ICAVE

Service Documentation: Display and Projector Configuration / Calibration

Last Updated: 10-26-2020

Summary: The following provides documentation for properly servicing the configuration of the ICAVE's 5 projectors. A breakdown of the current awareness for the projector system's hardware setup will be provided along with the software configuration of these projectors.

Projector Model: E-Vision Laser 8500 WUXGA

Breakdown:

At the server rack The USB extension boxes have the end outputs for each video out of the projectors. They use a female to male DVI-D to DisplayPort to a specific arrangement of the output ports of the GPUs for the Render Node (See figure: Render Node GPU to projector video out assignment)

Two USB extension boxes at the projector's frame.



Head Node's desktop display USB extension endpoint.



Render node USB extension endpoints (Output goes to DisplayPort's of render node GPUs).



Render Node GPU to projector video out assignment:





GPU Back Input Panel:

Each pair of two numbers (12, 34, 56, etc.) correspond to a pair of video signals from 1 projector.

Projector Mapping:

Projector	Windows Mapping	Physical GPU Index	Nvidia Control Panel Listing
1	1, 2	1	10, 6
2	3, 4	1	5, 1
3	5, 6	4	8, 3
4	7, 8	3	9, 2
5	9, 10	2	4, 7

In the Nvidia control panel, the full system mapping can be found in the Workstation category's View system topology option:



Each physical GPU is listed in the hierarchy with its model name and assigned index:



Within each GPU listing, the connected monitors are listed:

	DVI			Connected: PT-DZ870U (1 of 10) EDID (File), <u>Multi-Display Cloning</u> (Disabled)			
	SLI	SLI Mode			Disabled		
	Usage Mode Total memory			WDDM			
				122624 MB			
	Me	mor	y free		24328 MB		
Ξ		PT-	DZ870U (1 of 10)				
	Display state			Not synced			
	Ξ	Resolution, refresh rate , color de			1920 × 1200 pixels, 59.949 Hz, 32 bpp		
					Horizontal (2080)	Vertical (1235)	
			Active		1920	1200	
			Border		0	0	
			Front porch		48	3	
			Sync width		32	6	
			Back porch		80	26	
			Polarity		Positive (+)	Negative (-)	
	Timing			The display is using internal timing			
	EDID source OS Screen Identifier			Eile			
			OS Screen Identifier		4		
	HDCP		\triangle	Not supported			

Notable indexes can be found here including the Nvidia Control Panel listing, and the OS Screen Identifier (Windows display arrangement).

The display cloning and arrangement configuration: Each pair of outputs to the projector is cloned in the windows arrangement and are arranged in the same order that they are physically in the physical system.



Controller Patch Panel: Projector OSD menu is accessed through here using a aux cord to a compatible controller that came with the projectors. The patch panel is used if there are missing features or issues with accessing settings from the Projection Control Software provided by Digital Projection. (Needs pictures)

Configuration and Calibration Software: Projector Controller Software (PCS)

The PCS is the main interface for configuring and calibrating both the projector alignment / warping geometry and output settings. The application communicates to the projectors using TCP/UDP messages on the network.

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- Default						Shout	
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→ 18:01:04 Tx							
🛫 18:01:04 Rx							
CONTRACTOR - DOI							
⇒ 17:09:02 Tx							
17:09:02 Rx			00:18:23:55:28:01				
	Set ColorMode		00:18:23:55:28:01	*color.mode = 0/00:18:23:55:28:01; 8:00:19:72:55:39:01 ack color mode = 0			
→ 17.09.02 Tx	Set ColorTemp		00:18:23:55:28:01	*color.temp = 5:00:18:23:55:28:01:			
₩17:09:02 Rx			00:18:23:55:28:01	800:18:23:55:28:01 nack color.temp = NA			
→17:09:03 Tx							
17:09:03 Rx							
⇒ 17:09:03 Tx							
Model Elisionist	Suial CONTABROVINT	1 102 168 5 14 7000	Jest 00-18-72-55-78				Contract in the second second

The projectors for setting things up properly and having a proper ordered arrangement of the projectors to their physical counterparts were placed into a grouping:



Mapping:

Physical Projector	PCS Index		
1	0		
2	4		
3	2		
4	1		
5	3		



The main projector setting panels used are the following:



Lens: Its best to use this interface before doing the geometry as with a proper zoom and focus done with the ICAVE test pattern can minimize the amount of focus distortion. The lens position will have to be adjusted as the geometry is calibrated.

🔁 🛛 Select Task	0	~
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🔎 Fucus Llaur		
🕫 Focus Far		
S Move		
Laft Right Cantar Up Down		
Save / Recall		
😪 Save Lans 🔍 Cléar Lens		
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		-

Geometry: The projectors are all calibrated with a cornerstone warping method. Using the warp, each corner is first made sure to fit within the bounds of the screen, then each grid line is position to match the corresponding calibrated gridline of each other projector screen.

				🙎 🛛 Select Task			🗑 🐻
				🛋 Warp Settings			
				Warp Mode	Cornerstone		∽ Reset Warp
				🛋 Keystone			
A Select Task			6 7	🛋 Cornerstone			E
General Settings				Up-Left X		⊒ 40	\$
Aspect Ratio	Source		×	Up-Left Y			\$
Overscan	Off		~	Up-Right X			
Digital Zoom				Un-Right V		-20	\$
Zoom						-40	Ŷ
I		0	\$	Low-Left X		80	\$
Pan		0	\$	Low-Left Y			~
Scan		0	~	Low-Right X			~
			~ Pt			-26	\$
Further Settings			Reset	Low-Right Y		28	Ŷ
Adjust Size and	Position						
Adjust Blanking	a			KRetation			Ħ
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- Warp settings				🛋 Arc			±

Group: The group is used to manage the input and 3d settings of all the projectors. Any settings done individual for the projectors 3D wise has a chance of not showing proper results 3d anaglyphs artifacting on at least one of the screens.

The following settings are known to work:

1	😰 🛛 Select Tas	c	8 🛪
	Default		
	Input source	DualPipe	×
	🛠 Setup		
	Orientation		×
	Power		~
	Shutter		\sim
	Lens		~
	Color Setting	s	
	Gamma	G22	\sim
	Gamut	REC601	×
	Temperature	C6500K	×
	🕶 3D Config		
	Enable 3D	Enabled	×
	Frame rate	X1	~
	Format	DualPipe	×
	Dark time	ť1950µs	~
	Dominance	Left	×

3D Troubleshooting: If the 3D fails to work properly in a getReal3D loaded scene do the following steps:

- 1. Go to the projector group setting and toggle(disable then enable 3D) with a different dark time, then put back the t1950 us dark time.
- 2. If 3D fails to load properly or anaglyphs artifacts are showing, end the running scene, and stop the ART Controller using DTrack2.
- 3. Complete step 1 again and then start back up the ART Controller again using DTrack2.
- 4. From here launch the same scene again in getReal3D.
- 5. If the there are still issues check to make sure that the glasses batteries are not bad by taking them out and putting them back in.
- 6. If step 5 fails to resolve the issue, complete steps 1-4 again until 3D works properly.



ICAVE Screen Calibration Grid: