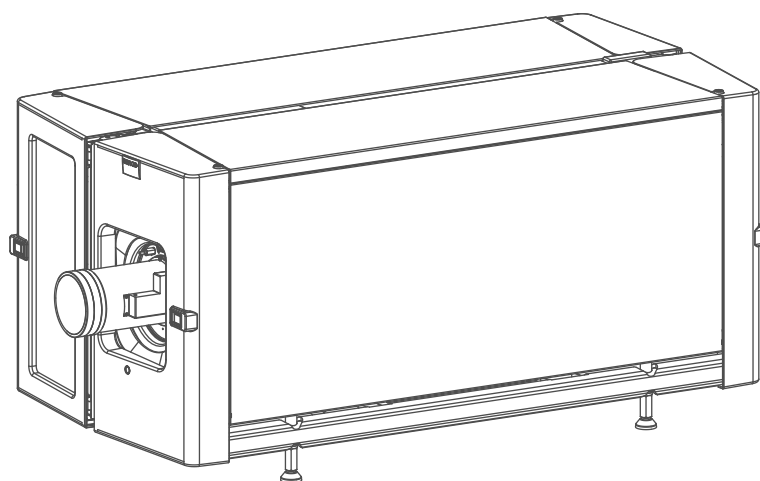


XDL



Installation Manual

Changes

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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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC responsible: Barco Inc.
3059 Premiere Parkway Suite 400
30097 Duluth GA, United States
Tel: +1 678 475 8000

EMC notices

EN55032/CISPR32 Class A MME (MultiMedia Equipment)

Warning : This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

GB/T 9254 Class A ITE (Information Technology Equipment)

Warning : This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

BSMI Taiwan Class A statement:

警告使用者：此為甲類資訊技術設備，於居住環境中使用，可能會造成射頻擾動，在此情況下，使用者會被要求採取某些適當的對策。

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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.

If the purchaser or a third party carries out modifications or repairs on goods delivered by Barco, or if the goods are handled incorrectly, in particular if the systems are operated incorrectly or if, after the transfer of risks, the goods are subject to influences not agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by Barco either.

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2. Reverse-Engineering. You may not reverse engineer, decompile, disassemble or alter this software product.

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GNU-GPL code

If you would like a copy of the GPL source code contained in this product shipped to you on CD, please contact Barco. The cost of preparing and mailing a CD will be charged.

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Safety

1

Overview

- General considerations
- Safety training to be provided by the installer
- Important safety instructions
- Product safety labels
- High Brightness precautions: Hazard Distance (HD)
- HD for fully enclosed projection systems
- HD in function of modifying optics

About this document

Read this document attentively. It contains important information to prevent personal injury while installing and using the XDL projector. Furthermore, it includes several cautions to prevent damage to the XDL projector. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before installing the XDL projector.

Clarification of the term “XDL” used in this document

When referring in this document to the term “XDL” means that the content is applicable for following Barco products:

- XDL-4K30, XDL-4K60, XDL-4K75

Model certification name

- XDL



Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. Observing the specification mentioned in this chapter is critical for projector performance. Neglecting this can result in loss of warranty.

1.1 General considerations



WARNING: Be aware of suspended loads.



WARNING: Wear a hard hat to reduce the risk of personal injury.



WARNING: Be careful while working with heavy loads.



WARNING: Mind your fingers while working with heavy loads.



WARNING: In case of optical radiation emergency, please disconnect the device from the mains current; this by employing the mains switch. In case the mains switch is not easily accessible, the projectors shall be disconnected by other means for example the mains junction box. It is advised to employ the shutter or select a black image on the projector in order to reduce the risk of the emergency.

General safety instructions

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

Notice on safety

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

Notice on optical radiation

This projector embeds extremely high brightness (radiance) lasers; this laser light is processed through the projector's optical path. Native laser light is not accessible by the end user in any use case. The light exiting the projection lens has been diffused within the optical path, representing a larger source and lower radiance value than native laser light. Nevertheless the projected light represents a significant risk for the human eye and skin when exposed directly within the beam. This risk is not specifically related to the characteristics of laser light but solely to the high thermal induced energy of the light source; which is equivalent with lamp based systems.

Thermal retinal eye injury is possible when exposed within the Hazard Distance (HD). The HD is defined from the projection lens surface towards the position of the projected beam where the irradiance equals the maximum permissible exposure as described in the chapter "Hazard Distance".



WARNING: No direct exposure to the beam within the hazard distance shall be permitted, RG3 (Risk Group 3) IEC EN 62471-5:2015



CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Users definition

Throughout this manual, the term SERVICE PERSONNEL refers to persons having appropriate technical training and experience necessary to be knowledgeable of potential hazards to which they are exposed (including, but not limited to HIGH VOLTAGE ELECTRIC and ELECTRONIC CIRCUITRY and HIGH BRIGHTNESS PROJECTORS) in performing a task, and of measures to minimize the potential risk to themselves or other persons. The term USER and OPERATOR refers to any person other than SERVICE PERSONNEL, AUTHORIZED to operate professional projection systems.

The XDL projector is intended "FOR PROFESSIONAL USE ONLY" by AUTHORIZED PERSONNEL familiar with potential hazards associated with high voltage, high intensity light beams and high temperatures generated by the light source and associated circuits. Only qualified SERVICE PERSONNEL, knowledgeable of such risks, are allowed to perform service functions inside the product enclosure.

1.2 Safety training to be provided by the installer

Users definition

The XDL projector is intended for persons who have been instructed and trained by a skilled person (installer or service personnel) to identify energy sources that may cause injury and to take precautions to avoid unintentional contact with or exposure to those energy sources.

The skilled person must instruct the user about:

- High intensity light beam. The user must respect the exclusion zone, based on the light beam Hazard Distance (HD).
- Dangerous energy sources inside the projector. The user is not allowed to remove any cover from the projector.
- The installation, maintenance or service is for skilled persons only.
- The requirements for a **restricted access location**, an **exclusion zone** and a **restriction zone**.

Restricted access location

To protect untrained persons and children, the projector must be installed in a **restricted access location**. The definition of a **restricted access location** is a location for equipment where both of the following paragraphs apply:

- Access can only be gained by skilled persons (installer or service personnel) or persons who have been instructed and trained by a skilled person. The persons must have been instructed about the reasons for the restriction applied to the location and about the precautions that shall be taken.
- Access is only possible through the use of the tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

Why a restricted access location: this is an RG3 product. Based on international requirements, no person is allowed to enter the projected beam within the zone between the projection lens and the related Hazard Distance (HD). This shall be physically impossible by creating sufficient separation height and width or by placing optional barriers. Within the restricted area operator training is considered sufficient. The applicable separation heights and widths are discussed in "High Brightness precautions: Hazard Distance (HD)", page 17.

Exclusion zone

The projector radiates heat on its external surfaces and from ventilation ducts during normal operation. 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 not be less than 40 cm (16 in).

Restriction zone

To protect untrained users and children against high intensity light beams, the light beam Hazard Distance (HD) shall be taken into account.

1.3 Important safety instructions

To prevent the risk of electrical shock

- This product is equipped with a five-terminal barrier strip for the connection of a 3W+N+PE or 3W+PE three phase power system.
- This projector should be operated from an AC power source. Ensure that mains voltage and capacity matches the projector electrical ratings.
- **Electrical ratings for Star system (3W+N+PE):**
 - The cross-sectional area of the conductors in the power supply cord shall be 4 mm² to 6 mm², 10 AWG to 8 AWG.
 - The electrical rating of the XDL-4K60/75 projector is 200-240V/346-415V 3W+N+PE 16A 50-60Hz (Y connection).
 - The electrical rating of the XDL-4K30 projector is 200-240V/346-415V 3W+N+PE 10A 50-60Hz (Y connection).
 - The building installation has to be provided with a circuit breaker of 25-40 A to protect the complete unit.
- **Electrical ratings for Delta system (3W+PE):**
 - The cross-sectional area of the conductors in the power supply cord shall be 6mm², 8AWG.
 - The electrical rating of the XDL-4K60/75 projector is 200-240V 3W+PE 28A 50-60Hz (Δ connection).
 - The electrical rating of the XDL-4K30 projector is 200-240V 3W+PE 15A 50-60Hz (Δ connection).
 - The building installation has to be provided with a circuit breaker of 40 A to protect the complete unit.
- **REMARK for XDL-4K60/75 projector:** In case of a Delta system (3W+PE) the circuit breakers rated lower than 40A can trip unwanted because of the internal laser power supply redundancy system. The projector remains working if one internal laser power supply module fails or is removed, but this results in a higher current in one mains power line. In case of very low line voltage (between 180V and 200V), and one failed or removed laser power supply, the line current can reach 35A.
- Installation according to the local electrical code and regulations by qualified technical personnel only. Do not defeat the purpose of the grounding.
- The cross-sectional area of the UPS inlet cord shall be not less than 0.75 mm² or AWG 18.
- The electronics of the projector (UPS INLET) must be powered either from a suitable UPS unit or from the power outlet socket (UPS OUTLET) provided on the projector. An adapted short power cord (2-pole 3-wire grounding) is added to the projector accessories to loop through the power from UPS OUTLET to UPS INLET.
- The provided power output socket (UPS OUTLET) on the projector may only be used to provide power to the projector electronics (UPS INLET). Never connect other devices to this power output socket.
- A readily accessible disconnect device must be incorporated externally to the equipment for removal of the power to the projector mains terminals.
- Disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.
- 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

- To prevent injury and physical damage, always read this manual and all labels on the system before powering the projector or adjusting the projector.
- Do not underestimate the weight of the projector. The projector weighs ± 240 kg (± 529 lbs). To prevent personal injury a hoisting tool should be used to lift the projector.
- To prevent injury, ensure that the lens, cooling system 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 projector:** This projector embeds extremely high brightness (radiance) lasers; this laser light is processed through the projectors optical path. Native laser light is not accessible by the end user in any use case. The light exiting the projection lens has been defused within the optical path, representing a larger source and lower radiance value than native laser light. Nevertheless the projected light represents a significant risk for the human eye when exposed directly within the beam. This risk is not specific related to the characteristics of laser light but solely to the high thermal induced energy of the light source; which is comparable with lamp based systems. Thermal retinal eye injury is possible when exposed within the Hazard Distance. The Hazard Distance (HD) is defined from the projection lens surface towards the position of the projected beam where the irradiance equals the maximum permissible exposure as described in the chapter "High Brightness precautions: Hazard Distance (HD)", page 17.
- Based on international requirements, no person is allowed to enter the projected beam within the zone between the projection lens and the related Hazard Distance (HD). This shall be physically impossible by creating sufficient separation height or by placing optional barriers. Within the restricted area operator training is considered sufficient. The applicable separation heights are discussed in "High Brightness precautions: Hazard Distance (HD)", page 17.
- The projector shall be installed in a restricted access room equipped with a key or security lock preventing untrained persons entering the Class 4 use zone.
- Before attempting to remove any of the projector's covers, disconnect the projector power cable from the mains electricity for removal of all power from the projector.
- When required to remove all power from the projector (e.g. during service), always disconnect the power from the projector mains terminals and UPS INLET connector. Use the disconnect device in the building installation to disconnect the power to the projector mains terminals, and unplug the power cord at the UPS INLET connector if the UPS INLET is separately powered.
- 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.
- Lenses, shields or 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.
- The associated Laser Safety responsible of the unit must evaluate the setup before the unit may be started.
- Never point or allow light to be directed on people or reflective objects within the HD zone.
- If the unit is shut down, remove the key control from the system; avoiding unauthorized startup.
- All operators shall have received adequate training and be aware of the potential hazards.
- Strictly minimize the number of people who have access to the unit. The unit may never be operated without permission of the responsible for laser safety.
- When the projected light causes a dangerous situation the operator must hit the beam stop button which is located close to the control panel. The beam stop removes all power from the laser power supplies.
- Don't put your hand in front of the beam.
- Do not clean the port window when the projector is switched on.
- Position the hoses of the cooling system so that they will not be tripped over, pulled, or contact hot surfaces.

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.

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 this projector.
- Do not place any object in the projection light path at close distance to the projection lens output. The concentrated light at the projection lens output may result in damage, fire or burn injuries.
- Ensure that the projector is solidly mounted so that the projection light path cannot be changed by accident.
- Do not cover the projector or the lens with any material while the projector is in operation. . 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 projector and cooling system to the outside of the building.
- Let the projector cool completely before storing. Remove cord from the projector when storing.

To prevent projector damage

- The air filters of the projector must be cleaned or replaced on a regular basis. Cleaning the booth area 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.
- If more than one projector is installed in a common projection booth, the exhaust air flow requirements are valid for EACH individual projector system. Note that inadequate air extraction or cooling will result in decreased life expectancy of the projector as a whole as well as causing premature failure of the lasers.
- 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 it's covers in place.
- Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. The 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.
- Proper operation of the projector can only be guaranteed in table mounted position. However, it is permitted to place the table-mounted projector under a specific tilt or roll angle. See installation procedure for correct installation.
- **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 projectors mains terminals before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning. Never use strong solvents, such as thinner or benzine or abrasive cleaners, since these will damage the cabinet. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution.
- To ensure the highest optical performance and resolution, the projection lenses are specially treated with an anti-reflective coating, therefore, avoid touching the lens. To remove dust on the lens, use a soft dry cloth. For lens cleaning follow the instructions precisely as stipulated in the projector manual.
- Rated maximum ambient temperature, $t_a = 35\text{ }^{\circ}\text{C}$ (95 $^{\circ}\text{F}$).
- Rated humidity = 5% RH to 80% RH Non-condensed.
- An external frame must be used to stack projectors.
- For functionality and reliability, the projector requires accurate temperature control and cooling below ambient. Therefore a liquid cooling system is provided consisting of liquid circuits inside the projector which are connected via hoses to external chillers. Only chiller models and hoses exclusively developed for this application and approved by Barco are allowed to be used. Barco approved chillers models are listed on the Barco website.
- An adequate draining system must be coupled with the drain pipes at the bottom of the projector to collect and lead away the condensed water from the built-in air-dryers. The capacity of the draining system must meet the humidity conditions wherein the projector operates. The water drain must arrive into an 'open' water container!

On servicing


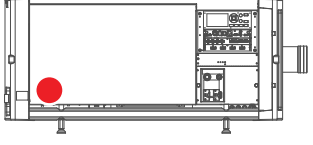

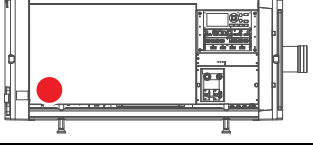
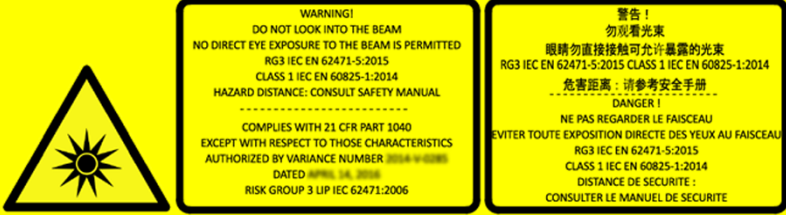
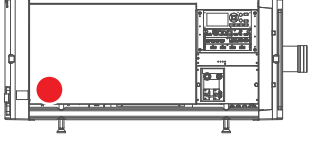

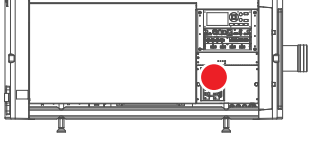

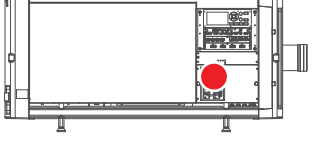
- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage potentials and risk of electric shock.
- Refer all servicing to qualified service personnel.
- Attempts to alter the factory-set internal controls or to change other control settings not 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.

Safety Data Sheets for Hazardous Chemicals


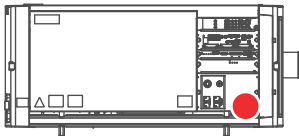


For safe handling information on chemical products, consult the Safety Data Sheet (SDS). SDSs are available upon request via safetydatasheets@barco.com.

1.4 Product safety labels

Light beam related safety labels

Label image	Label description	Label location
	Hazard RG3: not for household use symbol	
	Hazard RG3: optical radiation warning symbol	
		
<p>WARNING! DO NOT LOOK INTO THE BEAM NO DIRECT EYE EXPOSURE TO THE BEAM IS PERMITTED. RG3 IEC EN 62471-5:2015. CLASS 1 IEC EN 60825-1:2014. HAZARD DISTANCE: CONSULT SAFETY MANUAL.</p> <p>COMPLIES WITH 21 CFR PART 1040 EXCEPT WITH RESPECT TO THOSE CHARACTERISTICS AUTHORIZED BY VARIANCE NUMBER 2014-V-0285 DATED APRIL 14, 2016 RISK GROUP 3 LIP IEC 62471:2006.</p> <p>警告！勿观看光束 眼睛勿直接接触可允许暴露的光束 (RG3 IEC EN 62471-5:2015 CLASS 1 IEC EN 60825-1:2014) 危害距离：请参考安全手册</p> <p>DANGER ! NE PAS REGARDER LE FAISCEAU EVITER TOUTE EXPOSITION DIRECTE DES YEUX AU FAISCEAU. RG3 IEC EN 62471-5:2015. CLASS 1 IEC EN 60825-1:2014. DISTANCE DE SECURITE : CONSULTER LE MANUEL DE SECURITE.</p>		
	Beam stop. Arrêt de faisceau. 光束衰减器	
	Enable key. Clé de active. 启动钥匙	

Electric related safety labels

Label image	Label description	Label location
	<p>Disconnect the power to the unit mains terminals and unplug power cord at UPS inlet for removal of all power from the unit.</p> <p>WARNING : HIGH LEAKAGE CURRENT EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING TO THE SUPPLY.</p> <p>Déconnecter l'alimentation des bornes du réseau et déconnecter le câble de la prise UPS pour la coupure de toute l'alimentation de l'appareil. ATTENTION : COURANT DE FUITE ÉLEVÉ RACCORDEMENT À LA TERRE INDISPENSABLE AVANT LE RACCORDEMENT AU RÉSEAU VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RÉSEAU.</p> <p>断开放映机主电源端的电源并从UPS电源接入插座上拔下电源线。警告：大漏，电流在接通电源之前必须先接地。在与电源连接前请查看安装说明书。</p>	 <p>(located behind cover)</p>
	<p>UPS INLET : 200-240V 6A max. 50-60Hz. UPS OUTLET : ONLY FOR CONNECTION TO UPS INLET</p> <p>WARNING : Disconnect the power to the mains terminals and unplug power cord at UPS inlet for removal of all power from the unit.</p> <p>ATTENTION : Eteindre et déconnecter le câble dans la prise UPS pour la coupure de toute l'alimentation de l'appareil.</p> <p>警告 断开放映机主电源端的电源并从UPS电源接入插座上拔下电源线，切断放映机的所有电源。</p> <p>UPS电源输入插座：200-240V 最大电流 6A 50-60Hz. UPS 输出插座：仅用于连接 UPS电源输入插座。</p> <p>警告 断开放映机主电源端的电源并从UPS电源接入插座上拔下电源线，切断放映机的所有电源。</p>	

1.5 High Brightness precautions: Hazard Distance (HD)

HD



Hazard Distance (HD) is the distance measured from the projection lens at which the intensity or the energy per surface unit becomes lower than the applicable exposure limit on the cornea or on the skin. The light beam is considered (to be) unsafe for exposure if the distance from a person to the light source is less than the HD.

Restriction Zone (RZ) based on the HD

The HD depends on the amount of lumens produced by the projector and the type of lens installed. See chapter "HD in function of modifying optics", page 21.

To protect untrained end users (as cinema visitors, spectators) the installation shall comply with the following installation requirements: Operators shall control access to the beam within the hazard distance or install the product at the height that will prevent spectators' eyes from being in the hazard distance. Radiation levels in excess of the limits will not be permitted at any point less than 2.0 meter (SH) above any surface upon which

persons other than operators, performers, or employees are permitted to stand or less than 1.0 meter (SW) lateral separation from any place where such persons are permitted to be. In environments where unrestrained behavior is reasonably foreseeable, the minimum separation height should be greater than or equal to 3.0 meter to prevent potential exposure, for example by an individual sitting on another individual's shoulders, within the HD.

These values are minimum values and are based on the guidance provided in IEC 62471-5:2015 section 6.6.3.5.

The installer and user must understand the risk and apply protective measures based upon the hazard distance as indicated on the label and in the user information. Installation method, separation height, barriers, detection system or other applicable control measure shall prevent hazardous eye access to the radiation within the hazard distance.

For example, projectors that have a HD greater than 1 m and emit light into an uncontrolled area where persons may be present should be positioned in accordance with “the fixed projector installation” parameters, resulting in a HD that does not extend into the audience area unless the beam is at least 2.0 meter above the floor level. In environments where unrestrained behavior is reasonably foreseeable, the minimum separation height should be greater than or equal to 3.0 meter to prevent potential exposure, for example by an individual sitting on another individual's shoulders, within the HD. Sufficiently large separation height may be achieved by mounting the image projector on the ceiling or through the use of physical barriers.

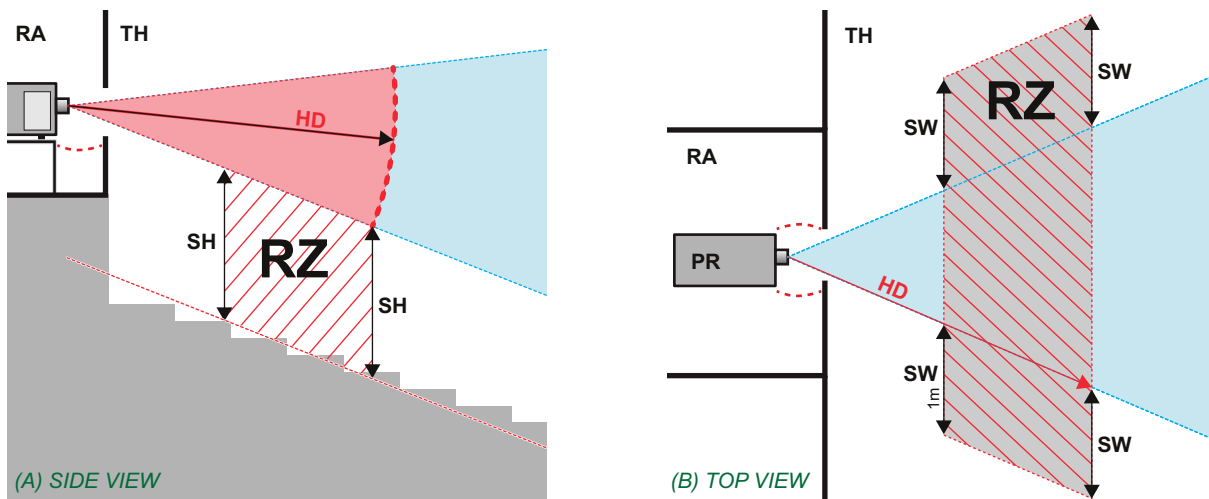


Image 1-1

- A** Side view.
- B** Top view.
- RA** Restricted Access location (boot area of projector).
- PR** Projector.

- TH** Theater.
- RZ** Restriction Zone in the theater.
- SH** Separation Height.
- SW** Separation Width.

Based on national requirements, no person is allowed to enter the projected beam within the zone between the projection lens and the related hazard distance (HD). This shall be physically impossible by creating sufficient separation height or by placing barriers. The minimum separation height takes into account the surface upon which persons other than operator, performers or employees are permitted to stand.

On Image 1-2 a typical setup is displayed. It must be verified if these minimum requirements are met. If required a restricted zone (RZ) in the theater must be established. This can be done by using physical barrier, like a red rope as illustrated in Image 1-2.

The restricted area sticker can be replaced by a sticker with only the symbol.

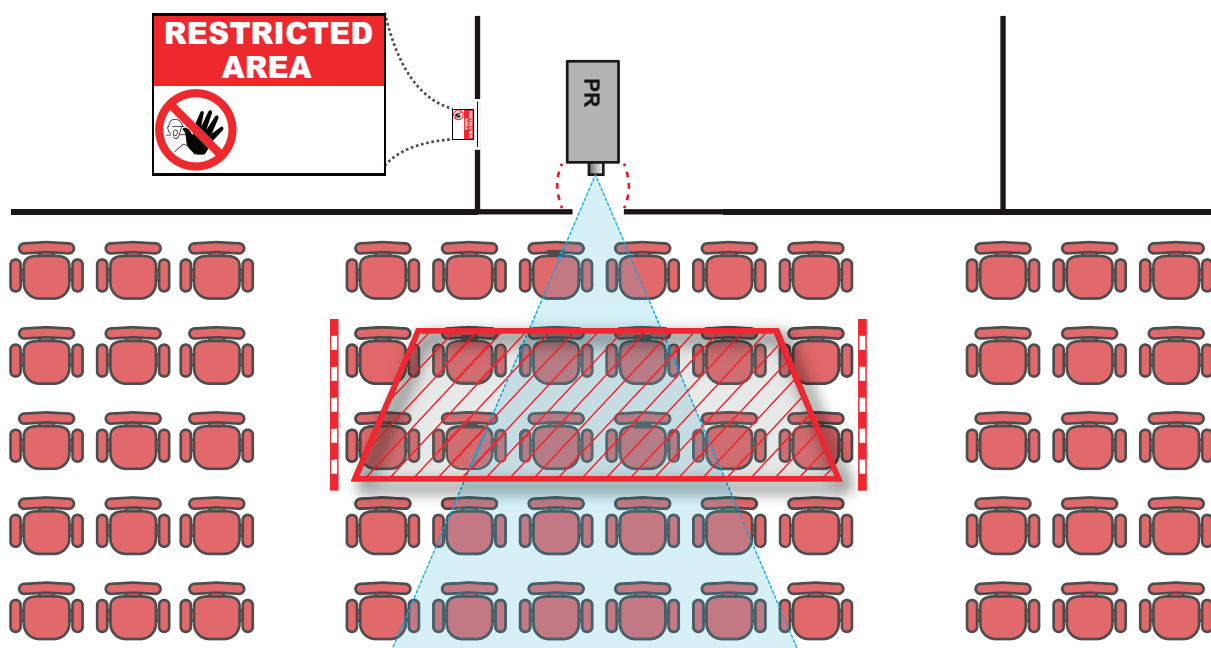


Image 1-2

1.6 HD for fully enclosed projection systems

HD



Hazard Distance (HD) is the distance measured from the projection lens at which the intensity or the energy per surface unit becomes lower than the applicable exposure limit on the cornea or on the skin. The light beam is considered (to be) unsafe for exposure if the distance from a person to the light source is less than the HD.

Restriction Zone (RZ) based on the HD

The projector is also suitable for rear projection applications; projecting a beam onto a diffuse coated projection screen. As displayed in Image 1-3 two areas should be considered: the restricted enclosed projection area (RA) and the observation area (TH).

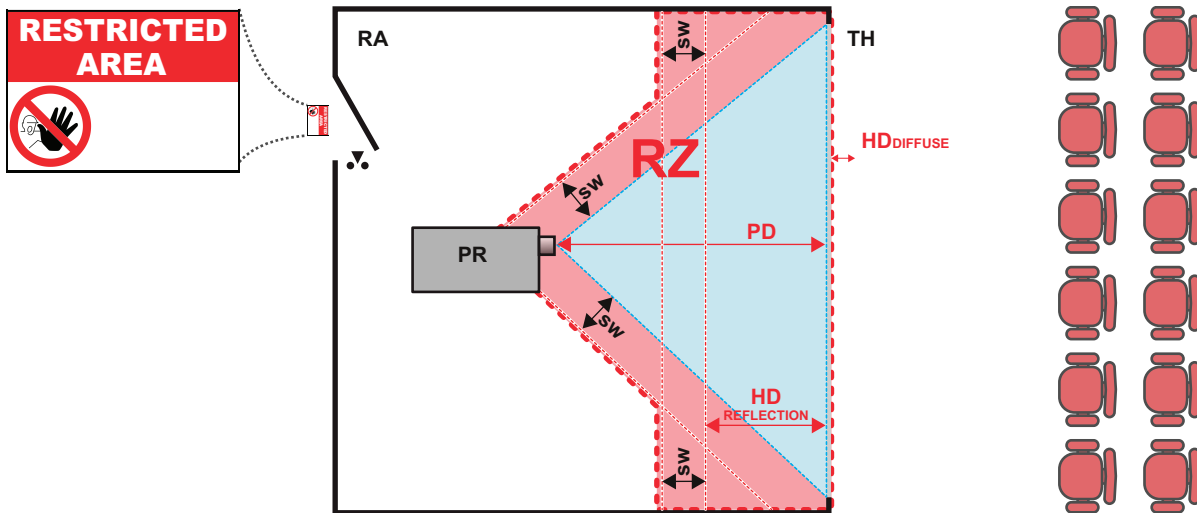


Image 1-3

RA Restricted Access location (enclosed projection area).

PR Projector.

TH Theater (observation area).

RZ Restriction Zone.

PD Projection Distance.

SW Separation Width. Must be minimum 1 meter.

For this type of setup 3 different HD shall be considered:

- HD as discussed in “High Brightness precautions: Hazard Distance (HD)”, page 17, relevant for intrabeam exposure.
- $HD_{\text{reflection}}$: the distance that has to be kept restrictive related to the reflected light from the rear projection screen.
- HD_{diffuse} : the relevant distance to be considered while observing the diffuse surface of the rear projection screen.

As described in “High Brightness precautions: Hazard Distance (HD)”, page 17, it is mandatory to create a restricted zone within the beam areas closer than any HD. In the enclosed projection area the combination of two restricted zones are relevant: The restricted zone of the projected beam toward the screen; taking into account 1 meter Separation Width (SW) from the beam onward. Combined with the restricted zone related to the rear reflection from the screen ($HD_{\text{reflection}}$); also taking into account a 1 meter lateral separation.

The $HD_{\text{reflection}}$ distance equals 25% of the difference between the determined HD distance and the projection distance to the rear projection screen. To determine the HD distance for the used lens and projector model see chapter “HD in function of modifying optics”, page 21.

$$HD_{\text{reflection}} = 25\% (HD - PD)$$

The light emitted from the screen within the observation shall never exceed the RG2 exposure limit, determined at 10 cm. The HD_{diffuse} can be neglected if the measured light at the screen surface is below 5000 cd/m² or 15000 LUX.

1.7 HD in function of modifying optics

Hazard Distance

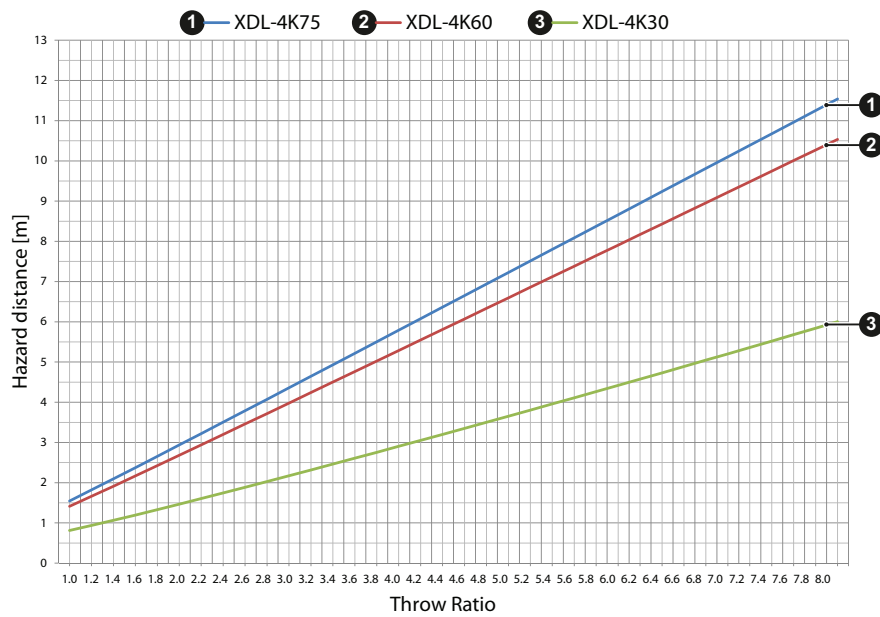


Image 1-4

System overview

2

About this chapter

This chapter briefly describes all different components of the complete projection system based on the XDL series projector. For more detailed information related to the projector we refer to other chapters in this document. For the other components in the system we refer to its own documentation set of the component. Note that the latest version of this document and all other related documentation sets are available on the Barco website.

Different components of the projection system.

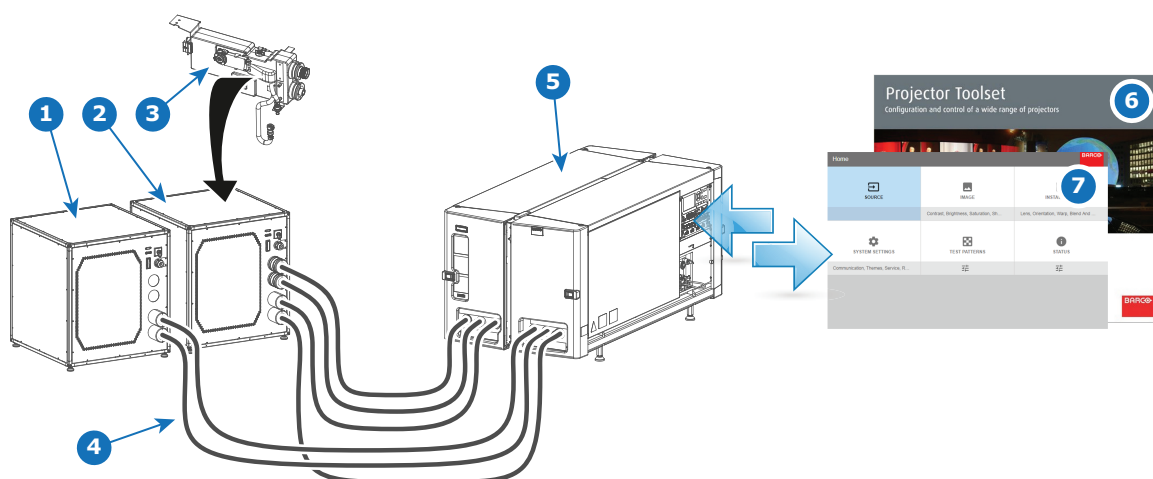


Image 2-1

- | | |
|---|---|
| 1 Chiller unit without expansion for DMD cooling (not used for XDL-4K30) | 5 Projector (with or without external safety interlocks) |
| 2 Chiller unit equipped with expansion for DMD cooling | 6 Projector Toolset (PC) |
| 3 Chiller cooling circuit expansion for DMD cooling | 7 Projector OSD |
| 4 Hoses | |

Overview

- XDL series projector
- Chillers and hoses
- Safety system
- Free download of Projector Toolset

2.1 XDL series projector

Introduction

The XDL projector is a RGB laser-illuminated compact projector. This high-brightness laser projector is capable of showing 4K content at 120 fps and 3D content in full 4K resolution at 120 fps. The XDL-4K30 and 4k60 projectors have an integrated color 3D system, with 6-Primary (6P) color laser modules. This Barco Laser 3D system maximizes 3D efficiency from a single projector, delivering constant and uniform images in excellent contrast, without lamp flicker.

For functionality and reliability, the projector requires accurate temperature control and cooling below ambient. Therefore a liquid cooling system is provided consisting of liquid circuits inside the projector which are connected via hoses to external chillers. Only chiller models and hoses exclusively developed for this application and approved by Barco are allowed to be used. Barco approved chillers models are listed on the Barco website.

Depending on the projector model one or two chillers are required.

Convention projector orientation

This manual refers to the left side of the projector as the side at your left hand when standing behind the projector and looking at the projection screen in front of the projector.

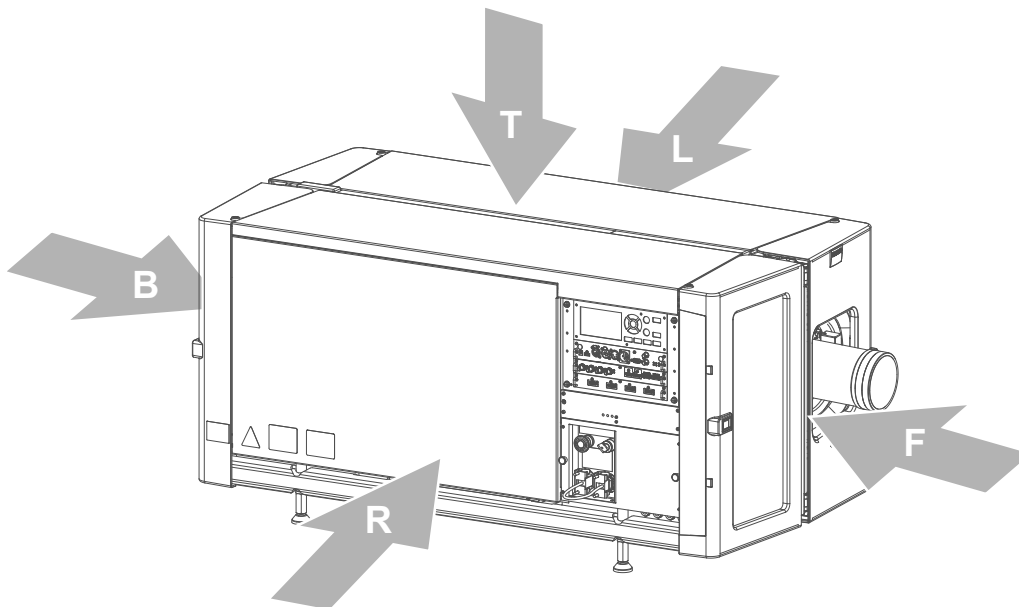


Image 2-2

- | | |
|--|---|
| T Top of the projector | R Right side of the projector (Input side) |
| L Left side of the projector (Light Processor side) | B Back of the projector |
| F Front of the projector | |

Component location

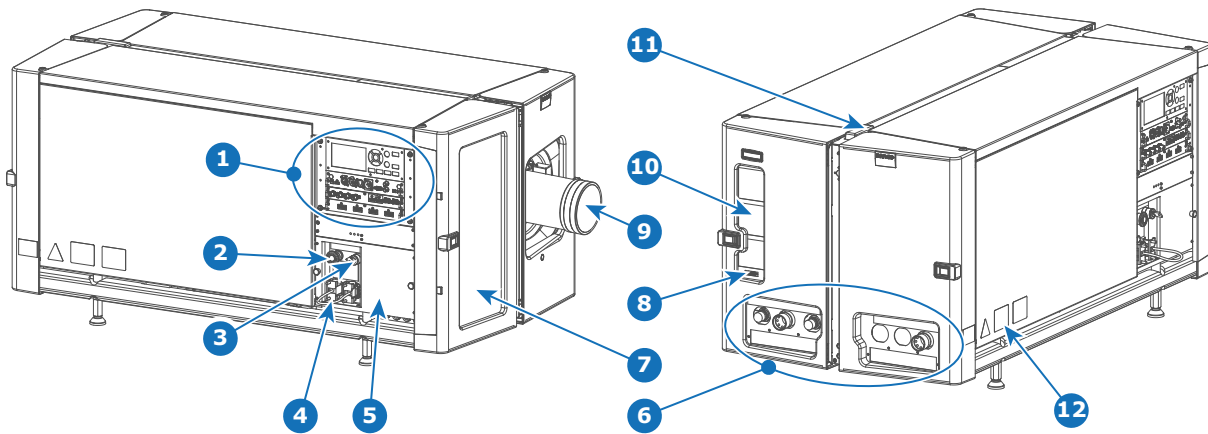


Image 2-3

- | | |
|---|--|
| 1 Input & Communication interface | 7 Air inlet filter |
| 2 Beam stop button | 8 Communication port with chillers. |
| 3 Beam enable key | 9 Lens |
| 4 UPS sockets | 10 Air outlet |
| 5 Cover mains compartment | 11 Laser status light |
| 6 Valve coupling to connect with external chiller(s) | 12 Projector ID label |

Air flow

The XDL series projector has two air flow channels (reference A & B) to cool the projector electronics. The air intake is at the front side of the projector, the air outlet is at the back.

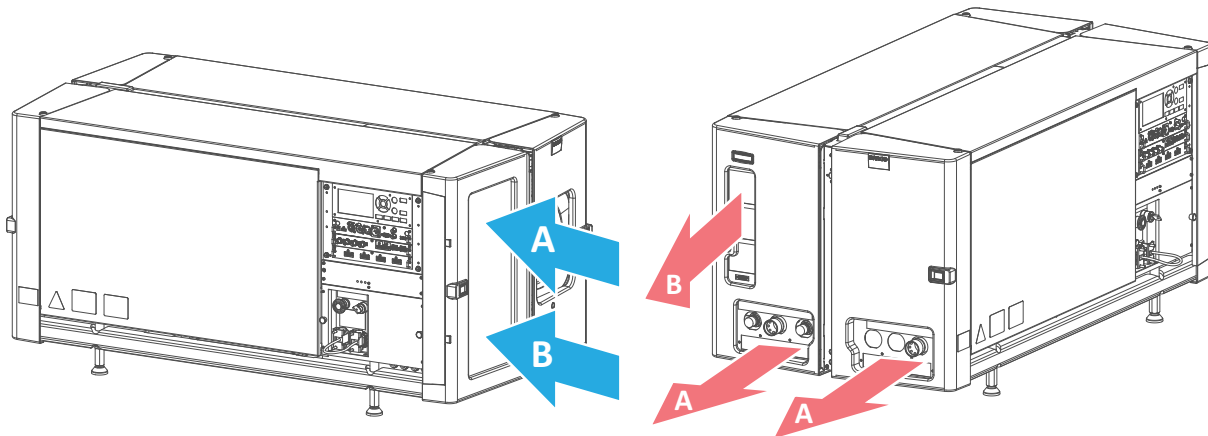


Image 2-4

2.2 Chillers and hoses



DMD

A digital micromirror device, or DMD, is an optical semiconductor that is the core of DLP projection technology.

Introduction

The chillers are specially designed for the XDL projector. The chillers are controlled by the projector and ensure that the ambient temperature of the lasers and DMDs is within specs. Without these chillers the projector will not operate.

Depending on the projector model one or two chillers are required! For the XDL-4K30 series projector one chiller has to be installed. The XDL-4K60/75 series needs two chillers.

One chiller must be equipped with a cooling circuit expansion unit to cool the DMDs. This chiller can be recognized by the extra coupling for the hoses at the front (reference 1 Image 2-5). The expansion unit has to be installed on site.

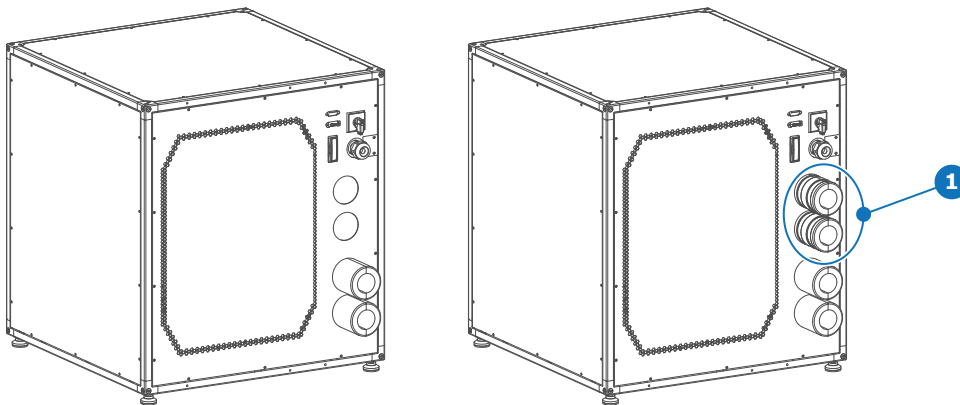


Image 2-5



For installation instructions see documentation of the chiller. All latest documentation files are available on the Barco website. How to connect the chiller(s) with the projector is described in this document.

Chiller cooling circuit expansion for DMD cooling

The valve coupling of this expansion unit is of the same type and size as the standard installed coupling on the chiller. However, the hoses of the DMD cooling which have to be connect with the coupling of this expansion unit has a smaller diameter than the hoses for the Red, Green and Blue laser cooling. Note that the cooling circuit expansion unit for the DMD cooling has to be installed on site.

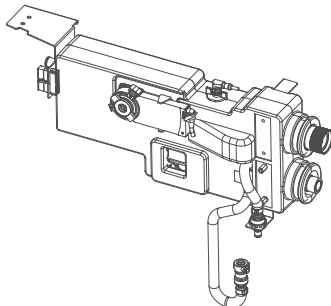


Image 2-6

The chiller cooling circuit expansion for DMD cooling may only be installed by trained technicians. Installation instructions are included in the service documentation of the chiller.

Hoses

Only hoses specified by Barco can be used to couple the cooling liquid of the chiller with the cooling circuit of the projector. The hoses specified are specially designed for this purpose. Using other hoses than those will have impact on the cooling capacity of the system and may make the system fail!

The hoses are available in different lengths up to 10 meter which is also the maximum distance allowed between chiller and projector. The chiller side of the hose has a straight coupling, the projector side has a 90 degree tube elbow with coupling. The flow direction at the coupling is always from female towards male. The hoses are isolated and reinforced for optimal performance.

The hoses for the RED, GREEN and BLUE laser cluster cooling have a larger diameter size than the hoses for the DMD cooling. However, take into account that the couplings are of the same type and size. So, ensure to connect the right hose with the right cooling channel.

See Barco website for available kits of hoses and corresponding ordering information.



Image 2-7: Hose with 90° angle female coupling.



Image 2-8: Hose with 90° angle male coupling.



For chillers and hoses ordering information see Barco website.

2.3 Safety system

Safety controller

The projector is equipped with a safety controller which is located inside the mains compartment. This safety controller operates independent from the projector electronics and has its own power supply. The safety controller is connected with the beam stop button (reference 1 Image 2-9) and the beam enable key (reference 2 Image 2-9) of the projector. In case the beam stop button is pushed or the beam enable key is switched off the safety controller immediately triggers the relay to disconnect the power from all Power Supply Units (PSU) of the lasers.

Beam enable key

The beam enable key (reference 2 Image 2-9) must be in the “on” position to be able to activate the lasers. In case the safety controller is triggered by an interlock event (internal or external) then, after restoring the interlock, the beam enable key must be switched off and on to reset the safety controller. Otherwise, the lasers can not be activated.

External beam enable key

The beam enable key is built-in but there is also a connection available for an additional, external switch which is connected in series with the internal beam enable key. This means that both keys must be switched on to power the PSUs of the lasers.

Beam stop button

The beam stop button (reference 1 Image 2-9) is easy accessible by the operator. Pushing the beam stop button will result in disconnecting the power from all Power Supply Units (PSU) of the lasers. The beam stop button requires a quarter turn to restore its normal operating position. After restoring the beam stop button the beam enable key must be switched off and on to reset the safety controller.

External safety interlocks

Two external safety interlocks can be connected with the safety controller (e.g. to connect an infrared field scanning device for the restricted HD area). In case an external safety interlock switch opens the safety controller immediately opens relays to disconnect the power from all Power Supply Units (PSU) of the lasers.

The safety controller requires per interlock a double pole switch. It is not sufficient to break only one of the two interconnections. Both contacts should be opened and closed simultaneously. If only one contact is opened without the second one, the projector will not start up again after the contact is closed. To recover from such an error, open and close the external interlock with both contacts simultaneously, then turn the beam enable key off and on.

Both switch inputs should not be electrically interconnected in any way. An electrical connection between the switches will be seen as an interlock open situation.

The connector (reference 3 Image 2-9) for the external interlocks can be found behind the mains input compartment door. It is in the form of a 10 pole screw type removable terminal block (reference 5 Image 2-9).

There are three cable glands (reference 4 Image 2-9) at the base of the mains compartment for the cabling of the external interlock devices.

The projector is shipped with a connector of which the external beam enable key and the 2 external interlocks are bypassed. Before connecting an external interlock the appropriate shunt wires (reference 6 Image 2-9) should be removed and replaced by the interlock wiring.

Component location

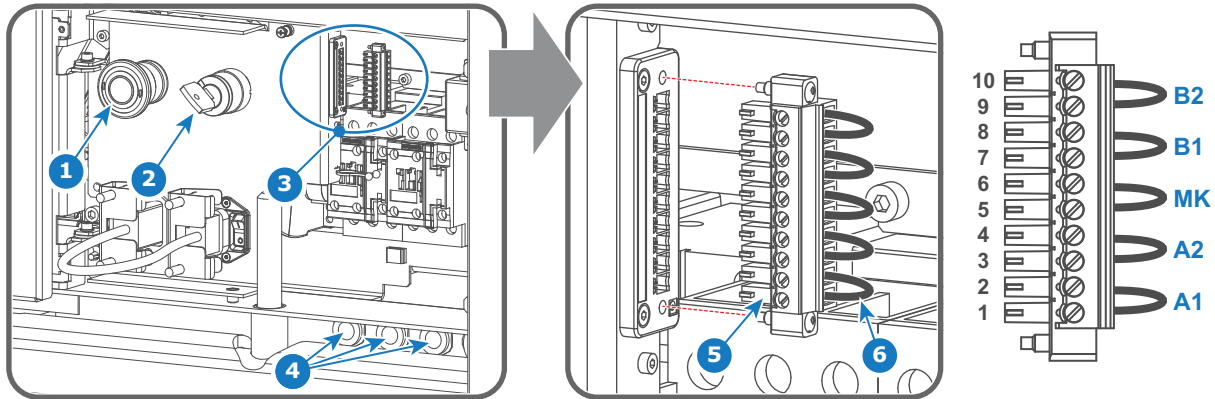


Image 2-9

- 1 Beam stop button.
- 2 Beam enable key.
- 3 Socket and connector for external safety interlocks.
- 4 Three cable glands (M20 D7-13).
- 5 10 pins connector.
- 6 Shunt wire.

- A1 External safety interlock A contact No 1.
- A2 External safety interlock A contact No 2.
- MK External beam enable key.
- B1 External safety interlock B contact No 1.
- B2 External safety interlock B contact No 2.



CAUTION: The need for installing external safety interlocks is the responsibility of the Safety Officer and depends on the installed application and local regulations.



WARNING: The connector with shunt wires is delivered with the projector but not installed. The Safety Officer of the boot area must decide either if the connector with shunt wires can be installed or if external safety interlocks must be installed.



The external safety interlocks used must be of the type 'micro load' and must be approved interlocks for safety applications. In order to achieve the highest reliability level of safety; employ only SIL level 4 (according IEC 62061) dual normal open contact or performance level Ple (according IEC 13849-1) dual normal open contact devices.

2.4 Free download of Projector Toolset

About Projector Toolset

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

The Projector Toolset software works with configurations that can be loaded. Several configurations can be controlled simultaneously. Even when the configurations are connected via different ways.

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



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

Where to find the download file(s)

The program and all necessary plug-ins, as well as the Reference manual can be downloaded for free from my.barco.com. Registration is necessary.

1. Go to the Barco website www.barco.com.
2. On the home page, click on **myBarco log in**.
3. On the Sign In page, enter your Email address and your password to login.
If you are not yet registered click on **New to myBarco?** and follow the instructions. With the created login and password, it is possible to enter the Partner zone of Barco.
When your login is correct, the Partner zone is free accessible.
4. In the search field, enter Projector Toolset and click on the search icon.
5. Select **Technical Downloads**.
6. Click on Application Software and download the Projector Toolset software package, which includes the device plug-in updates.

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

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

To download the reference manual, select Reference Guide and download the latest version of the manual for your projector.

Installation

Download first the reference manual and follow the installation instructions as written in this manual.

Installation preparations

3

About this chapter

Read this chapter before installing the XDL projector. It contains important information concerning installation requirements for the projector, such as minimum and maximum allowed ambient temperature, humidity conditions, required safety area around the installed projector, required power net, etc.

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



Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. Observing the specification mentioned in this chapter is critical for projector performance. Neglecting this can result in loss of warranty.

Overview

- Installation requirements
- Unpacking the projector
- Initial inspection
- Projector configurations
- Additional vertical shift of the Lens Holder
- Removing the projector feet

3.1 Installation requirements

Environment conditions

Table below summarizes the physical environment in which the XDL projector may be safely operated or stored.

Environment	Operating	Non-Operating
Ambient Temperature	10°C (50°F) to 35 °C (95 °F)	-15°C (5°F) to 60°C (140°F)
Air cleanliness	Clean office environment (equivalent with cleanroom standard ISO 14644-1 ISO Class 9)	n.a.
Humidity	5% RH to 80% RH non-condensed	5% to 95% RH Non-Condensed
Altitude	-60 m (-197 Ft) to 3000 m (9843 Ft) Automatic decrease of brightness possible for altitudes above 1000 m. ¹	-60 m (-197 Ft) to 10 000 m (3 2810 Ft)



Let the projector acclimatize after unpacking. Neglecting this may result in a startup failure of the Light Processor Unit.

Cooling requirements

For functionality and reliability, the projector requires accurate temperature control and cooling below ambient. Therefore a liquid cooling system is provided consisting of liquid circuits inside the projector which are connected via hoses to external chillers. Only chiller models and hoses exclusively developed for this application and approved by Barco are allowed to be used. Barco approved chillers models are listed on the Barco website.

The chiller must be installed in the same environmental conditions as the projector (ambient temperature and humidity must be the same on both projector and chiller locations). The chiller must be installed in upright position (not tilted) conform all the installation instructions of the chiller. Maximum 3 meter height differences is allowed between projector coupling and chiller coupling.

Sensors measure the temperature and relative humidity (RH) inside the sealed compartments of the projector. From these measured values the dew point is calculated and compared with the temperature of the liquid cooling in the chiller(s).

The dew point inside the sealed compartments of the projector must be lower than the temperature of the cooling liquid coming from the chiller(s). If not, the projector will fail to startup. This to prevent drops of moisture deposit on the electronic boards.

In case the projector fails to startup due to a dew point inside the projector that is too high, the projector and chiller(s) need more time to acclimatize to the environment. For a first install the time needed to acclimatize depends on the environmental storage conditions of the projector and chiller(s). In extreme conditions the acclimatization time may take several hours.

Note that the lower the relative humidity of the boot area the shorter the acclimatization time needed for the projector and chiller(s).

The electronics of the projector are fan cooled. For that the projector must be installed with sufficient space around the projector, minimum 20 cm (8 inch) to ensure sufficient air flow. It should be used in an area where the ambient temperature, as measured at the projector air inlet, does not exceed 35 °C (95 °F).

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 projector and cooling system (chiller units) to the outside of the building. The minimum flow rate of the air extraction system depends on the ambient temperature:



Temporary values— final values to be determined

¹: For PRC (People's Republic of China) the certified altitude is specified on the product label.

XDL-4k75**Ambient temperature**

30°C (86°F)
25°C (77°F)
20°C (68°F)

Minimum airflow per system

490 l/s (1040 CFM)
360 l/s (760 CFM)
290 l/s (615 CFM)

XDL-4k60**Ambient temperature**

30°C (86°F)
25°C (77°F)
20°C (68°F)

Minimum airflow per system

490 l/s (1040 CFM)
360 l/s (760 CFM)
290 l/s (615 CFM)

XDL-4k30**Ambient temperature**

30°C (86°F)
25°C (77°F)
20°C (68°F)

Minimum airflow per system

280 l/s (590 CFM)
210 l/s (440 CFM)
166 l/s (350 CFM)

Where two projectors or more are installed close to each other, ensure that the projectors do not thermally affect each other.

Dew point

The dew point is the saturation temperature for water in air. The dew point is associated with relative humidity. A high relative humidity implies that the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and that the air is maximally saturated with water. When the moisture content remains constant and temperature increases, relative humidity decreases.

Condensed water drain requirements

The projector is equipped with air dryers to remove moisture from the sealed compartments. The condensed water collected by the air dryers is removed from the projector through small drain tubes at the bottom of the projector. It's most efficient and recommended to guide the small drain tubes directly to a water drain.

- A vertical air gap fitting must be installed between the small drain tubes and the building drain! Note that the end of the small drain tubes must be in free air (not airtight taped off) to prevent back flow.
- The minimum downwards slope over the whole length of the small drain tubes is 15 cm per meter (1.8 inch per foot). It's recommended to guide the small drain tubes vertically for optimal flow. Clogging is often the result of improper slope (sloping uphill).
- The maximum allowed length of the small drain tubes (Ø8 mm) before ending into the water drain is 2.5 meter (8 feet).
- If no water drain is available then an 'open' water container can be installed to capture the condensed water coming out of the small drain tubes. The volume of the water container depends on the humidity level of the operation environment. In most applications a water container with a volume of 5 liter should be sufficient if emptied regularly.

Main Power requirements

The XDL series projector operates from a nominal 3W+N+PE or 3W+PE power net. The projector must be switched internally between a star connection to a delta connection or vice versa. See installation instructions.

- **Electrical ratings for Star system (3W+N+PE):**
 - The cross-sectional area of the conductors in the power supply cord shall be 4 mm² to 6 mm², 10 AWG to 8 AWG.
 - The electrical rating of the XDL-4K60/75 projector is 200-240V/346-415V 3W+N+PE 16A 50-60Hz (Y connection).
 - The electrical rating of the XDL-4K30 projector is 200-240V/346-415V 3W+N+PE 10A 50-60Hz (Y connection).
 - The building installation has to be provided with a circuit breaker of 25-40 A to protect the complete unit.

- **Electrical ratings for Delta system (3W+PE):**

- The cross-sectional area of the conductors in the power supply cord shall be 6mm², 8AWG.
- The electrical rating of the XDL-4K60/75 projector is 200-240V 3W+PE 28A 50-60Hz (Δ connection).
- The electrical rating of the XDL-4K30 projector is 200-240V 3W+PE 15A 50-60Hz (Δ connection).
- The building installation has to be provided with a circuit breaker of 40 A to protect the complete unit.

The power cord required to connect the projector with the power net is not delivered with the projector. It is the responsibility of the customer to provide the correct type of power cord. Take into account that the cable gland allows a cable diameter from 11 to 21 mm.

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.

A readily accessible disconnect device shall be incorporated externally to the equipment for removal of the power to the equipment mains terminals.



WARNING: Disconnect the power to the unit mains terminals and unplug power cord at UPS inlet for removal of all power from the unit

UPS requirements

The Uninterruptible Power Supply (UPS), also known as a Continuous Power Supply (CPS), must have an output voltage of 200-240 V at 50-60 Hz and must be capable of delivering an output current of 5,5 A. This UPS provides only power for the electronics in the Card Cage.

The connection between the UPS unit and the UPS inlet of the projector must be done with a certified AC power supply cord of minimum 0,75 mm² or 18 AWG and minimum 300 V.



CAUTION: The 200–240V power outlet (UPS OUTLET) of the projector may not be used to provide the UPS unit with power! The UPS OUTLET of the projector may only be used for connection to the UPS INLET of the projector.



The XDL series projector does not have a built in UPS unit.

Projection screen

The XDL series projector performs best when the image is projected on white screen with minimum gain (between 1 and 1.8). Very high gain screens (e.g. silver screens with gain 2.4) are not recommended.

Projector weight

Do not underestimate the weight of the XDL series projector. The XDL-4K60/75 projector weight approximately ±240 kg (±529 lbs) without lens. The XDL-4K30 projector weight approximately ±200 kg (±440 lbs) without lens. Ensure that the pedestal on which the projector is installed is capable of supporting the complete load of the system. To prevent personal injury a hoisting tool should be used to lift the projector.



CAUTION: An external frame must be used to stack projectors.

3.2 Unpacking the projector

What you need to do?

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

Required tools

10 mm Allen wrench.

How to unpack the projector?

1. Loosen the banding (reference 1 Image 3-1) by pulling the free end of the banding loop in the clip.
2. Take off the box cover (reference 2 Image 3-1).
3. Remove the carton plate (reference 3 Image 3-1) from the top of the projector.
4. Take out the small box between the outer and inner box. This box contains the product documentation (manuals etc.).

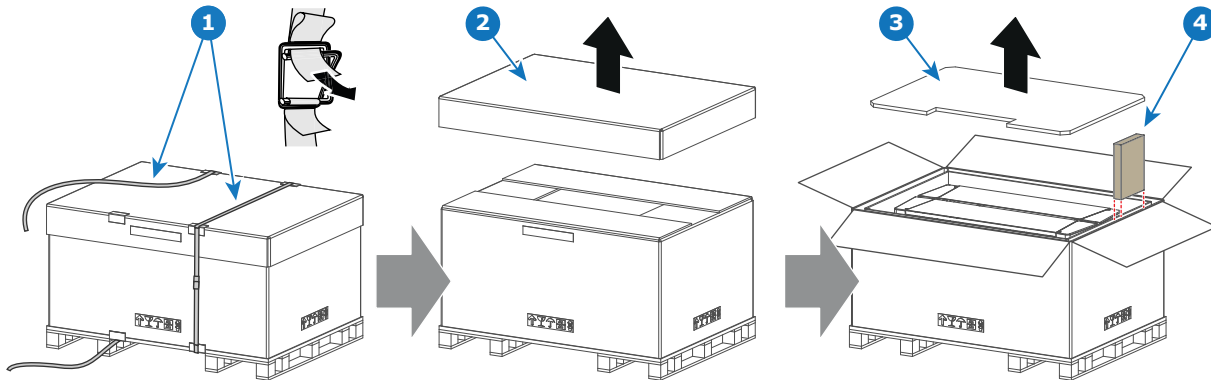


Image 3-1

5. Lift up the outer carton box (reference 5 Image 3-2) as a whole and remove it away from the projector package.
6. Lift up the inner carton box (reference 6 Image 3-2) as a whole and remove it away from the projector package.
7. Remove the screw (reference 7 Image 3-2) in the centre of both transport fixation bars (front and rear of the projector). Use a 10 mm Allen wrench.
8. Now the projector can be lifted up and put in place.



Warning: Do not underestimate the weight of the projector. The projector weighs ± 240 kg (± 529 lbs). To prevent personal injury a hoisting tool should be used to lift the projector.



Note: The top side of the projector is foreseen with four threaded holes M10 (25 mm depth), one in each corner. These holes can be used to insert eyebolts to connect the shackles of the lifting equipment.

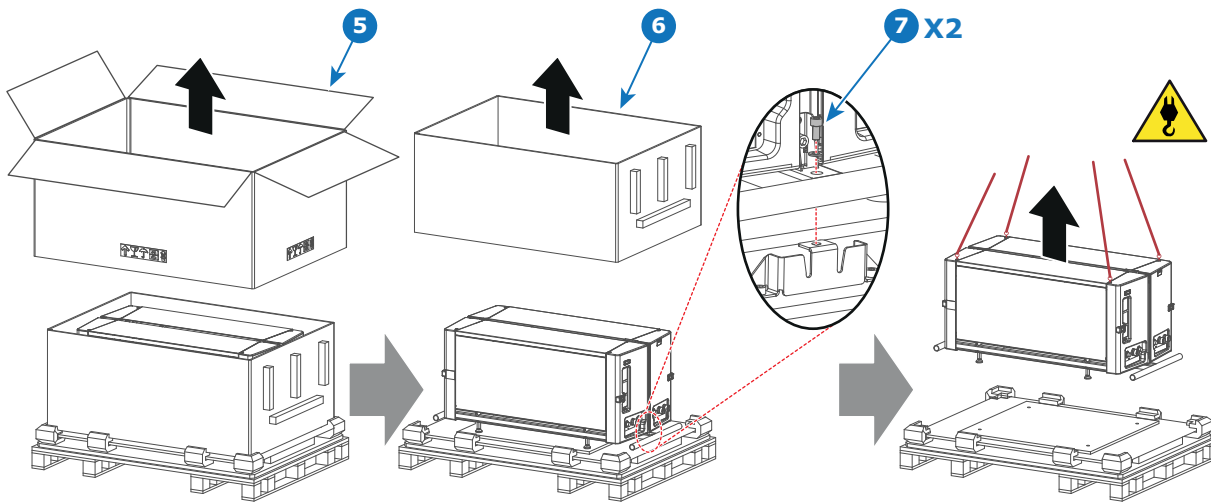


Image 3-2

Caution: Ensure that the pedestal is capable to carry the weight of the projector.



After unpacking, allow the projector to acclimatize to a room temperature ranging from 10°C (50°F) to 35 °C (95 °F) MAX. Neglecting this may result in a start up failure of the Light Processor Unit.

3.3 Initial inspection

General

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



The packaging of the XDL projector is provided with a **shock-watch** label. If this shock-watch label was triggered (red colored at arrival) during transport may indicate rough handling by the transport company. In this case, the instructions mentioned on the label, should be followed, which are: adding a note on the “bill of lading” and informing the transport company and the Barco sales and service office as soon as possible.

Box content

- Projector.
- User and installation manual (this document).
- Safety manual.



The projector lens is not included in the package of the projector.

Mechanical check

This check should confirm that there are no broken knobs or connectors, that the cabinet and panel surfaces are free of dents and scratches, and that the operating panel is not scratched or cracked. The Barco Sales and Service office should be notified as soon as possible if this is not the case.

3.4 Projector configurations

The different configurations

While the XDL projector can do both front projection as rear projection, the projector can only be installed in table-mount position.

1. Front / Table (F/T)
2. Rear / Table (R/T)

Front projection

The projector is installed at the same side of the screen as the audience.

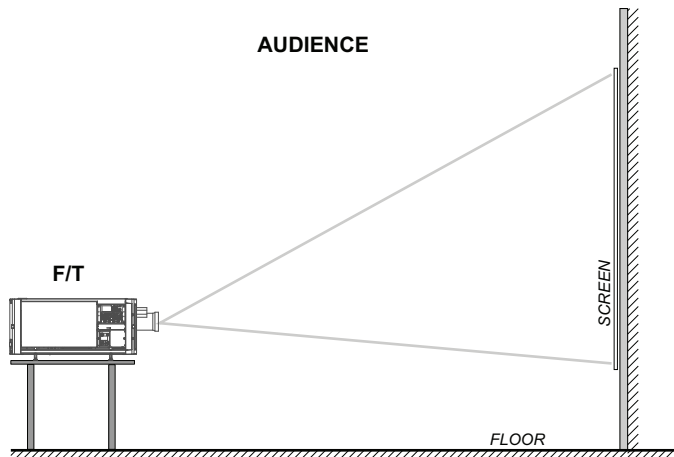


Image 3-3: Front projection

Rear projection

The projector is installed at the other side of the screen opposite the audience.

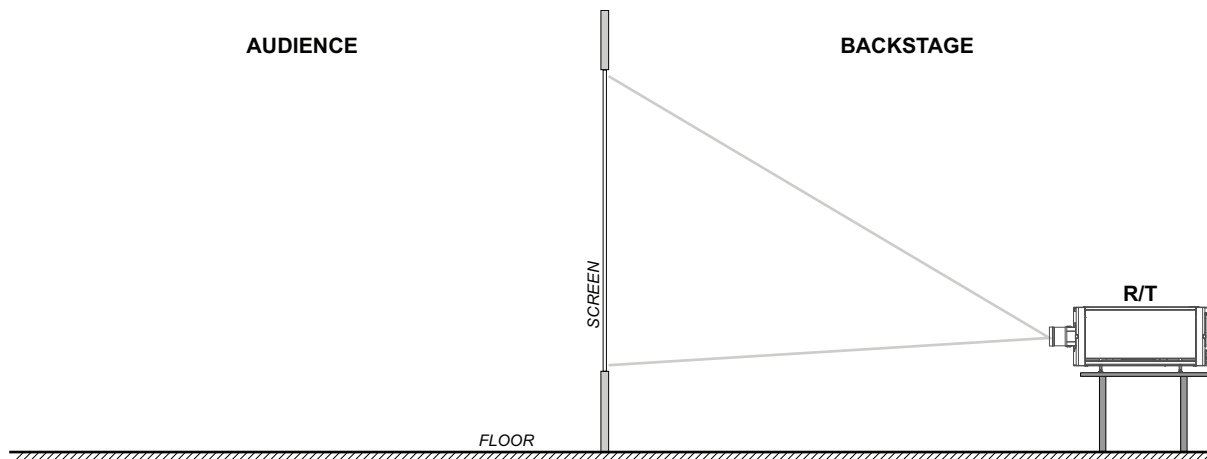


Image 3-4: Rear projection.

Positioning the projector

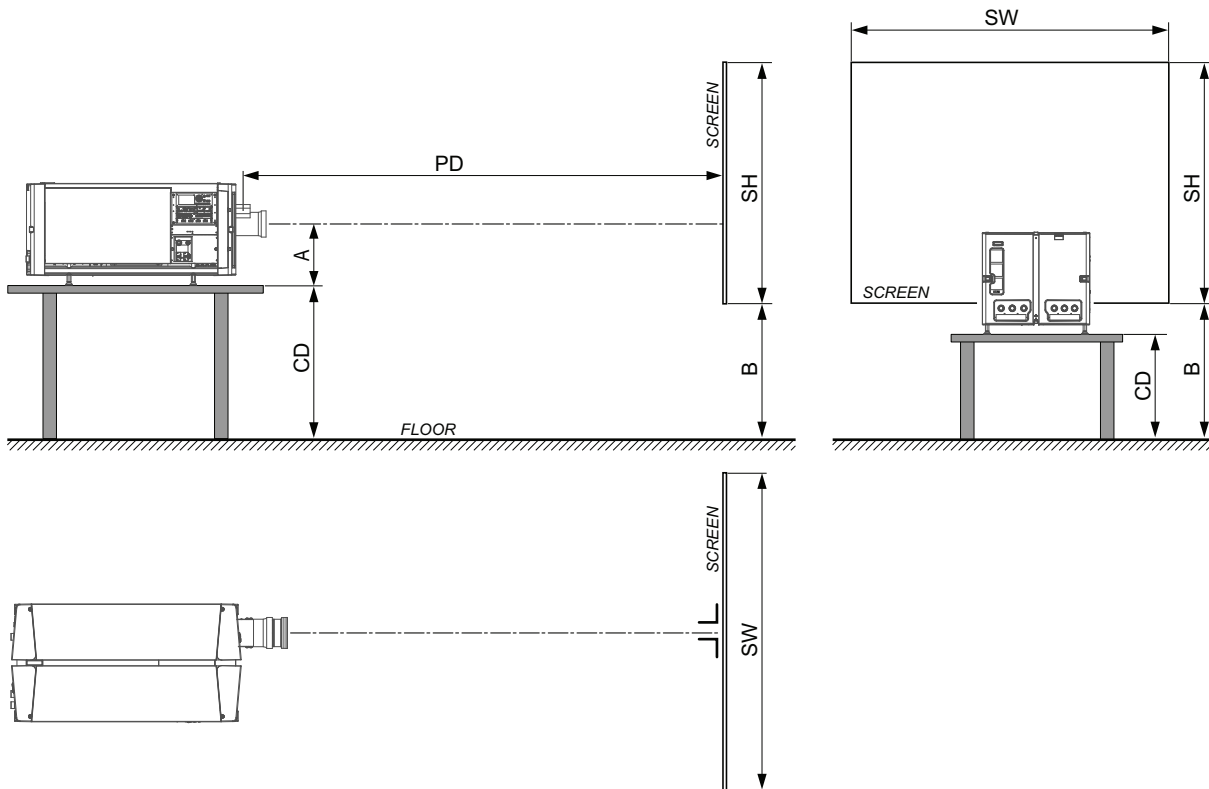


Image 3-5: Positioning the projector

The projector should be installed at right angles (horizontally and vertically) to the screen at a distance PD. Note the distance (A) between lens centre and table surface is slightly variable. This distance (A) is nominal 223 mm in case all feet are turned in completely and the vertical lens shift is set to zero (0).

On axis / off axis projection

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

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

Shift range

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

The only method to increase the vertical shift range without a decrease in image quality is by shifting the lens holder itself. For more info on this, see "Additional vertical shift of the Lens Holder", page 40.

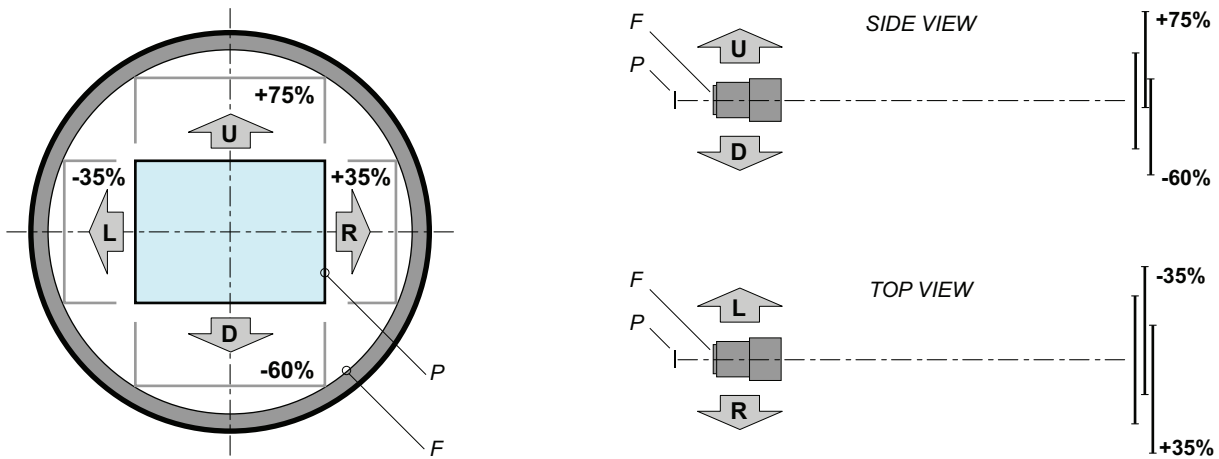


Image 3-6: Vertical and horizontal shift range

P DMD
F Field of view



It is mechanical possible to shift outside the recommended field of view, but it will result in a decline of image quality depending on the used lens and the zoom position of the used lens. Furthermore, shifting too much in both directions will result in a blurred image corner.



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

Horizontal and vertical projector tilt ranges

Side to side tilting of the projector may not exceed $\pm 20^\circ$. Outside of this range, there is one exception (area C) when the projector can be mounted at 90° sideways IF the Input and communication unit is facing downwards. No other sideways tilting is allowed.

The projector can also be rotated and mounted up and downwards in an angle that does not exceed:

- $\pm 45^\circ$ upwards.
- $\pm 30^\circ$ downwards.

These limitations ensures that the air dryers in the projector work properly and safely. Mounting a projector outside of these “green zones” may cause condensate to appear in the projector and may cause damage to the electronic and/or the optical parts.



Take into account that the projector feet are unable to achieve the maximum allowed tilt angles. Use an external mechanical frame that allows to tilt the projector within the allowed tilt ranges. When using an external frame, make sure to remove the projector feet and replace them with screws of M16 x 200 to mechanically connect the projector with the frame. Make sure these screws are long enough to secure the projector to the frame AND leave an open space of minimum 50 mm between frame and projector. The open space is necessary for the drains to evacuate any built up condensation water.

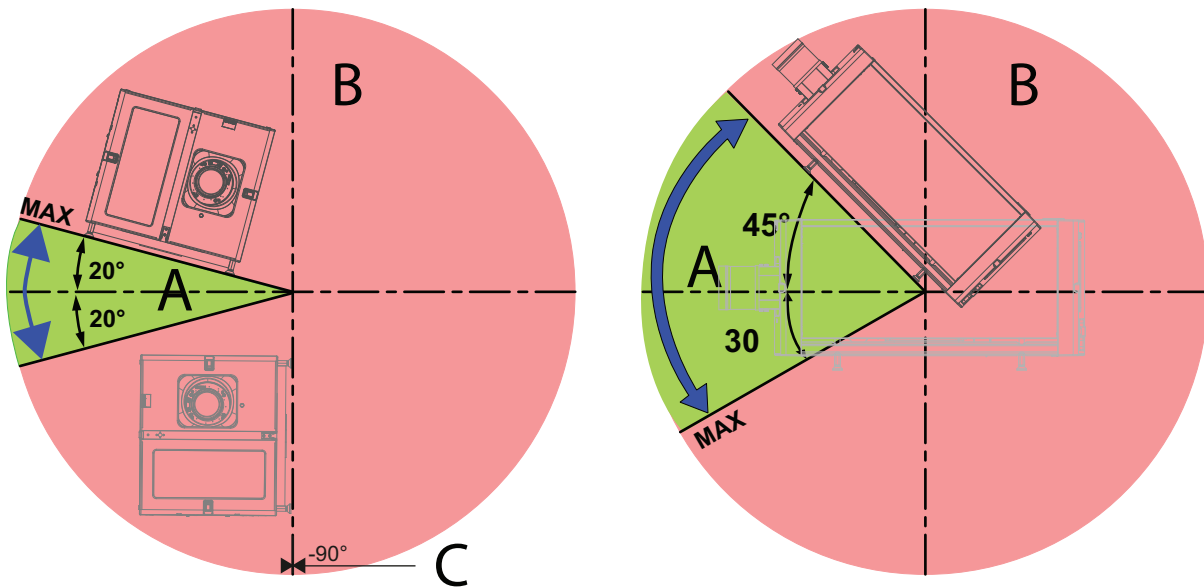


Image 3-7

- A** Tilting allowed without problem
- B** No tilting allowed in this area
- C** Tilting allowed under 90° while the Input & Communication unit is facing downwards

3.5 Additional vertical shift of the Lens Holder

Introduction

The lens of the XDL can be shifted vertically. The maximum vertical shift range is –65–+75%, which is not sufficient in some situations. To extend the vertical shift range in a certain direction, the Lens Holder can be shifted manually.

Extending the vertical shift range in a certain direction, will reduce the available range in the other direction. This will result in the following lens shift:

- Lens holder in highest position: –20 to +120%
- Lens holder in neutral position: –65 to +75%
- Lens holder in lowest position: –105 to +30%

Required tools

Allen wrench 3 mm

How to shift the Lens Holder?

1. Open the projector front cover. See “Opening the front and rear cover doors”, page 128.
2. Loosen the 4 screws (1) until the central part of the Lens Holder becomes loose. Use a 3 mm Allen wrench.
3. Shift the central part up or down as desired. The lowermost, middle and uppermost shift positions are marked on the Lens Holder with a little arrow (2).
4. Tighten the 4 screws (1) to a torque of **8.4 Nm**.

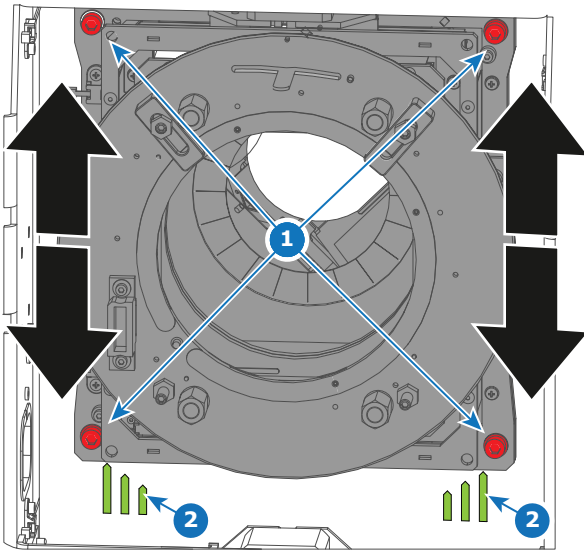


Image 3-8

5. Close the front projector cover again.

3.6 Removing the projector feet



When trying to tilt the projector in an angle beyond what the projector feet can handle, use an external frame that achieves this angle instead.

Take into account that when using an external frame, the projector feet must be removed completely and the holes must be used to attach the projector to the rigging frame (using screws of M16 x 200).

Required tools

- Open end wrench 17 mm
- Open end wrench 24 mm

How to remove

1. Loosen the long nut (reference 1 Image 3-9) on the threaded rod of the four projector feet. Use a 24 mm open end wrench.

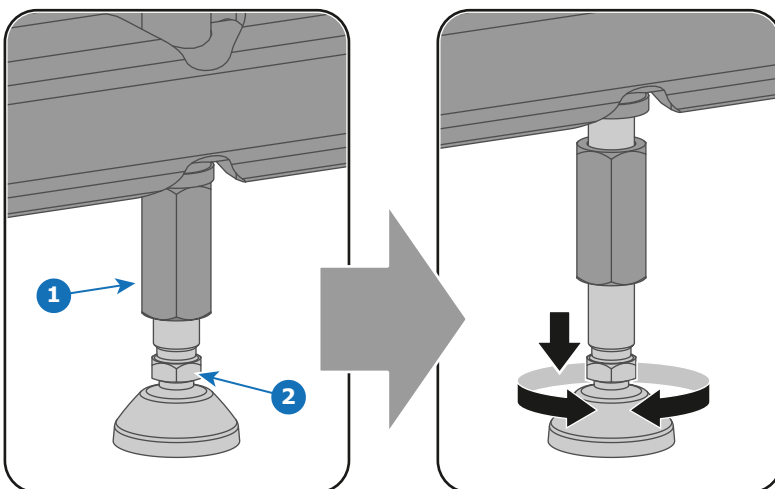


Image 3-9

2. Fully remove the projector feet. Use a 17 mm open end wrench to rotate the projector feet (reference 2 Image 3-9).

Pulse Remote Control Unit

4

Overview

- Remote control, battery installation
- Remote control, protocol setup
- Remote control, on/off button
- Functionality overview
- Functions of the “button pressed indicator”
- Function of the RGB filter button
- Displaying and Programming addresses into the RCU
- Using the XLR connector of the RCU
- Using the mini-jack connector of the RCU
- Silicone protection sleeve for the RCU (optional)

4.1 Remote control, battery installation

Where to find the batteries for the remote control ?

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

How to install

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

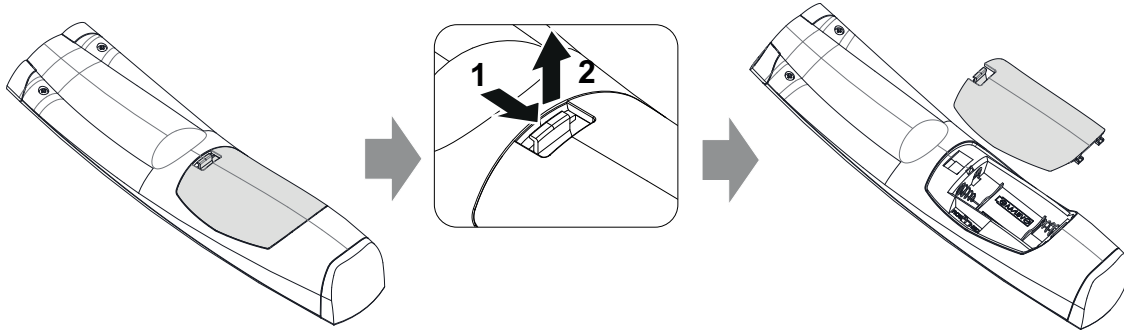


Image 4-1

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



Tip: Use alkaline batteries for optimum range and life time.

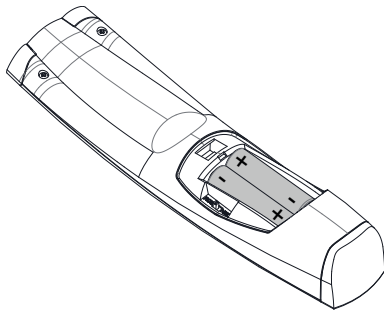


Image 4-2

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

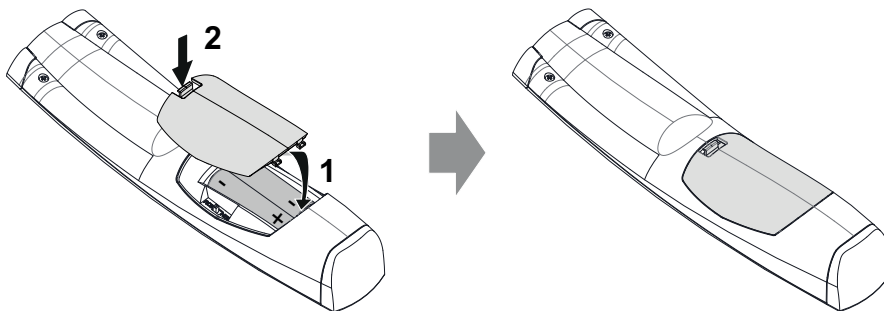


Image 4-3



When replacing batteries, the broadcast address of the RCU will be reset to its default value '0'.



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



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

4.2 Remote control, protocol setup

About the used protocol

The protocol is the code send out by the remote control when a button is pressed. Depending on this code, the projector can decode the signals. The remote control can be used with two different protocols: RC5 and NEC. Depending on the projector to control the remote control can be switched between these protocols.

Which protocol to use

- The **NEC** protocol has to be used for Barco projectors based on the Pulse platform: F70, F80, F90, HDX 4K, UDX, XDL, etc.
- The **RC5** protocol has to be used all legacy Barco projectors: HDQ 2k40, HDF, HDX W, etc.

How to set

1. Remove the cover. For more info on how to remove, see “Remote control, battery installation”, page 44.
2. Place the switch in the desired position.

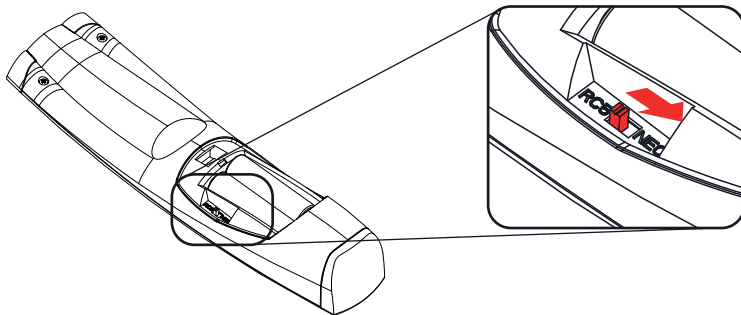


Image 4-4

Remarks when using the RC5 protocol

Due to new or updated functionality not all buttons of the Pulse RCU are one-to-one compatible with the legacy Barco RCU and projectors. Take the following limitations into account:

- Buttons **Shutter open** and **Shutter close** emit the same code when in RC5 mode. This because the legacy RCU's only had 1 button for Shutter functionality.
- Buttons **Power on** and **Power off** emit the same code when in RC5 mode. This because the legacy RCU's only had 1 button for Power functionality.
- The **RGB filter** button is not supported.
- The **Input selection** button is not supported.
- The **Default value** button is not supported.
- The **Macro** button is not supported.

4.3 Remote control, on/off button

Purpose of the remote control on/off button

The Pulse remote control unit has at the front side an on/off switch (reference 1 Image 4-5). Switching off the remote control prevents that unwanted commands are send due to an accidental key press. Furthermore, switching the RCU off will extend the battery life time of the remote control.

To activate the remote control press the on/off button.

To deactivate the remote control press the on/off button again.

Default when (re)placing batteries, is "ON".

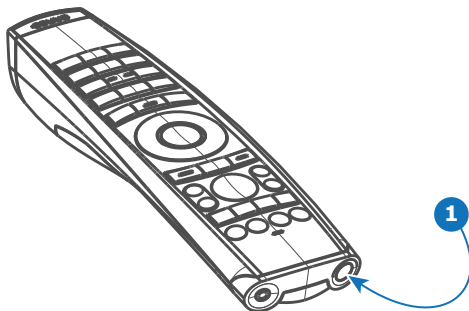


Image 4-5

4.4 Functionality overview

Remote Control Unit buttons

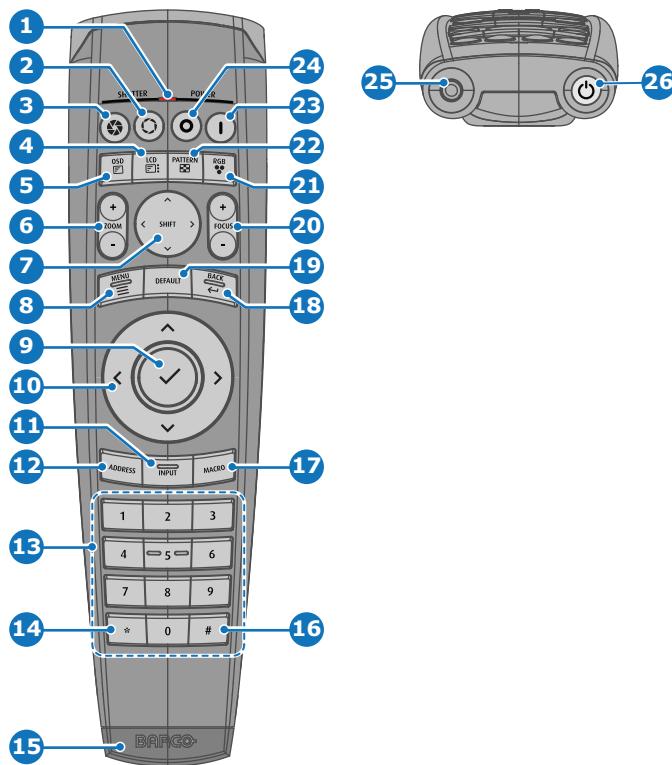


Image 4-6

- | | |
|------------------------------------|--|
| 1 Button pressed indicator | 14 Backspace (while entering values) |
| 2 Shutter open | 15 XLR connector |
| 3 Shutter close | 16 Decimal mark (while entering values) |
| 4 LCD panel on / off | 17 Macro button |
| 5 Project OSD on / off | 18 Menu back |
| 6 Lens zoom | 19 Default value button |
| 7 Lens shift | 20 Lens focus |
| 8 Menu open / close | 21 RGB filter |
| 9 Menu selection, OK button | 22 Test patterns |
| 10 Menu navigation | 23 Power on |
| 11 Input selection | 24 Power off |
| 12 Address button | 25 3.5 mm jack |
| 13 Numeric buttons | 26 RCU on / off |

4.5 Functions of the “button pressed indicator”

Functions button pressed indicator

- Rapidly flashes when commands are sent, this is the normal “button pressed” indication.
- 1 Short flash when remote control is switched ON by means of the on/off button.
- Continuously lit (up to 5 seconds) when address digits are expected after pressing the ADDR button.
- Slowly flashes (2 times a second) when the battery level is becoming low; typically when more than 85% of the useful life is past.

4.6 Function of the RGB filter button

Filtering the color of the projected image

By pressing the RGB filter button on the RCU you can place a color filter on the output of the projector. This feature can be useful during the installation and configuration of a multi-projector or multi-channel setup. By having one projector project a red image and another project a green image, it is easier to spot and adjust the overlap section.

By pressing this button multiple times, you will have different active filters, in the following cycle:

- Red + Green + Blue (default)
- Red only
- Green only
- Blue only
- Red + Green
- Green + Blue
- Red + Blue
- Red + Green + Blue
- etc



After powering up, the colors will always revert back to full RGB.

4.7 Displaying and Programming addresses into the RCU

Displaying the Projector Address on the Screen.

1. If the projector is on, press the menu key and navigate to the Status page. The projector address and the broadcast address can be seen under the Communication heading.

The projector's address is displayed on the LCD status screen and / or the OSD.

How to Program an Address into the RCU?

1. Press the **Address** button until the *Button pressed indicator* lights up continuously (proximately 5 seconds).
2. Enter the address with the digit buttons within the time the indicator lights up (also proximately 5 seconds).



Note: That address can be any value between 0 and 31.

Tip: A few examples:

To enter address 3, press "3" digit button on the RCU to set the RCU's address to 3 and wait until the *button pressed indicator* is out. Alternatively, you can also press "0" and "3". This way, the *button pressed indicator* goes out immediately.



To enter address 31, then press "3" and "1" on the digit button on the RCU and the *button pressed indicator* goes out immediately.

4.8 Using the XLR connector of the RCU



Connecting a cable with the XLR connector will reset the broadcast address of the RCU to its default value '0'.

How to use the XLR connector

1. Remove the XLR cover by pulling it backwards.



Image 4-7

2. Connect a cable with XLR plug into the XLR connector of the RCU.
3. Connect the other end of the cable with the XLR input of the projector.



Note: While the XLR cable is connected, the IR beam of the RCU is switched off.

4.9 Using the mini-jack connector of the RCU



Connecting a cable with the mini-jack connector will reset the broadcast address of the RCU to its default value '0'.

How to use the mini-jack connector

1. Connect a cable with the mini-jack connector (reference 2 Image 4-8) of the RCU.
2. Connect the other end of the cable with the mini-jack input of the projector.

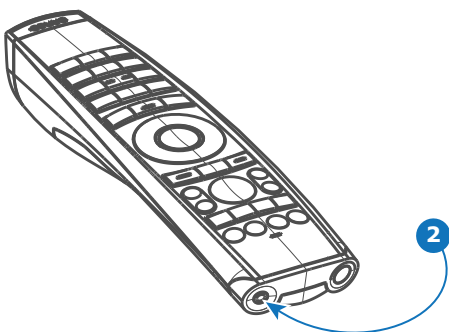


Image 4-8



Note: While the mini-jack cable is connected, the IR beam of the RCU is switched off.

4.10 Silicone protection sleeve for the RCU (optional)

Introduction

Barco offers a silicone form fitting protection sleeve for the Pulse RCU. The silicone material keeps it comfortably, non slip and soft touch. All buttons and holes remain accessible. The sleeve is quick and easy installed. For ordering information see Barco website.

How to install

1. Pull off the rubber XLR-lid from the RCU.



Image 4-9

2. Place back side (XLR side) of the RCU into the sleeve and pull the other side of the sleeve over the front side of the RCU.

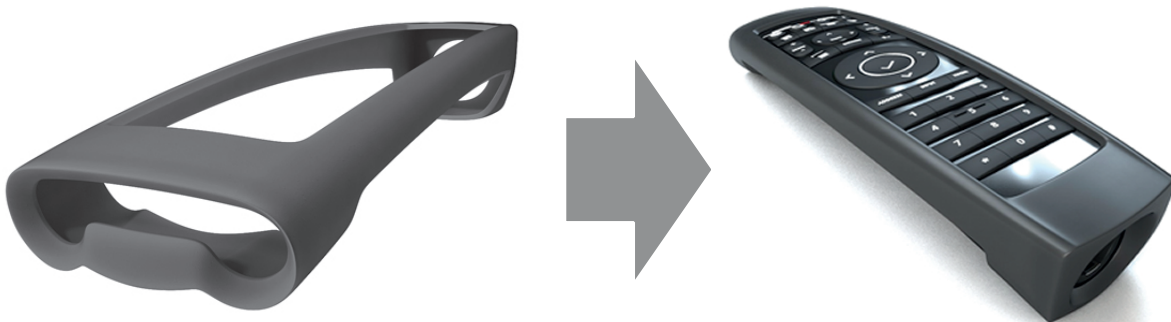


Image 4-10

Physical Installation

5

Overview

- Removing the transport protection bars
- Alignment of a table mounted projector
- Connecting the hoses with projector and chillers
- Connecting the data cable with projector and chillers
- Accessing the mains compartment
- Connecting the external safety interlocks
- Three phase power input configuration of the projector
- Connecting the projector with the mains electricity
- Power loop through to the projector electronics
- Connecting a UPS to the projector electronics

5.1 Removing the transport protection bars

What needs to be done?

After the projector is unpacked and placed on its pedestal the transport protection bars at the front and at the rear of the projector have to be removed.



The transport protection bars need to be removed to connect the hoses of the cooling system with the projector and to have easy access to the dust filter at the front side.

Required tools

Allen wrench 10 mm

How to remove the transport protection bars?

1. Remove the two fixation screws (reference 1 Image 5-1) in the center of the transport protection bar. Use a 10 mm Allen wrench.

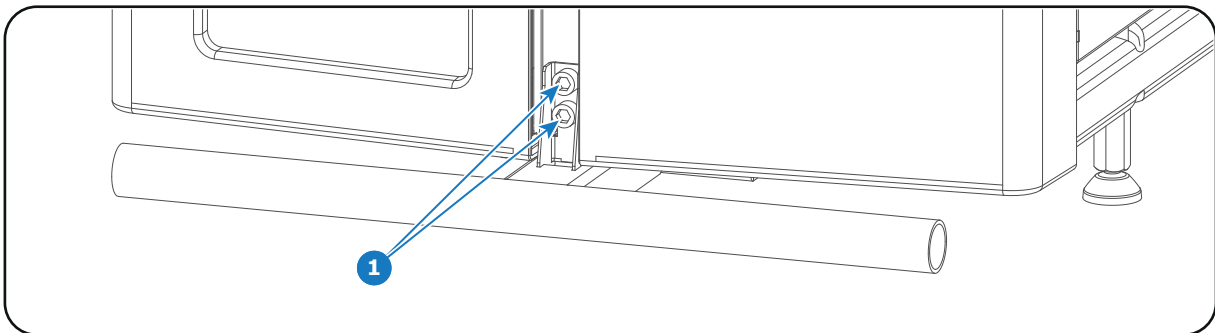


Image 5-1

2. Pull the transport protection bar out of its slot.

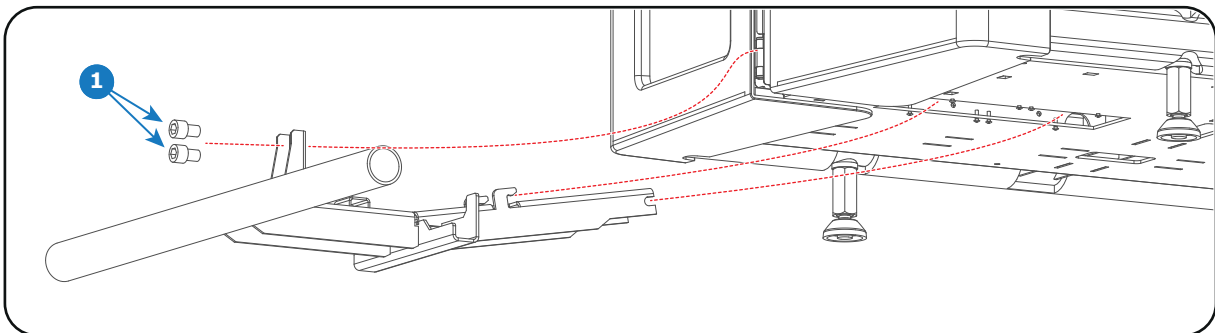


Image 5-2

3. Repeat these steps to remove the other transport protection bar as well.

5.2 Alignment of a table mounted projector



Barco offers a pedestal for the XDL series projector. This pedestal allows for a solid and easy setup of the projector and chillers that fit underneath the pedestal.



When trying to tilt the projector in an angle beyond what the projector feet can handle, use an external frame that achieves this angle instead. Take into account that when using an external frame, the projector feet must be removed completely and the holes must be used to attach the projector to the rigging frame (using 17 mm hex screws).

Required tools

- Open end wrench 17 mm
- Open end wrench 24 mm

How to align

1. Place the projector in the desired location. Take into account the zoom range of the used lens and the size of the screen.
2. Project one of the internal patterns on the screen.
3. Turn the adjustable feet in or out until the projected pattern has a perfect rectangle shape and is leveled. To do so, proceed as follows
 - Loosen the long nut (reference 1 Image 5-3) on the threaded rod of the four projector feet. Use a 24 mm open end wrench.
 - Adjust the height of the four legs to level the projector. Use a 17 mm open end wrench to adjust the height as illustrated (reference 2 Image 5-3).
 - Secure the leg height by tightening the long nuts (reference 1 Image 5-3) of each projector foot against the projector chassis.

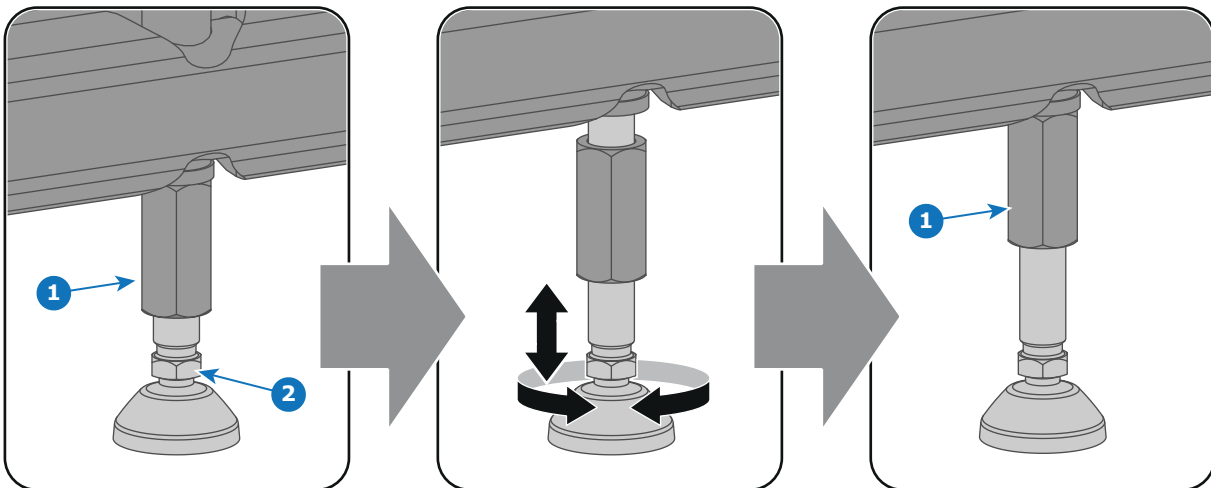


Image 5-3: Level alignment

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

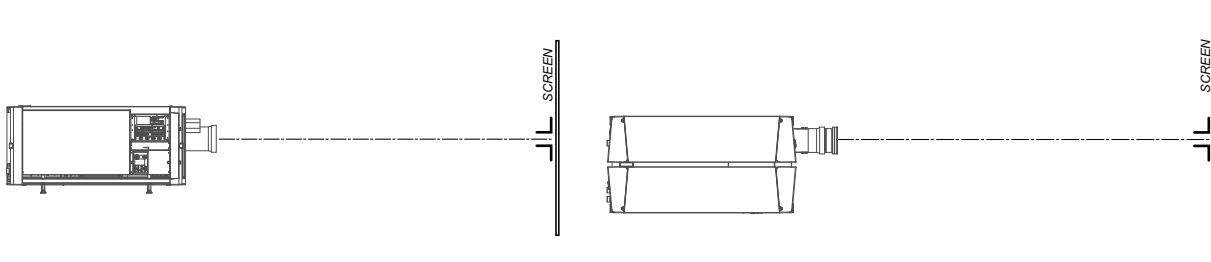


Image 5-4: Angle adjustment

5.3 Connecting the hoses with projector and chillers

What has to be done?

The cooling circuit of the chiller(s) has to be connected with the cooling circuit of the projector. For that hoses are needed. The length of the hoses depend on the position of the chillers in relation to the projector. The maximum length is 10 meter!

Depending on the projector model one or two chillers are required! For the XDL-4K30 series projector one chiller has to be installed. The XDL-4K60/75 series needs two chillers.



This procedure assumes that the chiller(s) and projector are already installed.

It is also advised to use the XDL accessory kit and install the support frames before you connect the hoses and use the hose shells after connecting the hoses. See the Accessory kit installation manual for more details.

Hoses IN/OUT connection scheme

The labels on the projector and on the chiller indicating the three different cooling circuits: **(R/B, G and DMD)** and the direction of the liquid flow: **OUT** and **IN**. 'OUT' means liquid flows out of the chiller or projector, 'IN' means liquid flows into the chiller or projector. Both sides of all hoses are also labeled.

Chiller without DMD cooling unit (not for XDL-4K30)	Chiller with DMD cooling unit	Projector
	DMD OUT	DMD IN
	DMD IN	DMD OUT
	R/B OUT	R/B IN
G OUT		G IN
G IN		G OUT
	R/B IN	R/B OUT



The XDL-4K30 series projector requires only one chiller. The circuits G-IN and G-OUT are omitted.

How to connect the hoses?

1. Ensure that all connectors of the hoses, chillers and projector are clean. Wipe away any dust before attaching.
2. Connect the hoses one by one with the chiller and projector as illustrated below. (see also 'IN/OUT connection scheme' above)

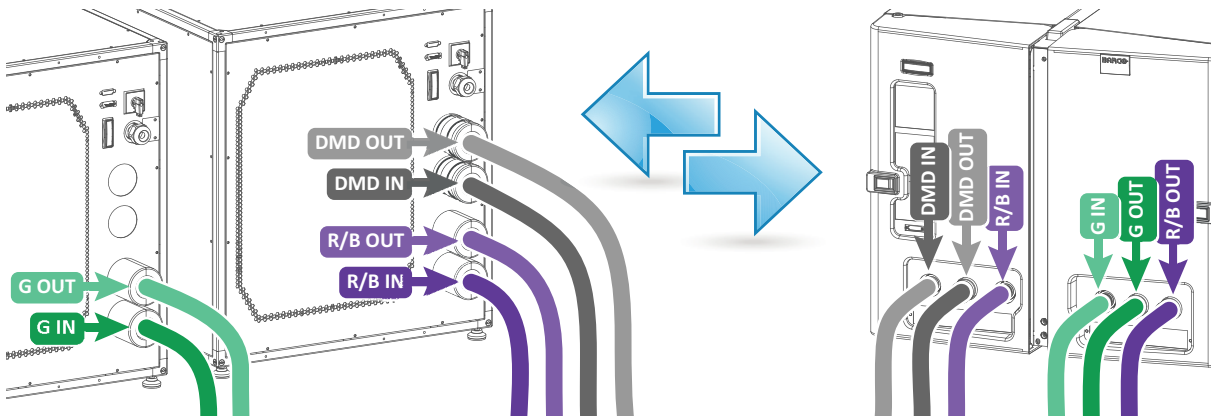


Image 5-5



Note: The circuit is pressurized which makes it sometimes difficult to insert the hoses.



Tip: First move the latch (reference 1 Image 5-6) away from the connection while coupling the hose. Then release the latch and push the hose further until the latch locks.

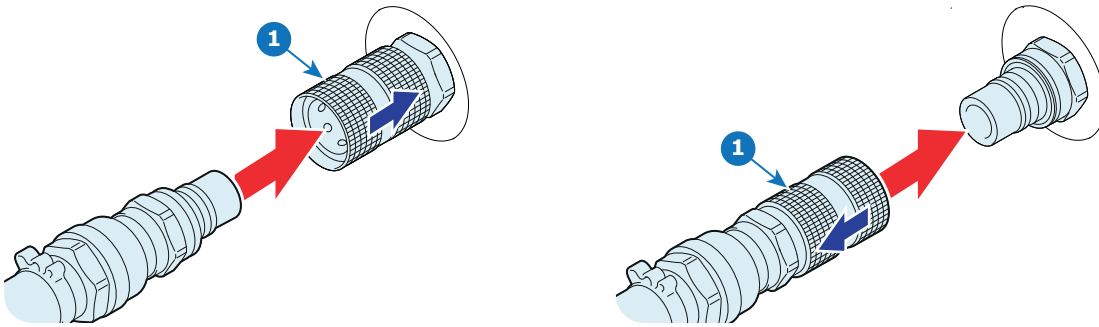


Image 5-6: Left: Male hose connection, right: Female hose connection



CAUTION: Do not interchange the different cooling circuits with each other! Otherwise the system will fail.



CAUTION: The minimum bend radius of the hoses is 30 centimeter.

5.4 Connecting the data cable with projector and chillers

What has to be done?

Next to connecting the hoses, the communication port of the chillers has to be connected with each other and with the projector.

Depending on the projector model one or two chillers are required! For the XDL-4K30 series projector one chiller has to be installed. The XDL-4K60/75 series needs two chillers.

Required parts

- One long (10 meter) communication cable with SUBD Male/Female 15 pins plugs.
- One short (5 meter) communication cable with SUBD Male/Female 15 pins plugs (only if two chillers are required).

How to connect the communication ports of the chillers with the projector?

1. Does the system contain two chillers?
 - **If yes**, connect the output port of one chiller (reference 1 Image 5-7) with the input port of the other chiller (reference 2 Image 5-7). Use for this a short communication cable.
 - **If no**, proceed with the next step.
2. Connect the output port of the chiller (reference 3 Image 5-7) with the communication port of the projector (reference 4 Image 5-7). Use for this a long communication cable.



Tip: Guide the long communication cable together with the hoses.

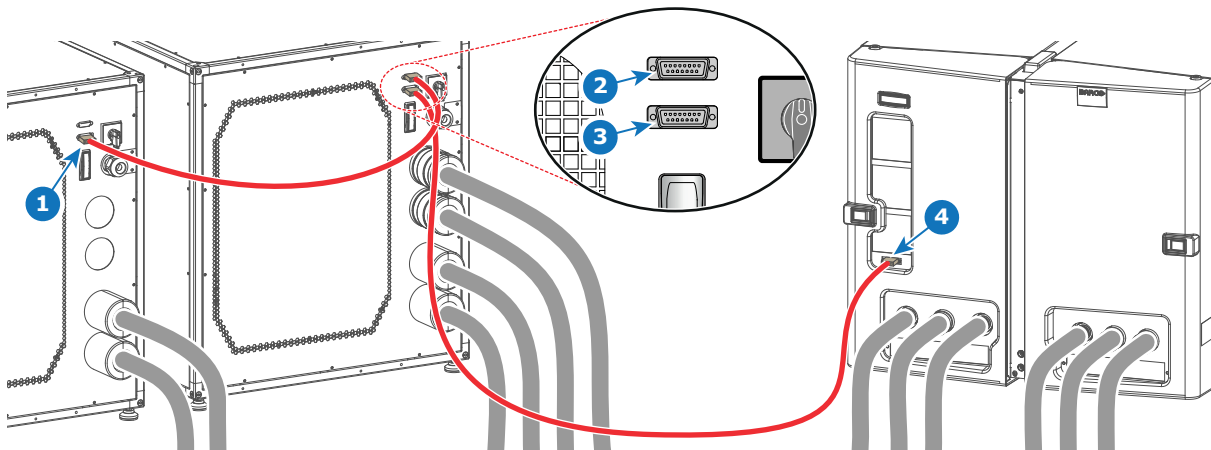


Image 5-7

5.5 Accessing the mains compartment

Required tools

- Phillips screwdriver PH1
- Allen wrench 3 mm

How to access the mains compartment?

1. Loosen the four retaining screws (reference 1 Image 5-8) of the mains cover. Use a PH1 Phillips screwdriver.
2. Remove the mains cover.

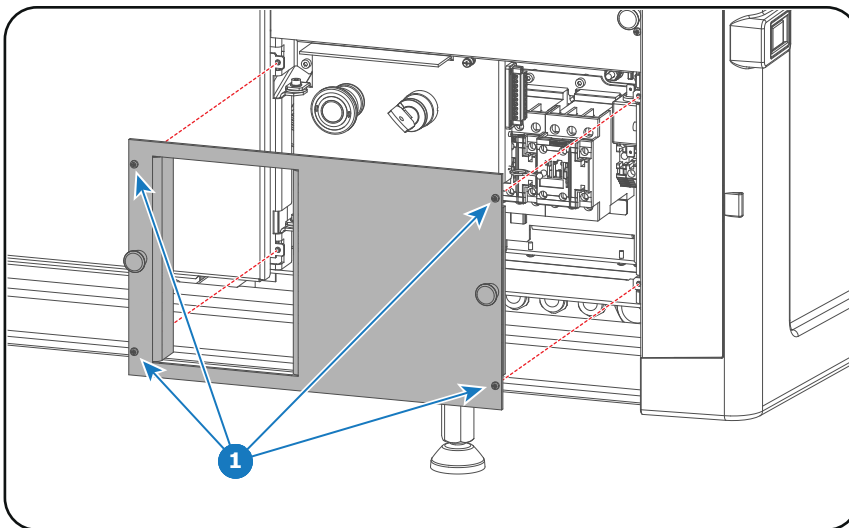


Image 5-8

3. Unlatch and pivot the right front plastic cover door (door which contains the dust filters).
4. Loosen the retaining screw (reference 2 Image 5-9) of the inner door. Use a PH1 Phillips screwdriver.
5. Pivot the inner door to access the mains compartment from the side.

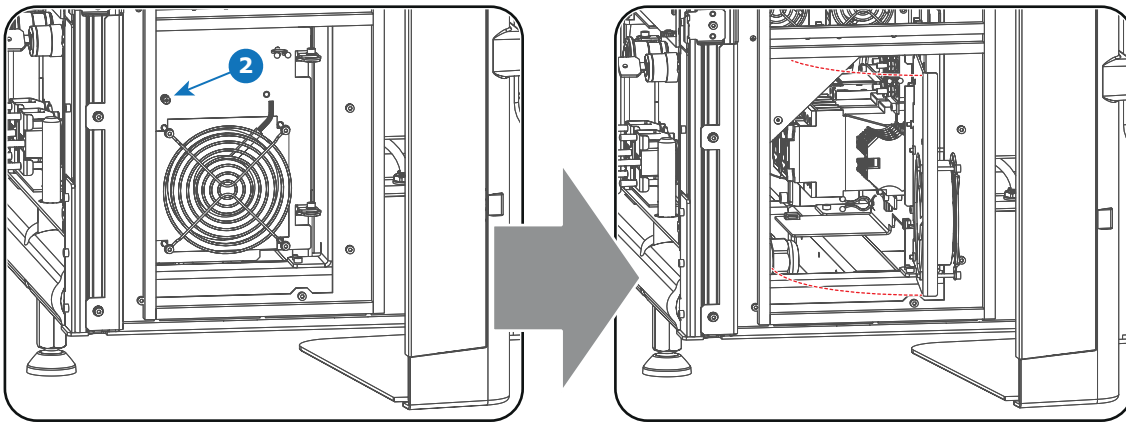


Image 5-9

6. Loosen the retaining screw (reference 3 Image 5-10) of the inner front door (door with the Stop button). Use a 3 mm Allen wrench.
7. Pivot the inner front door to have full access the mains compartment parts.

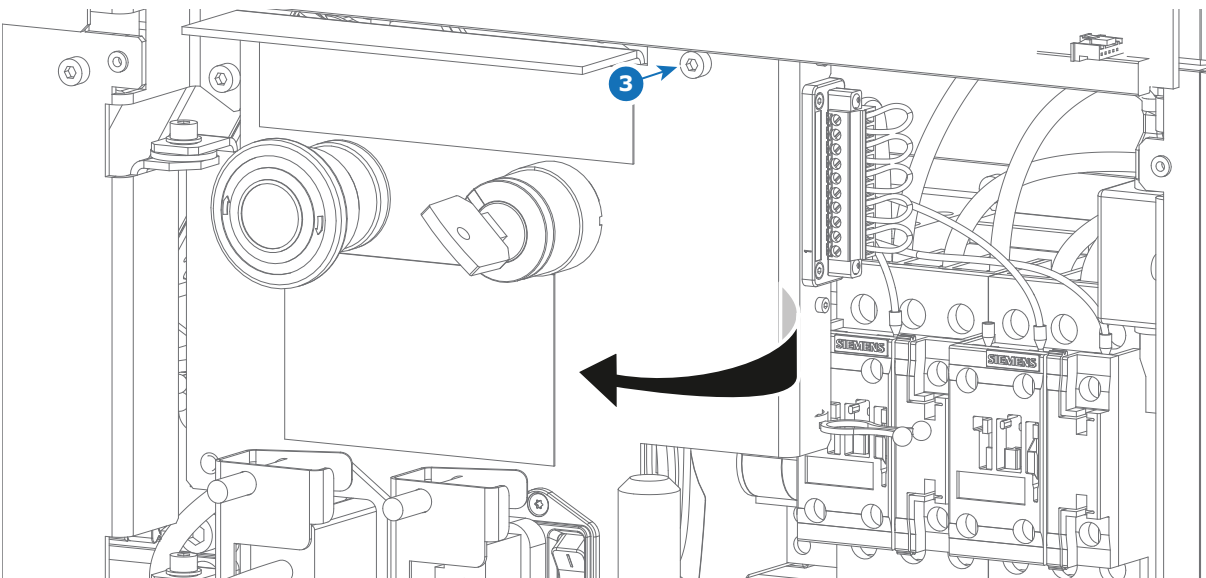


Image 5-10

5.6 Connecting the external safety interlocks



The terminal for the external safety interlocks is located inside the mains compartment. This procedure assumes that the cover of the mains compartment is already removed. See chapter "Accessing the mains compartment", page 56.

Required tools

Flat screwdriver (small)

How to connect the external safety interlocks with the projector?

1. Remove the 10 pole terminal block from its socket (reference 3 Image 5-11). Use a small screw driver.
2. Guide the cable(s) coming from the external interlock device(s) through the cable gland(s) located at the base of the mains compartment (reference 4 Image 5-11).
3. Remove the shunt wire(s) from the 10 pole terminal block and connect the cable(s) according the schematic in Image 5-11.

Note: Only remove the shunt wires from these pins which have to be connected with an external safety interlock device. All other shunt wires must remain in place.

Note: Maximum two external safety interlock devices can be connected. These interlock devices must have double pole normal open contacts. So, for normal operation of the projector the normal open contacts are pushed into the closed state to close the circuit and thus enabling the activation of the PSU of the lasers.

The internal master key can be extended with a single pole external master key (MK).

4. Insert the 10 pole terminal block back in its socket. Use a small screw driver to fixate the terminal block.
5. Insert the cable(s) in the cable tie located below the terminal block (reference 5 Image 5-11).

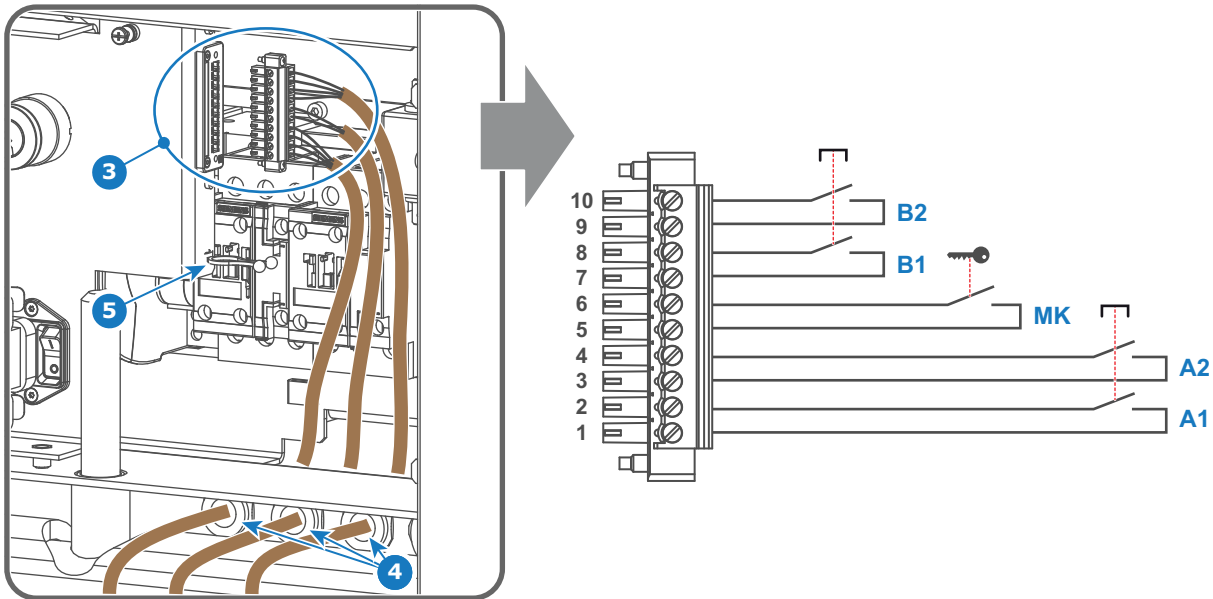


Image 5-11

6. Install the cover of the mains compartment.

5.7 Three phase power input configuration of the projector

About the power input

The projector power input can be configured for a power supply of 200-240V / 346-415V in a Y configuration (3W+N+PE) or for 200-240V in a Δ configuration (3W+PE). Before operating the projector, place the links in the correct position depending on the local power supply.

For a 3W+N+PE system, 346-415V is measured between the lines, 200-240V is measured between the lines and the neutral.

For a 3W+PE system, 200-240V is measured between the lines.

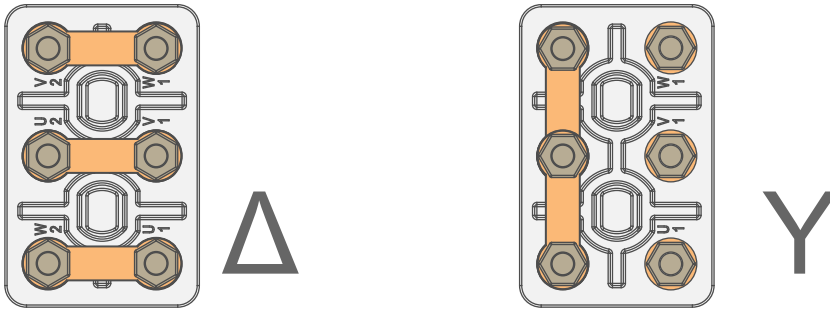


Image 5-12: Y/Δ configuration block (left: delta, right: star)



WARNING: Ensure that the mains is disconnected from the projector prior to start with this procedure.



The Y/Δ configuration block is located inside the mains compartment. This procedure assumes that the cover of the mains compartment is already removed. See chapter “Accessing the mains compartment”, page 56.

Required tools

- Nut driver 10 mm
- Torque wrench with 10 mm hexagon socket

How to switch from a Y-connection to Δ-connection

1. Loosen the 6 top nuts on the Y/Δ configuration block. (1 to 6)

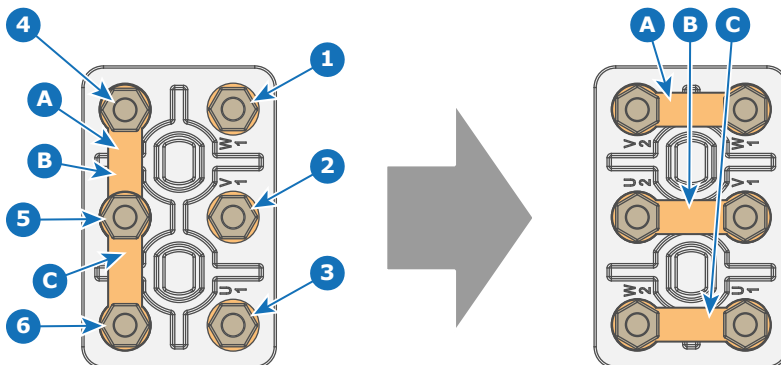


Image 5-13

2. Take off the mounted links (A, B and C). Two links above each other or mounted between the upper and middle pin (A, B) and one link between the middle pin and lower pin (C).
3. Mount the links horizontally on the pins.
4. Turn a nut on each pin and secure with a torque wrench set to **7.5 Nm**.

How to switch from a Δ-connection to Y-connection

1. Loosen the top nuts on the Y/Δ configuration block (1 to 6).

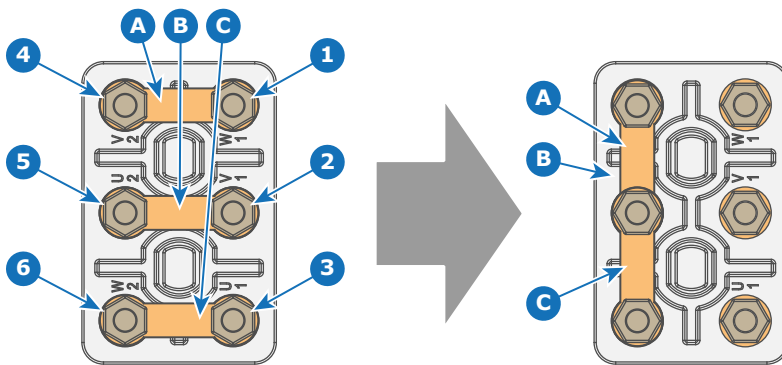


Image 5-14

2. Take off the mounted links (A, B and C).
3. Connect the left pins together. Place 2 links between the upper pin and the middle pin (A, B) and 1 link between the middle pin and the lower pin (C).

5.8 Connecting the projector with the mains electricity



WARNING: The total electrical installation should be protected by an appropriate rated and readily accessible disconnect switch, circuit breakers and ground fault current interrupters. The installation shall be done according to the local electrical installation codes.



CAUTION: The cross-sectional area of the conductors in the AC power supply cord shall be not less than 4 mm² to 6 mm², 10 AWG to 8 AWG in case of a star (Y) configuration and not less than 6mm², 8AWG in case of a delta (Δ) configuration.

Required tools

- Flat screw driver 4 x 100 mm
- Torque wrench with flat-head socket (medium size)

Required parts

Certified AC power supply cord, min. 500V. Take into account that the cable gland of the projector allows a cable diameter from 11 to 21 mm.

How to connect the projector with the mains electricity?

1. Remove the cover of the mains compartment. See procedure “Accessing the mains compartment”, page 56.
2. Push the stripped AC power supply cord through the cable gland (reference 2 Image 5-15).
3. Connect the wires to the 5-terminal strip (reference 1 Image 5-15) as illustrated. Use a torque screw driver to fasten the screws of the 5-terminal strip with a torque of **1.7Nm** (1.25 lbf*ft).

Always connect the ground wire (PE) with the connector indicated with PE on the terminal barrier strip.

If a neutral conductor is available, connect always to the connector indicated with N on the terminal barrier strip.



Warning: Connect first the PE wire, then the other wires.



Caution: When using a flexible AC power supply cord, make sure that each conductor end is provided with an end sleeve.



Tip: Check for good fixation by pulling on each wire.

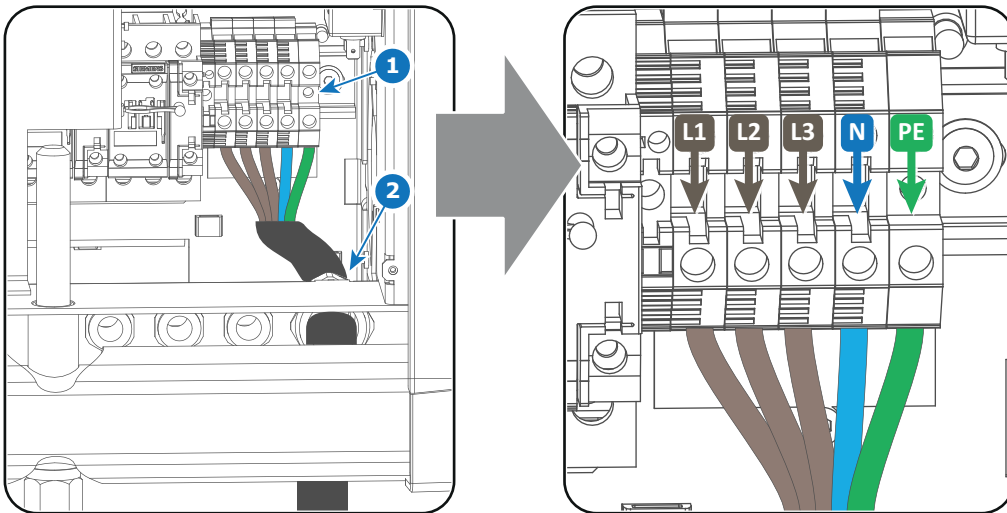


Image 5-15

4. Secure the AC power supply cord by fastening the cable gland (reference 2 Image 5-15).
5. Install the cover of the mains compartment.

5.9 Power loop through to the projector electronics



This procedure explains how to provide the projector electronics with power in case no UPS unit is used. Note that the projector is by default configured for use without UPS. So, the short power link cable is already installed.


Required tools

No tools required.

Required parts

Short power link cable with plug type C13/C14

How to loop through the power?

1. Plug in the short power cable (reference 1 Image 5-16) which was delivered with the projector.
 -  **Warning:** Always use the Barco short power cable which is delivered with the projector.
2. Secure both plugs of the short cable with a fixation spring (reference 2 Image 5-16). Handle as follow:
 - Squeeze the fixation spring together.
 - Slide the fixation spring on the fixation pins (reference 3 Image 5-16) while squeezing together and push it against the power plug.
 - Release the fixation spring.

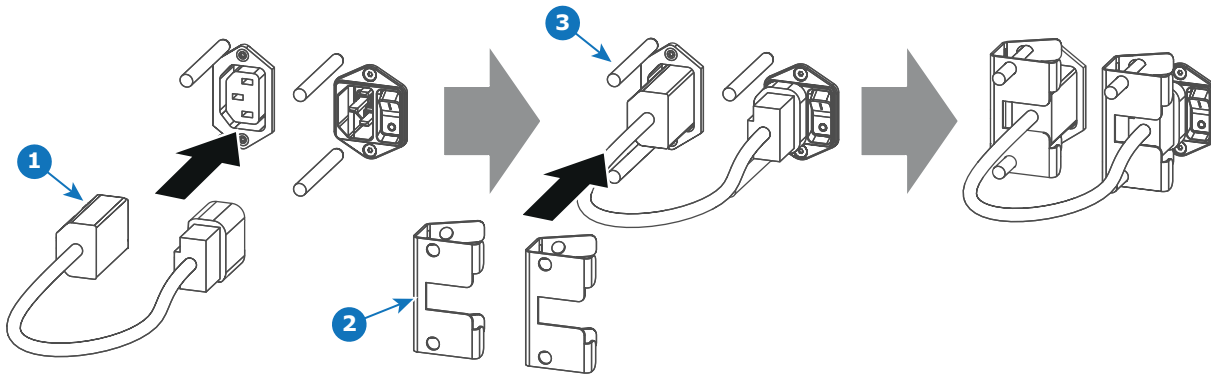


Image 5-16

5.10 Connecting a UPS to the projector electronics



WARNING: Only use UPS units which are suitable for the XDL series projector. See chapter “Installation requirements” for more information about the requirements of the UPS.

Required tools

No tools required.

How to connect the UPS

1. Install the UPS according to the instructions of the manufacturer and the local regulations.
2. Connect the power output cord from the UPS unit to the UPS inlet socket of the projector (right socket).

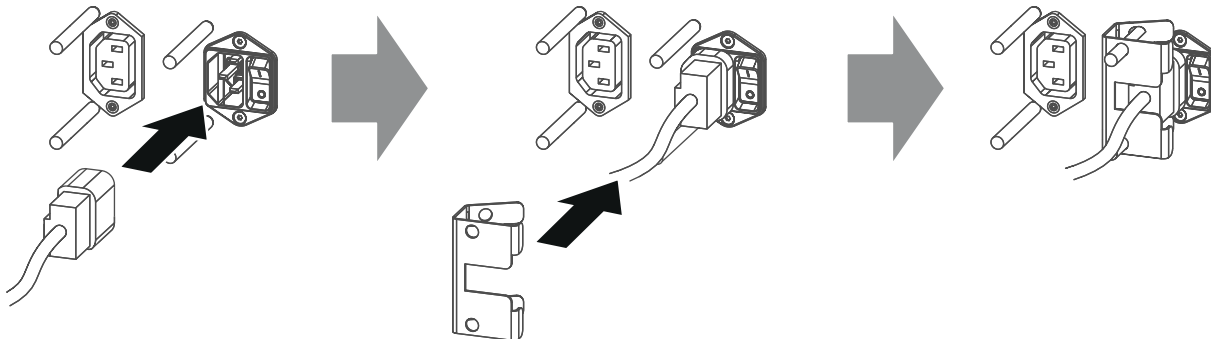


Image 5-17

3. Secure the UPS inlet socket with a fixation spring. Handle as follow:
 - Squeeze the fixation spring together.
 - Slide the fixation spring on the fixation pins while squeezing together and push it against the power plug.
 - Release the fixation spring.
4. Install on the power outlet the second fixation spring to prevent losing it.

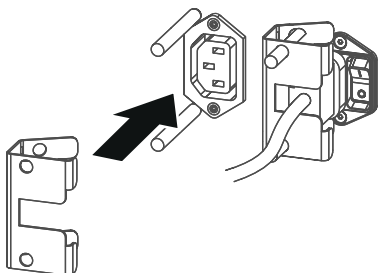


Image 5-18



CAUTION: The electrical connection with the UPS INLET socket of the projector must be done with a certified AC power supply cord (minimum 0,75 mm² or 18 AWG and minimum 300V)



CAUTION: Do not use the power OUTLET socket of the projector to provide power to other equipment!

Lenses & Lens selection

6

Overview

- Available lenses
- Lens selection
- Lens safety cable
- Lens installation
- Lens removal

6.1 Available lenses

Which lenses are available for my projector?



The table below is subject to changes and was last updated on 20/02/2018. Consult Barco's web site for the most recent information about available lenses.

Order No	Type	Throw Range (4K)
R9852945	XLD	0.75
R9852950	XLD	1.0
R9852090	XLD	1.45 - 1.8
R9852092	XLD	1.8 - 2.4
R9852094	XLD	2.2 - 3
R9852100	XLD	2.8 - 5.5
R9852920	XLD	5.5 - 8.5
R9856506	HB	1.13 - 1.72
R9856294	HB	1.35 - 1.86
R9856297	HB	1.46 - 2.10
R9856300	HB	1.65 - 2.60
R9856303	HB	2.00 - 3.35

6.2 Lens selection

How to select the right lens

1. Determine the required screen width (SW).
2. Determine the approximate position of the projector in the room.
3. Start up the *Lens Calculator* on the Barco website: <https://lenscalculator.barco.com/> to determine the possible lenses for your configuration.

The Lens Calculator window opens.

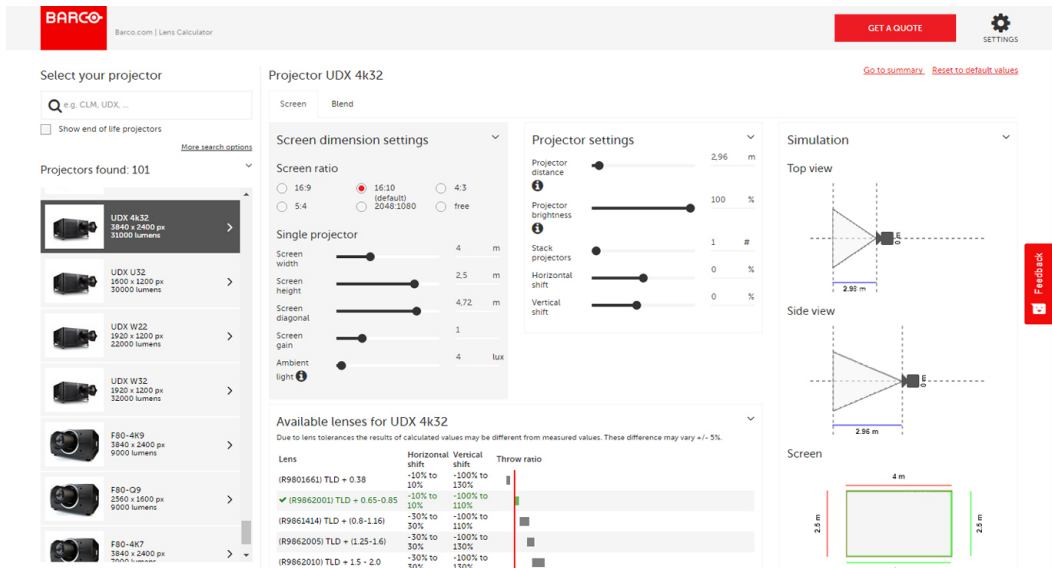


Image 6-1: Lens calculator



The Lens Calculator can also be used to determine the position of the projector when the lens type and screen width is known.



Due to lens tolerances the results of calculated values may be different from measured values. These difference may vary +/- 5%.

6.3 Lens safety cable

When using the safety cable ?

The lens safety cable must be used in any circumstances to protect a mounted lens in the lens holder when the projector is mounted above persons.

Configuration differences

There are two different configurations for the safety cable. The configuration used depends on the used carrying handle or hoisting eye.

- Configuration A applies when connecting the projector to the bottom carrying handle.
- Configuration B applies when connecting the projector to the top carrying handle.

Required tools

Allen wrench 10 mm

Required parts

- Safety Cable (750 mm, Ø3 mm)
- Cable clamp M4
- Shackle 7x70 mm
- 4 x Cable clip (16x16 mm, Ø4 mm)
- XDL safety cable bracket kit

How to mount the cable

1. Paste four cable clips on the lens as illustrated (reference 1). Orient the open side of the clips towards the front of the lens.

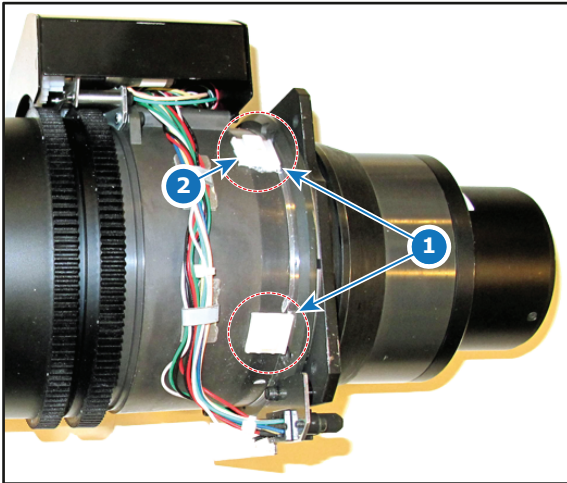


Image 6-2

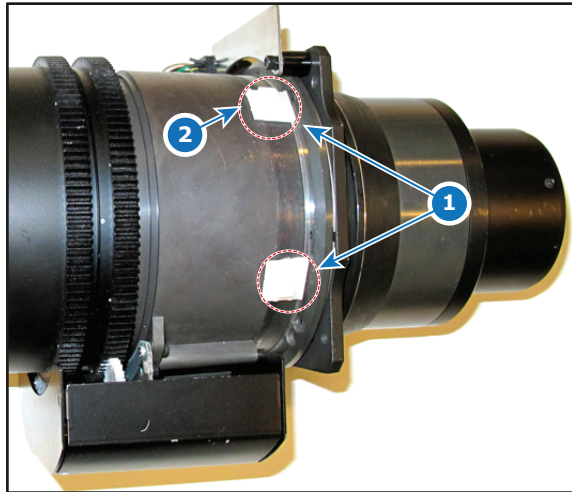


Image 6-3

2. Snap the first loop end of the safety cable into the upper clip on the side of the cable bundle (reference 2, Image 6-2). and let the loop end point downwards.
3. Slide the rest of the cable around the lens counterclockwise. Click the cable into every clip it passes in this loop.



Note: Make sure the cable passes between the lens and the cable bundle.

4. Slide the cable through the loop end at the beginning of the cable.

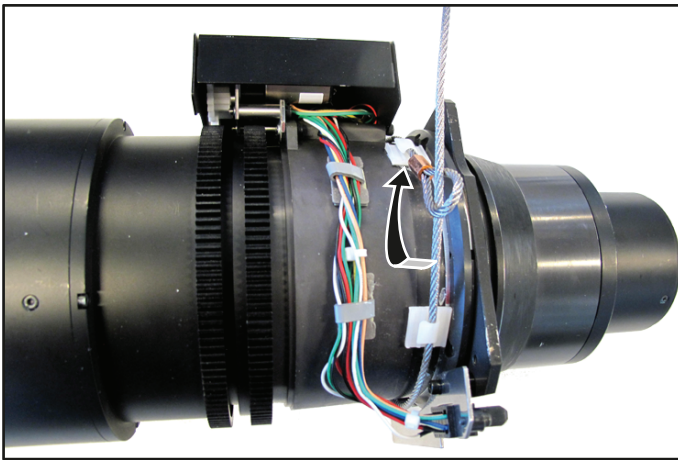


Image 6-4: Example of configuration A

5. Install a U-bolt on the lens holder, with the open ends oriented outwards (reference 3). Make sure that both a part of the loop end and the outgoing part of the safety cable are placed in the enclosure.

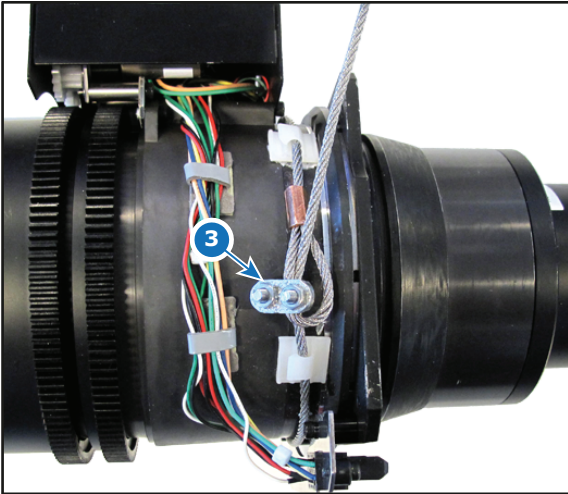


Image 6-5

6. Close the U-bolt and tighten it.



Note: Make sure the safety cable is tightened around the lens before tightening the U-bolt nuts.

7. Place the shackle through the free loop end of the safety cable.

How to mount the cable

1. Make sure the transport protection bars are removed from the projector. Refer to “Removing the transport protection bars”, page 52.
2. Mount the lens safety cable bracket onto the projector frame. Mount it on the place where the transport protection bar used to be. Use a 10 mm Allen wrench.

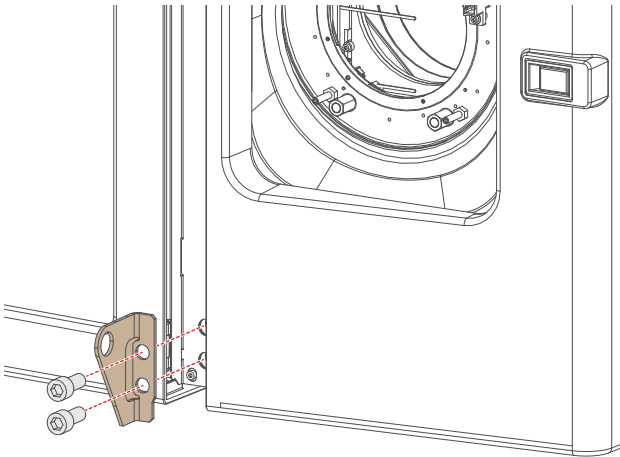


Image 6-6

3. Place the lens in the lens holder, using the lens locking mechanism.



Caution: Always make sure the lens is really secured by trying to pull the lens out of the lens holder.

4. Snap the shackle through the fixation ring of the safety cable bracket.
5. Secure the shackle by screwing the safety ring of the shackle over the open end.

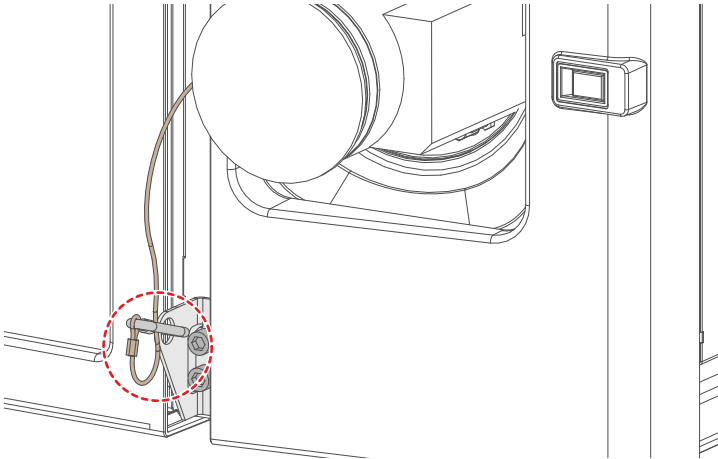


Image 6-7

6.4 Lens installation

How to install a lens into the Lens Holder?

1. Remove the plastic cover in the opening of the Lens Holder if not removed yet. Place the Lens Holder in the “**unlocked**” position by moving the lens lock handle (reference 1 Image 6-8) to the right. Then, take away the plastic cover.

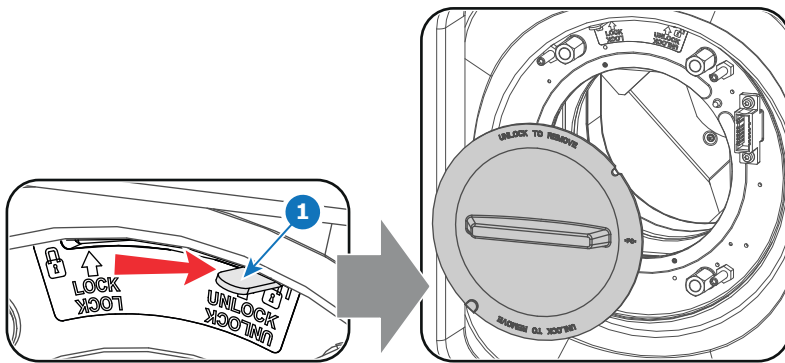


Image 6-8

2. Take the lens assembly out of its packing material and remove the lens caps on both sides.
 - ⚠ **Caution:** Do not touch the glass of the lens!
3. Ensure that the Lens Holder stands as good as in the On-Axis position (horizontal and vertical mid position).
4. Place the Lens Holder in the “**locked**” position by moving the lens lock handle (reference 1 Image 6-9) to the left, away from the lens power supply socket (reference 2 Image 6-9).
5. Gently insert the lens in such a way that the lens connector matches the socket. To prevent collision of the lens ensure you center the lens and keep it on-axis while approaching.
 - ⚠ **Warning:** Do not release the Lens yet, as the Lens may fall out of the Lens Holder.
6. **Push** the lens completely against the Lens Holder front plate. An **audible click** should be noticed. Once seated, there may be no airgap between lens flange and Lens Holder front plate.

- ⚠ **Caution:** Ensure that the lock handle remains in the “locked” position.

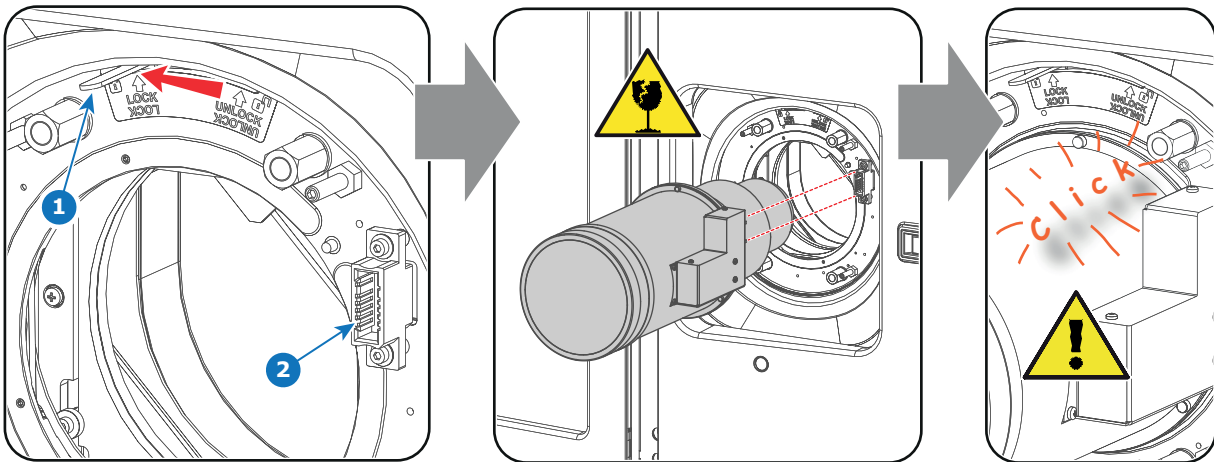


Image 6-9

Note: For frequent installation and removal of the lens it is recommended to install the lens while the lock handle is in “open” position (to the right) and put the lock handle in “locked” position once the lens is inserted. Then check if the lens is properly installed by trying to pull the lens out of the Lens Holder. This alternative procedure results in less wear of the Lens Holder and reduces the risk of accidentally moving the projector while pushing in the lens.

7. Check if the lens is really secured by trying to pull the lens out of the Lens Holder.



CAUTION: Never transport the projector with a Lens mounted in the Lens Holder. Always remove the Lens before transporting the projector. Neglecting this can damage the Lens Holder and Prism.

6.5 Lens removal

How to remove a lens from the Lens Holder?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle (reference 1 Image 6-10) towards the “unlocked” position as illustrated.
2. Gently pull the lens out of the lens holder, maintaining its coaxial direction.

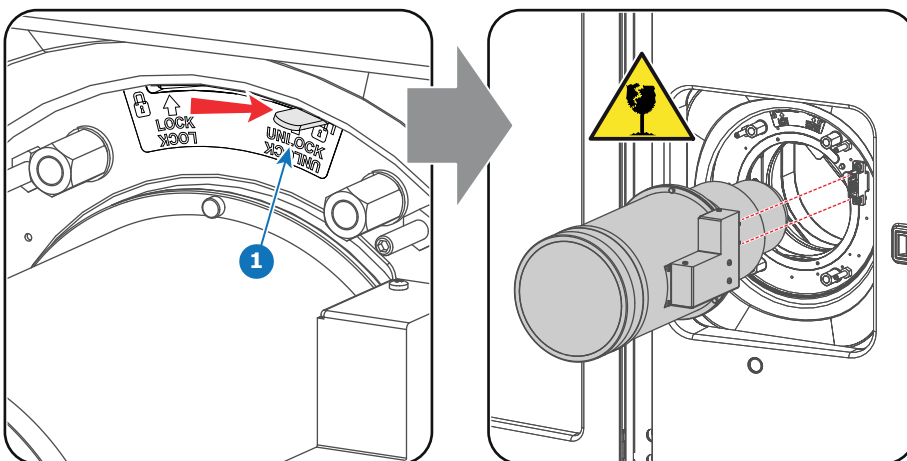


Image 6-10



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



It's recommended to place the plastic cover of the original projector packaging, back into the lens opening to prevent intrusion of dust. This plastic cover prevents that dust is entering the projector.

Scheimpflug

7

About this chapter

This chapter explains the Scheimpflug principle and when to apply Scheimpflug correction upon the projector.

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.

Overview

- Scheimpflug introduction
- Scheimpflug adjustment
- Fixation of the Lens Holder front plate

7.1 Scheimpflug introduction

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).

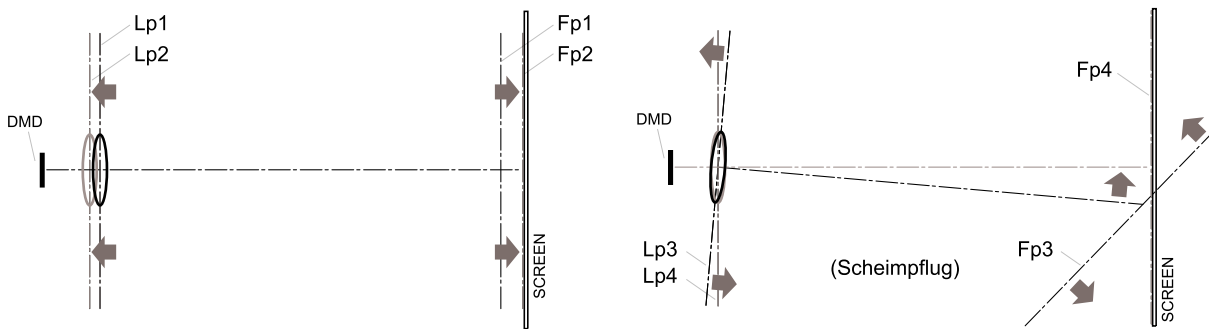


Image 7-1: Scheimpflug principle

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

The front plate of the Lens holder is equipped with four bronze (Scheimpflug) nuts and four set screws with lock nut. These screws and nuts are used for Scheimpflug adjustment.

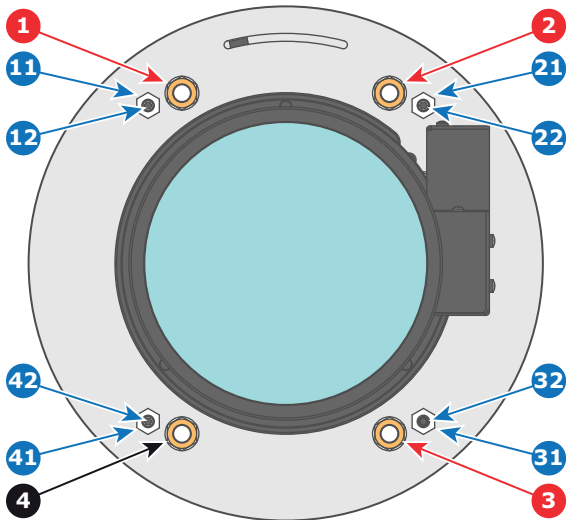


Image 7-2

- | | |
|---|--|
| <p>1 Scheimpflug adjustment nuts No1: Influences the sharp focus plane in the lower left corner of the projected image.</p> <p>2 Scheimpflug adjustment nuts No2: Influences the sharp focus plane in the lower right corner of the projected image.</p> <p>3 Scheimpflug adjustment nuts No3: Influences the sharp focus plane in the upper right corner of the projected image.</p> <p>4 Scheimpflug nut No 4: without adjustment functionality.</p> <p>11 Lock nut.</p> <p>12 Set screw for nut No1.</p> | <p>21 Lock nut.</p> <p>22 Set screw for nut No2.</p> <p>31 Lock nut.</p> <p>32 Set screw for nut No3.</p> <p>41 Lock nut.</p> <p>42 Set screw for nut No4.</p> |
|---|--|



Reference 1, 2 and 3 are adjustment points. Reference 4 is a locking point and NOT used during Scheimpflug adjustment.

When to apply Scheimpflug?

Only apply a Scheimpflug correction in case the overall focus of the projected image is not equally sharp (can be caused if the projector is **NOT in parallel** with the screen or a previous misaligned Scheimpflug) . Take into account 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. **Warping** will be required to solve the distortion.

The disadvantage of Warping is a small decrease in pixel quality. 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. In case the SHIFT range is not sufficient then the projector can be tilted and Scheimpflug can be applied.

7.2 Scheimpflug adjustment

Required tools

- Allen wrench 3 mm
- Nut driver 13 mm
- Nut driver 10 mm

Preparation steps:

1. Ensure that the throw ratio of the installed lens matches the requirements of the application (projection distance and screen size).

2. Perform a **lens calibration** operation. (See user guide chapter *GUI – System Settings – Lens Calibration*)
3. Project the **Focus white** test pattern.

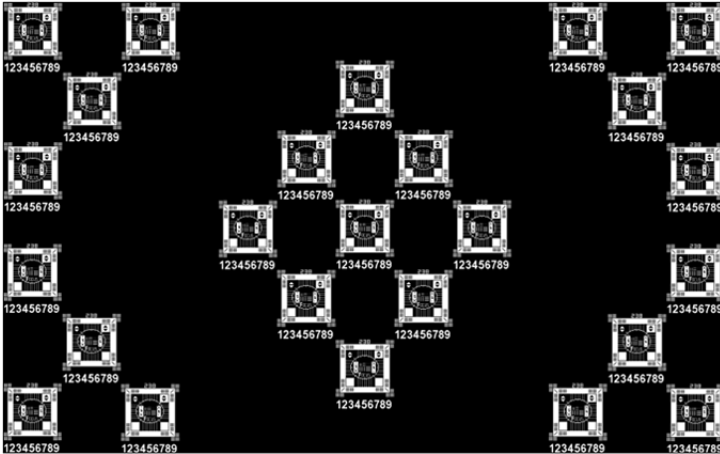


Image 7-3

4. Zoom the lens for maximum image on the screen.
5. Unlock and turn out the 4 set screws (reference 11 Image 7-4) of the Lens Holder by 1 centimeter. Use a 10 mm nut driver for the lock nuts (reference 21 Image 7-4) and use a 3 mm Allen wrench for the set screws.

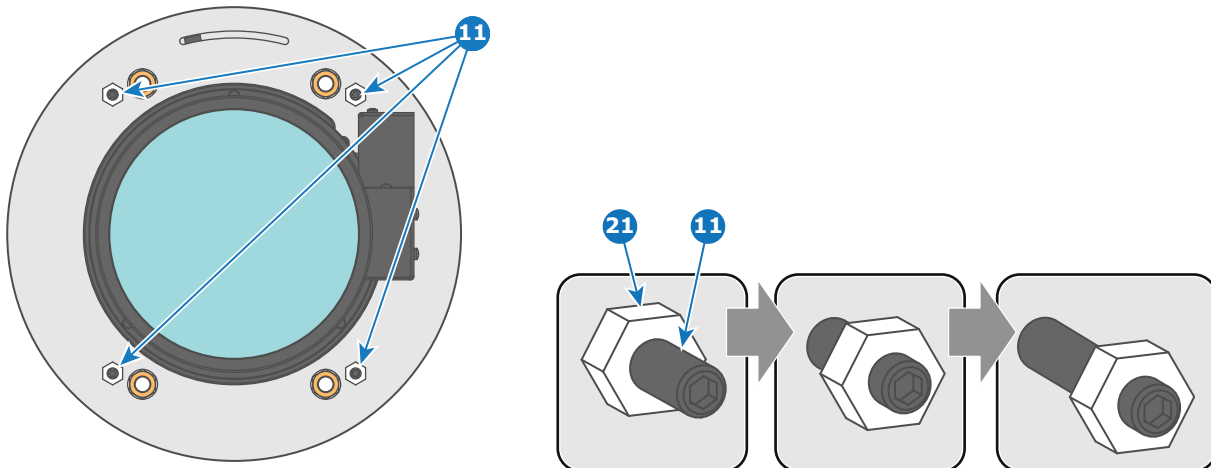


Image 7-4

6. Fully loosen the Scheimpflug nut at the lower left of the Lens Holder (reference 4 Image 7-5). Use a 13 mm nut driver.
7. Optimize the focus of the projected image in the center of the screen (F) using the motorized focus control (Local Keypad).

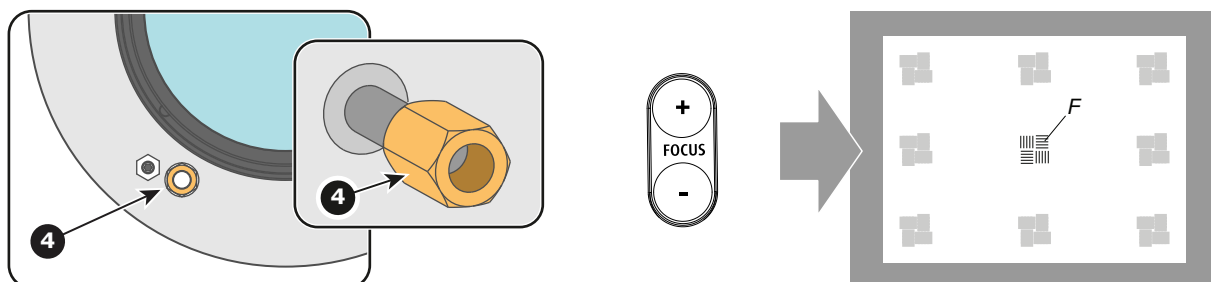


Image 7-5

Scheimpflug adjustment steps:

1. Sharpen the image at the bottom left corner of the screen by turning the upper left Scheimpflug adjustment nut (reference 1 Image 7-6). As a result the focus in the center will fade a bit but that's normal.



Caution: Do not remove any of the Scheimpflug adjustment nuts completely from the threaded rod. Otherwise the lens holder front plate with lens will fall off.

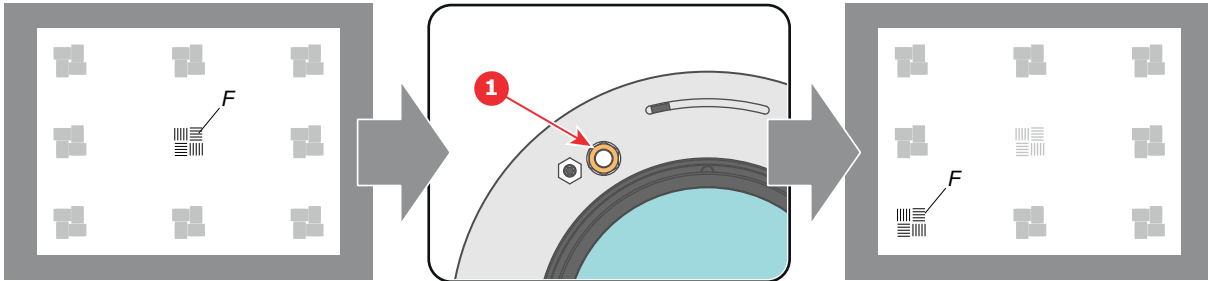


Image 7-6

2. Sharpen the image at the top right corner of the screen by turning the lower right Scheimpflug adjustment nut (reference 3 Image 7-7).

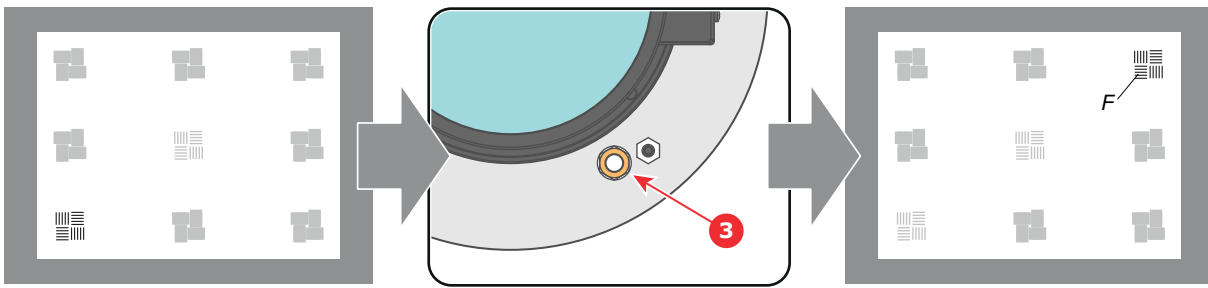


Image 7-7

3. Sharpen the image at the bottom right corner of the screen by turning the upper right Scheimpflug adjustment nut (reference 2 Image 7-8).

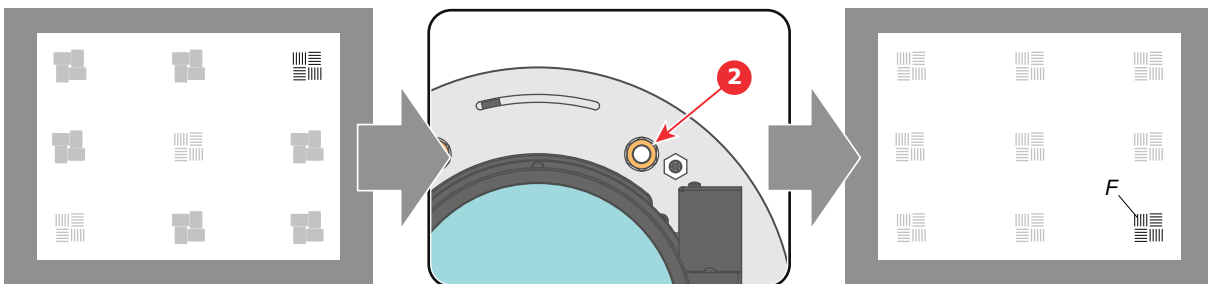


Image 7-8

4. Optimize the focus of the projected image in the center of the screen using the motorized focus control (Local Keypad).

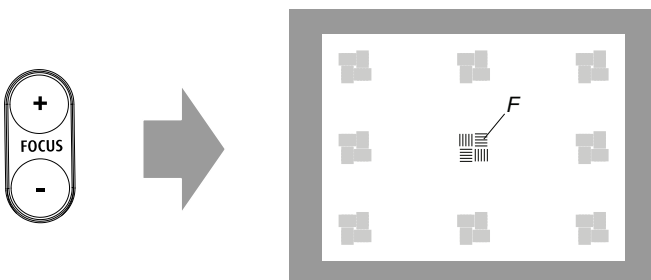


Image 7-9

5. Repeat from step 1 until the projected focus pattern is as sharp as possible in the center, left, right, top and bottom of the screen.
6. Proceed with the procedure “Fixation of the Lens Holder front plate”, page 78.

7.3 Fixation of the Lens Holder front plate

When fixing the Lens Holder front plate

After performing the procedure for Scheimpflug adjustment or Back Focal Length adjustment the Lens Holder front plate must be secured in such a way that it doesn't disturb the result of the adjustment.

Required tools

- Allen wrench 3 mm
- Nut driver 10 mm
- Nut driver 13 mm

How to fix the Lens Holder front plate?

Start the fixation as follows (steps must be followed strictly) :

1. Project the **Outline** / **Aspect** test pattern (depending on projector type).
2. Zoom the projected image until the edges of the projected test pattern matches with the edges of the projection screen.
3. Turn in the three set screws indicated with reference 11 Image 7-10 without disturbing the projected image. Tighten lightly . Do not turn in the set screw at the lower left of the Lens Holder!



Note: Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.

4. Fasten the lock nut (reference 21 Image 7-10) of the three set screws. Use a 10 mm nut driver. Ensure the image doesn't move.

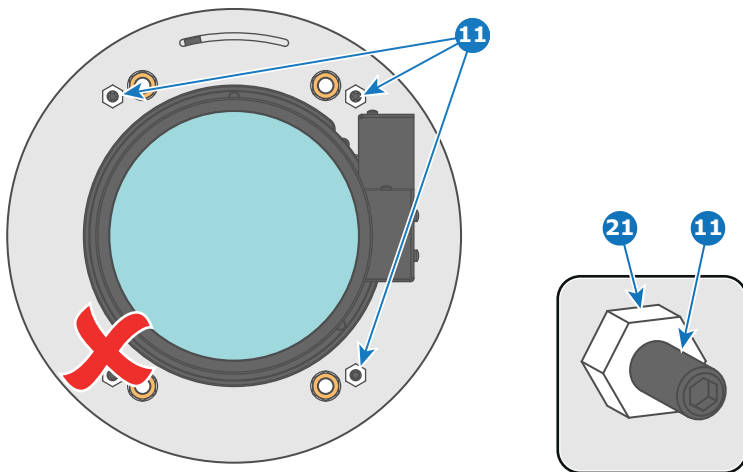


Image 7-10

5. Gently turn (by hand) the Scheimpflug adjustment nut at the lower left of the Lens Holder (reference 4 Image 7-11) against the Lens Holder front plate without disturbing the projected image.
6. Turn in the set screw at the lower left of the Lens Holder (reference 14 Image 7-11) without disturbing the projected image. Use a 3 mm Allen wrench.



Note: Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.



Tip: Fasten the set screw and the Scheimpflug nut alternately, without disturbing the projected image, until the Scheimpflug nut and set screw are completely tightened.

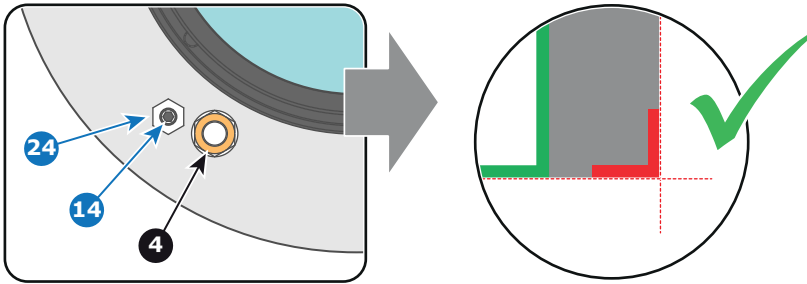


Image 7-11

7. Fasten the lock nut at the lower left of the Lens Holder. Use a 10 mm nut driver.

Input & Communication

8

Overview

- Introduction
- Local Keypad and LCD panel
- Communication connections
- Input source connections – Quad combo input Mark II
- Input source connections – Quad DP 1.2 Input board
- Input source connections – SFP Input Board
- LED and Button indication chart
- Laser Status

8.1 Introduction

General

The Input & Communication side of the projector consists of a local keypad (1), a communication panel (4), a Quad Combo input board (5) and the Quad DP 1.2 input board (6 – exclusive to XDL 4k30 and 4k60).

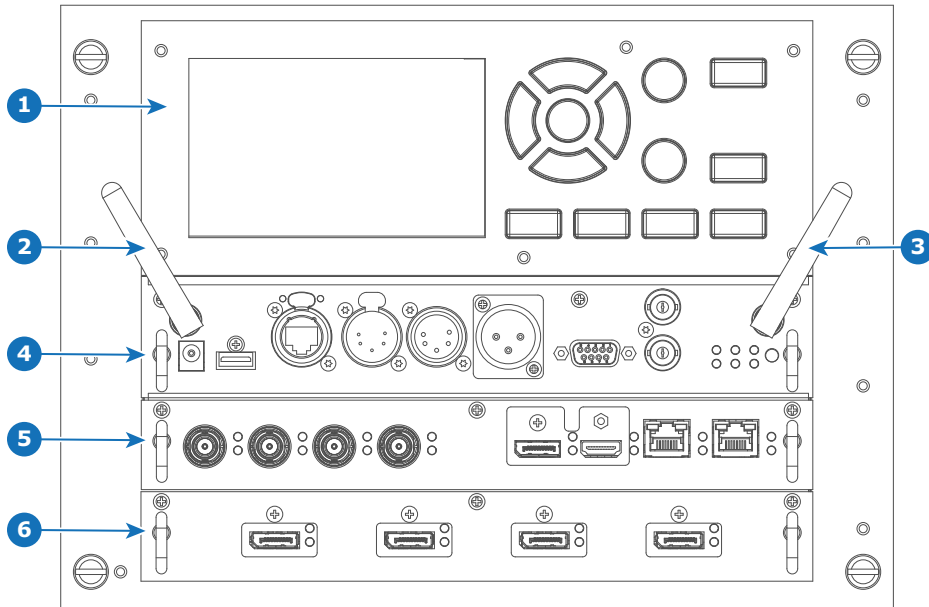


Image 8-1

- | | |
|--|--|
| 1 Local Keypad and LCD panel | 4 Communication panel |
| 2 Optional antenna for WiFi connection | 5 Quad Combo Input board Mk II |
| 3 Optional antenna for GSM | 6 Quad DP 1.2 Input board (XDL-4k30 and 4k60 only) |

8.2 Local Keypad and LCD panel

Overview

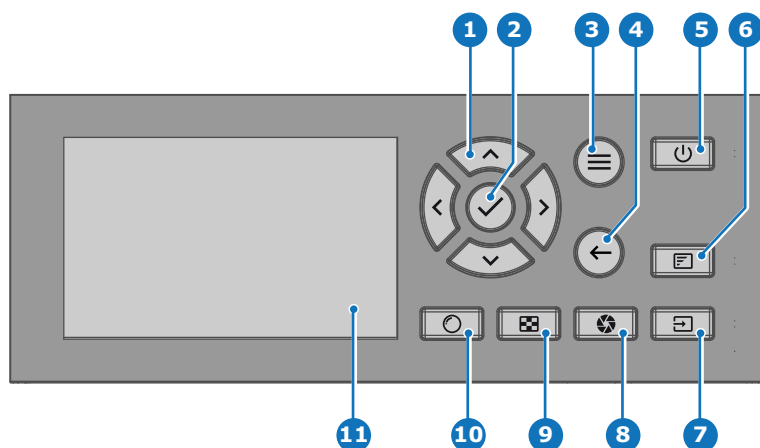


Image 8-2

- | | |
|--------------------------------|------------------------|
| 1 Menu navigation | 7 Input selection |
| 2 Menu confirmation, OK button | 8 Shutter open / close |
| 3 Menu open / close | 9 Test patterns |
| 4 Menu back | 10 Lens adjustment |
| 5 Power on / off | 11 LCD panel |
| 6 Project OSD on / off | |

Local Keypad

The Keypad gives direct access to several functions, in addition to access to the menu system.

The keypad has a backlight that can be switched on and off manually. By default the light turns off after 5 minutes.

The Power button and Shutter buttons are equipped with white, blue and red backlit LEDs. The other keys are only equipped with white and blue backlit LEDs. The LEDs are controlled according to the features available.

LCD panel

The LCD panel has two main functions:

1. Showing the menus, the adjustment information and also a mirror of the OSD, (On Screen Display) described in *User Interface* when this is enabled.
- Information regarding the status of the projector showing this data:
 - Projector status
 - Network address
 - Active source
 - Current firmware version
 - Operation Data
 - Active functions (Enabled Functions).

Toggle between the two indications by using the **Menu** button on the keypad, or on the remote control.

The LCD Display will fade out 30 seconds after the last key operation.

8.3 Communication connections

Communication Panel

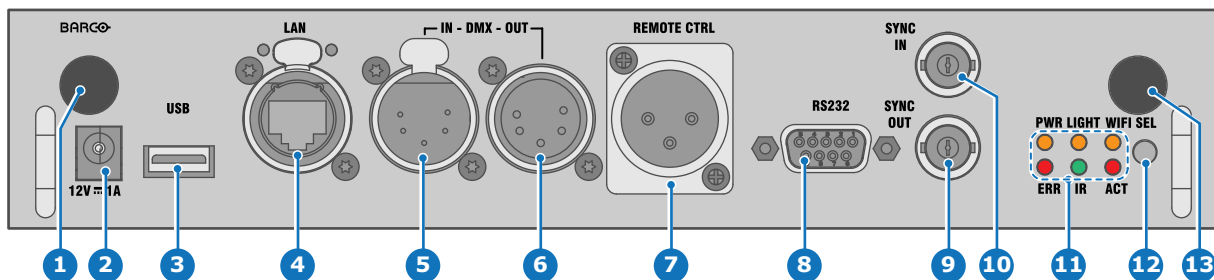


Image 8-3

- | | |
|--|----------------------------------|
| 1 WIFI antenna for wireless IP (optional) | 8 RS232 for serial communication |
| 2 12V 1A output | 9 Sync Out 3D |
| 3 Firmware update / USB download log files | 10 Sync In 3D |
| 4 10/100 base-T for external control over IP and Art-Net | 11 Status lights |
| 5 DMX interface input | 12 IR receive sensor |
| 6 DMX interface output | 13 GSM antenna input (optional) |
| 7 XLR input for wired projector control | |

12 V output

12 V output, maximum 1 A, available when projector is not in stand by.

DMX interface

DMX is used as communication bus between different devices in the light technic. Each device has an input and an output, so that the bus can be looped between the different devices. According the standard a five wire cable with XLR connector is used.

You can use the DMX input port to connect a DMX device (DMX console) to the projector. This way you can control the projector from that DMX device (console). The DMX output port can be connected with the next device in the loop.

Pin	Description
1	Earth
2	Cold
3	Hot
4	Return - (or not used)
5	Return + (or not used)



DMX

DMX-512 Lighting protocol over RS-485 interface. Carries information of 512 channels from a lighting controller to lighting devices. Standardized by USITT.

RS232/RS422 input

The communication interface of the XDL series projector supports RS232 and RS422 serial communication on two different types of input connectors, a Sub-D connector and an USB connector acting as RS input when connected to an USB input of a PC.

You can use the RS232/RS422 input to connect a local PC to your XDL series projector. By this way you can configure and control your projector from your local PC.

Advantages of using RS232/RS422 serial communication:

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

RS232/422 input (Sub-D) port

Pin	Description
1	DCD : Data Carrier Detect
2	RXD- : Receive Data
3	TXD- : Transmitted Data
4	DTR : Data Terminal Ready [RS232] TXD+ : Transmitted Data [RS422]
5	GND : Ground
6	DSR : Data Set Ready [RS232] RXD+ : Received Data [RS422]
7	— (not connected) —
8	CTS : Clear To Send
9	RI : Ring Indicator

RS232

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

RS422

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

USB port

The communication interface is equipped with a master USB port, type "A" connector. This USB port will simplify the service procedures for firmware updates or for downloading the log files without a network connection.

If the only file on the USB device is the firmware file (a "*.fw" file), the projector will automatically start one of the following processes.

- **cornet<version nr>.fw**: The projector will upgrade or downgrade, depending on the version number.
- **LogExtractor.fw**: The log files will be downloaded.



Make sure that any used USB-stick is FAT32 compatible and contains no other files or folders.

8.4 Input source connections – Quad combo input Mark II

About the Quad combo input Mark II

Due to demand from the market, Barco has created a second generation of the Input board to support 12G input and throughput on the SDI connectors. From the release of this board onward, the Quad combo input will be supported and will be the standard input board in every Input & Communication Unit, effectively replacing the Mark I variant.

The updates on this new board include the following compared to its predecessor:

- **SDI Input A** now also supports **12G** input signals.
- **SDI Input C** now also functions as a **loop-through output** for any signal placed on **Input A**.
- **SDI Input D** now also functions as a **loop-through output** for any signal placed on **Input B**.
- **HDBaseT Input 1** now also supports **network connectivity**.

SDI Input & output – How does it work?

When connecting an SDI source to the projector and the signal is HD or 3G, you can choose any of the four input connectors.

When connecting multiple projectors with the same signal, you can connect the signal as follows:

- Connect the source signal to Input A or B of the first projector.
- If the source signal is connected to **Input A**, connect **Input/Output C** to the Input of the following projector.
- If the source signal is connected to **Input B**, connect **Input/Output D** to the Input of the following projector.
- Continue in the same fashion until all projectors are connected.

When connecting a 12G SDI source to the projector, you can only connect that source to input A.



Only Input A accepts 12G SDI signals . While it is technically possible to connect a 12G SDI source to Input B and connect that source to another projector in line (using Input/Output D), this first projector itself will not be able to process the 12G signal.

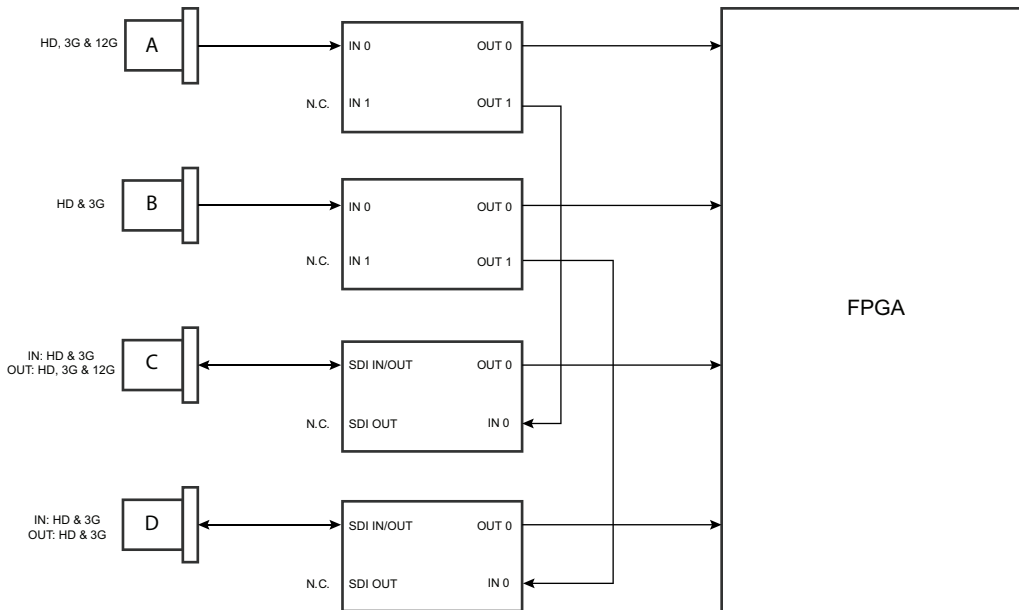


Image 8-4

Spotting the difference between the Mark I and Mark II Input boards

Since there will be projectors in the field that have the Mark I Input Board and others that have the Mark II input board, it is important to know the difference between the two variants.

While there are several minor and barely noticeable differences between the two boards, there is one real visual aid to tell the two variants apart. There are visual markings added on the Mark II Input board, marking which connector supports 12G and which only supports 3G.

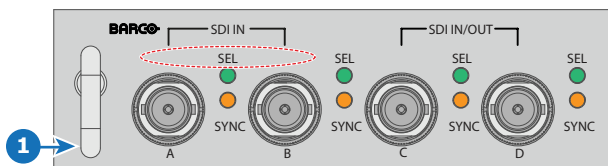


Image 8-5: Mark 1 Quad Combo input board, without markings above the SDI inputs

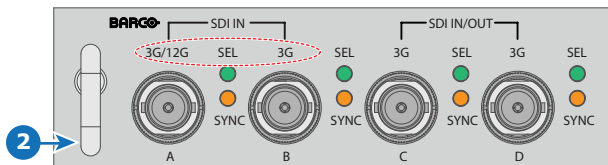


Image 8-6: Mark 2 Quad Combo input board, with 3G/12G markings above the SDI inputs/outputs.

Overview Mark 2 Quad Combo Input board

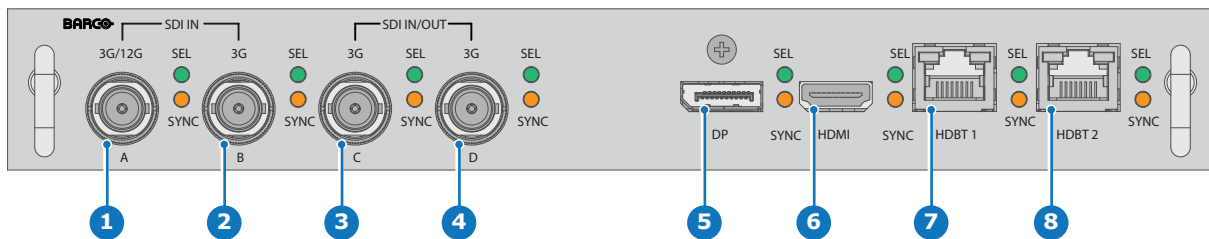


Image 8-7

- | | |
|---|----------------------------|
| 1 Quad SDI channel A: 3G/12G input | 5 DisplayPort Input |
| 2 Quad SDI channel B: 3G input | 6 HDMI input |
| 3 Quad SDI channel C: 3G SDI input + 3G/12G output | 7 HDBaseT input 1 |
| 4 Quad SDI channel D: 3G SDI input / output | 8 HDBaseT input 2 |



The yellow LED lights up when valid input sync is detected.
The green LED lights up when the input is selected.
The green LED lights blink when the input/output is selected and configured as output.

Input specifications – SDI Inputs



For readability, the video timings listed are summarized. For the full list of video timings, refer to the appendices.



HD-SDI follows the SMPTE 292M standard
3G SDI follows the SMPTE 425M standard Level A
12G-SDI follows the SMPTE ST-2082-1 and ST-2082-10 standards.

Color space	YCbCr		
Color depth	10 bpc		
Chroma sampling	4:2:2		
Audio support	not supported		
For future release	<ul style="list-style-type: none"> • 3D support • Interlaced support • Segmented frame support 		
Video timings progressive ²	Type	Port type	Format
	HD-SDI	Single link Quad link	<ul style="list-style-type: none"> • Up to 1920 x 1080 @24 Hz • Up to 1920 x 1080 @25 Hz • Up to 1920 x 1080 @30 Hz • Up to 1280 x 720 @50 Hz • Up to 1280 x 720 @60 Hz
	3G-SDI "BarcoLink"	Single link Quad link	1920 x 1200 @50 Hz, @59.94 Hz and @60 Hz
	12G-SDI (Channel A only)	Single link	3840 x 2160 @50 Hz and @60 Hz 4096 x 2160 @50 Hz and @60 Hz
	12G-SDI "BarcoLink 4k" (Channel A only)	Single link	3840 x 2400 @50 Hz, @59.94 Hz and @60 Hz.

2: For the full list of video timings, see Appendix

Input specifications – HDMI Input



For readability, the video timings listed are summarized. For the full list of video timings, refer to the appendices.

Pixel rate	25 – 600 MHz pixel clock
HDCP support	<ul style="list-style-type: none"> • HDCP 1.x • HDCP 2.2 • RGB 4:4:4
Color space	<ul style="list-style-type: none"> • YCbCr 4:2:0 • YCbCr 4:2:2 • YCbCr 4:4:4 • RGB 4:4:4
Color depth	<ul style="list-style-type: none"> • 24 bpp • 30 bpp • 36 bpp
3D support	<ul style="list-style-type: none"> • Field sequential 3D (Active 3D) <ul style="list-style-type: none"> - Frame-packed - Top Bottom progressive - Side-by-side progressive • Passive 3D not supported.
For future release	<ul style="list-style-type: none"> • Interlaced support
Audio	Not supported
Video timings²	<ul style="list-style-type: none"> • Up to 4096 x 2160 @24 Hz • Up to 4096 x 2160 @25 Hz • Up to 4096 x 2160 @30 Hz • Up to 2048 x 1080 @48 Hz • Up to 4096 x 2160 @50 Hz • Up to 4096 x 2160 @60 Hz
Native video timings	<ul style="list-style-type: none"> • 3840 x 2400 @60 Hz



CAUTION: The HDBaseT inputs can bridge a distance of 100 m but are sensitive to radiated electromagnetic interference: radiated electromagnetic interference (e.g. from GSM or switching inductive or capacitive loads) within the limits of electromagnetic compatibility requirements of 3 V/m can cause random flashes or temporary loss of the projected image. As such, shielded CAT-6 cables with metal RJ-45 connectors are recommended; choose cable length no longer than required and route HDBT cable optimally screened from possible sources of electromagnetic emission.

Input specifications – HDBaseT inputs



For readability, the video timings listed are summarized. For the full list of video timings, refer to the appendices.

Pixel rate	25 – 297 MHz pixel clock
Color space	<ul style="list-style-type: none"> • YCbCr 4:2:2 • YCbCr 4:4:4 • RGB 4:4:4
Color depth	<ul style="list-style-type: none"> • 24 bpp • 30 bpp • 36 bpp
HDCP support	HDCP 1.x supported on HDBaseT Input 1

Network support	Yes, on HDBaseT Input 1	
For future release	<ul style="list-style-type: none"> • 3D support • Interlaced support 	
Audio	not supported	
Video timings progressive²	Layout mode	Supported formats
	Standard layout (1x1 layout)	<ul style="list-style-type: none"> • Up to 4096 x 2160 @24 Hz • Up to 4096 x 2160 @25 Hz • Up to 4096 x 2160 @30 Hz • Up to 2048 x 1080 @48 Hz • Up to 2560 x 1600 @50 Hz • Up to 2560 x 1600 @60 Hz
	2 Column mode (2x1 layout)	<ul style="list-style-type: none"> • 1920 x 2160 @50 Hz • 1920 x 2160 @60 Hz • 2048 x 2160 @50 Hz • 2048 x 2400 @60 Hz
Native video timings	<ul style="list-style-type: none"> • 3840 x 2160 @60 Hz 	



CAUTION: In order to display high resolution images (e.g.: 3840 x 2160 @60 Hz) via the DP1.2 input, the quality of the cable must be adequate, in addition the length of the cable can also influence the performance. In case there is an issue with one of these criteria the automatic link-training initiated by the DP-standard may decide to switch to a lower resolution.

Input specifications – DisplayPort 1.2 input



For readability, the video timings listed are summarized. For the full list of video timings, refer to the appendices.

Pixel rate	Up to 600 MHz pixel clock		
Color space	<ul style="list-style-type: none"> • YCbCr 4:2:2 • YCbCr 4:4:4 • RGB 4:4:4 		
Color depth	<ul style="list-style-type: none"> • 24 bpp • 30 bpp • 36 bpp 		
Data rate support	<ul style="list-style-type: none"> • 1.62 Gbps: Reduced Bit Rate (RBR) • 2.7 Gbps: High Bit Rate (HBR) • 5.4 Gbps: High Bit Rate 2 (HBR2) 		
HDCP support	HDCP 1.4		
For future release	<ul style="list-style-type: none"> • Interlaced support 		
Audio	not supported		
3D support	<ul style="list-style-type: none"> • Field sequential 3D (Active 3D) • Passive 3D not supported on this board. 		
Video timings progressive²	2D / 3D	Layout Mode	Supported formats
	2D	Standard layout (1x1 layout)	<ul style="list-style-type: none"> • Up to 4096 x 2160 @24 Hz • Up to 4096 x 2160 @30 Hz • Up to 2048 x 1080 @48 Hz • Up to 4096 x 2160 @50 Hz • Up to 4096 x 2160 @60 Hz • Up to 2560 x 1600 @120 Hz

Active 3D	Standard layout (1x1 layout)	<ul style="list-style-type: none"> • 1600 x 1200 @120 Hz • 2560 x 1080 @120 Hz • 2560 x 1600 @120 Hz
-----------	------------------------------	---

Native video timings	<ul style="list-style-type: none"> • 3840 x 2400 @60 Hz
----------------------	--

8.5 Input source connections – Quad DP 1.2 Input board

Quad DP 1.2 Input board

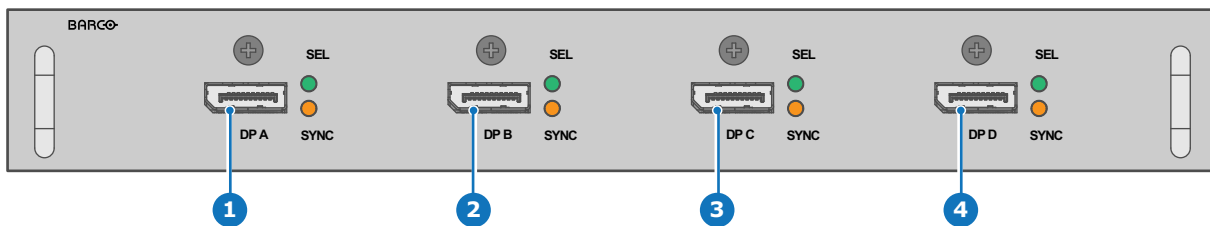


Image 8-8

- 1 Quad DisplayPort channel A input
- 2 Quad DisplayPort channel B input
- 3 Quad DisplayPort channel C input
- 4 Quad DisplayPort channel A input

The yellow LED lights up when valid input sync is detected.

The green LED lights up when the input is selected.

Input specifications – DisplayPort 1.2 inputs

Pixel rate	Up to 600 MHz pixel clock		
Color space	<ul style="list-style-type: none"> • YCbCr 4:2:2 • YCbCr 4:4:4 • RGB 4:4:4 		
Color depth	<ul style="list-style-type: none"> • 24 bpp • 30 bpp • 36 bpp 		
Data rate support	<ul style="list-style-type: none"> • 1.62 Gbps: Reduced Bit Rate (RBR) • 2.7 Gbps: High Bit Rate (HBR) • 5.4 Gbps: High Bit Rate 2 (HBR2) 		
For future release	<ul style="list-style-type: none"> • Interlaced support • HDCP 1.4 		
Audio	not supported		
3D support	<ul style="list-style-type: none"> • Field sequential 3D (Active 3D) • Passive stereoscopic 3D (Passive stereo) converted to active 3D 		
Video timings progressive	2D / 3D	Layout Mode	Supported formats
	2D	Standard layout (1x1 layout)	<ul style="list-style-type: none"> • Up to 4096 x 2160 @24 Hz • Up to 4096 x 2160 @30 Hz • Up to 2048 x 1080 @48 Hz • Up to 4096 x 2160 @50 Hz • Up to 4096 x 2160 @60 Hz

		<ul style="list-style-type: none"> Up to 2560 x 1600 @120 Hz
2D	2 column mode (2x1 layout)	<ul style="list-style-type: none"> 1920 x 2160 @60 Hz 1920 x 2160 @120 Hz 1920 x 2400 @60 Hz
2D	4 quadrant mode (2x2 layout)	<ul style="list-style-type: none"> 960 x 1080 @120 Hz 960 x 1200 @120 Hz 1280 x 1080 @60 Hz 1280 x 1080 @120 Hz 1280 x 1600 @60 Hz 1280 x 1600 @120 Hz 1920 x 1080 @120 Hz 1920 x 1200 @120 Hz 2048 x 1080 @120 Hz
2D	4 column mode (4x1 layout)	<ul style="list-style-type: none"> 960 x 2160 @120 Hz 960 x 2400 @120 Hz 1024 x 2160 @60 Hz
Active 3D	Standard layout (1x1 layout)	<ul style="list-style-type: none"> 1600 x 1200 @120 Hz 2560 x 1080 @120 Hz 2560 x 1600 @120 Hz
Active 3D	2 column mode (2x1 layout)	1920 x 2160 @120 Hz
Active 3D	4 quadrant mode (2x2 layout)	<ul style="list-style-type: none"> 1920 x 1080 @120 Hz 1920 x 1200 @120 Hz 2048 x 1080 @120 Hz
Active 3D	4 column mode (4x1 layout)	<ul style="list-style-type: none"> 960 x 2160 @120 Hz 960 x 2400 @120 Hz 1024 x 2160 @120 Hz
Passive stereo	Standard layout (1x1 layout)	3840 x 2160 @60 Hz
Passive stereo	2 column mode (2x1 layout)	1920 x 2160 @60 Hz

8.6 Input source connections – SFP Input Board



The Barco SFP Input Board has been designed and tested to work alongside the Barco SFP Output Board.

However, it is possible that the SFP Input board can also work with other third-party devices that support 12G over fiber. Due to the many third-party options available on the market, the input board could not be tested for every option available.

SFP input board

To connect 12G SDI over fiber.

The input board is delivered without any connector. It is up to the customer to buy the necessary connectors, transceivers and cables. These parts can be mounted on the indicated places on the front panel of the board.

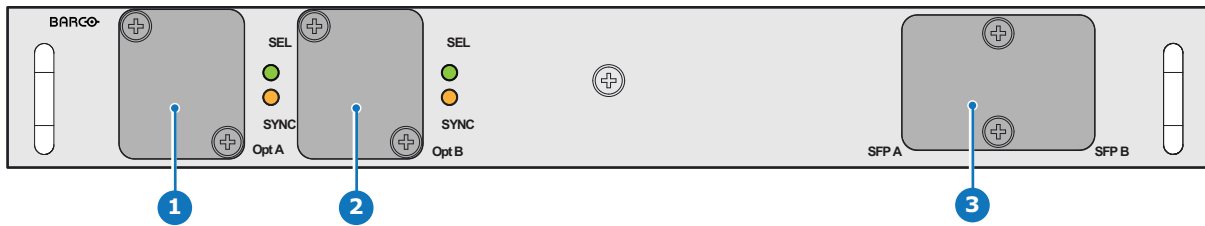


Image 8-9

- 1 Neutrik Duo optical connector or Neutrik Quad optical connector
- 2 Neutrik Duo optical connector or Neutrik Quad optical connector
- 3 2x12G SDI/10GE transceiver

Input specifications



For readability, the video timings listed are summarized. For the full list of video timings, refer to the appendices.

Color space	YCbCr		
Color depth	10 bpc		
Chroma sampling	4:2:2		
Audio support	not supported		
Video timings progressive³	Type	Port type	Format
	HD-SDI	Single link	<ul style="list-style-type: none"> Up to 1920 x 1080 @24 Hz Up to 1920 x 1080 @25 Hz Up to 1920 x 1080 @30 Hz Up to 1280 x 720 @50 Hz Up to 1280 x 720 @60 Hz Up to 1280 x 720 @24 Hz Up to 1280 x 720 @30 Hz Up to 1280 x 720 @25 Hz
	3G-SDI	Single link	1920 x 1080 @50 Hz and @60 Hz 1920 x 1200 @50 Hz, @59.94 Hz and @60 Hz. 2048 x 1080 @50 Hz and @60 Hz
	12G-SDI	Single link	3840 x 2160 @50 Hz and @60 Hz 4096 x 2160 @50 Hz and @60 Hz 3840 x 2400 @50 Hz, @59.94 and @60 Hz

³: For the full list of video timings, see Appendix

User case 1 : SFP+ transceiver + Fiber connection (integrated or separated)

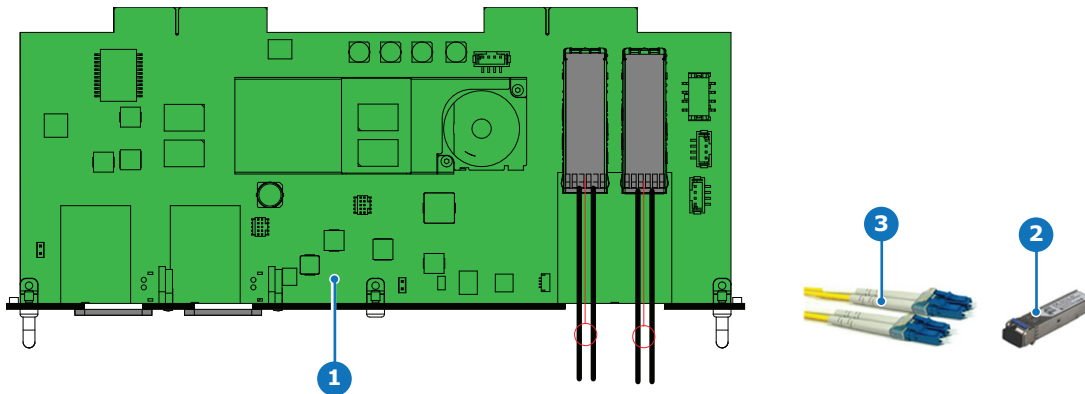


Image 8-10

- 1** SFP input board
- 2** SFP+ fiber transceiver
- 3** Optional breakout Optical adapter

Barco delivers only the Fiber-Network input board and SFP+ fiber transceivers.

The customer has to buy the SFP+ transceiver and the optional breakout adapter or the fiber integrated cable.

1. Remove the plate covering the access to the SFP cages.
2. Insert the SFP+ transceivers
3. Connect the breakout adapter.

Use case 2: Neutrik OpticalCon Duo + SFP+ transceiver + internal fiber

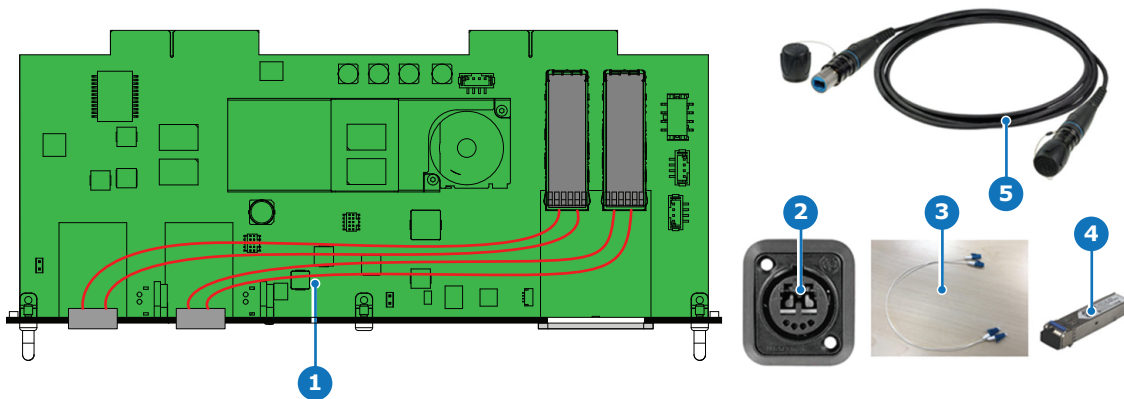


Image 8-11

- 1** SFP input board
- 2** Neutrik OpticalCon DUO
- 3** Internal fiber cable
- 4** SFP+ fiber transceiver
- 5** Cable

Barco delivers only the Fiber-Network input board and SFP+ fiber transceivers.

The customer has to buy the SFP+ transceiver, the Neutrik OpticalCon Duo, the internal cable and cable.

1. Remove both plates covering the access to the Neutrik connector locations.
2. Mount the Neutrik OpticalCon Duo connectors.
3. Remove the plate covering the access to the SFP cage and insert the SFP+ transceivers. Re-install the cover plate.
4. Mount the optical internal cables between the Neutrik connectors and the SFP+ transceivers.

Use case 3: Neutrik OpticalCon Quad + SFP+ transceiver + internal fiber

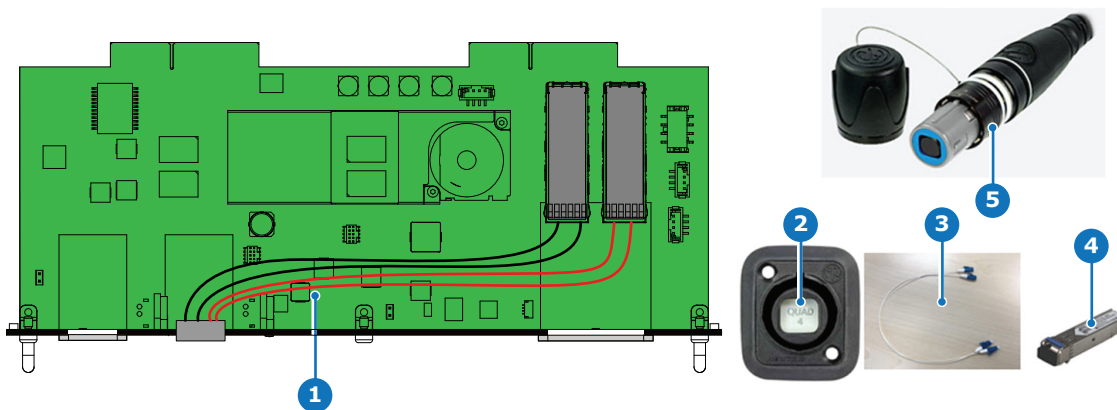


Image 8-12

- | | |
|----------------------------------|---------------------------------|
| 1 SFP input board | 4 SFP+ fiber transceiver |
| 2 Neutrik OpticalCon Quad | 5 Advanced quad cable |
| 3 Internal fiber cable | |

Barco delivers only the Fiber-Network input board and SFP+ fiber transceivers.

The customer has to buy the SFP+ transceiver, the Neutrik OpticalCon Quad, the internal cable and cable.

1. Remove one plate covering the access to a Neutrik connector location.
2. Mount the Neutrik OpticalCon Quad connector.
3. Remove the plate covering the access to the SFP cage and insert the SFP+ transceivers.
Re-install the cover plate.
4. Mount the optical internal cables between the Neutrik connector and the SFP+ transceivers.

Use case 4: Loop-through mode

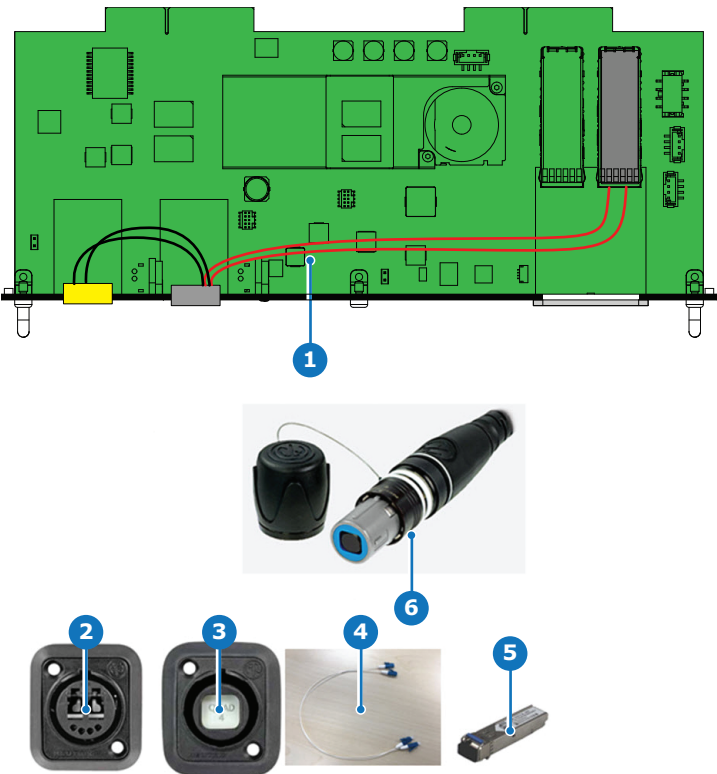


Image 8-13

- 1

SFP input board
- 2

Neutrik OpticalCon Duo
- 3

Neutrik OpticalCon Quad
- 4

Internal fiber cable
- 5

SFP+ fiber transceiver
- 6

Advanced Quad cable

- Barco delivers only the Fiber-Network input board and SFP+ fiber transceiver.
- The customer has to buy the SFP+ transceivers, both Neutrik connectors, the internal cable and the cable.
- 1

Remove both plates covering the access to a Neutrik connector locations.
- 2

Mount the Neutrik OpticalCon Quad connector and the Neutrik OpticalCon Duo.
- 3

Remove the plate covering the access to the SFP cage and insert the SFP+ transceivers.
Re-install the cover plate.
- 4

Mount the fiber internal cables between the Neutrik OpticalCon Quad and the SFP+ transceivers.
- 5

Mount the fiber internal cables between the Neutrik OpticalCon Quad and the Neutrik OpticalCon Duo.

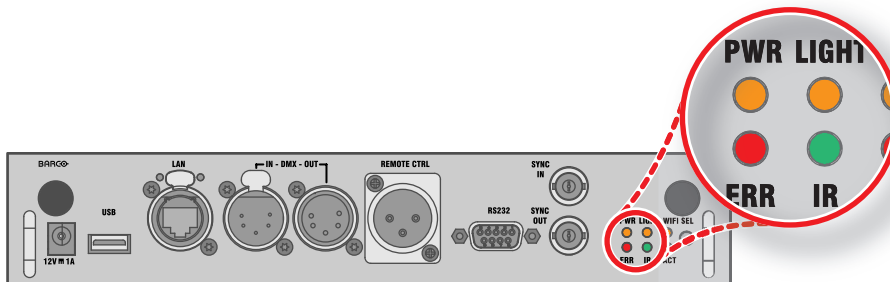
8.7 LED and Button indication chart

Button Backlight Status

Button	Color status	Description
<div>Standby button</div> <div></div>	Blinking WHITE (slow)	Projector starts up (booting)
	Blinking WHITE (fast)	Projector is upgrading firmware
	Solid WHITE	Projector is in Standby mode
	Blinking BLUE	Projector goes to ON mode
	Solid BLUE	Projector is ON
	Blinking RED	Error condition
<div>Shutter button</div> <div></div>	Off (no color)	Projector is OFF, starts up, or is in Standby mode.
	Solid WHITE	Projector is ON, shutter is open

Button	Color status	Description
	Solid RED	Projector is ON, shutter is closed

LED Status



LED	Color status	Description
PWR (power LED)	Off	Projector powers up or has no power
	RED	Projector is in Standby
	ORANGE	Projector is Ready
	GREEN	Projector is on
LIGHT (Illumination LED)	Off	Light source is off
	RED	No light source detected
	GREEN	Light source is on in normal mode
	GREEN-ORANGE	Light source is on in CLO mode
ERR (error LED)	Off	No error
	RED toggles on/off	Error
	ORANGE toggles on/off	Projector is installing firmware Warning
IR	RED	IR signal received
	GREEN	IR signal acknowledged

8.8 Laser Status

About the Laser Status Light

The Laser Status Light is located at the rear top of the projector (reference 2 Image 8-14). The Laser Status Light is a real time indicator of the laser condition.

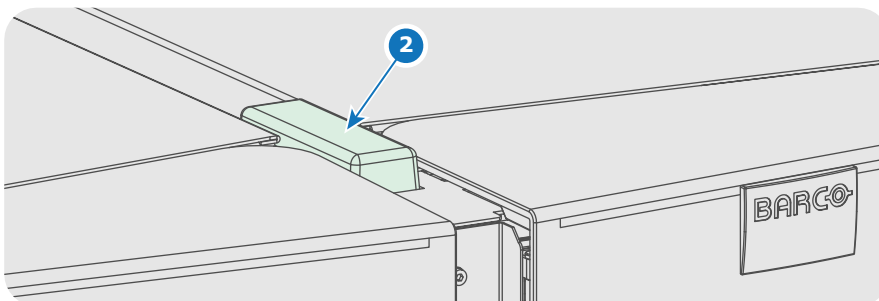


Image 8-14

Status overview

The Laser Status light has only one color: white. The combination of the Laser Status light and the backlight of the Light button on the Local Keypad indicates a certain condition of the projector. See table below.

Status light	Power On/Off button	Meaning
Off	Off, blinking white, blinking blue or continuous white	Sealed compartments are DECONDITIONED. Lasers are not activated. It is safe for service personnel to open the compartments.
Blinking (6 seconds)	Blinking blue	Indicates the start of the CONDITIONING process. After six seconds the status light will light up continuously.
On	Blinking blue	Ongoing CONDITIONING process. Lasers are tested
	Continuous blue	Sealed compartments are fully CONDITIONED. Lasers are activated for image projection.
	Blinking white	Ongoing DECONDITIONING process. Lasers can be active on low power.
Slow blinking	Continuous white or red	Not safe to open the sealed compartments due to risk of condensation. The external dew point of the booth area is too high. Wait until the status light turns off and remains off.

WiFi & GSM Module

9



Regulatory information for US and Canada can be accessed in the OSD of the projector. In order access it, select *System Settings* → *Regulatory Information* → *Country*.

9.1 Compliance FCC

Federal Communication Commission Interference Statement

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

FCC ID: 2AOUF-R8767900X

9.2 Compliance IC

Radio Frequency (RF) exposure information

This equipment IC ID: 23575-R8767900X complies with IC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Industry Canada statement

This device complies with Industry Canada's license-exempt RSSs

Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems. For the frequency 5600-5650 MHz, no operation is permitted".

Industry Canada class A emission compliance statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Canadian ICES-003.

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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Informations concernant l'exposition aux fréquences radio (RF)

Cet équipement IC ID: 23575-R8767900X est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Avis d'industrie Canada

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La bande 5 150-5 250 MHz est réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Pour la fréquence 5600-5650 MHz, aucune opération est autorisée

Avis de conformité a la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme a la norme NMB-003 du Canada.

9.3 Installation of the WiFi module



WARNING: The procedures below may only be performed by Barco trained and qualified technicians.



CAUTION: Always wear a wrist band which is connected to the ground while handling the electrostatic discharge (ESD) sensitive parts.



After the installation, the WiFi module needs to be configured.

Required tools

Phillips screwdriver PH1

How to install

1. Remove the Communication board.
2. Remove the drive fastener (D) from the front side of the Communication module.

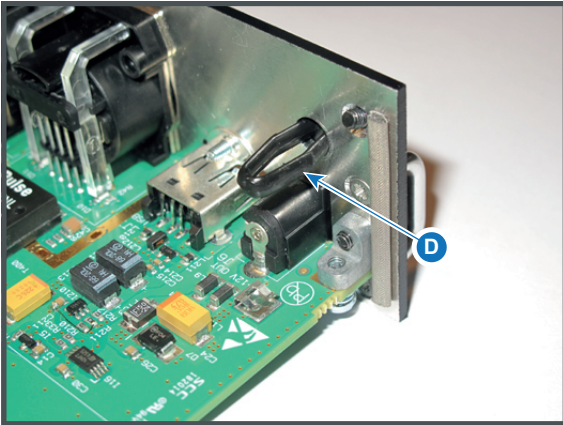


Image 9-1

3. Plug in the antenna wire connector on the WIFI module. Ensure to use bottom connection.

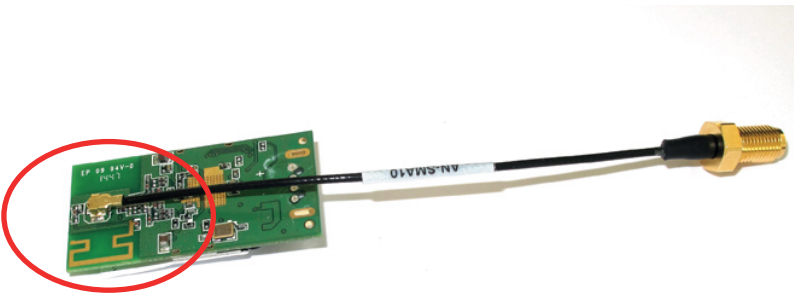


Image 9-2

4. Place the WiFi module (2) upon the plastic socket (1). Note that the plastic socket is provided with two positioning pins which fits the small holes of the WiFi module.
5. Press the plastic cover (3) upon the plastic socket containing the WIFI module as illustrated.

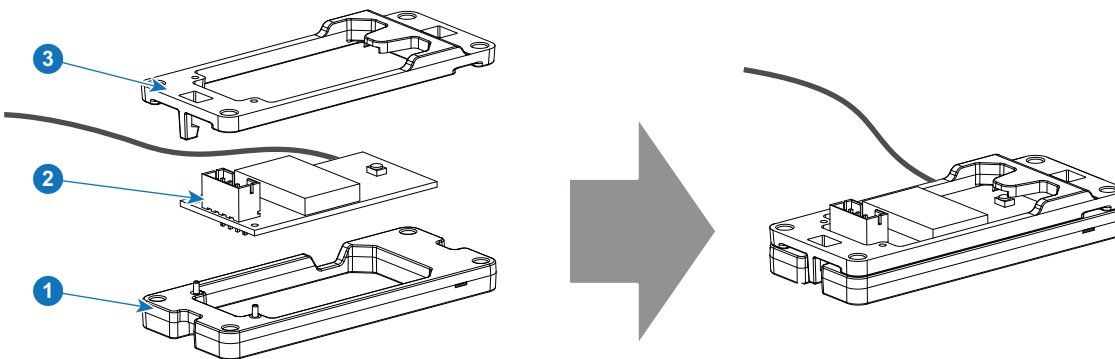


Image 9-3

6. Install the WiFi assembly on the Communication board as illustrated. Use four screws (4) and 4 nuts (5) to secure the WiFi assembly.

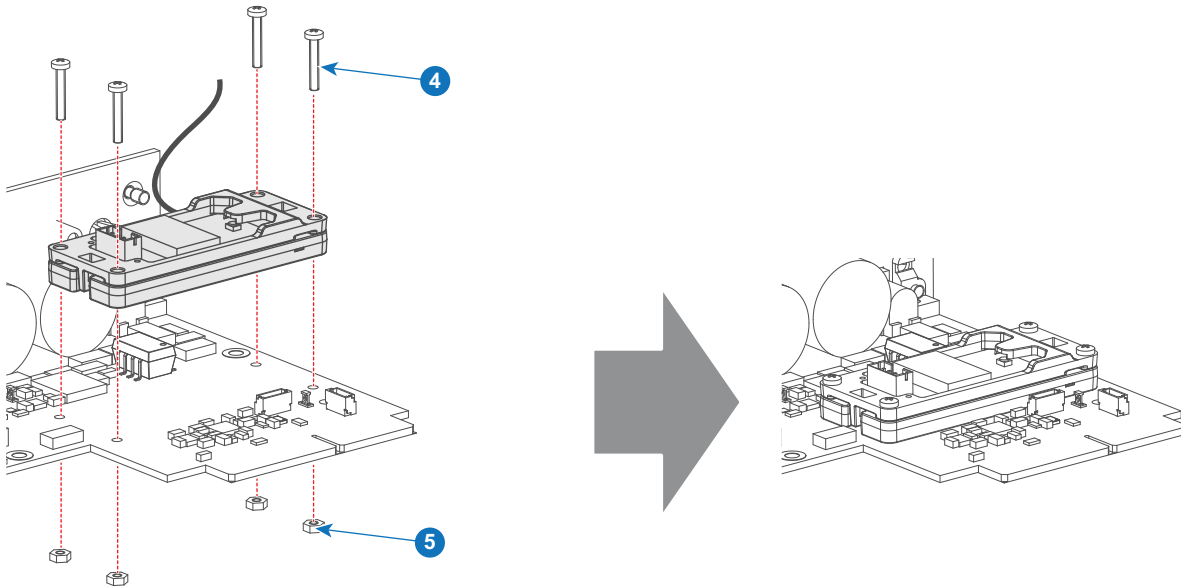


Image 9-4

7. Install the data wire by plugging in the electrical connectors (connector J327, reference 1).

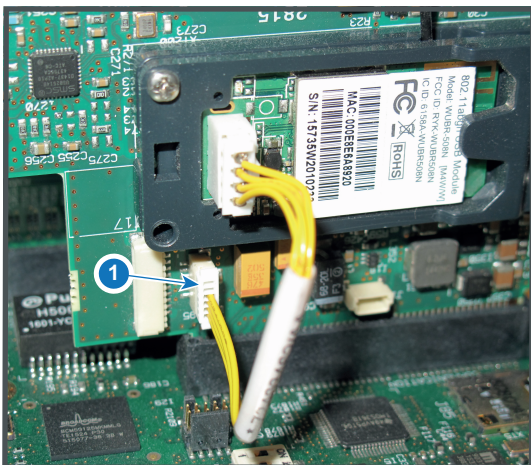


Image 9-5

8. Position the antenna (7) in the hole on the front side of the Communication module.
9. Secure the antenna wire by installing the lock washer and nut (8).

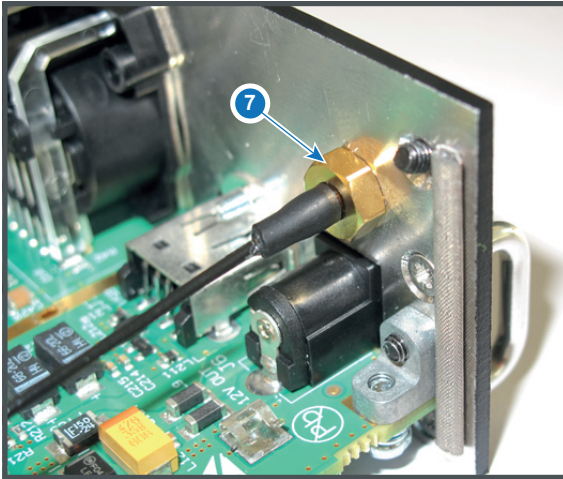


Image 9-6



10. Turn on the antenna (9).



Image 9-7

11. Stick the black label with certification numbers on the front plate of the communication board.

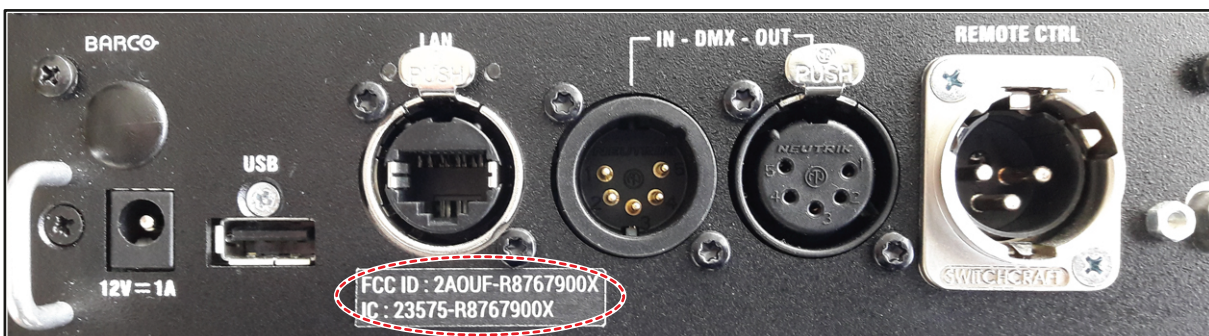


Image 9-8: Example of the black label on the communication board

12. Reinsert the communication board.

9.4 Installation of the GSM module



WARNING: The procedures below may only be performed by Barco trained and qualified technicians.



CAUTION: Always wear a wrist band which is connected to the ground while handling the electrostatic discharge (ESD) sensitive parts.

About the two antenna connectors

While the GSM module has two antenna connectors, only one of them can be used: the main RF antenna (reference 2, Image 9-9).

The secondary antenna (reference 1) is an RX diversity antenna, but is not enabled when the GSM module is plugged into the communication module.

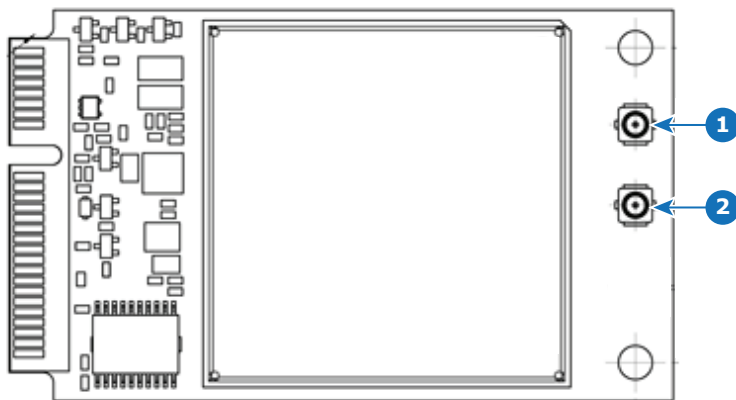


Image 9-9: Overview GSM module

- 1 RX Diversity antenna (DIV)
- 2 Main RF antenna (ANT)

Required tools

Phillips screwdriver PH1

Required parts

SIM card (not delivered)

How to install

1. Remove the Communication board.
2. Remove the drive fastener (1) from the front side of the Communication module.

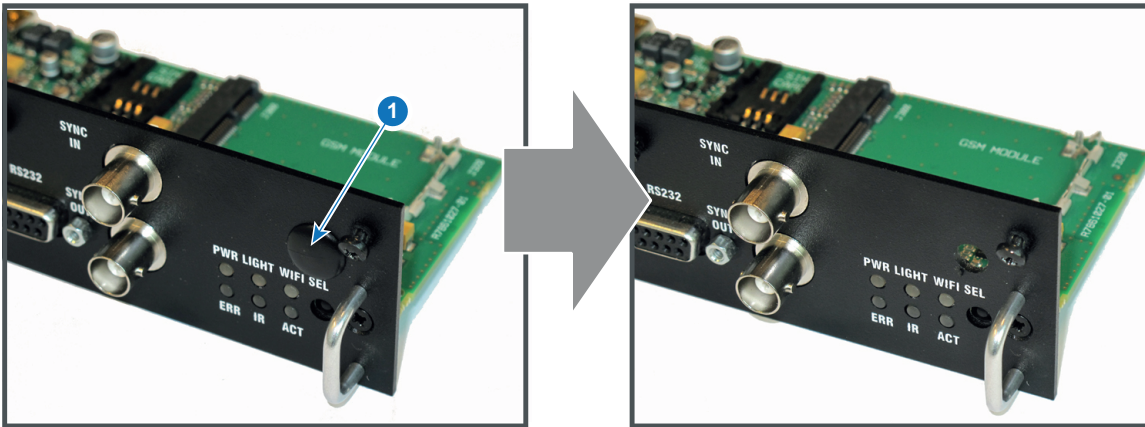


Image 9-10

3. Slide in the SIM card into the SIM card holder (2).
Ensure that the truncated corner of the SIM card is facing the edge of the module (3).

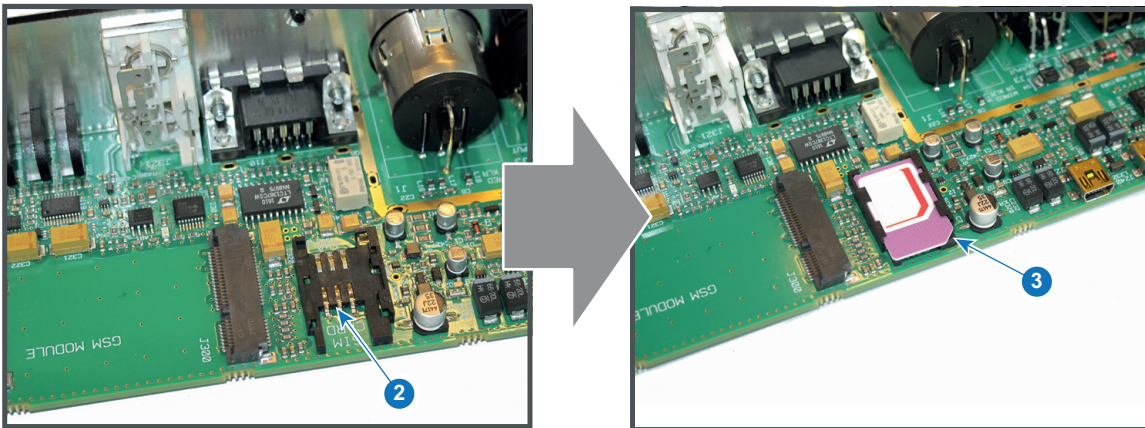


Image 9-11

4. Plug in the antenna wire connector on the front side of the GSM module (4).

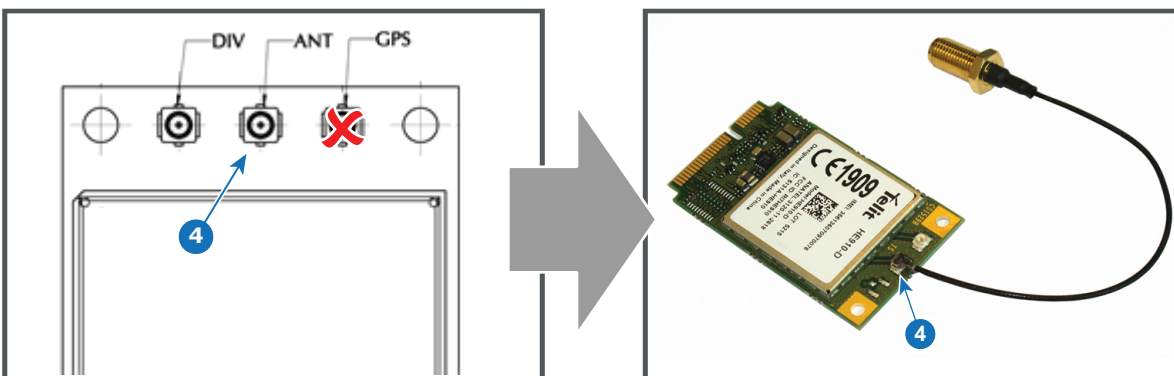


Image 9-12

5. Insert the GSM module with antenna wire into the connector (5). Push the other side of the module down until it clicks so that the module is secured (6).

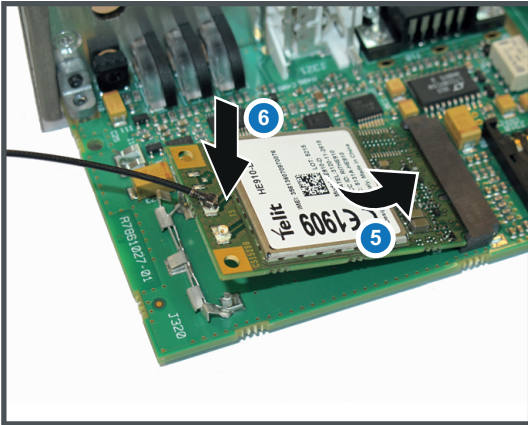


Image 9-13

6. Push the antenna connector through the hole in the front plate and secure the antenna wire by installing the lock washer and nut (7).

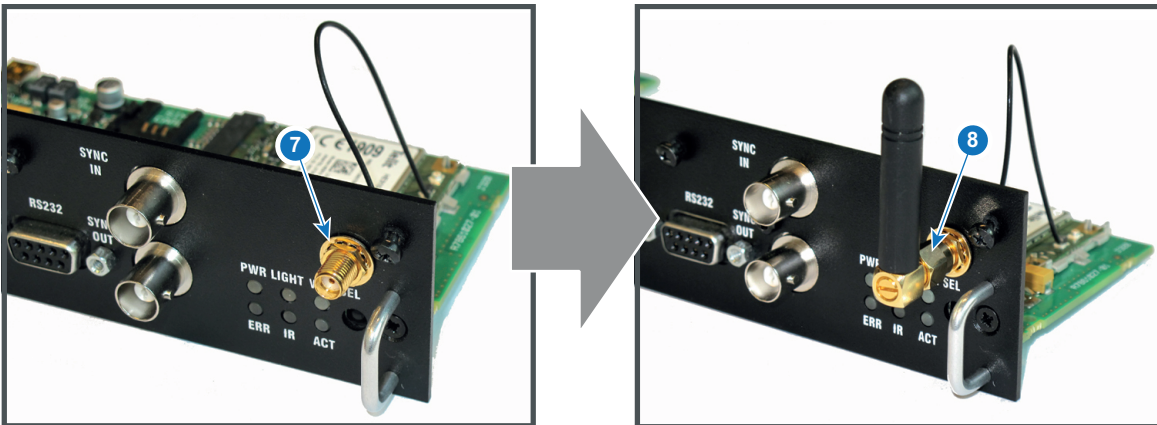


Image 9-14

7. Install the antenna by screwing it on its base (8).
8. Stick the black label with certification numbers on the front plate of the communication board.

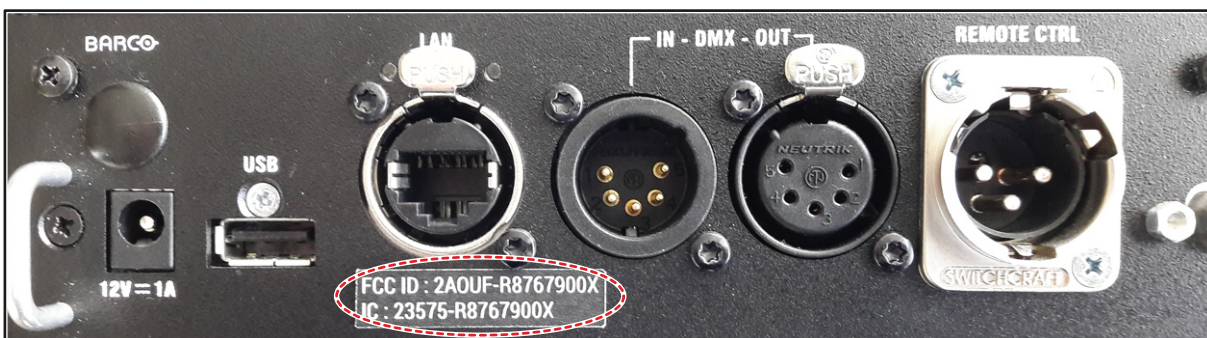


Image 9-15: Example of the black label on the communication board

9. Reinsert the communication board.

Getting Started

10

How to control the projector ?

The projector can be controlled by the local keypad, by the remote control unit, by the Projector Toolset.

Location of the local keypad ?

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

Remote control functions.

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

Other functions of the remote control are :

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

Overview

- Switching on the XDL
- Switching to standby
- Projector ON/OFF cycle explained
- Using the RCU
- Projector Address
- Quick setup via Direct access
- Software update

10.1 Switching on the XDL

About the start up process

To start up the XDL series projector the sealed compartment of the Light Processor and the sealed compartment of the Laser Clusters must be brought into a 'condition' which is safe for the electronics to operate (avoid moisture due to extreme cooling). In other words, the temperature and humidity inside these compartments must be brought within specs prior to activating the lasers and Light Processor. The time needed to bring the projector from a **deconditioned** state into a **conditioned** state depends on the ambient conditions and can take several minutes. This process is called **conditioning**.

Startup checklist

1. Check if the chillers are correctly installed. See documentation set of the chillers.
2. Check if one chiller is equipped with the expansion unit for DMD cooling.
3. Check if the XDL series projector is properly installed onto a stable platform and all covers are installed.
4. Check if all hoses are properly connected with the chiller(s) and projector. See chapter "Connecting the hoses with projector and chillers", page 53.
5. Check if the data cables between chiller(s) and projector are correctly installed. See chapter "Connecting the data cable with projector and chillers", page 55..
6. Check if the projector is connected with the mains electricity. See chapter "Connecting the projector with the mains electricity", page 60.
7. Check if the ambient temperature and humidity are within specifications. See chapter "Installation requirements", page 32.
8. Check if the chiller(s), hoses and projector are completely acclimatized to the same ambient temperature.
9. Check if the correct lens is installed for the application and the lens cap is removed from the lens. See "Lens installation", page 70.
10. Check if the small drain tubes at the bottom of the projector lead to a water drain or to an open reservoir to capture the condensed water. See chapter "Installation requirements", page 32.



Keep in mind that it can take up to 10 minutes to start the lasers again after they were switched off. If there are only 30 to 45 minutes between the shows it's advisable to keep the lasers on with shutter closed. When the shutter is closed the lasers are automatically dimmed.

Start up procedure

1. Switch on the chiller(s). The status light of the chiller(s) should light up white. See documentation set of the chiller.



Caution: Make sure the chiller(s) are powered **before** powering the projector. The chiller(s) should always be on while the projector is powered.

2. Press the **Power Switch** (reference 1, Image 10-1) to switch the projector **ON**.

The projector starts up to standby mode. The **Power on/off** button will blink until standby mode is achieved (reference 1, Image 10-2). Once in standby mode, the Power on/off button will be lit WHITE, but the LCD display will be off.

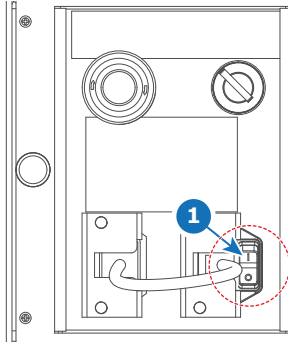


Image 10-1

3. Press the **Power on/off** button on the projector, or the **Power On** button on the remote control. The projector will continue to operational mode. The **Power on/off** button will blink BLUE until the projector is ready (reference 2, Image 10-2). In this process the shutter will close and the **Shutter** button will be lit RED. The start up screen is displayed on the LCD display and when fully started up, it changes to the overview screen.

Once the projector is ready & conditioned, the Power on/off button will be lit BLUE. Now the lasers are active and light can come out of the projector. The shutter however remains closed. While the shutter is closed, the lasers will be set to minimum power.

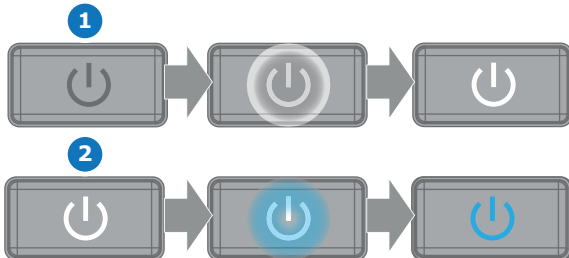


Image 10-2

4. Press the **SHUTTER** button on the Local Keypad, remote control or use the Projector Toolset to open the shutter.

Status overview

Once the projector is started, press the **Menu Activation** button to get an overview of parameters such as :

- Device serial number and article number
- Current firmware version and model name
- Current illumination (in percentage)
- Projector runtime in hours
- Uptime in hours
- Chosen source
- Current resolution and refresh rate
- Chosen communication method and IP address (if connected)
- Active functions

Starting image projection

1. Make sure the available sources are connected to the appropriate input ports.



Tip: If properly connected, the “SYNC” LED will light up ORANGE.

2. Press the **Input Selection** button on the keypad or on the remote control until:
 - the LED of the selected source (the “SEL” LED) light up GREEN, and
 - the image of the selected source is projected.

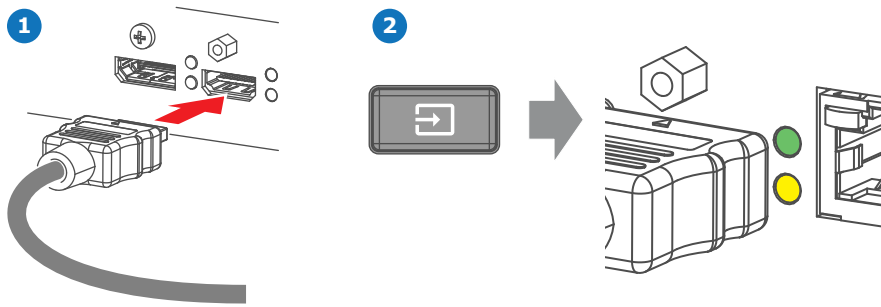


Image 10-3

10.2 Switching to standby

About the switch off process

To switch off the projector in a safe manner to protect the internal electronics (avoid moisture due to warming up) the temperature inside the sealed compartments has to be brought back to ambient in a controlled manner. This process is called **deconditioning**.

How to switch to standby

1. Press and hold the **Power on/off** button for 3 seconds on the local keypad, or press the **Power Off** button on the remote control.

Caution: Do not switch off the power from the projector until the laser status light is off. Also make sure not to power off the chiller(s). The chiller(s) should remain on as long as the projector is powered on.

The projector goes to standby mode. The deconditioning cycle will start and the lasers will be turned off. During this period the Power on/off button will blink. Once the deconditioning cycle has ended, the projector will be in preconditioned state. If left alone, the projector will eventually go into standby mode. In both states, the power on/off button will be lit WHITE.



Keep in mind that it can take up to 10 minutes to start the lasers again after they were switched off. If there are only 30 to 45 minutes between the shows it's advisable to keep the lasers on with shutter closed. When the shutter is closed the lasers are automatically dimmed.

10.3 Projector ON/OFF cycle explained

Projector ON/OFF cycle

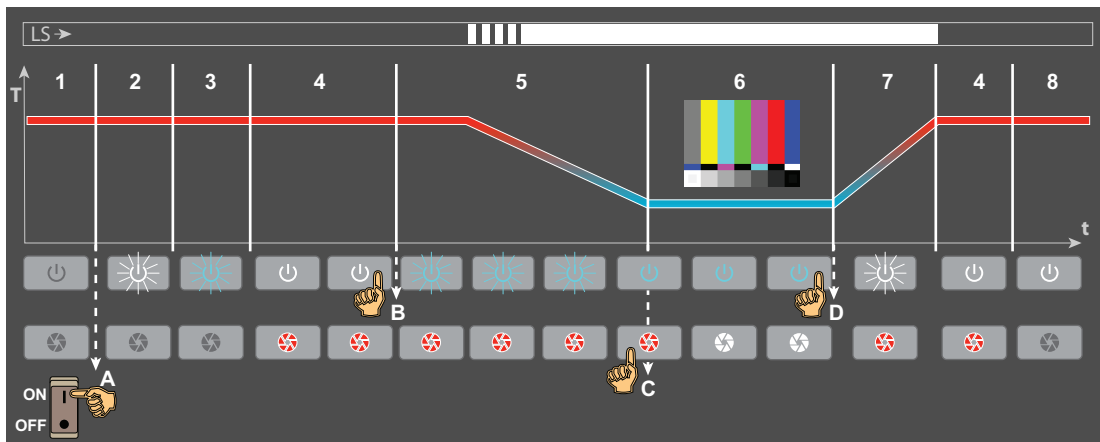


Image 10-4

LS Laser Status light.

T Temperature inside sealed compartments.

t time.

A.. Operator manipulations.

D

1..8 Different process stages.

Stage description

Stage 1 : Projector is **switched off**. Input & Communication Unit is not active and the laser status light (LS) is off.

Stage 2 : Projector is **booting**. This process starts as soon as the power switch is switched on (reference A, Image 10-4). This process takes several seconds and during this process the Power On/Off button is blinking white. The laser status light remains off.

Stage 3 : Initialization. This process starts as soon as the projector has finished booting up. The initialization of all electronic boards takes approximately two minutes and during this process the backlight of the Power On/Off button is blinking blue. The laser status light remains off.

Stage 4 : Projector is **READY**. All electronic boards are up and running. On the local keypad the OK button, Shutter button and the Menu Activation button become active. The backlight of the Power on/off button is white. The laser status light remains off.

Stage 5 : The projector is in **CONDITIONING** mode. This process starts as soon as the On/Off button is pressed when the projector is in READY mode (reference B, Image 10-4). The shutter automatically closes in this stage for laser safety reasons. The laser status light remains off.

The first stage of the **CONDITIONING** process is the environmental checks. In this stage, the projector verifies if it is safe to turn on the pump of the cooling circuit and to extract humidity from the sealed compartments without having the risk of condensation. The temperature inside the sealed compartments is kept on ambient level.

Once the projector has confirmed it is safe to start conditioning, the conditioning process itself will start. This is indicated by the **laser status light (LS)** on the top of the projector. This light will flash a few times and will then light up continuously white. The sealed compartments are cooling down from ambient to operating temperature and humidity is extracted. The conditioning process takes approximately 3 to 20 minutes (exact time depends on the environmental conditions).

Following substages take place during **CONDITIONING**:

Stage 6.1 : Checking ambient and internal conditions.

Stage 6.2 : Turning pump on. Reaching liquid flow target.

Stage 6.3 : Flow target reached. Conditioning humidity in the projector.

Stage 6.4 : Cooling started.

Stage 6.5 : Reaching liquid temperature target.

Stage 6 : Projector is **CONDITIONED** and **ON**. Temperature and humidity inside the sealed compartments are within specifications and the lasers are activated. The backlight of the On/Off button is blue. Once you press the Shutter button (reference C, Image 10-4), the image will be projected on the screen (if a source has been selected or a test pattern is active). The laser status light on the top of the projector lights up white.



While the shutter is closed (backlight of Shutter button is red) the laser power is set to minimum power and a protective test pattern is projected. This to protect the DMDs and Shutter itself. When you open the shutter again, the projector will resume the previous power settings.

Stage 7 : Projector is in **DECONDITIONING** mode. This process starts as soon as the On/Off button is pressed for 3 seconds (reference D, Image 10-4) while the projector is in conditioning or conditioned mode. The DECONDITIONING mode brings the system back to the **READY** mode. The laser status light on the top of the projector remains lighting up white. The sealed compartments are brought back to ambient temperature and humidity extraction is stopped. The deconditioning process can take up to 15 minutes (depending on the environmental conditions). During this process the backlight of the Power On/Off button is blinking white.

If the projector is left alone for several minutes while it is in **READY** mode, the projector will automatically go into **STANDBY** mode. You can also go from Ready to Standby mode by pushing the On/Off button for 3 seconds.

Stage 8 : Projector is in **STANDBY** mode. The Input & Communication Unit remains running, but only the On/Off button is active and solid white. The shutter button turns off. The laser status light remains off.

By pressing the On/Off button, you activate the projector and go to **CONDITIONING** mode (effectively skipping Ready mode). Alternatively, you can transition to **READY** mode instead. Do this by pressing the (non-lit) Menu button for three seconds.

10.4 Using the RCU

Pointing to the reflective screen

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

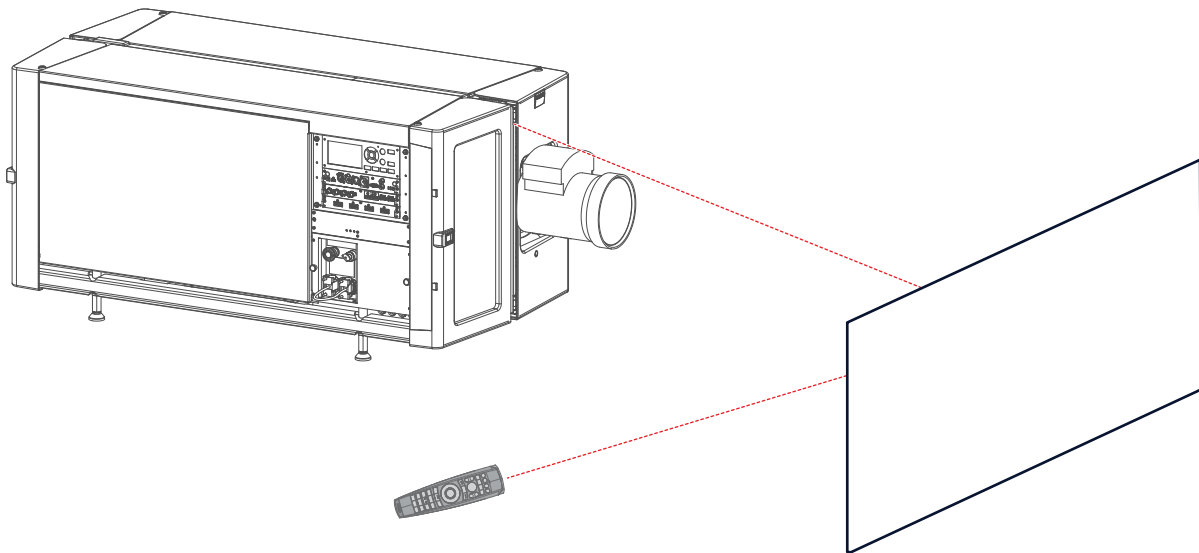


Image 10-5: IR control via reflective screen

Hardwired to the XLR input

1. Plug one end of the remote cable in the connector on the bottom of the RCU.
2. Plug the other end in the big connector on the communication interface of the projector, labelled '*Remote CTRL*'.



Note: Plugging the remote control will switch the broadcast address of the remote control to the default value '0'. This is the only broadcast address that will work when hardwired. If you want to change the broadcast address after disconnecting the remote control, see "Displaying and Programming addresses into the RCU", page 47.

Pointing directly to the IR sensor

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

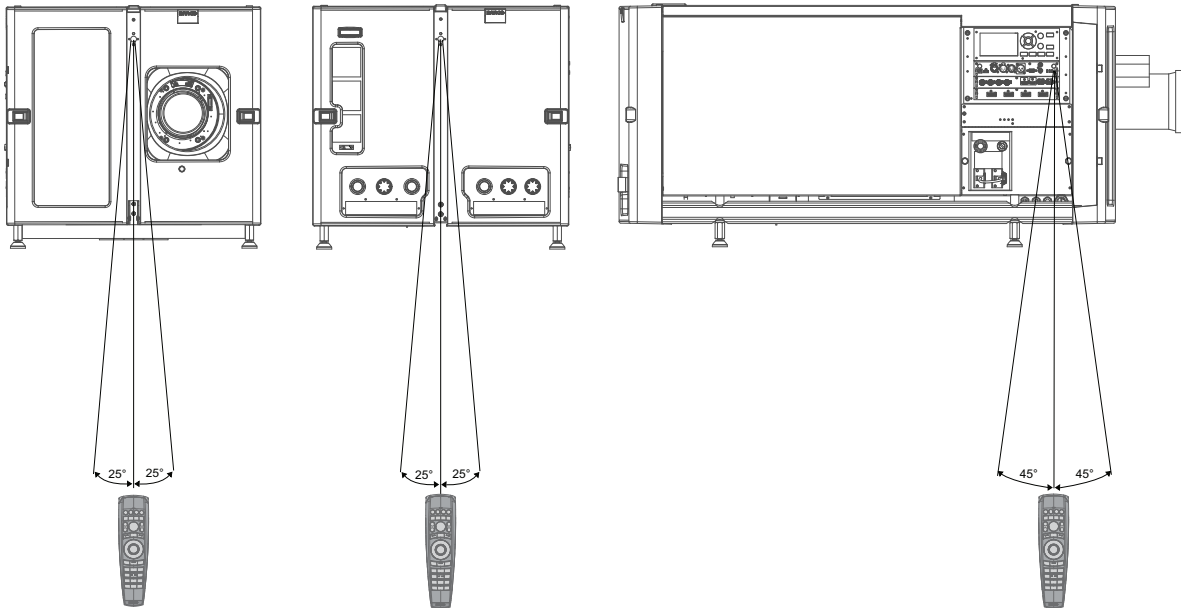


Image 10-6: RCU to one of the three IR sensors

Using the RCU in combination with a 3D emitter

When using a 3D emitter that radiates IR beams (e.g. the optional 3D emitter that Barco provides), the IR beams of the 3D emitter may interfere with the IR communication between the RCU and the projector.

If such interference occurs, connect the RCU to the projector using the remote cable with XLR connector. It is also advised to turn the IR receivers of the projector off to avoid the 3D emitter interference. The IR receivers can be turned off in the GUI: *System Settings* → *Communication* → *IR Control*.

10.5 Projector Address



Projector address

Address installed in the projector to be individually controlled.



Broadcast address

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

Why a projector address?

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

Set up an individual Projector Address

The set up of a projector address can be done via the software.

Projector controlling

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

- with the RCU: only for addresses between 1 and 31.

Broadcast Address

Every projector has a broadcast (common) address '0' or '1'. The default address is '0'.

The choice between '0' and '1' can be selected in the GUI: “*System Settings*” → “*Communication*” → “*IR Control*”.



Placing new batteries in the remote control or plugging the remote to a projector via a cable will automatically reset the address back to its default value '0'.

10.6 Quick setup via Direct access

Quick source selection

1. Press the **Input** button on the remote control or local keypad.

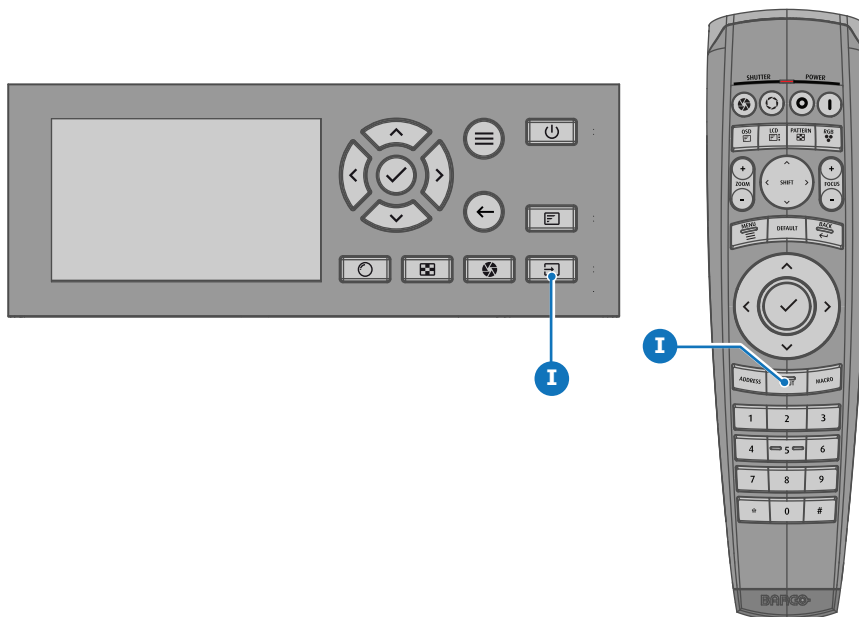


Image 10-7

The *Source selection* menu opens on the LCD display.

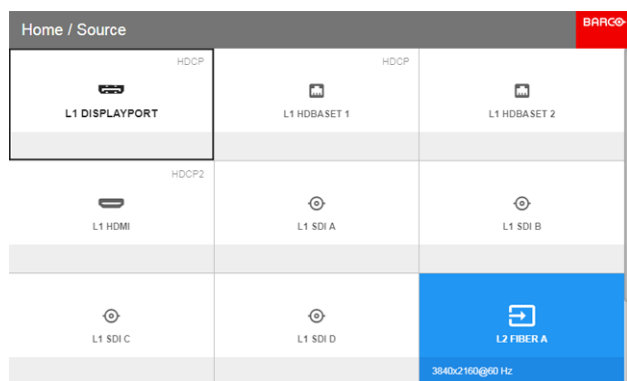


Image 10-8: Input selection

2. Use the arrow keys to select the desired source.

Quick test pattern selection

1. Press the Test pattern button on the remote control or local keypad.

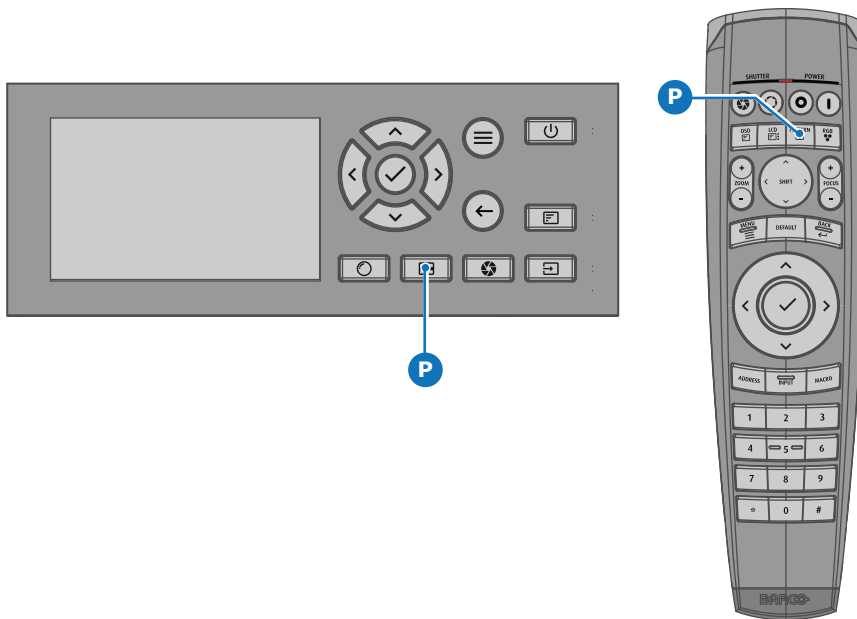


Image 10-9

The *Test pattern* menu opens on the LCD display.

2. Use the arrow keys to select the desired test pattern.

10.7 Software update



CAUTION: Make sure not to power off or unplug the projector while the software update is going on.

How to update the software

1. Power on the projector. Wait until the **Power on/off** button is lit white or blue.
2. Download and install the latest version of Projector Toolset for Pulse. The program can be downloaded for free from Barco's website, (URL: <http://www.barco.com>). Click on *myBarco* and log in to get access to secured information. Registration is necessary.
If you are not yet registered, click on *New to myBarco* and follow the instructions. With the created login and password, it is possible to log in where you can download the software.
3. Download the latest firmware (format .fw) from Barco's website in the same way as for Projector Toolset.
4. Start Projector Toolset and make a connection with the projector. For more information, see the Projector Toolset user guide.
5. Select tab **Update settings**.
6. Fill out the path to the update file (1)

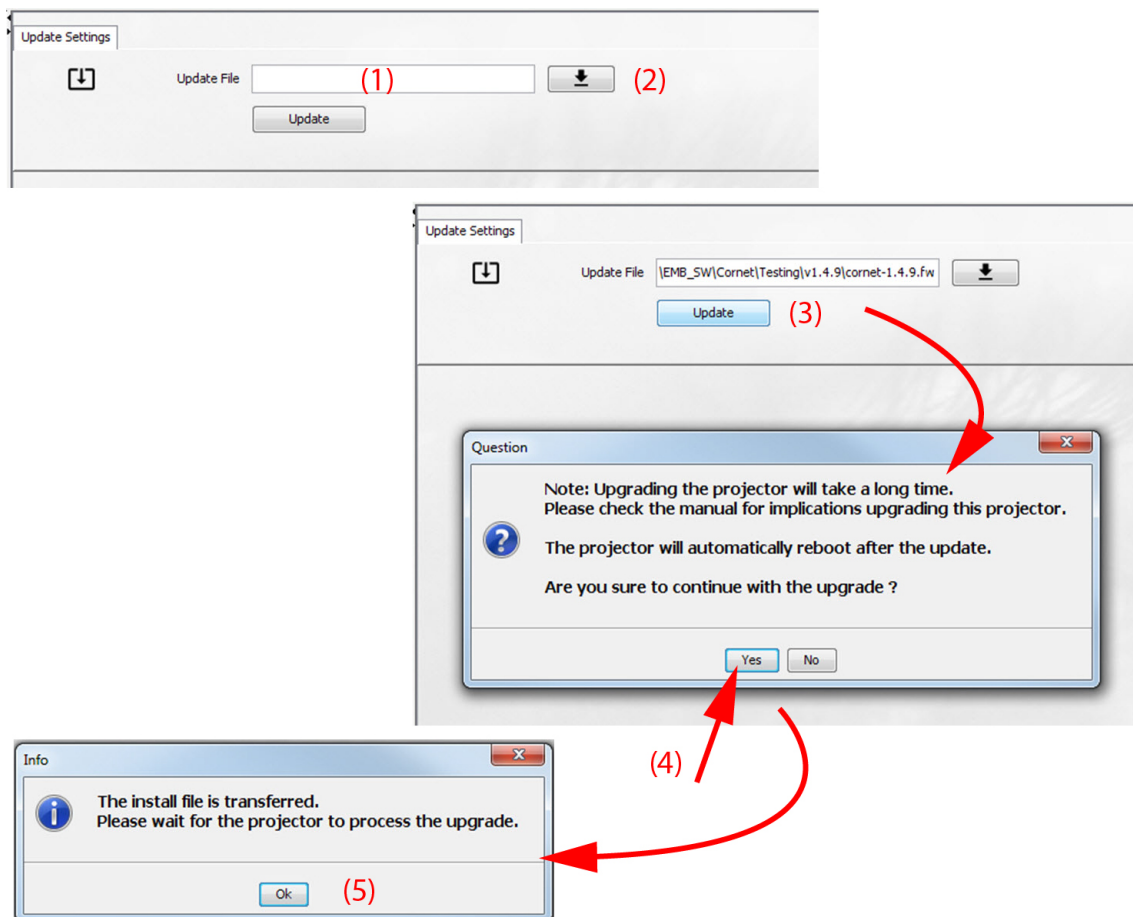


Image 10-10: Update Pulse projector


or

click on the path selection icon (2) to open a browser window.

7. Browse to the desired update package (format .fw) and click **Select Update Package**.
The path will be filled out in the input field next to *Update File*.
8. Click **Update** (3).
The update starts. This action can take a long time. A message is displayed.
9. Click **Yes** to continue (4).
The update file will be transferred to the projector and installed. The projector will reboot.
A message is displayed. Click Ok to clear the message.

How to update the software if the projector isn't connected to the network

1. Power on the projector. Wait until the **Power on/off** button is either lit white or blue.
2. Download the latest firmware file (format .fw) from Barco's website. The firmware can be downloaded for free from Barco's website, (URL: <http://www.barco.com>). Click on *myBarco* and log in to get access to secured information. Registration is necessary.

If you are not yet registered, click on *New to myBarco* and follow the instructions. With the created login and password, it is possible to log in where you can download the software.
3. Place the firmware file on a clean USB flash drive.
 -  **Note:** Make sure the flash drive is FAT32 compatible & no other files are on the flash drive.
4. Plug the flash drive in the USB port on the Communication Panel.

The update file will be transferred to the projector and installed. The projector will reboot when completed.



Take note that the update process can take a long time to complete.

Maintenance procedures

11

About this chapter

This chapter describes several maintenance procedures for the projector.



WARNING: All procedures described in this chapter may only be performed by TRAINED PROJECTIONISTS or qualified SERVICE PERSONNEL.


Overview

- Check the dust filters
- Vacuum cleaning of the dust filters
- Vacuum cleaning of the dust filters
- Washing and drying the dust filters
- Cleaning the lens
- Cleaning the exterior of the projector

11.1 Check the dust filters

How to check the large dust filter?

1. Unlatch and pivot the front cover door which contains the dust filters.

 **Note:** In case there is insufficient space to pivot the front cover door 90 degrees pull out the small side panel from the front cover door assembly as illustrated below.

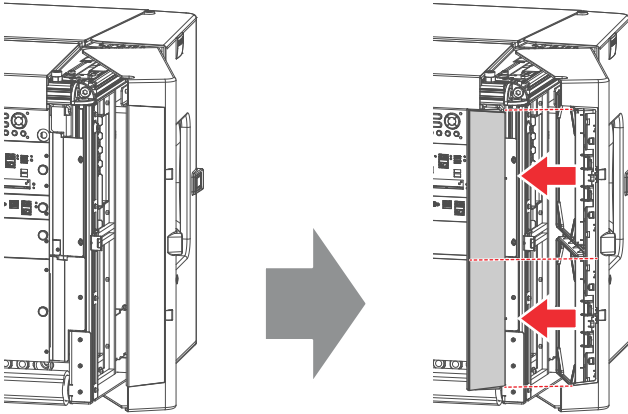


Image 11-1

2. Detach the dust filters from the inner side of the front cover door. Do this by pushing the two latches (reference 1 Image 11-2) of the dust filter inwards.

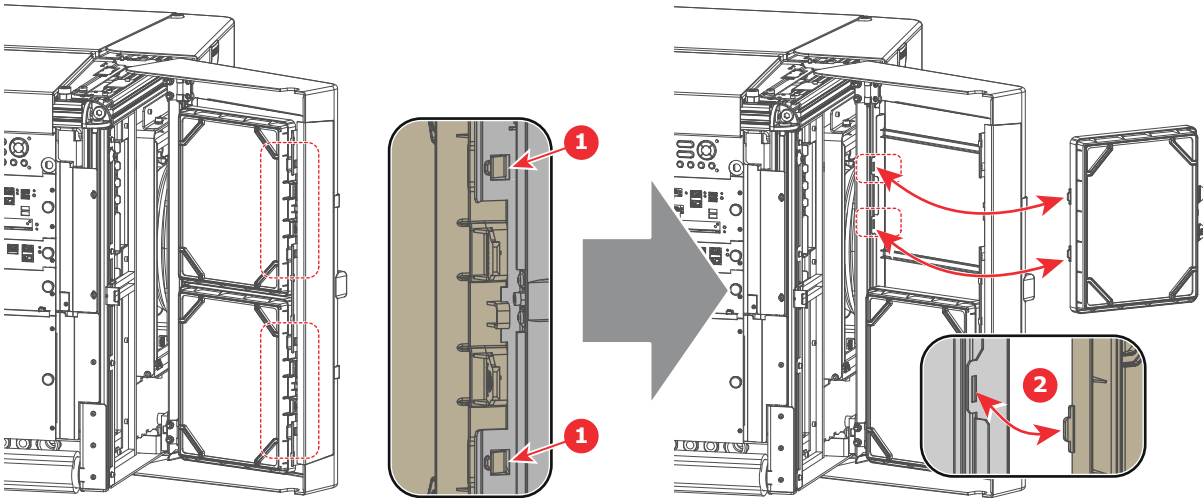




Image 11-2

3. Check the “air in” side of the dust filter for **dust** and/or **grease**.

In case the filter is contaminated with grease wash and dry the dust filter. See cleaning procedure “Washing and drying the dust filters”, page 124.

In case the filter contains dust but doesn't feel greasy then vacuum clean the dust filter. See procedure “Vacuum cleaning of the dust filters”, page 123.

 **Note:** Grease on the filter can build up after several months in an environment contaminated with greasy air. Note that areas where popcorn is consumed are subject to greasy air.

 **Tip:** Take into account that the time needed to dry the dust filters may be 24 hours or more. For that, it's recommended to have a second set of dust filters which can be used while cleaning the first set.

4. Attach the clean dust filters to the inner side of the front cover door. Ensure that both latches and both mounting lips (reference 1 and 2 Image 11-2) of the dust filters are engaged.



Caution: UNDER NO CIRCUMSTANCES SHOULD WET FILTERS BE INSTALLED BACK INTO THE PROJECTOR. THIS CAN HAVE SERIOUS SAFETY CONSEQUENCES AS WELL AS JEOPARDIZE INTERNAL COMPONENTS OF THE SYSTEM.

5. Reinstall the small side panel (if removed, see Image 11-1) and close the front cover door.



The dust filter is cleanable. See cleaning procedure for correct cleaning and drying instructions.

11.2 Vacuum cleaning of the dust filters

When to vacuum the dust filters?

The dust filters of the projector should be checked every month. If the filters are contaminated with dust then cleaning the filters with a vacuum cleaner should be sufficient. In case the filters feel greasy these must be washed. See cleaning procedure "Washing and drying the dust filters", page 124.



This procedure assumes that the dust filters are removed from the projector.

Required tools

Vacuum cleaner with soft brush suction nozzle.

How to vacuum-clean the dust filter?

1. Carefully vacuum the air inlet side of the dust filter. Use a vacuum cleaner with a soft brush suction nozzle. The air inlet side of the dust filter is the side which is surrounded with a glue edge.



Tip: Lightly tap the filter on its dusty side to expel heavy dust contamination.



Tip: Compressed air is also permitted to clean the filters but take care not to damage them.



Caution: Do not use compressed air inside the booth area. Bring the dust filters outside the building to blow off the dust.



Caution: Do not damage the dust filter. Replace damaged dust filters immediately.

11.3 Vacuum cleaning of the dust filters

When to vacuum clean the dust filters?

The dust filters of the projector should be checked every month. If the filters are contaminated with dust then cleaning the filters with a vacuum cleaner should be sufficient. In case the filters feel greasy these must be washed. See cleaning procedure "Vacuum cleaning of the dust filters", page 123.



Grease on the filter can build up after several months in an environment contaminated with greasy air. Note that areas where popcorn is consumed are subject to greasy air.







This procedure assumes that the dust filters are removed from the projector.

Required tools

Vacuum cleaner with soft brush suction nozzle.

How to vacuum-clean the dust filter?

1. Carefully vacuum the air inlet side of the dust filter. Use a vacuum cleaner with a soft brush suction nozzle. The air inlet side of the dust filter is the side which is surrounded with a glue edge.
 -  **Tip:** Lightly tap the filter on its dusty side to expel heavy dust contamination.
 -  **Tip:** Compressed air is also permitted to clean the filters but take care not to damage them.
 -  **Caution:** Do not use compressed air inside the booth area. Bring the dust filters outside the building to blow off the dust.
 -  **Caution:** Do not damage the dust filter. Replace damaged dust filters immediately.

11.4 Washing and drying the dust filters

About filter washing and drying

For environments where popcorn grease and such can contaminate the filters, Barco advises the client to purchase one extra set of filters to cover drying time, as well as taking following extra precautions and instructions pertaining to filter cleaning and drying.

Cleansing agent

To clean sticky, greasy dust filters we suggest usage of **Sodium carbonate** crystals (Na_2CO_3). Sodium carbonate (Often called **washing soda**, **soda crystals**, or **sal soda** in the detergent section of stores) is widely used to effectively remove oil, grease, alcohol stains ... The product itself is relatively safe, sodium carbonate is used in toothpastes and as a food additive (E500). Potential Hazards are described in the section "Hazards", page 143.

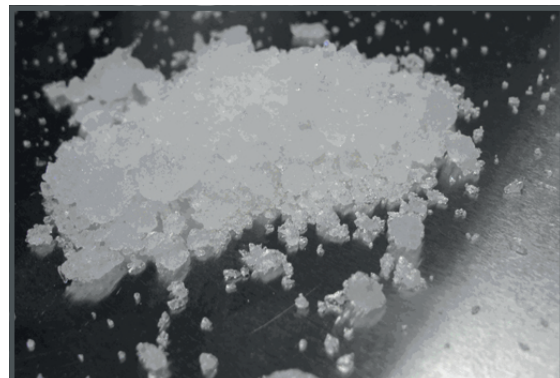


Image 11-3: Sodium carbonate crystals.



This cleaning procedure assumes that the filters are already removed from their slots.



Take into account that the time needed to dry the dust filters may be 24 hours or more. For that, it's recommended to have a second set of dust filters which can be used while cleaning the first set.

Required tools

- Bucket with hot water
- Sodium carbonate, 30 gram (handful) per liter hot water

How to wash and dry the dust filters?

1. Make a solution with a ratio of 30 gram (a handful) sodium carbonate to 1 liter **hot water**.
2. Soak the dust filters in the solution for **30 to 60 minutes**. The grease should be dissolved after 1 hour.
3. If the dust filter is still clogged repeat this procedure from step 1.
4. Rinse the dust filters with clean water to flush all grease residue away.
5. Shake out all excess liquid by repeatedly swinging the filter to-and-fro in a centrifugal action.
6. Then allow the filters to **dry thoroughly**.



Note: Drying time of the dust filters can be up to 24h or more. Drying time can be shorter when being done in a well-ventilated area.



Tip: To speed-up drying, allow the filter(s) to dry at 50°C max in a well ventilated room.



CAUTION: UNDER NO CIRCUMSTANCES SHOULD WET FILTERS BE INSTALLED BACK INTO THE PROJECTOR. THIS CAN HAVE SERIOUS SAFETY CONSEQUENCES AS WELL AS JEOPARDIZE THE INTERNAL OPTICS OF THE SYSTEM.



CAUTION: Do not install/use damaged dust filters. Replace damaged dust filters immediately with new dust filters of the same type. See <https://my.barco.com> for the correct replacement part.

11.5 Cleaning the lens



WARNING: Make sure that the lasers are switched OFF before performing this procedure



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

Required tools

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

Required parts

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

How to clean the lens?

1. Blow off dust with clean compressed air (or pressurized air cans⁴).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes in one single direction.

Warning: Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

⁴: Pressurized air cans are not efficient if there is too much dust on the surface, the pressure is too low



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

11.6 Cleaning the exterior of the projector

How to clean the exterior of the projector ?

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

Removal and installation of the projector covers

12



WARNING: Switch off the projector prior to opening or removing the projector covers, unless otherwise specified in the procedure.

Overview

- Opening the front and rear cover doors
- Removal of the top cover
- Removal of the side covers

12.1 Opening the front and rear cover doors



This procedure assumes that the lens is removed and that the hoses are disconnected from the projector. This procedure is applicable for all four cover doors.



To access the thumbscrews of the top cover it is sufficient to open the cover doors a few centimeters. In this case it's not needed to remove the lens and to disconnect the hoses.

Required tools

No tools required.

Open cover doors

1. Unlatch (reference 1 Image 12-1) and pivot the plastic cover door.

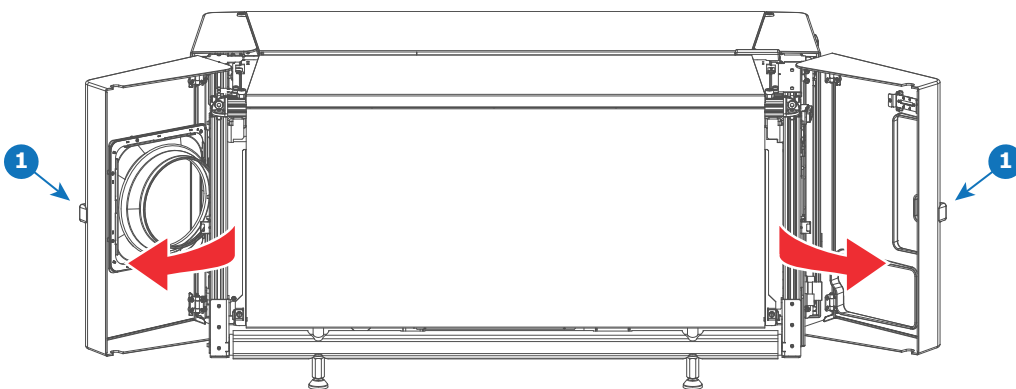


Image 12-1

12.2 Removal of the top cover



The illustrations in this procedure are based on the top-left cover. Nevertheless, the same procedure is applicable for the top-right cover as well.

Required tools

Flat screwdriver 7 mm

How to remove a top cover?

1. Unlatch and pivot the front and rear plastic cover doors a few centimeters. This to gain access to the two thumbscrews of the top cover. See procedure "Opening the front and rear cover doors", page 128.
2. Loosen the two captive thumbscrews of the top cover (reference 2 Image 12-2).

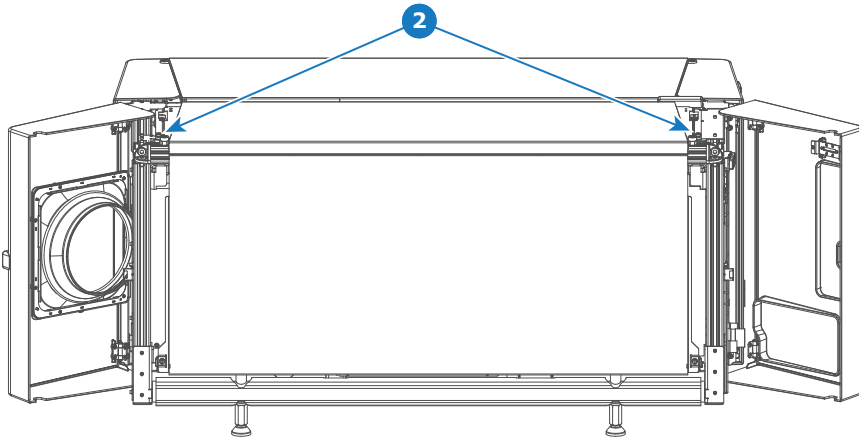


Image 12-2

3. Slide the top cover in horizontal direction a few centimeters away from the center of the projector (this to unhook), then remove it from the projector.

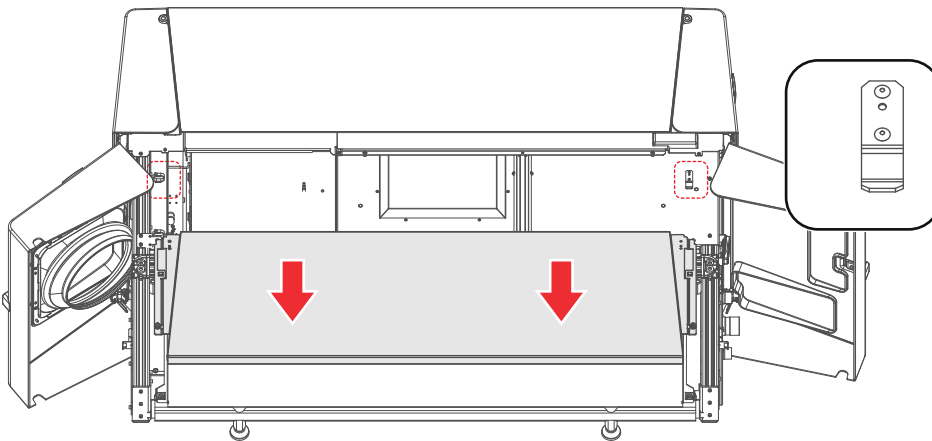


Image 12-3

12.3 Removal of the side covers



The illustrations in this procedure are based on the left-side cover. Nevertheless, the same procedure is applicable for the right-side cover as well.

Required tools

- Flat screwdriver 7 mm
- Allen wrench 3 mm

How to remove a side cover?

1. Unlatch and pivot the front and rear plastic cover doors a few centimeters. This to gain access to the two thumbscrews of the top cover and the side cover. See procedure “Opening the front and rear cover doors”, page 128.



Note: The side cover is partially captured by the top cover and the front and rear plastic cover doors. For that, both cover doors have to be (partially) opened first.

2. Remove the top cover or at least loosen the two captive thumbscrews of the top cover. See procedure “Removal of the top cover”, page 128.



Tip: It's not needed to remove the top cover completely away from the projector to remove the side cover.

3. Loosen the two captive thumbscrews of the side cover (reference 3 Image 12-4).
4. Remove the two screws located at the middle bottom of the side cover (reference 4 Image 12-4). Use a 3 mm Allen wrench.
5. Lift up the side cover about two centimeters and then remove it from the projector.

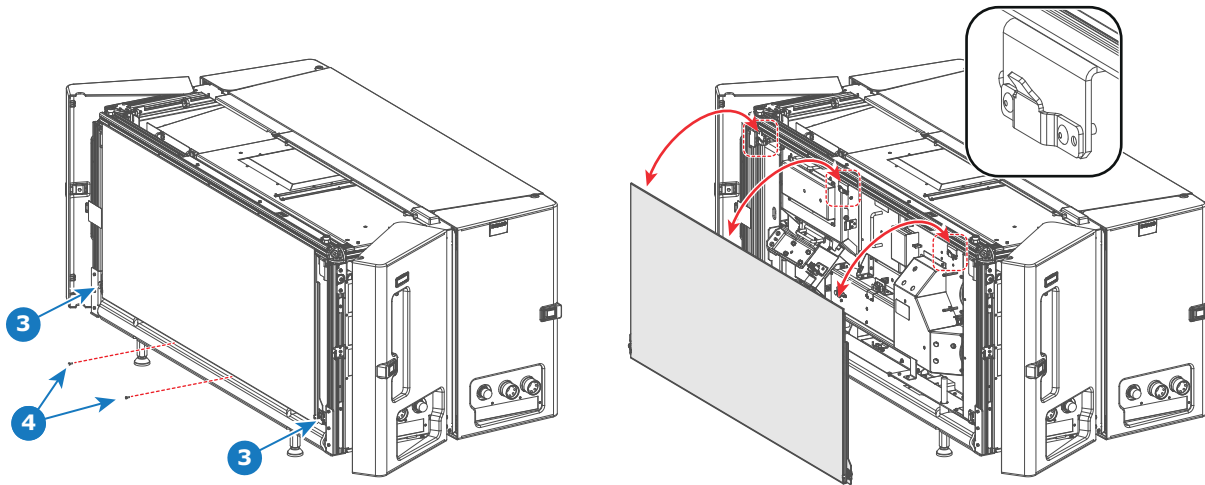
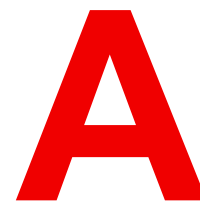


Image 12-4

Specifications



About this chapter

This chapter gives an overview of the specification of your XDL series projector as well as the dimensions and the center of gravity.

Overview

- Specifications of the XDL-4K30
- Specifications of the XDL-4k60
- Specifications of the XDL-4k75
- Dimensions of the XDL series projector
- Technical Regulations

A.1 Specifications of the XDL-4K30

Specifications

Projector type	Native 4K 3-chip DLP digital projector up to 120 Hz
Technology	1.38" DMD™ x3
Resolution	4,096 x 2,160
Brightness	Up to 28,000 center lumens using HC lenses / Up to 30,000 center lumens using HB lenses 29,700 ansi lumen 33,400 ISO lumen
Native contrast ratio	2,800:1 (typical using HC lenses) / 500:1 ANSI contrast (typical) 2,000:1 (typical using HB lenses) / 450:1 ANSI contrast (typical)
Prime lenses	HC: 1.13-1.72; 1.35-1.86; 1.46-2.10; 1.65-2.60; 2.00-3.35 / HB : XLD 0.8; 1:0 ; 1.45-1.8; 1.8-2.4; 2.2-3.0; 2.8-5.5; 5.5-8.5
Optical lens shift	Vertical up to +/-100%, depending on lens Horizontal up to +/- 32%, depending on lens Motorized zoom and focus with memory Motorized lens shift with memory
Light source	Direct coupled RGB lasers 6P
Light source lifetime	20,000 hrs*
Color correction	P7
Optical dowser	Standard
Orientation	Tilt 45° up and 30° downwards Rotation – 20 degrees / +90 degrees (=Portrait)
Sealed DLP™ core	standard
Inputs	Slot 1 :Dual HDBt; HDMI 2.0 (HDCP 2.2); DP 1.2 (HDCP 1.3); Quad 3G/12G SDI / BarcoLink Slot 2: Quad DP1.2
Input resolutions	From NTSC up to 4K (4,096 x 2,160) 120 Hz refresh rates: 24hz to 120hz 4K/4KUHD (4096 x 2160/ 3860 x 2160)
Picture-in-picture	Two sources simultaneously
CLO (constant light output)	Standard
ScenergiX	Horizontal and vertical edge blending, Direct adjust OSD + toolset
Image processing	Embedded warp & blend engine
Keystone correction	Yes
Integrated web server	Yes
Software tools	Projector Toolset
Control	XLR wired + IR, RS232, Wifi (opt), GSM (opt)
Network connection	10/100 base-T, RJ-45 connection, Wifi (optional)
Dimensions (WxLxH)	Projector: 744 x 1,445 x 706 mm / 29.3 x 56.9 x 27.8 inches (with feet, no lens) one chillers, with the following dimensions: 701 x 701 x 800 mm / 27.6 x 27.6 x 31.5 inches

Weight	Projector: 200kg (~440lb) / Chiller: ~115kg (~250lb)
Cooling liquid hose length	2.5-5-10m (8.2-16.4-32.8ft)
Power requirements	Projector: 200-240/346-415V 50-60Hz 16A 3W+N+PE (Y connection) / Power cord size range: 4 sq mm to 6 sq mm, 10AWG to 8AWG / Circuit breaker range: 25A to 40A 200-240V 3W+PE 28A 50-60Hz (Δ-connection) / Power cord size: 6 sq mm, 8AWG / Circuit breaker: 40A Chillers: 230/400V 3W+N+PE 16A, 2.5 sq mm (Y connection) or 208V / 3W+PE (Δ-connection) / Max. 16A per phase
Ambient temperature	10-35°C (95°F) Max. (projector and chillers)
Operational humidity	5-80% (non condens)
Power consumption	Projector @ full laser power: 3.5 kW (2D or Polarization 3D) / 2.0 kW (Barco Laser3D - 6P) Chillers @ full laser power: 2.0 kW (2D or Polarization 3D) / 1.6 kW (Barco Laser3D - 6P)
3D systems	Color3D (Barco Laser3D): Native 6-primary color-3D system. Only requires color filter glasses / Active glasses systems / Polarization recuperation systems
Safety class	Class 1, RG3
Certifications	CE; ETL/UL/FCC
*Note	*Less than 20% decrease during a runtime of 20,000 hrs

A.2 Specifications of the XDL-4k60

Specifications

Projector type	Native 4K 3-chip DLP digital projector up to 120 Hz
Technology	1.38" DMD™ x3
Resolution	4,096 x 2,160
Brightness	Up to 56,000 center lumens using HC lenses / Up to 60,000 center lumens using HB lenses 59,200 ansi lumen 66,600 ISO lumen
Native contrast ratio	2,800:1 (typical using HC lenses) / 500:1 ANSI contrast (typical) 2,000:1 (typical using HB lenses) / 450:1 ANSI contrast (typical)
Prime lenses	HC: 1.13-1.72; 1.35-1.86; 1.46-2.10; 1.65-2.60; 2.00-3.35 / HB : XLD 0.8; 1:0 ; 1.45-1.8; 1.8-2.4; 2.2-3.0; 2.8-5.5; 5.5-8.5
Optical lens shift	Vertical up to +/-100%, depending on lens Horizontal up to +/- 32%, depending on lens Motorized zoom and focus with memory Motorized lens shift with memory
Light source	Direct coupled RGB lasers 6P
Light source lifetime	20.000 hours*
Color correction	P7
Optical dowser	Standard

Orientation	Tilt 45° up and 30° downwards Rotation – 20 degrees / +90 degrees (=Portrait)
Sealed DLP™ core	Standard
Inputs	Slot 1 :Dual HDBt; HDMI 2.0 (HDCP 2.2); DP 1.2 (HDCP 1.3); Quad 3G/12G SDI / BarcoLink Slot 2: Quad DP1.2
Input resolutions	From NTSC up to 4K (4,096 x 2,160) 120 Hz refresh rates: 24hz to 120hz 4K/4KUHD (4096 x 2160/ 3860 x 2160)
Picture-in-picture	Two sources simultaneously
CLO (constant light output)	Standard
ScenergiX	Horizontal and vertical edge blending
Image processing	Embedded warp & blend engine
Keystone correction	Yes
Integrated web server	Yes
Software tools	Projector Toolset
Control	XLR wired + IR, RS232, Wifi (opt), GSM (opt)
Network connection	10/100 base-T, RJ-45 connection, Wifi (optional)
Dimensions (WxLxH)	Projector: 744 x 1,445 x 706 mm / 29.3 x 56.9 x 27.8 inches (with feet, no lens) Two chillers, each with the following dimensions: 701 x 701 x 800 mm / 27.6 x 27.6 x 31.5 inches
Weight	Projector: 235kg (~520lb) / Chillers: ~115kg (~250lb) per chiller (two chillers needed)
Cooling liquid hose length	2.5-5-10m (8.2-16.4-32.8ft)
Power requirements	Projector: 200-240/346-415V 50-60Hz 16A 3W+N+PE (Y connection) / Power cord size range: 4 sq mm to 6 sq mm, 10AWG to 8AWG /Circuit breaker range: 25A to 40A 200-240V 3W+PE 28A 50-60Hz (Λ-connection) / Power cord size: 6 sq mm, 8AWG / Circuit breaker: 40A Chillers: 230/400V 3W+N+PE 16A, 2.5 sq mm (Y connection) or 208V / 3W+PE (Λ- connection) / Max. 16A per phase
Ambient temperature	10-35°C (95°F) Max. (projector and chillers)
Operational humidity	5-80% (non condens)
Power consumption	Projector @ full laser power: 6.7 kW (2D or Polarization 3D) / 3.6 kW (Barco Laser3D - 6P) Chillers @ full laser power: 3.0 kW (2D or Polarization 3D) / 2.5 kW (Barco Laser3D - 6P)
3D systems	Color3D (Barco Laser3D): Native 6-primary color-3D system. Only requires color filter glasses / Active glasses systems / Polarization recuperation systems
Safety class	Class 1, RG3
Certifications	CE; ETL/UL/FCC
*Note	*Less than 20% decrease during a runtime of 20,000 hrs

A.3 Specifications of the XDL-4k75

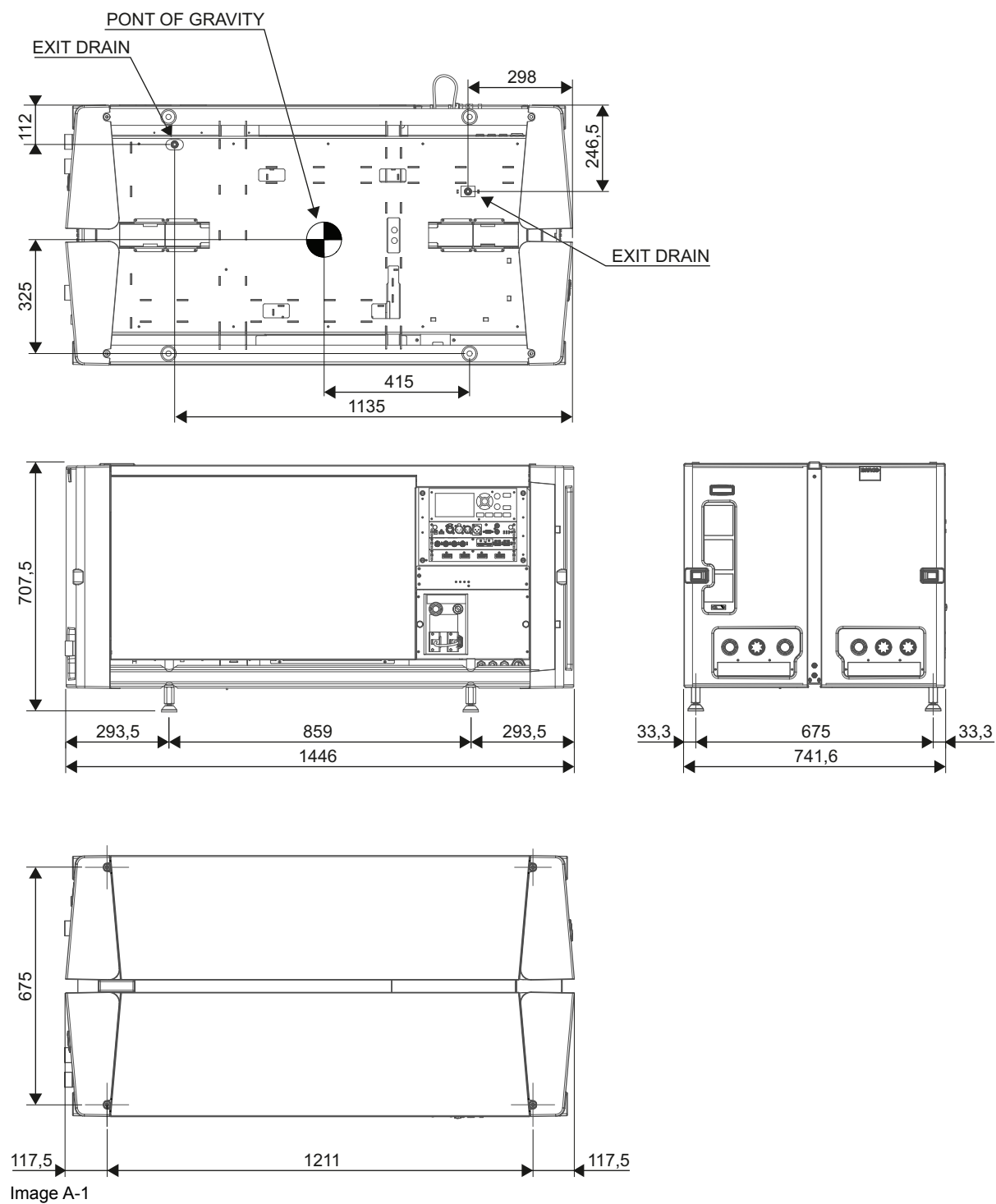
Specifications

Projector type	Native 4K 3-chip DLP digital projector up to 120 Hz
Technology	1.38" DMD™ x3
Resolution	4,096 x 2,160
Brightness	Up to 70,000 center lumens using HC lenses / Up to 75,000 center lumens using HB lenses 72,600 ansi lumen 81,600 ISO lumen
Native contrast ratio	2,800:1 (typical using HC lenses) / 500:1 ANSI contrast (typical) 2,000:1 (typical using HB lenses) / 450:1 ANSI contrast (typical)
Prime lenses	HC: 1.13-1.72; 1.35-1.86; 1.46-2.10; 1.65-2.60; 2.00-3.35 / HB : XLD 0.8; 1:0 ; 1.45-1.8; 1.8-2.4; 2.2-3.0; 2.8-5.5; 5.5-8.5
Optical lens shift	Vertical up to +/-100%, depending on lens Horizontal up to +/- 32%, depending on lens Motorized zoom and focus with memory Motorized lens shift with memory
Light source	Direct coupled RGB lasers 3P
Light source lifetime	15,000 hours
Color correction	P7
Optical dowser	Standard
Orientation	Tilt 45° up and 30° downwards Rotation – 20 degrees / +90 degrees (=Portrait)
Sealed DLP™ core	standard
Inputs	Slot 1 :Dual HDBt; HDMI 2.0 (HDCP 2.2); DP 1.2 (HDCP 1.3); Quad 3G/12G SDI / BarcoLink
Input resolutions	From NTSC up to 4K (4,096 x 2,160) 120 Hz refresh rates: 24hz to 120hz 4K/4KUHD (4096 x 2160/ 3860 x 2160)
Picture-in-picture	Two sources simultaneously
CLO (constant light output)	Standard
ScenergiX	Horizontal and vertical edge blending, Direct adjust OSD + toolset
Image processing	Embedded warp & blend engine
Keystone correction	Yes
Integrated web server	Yes
Software tools	Projector Toolset
Control	XLR wired + IR, RS232, Wifi (opt), GSM (opt)
Network connection	10/100 base-T, RJ-45 connection, Wifi (optional)
Dimensions (WxLxH)	Projector: 744 x 1,445 x 706 mm / 29.3 x 56.9 x 27.8 inches (with feet, no lens) Two chillers, each with the following dimensions: 701 x 701 x 800 mm / 27.6 x 27.6 x 31.5 inches

Weight	Projector: 235kg (~520lb) / Chillers: ~115kg (~250lb) per chiller (two chillers needed)
Cooling liquid hose length	2.5-5-10m (8.2-16.4-32.8ft)
Power requirements	Projector: 200-240/346-415V 50-60Hz 16A 3W+N+PE (Y connection) / Power cord size range: 4 sq mm to 6 sq mm, 10AWG to 8AWG / Circuit breaker range: 25A to 40A 200-240V 3W+PE 28A 50-60Hz (Δ-connection) / Power cord size: 6 sq mm, 8AWG / Circuit breaker: 40A Chillers: 230/400V 3W+N+PE 16A, 2.5 sq mm (Y connection) or 208V / 3W+PE (Δ-connection) / Max. 16A per phase
Ambient temperature	10-35°C (95°F) Max. (projector and chillers)
Operational humidity	5-80% (non condens)
Power consumption	Projector @ full laser power: 6.7 kW Chillers @ full laser power: 3.0 kW
3D systems	Active glasses systems / Polarization recuperation systems
Safety class	Class 1, RG3
Certifications	CE; ETL/UL/FCC
*Note	*Less than 20% decrease during a runtime of 15,000 hrs

A.4 Dimensions of the XDL series projector

Dimensions



A.5 Technical Regulations

Certificates



Image A-2:
Rohs OK



Image A-3: CE
mark



Image A-4: FCC
label



Image A-5:
RCM mark

Environmental information

B

Overview

- [Turkey RoHS compliance](#)
- [China RoHS compliance](#)
- [Taiwan RoHS compliance](#)
- [Disposal information](#)
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B.1 Turkey RoHS compliance

Turkey RoHS compliance



■ Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

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

B.2 China RoHS compliance

中国大陆 RoHS (Chinese Mainland RoHS)

根据中国大陆《电器电子产品有害物质限制使用管理办法》（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 “Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic 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	X	O	O	O
外接电(线)缆 External Cables	X	O	O	O	O	O
内部线路 Internal wiring	X	O	O	O	O	O
镜头支架 Lensholder	X	O	O	O	O	O
光学镜头 Optical lenses	X	O	O	O	O	O
激光发生器 Laser	X	O	O	O	O	O
螺帽,螺钉(栓),螺旋(钉),垫圈,紧固件 Nuts, bolts, screws, washers, Fasteners	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

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)
附電池遙控器 Remote control	X	O	O	O	O	O

本表格依据SJ/T 11364的规定编制

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 toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in 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 toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.



在中国大陆销售的相应电子信息产品（EIP）都必须遵照中国大陆《电子电气产品有害物质限制使用标识要求》标准贴上环保使用期限（EFUP）标签。Barco产品所采用的EFUP标签（请参阅实例，徽标内部的编号使用于指定产品）基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the "Marking for the restriction of the use of hazardous substances in electrical and electronic product" of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the "General guidelines of environment-friendly use period of electronic information products" of Chinese Mainland.

B.3 Taiwan RoHS compliance

限用物質含有情況標示聲明書 (Declaration of the Presence Condition of the Restricted Substances Marking)

設備名稱： 投影儀， 型號（型式）： XDL

Equipment name: Projector, Type designation: XDL

限用物質及其化學符號

Restricted substances and its chemical symbols

單元 Unit	鉛 Lead (Pb)	汞 Mercu- ry (Hg)	鎘 Cadm- ium (Cd)	六價鉻 Hexava- lent chromi- um (Cr6+)	多溴聯苯 Polybromi- nated biphenyls (PBB)	多溴二苯醚 Polybromi- nated diphenyl ethers (PBDE)
印製電路板配件 Printed Circuit Assemblies	—	O	—	O	O	O
外接電（線）纜 External Cables	—	O	O	O	O	O
內部線路 Internal wiring	—	O	O	O	O	O
鏡頭支架 Lensholder	—	O	O	O	O	O
光學鏡頭 Optical lenses	—	O	O	O	O	O

設備名稱： 投影儀， 型號 (型式)： XDL

Equipment name: Projector, Type designation: XDL

限用物質及其化學符號

Restricted substances and its chemical symbols

單元 Unit	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr6+)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
激光發生器 Laser	—	○	○	○	○	○
螺帽, 螺釘 (栓), 螺旋 (釘), 墊圈, 緊固件 Nuts, bolts, screws, washers, Fasteners	—	○	○	○	○	○
電源供應器 Power Supply Unit	—	○	○	○	○	○
風扇 Fan	—	○	○	○	○	○
遙控器 Remote Control	—	○	○	○	○	○

備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。

Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。

Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “—” 係指該項限用物質為排除項目。

Note 3 : The “—” indicates that the restricted substance corresponds to the exemption.

B.4 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/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.

B.5 Hazards

Safety notice Sodium Carbonate (Na_2CO_3)

According to the Safety Data Sheet (SDS), Sodium Carbonate could cause serious eye irritation.

Safety Data Sheets for Hazardous Chemicals

For safe handling information on chemical products, consult the Safety Data Sheet (SDS). SDSs are available upon request via safetydatasheets@barco.com.

B.6 Production address

Factories

Barco NV (BELGIUM)

President Kennedypark 35, B-8500 Kortrijk

Barco Visual (Beijing) Electronics Co. Ltd.

巴可伟视 (北京) 电子有限公司

No.16 Changsheng Road, Changping District, 102200, Beijing, P.R.C

北京市昌平区中关村科技园区昌平园昌盛路16号 邮政编码：102200

Made in information

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

Production date

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

B.7 Contact information

Barco contact information

Registered office address: President Kennedypark 35, 8500 Kortrijk, Belgium

Contact address: Beneluxpark 21, 8500 Kortrijk, Belgium

Importers contact information

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

B.8 Download Product Manual

Download Product Manual

Product manuals and documentation are available online at www.barco.com/td.

Registration may be required; follow the instructions given on the website.

IMPORTANT! Read Installation Instructions before connecting equipment to the mains power supply.

Overview video timings for video interfaces



Overview

- Overview video timings
- Overview video timings SDI Inputs
- Overview video timings HDMI 2.0 inputs
- Overview video timings DisplayPort 1.2 inputs
- Overview video timings HDBaseT inputs

C.1 Overview video timings

List of compatible signals

The following table specifies the video signals that the projector can project. Barco Events projectors supports the signal with “X” in the Compatible signals column.

Note: Support for refresh rates 24.00, 30.00, 60.00 Hz automatically includes support of 1/1.001 x those refresh rates.

Resolution	Vertical refresh rate (Hz)	Compatible signal				
		HDMI 2.0 Inputs	12G SDI Input on Mk II Input board & Fiber Network Inputs	3G SDI Inputs	DisplayPort 1.2 Inputs	HDBaseT & HDMI 1.4 Inputs
640 x 480	60	X	—	—	X	X
720 x 480	60	X	—	—	—	X
720 x 576	50	X	—	—	—	X
800 x 600	60	X	—	—	X	X
1024 x 768	60	X	—	—	X	X
1280 x 720	24	—	X	X	—	—
1280 x 720	25	—	X	X	—	—
1280 x 720	30	—	X	X	—	—
1280 x 720	50	X	X	X	X	X
1280 x 720	60	X	X	X	X	X
1280 x 800	60	X	—	—	X	X
1280 x 960	60	X	—	—	X	X
1280 x 1024	60	X	—	—	X	X
1400 x 1050	60	X	—	—	X	X
1600 x 1200	60	X	—	—	X	X
1600 x 1200	120	—	—	—	X	—
1920 x 1080	24	X	X	X	X	X
1920 x 1080	25	X	X	X	—	X
1920 x 1080	30	X	X	X	—	X
1920 x 1080	50	X	X	X	X	X
1920 x 1080	60	X	X	X	X	X
1920 x 1080	120	—	—	—	X	—
1920 x 1200	50	X	X	X	X	X
1920 x 1200	60	X	X	X	X	X
1920 x 1200	120	—	—	—	X	—
2048 x 1080	24	X	—	—	X	X
2048 x 1080	25	X	—	—	X	X
2048 x 1080	30	X	—	—	X	X

Resolution	Vertical refresh rate (Hz)	Compatible signal				
		HDMI 2.0 Inputs	12G SDI Input on Mk II Input board & Fiber Network Inputs	3G SDI Inputs	DisplayPort 1.2 Inputs	HDBaseT & HDMI 1.4 Inputs
2048 x 1080	48	X	—	—	X	X
2048 x 1080	50	X	X	X	X	X
2048 x 1080	60	X	X	X	X	X
2048 x 1080	120	—	—	—	X	—
2560 x 1600	50	X	—	—	X	X
2560 x 1600	60	X	—	—	X	X
2560 x 1600	120	—	—	—	X	—
3840 x 2160	24	X	—	—	X	X
3840 x 2160	25	X	—	—	X	X
3840 x 2160	30	X	—	—	X	X
3840 x 2160	50	X	X	—	X	—
3840 x 2160	60	X	X	—	X	—
3840 x 2400	50	X	—	—	X	—
3840 x 2400	60	X	—	—	X	—
4096 x 2160	24	X	—	—	X	X
4096 x 2160	25	X	—	—	X	X
4096 x 2160	30	X	—	—	X	X
4096 x 2160	50	X	X	—	X	—
4096 x 2160	60	X	X	—	X	—

C.2 Overview video timings SDI Inputs

Overview

The following standard video formats are available for the projector.

Video timing (active pixels x active lines)	Vertical refresh rate (Hz) ⁵	Type	Port Type
1280 x 720	24	HD-SDI	Single Link & Quad Link
1280 x 720	25	HD-SDI	Single Link & Quad Link
1280 x 720	30	HD-SDI	Single Link & Quad Link
1280 x 720	50	HD-SDI	Single Link & Quad Link
1280 x 720	60	HD-SDI	Single Link & Quad Link
1920 x 1080	24	HD-SDI	Single Link & Quad Link

5: Support for refresh rates 24.00, 30.00 and 60.00 Hz automatically includes support of 1/1.001 x those refresh rates.

Video timing (active pixels x active lines)	Vertical refresh rate (Hz) ⁵	Type	Port Type
1920 x 1080	25	HD-SDI	Single Link & Quad Link
1920 x 1080	30	HD-SDI	Single Link & Quad Link
1920 x 1080	50	3G-SDI	Single Link & Quad Link
1920 x 1080	60	3G-SDI	Single Link & Quad Link
1920 x 1200	50	3G-SDI "BarcoLink"	Single Link & Quad Link
1920 x 1200	59.94	3G-SDI "BarcoLink"	Single Link & Quad Link
1920 x 1200	60	3G-SDI "BarcoLink"	Single Link & Quad Link
2048 x 1080	50	3G-SDI	Single Link & Quad Link
2048 x 1080	60	3G-SDI	Single Link & Quad Link
3840 x 2160	50	12G-SDI ⁶	Single Link
3840 x 2160	60	12G-SDI ⁶	Single Link
3840 x 2400	50	12G-SDI "BarcoLink 4k" ⁶	Single Link
3840 x 2400	59.94	12G-SDI "BarcoLink 4k" ⁶	Single Link
3840 x 2400	60	12G-SDI "BarcoLink 4k" ⁶	Single Link
4096 x 2160	50	12G-SDI ⁶	Single Link
4096 x 2160	60	12G-SDI ⁶	Single Link

C.3 Overview video timings HDMI 2.0 inputs

Overview

The following standard video formats are available for the projector.

Note: support for refresh rates 24.00, 30.00, 60.00 Hz automatically includes support of 1/1.001 x those refresh rates

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	3D support?
640 x 480	60	
720 x 480	60	
720 x 576	50	
800 x 600	60	
1024 x 768	60	
1280 x 720	50	Frame packing Top – bottom
1280 x 720	60	Frame packing Top – bottom
1280 x 800	60	

5: Support for refresh rates 24.00, 30.00 and 60.00 Hz automatically includes support of 1/1.001 x those refresh rates.

6: 12G SDI board only, and only on Channel A

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	3D support?
1280 x 960	60	
1280 x 1024	60	
1400 x 1050	60	
1600 x 1200	60	
1920 x 1080	24	Frame packing Top – bottom
1920 x 1080	25	
1920 x 1080	30	
1920 x 1080	50	Side by Side (SbS) progressive
1920 x 1080	60	Side by Side (SbS) progressive
1920 x 1200	50	
1920 x 1200	60	
2048 x 1080	24	
2048 x 1080	25	
2048 x 1080	30	
2048 x 1080	48	
2048 x 1080	50	
2048 x 1080	60	
2560 x 1600	50	
2560 x 1600	60	
3840 x 2160	24	
3840 x 2160	25	
3840 x 2160	30	
3840 x 2160	50	
3840 x 2160	60	
3840 x 2400	50	
3840 x 2400	60	
4096 x 2160	24	
4096 x 2160	25	
4096 x 2160	30	
4096 x 2160	50	
4096 x 2160	60	

C.4 Overview video timings DisplayPort 1.2 inputs

Overview

The following standard video formats are available for the projector.

Note: support for refresh rates 24.00, 30.00, 60.00 Hz automatically includes support of 1/1.001 x those refresh rates

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	Available layout modes, other than standard layout (1 x 1 layout) ⁷	Support for 3D?
640 x 480	60		
800 x 600	60		
960 x 1080	120	4 Quadrant mode (2 x 2 layout)	Active 3D
960 x 1200	120	4 Quadrant mode (2 x 2 layout)	Active 3D
960 x 2160	120	4 Column mode (4 x 1 layout)	Active 3D
960 x 2400	120	4 Column mode (4 x 1 layout)	Active 3D
1024x 768	60		
1024 x 2160	60	4 Column mode (4 x 1 layout)	
1024 x 2160	120	4 Column mode (4 x 1 layout)	Active 3D
1280 x 720	50		
1280 x 720	60		
1280 x 800	60		
1280 x 960	60		
1280 x 1024	60		
1280 x 1080	60	4 Quadrant mode (2 x 2 layout)	
1280 x 1080	120	4 Quadrant mode (2 x 2 layout)	Active 3D
1280 x 1600	60	4 Quadrant mode (2 x 2 layout)	
1280 x 1600	120	4 Quadrant mode (2 x 2 layout)	Active 3D
1400 x 1050	60		
1600 x 1200	60		
1600 x 1200	120		Active 3D
1920 x 1080	50		
1920 x 1080	60		
1920 x 1080	120	4 Quadrant mode (2 x 2 layout)	Active 3D
1920 x 1200	50		
1920 x 1200	60		
1920 x 1200	120	4 Quadrant mode (2 x 2 layout)	Active 3D

⁷: Other layout modes are only available on Input boards that have multiple DP inputs.

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	Available layout modes, other than standard layout (1 x 1 layout)⁷	Support for 3D?
1920 x 2160	60	2 Column mode (2 x 1 layout)	Passive stereo
1920 x 2160	120	2 Column mode (2 x 1 layout)	Active 3D
1920 x 2400	60	2 Column mode (2 x 1 layout)	
2048 x 1080	24		
2048 x 1080	25		
2048 x 1080	30		
2048 x 1080	48		
2048 x 1080	50		
2048 x 1080	60		
2048 x 1080	120	4 Quadrant mode (2 x 2 layout)	Active 3D
2048 x 2160	60	2 Column mode (2 x 1 layout)	
2048 x 2160	120	2 Column mode (2 x 1 layout)	Active 3D
2560 x 1080	120		Active 3D
2560 x 1440	120		Active 3D
2560 x 1600	50		
2560 x 1600	60		
2560 x 1600	120		
3840 x 2160	24		
3840 x 2160	25		
3840 x 2160	30		
3840 x 2160	50		
3840 x 2160	60		Passive Stereo
3840 x 2400	50		
3840 x 2400	60		
4096 x 2160	24		
4096 x 2160	25		
4096 x 2160	30		
4096 x 2160	50		
4096 x 2160	60		

⁷: Other layout modes are only available on Input boards that have multiple DP inputs.

C.5 Overview video timings HDBaseT inputs

Overview

The following standard video formats are available for the projector.

Note: support for refresh rates 24.00, 30.00, 60.00 Hz automatically includes support of 1/1.001 x those refresh rates.

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	Available layout modes, other than standard layout (1 x 1 layout)
640 x 480	60	
720 x 480	60	
720 x 576	50	
800 x 600	60	
1024 x 768	60	
1280 x 720	50	
1280 x 720	60	
1280 x 800	60	
1280 x 960	60	
1280 x 1024	60	
1400 x 1050	60	
1600 x 1200	60	
1920 x 1080	24	
1920 x 1080	25	
1920 x 1080	30	
1920 x 1080	50	
1920 x 1080	60	
1920 x 1200	50	
1920 x 1200	60	
1920 x 2160	50	2 Column mode (2 x 1 layout)
1920 x 2160	60	2 Column mode (2 x 1 layout)
2048 x 1080	24	
2048 x 1080	25	
2048 x 1080	30	
2048 x 1080	48	
2048 x 1080	50	
2048 x 1080	60	
2048 x 2160	50	2 Column mode (2 x 1 layout)
2048 x 2160	60	2 Column mode (2 x 1 layout)
2560 x 1600	50	
2560 x 1600	60	
3840 x 2160	24	

Video timing (active pixels x active lines)	Vertical refresh rate (Hz)	Available layout modes, other than standard layout (1 x 1 layout)
3840 x 2160	25	
3840 x 2160	30	
4096 x 2160	24	
4096 x 2160	25	
4096 x 2160	30	

Glossary

HD

Hazard Distance (HD) is the distance measured from the projection lens at which the intensity or the energy per surface unit becomes lower than the applicable exposure limit on the cornea or on the skin. The light beam is considered (to be) unsafe for exposure if the distance from a person to the light source is less than the HD.

HD

Hazard Distance (HD) is the distance measured from the projection lens at which the intensity or the energy per surface unit becomes lower than the applicable exposure limit on the cornea or on the skin. The light beam is considered (to be) unsafe for exposure if the distance from a person to the light source is less than the HD.

DMD

A digital micromirror device, or DMD, is an optical semiconductor that is the core of DLP projection technology.

Dew point

The dew point is the saturation temperature for water in air. The dew point is associated with relative humidity. A high relative humidity implies that the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and that the air is maximally saturated with water. When the moisture content remains constant and temperature increases, relative humidity decreases.

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 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.

DMX

DMX-512 Lighting protocol over RS-485 interface. Carries information of 512 channels from a lighting controller to lighting devices. Standardized by USITT.

RS232

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either D-SUB 9 pins or D-SUB 25 pins connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector

to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is $> +3V$, Logical '1' is $< -3V$. The range between $-3V$ and $+3V$ is the transition zone.

RS422

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

Projector address

Address installed in the projector to be individually controlled.

Broadcast address

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

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