

**VISTA**  
SYSTEMS

*SPYDER*<sup>TM</sup>

OPERATION MANUAL

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## REVISION HISTORY

DATE	VERSION	CHANGE DESCRIPTION
07-07-2009	1.35	ADDED SPYDER X20 INFORMATION
07-15-2009	1.36	SMALL SPELLING AND GRAMMATICAL CHANGES
07-21-2009	1.37	UPDATED FCC COMPLIANCE STATEMENT
07-30-2009	1.38	ADDED LSP (LAYER SIZE & POSITION) EXTERNAL COMMAND

## Section 1: Important Safety Instructions



This symbol indicates the presence of “dangerous voltage” within the product enclosure that may be significant enough to cause a risk of electrical shock.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water. Do not place objects containing water on top of or near the unit.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding – type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

## Cautions and Safety Notices

### FCC Notice - For Commercial Use Only

This device complies with part 15 of the FCC rules. Operation is subject to the following 2 conditions: (1) This device may not cause harmful interference (2) This device must accept any interference received, including any interference that may cause undesired operation. This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### Battery Warning

The battery in Spyder is not intended to be replaced by the user. Failure to follow these instructions will void the warranty of the unit.

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type of battery.

### Service Warning

All servicing instructions are for use by qualified service personnel only. There are no procedures, exchange, or parts that are inside the unit that are intended to be performed by the user. Any procedure performed inside the unit is intended to be performed by qualified service personnel only.

To reduce the risk of electrical shock, the service technician shall remove the cord from the wall receptacle and the rear of the unit before attempting to service the unit.

Failure to follow these instructions may void the warranty.

### Class I Construction Warning

An apparatus with **Class I** construction shall be connected to a **MAINS** socket outlet with a protective earthing connection.

## Operating in 110V or 220V

Spyder™ ships in the setting predetermined by where it is shipping to be ready for operation out of the box. It comes with a sticker over the AC inlet noting if it is set for 110V or 220V. If operating with a voltage other than what it is set for, a few changes need to be made.

### To change from 110V to 220V:

1. Pull the fuse holder (See figure 1.1.2) from the AC inlet (See figure 1.1.3).
2. Pull the jumper and current fuse from the fuse holder.
3. Add fuses included with shipping kit (2-3A fuses for 3RU or 2-2A fuses for 2RU). One on each side of the fuse holder.
4. Insert fuse holder back into the AC inlet and power up. You are now set for 220V.

### To change from 220V to 110V:

1. Pull the fuse holder (See figure 1.1.2) from the AC inlet (See figure 1.1.3).
2. Pull both fuses from the fuse holder
3. Add jumper (See figure 1.1.1) on one side of fuse holder and fuse on the other side that is included with shipping kit (1-5A fuse for 3RU or 1-3A fuse for 2RU).
4. Insert fuse holder back into the AC inlet and power up. You are now set for 110V.

Figure 1.1.1

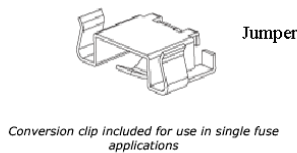


Figure 1.1.2

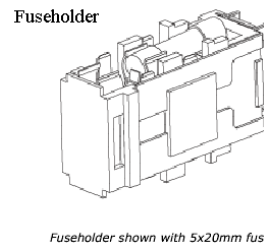
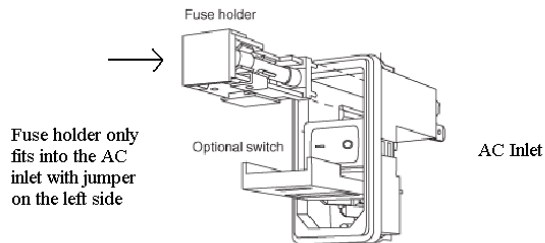


Figure 1.1.3



## Section 2: Spyder Hardware Family

Spyder™ is a compact versatile video processing product with superb capabilities to blend, window and scale a very wide array of video signals with unparalleled quality and ease.

The compact modular design allows Spyder to be used to display a virtually endless variety of windows through a single output, or stretch a single input across multiple displays to create a seamless widescreen image, and do just about anything in-between.

Spyder consists of 2 model families, the 200 and 300 series, each family has multiple configurations available to meet the most demanding environment and all models have expansion ability (optional) to provide more inputs/windows or more output/displays or both.

Spyder control can be accomplished multiple ways depending on application:

- Spyder control suite PC based software applications
- Hardware based Vista controllers
- 3<sup>rd</sup> party control systems such as Crestron or AMX

This manual is designed to give an overview of Spyder features, functionality and operation. The detailed operation of will be found in the respective manuals for each individual control platform.

Section 3: Model Descriptions

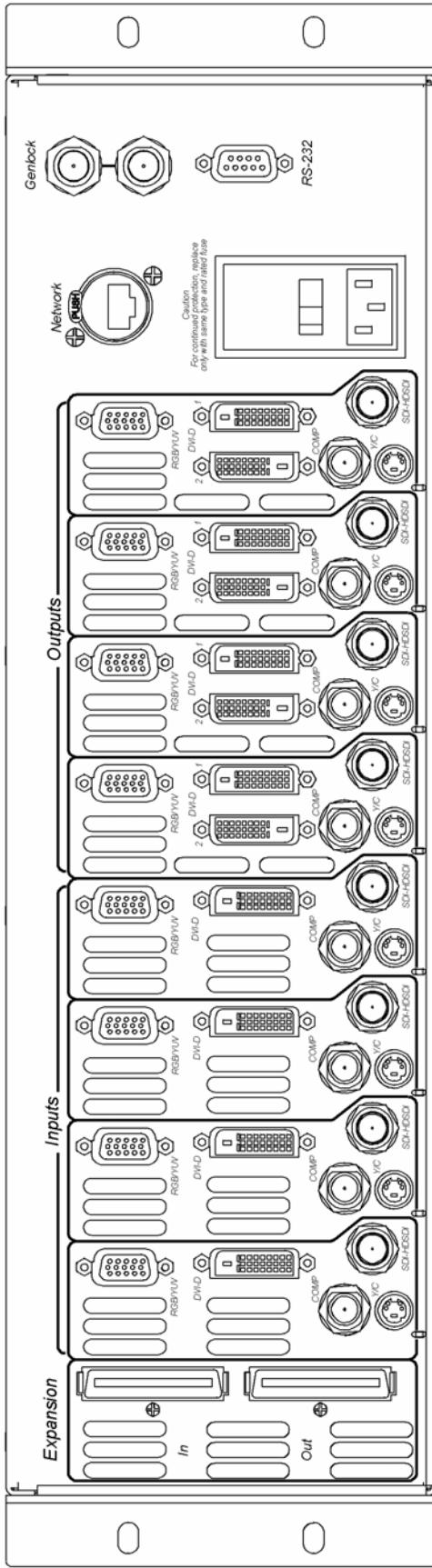


Figure 3 a Spyder 300 Series (Model 344 shown)

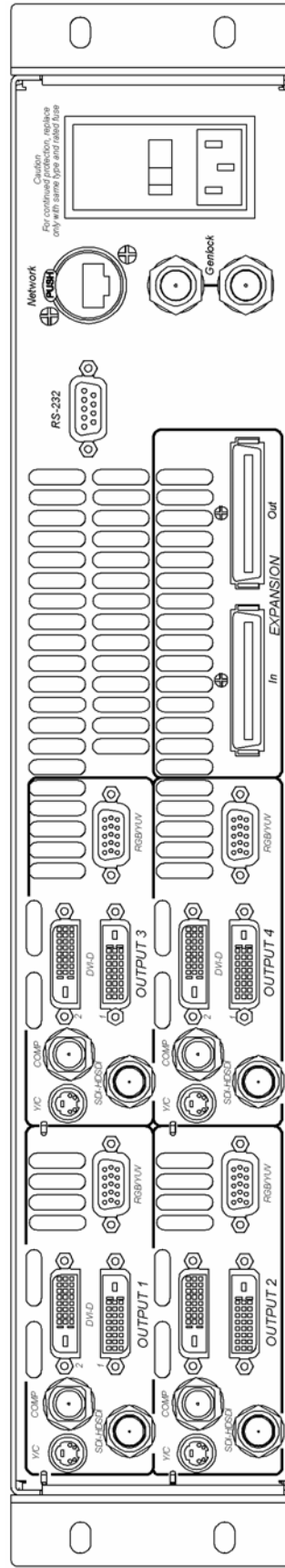


Figure 3 b Spyder 200 Series (Model 204 shown)

## Spyder Models and Options

### Spyder 200 Series

The 200 series is a 2 RU unit that utilizes 4 I/O modules.

A sample of valid configurations is listed below.

Model Number	No. of Inputs	No. of Outputs
240*	4	0
204*	0	4
222	2	2
213	1	3
231	3	1

### Spyder 300 Series

The 300 series is a 3RU unit that utilizes 8 I/O modules.

A sample of valid configurations is listed below.

Model Number	No. of Inputs	No. of Outputs
380*	8	0
308*	0	8
344	4	4
353	5	3
362	6	2

\*These models available only with control expansion option. Fixed control versions not available.

## Inputs

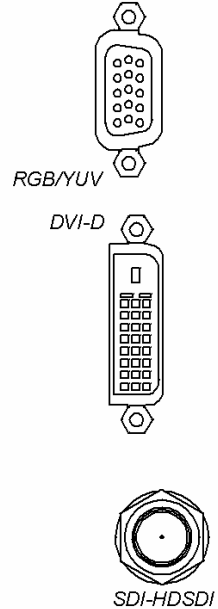
Below are listed the standard video formats accepted by Spyder

- 24p, NTSC, PAL, and SECAM
- Analog RGB (SOG, Composite or Separate Sync)
- Analog YUV
- SDI
- HD-SDI
- DVI-Single Link
  - DVI-Dual Link

Each input module has a single input connector for the supported signal types:

- ANALOG
- SDI/ HD-SDI
- DVI
- Composite and S-Video (Comp/ S-Vid Optional)

Each input is universal: an input can be dynamically assigned and used as a mixer, a mixer, or a key. These settings are also accomplished from the chosen control type.



## Outputs

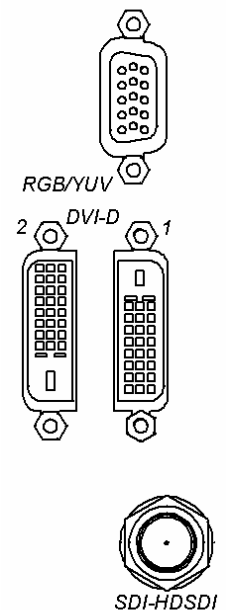
Each Output Module has various video connectors on the rear. Conditions exist when multiple output types can be utilized.

Below are listed the standard video formats accepted by Spyder

- 24p, NTSC, PAL, and SECAM
- Analog RGB (SOG, Composite or Separate Sync)
- Analog YUV
- SDI
- HD-SDI
- (2) DVI-Single Link
- (2) DVI-Dual Link
  - DVI Twin Link

Each output module has a single connector for the supported signal types:

- ANALOG
- SDI/HD-SDI



- DVI
- DVI –Dual
- Composite and S-Video (Comp/S-Vid Optional)

Multiple output connector types can be used simultaneously, provided that the video format is valid for the specific video connections. Below are a few examples.

- *DVI & Analog*: When an output is configured for Non-Interlaced Computer Signals
- *SDI & Analog*: When configured for 480i/575i
- *HD-SDI & Analog*: When configured for 1080i

### Options

Spyder options listed below are available on either 200 or 300 Series products.

Existing units can be retrofitted once shipped but must be returned to the factory for any of these procedures.

### **200X/300X Expansion Option**

Allows multiple units to be connected together to expand Inputs, Outputs or both. (See Figure 3.3.1 b on following page)



**InfiniBand Cable (Vista P/N CAB-60670)**

This cable allows multiple Spyder units to be connected to the Expansion Ports. This option is only applicable with the 200X or 300X Option.

### **200C/300C (Composite/S-Video Option)**

When selected this option will provide Composite (BNC) and S-Video (SVHS) connections on each Input and each Output of the Spyder unit.

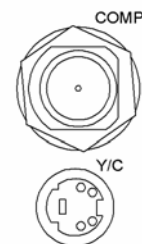
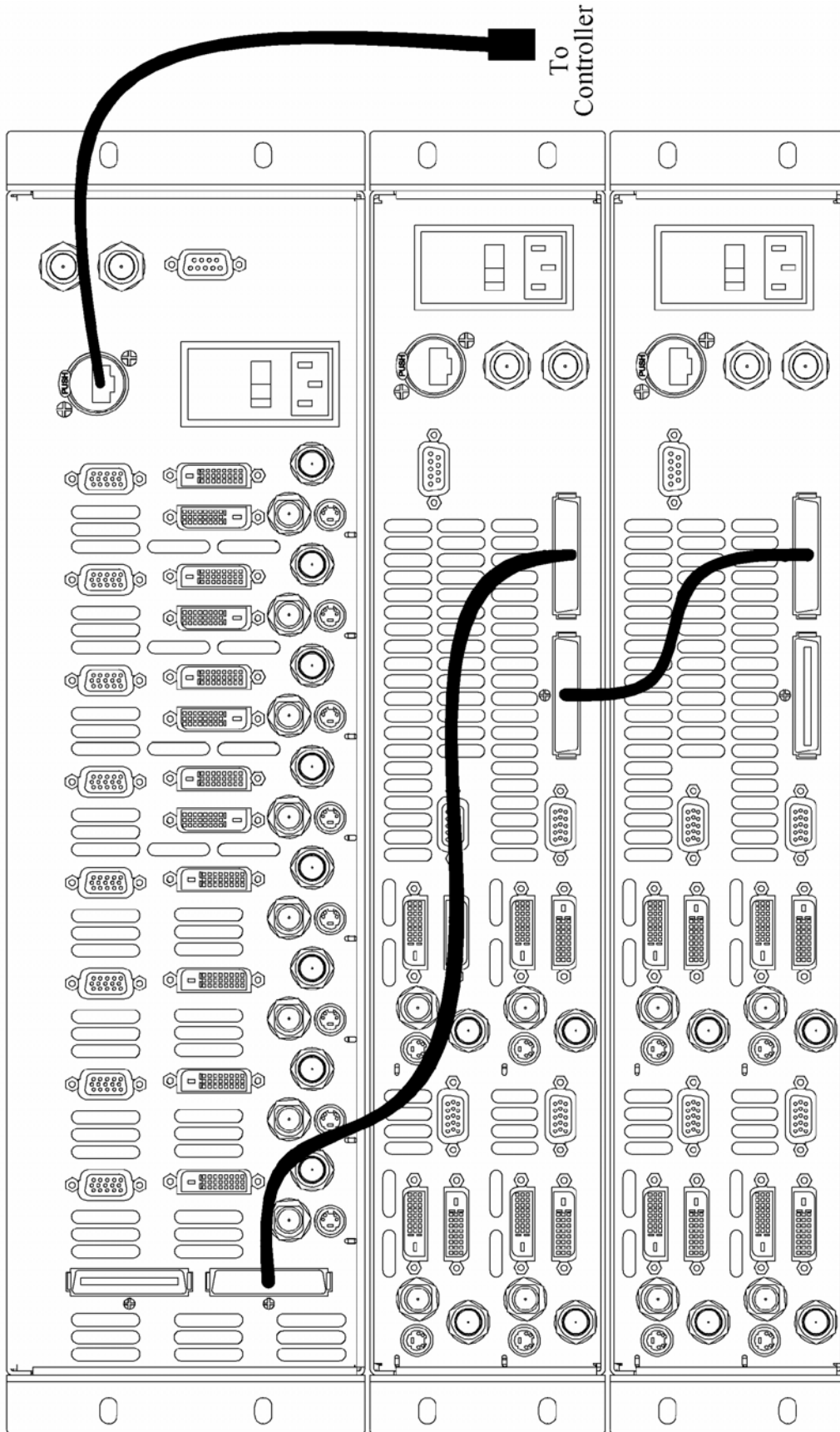


Figure 3.3.1 b Control Expansion Detail



### Power Control

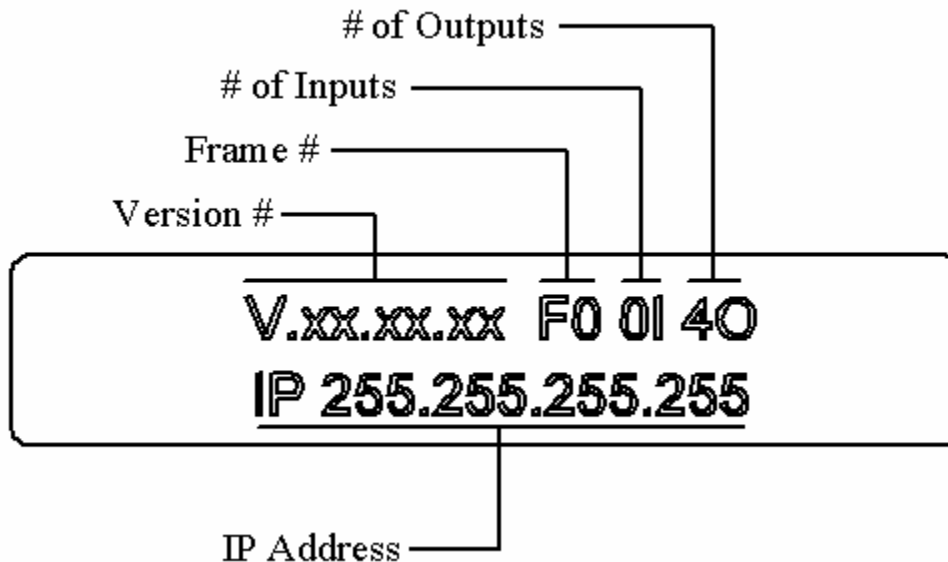
The Spyder uses a soft power scheme. Pressing the Standby switch initiates a power up cycle and after a short boot time the front panel display will indicate operational status. Pressing the Standby switch again initiates the power down cycle after which the unit enters standby mode. There is a hard power switch on the rear that should be used only when Spyder is in the standby state (Standby Switch LED is off).



The user should avoid disconnecting the primary power source (AC input) until the unit is in standby mode. Failure to do this could result in hard drive data corruption.

### Display

The Spyder enclosure is equipped with a status/error display located on the front panel. This is helpful in determining proper start-up and shut-down of the unit, as well as indicating error messages. The following diagram indicates the status when the unit has been booted up and has determined the version, frame, I/O configuration and IP address.



## **Section 3: Spyder X20 Hardware Family**

Spyder X20™ is a second generation Spyder hardware line. X20 increases both the I/O capacity and virtual image space (VI) available within a single chassis, making a powerful and cost-effective solution for mid-range Spyder configurations.

### **Spyder X20 Models**

Spyder X20 uses a modular chassis design, which can be populated at the factory with various combinations of input and output channels as required. Available chassis sizes start at three-slot configurations.

Note that not all slots must be filled in a chassis; a larger chassis will operate without all slots being filled. This makes an easy hardware upgrade path for systems that may need to increase capacity over time.

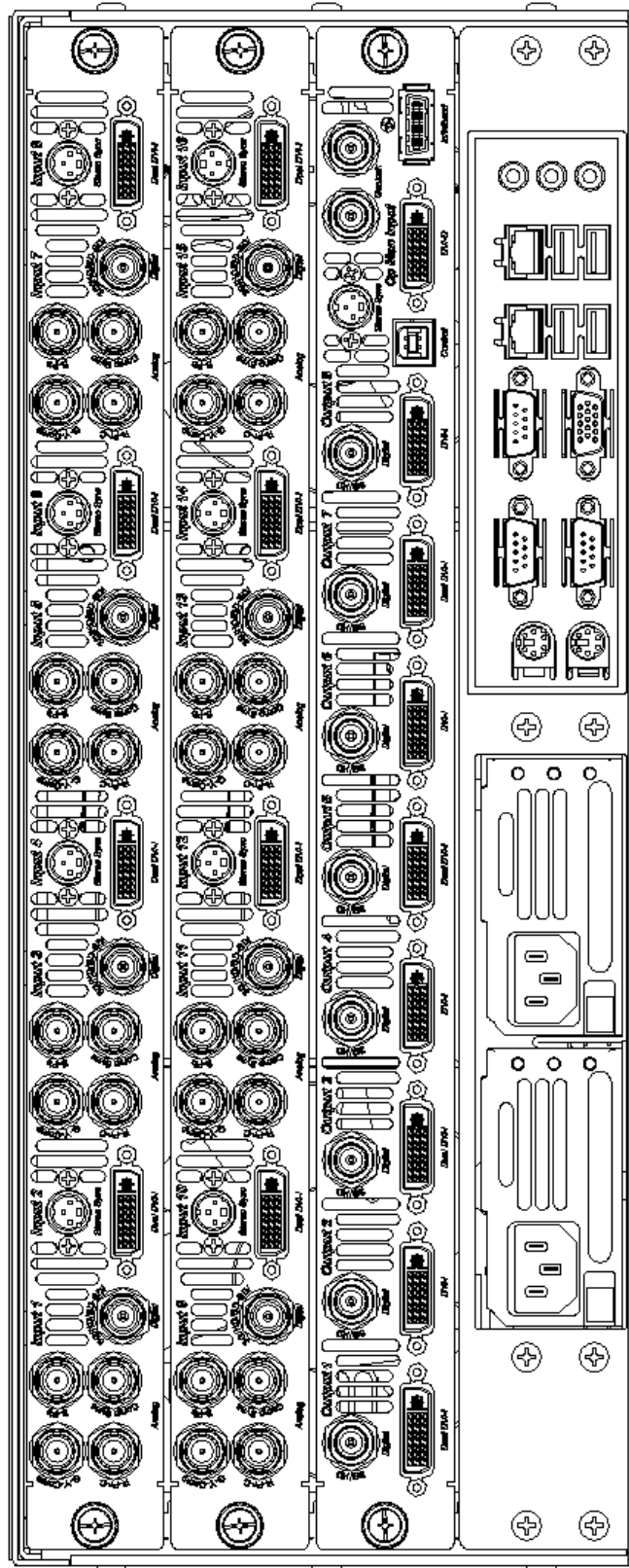


Figure 1: X20 1608 Back Panel

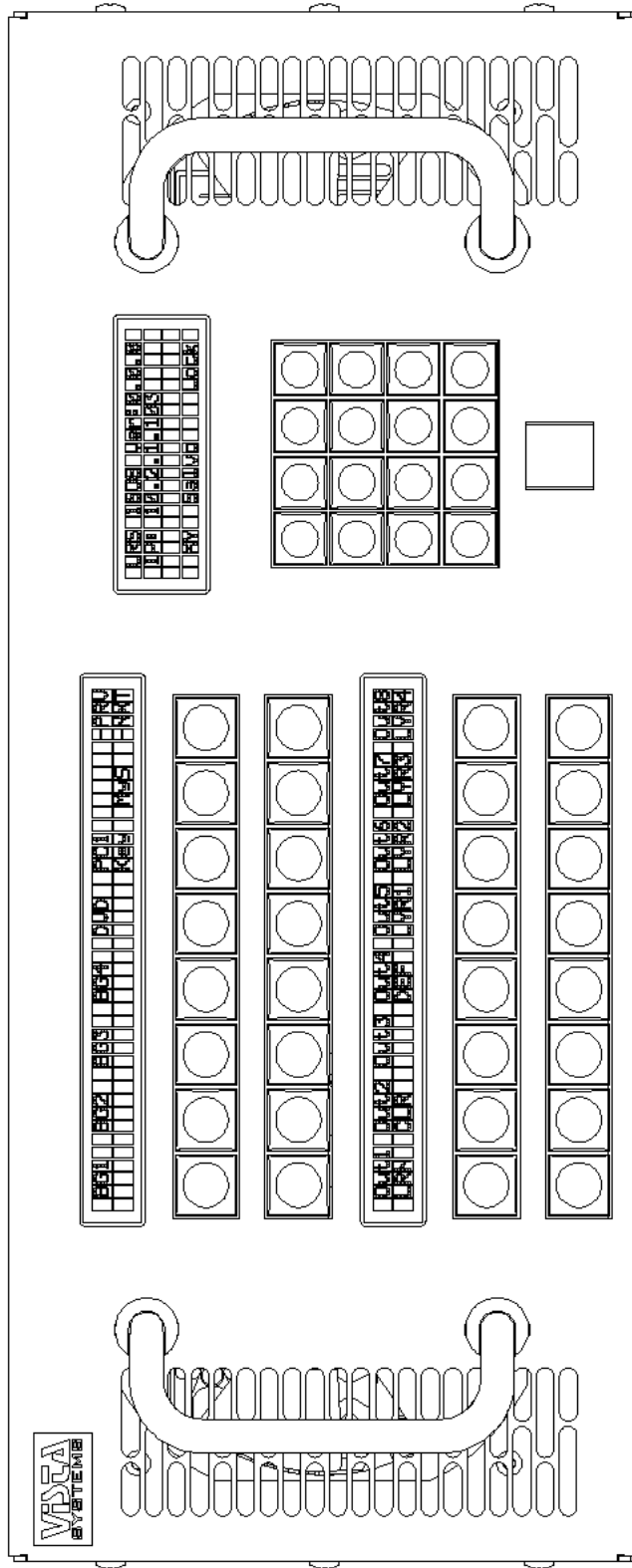


Figure 2: X20 Front Panel

## Inputs

The connector types alternate on each input connector for maximum flexibility, and the specific connector types are listed below. For each input, only one connector / signal type can be selected at a time.

### Odd Input Connectors (1, 3, 5, etc.)

- Analog (3 or 4 wire BNC)
- Composite / S-Video (Shares BNC with composite analog sync signal)
- SDI / HD-SDI / 3G-SDI (Single dedicated BNC)

### Even Input Connectors (2, 4, 6, etc.)

- DVI-I (Analog and Digital on single connector)
- Stereo Sync input (3-Pin DIN)

## Outputs

Each Output Module has various video connectors on the rear. Multiple output connectors can be enabled simultaneously, provided that the user defined output format is valid for the connector. SXGA (1280x1024) for example, is valid for DVI and analog connectors, but is not a valid format for SDI, composite, or S-Video connectors.

Each output channel provides the following connector types:

- DVI-I (Analog and Digital on single connector)
- SDI / HD-SDI / 3G-SDI

## Power

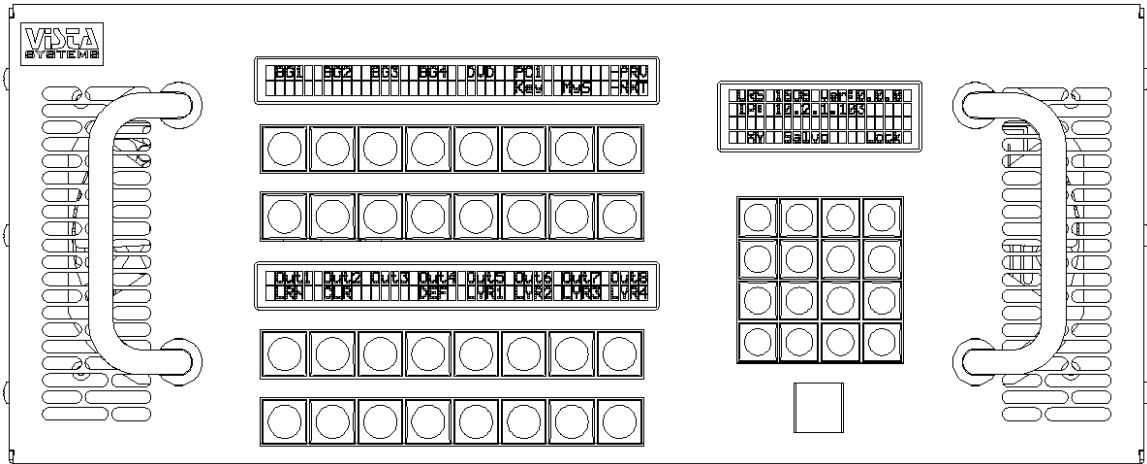
The X20 uses a soft power scheme. Pressing the Standby switch initiates a power up cycle and after a short boot time the front panel display will indicate operational status. Pressing the Standby switch again initiates the power down cycle after which the unit enters standby mode. Holding the power button on the front panel of the system for 13-15 seconds can be used to force power off, however this technique may cause permanent configuration data loss.



The user should avoid disconnecting the primary power source (AC input) until the unit is in standby mode. Failure to do this could result in hard drive data corruption.

## Front Panel

The X20 enclosure is equipped with a LCD / switch button interface located on the front panel. This interface allows for both control and access to status information of the unit. As the front panel functionality is dependent on the version of firmware running on the unit, actual front panel operation is discussed in detail in the software / operator's manual for the X20.



## Section 4: External Control

The Spyder frame uses an ASCII based command system for external control. Connectivity is available via an RJ-45 (Ethernet) connection, or a 9-pin RS-232 serial connection to the frame. Both the Ethernet and Serial interfaces respond to the same string commands, and can do so concurrently.

### Serial Connectivity

One of the three RS-232 serial ports available on the back of the Spyder frame can be configured to accept external control commands by using the Vista Basic or Vista Advanced user interface. See the software operation's manual for more information on configuring Spyder for external control.

**Note:** When using serial control, each command must be terminated with a carriage return.

RS-232 Serial Pinout	
Pin	Function
2	Receive (RX)
3	Transmit (TX)
5	Ground

Index	Character
0	s
1	p
2	y
3	d
4	e
5	r
6	0x00 (hex)
7	0x00 (hex)
8	0x00 (hex)
9	0x00 (hex)

### Ethernet Connectivity

The Spyder frame can be controlled remotely by sending the ASCII commands listed below within a UDP packet sent to port 11116 on the frame; no configuration is required. Each message sent to Spyder over UDP must be precluded by a 10 byte message header. This header is shown to the left of this paragraph.

**Note:** Do not put an argument delimiter (space character) between the header and the external control command.

**Note:** Commands and arguments are delineated by a single space character.

**Command Table:** Command set applies to both Serial and Ethernet Requests

Command	Description	Command	Description
BPL	Learn Basic Preset	FKR	Function Key Recall
BPR	Recall Basic Preset	ARO	Aspect Ratio Offset
ICR	Input Config Recall	ILA	Input Level Adjust
ICL	Input Config Learn	ILK	Input Luminance Key
SDN	Restart Spyder Server	ICK	Input Color Key
SAV	Force Server Save	LAP	Layer Assign PixelSpace
RSC	Recall Script Cue	FRZ	Freeze Layer(s)
TRN	Transition Layer(s)	RSN	Request Source Names
KSZ	Layer Size Adjust	RLC	Request Layer Count
KTL	Learn Treatment	RAR	Request Aspect Ratio
KTR	Recall Treatment	SCR	Script Cue Request
SLD	Still Load on Layer(s)	RRC	Request Register Count
SCL	Still Clear on Layer(s)	RRL	Request Register List
BTR	Background Transition	ARL	Apply Register to Layer(s)
BLD	Background Load Image	RBL	Request Basic Preset List
KBD	Border Adjust	KSH	Shadow Adjust
CSO	Clear Still on Output	CRP	Crop Adjust
LSO	Load Still on Output	SRA	Source Apply to Layer(s)
RPS	Request I/O Processor Status	RPD	Request PixelSpace Definitions
LCK	Learn Command Key	LAC	Layer Alignment Control
ZPA	Zoom / Pan Adjust	RLK	Request Layer KeyFrame
RLS	Request Layer Source	LCC	Layer Clone Control
RCS	Request Connection Status	DCK	Delete Command Key
IRA	Input Config Raster	QRC	Query Router Crosspoint(s)
LSP	Layer Size and Position	OFZ	Output Freeze

**Note:** Some commands listed display their last

Argument as 'Argument x ~ XX:'. These commands allow the last argument field to be repeated, allowing multiples of the last argument to be specified with a single command.

**Note:** Some commands listed display argument(s) with an asterisk. These options are optional; however no further arguments may be entered in the command.

**Note:** When specifying layer IDs in Spyder commands, note that the IDs start at 2. Layer ID 0 and 1 are reserved for future commands using the two background layers of the system.

**Note:** String argument spaces must be replaced with the three character ASCII string %20 to create a valid command, as space is used as the argument delimiter.

## Command Processor Responses

A response is returned for every command sent to the Spyder system. If multiple values are returned in a single response, the argument delimiter is an ASCII space character, and argument values containing a space will be converted to the 3 character ASCII string "%20". The first response argument is always the error code for the command, which lets the user know if a command was successfully processed. The table below displays the various responses which can be returned by the Spyder.

Response Character	Response Name	Description
0	Success	Command was successfully processed
1	Empty	Data requested is not available
2	Header	Invalid command specified
3	Argument Count	Missing required minimum number of arguments
4	Argument Value	One or more arguments were invalid
5	Execution	An error occurred while processing the command. Check alert log in Spyder Basic / Advanced software for details.
6	Checksum	* Reserved *

## Supported Command Descriptions

### Basic Preset Learn

Stores the current screen layout to a specified preset ID.

*Command:* BPL

*Argument 1:* Preset ID to save current window position and keyframe information to.

*Argument 2:* Duration. This argument is optional. If not specified, duration will default to 60.

### Basic Preset Recall

This command recalls an existing basic preset from the frame, by using its corresponding ID.

*Command:* BPR

*Argument 1:* Preset ID to recall from server.

*Argument 2:* Duration. This argument is optional. If not specified, duration will default to 60.

### **Input Configuration Recall**

This command loads a previously saved input configuration onto the video source of a specified layer ID.

*Command:* ICR

*Argument 1:* Configuration ID. This is the ID number to store the layer ID's current input configuration to. Set the Configuration ID to -1 to force auto sync.

*Argument 2:* The layer ID to apply the specified input configuration to.

*Argument 3\*:* If -1 is set for argument 1, this value will set the connector type to be switched to and auto synced on a layer. 0=HD15, 1=DVI, 2=SDI, 3=Composite, 4=S-Video

### **Input Config Learn**

This command saves the input configuration for a specified layer ID, to a specified input configuration ID for later recall.

*Command:* ICL

*Argument 1:* Input configuration ID to save to.

*Argument 2:* Layer ID to save configuration information from.

### **Restart Spyder Server**

This command allows the user to remotely restart the server application remotely.

*Command:* SDN

*Argument 1:* 0 = Power Off, 1 = Restart

### **Force Server Save**

This command forces the remote Spyder frame to flush all configuration and user data changes to non-volatile storage.

*Command:* SAV

### **Recall Script Cue**

This command recalls an existing script at a specified cue. Use 'Vista Advanced' software interface to build scripts. Argument 3 optionally defines the ID type being recalled in argument 1, and defaults to 'ScriptID' if not specified. See "Understanding Registers" in this manual for information on registers.

Note: To access registers on pages above the first page, add (<Page number> \* 1000) to the register ID to be recalled. For example, to recall a script at register ID 2 on page 3, send a register ID of 3002.

*Command:* RSC

*Argument 1:* ID to recall

*Argument 2:* Script Cue to recall

*Argument 3\*:* ID Type in Argument 1 (S=ScriptID, R=RegisterID)

### **Transition Layer(s)**

This command transitions layers on and off of their currently assigned PixelSpace.

*Command: TRN*

*Argument 1: 0 = Mix Off - 1 = Mix On*

*Argument 2: Transition Duration (in frames)*

*Argument 3 ~ XX: Layer ID to transition*

### **Layer Size Change**

This command sets the horizontal size of one or more specified layers. Vertical size adjusts automatically to ensure the layer's aspect ratio.

*Command: KSZ*

*Argument 1: Horizontal Size (in pixels)*

*Argument 2 ~ XX: Layer ID to set size*

### **Layer Position Change**

This command sets the horizontal and vertical position of one or more specified layers. Positions are mapped in pixels, relative to the top left PixelSpace corner associated with the layer. Position changes can be relative to the layer's current position, or can be an absolute position setting.

*Command: KPS*

*Argument 1: 0 = Absolute Position / 1 = Relative Position*

*Argument 2: Horizontal Position*

*Argument 3: Vertical Position*

*Argument 4 ~ XX: Layer ID to set position*

### **Layer Size and Position Change**

This command sets the horizontal and vertical position of one or more layers, as well as their size. In cases where size and position are being modified simultaneously for an application, this command is recommended over using the individual layer size and position commands. Position and size changes can be relative to the layer's current position, or can be an absolute position setting.

*Command: LSP*

*Argument 1: 0 = Absolute Position / 1 = Relative Position*

*Argument 2: Horizontal Position (Pixels)*

*Argument 3: Vertical Position (Pixels)*

*Argument 4: Horizontal Layer Size (Pixels)*

*Argument 5 ~ XX: Layer ID(s) to set*

### **Treatment Learn**

This command learns keyframe attributes from a specified layer.

*Command: KTL*

*Argument 1: Treatment ID to learn (-1 for next available)*

*Argument 2: Layer ID to learn from*

*Argument 3\*: Learn Position*

*Argument 4\*: Learn Crop*

*Argument 5\*: Learn Clone*

*Argument 6\*: Learn Border*

*Argument 7\*: Learn Shadow*

### **Treatment Recall**

This command recalls a treatment to one or more specified layers.

*Command: KTR*

*Argument 1: Treatment ID to recall*

*Argument 2 ~ XX: Layer ID to recall treatment to*

### **Load Still on Layer**

This command loads a specified file onto one or more specified layers.

*Command: SLD*

*Argument 1: File name to load*

*Argument 2 ~ XX: Layer ID to load still image on*

### **Clear Still on Layer**

This command clears any loaded still image from one or more specified layers.

*Command: SCL*

*Argument 1 ~ XX: Layer ID to clear still image from*

### **Load Still on Background**

This command loads a specified file onto either the current or next background layer. The image name specified will automatically be scaled to fit the PixelSpace if the image is not the same size as the PixelSpace it is being loaded on.

*Command: BLD*

*Argument 1: File name to load*

*Argument 2: PixelSpace ID to load to*

*Argument 3: 0 = Load Next / 1 = Load Current*

### **Transition Background**

This command transitions the background layers across all PixelSpaces defined in the system. Note that it is not possible to transition individual PixelSpace backgrounds.

*Command: BTR*

*Argument 1\*: Transition duration (in frames)*

### **Border Adjust**

This command forces adjusts one or more specified border properties on a specified layer. Note that the color specific arguments are optional, but all 3 (RGB) must be specified to be processed.

*Command: KBD*

*Argument 1: Layer ID to adjust*

*Argument 2: Border Thickness (-255 – 255, negative for outside softness)*

*Argument 3\*: Color Red (0-255)*

*Argument 4\*: Color Green (0-255)*

*Argument 5\*: Color Blue (0-255)*

*Argument 6\*: H-Bevel offset (0-255)*

*Argument 7\*: V-Bevel offset (0-255)*

*Argument 8\*: Inside Softness (0-255)*

### **Shadow Adjust**

This command adjusts the shadow parameters for a specified layer

*Command: KSH*

*Argument 1: Layer ID to adjust*

*Argument 2\*: Horizontal Position (0-255)*

*Argument 3\*: Vertical Position (0-255)*

*Argument 4\*: Size (0-255)*

*Argument 5\*: Transparency (0-255)*

*Argument 6\*: Outside Softness (0-255)*

### **Crop Layer**

This command sets left, right, top, and bottom cropping for one or more specified layers.

*Command: CRP*

*Argument 1: Left Crop (0.0 – 1.0)*

*Argument 2: Right Crop (0.0 – 1.0)*

*Argument 3: Top Crop (0.0 – 1.0)*

*Argument 4: Bottom Crop (0.0 – 1.0)*

*Argument 5 ~ XX: Layer ID to Apply Crop to*

### **Source Apply**

This command applies an existing source to one or more specified layers. A source is defined as an input configuration and a router input. Use Vista Advanced to create sources and define connected routers.

*Command: SRA*

*Argument 1: Source Name*

*Argument 2 ~ XX: Layer ID(s) to apply source to.*

### **Router Crosspoint Recall**

This command is used to switch crosspoints on a router connected to the Spyder frame. Note that argument 2 is optional; if it is not specified, the logical patch is switched. A 'logical' output refers to the router patch configured from the Spyder software interfaces, which is stored as part of a router configuration. Also note that arguments 3 (output) and 4 (input) can be repeated as many times as a user likes to stack a series of switches into a single command. If the router and the Spyder control protocol for the router support 'stack and trigger' switching, Spyder will use this functionality automatically when sending a command with multiple switch assignments.

*Command: RCR*

*Argument 1: Router ID to switch.*

*Argument 2: (L = Switch Logical Output, P = Switch Physical Outputs)*

*Argument 3: Output to switch (Zero based).*

*Argument 4: Input to switch to (Zero based).*

### **Function Key Recall**

This command will recall a single function key defined in Spyder. Optionally, layer arguments can be listed in this command for relative function keys.

Note: To access registers on pages above the first page, add (<Page number> \* 1000) to the register ID to be recalled. For example, to recall a function key at register ID 2 on page 3, send a

register ID of 3002.

*Command:* FKR

*Argument 1:* Function Key ID to recall.

*Argument 2\* ~ XX:* Layer ID(s) to be included in relative function key.

### **Request PixelSpace Definitions**

This command returns a list of all PixelSpaces currently defined in the Spyder system.

*Syntax:* RPD

*Response:* <Result Code> <Count> [<ID> <Name> <Current Background> <Next Background> <X Position> <YPosition> <Width> <Height> <RenewalGroup ID>]...

*Command:* RPD

### **Aspect Ratio Offset**

This command is used to adjust the aspect ratio offset KeyFrame parameter of one or more layers. This aspect ratio command can be used to set the total aspect ratio for a layer, or can adjust KeyFrame aspect ratio offset directly.

*Command:* ARO

*Argument 1:* A/R Type (*t* = set total A/R, *o* = set KeyFrame A/R offset, *a* = adjust existing KeyFrame A/R offset).

*Argument 2:* Floating point aspect ratio value (Ex: 0.17).

*Argument 3 ~ XX:* Layer ID(s) to apply aspect ratio offset to.

### **Input Level Adjust**

This command allows for adjustment of brightness, hue, contrast, and saturation on any layer in the system.

*Command:* ILA

*Argument 1:* Brightness (0.0 – 2.0)

*Argument 2:* Contrast (0.0 – 2.5)

*Argument 3:* Hue (-180 – 180)

*Argument 4:* Saturation (0.0 – 2.0)

*Argument 5 ~ XX:* Layer(s) to apply settings to.

### **Input Luminance Key**

This command allows for enabling, disabling, and adjustment of the luminance key for one or more Spyder layers. If disabling key with this command, all key specific arguments will not be used, and should be set to zero. Note that this command is mutually exclusive with the 'Input Color Key' command (below). If this command is used, color key will automatically be disabled.

*Command:* ILK

*Argument 1:* Key enabled (0 = Off, 1 = On)

*Argument 2:* Clip (0 – 512)

*Argument 3:* Gain (0 – 512)

*Argument 4 ~ XX:* Layer(s) to apply settings to.

### **Input Color Key**

This command allows for enabling, disabling, and adjustment of the color key for one or more Spyder layers. If disabling key with this command, all key specific arguments will not be used,

and should be set to zero. Note that this command is mutually exclusive with the 'Input Luminance Key' command (above). If this command is used, luminance key will automatically be disabled.

*Command: ICK*

*Argument 1: Key enabled (0 = Off, 1 = On)*

*Argument 2: Color Red (0 – 255)*

*Argument 3: Color Green (0 – 255)*

*Argument 4: Color Blue (0 – 255)*

*Argument 5: Range Red (0 – 255)*

*Argument 6: Range Green (0 – 255)*

*Argument 7: Range Blue (0 – 255)*

*Argument 8: Color Gain (0 – 512)*

*Argument 9 ~ XX: Layer(s) to apply settings to.*

### **Layer Assign PixelSpace**

This command associates a layer with a particular PixelSpace. The layer can optionally be made visible at the time this command is applied, allowing additional commands to be sent to configure the layer before it is transitioned on screen with the TRN command.

*Command: LAP*

*Argument 1: PixelSpace ID to associate layer with*

*Argument 2: Make Visible (0 = Don't make visible, 1 = Make Visible)*

*Argument 3 ~ XX: Layer(s) to apply PixelSpace settings to.*

### **Freeze Layer(s)**

This command is used to freeze or un-freeze one or more layers within Spyder.

*Command: FRZ*

*Argument 1: (1 = Enable Freeze, 0 = Disable Freeze)*

*Argument 2~XX: Layer(s) to freeze / un-freeze*

### **Freeze Output(s)**

This command is used to freeze or un-freeze one or more outputs within Spyder. Note that this command is compatible with universal outputs only. DX4 outputs do not support individual freeze / unfreeze functionality.

*Command: OFZ*

*Argument 1: (1 = Enable Freeze, 0 = Disable Freeze)*

*Argument 2~XX: Outputs(s) to freeze / un-freeze*

### **Request Source Name(s)**

Retrieves a list of sources defined within Spyder. This command returns a list of source names separated by spaces.

*Command: RSN*

### **Request Layer Count**

This command retrieves the logical layer count within the connected Spyder system. As this logical layer count includes the two background layers within Spyder; applications will typically want to subtract two from the response.

*Command: RLC*

### **Request Aspect Ratio**

This command is used to request the aspect ratio of a defined source.

*Command:* RAR

*Argument 1:* Source name or layer ID

### **Script Cue Request**

This command will request the current execution cue of a specified script ID. Returns a single integer value representing the current cue of the specified script, or -1 if the specified script is not being executed on any layer.

*Command:* SCR

*Argument 1:* ID to request status for

*Argument 2\*:* ID Type in Argument 1 (S=ScriptID, R=RegisterID)

### **Request Register Count**

This command returns the number of registers for a specified data type, optionally in a specific page.

*Syntax:* RRC <RegisterType> [<Page>]

*Response:* <Result Code> <Register Count>

*Command:* RRC

*Argument 1:* Register type (See 'Register Types' section in this manual)

*Argument 2\*:* Page number to return (zero based index), or -1 for all pages.

### **Request Register List**

This command returns a list of registers and their associated IDs for a specified data type, optionally in a specific page. Because the register lists can be particularly long, additional arguments are available to request portions of the list at a time.

*Syntax:* RRL <RegisterType> [<Page>] [<StartIndex>] [<MaxCount>] [<chars>]

*Response:* <Result Code> <Return Count> [<Register1 ID> <Register1 Name>]...

*Command:* RRL

*Argument 1:* Register type (See 'Register Types' section in this manual)

*Argument 2\*:* Page number to return (zero based index), or -1 for all pages.

*Argument 3\*:* Start index to begin returning

*Argument 4\*:* Maximum number of registers to return

*Argument 5\*:* Number of characters to truncate register names to.

### **Apply Register to Layer**

This command applies a specified register to one or more layers. This is useful for recalling register data types such as sources or treatments to layers.

*Command:* ARL

*Argument 1:* Register type (See 'Register Types' section in this manual)

*Argument 2:* Register ID to recall

*Argument 3~XX:* Layer IDs to recall specified register to

### **Request Basic Preset List**

This command returns a list of basic preset names and their associated IDs. Because the basic preset lists can be particularly long, additional arguments are available to request portions of the list at a time.

Syntax: RBL [<StartIndex>] [<MaxCount>] [<chars>]

Response: <Result Code> <Return Count> [<Preset1 ID> <Preset1 Name>]...

*Command:* RBL

*Argument 1\*:* Start index to begin returning

*Argument 2\*:* Maximum number of registers to return

*Argument 3\*:* Number of characters to truncate names to.

### **Clear Still on Output**

This command will clear an image currently loaded on a specified output ID. Note that the ChannelID argument is only necessary on the quad-output DX4 output modules. If no channel ID is specified for a DX4 output ID, all channels will be cleared.

*Command:* CSO

*Argument 1:* Output ID to clear image on

*Argument 2\*:* Channel ID on output module to clear (0-3).

### **Load Still on Output**

This command will load an unscaled still image directly onto a Spyder output, for the purpose of loading custom test patterns. The file name specified must exist in the 'Stills' directory on the Spyder server, which can be accessed using FTP or the Spyder client software. Note that the channel ID argument is only necessary on the quad-output DX4 output modules, in which case the channel ID argument is required.

*Command:* LSO

*Argument 1:* File Name of image to load

*Argument 2:* Output ID to load image on

*Argument 3\*:* Channel ID on DX4 output module to load to (0-3).

### **Request I/O Processor Status**

Asynchronous operations, such as still loading, are processed serially (one at a time) as background tasks in Spyder. You can query the current state of the I/O processor for use in external state logic such as needing to wait for image load commands to complete. The status returned includes a numeric value from 0-100 giving the percent progress, as well as an ASCII string with a generic description of the task being processed. When idle, this request will return 0 for progress and nothing for the status message.

Syntax: RPS [<chars>]

Response: <Result Code> <Progress> <Status Message>

*Command:* RPS

*Argument 1\*:* Number of characters to truncate names to.

### **Learn Command Key**

A command key can be learned, or recorded, from the current layer status on screen. This function will perform the same operation as learning a new command key from one of the Vista software interfaces.

Syntax: LCK <Absolute/Relative> <Name> <Register ID> <Learn From><Learn Mixers>

Response: <Result Code> <CommandKey ID> <Script ID>

*Command: LCK*

*Argument 1: Learn as (0 = Absolute / 1 = Relative)*

*Argument 2: Command key name*

*Argument 3: Register ID to learn command key to*

*Argument 4: Learn from (1 = Preview Only / 2 = Program Only / 3 = Both)*

*Argument 5: Learn as Mixers (0 = False / 1 = True)*

### **Zoom / Pan Adjust**

The ZPA command can be used to change the zoom and/or the pan KeyFrame controls on a specified layer. Adjustments can be relative to the layer's existing pan / zoom settings or can be set to specific values directly.

Syntax: ZPA <Recall Mode> <Zoom> <Horz Pan> <Vert Pan> <Layer ID>

*Command: ZPA*

*Argument 1: Recall Mode (0 = Absolute values / 1 = Relative adjustment)*

*Argument 2: Zoom Value (Effective Range = 0.0 to 20.0)*

*Argument 3: Horizontal Pan Value (Effective Range = -2048 to 2048)*

*Argument 4: Vertical Pan Value (Effective Range = -2048 to 2048)*

*Argument 5: Layer ID*

### **Layer Clone Control**

The LCC command can be used to adjust the clone property on the KeyFrame of a specified layer. Clone modes can be switched between Off, Mirror, or Offset, and an optional parameter can be specified to set the offset distance (in relative coordinates) for the clone position. If an Offset clone mode is specified with no offset value, the clone offset value stored in the layer's current KeyFrame will be used.

*Command: LCC*

*Argument 1: Layer ID*

*Argument 2: Clone Mode (0 = Off / 1 = Offset / 2 = Mirror)*

*Argument 3\*: Clone offset (relative coordinate number)*

### **Request Layer KeyFrame**

The RLK command retrieves the KeyFrame values for a specified layer ID. Note that additional values may be appended to this command's response in future versions of the Spyder firmware, and the requesting device software should be written to handle additional appended values.

Syntax: RLK <Layer ID>

Response: <Result Code> <Relative HPosition> <Relative VPosition> <X Position> <Y Position>  
<Width> <Height> <Border Thickness> <Border Red> <Border Green> <Border Blue> <Border  
HBezel Offset> <Border VBezel Offset> <Border Inside Softness> <Border Outside Softness>  
<OutSide Edges\*\*> <Shadow HOffset> <Shadow VOffset> <Shadow HSize> <Shadow Softness>  
<Shadow Transparency> <Clone Mode\*\*\*> <Clone Offset> <Left Crop> <Right Crop> <Top Crop>  
<Bottom Crop> <Crop Anchor\*\*\*\*> <AR Offset> <Zoom> <HPan> <VPan> <PixelSpace ID>  
<Transparency>

*Command: RLK*

*Argument 1: Layer ID*

**\*\* Outside Edges are provided as a hexadecimal value, with the lower 4 bits indicating specific edges enabled as shown below:**

- *0x01: Top enabled*
- *0x02: Bottom enabled*
- *0x04: Left enabled*
- *0x08: Right enabled*

**\*\*\* Clone Mode: 0=Off, 1=Offset, 2=Mirror**

**\*\*\*\* Crop Anchor: 0 =Input Center, 1=Window Center**

### **Request Layer Source**

The RLS command retrieves the current source name and associated source register ID loaded on a specified layer. If no source is currently assigned to the specified layer, the 'Empty' result code will be returned with no further parameters. If a source is assigned to the specified layer, but no corresponding register can be found, a -1 will be returned for the register ID.

Syntax: RLS <Layer ID>

Response: <Result Code> <Source Name> <Source Register ID>

*Command: RLS*

*Argument 1: LayerID*

### **Layer Alignment Control**

The layer alignment control allows one or more layer KeyFrames to be manipulated by the Spyder server to achieve a specified alignment effect. The alignment effects are the same as the ones available from the simulator control of the Vista control suite software clients.

*Command: LAC*

*Argument 1: Alignment effect ID. See 'Layer Alignment Effects' table below*

*Argument 2: Alignment recall duration (specified in frames)*

*Argument 3~XX: Layer ID(s)*

### **Delete Command Key**

This command can be used to delete an existing command key by either a specified register ID, or by a script ID. Note that argument two is optional, if not supplied is defaulted to 'Script ID'.

*Command: DCK*

*Argument 1: ID to Delete*

*Argument 2\*: ID Type in Argument 1 (S=ScriptID, R=RegisterID)*

### **Request Connection Status**

This command allows for the current connected or disconnected status of a specified input to be queried. When called, the system will poll the current connector type of the specified input in an attempt to determine if a video source is connected. Calling applications should be careful not to call this command too frequently (more than once per second), or degraded system performance may occur as a result.

Syntax: RCS <Layer ID>

Response: <Result Code> <Layer ID> <Current Connector Type> <Connection Status>

- Connection Status (0=Disconnected, 1=Connected, 2=Unknown)
- Current Connector Type (0=HD15, 1=DVI, 2=SDI, 3=Composite, 4=SVideo)

*Command: RCS*

*Argument 1: Layer ID to check connection status on*

### **Input Config Raster**

Input video rastering commands, which allow the video shown inside of a window to be re-positioned on a per-edge basis, can be made with this command. This command can additionally be used to perform an 'auto raster' (analog only), in which a specified layer inspects the video content currently in the layer and re-positions the input video automatically.

Syntax: IRA <Layer ID> <Edge> <Delta>

Response: <Result Code>

*Command: IRA*

*Argument 1: Layer ID to adjust*

*Argument 2: Edge to adjust (L=Left, R=Right, T=Top, B=Bottom, A=AutoRaster)*

*Argument 3\*: Number of pixels to move*

- *Negative numbers move video edge inwards*
- *Positive numbers move video edge outwards*

### **Query Router Crosspoint(s)**

This command allows one or all router outputs to be queried for their currently connected input. In the case of level controlled routers, the input returned will be the input connected to the output on the level configured to be controlled by Spyder. If no specific output is supplied, the inputs for all outputs will be returned. Outputs / inputs returned are zero indexed, so for example output 1 on the router will be returned as a zero (0). An output with no input connected (disconnected) will return a -1 for the input.

Syntax: QRC <Router ID> [<Output ID>]

Response: <Result Code> <Router ID> <Output>:<Input> [<Output>:<Input>]

*Command: QRC*

*Argument 1: Router ID to query*

*Argument 2\*: Router output to query status for*

## **Understanding Registers**

Registers provide an abstraction layer from specific data types with Spyder. Common data types such as sources, stills, command keys, and treatments all have corresponding registers. In the Vista software interfaces such as Vista Basic and Vista Advanced, all lists are sorted and displayed using the register lists, which allow users to organize the way their data is displayed without changing the underlying data.

**Figure 1** displays a command key list in Vista Advanced containing a single command key named 'Look 1'. The number 4 is displayed in the top-left corner of the command key, denoting that the register ID for this command key is 4. Notice in the property panel to the right of the

command key panel that the Command Key's data ID is 10. The 'Recall Script Cue' (RSC) command allows command keys to be recalled externally using either the register ID (4) or the command key script ID (10).

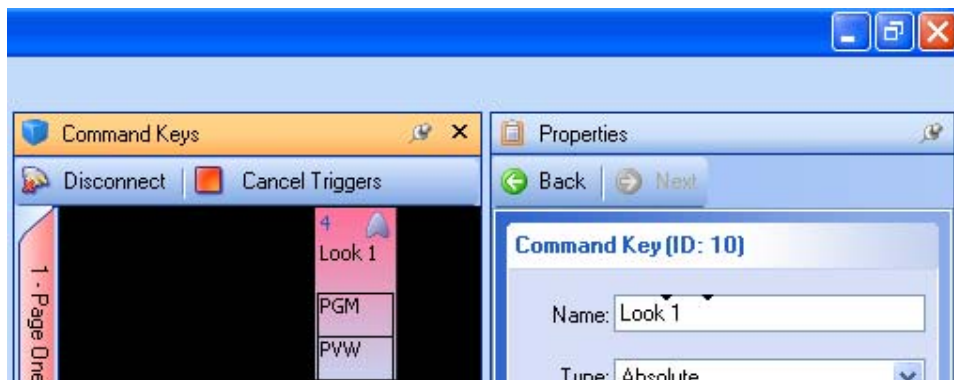


Figure 1

In **Figure 2** the user has moved the 'Look 1' command key's position in the command key list. Notice that the register ID has changed to 5, but the command key's script ID has not changed. Recalling a script cue externally now using the register ID would require sending an ID of 5 instead of 4 to recall the 'Look 1' command key.

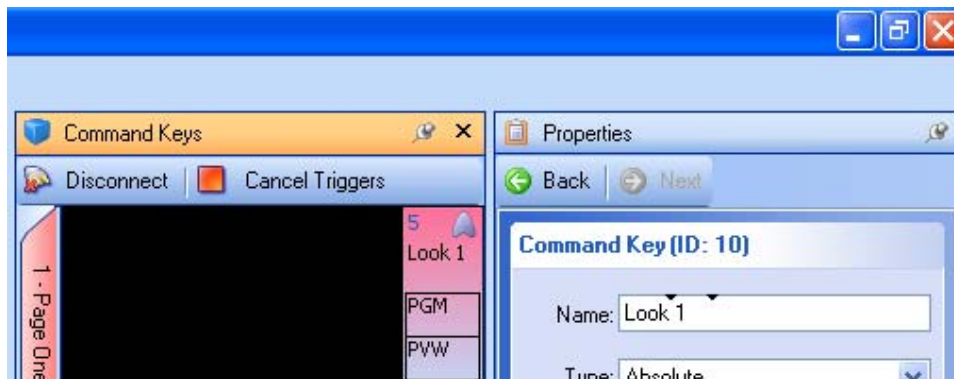


Figure 2

It may be desirable in many circumstances to recall a data element using a register ID, because it allows a user to change the functionality of an external recall command by replacing the data in a specific register. In our example, if a new command key were created and placed in Register ID 4, our original command key script recall command would recall a completely different script independent of the external control device.

## Register Types

Register types represent the various types of data within the Spyder system. Any external command requiring a register type argument is expecting an ASCII representation of a numerical index which represents the register type. The lookup table to the right provides these numerical arguments required for commands

Register Type ID	Register Type Name
0 (0x30)	Effect
1 (0x31)	PlayItem
2 (0x32)	*Not Used*
3 (0x33)	*Not Used*
4 (0x34)	Command Key / Script
5 (0x35)	Treatment
6 (0x36)	Source
7 (0x37)	Function Key
8 (0x38)	*Not Used*
9 (0x39)	*Not Used*
10 (0x31 0x30)	Still Image

## Layer Alignment Effects

Recall ID	Effect Name	Min Layers	Description
0	Align Bottom	2	Repositions specified layers vertically to make bottom edge of layers match the first specified layer.
1	Align Center	2	Repositions specified layers horizontally to make center position of all layers match the first specified layer.
2	Align Left	2	Repositions specified layers horizontally to make left edge of all layers match the first specified layer.
3	Align Middle	2	Repositions specified layers vertically to make center position of all layers match the first specified layer.
4	Align Right	2	Repositions all specified layers horizontally to make right edge of all layers match the first specified layer.
5	Align Top	2	Repositions specified layers vertically to make top edge of layers

			match the first specified layer.
6	Center Horizontal	1	Repositions all specified layer(s) as a group so that layers are centered horizontally in their current PixelSpace.
7	Center Vertical	1	Repositions all specified layer(s) as a group so that layers are centered vertically in their current PixelSpace.
8	Horizontal Decrement	2	Decreases the horizontal spacing between two or more layers.
9	Horizontal Increment	2	Increases the horizontal spacing between two or more layers.
10	Make Horizontal Equal	3	Makes the horizontal spacing between all specified layers equal to the spacing between the first and second specified layers
11	Make Same Height	2	Makes all specified layers the same height as the first specified layer, maintaining aspect ratio in all layers.
12	Make Same Width	2	Makes all specified layers the same height as the first specified layer, maintaining aspect ratio in all layers.
13	Make Vertically Equal	3	Makes the vertical spacing between all specified layers equal to the spacing between the first and second specified layers.
14	Remove Horizontal Spacing	2	Removes spacing between specified layers, causing them to be horizontally stacked in the order specified.
15	Remove Vertical Spacing	2	Removes spacing between specified layers, causing them to be vertically stacked in the order specified.
16	Size to Display Height	1	Resizes specified layer(s) to fill their respective PixelSpace vertically. No adjustment is made to the horizontal position.
17	Size to Display Width	1	Resizes specified layer(s) to fill their respective PixelSpace horizontally, and centers the input vertically.
18	Snap to Bottom	1	Repositions specified layers vertically to align bottom edges of layers with the bottom of their PixelSpaces.
19	Snap Left	1	Repositions the specified layers horizontally to align left edges of layers with the left edge of their PixelSpaces.
20	SnapRight	1	Repositions the specified layers horizontally to align right edges of layers with the right edge of their PixelSpaces.
21	SnapTop	1	Repositions the specified layers vertically to align top edges of the

			layers with the top edge of their PixelSpaces.
22	Stack Horizontal	2	Makes all layers the same height, centers them vertically with the first specified layer, and then positions them in a horizontal array running to the right of the first layer.
23	Stack Vertical	2	Makes all layers the same width, centers them horizontally with the first specified layer, and positions them in a vertical array running downward starting at the first layer's position.
24	Swap Windows	2	Swaps horizontal position and size between the two specified layers.
25	Vertical Decrement	2	Decreases the vertical spacing between two or more layers
26	Vertical Increment	2	Increases the vertical spacing between two or more layers

## Section 5: Physical Specifications

### Dimensions (W x H x D)

- Spyder X20 4 RU: 17.3 x 7 x 21.9 inches (43.9 x 17.78 x 55.6 centimeters)
- Spyder 3 RU: 17.3 x 5.3 x 22.1 inches (43.9 x 13.3 x 56.1 centimeters)
- Spyder 2 RU: 17.3 x 3.5 x 22.1 inches (43.9 x 8.9 x 56.1 centimeters)

### Weight

- Spyder X20 4 RU: 70lbs (Approx)
- Spyder 3 RU: 33lbs (Approx)
- Spyder 2 RU: 25lbs (Approx)

### Power Consumption

- Spyder X20 4 RU: 100-240V AC 1000W max (Fuse: Internal Auto-Resetting)
- Spyder 3 RU: 100-240V AC 375W max (Fuse: 5A Slow-Blow)
- Spyder 2 RU: 100-240V AC 225W max (Fuse: 3A Slow-Blow)
- Stand By Power (200 / 300 / X20 Series): <20W

## Rack mount Instructions

