

3D functionality Pulse Platform

User Guide

Valid for F70, F80 and F90 series projectors.

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1. 3D PRINCIPLES

1.1 3D projection

About

The projectors based on the Pulse software platform are capable of displaying 3D images and movies in both active and passive stereoscopic 3D.

The projectors default method is active stereo output.

When using passive stereo output, special equipment and setup is required.

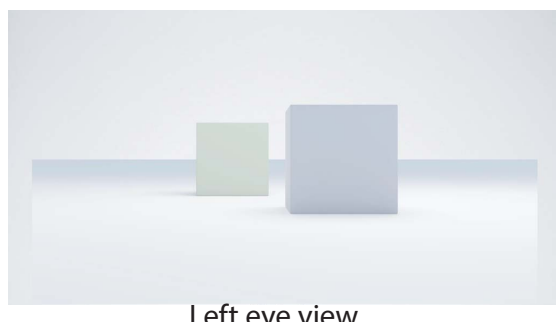
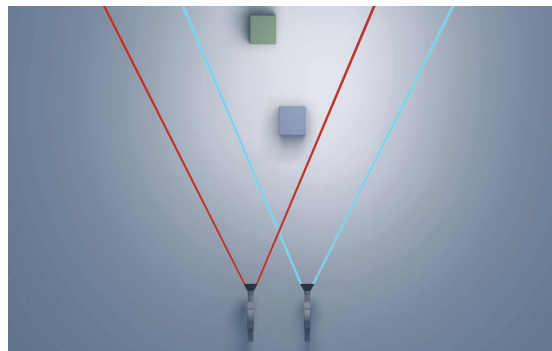
This manual concerns setup procedures, equipment and necessary knowledge which is necessary to set up the projector for 3D rendering.

In addition to the projector setup, it is also a setup procedure for the 3D source. The procedures for the 3D source equipment is not mentioned in this manual, due to the large number of this kind of equipment.

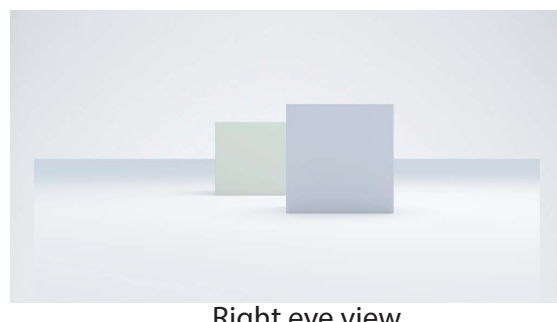
Setup of a 3D installation, is a demanding task that requires a certain level of theoretical knowledge of the techniques around 3D rendering. If setup and use of the 3D mode is not performed correctly, there is a risk of image artifacts that will disturb the experienced quality of the picture. It is therefore of great importance to setup and configure the 3D mode in a proper way

3D principle

To present 3D (stereoscopic) images on the screen, two images must be projected, superimposed onto the same screen. The two images represent the view that we normally see through each eye, and in order to reproduce a correct 3D image for the viewer, the projected images must be filtered and processed so that the perceived picture appears as 3D for the viewer. The principles used for this process is called Active Stereo output, and Passive Stereo output. These two principles are described below.



Left eye view



Right eye view

Image 1-1
The principle of 3D rendering

1.2 The difference between Active Stereo & Passive Stereo output

About

The Barco Pulse based projectors have an implemented functionality for Active 3D output, which is the standard mode for the Pulse platform.

In addition, the Pulse platform also have the possibility for rendering passive 3D. This requires a special version of the projector which can be ordered on a separate article number. This version contains extra hardware in the optics path.

What is Passive Stereo output?

Passive Stereoscopic 3D (also known as "Passive Stereo") is the traditional, standard method of creating the illusion of depth in an image, by using passive goggles.

There are several sub methods, such as:

- Different color spectrum on each channel (eye), recognized by goggles with different colored glasses.
- Polarizing method with different polarization on each channel (eye) using passive goggles with polarized lenses. The Barco passive stereo output uses the polarization method.

In order to preserve the polarization, a silver screen must be used.

On most passive displays every other row of pixels are polarized for one eye or the other. This method is also known as interlacing.

Passive output also requires external equipment in the form of a active polarization filter mounted in front of the lens. This equipment is supplied from a 3rd part vendor.

The viewer wears passive glasses which contain a pair of opposite polarizing filters. As each filter only passes light which is similarly polarized and blocks the opposite polarized light, each eye only sees one of the images, and the effect is achieved.

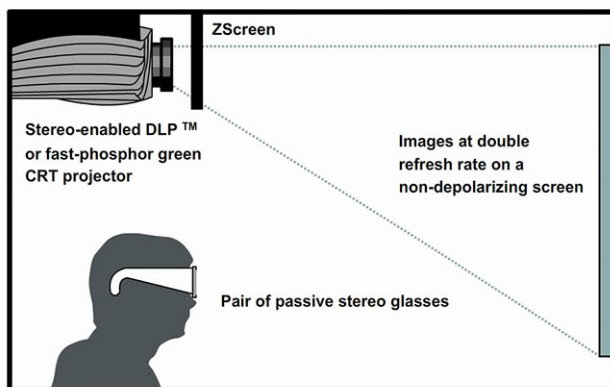


Image 1-2

What is Active Stereo output?

Field sequential 3D (also known as active 3D or Active Stereo) is a technique of displaying stereoscopic 3D images, which is the standard mode for the Pulse platform.

The principle of operation is that the image intended for the left eye is presented while blocking the right eye's view, then presenting the right-eye image while blocking the left eye, and repeating this so rapidly that the interruptions do not interfere with the perceived fusion of the two images into a single 3D image.

This system setup uses liquid crystal shutter glasses (also known as active shutter glasses). Each eye's glass contains a liquid crystal layer which has the property of becoming opaque when voltage is applied, being otherwise transparent. The glasses are controlled by a timing signal that allows the glasses to alternately block one eye, and then the other, in synchronization with the refresh rate of the screen. The timing synchronization to the video equipment may be achieved via a wired signal or via wireless communication, this by using either an infrared or radio frequency (e.g. Bluetooth, DLP link) transmitter.

There are several types of 3D glasses available from 3rd part vendors.



If a 3D emitter is used that radiates IR beams, the IR beams may interfere with the IR communication between projector and the remote control unit. If such interference occurs, connect the RCU to the projector using the remote cable. It is also advised to turn the IR receivers on the projector off to avoid the 3D emitter interference. To turn off the IR receivers, refer to the User guide for the projector concerned.

The options in the projector software allow you to fine-tune the 3D settings accordingly to the specifications of the 3D emitter.

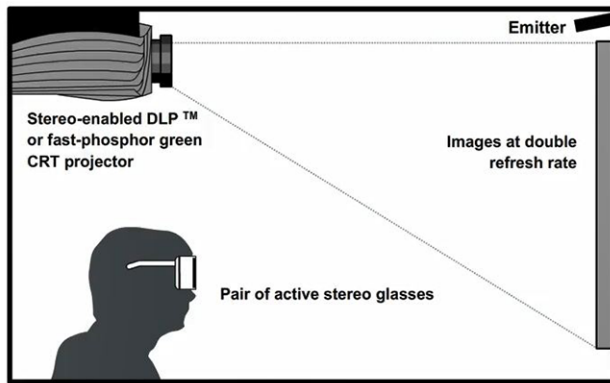


Image 1-3

2. INPUT MODES

About

There are two different 3D input modes; Active and passive. The principles and setup is explained below.

2.1 Input channel setup

About

There are two input ports that can be used and configured for 3D rendering: DVI-I and Displayport 1.2. Both ports have two input channels each, and can be used in either passive or active stereo input mode.

A simple explanation of the two modes are described below.

Since the standard output mode for the Pulse based projectors are Active stereo, the input signals always will be converted to a active output.

Active stereo input.

One channel input. (One cable). This signal combines both left and right signal in a sequence with a update frequency of 120Hz. This means that the update frequency for each channel (left and right eye) is 60 Hz. But since every other frame for each eye is blanked out by the goggles, this also means that the projected image is perceived as 60 Hz.

When DVI source is used an extra sync signal must be used.

When using a Displayport source, the sync signal is present in the signal cable, but external sync can also be used if necessary.

The signal format in active mode is sequential, ie the image for the left and right eye comes every other time. This also means that the update frequency for the rendered 3D picture is 60 Hz.

Projector source selection: Single input.

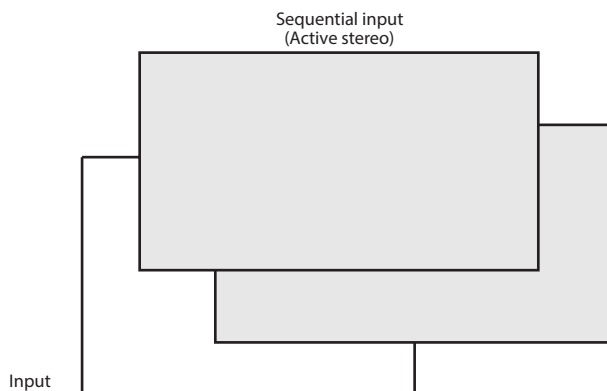


Image 2-1
Active stereo input principle.

Source setup

Refer to the manual for the specific graphic source.

Select active stereo display mode

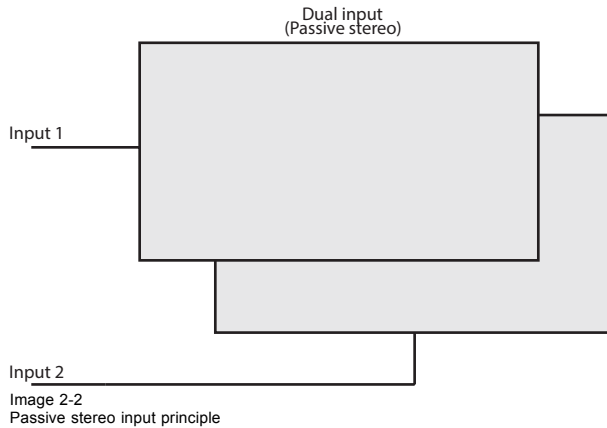
For DVI, connect the synchronization signal from the source to the BNC sync input no. 1 on the projector.

Passive stereo input.

Use two channel input (two cables), one for each eye. Update frequency limited to 60 Hz for each channel. Dual Sequential input source (DVI or Displayport) must be used. No external sync signal required in this modus.

Projector source selection: Sequential input.

2. Input Modes



Source setup

Refer to the manual for the specific graphic source.

Select passive stereo display mode

2.2 Synchronization

There are two sync inputs in use in the Pulse projector 3D mode.

- Mini-DIN connector: Output sync for the 3D glasses. 5V , 765mA nom, available in the connector. Suitable for supplying the IR emitter for the 3D goggles.
- BNC Sync port 1. Bidirectional. For sync signal from source.

2.3 3D input specification.

2.3.1 DVI-I

Specifications

Parameter	Value
Connector	DVI-I female digital RGB
Signal characteristics	DVI 1.0, Digital, TMDS
Max. cable length	25 m (24 AWG)
Max. pixel rate	330 MHz (dual link), 165 Mhz (single link)
Scan format	Progressive
Max. input data resolution	1920x1200 60Hz (Single link), 2560x1600 60Hz (Dual Link).1920x2400 @60Hz
Bit depth	8 bit
EDID	Supported
HDCP	Supported

2.3.2 Display Port 1.2

Specifications

Parameter	Value
Connector	Standard Display port
Signal characteristics	DP 1.2
Functionality	Mandatory
Max. cable length	15 m (24 AWG) - RBR; 2 m (24 AWG) – HBR1, HBR2

Parameter	Value
Supported Link Rate	RBR, HBR1, HBR2
Scan format	Progressive
Max. input data resolution	2560x1600@120Hz WQXGA / 3840x2400 @60Hz (4K) Max
Bit depth	8, 10, 12 bit
EDID	Supported

3. PROJECTOR 3D SETUP

3D setup

Setup of a 3D installation requires an advanced understanding of the 3D systems, both for the projector, and also for the signal source.

Regarding setup of the signal source, refer to the user manual for the specific unit.

In 3D setup, it is crucial that the projected images are perfectly synchronized through the whole signal path, from the signal source to the picture viewed through the 3D goggles.

See instructions in this chapter to set up the projector for this feature.

In 3D mode, the maximum resolution is WQXGA, meaning that 3D mode will not work in 4K UHD mode.

3.1 Preparing 3D setup

Preparing external connection and equipment.

1. Connect the desired source cable(s) to the projector. Meaning DVI or Displayport, single or dual.
2. Setup and connect the 3D emitter (goggle equipment) to the mini-DIN sync connector. See operators manual for the desired equipment.
Connect sync from the source to the BNC 1 sync connector input.
3. Power on the projector.
4. Select the correct source input from the Source menu.

3.2 Block diagram connections

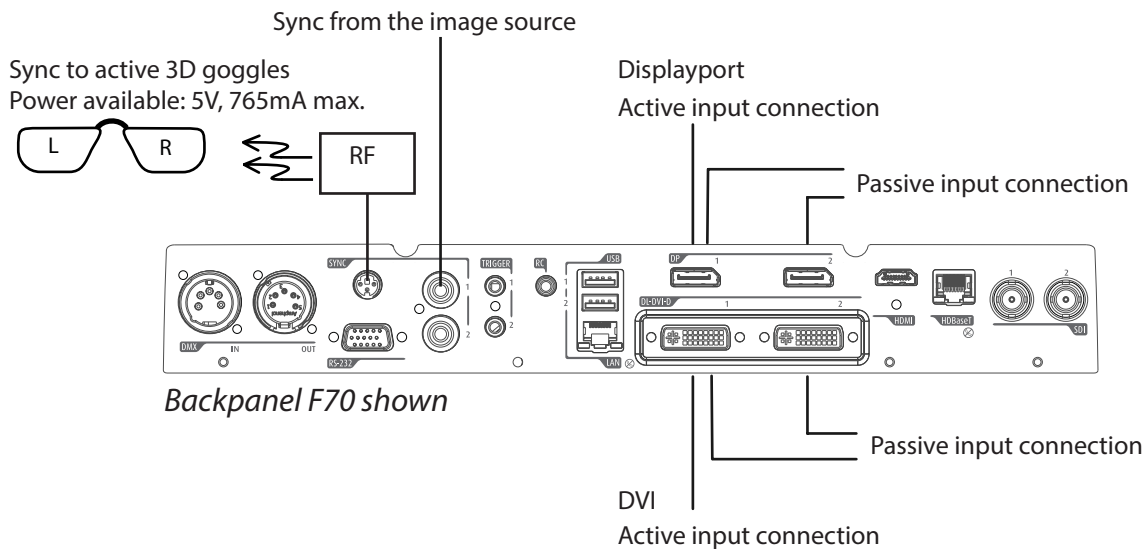


Image 3-1

3.3 Setup 3D mode.

Setup 3D mode.

1. Enter the Source menu, and select the desired input source.
 - For active stereo input, select Displayport 1 or DVI-1
 - For passive stereo input, select Dual displayport sequential, or Dual DVI sequential

3. Projector 3D setup

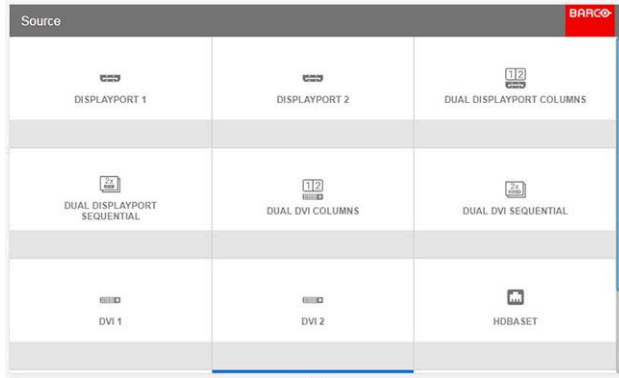


Image 3-2

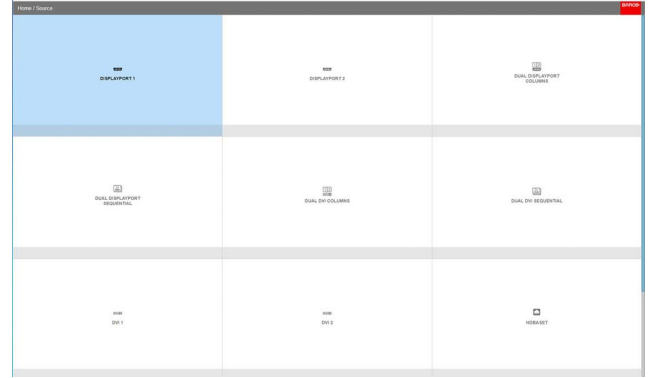


Image 3-3

2. Enter the menu *Home/Installation/Display Setup*, and select *AutoStereo* in the drop down menu. (The other choices in the drop down menu is not applicable).

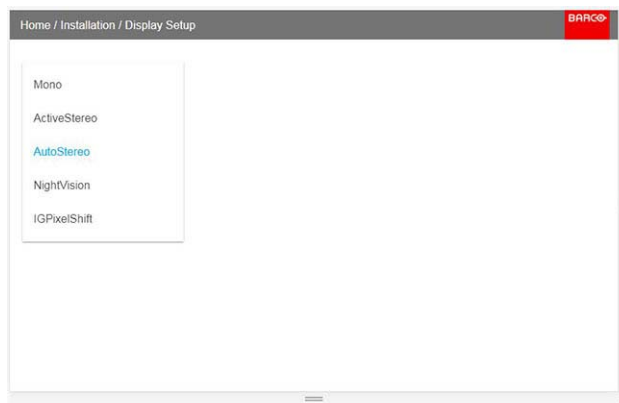


Image 3-4

3. Enter the menu *Home/Installation/3D Setup*, and set the dark time to 1600us or 1850us depending on which colorwheel is installed. (The projector detect the color wheel, and only one option is available, depending on the color wheel).

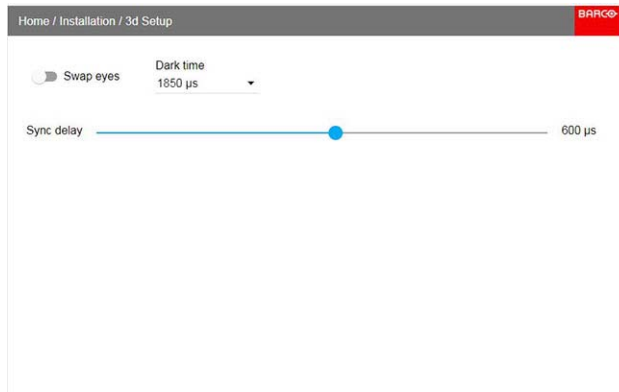


Image 3-5

4. Run a 3D image or movie from the source.
Put on the 3D goggles, and verify by looking through the goggles with one eye at the time that only one image is visible in each eye. A double picture or a shade of the picture from the other side shall not be observed. Repeat for both sides, and adjust the Sync Delay slider until a "clean" picture is visible in each eye.
If the 3D picture looks a bit "strange" through the 3D goggles, the solution is to swap eyes by enabling the Swap eyes button in the menu.