

STUDIO

User Guide

Rev 1.0

Contents

Intr	oduction7
1.	About Vset3d Studio
2.	License
	Licensing Vset3D Studio9
3.	Quick Start
4.	CamerA sWITCHING12
	How to work with the Control Panel12
	Mouse Camera switching:
	Keyboard Camera switching:14
	To switch camera with your keyboard:15
Stre	eam Deck and companion16
5.	User Interface
	Vset3D Studio User Interface
	General Tools Icones
	Creation Tools Icons
	Transform tools Icons
	Editor Quality settings Icons
	Editor View Selection
	Actions Icons 20
	Layout menu 20
	Settings Icons
6.	3D Editor View
	Light Gizmos 23
	Camera Gizmos
	Camera Facing Plane
	Group
	Primitive Meshes
7.	Settings

	UI language	
	Auto load auto Backup 29	
	Remote	
	Video Settings	
	Art-Net	
	Midi 33	
	License	
8.	Tools	
	File	
	Sources	
	Scene	
	Inspector	
	Animation	
	Rendering	
	Mixer 41	
	Camera remote 42	
	Layout	
	Control Panel 44	
	Sources Media player 45	
	Chroma Keyer 46	
9.	Unity 3D Addressables/Librairy	
10). media File Format	
	PNG/JPG	
	H264/MPEG/MOV/AVI/	
11	1. 3D File Format	
	FBX	
12	2. DMX Fixtures and Lights	
	Generic	
	Clay Paky 50	
	System	

Vset3D Studio

User Guide

13	3. NDI	51
14	4. WDM Devices	
15	5. BlackMagic DesiGN	53
16	6. Materials	54
	Standard 54	
	Double Sided	
	Transparent	
	Transparent Cutout	
	Transparent Refraction	
	Unlit	
	Unlit Transparent Cutout	
	Water River / Water Lake 54	
	Standard Recursive	
	Double Sided Recursive	
	Transparent Recursive	
	Transparent Cutout Recursive	
	Transparent Refraction Recursive	
17	7. Video Format	56
18	3. DLSS/ Render Quality Settings	
19	P. Rendering Settings	
	Ambient Occlusion	
	Beautify	
	Bloom	
	Adds glow on Highlight image parts58	
	Color Adjustments	
	Contact Shadows	
	Depth Of Field	
	Exposure	
	Fog 58	
	Gradient sky	

HDRI Sky	
Indirect Lighting Control	
Screen Space Global illumination 58	
Screen Space Reflection	
Screen Space Refraction	
Tone Mapping	
Adds overall image lighting curve control to the render engine 59	
Vignette 59	
Visual Environment	
20. PTZ camera tracking	60
21. how To	61
How to Add Light	
How to Add Camera	
How to Create an Empty Project	
How to Import FBX File	
How to Setup a basic Ray Traced Project	
How to Import Custom 3D Set In FBX	
How to Import Vset3D library	
How to Add Live Input or media	
How to Add Live Output	
How to Set Project Resolution & Frame rate70	
How to activate Volumetric light FX71	
How to Animate object, camera or light72	
How to add item to the Control panel73	
Video standard and frame syncronisation	74
You must set computer refresh rate and resolution according to your project. 74	
Setup your computer for a 25 Fps 1080 Project 75	
Setup your computer for a 30 Fps 1080 Project 76	
Hardware	77
Hardware77	

Vset3D Studio User Guide

Laptop Computers	
shortcuts	80
GPU load optimisation	81
Vset3D Studio versions Features	82
GRaphic Cards	82

INTRODUCTION

Vset3D Studio

Vset3D Studio offers a true 3D virtual environment where you can greatly enhance the production value of your project. Our powerful and versatile software allows you to use a wide range of lighting effects and camera controls within every virtual studio offering.

All you need is a few yards of green material as a backdrop, a good light source, and a camera to record or stream your video footage.

Once you have the footage on the computer running Vset3D Studio, you can adjust the video keying to remove any of the green from the shot leaving only you or your subject placed in the virtual studio.

We provide amazing and professional results at a fraction of the cost to create a similar production in the real world. Best of all, we can do this real time!

Use our software for your live production.

Our software allows you to set several different positions for your virtual camera. These positions can be changed giving the appearance that you have a several camera shoot. The amazing thing about this is that it only requires one camera to get these results.

To use Vset3D's ray tracing and DLSS options, you must use an NVidia RTX graphics card. Vset3D can be run on an AMD card, but ray tracing and DLSS will not be available.

Vset3D can be started in DirectX11 or 12.

Ray tracing and DLSS are only available in DirectX 12 mode.

Vset3D Studio versions Features Which Graphic card ? About hardware

1. ABOUT VSET3D STUDIO

Vset3D is a DirectX 64 Bits software built for Microsoft Windows 10 or 11.

Vset3D can also be started with command line arguments:

- -monitor N Run Vset3D on specified monitor; N = monitor number
- -screen-height Set the screen height resolution
- -screen-width Set the screen width resolution
- -force-d3d11 Start Vset3D Studio in DirectX11
- -force-d3d12 Start Vset3D Studio in DirectX12
- -window-mode Force Vset3D in resizable windows mode
- -screen-fullscreen Force Vset3D in full screen

This starts Vset3D in DirectX11 >> STUDIO.exe -force-d3d11

2. LICENSE

Vset3D studio license is a lifetime license for one computer. The change of computer is allowed within the limit of 4 per year.

Licensing Vset3D Studio

- Open the Settings menu
- Go to License section
- Send the Machine Identifier to Info@vset3d.com to get the Serial and Activation Key
- Enter the serial number and the activation key sent you.

Preferences	
Language	
EN	×
V Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
	Interface IP address 192 168 1.121
	7000
✓ Video settings	
Video Standard	
3840 x 2160 - 25p	~
MainDisplay	~
V_Art Nat	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
255.255.255.255	
∨ Midi	
Interface	
	v
V License	
	tech lowest to be all on ADL Deald into
inputs 2 - Media Players 2 - Mixers 2 - Virtual Cameras 3 - M	iesn import Animation NDI DeckLink
c2d98928e2b565010df5761fa63a865df91e3f91	
Activation key	

3. QUICK START

Quick Start

Loading a template :

- 1. Open Library window
- 2. Select Virtual Sets
- 3. Select the template
- 4. Press Add or double click on it

 \otimes

> Standard Lights -A PER P I HE F Decor58 Decor002 SampleScen THE Decor03 Decor04 Decor40 HERE! Decor14 Set064 Set063 Decor57 Set067 Decor56 Number of objecs x 1 y 1 z 1 Spacing: x 1.0 y 1.0 z 1.0 Add

Load Project :

- 1. Open file window
- 2. Select New
- 3. Select your project
- 4. Select Create



Vset3D Studio

User guide

Add Output :

- 1. Create or select one camera
- 2. Add mixer Đ
- 3. Add Output +
- 4. Open Mixer window to start switching



4. CAMERA SWITCHING

Once you have set all cameras, live inputs and animations you are able to control them from the Control Panel window.



How to work with the Control Panel

There are three ways to use the control panel.

- The Mouse
- The Keyboard
- Network / Stream Deck / companion ...

Mouse Camera switching:

- 1. Click with your mouse on the button corresponding to the camera you wish to switch
- 2. Click Mixer Cut or Mixer Move to start switching or movement



The transition speed can be set with the Monitor Duration value (1 = one second)

Keyboard Camera switching:

• Make sure you have a number pad on your keyboard.



When you create cameras or inputs, Vset3D
Studio automatically adds the corresponding
button with its shortcut in the Control Panel
You can use Right click to modify settings of any
button
Shortcut: Define the Keyboard key which
preselects the camera
Name: Use it to rename the button
Camera 9 Settings
Camera 9
Shorcut
Name: Use it to rename the button

Auto name: Let Vset3D naming the button

Size: Button size in the Control Panel

Background Color: Set the button color

Trigger: launches the selected animation at the same time that the switching



To switch camera with your keyboard:

Make sure all Control panel shortcuts are correctly assigned.

- 1. Press the number corresponding to the desired camera on the numeric keypad of your keyboard.
- 2. Release
- 3. Press Enter on the num pad to start the switching

Vset3D allows you to have movement between camera positions.

To start movement:

- 1. Press the number corresponding to the desired camera on the numeric keypad of your keyboard.
- 2. Release
- 3. Press + on the num pad to start the movement



Start the Movement

Start the Switching

STREAM DECK AND COMPANION



<u>Stream deck</u> or any other device/software able of sending commands over a TCP-IP network.

You can send commands to Vset3D Studio through tcp-udp on Port 7000. Command end character is \n

- To select Camera 1 on Mixer 1, use: setpreview: 0 virtualcamera 0 \n
- To do a 5 seconds smooth transition to Camera 1 on Mixer 1, use: dotransition: 0 fade 5 \n
- To do Cut transition to Camera 1 on Mixer 1, use: dotransition: 0 cut n
- To start Media Player 1, use: mediaplayer: 0 play \n
- To start Animation, 1 use: animation: 0 play n

5. USER INTERFACE

Vset3D Studio User Interface



The user interface of Vset3D Studio is divided into 3 sections. The top section which shows all the tools icons, the middle section which is the 3D editor view, the bottom section which is the statue section.

General Tools Icones



- 1. File: Allows you to load and save project
- 2. Sources: Allows you to add live video inputs, NDI, images, media players, to your project
- 3. Scene: Allows you to navigate and select item in your project
- 4. Inspector: Gives you access to the setting of the selected item
- 5. Animation: Allows you to add animation to the selected item
- 6. Rendering: Allows you to add and manage rendering option
- 7. Mixer: Allows you to add live outputs to your project
- 8. Camera Remote Control: Open Camera Remote window
- 9. Control Panel: Open Vset3D Control Panel
- 10. Open Mixer1 monitor

Creation Tools Icons



- 1. Add Virtual Camera: Allows you to create virtual camera
- 2. Add Camera Facing Plane: Allows you to add plane dedicated to green screen video
- 3. Add Item from library: Allows you to add standard light or fixture, 3D object, primitive
- 4. Add Imported Mesh: Allows you to import single FBX object or full virtual set
- 5. Add Group: Allows you to add dummy objet usefull to group objects in the project

Transform tools lcons



- 1. Move : Allows you to move selected object
- 2. Rotate: Allows you to rotate selected object
- 3. Scale: Allows you to rescale selected object

Editor Quality settings Icons



- 1. Editor OFF : Allows you to turn off 3D editor view to save 3D resources when you are in live.
- 2. Editor quality Draft: Allows you to disable all rendering option available in the Rendering menu
- 3. Editor Quality Full: Allows you to apply all rendering option from the Rendering menu

Editor View Selection



Actions Icons



- 9. Undo
- 10. Redo
- 11. Save Project

Layout menu



Allows you to save and manage Vset3D Studio windows position

Settings Icons



- 1. Settings : Open project settings window
- 2. Open Help window
- 3. Open Exit menu

6. 3D EDITOR VIEW

The user interface of Vset3D Studio is divided into 3 sections. The middle section is the 3D editor view.

In this view you will can :

- Add Vset3D library
- Import FBX
- Create animations
- Add and adjust light settings and positions
- Add and adjust cameras positions and settings
- Scale and move objects
- Orient and zoom Editor view



In the editor view your can use **Tab** to **show/hide** all opened windows and **Escape** to **reset** selected window.

Vset3D Studio User guide



Use the number 1 quality setting icon to stop the editor when you are in live, it will save a lot of GPU

Resources.

Use the control panel to switch your cameras. The Mixer monitor can be used as program monitor.



If you have a dual monitor you can assign the mixer output on the 2nd monitor by selecting Display.



Light Gizmos

- 1. Area light
- 2. Omnidirectional Light
- 3. Direct Light (Sun)
- 4. Spot Light



Camera Gizmos

- 1. Camera Gizmo
- 2. Focus target gizmo. Allows you to adjust camera's Depth of field focus distance.
- 3. Camera target gizmo in Locked to target mode enabled.



Camera Facing Plane

This object is dedicated to green screen video. Use it to display your talent and do Chroma key.



This object is always oriented towards the selected Mixer



Group

Group is an invisible object that allows you to parent Lights or objects

Point Lights Group holds 4 spotlights. Example below :



Primitive Meshes

Vset3D comes with build in primitive objects

- Plane
- Cube
- Sphere Cylinder
- Capsule



7. SETTINGS

UI language

ferences		
I		
V UI		
Language		
EN		~
V Remote		
Interface		
Marvell FastLinQ Edge 10Gbit Network Ad	apter	~
	Interface IP address 192.168	.1.12
Port	70	000
✓ Video settings		
Video Standard		
3840 x 2160 - 25p		~
Render framerate		
MainDisplay		~
✓ Art-Net		
Interface		
Marvell FastLinQ Edge 10Gbit Network Ad	apter	~
	Interface IP address 192.168	.1.12
Mask		
255.255.255.255		
Net		0
Subnet		0
∨ Midi		
Interface		
		\sim
V License		
Serial number		
Inputs 2 - Media Players 2 - Mixers 2 - Vin	ual Cameras 3 - Mesh Import Animation NDI Decki	Link
Machine identifier		
c2d98928e2b565010df5761fa63a8	865df91e3f91	
Activation key		

This Option allows you to set Vset3D UI language

Auto load auto Backup



This Option allows you to manage the Auto load and Auto save options

Vset3D Studio

User guide

Remote

1	
V UI	
Language	
EN	~
V Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
	Interface IP address 192.168.1.121
Port	7000
∨ Video settings	
Video Standard	
3840 x 2160 - 25p	~
Render framerate	
MainDisplay	~
V Art-Net	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
	Interface IP address 192.168.1.12.
Mask 255 255 255	
Not	Ö
	0
Submet	0
V Midi	
Interface	
	~
V License	
Serial number	
-	
inputs 2 - Media Players 2 - Mixers 2 - Vittual Cameras 3 - I	Mesh Import Animation NDI DeckLink.
Machine Identifier c2d98928e2b565010df5761fa63a865df91e3f91	
Activation key	

This option allows you to set network interface used to control Vset3D through IP command

Video Settings

Preferences	
All	
V UI	
Language	
EN	~
V Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interface IP	address 192.168.1.121
Port	7000
∨ Video settings	
Video Standard	
3840 x 2160 - 25p	~
Render framerate	
MainDisplay	~
V Art-Net	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interface IP	address 192.168.1.121
Mask 255 255 255	
Not	0
Rubect	0
Subret	U
∨ Midi	
Interface	
V License	
Serial number	
-	mation NDI Deckl ink
nipuls 2 - Meula Flayers 2 - Mixers 2 - Vitual Cameras 5 - Mesh import Anin	nauon non decklink
c2d98928e2b565010df5761fa63a865df91e3f91	
Activation key	

This option allows you to set the project video resolution and frame rate synchronization method.

Always set frame rate and project frame rate to the same value, otherwise you will face dropped frames

Art-Net

Preferences	
All	
V UI	
Language	
EN	× .
V Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	×
Interfa	ace IP address 192.168.1.121
Port	7000
✓ Video settings	
Video Standard	
3840 × 2160 - 25p	~
Render framerate MainDisplay	~
V/ Art Not	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interfa	nce IP address 192.168.1.121
Mask	
255.255.255.255	
Net	0
Subnet	0
∨ Midi	
Interface	
	~
V License	
Serial number	
Inputs 2 - Media Players 2 - Mixers 2 - Virtual Cameras 3 - Mesh Impo	ort Animation NDI DeckLink
Machine identifier c2d98928a2b565010df5761fa63a865df91a3f91	
Activation key	
-	

This option allows you to adjust the network device setting used by DMX fixtures

Vset3D Studio

User guide

Midi

Preferences	
All	
V UI	
Language	
	~
∨ Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interface IP addre.	ss 192.168.1.121
Port	7000
V Video settings	
Video Standard	
3840 x 2160 - 25p	~
Render framerate	
MainDisplay	~
V Art-Net	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interface IP addre.	ss 192.168.1.121
Mask	
255.255.255.255	
Net	0
Subnet	0
V Midi	
Interface	
	\sim
V License	
Serial number	
Inputs 2 - Media Players 2 - Mixers 2 - Virtual Cameras 3 - Mesh Import Animation	NDI DeckLink
Machine identifier	
C20a0a20650200100121011902900201a1621a1	
-	

This option allows you to select a MIDI device

User guide

License

Preferences	
All	
V UI	
Language	
EN	~
∨ Remote	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	× .
Interface I	P address 192.168.1.121
Port	7000
✓ Video settings	
Video Standard	
3840 x 2160 - 25p	×
Render framerate	
MainDisplay	~
∨ Art-Net	
Interface	
Marvell FastLinQ Edge 10Gbit Network Adapter	~
Interface l	P address 192.168.1.121
Mask	
255.255.255.255	
Ner	0
Subnet	0
∨ Midi	
Interface	
	~
∨ License	
Serial number	
Inputs 2 - Media Players 2 - Mixers 2 - Virtual Cameras 3 - Mesh Import A	nimation NDI DeckLink
Machine identifier	
Activation key	
-	

This option allows you to manage Vset3D Studio license.

Don't forget to send your Machine Identifier to <u>Info@vset3d.com</u> to get your activation Key and Serial Number.

8. TOOLS

File



This window allows you to create, load and save your projects.

Sources



This window allows you to add sources to your project.

Source can be a live video input, NDI stream, video media, png or jpg image.

Vset3D Studio natively supports Blackmagic Decklink devices.

WDM devices are also supported.
Vset3D Studio User guide

Scene



This window allows you to select or show/hide objects from the scene.

You can use the Object, Light, and Camera icons to filter displayed items.

Inspector

Inspector			
₩ () ***			
Name			
Main Camera			
Parent			
None			\sim
₩ @			
Properties C			
Position	-2,66	1,59 z	-10,12
Rotation	10,16	11,55	z 1,27
ISO			
			1000
Shutter speed			
			25,00
Anerture			
			4 75
Feed Length			
Focar Length			25.42
			23,40
Focus Distance			10.00
			10,00

The inspector gives you access to all the parameters and settings of the selected item.

Displayed property depends of the selected item.

Animation

Animations	
Camera 1 animations	+
V Camera 1 Animation 01 ℃	萤
V Animation settings C	
Name	
Camera 1 Animation 01	
Duration	10
Play Mode	
Loop	~
Animation Mode	
Absolute	~
Auto Start	
✓ Key frames C	
Time 0,000 K ▶ 11	
Position N O N + D	
Rotation NON+ 9	
Shutter speed N O N + D	
Aperture KON+	
Focal Length NON+S	
Focus Distance N O D + D	

This window allows you to add animation to selected item.

Displayed Property depends of the selected item

Rendering

Rendering		
✓ Render quality settings		
Render quality		
	100)
Dreset Default Dendering Dreset	×	+
Name Default Rendering Preset		
Add Setting		
		Ň
Ambient Occlusion		H.
Reputify		
Bloom		
ColorAdiustments		
Contact Shadows		
Depth Of Field		

This window allows you to control rendering quality and rendering settings options.

The **Render Quality** slider adjust DLSS value and is only available on RTX NVidia graphic cards.

- RTX 20xx
- RTX 30xx
- RTX 40xx

Add settings allows you to add rendering options.

Today's Available Rendering options:

- Ambient Occlusion
- Beauty
- Bloom
- Color adjustments
- Contact shadows
- Depth of field
- Exposure
- Fog
- HDRI Sky
- Indirect Lighting Controller
- Light Cluster
- Screen Space Global illumination
- Screen Space Reflection
- Split Toning
- Tone mapping
- Vignette
- Visual Environment
- Recursive Rendering (experimental)

Vset3D Studio

User guide

Mixer

Mixers	
∨ Mixer 1	
<i>Name</i> Mixer 1	
∨ Overlays	+
∨ Outputs	Display
	NDI
	Blackmagic device

This window allows you to add video outputs to your project.

Outputs can be another monitor, an NDI stream or a Blackmagic Decklink card.

Camera remote



This window shows you the view of the selected camera and allows you to control this camera with your mouse.

Align to view: set orientation of selected camera same as editor.

Reset Transform: resets the camera position and orientation.

Available mouse controls in this window:

- Wheel = Field of view
- Middle Click = Pan
- Alt + Middle Click = Pan/Tilt
- Ctrl + Middle Click = Roll
- Maj + Wheel = Move forward/backward

```
A + Wheel = Aperture
```

F + Wheel = Focus (Add Depth of Field in the render option to enable it)

Layout



This tool allows you to save Vset3D window position.

- Use **New** to create a new layout slot.
- Use **Reset Current** to clear the active layout.
- Use **Delete Current** to delete active layout.

Use key **Tab** to show/hide all windows

Use key **Esc** to reset selected window.

Control Panel



This tool allows you to switch cameras, control animations and media players.

This is a dynamic window. All buttons are automatically created by Vset3D Studio when you add Camera, Media, Animation and Mixer.

Each button has a keyboard shortcut that can be customized (Use right-click to bring up a button's configuration menu).

Sources Media player

Sources			
			+
Media Player 1			Ш
Playlist			+
00:00:00:00	Þ	Ш	M
Thumbnail			
Infos) - Os
V Settings			
Name			
Media Player 1			
Video Api			
MediaFoundation			\sim
Hardware Acceleration			\checkmark
Auto Start			
Auto Next			\checkmark
Loop			\checkmark
Transition			
None			\mathbf{v}
Transition Duration			
		1,0	00

This window allows you to add media players. Each player can handle several videos in a playlist

Chroma Keyer

Inspector	
t () 🎫	
Name	
Mesh 1 - Facing plane	
Parent	
None	~
= <u>≻</u> ®⊔	
Material C	+
> Material Mesh 1 - Facing plane -	
Open monitor	
Main Texture	ŧ
✓ Chroma keyer	
Key color	
Main found	
Main lever	0.300
Threshold bottom	0,000
0.90	1.00
Threshold top	
0,90	1,00
Transition position	
	0.200
Transition falloff	
	0,500
Soft transition	
0,20	0,80
✓ Matte key	
Matte kev enable	
male key enable	
Matte key source	Ħ
Capture	
✓ Color killer	
Green cast remove	
	0,000
Despill chroma	
	1,000
Despill chroma offset	
	0,000
Despill luma	
	0,000
Despill composite luma	
	0,000

This window allows you to adjust keyer parameters of the selected Facing plane object.

9. UNITY 3D ADDRESSABLES/LIBRAIRY

Vset3D is based on the Unity 3D game engine, which allows you to use Unity's addressable files and create your 3D Set in Unity 3D, then import them into Vset3D Studio as library.

The addressable Library creation documentation comes with the Expert license.





10. MEDIA FILE FORMAT

PNG/JPG

H264/MPEG/MOV/AVI/

11.3D FILE FORMAT

FBX

Vset3D studio supports FBX file format

12. DMX FIXTURES AND LIGHTS

Vset3D comes with fixtures that can be added to your project. They can be animated with the Vset3D animation tool or controlled via DMX device or software.

Generic

- RGB Led Bar
- RGB Spot (PAR 64)
- RGB Spot Moving Head
- RGB Wash
- RGB Wash Moving Head

Clay Paky

• Sharpy

System

- Aera light
- Directional Light
- Point Light
- Spot Light



13. NDI

Vset3D supports Ndi technology from Newtek. Don't forget to install Newtek NDI Runtime and NDI Tools.

14. WDM DEVICES

WDM = Windows Driver Mode

Vset3D Studio supports WDM compliant USB video capture device.

Sources	
	Image
	Media player
	NDI
	Blackmagic device
	WDM

15. BLACKMAGIC DESIGN

Vset3D studio natively supports Blackmagic Decklink devices.

Compatible Video Capture Cards (Tested):

- DeckLink Mini Monitor
- DeckLink Mini Recorder
- DeckLink Mini Monitor 4K
- DeckLink Mini Recorder 4K
- DeckLink Duo 2
- DeckLink 8K Pro
- DeckLink Quad HDMI Recorder
- DeckLink Quad 2

16. MATERIALS

Vset3D comes with build in Materials which can be applied to any object.

Standard

• Use it on opaque object (default material)

Double Sided

• Use it to have both sides of the object visible

Transparent

• Use it to on basic semitransparent object.

Transparent Cutout

• Use it on transparent object

Transparent Refraction

• Use it to on refractive semitransparent object. (ex: glasses)

Unlit

• Use it on an object that will not be affected by ambient light conditions

Unlit Transparent Cutout

• Use it on an object that will be transparent and not affected by ambient light conditions

Water River / Water Lake

• Specialized materials dedicated to dynamic water simulation

Recursive Shaders (experimental at the moment)

Standard Recursive Double Sided Recursive Transparent Recursive Transparent Cutout Recursive Transparent Refraction Recursive

17. VIDEO FORMAT

Preferences	
Language	
EN	× .
∨ Remote	
Interface	
Marvell FastLinQ Edge 10Gbit	Network Adapter 🗸 🗸
	Interface IP address 192.168.1.121
Port	7000
 Video settings 	
Video Standard	
3840 × 2160 - 25p	~
Render framerate	X
manoispiay	· · · · ·
∨ Art-Net	
Interface Marvell FastLinO Edge 10Gbit	Network Adapter
	Interface IP address 192 168 1 121
Mask	
255.255.255.255	
Subnet	
V Midi	
Interface	
	v
V License	
Serial number	
Inputs 2 - Media Players 2 - N	lixers 2 - Virtual Cameras 3 - Mesh Import Animation NDI DeckLink
c2d98928e2b565010df5	761fa63a865df91e3f91
Activation key	

Video format can be set from the Setting window.

Carefully select the resolution and frame rate as they have a direct impact on VSet3D's performances.

High frame rate and high resolution means high GPU load and can lead to dropped frames.

18. DLSS/ RENDER QUALITY SETTINGS

V Render quality Render quality 100 Preset Default Rendering Preset Aum Default Rendering Preset Add Setting Image: ColorAdjustments ColorAdjustments Contrad Shadows Depth Of Field Image: ColorAdjustments
Render quality 100 Preset Default Rendering Preset + Name Default Rendering Preset - Add Setting - - Authient Occlusion - - Beaulity - - ColorAdjustments - - Contact Shadows - - Depth Of Field - -
Preset Default Rendering Preset Name Default Rendering Preset Add Setting Image: ColorAdjustments ColorAdjustments Image: ColorAdjustments Depth Of Field Image: ColorAdjustments
Preset Default Rendering Preset Name Default Rendering Preset Add Setting Image: Colurion image: ColorAdjustments Contract Shadows Depth Of Field
Name Default Rendering Preset Add Setting Ambient Occlusion Beaufly Bloom ColorAdjustments Contact Shadows Depth Of Field
Name Default Rendering Preset Add Setting Annbient Occlusion Beaufity Bloom ColorAdjustments Contact Shadows Depth Of Field
Add Setting
Ambient Occlusion Beautify Bloom ColorAcijustments Contaci Shadows Depth Of Field
Ambient Occlusion Beautify Bloom ColarAdjustments Contact Shadows Depth Of Field
Amblent Occlusion Beaufity Bloom ColaAdjustments Contact Shadows Depth Of Field
Beaulity Bioom ColorAdjustments Contact Shadows Depth Of Field
LolorAdjustments Contad Shadovs Depth Of Field
Contad Shadows Depth Of Field
Dopth Of Field

Render Quality Settings. This slider adjusts the DLSS level.

DLSS is upsampling technology based on Deep learning and AI. DLSS allows you to reduce the GPU load on 4K projects.

You need compatible **NVidia** GeForce RTX 20xx, RTX 30xx, RTX 30xx graphics card to use DLSS.

19. RENDERING SETTINGS

Ambient Occlusion

Adds a shadow to the contact area between objects and in the corners of the decor.

Beautify

Adds sharpness parameter to the render engine

Bloom

Adds glow on Highlight image parts

Color Adjustments

Adds color & contrast parameter to the render engine

Contact Shadows

Enhances shadow quality at the surface contact (works only with Directional light)

Depth Of Field

Adds camera depth of field control to the render engine

Exposure

Overrides camera exposure

Fog

Adds fog fx to the render engine (must be added to use volumetric lights)

Gradient sky

Adds 3 color gradients sky to the render (needs Visual environment)

HDRI Sky

Allows you to use HDRI image as Sky (needs Visual environment)

Indirect Lighting Control

Adds intensity control on Global illumination and reflection

Screen Space Global illumination

Adds indirect lighting support to the render (supports real-time ray tracing on NVIDIA graphic cards)

Screen Space Reflection

Adds refection support to the render (supports real-time ray tracing on NVIDIA graphic cards)

Screen Space Refraction

Adds refraction support to the render (supports real-time ray tracing on NVIDIA graphic cards)

Tone Mapping

Adds overall image lighting curve control to the render engine

Vignette

Reduces peripheral image brightness

Visual Environment

Adds Sky to the render engine

20. PTZ CAMERA TRACKING

This Expert license feature is not yet available.

21. HOW TO

How to Add Light

1. Select add library icon



2. Select one light from the Lights Library



- 3. Press Add or double click on it
- 4. Double click on the light in the 3D view to open the **Inspector** window
- 5. Adjust light parameters

How to Add Camera

1. Select Add Virtual Camera icon, the Camera will be created at the same orientation as the editor 3D view.



- 2. Double click on the Camera gizmo in the 3D view to open Inspector window
- 3. Adjust Camera parameters

Mouse camera controls available from Editor view:

Wheel	=	Move Backward/Forward
Middle Click	=	Pan
Alt + Middle Click	=	Camera orientation
Double Left click	=	Object selection

Inspector					
₩ () ##					
Name					
Main Camera					
Parent					
None					\sim
₩ ©					
Properties C					
Position	x	-2,66	1,59	z	-10,12
Rotation	x	10,16	11,55		z 1,27
ISO					
	0				1000
Shutter speed					
					25,00
Anerture					
					4.75
Focal Lepath					
					25.43
Foous Distance					
Focus Distance					10.00
					10,00

How to Create an Empty Project

1. Open File menu



- 2. Select New
- 3. Select the **Empty** template in the library
- 4. Enter project Name
- 5. Set **Directory** if needed
- 6. Press Create

File		\Box \Box \times
Open		
New 2	Name New VSET3D project 4	
Save As	Directory C:\Users\admin\Documents\Vset3D 5	
Save	Virtual set template	
Exit	3	
	Empty Set062	
	6 Create	2

How to Import FBX File

1. Press Add Imported Mesh



- 2. Browse your FBX Object
- 3. Double click on any object in the 3D view to open **Inspector** window



How to Setup a basic Ray Traced Project

Ray trace is only available on DirectX 12

- 1. Create a new project
- 2. Add Camera
- 3. Add light
- 4. Import a 3D Set or 3D object
- 5. Open Rendering Window



- 6. Press Add Settings then ...
 - a. Add Visual Environment (Select gradient Sky)
 - b. Add Gradient Sky
 - c. Add Screen Space Global Illumination (Select Ray tracing option)
 - d. Add Screen Space Reflection (Select Ray tracing option)
 - e. Add Exposure (Select Physical camera)

Rendering			
∨ Render quality settings			
Render quality			
		100	
Preset	Default Rendering Preset	× +	
Name	Default Rendering Preset		
Add Se	tting <mark>6</mark>		
		~	
✓			
An	Ambient Occlusion		
Beautify			
DIC CO	uni IorAdiustmente	_	
C0	ntact Shadows		
De	oth Of Field		

You can now explore all rendering settings to set the desired lighting condition.

Remember to use camera aperture, shutter speed and iso to adjust overall exposure.

Vset3D Studio User guide

How to Import Custom 3D Set In FBX

- 1. Create an empty project
- 2. Press Add Imported Mesh
- 3. Browse your FBX Set



How to Import Vset3D library

Select library icon



- 2. Select Virtual Set
- 3. Select a thumbnail
- 4. Double click on it or press Add



How to Add Live Input or media

1. Open Sources menu



- 2. Press the plus icon (+) at the top right corner
- 3. Select the desired source type

Sources 🗖 🗆 X		
▶ 目 근 2		
	Image	
M	ledia player	
	NDI	
Black	kmagic device	
	WDM	

4. Adjust its parameters

Sources			$\square \times$
🖬 🔲 E			+
Media Player 1			Ť
Playlist			+
00.00.00.00	M	11	M
Thumbnail			
Infos) - OS
∨ Settings			
<i>Name</i> Media Player 1			
Video Api			
MediaFoundation			\sim
Hardware Acceleration			\checkmark
Auto Start			
Auto Next			\checkmark
Loop			\checkmark
Transition			
None			\mathbf{v}
Transition Duration		1,0	00

How to Add Live Output

1. Open the Mixer menu



- 2. Press the plus icon
- 3. Press V Mixer 1
- 4. Press > Output
- 5. Select the desired Output method

Mixers	= = × 2+
3 ∨ Mixer 1 <i>Name</i> Mixer 1 V. Overlave	
4 V Outputs	5 Display 5 NDI 5 Blackmagic device

Vset3D Studio User guide

How to Set Project Resolution & Frame rate

1. Open Setting menu



- 2. Press > Video Settings
- 3. Set the video standard and Render Frame rate

Preferences			×
All			
Language			
EN		\sim	
V Remote			
Interface			
Marvell FastLinQ Edge 10Gbit Network Adapter		\sim	
Interface IP address 1	92_168	.1.121	
Port	70	000	4
2 v Video settings			
Video Standard			
3 3840 × 2160 - 25p		~	
Render framerate		V	
✓ Art-Net			
Marvell FastLinQ Edge 10Gbit Network Adapter		~	
Interface IP address 1	92.168	1.121	
Mask			
255.255.255.255			
		0	
Subnet		0	
∨ Midi			
Interface			
		~	
V License			
Serial number			
Inputs 2 - Media Players 2 - Mixers 2 - Virtual Cameras 3 - Mesh Import Animation ND	l Deck	Link	
Machine identifier			
C20969262D50501001576114034605019163191			

The Render Frame rate option sets Vset3D vertical synchronization method (MainDisplay by default)

How to activate Volumetric light $\ensuremath{\mathsf{FX}}$

- 1. Set basic Ray traced project
- 2. In the Rendering Setting Add Fog setting
- 3. Use inspector to adjust Spot light Volumetric settings

Inspector	
₩ (2 :::	
Name	
Light 1 - Spot	
Parent	
None	~
≢ <u>©</u> ⊡	
Settings C	
> Light	
> Shadows	
∨ Volumetric	
Affects Volumetric	\checkmark
Volumetric Dimmer	
	5,00
Volumetric Shadow Dimmer	
	1,000
Volumetric Fade Distance	
	10,00

How to Animate object, camera or light

1. Select an Object or Light from the 3D view



2. Open Animation windows



- 3. Press the plus icon
- 4. Press > to deploy the parameters
- 5. Press Key Frames to deploy the Key framer
- 6. Press Position + to add key at the current time
- 7. Change Time
- 8. Move the object in the 3D view
- 9. Press Position + to add key at the new time

Animations	
Light 1 - Spot animations	3+
V Light 1 - Spot Animation 01 C	T
4 V Animation settings C	
Name	
Light 1 - Spot Animation 01	
Duration	10
Play Mode	
Loop	~
Animation Mode	
Absolute	~
5 V Keytrames C	
Time 3,07 K N ▶ II	
Position 🛛 🖻 😼 🔶	
Rotation KON+	
Color Color	
Dimmer K • + +	

You can do the same for all available parameters. Displayed parameters depend on selected item
How to add item to the Control panel

- 1. Select + icon
- 2. Select the item



VIDEO STANDARD AND FRAME SYNCRONISATION

You must set computer refresh rate and resolution according to your project.

To work properly, Vset3D must be running on a perfectly synchronized computer, which means that your Windows display setting must be set according to the resolution and frame rate of your project.

All media, live video and monitors must be played, streamed or set to the same frame rate.

The entire workflow should run at the same frame rate.

Use Windows NVidia Settings to set the frame rate :

Connecteur :	
DisplayPort - Écran de PC	
Résolution :	Fréquence de rafraîchissement :
Personnalisé	25 Hz
3840 × 2160	60 Hz
1020 × 1080	30 Hz
1920 ~ 1000	= 25 Hz
PC	24 HZ
3840 × 2160 (Natif)	
3840 × 1080	
2560 × 1600	
2560 × 1440	

Setup your computer for a 25 Fps 1080 Project

- 1. 1. Make sure your computer monitor supports 25Hz
- 2. Open the Nvidia display settings and set the frequency to 25Hz

Sélectionnez l'afficha	age à modifier.		
Eizo CS2740	ViewSonic VP2785 (1 sur 2)	ViewSonic VP2785 (2 sur 2)	
Chaicissan la résolut	lon		
Choisissez la resolut	ion.		
Connecteur :			
Connecteur : DisplayPort - Éc	ran de PC		
Connecteur : DisplayPort - Éc Résolution :	ran de PC	Fréquence de rafraîch	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé	ran de PC	Fréquence de rafraîch 60 Hz	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé 3840 × 2160	ran de PC	Fréquence de rafraîch 60 Hz 60 Hz	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé 3840 × 2160 1920 × 1080	ran de PC	Fréquence de rafraîch 60 Hz 60 Hz 30 Hz 25 Hz	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé 3840 × 2160 1920 × 1080 PC	ran de PC	Fréquence de rafraîch 60 Hz 30 Hz 25 Hz 24 Hz	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé 3840 × 2160 1920 × 1080 PC 3840 × 2160 (Natif)	ran de PC	Fréquence de rafraich 60 Hz 60 Hz 30 Hz 25 Hz 24 Hz	issement :
Connecteur : DisplayPort - Éc Résolution : Personnalisé 3840 × 2160 1920 × 1080 PC 3840 × 2160 (Natlf) 3840 × 1080	ran de PC	Fréquence de rafraîch 60 Hz 50 Hz 30 Hz 25 Hz 24 Hz	issement :
Connecteur : DisplayPort - Éci Résolution : Personnalisé 1920 × 1080 PC <u>3840 × 2160</u> (Natif) <u>3840 × 1080</u> 2560 × 1600	ran de PC	Fréquence de rafraîch 60 Hz 30 Hz 25 Hz 24 Hz	issement :

If the 25Hz is unavailable, create it with Customize menu

- 3. Open Vset3D Studio Settings menu
- 4. Select Video Settings
- 5. Select 1920 X 1080 25P as video Standard
- 6. Select MainDisplay as Render FrameRate

Preferences	
All	
> UI	
> Remote	
✓ Video settings	
Video Standard	
1920 x 1080 - 25p	~
Render framerate	
MainDisplay	×
> Art-Net	
> Midi	
> License	

Setup your computer for a 30 Fps 1080 Project

- 1. 1. Make sure your computer monitor supports 30Hz
- 2. Open the Nvidia display settings and set the frequency to 30Hz

Eizo CS2740	ViewSonic VP2785 (1 sur 2)	ViewSonic VP2785 (2 sur 2)	
Choisissez la résolut	ion.		
DisplayPort - Éc	ran de PC		
DisplayPort - Éc Résolution :	ran de PC	Fréquence de rafraîc	nissement
DisplayPort - Éo Résolution : Personnalisé	ran de PC	Fréquence de rafraîch	nissement
DisplayPort - Éc DisplayPort - Éc Résolution : Personnalisé 3840 × 2160	ran de PC	Fréquence de rafraîch 60 Hz 60 Hz	nissement
DisplayPort - Éc Aésolution : Personnalisé 3840 × 2160 1920 × 1080	ran de PC	Fréquence de rafraîch 60 Hz 60 Hz 30 Hz 30 Hz	nissement
DisplayPort - Éc Adsolution : Personnalisé 3840 × 2160 1920 × 1080 PC	ran de PC	Fréquence de rafraid 60 Hz 30 Hz 25 Hz 24 Hz	nissement
DisplayPort - Éc Lésolution : Personnalisé 3840 × 2160 1920 × 1080 PC 3840 × 2160 (Natth)	ran de PC	Fréquence de rafraid 60 Hz 30 Hz 25 Hz 24 Hz	nissement
DisplayPort - Éc Sésolution : Personnalisé 3840 × 2160 1920 × 1080 PC 3840 × 2160 (Nath) 3840 × 1080	ran de PC	Fréquence de rafraid 60 Hz 60 Hz 30 Hz 25 Hz 24 Hz	nissement

If the 30Hz is unavailable create it with the Customize menu

- 3. Open Vset3D Studio Settings menu
- 00
- 4. Select Video Settings
- 5. Select 1920 X 1080 30P as video Standard
- 6. Select MainDisplay as Render FrameRate



HARDWARE

Hardware

- Processor Intel / AMD
- NVidia GeForce RTX 20xx, RTX 30xx, RTX 30xx graphic cards.
- 16Gb Ram.
- BlackMagic DeckLink Video capture card.
- Operating System Windows 10 or 11 64Bits.

Reference computer 1:	Reference computer 2:
 Asus ROG Maximus Z690 Formula I7 1200KF RTX 3090 32 GBytes 	 Asus WX 299 Sage I7-7820 3.6Ghz RTX 3080 32 GBytes
Reference computer 3:	Reference computer 4:
 Asus WX 299 Sage I7-7820 3.6Ghz RTX 2070 16 GBytes 	 Asus WX 299 Sage 17-7820 3.6Ghz RTX 1080 32 GBytes

Vset3D primarily uses the GPU for all calculations, so if you are planning large project with lots of polygons, objects, textures, 50 or 60 fps, choose the biggest GPU possible.

Make sure your project does not exceed the memory capacity of the graphic card to avoid shared memory usage.

Using shared memory will cause performance to drop drastically

When installing the graphics card in the computer, make sure you have enough free PCIe lanes to ensure that the graphic card bus interface will operate at full speed. Use <u>GPU-Z</u> to check it.

PCIe lanes are the physical link between the PCIe-supported device and the processor/chipset.

FechPower	Jp GPU-Z 2.46.0)		
Graphics Card	Sensors Advance	ced Validatio	n	≣ Ø 181
Name	NVIDIA G	Lookup		
GPU	GA102	Revision	A1	
Technology	8 nm	Die Size	628 mm ²	
Release Date	Sep 1, 2020	Transistors	28000M	NVIDIA
BIOS Version	94.	02.42.00.A7		[🗹 🔽 UEFI
Subvendor	Palit	Device	ID 10DE 2	204 - 1569 2204
ROPs/TMUs	112/328 B	us Interface	PCIe x16	4.0 @ x16 4.0 ?
Shaders	10496 Unifie	ed Direc	tX Support	12 (12_2)
Pixel Fillrate	189.8 GPixel/s	Texture	Fillrate !	556.0 GTexel/s
Memory Type	GDDR6X (M	icron)	Bus Width	384 bit
Memory Size	24576 MB	Ban	dwidth	936.2 GB/s
Driver Version	30.0.15.12	96 (NVIDIA 5	512.96) DCH	/ Win11 64
Driver Date	May 19, 2022	2 Digital	Signature	WHQL
GPU Clock	1395 MHz M	emory 1219	MHz Bo	oost 1695 MHz
Default Clock	1395 MHz M	emory 1219	MHz Bo	oost 1695 MHz
NVIDIA SLI	Disabled	Res	izable BAR	Enabled
Computing	OpenCL 🔽	CUDA 🔽 🛛	DirectCompu	ite 🔽 DirectML
Technologies	🔽 Vulkan 🛛 🔽	Ray Tracing	PhysX	V OpenGL 4.6
NVIDIA GeForce	e RTX 3090	~		Close

LAPTOP COMPUTERS

Vset3D Studio can be operate on high performances laptop.

Don't forget Vset3D is a video production software and needs to be in sync with all your video inputs and outputs.

So when you choose your laptop, make sure it will be able to operate at video standard frequency.

This two points must be verified:

- Make sure its default frame rate is not 120Hz or higher.
- Make sure its display can be set to 50 or 25 Hz if you plane PAL projects.

If you are in one of the above cases, you can use an external monitor to set the appropriate frame rate.

Always set the display frame rate and project frame rate to the same value, otherwise you will face dropped frames

		fichage à modif	Sélectionnez l'affi
7705	02785	ViewCo	Eizo (S2740
)	2)	(1	EI20 C32740
		olution.	Choisissez la réso
			Connecteur :
		- Écran de PC	DisplayPort -
ence de rafraïchissement :			Résolution :
z v			Personnalisé
Z			3840 × 2160
7			1920×1080
Z			PC
		atif)	3840 × 2160 (Na
			3840×1080
			2560 × 1600
			2560 × 1440
Z		atif)	PC <u>3840 × 2160 (Na</u> 3840 × 1080 2560 × 1600 2560 × 1440

SHORTCUTS

Here is the list of shortcuts available in Vset3D Studio

Ctrl + z	Undo
Ctrl + y	Redo
Ctrl + s	Save
R	Select the rotate tool
Μ	Select the moving tool
S	Select the scaling tool
Alt + Middle Click	Camera orientation
Tab	Show Hide user interface
Esc	Reset selected window
Alt + Middle Click	Pan/Tilt
Ctrl + Middle Click (in the camera remote view)	Roll
Maj + Wheel (in the camera remote view)	Move forward/backward
A + Wheel (in the camera remote view)	Aperture
F + Wheel	= Focus (Add Depth of Field in the render option to enable it)

GPU LOAD OPTIMISATION

Lights count, polygons count, textures count and size, Live outputs or inputs, render FX, Ray tracing, Shadow... All of these have direct impact on GPU load. To maintain stable frame rate and avoid frame dropping, use with care.

The following list shows their estimated GPU load.

	High Load	Moderate Load	Low Load	Requires a lot of GPU RAM
Ray tracing				
Ray traced shadows				
High polygons count				
Global illumination				
Animation				
DMX fixtures				
Volumetric light				
Volumetric Fog				
Volumetric Shadow				
NDI Out				
NDI In				
Decklink Blackmagic Out				
Decklink Blackmagic In				
Media player				
4K texture				
Chroma Keyer				
Camera Depth of Field				
Reflection				
Refraction				
Recursive				
25/30 Fps Project				
50/60 Fps Project				
1080 Project				
4K Project				
Control panel				
Editor view				

Mixer View

Don't forget to use Render Quality Settings slider to save GPU load (DLSS)

VSET3D STUDIO VERSIONS FEATURES

*Only on Nvidia

** This Starts Vset3D in DirectX11 >> **STUDIO.exe -force-d3d11**

GRAPHIC CARDS

Vset3D Studio is designed to use specific features of the NVidia RTX series such as real-time ray tracing and DLSS.

But you can pretty much use any decent gaming graphics card if you don't need real-time ray tracing. AMD GPUs are suitable for non Raytrace projects.

Vset3D Studio does not take advantage of the multi-GPU setup.

Since Vset3D Studio uses the DirectX API, it is not recommended to run it on a Quadro GPU.

Features	Studio Demo	Studio Basic	Studio	Studio Expert
Watermark	\checkmark	X	X	X
Inputs	3	2	10	10
Mixers (Simultaneous Outputs)	2	2	4	4
Media Players	2	2	10	10
Virtual Cameras	5	5	20	20
Import	\checkmark	\checkmark	\checkmark	
Animation	\checkmark	\checkmark	\checkmark	\checkmark
Object Parenting	\checkmark	\checkmark	\checkmark	\checkmark
NDI In Out	\checkmark	\checkmark	\checkmark	
Decklink Blackmagic In Out	\checkmark	X	\checkmark	\checkmark
DMX Fixtures	\checkmark	X	\checkmark	\checkmark
Art-Net	\checkmark	X	\checkmark	\checkmark
MIDI	\checkmark	\checkmark		\checkmark
FreeD	\checkmark	X	X	\checkmark
DLSS Nvidia *	\checkmark	\checkmark	\checkmark	
FBX Importation	\checkmark	\checkmark	\checkmark	\checkmark
Unity3D Addressable	\checkmark	\checkmark	\checkmark	\checkmark
Primitive Objects	\checkmark	\checkmark		
Ambient Occlusion	\checkmark	\checkmark	\checkmark	
Bloom	\checkmark	\checkmark	\checkmark	\checkmark
Color Correction	\checkmark	\checkmark	\checkmark	
Depth of field	\checkmark	\checkmark	\checkmark	\checkmark
Fog	\checkmark	\checkmark	\checkmark	\checkmark
HDRI Sky	\checkmark	\checkmark		
Indirect Lighting	\checkmark	\checkmark	\checkmark	
Global Illumination	\checkmark	\checkmark	\checkmark	\checkmark
Real Time Ray tracing*				
Real Time Reflection	\checkmark	\checkmark	\checkmark	\checkmark
Real Time Refraction	\checkmark			
DirectX12	\checkmark			
DirectX11**	\checkmark	\checkmark		
Windows 10/11 64Bits	\checkmark	\checkmark	\checkmark	
Customer Extend Support	X	X	X	
Unity Addressable kit	X	X	X	