User Manual

020-000875-01

Spyder X20

CHRISTIE

User Manual

020-000875-01

Spyder X20

NOTICES

COPYRIGHT AND TRADEMARKS

GENERAL

Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie reserves the right to make changes to specifications at any time without notice. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are based on information available at the time of printing. Christie makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of fitness for a particular purpose. Christie will not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of this material. Canadian manufacturing facility is ISO 9001 and 14001 certified.

WARRANTY

Products are warranted under Christie's standard limited warranty, the complete details of which are available by contacting your Christie dealer or Christie. In addition to the other limitations that may be specified in Christie's standard limited warranty and, to the extent relevant or applicable to your product, the warranty does not cover:

a) Problems or damage occurring during shipment, in either direction.
b) Projector lamps (See Christie's separate lamp program policy).
c) Problems or damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp other than a Christie lamp supplied by Christie or an authorized distributor of Christie lamps.
d) Problems or damage caused by combination of a product with non-Christie equipment, such as distribution systems, cameras, DVD players, etc., or use of a product with any non-Christie interface device.
e) Problems or damage caused by the use of any lamp, replacement part or component purchased or obtained from an unauthorized distributor of Christie lamps, replacement parts or components including, without limitation, any distributor offering Christie lamps, replacement parts or components through the internet (confirmation of authorized distributors may be obtained from Christie).
f) Problems or damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake or other natural disaster.
g) Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.
h) Problems or damage caused by use of a product on a motion platform or other movable device where such product has not been designed, modified or approved by Christie for such use.
i) Problems or damage caused by use of a projector in the presence of an oil-based fog machine or laser-based lighting that is unrelated to the projector.
j) For LCD projectors, the warranty period specified in the warranty applies only where the LCD projector is in "normal use" which means the LCD projector is not used more than 8 hours a day, 5 days a week.
k) Except where the product is designed for outdoor use, problems or damage caused by use of the product outdoors unless such product is protected from precipitation or other adverse weather or environmental conditions and the ambient temperature is within the recommended ambient temperature set forth in the specifications for such product.
l) Image retention on LCD flat panels.
m) Defects caused by normal wear and tear or otherwise due to normal aging of a product.

The warranty does not apply to any product where the serial number has been removed or obliterated. The warranty also does not apply to any product sold by a reseller to an end user outside of the country where the reseller is located unless (i) Christie has an office in the country where the end user is located or (ii) the required international warranty fee has been paid.
The warranty does not obligate Christie to provide any on site warranty service at the product site location.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Please see the Maintenance section for specific maintenance items as they relate to your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

REGULATORY (if applicable)

The product 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 product is operated in a commercial environment. The product 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 the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.
CAN ICES-3 (A) / NMB-3 (A)

이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

ENVIRONMENTAL

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

China RoHS Compliance Information

关于中国《电子信息产品污染控制管理办法》的说明

- Environmentally Friendly Use Period
  环保使用期限

The year number in the centre of the label indicates the Environmentally Friendly Use Period, which is required to mark on the electronic information product sold in China according to the China RoHS regulations.
本标志中表示的年数是根据《电子信息产品污染控制管理办法》（2006年2月28日）以及《电子信息产品污染控制标识要求》（2006年11月6日）制定的、适用于在中华人民共和国境内销售的电子信息产品的环保使用期限。

- Material Concentration Values Table
  有毒有害物质含量表

Part Name	部件名称	Material Concentration (有毒有害物质或元素)					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr 6+)	多溴联苯 (PBB)	多溴二联苯醚 (PBDE)
Low voltage power supply	低压电源	X	O	O	O	O	O
Standby LVPS	备用低压电源	X	O	O	O	O	O
Switch	开关	X	O	O	O	O	O
Ballast	镇流器	X	O	O	O	O	O
Line filter	滤波器	X	O	O	O	O	O
Ignitor	点火器	X	O	O	O	O	O
Harness/cable	连接电线/缆	X	O	O	O	O	O
Integrated Cinema Processor	集成处理板	X	O	O	O	O	O
Projector Intelligence Board	智能板	X	O	O	O	O	O
Backplane	底板	X	O	X	O	O	O
Internal Motor Control Board	内部电机控制板	X	O	O	O	O	O
Touch Panel Controller	触摸控制屏	X	O	O	O	O	O
Blower/fan	吹风机/风扇	O	O	O	O	O	O
Sensor	传感器	O	O	O	O	O	O
Illumination optics system	照明光学系统	X	O	X	O	O	O
Projection lens	投影镜头	X	O	X	O	O	O
Mechanical enclosure*	机械附件	X	O	O	O	O	O
Lamp	灯泡	X	O	O	O	O	O
Motorized intelligent lens mount (optional)	智能电动镜头架（备选件）	X	O	O	O	O	O

Note:
O: indicates that the concentration value of the particular hazardous substance contained in all the homogeneous materials for this part, according to EIP-A, EIP-B, EIP-C, is below the stipulated levels in China SJ/T11363-2006.
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SJ/T11363-2006规定的限量要求以下。

X: indicates that the concentration value of the particular hazardous substance contained in all the homogeneous materials for this part, according to EIP-A, EIP-B, EIP-C, may be above the stipulated levels in China SJ/T11363-2006.
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可能超出SJ/T11363-2006规定的限量要求。

* This part uses metallic alloys, which may contain Lead.
- 因该部件使用金属合金材料，故可能含有铅。

Addendum

Translated copies of this document are provided on the CD in the back of this document. The CD may also contain additional product documentation. Read all instructions before using or servicing this product.

本文档的翻译副本在本文档背面的 CD 上提供。该 CD 中还可能包含其他产品文档。使用或维修本产品之前请务必阅读所有说明。

文件背面的光碟提供了本文件的翻譯副本。這張光碟可能另外包含其他產品文件。請先閱讀所有指示再使用或送修本產品。

Le CD au dos de ce document contient des traductions de celui-ci dans différentes langues. Ce CD peut également contenir de la documentation supplémentaire sur le produit. Lisez toutes les instructions avant d'utiliser ou d'entretenir ce produit.

Übersetzte Versionen dieses Dokuments werden auf der CD auf dem Vorsatzblatt dieses Dokuments bereitgestellt. Die CD kann auch zusätzliche Produktdokumentation enthalten. Bitte lesen Sie diese Anweisungen vor der Verwendung dieses Produkts oder vor der Ausführung von Wartungsarbeiten am Produkt.

Le copie tradotte di questo documento sono fornite sul CD, sul retro di questo documento. Il CD potrebbe anche contenere altra documentazione sul prodotto. Si prega di leggere tutte le istruzioni prima di utilizzare questo prodotto o sottoporlo a manutenzione.

このドキュメントの翻訳版がこのドキュメントの裏面のCDで提供されています。CDには追加の製品マニュアルも収められています。この製品を使用したり、機能させたりする前に、すべての指示をお読みください。

이 문서의 번역된 사본이 이 문서 후면의 CD에서 제공됩니다. 이 CD에는 추가 제품 설명서가 포함되어 있을 수 있습니다. 이 제품을 사용하거나 수리하기 전에 모든 지침을 확인하십시오.

Copias traduzidas deste documento são fornecida no CD contido na parte de trás deste documento. O CD pode conter documentação adicional do produto. Leia todas as instruções antes de usar ou prestar serviço com este produto.

Перевод данного документа представлен на компакт-диске на оборотной стороне документа. Компакт-диск может также содержать дополнительную документацию по продукту. Перед использованием или обслуживанием продукта ознакомьтесь со всеми инструкциями.

Las copias traducidas de este documento se proporcionan en el CD que se encuentra en la parte trasera. En el CD también puede encontrar documentación adicional del producto. Lea todas las instrucciones antes de utilizar o realizar el mantenimiento de este producto.

Перекладені екземпляри цього документа містяться на компакт-диску, який додано до цього документа. На компакт-диску може також бути додаткова документація до виробу. Перш ніж користуватися виробом або його обслуговувати, прочитайте всі інструкції.

Content

Introduction

This document describes the physical and logical workings of the Spyder X20 video processor when used in conjunction with the SSO license option to create a stereoscopic display.

Understanding Stereoscopic Modes

The sections below provide an introduction to the various stereoscopic modes available for use with Spyder. Each of these modes will be discussed in detail throughout this document.

Active Stereo

Overview

An active stereo video signal consists of a single video connection which interleaves a left-eye and right-eye signal on alternating video frames, and uses a separate sync signal which is used to identify the left and right eye frames. On graphics cards, the sync signal is typically provided by a 3-pin mini-DIN connector (shown in figure 1 below).

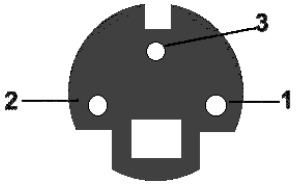


Figure 1: VESA miniDIN-3 connector

Pin	Function
1	+5V DC (secured with 750mA)
2	Ground
3	Stereo Sync

Table 1: miniDIN-3 Pin Description

Since both the left and right eye video frames are interleaved within a single video connection, two frames are required (a left eye and a right eye frame) to present one full frame of active stereo video. Because of this frame pairing, the effective frame rate for the video signal is half the original signal's refresh rate. To regain a full video frame rate, the refresh rate of the signal is doubled, turning a 60Hz signal into a 120Hz signal for example.

Active Stereo Related Signals and Resulting Image

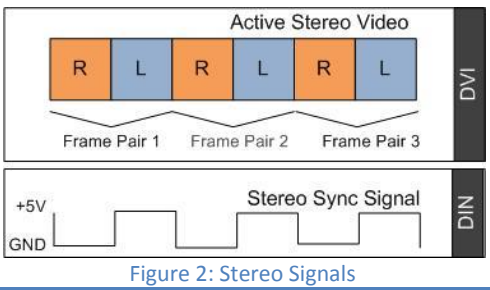


Figure 2: Stereo Signals

Figure 3: Resulting Display

Passive Stereo

Overview

A passive stereo source generates two physical video connections, one displaying a left-eye signal and the other displaying the corresponding right-eye signal. The sync timings of the two signals are locked together, which ensures that the current left and right eye frames match each other when displayed. Figure 4 (below) depicts the two separate DVI connections of a passive source, and the resulting image when displayed in a stereoscopic display.

Passive Stereo Related Signals and Resulting Image

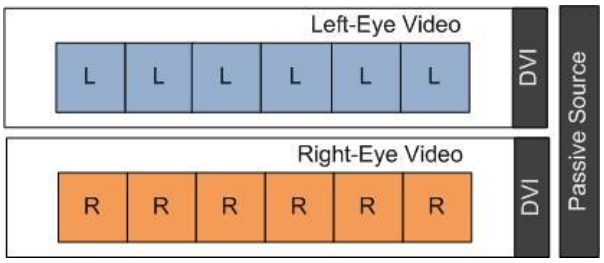


Figure 4: Passive Source

Figure 5: Resulting Display

Since two separate physical connections are used to provide the left and right eye image content, each of the connections can run at a standard video frame rate such as 50Hz (PAL) or 60Hz (NTSC).

Mirage HD Stereo

Overview

The Mirage HD stereo mode (Spyder SSO2) utilizes the frame doubling capability of the Christie Mirage HD projector to alleviate bandwidth requirements involved with traditional active stereoscopic systems. Source content and video processing equipment (including the Spyder X20) run active stereoscopic content at normal video refresh rates, and the projector internally uses frame doubling to prevent any flicker from being visible to the user.

Note: Certain areas of the Vista Advanced software may refer to Mirage HD stereo as ‘interleaved’. Interleaved stereo is an operational mode specific to Spyder 200/300 series, and does not apply to X20. Interleaved / Half-frame rate stereo modes are configured as active when using X20.

How does the Spyder X20 Stereo Option Work?

Overview

Any Spyder windowing processor can be used to manage and create stereoscopic imagery once equipped with the required stereoscopic license. This section describes stereoscopic imagery as it pertains to the Spyder system.

Spyder Internals

The Spyder X20 windowing processor contains an internal video canvas, on which background images and video inputs are composited before being split into individual outputs which are sent to display devices. When working with active or passive stereo solutions, a second video canvas within the system is utilized. One canvas contains all left-eye video content, and the other contains right-eye content.

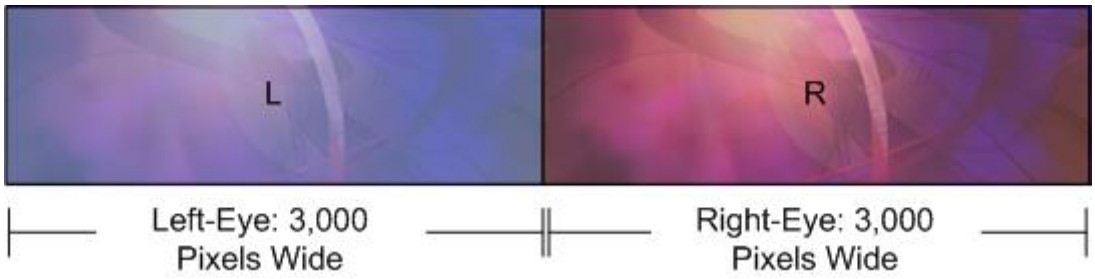


Figure 6: Two separate areas internally for left and right eyes

Figure 6 (above) depicts a configuration containing a single PixelSpace spanning 3,000 horizontal pixels. To create a stereoscopic image the Spyder system internally utilizes two separate VI sections, each with a maximum capacity of 20 million pixels, for left / primary and right / alternate eye content.

Whether the VI is running in 2D or a stereoscopic mode, the maximum VI size remains at 20 million pixels. This effectively means that a stereo configuration may internally be processed at up to 40 million pixels (20 million for the left eye and 20 million for the right eye). In scenarios where there are not enough pixels available to achieve a desired configuration, the stereoscopic modes can be used in conjunction with a parallel widescreen or parallel discreet configuration. Both parallel modes allow multiple X20 frames to be combined in order to increase available pixels in a large configuration. Parallel configurations are outside the scope of this document; contact Christie support for additional information.

Active and passive stereo input content is split left-eye / right-eye pixel areas within X20. Because the internal display contains format independent, separated areas for left / right eye content, any number of active and passive stereoscopic inputs can be passed into the Spyder system simultaneously.

In scenarios where non-stereo (2D) content is applied to a stereo PixelSpace, the 2D image is automatically copied into both the left and right eye areas. This allows 2D and 3D content to be easily used with X20 simultaneously.

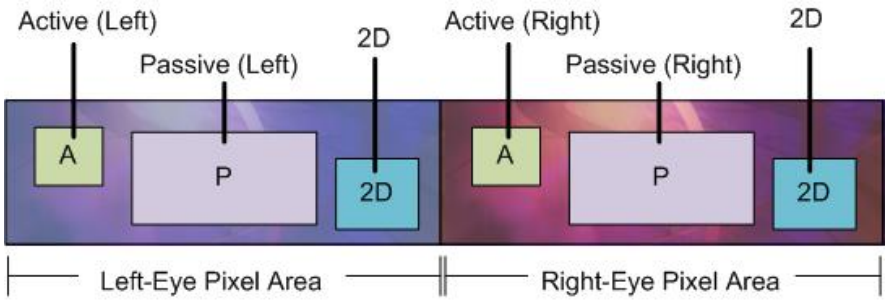


Figure 7: Multiple Stereo and Non-Stereo Sources

Figure 7 displays an example combination of active, passive, and 2D inputs applied to the VI simultaneously.

Active Stereo Inputs

Spyder X20 Supported Input Resolutions and Formats

The tables below show the maximum resolutions supported at common stereoscopic frame rates. Note that all active stereoscopic connections, both digital and analog, must be made via the DVI-I input connectors.

Active Stereo DVI Inputs (Max Pixel Clock = 317Mhz)	
Active Stereo Frame Rate	Maximum Supported Resolution
120Hz	1920 x 1200, 1920 x 1080, 2048 x 1080, 1600 x 1200
100Hz	2048 x 1200
96Hz	2048 x 1200
Note: Max resolution cannot be greater than 2048 horizontal and 1200 vertical regardless of refresh rate.	

Active Stereo Analog Inputs (Max Pixel Clock = 165Mhz)	
Active Stereo Frame Rate	Maximum Supported Resolution
100Hz	1280 x 1024
96Hz	1400 x 1050
60Hz	2048 x 1080

Connecting an Active Stereo Source into Spyder X20

An active stereo source must be provided to Spyder using one of the DVI (even) connectors. Additionally, the stereo sync signal provided by the stereo graphics source must also be routed to the 3-pin connection located above the DVI connector.

Both the video and the stereo sync signal can be connected to an upstream router and managed by the Spyder X20 software. When using upstream routers, the sync signal is commonly passed through the V-Sync channel of an analog routing switcher.

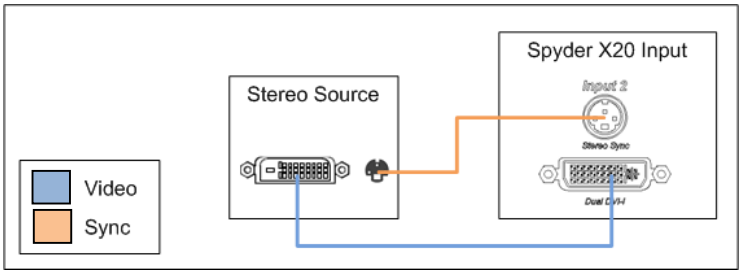


Figure 8: Splitting Active Stereo Connections to Spyder Inputs

Dual link inputs require two input channels and all stereoscopic sources will use two layers.

For an example a 1920 x 1080 @ 120Hz active stereo input (285MHz) on input channel 2 will use input channels 1 and 2. While the source is displayed it will use any two adjacent layers.

Passive Stereo Inputs

Spyder X20 Supported Input Resolutions and Formats

The maximum input resolution of passive inputs is 2048x1200 @ 60Hz. The video signal can be DVI, analog, or HDSDI provided the resolution required is valid for the desired connector type.

Connecting a Passive Stereo Source into Spyder X20

A passive stereo source must be provided to Spyder using two separate input modules. Although not required, the right-eye signal is typically provided to the DVI input adjacent to the input used for the left-eye signal.

Passive stereo connections can be connected directly to the Spyder X20 system, or can be connected and managed through an upstream routing switcher.

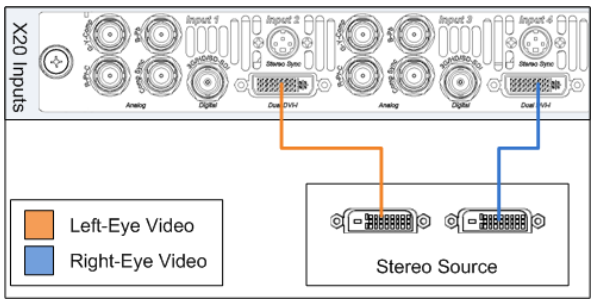


Figure 9: Connecting Passive Stereo to X20 Inputs

Active Stereo Outputs

Spyder Supported Output Resolutions and Formats

The maximum resolution of Spyder active stereo output limits depend on the connection type and the specific output channel being used. Odd output connectors (1, 3, 5…) support dual-link bandwidth, while the even output connectors (2, 4, 6…) support only single-link bandwidth. DVI and analog connection types can be used as outputs to displays, and the table below describes the maximum rates for the various connection options.

	Odd Connectors		Even Connectors	
	Analog	Digital	Analog	Digital
Max Pixel Clock	165Mhz	317Mhz	165Mhz	165Mhz
120Hz	N/A	1920 x 1200 2048 x 1080	N/A	N/A
100Hz	1280x1024	2048 x 1200	1280 x 1024	1280 x 1024
96Hz	1400x1050	2048 x 1200	1400 x 050	1400 x 1050
60Hz	1920x1200 2048x1080	2048 x 1200	1920 x 1200 2048 x 1080	1920 x 1200 2048 x 1080

Table 2: Maximum Supported Output Resolutions

N***otes: Output rotation is not currently supported in active stereo except for interleaved (SSO2) up to 1920 x 1200 @ 60Hz.***

Connecting Spyder to an Active Stereo Display

The Spyder X20 output board shares a single 3-Pin din connector for all outputs on the board. When using multiple active stereo displays, this signal must be split downstream of the X20 frame.

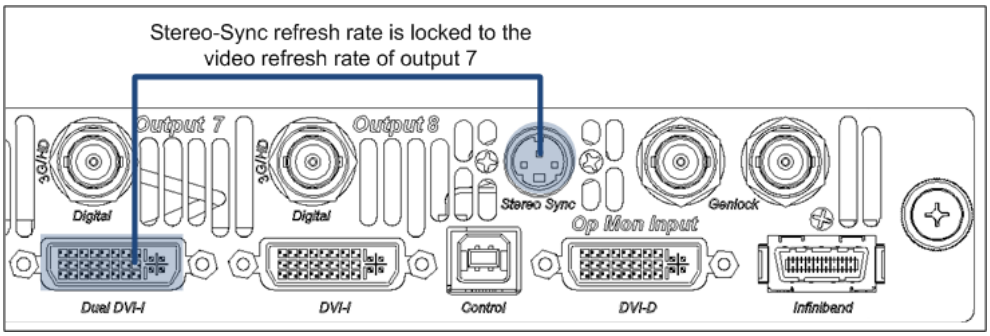


Figure 10: Stereo Sync Rate Locked to Output 7

The refresh rate of the stereo sync signal is locked to the video refresh rate of the seventh (7th) output channel on the output board. In systems containing multiple output boards, the seventh output on each board controls the interval of the refresh signal.

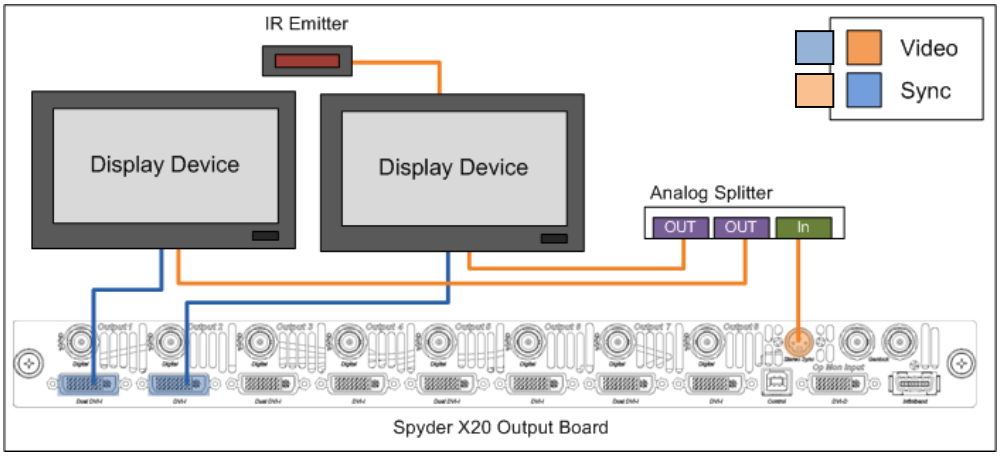


Figure 11: Connecting Active Stereo Outputs

Figure 11 depicts two active stereoscopic displays correctly patched to an output board of an X20 system. Note that the same stereo sync signal for the system is being split and sent to both of the displays. Also note that the Infrared emitter is being from the display device and not the X20 sync signal. This configuration allows the stereoscopic display to offset the timing of the sync signal to compensate for any delay added by the display. The configuration shown above assumes that output 7 is running at the same refresh rate as outputs 1 and 2, to ensure the timing of the sync signal matches the rate of the stereo outputs.

Passive Stereo Outputs

Spyder Supported Output Resolutions and Formats

The maximum resolution of passive outputs is 2048x1200 @ 60Hz. Any connector can be used for passive outputs, provided the video format selected is valid for the desired connector type.

Connecting Spyder to a Passive Stereo Display

Two outputs are required to display a passive video output. When using universal output modules, as shown in figure 12 below, two separate output modules must be used to provide the individual left and right eye video feeds.

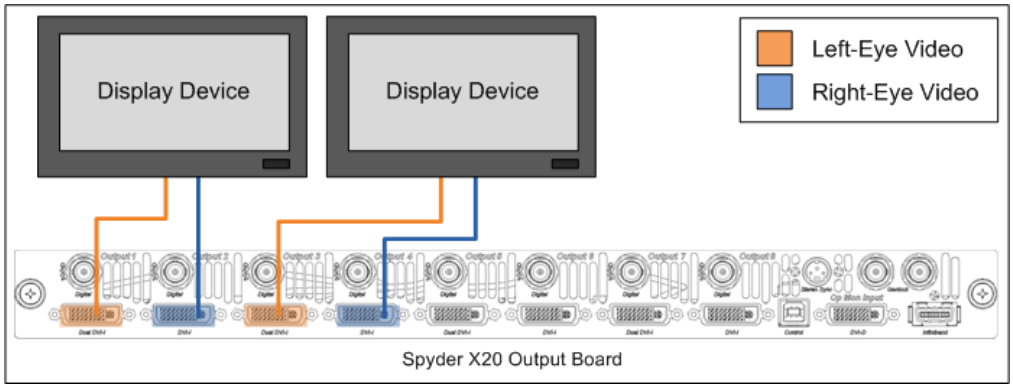


Figure 12: Connecting Spyder Universal Output to Display Device

Licensing

The Spyder X20 stereoscopic option is available with any new or existing Spyder X20 system, and is applied in the form of a license file provided by Christie. Spyder systems not containing a valid stereo license file will not perform any of the stereoscopic specific functions listed in this guide.

The stereoscopic option (SSO) is purchased separately from the Spyder system. For information on SSO license pricing information, contact support , visit:
http://www.christiedigital.com/en-us/product-support/support-offices/Pages/default.aspx

Creating and Editing Spyder Stereoscopic Configurations

This section describes the process of configuring the X20 windowing system to generate a stereoscopic image. As stereo configuration and operation procedures within Spyder are nearly the same as non-stereo configurations, this section will focus on specific differences related to stereoscopic modes of operation.

Building a new Configuration

The process of building a stereoscopic configuration in Spyder is almost identical to the process of building non-stereo configurations, with a single important exception. The frame rate selector on the new configuration GUI contains a 'mode' dropdown which designates whether the new configuration is to be generated for a normal (2D) or a stereoscopic display. The Active, Passive, and MirageHD stereo modes specify the output configuration of the system; the inputs for the system (active and/or passive) are defined after the initial configuration.

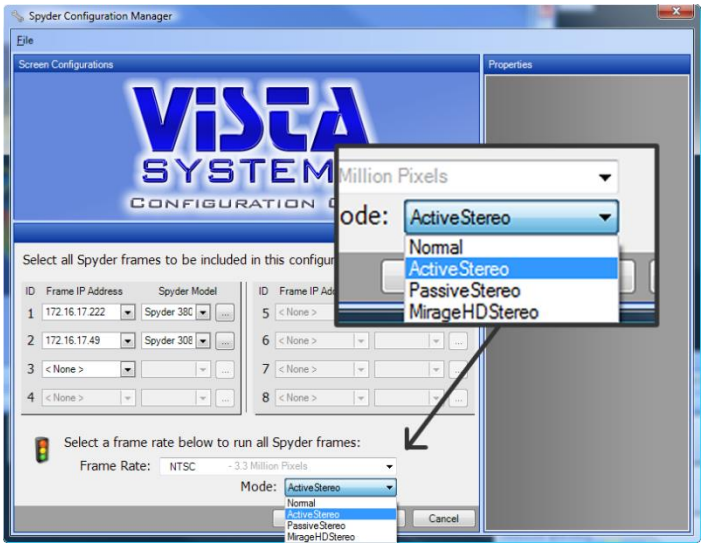


Figure 13: New Configuration Mode Selection

Figure 14 shows the mode selector in the new configuration GUI which is used as part of the definition of a new stereoscopic configuration. Note that stereo modes are global, meaning that it is not possible to create both stereo and non-stereo PixelSpaces in a single system using the new configuration GUI.

When running active stereoscopic outputs, the frame rate selection should be set to half the output frame rate. When running passive or Mirage HD stereo modes, the VI rate should match the rate of the outputs. A Spyder frame running 120Hz active stereo outputs, for example, must be configured with an internal frame rate of NTSC (59.94Hz). As another example, frames running passive outputs at 50Hz must be configured with an internal

frame rate of PAL (50Hz) to match the output rate. Attempting to select a different frame rate for the internal VI may cause erratic operation of both the inputs and outputs of the system.

The frame rate of stereoscopic outputs will be automatically adjusted by the system depending on the VI frame rate selected (as described above), regardless of the frame rate selected by the user when defining PixelSpaces. When building an active stereo configuration at 50Hz, for example, the output frame rate(s) will be adjusted to 100Hz regardless of user selection.

A step-by-step set of instructions for creating new configurations are described in the standard Christie Advanced software guide. Please consult this guide for additional information on creating new configurations.

Defining Input Sources

Stereo and non-stereo sources are defined after initial system configuration. The new source property panel allows for default options when creating the source definition. This property panel is accessible from the Vista Advanced software application by clicking an unused register in the source list. Figure 15 shows the new source property panel.

Notice the 'Stereo Options' section of the panel. When set to 'Off' (default), the new source being created will not be defined as a 2D / non-stereo input. The selections available for the stereo options within the new source panel change depending on the mode selected. The table below shows and explains the options available for each selectable stereo mode.

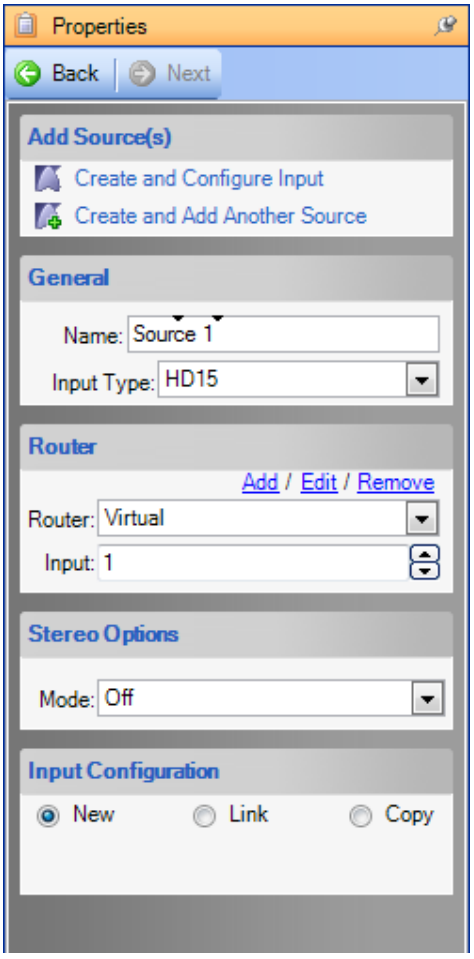
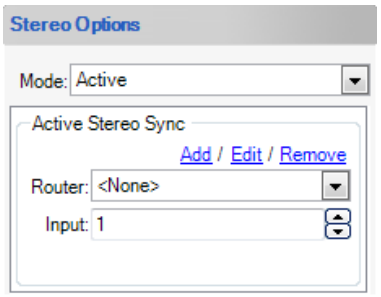
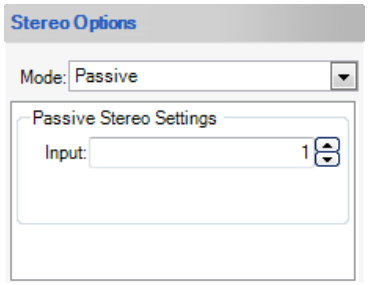
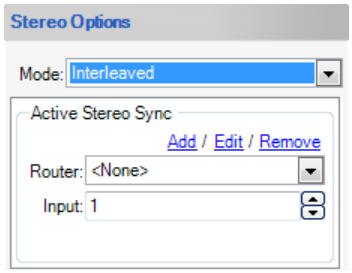


Figure 14: New Source Panel

Options for Creating New Stereoscopic Sources	
	**Active Stereo Input** When defining an active stereo source, a router and associated input can be defined for the stereo sync signal, which can be routed separately from the video signal.
	**Passive Stereo Input** When a passive stereo source is created and is connected to a routing switcher connected to Spyder, a passive stereo option allows a second router input to be defined which specifies the input of the alternate eye video signal.
	**Interleaved Stereo Input** The 'Interleaved' stereo input option is used Spyder 200/300 series hardware only, and is not valid when using the Spyder X20.

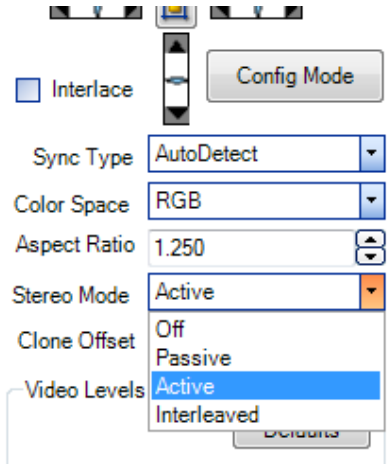
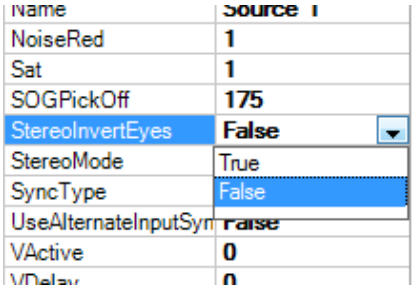
After selecting the desired options in the new source property panel, click either the 'Create and Configure Input' or the 'Create and Add Another Source' link at the top of the panel. Each of the two options will use the specified options to create a new source definition, however the first option will display the source in a configuration monitor (if present). Note that the configuration monitor does not support stereoscopic output, and only a 2D representation of the source can be displayed on a monitor in this mode.

Note: Auto-syncing after stereo mode is selected will revert back to ***Off***.

Editing input configurations

After a source is created as described above, all properties of the source and the associated input configuration can be edited within the layer property panel. To display the layer property panel, simply click an onscreen layer.

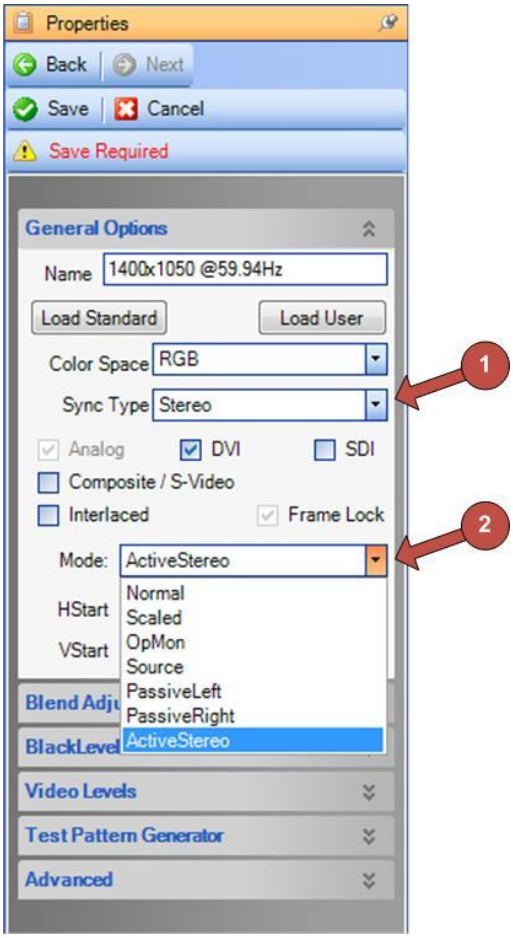
The table below shows the input configuration section of the layer property panel. To conserve space, the image displayed has been cropped to display only the section with relevance to stereo options.

Stereoscopic specific options for input modules	
	**Input Configuration Layer Properties** **Stereo Mode** • Defines the stereo mode for the selected input. **Clone Offset** • This option is specific to the previous generation of Spyder hardware, and has no effect when using the Spyder X20 platform.
	**Input Configuration Advanced Properties** **StereoInvertEyes** • This option, available only in the advanced section of the layer properties panel, causes the system to invert the left and right eye signals on the VI.

Editing output configurations

Stereo properties of output configurations can be edited in the same manner as the normal output properties after the initial system configuration is performed. To access output properties, click the desired output in the 'System Patch' tab of the Vista Advanced or Vista Basic user interface.

The tables below show the available options for manipulating stereoscopic outputs using the output property panels.

Stereoscopic specific modes for standard output modules	
 Figure 15: Standard Output Properties	**Standard Output Property Panel Options** 1. **Output Sync Type** • ***NOTE: The 'Stereo' option is available in this dropdown, which is used with the previous generation of Spyder hardware. This sync-type option is not valid when connected to a Spyder X20 system.*** 2. **Mode** • The 'ActiveStereo' setting causes the output to interleave frames between the left-eye and right-eye areas of the VI to create an active stereo signal. • 'Passive Left' and 'Passive Right' force the output to display either the left or right eye content of the VI. Note that 'Passive Left' is equivalent to the 'Normal' mode, and is provided as a separate option for clarity only. • With Interleaved (SSO2) output mode is set to 'ActiveStereo' but refresh rate must be set to 59.94Hz in the Advanced Menu. Output 7 must also be set to 59.94Hz.

Corporate offices

USA – Cypress
ph: 714-236-8610

Canada – Kitchener
ph: 519-744-8005

Consultant offices

Italy
ph: +39 (0) 2 9902 1161

Worldwide offices

Australia
ph: +61 (0) 7 3624 4888

Brazil
ph: +55 (11) 2548 4753

China (Beijing)
ph: +86 10 6561 0240

China (Shanghai)
ph: +86 21 6278 7708

Eastern Europe and
Russian Federation
ph: +36 (0) 1 47 48 100

France
ph: +33 (0) 1 41 21 44 04

Germany
ph: +49 2161 664540

India
ph: +91 (080) 6708 9999

Japan (Tokyo)
ph: 81 3 3599 7481

Korea (Seoul)
ph: +82 2 702 1601

Republic of South Africa
ph: +27 (0)11 510 0094

Singapore
ph: +65 6877-8737

Spain
ph: +34 91 633 9990

United Arab Emirates
ph: +971 4 3206688

United Kingdom
ph: +44 (0) 118 977 8000