Vertex User Manual

December 2025
1.

Welcome

1 Welcome

Welcome to the VERTEX User Manual!

Mobile Navigation

Do you read this Manual on your mobile phone?

Just **swipe from left to right to open the topic tree and the navigation**

Version and publishing state

This Manual is based on Vertex Version: 2025 R2

Last changes to this manual: 12/16/2025

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This manual is a work in progress.

It will be continuously growing alongside VERTEX's feature list.

If you find there is something missing in our documentation, please write an email to vertex.support@rossvideo.com.

Reporting Bugs or Requesting Features

VERTEX is carefully tested by the team of Ross Experiential Technologies and many beta users.

Nevertheless, bugs can occur. Or maybe you have a feature request that should be implemented into VERTEX.

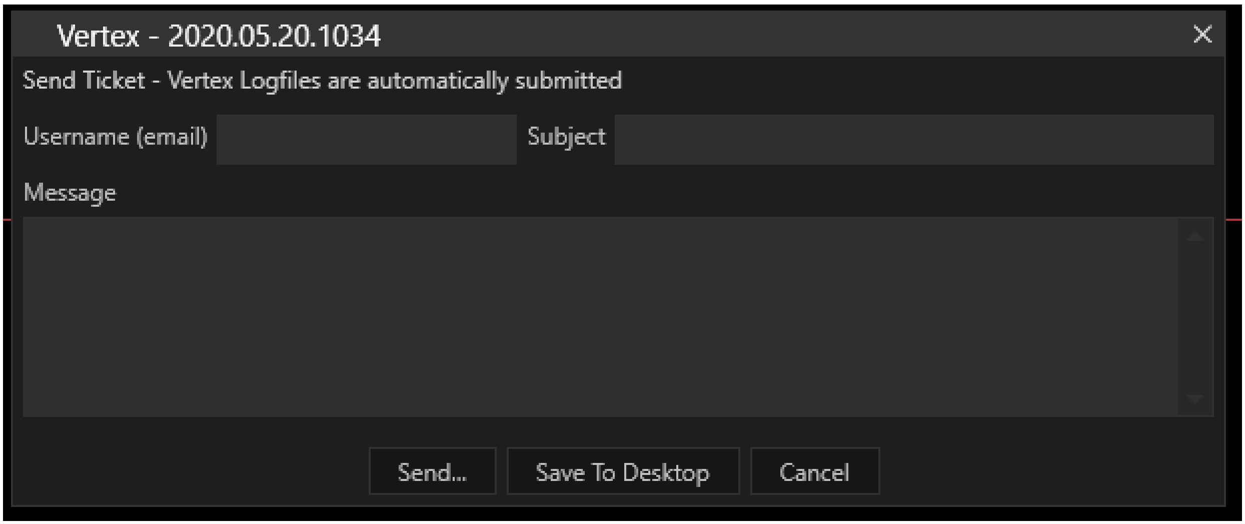
Please report your bugs and feature request and help us making VERTEX better.

Ross Experiential Technologies and our support team are ready to help you with any questions.

Just **drop us an e-mail to vertex.support@rossvideo.com.**

Or send a **support ticket directly out of VERTEX** via *MAIN MENU > HELP >* ***Send Ticket*****.**

This has the advantage that log files and error messages will be automatically sent as an attachment.


Vertex - 2020.05.20.1034

Send Ticket - Vertex Logfiles are automatically submitted

Username (email)

Subject

Message

Open "Help" into the Main Menu on top and select "Send Ticket"

Questions

Write us an e-mail: vertex.support@rossvideo.com

Introduction

2 Introduction

What is VERTEX?

VERTEX

- is a real-time AV Production Suite - more than simply a media server!
- offers a multi user work environment for visual and audio content, programming devices and management of control data.
- has got a discrete preview function that allows for editing and monitoring your show independently from the main output(s) - regardless of time or space
- is a versatile toolbox making your daily work easier and, above all, quicker.

VERTEX Principles

- Focus on a quick and easy workflow for everyday standard tasks.
- VERTEX takes care of your project data and its sharing - even in multi client environments.
- Clean UI for basic tasks. Additional editors and settings exist when higher complexity is needed.
- Cue-sheet, Playlist, Shotbox or timeline-based Sequence - choose your preferred type and workflow.
- Use 2D and/or 3D previews - VERTEX suits your project's needs. Why working in a 3D environment when there is no need for that in your project?
- Prepared for complex task and control logic: link devices, stream media and add a logic - from easy level up to advanced installations.
- VERTEX accompanies you from simple to complex projects.

Software License, Functionality and Options

Licensing Information
What's on the screen? User Interface & Rendered Output
Running Multiple VERTEX Systems in a Network Session

2.1 Licenses and Editions

- VERTEX licensing editions allow a highly flexible setup.
- Cost effective editions complement one another. The extend to their functionality is tailored to the needs of our clients with multi-system setups.
- License purchase is available online at www.ioversal.com
- A license can be be either authorized on a PC system or on a dongle.
- Licenses can be activated and de-activated from within VERTEX, as well as managed online in the user account settings.

VERTEX Editions

To give our clients the highest flexibility in planning their projects, we offer **various Vertex license editions:**

Trial Version

Free and with full functionality that is interrupted by a watermark.
Can only connect to other trial versions, but not to licensed systems.

Designer

Offline programming environment.
Can connect to a Director for real-time collaboration on site.

Director

Core control system for a Vertex cluster.
Allows for programming and control of shows and timelines.

Show Control Option

Add-on to Director edition. Required for third-party control, interactive logic and scheduling in Vertex.

Node

Video rendering only. Director is required for programming.

Solo

Programming and rendering on a single stand-alone system.
No connection to Nodes possible.

	Vertex License Editions				
Supported Features:	**Trial**	**Designer**	**Director**	**Node**	**Solo**
Programming	√	√	√	x	√
Rendering	√ interrupted by watermark	x	x	√	√
Audio Output	√ interrupted	√	√	√	√
Control View	√	√	√	x	√
Show Control	√ interrupted	x	√ requires Show Control Option	x	x
Stand Alone	√	x	√	x	√
Session Mode	√ only with other Trial systems	√ requires Director system	√	√	x except with Solo-Backup or Director

One single Installer for all VERTEX editions

Version handling made as easy as possible - you still need one single installer. The feature and output restrictions of those editions lies in your license key.

You have full flexibility to run any VERTEX edition from a single installation by changing the license key without the need to re-install.

Update-Plan and Renewal

- from activation date, every license is automatically subscribed to an **update plan for 1 year.**
- the end of such a 1 year update subscriptions is called the **expiry date of a license**
- when the expiry date is reached, a license will still work for all software versions up until this point.
- however, all software updates after the expiry date will only run in TRIAL mode until the subscription to VERTEX's update plan is renewed.
- a renewal to a licence's 1-year-update-plan subscription can be purchased at any time.

2.2 User Interface and Fullscreen Renderer

There are several ways VERTEX can be displayed on a PC system:

- Per default, VERTEX shows the user interface for editing and programming when a new project is being created.
- In fullscreen mode VERTEX only displays the rendered output(s) without the UI being visible.
- Also possible and not uncommon is a combination of the two - for instance UI on screen 1 and rendered output on screen 2.

The following options are depending on your license model and system hardware:

- VERTEX SUITE offers full flexibility in setting and/ or combining UI and FS.
- EDIT, PLAY & TOUCH Editions only work in the assigned context with the sole purpose they are named after.
- Complex projects require multiple systems at times, connected in a so-called session. Go to Multi-Systems Design to learn more.

2.3 Multi-System Application

VERTEX is designed to work as a swarm of individual systems where every information and setting is shared.

- **A network / cluster** of various systems connected **is called a VERTEX Session.**
- There is always one system responsible for Project data handling in a so called **Master Role.**
- All other Systems are called **Session Members** that can work in UI mode or in fullscreen mode (or in both)
- **The multi-systems design** of VERTEX is **based on individual components** handling different tasks.

For an in-depth overview, please read the chapter Multi System Configuration.

Installation and Setup

3 Installation and Setup

3.1 Hardware Requirements

> ❗ VERTEX is build to run on a 64 bit Windows platform only to ensure optimal performance for your System.
> **Platforms that are running on 32 bit CPU architecture are not supported.**

- Windows 10 & 11 (recommended: Pro or Enterprise)
- 64Bit CPU/ OS platform
- Network Card (Ethernet strictly recommended!!) Minimum 1gb - 10gb recommended for e.g. content transfer
- Graphic Card (Pro Level for complex rendering tasks, Gaming level for standard tasks)
- free choice of your hardware:
  - low for standard playout tasks (e.g. kiosk modes or digital signage Systems)
  - high performance hardware for live events or complex tasks
- Additional *ioversal io* interfaces for DMX-512 or Timecode
- SSD or even better NVMe Drive for Content handling and System folder

Recommended Hardware Requirements

CPU

- VERTEX needs a **balance between single-core speed and amount of CPU Cores**. Ideal are single-core speeds above 4GHz and 8 Cores and more.
- We do not recommend a dual CPU. **Avoid dual CPU Systems** - opt for a single CPU with high core speed

GPU

- VERTEX requires a **GPU compatible with Direct X11** or higher.Nvidia Quadro Cards are recommended for demanding projects with multiple outputs per System, but Nvidea GeForce Series or AMD work as well.
- When working with a higher number of outputs or high resolution, try to test a NVidia Mosaic (or AMD Eyefinity) setup. Our internal tests indicates that these drivers perform significantly better on high number of screens or high resolutions as the OOTB-Windows solution.

Storage and RAM

- VERTEX relies on fast data transfers.NVMe drives are recommended for compressed video playbacks and NVMe RAIDs for high performance uncompressed playback.
- Fast System RAM is essential to all tasks. Opt for highspeed RAM as possible

Quick Tips

- **Consult with your local hardware partner** to find the best solution for your project
- When **using notebooks**, check that Microsoft Windows is using the **dedicated GPU** and not the internal one.
- **Notebooks acting as UI and Playout System** will only work smoothly if the **external and internal displays run on the dedicated GPU**.
  Using Notebooks in such a setup is not recommended and can lead to bad performance
- Using **multiple NVIDIA Quadro cards is possible** but **requires special skills** for setup.
- Check your Systems **energy saving settings** to ensure that **no processor throttling** is active
- VERTEX supports standard audio devices as well as ASIO Devices. **For reliable synchronization use ASIO** enabled audio devices
- Compressed Video Formats such as H264 and Apple ProRes depend more CPU performance than on the disk speed while uncompressed formats such as image sequences require fast storage

Virtual Machines

Licenses are not working on virtual machines and virtual desktops, except Bootcamp on Apple Hardware
The VERTEX License System does not support software installations that run on virtual machines.
It is **not possible to activate** a VERTEX License when Windows 10 is hosted by **Virtual Box, VMware and Parallels.**

Apple Hardware: When Windows is started with **Bootcamp**, the License is not blocked and VERTEX should run.

3.2 Installation

- **How to install VERTEX** on your PC.
- Required **Windows components** for VERTEX.
- Check if **VERTEX Background Services** are running after your installation and even better: **reboot your System once**.

Install VERTEX

SAME INSTALLER FOR TRIAL VERSION AND LICENSED VERSION

Whether you want to try the VERTEX trial version or buy a license: the installer is always the same.

You can convert the trial version to a licensed version with a dongle or license activation.

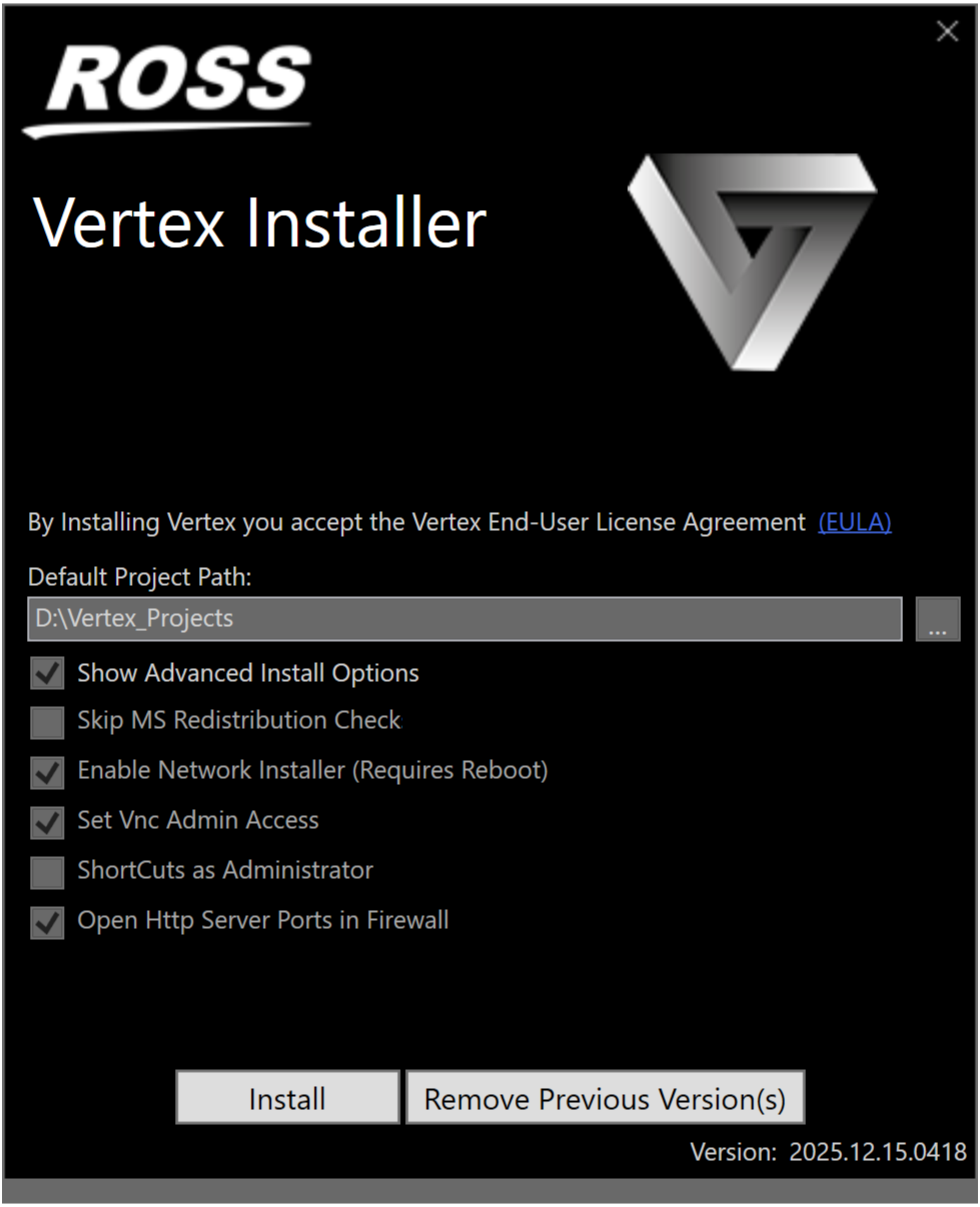
If a licensed VERTEX version has been previously installed, your license will be inherited.

VERTEX comes with some third party components that need **C++ Redistributable** packages (2008, 2012 and 2015-2019) for which the installer will search your PC.

If none of them have been previously installed, the installer will ask you for each of the 3 packages to install.

After each Redistributable package is installed, please continue by pressing the "Install" Button again.

1. **Download** the latest VERTEX version from www.ioversal.com
2. **Start the VertexInstaller.exe** on your PC
3. After the installer has been launched, please **double check** the *Default Project Path*.
   We strongly recommend **using a fast drive for the project path.**
   You'll be able to change this path at a later point. To avoid performance issues, always set the project path to a fast drive.
4. Follow the instructions. The installer will display status updates on the installation progress.



Vertex Installer

By Installing Vertex you accept the Vertex End-User License Agreement (EULA)

Default Project Path:

D:\Vertex_Projects

☑ Show Advanced Install Options

□ Skip MS Redistribution Check

☑ Enable Network Installer (Requires Reboot)

☑ Set Vnc Admin Access

□ ShortCuts as Administrator

☑ Open Http Server Ports in Firewall

Version: 2025.12.15.0418

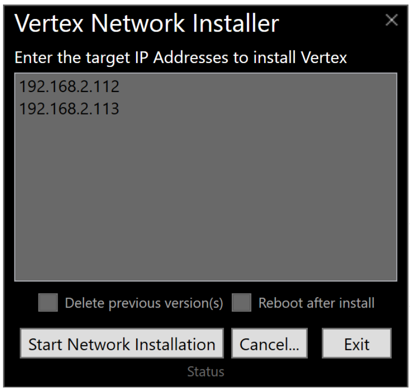
Skip MS Redistribution Check	You may skip the check for C++Redistributable packages, if Vertex has been previously installed on this PC.

Enable Network Installer	If you need to install Vertex remotely in your network, check this box and the required components will be installed.
Set VNC Admin Access	When a VNC server is not in admin mode, dialogue windows will not be popping up, suppressing the user's access.
ShortCuts as Administrator	Enable and VERTEX's desktop shortcuts will always run in admin mode.
Disable UAC / Administrator Prompts	Disabling the User Account Control is not recommended. All running applications will gain full admin access which can be a high security risk.
Open Http Server Ports in Firewall	Required for the use of VERTEX's WebView feature.

- After your first installation we recommend a system restart. Thereafter, please confirm that VERTEX Service is running in the background.
- If you run the installer to update a licensed version of vertex, the newer version will run under your license unless your license's update plan has expired. Then VERTEX will automatically run in trial mode. In this case, you may go back to your older version or you may contact us to renew your update plan. Also, it is possible to have multiple versions of VERTEX installed.

Remote Installation

When using a setup with multiple systems, *Vertex Network Installer* offers a quick way to update VERTEX remotely from the master system onto its session members within the network - without having to copy or download an installer onto the other systems. Click on *Remote Installer...* in the installer window. A second installer window will appear:


Vertex Network Installer

Enter the target IP Addresses to install Vertex

192.168.2.112
192.168.2.113

- *Network Installer* only works if this feature's checkbox has been enabled at a previous installation on the target system. Meaning you'll need to install VERTEX the conventional way from an installer on the target system at least once before remote deployment.
- Windows network discovery and file & printer sharing needs to be enabled, as well as the optional *SMB 1.0 CIFS Support.*
- Enter either the target system's name or IP.

Check if .Net 4.8 is installed on your Windows Built - especially when using Windows LTSB (Long Term Service Branch)

VERTEX requires .Net 4.8 version to start. This version is shipped with Microsoft Windows Functionality Updates.

When using Windows 10 LTSB or deactivated Updates, please double check if this .Net-Version already is installed

VERTEX program folders

The default installation folder for all program data is the Windows program folder: C:\Program Files\ioversal\VERTEX

The folder where all app settings are stored is C:\Users\Public\Documents\ioversal\VERTEX

Check Firewall and Antivirus Settings

- The VERTEX installer registers all necessary ports in your **firewall** - please double check after installation if VERTEX has access and none of the ports are blocked

When using an Antivirus Software or/ and a firewall - take care of the following points:

- **Check if none of the files out of the VERTEX program folder is blocked** by your Antivirus- Software. VERTEX is carefully designed but we unfortunately can not forecast the behaviour of each Antivirus Software on the market
- Check the **firewall settings** and **allow VERTEX and its services to communicate both in private and public networks**

Check Windows Update and Notification Settings

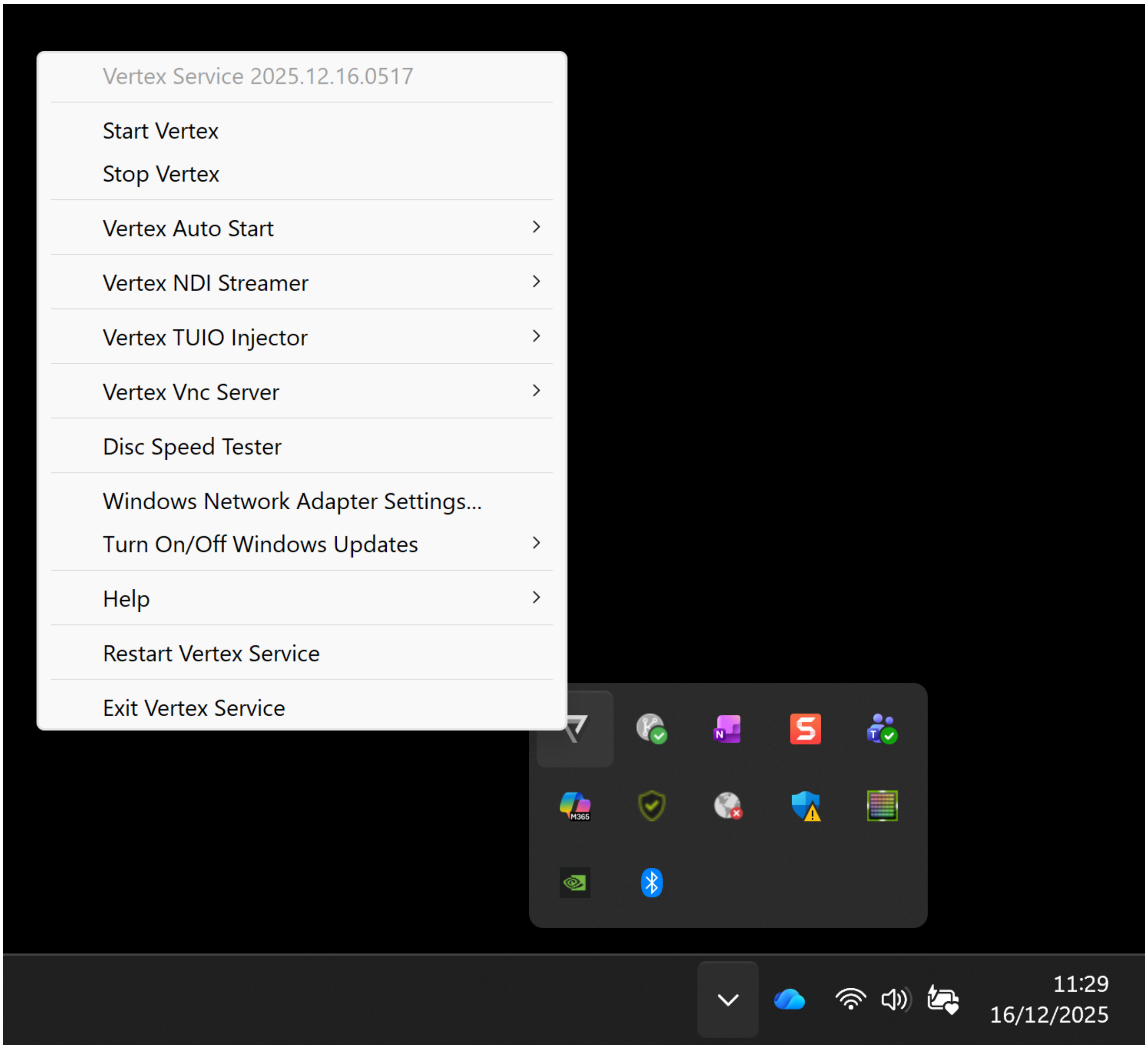
Windows 10 Pro or Enterprise for Production Environments!

Although VERTEX runs both on Windows 10 Home and Pro, we strictly recommend to use Windows 10 Pro for production environments.

Windows 10 Pro comes up with more detailed settings especially for maintenance updates. Windows 10 Home is shipped with an automated update service. There is no reliable and permanent option to be in control of those updates in the Home Version, whereas the Pro version is customizable in regard to updating preferences.

3.3 Background Service

- **VERTEX Background Service** contains **several Windows Services,** which need to run as a requirement for connections between multiple VERTEX systems.
- The services start at log-in of the Windows user.
- Access VERTEX Service by clicking on the VERTEX tray Icon in your Windows task bar:



Version Build	Displays the current build of VERTEX version installed.
Start Vertex / Stop Vertex	Starts / stops the application.

Vertex Auto Start	Enables / disables Vertex auto start after log-in of Windows user. Enables / disables Vertex Watchdog (ensuring Vertex is restarted if not responding).
Vertex NDI Streamer	Starts / stops Vertex NDI Streamer.
Vertex TUIO Injector	Starts / stops Vertex TUIO Injector for touch interaction.
Vertex VNC Server	Starts / stops Vertex VNC Server.
Disc Speed Tester	Opens a tool for testing your system's drives.
Windows Network Adapter Settings	Shortcut to the Windows settings for network adapters.
Turn On/Off Windows Updates	Unexpected Windows Updates may interfere with Vertex running. This setting might save you from the dreaded blue screen during a live production.
Help	Contains options to request remote support and locate the Vertex Logs folder.
Restart/ Exit Vertex Service	In case your auto-start configuration leads to to unexpected behavior, you may restart or exit Vertex Service for troubleshooting purposes.

3.4 Trial Version

- **Download** a VERTEX Trial Version on www.ioversal.com
- The Trial version has the **full functionality** with all features and **only some little playback and network limitations.**
- Every VERTEX Trial Version **can be converted to a full version** of the software. Just log in with a valid VERTEX license or plug in an activated dongle.

Features

- A **project file** that has been saved with a VERTEX Trial version **can be opened with a licensed version**
- **Session Test Mode:** Trial Versions are able to connect with Trial Versions to test a Multi-Client Session
- **No limitation in functionality and features**, no limitation for number of playbacks or bandwidth

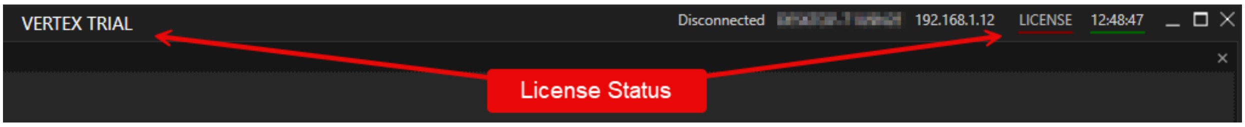
Limitations

- "VERTEX Trial" is displayed in the **Top Bar**
- In fullscreen mode and in Render Editor **a watermark** is displayed every 10 Minutes
- Playbacks stop every 10 Minutes
- The **outputs** for external protocols (e.g Art-Net™) stop every 10 Minutes
- Trial Versions are **only allowed to connect with Trial Versions** to test a **Multi-Client Session**.
  A Session with licensed VERTEX Systems is not possible. The network connections to licensed VERTEX versions are cut after a few seconds.

3.5 License Activation and Deactivation

- The **License Menu** is located **on the right side of the top bar**
- Licenses can be activated and de-activated online or offline from within VERTEX, as well as managed **online in the user account** settings.
- Read the topic **License Editions** for information on the **different types of VERTEX licenses**

License Menu

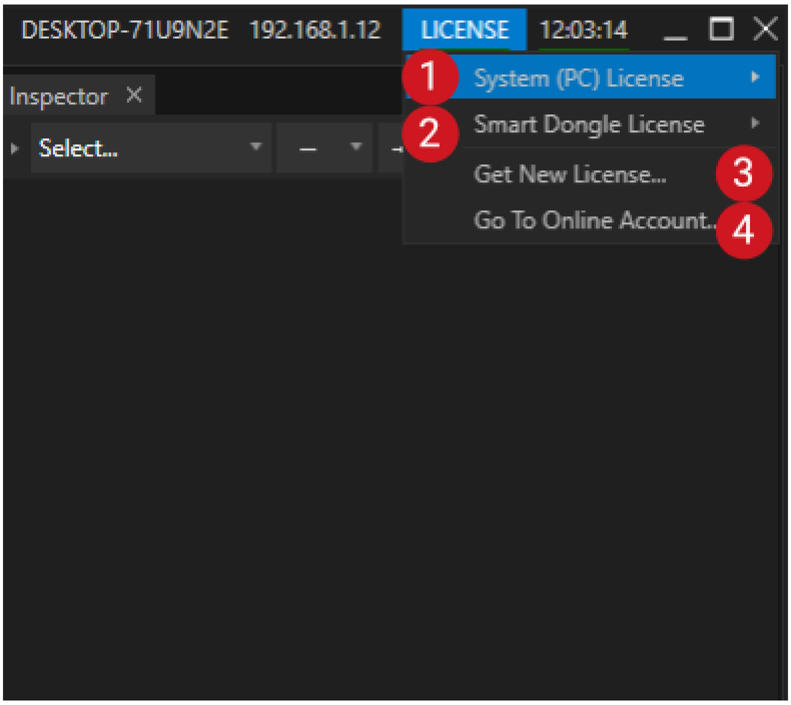


The **LICENSE status** is indicated by a color code:

- a **valid activated** license is underlined **green**
- if **no license** is activated and VERTEX is in Trial Mode, it is underlined **red**

The **LICENSE menu** contains **different options** to manage your license, depending on

- **internet access** or **offline options**
- a **System (PC) License** or a **Smart Dongle License**

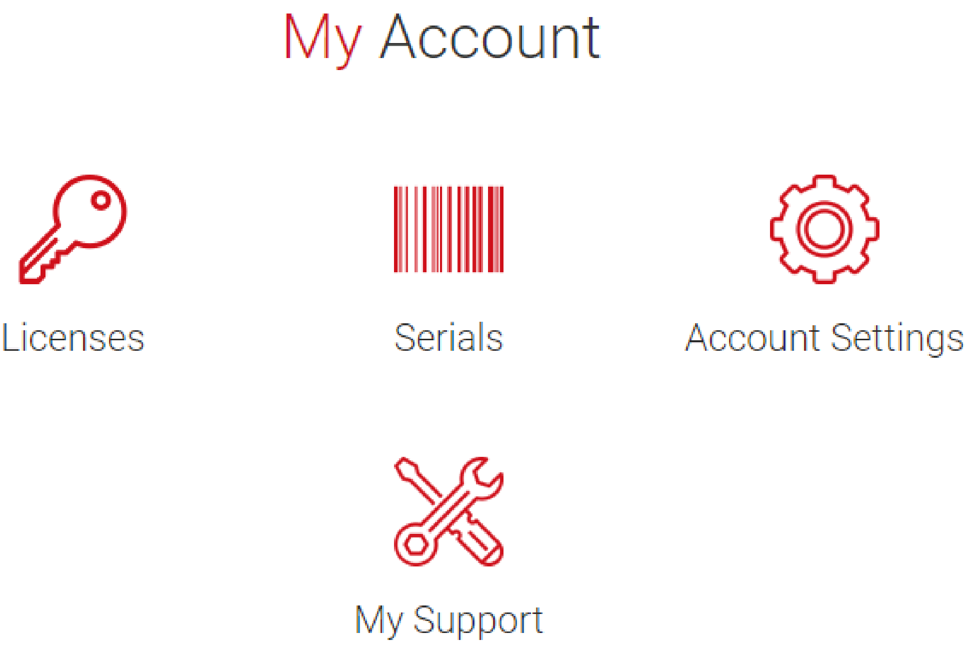


1	System (PC) License	**Activate** and lock one of your VERTEX license on your PC **Deactivate** and unlock licenses from your PC **Update** Licenses possible options are: **online** - connected to the internet (fast and easy) **offline** - requires a second computer with internet access
2	Smart Dongle License	**Activate** and lock one of your license to a VERTEX Smart Dongle **Deactivate** and unlock licenses from your Smart Dongle **Update** Licenses possible options are: **online** - connected to the internet (fast and easy) **offline** - requires a second computer with internet access **Smart Dongles** can be purchased by contacting our sales agents: sales.vertex@rossvideo.com
3	**Get New License**	directs you to ioversal.com. Get in touch with our sales agents directly: sales.vertex@rossvideo.com

5	Go to Online Account	directs you to the login page of your user account online for an overview of all licenses connected to your account.

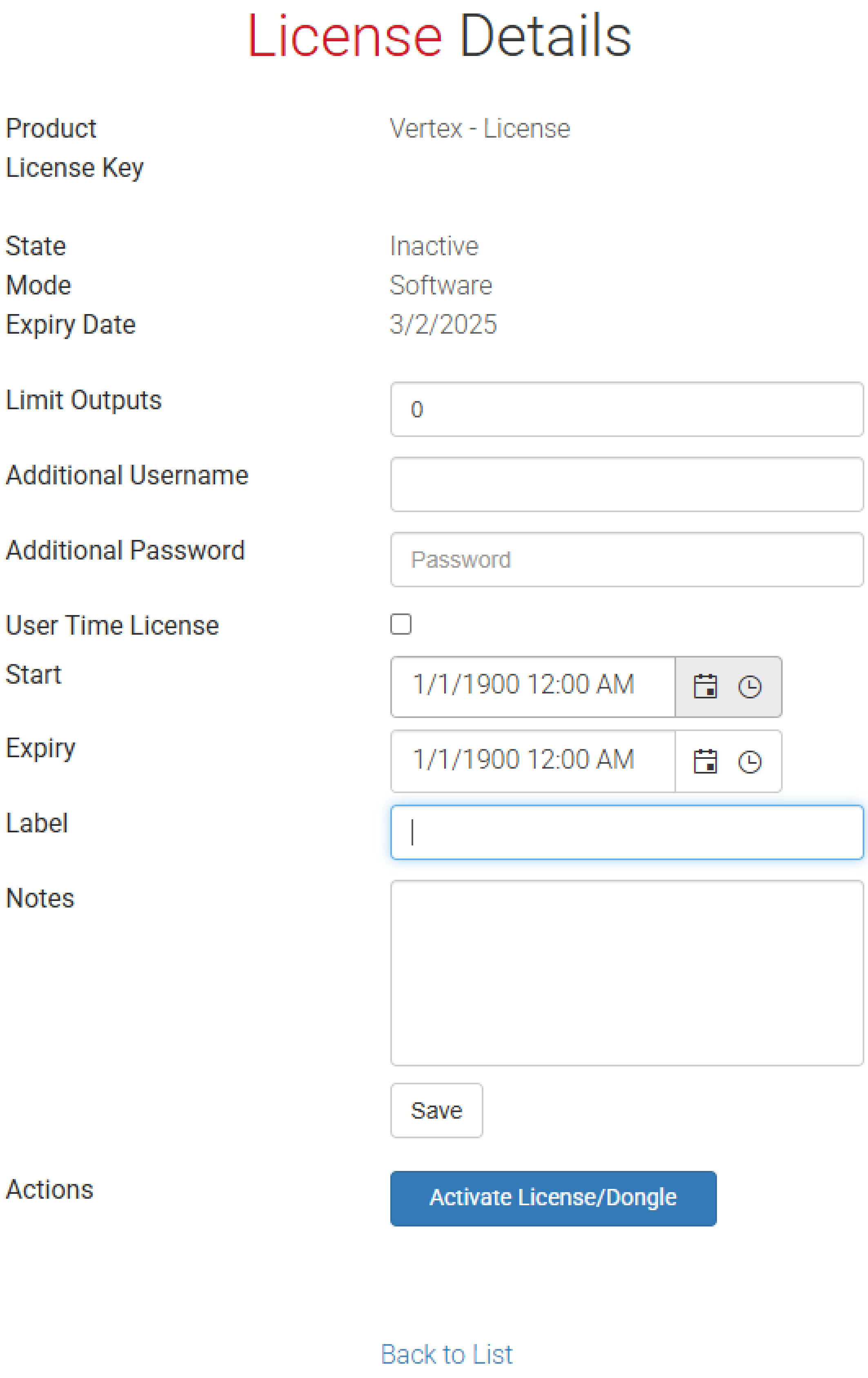
Online Account

- licenses can be purchased by contacting sales.vertex@rossvideo.com
- manage licenses from your **online user account at www.ioversal.com**
- once logged in, go to *My Account* by **clicking on your user name**
- go to ***Licenses*** to manage your VERTEX licenses



User Time License

In case you need to rent out your Vertex product, this feature enables you to edit additional user names, limit outputs and set a time range as needed.



License Details

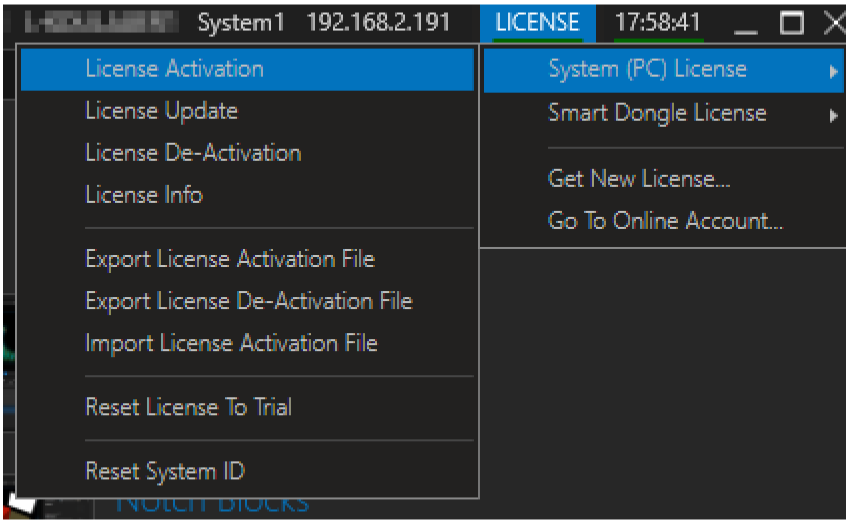
Product	Vertex - License
License Key	
State	Inactive
Mode	Software
Expiry Date	3/2/2025
Limit Outputs	0
Additional Username	
Additional Password	Password
User Time License	□
Start	1/1/1900 12:00 AM
Expiry	1/1/1900 12:00 AM
Label	
Notes	
	Save
Actions	Activate License/Dongle

Back to List

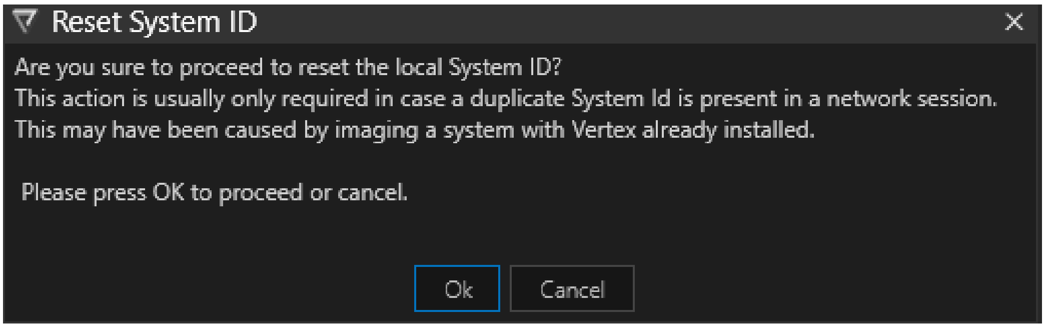
1. Always de-activate the license before changing these settings
2. Limit Outputs: 0 by default - if you want to ensure your customer not using more outputs as agreed upon, set it to a desired value in order to limit your rental system.
3. Set an Additional Username and Password different from your own to share with your customer
4. Enable *User Time License* and set a date and time range
5. Label the license for better orientation in your license list
6. Click *Save* to store your settings and proceed with activation

> **Caution! Always de-activate the license before changing these settings!**
> **Editing *License Details* on an active license may cause a failed recognition during activation/ de-activation process resulting in locking yourself out.**
> If this is the case, your only options are performing an Emergency License Reset or contacting vertex.support@rossvideo.com.

System (PC) License



License Activation, Update, De-Activation	**Activation:** registers and locks your license to your hardware (system ID) **Update**: updates your current license after renewal of update period **De-activation**: unlocks your license from your hardware to be used on another system or dongle For the above options, your VERTEX system requires **internet access**.

License Info	Shows all details of your current license (**user name, expiry date, license key, type**..)
Export/ Import License Activation/ Deactivation Files	**Activate** VERTEX and lock your license to the Hardware **Deactivate** VERTEX: Unlock your license from a Hardware and use it on another These options are for **offline use - no internet access** is required for the Vertex system. **Activation files need to be transferred to a second device with internet access** that logs in to your ioversal user account.
Reset License to Trial	Delete all license information from your current hardware and **set your license back to Trial.**
Reset System ID	This command is needed in case Vertex is run on a cloned system from a drive image. It will rewrite the system ID your license is tied to, in order to avoid duplicates in a network session.  Reset System ID Are you sure to proceed to reset the local System ID? This action is usually only required in case a duplicate System Id is present in a network session. This may have been caused by imaging a system with Vertex already installed. Please press OK to proceed or cancel.

License Activation/Update/ De-Activation

Requirements:

1. a user account on www.ioversal.com

2. a valid VERTEX license (status: *released*, proprietary to this account and not activated on another system/dongle)

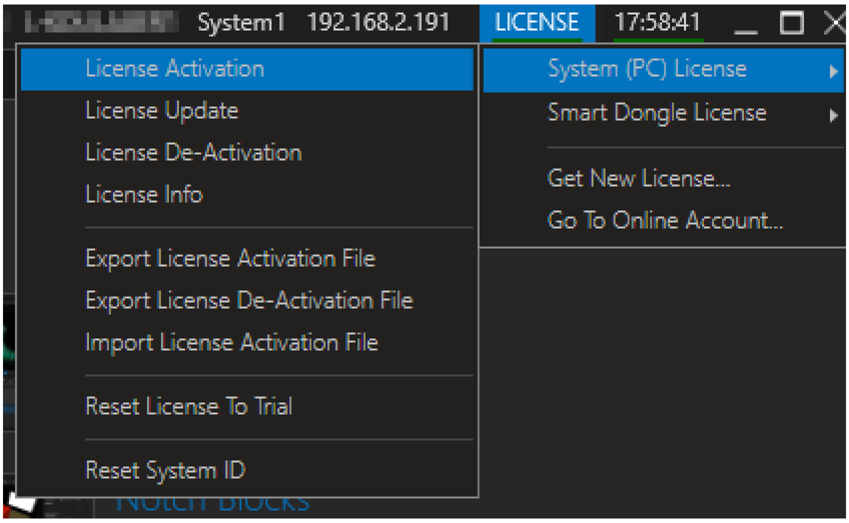
for license update: see below

3. internet access

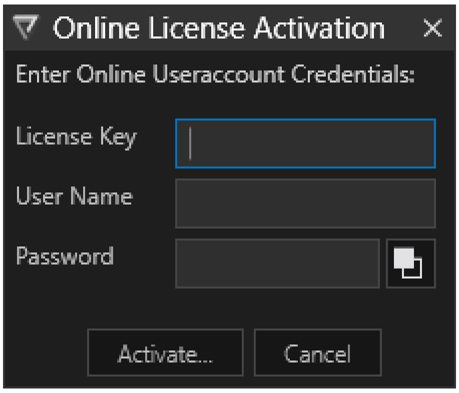
Activation

1. **Start** VERTEX

2. Go to LICENSE menu



3. Select System (PC) License > *License Activation*


Online License Activation
Enter Online Useraccount Credentials:
License Key
User Name
Password
Activate...
Cancel

4. Enter your user account credentials and your password.
   Enter a **License Key** to activate a specific license.
   If **no License Key is entered**, the license manager will automatically pick up one of the free licenses from your user account
5. A status message will report on the outcome of your activation.
6. Within a few seconds the red underline of your license status will change to green if your activation was successful.

Internet-Connection and License

Once a license is successfully activated you are free to use VERTEX without going online. An activated license will allow future software updates until its expiry date is reached *(*see *LICENSE Menu > License Info*) .

Any VERTEX versions released after your license's expiry date will set your license status back to trial version (red underline). However, **older versions released before the license expiry date will continue to work perpetually.**

Deactivation

1. Go to LICENSE Menu > System (PC) License > License De-Activation
2. Enter your user account credentials and confirm
3. A status message will confirm the success of your de-activation process.
4. The VERTEX License Status changes to red
5. Your License in your online license management at www.ioversal.com is in status released again

Update

License Renewal and Update

Renew the update plan of your perpetual license. This is required for VERTEX version updates released after the update expiry date of your license. For license renewal, please contact sales.vertex@rossvideo.com.

1. Go to your user account online and find the license locked to the VERTEX System in need of an update. Make sure your license renewal has been processed successfully.
2. In VERTEX, go to **LICENSE Menu > License Update**
3. When prompted, enter your user user account credentials and confirm
4. A status message will show you whether the update was successful or not.
5. Check your **License Info** to see the updated expiry date.

License Info

- Opens a Window containing details on the VERTEX License in use.

Offline Activation

Requirements:

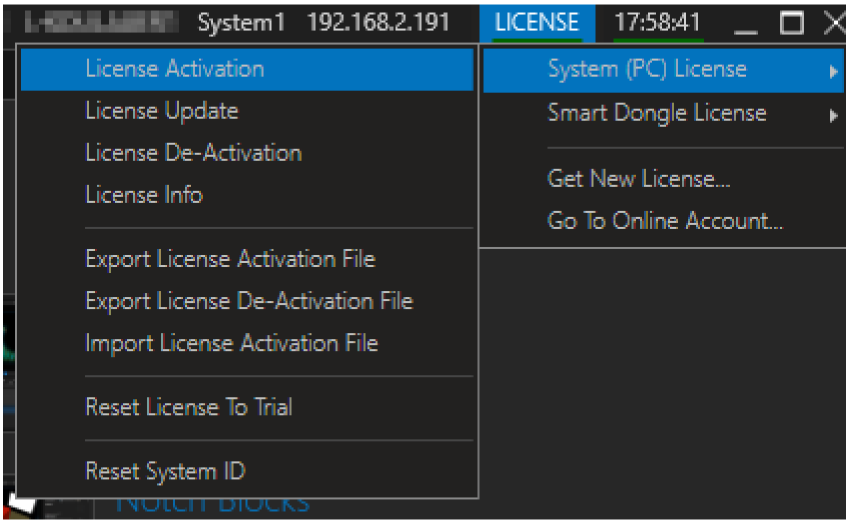
1 user account on www.ioversal.com

2. a valid VERTEX license (that was bought with/transferred to this account and that is not activated on another system/dongle)

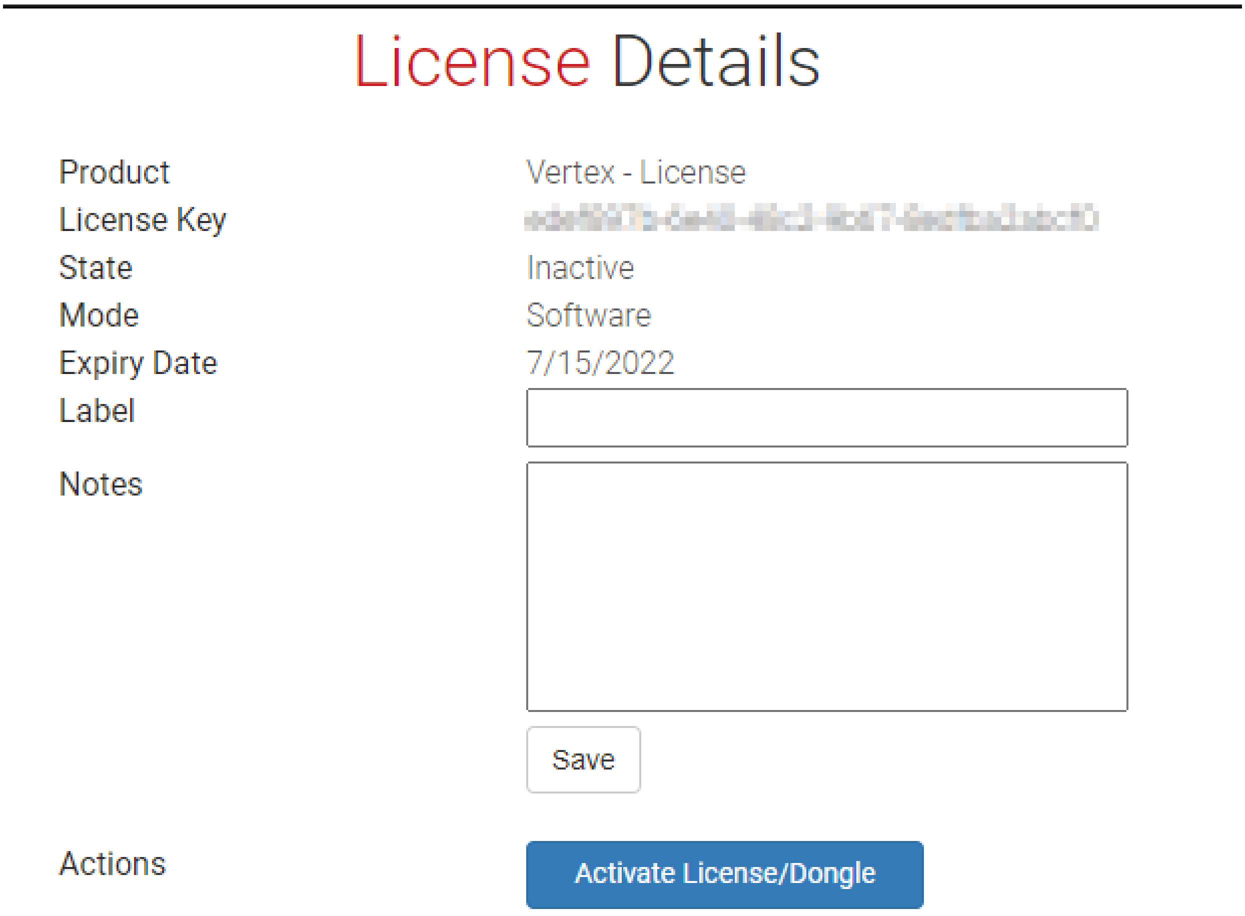
3. a USB Stick, SD Card or external harddrive

4. a second computer with internet access

1. Start VERTEX
2. Go to LICENSE Menu > System (PC) License



3. select **Export License Activation File**
4. Enter your credentials to be stored in the activation file and confirm.
5. **Save the activation file** on a portable drive
6. Go to a PC with internet access and **sign into your user account on www.ioversal.com**
7. Go to "My Licenses", select "License details"



License Details

Product	Vertex - License
License Key	[redacted]
State	Inactive
Mode	Software
Expiry Date	7/15/2022
Label	
Notes	
	Save
Actions	Activate License/Dongle

License details at www.ioversal.com for a released but not yet activated license. Once activated, you will see more options for e.g. deactivation

8. Select **Activate License/Dongle**
9. **Upload the activation file**
10. **Download the "Receipt" Activation File** and store it to your portable drive
11. Connect the drive back to your VERTEX system and select **"Import License Activation File**" from the License menu
12. Choose the "receipt" activation file from step 10
13. Your license will be successfully activated. Within a few seconds the license status will change from red to green .

Offline Deactivation

Requirements:

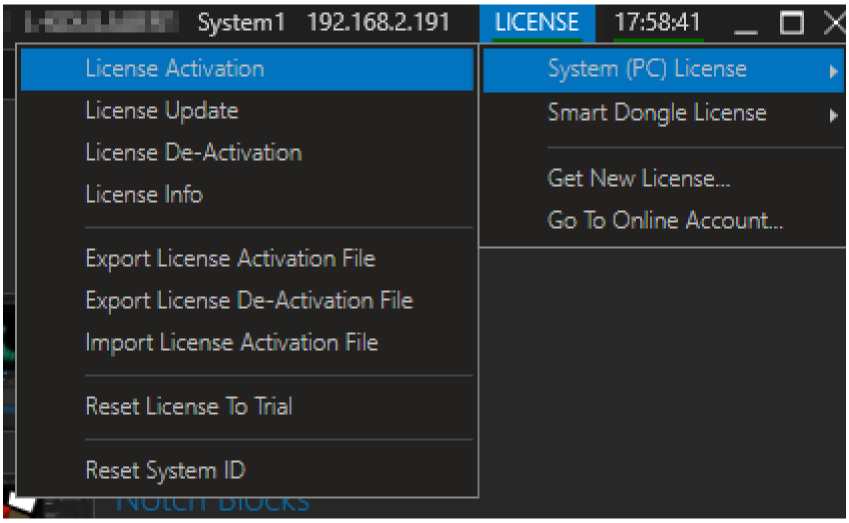
1 user account on www.ioversal.com

2. A VERTEX system with an active license assigned to your user account

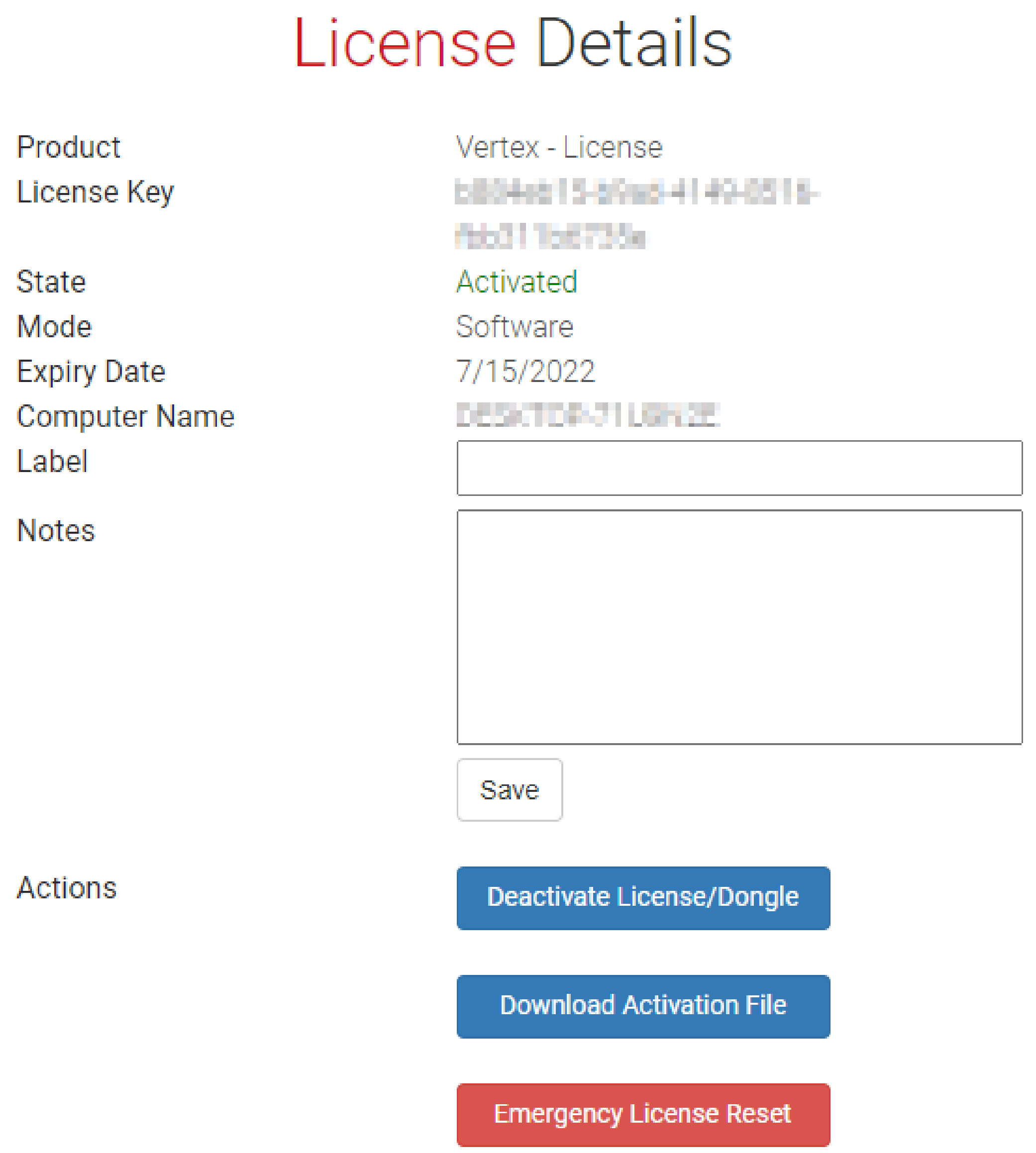
3. a USB Stick, SD Card or external harddrive

4. a second computer with internet access

1. Start VERTEX
2. Open License Menu
3. Select System (PC) License
4. Select Export License De-Activation File



5. Enter your credentials
6. Save the deactivation file on a portable drive
7. Go to a PC with internet access and **sign in with your user account on www.ioversal.com**
8. Go to "**My Licenses", select "License details**"
9. Click "**Deactivate License/Dongle**"

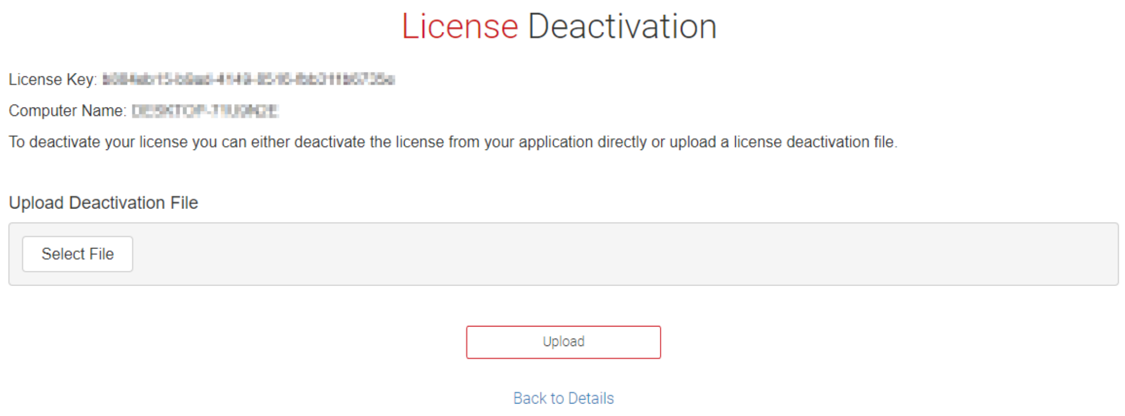


License Details

Product	Vertex - License
License Key	[redacted]
State	Activated
Mode	Software
Expiry Date	7/15/2022
Computer Name	[redacted]
Label	
Notes	

License details at www.ioversal.com for an active license that has options for deactivation etc.

10. A file **upload dialog** opens
11. Select the **deactivation file and upload it**



License Deactivation

License Key: [redacted]

Computer Name: [redacted]

To deactivate your license you can either deactivate the license from your application directly or upload a license deactivation file.

Upload Deactivation File

12. Your license is **successfully deactivated**

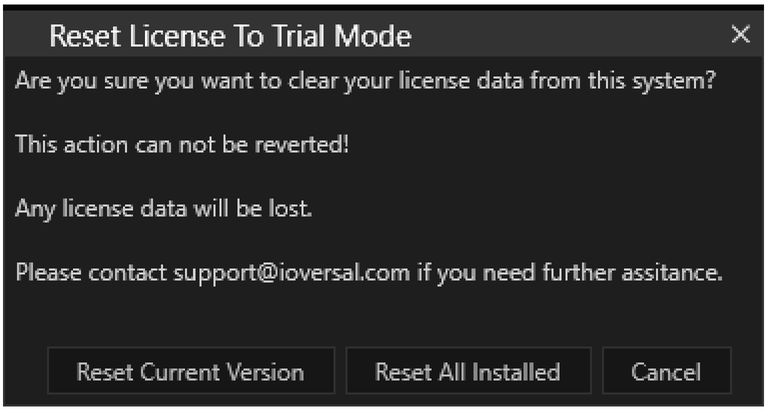
De-Activation when uninstalling VERTEX

If you attempt to uninstall VERTEX with the Installer.exe, it will ask you whether it should remove your license from the system or leave it for a different VERTEX installation. If you say "Yes, remove license", you will be asked to save a deactivation file.

Complete the deactivation process with the file created from step 7. to 12.

Reset License to Trial

- This option enables you to reset the current or all VERTEX versions on your PC back to trial mode.
- **Make sure to deactivate your license beforehand**, so it is released and can be used by another system.



Reset License To Trial Mode

Are you sure you want to clear your license data from this system?

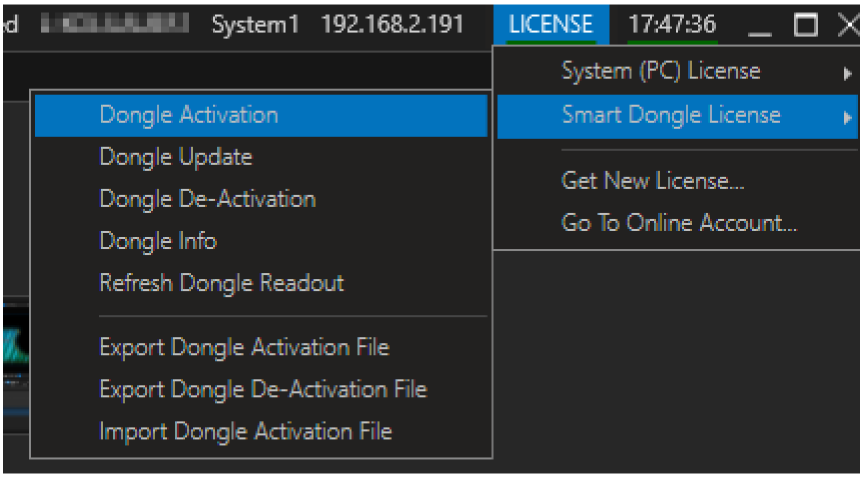
This action can not be reverted!

Any license data will be lost.

Please contact support@ioversal.com if you need further assitance.

Reset License to Trial - Licenses will not be deactivated
Please consider that all license data will be deleted. Without a valid deactivation beforehand, the license will be still locked to your hardware ID and can neither be activated/ deactivated on your current system, nor on any other system. If accidentally done, contact VERTEX support or perform an Emergency License Reset

Smart Dongle License



Dongle Online Activation, Deactivation or Update	**Dongle Activation:** store and activate your license to a VERTEX Smart Dongle **Dongle Deactivation** Unlock your license from a VERTEX Smart Dongle **Dongle Update**: Update your current license. e.g. when a renew for another feature update period For all this options, the PC with VERTEX has **to be connected to the Internet**.
Dongle Info	Shows all information stored on your smart dongle (**user, expiry date, license key, type**..)
Refresh Dongle Readout	Use this option in case you changed a Smart Dongle connection while VERTEX is running.

Dongle Offline Activation/ Deactivation	**Dongle Activation:** store and activate your license to a VERTEX Smart Dongle **Dongle Deactivation** Unlock your license from a VERTEX Smart Dongle Use these options if your VERTEX system has **NO internet access**. Requires a second computer with internet access and a portable drive.

Dongle Activation/Update/ Deactivation

Requirements:

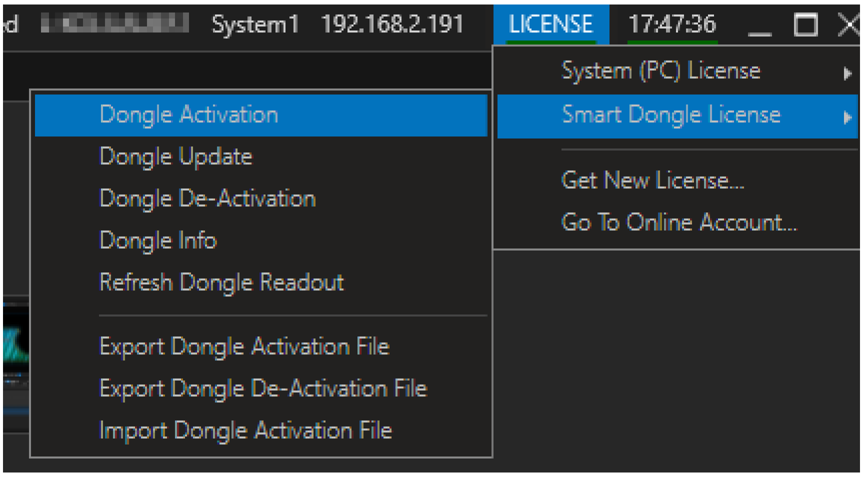
1. a user account on www.ioversal.com
2. a valid VERTEX license with status "released" (that was bought with/transferred to this account and that is not activated on another system/dongle)
3. internet access
4. an unassigned VERTEX Smart Dongle that holds no license.

USB 3-Hubs and Dongles

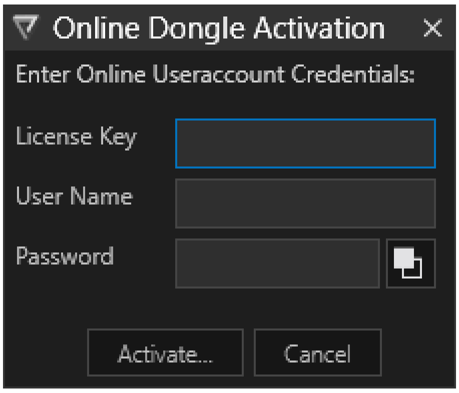
Try to avoid to plug in Dongles into an USB 3.0 Hub. Some hubs might have down compatibility problems with USB 2 and 1 drivers. Result can be that the dongle is frequently check out and in again for a short time frame. You can avoid this risk by using the USB 3.0 or USB 2.0 ports on your System to plug the dongle in.

Activation

1. Connect an unassigned VERTEX Smart Dongle to a USB port on your PC
2. **Start** VERTEX
3. Go to **LICENSE** menu



4. Select **Smart Dongle License > Dongle Activation**



5. Enter your user account credentials and your password.
   Enter a **License Key** to activate a specific license.
   If **no License Key is entered**, the license manager will automatically pick up one of the free licenses from your user account
6. A status message will report on the outcome of your activation.
7. Within a few seconds the red underline of your license status will change to green if your activation was successful.

Internet-Connection and License

Once a license is successfully activated you are free to use VERTEX without going online. An activated license will allow future software updates until its expiry date is reached *(see LICENSE Menu > License Info*) .

Any VERTEX versions released after your license's expiry date will set your license status back to trial version (red underline). However, **older versions released before the license expiry date will continue to work perpetually.**

Use your activated Smart Dongle to license VERTEX systems on the fly independent from a hardware ID.

Deactivation

1. Select **Dongle De-Activation**
2. Enter your credentials and confirm
3. A status message will show you whether the de-activation was successful or not.
4. The VERTEX License Status changes to red
5. In your online license management at www.ioversal.com , the license status will change to "released".

Update

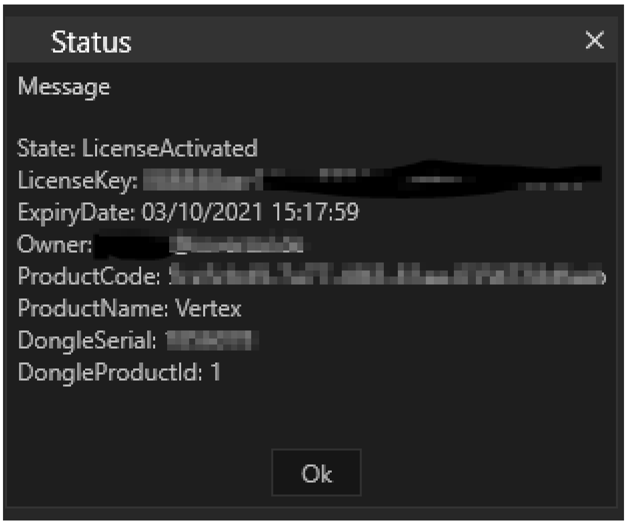
License Renewal and Update

Renew the update plan of your perpetual license. This is required for VERTEX version updates released after the update expiry date of your license. For license renewal, please contact sales.vertex@rossvideo.com.

1. Go to your user account online and find the license locked to the VERTEX Smart Dongle you want to update. Make sure your license renewal has been processed successfully.
2. In VERTEX, go to **LICENSE Menu > Smart Dongle License > Dongle Update**
3. When prompted, enter your user name and your password, confirm
4. A status message will show you whether the update was successful or not.
5. Check your **Dongle Info** to see the updated expiry date.

Dongle Info

- Opens a Window containing all information stored on your connected Smart Dongle



Message

State: LicenseActivated
LicenseKey: [redacted]
ExpiryDate: 03/10/2021 15:17:59
Owner: [redacted]
ProductCode: [redacted]
ProductName: Vertex
DongleSerial: [redacted]
DongleProductId: 1

Dongle Offline Activation

Requirements:

1 user account on www.ioversal.com

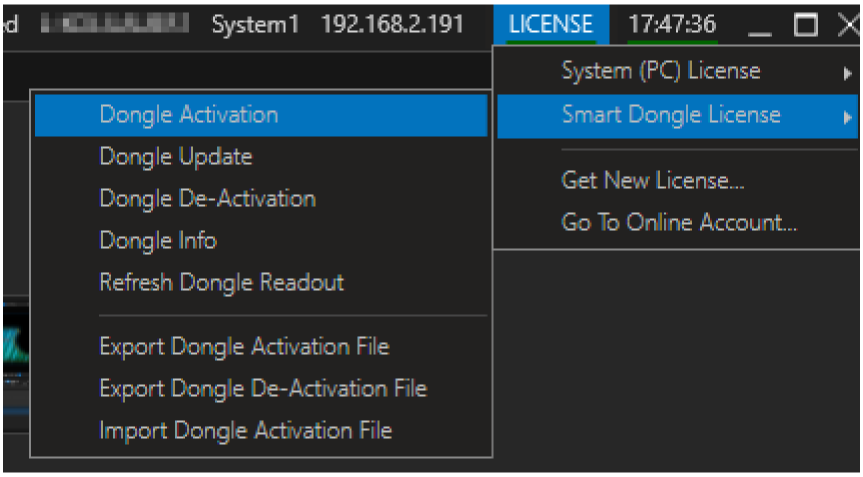
2. a valid VERTEX license (that was bought with/transferred to this account and that is not activated on another system/dongle)

3. a USB Stick, SD Card or external harddrive

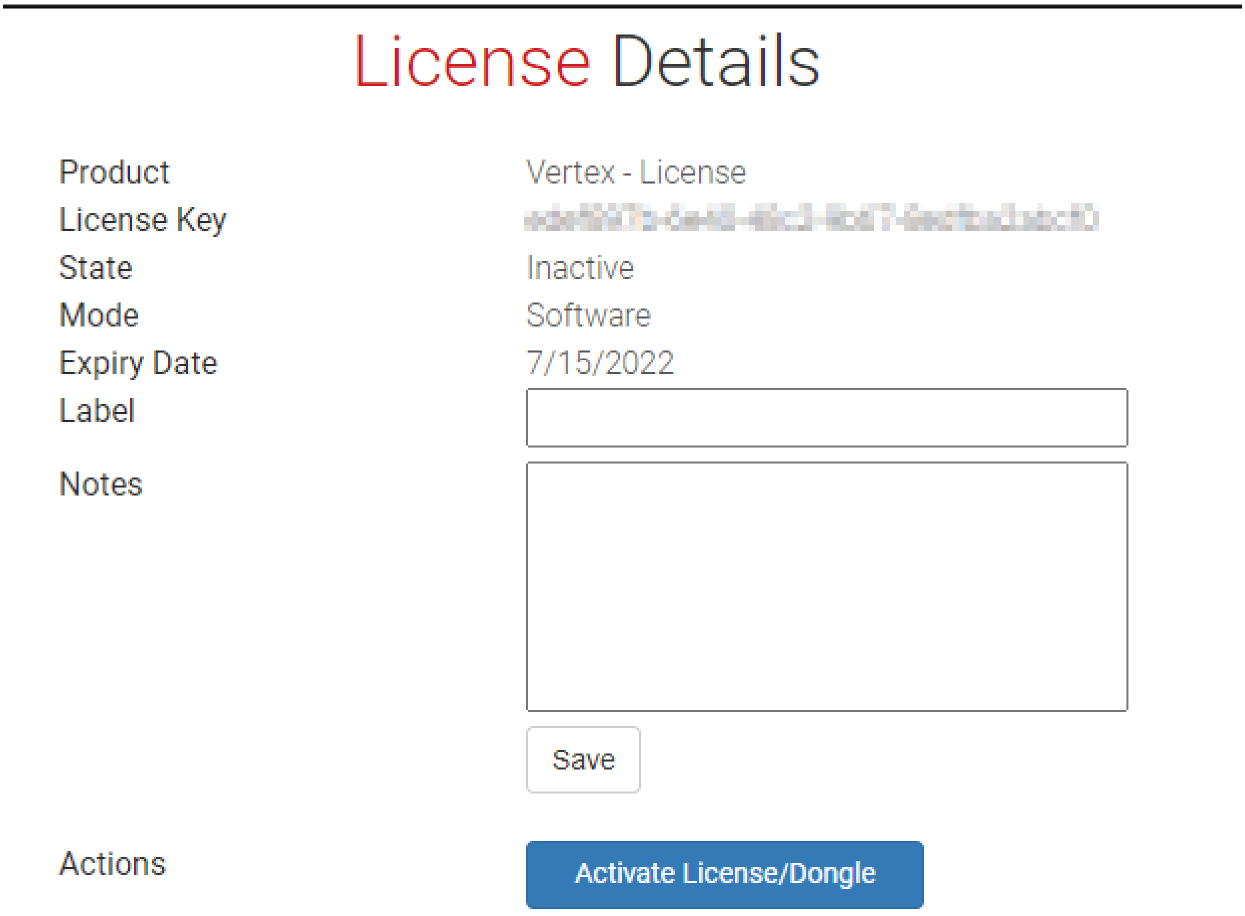
4. a second computer with internet access

5. an unassigned VERTEX Smart Dongle that holds no license.

1. Start VERTEX
2. Open License Menu
3. Select Smart Dongle License



4. select **Export Dongle Activation File**
5. Enter your credentials to be stored in the activation file and confirm.
6. **Save the activation file** to a portable drive
7. Go to a PC with internet access and **sign into your user account on www.ioversal.com**



License Details

Product	Vertex - License
License Key	[redacted]
State	Inactive
Mode	Software
Expiry Date	7/15/2022
Label	
Notes	
	Save
Actions	Activate License/Dongle

License details at www.ioversal.com for a released but not yet activated license. Once activated, you will see more options for e.g. deactivation

8. Select **Activate License/Dongle**
9. **Upload the activation file**
10. **Download the "Receipt" Activation File** and store it to your portable drive
11. Connect the drive back to your VERTEX system and select **"Import Dongle Activation File**" from the License menu
12. Choose the "receipt" activation file from step 10
13. Your license will be successfully activated. Within a few seconds the license status will change from red to green.
14. Verify the successful activation by going to Dongle Info

Offline Deactivation

Requirements:

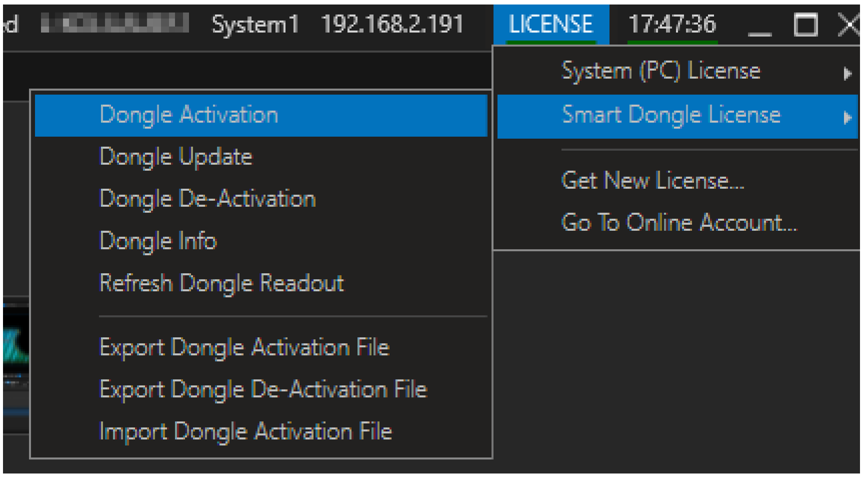
1 user account on www.ioversal.com

2. A VERTEX system with a Smart Dongle, actively licensed to your user account

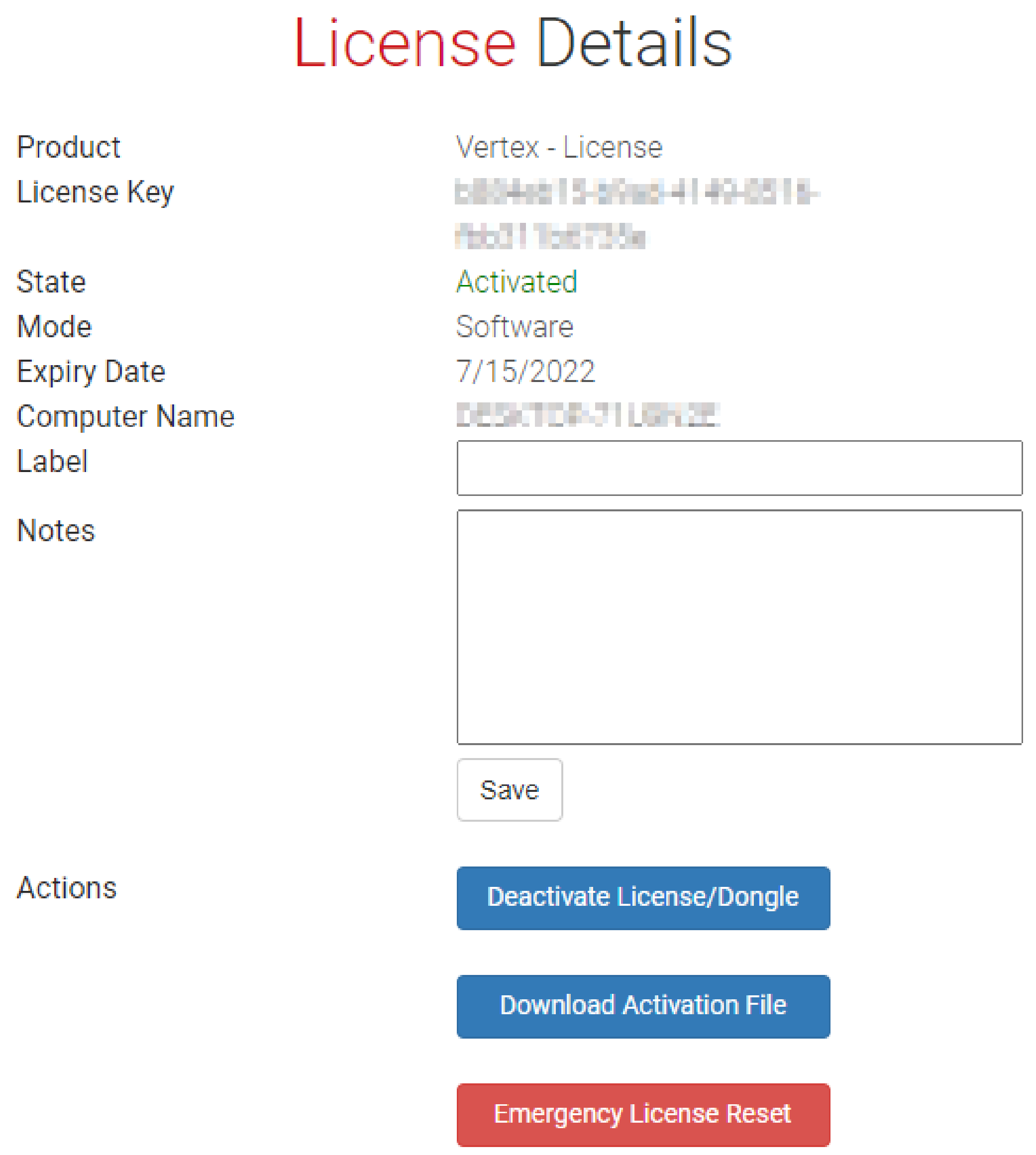
3. a USB Stick, SD Card or external harddrive

4. a second computer with internet access

1. Start VERTEX
2. Open **License Menu**
3. Select **Smart Dongle License**
4. Select **Export Dongle De-Activation File**



5. Enter your credentials
6. Save the deactivation file on a portable drive
7. Go to a PC with internet access and **sign in with your user account on www.ioversal.com**
8. Go to "**My Licenses", select "License details**"
9. Click to "**Deactivate License/Dongle**"

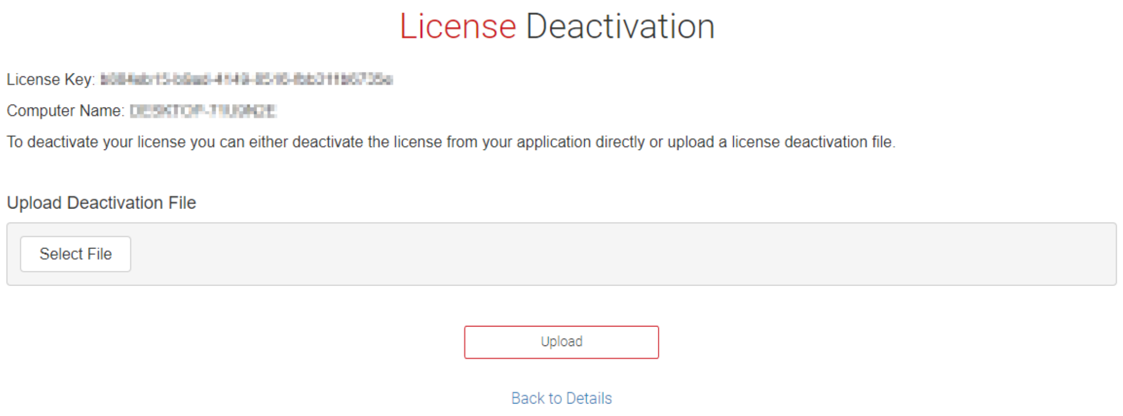


License Details

Product	Vertex - License
License Key	[redacted]
State	Activated
Mode	Software
Expiry Date	7/15/2022
Computer Name	[redacted]
Label	
Notes	

License details at www.ioversal.com for an active license that has options for deactivation etc.

10. A file **upload dialog** opens
11. Select the **deactivation file and upload it**



License Deactivation

License Key: [redacted]

Computer Name: [redacted]

To deactivate your license you can either deactivate the license from your application directly or upload a license deactivation file.

Upload Deactivation File

12. Your license is **successfully deactivated**

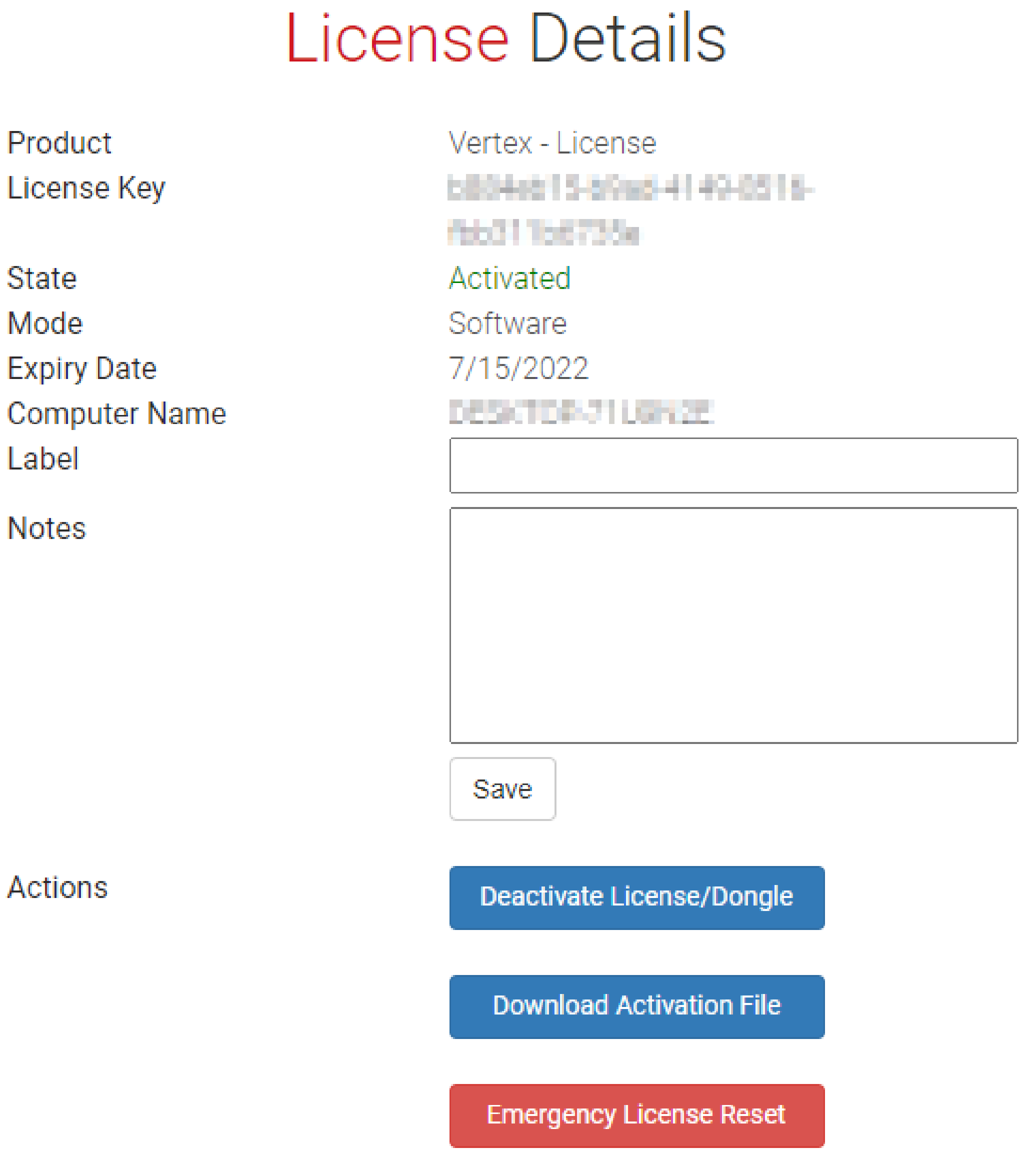
Emergency License Reset

- The Emergency License Reset should help you when your **hardware was changed without a license logout** before, your hardware was **stolen** or even if **something went absolutely wrong** during your license activation
- You can trigger an Emergency License Reset at your www.ioversal.com online Account (My Licenses -> Details)

> **For every of your licenses you can trigger an Emergency License Reset maximum 3 times.**
> If you have reached this limit for somehow, please contact the support team.
> With every Emergency License Reset the recent hardware and/or dongle ID that was connected with this license will be blocked and blacklisted. You are able to activate this license again on another System.

Steps

- Go to www.ioversal.com
- Log In with your account
- Go to "My Licenses"
- select the affected License there and click on "Details"
- If this licenses is activated you will find there the Emergency License Reset Button
- Check the details and confirm



License Details

Product	Vertex - License
License Key	[redacted]
State	Activated
Mode	Software
Expiry Date	7/15/2022
Computer Name	[redacted]
Label	
Notes	

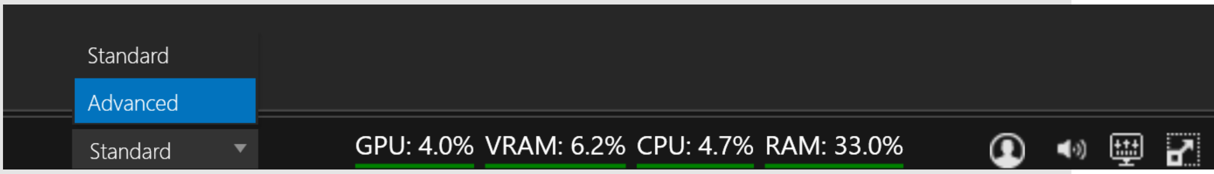
License details at www.ioversal.com for a license that was activated on a system before. Once activated, you will see more options for e.g. deactivation

3.6 FAQ Performance Recommendations

As Vertex is designed to be hardware independent the software comes with reasonable variety of settings to tweak its behavior and thus matching your specific hardware's performance to the needs of your individual projects.

The initial values of the settings have been chosen to establish a reliable playback on an average scaled hardware whilst playing back average sized content in an average amount. Due to the nature of averages, you might feel the need of improving the behavior of Vertex to either slowing it down to handle a higher quantity of media on a slower system or to unleash your high performance hardware.

Note:
Switch the inspector mode to *Advanced* in the drop-down located in the status bar to access the properties listed below.



GPU: 4.0% VRAM: 6.2% CPU: 4.7% RAM: 33.0%

PERFORMANCE OPTIMIZATIONS:

Single GPU

- Make sure you have the **same monitor sync frequencies and refresh rates on each output** of a system.
- Try using the **same resolution on each output** of a system.
- Ideally use one system as a master and another system exclusively dedicated to playout in fullscreen mode without the UI. Same applies for audio playout.

Multi GPU

- When mixing UI and fullscreen outputs try using **two GPUs - one for the UI and one for fullscreen** rendering.
- When **using multiple GPUs** ensure that the UI and fullscreen GPU are setup correctly -> **System** context menu
- Check mosaic setup to ensure the same resolutions and frequencies (EDIDs) for your multi GPU usage.

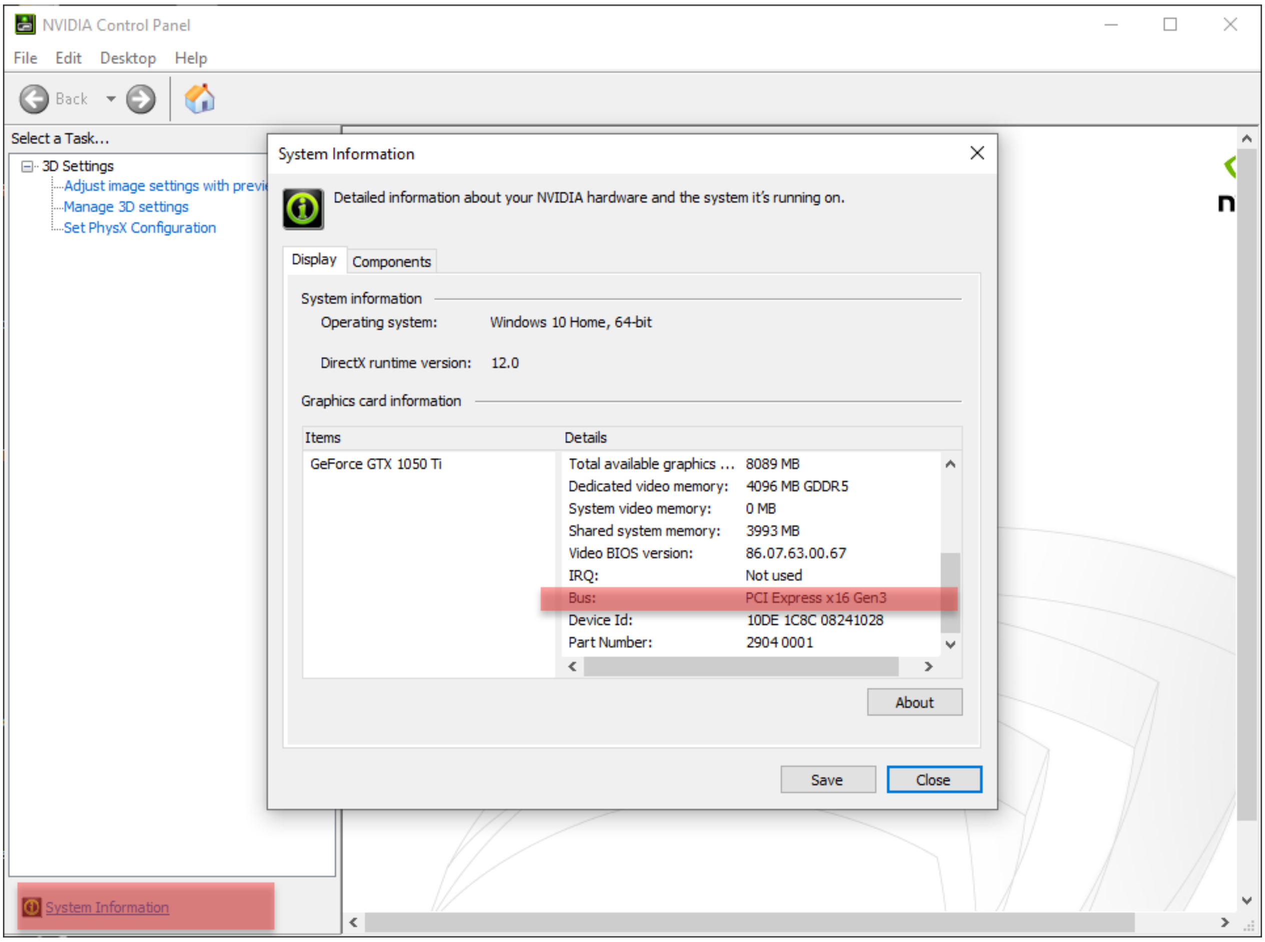
General

- Try change the clip containers' settings to **Render In View Only.** This will ensure that content will not be rendered for those surfaces and respective outputs where it is not placed and visible. By rendering only the content *in view* of a surface you can free up valuable processing resources.
- Freeze the property updates of a surface or static non animated clip containers. This will reduce the amount of property updates per rendered frame. In doing so the properties are only updated when the playhead enters a clip.

- Avoid too many surfaces - up to 8 work fine. If you need more, then freezing the properties might be required to reduce the rendering workload.

- Render a surface in an output directly by switching the surface render mode to output in the inspector settings of the surface - careful though, as this may lead to undesired side effects when rendering multiple surfaces into the same output as overlapping content may be the result.
- Render content directly to an output by setting the clip target of a clip container to the designated output. By doing so, you can bypass canvas-surface workflow, if necessary.

- When using GPUs on a PCIe bus, make sure the card slots are no less than 16 lanes wide (x16):



System Information

Detailed information about your NVIDIA hardware and the system it's running on.

System information

Operating system: Windows 10 Home, 64-bit

DirectX runtime version: 12.0

Graphics card information

Items	Details	
GeForce GTX 1050 Ti	Total available graphics ...	8089 MB
	Dedicated video memory:	4096 MB GDDR5
	System video memory:	0 MB
	Shared system memory:	3993 MB
	Video BIOS version:	86.07.63.00.67
	IRQ:	Not used
	Bus:	PCI Express x16 Gen3
	Device Id:	10DE 1C8C 08241028
	Part Number:	2904 0001

***Use Resource Pooling* & *Video Pooling* only on high-performance systems.**

Resource Pooling bundles resources on the GPU as needed. Video Pooling leaves all necessary video codecs and players open in a cache to be used by similar ClipContainers. These two properties can be found through the search filter in the System Settings. They are a prerequisite for the *Instant Play* feature of content items.

FAQ

I'm having multiple GPUs installed in my system. How to select my preferred GPU for full screen rendering?

Right-click your system in the Project Explorer and select "**Set Preferred GPU Adapter**" from the context menu. Choose the GPU from the drop-down list. The selected adapter will get stored in your systems registry on a global level.

The content seems to be transferred to my Windows hard drive. I need Vertex to transfer the content to my dedicated content hard drive with larger capacity and higher speed.
How do I tell Vertex my content drives path?

Vertex will store all projects and its assets at the path that has been defined as "**Default Project Path**" during the installation of Vertex. If later you need to change this, select your System from Project Explorer and search for "**Path**" by using the filter in the inspector window. Change either the "**Default Project Path**" or your project specific "**Local Project Path**" in order to change the drive or directory of transferred content.
Note: you might stumble upon the system property "**Content Drive**". This value is only used for the calculation of "**Free Content Space**" (System Info).

When manually seeking or spontaneously jumping to a cue in my sequence with a large number of tracks and clips, I see the clips being created sequentially with a short time delay. How to manually influence this interval?

Select your **System** from your Project Explorer and navigate to "**Settings**" in the inspector window. Adjust the "**Render Element Create Interval**" (Default: 40ms) in order to speed-up or slow down this process.

Why do I occasionally see jerks/shudder in my playback, that look like missing frames or tiny jumps?

Especially when dealing with different framerates (content framerates vs. sequence framerate vs. output framerate), small glitches in playback might become visible when frames are missing or need to be dropped in order to stay in sync.
Activate the parameter "**Frame Blending**" (default: false) for contents that require smoother rendering. Consequently, frames will get interpolated. However, we do not recommend activating frame blending for any content in general, as this will have an impact on the performance of systems with a heavy load.

My ASIO audio playback is occasionally cracking during playback. How do I solve this?

It's highly recommended to use a dedicated hardware for audio playback. Ensure the system connected to your audio interface is not rendering any video output, handling DMX data nor is used as sync master of your session.
The use of virtual ASIO devices such as Dante Virtual Soundcard is fully supported by Vertex. Please keep in mind these virtual devices are utilizing your systems CPU for their tasks while Vertex might claim the same resources. The same applies to USB connected audio interfaces.
We recommend using dedicated Yamaha or Focusrite PCIe cards as they come with a Datan chip onboard that is providing dedicated performance.
General advice:

- Make sure you've set your "**Asio Output Channel Count**" (Default: 0) to the amount of audio channels used in your project. You can find this parameter in your project settings.
- We also recommend **setting your ASIO drivers' buffer to above 1024 samples**.

My composition's background becomes visible for a few frames when seeking/ jumping into different clips or using GotoCue/GotoTime as my system is creating the new clips too slow. How to tweak this behavior?

In an ideal scenario the playhead is either running into your clips that have their **PreRoll** parameter set according to the content size (default: 2 sec), or the clips that you are jumping to are set to "**Pre-Loaded**" (default: false).
If both options can't be guaranteed there are further ways to enable a seamless jump:

- Temporarily pre-load your clips in case you know where to jump in advance. Trigger this script (e.g. via cue script code, ControlView button etc.) to pre-load any clips at a certain cue or time:
- **Playback1.TempPreloadCue [CueID]**
- **Playback1.TempPreloadTime [Timecode]**
  The clips will get unloaded automatically once jumped into them.
- define a "**Clip Hold Time**". Your clip will still be rendered for the specified time after the playhead left the clip. Meanwhile the next clip can be loaded (either in foreground or background, depending on time and Z-hierarchy), while the previous clip is still present.

The **Clip Hold Time** can be defined for the whole sequence as "**Default Clip Hold Time**" (default: 50ms), or on single clip basis: Activate "**Enable Hold Mode**" (default: false) and specify the "**Release Hold Time**" (default: 1 sec) and – if desired – a "**Hold Fade Time**" (default: 13 frames). Once the clip specific **Hold Mode** is enabled, this value will overwrite the sequence's "**Default Clip Hold Time**".

My playback is out of sync. How do I re-sync my playback automatically?

Vertex is constantly improving its abilities to automatically synchronize the playback of multiple clips on multiple outputs and multiple systems. If you are experiencing playback out of sync, a very quick manual PAUSE/PLAY command will most likely solve your synchronization issue.

Tip: In most cases, out-of-sync playback is caused by the lack of your clips' pre-load time. E.g., skipping to a position in your sequence with clips that are not preloaded and instantly hitting PLAY will force all clips to start playing without being loaded. To counteract such events each sequence has its "**Load Goto Play Cue Wait Time**" property (default: 1 sec). When using the script "**GotoCue Play**", this property defines a buffer in time for VERTEX to anticipate clips that are not set to pre-loaded or haven't been temporarily preloaded.

My hardware's performance is absolutely not matching the content's requirements. Is there any chance – at least for pre-programming or rehearsal scenarios – to enable a fluid playback of the content?

There are multiple options available, depending on your timeframe and emergency severity:

- transcode your content by using our build-in content transcoder to generate HAP files easily. Right-Click your content and select "**Transcode**" from the context menu.
- reduce your surface's resolution by using the surface property "**Down Scale Factor**" (Default: 1).
- reduce your individual contents framerate by using the content property "**Custom Video FPS**" (Default: 0).

I’ve set up my systems accordingly and applied all Windows and NVIDIA tweaks (all outputs w/ same framerate, mosaic, etc.) to get the best performance out of my hardware. But still Vertex is showing issues in playback behavior. What can I do?

Some general adjustments can be made to ensure a higher performance:

- set system property “**Disable Preview in Fullscreen**” (default: false) to **TRUE** to disable the UI’s Render Editor Window in order to save resources.
- set system property “**Render LocalSystem Only**” (default: false) to ensure the particular system is only rendering its specific surfaces.
- Reduce your systems “**Render Window Size**” to the resolution that is actually required and limit your GPUs output quantity accordingly. Disable outputs that are not in use.

3.7 GPU Sync / Frame Lock Setup

- For synchronized **playout of media across multiple systems** it is mandatory to **precisely align their display rates** and to **force all GPUs to generate their frames at a coordinated time**.
- VERTEX fully supports NVIDIA GPU synchronization by utilizing NVIDIAs frame counter as an optional VERTEX Systems Sync Clock source. Hence, GPU sync does not synchronize on hardware level only.
- The interface to NVIDIAs API ensures that textures on multiple VERTEX instances are generated at the same rate on all systems.
- As NVIDIA Quadro Sync II cards also support external references / house sync (“Genlock”) as their clock source, VERTEX is also able to connect to these reference signals.

The procedures described in this manual summarize some complex third-party topics. We recommend to additionally study these documents/pages for deeper insights and troubleshooting advice:

NVIDIA Quadro Sync II Card Setup:
https://www.nvidia.com/content/dam/en-zz/Solutions/design-visualization/quadro-product-literature/du-08348-001_v03.pdf

NVIDIA EDID Emulation:
https://nvidia.custhelp.com/app/answers/detail/a_id/3569/~/managing-a-display-edid-on-windows

NVIDIA MOSAIC setup:
https://nvidia.custhelp.com/app/answers/detail/a_id/3568/~/how-to-setup-mosaic-using-nvidia-control-panel

Requirements

- Systems equipped NVIDIA Quadro RTX GPU.
- NVIDIA Quadro Sync II Card installed in each System that needs to playout in sync.

> Note: The master system does not necessarily need to have a Sync Board neither a Quadro RTX GPU if it is not playing out any video. Only if you need to apply the Master role to an actively rendering System that is part of a synchronized playout, this System needs to be part of the NVIDIA Sync Group and a Quadro RTX card and Sync Board is required.

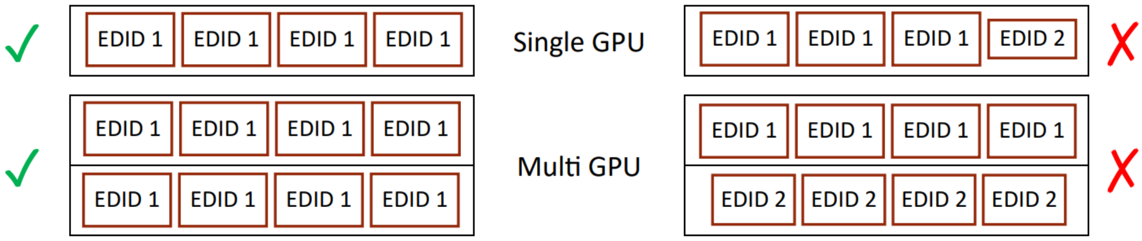
- Optional: external House Sync source / reference generator (genlock).

Hardware Setup

Install the Quadro RTX GPUs and Quadro Sync II Cards on your mainboards PCIe ports. Connect all systems GPUs that need to be synchronized to any available GPU Connector of your Quadro Sync II Card using the NVIDIA Sync Cables.

It is important to provide the same resolution and display rate (most likely even the same EDID) for every Systems GPU output. If different resolutions/EDIDs are involved, make sure to isolate these to dedicated Systems, each hosting only one type of EDID.

- If running different EDIDs on one GPU, setting up a NVIDIA Mosaic will not be possible anymore which impacts both performance and synchronization.
- If running different EDIDs on one system, though grouped together on dedicated GPUs, setting up a single NVIDIA Mosaic will not be possible anymore which impacts both performance and synchronization.



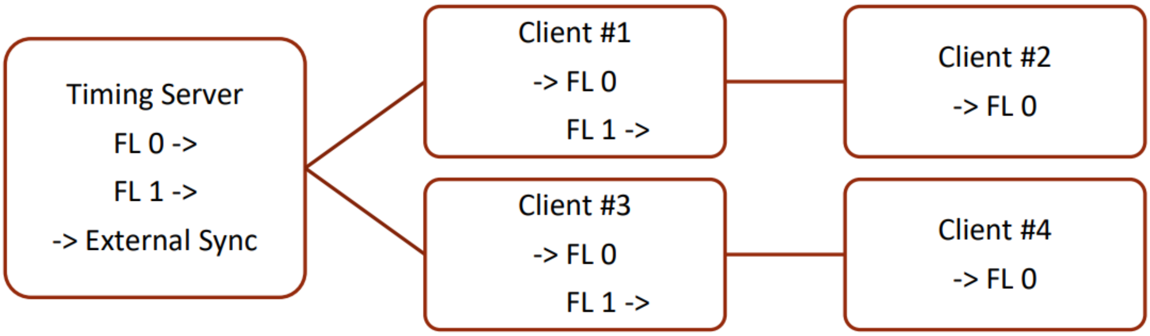
We recommend disabling additional GUI GPUs as well as all mainboard display outputs prior to NVIDIA and VERTEX setup in order to avoid complications during setup and runtime. If additional GUI outputs are needed, please try enabling them after successful setup and perform an in-depth before-after analysis of the Vertex systems rendering performance. Disable additional outputs if the performance decreased.

Note: ensure all NVIDIA Quadro GPUs are installed in x16 PCIe ports of your mainboard. Check whether your CPU/Mainboard supports the required quantity of total PCI lanes to unlock the required performance of the system.

Cabling

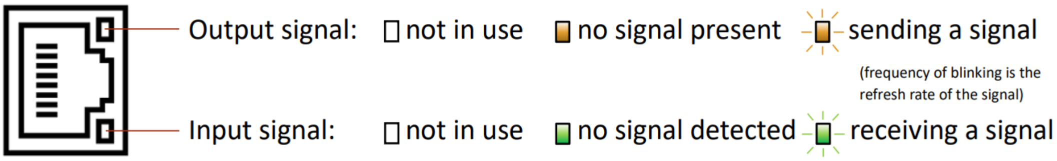
After setting up the individual Systems, establish a physical connection between all systems of your cluster:

- One system needs to be set up as “Frame Lock Master” / “Timing Master”.
- Start your signal chain from the timing master: connect a CAT 5 cable between the Frame Lock connectors on the timing master and a client machine.
  It does not matter which connector you use. Both RJ45 ports on the Quadro Sync Board can be in- or output. It is recommended to create two signal chains off the timing master.
- Daisy chain all Clients.
- **Do not connect the Quadro Sync II cards to TCP/IP networking equipment**.
  Although it’s the same cable, damages can occur to both the Quadro Sync II cards as well as to networking equipment.



Note: If an external reference is used, connect the cable (BNC connector) to the Timing Masters Quadro Sync II card.

- The state of the port is indicated by a Small LED on the port:



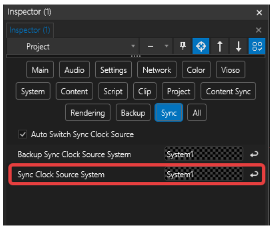
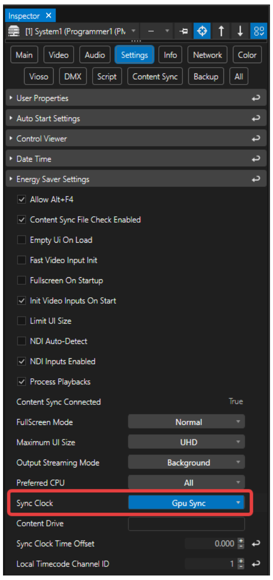
NVIDIA Setup

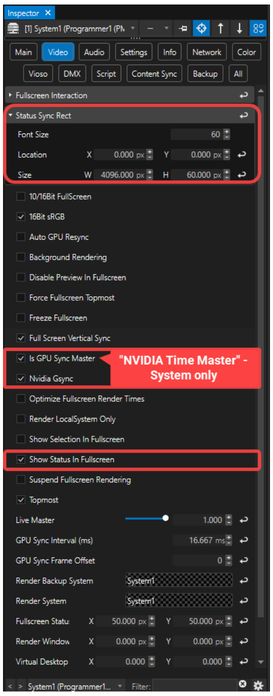
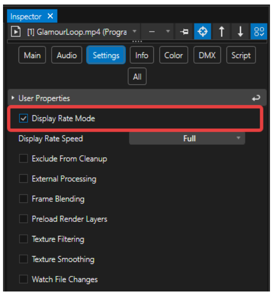
Make sure to install the same NVIDIA Quadro RTX display driver on all systems. Vertex usually works best with the latest stable releases.

1. EDID Emulation: Load Display EDIDs for all connected displays in System Topology Menu.
2. Mosaic Setup: Create a single Mosaic with all displays aligned horizontally.
3. Reboot System to ensure NVIDIA driver kept all settings.
4. Synchronize Displays
    a. Start with the Timing Server Master. Choose the time server is “On this system” (edit Settings to configure external reference) and apply.
    b. Continue with all Client Systems. Choose the time server is “On another system”, select the Mosaic Display to lock to the time servers clock and apply.

VERTEX Setup

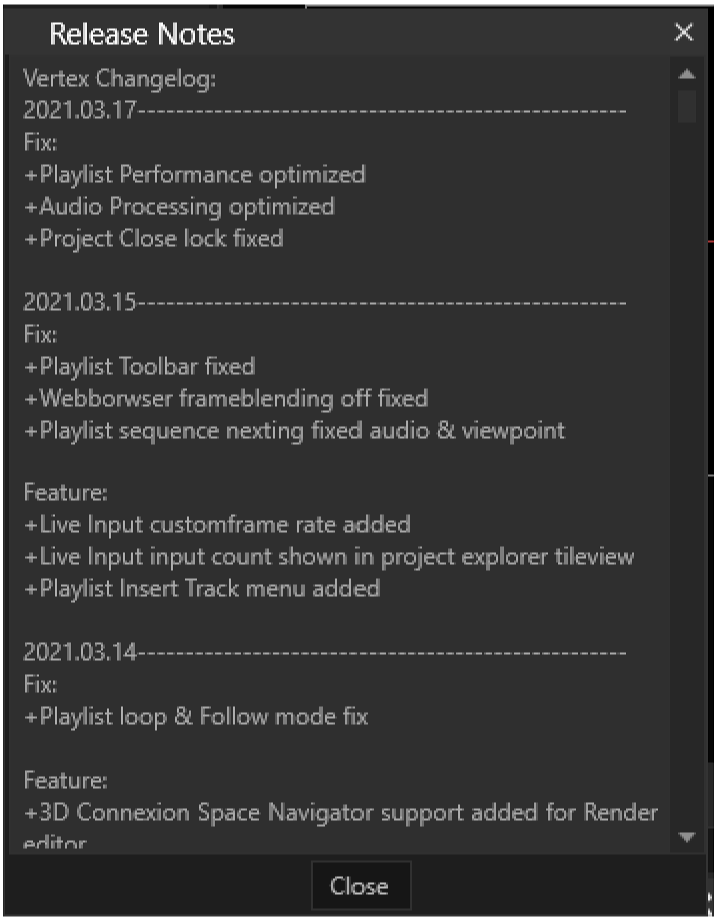
Once the NVIDIA GPU sync setup is done, launch VERTEX on all systems and connect to your session. The following steps can be performed by any system in the session (Suite or EDIT license), regardless of the availability of a Quadro Sync II card.

 Inspector (1) Inspector (1) Project Main Audio Settings Network Color Vioso System Content Script Clip Project Content Sync Rendering Backup Sync All ☑ Auto Switch Sync Clock Source Backup Sync Clock Source System: System1 Sync Clock Source System: System1	Go to *Project Settings > Sync > Sync Clock Source System...*	... and **set it to the particular system configured as your NVIDIA Time Master**.
 Inspector [1] System1 (Programmer1 (PM Main Video Audio Settings Info Network Color Vioso DMX Script Content Sync Backup All User Properties Auto Start Settings Control Viewer Date Time Energy Saver Settings ☑ Allow Alt+F4 ☑ Content Sync File Check Enabled ☐ Empty Ui On Load ☐ Fast Video Input Init ☐ Fullscreen On Startup ☑ Init Video Inputs On Start ☐ Limit UI Size ☐ NDI Auto-Detect ☑ NDI Inputs Enabled ☑ Process Playbacks Content Sync Connected: True FullScreen Mode: Normal Maximum UI Size: UHD Output Streaming Mode: Background Preferred CPU: All Sync Clock: Gpu Sync Content Drive: Sync Clock Time Offset: 0.000 Local Timecode Channel ID: 1	Go to *System Settings...* ...for systems **with** a Quadro Sync II	**set Sync Clock** to *Gpu Sync*. These systems will use the hardware-synchronized NVIDIA frame counter as their sync source.
	... for systems **without** a Quadro Sync II	**set Sync Clock** to *System Clock*. These systems (e.g. operators' laptop, editing system etc.) will receive a VERTEX generated clock signal from the *Sync Clock Source System* through the network.

 Inspector [1] System1 (Programmer1 (PN Main Video Audio Settings Info Network Color Vioso DMX Script Content Sync Backup All Fullscreen Interaction Status Sync Rect Font Size 60 Location X 0.000 px Y 0.000 px Size W 4096.000 px H 60.000 px □ 10/16Bit FullScreen ☑ 16Bit sRGB □ Auto GPU Resync □ Background Rendering □ Disable Preview In Fullscreen □ Force Fullscreen Topmost □ Freeze Fullscreen ☑ Full Screen Vertical Sync ☑ Is GPU Sync Master ☑ Nvidia Gsync "NVIDIA Time Master" - System only □ Optimize Fullscreen Render Times □ Render LocalSystem Only □ Show Selection In Fullscreen ☑ Show Status In Fullscreen □ Suspend Fullscreen Rendering ☑ Topmost Live Master 1.000 GPU Sync Interval (ms) 16.667 ms GPU Sync Frame Offset 0 Render Backup System System1 Render System System1 Fullscreen Statu: X 50.000 px Y 50.000 px Render Window X 0.000 px Y 0.000 px Virtual Desktop X 0.000 Y 0.000 System1 (Programmer1... Filter:	**Go to** *System Settings > Video* … …for systems **with** a Quadro Sync II	**enable** the property *Is GPU Sync Master* only for the particular VERTEX System that is your dedicated NVIDIA Time Master. Also, enable the property *Nvidia Gsync* on all synchronized systems.
	For testing purposes	**enable** *Show Status in Fullscreen* on all synchronized Systems. This will embed synchronization information on the systems fullscreen rendering outputs. A white rectangle will pulse in the interval provided by NVIDIAs clock to quickly check the synchrony of all systems (e.g. on a large LED screen fed by multiple systems). Set *Size* and *Location* in the property group called *Status Sync Rect.* Once testing has been satisfactory, you can disable *Show Status in Fullscreen* and may proceed to play out media.
 Inspector [1] GlamourLoop.mp4 (Progra Main Audio Settings Info Color DMX Script All User Properties ☑ Display Rate Mode Display Rate Speed Full □ Exclude From Cleanup □ External Processing □ Frame Blending □ Preload Render Layers □ Texture Filtering □ Texture Smoothing □ Watch File Changes	*optional setting* for content produced in the systems' display rate	**enable** *Display Rate Mode* to force VERTEX to play out every video frame exactly in synch with the GPU frame cycle.

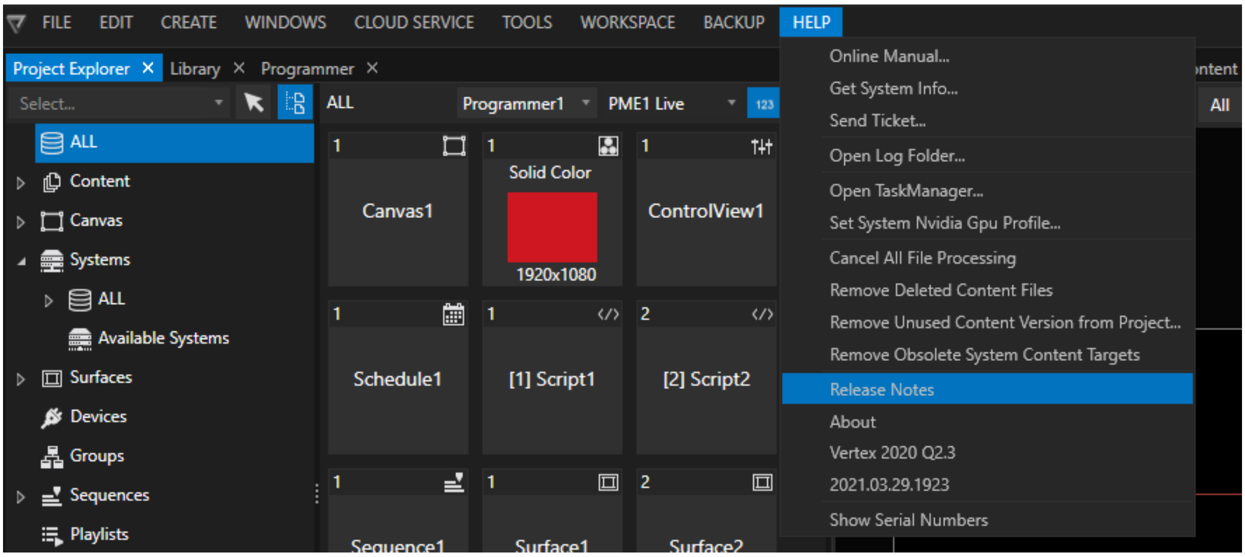
3.8 Release-Notes

- Each new VERTEX version has the **release notes** along with it
- With less clicks you are **able to check easily** what has **been fixed**, **improved** or **what is new**
- If you are **curious about our development,** the **changelog in the release notes** is always a good place to start



```
Vertex Changelog:
2021.03.17------------------------------------------------
Fix:
+Playlist Performance optimized
+Audio Processing optimized
+Project Close lock fixed

2021.03.15------------------------------------------------
Fix:
+Playlist Toolbar fixed
+Webborwser frameblending off fixed
+Playlist sequence nexting fixed audio & viewpoint

Feature:
+Live Input customframe rate added
+Live Input input count shown in project explorer tileview
+Playlist Insert Track menu added

2021.03.14------------------------------------------------
Fix:
+Playlist loop & Follow mode fix

Feature:
+3D Connexion Space Navigator support added for Render
editor
```

Where to find



- Just open **HELP** into the main menu on top
- Navigate to **"Release Notes"**
- A new window is opened

Getting Started

4 Getting Started

- Start from scratch with an easy quick-start workflow.
- Get a little more complex with the Compositions workflow.
- Or use this manual as a reference / background information for a specific task.

Create your first project

1. How to create a project
2. Where to find global Project Settings
3. Basics on Project Load and Save

User Interface

Learn more about the different Parts and Windows
Get to know the most important and most useful editors. Get some useful background information about special settings
Learn Basics about User Interaction into VERTEX

Add Content

Different types of content in VERTEX and their specific settings

Manage Content

Manage your content into the Project Explorer

1. Define User Properties like Notes, Color, Names
2. Sort content with Collections
3. Group Devices
4. Use the unique visioning feature and switch through Content versions with ease

Content Arrangement

Canvas, Clip Containers, Keyframes, Playback , Playlist, Video FX, ...
Read the Introduction first to get the Basics

Configure Outputs

Live and Preview Playback

Vertex supports simultaneous playback instances, allowing previews to run without affecting the live output.

Enough Basics?

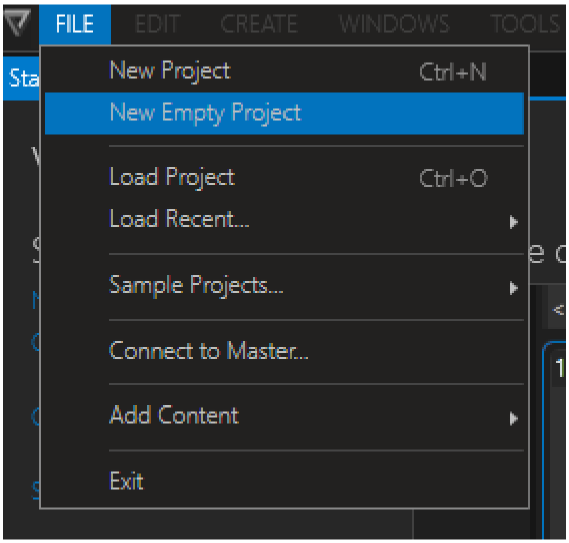
Learn more about the Advanced Features

4.1 Easy Workflow With Destinations

- If this is your first time using Vertex, then this is your quick start guide.
- *Destinations* is a **fast-lane feature expediting basic tasks.**
- Position and route your content from Canvas to Output with a *Destination.*
- **This simplified workflow** in 5 easy steps will have your content displayed in your video output in less than 1 Minute and not more than 11 clicks.

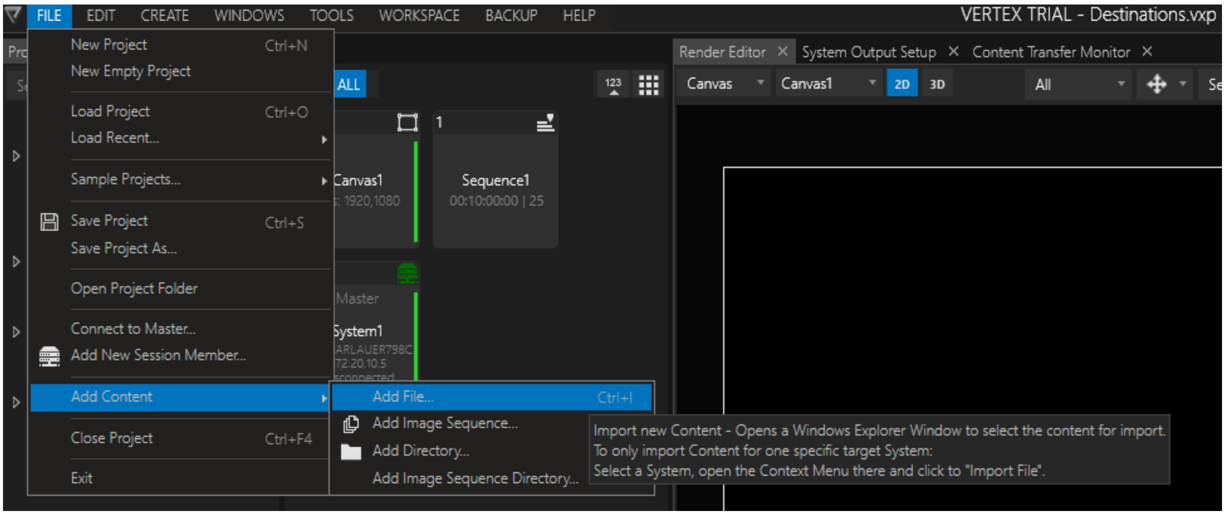
Start From Scratch

1. **start Vertex** and from the start screen, go to MAIN MENU > FILE > **CREATE NEW EMPTY PROJECT**



For this quick setup to work, it is important to choose NEW EMPTY PROJECT, as the other option holds pre-configured Canvas-Surface-Output setups, that might obscure the easy Destinations workflow.

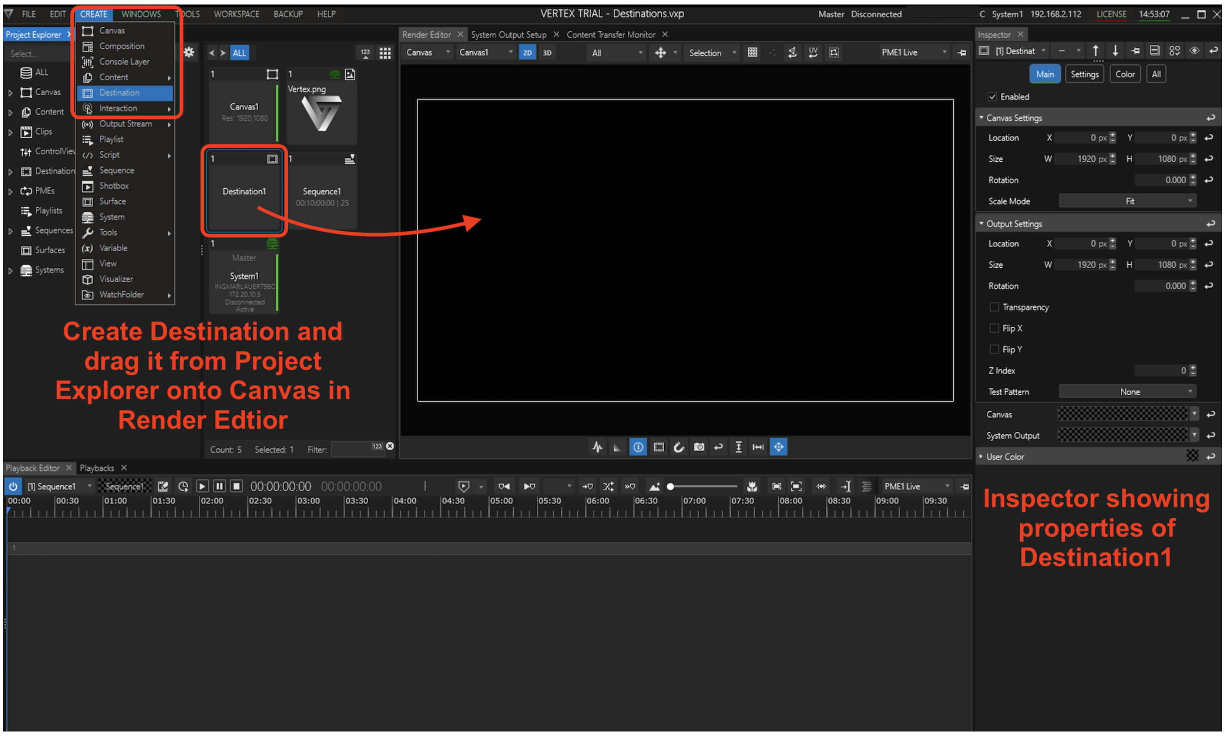
2. **import content**: MAIN MENU > FILE > ADD CONTENT



Import new Content - Opens a Windows Explorer Window to select the content for import.
To only import Content for one specific target System:
Select a System, open the Context Menu there and click to "Import File".

Choose a content file of your choice to import. Vertex supports a vast number of video and stills file formats. Read more on content import...

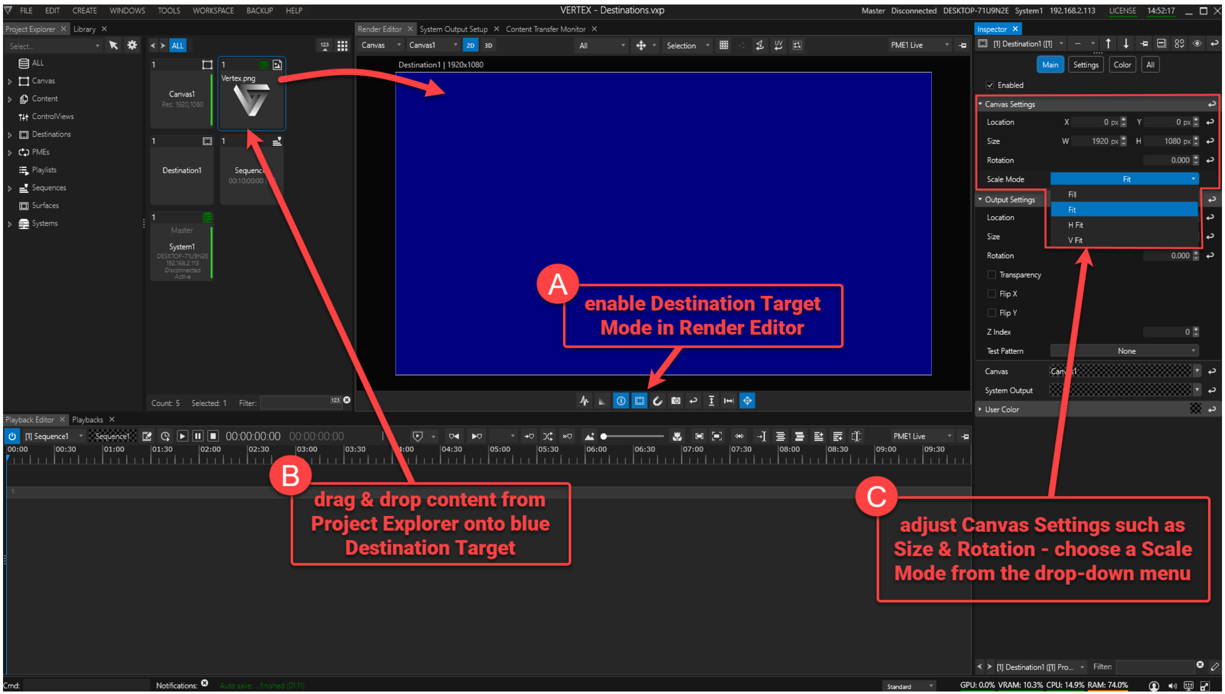
3. **create Destination,** assign & position on Canvas



Create Destination and drag it from Project Explorer onto Canvas in Render Edtior

Inspector showing properties of Destination1

4. drop and adjust content



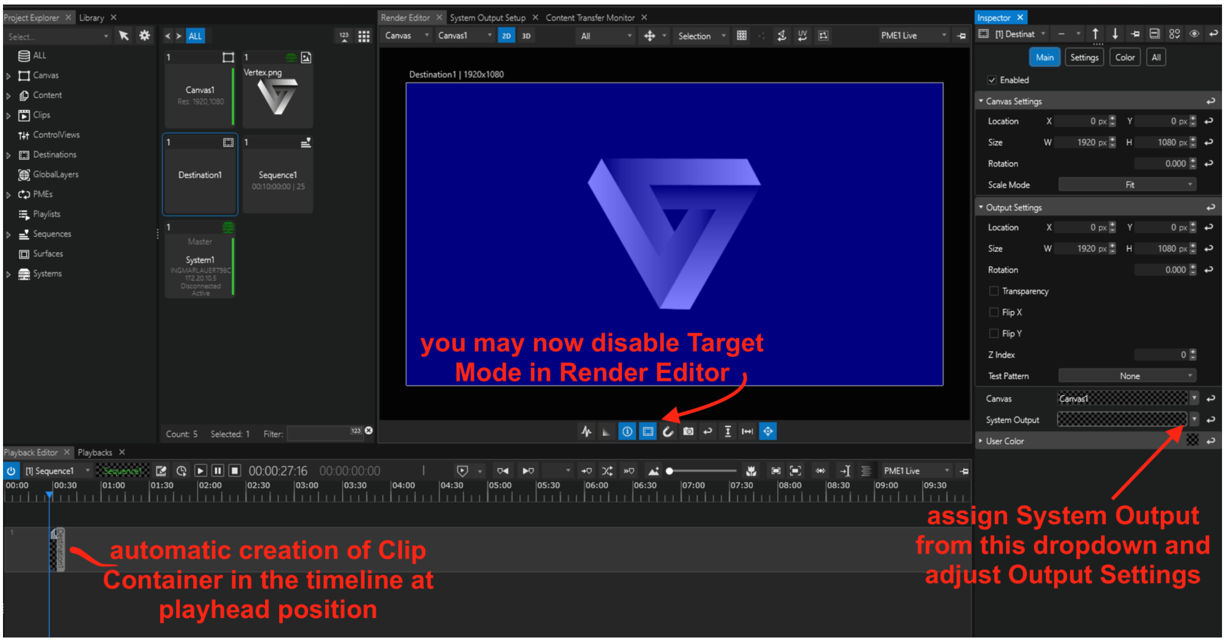
A enable Destination Target Mode in Render Editor

B drag & drop content from Project Explorer onto blue Destination Target

C adjust Canvas Settings such as Size & Rotation - choose a Scale Mode from the drop-down menu

Adjustment Settings (C) are optional, als your content should fit right in with the default settings.

5. assign & adjust output



you may now disable Target Mode in Render Editor

automatic creation of Clip Container in the timeline at playhead position

assign System Output from this dropdown and adjust Output Settings

As soon as you have dropped your content onto the blue Destiantion area, Vertex will automatically create a Clip Container in your sequence at the playhead position. Read more on Clip Containers and Sequences...

Once you have an output assigned, Vertex will render your content in your full screen output window. To engage/leave full screen rendering, press CTRL-F.

ⓘ **If this is your first time with VERTEX and you're just trying it out on a laptop without an external display:**
Press SPACE bar first to start the playback before going into full screen. Once the FS render window is on top of the UI, VERTEX will ignore the SPACE bar's transport commands (play/pause).

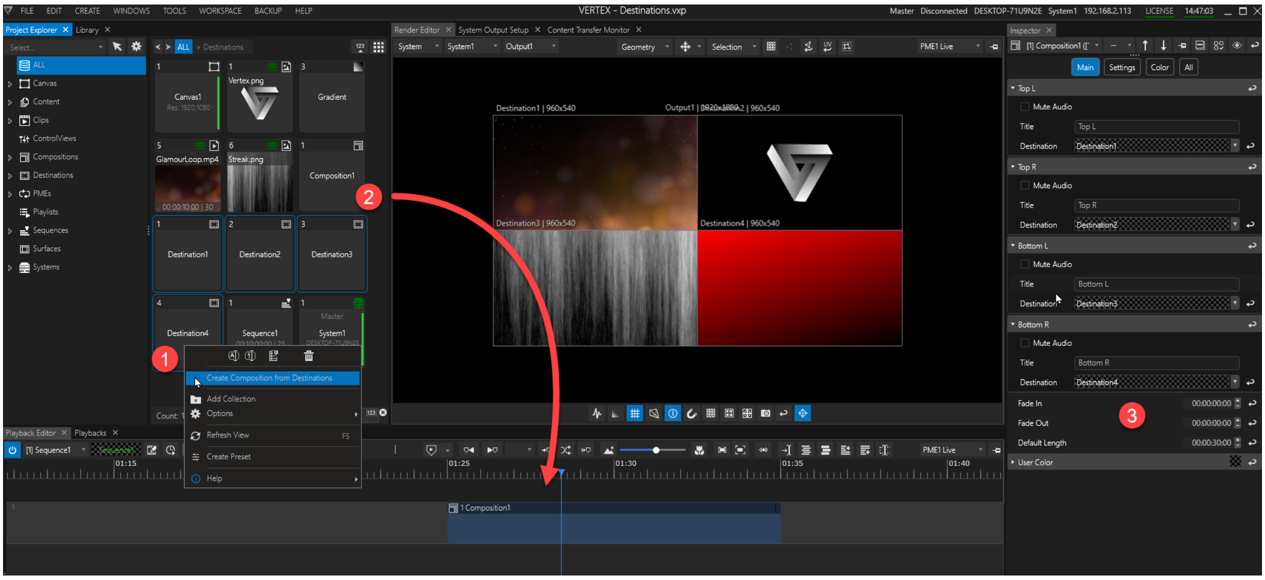
- Try out the next level: Vertex's smart Compositions feature with multiple Destinations.

4.2 Compositions

- *Compositions* are another **fast-lane feature for repetitive tasks**
- **Bundle** multiple *Destinations* into one *Composition*
- *Create a template layout for multiple content Destinations* along with their respective *Canvas & Output Locations*, **instead of tediously handling each clip separately**.
- ***Compositions*** will appear as *Clip Containers* **when dragged onto the timeline**, where **their slots can be filled with content**.

> **Benefits of this workflow:**
> This is a perfect solution for multiple repetitive content displays during your show, such as a brand logo appearing multiple times simultaneously on different outputs. Instead of cramming your timeline full of individual clip containers for this taks, everything is neatly folded into a Composition.

Bundling Destinations into Compositions

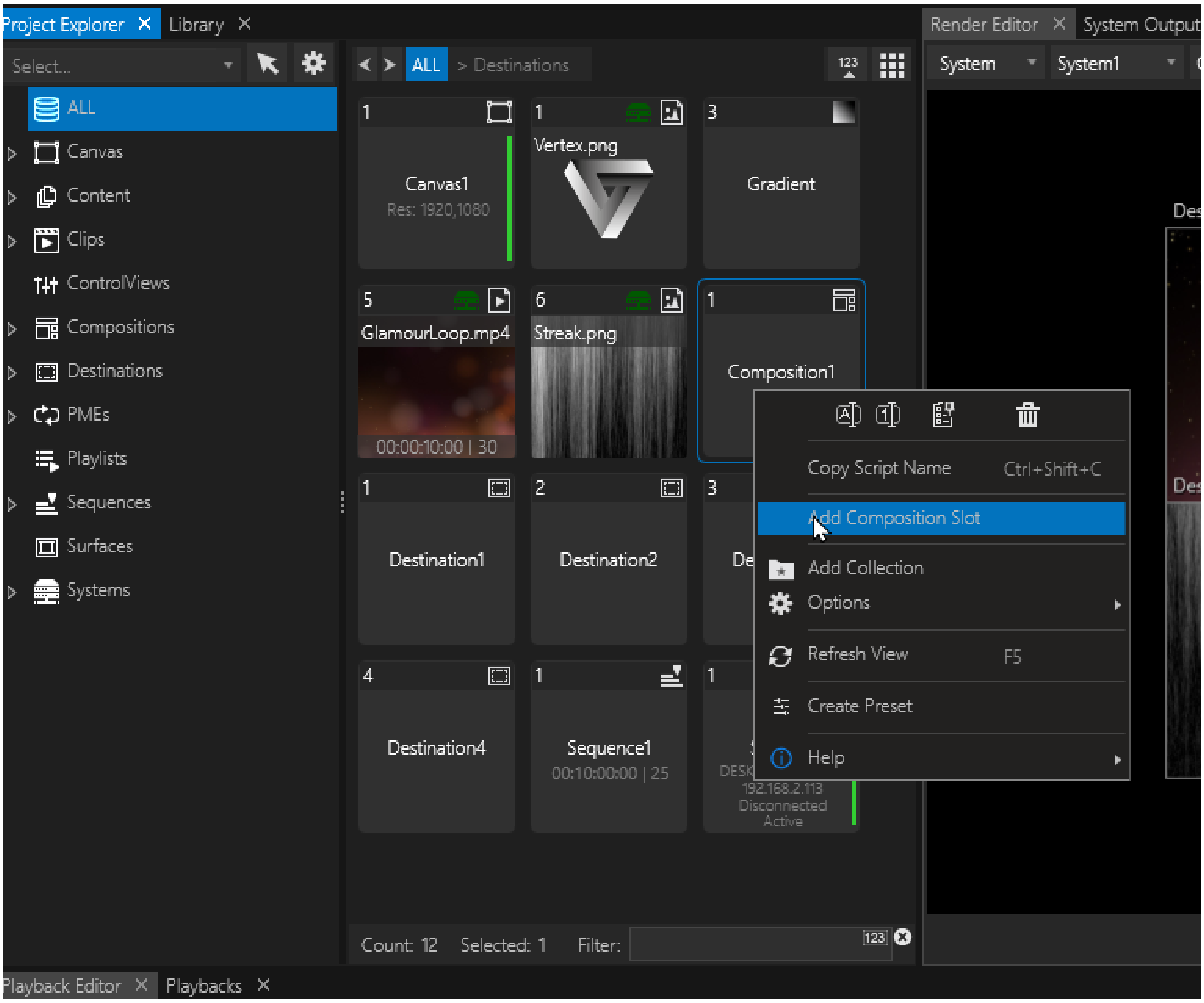


1. **Select** one or more *Destinations*, access the **context menu** with a right-click and choose ***Create Composition from Destinations***.
2. **A *Composition* is created** and appears as a new object in *Project Explorer*. **Drag and drop it onto your timeline**. This creates a *Clip Container* from your composition.
3. **Selecting** the Composition in Project Explorer will focus it into the **Inspector** window where you can:
   - find the **number of *Slots*** per Destination according to your selection

- give each *Slot* a ***Title*** for orientation purpose
- set a *Destination* for each *Slot*
- set default **fade times** and **clip length**

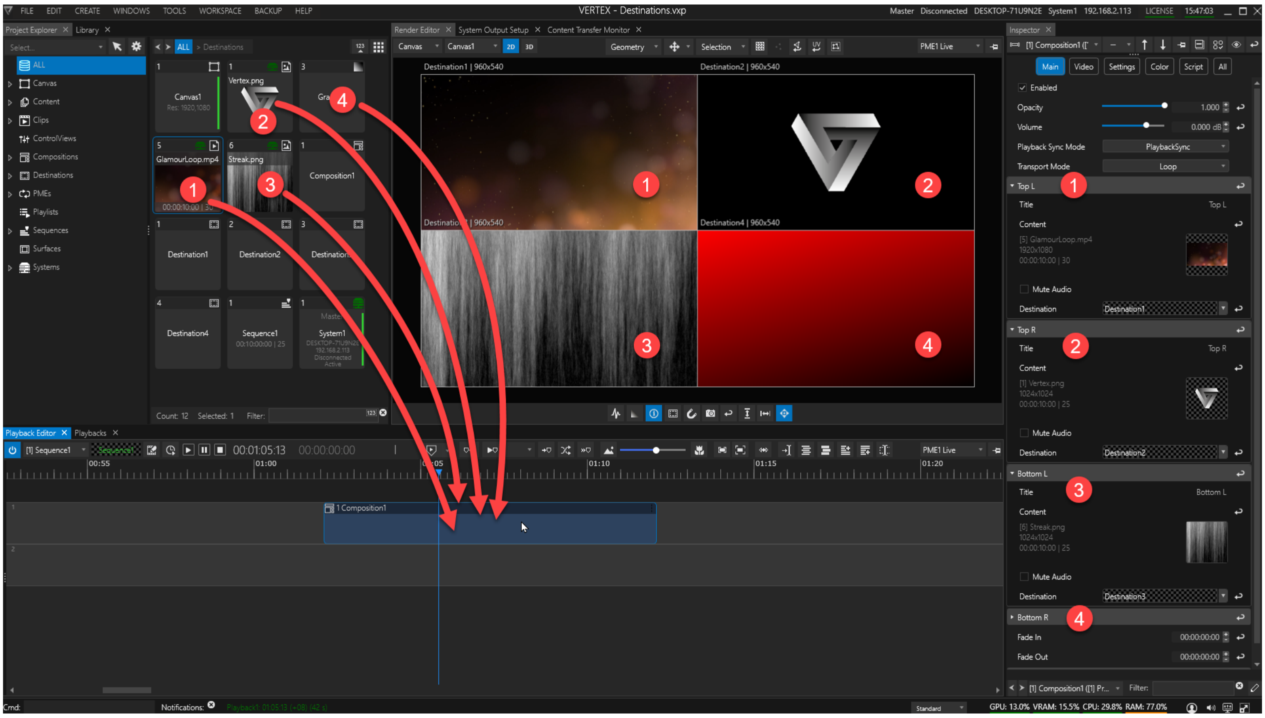
Adding blank Compositions

- **Go to** MAIN MENU > CREATE > COMPOSITION
- By default, every blank Composition is created with just one *Slot.* Add more Slots via the context menu (right-click on *Composition* object in *Project Explorer*)



Adding Content

Once the *Composition* has been dropped onto the timeline,
content items can be added per drag and drop and will be filling the *Slots* incrementally in the same order of the dropping action:



- The above screenshot shows 4 *Destinations* positioned as a quad-split layout and titled accordingly as *Slots* in the *Composition*.

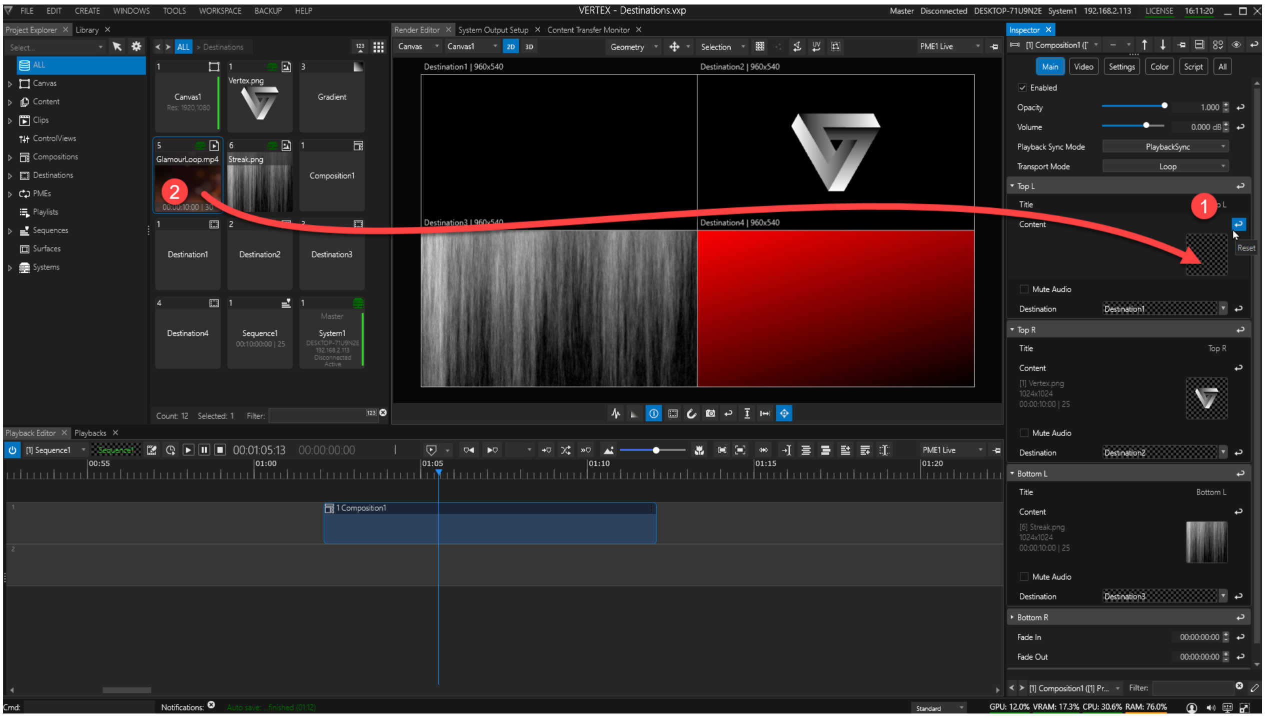
  4 content items are dragged to the *Composition's* *Clip Container*. They fill each *Slot* in the same order as dropped (compare the numbers in the picture above).
- Selecting the *Composition's Clip Container* focuses it in the Inspector where

  - each Slot's content can be set,

  - each Slot's audio can be muted individually,

  as well as basic Clip Container Settings: Opacity, Volume, Playback Sync Mode, Transport Mode and Fade Times.

Changing Assigned Content

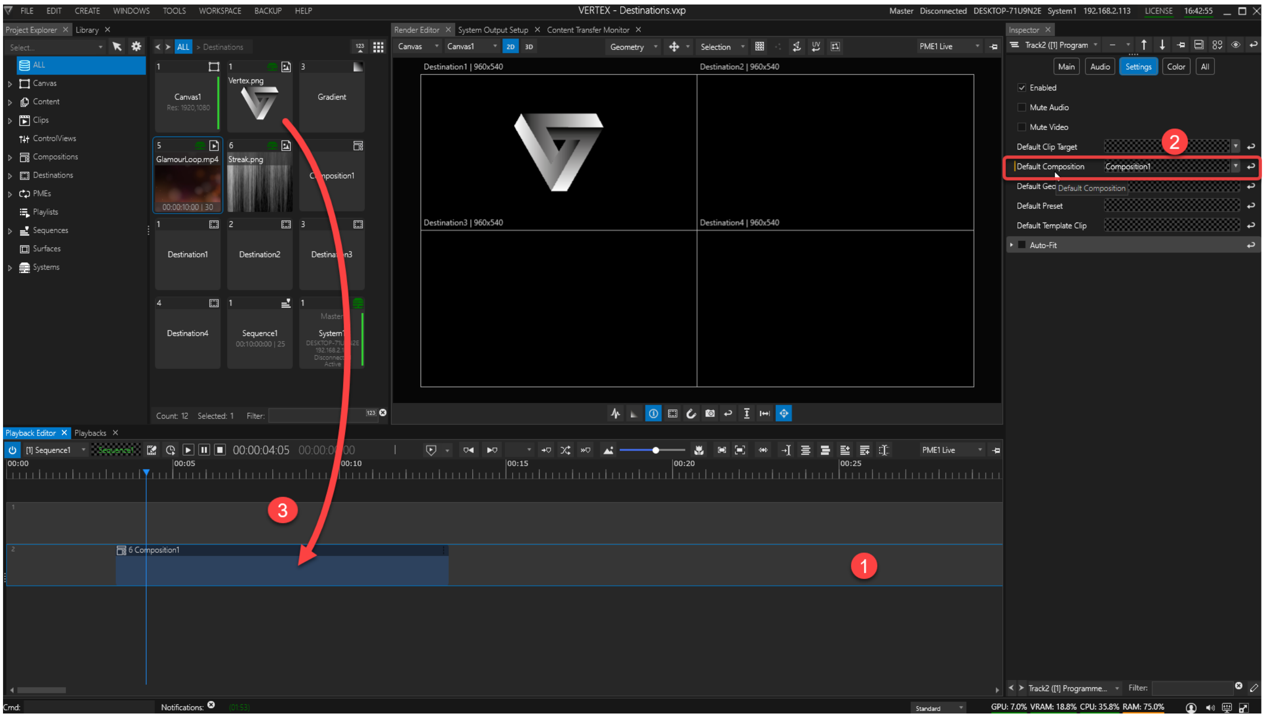


1. Reset a *Slot's Content* assignment with a click on the Reset button.
2. Drag & drop your alternative choice of content from Project Explorer onto the target field in the Inspector.

Compositions as Default Track Targets

Assigning a *Composition* as a default target for a sequence track is a time-saving way of **mapping content on the fly.**

Any content dropped onto the track with a *Default Composition* will instantly become part of the *Composition* set.



Default Composition: Composition1

1. click onto *Track2*, select & inspect
2. choose a *Composition* from the drop-down menu or drag & drop it from *Project Explorer* onto the Inspector's target field.
3. drag a content item directly onto *Track2*
   - instead of creating the usual *Clip Container,* the content item is directly transformed into *Slot1* of the *Composition*.
   - repeat this process to fill up your other *Slots*

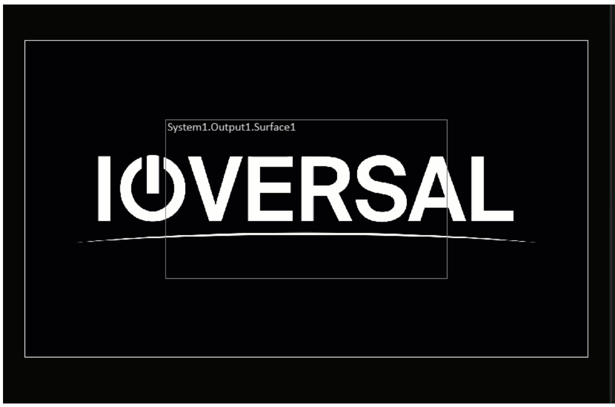
4.3 Canvas, Surface and Output

- Content arrangement, playback and rendering to output is basically done on three levels: **Canvas, Surface and Output.**
- Understanding the relationship and differences between these three levels is crucial.
- Alternatively, you may use the easy **Destinations** Workflow instead.

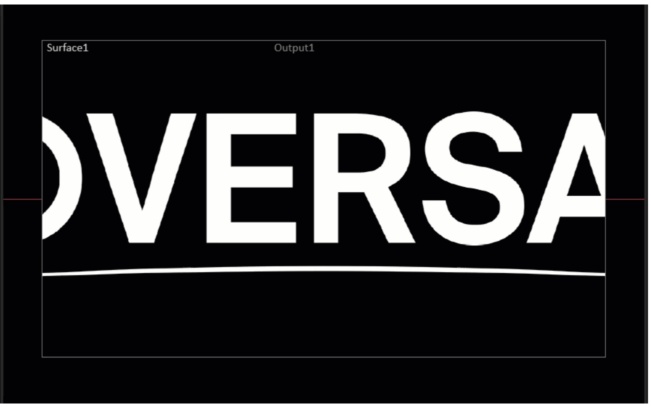
Workflow In 3 Quick Steps - From Canvas To Output:

1. Import media and arrange it on a Canvas.
2. Add surfaces to your canvas and position them.
3. Assign surface(s) to a system output, and fit it to your physical output dimensions.

Surface Is The Link Between Canvas And Output

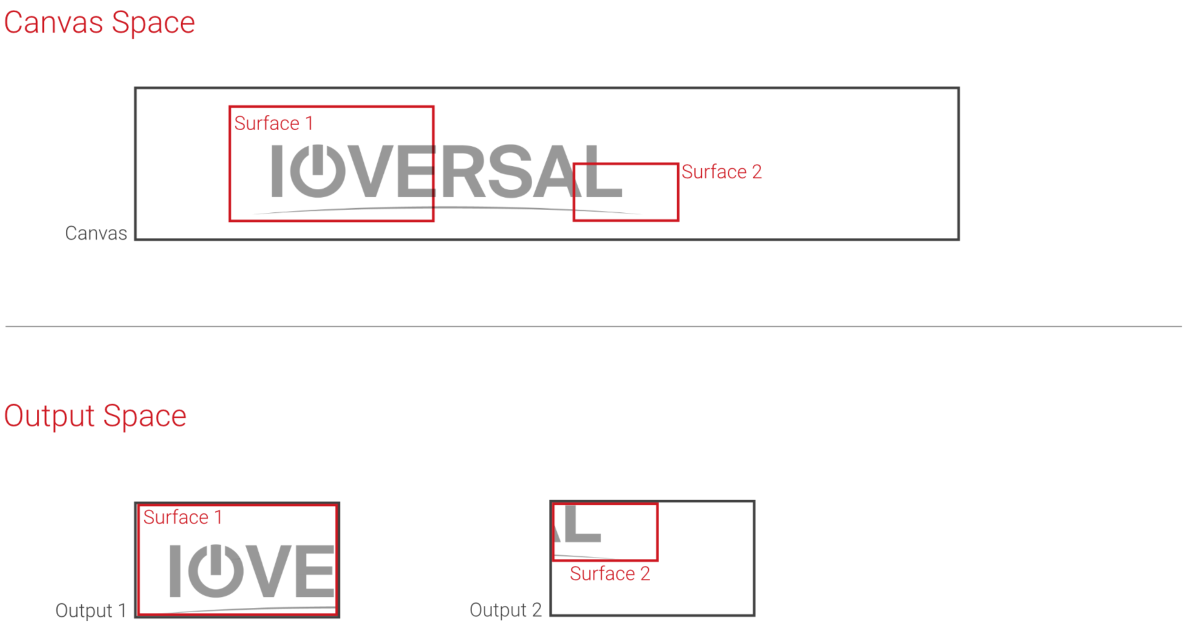


Surface Position in Canvas View



Output View

- The **Canvas** is VERTEX's virtual stage area where all media content is arranged.
- A **Surface** is a frame positioned onto the Canvas - much like the viewfinder of a camera capturing a part of that stage.
- The **Surface** captures a 2D render texture with optional **warping & blending** and sends it to an **Output.**
- The **Output** plays out the rendered image to the connected hardware (screen, projector, LED wall, etc).



Workflow and Advantages

For your convenience, every new VERTEX project starts with a Canvas in the size of your local Windows desktop. Canvas size can be changed anytime.
Per default, a Surface is automatically added and assigned to your output hardware in matching size and pixel resolution.

Advantages

- Your content and **creative workspace is independent of your outputs.**
- You can always get started arranging your show without knowing the number of your total VERTEX Systems, their output routing, or the exact number of your total outputs.
- Your project can be can be rearranged on each of the three levels **'Canvas-Surface-Output'** at any time.
- This flexibility makes it easy to adjust your output hardware when your project grows in size and complexity.

4.4 Configure Outputs

- This Chapter guides you through your output configuration. Set up outputs, assign surfaces to outputs and configure settings for audio playput.

Set up your Outputs

arrange your systems output setup

Output Settings

learn more about the output settings of a system

Surfaces

the important role of surfaces and how to assign them to outputs

Softedge Blending

information on tools for softedge blending

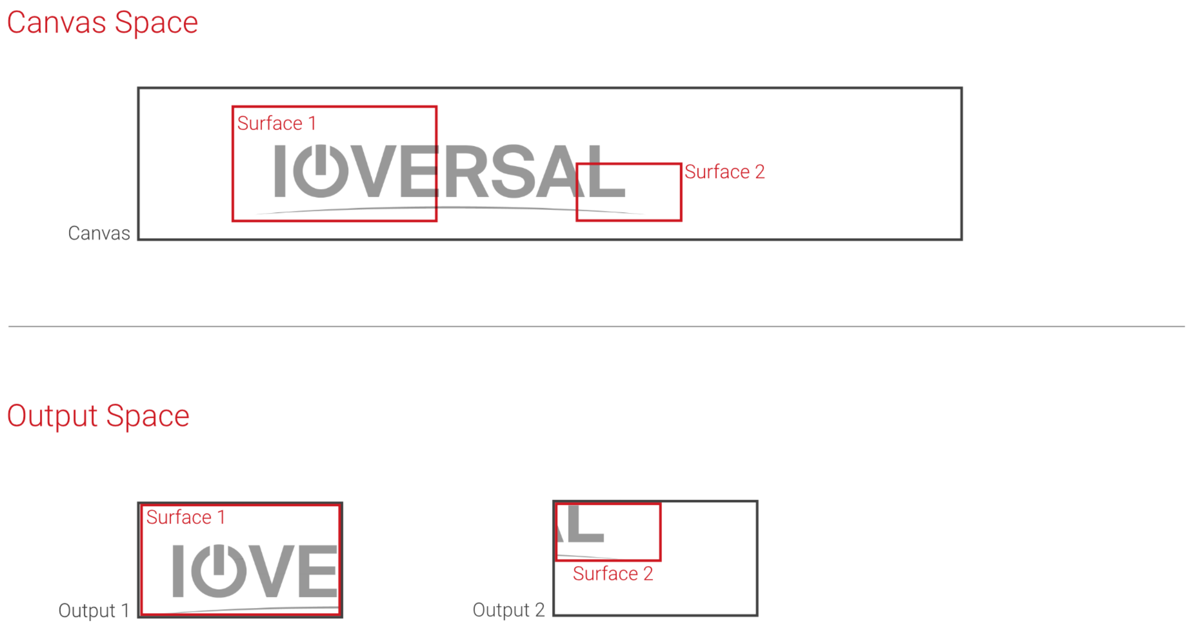
Audio Outputs

how to set up audio devices and how to configure audio outputs

4.4.1 Surface

- Because the compositing space of a *Canvas* **is processed independently** from your *Output(s),* a ***Surface*** is the **link between the two.**
- In order to play out content, Surfaces need to be **added to a *Canvas*** and **assigned to an *Output* -** either per drag-and-drop or from a context menu.
- *Surface* settings include **Canvas Offset (position of Surface on Canvas)** and ***Canvas Viewpoint***, as well as settings for output positioning.
- **Multiple Surfaces** can be **assigned to the same Output in split configurations.**

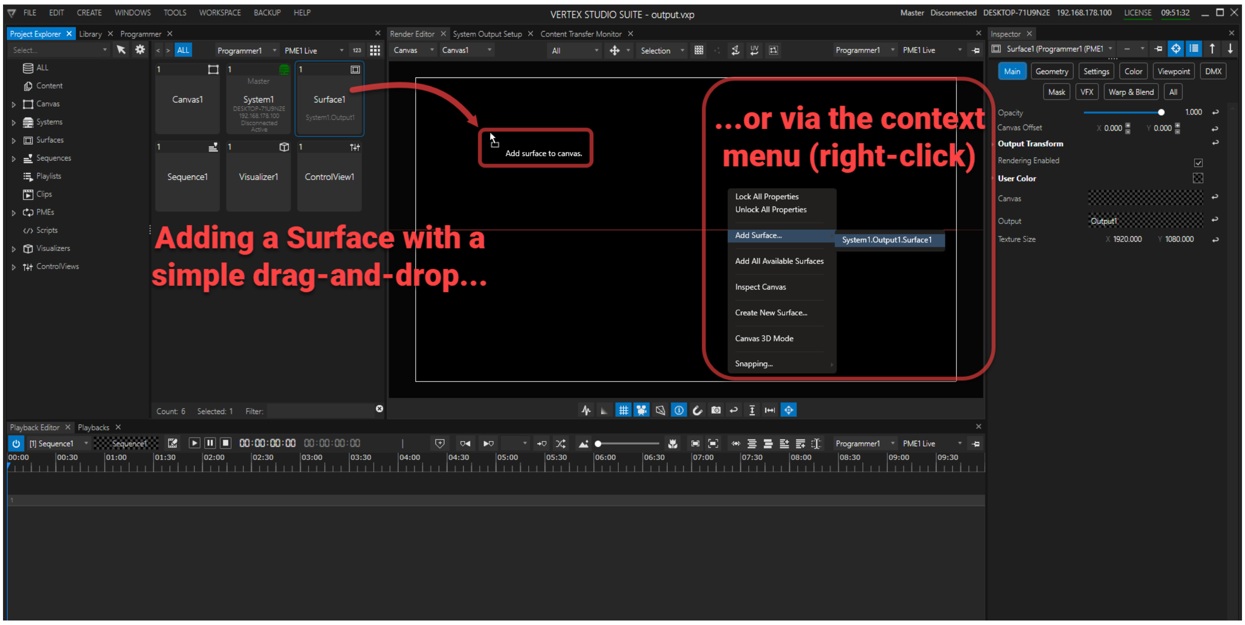
Surface links Canvas to Output



A Surface acts as a **bridge between Canvas Space and Output Space**. Like a camera frame capturing a **2-dimensional Render** Texture which is provided **for the Output**.
Because a *Surface* links both spaces, there are **transformational properties** in a Surface's Inspector **that work for Canvas and Output separately.**

Please also read the introduction to Canvas, Surface and Output.

Add / Remove a Surface



Adding a Surface with a simple drag-and-drop...

...or via the context menu (right-click)

Add surface to canvas.

There are **two different options** for adding a surface to a canvas

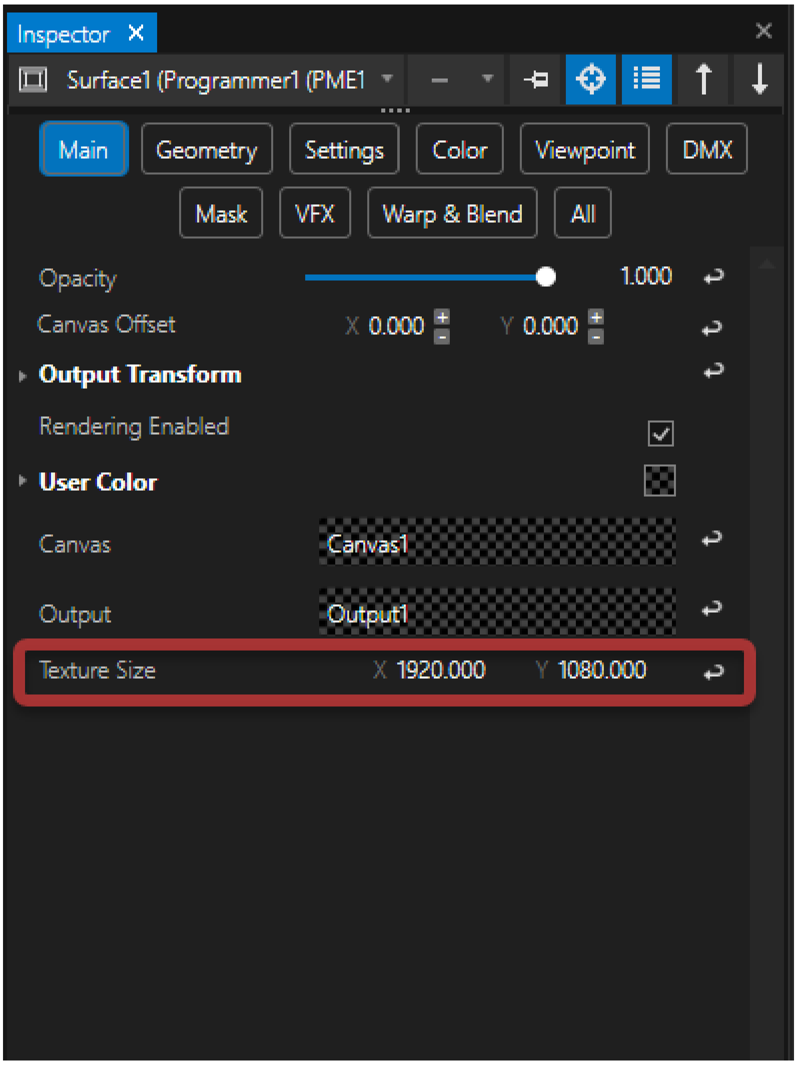
1. Per drag-and-drop from Project Explorer into Render Editor
2. or via the context menu (right-click in Render Editor) with the option of adding only one specific surface or all available surfaces at once.

Removing a Surface from a Canvas

- Access the REMOVE SURFACE command via the context menu of a surface in the Render Editor. Choose between removing only one specific surface or remove all surfaces from canvas.

Settings for a Surface

Surface Size



Opacity 1.000

Canvas Offset X 0.000 Y 0.000

Output Transform

Rendering Enabled ☑

User Color

Canvas Canvas1

Output Output1

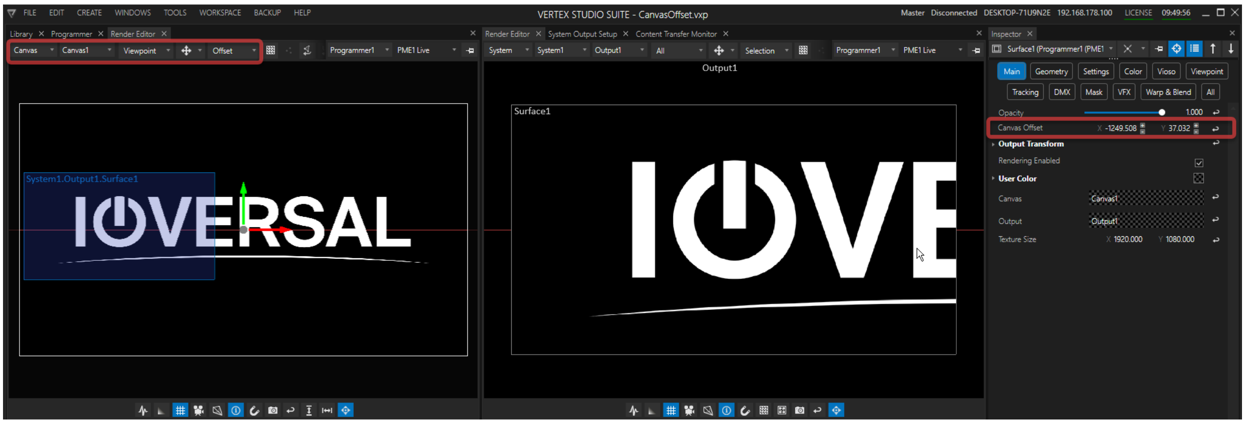
Texture Size X 1920.000 Y 1080.000

The ***Texture Size*** defines the **size of the *Surface***.

By default the texture size for new Surfaces is 1920 x 1080 Pixel

When adding a new system with outputs, VERTEX automatically creates a Surface for each new output.
In this case the *Texture Size* of the Surface matches the pixel size of the Output.

Surface Position and Viewpoint on Canvas

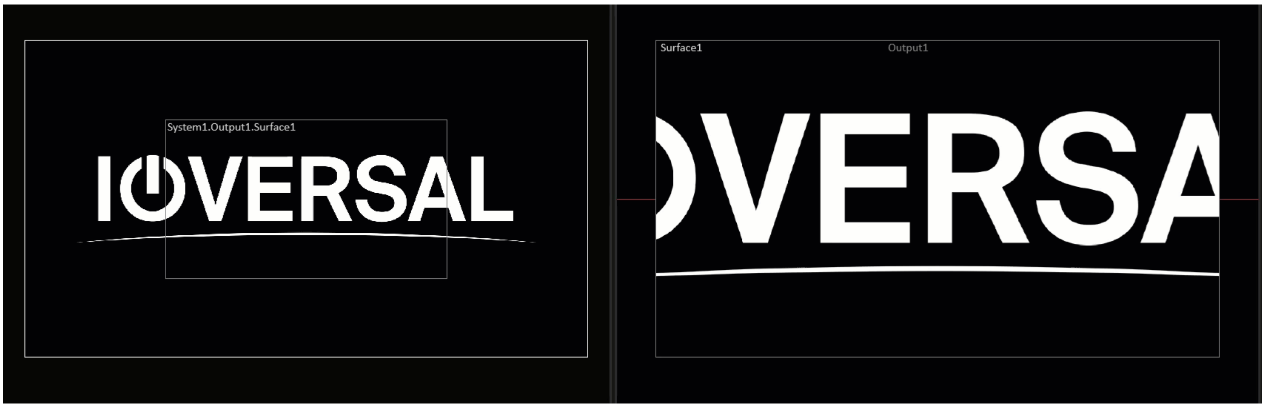

FILE EDIT CREATE WINDOWS TOOLS WORKSPACE BACKUP HELP
VERTEX STUDIO SUITE - CanvasOffset.vxp
Master Disconnected DESKTOP-71U9N2E 192.168.178.100 LICENSE 09:49:56
Library Programmer Render Editor
Canvas Canvas1 Viewpoint Offset Programmer1 PME1 Live
Render Editor System Output Setup Content Transfer Monitor
System System1 Output1 All Selection Programmer1 PME1 Live
Output1
System1.Output1.Surface1
Surface1
Inspector
Surface1 (Programmer1 (PME1
Main Geometry Settings Color Vioso Viewpoint
Tracking DMX Mask VFX Warp & Blend All

Opacity 1.000
Canvas Offset X -1249.508 Y 37.032
Output Transform
Rendering Enabled ☑
User Color
Canvas Canvas1
Output Output1
Texture Size X 1920.000 Y 1080.000

The **position** of the Surface on a Canvas is called ***Canvas Offset***.

The values for X and Y **offset** the frame of the *Surface* from its default position. Use them to reposition the *Surface* to its desired spot.

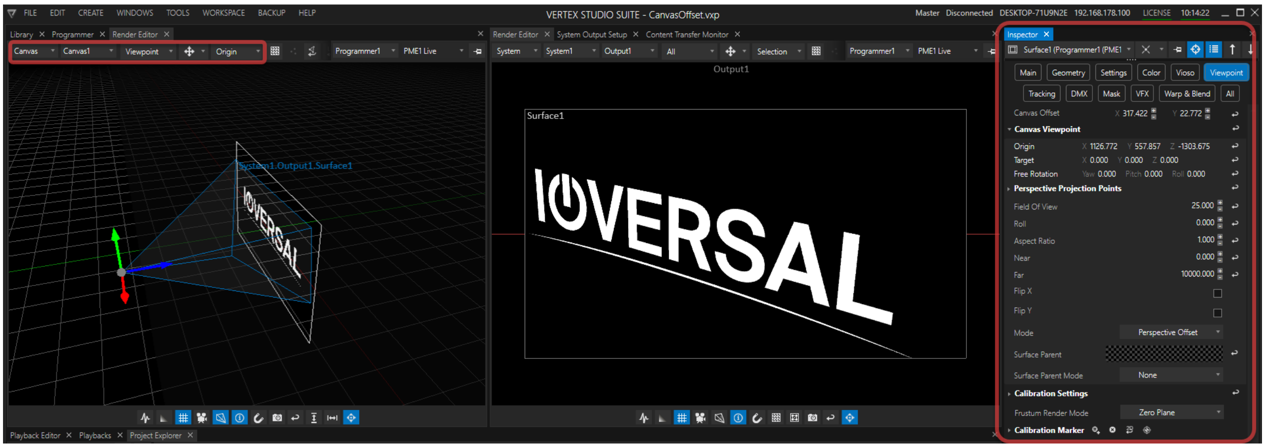
Switch to *Canvas View* in the Render Editor to see what you set:



Surface Position in Canvas View Output View

Canvas Viewpoint

The *Viewpoint* Tab of a Surface's Inspector contains various settings to **define** and **manipulate the Surface's viewing angle** onto the Canvas **for specific 3D views**.
In most cases the default settings should work. VERTEX automatically calculates the viewpoint origin based on *Texture Size* and *Canvas Size.*



Canvas Offset X 317.422 Y 22.772

Canvas Viewpoint

Origin X 1126.772 Y 557.857 Z -1303.675
Target X 0.000 Y 0.000 Z 0.000
Free Rotation Yaw 0.000 Pitch 0.000 Roll 0.000

Perspective Projection Points

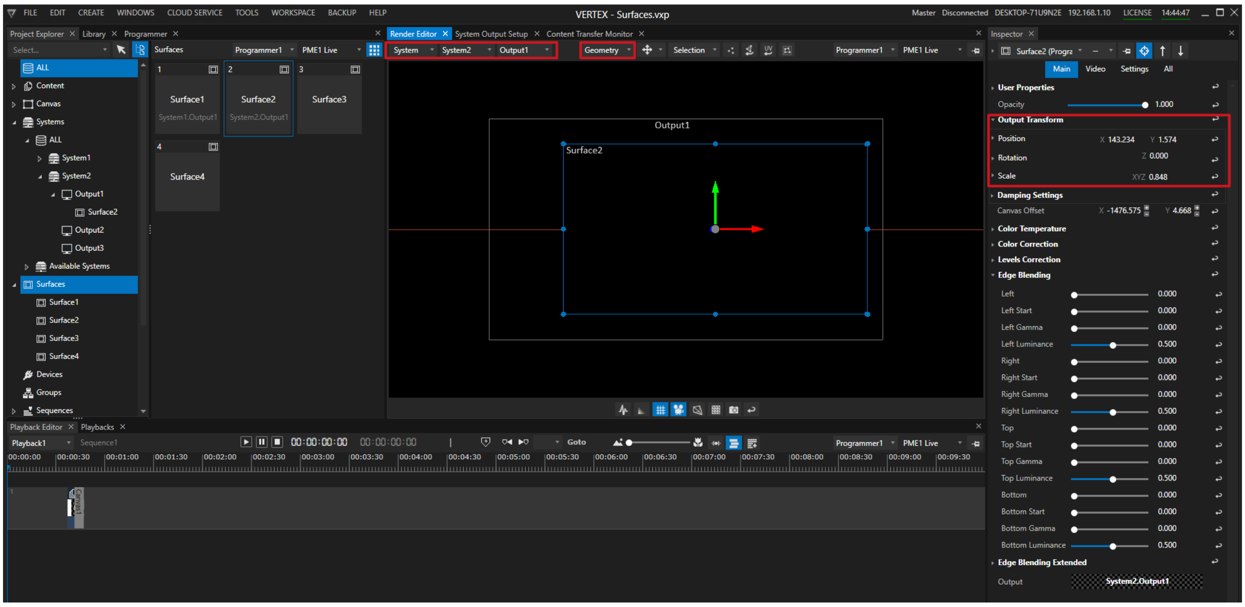
Field Of View 25.000
Roll 0.000
Aspect Ratio 1.000
Near 0.000
Far 10000.000
Flip X □
Flip Y □
Mode Perspective Offset
Surface Parent
Surface Parent Mode None

Calibration Settings

Frustum Render Mode Zero Plane

Calibration Marker

Output Position



User Properties

Opacity 1.000

Output Transform

Position X 143.234 Y 1.574
Rotation Z 0.000
Scale XYZ 0.848

Damping Settings

Canvas Offset X -1476.575 Y 4.668

Color Temperature

Color Correction

Levels Correction

Edge Blending

Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.000
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500

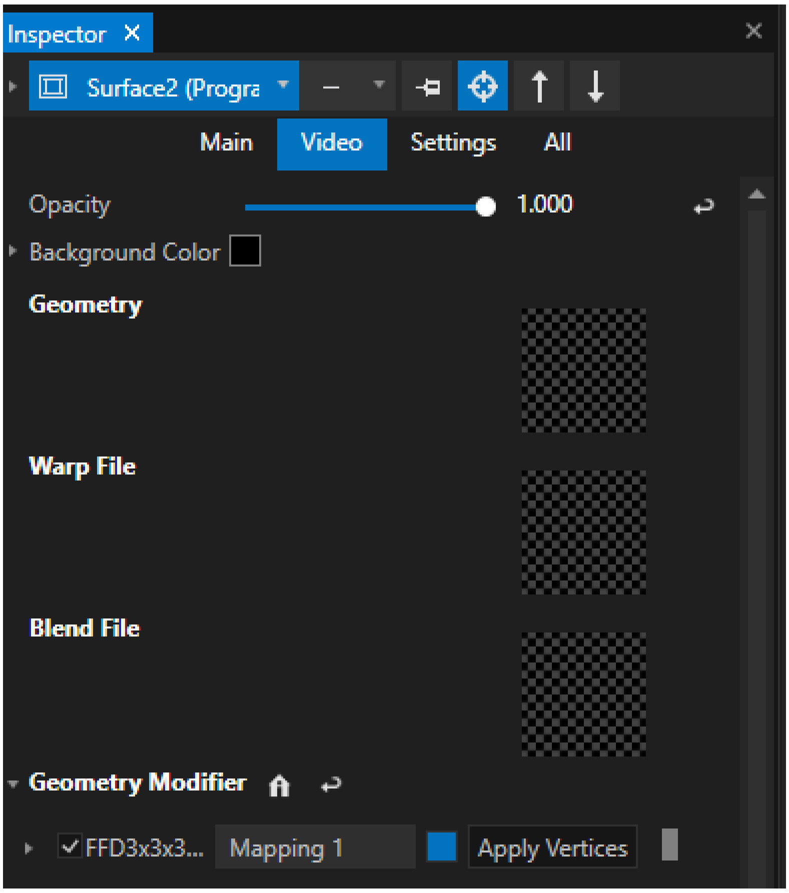
Edge Blending Extended

Output System2.Output1

The **Output Transform Settings** adjust the position of the Surface in its output .

- Select view ***System*** in the Render Editor and **select the Output** that is assigned to the Surface
- Switch to **Geometry Selection** to select your Surface
- **Transform your Surface** by setting the **values in the Inspector** or **move the Surface with your mouse** in the Render Editor.

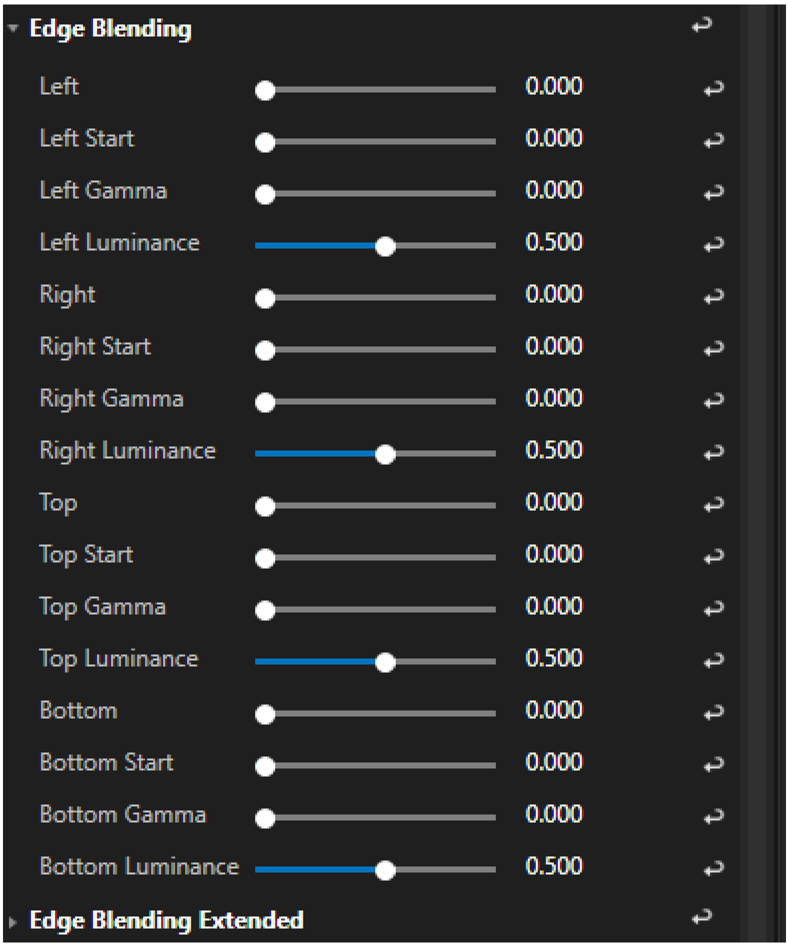
Geometry Modifier and Warp Files



Each Surface has Property fields for

- A **3d Geometry** that can assigned by drag and drop from Project Explorer
- A **Warp file**
- A **Blend file**
- Geometry Modifiers to do a Warping

Edge Blending



Edge Blending

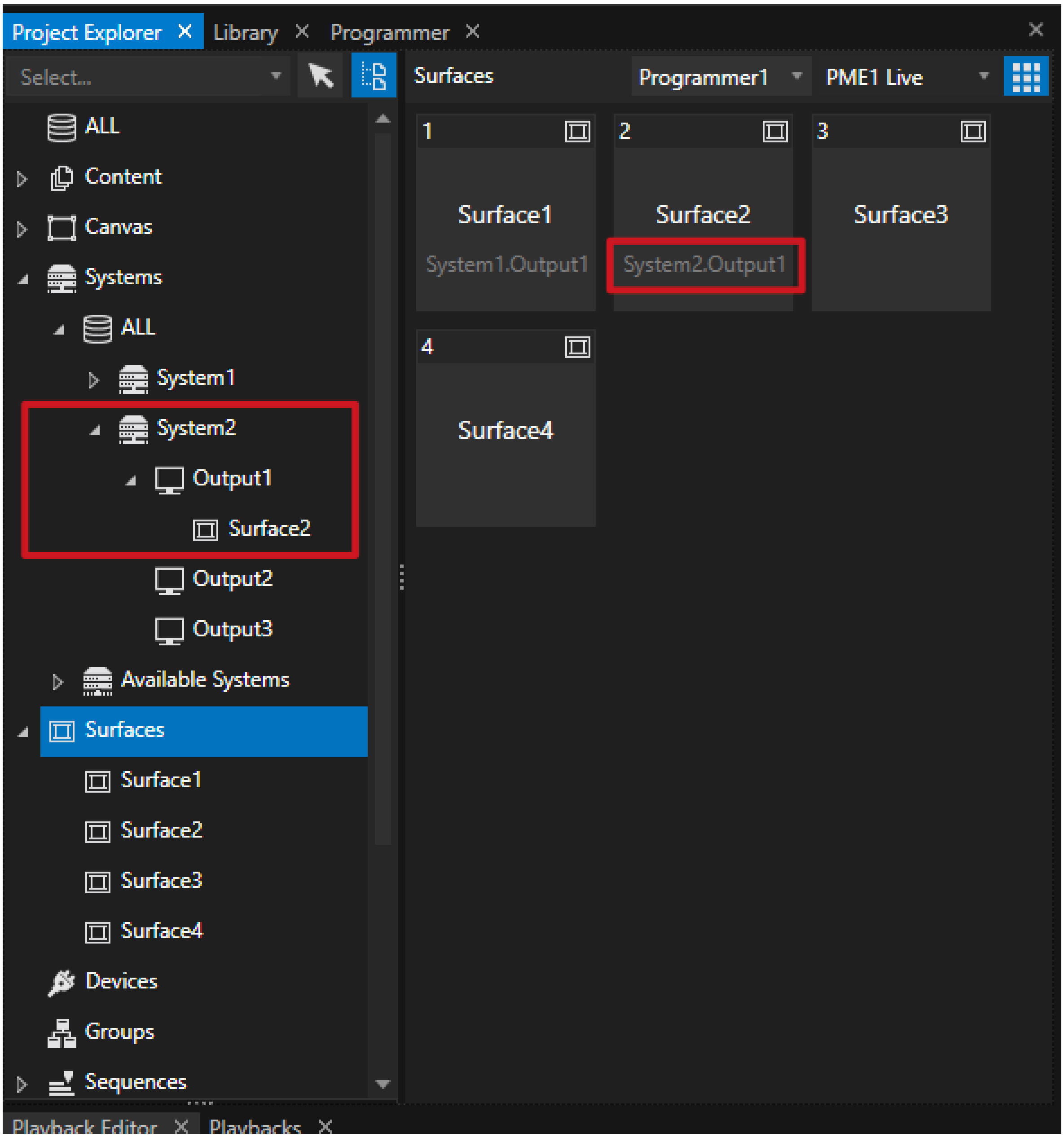
Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.000
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500

Edge Blending Extended

Each Surface has Edge Blending Parameters to set up an Edge Blending

Assign Surface to an Output / Remove Surface from an Output

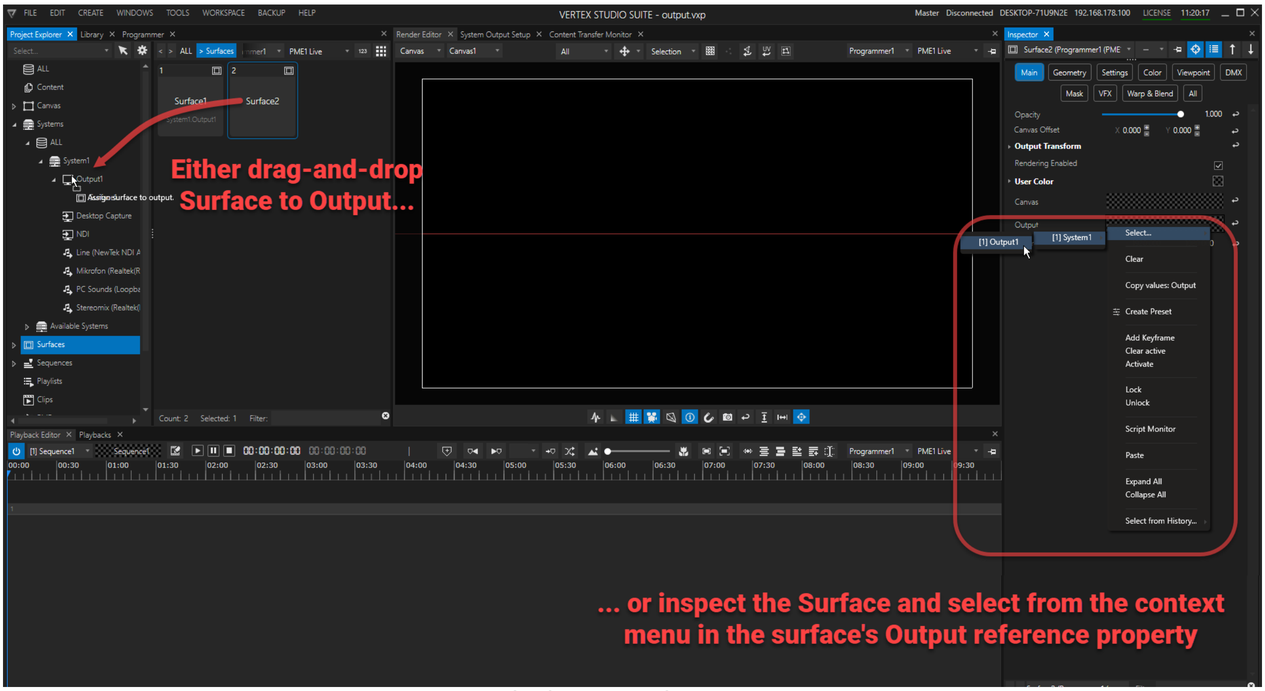
Output Reference



The output reference for each *Surface* assigned to an *Output* is shown in various places:

- the **Surface tile** in the Project Explorer
- top-left corner of the **Render Editor** (i.e. *System2.Output1.Surface2*)
- in the **Inspector** of a Surface under the tabs *Main* and *Settings*.

Assign Surface to an Output



Either drag-and-drop Surface to Output...

... or inspect the Surface and select from the context menu in the surface's Output reference property

There are 3 ways to assign an already existing Surface to an Output:

1. **Drag-and drop the Surface tile** from Project Explorer to a system's output in the tree-view
2. or drag and drop the Output from the tree-view of Project Explorer to the Surface's Output reference property in the Inspector,
2. or **access the context menu** (right-click) in the **Surface's Output reference** property in the Inspector and select your desired output from there.

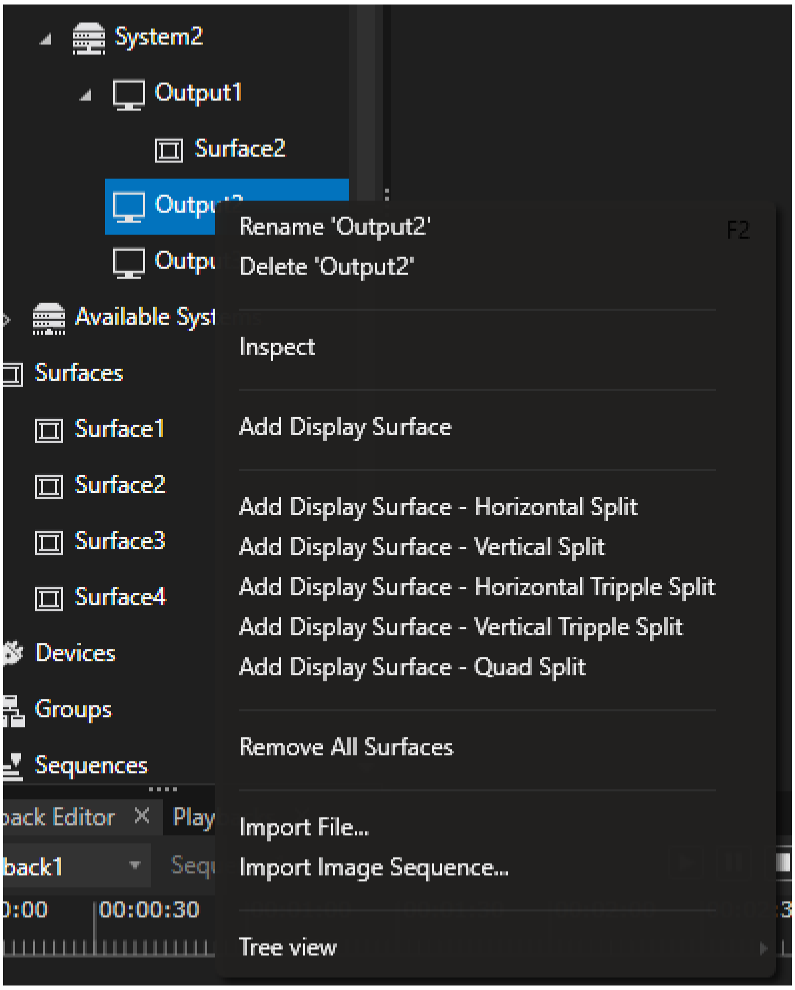
When starting a new project or add a System as session member to your project, for every output a Surface is automatically created.

This surface already is assigned to the corresponding output.

If no Surface exist or if you want to add more than one Surface to an output:

Select your output from *Project Explorer* or *System Output Setup* and access the context menu.

The texture sizes are automatically set for each new Surface.



Create a Spout Output from VERTEX:
Any Surface in VERTEX can render its texture as a Spout Output. Inspect the *Surface*, go to *Settings* tab (in advanced mode) and enable *Spout Output*.

Spout is an open source video texture sharing framework for Microsoft Windows.

With Spout it is possible to share video or graphics textures in realtime between windows applications on the same System.

Spout is supported and integrated by a lot of creative applications.

All information including a Spout test sender and receiver could be downloaded on the [Spout Website]

Remove Surface from an Output

There are **3 ways to remove a Surface from an Output**:

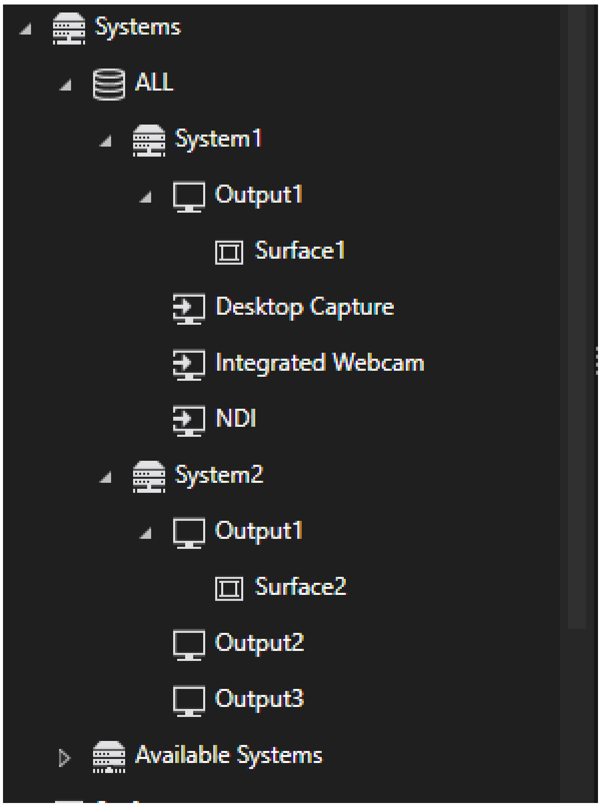
- Go to **Project Explorer** and navigate to your Surface, access the context menu and select *Remove Output Reference*.
- **OR**
- Delete the Surface as Child Element from an Output.
- **Surface Inspector:** Main Tab, go to **Output Reference** and select "**Clear**" from the context menu (right-click).

4.4.2 Output

- Outputs are usually **connected to a Surface**. Without an **assigned Surface,** there will be no signal routed to your output.
- **Outputs can be previewed** in *System* view of the Render Editor.
- **System Output Setup** window configures your outputs - **additional output settings** can be adjusted in the **Inspector.**

Output and Surface

- **Surfaces** connect canvas and output.
- assign a minimum of 1 Surface to an output.
- Read more about the basics behind
- How to assign a surface to your output.



Outputs of a System and the assigned Surfaces into Project Explorer

System Output Setup

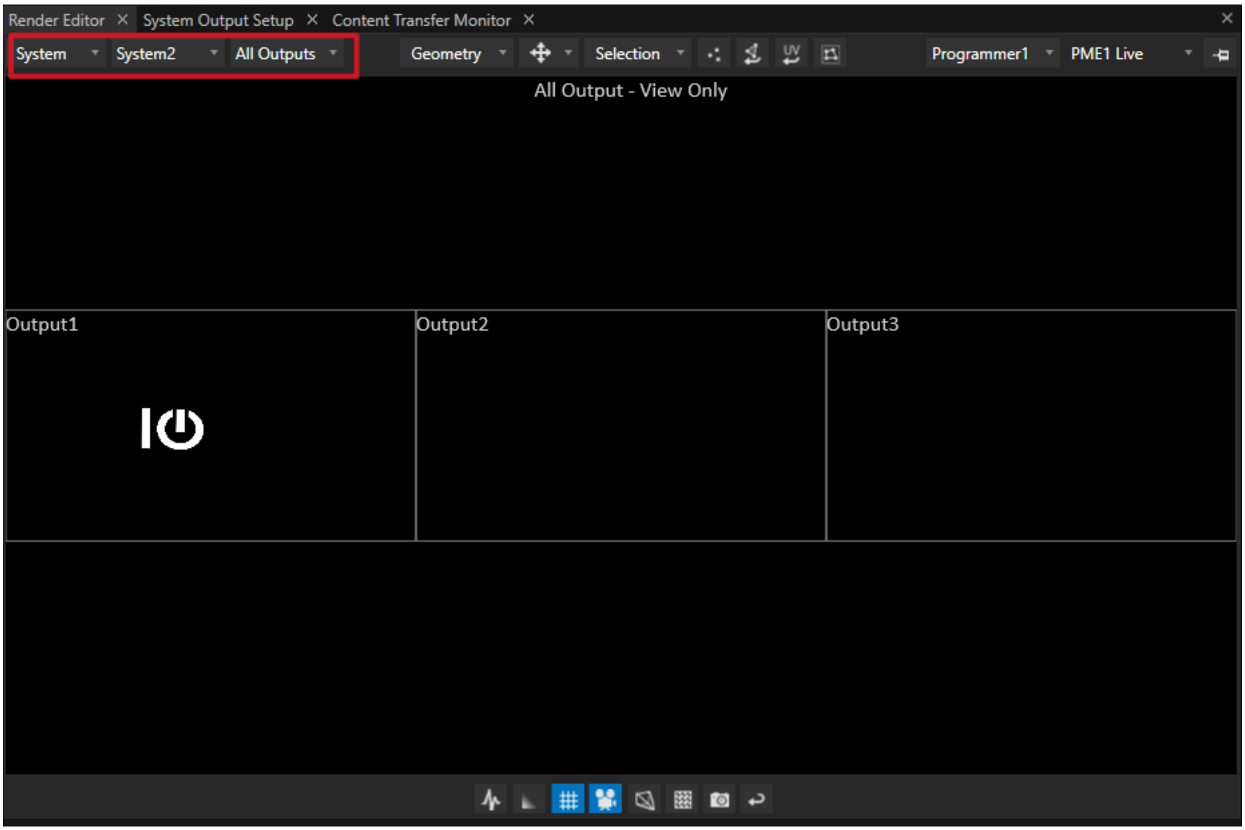
- System Output Setup Editor

Preview Outputs in Render Editor

Got to **System view** in the **Render Editor**

- **Preview all Outputs** of a System
- **Edit or warp a specific output** and the assigned **Surfaces**

All Output View

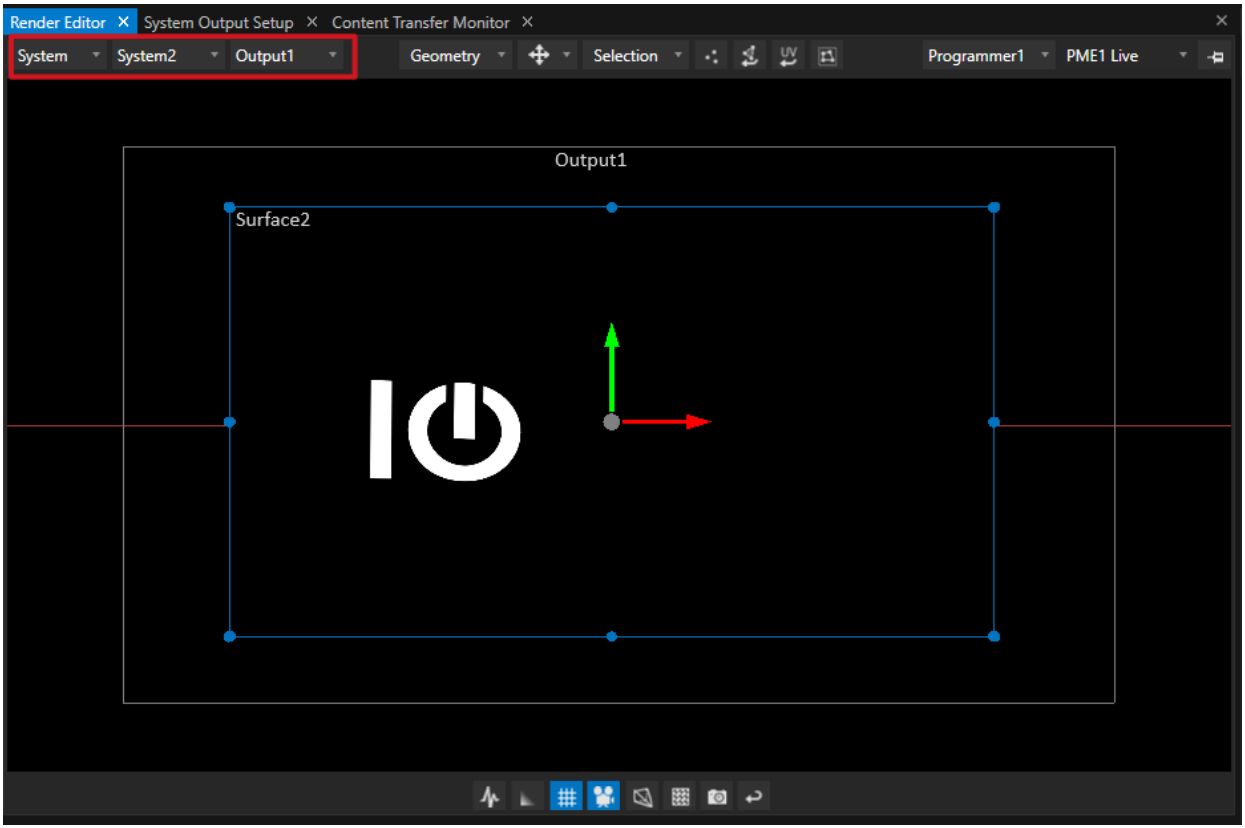


all outputs view

All Outputs previews the rendered results **for all outputs of your system**. However, you cannot edit in this view. **Switch to a specific output for editing (see below).**

You can also switch to other systems of your project. if working in a session in order to preview their respective outputs.

Output View

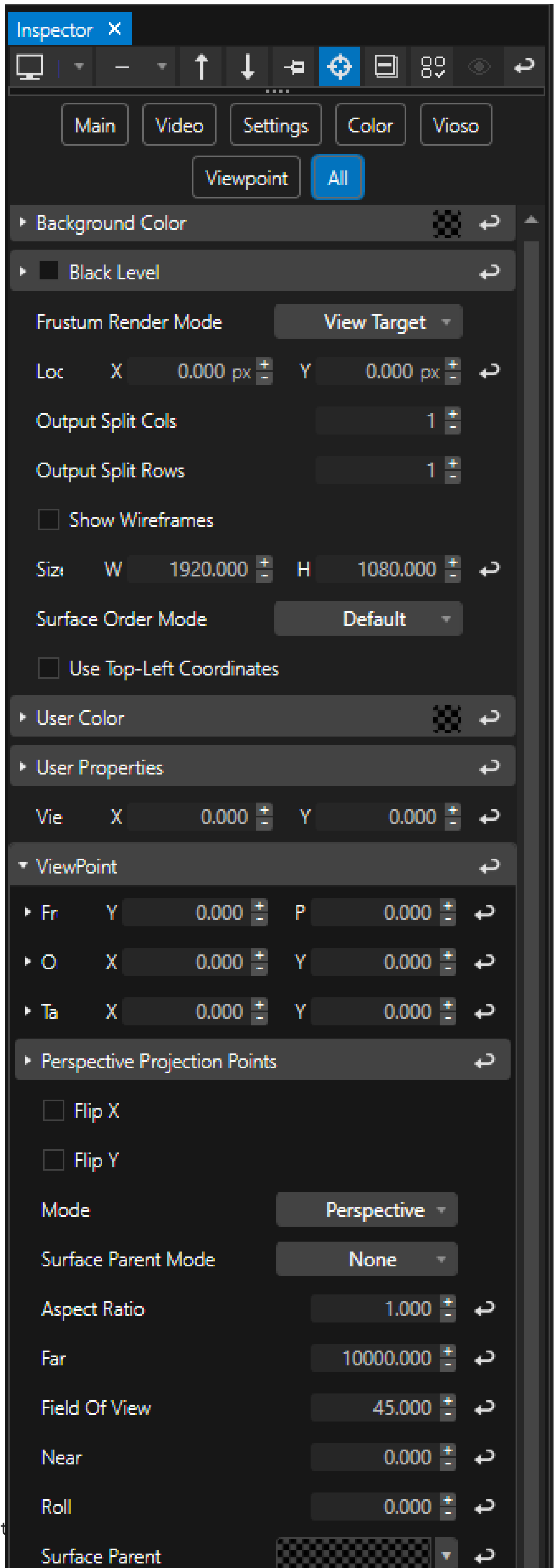


all outputs view

Choose a specific Output - for instance Output1 - of your System.

Access all Surfaces assigned to this output from here for **editing**, warping, modifying geometry.

Settings



Background Color

Black Level

Frustum Render Mode: View Target

Loc X 0.000 px Y 0.000 px

Output Split Cols 1

Output Split Rows 1

□ Show Wireframes

Siz W 1920.000 H 1080.000

Surface Order Mode: Default

□ Use Top-Left Coordinates

User Color

User Properties

Vie X 0.000 Y 0.000

ViewPoint

Fr Y 0.000 P 0.000

O X 0.000 Y 0.000

Ta X 0.000 Y 0.000

Perspective Projection Points

□ Flip X

□ Flip Y

Mode: Perspective

Surface Parent Mode: None

Aspect Ratio 1.000

Far 10000.000

Field Of View 45.000

Near 0.000

Roll 0.000

Surface Parent

Basic Settings:

- Position (of the Output)
- Size (of the Output)
- Show Wireframes
- Opacity

When you did a System Output Setup, you usually don't have to change output settings.

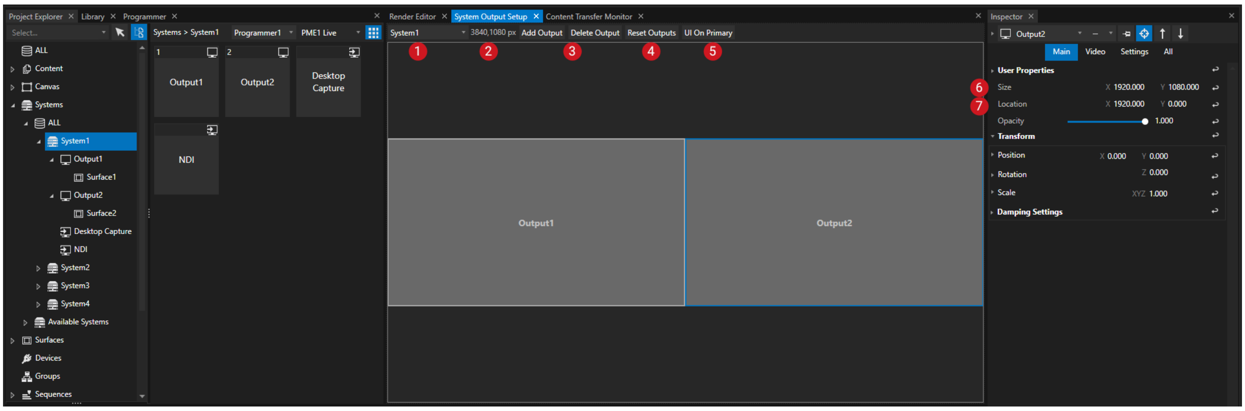
Complex setups might need advanced output settings:

- Transform Output,
- Change Viewpoint of the Output

4.4.3 System Output Setup

- **System Output Setup** is the editor where you **manage the outputs of a system.**
- **"UI on Primary"** is a quick setting for a **mixed usage of UI and fullscreen** on the same system.
- **Reset Outputs** will reset all output settings of a system back to current Windows 10 desktop settings.

User Interface

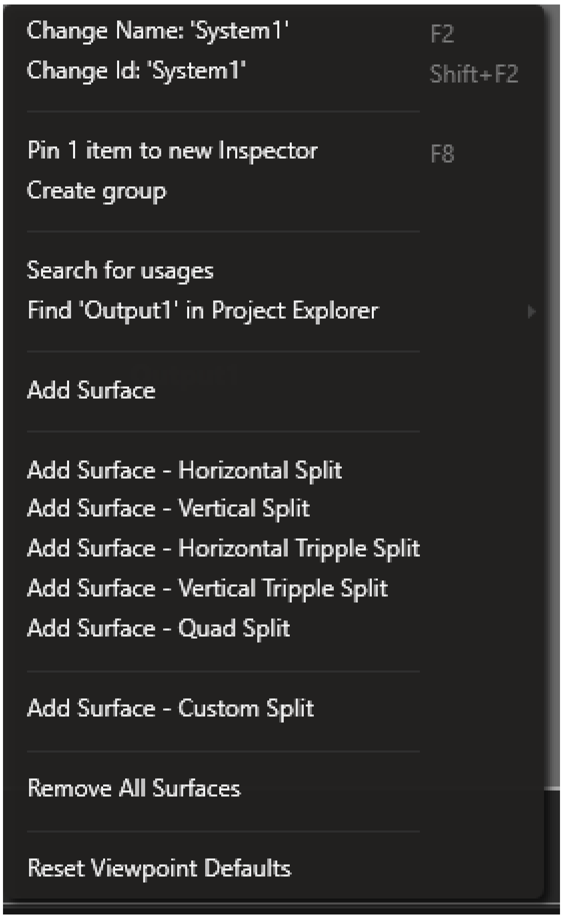


Size X 1920.000 Y 1080.000
Location X 1920.000 Y 0.000
Opacity 1.000
Position X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000

1	**Select System**	**default:** local system In a project with multiple systems you can manage the output settings for each session member system like so: select the system you want to assign outputs to. Manage all system-output configurations from the same editor.

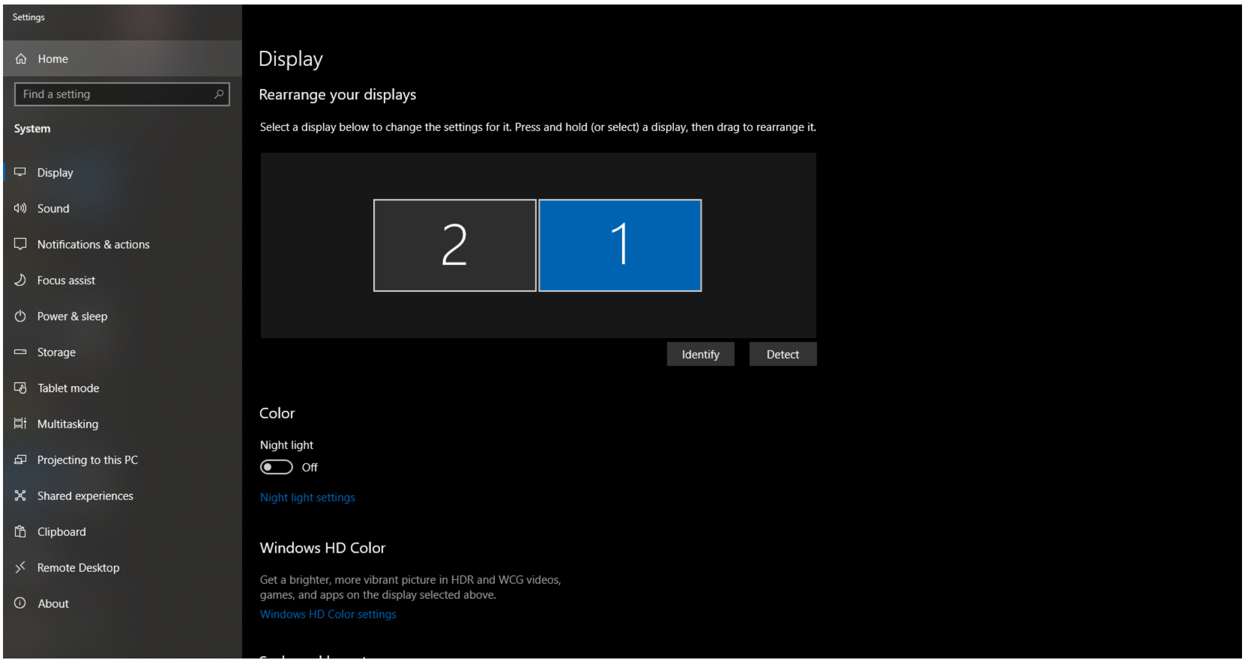
2	**Desktop Size of a System**	Shows the total Windows 10 desktop size of your system. VERTEX takes over the size that is set into your Windows 10 desktop management.
3	**Add or Delete Output**	Adds a new output or deletes a selected output.
4	**Reset Outputs**	**Resets outputs of a system**. VERTEX takes over the desktop settings from Windows 10 again. Use when outputs have changed since last project file load or just to take over again the Windows 10 settings. Old outputs are deleted, new ones are created for this System. For surfaces that were assigned only the "old" outputs the output reference is removed, but the surface not. After resets new surfaces are created for each output. If want to use the old ones again, reassigned the to the outputs.
5	UI on Primary	**Sets VERTEX User Interface on Screen that is defined as primary Screen in Windows 10 Desktop Setup.** Use when you want to work with the Vertex UI on one screen and fullscreen renderer on the other connected screens. "UI on primary" removes the primary output from system output setup.
Select an output with your mouse - properties are shown in the inspector		
6	**Size**	**pixel size of the output**
7	**Location**	location of the output into the Windows 10 desktop window

Context Menu


Change Name: 'System1' F2
Change Id: 'System1' Shift+F2
Pin 1 item to new Inspector F8
Create group
Search for usages
Find 'Output1' in Project Explorer
Add Surface
Add Surface - Horizontal Split
Add Surface - Vertical Split
Add Surface - Horizontal Tripple Split
Add Surface - Vertical Tripple Split
Add Surface - Quad Split
Add Surface - Custom Split
Remove All Surfaces
Reset Viewpoint Defaults

Right-click on an output to **open the context menu**.
Here you will find some **quick actions to create and assign one or multiple surfaces,** i.e. a quad-split for a 4 output-vertical NVidia MOSAIC or AMD Eyefinity Setup.

Windows 10 Desktop Settings



Display

Rearrange your displays

Select a display below to change the settings for it. Press and hold (or select) a display, then drag to rearrange it.

Color

Night light

Off

Windows HD Color

Get a brighter, more vibrant picture in HDR and WCG videos, games, and apps on the display selected above.

VERTEX appropriates the following properties from the Windows 10 desktop settings:

- the number of connected screens,
- total Windows 10 desktop size,
- the primary screen and output arrangement.

Check these settings first. The screen's number in VERTEX can differ from Microsoft Windows depending on your setup and assignment.

DPI scaling has to be set to 100%

Please double check the scaling for your screens in Windows 10 desktop setup.
We strictly recommend a 100% scaling for each of your screens. Especially for high resolution screens Windows 10 automatically sets the scaling to 125%, 150% or even higher. This can cause side-effects with calculation in the render editors. To avoid trouble, use the advanced scaling settings of Windows 10.

4.4.4 Canvas & Surface Dimensions

Sometimes handling multiple outputs with varying resolutions and pixel densities can be quite challenging. VERTEX can translate the actual physical dimensions of all outputs from meters into pixels.

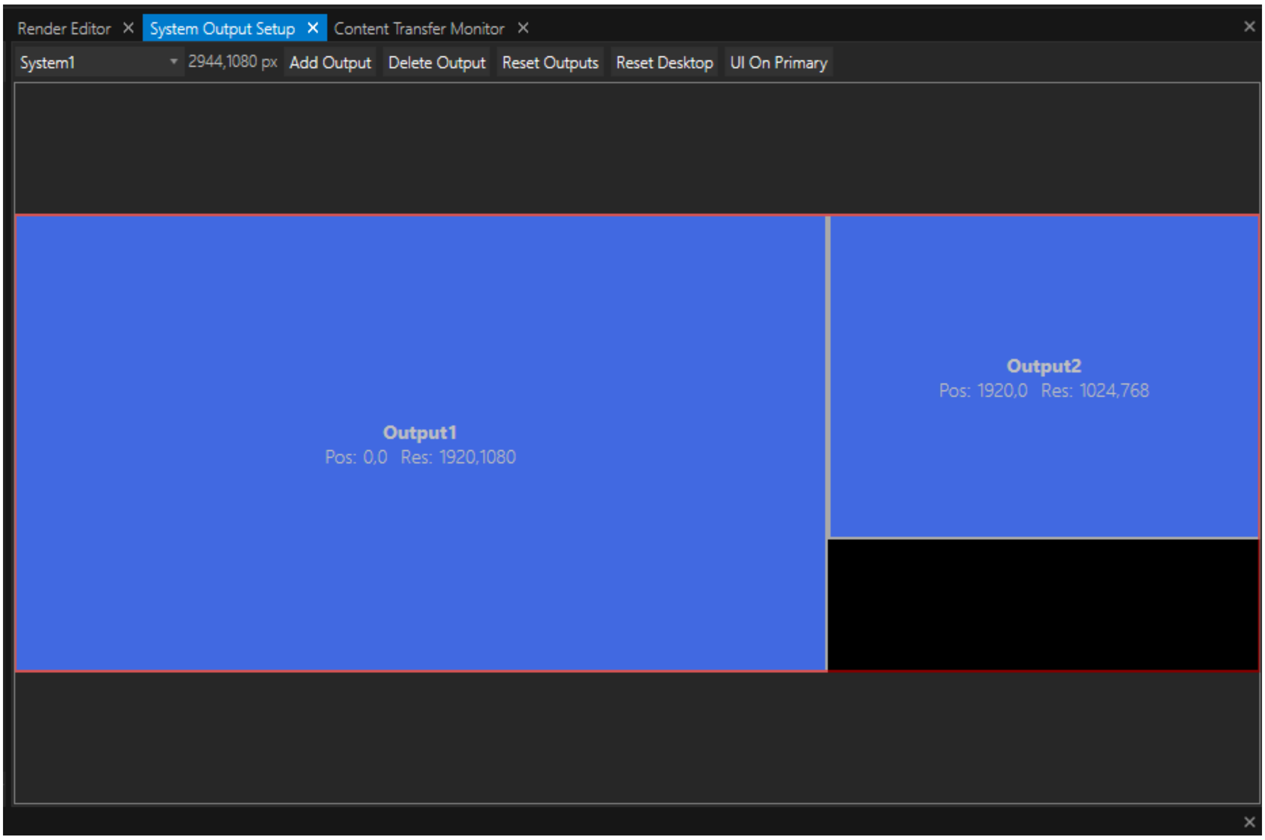
Your content will be lined up neatly irregardless of pixel size, density or aspect ratio.

KEY FEATURES:

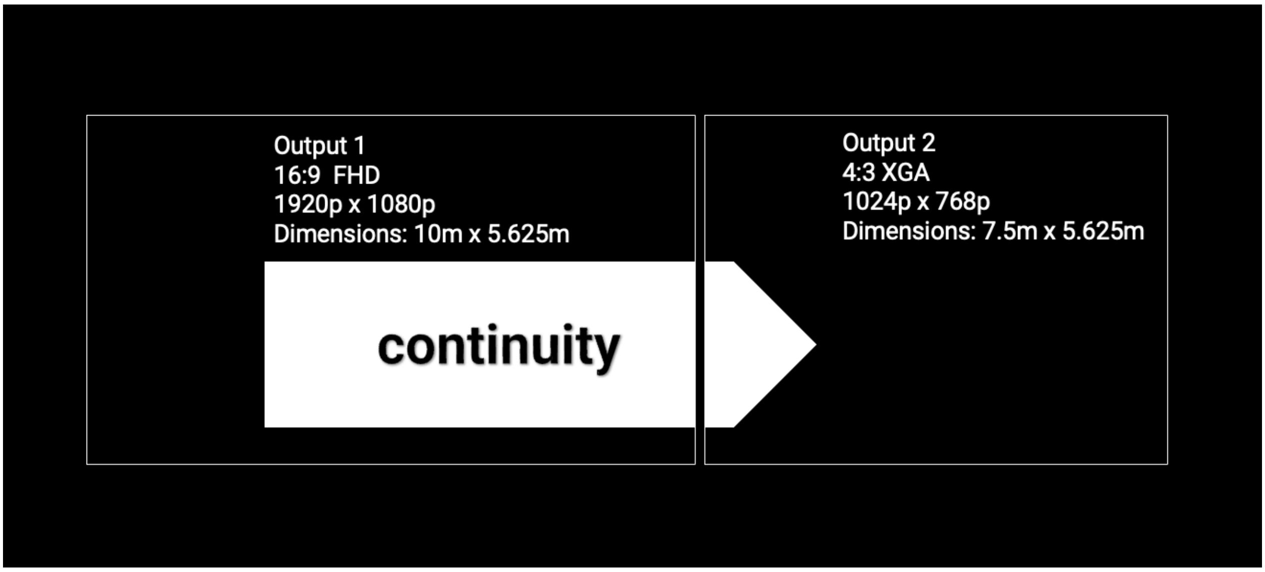
- Both *Canvas* and *Surface* can be set up in relation to the actual dimensions of your physical outputs.
- *Use Canvas Dimensions* when creating a new Surface to help aligning outputs with varying pixel resolutions and pixel densities.
- *Auto Update Size* is resizing the pixel resolution of *Canvas* and *Surface* if needed.

WORKFLOW & SETTINGS

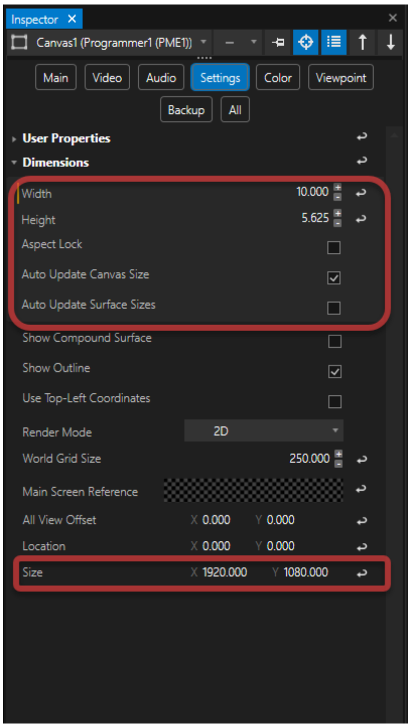
When your outputs have different resolutions and aspect ratios, your *System Output Setup* might look like this:



The physical outputs in your production however have got the same height and yet you want continuity in your displayed content:



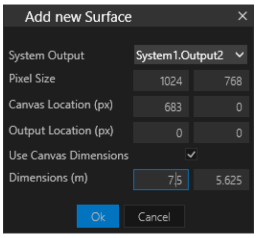
You can start by resizing your *Canvas* to fit dimensions of your total outputs. Inspect your *Canvas* and go to the ***Settings*** tab:

 Inspector Canvas1 (Programmer1 (PME1)) Main · Video · Audio · Settings · Color · Viewpoint · Backup · All User Properties Dimensions Width 10.000 Height 5.625 Aspect Lock □ Auto Update Canvas Size ☑ Auto Update Surface Sizes □ Show Compound Surface □ Show Outline ☑ Use Top-Left Coordinates □ Render Mode 2D World Grid Size 250.000 Main Screen Reference All View Offset X 0.000 Y 0.000 Location X 0.000 Y 0.000 Size X 1920.000 Y 1080.000	*Width & Height*	Enter Canvas Dimensions in metric units. If the total dimensions of your eventual outputs exceed the default value, you can adjust the dimensions according to your needs. Just pretend your virtual *Canvas* was a piece of physical hardware.
	Aspect Lock	Locks the aspect ratio of the *Canvas' Dimensions*. If enabled, changing *Width* will result in changing *Height in the same ratio*.
	Auto Update Canvas Size	If enabled, any change in the *Canvas' Dimensions* will automatically update the *Canvas' Size* (in pixels - values at the bottom of the *Inspector* window).
	Auto Update Surface Size	If enabled, any change in the *Canvas' Dimensions* will automatically update the pixel size of any *Surface* assigned to this *Canvas.*

As mentioned above, the combined width of all outputs adds up to 17.5 meters. Make sure that Auto Update Canvas Size is enabled and enter a width of 17.5 meters.

The new values for your virtual *Dimensions* will automatically re-scale the pixel size of your canvas accordingly.

Next, go to the *Render Editor* window in *Canvas* view and open the context menu with a right-click on the Canvas. Choose *Create New Surface...* and the *Add Surface* dialogue pops up:

 Add new Surface System Output: System1.Output2 Pixel Size: 1024, 768 Canvas Location (px): 683, 0 Output Location (px): 0, 0 Use Canvas Dimensions: ☑ Dimensions (m): 7.5, 5.625 	*System Output*	Assign your new surface directly to one of your outputs.
	Pixel Size	*Set the size of your new surface in pixel*. In most cases this will be the same size as the chosen output's resolution, but of course it is possible to diverge from those standard values.
	Canvas Location	Values entered here will set a *Canvas Offset* in the *Surface Settings* and thus automatically position the new surface onto canvas. Units are pixels in width and height.
	Output Location	Any values entered here will set the *Output Transform Position* of the new surface. This can be useful if the new surface shall only cover the chosen output partially, like in quad-split setups. Units are pixels in width and height.
	Use Canvas Dimensions	Enable to scale the pixel density of the new surface directly to the canvas dimensions.
	Dimensions	Sets width and height in metric units for the new surface and thus scales the pixel density to an actual physical size in the real world. Values entered here only have an effect if *Use Canvas Dimensions* is enabled.

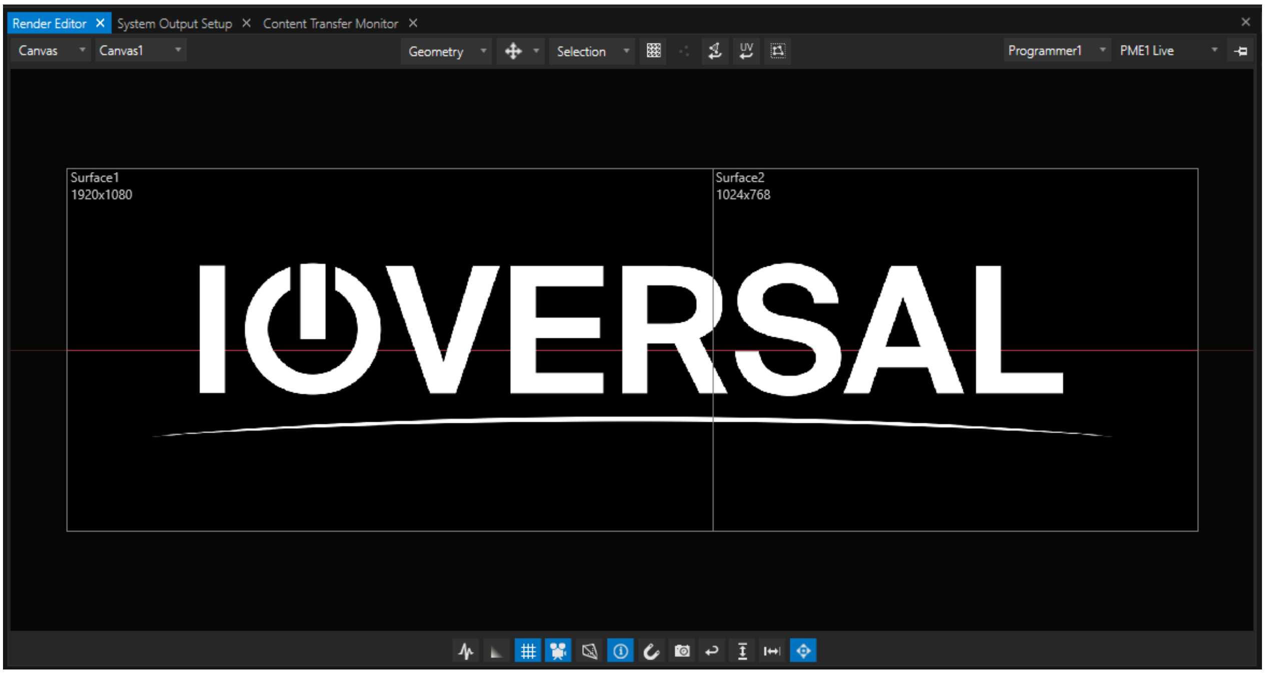
Add two surfaces according to your outputs' resolutions and dimensions. In this example, enter for *Surface1:*

```
System1.Output1
1920 , 1080
-720 , 0
0 , 0
true
10 , 5.625
```

And for *Surface2:*

```
System1.Output2
1024 , 768
683 , 0
0 , 0
true
7.5 , 5.625
```

Don't worry, if you don't know the values of the surface's location right away. You may adjust offset and output position either in the render editor or inspector window at a later stage.
Once this is set up, your render editor's *Canvas View* will look like this:

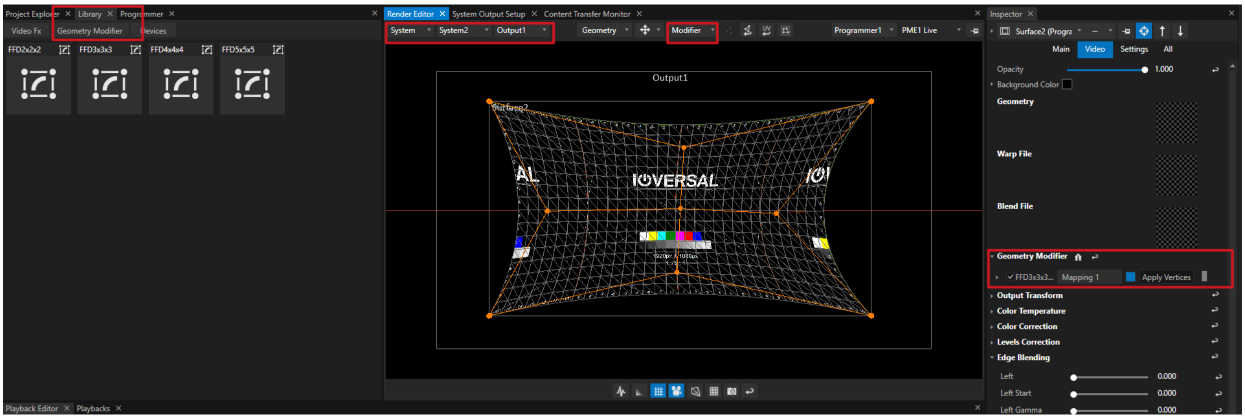


Compare this neat and aligned view with the system output view or the first picture in this chapter where the pixel densities are not scaled to dimensions and you will forget that you silently cursed when you had to convert measurements from imperial to metric units during this workflow.

4.4.5 Warping

- **Warping for an Output** is done **via the Inspector** of **a Surface**
- Open the **Render Editor**, switch to **System View** and select an **Output** to edit.
- **Combine different Freeform Deformers on a Surface** or even modify single vertices.

Workflow



- **Open Library**, select **Geometry Modifier**
- Go to **Render Editor**, Switch to **System View**, Select your System and an **Output**
- **Select a Surface** that is assigned to your Output
- **Drag a FFD from Library** to a Surface

or

- **select single Vertices** of your Surface
- **Drag an FFD** to this Vertex

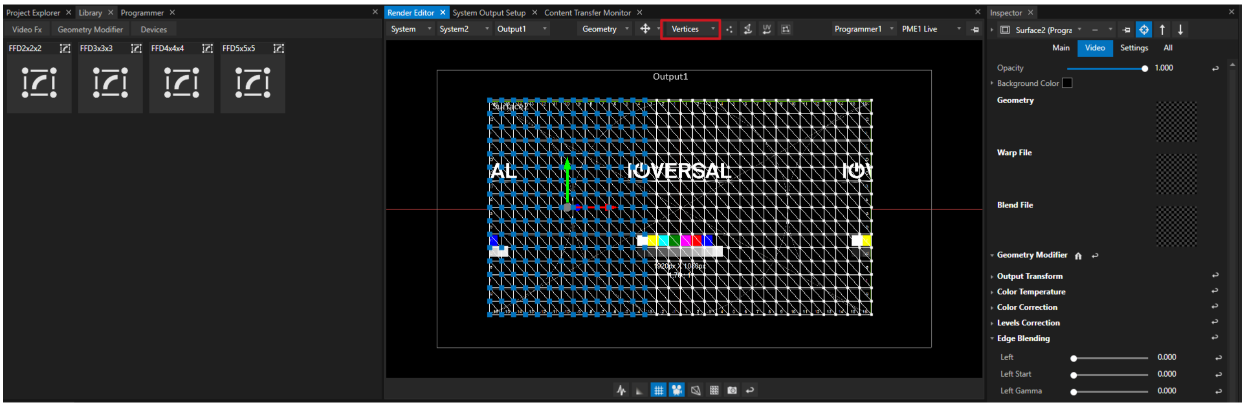
Warpings also could be done in the same way for a Clip Container.
In this case the Warping is only valid for one single Clip Container and not related to the whole Output

Select Vertices and add FFDs

VERTEX gives you the option to **add several FFDs on different parts of your Surface** to make a more detailed warping.
Please follow the steps below:

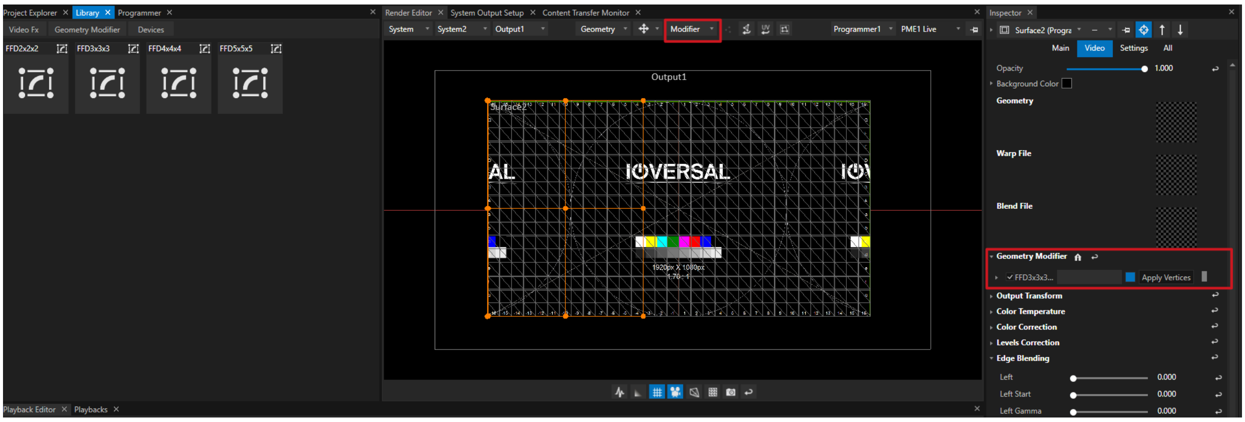
Select single Vertices

Switch Selection Mode of Render Editor to "Vertices"



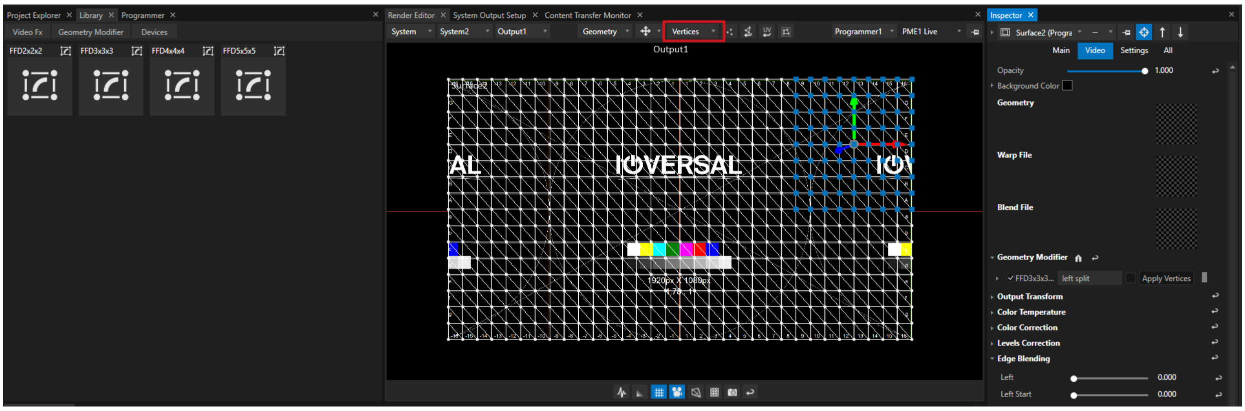
Drag an FFD from Library to these Vertices

or use Apply Vertices Button in Inspector to apply the selected Vertices to an already existing FFD



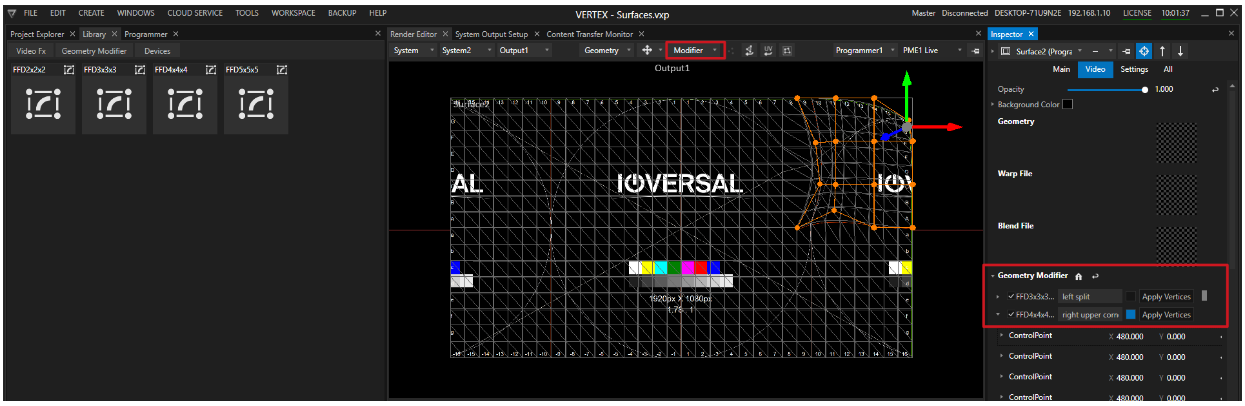
Do another selection of Vertices

Switch Selection Mode of Render Editor to "Vertices" before



Drag an FFD from Library to this Vertices

or use Apply Vertices Button into Inspector to apply the selected Vertices to an already existing FFD



Select an FFD to show into Render Editor

When working with multiple FFDs on a Surface, you are able to select one of your FFDs with the blue Button (next the each FFD)

into the Geometry Modifier Section of the Inspector

Shortcuts for Render Editor

- Use **arrow keys to j**ump to next FFD **Control Point**
- Hold **Shift** and use **arrow keys** to change **Control Point position**
- Hold **CTRL** and use **arrow keys** to jump into the middle of 2 control points and **select them both to modify**

VIOSO AutoCal

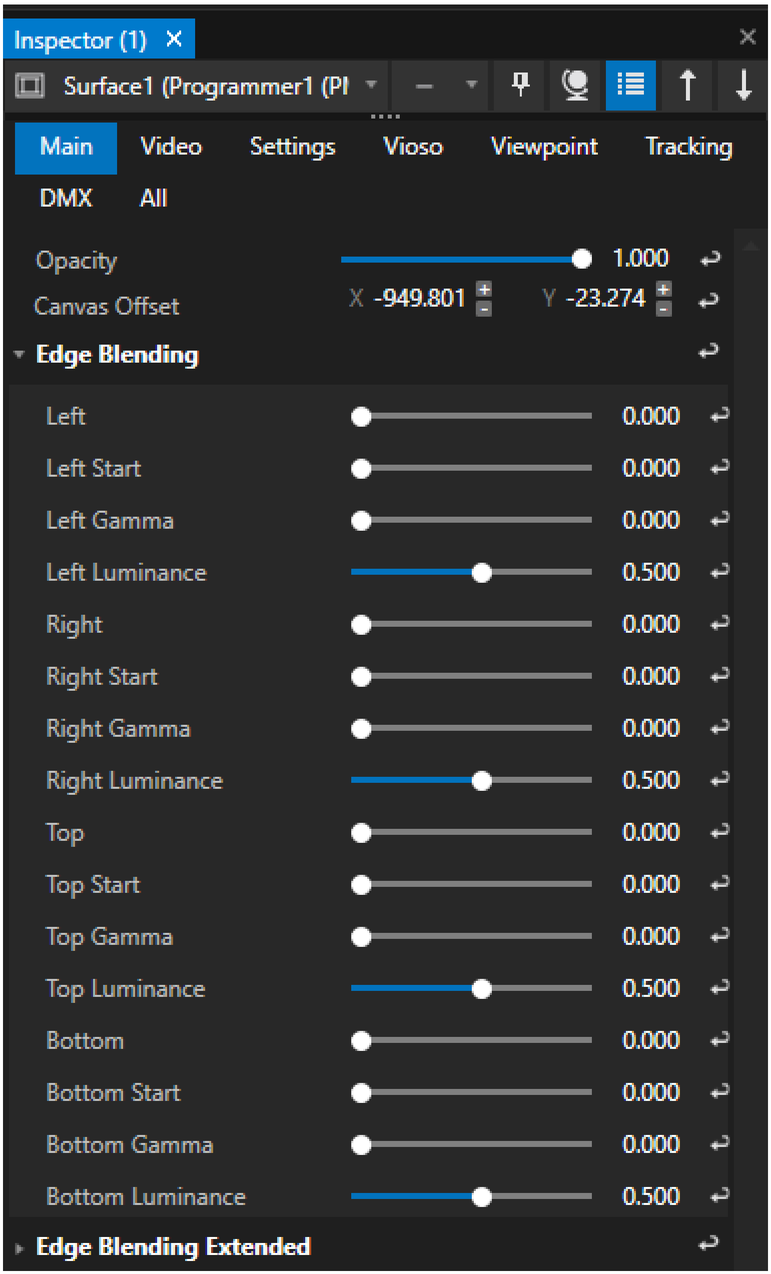
With VIOSO Autocal, Warping could be done camera-based.
Every Surface also has property fields where you can add VIOSO Blend and Warp Files

ⓘ ioversal still works on the integration of VIOSOs Autocal Tool into VERTEX
The VIOSO feature set will be available soon.
Warp and Blend files could not be processed with the current VERTEX release version
Contact us for further questions on this: vertex.support@rossvideo.com

4.4.6 Softedge Blending

- Every Surface has a **set of edge blending parameters** to create a softedge blending
- **The QuickBlend Wizard** creates fast solutions with ease based on VERTEX' blending algorithms

Edge Blending Parameters for a Surface



Opacity	1.000
Canvas Offset	X -949.801 Y -23.274
Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.000
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500

Inspector wih the Edge Blending Parameters of a Surface.
Advanced Edge Blending Parameters extend to blending options for edge cases.

Every **surface** offers you a **set of parameters for edge blending**.
With 4 **parameters for each side**, VERTEX gives you many options to create a blending.

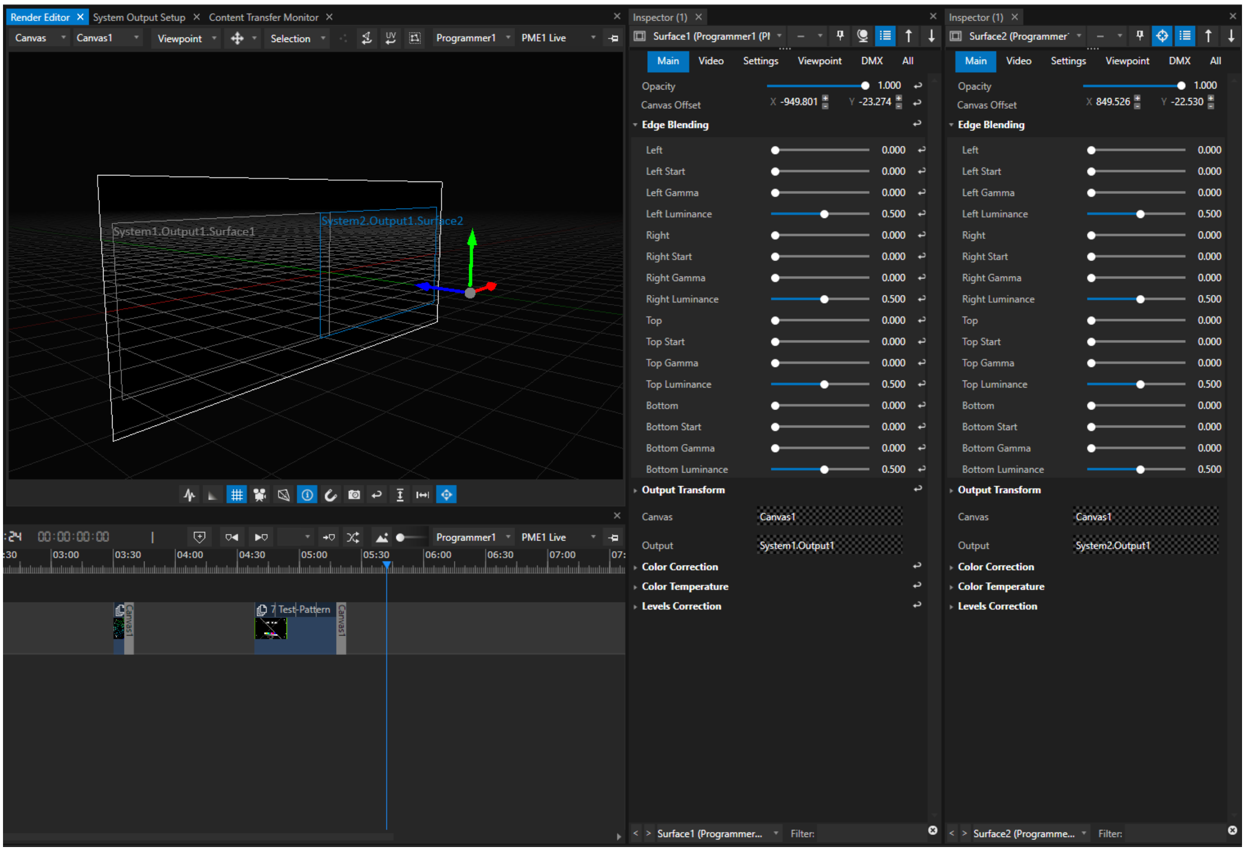
Use Edge Blending Extended parameters to adjust a blending of a large projection which is only partially overlapped by a smaller projection.

Work with a second Inspector

For a soft edge with two projectors, open a second inspector. Dock the window next to the first inspector.

Select the first surface in first inspector and use the "Pin" button to fix the first surface to the inspector.

Select the second surface in the second inspector. Open Edge Blending Parameters for both.



Inspector (1) – Surface1 (Programmer1 (Pl	Value
Opacity	1.000
Canvas Offset	X -949.801 Y -23.274
Edge Blending	
Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.000
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500
Output Transform	
Canvas	Canvas1
Output	System1.Output1
Color Correction	
Color Temperature	
Levels Correction	

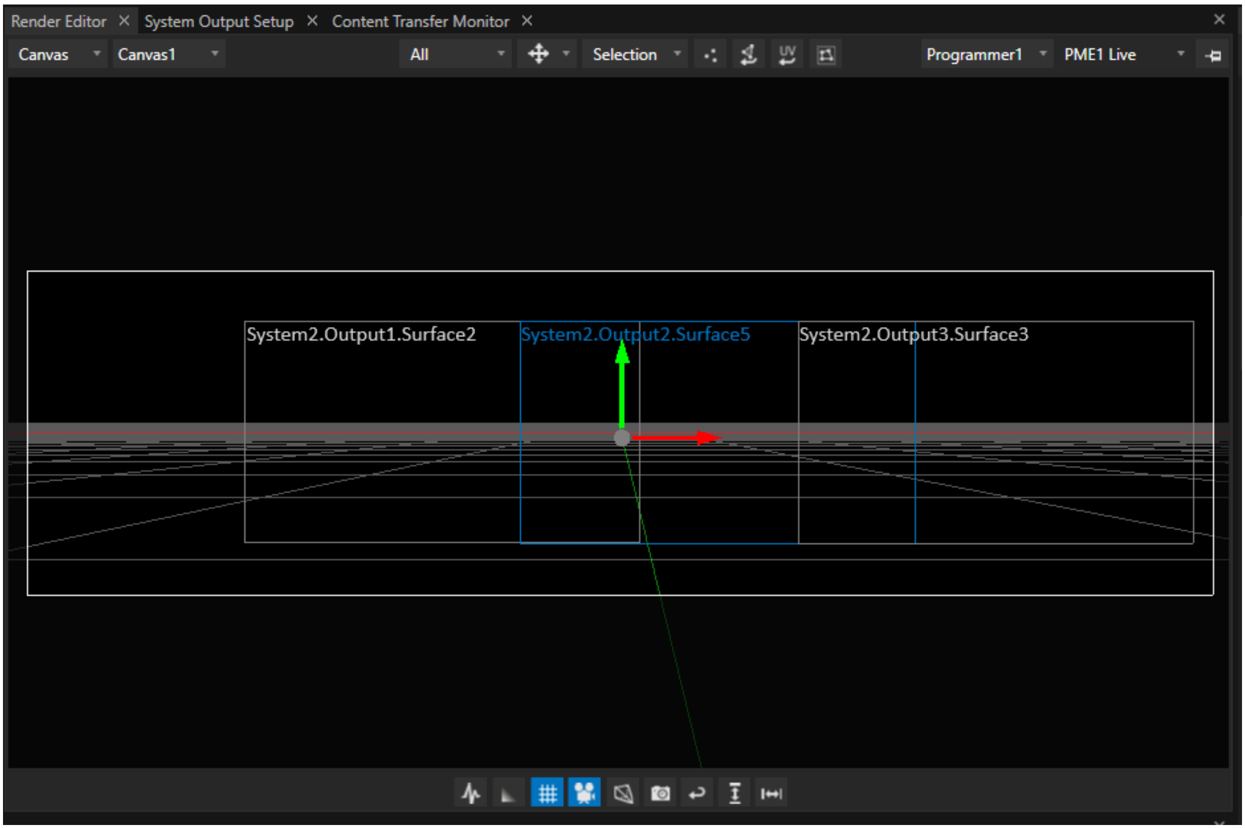
Inspector (1) – Surface2 (Programmer	Value
Opacity	1.000
Canvas Offset	X 849.526 Y -22.530
Edge Blending	
Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.000
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500
Output Transform	
Canvas	Canvas1
Output	System2.Output1
Color Correction	
Color Temperature	
Levels Correction	

Workspace example for an edge blending:
2 surfaces on a canvas, each surface is pinned to an inspector.

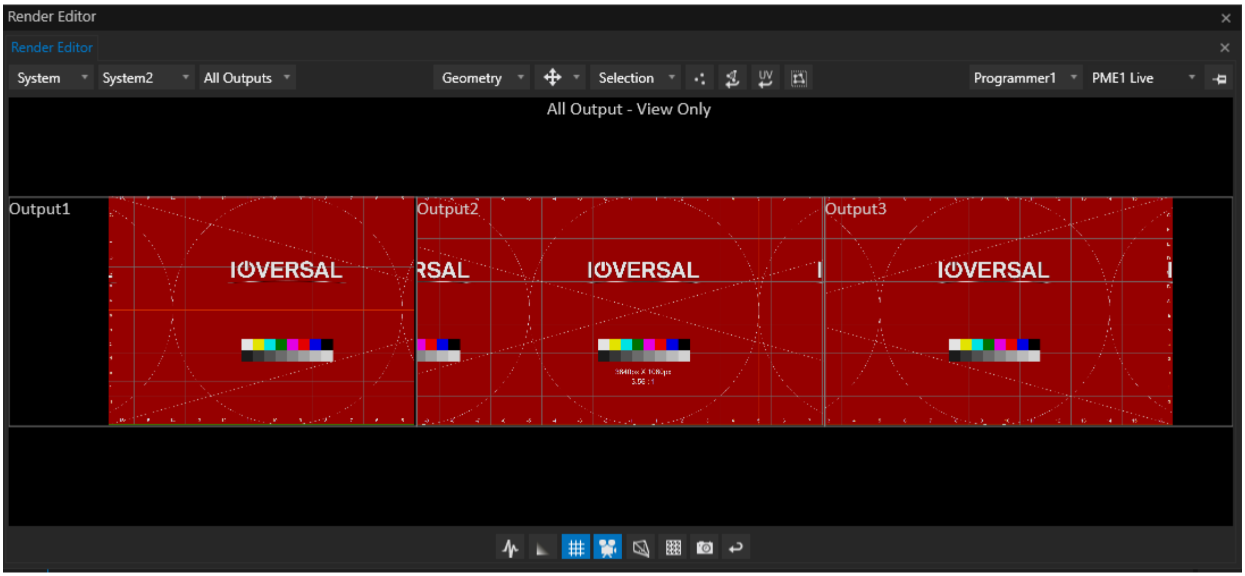
QuickBlend

- The Quick Blend wizard **helps you to create edge blending for groups of two surfaces or more**
- If the surfaces **overlap** is set, the wizard **calculates the blending automatically** and **sets the corresponding edge blending parameters for all surfaces**

- Afterwards you only have to bring your Blending to perfection and do **fine adjustment**



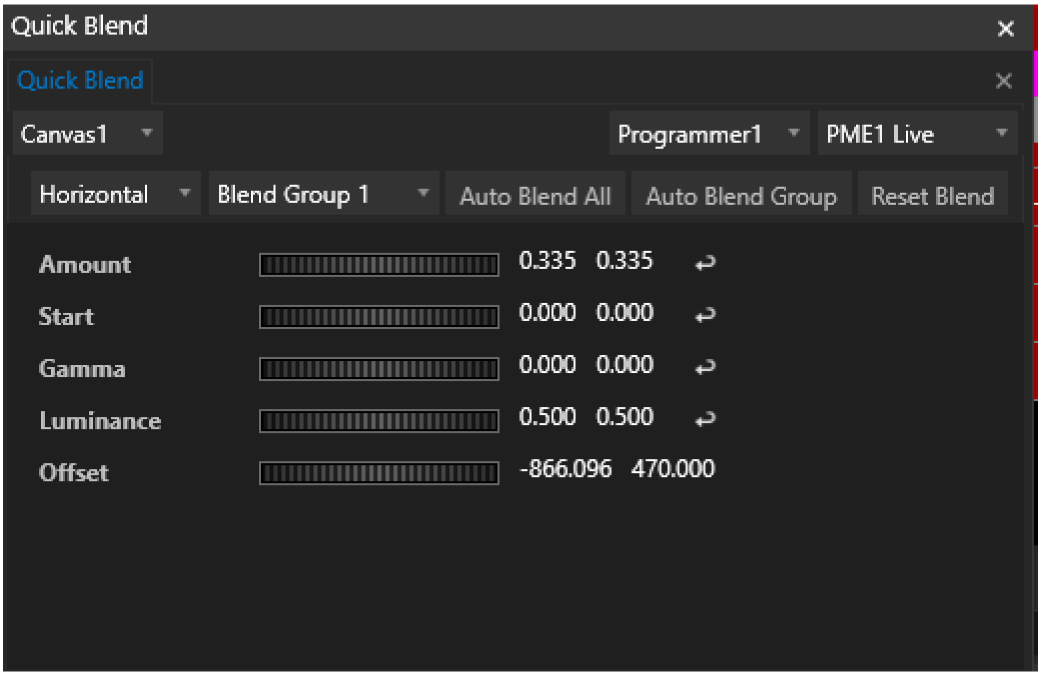
Example set-up: three surfaces on a canvas - each overlaps the next one.
Final result should be an edge blending for three projectors to have an continous single projection.



initial situation: outputs without blending

1. Go to main menu, select "Window" and open a new Quick Blend editor

2. Select your canvas in the Quick Blend editor



Amount	0.335	0.335
Start	0.000	0.000
Gamma	0.000	0.000
Luminance	0.500	0.500
Offset	-866.096	470.000

3. Select if you want to combine a horizontal or a vertical blend group

   If there are multiple surfaces on your canvas, QuickBlend creates groups for every two neighboring surfaces.

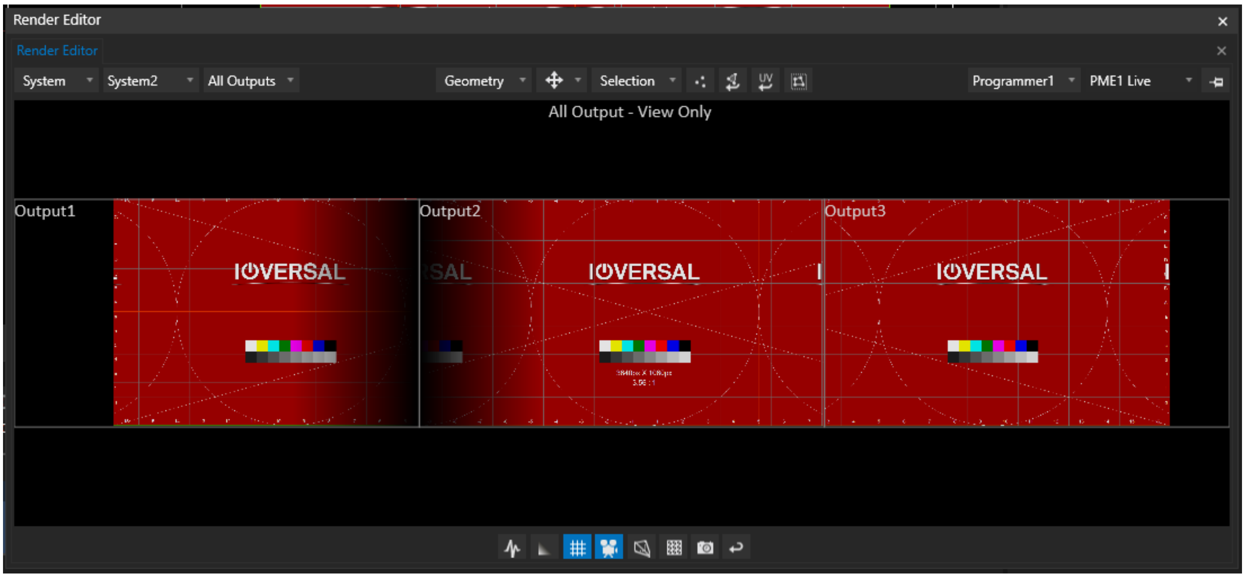
4. Adjust the canvas offset for surfaces to finally define the overlap.

   By default the overlap that was set before for each surface is taken into account.
   As a result of the fine adjustment the overlap should correspond to the overlap of the projectors.

   Use the **slider** to influence the **canvas offset of all surfaces** of your group.
   Use **first value field** to set the **offset of the first surface** of your group.
   Use **second value field** to set **the offset of the second surface** of your group.

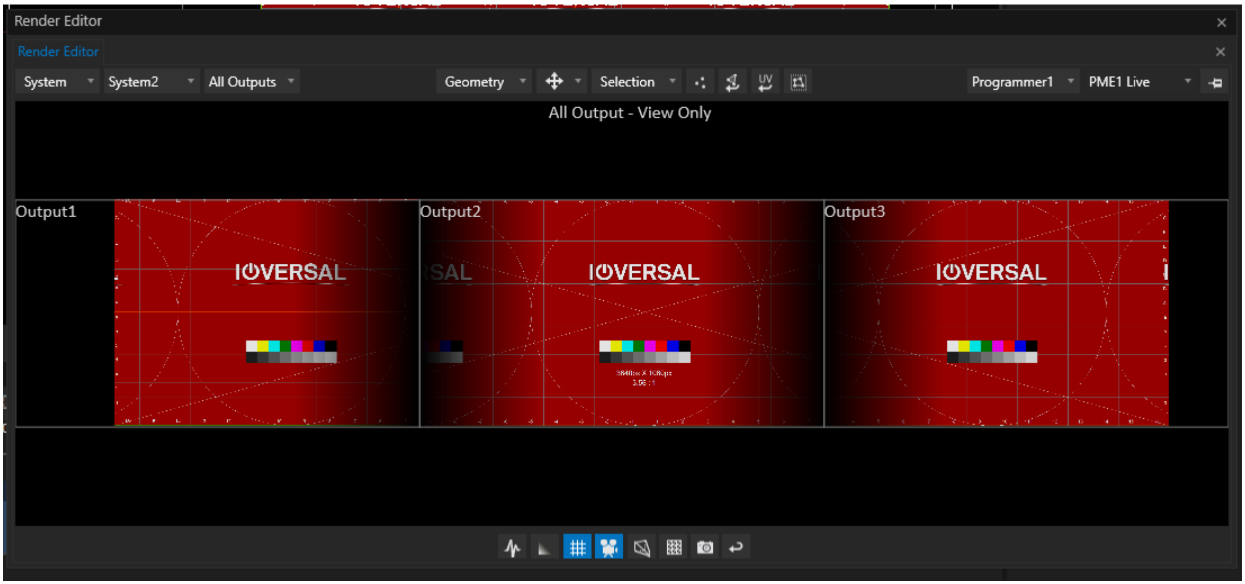
5. Select "Auto Blend Group" to blend a group

Repeat the steps for all available horizontal groups



Blending for the first group of two horizontal surfaces

6. Select "Auto Blend All" to blend all available surfaces

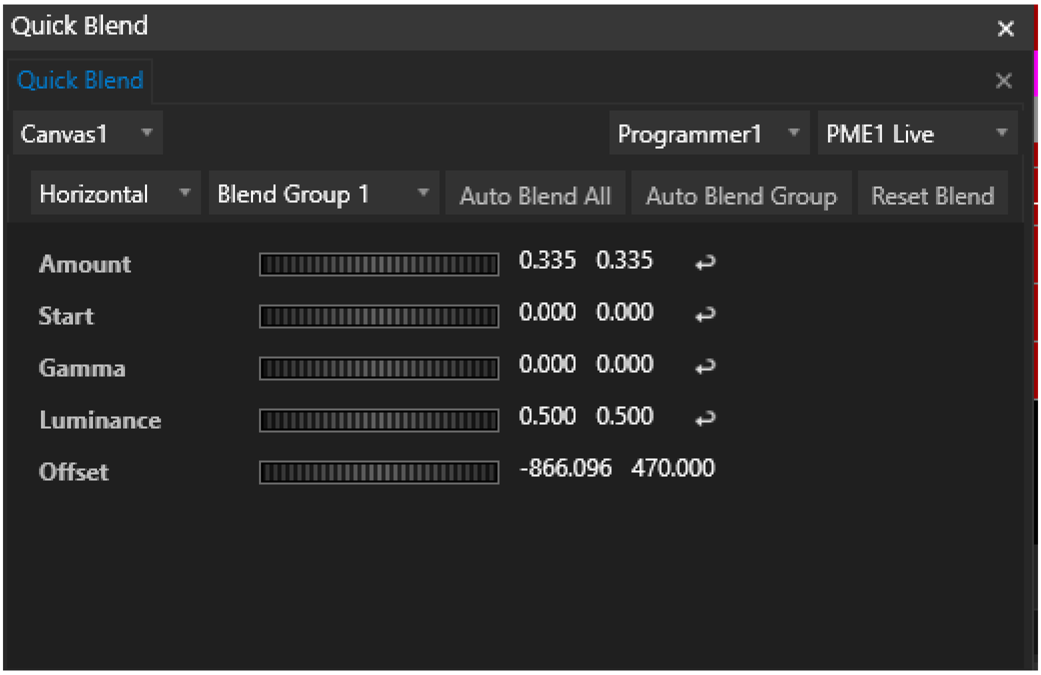


Blending for all horizotal surfaces

7. Do fine adjustments for blending with the help of Quick Blend

parameters

Fine tune your blending with parameters for amount, start, gamma and luminance



Amount 0.335 0.335

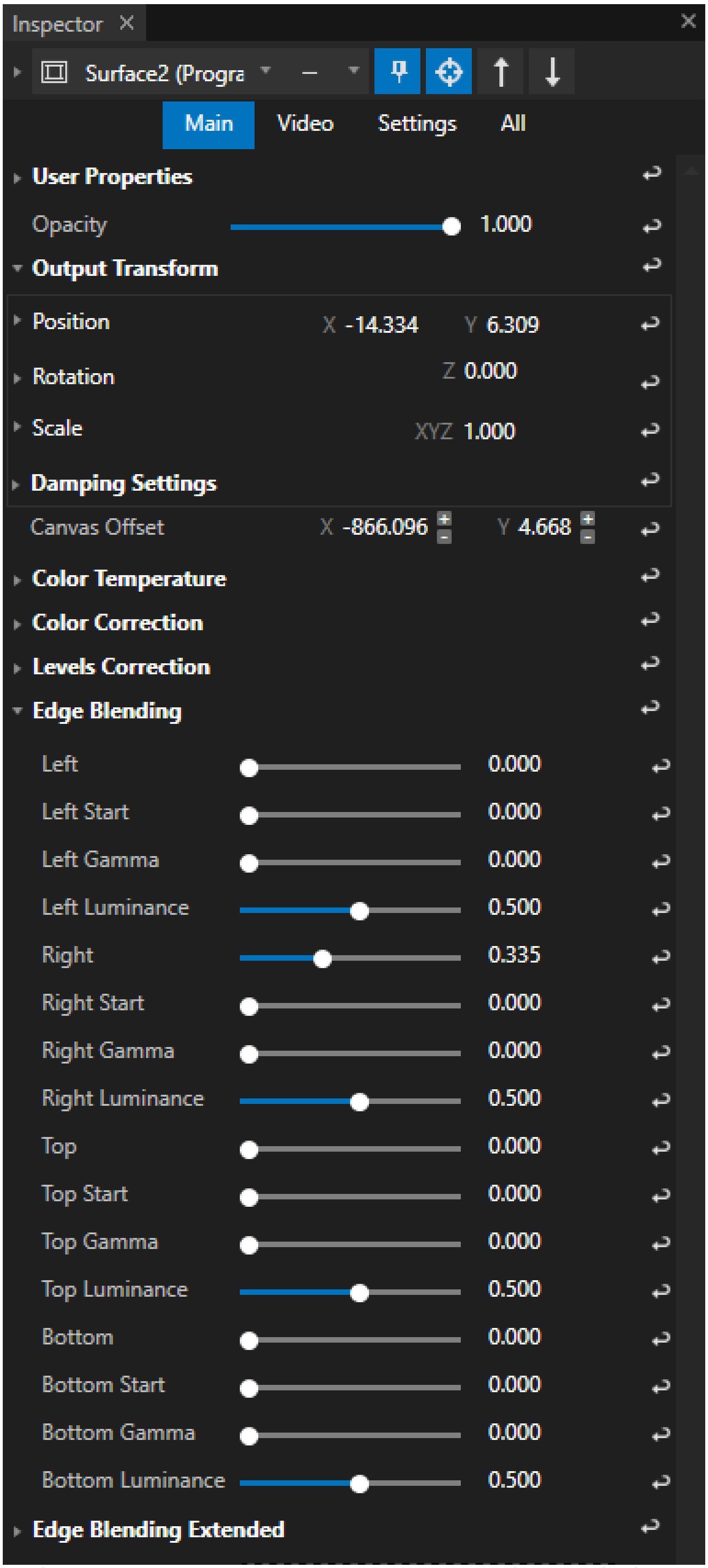
Start 0.000 0.000

Gamma 0.000 0.000

Luminance 0.500 0.500

Offset -866.096 470.000

Result: for every selected surface the edge-blending parameters are set by Quick Blend



User Properties

Opacity 1.000

Output Transform

Position X -14.334 Y 6.309

Rotation Z 0.000

Scale XYZ 1.000

Damping Settings

Canvas Offset X -866.096 Y 4.668

Color Temperature

Color Correction

Levels Correction

Edge Blending

Left	0.000
Left Start	0.000
Left Gamma	0.000
Left Luminance	0.500
Right	0.335
Right Start	0.000
Right Gamma	0.000
Right Luminance	0.500
Top	0.000
Top Start	0.000
Top Gamma	0.000
Top Luminance	0.500
Bottom	0.000
Bottom Start	0.000
Bottom Gamma	0.000
Bottom Luminance	0.500

Edge Blending Extended

QuickBlend sets the Edge Blending Parameters for each Surface

4.4.7 Audio Outputs

- VERTEX lets you select between **preview audio** i.e. for programming and **live audio** for the final playout.
- You can **assign preview and live audio to your ASIO or standard audio cards or interfaces**. You can **switch the audio clock** between standard audio and ASIO.
- **For each system** you can set **Windows volume**, **live and preview volume.**

Preview and Live Audio

The main difference between **preview audio** and **live audio**:

Preview Audio

- Preview audio monitors all audio signals from all playback mixing engines - That includes all playbacks in PME live AND preview PMEs.
- Preview audio is played out from every system in your session.

Live Audio

- Live audio plays out only audio from playbacks that are running in PME Live.
- Live audio is played out by a defined audio system that can be set for a canvas and/or for a whole Vertex system.

By default live audio is set to the same system for all canvases. But it is possible to define individual audio systems per canvas.

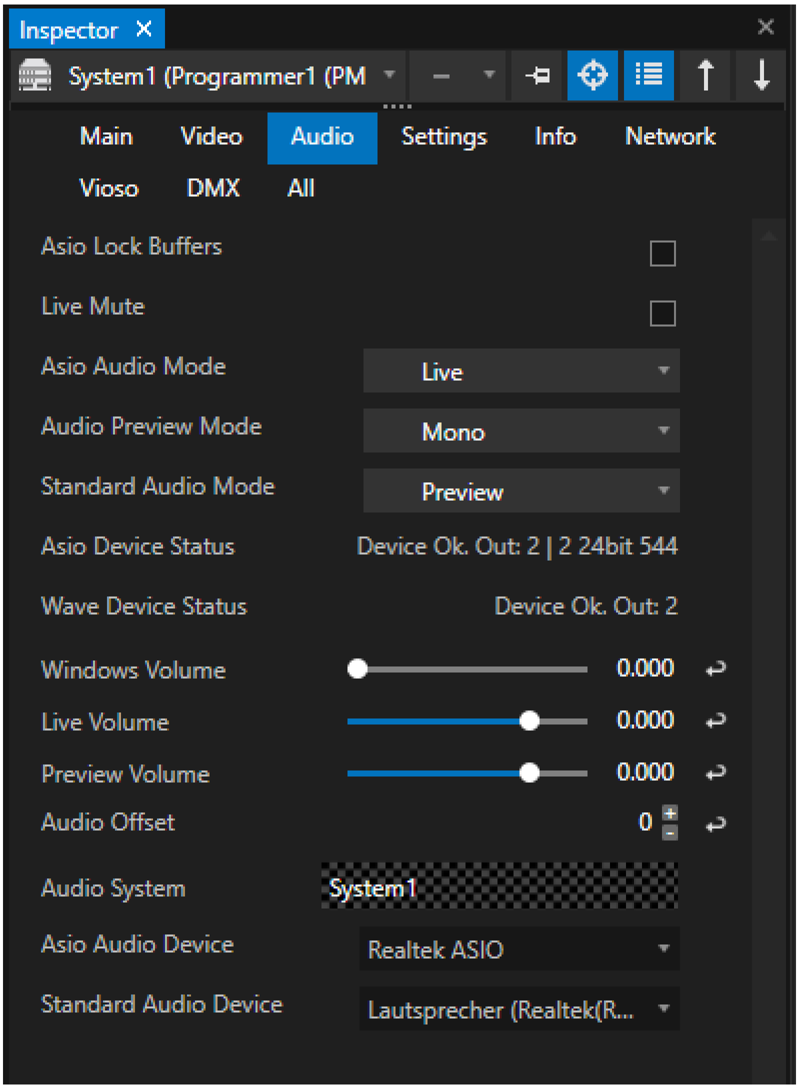
Default Configuration (System Audio Settings)

The system's built-in Windows Wave device to monitors Preview Audio*: Wave Audio Mode* is set to *Preview.*
Connect an ASIO interface for live audio playout: *ASIO Audio Mode* is set to *Live*.

Workflow for Audio Output Setup

1. select a standard audio device for your system
2. select an ASIO audio device, if connected to your system
3. define audio devices for live audio and for preview audio
4. check sync-clock settings (sync clock is changed when live audio device is set)
5. adjust volume settings for your system
6. do final adjustments like audio offset or advanced settings

Audio Settings for a System



Asio Lock Buffers □

Live Mute □

Asio Audio Mode: Live

Audio Preview Mode: Mono

Standard Audio Mode: Preview

Asio Device Status: Device Ok. Out: 2 | 2 24bit 544

Wave Device Status: Device Ok. Out: 2

Windows Volume: 0.000

Live Volume: 0.000

Preview Volume: 0.000

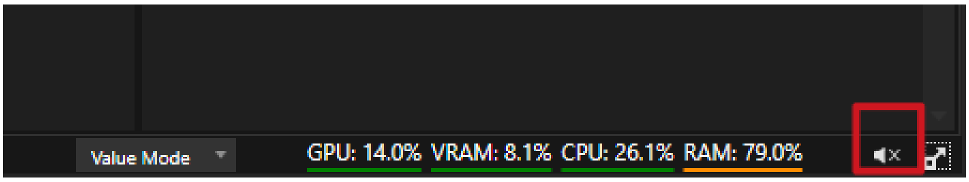
Audio Offset: 0

Audio System: System1

Asio Audio Device: Realtek ASIO

Standard Audio Device: Lautsprecher (Realtek(R...

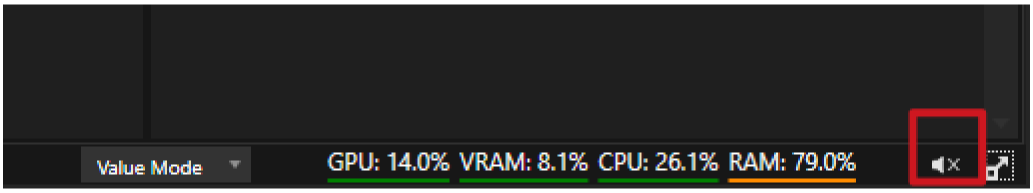
ASIO Lock Buffers	Default: disabled Enable recommended if you use an USB audio device.
Live Mute	Default: disabled When enabled, live audio output is muted.
ASIO Audio Mode	Select whether the ASIO audio device should be used for Preview Audio or Live Audio. The difference between the both is explained above. For high quality live output, we recommend an ASIO audio device.
Audio Preview Mode	Choose between a monoaural fold-down, a stereo mix of your preview listening or just keep the channel mapping one-to-one.

Standard Audio Mode	Select whether the standard audio device should be used for Preview Audio or Live Audio. The difference between the both is explained above. For high quality live output, we recommend an ASIO audio device.
ASIO Device Status	Shows the status of the ASIO audio device you have selected. Shows the number of output channels that are being used by Vertex, the sampling rate that is detected and the total number of outputs channels of the interface. For DANTE cards with a high number of channels: reduce channels in Project Settings to ensure a better audio playback performance.
Wave Device Status	Shows the status of the selected Standard Audio Device. Shows the number of output channels that were detected by VERTEX.
Windows Volume	Sets Windows system volume for the selected VERTEX system.
Live Volume	Sets the master volume level of the live audio output for this system.
Preview Volume	Sets the preview audio volume level for this system. For **Preview Audio Mute**, please use the mute button in the status bar at the bottom of the UI.  Value Mode GPU: 14.0% VRAM: 8.1% CPU: 26.1% RAM: 79.0%
Audio Offset	Sets a global Audio offset for this system, for example to adjust synch issues in audio and video playback. Values are set in milliseconds. Negative Values: Audio is sent out later. Positive Values: Audio is sent out earlier.
Audio System	Defines on which VERTEX system live audio should be played out. By default and when working only with a local system without session members, this is set always to the same System. Switch the system in backup scenarios where another VERTEX system should take over the audio playout.
ASIO Audio Device	Select an ASIO interface from a list of all available interfaces that are connected to your system.

Wave Audio Device	Select the standard audio device from a list of available Windows audio devices in your system.

Using Dante PCI or USB Audio Devices:
Use Yamaha products only with Intel CPUs as AMD CPUs are not supported. Yamaha products have per default 128 channels activated. You might need to change this in the project settings in order to avoid performance issues.
When using Dante Virtual Soundcard make sure you set it to 16bit and 48kHz. Recommended settings for ASIO devices is 16bit/ 48kHz with a buffer size of 1024 or higher. Focusrite USB devices may require ASIO lock buffers.

Mute Preview Audio for local System

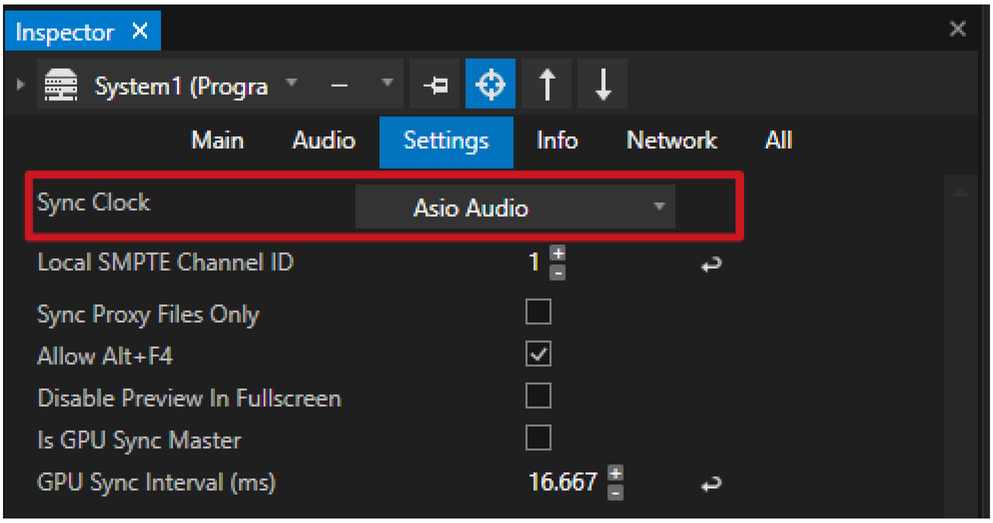


The status bar provides you quick access to **mute preview audio** on a VERTEX system

Channel Routing

Audio channel routing **is done on clip container or track level**.
Audio from each single clip container can be routed freely to the available channels of the audio device.
Please read topic *Audio in the chapter Working With Content*.

Sync Clock Settings



Sync Clock: Asio Audio

Local SMPTE Channel ID: 1

Sync Proxy Files Only: □

Allow Alt+F4: ☑

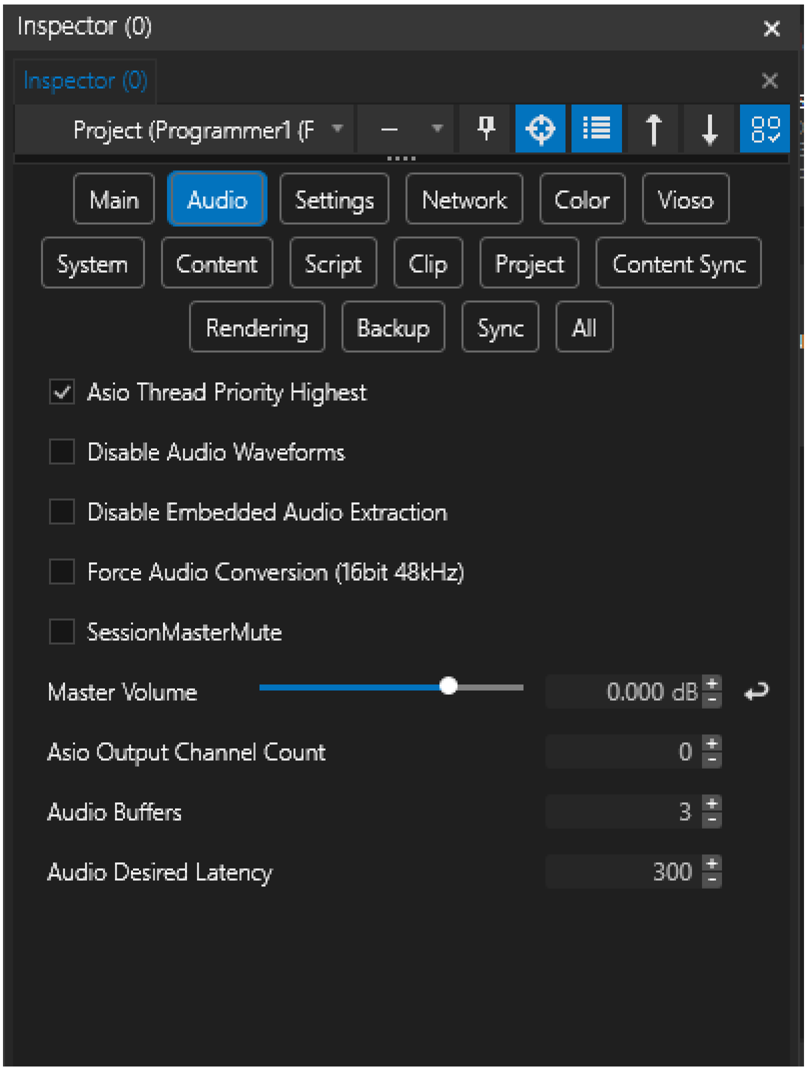
Disable Preview In Fullscreen: □

Is GPU Sync Master: □

GPU Sync Interval (ms): 16.667

When switching between audio devices, VERTEX also changes the sync clock source.
Assume that the audio output generates the clock for a playback.
Please double check the settings and the clock source.

Advanced Audio Settings



Inspector (0)

Project (Programmer1 (F

☑ Asio Thread Priority Highest

□ Disable Audio Waveforms

□ Disable Embedded Audio Extraction

□ Force Audio Conversion (16bit 48kHz)

□ SessionMasterMute

Master Volume 0.000 dB

Asio Output Channel Count 0

Audio Buffers 3

Audio Desired Latency 300

Open project settings to set advanced audio parameters.

ASIO Thread Priority Highest
Enabled per default: ASIO processing gets highest Windows 10 thread priority to ensure best audio processing and playback performance.
Disable for a better system performance. ASIO audio processing will not be done with highest thread priority anymore.

Disable Audio Waveforms affects the display of waveforms in Sequence Editor and Inspector in order to save CPU resources.

Disable Embedded Audio Extraction if you want to suppress processing of the audio track in your video content.

Force Audio Conversion (16bit 48kHz) to convert all audio formats in your project.

ASIO Output Channel Count

Number of channels that are being processed by your ASIO device driver. By default (0), channels are processed as set up in your ASIO driver settings.
Set to the desired value if the number of your channels has not been detected correctly by VERTEX. Also, to reduce channels due to performance reasons (e.g. for DANTE physical or virtual sound cards).
Set back to 0 to reset.

Buffer and Latency for Wave Audio

Set to optimize the audio playback quality before VERTEX sends audio to your Wave Audio device.

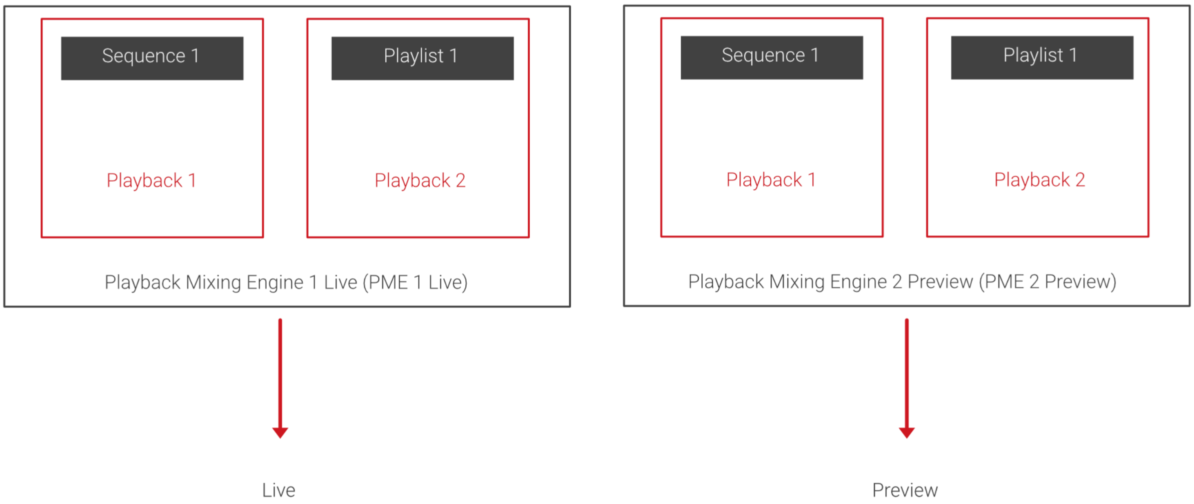
4.5 Content Editing, Composition & Playout

- Choose whether you want to arrange your content in a **timeline based sequence** or with a **clip based playlist.**
- Create multiple **playbacks** that **can either host a sequence or a playlist**
- The **Playback Mixing Engine** or ***PME*** is VERTEX's video mixer.

Content Compositing On Canvas

- Whether you like to arrange the order of your content in a playlist or or a timeline based sequence, the positioning of all content happens on a *Canvas*.
- If you have used the easy Destinations workflow already, feel free to advance your skills and familiarize yourself with Canvas, Surface and Output.
- or read more about the details in the following chapters on Canvas and Surface.

Sequence, Playlist, Playback and PME



Sequence Or Playlist As Playback Provider

Sequences and a playlists are so-called "playback providers" that have a defined length and are hosted by a *Playback*.

Learn more about Sequences

- Sequence
- Clip Container
- Keyframes

Learn more about Playlists

- Playlist
- Clip

Playback

A *Playback* is the host for your *playback provider* - a sequence or a playlist.
The playback handles the transport functions PLAY , PAUSE and STOP. It defines the mode how your playlist or sequence is played (Loop, Once, Reverse)
and is responsible for timecode handling. Each Playback has a mixing level to fade in or out.
It is possible to change the playback provider anytime from sequence to playlist or another sequence.

ⓘ When a new *Sequence* or a *Playlist* is created, VERTEX automatically creates a new *Playback*.

Learn more about Playback settings:

- Playback

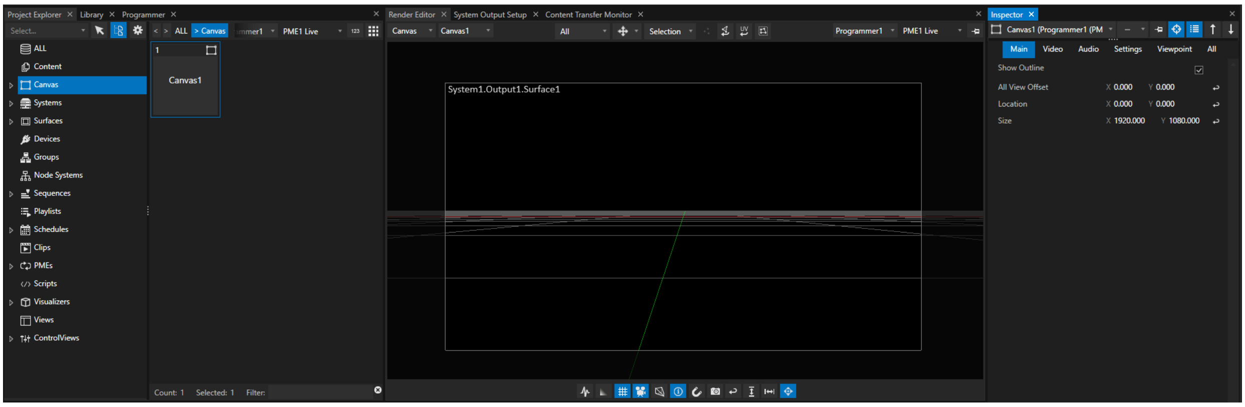
Playback Mixing Engine (PME)

PMEs host all Playbacks of a project.- In terms of a video mixer, PMEs are your master groups or faders.
By default there are 2 PMEs: **Live** and **Preview**.
Route or fade any of your playbacks either to a **live output** for your audience, **or to a preview output** for an operator.
Learn more about PMEs here.

4.5.1 Canvas

- A *Canvas* **defines your working area in VERTEX** - like a canvas **for your painting.**
- It is possible to have **multiple *Canvases*** in one VERTEX project - for instance one for each video wall of your stage, or one for each room.
- **The target *Canvas*** *of each* ***Clip Container*** (or a *playlist's* ***Clip****)* can be changed on the fly. This way, it is easy to re-arrange content in your *[Canvas-Surface-Output]()* setup.

Canvas Model in VERTEX



Show Outline ☑

All View Offset X 0.000 Y 0.000

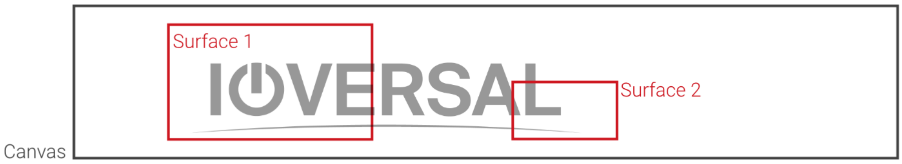
Location X 0.000 Y 0.000

Size X 1920.000 Y 1080.000

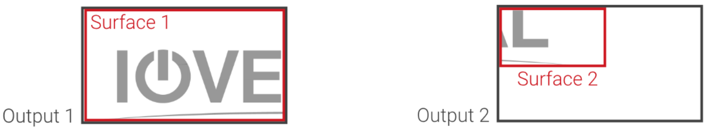
- Every new VERTEX project **starts with one Canvas** in the size of your local Windows desktop.
- The **Canvas size** is adjustable anytime in the *Inspector*
- and so is the **number of Canvases in your Project Explorer.**
- By default, the **coordinates zero position is the center of the Canvas** with the option of using **the top-left corner** of a Canvas instead (individually in Canvas Settings, or globally in Project Settings)

- **Add a Surface** to a Canvas per drag-and-drop from Project Exlorer or via context menu from the Render Editor.
- Please also read [about the Canvas-Surface relation.]()

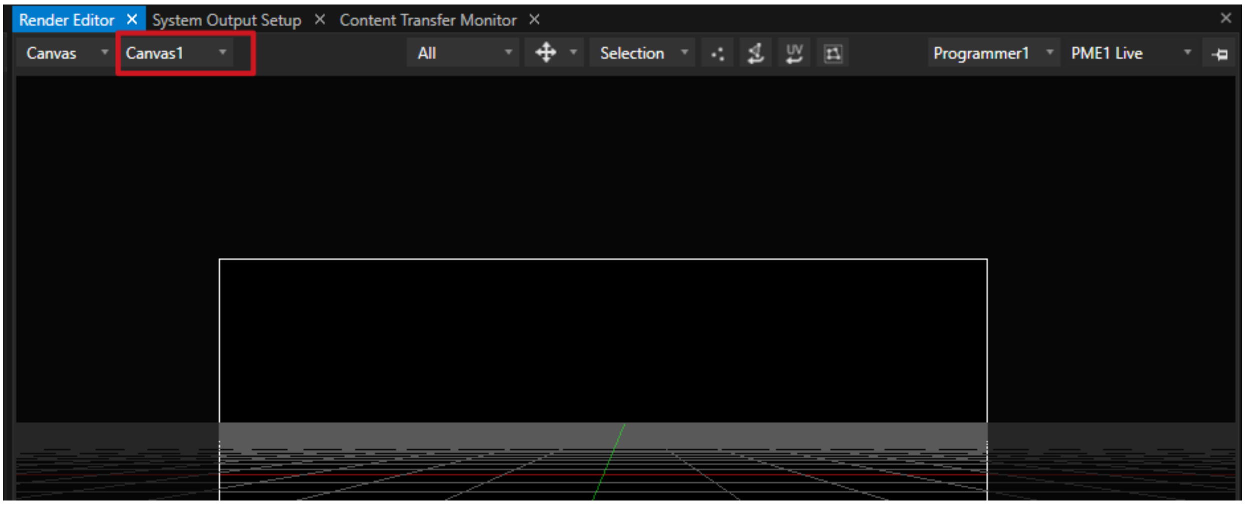
Canvas Space



Output Space



Select and show Canvas in Render Editor



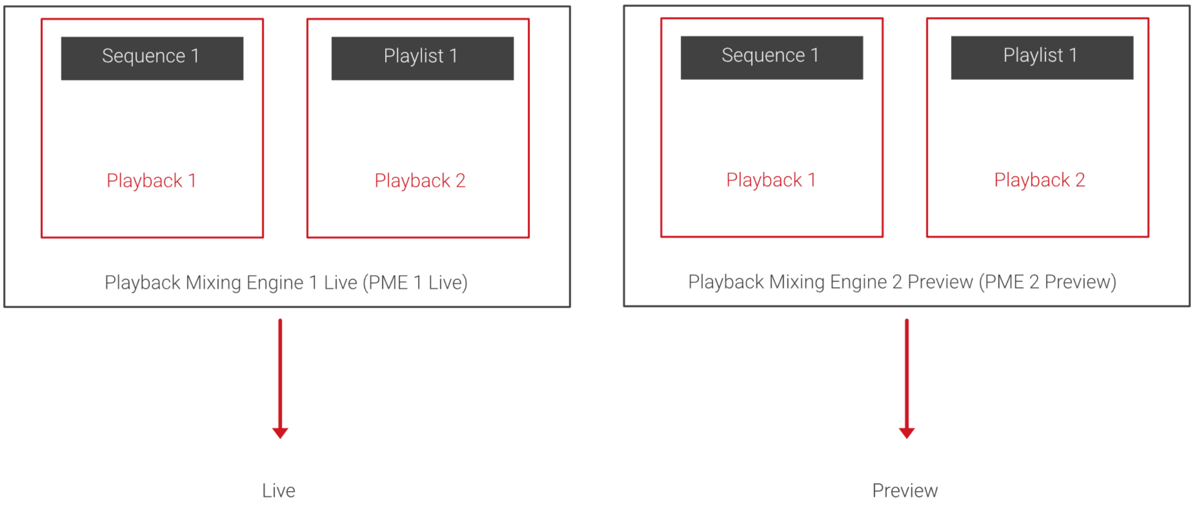
- Go to "Canvas View" in the Render Editor
- Use the drop-down menu to select the Canvas that needs to be shown.

When having a big Canvas with multiple Surface from different Systems, please keep in mind:
In the current version of VERTEX all Clip containers that are assigned to this Canvas are rendered on all
assigned Systems. For splitting the render performance, we recommend to use a Canvas for each System.

4.5.2 Playback

- A **Playback is the host** for your **Playback Provider**: a **Sequence**, a **Playlist** or a **Shotbox**
- The Playback handles **play, pause and stop**. It defines the **mode** how your Playlist or Sequence is played and is responsible for **timecode** handling.
- The **Playback Editor** is the place where you arrange & edit content of the selected *Playback Provider*
- **Depending on the Playback Provider**, the **UI of the Playback Editor** changes: a **Timeline Interface** for Sequence or a **Playlist Interfaces** for a Playlist

Overview: Playbacks in VERTEX



A **Playback is the host for the Playback Provider** - which can be either a Sequence or a Playlist.

ⓘ Speed up the daily work: VERTEX automatically produces a Playback for every new Sequence or Playlist you create.
The base settings are done for you.

The **Playback controls transport functions (PLAY, PAUSE & STOP)**.
The inspector setting *Playback Mode* **defines how your Playlist or Sequence is played** (Once, Loop, Shuffle, Shuffle Once)
Playbacks are **responsible for timecode processing**. Each Playback has a **mixing level** to fade in or out.
Users are able to **change the Playback Provider** of a Playback from one *Sequence/ Playlist to another* or *select between Playlist and Sequence* altogether.

ⓘ **The length of Playbacks is defined by their Playback Provider.**
By default the length is set to 10 Minutes.
If you want to change the length of your timeline / sequence or the grid of frame rate select the hosted Sequence to access the settings *Playback Provider Time* in the Inspector.

Arranging and editing of content is done in the *Playback Provider* (Sequence or Playlist)
Each Playback is available in every **Playback Mixing Engine (PME)**. PME acting as "Video Master Faders". They control the main playout level for the whole mix. By default for live and for one preview.

The **Playback Editor** is the place to edit and compose your content. Depending on the type of *Playback Provider* , the **UI of the Playback Editor changes**. You will get a

- timeline interface for a Sequence
- playlist interface for a Playlist

Working with Playbacks

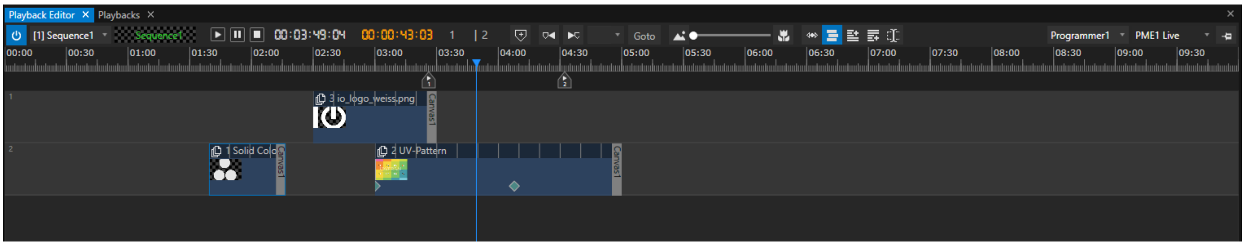
There are 3 main windows to edit, review and control Playbacks.
All properties and settings of a Playback can be set in the Inspector and most of them can be accessed by script commands (e.g. *Playback1.Play)*

Playback Editor

The Playback Editor is the main window where you arrange and edit the content of your *Playback Provider*.

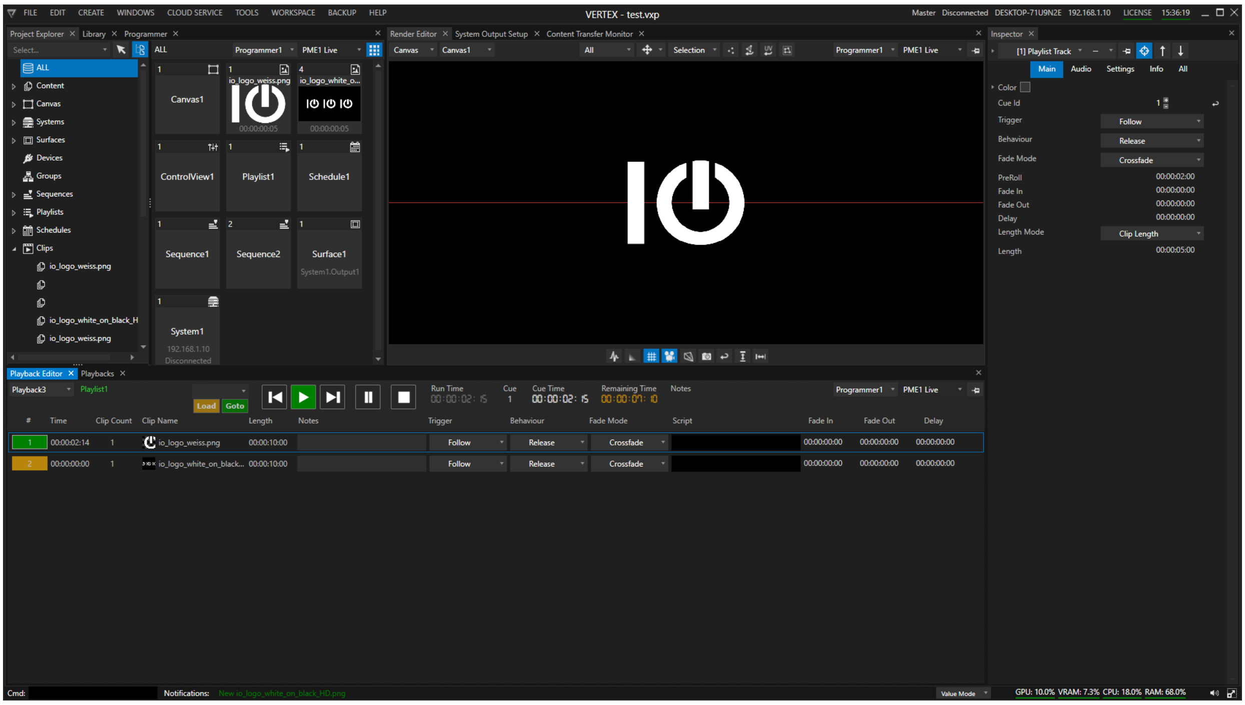
Read more on the Playback Editor's User Interface.

Playback Editor UI for a Sequence:



For details on the timeline based workflow go to the Sequence Topic.

Playback Editor UI for a Playlist



#	Time	Clip Count	Clip Name	Length	Notes	Trigger	Behaviour	Fade Mode	Script	Fade In	Fade Out	Delay
1	00:00:02:14	1	io_logo_weiss.png	00:00:10:00		Follow	Release	Crossfade		00:00:00:00	00:00:00:00	00:00:00:00
2	00:00:00:00	1	io_logo_white_on_black...	00:00:10:00		Follow	Release	Crossfade		00:00:00:00	00:00:00:00	00:00:00:00

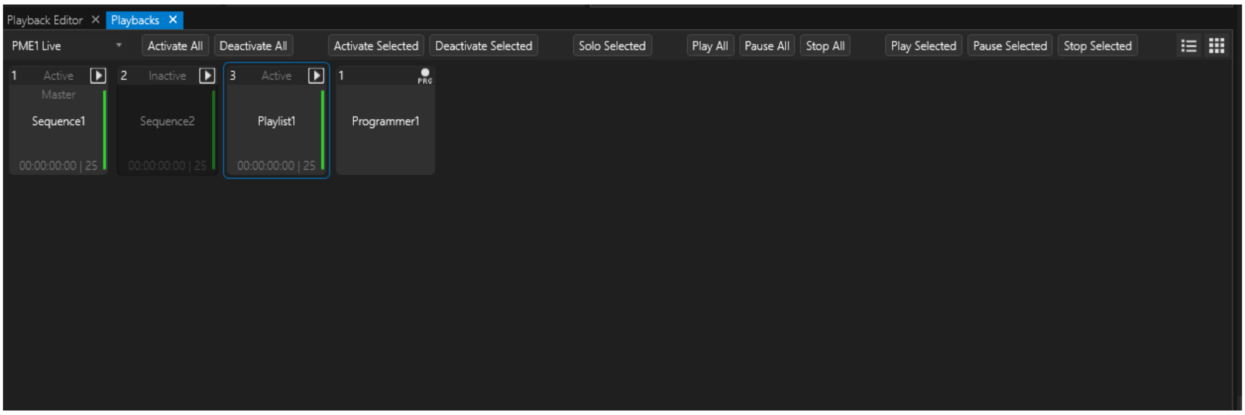
Run Time 00:00:02:15 Cue 1 Cue Time 00:00:02:15 Remaining Time 00:00:07:10

Color
Cue Id 1
Trigger: Follow
Behaviour: Release
Fade Mode: Crossfade
PreRoll 00:00:02:00
Fade In 00:00:00:00
Fade Out 00:00:00:00
Delay 00:00:00:00
Length Mode: Clip Length
Length 00:00:05:00

Get more insight on how to work with a Playlist.

A Shotbox is VERTEX's third option for a Playback Provider. Read more on Shotboxes here.

Playbacks Window



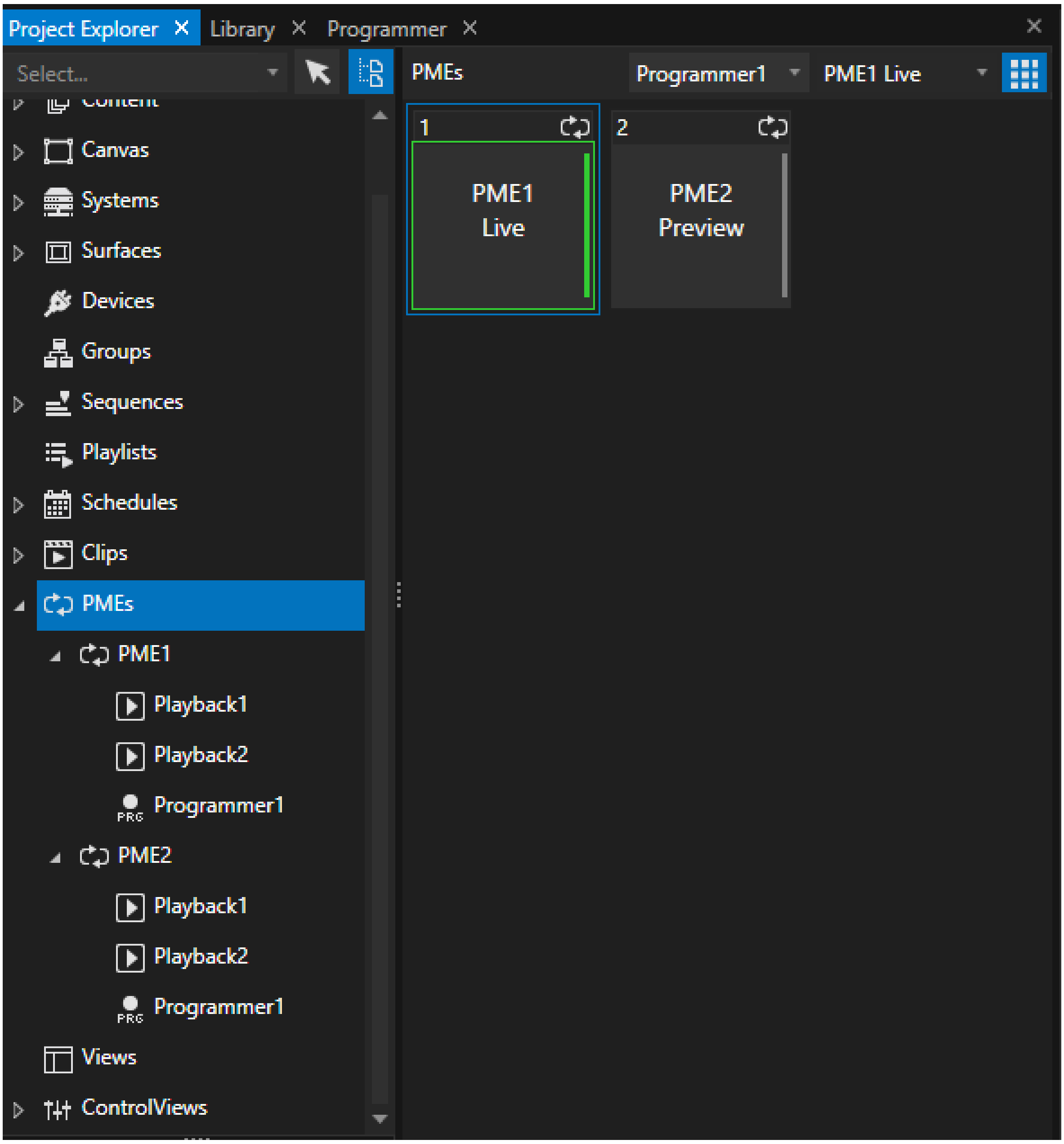
The Playbacks-Window shows a quick view of

- all Playbacks of your Project
- their Playback Provider
- their current status
- their mixing level.

Select a Playback to view its properties in the Inspector or right-click on a tile to access a Playback's context menu.

Project Explorer

Alternatively you can find all Playbacks in the Project Explorer as a sub-elements of the PMEs-Manager:



Assigning a Playback Provider to a Playback

When you create a new Sequence or Playlist, VERTEX creates also a new Playback and directly assigns it to the Playback Provider just created.

Use Case:
Playback2 hosts a Sequence. At a later stage in your work, it seems a Playlist would have been the better choice for your content arrangement.
Since you have already created a ControlView and assigned it to Playback2, your best option would be to continue using that Playback.
You want to change the Playback Provider of Playback2 from Sequence to Playlist.

There are three ways to change or assign a Playback Provider to a Playback:

Inspector

Select a Playback and go to Inspector > Settings tab .
Go to the Playback Provider target field and make your choice either from the drop-down or drag a Sequence/ Playlist from the Project Explorer.

Playback Editor

Select your Playback in the Playback Editor.
Drag a Playlist or a Sequence into the Playback Provider target field.

Playbacks Window

Open a Playbacks Window or navigate to the already opened Playbacks tab
Drag a Sequence or a Playlist from Project Explorer to a Playback

Playback Order in Fullscreen and Render Editor

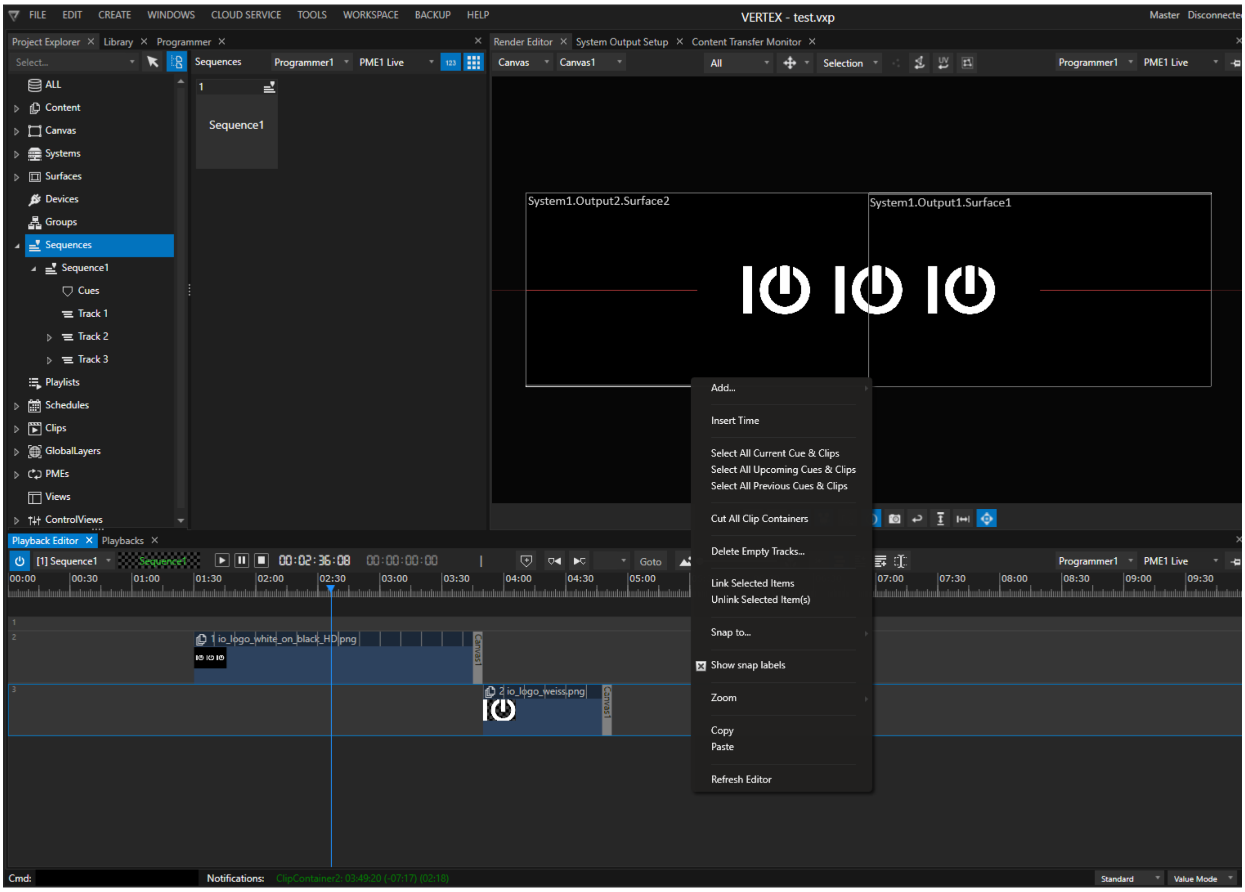
- Playback Order: By default ascending.
  When Playback 1 and 2 are running in parallel and are assigned to the same Canvas:
  Means Playback 2 is in front of playback 1
- you are able to change this order into project settings
  Options: ascending, descending or last updated (LTP)

4.5.3 Sequence

- Sequences are VERTEX' **timeline-based Playback Providers** that are **hosted by a Playback**
- In a Sequence **Clip Containers** and **Cues** are arranged on various **Tracks**
- Sequences have a **default *Canvas***, but every *Clip Container* can be assigned to a different *Canvas* or *Output.*

- A Sequence **can be nested as Clip Container** into another Sequence - similar to what you know from sub-compositions in other video compositing applications

Working with Sequences



Creating a new Sequence

- go to MAIN MENU > CREATE and select *Sequence*
- go to Project Explorer, navigate to the Sequences Manager, access the context-menu (right-click) and select ***+ Add new...***

Clip Containers & Tracks

Clip Containers are - as the name suggests - containers that mainly hold your content clips.

The Tracks of a sequence aid you in arranging various Clip Containers and building your show.
Clip Containers can be positioned freely between different tracks at discretionary points in time - they are not 'glued' to a main storyline.

View and zoom tips:
Use your mouse wheel to scroll up and down the tracks. Hold down CTRL while scrolling will zoom in and out (keys + and - also adjust the zoom) .
To scroll horizontally hold down SHIFT.

Are Tracks the same as the layers I already know from other media server software?
No, Tracks are just ledges to arrange your Clip Containers on. While Tracks do have some proprietary settings, there is, however, no layer restriction like other media servers have.
Tracks and Clip Containers are flexible objects - such as the objects you may already know from video editing or compositing software.

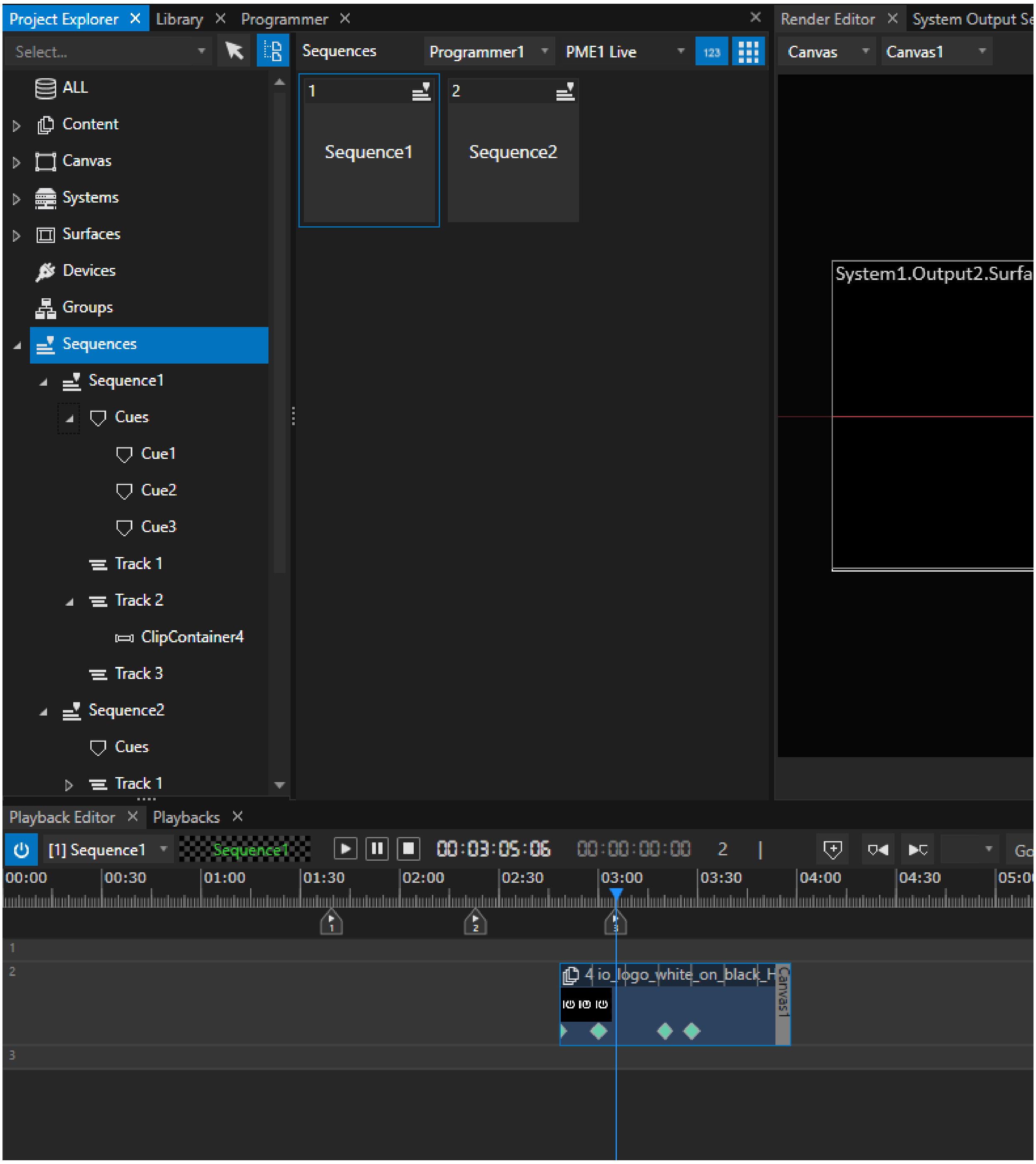
Length and Frame Rate Grid

The default length of each Sequence is set to 10 minutes and can be customized in the Sequence's Inspector.
Find the category *Playback Time* and expand it with a click to adjust the settings.
The Sequence's FPS (frames per second) serves as a frame rate grid.
Change the grid to a time signature, if you need to arrange your content to musical beats.

Context Menu

Access the Sequence's context menu by right-click into the Playback editor for various options to select clip Containers, create or insert new Tracks or to create other items.

Access all items of a Sequence in Project Explorer



All Tracks, Cues and Clip Containers are also accessible as sub-elements in the Project Explorer
Use it to select items, to focus them into the Inspector or to delete them.

Lost a Clip Container?

Searching for a Clip Container that appears lost or is too small for manual selection on the timeline?

You can find and select it in the Project Explorer.

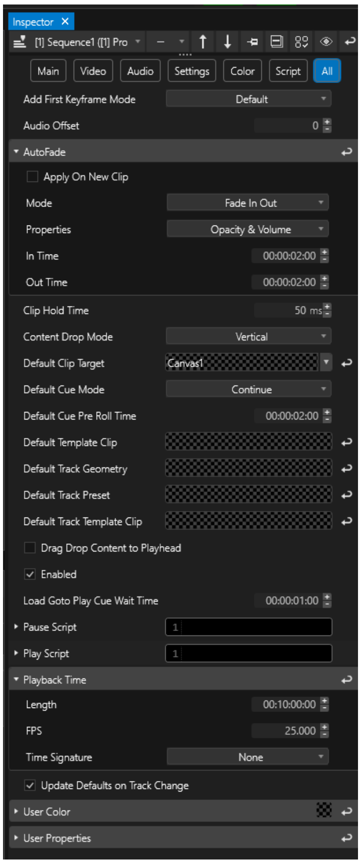
To reset the Clip Container to its default length, you need to open the context menu and select *"Reset to Clip Length*".

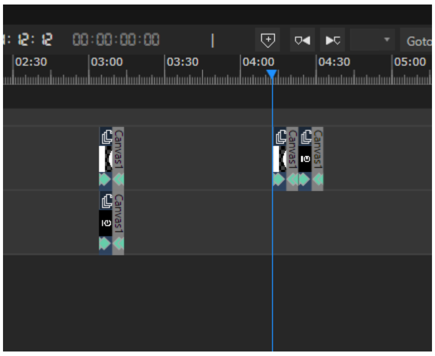
Cues

Cues are powerful tools aiding you in programming and controlling the playback of your sequence.

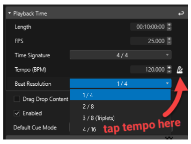
Go to the Cue-topic for further reading.

Sequence Settings

 Inspector [1] Sequence1 ([1] Pro Main Video Audio Settings Color Script All Add First Keyframe Mode: Default Audio Offset: 0 AutoFade □ Apply On New Clip Mode: Fade In Out Properties: Opacity & Volume In Time: 00:00:02:00 Out Time: 00:00:02:00 Clip Hold Time: 50 ms Content Drop Mode: Vertical Default Clip Target: Canvas1 Default Cue Mode: Continue Default Cue Pre Roll Time: 00:00:02:00 Default Template Clip Default Track Geometry Default Track Preset Default Track Template Clip □ Drag Drop Content to Playhead ☑ Enabled Load Goto Play Cue Wait Time: 00:00:01:00 Pause Script: 1 Play Script: 1 Playback Time Length: 00:10:00:00 FPS: 25.000 Time Signature: None ☑ Update Defaults on Track Change User Color User Properties	**Add First Keyframe Mode**	Sets the global behavior for an auto-generated keyframe at the first frame of a ClipContainer when adding keyframes in that Sequence. Keyframes at the start of a ClipContainer allow VERTEX to interpolate the values between the starting point and the values of the manually added keyframes. None: no first-frame keyframes will be added. Default: VERTEX adds a first-frame keyframe with an automatic default value (e.g. Opacity = 0) Input: VERTEX adds a first-frame keyframe. Its value will be matching the keyframe added by the user.
	Audio Offset	Audio Offset in milliseconds per Sequence. Positive values set audio earlier, negative values later in time. Please note: Audio Offset can also be adjusted globally in the System's Audio Settings.
	AutoFade	*Apply on new Clip* - when enabled, VERTEX generates *fade* or *transition* keyframes for each new Clip Container in that Sequence.

		Mode: Select whether you need to fade in, fade out, or both. *Properties:* Select if either Opacity, or Volume or both shall be faded. *In- and Out Time* can be set to a desired duration.
	Clip Hold Time	Sets a time in ms that determines how long a texture is being rendered after playhead has left the Clip Container. Common use cases: back-to-back clips with large file sizes where Clip Hold Time will prevent background flashes.
	Content Drop Mode	Defines how multiple selections of content will be dropped onto your timeline when dragged from the Project Explorer. *Vertical* (default): each Clip Container on an individual track at the same timecode position. *Horizontal*: back to back on the same Track  00:00:00:00 Goto 02:30 03:00 03:30 04:00 04:30 05:00 Canvas1
	Default Clip Target	Specifies the default target for each Clip Container created in that Sequence. By default it is set to Canvas1. Alternative targets can be selected from the drop-down menu or by drag & drop from Project Explorer, including: Canvases, Destinations, System Outputs. Note: a Surface is not a valid target and the Clip will not be rendered.

	Default Cue Mode	Each Cue added to that Sequence will have the selected mode by default.
	Default Cue Pre Roll Time	Sets a default Pre Roll Time for each cue in that Sequence. When fading or jumping to a cue that is positioned over rendered content, Clips will be pre-loaded by default 02:00 seconds before their start time.
	Default Template Clip	Sets a default Template Clip for each new ClipContainer generated in that Sequence. Each ClipContainer will have the template's settings applied. Exception: If a Sequence Track has got a default Template Clip of its own, it will override the Sequence's default.
	Default Track Geometry	Sets a default Geometry file for each Track added. Each Clip Container added to the Tracks thereafter will use that default Geometry.
	Default Track Preset	Sets a default Preset to each Track added. Each Clip Container added to the Tracks thereafter will use that default Preset.
	Default Track Template Clip	If this property has got a Template Clip assigned, each Track added to the Sequence will use that Template for any Clip Container added therafter. *Default Track Template Clip* will override the Sequence's default Template Clip.
	Drag Drop Content To Playhead	Enable this setting if you need content to automatically drop to the playhead's position. Regardless where your mouse actually drops it on the timeline, content will always snap to the playhead.
	Enabled	Enables or disables the Sequence as a whole.
	Load GoTo Play Cue Wait Time (default	When using the VERTEX script command *GoToCuePlay,* the transport will wait after jumping to the cue for the time set before

	= 01:00 seconds)	resuming playback and thus allowing to buffer Clips that are not loaded yet.
	Pause & Play Scripts	Users can enter scripts that will be run when the transport pauses or resumes play.
	Playback Time  Playback Time Length 00:10:00:00 FPS 25.000 Time Signature 4 / 4 Tempo (BPM) 120.000 Beat Resolution 1 / 4 1 / 4 2 / 8 3 / 8 (Triplets) 4 / 16 ☐ Drag Drop Content ☑ Enabled Default Cue Mode tap tempo here	**Length:** Sets the length of your Sequence. The timeline will adapt to any changes set here. **FPS:** Defines the frames per second grid on the Playback Editor's timeline. This value only affects the user's timeline with starting points, cues, synchronization, etc. The rendering engine, however, pushes all frames of your content to your GPU. **Time Signature:** As soon as you divert from the default *"None"* and select a time signature (1/4, 2/4, 3/4, 4/4 or 5/4 time) **a couple of musical properties will unlock**. Also, the timeline grid will change from a frame based to beat based view. **Tempo BPM:** sets the sequence tempo in *beats per minute*. Alternatively, tap on the metronome button to any groove and let VERTEX calculate your tempo. **Beat Resolution (default = quarter note):** allows for sub-divisions of the quarter note beat in the Sequence's grid (eight notes, triplets, sixteenth notes).
	User Color & User Properties	Customize the UI appearance (e.g. name, ID, color and notes) of your Sequence.

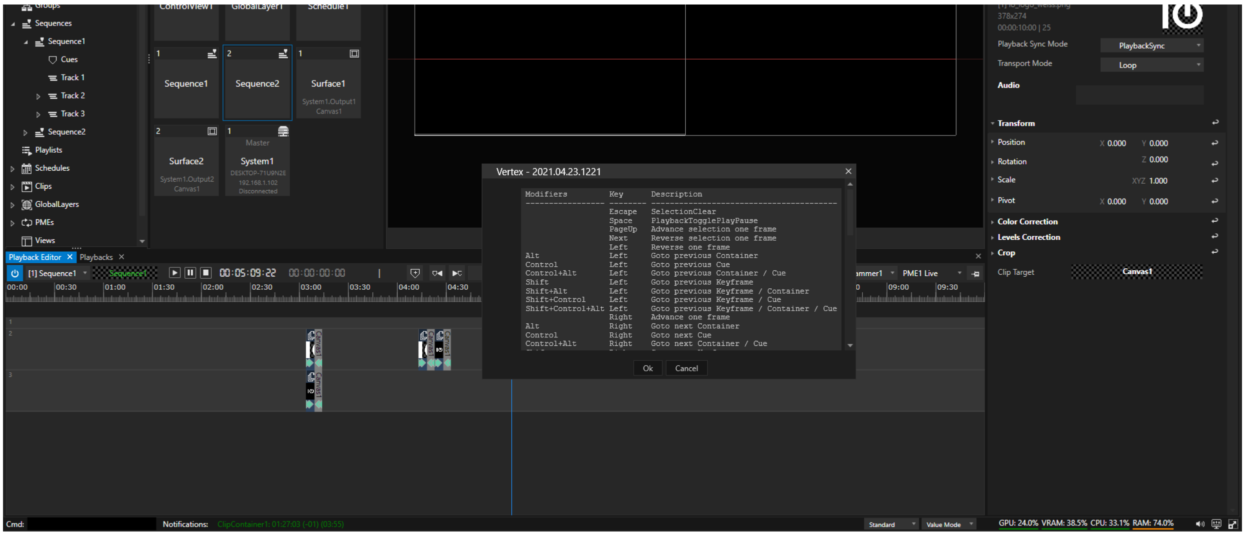
Changing the sequence's FPS may shift pre-existing cues!
All Cues that exist before changing the frame rate of a sequence will be shifted to the next frame according to the new grid.
Depending on your changes, this recalculation may cause a minimal shift in cues - please inspect all your cue times after changing the frame rate.

Advanced Settings

Change Inspector Mode to Advanced to display all advanced settings for a Sequence

Shortcuts

- Each editor window in VERTEX has got a varying set of shortcuts that are **automatically created and updated**.
- **Press Shift-F1** to open a list of shortcuts corresponding to the current window/ editor in focus.



Vertex - 2021.04.23.1221

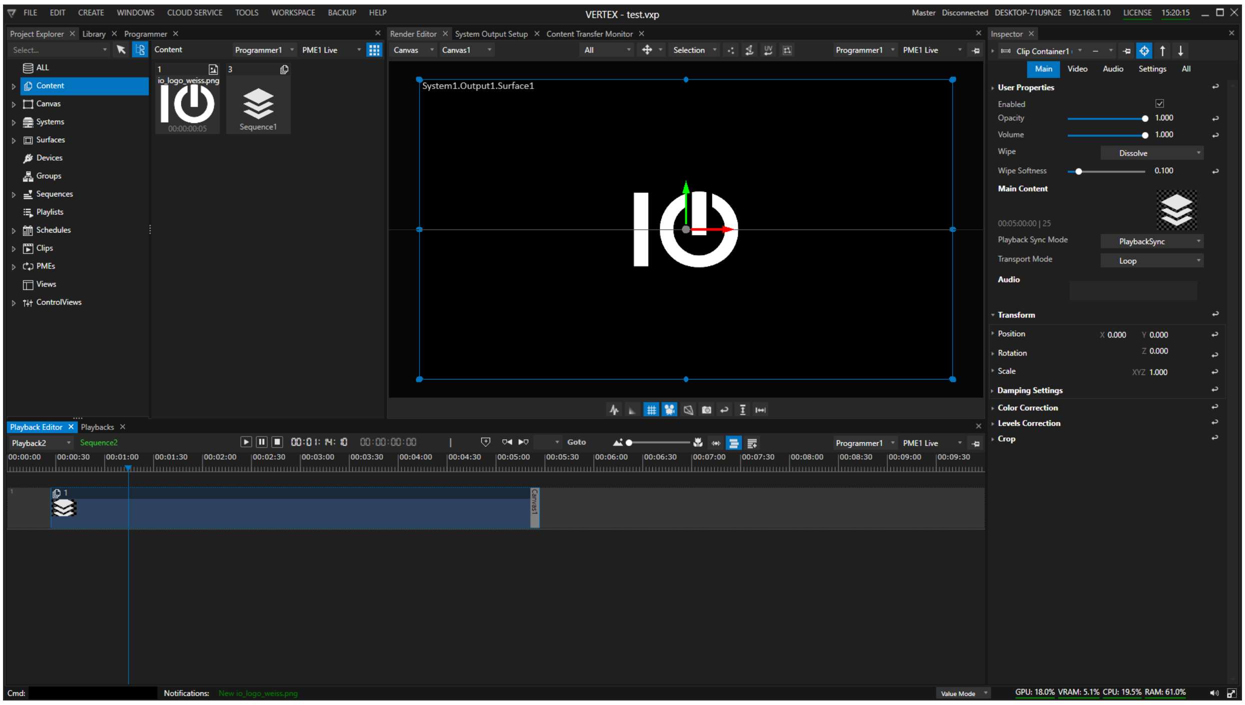
```
Modifiers         Key      Description
----------------- -------- ----------------------------------------
                  Escape   SelectionClear
                  Space    PlaybackTogglePlayPause
                  PageUp   Advance selection one frame
                  Next     Reverse selection one frame
                  Left     Reverse one frame
Alt               Left     Goto previous Container
Control           Left     Goto previous Cue
Control+Alt       Left     Goto previous Container / Cue
Shift             Left     Goto previous Keyframe
Shift+Alt         Left     Goto previous Keyframe / Container
Shift+Control     Left     Goto previous Keyframe / Cue
Shift+Control+Alt Left     Goto previous Keyframe / Container / Cue
                  Right    Advance one frame
Alt               Right    Goto next Container
Control           Right    Goto next Cue
Control+Alt       Right    Goto next Container / Cue
```

Focus Playback Editor and Press F1 Key.
A window with all available shortcuts for your Sequence opens.

Nested Sequence Content

- In VERTEX you can **nest one sequence as content into another sequence**.
- This gives users the capability of making **sub-compositions** and **compound sequences.**
- The performance of *Nested Content* depends on your hardware. In general: **Nested sequences need more render resources** than regular video content.

How To Create Nested Sequences



Clip Container1

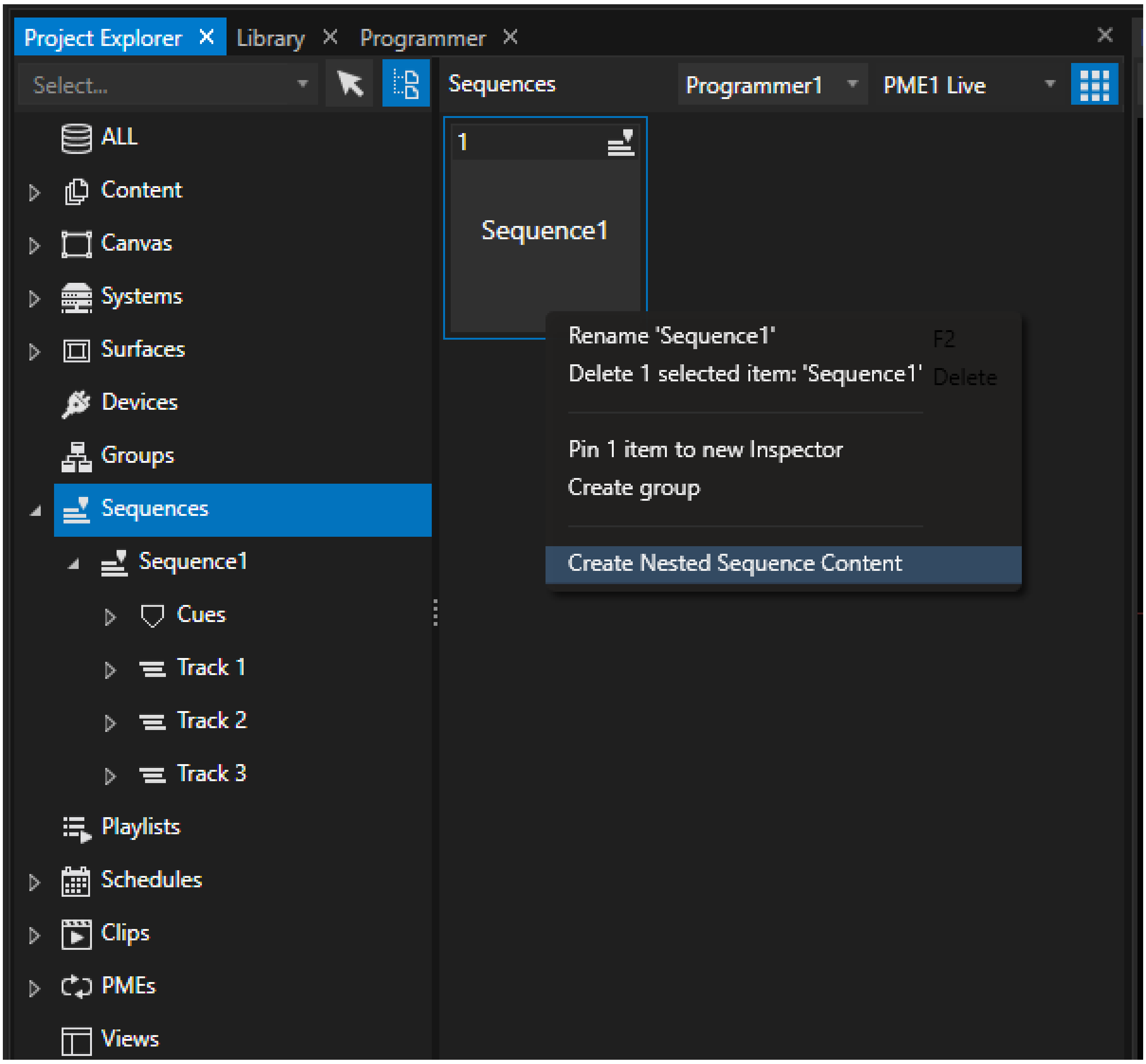
Main | Video | Audio | Settings | All

User Properties
Enabled ☑
Opacity 1.000
Volume 1.000
Wipe Dissolve
Wipe Softness 0.100
Main Content
00:05:00:00 | 25
Playback Sync Mode PlaybackSync
Transport Mode Loop
Audio
Transform
Position X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000
Damping Settings
Color Correction
Levels Correction
Crop

There are **two different ways to nest sequences into one another**:

1. **Go to Project Explorer, drag a Sequence tile to the Playback Editor and drop it onto a track.**
   VERTEX creates a Clip Container for this sequence and a Nested Sequence content item in the Project Explorer (it has got an icon with layers).

2. **Use the Context menu of a Sequence in the Project Explorer to create *Nested Sequence Content***
   Once created, a Nested Sequence Content item is listed in the content section of your Project Explorer and can be dropped into another Sequence.


Project Explorer
Library
Programmer
Select...
Sequences
Programmer1
PME1 Live
ALL
Content
Canvas
Systems
Surfaces
Devices
Groups
Sequences
Sequence1
Cues
Track 1
Track 2
Track 3
Playlists
Schedules
Clips
PMEs
Views
1
Sequence1
Rename 'Sequence1' F2
Delete 1 selected item: 'Sequence1' Delete
Pin 1 item to new Inspector
Create group
Create Nested Sequence Content

Restrictions for Nesting

Not all Devices are supported for Nested Sequence Content, so be aware of that.

A **circular reference is not possible**: Nested Sequence Content from a Sequence 1 cannot be used in Sequence 1.

Likewise, **nesting content with multiple Canvases is not supported**, so be mindful of your Canvas-Surface-Output setup.

We strongly recommend sticking to one Canvas when using Nested Sequence Content.

Performance

VERTEX is a real time software - please keep in mind that using nested sequence content costs you more System performance.

Each nested Sequence has impact on the render pipeline. The performance needs of the render engine increases with deeper nesting, repeated or multiple nesting.

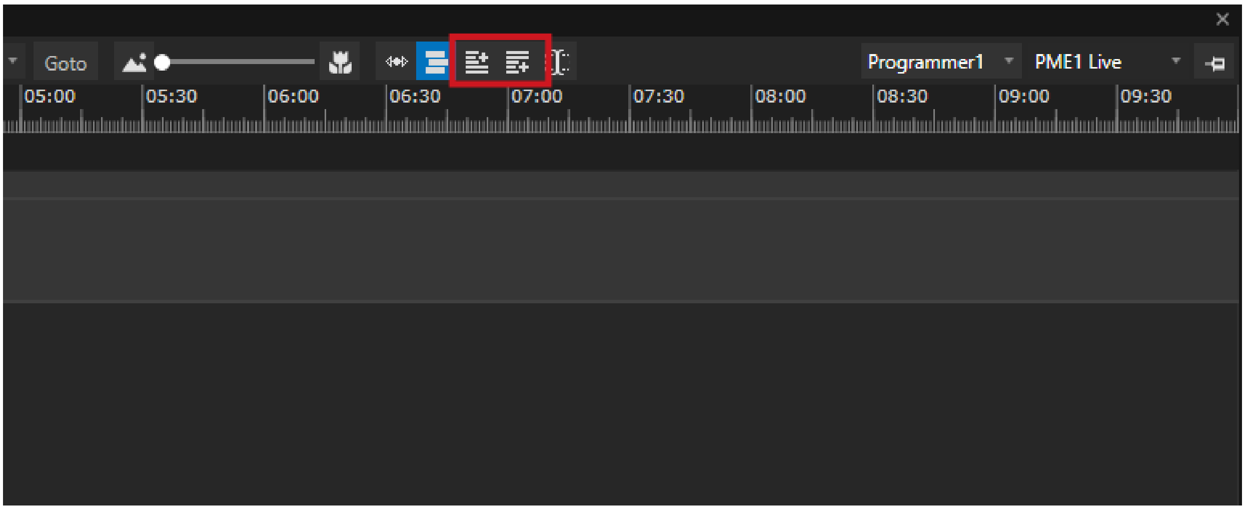
4.5.4 Track

- *Tracks* host all *Clip Containers* within your *Sequence* aiding to **structure your arrangement** and **sort the compositing / redendering hierarchy**.
- **Move *Clip Containers* freely between different tracks**
- Configuring **a track's default settings** applies those properties**—such as Clip Targets—to all *Clip Containers* created on that track.**

Add Track

There are 2 ways to add a track:

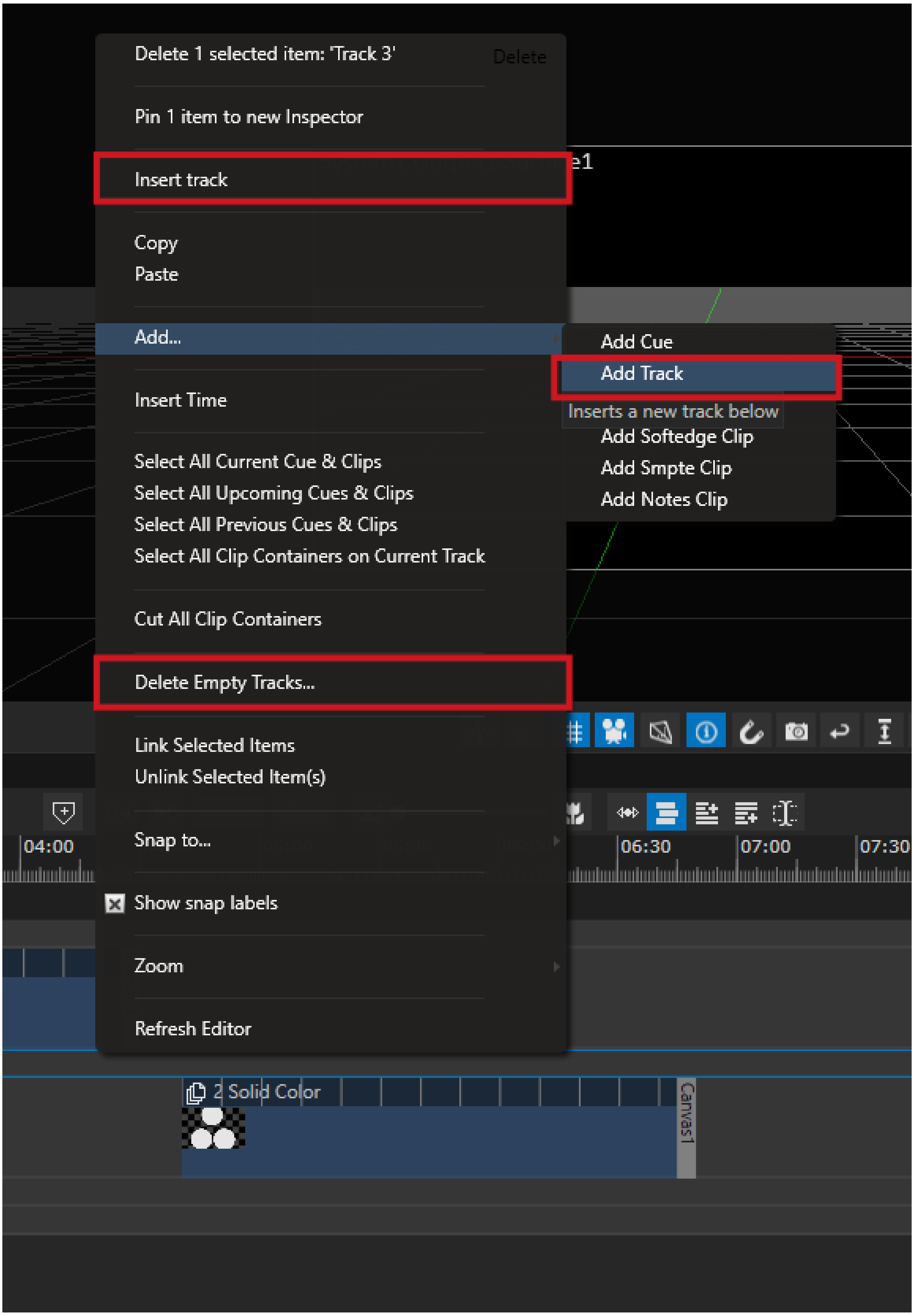
Add Track Icon into Playback Editor UI



- The first of the two +-buttons adds a new track on the top
- The second + button adds a new track at the bottom below all other tracks

ⓘ Unlike layers in other media servers, *Tracks* impose no restrictions: they simply organize Clip Containers and can hold track-level settings; both Tracks and Clip Containers remain flexible, similar to objects in video editing or compositing software.

Add Tracks via Context Menu


Delete 1 selected item: 'Track 3'
Delete
Pin 1 item to new Inspector
Insert track
Copy
Paste
Add...
Add Cue
Add Track
Inserts a new track below
Add Softedge Clip
Add Smpte Clip
Add Notes Clip
Insert Time
Select All Current Cue & Clips
Select All Upcoming Cues & Clips
Select All Previous Cues & Clips
Select All Clip Containers on Current Track
Cut All Clip Containers
Delete Empty Tracks...
Link Selected Items
Unlink Selected Item(s)
Snap to...
☒ Show snap labels
Zoom
Refresh Editor
04:00
06:30
07:00
07:30
2 Solid Color
Canvas1

- right-click in the Playback Editor to open the **Context Menu**
- go to "Add..." and select **"Add Track**" - a new track is added below all pre-existing tracks
- if you right-click onto a pre-existing Track, the context menu shows the option **"Insert Track**" which will add a track above the one you've right-clicked
- furthermore, the option **"Delete Empty Tracks"** will clean up your current Sequence

Scroll and Zoom
Use your mouse wheel to scroll up and down, hold down CTRL-Shift while using the mouse wheel to scroll the timeline horizontally.
To adjust the Playback Editor's zoom level, use + and - keys or hold down CTRL while using the mouse wheel.

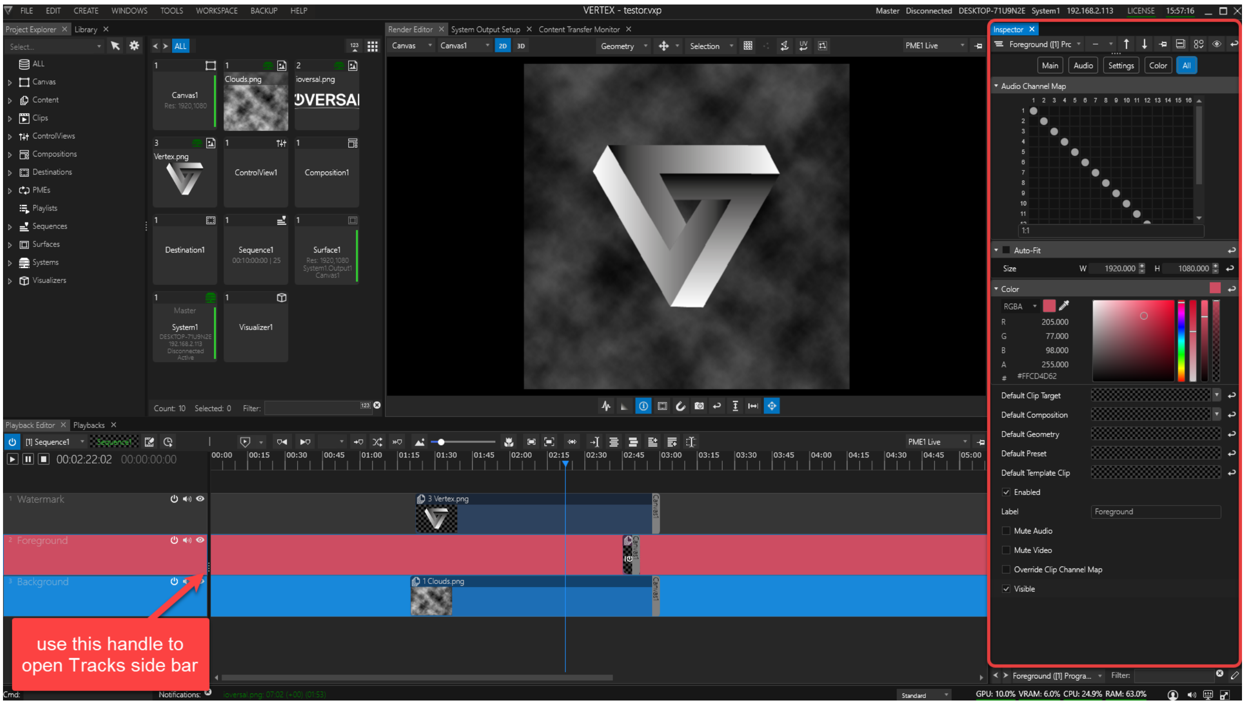
Accessing a Track's Settings

Option 1 Playback Editor

- Left-Click with your mouse on a free space of a track - avoid accidentally selecting a Clip Container

Option 2 Project Explorer

- double-click on the project item of your current Sequence
- or expand the Sequences Manager in the Project Explorer's tree view
- select a Track
- your Track is shown in the Inspector



use this handle to open Tracks side bar

Audio Channel Map	Sets a default [routing matrix for audio channels]() per Track. Source channels are located on Y axis, output channels on X axis.
Auto-Fit	Defines a default Auto-Fit setting, ensuring any content will be fitted to the defined target resolution; adjusting UV Mode and Default Plane Resolution properties accordingly for each clip.
Color	Sets a user specific Track Color as shown in the screenshot above - ideal to stay organized.
Default Clip Target	Sets a new default target for each Clip Container created on that Track. The original default it is set to Canvas1. Alternative targets can be selected from the drop-down menu or by drag & drop from Project Explorer, including: Canvases, Destinations, System Outputs. Note: a Surface is not a valid target and the Clip will not be rendered.
Default Composition	Bundle multiple [Destinations]() into one [Composition](). Any content item dragged onto a Track with a Default Composition will fill the first slot of the set Composition, instead of creating a Clip Container.

Default Geometry	Sets a default Geometry file for each Clip Container added to this Track.
Default Preset	Sets a default Preset file for each Clip Container added to this Track.
Default Template Clip	If this property has got a Template Clip assigned, each Clip Container added to the Track therafter will use that Template. A *Default Template Clip* on Track level will override the Sequence's default Template Clip.
Enabled	Enables/ disables the Track.
Label	Label your tracks to stay organized. Labels will appear in the *Playback Editor* side bar.
Mute Audio	Mutes all audio per Track.
Mute Video	Mutes all video per Track.
Override Clip Channel Map	Enforces the Track's Audio Channel Map onto the channel routing of all Clip Containers on this Track.
Visible	Shows / hides the Track in the Playback Editor.

Setting New Defaults:
Pre-existing Clip Containers on a Track will not be affected by changing the Track's defaults (Clip Target, Template Clip, Presets, etc).
Only Clip Containers created thereafter will inherit the track's new default settings.

4.5.5 Clip Container

- **Clip Container** can host content, settings, device controller data or even work as a notepad.
- Clip containers are **free from layer restrictions** and **can be moved around freely in the timeline.**
- Clip containers are arranged **on tracks** in the timeline.

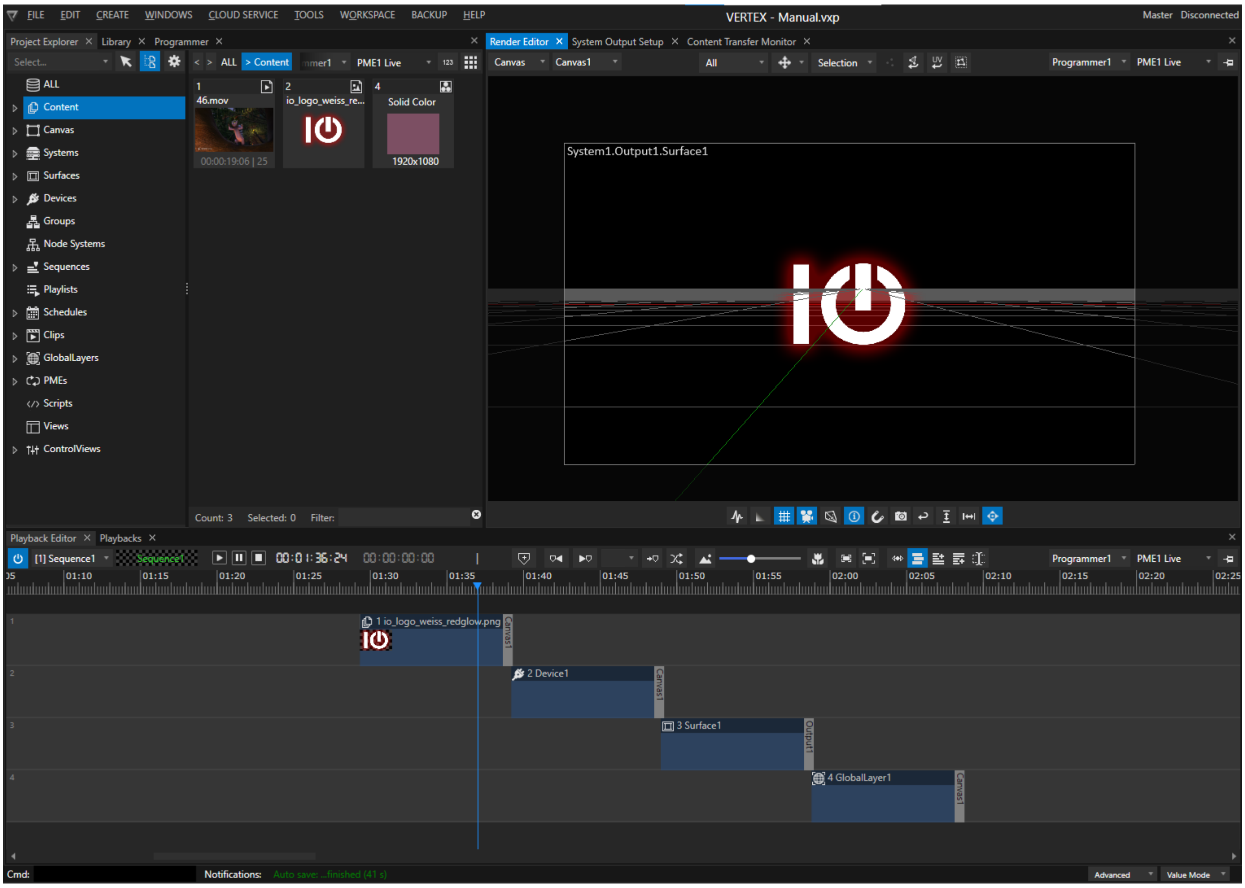
THE VARIOUS KINDS OF CLIP CONTAINER

There are different types of clip containers available - most of the settings are similar for all - some of them have special parameters and properties:

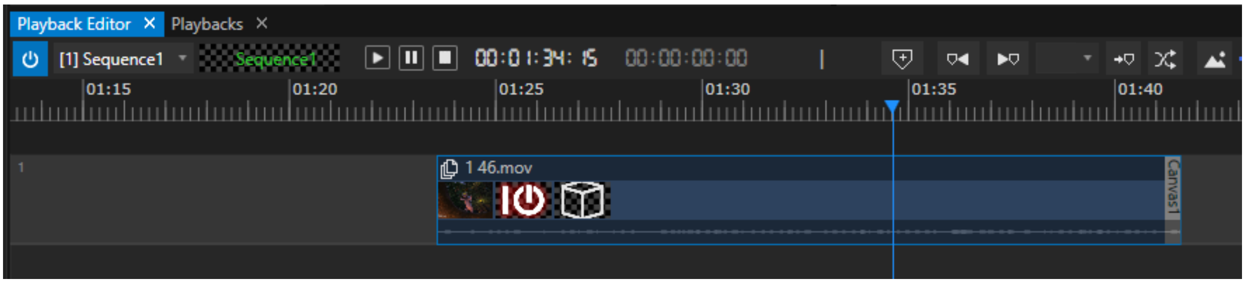
1. **Clip containers for content** (most flexible type that you will use frequently for almost everything)

2. And **other types of clip containers** such as
   - clip containers that control **devices** (i.e. DMX devices)
   - clip containers that **overwrite global settings for surfaces and outputs**
   - clip containers for **special elements like global-layers or console layers**
   - clip container just for **notes**
   - **SMPTE clips** that generate timecode

Some of them (like those for content) you will use more often than others. Some of them are useful for edge cases .



CLIP CONTAINER TARGET



Clip Container with Canvas 1 as Target

Every clip container has got a target:

- This target is displayed **as a flag at the end of each clip container**
- For content clips this **target is** usually **a canvas**. In special cases, this **target could also be an output or even a surface**. Or just another canvas.
- Different clip containers in the same sequence **can have different targets**- there is no restriction. For instance, when working with 3 different canvases, you are able to set them as different targets for your clip containers in the same sequence.

Add or change a target

1. **Drag** a canvas, a surface or an output with your mouse **from the project explorer** and **drop it into a clip container.**
2. Select a clip container with your mouse, go to settings tab in the **inspector**, drag another target from the project explorer and drop it into this property field.

Change The Default Canvas Of A Sequence
Select a sequence in the inspector and change the default canvas in the settings tab there.
Every new clip container in this sequence will have this new canvas as target.

CLIP CONTAINERS FOR CONTENT

Content types

A content clip container can host one of the content assets below:

- audio
- image

- an image sequence
- video
- generative/procedural content such as text, solid colors, gradients or test patterns
- shared textures
- nested sequence content
- HTML browser content

Additions

In addition to one of the content types above you are able to assign **from the project explorer:**

- a mask
- a separated audio track
- a 3D object

or **from the project library**

- Video Effects (FX)

Workflow and Settings

- **Create a clip container:** just drag and drop content from the project explorer into the playback editor.
- **Replace content** by dragging another content file from the project explorer into the clip container
- **Scaling** can be applied either in the Inspector Transform Properties, in the Plane Settings > Plane Resolution, or via the various options of the context menu *Auto fit / Scale to...*
- Add **video FX** : drag and drop your desired effects from the library into the clip container

FX always requires a base texture in the clip container to work.
This texture can be every type of content - To run an effect like a particle shader use a solid color content as texture for the clip container.

- Add audio to a clip container with video or image content inside: Just drag the audio file from the project explorer into the clip container.
  This action also will **replace the embedded audio file** from a video in the clip container with the new one.
- **Add a mask** to a clip container with already video or images inside: Hold Shift key and drag the mask image to the clip container.
- Drag a **3D object** with your mouse from project explorer to a clip container to add.

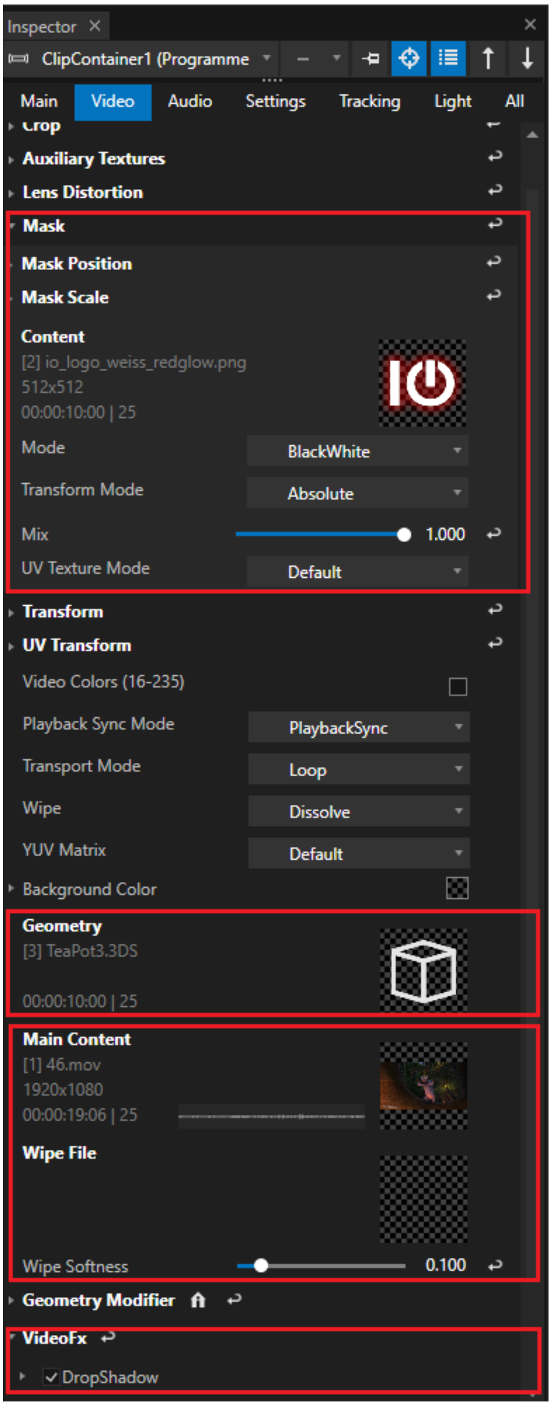
ⓘ **3D Objects always require a texture**

3D Objects in a Clip Container always require a texture. This texture could be every type of content: an image , a video, an HTML or generative content.

Remove or add a content, a mask, audio, 3D object or FX in the inspector:

In the video or audio tab of the inspector of a clip container you will find all assigned assets

- **Drag** a mask, 3D object, audio or content **to the corresponding fields** in inspector to change them.
- Open the context-menu with a right-click to **clear or remove an asset**



Crop

Auxiliary Textures

Lens Distortion

Mask

Mask Position

Mask Scale

Content
[2] io_logo_weiss_redglow.png
512x512
00:00:10:00 | 25

Mode: BlackWhite

Transform Mode: Absolute

Mix: 1.000

UV Texture Mode: Default

Transform

UV Transform

Video Colors (16-235) □

Playback Sync Mode: PlaybackSync

Transport Mode: Loop

Wipe: Dissolve

YUV Matrix: Default

Background Color

Geometry
[3] TeaPot3.3DS
00:00:10:00 | 25

Main Content
[1] 46.mov
1920x1080
00:00:19:06 | 25

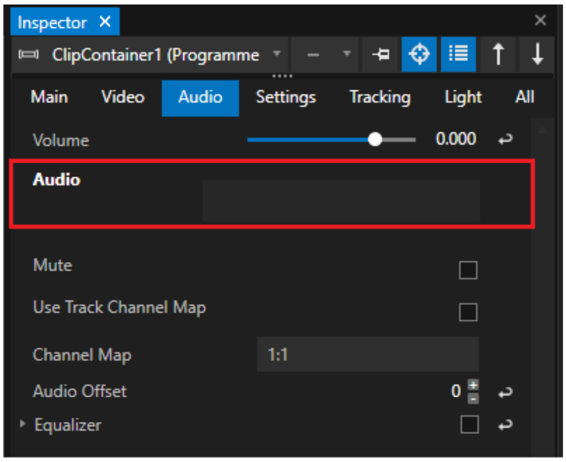
Wipe File

Wipe Softness: 0.100

Geometry Modifier

VideoFx

✓ DropShadow



Volume: 0.000

Audio

Mute □

Use Track Channel Map □

Channel Map: 1:1

Audio Offset: 0

Equalizer □

OTHER TYPES OF CLIP CONTAINER

Devices

- Drag a device from the library into your sequence playback editor and VERTEX creates a clip container automatically.
- This is useful for devices that have animatable properties (like e.g. DMX devices have)
- **Learn more** about devices here

Overwrite Surface and Output Settings

- You are able to create a clip container for each **surface and output.**
- With this kind of Clip Container you are able to **animate surface and output settings**
- **When this clip container is being played back**, it overwrites the global settings of an **output or an surface temporarily** as long as its duration allows**.**

There are two ways to create such a clip container:

1. **Drag** an output or a surface with your mouse **from the project explorer into your sequence.**
2. **Switch to programmer mode**. Change the settings of a surface or output in programmer mode. A clip container with keyframes is created when you store your programmer scene.

> ⓘ **Check Clip Container Target**
> Clip containers for surfaces and outputs always have an output as target - instead of a canvas. Please double check if the correct output is set as target of your clip container.

Global Layer and Console Layer

- **Settings for global layers can be overwritten** with clip containers as well.
- **Once the playhead runs into the clip container**, the settings of a **global layer are temporarily overwritten.**

There are two ways to do this:

1. **Drag** a **global layer** with your mouse **from the project explorer into your sequence.**
2. **Switch to programmer mode**. Change settings of a global layer in programmer mode. A clip container with keyframes is created when you store your programmer scene

Notes

- A simple clip container that **hosts and shows your notes**.
- **Create a Clip Container for Notes:**
  - Go to the playback editor and open the context menu (right-click).
  - Select "Add"

- ○ Select "Add Notes Clip"

SMPTE Clip

- generates SMPTE timecode when playhead is running into the clip container.
- For further Information read the chapter for SMPTE.

WORKING WITH CLIP CONTAINERS:

COMMON TASKS

- Copy/Paste a clip container and its settings (or keyframes) with shortcuts (CTRL + C / CTRL+V) or with help of the context menu.
- Double-click on a clip container to open the Keyframe Editor
- Move a clip container in the timeline or between tracks by simply dragging it.
- Adjust a Clip Container's length by edge editing: move the mouse over the edges at the beginning and end of a clip container and the arrow will change to the edge editing tool <--> automatically.
- Set a User Color for your clip container.

SELECTION

There are various options to select clip containers in your Sequence Editor:

- Select multiple clips by dragging a lasso around them.

or

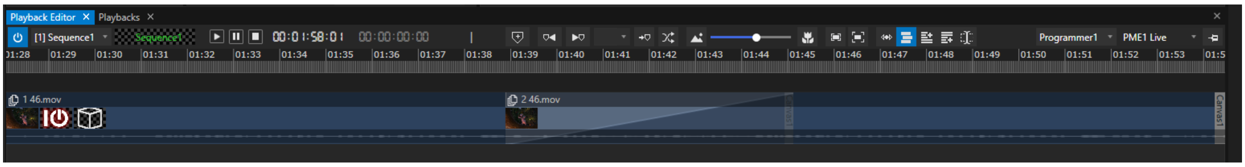
- Right-click on a track or an empty space in the Sequence Editor to open the context menu and go to ***Select... .***

From there you can choose to select all clips vertically (at current playhead position), all upcoming/ previous clips and all clips on the current track.

A multi-selection allows property changes of all selected clip containers in the Inspector.

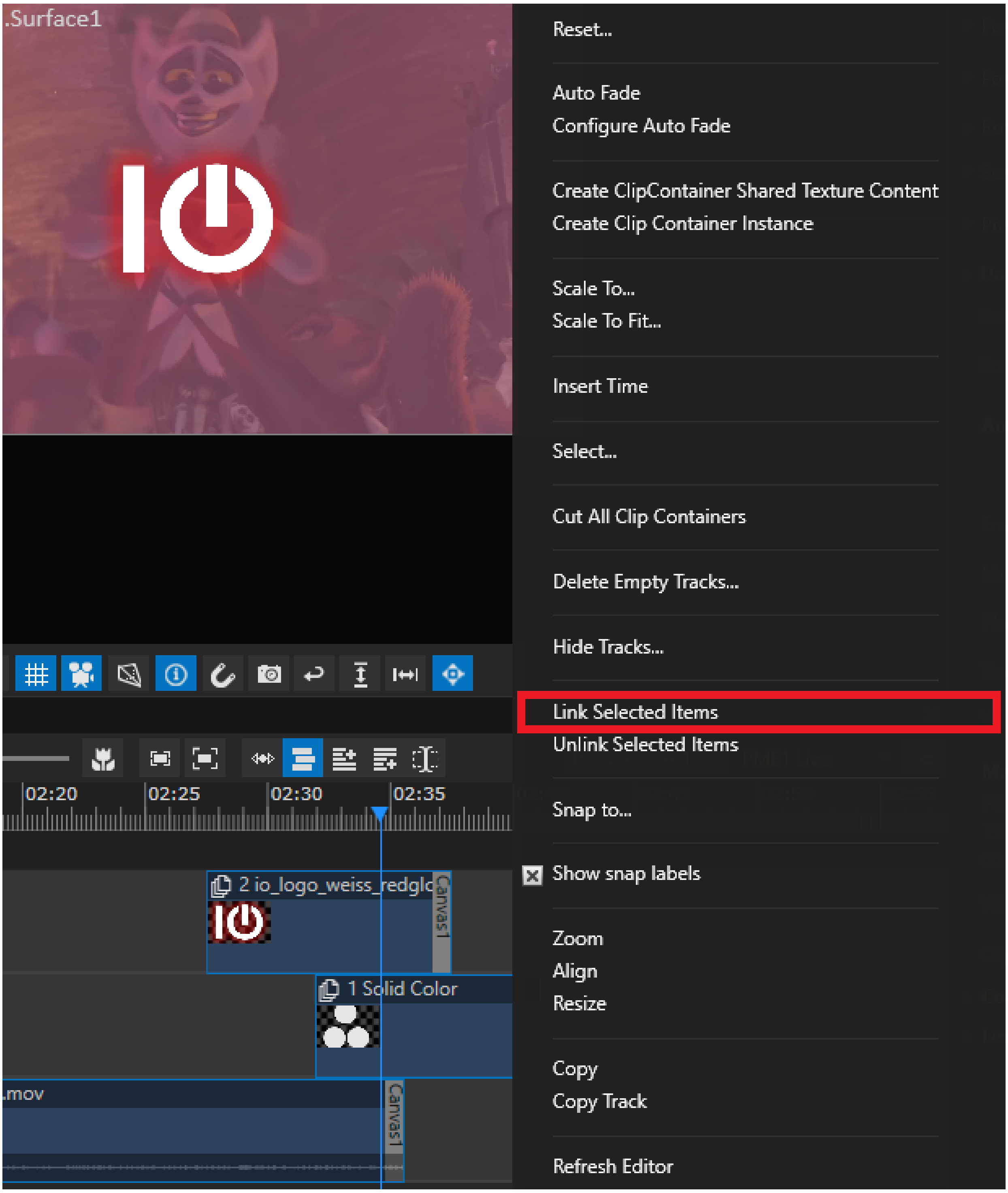
AUTOFADE

- When you drag a Clip Container into another one on the same Track, VERTEX automatically generates an auto-fade for video and audio.



LINK AND UNLINK

- Link or unlink a selection of clip containers as a group.
- You can move linked clip containers "as a package"
- Property changes are taken over for all linked clip containers

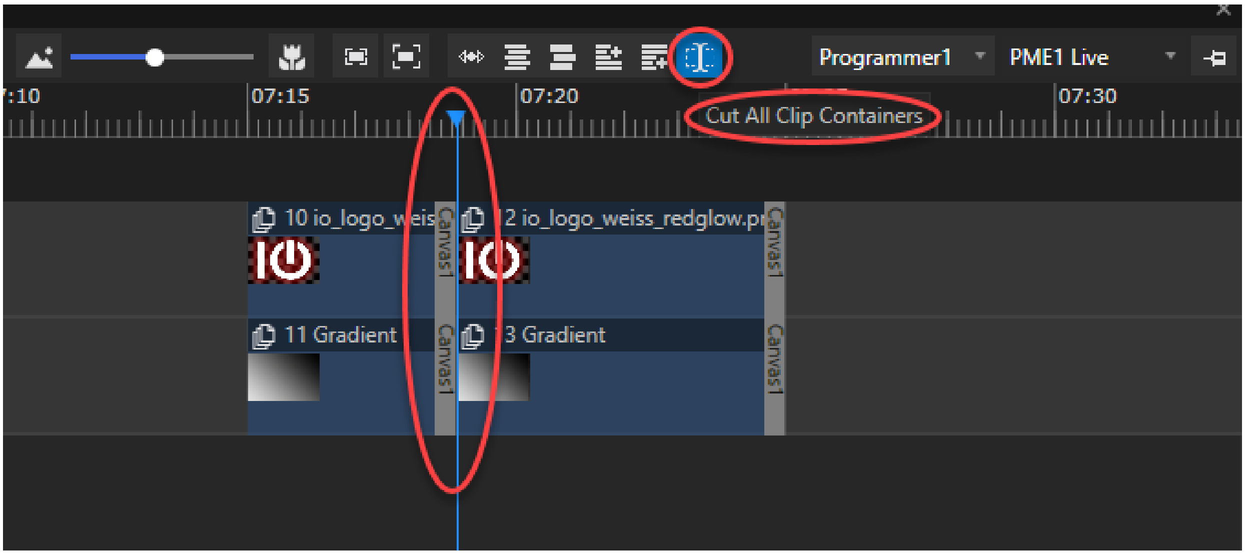


CUT CLIP CONTAINER

- Splits a clip container into two parts at playhead position.

- You have 2 options:

CUT ALL CLIP CONTAINERS AT PLAYHEAD POSITION



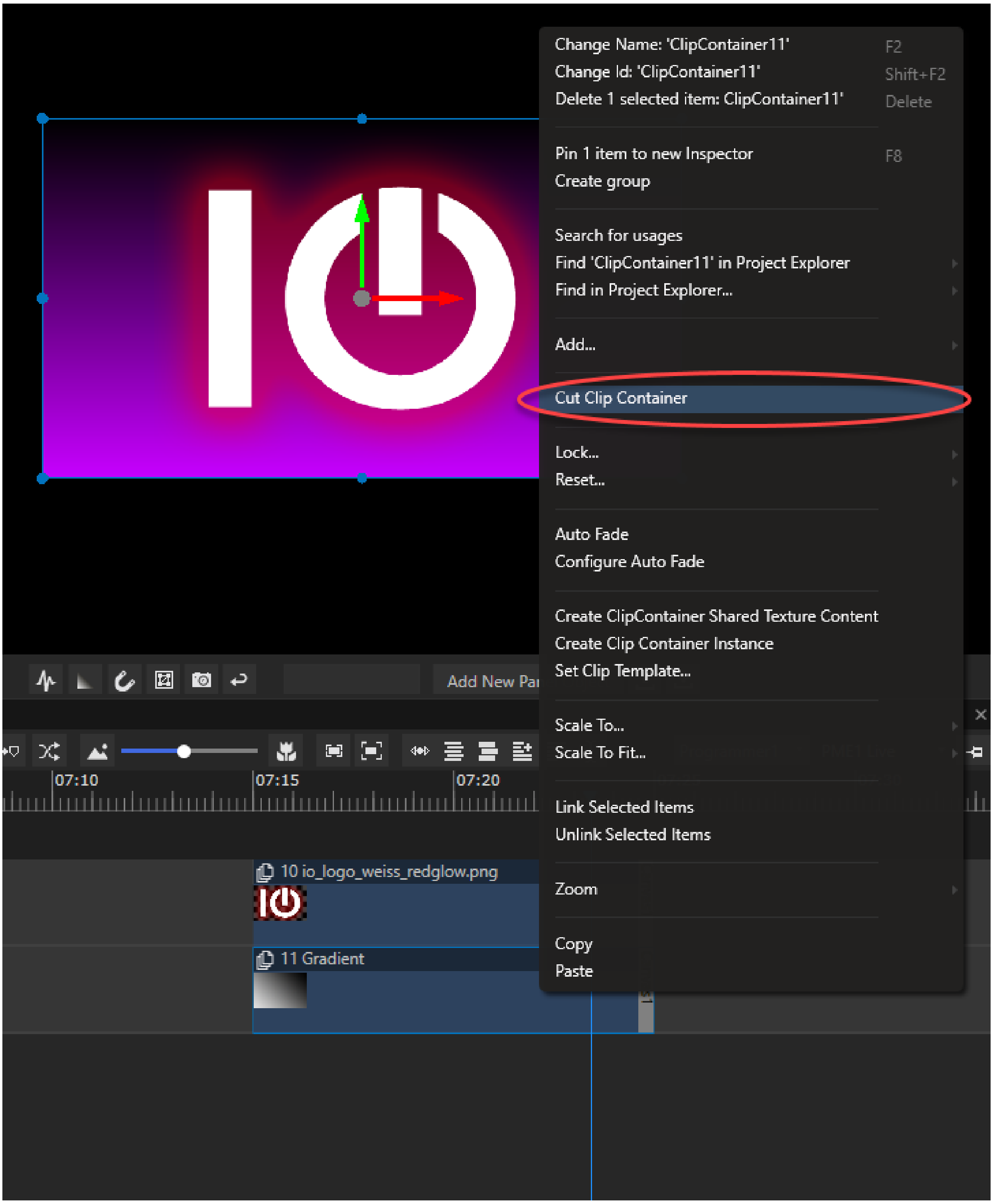
- Use the cut-button in the Playback Editor

or

- Select a clip container
- Open the context menu with a right-click
- Select "Cut All Clip Containers"

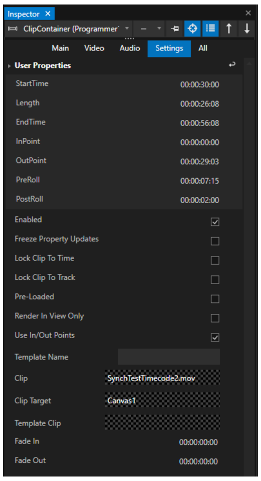
CUT ONLY ONE CLIP CONTAINER AT PLAYHEAD POSITION

- Select a clip container
- Open the context menu with a right-click
- Select "Cut Clip Container"


Change Name: 'ClipContainer11' F2
Change Id: 'ClipContainer11' Shift+F2
Delete 1 selected item: ClipContainer11' Delete
Pin 1 item to new Inspector F8
Create group
Search for usages
Find 'ClipContainer11' in Project Explorer
Find in Project Explorer...
Add...
Cut Clip Container
Lock...
Reset...
Auto Fade
Configure Auto Fade
Create ClipContainer Shared Texture Content
Create Clip Container Instance
Set Clip Template...
Scale To...
Scale To Fit...
Link Selected Items
Unlink Selected Items
Zoom
Copy
Paste
Add New Par
07:10
07:15
07:20
10 io_logo_weiss_redglow.png
11 Gradient

SETTINGS

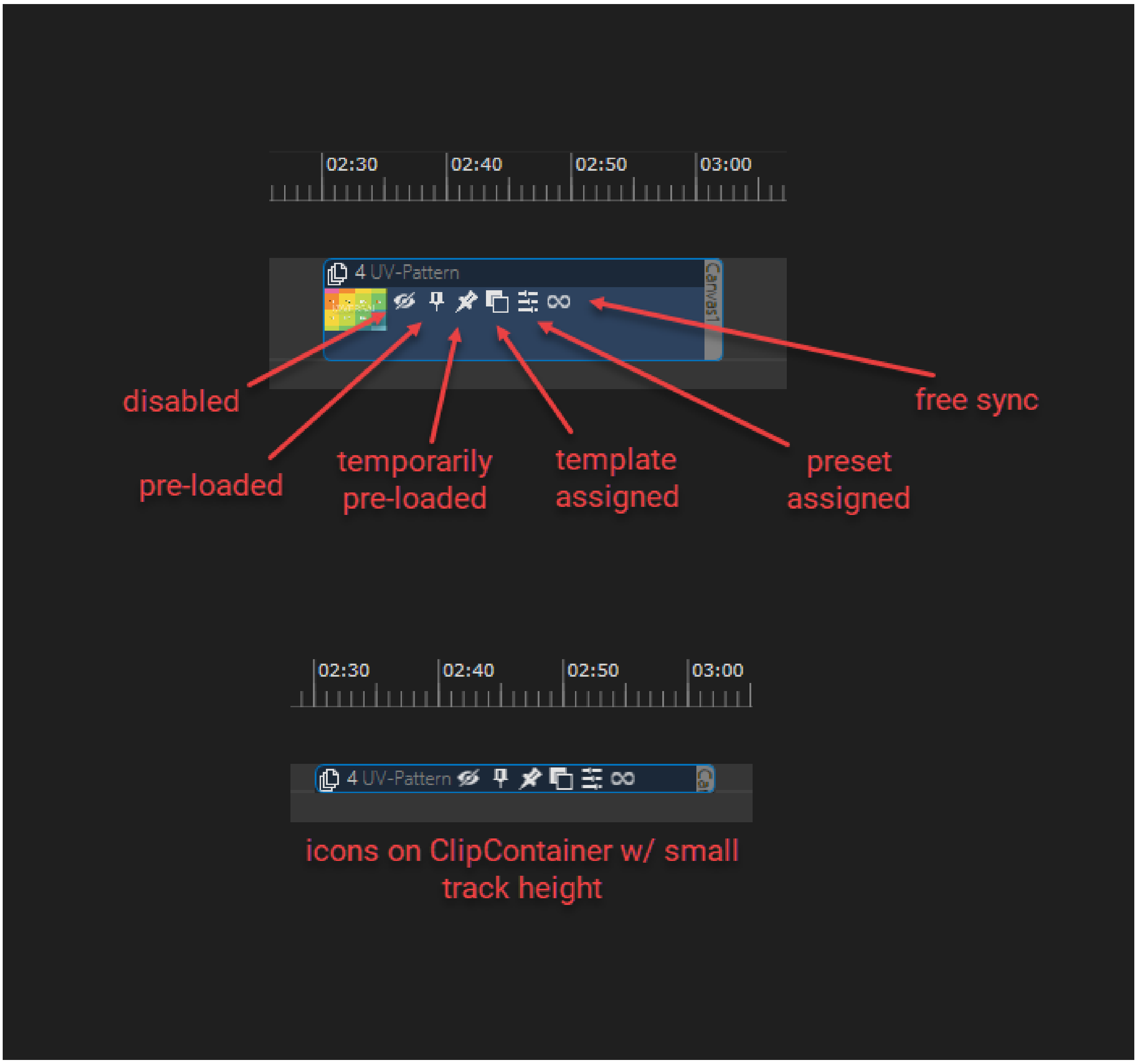
There are several properties you can set for a clip container.
Some of them depend on the type of clip container (surface, content, device), whereas some of them are valid for every type.

 Inspector ClipContainer (Programmer Main Video Audio Settings All User Properties StartTime 00:00:30:00 Length 00:00:26:08 EndTime 00:00:56:08 InPoint 00:00:00:00 OutPoint 00:00:29:03 PreRoll 00:00:07:15 PostRoll 00:00:02:00 Enabled ☑ Freeze Property Updates □ Lock Clip To Time □ Lock Clip To Track □ Pre-Loaded □ Render In View Only □ Use In/Out Points ☑ Template Name Clip SynchTestTimecode2.mov Clip Target Canvas1 Template Clip Fade In 00:00:00:00 Fade Out 00:00:00:00	**Start Time** **End Time**	Sets the points in the timeline where a clip container starts or stops. A reset is possible via the context menu. Select a clip container in your playback editor or project explorer and use the command "Reset to Cliplength"
	Length	Sets the clip container's length in the timeline. By default the length is set to the duration of the original content audio or video clip. Any other clip containers holding colors, images, textures or data are set to a lenght of 10 seconds by default. The clip container's length is relative to its start and end times.
	InPoint **OutPoint**	Sets the point of time within the content from which the clip container rolls in and out. For instance, if your clip is just 10 seconds long and the original content exceeds that time, you can select the frame which will be played in the clip. These Settings, however are *not* relative to the clip's length or start and end times. One of the many ways to create video loops in VERTEX.
	PreRoll **PostRoll**	Sets a buffer time for loading content before and after the playhead rolls in and out of a clip container.
	Enabled	Enable or disable a clip container to free your system's resources. Content is neither loaded nor rendered if the clip container is disabled (box is set unchecked).
	Freeze Property Updates	Freezing static non animated clip containers will reduce the amount of property updates per rendered frame. In doing so the properties are only updated when the playback enters a clip.
	Lock Clip To Time **Lock Clip To Track**	To prevent from accidentally moving, lock a clip container to time or to track. Both settings also are available in the context menu of a clip container. When set, a lock icon appears in the clip container.

	Pre-Loaded	This option will permanently load all textures and object data into into system RAM and GPU RAM. Please use only when required as this setting will fill up your system's resources.
	Render In View Only	VERTEX's render engine processes everything on canvas where the playhead points in your timeline. Rendering of clip containers with this setting enabled will be bypassed if the clip is not *in view* of a surface. A clip container will be *rendered when in view only*.
	Use In/Out Points	Enables the use of specific in- and out-points. See above.
	Template Name	Name this clip for external references and watch-folder usage
	Clip	Reference to the content of this clip container.
	Clip Target	Sets the canvas where the clip will be displayed. To change it just drag another canvas from the project explorer and drop it into this field or into a clip in the playback editor.
	Template Clip	Names the source of the template clip.
	Fade In/Out	Sets the desired fade length if you choose to fade the clip in or out.

ICONS ON CLIP CONTAINERS

When certain settings are activated, their respective icons appear on the Clip Container. Here is a quick overview:



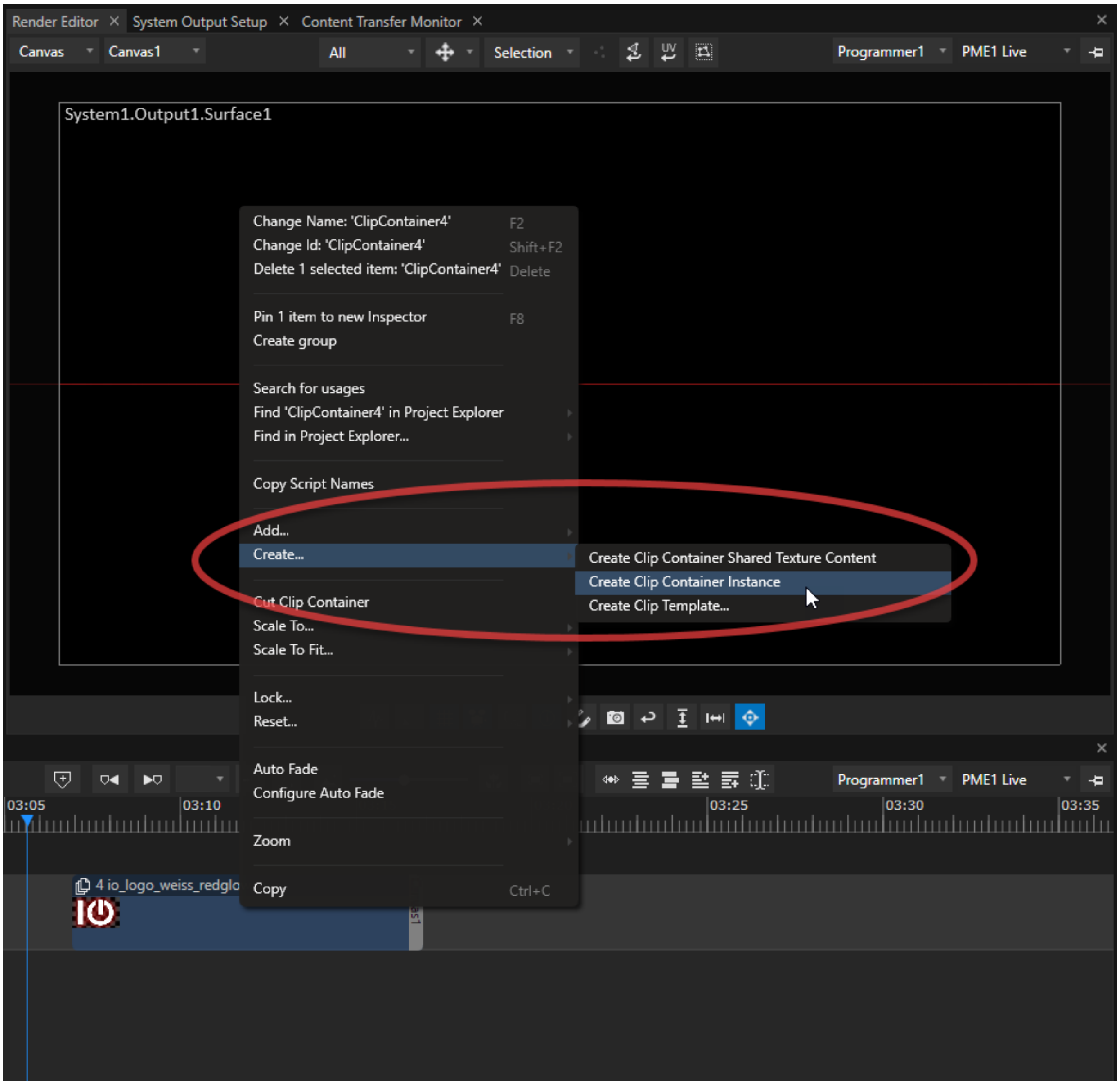
Instances

- Instances offer an quick way to duplicate and link clip containers.
- All property settings including keyframe edits are duplicated and linked for all instances of a clip container.
- Clip container instances are marked by default in deep gray color.

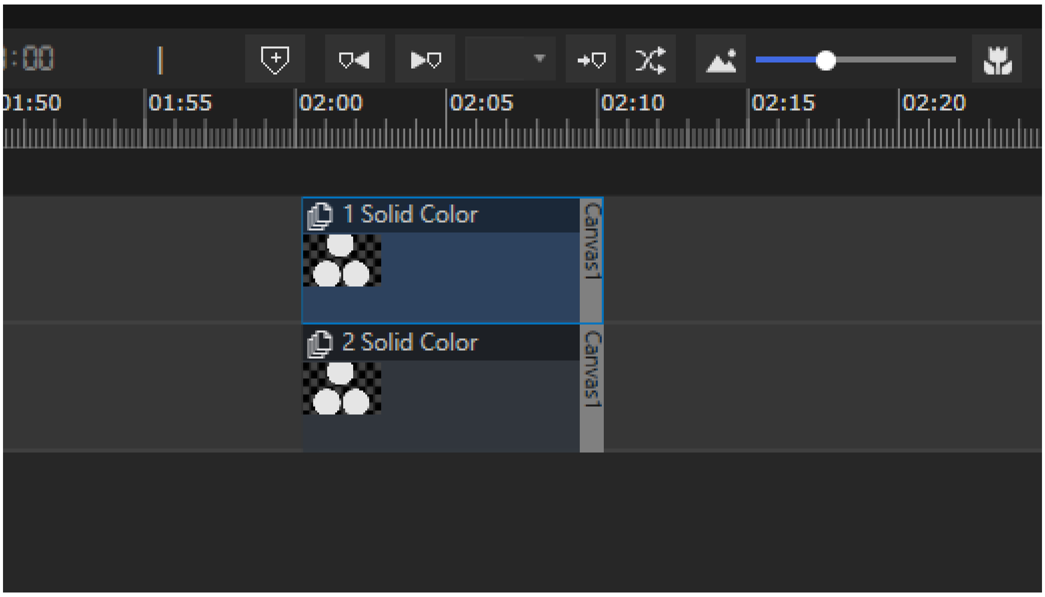
Create Instance

- Select a clip container

- Right-click and open the context menu
- Select *Create* -> *Create Clip Container Instance*
- A new instance is created by default on a new track at same position.



- Work with the clip container instance and move it around independently.
- Property changes on the original container are taken over to all Instances.
- changes on an instance are taken over also to original clip container.



Shared Textures

Related to the instance function are clip containers with shared textures of content.

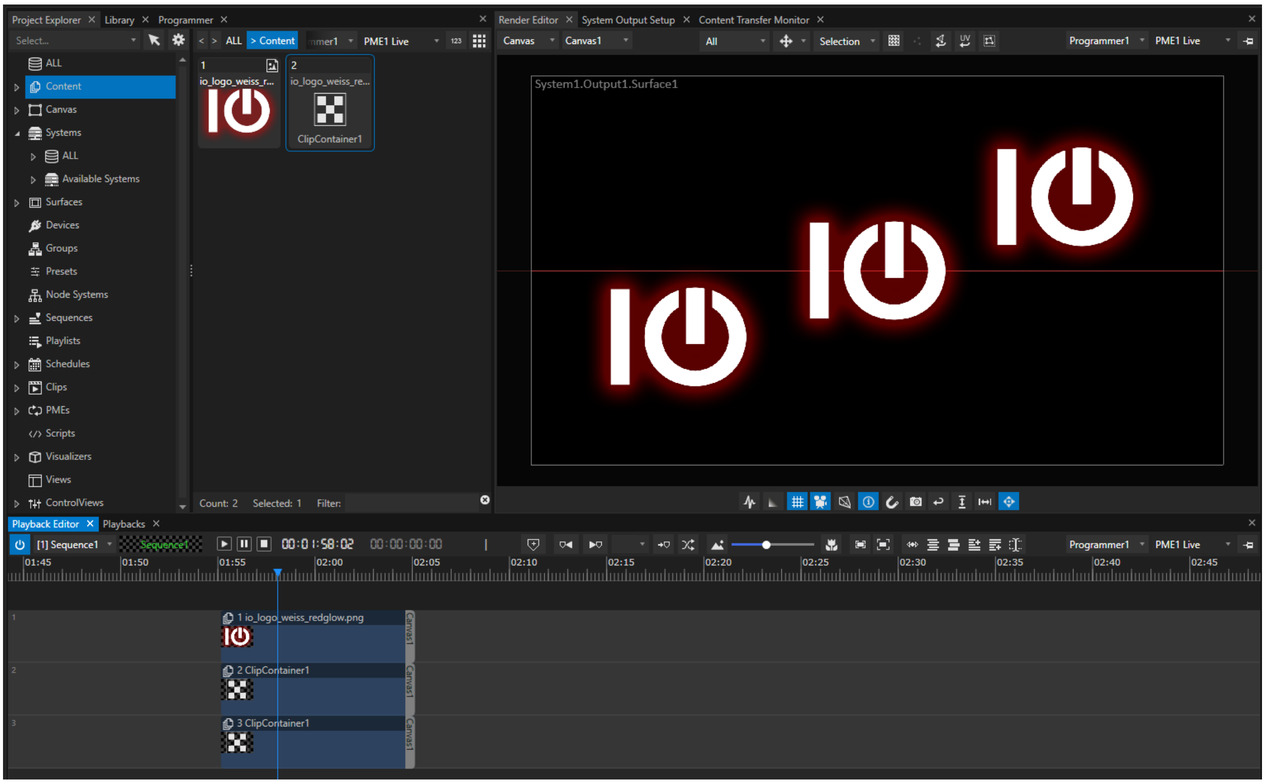
Creating a clip container that shares another clip's texture is **a resource friendly way to output the same content multiple times** simultaneously.

The main difference to creating an instance of a clip is that the clips' **property settings are not linked**.

Also, the clip with a shared texture will only be played out at the same time the original clip is being rendered.

Create a shared texture **by selecting the source clip** with the content you want to share and go to ***Create...*** in its **context menu**.

A new clip container with a shared texture will appear in the Project Explorer's Content section and while **the source content is only loaded once** into the system's memory, it **can be used multiple times** in the sequence.



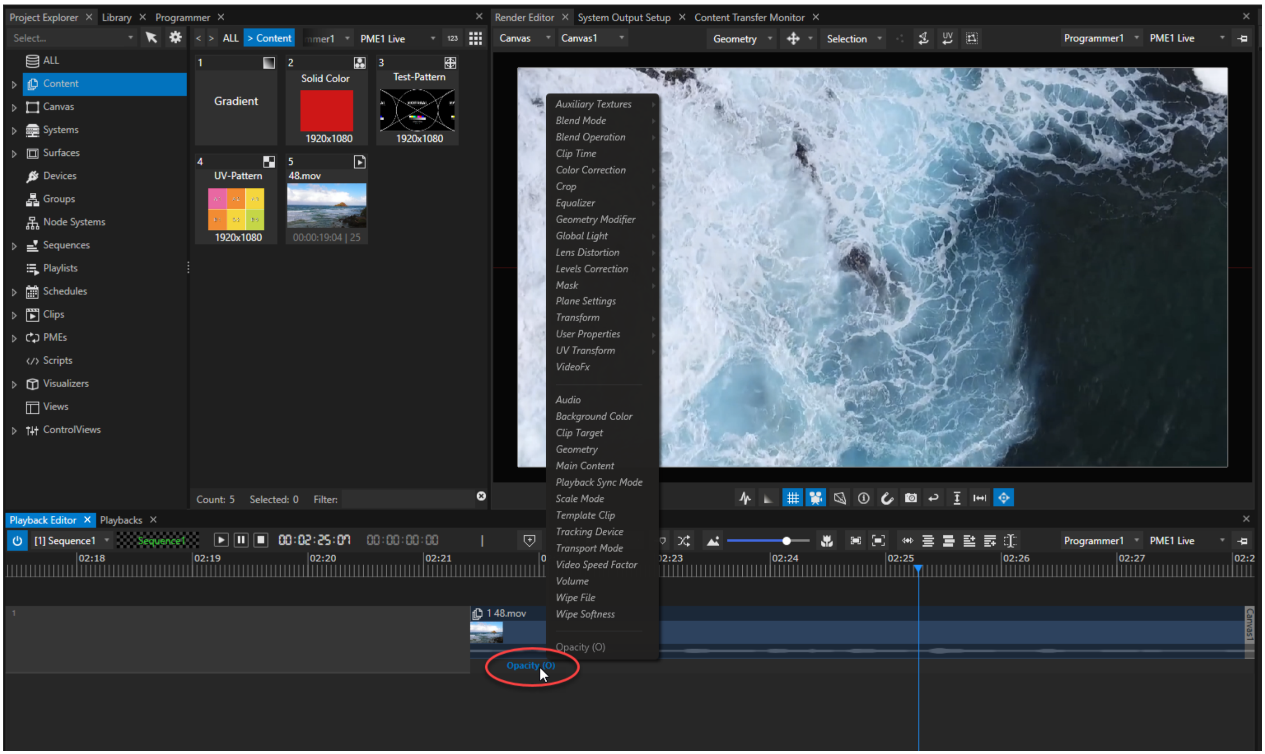
4.5.6 Keyframes

- By adding **keyframes** to a Clip Container you can **animate changes in property values and parameters** at specific points in time.
- VERTEX calculates a curve from keyframe to keyframe and interpolates the data. You can choose the type of curve from **linear, bezier** and on/off **switch.**
- **Keyframes are hosted by clip containers**. Their **position and time settings are relative and locked** to their clip container: Moving a clip container, moves all keyframes together along.

Open The Keyframe Editor In The Playback Editor

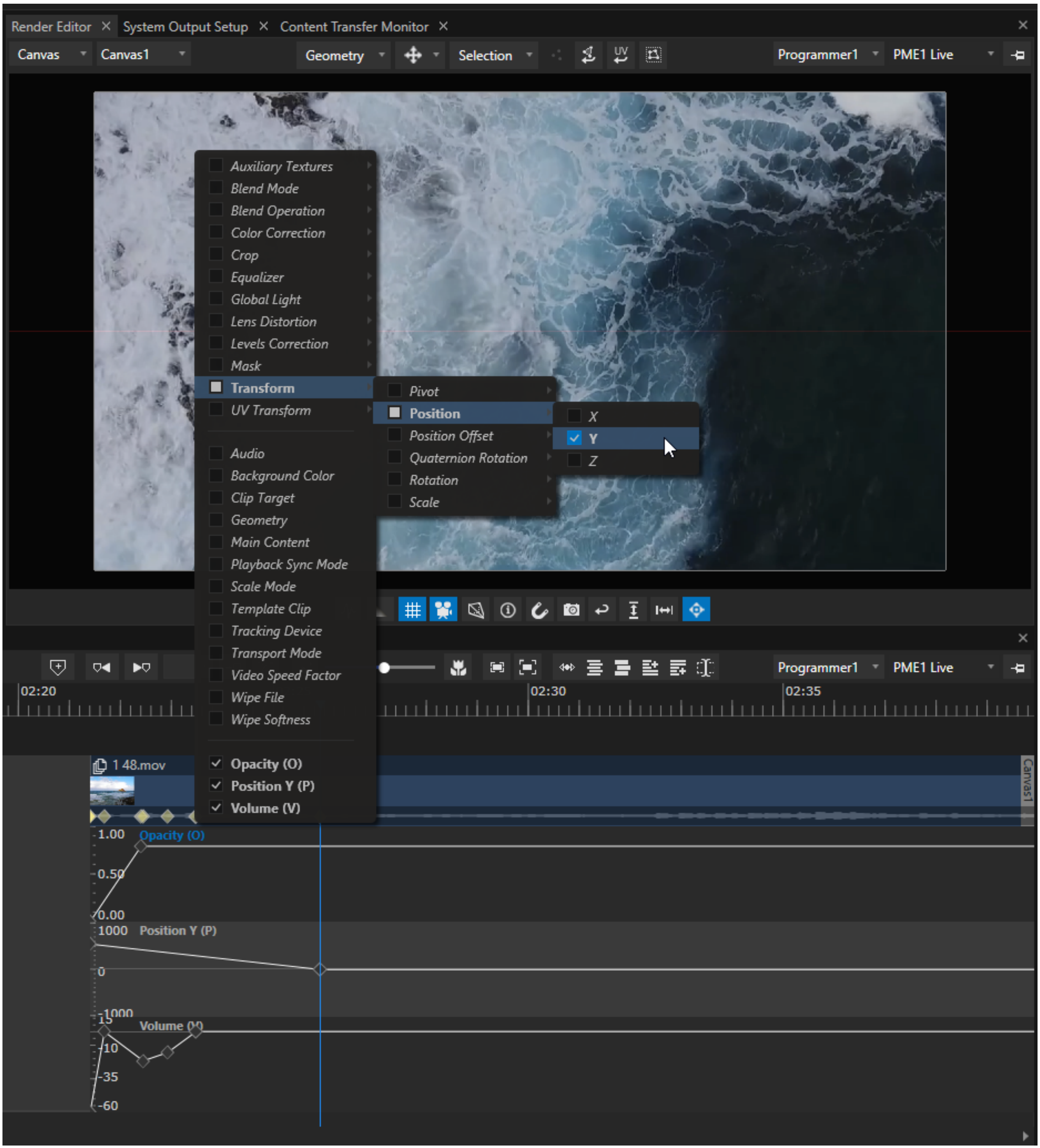
ACCESSING THE **KEYFRAME EDITOR** OF A **CLIP CONTAINER:**

- Double-click on a clip container to show/ hide its keyframe editor. It will appear below the clip container.
- The default property displayed in the new editor is *Opacity (O).*



Click on this property to access a context menu with any other properties to choose from. Here you can filter the data displayed.

- CTRL+ click on the property name for a multiple selection. All selected properties will be shown in their own editor lanes.



The property name of the keyframe lane you're currently working in is always highlighted blue.

- Double-click next to the property name or anywhere in the lane to expand/ collapse the keyframe editor. You can also do this from the context menu (right-click).

ADDING KEYFRAMES is easy:

- Just **press K in a property's editor lane** and a keyframe will be added at the playhead's position.

or

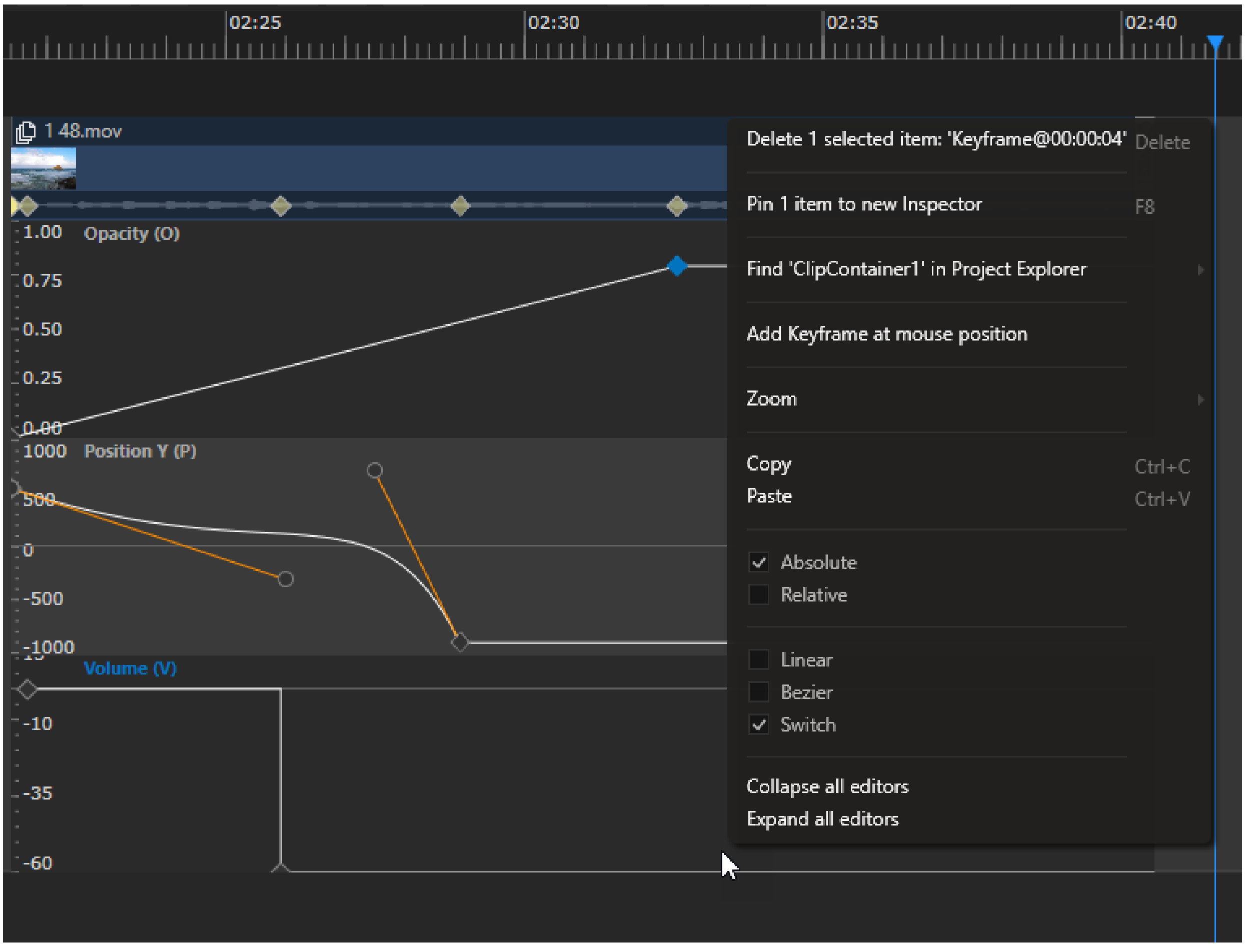
- **CTRL-click in the lane on the position** where you want to add the keyframe. Is the **editor lane expanded**, you can even add the keyframe with its **desired parameter value**.

- Depending on your choice of *Add First Keyframe Mode* in the Sequence Settings, a keyframe will be generated at the beginning of your ClipContainer and the values between Keyframes will be interpolated.

- **Navigate** between keyframes with the shortcut Shift + right or left ARROW KEY.
- Double-click on a keyframe to **directly edit the keyframe's parameter value**. A small value window pops up next to the keyframe.
- **Zoom in and out on vertical axis** of the keyframe editor by holding down CTRL and using your mouse wheel.
- **Select one or more keyframes to copy / paste them**. They will be inserted at playhead position. This also works for pasting keyframes from one to another clip container.

ⓘ In *value mode,* after first keyframe has been set for a clip container, every value change in the inspector will automatically generate a new keyframe for the current property at the playhead's position. This can be done while playback is running and is a powerful tool to program animations and property changes on the fly.

Curve Types



There are **three types of curves** that interpolate the values between keyframes:

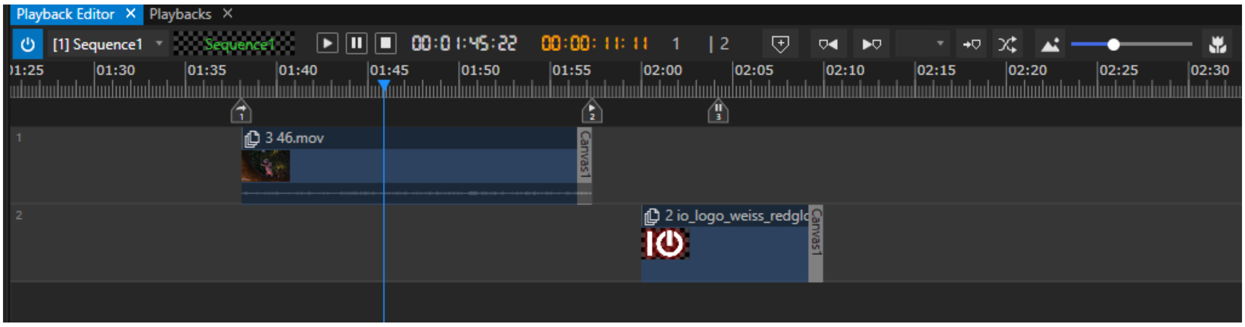
- **Linear** - just a straight line
- **Bezier** - a curve that can be shaped by two control points
- **Switch** - just binary on/ off behavior

You can set these types either in the inspector or in the context menu (right-click on a keyframe).

4.5.7 Cue

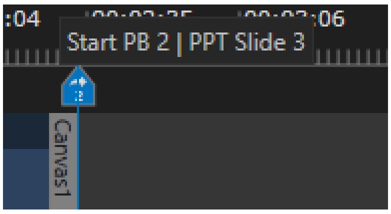
- **control and program your sequence** with the help of cues in the playback editor.
- a cue can be set to different **modes of functionality: continue, jump, pause or wait.**
- use **script commands** to program a more complex logic for a cue.

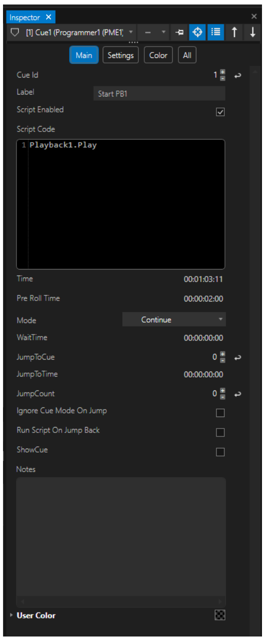
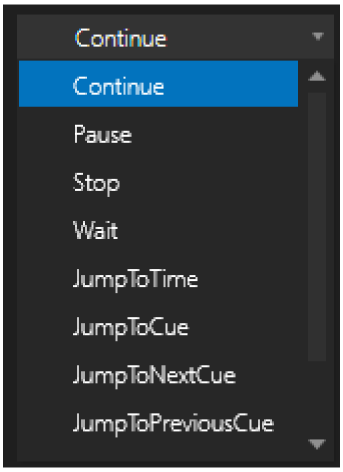
User Interface



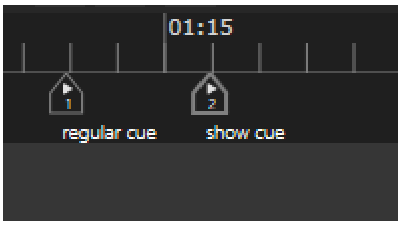
- **Create a cue at the playheads position** with the **button** in the playback editor or use **"Add" from the Context Menu** (open with a right-click in the playback editor).
- The **orange timecode** displays the **remaining time until the next cue.**
- **Navigate through cues** with the help of the buttons in the top bar of the playback editor.
- Select a cue and set its **mode or other settings in the inspector.**

Settings

	Cue ID	**ID of a Cue.** Essential identifier for a cue. Must have a unique number for each sequence and appears on each cue in the playback editor.
	Label	Label your cue with text. This label also is shown as tooltip in playback editor when run over with your mouse cursor. 
	Script Enabled	Default: Enabled Uncheck to disable script execution for this cue.

 Inspector [1] Cue1 (Programmer1 (PME1) Main Settings Color All Cue Id 1 Label Start PB1 Script Enabled ☑ Script Code 1 Playback1.Play Time 00:01:03:11 Pre Roll Time 00:00:02:00 Mode Continue WaitTime 00:00:00:00 JumpToCue 0 JumpToTime 00:00:00:00 JumpCount 0 Ignore Cue Mode On Jump □ Run Script On Jump Back □ ShowCue □ Notes User Color	**ScriptCode**	**Enter script commands that will be executed when the cue is reached.** Click into the script terminal and use the shortcut" CTRL + Space" to show all available commands.
	Time	Position of the cue in the timeline.
	PreRoll Time	When in jump mode, you can set the time of pre-load for the next cue.
	Mode	**Sets mode and behavior of a Cue**  Continue Continue Pause Stop Wait JumpToTime JumpToCue JumpToNextCue JumpToPreviousCue **Default Setting**: Continue continuous playback when cue is reached by playhead. Options: **Pause:** pauses playback when cue is reached by playhead. **Stop:** stops playback when cue is reached by playhead. **Wait:** Playback will wait at the cue for a time that is defined as **WaitTime.** The wait time is displayed in the playback editor counter in red color.

		When jumping back in time, **Wait Time** cannot be processed. Instead, enable **Run Script On Jump Back** and use a script in the Jump Cue; e.g.: *Playback1.Pause* *wait 2* *Playback1.Play* **JumpToTime:** Jumps to a defined time when cue is reached by playhead. This time has to be defined in the **JumpToTime** property. By default this time is 00:00:00:00. **JumpToNextCue:** Jumps to next cue in the timeline. **JumpToPreviousCue**: Jumps to previous cue in the timeline. **Playback Once:** overrides the current Playback Mode setting it to *Once* **Playback Loop**: overrides the current Playback Mode setting it to *Loop*
	WaitTime	Time that the playback waits when cue mode is set to **Wait.**
	JumpToCue	Set the cue ID of the target cue - the cue you want to jump to.
	JumpToTime	Defines the jump's target time when cue mode is set to **JumpToTime**.
	JumpCount	Parameter for modes **JumpToCue** and **JumpToTime.** You can set the number of times your jump command needs to be executed. After the number is reached, the playback continues from the cues position and the jump is no longer executed. The default setting is zero and means the jump will proceed indefinitely.
	Ignore Cue Mode On Jump	Resets the cue mode to CONTINUE when jumped to.

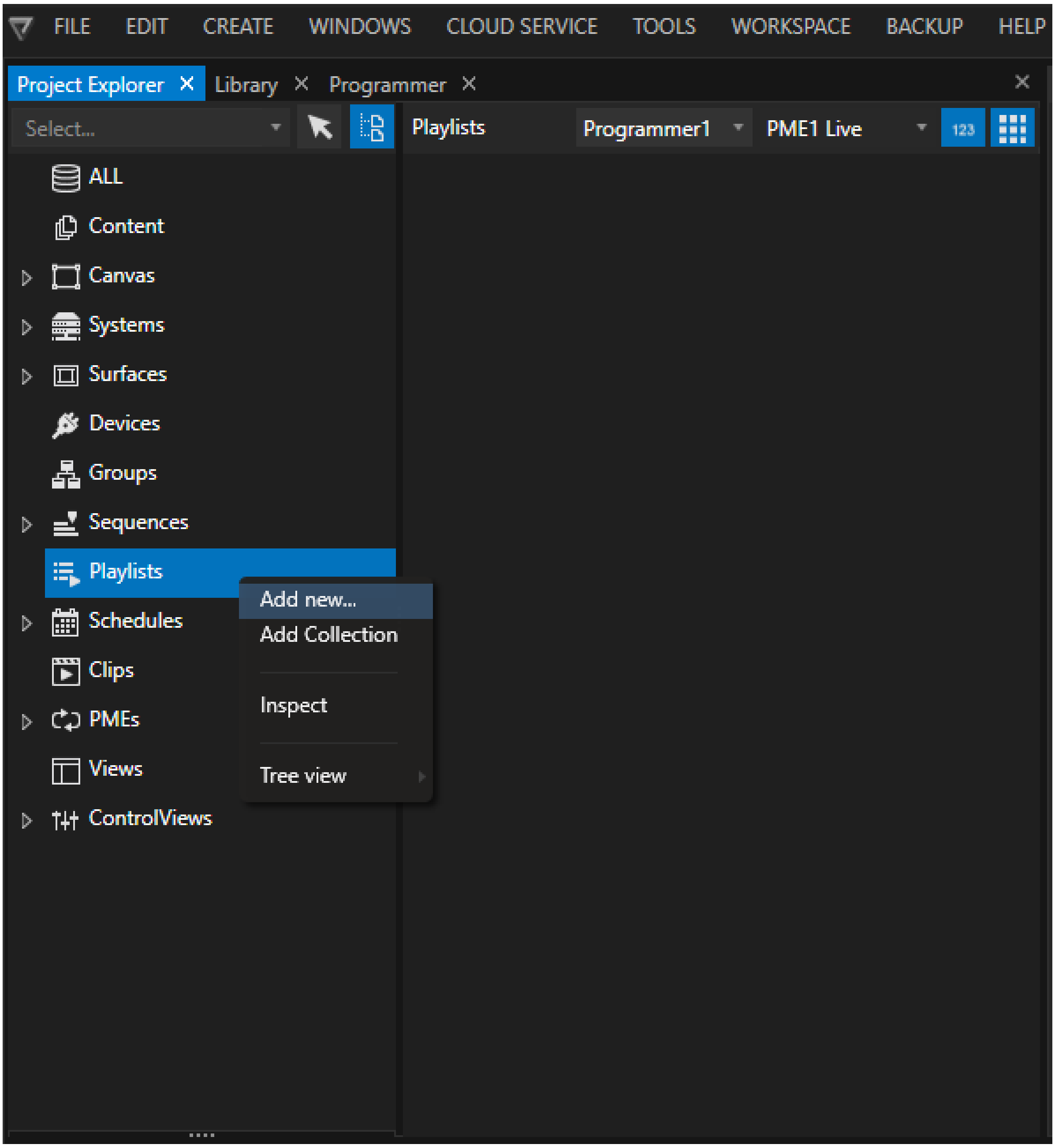
	Run Script On Jump Back	Executes the cue's script after completing a jump to a previous point in the timeline.
	ShowCue	When enabled, this setting turns the regular cue into a show cue. Show cues work just like regular cues but have additional function of marking distinctive points in your show with increased visibility for a non operating party such as customers, directors, producers, et al.  show cues have a slightly bolder appearance than regular cues

Changing the sequence's FPS may shift pre-existing cues!
All Cues that exist before changing the frame rate of a sequence will be shifted to the next frame according to the new grid.
Depending on your changes, this recalculation may cause a minimal shift in cues - please inspect all your cue times after changing the frame rate.

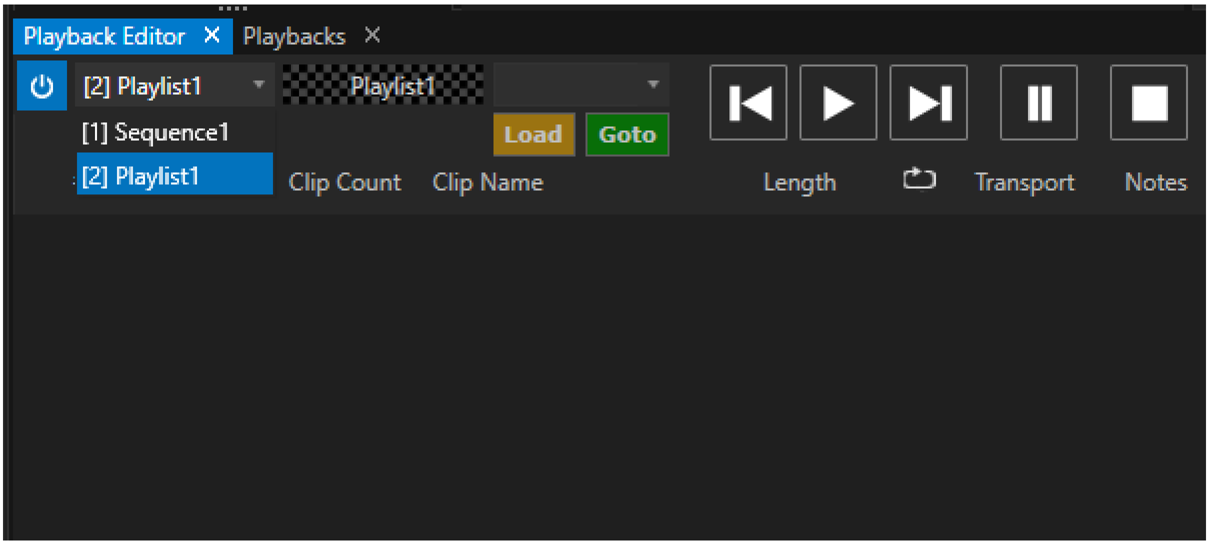
4.5.8 Playlist

- A Playlist is a **list based Playback Provider** that is **hosted into a Playback**
- A Playlist **contains a list of Clips**, **sorted on different Tracks** into a list.
- Compared to a sequence, the **Cue number** of a Playlist is the **same as the Track number**
- A Playlist has a **default Canvas**, but every Clip could be assigned to a different Canvas or even output

Create a Playlist



- On Startup, VERTEX creates a timeline based Sequence for you.
- To create a new Playlist, just navigate to the Playback section into Project Explorer, open context menu by a right click and select "Add New"
- Or just use "Create"in the main menu on the top bar
- Go to the Playback Editor and switch to the new Playback "Playlist 1"



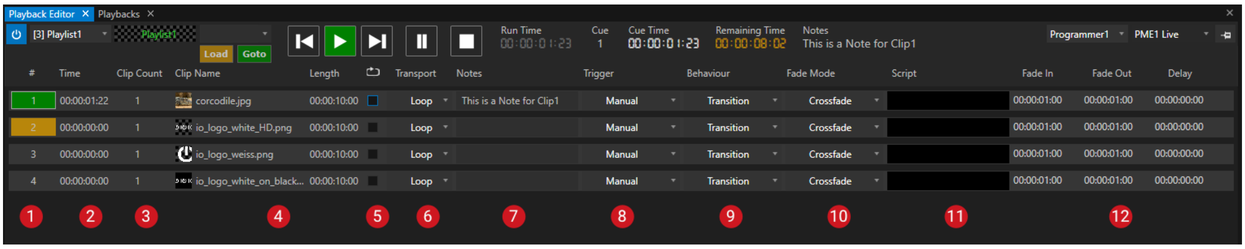
User Interface and Workflow

The Playlist in VERTEX is **ready for a quick start with its default settings**.
For special needs, **different options and settings** gives you a **powerful and flexible way to handle also more complex tasks** with a Playlist.

- Drag Content from Project Explorer to the Playback Editor. For each Content item a new Playlist Track is created

Sequence as Playlist Track
It is also possible to drag a whole Sequence as Content into a Playlist.

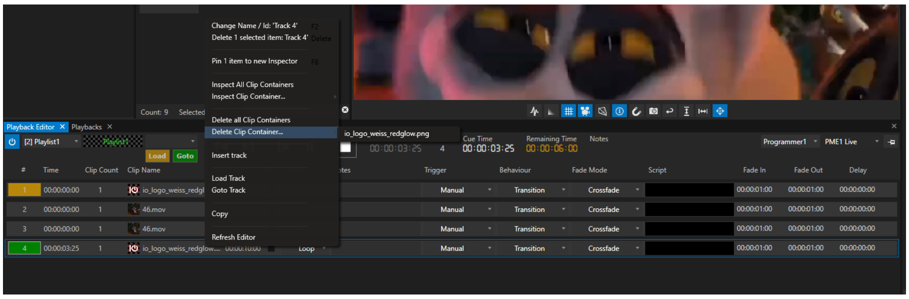
- To change the track order:
  - Select one or multiple Tracks, hold the left mouse button and drag it to a new position
  - Select a track, go to Inspector and change "Cue Id"



Run Time 00:00:01:23
Cue 1
Cue Time 00:00:01:23
Remaining Time 00:00:08:02
Notes This is a Note for Clip1

#	Time	Clip Count	Clip Name	Length		Transport	Notes	Trigger	Behaviour	Fade Mode	Script	Fade In	Fade Out	Delay
1	00:00:01:22	1	corcodile.jpg	00:00:10:00	□	Loop	This is a Note for Clip1	Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
2	00:00:00:00	1	io_logo_white_HD.png	00:00:10:00	■	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
3	00:00:00:00	1	io_logo_weiss.png	00:00:10:00	■	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
4	00:00:00:00	1	io_logo_white_on_black...	00:00:10:00	■	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00

1	**Playlist Cue Number**	Shows the Cue/Track number **Status colors** Yellow: Clip is preloaded into cache Green: Currently Playing
2	**Playback Time**	Shows the playback time of the Clip/of the Clips that is/are currently playing
3	**Clip Count**	**Shows the amount of Clips on a Track** **Default**: only 1 - when Track Clip Mode of a Playlist is set to Single Clip default setting) **Option:** If you want to work with more than one Clip on a Track, set Track Clip Mode of a Playlist to Multi Clip. The Clip number shows you the number of Clips on a Track
4	**Clip Name Clip Length**	Shows Clip Name, and thumbnail of the first Clip of a Cue Shows Clip length of the first Clip of a Cue **Inspect Clips with the help of the context menu. Right-click with your mouse on Track.** Choose "Inspect Clip Container..." to select one of the Clips into Inspector

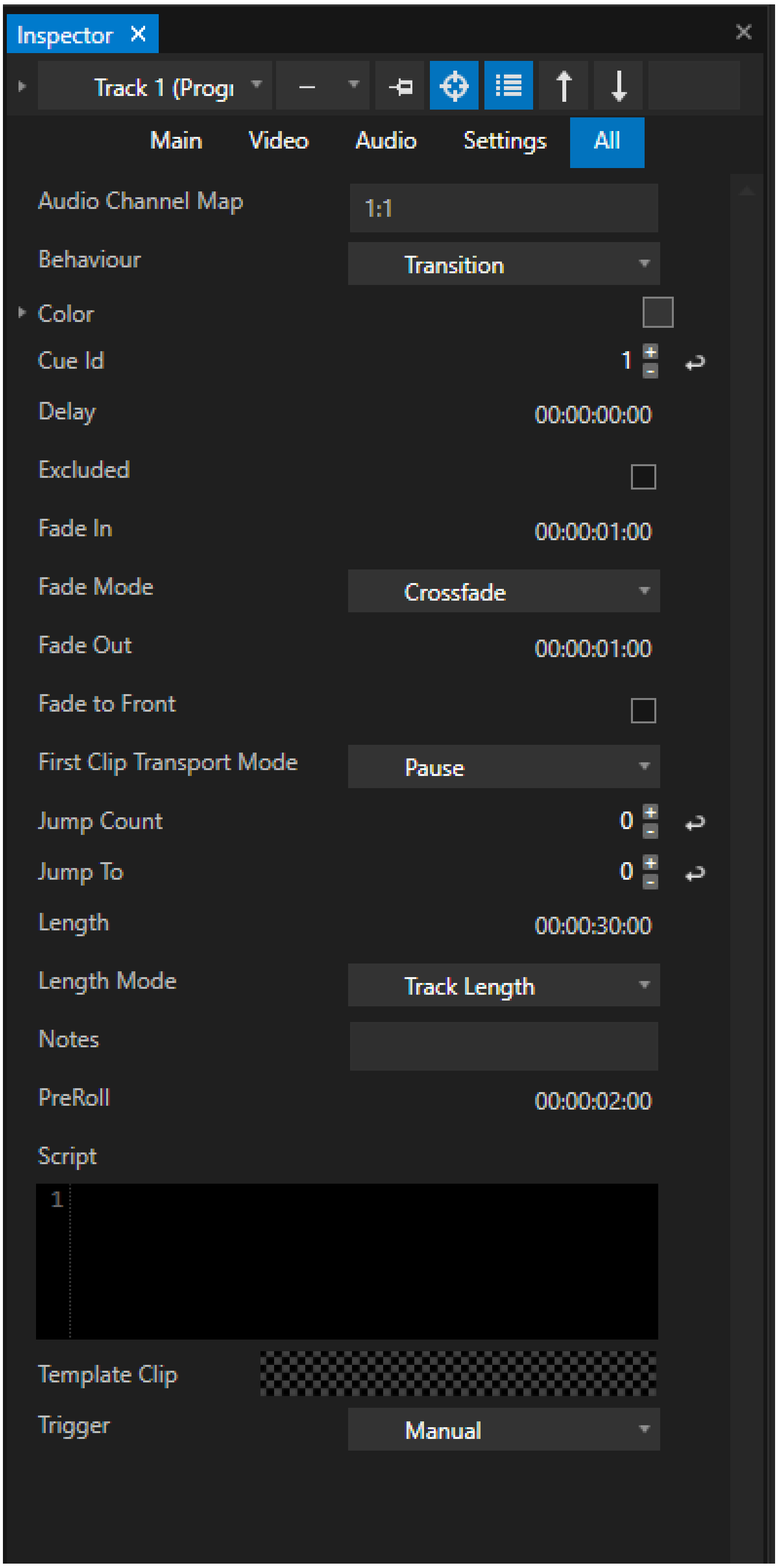
		Choose "Delete Clip Container..." to remove one of the Clips  Change Name / Id: 'Track 4' F2 Delete 1 selected item: Track 4' Delete Pin 1 item to new Inspector F8 Inspect All Clip Containers Inspect Clip Container... Delete all Clip Containers Delete Clip Container... io_logo_weiss_redglow.png Insert track Load Track Goto Track Copy Refresh Editor Count: 9 Selected Playback Editor Playbacks [2] Playlist1 Playlist1 Load Goto Cue Time 00:00:03:25 Remaining Time 00:00:06:00 Notes Programmer1 PME1 Live # Time Clip Count Clip Name Trigger Behaviour Fade Mode Script Fade In Fade Out Delay 1 00:00:00:00 1 io_logo_weiss_redgl Manual Transition Crossfade 00:00:01:00 00:00:01:00 00:00:00:00 2 00:00:00:00 1 46.mov Manual Transition Crossfade 00:00:01:00 00:00:01:00 00:00:00:00 3 00:00:00:00 1 46.mov Manual Transition Crossfade 00:00:01:00 00:00:01:00 00:00:00:00 4 00:00:03:25 1 io_logo_weiss_redglow.... 00:00:10:00 Loop Manual Transition Crossfade 00:00:01:00 00:00:01:00 00:00:00:00
5	**Freerun**	Sets Freerun on/off for a video Clip Default: off When set to off, the Clip Playback is synced to the System Clock
6	**Transport Mode**	Sets Transport Mode for a Clip. relevant when Track lenght of a Playlist Cue is longer than the lenght of the video clip or if Freerun is enabled **Options:** Loop (default) - Loops Video Content is Track lenght of a Playlist Cue is longer than the lenghts of the video clip Pause: Just pauses the Clip Once: Just play once
7	**Notes**	Add a Note.
8	**Trigger**	Sets method how this Cue will be started /triggered **Follow (Default):** Follows the previous Cue. Cue is triggered after previous Cue is finished **Manual** Manuel trigger is necessary to start the Cue. Cue will not automatically starts after previous Cue is finished A manual trigger could be the Play Button or even a Script Command **With Previous** Cue will be triggered with previous Cue. When previous Cue is started and played, Playback for this Cue also will start.

9	**Behaviour**	Defines the Cue behaviour at its end. **Transition (default)** Transition is done between this Cue and the next upcoming Cue. Both Cues are loaded into cache and running in parallel during transition time **Release** Releases this Cue when next Cue is started. Contrary to "Transition" both Cues are not loaded and running in parallel for the transition time. Use e.g. for systems with less performance **Hold** Hold the Content form this Cue also when next Cue already is started
10	**Fade Mode**	Defines the type of transition to the next Cue **Crossfade (default)** Crossfade is processed between Cues **No Fade** No Fade between Cues **Fade In/Out** Fade in and/or fade out is processed between cues. Timing could be set separately for in and out into Time Settings
11	**Script**	Enter a Script Command that should be executed when Cue starts
12	**Time settings for Fade and Start**	**Fade In** Sets duration for a fade in. Is used when behaviour was set to transition **Fade Out** Sets duration for a fade out. Is used when behaviour was set to transition **Delay** Sets a Delay for Start

Settings

For a Track

Select a Playlist Track to focus it into the Inspector and adjust its settings from there.



Audio Channel Map: 1:1

Behaviour: Transition

Color: □

Cue Id: 1

Delay: 00:00:00:00

Excluded: □

Fade In: 00:00:01:00

Fade Mode: Crossfade

Fade Out: 00:00:01:00

Fade to Front: □

First Clip Transport Mode: Pause

Jump Count: 0

Jump To: 0

Length: 00:00:30:00

Length Mode: Track Length

Notes:

PreRoll: 00:00:02:00

Script:

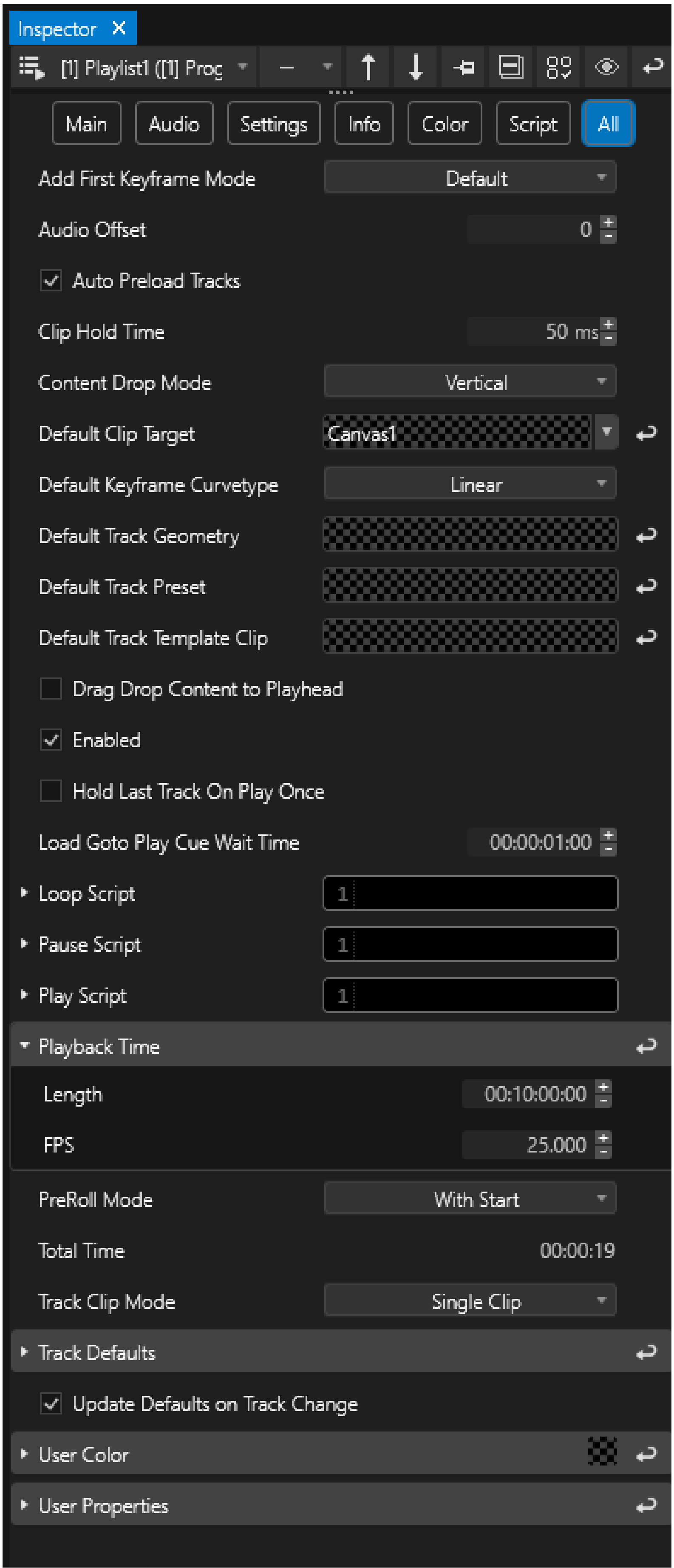
Template Clip:

Trigger: Manual

> Please keep in mind that there is a **difference between this Track settings** with behaviour and transitions **and the settings for a Clip into this Track**
> **To select a Clip into Inspector** and do settings like position in Canvas, corrections, etc, right-click on an Playlist entry, open the context menu and click to "Inspect Clip Containers...."

For a Playlist

Similar to a Sequence, there are also some **settings for a Playlist**.
Select a Playlist into Project Explorer and change the settings into the **Inspector**



Inspector

[1] Playlist1 ([1] Prog

Main | Audio | Settings | Info | Color | Script | All

Add First Keyframe Mode: Default

Audio Offset: 0

☑ Auto Preload Tracks

Clip Hold Time: 50 ms

Content Drop Mode: Vertical

Default Clip Target: Canvas1

Default Keyframe Curvetype: Linear

Default Track Geometry

Default Track Preset

Default Track Template Clip

□ Drag Drop Content to Playhead

☑ Enabled

□ Hold Last Track On Play Once

Load Goto Play Cue Wait Time: 00:00:01:00

Loop Script: 1

Pause Script: 1

Play Script: 1

Playback Time

Length: 00:10:00:00

FPS: 25.000

PreRoll Mode: With Start

Total Time: 00:00:19

Track Clip Mode: Single Clip

Track Defaults

☑ Update Defaults on Track Change

User Color

User Properties

Default Canvas

Defines the default Canvas that is assigned to each Clip.
Drag with your mouse a Canvas from Project Explorer to this property field to change.

Audio Offset

Set an Audio offset for the Playback of the whole Playlist.
Values are in milliseconds.
Enter a negative value to play Audio earlier than video
Enter a positive value to delay Audio from video

Length and FPS

Changing FPS will affect the displayed Timecode for a Playlist.
Length will affect the length of the Playlist as Playback provider

Global Position Offset and Global Position Scale (Advanced Inspector Mode)

Sets a Global Offset for Position for all Content into a Playlist
or
Scales all Content into a Playlist globally

Track Clip Mode

Single Clip (default)
A Track/cue of a Playlist can host only 1 Clip

Multi Clip
A Track/cue of a Playlist can host multiple Clips.
Read Subchapter "Multi Clip Mode" for more information

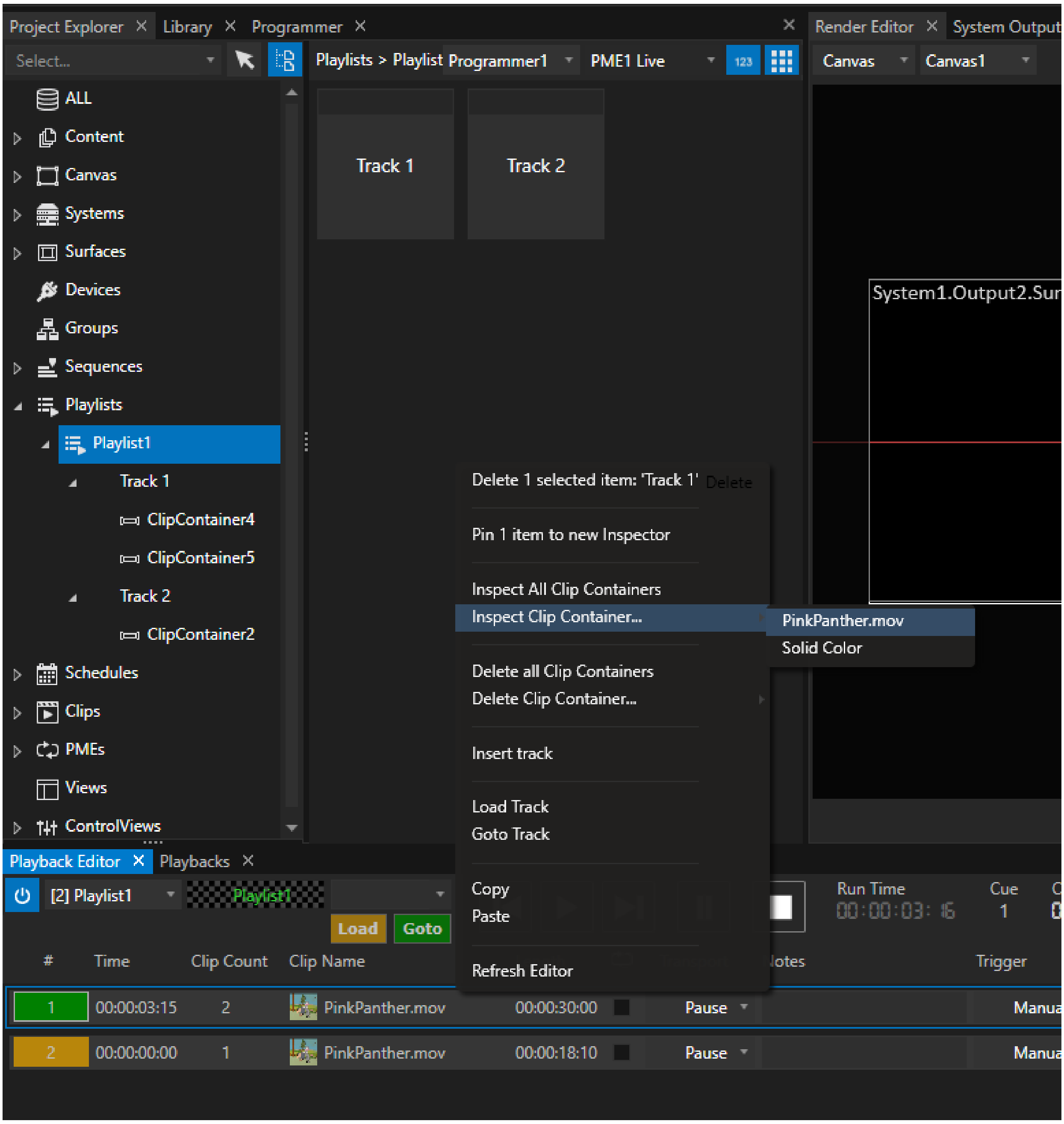
Track Defaults

Set up default values and settings that are valid for every new Playlist entry you will create
Read more about this setting in the subchapter above

Caution when using a Playlist with just 2 Tracks in *Follow* mode:
The default **Pre-Roll Mode** (*With Start*) in the Playlist settings might interfere with the transition between tracks.
Please set it to *Before End* so that the following clip will not be pre-loaded during the crossfade, if you are arranging a Playlist with only two Tracks.

Multi Clip Mode

- In "**Multi Clip**" Mode , VERTEX is able to host a **number of Clips on the same Playlist Track**
- With this feature you are allowed to handle more complex scenarios within a Playlist:
  e.g. to play multiple Clips on different Canvases with one single Playlist Cue.
- To use this feature, **you first have to change the Track Clip Mode of a Playlist**. By default, this mode is set to Single



#	Time	Clip Count	Clip Name				Notes	Trigger
1	00:00:03:15	2	PinkPanther.mov	00:00:30:00	■	Pause		Manua
2	00:00:00:00	1	PinkPanther.mov	00:00:18:10	■	Pause		Manua

Working in Multi Clip Mode

- Create a Clip by **first dragging just 1 content item** from Project Explorer into the Playback Editor
- Then, **drag one or more Content Items** from Project Explorer **to the same Track**: the Clip Count of this Track increases
- Also in Project Explorer all Clips now are listed **as subordinate elements of a Track**

- **Inspect a Clip Container** with **help of the Context Menu**: Right-Click on a Track to open a list of Clip Containers or to Inspect All
- **Delete a Clip Container** with help of the Context Menu: Right-Click on a Track to open a list of Clip Containers or to Delete All

4.5.9 Shotbox

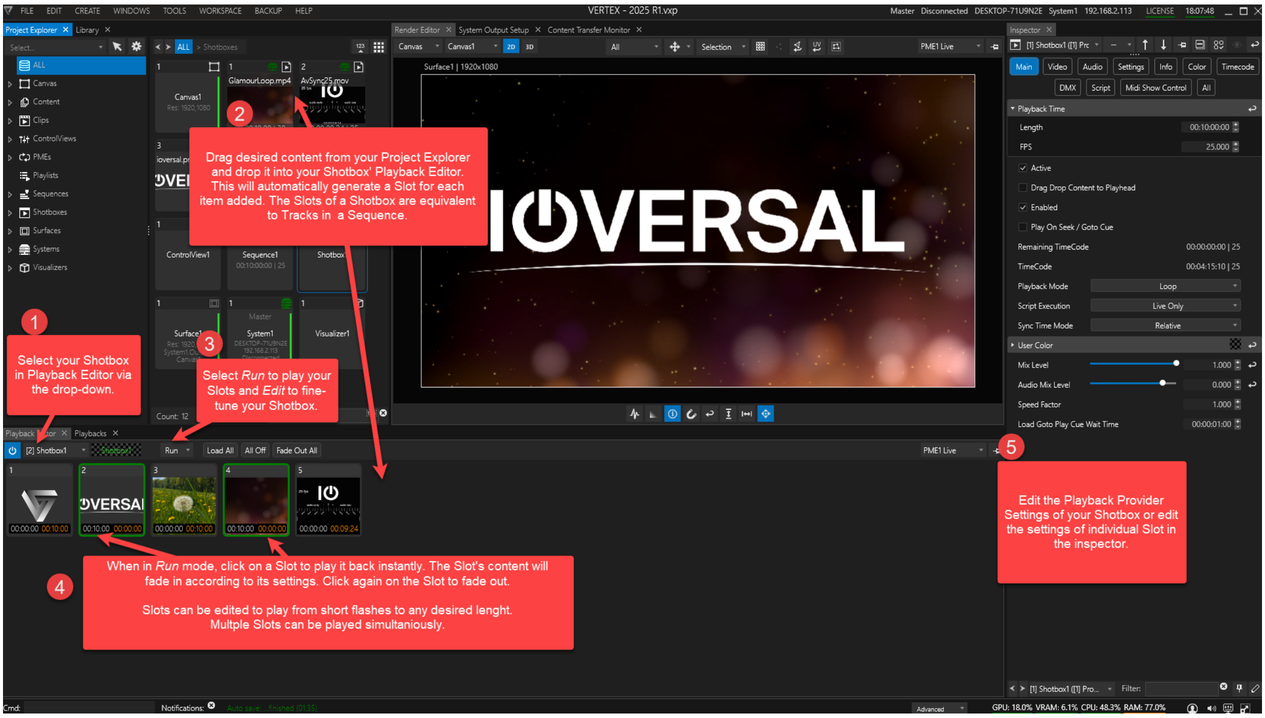
- A *Shotbox* is **the third form of Playback Provider** next to *Sequence* and *Playlist*
- ...and the **quickest way to cast content** onto your output screens
- ... **with just one drag and one click.**

Imagine a *Playback Provider* that is neither *Sequence* nor *Playlist* but more so resembles a sampling pad or a StreamDeck, where content is put in little boxes that play back the instant you tap on them.

Create A Shotbox

Go to MAIN MENU > CREATE > Shotbox

Playing A Shotbox



1 Select your Shotbox in Playback Editor via the drop-down.

2 Drag desired content from your Project Explorer and drop it into your Shotbox' Playback Editor. This will automatically generate a Slot for each item added. The Slots of a Shotbox are equivalent to Tracks in a Sequence.

3 Select *Run* to play your Slots and *Edit* to fine-tune your Shotbox.

4 When in *Run* mode, click on a Slot to play it back instantly. The Slot's content will fade in according to its settings. Click again on the Slot to fade out.

Slots can be edited to play from short flashes to any desired lenght. Multple Slots can be played simultaniously.

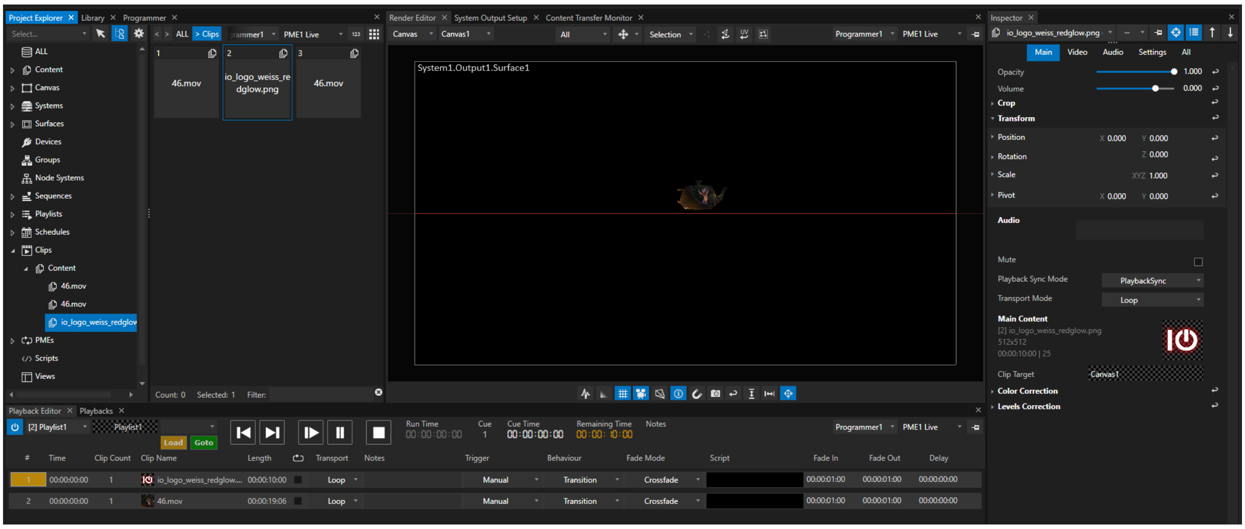
5 Edit the Playback Provider Settings of your Shotbox or edit the settings of individual Slot in the inspector.

A Shotbox can host any number of track-like Slots.
The Slot, in turn can host one or more ClipContainers.

The timely order in which Slots are triggered affects the sorting of your content on the Z-axis.
E.g. In order to display Slot4 in the background and Slot2 in the foreground, you need to trigger Slot4 first and then Slot2.

4.5.10 Clip

- Clips are created automatically when adding content item from Project Explorer to a Playlist or a Sequence
- All Clips are listed in the Clips Manager of the Project Explorer
- Clip Templates can be created from Clips and ClipContainers



Count: 0 Selected: 1 Filter:

Inspector: io_logo_weiss_redglow.png

Opacity 1.000
Volume 0.000
Crop
Transform
Position X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000
Pivot X 0.000 Y 0.000
Audio
Mute □
Playback Sync Mode PlaybackSync
Transport Mode Loop
Main Content
[2] io_logo_weiss_redglow.png
512x512
00:00:10:00 | 25
Clip Target Canvas1
Color Correction
Levels Correction

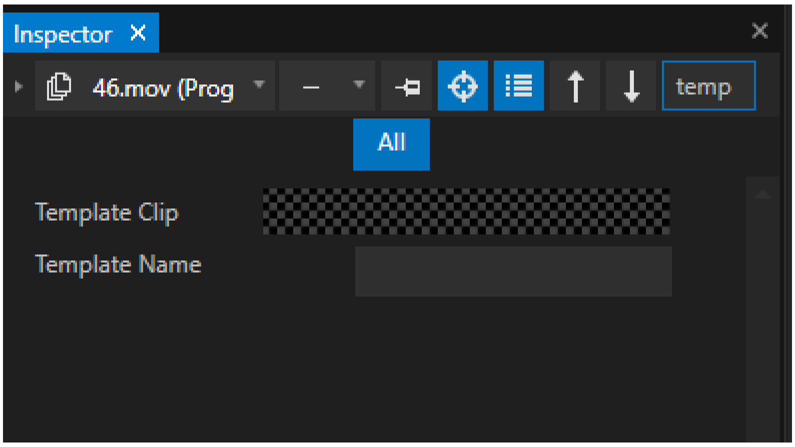
[2] Playlist1 Playlist1

Run Time 00:00:00:00 Cue 1 Cue Time 00:00:00:00 Remaining Time 00:00:10:00 Notes

#	Time	Clip Count	Clip Name	Length		Transport	Notes	Trigger	Behaviour	Fade Mode	Script	Fade In	Fade Out	Delay
1	00:00:00:00	1	io_logo_weiss_redglow....	00:00:10:00	■	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
2	00:00:00:00	1	46.mov	00:00:19:06	■	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00

Template Clip

- **Every Clip** can either be **a template for other Clips**
- A Clip which **has a template assigned will inherit the properties and keyframe animations** from the template clip



Template Clip

Template Name

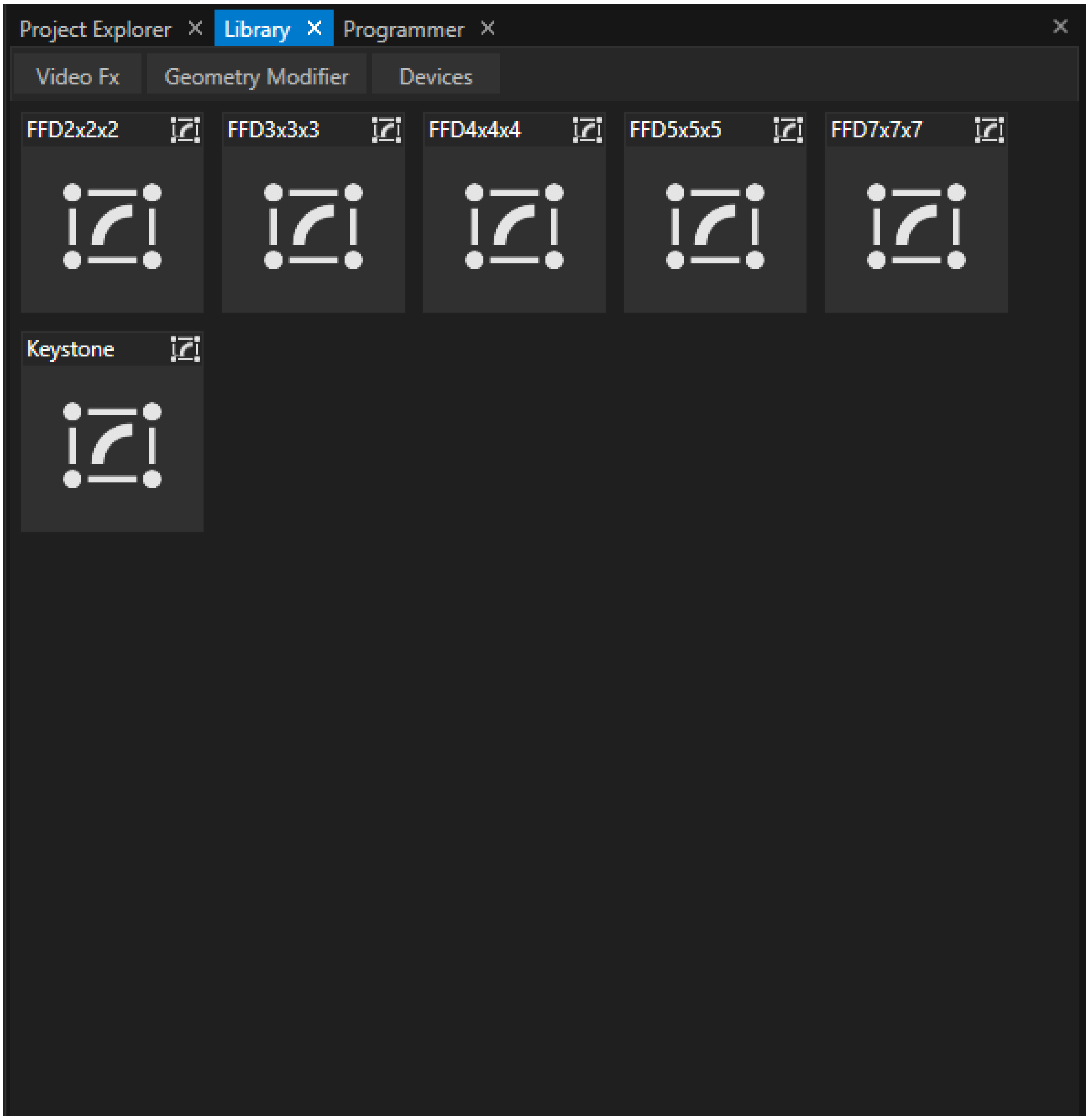
Template Clip:
Drag & Drop target onto which clips can be dragged from the “Clip“ tree in the project explorer.

Template Name:
To use a clip as a template, enter a name for the template into this field.

Template Clips for WatchFolders
WatchFolders gives you the option to automatically generate a Playlist or a Sequence based on Content files into a specified folder.
You have to define a Clip template first. Based on this template, your Playlists or Sequences will be generated

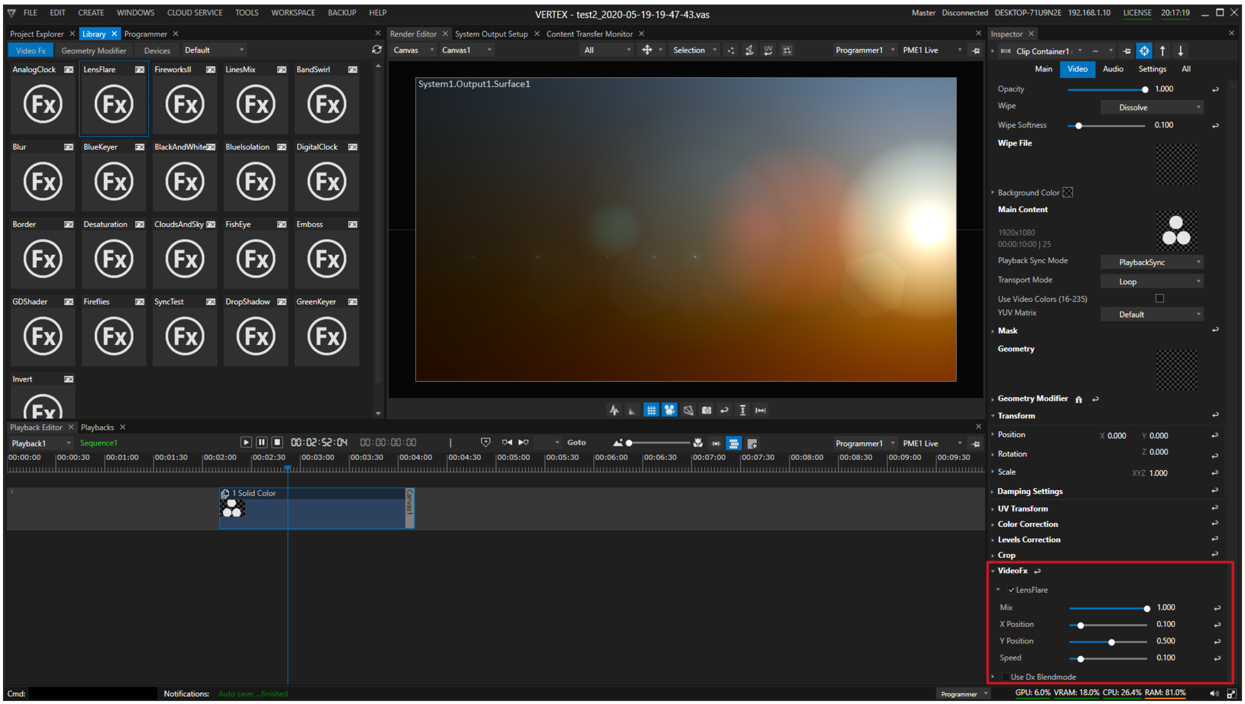
4.5.11 Geometry Modifiers

- Geometry Modifiers **help you to manipulate planes or 3D Objects**
- **FFDs (Free Form Deformers)** let you **easily** warp a video texture by **manipulating groups of vertices**
- **Go to Library >** ***Geometry Modifyer*** and drag an item either to a Clip Container or onto a Surface in the Render Editor.



4.5.12 Video FX

- VERTEX comes with **library of video effects** that are easily applied
- **Drag any Video FX** from the Library onto a Clip Container . The effect's settings can be adjusted in the Inspector.
- **Video FX can only be applied to a texture already in place**: the target of the video effect needs to be a clip container hosting either a video, an image or some generative pattern underneath the superimposed video effect. The texture of a *Surface* can also be used as a matte for video effects.
- **Multiple video effects** can be stacked and combined.



Opacity 1.000
Wipe Dissolve
Wipe Softness 0.100
Wipe File
Background Color
Main Content
1920x1080
00:00:10:00 | 25
Playback Sync Mode PlaybackSync
Transport Mode Loop
Use Video Colors (16-235) □
YUV Matrix Default
Mask
Geometry
Geometry Modifier
Transform
Position X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000
Damping Settings
UV Transform
Color Correction
Levels Correction
Crop
VideoFx
✓ LensFlare
Mix 1.000
X Position 0.100
Y Position 0.500
Speed 0.100
Use Dx Blendmode

Video FX "Lens Flare" draged on a Clip Containmer with a Solid Color. Settings for Video FX into Inspector are highlighted.

4.5.13 Audio

- VERTEX runs two audio engines in parallel: ***Preview Audio* for monitoring** and ***Live Audio* for playout**
- **Volume levels** can be set per **Clip Container/Clip** or for a whole **System**
- Various options enable you to **route audio channels, basic equalization, A/V offset** and more.

Preview and Live Audio

The main difference between **preview audio** and **live audio**:

Preview Audio

- Preview audio monitors all audio signals from all playback mixing engines - That includes all playbacks in PME live AND preview PMEs.
- Preview audio is played out from every system in your session.

Live Audio

- Live audio plays out only audio from playbacks that are running in PME Live.

- Live audio is played out by a defined audio system that can be set for a canvas and/or for a whole Vertex system.

By default live audio is set to the same system for all canvases. But it is possible to define individual audio systems per canvas.

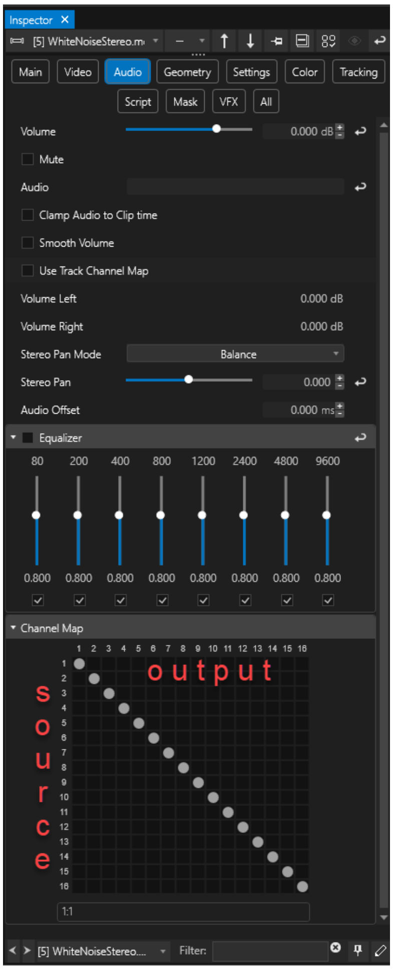
Default Configuration (System Audio Settings)

The system's built-in Windows Wave device to monitors Preview Audio*: Wave Audio Mode* is set to *Preview.*
Connect an ASIO interface for live audio playout: *ASIO Audio Mode* is set to *Live*.

For **more information about Audio Card /Audio Interface Settings** and
Audio properties and settings on Vertex System level, please also read the Audio Out and Audio Playback Chapters

Audio Settings for a Clip Container or a Clip

For a Clip Container in a Sequence or a **Clip in a Playlist** there are different options to **set or route Audio**.
To see all available audio settings for an item, select the **"Audio"-Tab in the inspector.**



Volume	Adjusts the volume level for the Clip Container
Mute	mutes the audio track
Audio	Target field for a secondary audio track. Whether your content has got embedded audio or not, this field is empty. **If you need to add audio** to a silent Clip or need to change the embedded audio track, **just drag & drop the audio content of your choice from Project Explorer onto this target field.**
Clamp Audio to Clip time	Cuts off audio at beginning and end of the Clip Container to avoid sound overlapping when using Audio Offset.
Smooth Volume	Adds a damping to sudden volume changes.
Use Track Channel Map	When enabled, the Clip Container's routing set in its Audio Channel Map is overridden by the channel routing defined in its hosting Track.
Volume Left / Right	Shows level meters in numerical form.
Stereo Pan Mode	**Balance** Mode attenuates L&R channels according to value/ slider, **Mix** Mode attenuates one channel while slightly boosting the other.
Stereo Pan	Slider and numerical value field to adjust L/R balance in stereo tracks.
Audio Offset	Offsets the audio track of a Clip Container/Clip to an earlier or later point in milliseconds: - negative values play audio earlier - positive values play audio later Ideal tool to fix minor synchronization issues!

	Equalizer	Enable the EQ by ticking the check box. The EQ holds eight bands. Its frequencies are located above the faders and can be altered by clicking on a number and typing in a new value. Faders boost or cut the frequency. Adjust the width (octave) in the numerical values below the faders.
	Channel Map	VERTEX's Audio Matrix enables you to route the audio channels of your source content to the output channels of your audio interface. By default the Audio Mapping is set to 1:1. For a video containing a stereo audio track this means: Channel 1 is routed to Channel 1 of the ASIO interface. Channel 2 is routed to Channel 2 of the ASIO interface. To customize your routing, either use the graphic matrix by dragging the dots in its coordinate system, or use the syntax field below: Enter e.g. 1@4 to route channel 1 of this clip container to output 4 of your audio output device. • Use comma separated values to enter multiple routings - eg 1@42@5 Use 1:1 to reset the default audio routing. A combination of 1:1 and individual routing is also possible - eg 11,2@5 Use 1-10>21 to shift the channel range from 1 to 21 Use #10 to set a new start output channel 10

Customize your routing:
To route channel 1 of your source to channel 7 in your output
and source channel 2 to output channel 8, the routing syntax is:

```
1@7,2@8
```

The **Syntax for an Audio Routing is**

```
AudioChannel#@OutputChannel#,AudioChannel#@OutputChannel#,AudioChannel#
@OutputChannel#
```

To **reset a routing**, just type in:

```
1:1
```

Use Track Channel Map

You also can create a **Channel Map f**or an entire Track of a Sequence.
Enable **"Use Track Channel Map"** in a Clip Container's settings and **it will use the routing of the hosting track's channel map.**
If this setting is disabled, the Clip Container's proprietary routing is executed.

Follow up Chapters for Audio

Configure Audio Outputs
Audio Playback

4.6 Content Types

- VERTEX encoding engine is **based on FFmpeg** - the most common an popular **video/audio codecs and file formats** are supported
- VERTEX offers you advanced options to **optimize Image Sequence Playback**
- Furthermore there are **many other content types** like HTML, Live Inputs or Generative Patterns
- There are **various options** how to import content including the **import of whole directories**

Import Content

- There are various ways for content import in VERTEX. Choose the way that fits best to your workflow and your project.
- You can also import whole folder structures directly into VERTEX. And for the import of Image Sequences there are additional settings.
- All options are summarized in the separate chapter Import Content
  There you will also learn some things about advanced settings for content import.
- Watchfolders are a tool to manage and automate content import

Types of Content

VERTEX supports a bunch of different content types. From videos, audio and images up to generative content like test pattern or even live inputs, if available on your hardware.

To get more information go ahead with the detailed-chapters below:

Basic Content

- Video
- Images
- Audio
- 3D Objects

Special or advanced content types

- Image Sequence
- Live Input like Cameras, Input Cards, NDI (a registered trademark of Vizrt NDI AB)

- Procedural Content like Testpatterns, Solid Colors or Gradients
- HTML-Content
- Text Content

File formats from 3rd- Party applications

- Powerpoint Files
- Adobe Photoshop- Files
- Notch Blocks

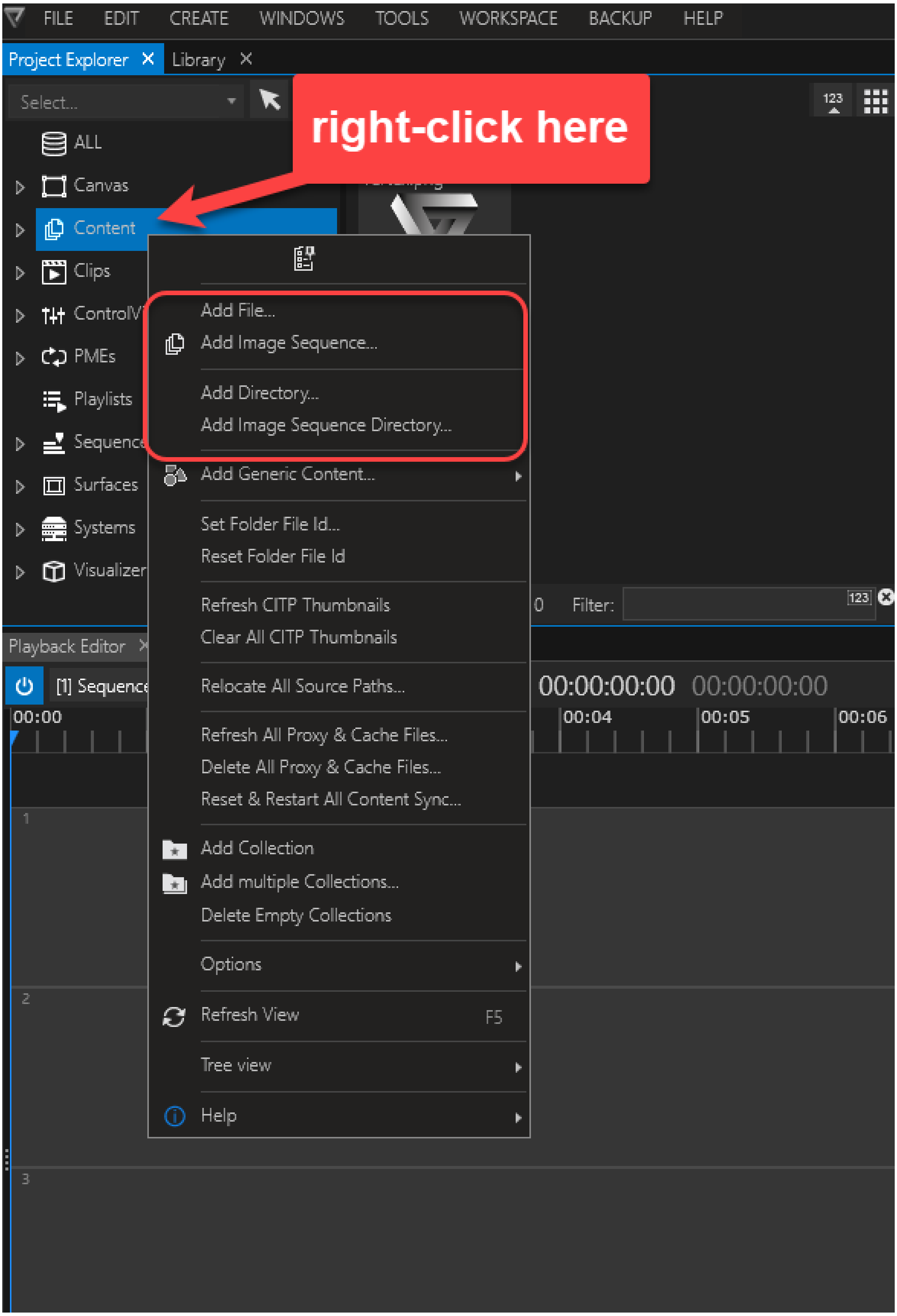
4.6.1 Import Content

- **Import content** into your VERTEX Project using either a shortcut, context menus or simply by drag & drop
- Import **one single file**, **multiple files** or **a whole directory** including all files and folder structures
- There is an an additional option to **import image sequences** or directories of image sequences

Various Import Workflows

1. Context Menu in Project Explorer

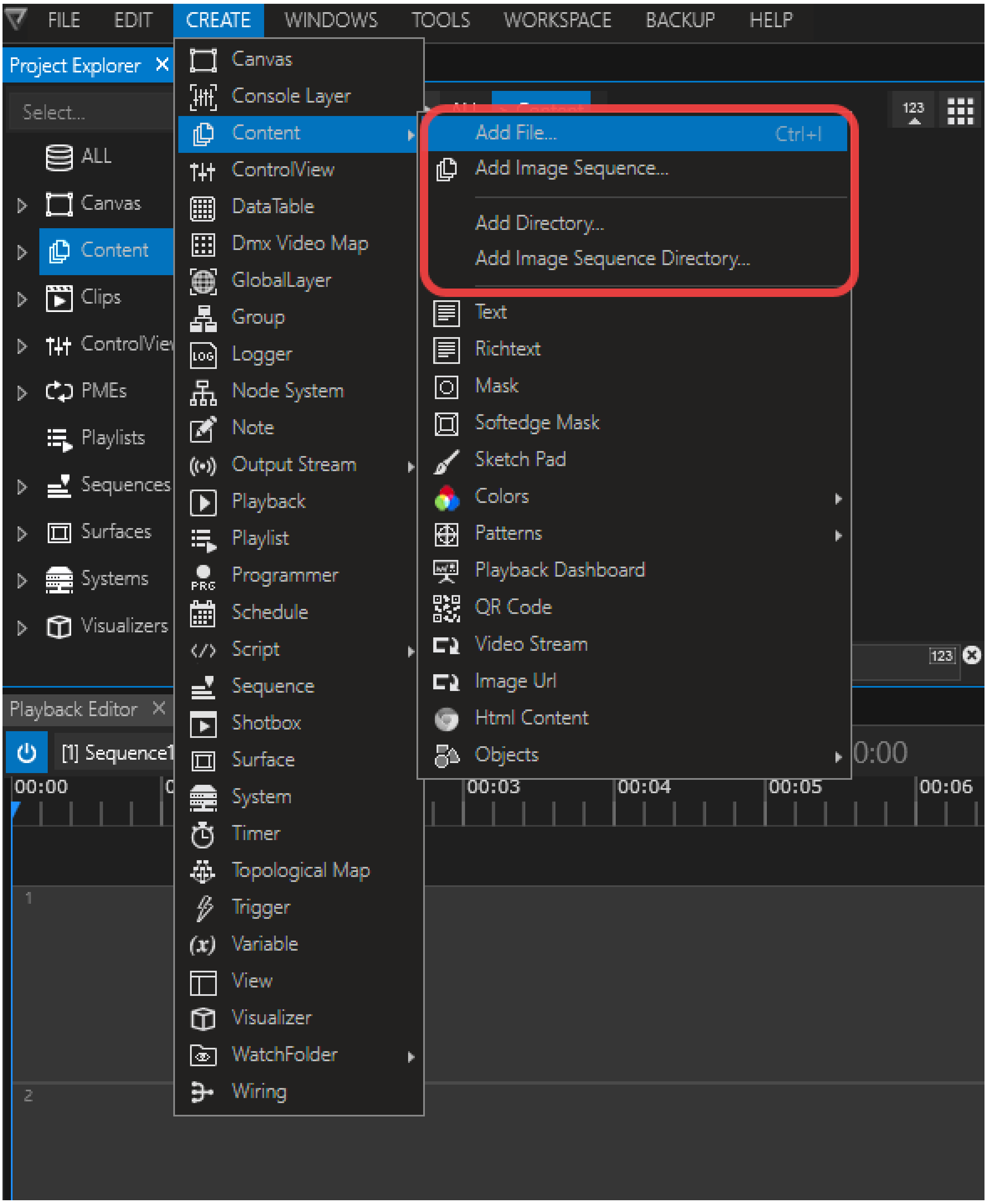
Right-click on the "Content" section in the Project Explorer and choose your import option from the context menu:



FILE EDIT CREATE WINDOWS TOOLS WORKSPACE BACKUP HELP
Project Explorer
Library
Select...
ALL
Canvas
Content
Clips
ControlV
PMEs
Playlists
Sequence
Surfaces
Systems
Visualizer
right-click here
Add File...
Add Image Sequence...
Add Directory...
Add Image Sequence Directory...
Add Generic Content...
Set Folder File Id...
Reset Folder File Id
Refresh CITP Thumbnails
Clear All CITP Thumbnails
Relocate All Source Paths...
Refresh All Proxy & Cache Files...
Delete All Proxy & Cache Files...
Reset & Restart All Content Sync...
Add Collection
Add multiple Collections...
Delete Empty Collections
Options
Refresh View F5
Tree view
Help
Filter:
Playback Editor
[1] Sequence
00:00:00:00 00:00:00:00
00:00 00:04 00:05 00:06
1
2
3

2. Main Menu: "Create"

Go to *Main Menu > CREATE > Content...* and select your import option:

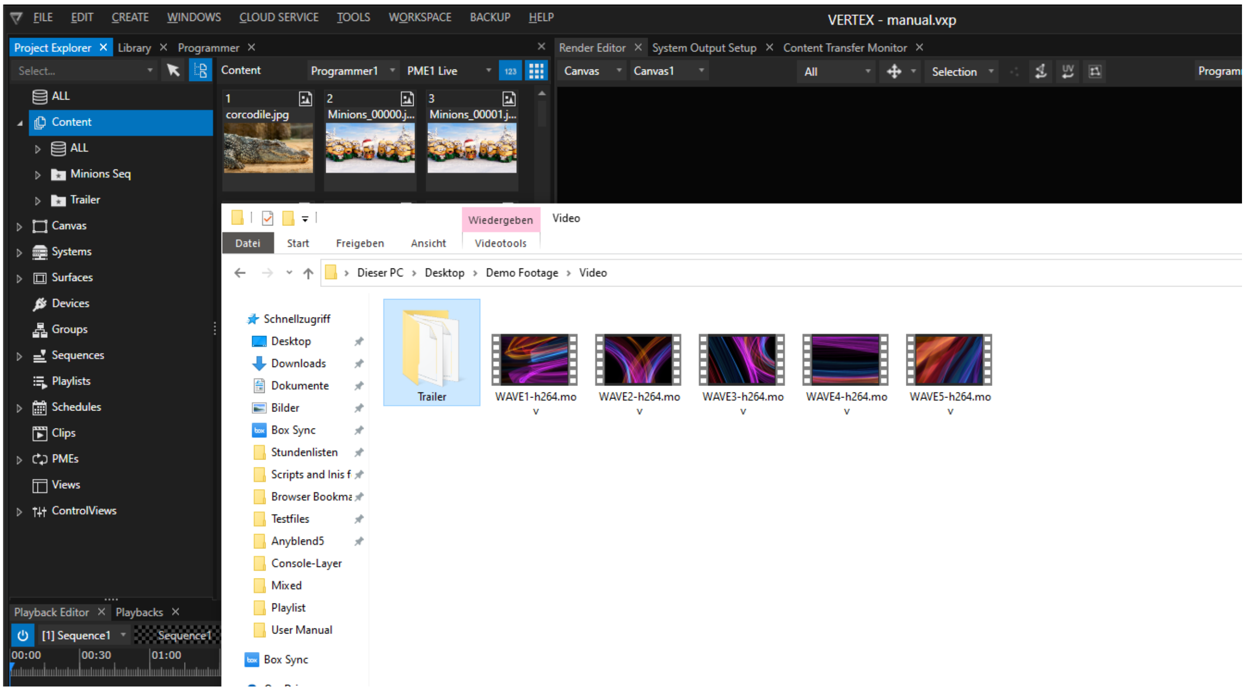


3. Shortcut CTRL+I

Focus the Project Explorer and press CTRL+I.
This will open the import dialog from Windows Explorer.

4. Drag and drop from Windows Explorer to Project Explorer

Users can also add content simply via drag & drop from Windows Explorer either to VERTEX Project Explorer or directly to your sequence timeline.
This also works for folders without a subfolder.



Import Options: Directory or File(s)

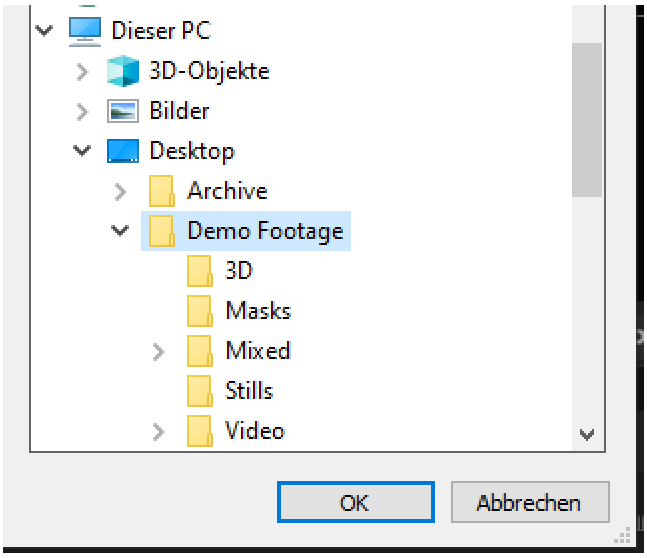
Choose whether you want to import a single file, several files or a folder structure.

Import one file or several files

- Select "Import File"
- The Windows Explorer opens
- Select one or multiple files from the same directory

Import Directory

- Select "Import Directory"
- Windows Explorer with a directory tree opens



- Choose a directory
- The directory will be imported including subfolders and their content
- Subfolders will be added as collections using the same folder structure

Import Image Sequence

The command to import an Image Sequence is available via the Project Explorer's context menu or the Main Menu. Learn more about your options for Image Sequences here: Image Sequence

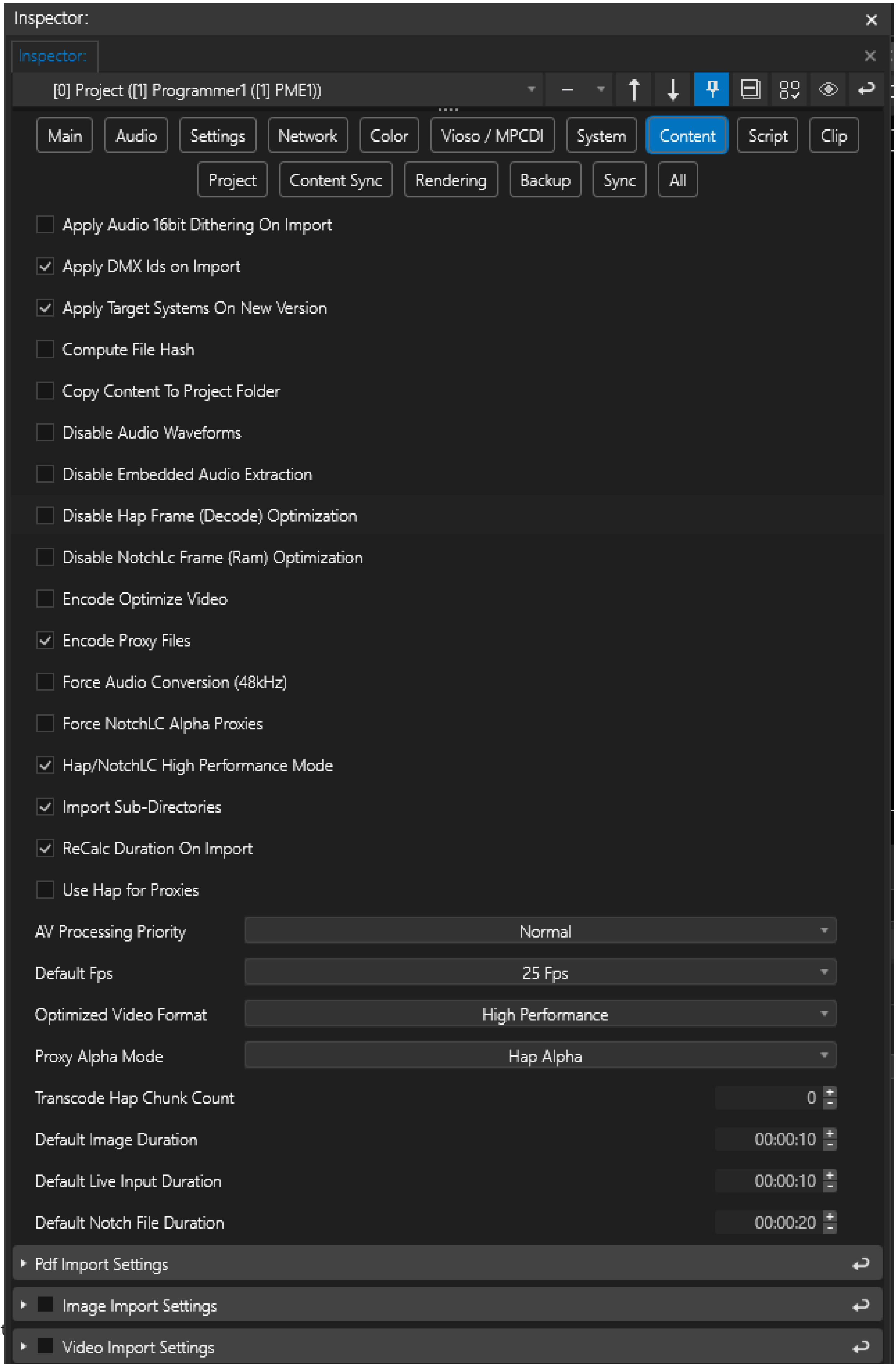
Settings

There are two places where users can customize VERTEX' import behavior:

Project Settings

Access the settings that affect content import via the tabs **Content, Audio and Content Sync**

- globally define details of file import
- switch Proxy file encoding on/off
- special options for codecs (NotchLC and HAP)
- Audio (Disable embedded Audio extraction, disable audio waveforms in content tiles, force audio conversion to 16Bit/ 48kHz)
- define data handling: Should the original content be copied to the VERTEX project folder? Should Sub-Directories imported...?
- define the Content Sync behaviour in session mode with multiple systems



☐ Apply Audio 16bit Dithering On Import

☑ Apply DMX Ids on Import

☑ Apply Target Systems On New Version

☐ Compute File Hash

☐ Copy Content To Project Folder

☐ Disable Audio Waveforms

☐ Disable Embedded Audio Extraction

☐ Disable Hap Frame (Decode) Optimization

☐ Disable NotchLc Frame (Ram) Optimization

☐ Encode Optimize Video

☑ Encode Proxy Files

☐ Force Audio Conversion (48kHz)

☐ Force NotchLC Alpha Proxies

☑ Hap/NotchLC High Performance Mode

☑ Import Sub-Directories

☑ ReCalc Duration On Import

☐ Use Hap for Proxies

AV Processing Priority: Normal

Default Fps: 25 Fps

Optimized Video Format: High Performance

Proxy Alpha Mode: Hap Alpha

Transcode Hap Chunk Count: 0

Default Image Duration: 00:00:10

Default Live Input Duration: 00:00:10

Default Notch File Duration: 00:00:20

▸ Pdf Import Settings

▸ ■ Image Import Settings

▸ ■ Video Import Settings

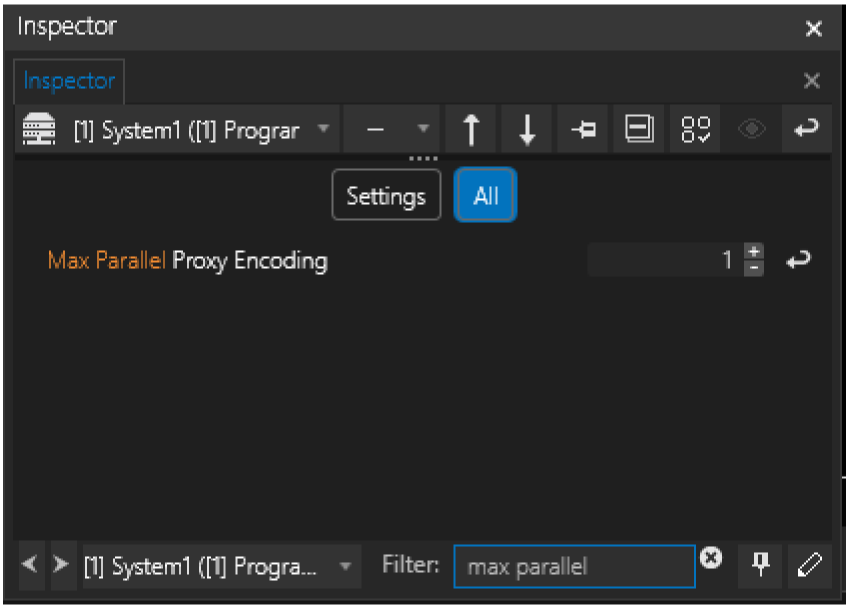
System Settings

Users can set VERTEX to automatically generate proxy files of your content right on import.

If your hardware has got sufficient processing power, you might want to speed-up the encoding process by setting the number of files that can be processed simultaneously.

The System Setting *Max Parallel Proxy Encoding* can be accessed via the Inspector's search filter and allows you to set a limit to the number of proxies encoded in parallel.

The default value is 1, which means that all proxies will be encoded in succession to limit the increased hardware load.



Max Parallel Proxy Encoding 1

Filter: max parallel

Advanced Options

WatchFolder

Define and observe Windows folders. Content import is automatically triggered if content was changed or added within your set WatchFolder.

Optionally, you can let VERTEX automatically create Playlists or Sequences based on WatchFolder content.

Learn more about WatchFolders

Folder and File ID

Folder and File IDs allow users to access content and folders by a value based ID.
This is necessary when working with DMX and Console Layers.

Learn more about a Console Layer or the Folder and File IDs .

Scripts

Users can add scripts to be executed upon changes of individual content files, e.g. *Created Script, Deleted Script, Changed Script*, ect.
These Scripts require the setting *Watch File Changes* in the *Settings Tab* of the desired content item is enabled.

4.6.2 Video

- The Encoding Engine in VERTEX is based on FFmpeg. Basically, VERTEX is able to import **every codec and file container that is supported by FFmpeg.**
- Depending on your hardware setup, **not every codec is recommended for every use case**
- **VETTEX supports high quality codecs like Apple ProRes, HAP/HAP-Q and Notch LC**
- VERTEX automatically extracts and resamples embedded Audio

Supported Formats and Codecs

- VERTEX is **based on ffmpeg** to read video data - basically **all video formats from ffmpeg are supported** (e.g. MPEG4/H264, MPEG 2...)
- Playback of high quality codecs like **Apple ProRes, HAP/Hap-Q or Notch LC** is supported
-

Choosing the right codec

The choice of a codec depends on your projects conditions, the resolution and your quality requirements. A general statement is difficult and also does not represent the full range of projects. The **choice of a codec** also depends on your hardware configuration. Some codecs require more GPU power, others require more CPU power or a fast hard disk

For **high quality playback** we recommend to use Apple ProRes, HAP, HAP-Q or Notch LC.

VERTEX comes with a **native integration** of **HAP** and **Notch LC**. Most parts of the encoding load is shifted to the GPU. The playback performance for especially high resolution files is great.

If there are any **questions** about codecs, please write us an email to vertex.support@rossvideo.com

10 Bit Playback with Notch LC

VERTEX supports 10 Bit Playback with the NOTCH LC codec. This codec is free. "It brings the equivalent of 10bit accuracy in a scrubbable codec that is extremely fast to encode and decode, with a compression ratios of around 5:1" (Source: Notch LC Website)

Related Links

Notch LC

Official Website of the free Notch LC Codec

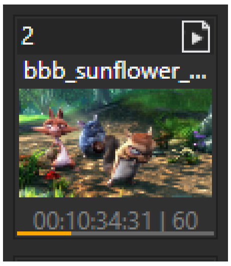
HAP

Official Website of the free HAP Codec

Proxy Files

- For each video content that you add to your project, VERTEX **automatically calculates proxy files** in a **small** and a **middle quality** and resolution.
- The **progress of this encoding** is displayed **with an orange progress bar** into your content tile
- Into the **Render Editor** you are able to **switch between original file and proxy file**.

Encoding and Status



- The **orange progress bar** into the content item in Project Explorer shows you the **status of the encoding process**
- By default, the **amount of parallel encoding jobs** into a VERTEX project is **set to 1**. When import multiple files, the encoding will be done one by one.
- **All Proxy Files are saved into your VERTEX Project Folder**. When the Encoding Process is finished, they **are distributed in background to all other VERTEX Systems** into a Project.

ℹ When VERTEX is creating the proxy file of your video content, the CPU usage is higher as usual. When the process is finished you should observe a decrease of your PC's CPU usage.

Settings

- For **each VERTEX System** you can set the **number of parallel encoding jobs** in the Inspector.
  Select your System into Project Explorer and navigate to Inspector (All-Settings Tab)

- For each **VERTEX Project** you are able to **globally disable the encoding of proxy files**
  Go to Main Menu -> Edit -> Project Settings

- For **each VERTEX System** into your current VERTEX project, you can **disable the Content Sync for Proxy Files**.
  Select your System into Project Explorer and navigate to Inspector (All-Settings Tab)

ℹ Proxy Files are saved into your project folder.
For each Content a Folder with an internal UUID is created into the project files subfolder
Data\Content

Embedded Audio

- **Embedded Audio of a Video file is extracted** and resampled **into a separated .wav file during import**

- The audio file **is stored into the VERTEX project folder.**
- For you as user, there is nothing special to keep in mind - When working with this video file, VERTEX always will automatically assign the resampled Audio track to your video. But if needed, you are able to change to audio track of your clip container.

Settings

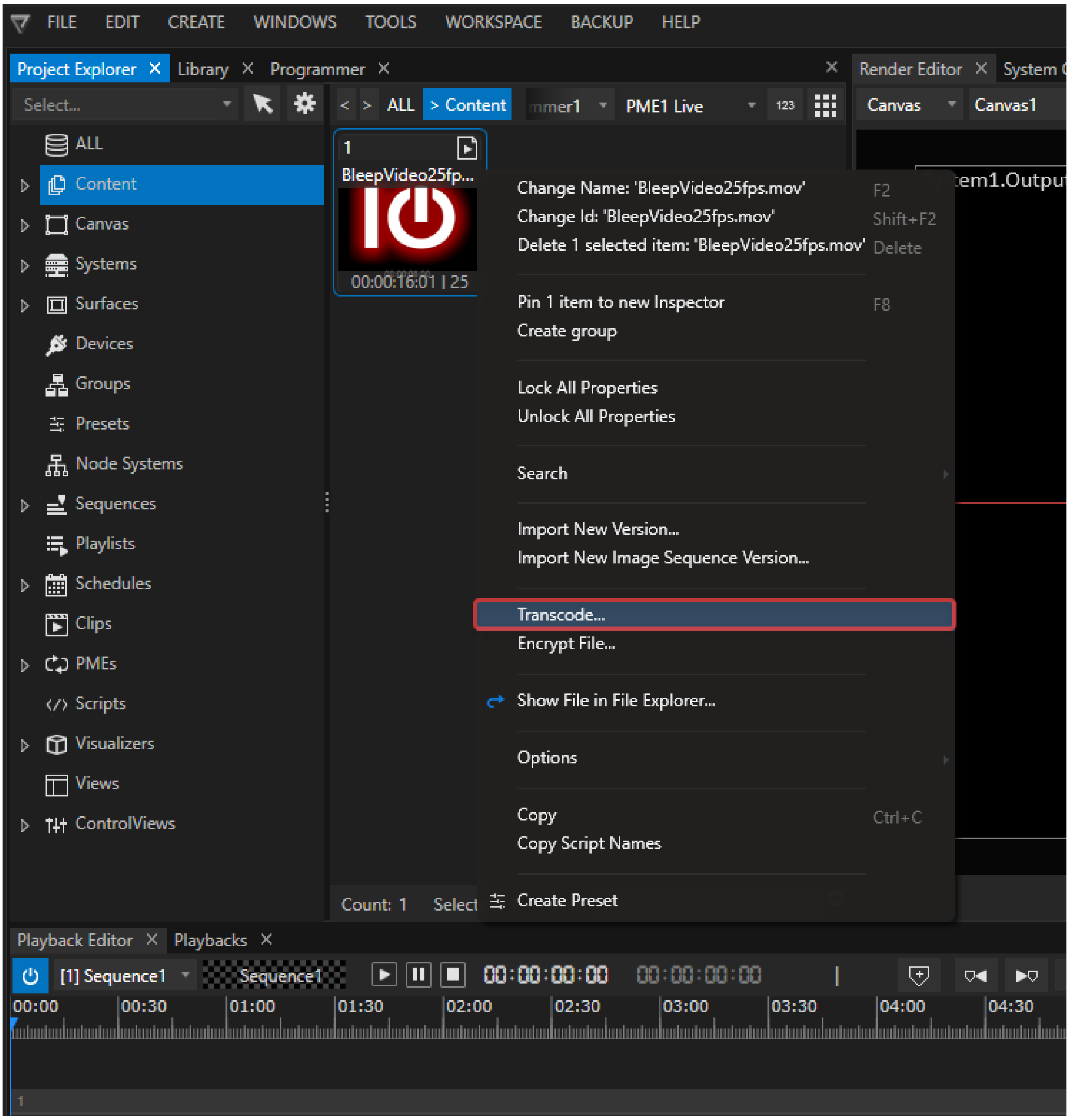
- Audio Extraction can be **globally disabled for a VERTEX Project** into **Project Settings**.
  Go to Main Menu -> Edit -> Project Settings

Transcoding Presets

- Transcoding for the **most common codec types** is available with a **simple right-click in the Project Explorer**
- No complicated settings are needed: VERTEX **offers you Presets with the ideal configuration** for best performance in VERTEX
- Choose weather the new file should be imported as **new content** or as **new version**

How to

- select the already imported **Content** into the **Project Explorer**
- **Right-Click** on this Content and open the **context menu**
- select **Transcode..**
- The **Transcode Settings** dialog will open (c.f. below)
- Do your **settings** there and **confirm**
- Transcoding will start - including proxy files. The status **is shown with a yellow progress bar** in the content items tile

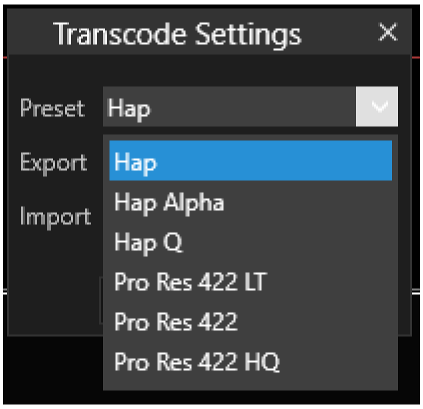


Transcode Settings

Presets

Choose from a list of specific codecs.

The presets for the specified format already have the optimal settings for a playback in VERTEX



File Sizes

Depending on the source file, its resolution and length, new transcoded Hap files (especially hap q) and ProRes files could have bigger file sizes! Ensure that there is enough space on your project data drive.

Export

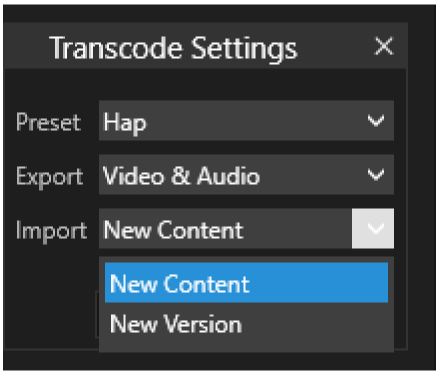
Select between the options "**Audio&Video**" (default setting) ans "**only Video**"

Import

There a two different options how to import the new and transcoded video into your current VERTEX project:

1. As **new content** Item
   The transcoded video will be added as a new content item into Project Explorer
   The new transcoded file and its proxy files are stored into the VERTEX project folder.

2. As a **new version** of the **current content item**
   The file will be transcoded into the chooses preset and is accessible as new version of the current content item
   The new transcoded file and its proxy files are stored into the VERTEX project folder.



Transcode Settings

Preset: Hap

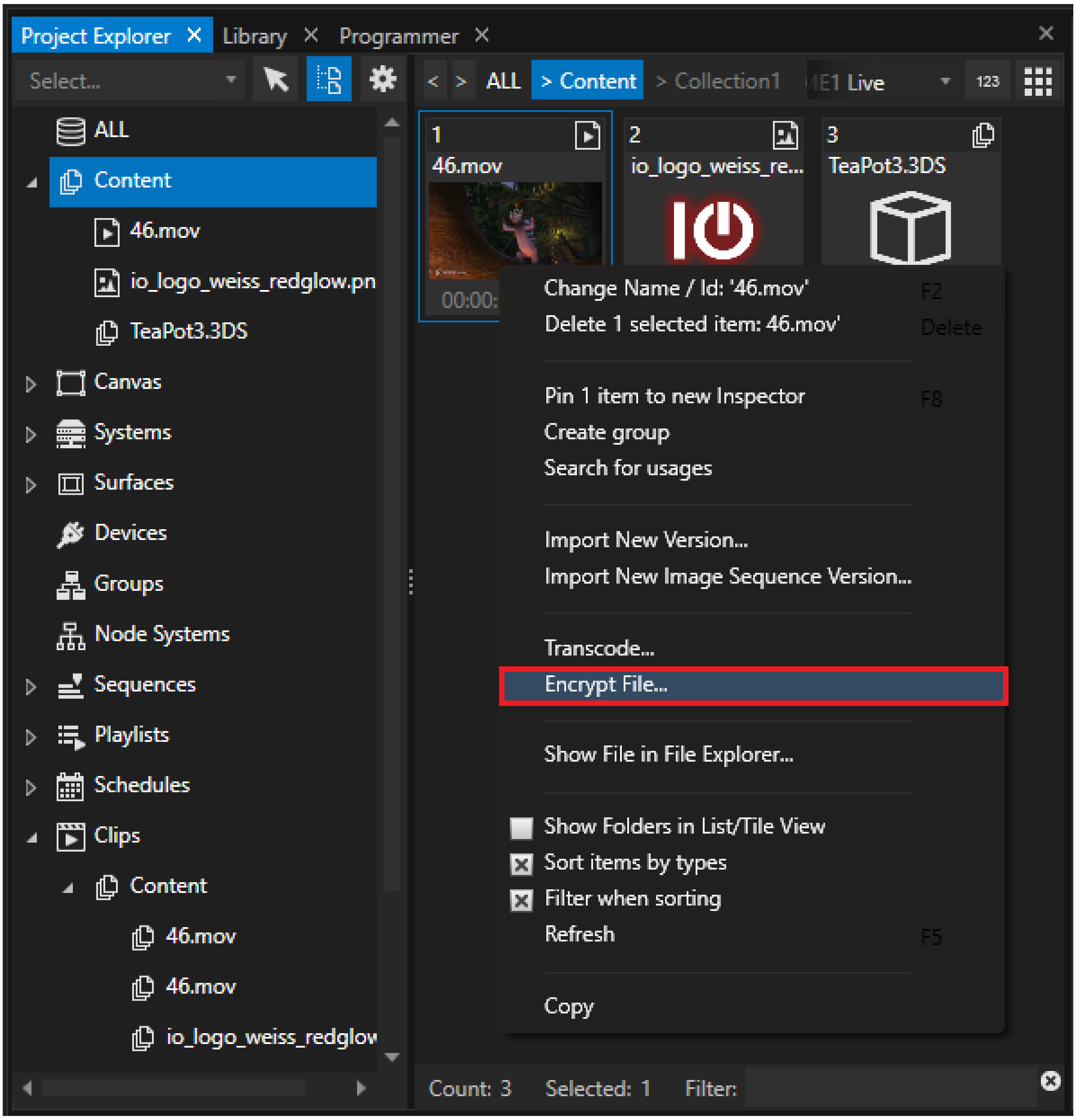
Export: Video & Audio

Import: New Content

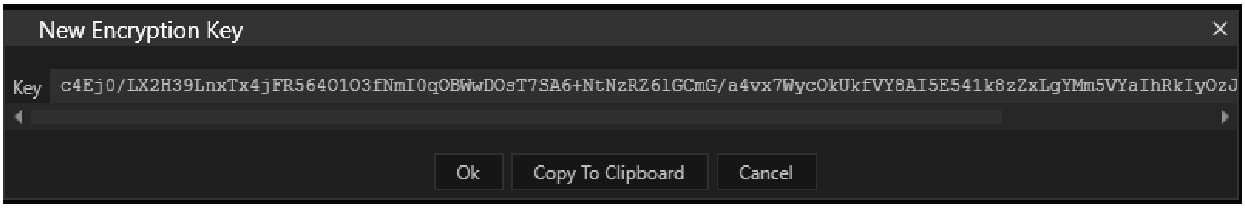
Content Encryption

- Protect your intellectual property with an **integrated Digital Rights Management (DRM) tool**.
- Video files (.mov - Quicktime container) can be **encrypted directly inside of VERTEX**
- Select between **different encryption modes**: a key, lock it to a license or dongle and/or fit it with an expiry date.

How to

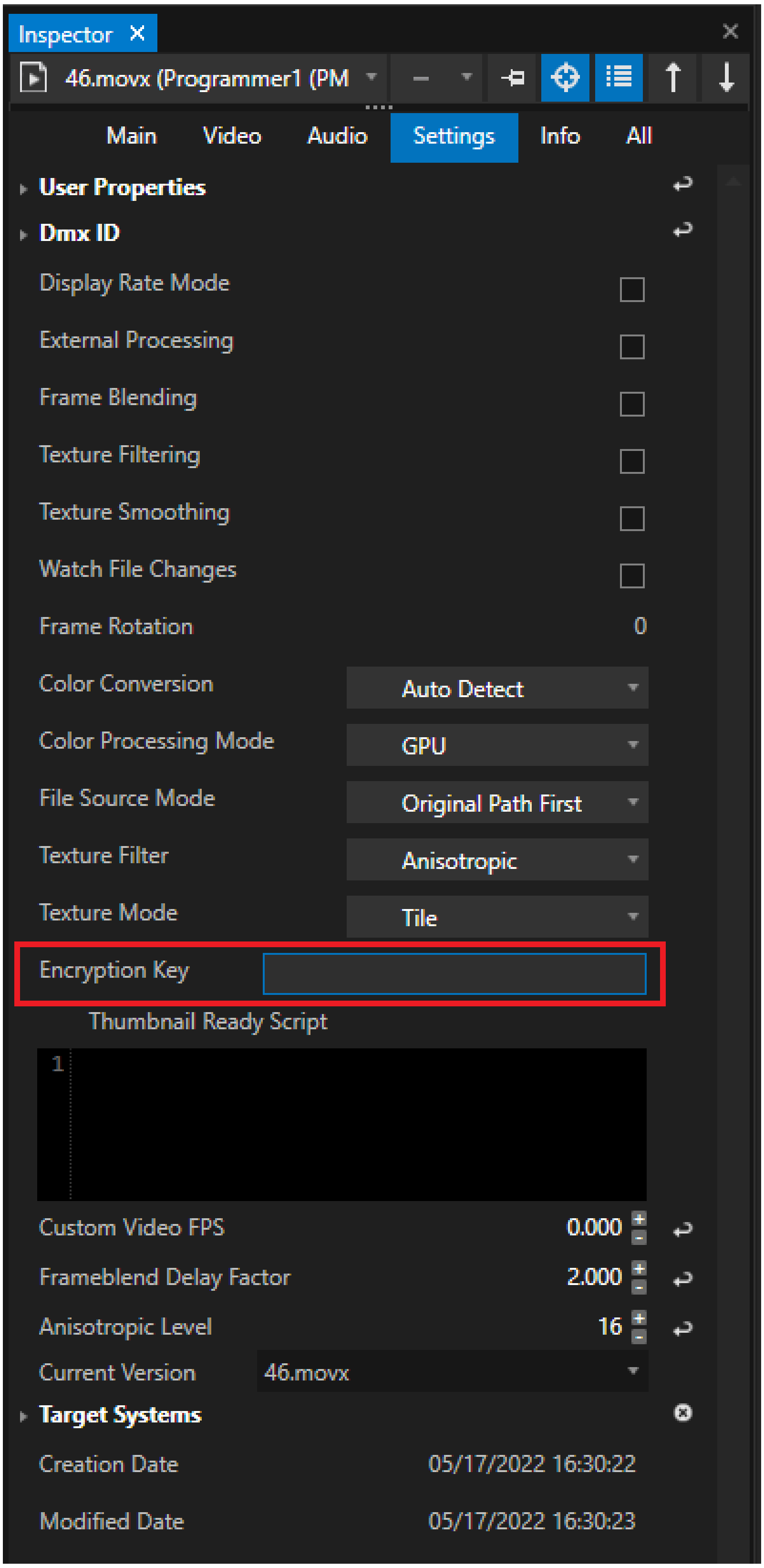


- Rightclick on a Video file into project Explorer
- Choose "Encrypt File" from Context Menu
- The "Encryption Settings" Dialog will open
- Do your settings and choose mode (see below)
- Copy the encryption key, confirm



Key c4Ej0/LX2H39LnxTx4jFR5640103fNmI0qOBWwDOsT7SA6+NtNzRZ61GCmG/a4vx7WycOkUkfVY8AI5E541k8zZxLgYMm5VYaIhRkIyOzJ

- VERTEX will transcode your video into a new .movx file
- If not automatically imported into project explorer open context menu on the original file and choose "Show file in File Explorer"
- Import the .movx file again
- select the file into Project Explorer
- change to Advanced Inspector Mode
- Search for Encryption Key in Inspector and enter the key



Inspector

46.movx (Programmer1 (PM

Main | Video | Audio | Settings | Info | All

- User Properties
- Dmx ID

Display Rate Mode □

External Processing □

Frame Blending □

Texture Filtering □

Texture Smoothing □

Watch File Changes □

Frame Rotation 0

Color Conversion: Auto Detect

Color Processing Mode: GPU

File Source Mode: Original Path First

Texture Filter: Anisotropic

Texture Mode: Tile

Encryption Key

Thumbnail Ready Script

Custom Video FPS 0.000

Frameblend Delay Factor 2.000

Anisotropic Level 16

Current Version 46.movx

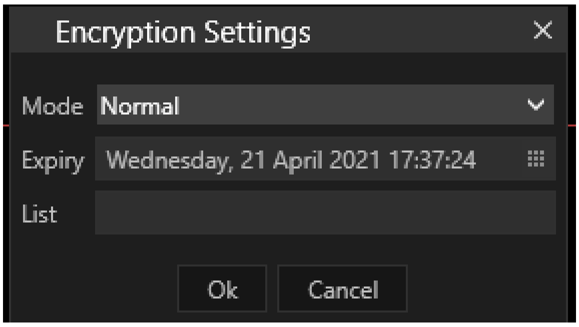
- Target Systems

Creation Date 05/17/2022 16:30:22

Modified Date 05/17/2022 16:30:23

- Refresh Proxy and Cache files: Right-Click - Context Menu on the encrypted content item in Project Explorer

Settings and Modes



Encryption Settings

Mode: Normal

Expiry: Wednesday, 21 April 2021 17:37:24

List:

Normal:
File is encrypted with a passkey. The passkey is generated after clicking OK

Expiry Date:
The File receives an expiry date, for how long the file can be opened

License list:
The file will only run on systems with a certain license key. The license key can be entered into the list field

Dongle:
The file can only be opened if the dongle plugged in during encryption is plugged in during playbac

4.6.3 Image Sequence

- VERTEX converts image sequences optionally in a **proprietary ioversal file format to ensure performance stability during playback**.
- Of course you are also able to use the original files as source format.
- The **playback performance** depends very much **on the chosen file format** and **especially your** **hardware.**
- There is an option to import image sequences as **whole directories with subfolders.**
- **TIFF is natively supported in RGB 8/16 bit RGBA 8/16 bit.**

Supported Formats

The following formats work with VERTEX.
Their playback performance varies, especially when working with compressed formats.

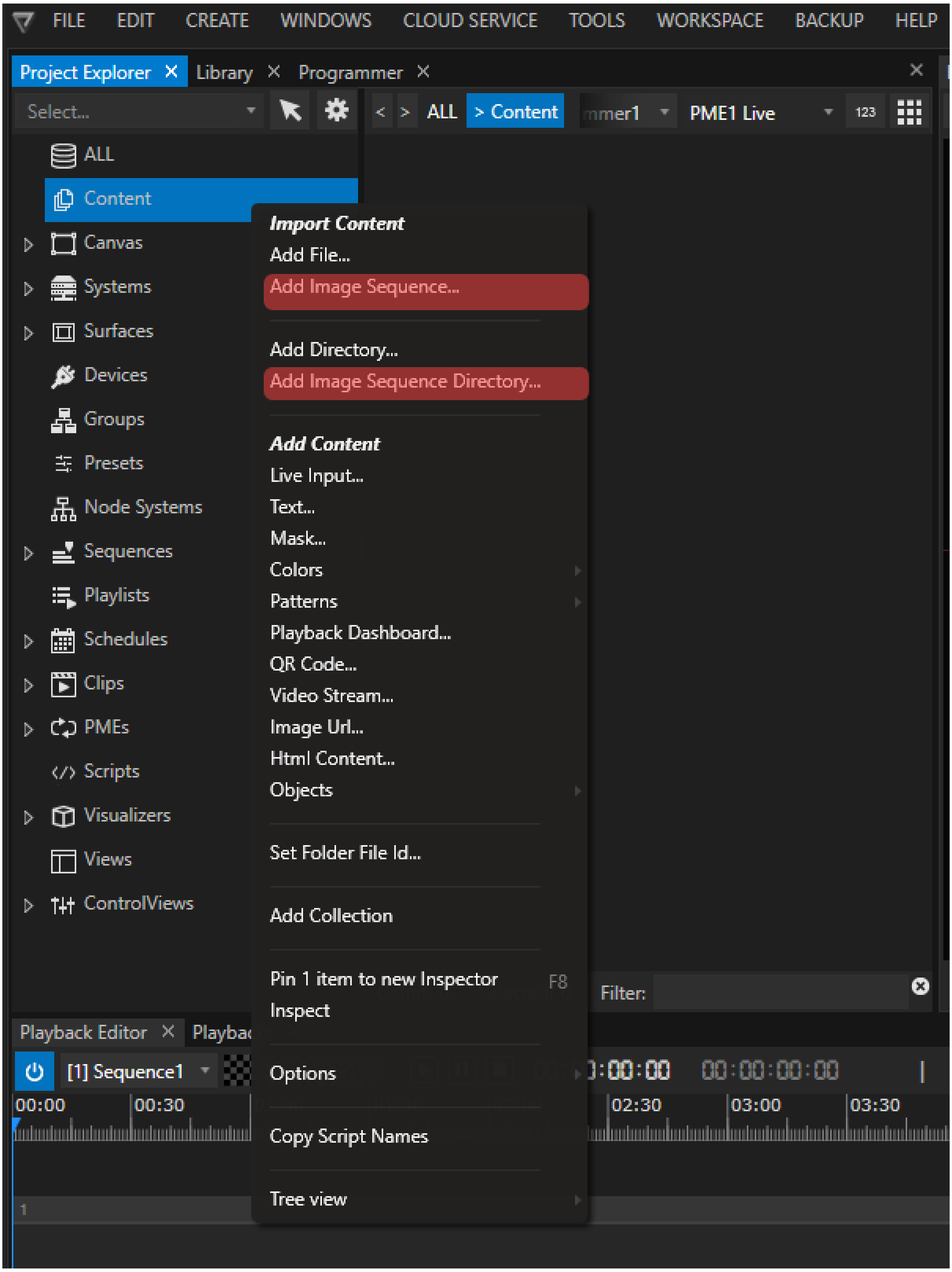
BMP, TIFF, TGA, JPEG, PNG, DPX, GIF
We strictly recommend to test format and playback performance with the VERTEX trial version beforehand.

16 Bit Playback works with TIFF images.
Also DPX supports 16 Bit, but is not yet tested in all cases.

Import and Playback

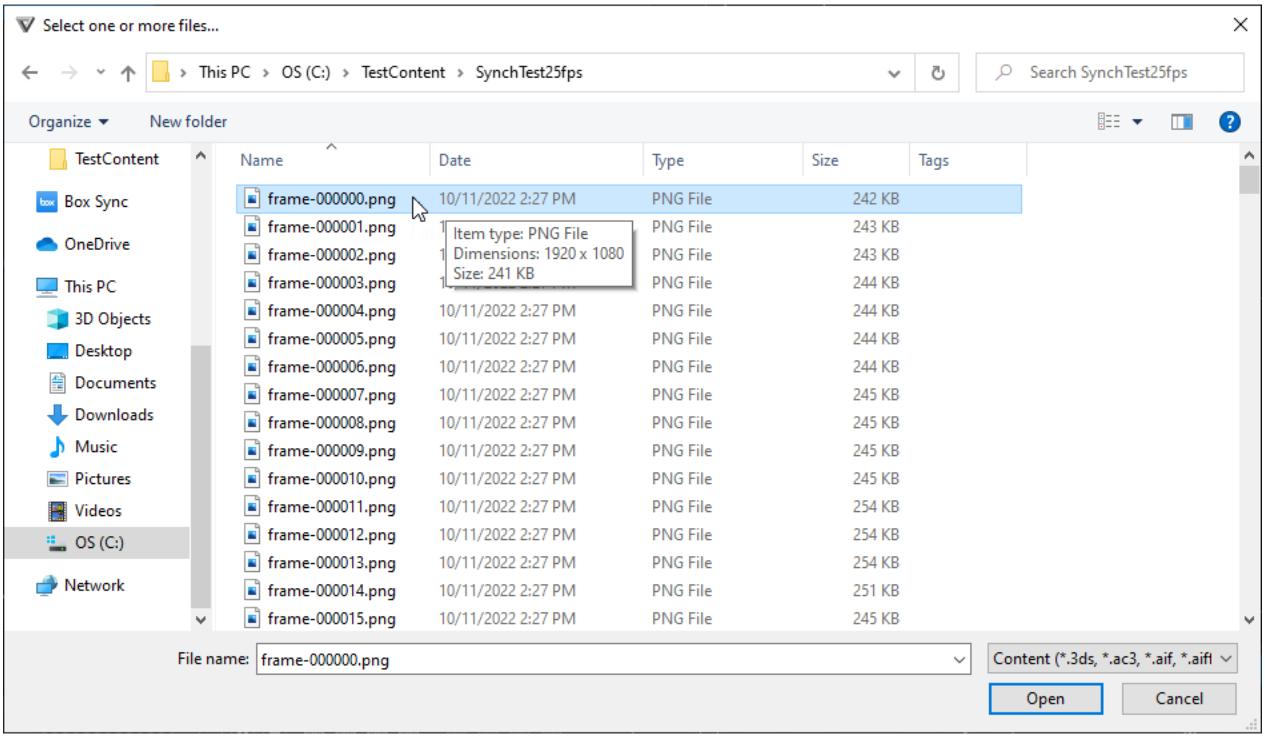
Import

You can import either an image sequence or a whole directory structure of image sequences into VERTEX:



Go to *Project Explorer > Content > right-click context menu* or *Main Menu > File > Add Image Sequence (or Image Sequence Directory).*

After giving the import command, select the first file of your image sequence:



Select one or more files...

This PC › OS (C:) › TestContent › SynchTest25fps

Search SynchTest25fps

Organize ▾ New folder

- TestContent
- Box Sync
- OneDrive
- This PC
  - 3D Objects
  - Desktop
  - Documents
  - Downloads
  - Music
  - Pictures
  - Videos
  - OS (C:)
- Network

Name	Date	Type	Size	Tags
frame-000000.png	10/11/2022 2:27 PM	PNG File	242 KB	
frame-000001.png	1	PNG File	243 KB	
frame-000002.png	1	PNG File	243 KB	
frame-000003.png	1	PNG File	244 KB	
frame-000004.png	10/11/2022 2:27 PM	PNG File	244 KB	
frame-000005.png	10/11/2022 2:27 PM	PNG File	244 KB	
frame-000006.png	10/11/2022 2:27 PM	PNG File	244 KB	
frame-000007.png	10/11/2022 2:27 PM	PNG File	245 KB	
frame-000008.png	10/11/2022 2:27 PM	PNG File	245 KB	
frame-000009.png	10/11/2022 2:27 PM	PNG File	245 KB	
frame-000010.png	10/11/2022 2:27 PM	PNG File	245 KB	
frame-000011.png	10/11/2022 2:27 PM	PNG File	254 KB	
frame-000012.png	10/11/2022 2:27 PM	PNG File	254 KB	
frame-000013.png	10/11/2022 2:27 PM	PNG File	254 KB	
frame-000014.png	10/11/2022 2:27 PM	PNG File	251 KB	
frame-000015.png	10/11/2022 2:27 PM	PNG File	245 KB	

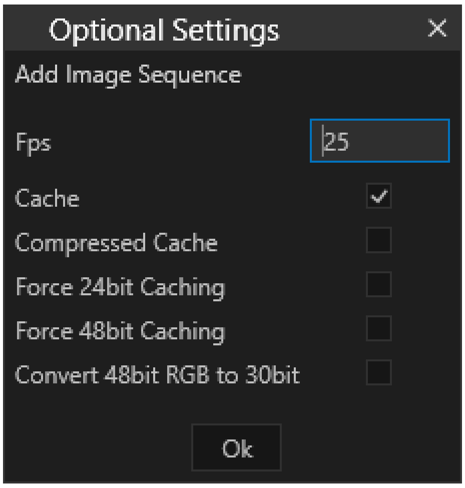
Item type: PNG File
Dimensions: 1920 x 1080
Size: 241 KB

File name: frame-000000.png

Content (*.3ds, *.ac3, *.aif, *.aifl

Open Cancel

Because importing image sequences is different from any other media type, you will be presented special options after the initial import command:



Optional Settings

Add Image Sequence

Fps 25

Cache ☑

Compressed Cache □

Force 24bit Caching □

Force 48bit Caching □

Convert 48bit RGB to 30bit □

Ok

Fps:

Sets the frame rate for your image sequence. When proxy file encoding is enabled, this frame rate is used to encode the image sequence to proxy file videos.

The frame rate is used for your content asset in the project explorer. Go to the inspector to change the settings.

Cache:

Enable for VERTEX to convert the imported image sequence into a proprietary .iovi format and store it in your project folder.
Advantage: optimized file processing, optimized data handling, optimized algorithm - ensuring the best playback performance
Disadvantage: the conversion of tga, and dpx files costs time and processing power.

Disable if you want **to import the original file format.**
Depending on the file format, playback performance can vary.
The system where the import was done uses the original files are for playback.
In a multi-client session the files are being copied by default to all session members' project folders (content sync).

> Please keep in mind that your project folder has to be located on a very fast drive with enough disk space.
> Double check this also for all other VERTEX systems when working in a multi-client session.
> Importing an image sequence directory can fill up your drive quickly with all the data created and copied into your project folder(s).

Compressed Cache

Default Setting: Disabled.
If enabled, Data into our Cache format (.iovi) will be compressed - (only binary data from the whole file - no effects on image quality

Advantage: Each file of the image sequence will be about 20% smaller. The amount of data that has to be read from the hard drive becomes smaller.
However, data compression has to reverted by the CPU - leading to a higher CPU load during playback.
Recommended when playing big or multiple image sequences on a system with high power CPU.

Recommendation for the best work routine: have your content creators export and deliver your content in a lossless PNG file format.

Force 24 Bit Caching

Default Setting: Disabled
Enable for our proprietary cached format - all data is converted to 24 Bit (R G and B @ 8Bit)

Force 48 Bit Caching

Default Setting: Disabled

Enable for our proprietary format - all data is converted to 48 Bit (R G and B @ 16Bit)

Convert 48 Bit RGB to 30 Bit

Default Setting: Disabled

Enable for our proprietary cached format - all data is converted to 30 Bit (R G and B @ 10Bit)

4.6.4 3D Objects

The documentation is work in progress and will be updated step by step

Until then: Please drop us an E-Mail with your "How-to-do-this-in-VERTEX" question to vertex.support@rossvideo.com

Supported Formats

* FBX
* 3DS

4.6.5 Images

- VERTEX **supports all major image file formats like JPEG, GIF, TIFF, PNG and BMPs**
- **Alpha Channels** and **transparency** are supported
- During import all formats are rasterized (for e.g SVGs or EPS files)

4.6.6 Audio

- VERTEX encoding is **based on FFmpeg** and therefore supports a **great variety of audio codecs.**
- When audio is imported, **VERTEX converts all audio formats to a 48kHz/16Bit WAV file**. The new files are stored in the project folder.
- **Multi-channel audio** is also supported.

Audio files that come in VERTEX' default format (.wav with 16bit /48kHz) are not converted during import.

You can, however, force VERTEX in the Project Settings to automatically convert *every audio file* that is imported - even if it has already got VERTEX's native format.

Although each audio file is converted to an industry standard of 48kHz/16Bit -even mp3 audio - , we recommend to only import uncompressed audio for best results in sonic quality.

4.6.7 Powerpoint

- VERTEX supports the import of Powerpoint presentations as PPT or PPTX files.
- All included slides are accessible as a PNG File in VERTEX.
- Videos or notes are accessible as child elements of the slide.
- Transitions between slides and animations are not supported.

Supported Powerpoint Formats

- ppt
- pptx

4.6.8 Notch Blocks

- VERTEX supports **native Notch Playback**
- Notch Blocks are handled into VERTEX as any other content element: Import a Notch Block into the Project Explorer, drag it to your timeline and create a Clip Container and set the exposed/auxiliary parameters in the Inspector
- For Notch playback you **require a Notch Playback License/Dongle** and an **installed Codemeter runtime** for license management

How to prepare VERTEX

- Check out the prerequisites for a notch Playback License on notch.one
- Follow the Notch manual for License handling and install the Codemeter License runtime
- Plug In your Notch Dongle and start VERTEX

Notch Playback License

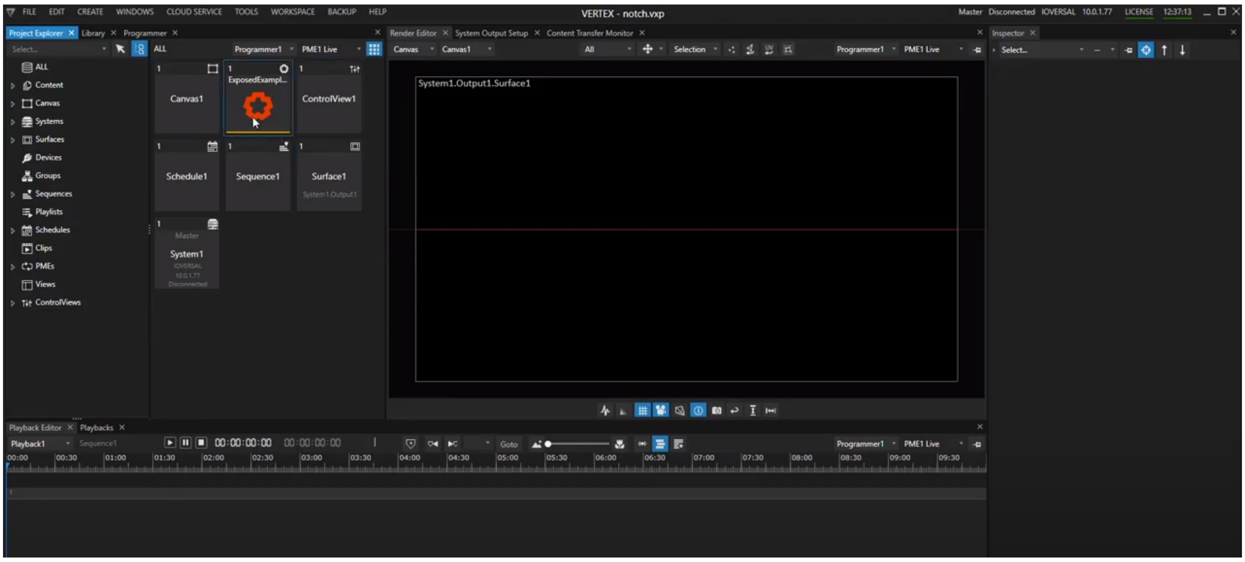
To display Notch content into VERTEX, a Notch Playback license on a specific Notch dongle is needed.

This license has to be purchased at Notch. To run this license, a third party license runtime is necessary.

There is no demo option - if no license is installed or the necessary Codemeter runtime for license handling is missing, an error message will occur. no notch content is displayed

Working with Notch Content

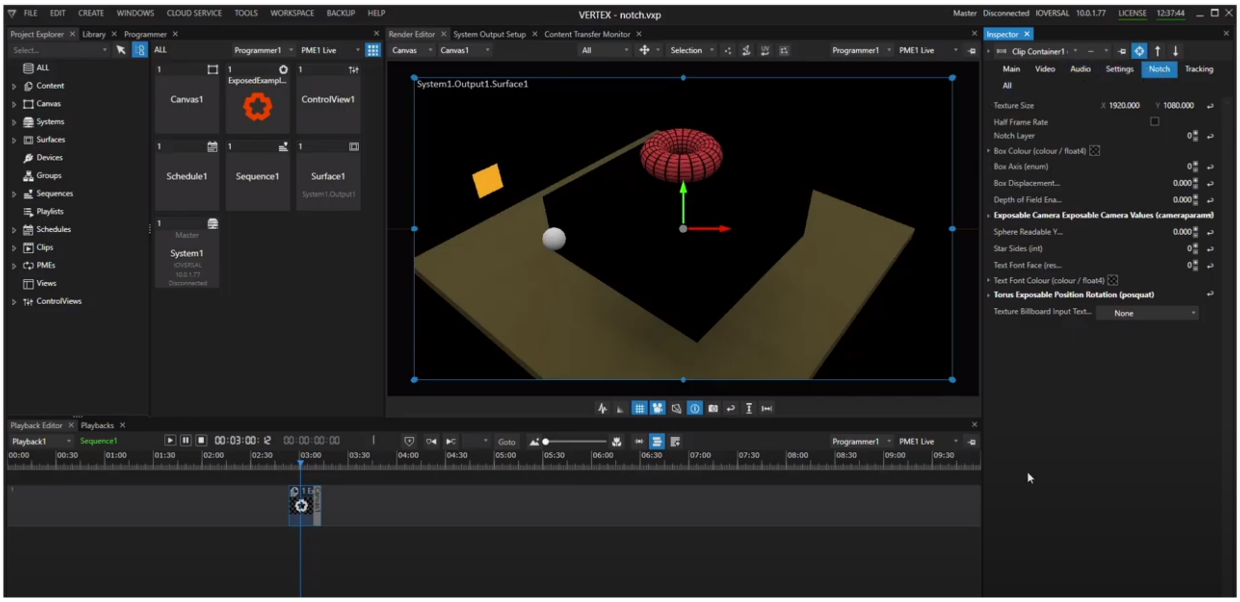
Import Notch Content



- Notch Blocks are handled as any other content asset into VERTEX.
- after the import there will be a short background processing (orange progress bar on content tile)
- You are able to use Botch Blocks as any other content. settings are made in the Inspector

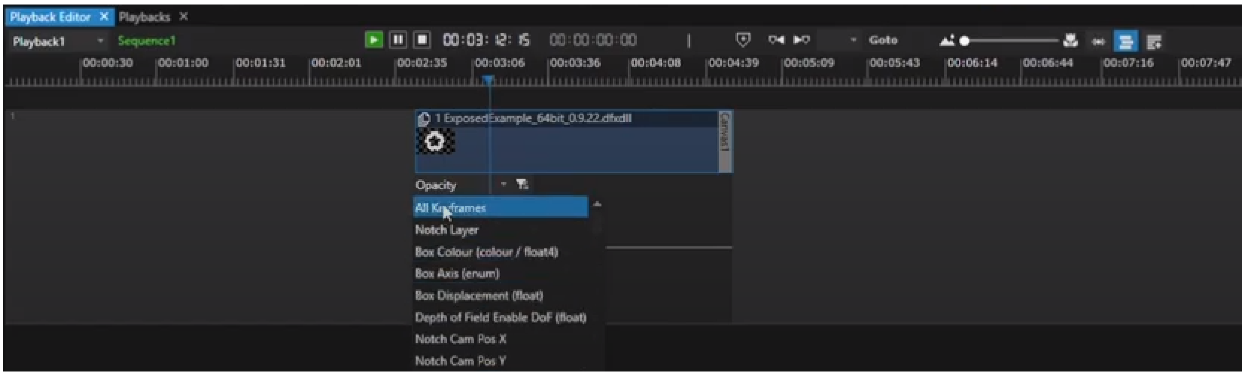
Notch tab into Inspector

- For Clip Containers with Notch Blocks, there is a tab called "Notch" in the Inspector
- The "Notch" tab shows all possible settings, Notch layers or texture settings that are available in VERTEX for this block.



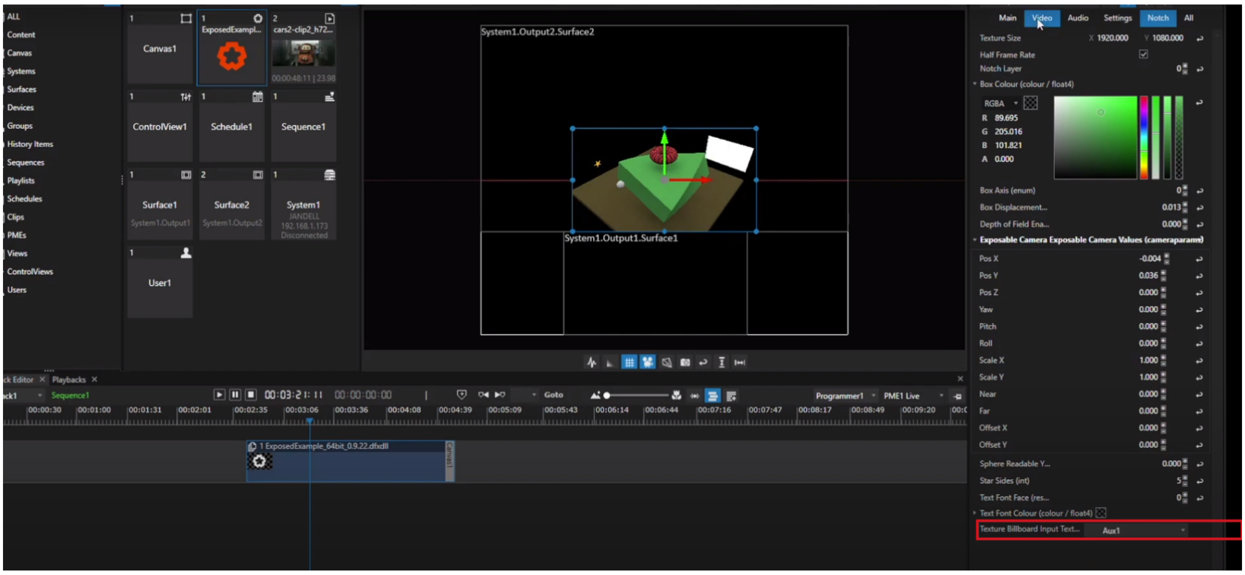
Keyframes

- All parameters that are listed into the Inspector for the selected Notch Block are also available as Keyframes for animation
- Double--Click with your mouse on the Clip Container to open the Keyframe-Editor and choose your property for animation from the drop down list

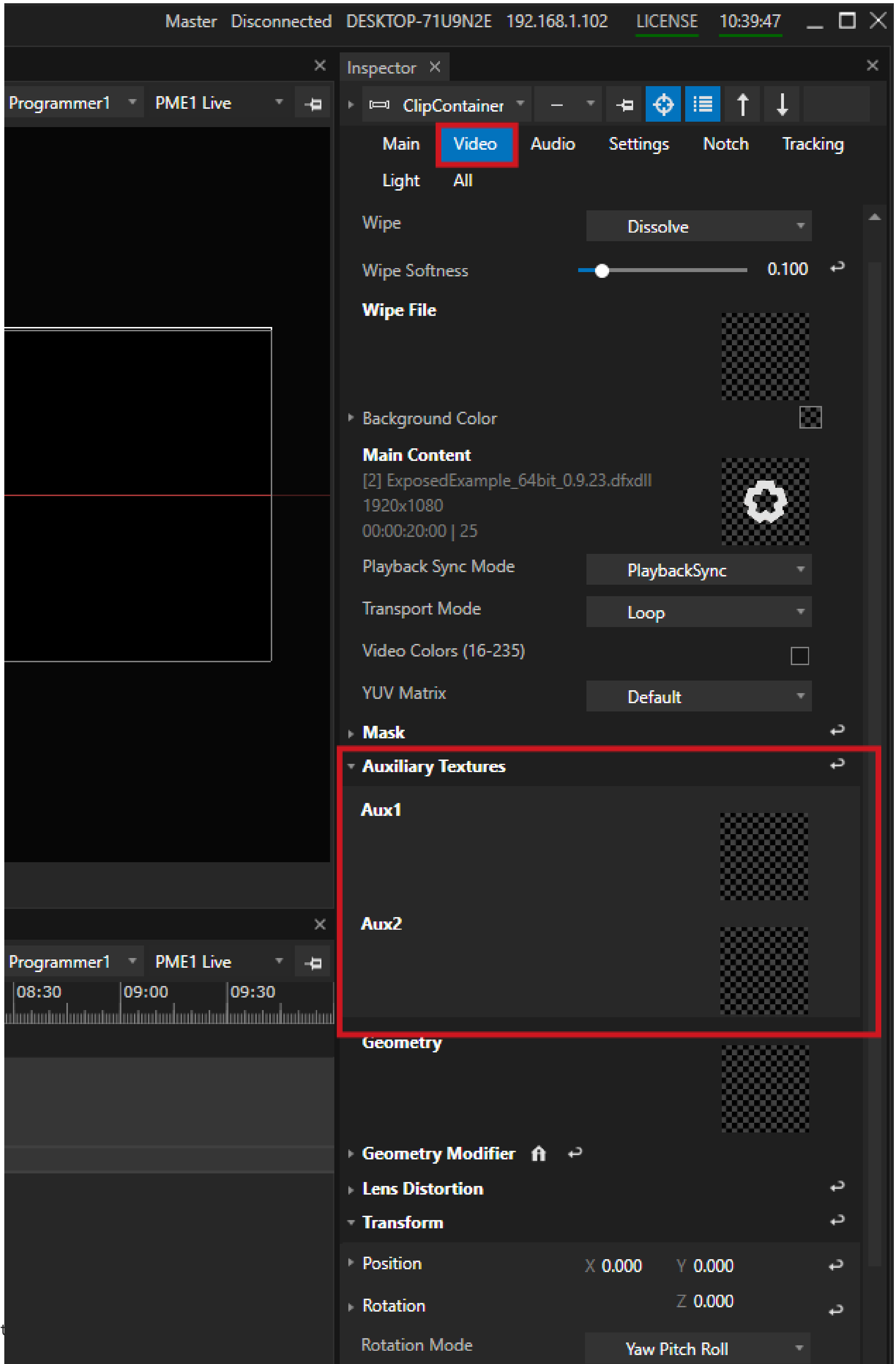


Auxiliary textures

- When your Notch Block includes textures that could be assigned to an element, there is an option to work with auxiliary textures that are provided from another content element into VERTEX



- Just choose e.g. AUX1 in the texture dropdown list
- then switch to the video tab and change Inspector Mode to Advanced
- Drag and drop a Video, Live Input or another content asset from the Project Explorer to the Auxiliary Textures field



Wipe: Dissolve

Wipe Softness: 0.100

Wipe File

Background Color

Main Content

[2] ExposedExample_64bit_0.9.23.dfxdll

1920x1080

00:00:20:00 | 25

Playback Sync Mode: PlaybackSync

Transport Mode: Loop

Video Colors (16-235): □

YUV Matrix: Default

Mask

Auxiliary Textures

Aux1

Aux2

Geometry

Geometry Modifier

Lens Distortion

Transform

Position: X 0.000 Y 0.000

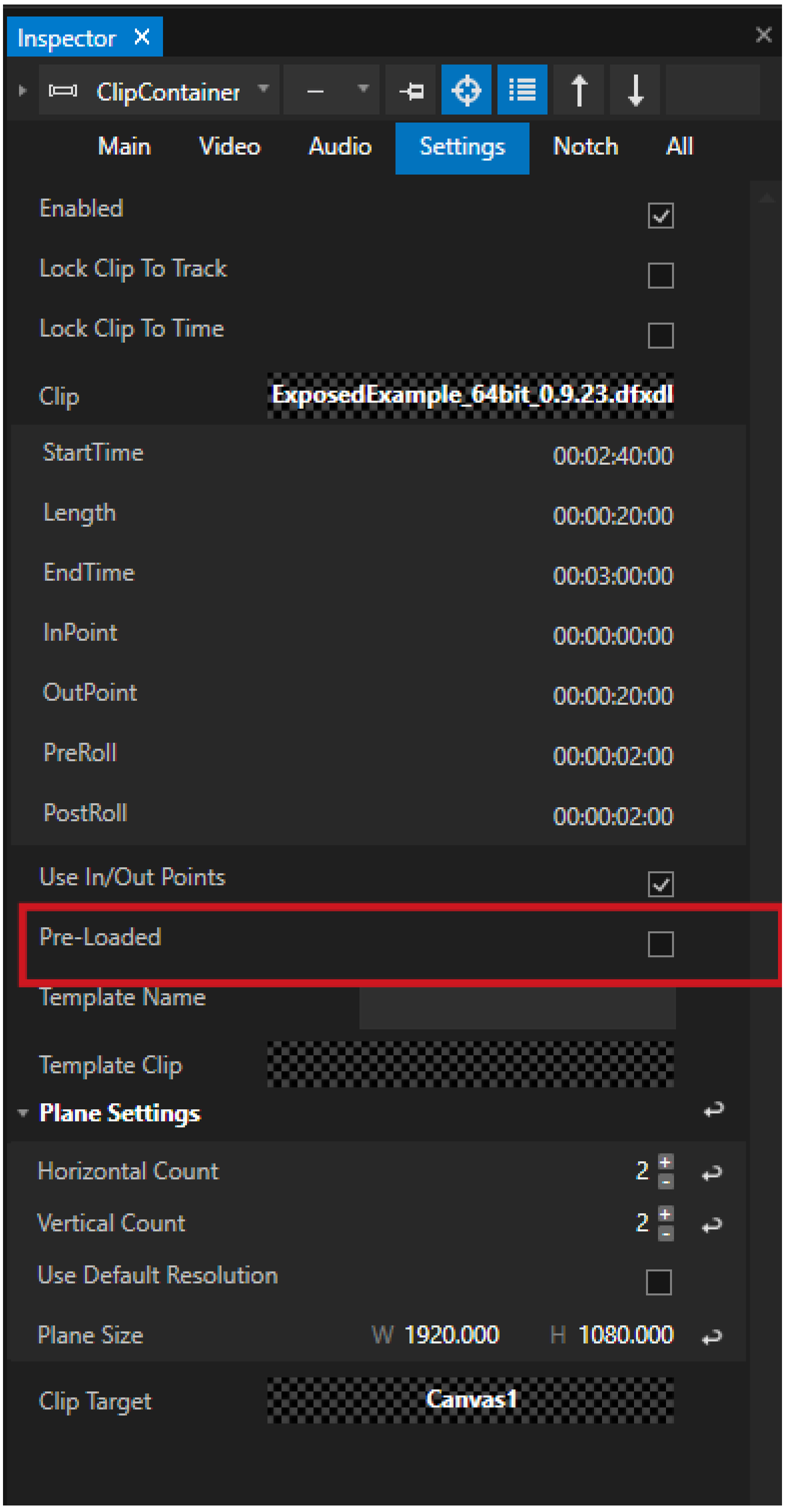
Rotation: Z 0.000

Rotation Mode: Yaw Pitch Roll

Vert

Proload Notch Blocks

- To minimize loading time and calculation times it also possible to preload a Clip Container with a Notch Block
- When enabled, Clip Containers are pre calculated and pre loaded into the GPU cache. The content directly is available and rendered when the Playhead runs into the Clip Container.
- Pre-loaded Content claims hardware resources of your GPU- please use carefully and monitor the hardware usage!



Enabled	☑
Lock Clip To Track	□
Lock Clip To Time	□
Clip	ExposedExample_64bit_0.9.23.dfxdl
StartTime	00:02:40:00
Length	00:00:20:00
EndTime	00:03:00:00
InPoint	00:00:00:00
OutPoint	00:00:20:00
PreRoll	00:00:02:00
PostRoll	00:00:02:00
Use In/Out Points	☑
Pre-Loaded	□
Template Name	
Template Clip	
Plane Settings	
Horizontal Count	2
Vertical Count	2
Use Default Resolution	□
Plane Size	W 1920.000 H 1080.000
Clip Target	Canvas1

System Performance and System Load

The Systems performance depends on your hardware setup and the settings made in Notch
For Notch performance optimization and measurement, please read the documentation from Notch about Managing Performance in Media Servers

VERTEX provides a setting to halve the frame rate for Notch Content which reduces the local load on your VERTEX System (e.g. for testings and programming)

Further Information

Notch website and documentation

4.6.9 PSD-Files

- VERTEX is able to read and import Files from Adobe Photoshop including layers
- Layers has to be rasterized in Photoshop before.
- Each single Layer is accessible as child element of the main content item and can individually be placed into Clip Containers or as Clip into a Playlist

4.6.10 Live Input

- VERTEX supports **different types of live inputs and capture cards**
- Live Inputs that are available for a System are **shown in the Project Explorer as child elements of this System**
- **Live Inputs first have to be added as Content Items** to your Project (right-click on Live-Input -> Add to project)

Capture Cards

SUPPORTED MODELS AND MANUFACTURERS

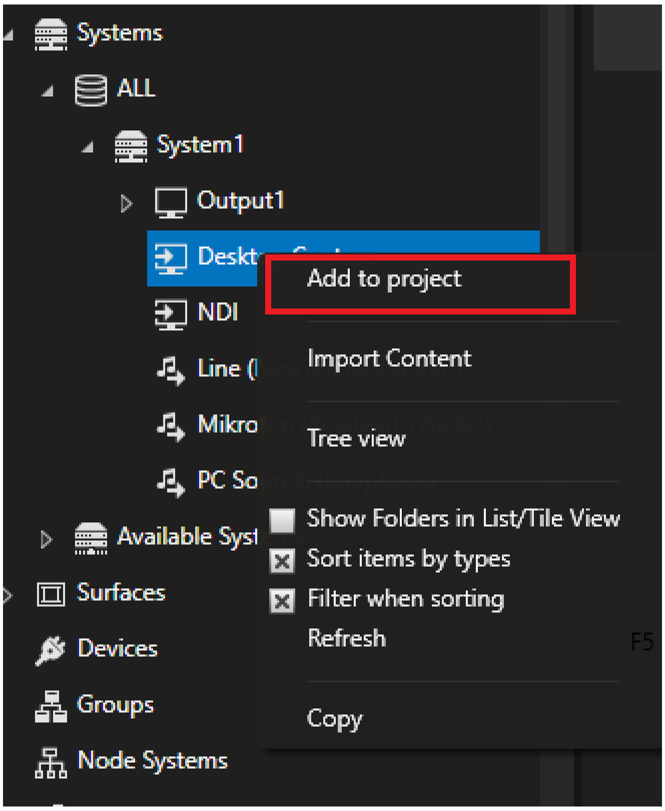
VERTEX can support a variety of input cards from different manufacturers, such as:

- AJA
- Blackmagic Design
- Bluefish444
- Magewell
- Datapath
- DeltaCast
- Deltacast FLEX
- Magewell
- Osprey
- Streamlabs

Each product has to be verified with a current driver and VERTEX version, due to the nature of the fast moving industry.
For most applications we recommend Blackmagic oder Magewell cards. We also recommend testing the compatibility of your hardware with our free VERTEX trial version.
If you need to request further assistance, please reach out to vertex.support@rossvideo.com.

❗ Follow the instructions of the manufacturer installing the hardware and the driver.
Once the driver is installed, VERTEX will detect your input card to be accessed in the Project Explorer's System Tree View.

ADDING LIVE INPUTS TO YOUR PROJECT



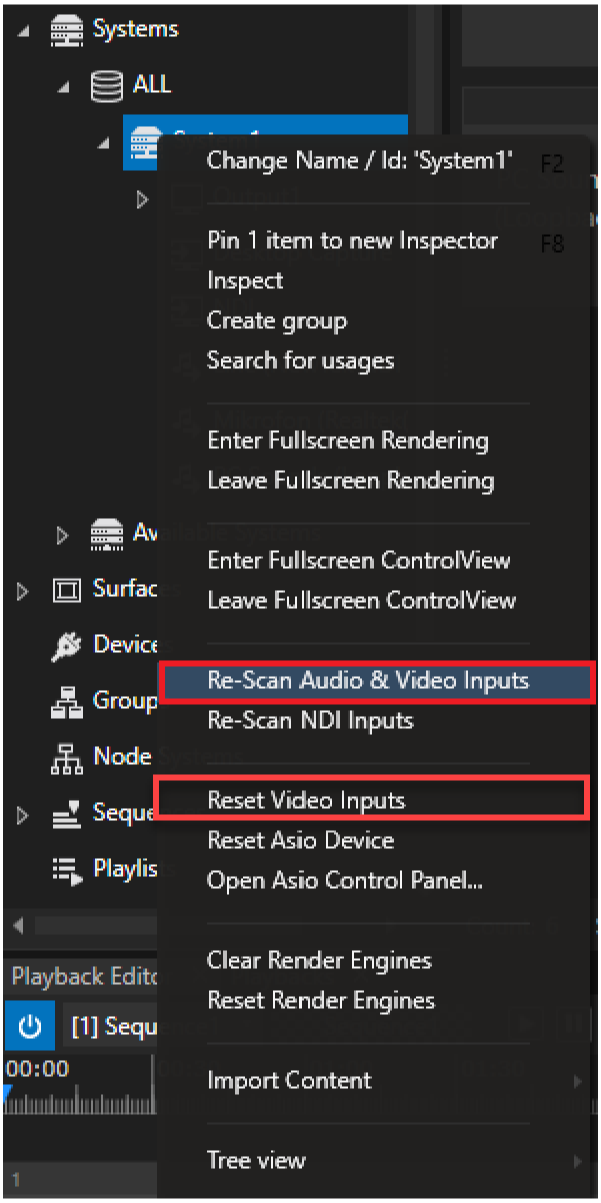
After an Input Card and its driver is installed, the Input Card should be listed as child element of your Vertex System into Project Explorer.

- go to **Project Explorer** and navigate to the **System** where the input device is installed
- **select the input device**
- right-click with your mouse and **open the context menu**
- select **"Add to project"**
- the input device now is listed as a **content item** in the Project Explorer
- **drag** the live input content into the Playback Editor

RE-SCAN VIDEO SOURCES

If your **input device is not listed as a child element** of a system in the project explorer, please refresh the video sources:

- select **System** in project explorer
- right-click with your mouse and open context menu
- select **"Re-Scan Audio & Video Inputs"**


Systems
ALL
Change Name / Id: 'System1' F2
Pin 1 item to new Inspector F8
Inspect
Create group
Search for usages
Enter Fullscreen Rendering
Leave Fullscreen Rendering
Enter Fullscreen ControlView
Leave Fullscreen ControlView
Re-Scan Audio & Video Inputs
Re-Scan NDI Inputs
Reset Video Inputs
Reset Asio Device
Open Asio Control Panel...
Clear Render Engines
Reset Render Engines
Import Content
Tree view
Surfac
Device
Group
Node
Seque
Playlis
Playback Edito
[1] Sequ
00:00

If the **input texture** of your capture card has a **wrong resolution**, try to reset your video inputs

- select **System** in project explorer
- right-click with your mouse and open the context menu
- select **"Reset Video Inputs"**

NDI

This product uses NDI® (SDK v5.0, 2023)
Licensed for free and commercial use under the terms in effect for this version.
Learn more at https://ndi.video/
NDI® is a registered trademark of Vizrt NDI AB.

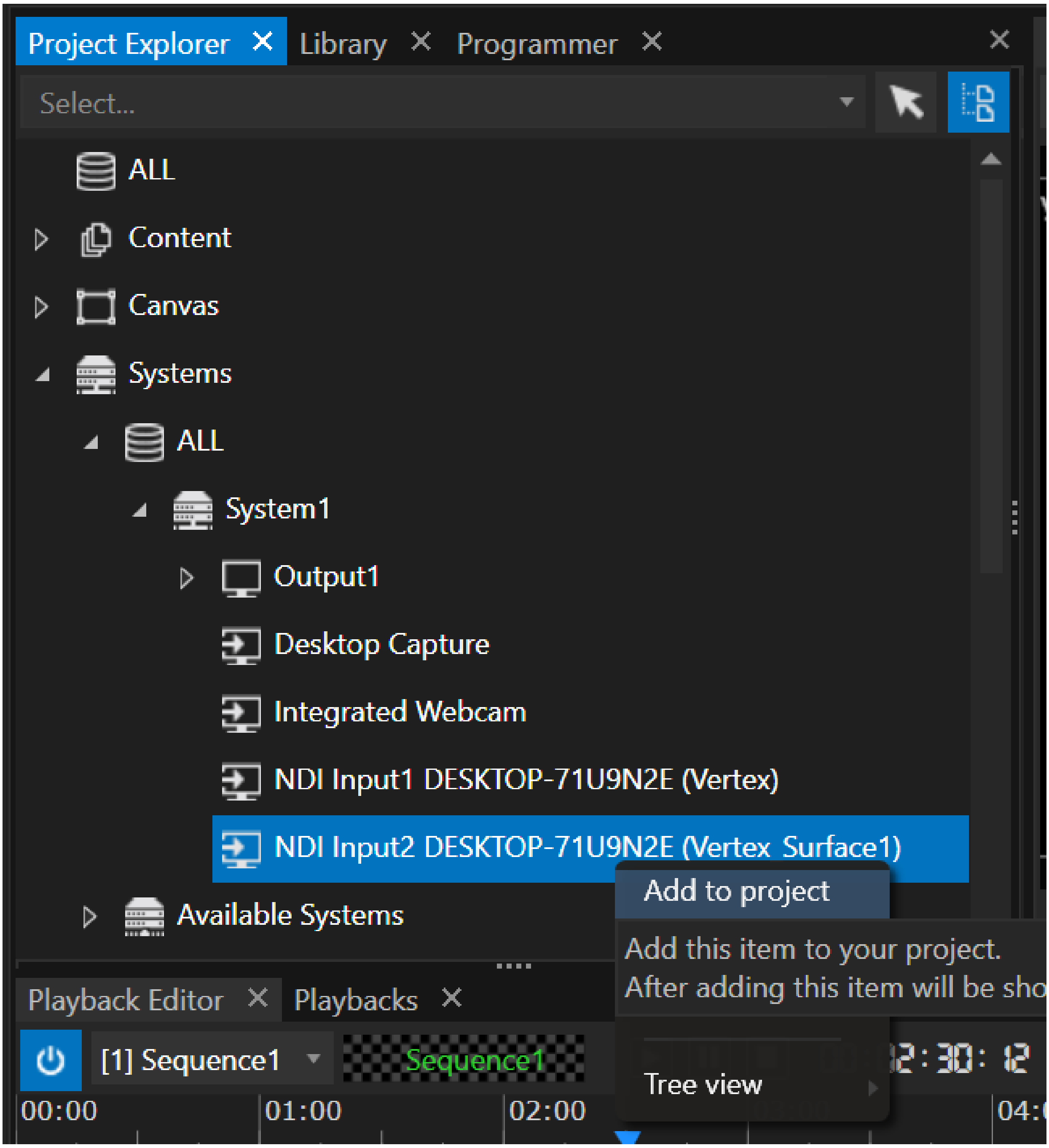
- **VERTEX automatically detects NDI streams** in your network.
- Each detected stream **is listed as a Live Input Element** in Project Explorer > Systems Manager > System

When no NDI Stream or a wrong number of streams is detected, try to refresh the **Video Sources of your System:**

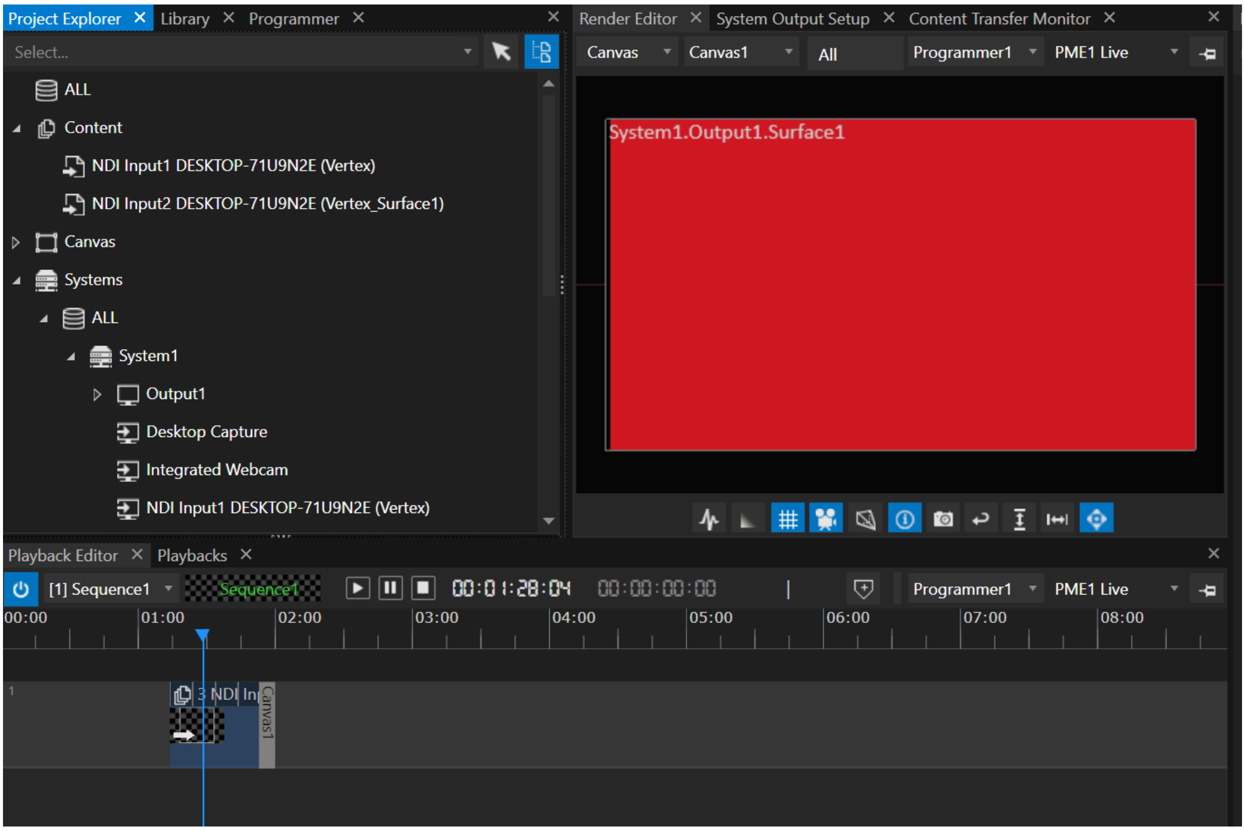
- Select your System in Project Explorer
- open the Context Menu with a right-cklick
- select "Refresh Video Sources"

Add NDI to your Project

- Navigate to your **System into Project Explorer**
- Open the tree and **show child elements of your System**
- **Right-Click with your mouse** onto NDI Receiver



- **"Add to Project"**
- The NDI Receiver now is listed in the **Content Section into Project Explorer**
- **Drag this NDI Content to the timeline of the Playback Editor** and create a Clip Container



Desktop Capture

- Captures the Windows Desktop of a System
- Shows Mouse or Touch Interactions

Add a Desktop Capture to your Project

- Navigate to your System into Project Explorer
- Open the tree and show child elements of your System
- Right-Click with your mouse onto Desktop Capture
- "Add to Project"
- The Desktop Capture now is listed in the Content Section into Project Explorer
- Drag this Desktop Capture Content the timeline of the Playback Editor to create a Clip Container

Camera

VERTEX supports all cameras that are working with Microsoft Windows after drivers are installed:

- integrated webcams
- USB webcams
- some ethernet- based cameras

Note: at the start of VERTEX and when loading a project, VERTEX initializes all input devices. A connected webcam's LED may flash briefly, but VERTEX is not recording anything.

Add Camera Live-Input to your Project

- Go to Project Explorer and navigate to your local system
- If cameras are detected from VERTEX, they should be listed as child elements of this system.
- Open the context menu with a right-click.
- "Add to project"
- The camera is now listed as a content item in the content section.
- Drag the camera content as a clip container into the timeline of the Playback Editor.

Spout

Spout is an open source video texture sharing framework for Microsoft Windows.
With Spout it is possible to share video or graphics textures in realtime between windows applications on the same System.
Spout is supported and integrated by a lot of creative applications.
All information including a Spout test sender and receiver could be downloaded on the Spout Website

Add Spout to your project

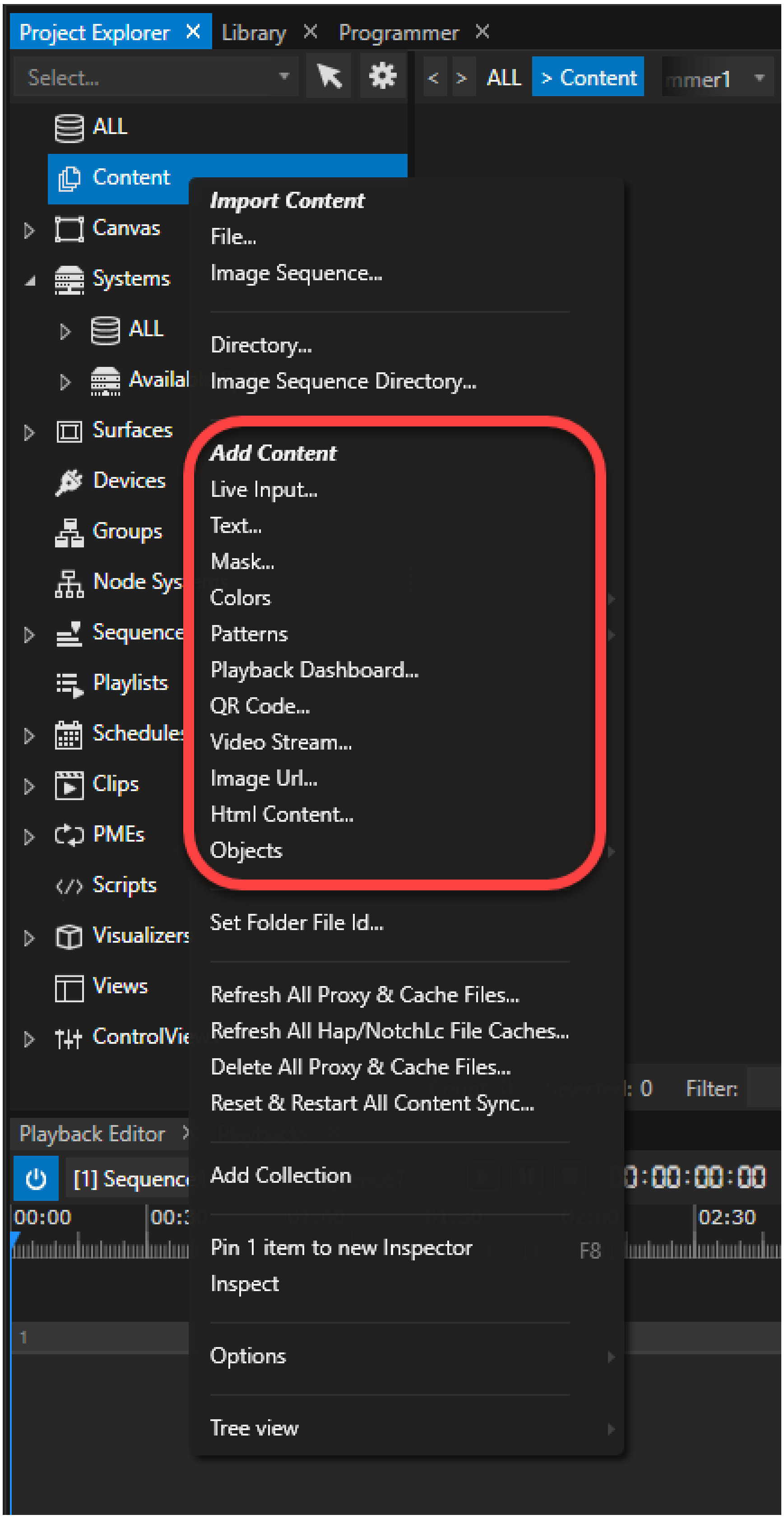
- Check if there is an active spout sender from another application active on your Windows System
- Go to the VERTEX Project Explorer and navigate to your local System
- Spout should now be listed as Live Input and child element of your local System
- If Spout is not listed in input branch of your local System's tree view: right-click on the System to access the context menu and select *Reset & Refresh > ReScan Audio & Video Inputs.*
- Right-Click on the Spout element and select "Add to project"
- Into the Content Section, Spout now is listed as Content of your project
- Select Spout from Content and drag it to the Playback Editors timeline to create a clip container

Create a Spout Output from VERTEX:
Any Surface in VERTEX can render its texture as a Spout Output. Inspect the *Surface*, go to *Settings* tab (in advanced mode) and enable *Spout Output*.

4.6.11 Generative Patterns

- Generative content is **static content** that is generated **based on your settings.**
- You have access to **solid color**, **gradients** or **test- or UV-patterns** directly from VERTEX, no needs to generate them with an external application.
- Once added as content to your project, you are able to **change and adapt the settings in the inspector**. Based on these settings, the visual result changes.

Add a Generative Pattern


Project Explorer
Library
Programmer
Select...
ALL
> Content
mmer1
ALL
Content
Canvas
Systems
ALL
Availal
Surfaces
Devices
Groups
Node Sys
Sequence
Playlists
Schedules
Clips
PMEs
Scripts
Visualizers
Views
ControlVie
Import Content
File...
Image Sequence...
Directory...
Image Sequence Directory...
Add Content
Live Input...
Text...
Mask...
Colors
Patterns
Playback Dashboard...
QR Code...
Video Stream...
Image Url...
Html Content...
Objects
Set Folder File Id...
Refresh All Proxy & Cache Files...
Refresh All Hap/NotchLc File Caches...
Delete All Proxy & Cache Files...
Reset & Restart All Content Sync...
Add Collection
Pin 1 item to new Inspector
F8
Inspect
Options
Tree view
Filter:
Playback Editor
[1] Sequenc
0:00:00:00
00:00
02:30

- go to *Project Explorer > Content* and access the the context menu by right-click

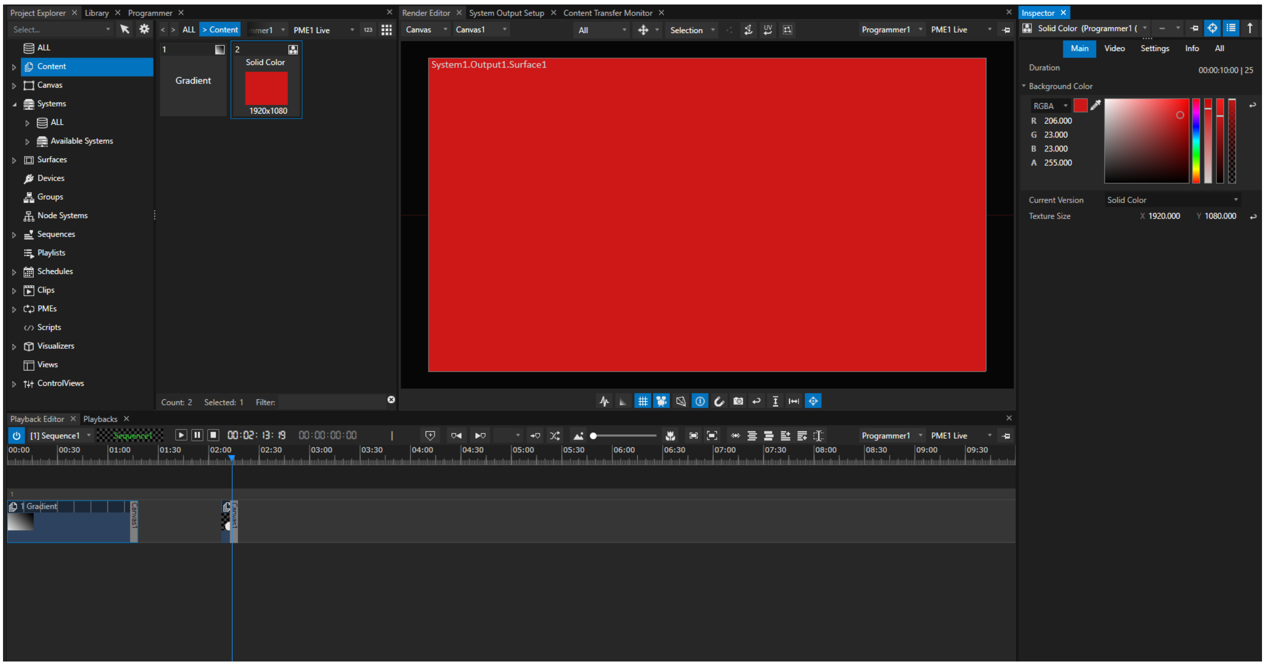
or

- go to MAIN MENU > *CREATE > Content*

> The render texture size defines the size of each of the content items below.
> By default this size is set to 1920x1080 pixel. You can change the size in the inspector

Solid Color

- solid color is a content element with a single color texture
- set color and texture size in the Inspector



Duration 00:00:10:00 | 25

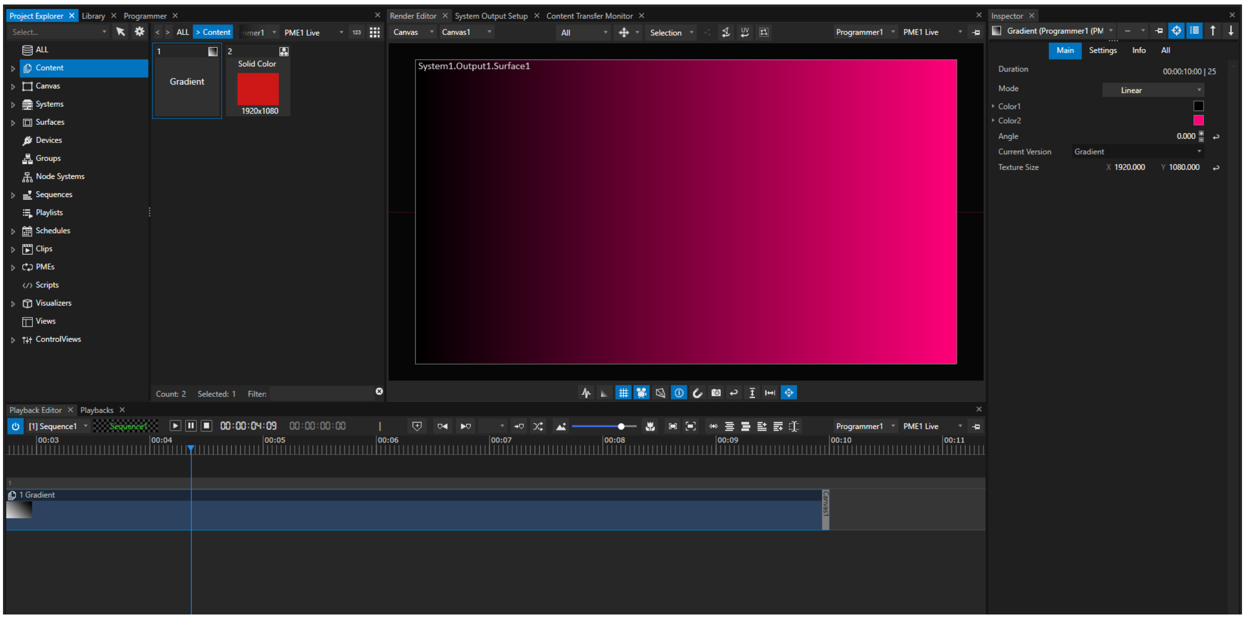
R 206.000
G 23.000
B 23.000
A 255.000

Current Version Solid Color

Texture Size X 1920.000 Y 1080.000

> After applying changes to this content item, you might have to refresh the clip container by moving the playhead in and out of the clip container in order for the changes to become effective.

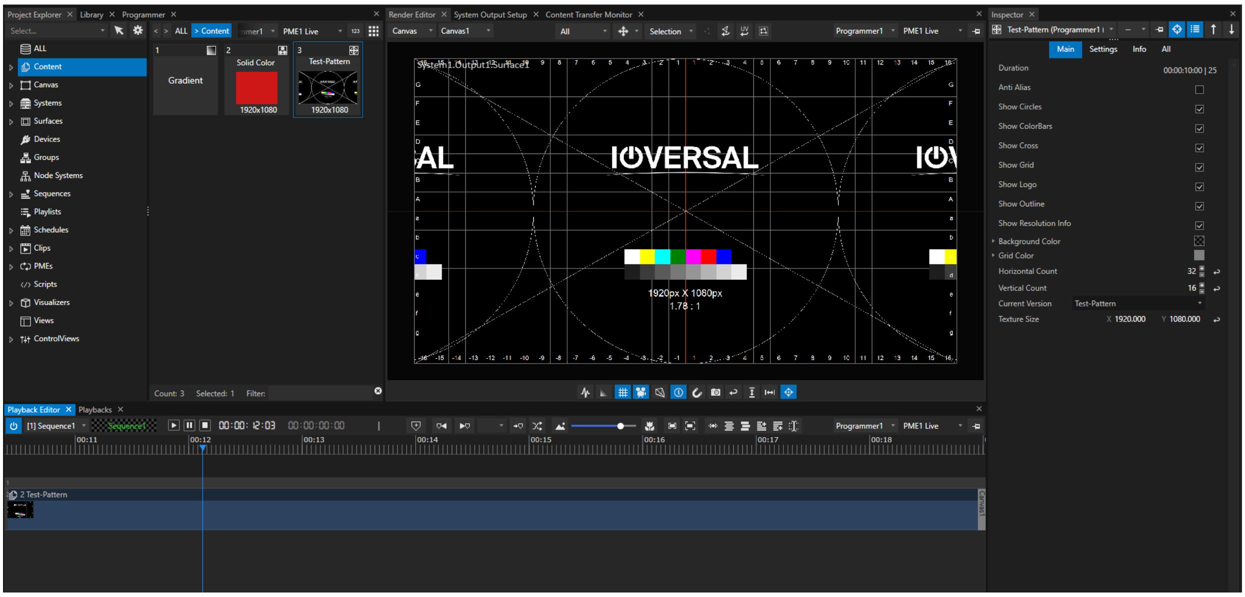
Gradient



Duration 00:00:10:00 | 25
Mode Linear
Color1
Color2
Angle 0.000
Current Version Gradient
Texture Size X 1920.000 Y 1080.000

Test-Pattern

- Based on the texture size you set in the inspector, VERTEX calculates and draws a test pattern.
- All parameters are based on the texture size and the horizontal and vertical count of elements.



Duration 00:00:10:00 | 25

Anti Alias ☐

Show Circles ☑

Show ColorBars ☑

Show Cross ☑

Show Grid ☑

Show Logo ☑

Show Outline ☑

Show Resolution Info ☑

Background Color

Grid Color

Horizontal Count 32

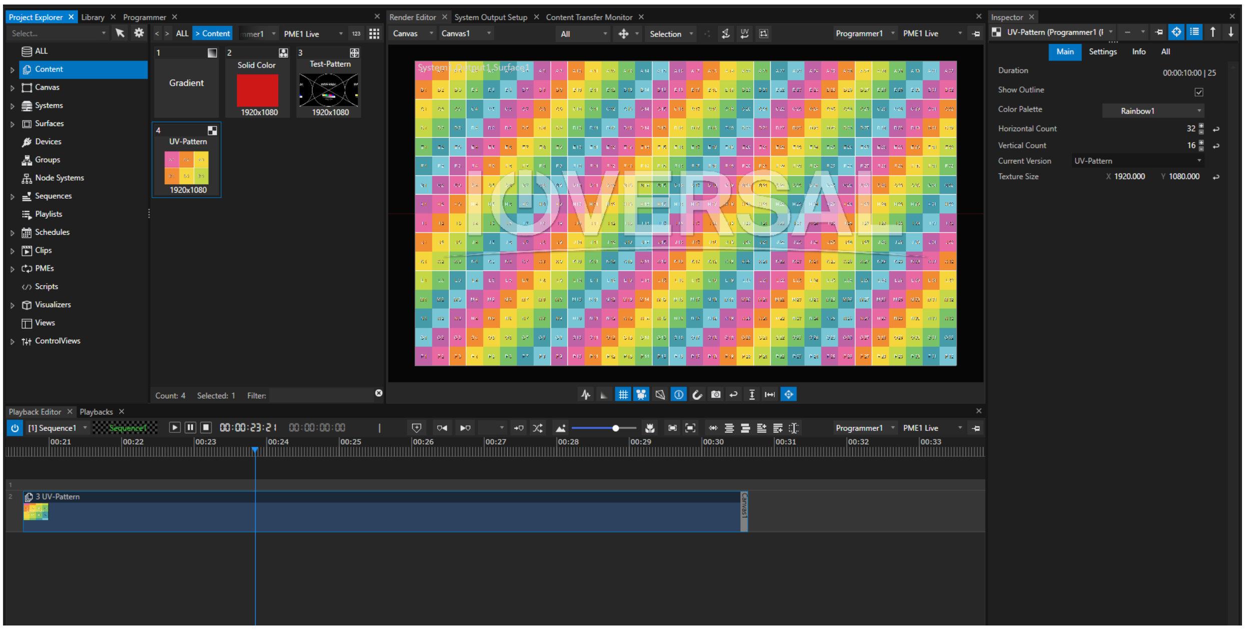
Vertical Count 16

Current Version Test-Pattern

Texture Size X 1920.000 Y 1080.000

UV-Pattern

- Based on the texture size you set in the inspector, VERTEX calculates and draws a UV-Test-Pattern.
- All parameters are calculated based on the texture size.



Duration 00:00:10:00 | 25

Show Outline ☑

Color Palette Rainbow1

Horizontal Count 32

Vertical Count 16

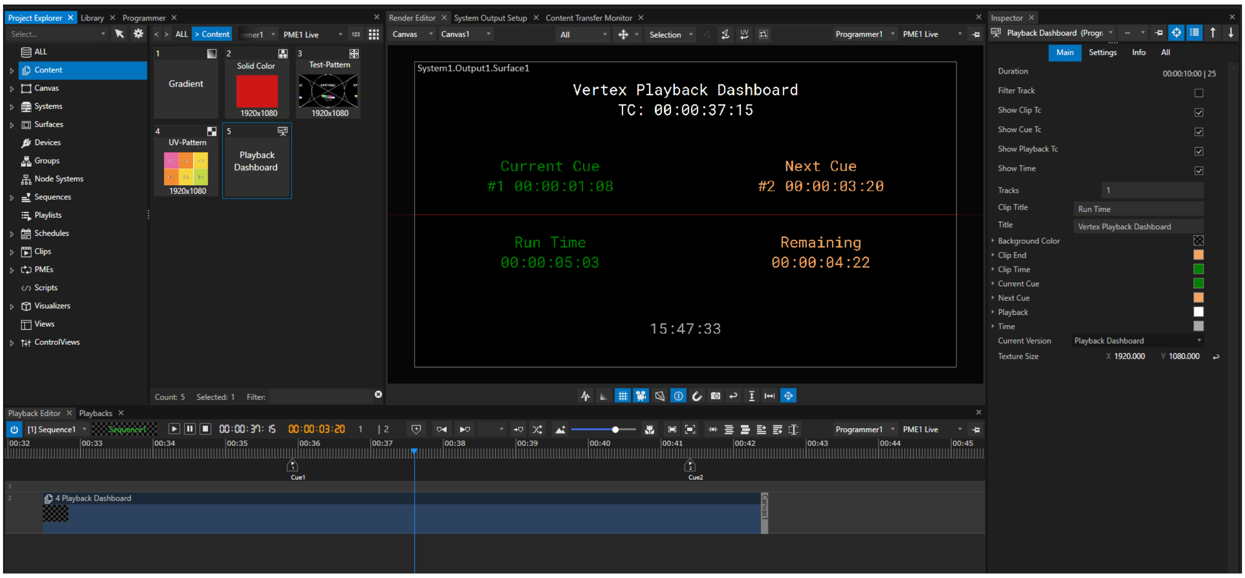
Current Version UV-Pattern

Texture Size X 1920.000 Y 1080.000

After applying changes to this content item, you might have to refresh the clip container by sliding the playhead in and out of the clip container in order for the changes to become effective.

Playback Dashboard

- Based on the texture size you set in the inspector, VERTEX calculates and draws a playback dashboard.
- All parameters and information are based on the timecode and the cue positions of your playback.



System1.Output1.Surface1

Vertex Playback Dashboard
TC: 00:00:37:15

Current Cue
#1 00:00:01:08

Next Cue
#2 00:00:03:20

Run Time
00:00:05:03

Remaining
00:00:04:22

15:47:33

Duration 00:00:10:00 | 25
Filter Track □
Show Clip Tc ☑
Show Cue Tc ☑
Show Playback Tc ☑
Show Time ☑
Tracks 1
Clip Title Run Time
Title Vertex Playback Dashboard
Background Color
Clip End
Clip Time
Current Cue
Next Cue
Playback
Time
Current Version Playback Dashboard
Texture Size X 1920.000 Y 1080.000

After applying changes to this content item, you might have to refresh the clip container by sliding the playhead in and out of the clip container in order for the changes to become effective.

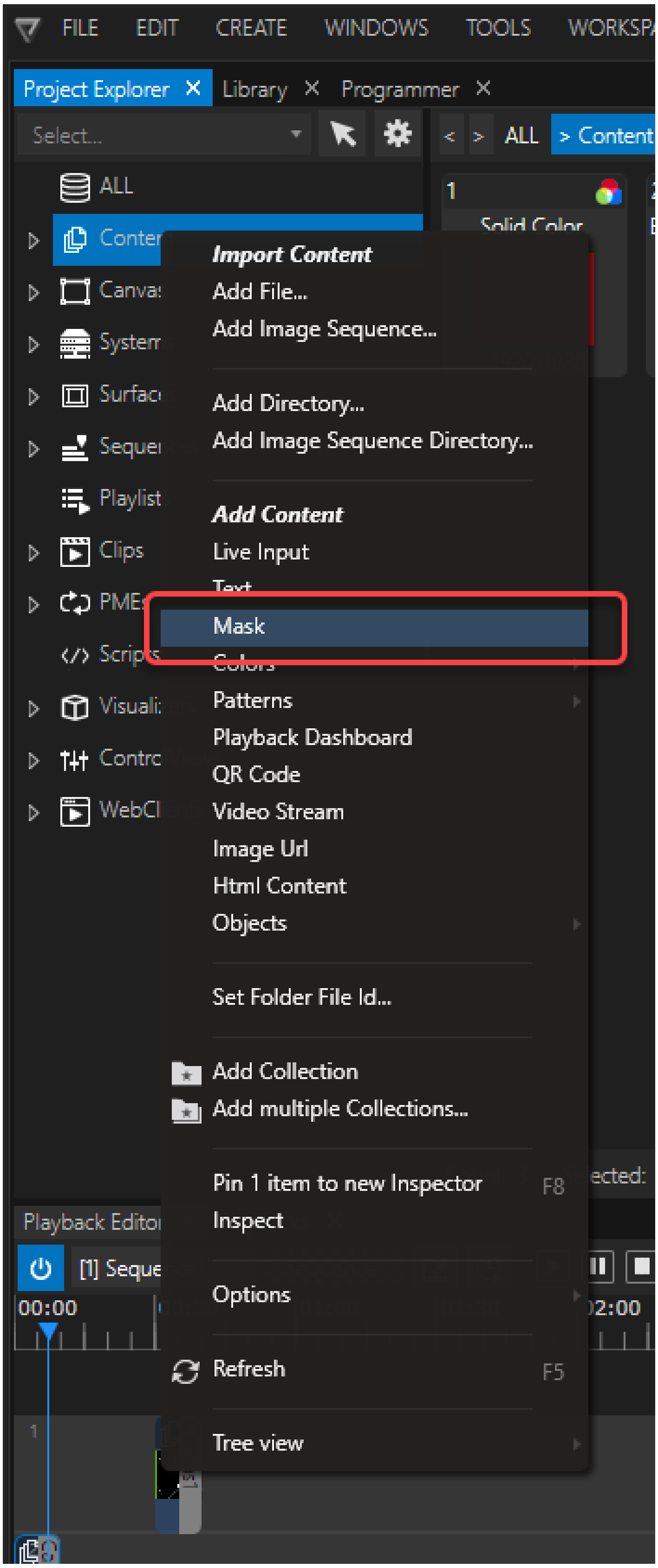
4.6.12 Mask

VERTEX offers various ways to use a masking tool - one of them is the generative mask.
Masking effects are an efficient way to single out a particular area of your video texture that you want to reveal, hide or modify in other ways.

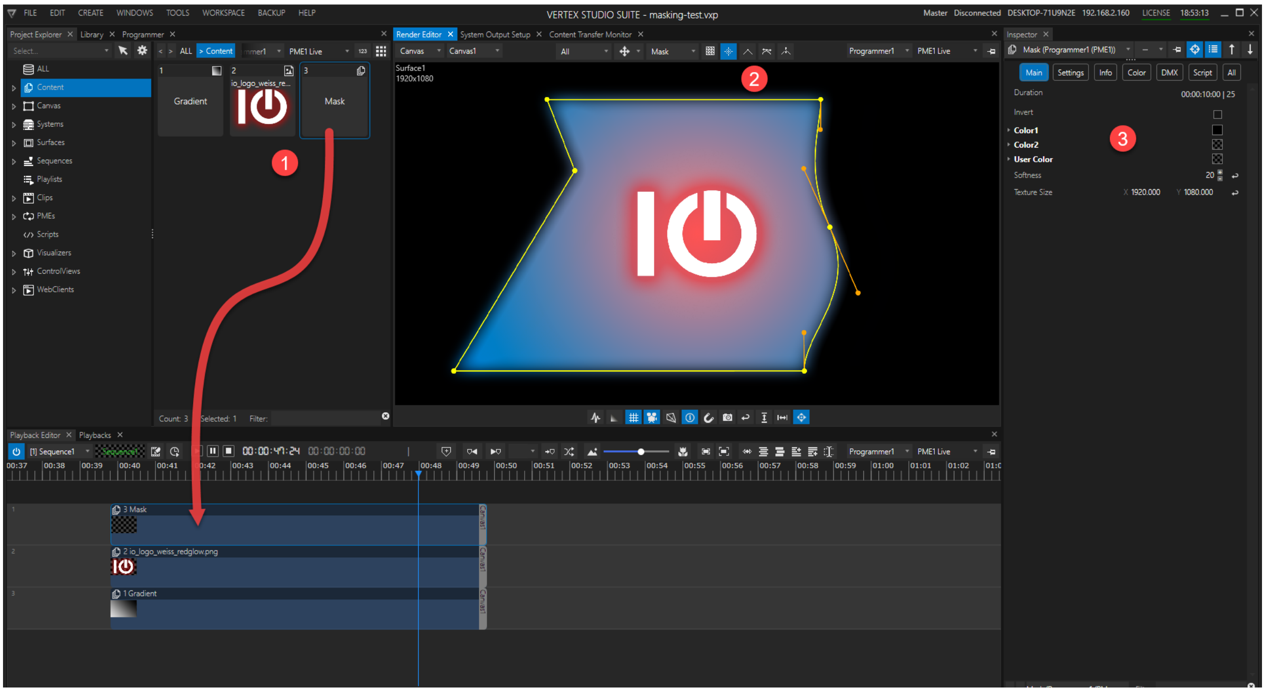
How To Create A Mask

Either go to *MAIN MENU > CREATE > Content > Mask*

or
right-click on *Project Explorer > Content* and select *Mask* from the *Add Content* context menu.



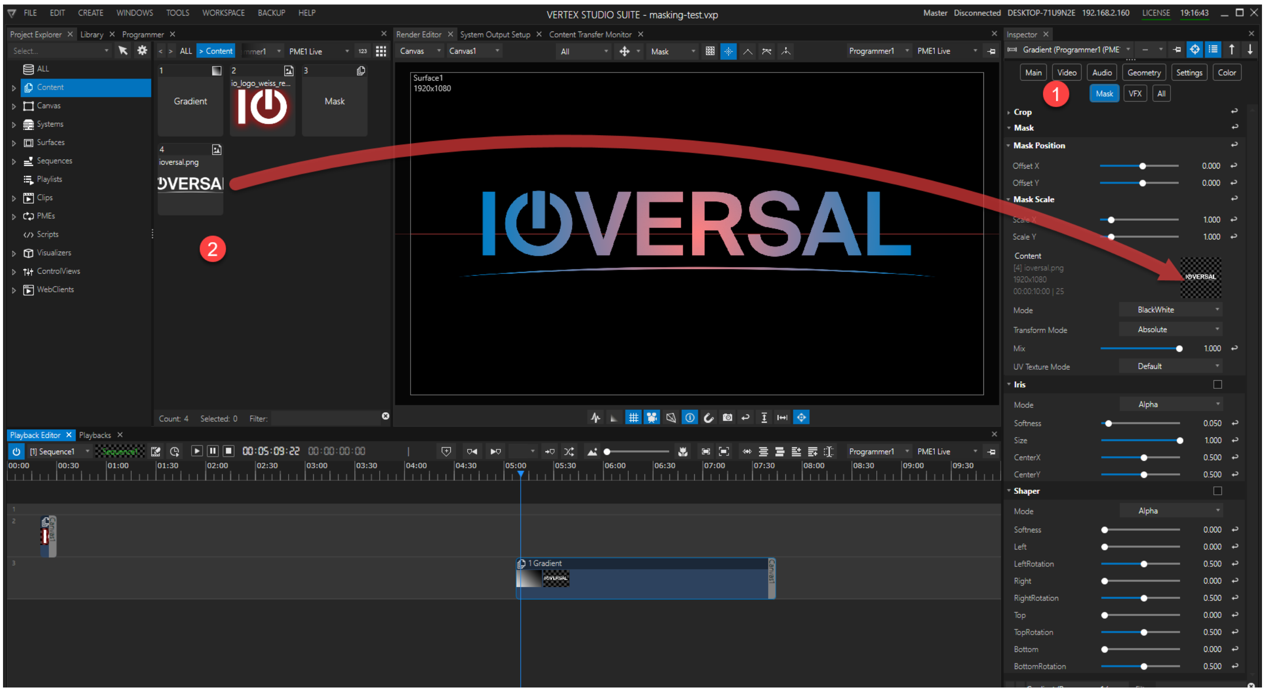
How To Apply And Edit A Mask



1. Drag your new mask from *Project Explorer* to *Playback Editor* and drop it on a track in your timeline above the composition you would like to mask.
2. The Render Editor switches automatically to the editing tools for your new mask modifier. Here you can edit your mask by adding/ deleting points to the outline.
3. For a gradual transition between foreground and background, go to the Inspector and set your desired *Softness* level. Here you can pick colors for your mask or invert foreground and background.

Masking Tools Within A Clip Container

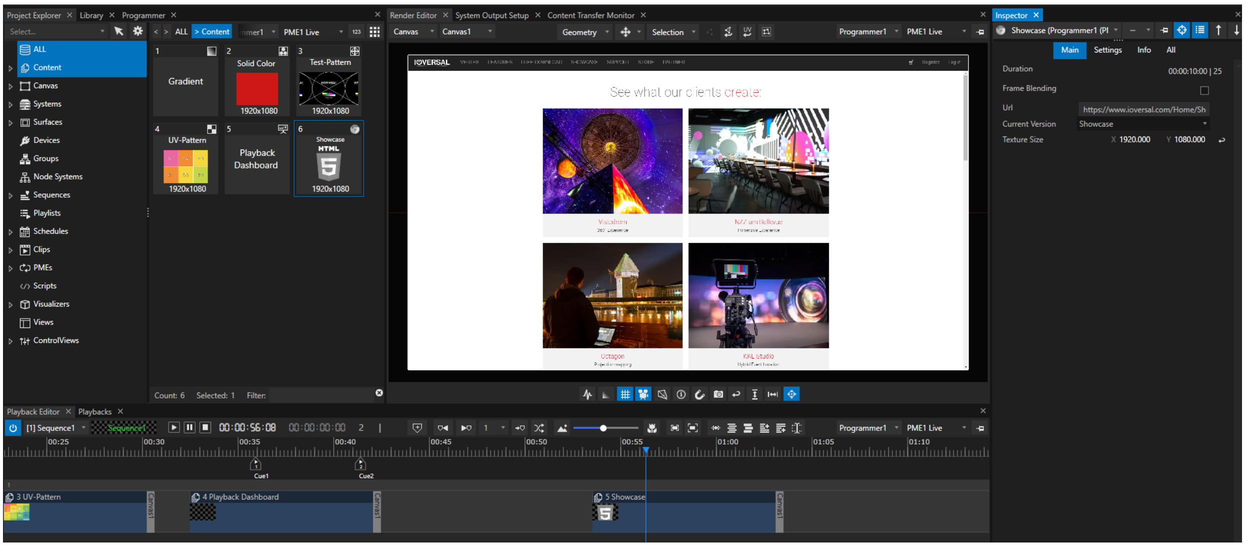
At times it can be convenient to store a mask within a particular *Clip Container*. Not only a generative mask but pretty much any visual content can be added to a *Clip Container* as a mask:



1. Inspect the *Clip Container* you would like to add a mask to and go to the *Mask* tab.
2. Drag your mask content from the Project Explorer and drop it into the *Content* field of the Inspector's *Mask* tab. Set the desired mix level, modes, scaling and position.

4.6.13 HTML-Content

- VERTEX offers a **HTML 5 render engine** - a browser based on the chromium code
- VERTEX HTML content **supports all common browser functionality** including JavaScript - for tasks like CSS Animations
- Works with both **local HTML pages or internet/intranet URL**

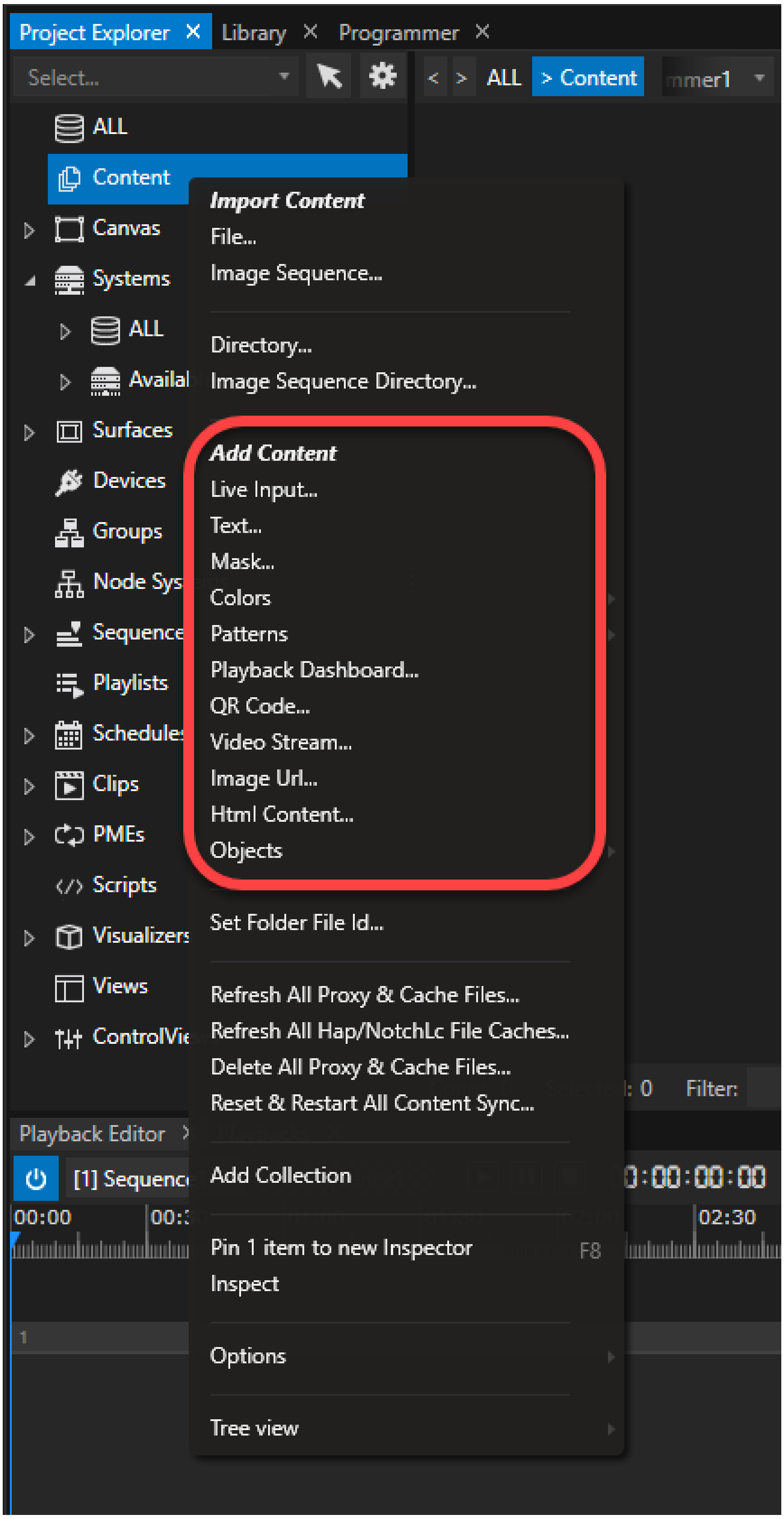


Add HTML Content to your Project

1. Go to project explorer
2. Right-click in the content section to open context menu
3. select ***Add...HTML Content***

or

Go to the main menu at the top bar and select ***Create -> Content -> HTML Content***


Project Explorer
Library
Programmer
Select...
ALL
> Content
mmer1
ALL
Content
Canvas
Systems
ALL
Availal
Surfaces
Devices
Groups
Node Sys
Sequence
Playlists
Schedules
Clips
PMEs
Scripts
Visualizers
Views
ControlVie
Import Content
File...
Image Sequence...
Directory...
Image Sequence Directory...
Add Content
Live Input...
Text...
Mask...
Colors
Patterns
Playback Dashboard...
QR Code...
Video Stream...
Image Url...
Html Content...
Objects
Set Folder File Id...
Refresh All Proxy & Cache Files...
Refresh All Hap/NotchLc File Caches...
Delete All Proxy & Cache Files...
Reset & Restart All Content Sync...
Add Collection
Pin 1 item to new Inspector
F8
Inspect
Options
Tree view
: 0
Filter:
Playback Editor
[1] Sequenc
0:00:00:00
00:00
00:3
02:30
1

Settings

URL

- can be an internet or intranet URL
- could also be a file path to a local HTML file

Make sure

- that the systems that render URL content have internet/intranet access.
- the system's fullscreen interaction settings enable the use of mouse or keyboard for full web browser functionality.

ⓘ Opacity/Transparency for HTML 5 is supported by the VERTEX HTML Browser Engine

Render Texture Size

- The render texture size defines the size of your HTML browser item.
- By default this size is set to 1920x1080 pixel. You can change the size in the inspector.
- If using responsive web content that is optimized for tablets or mobile phones, the view mode of the HTML content is adapted responsive for small render texture sizes.

FPS

- Frames per Second (FPS) defines how often the browser engine renders and refreshes your HTML content. Please keep in mind, that this number is related to the number of frames the browser engine renders the HTML content and not on URL reloading.

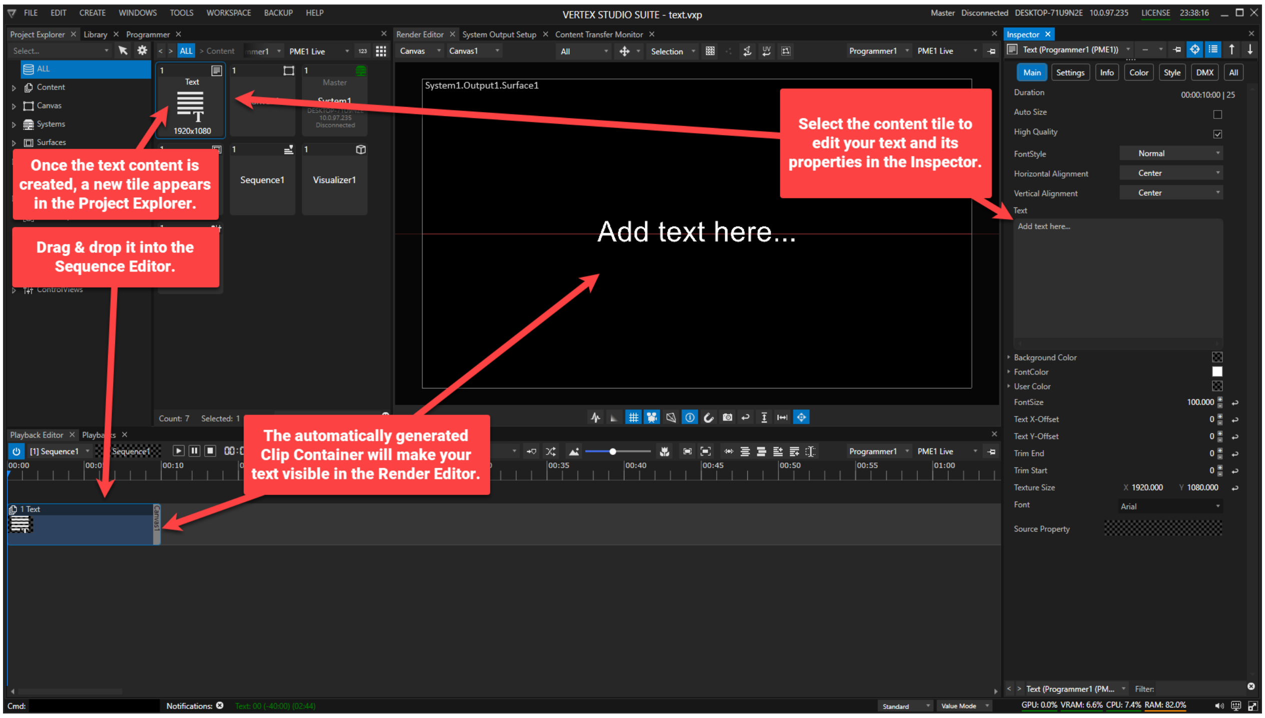
! To save your system's resources, dial down the FPS on static HTML pages without CSS Animations to 1.
Each HTML content in VERTEX opens its own browser engine. When woking with different HTML content elements or big render texture sizes, a lower FPS number for HTML rendering can save processing power of your render editor or the fullscreen renderer.

4.6.14 Text

- This feature **generates a text based content**.
- **Font, size, color and background** can be adjusted in the inspector.
- All **fonts installed under Windows** are supported.

Working with Text Content

- Text content can be added via context menu by right-click on *CONTENT* in the Project Explorer.
- Alternatively, go to: *MAIN MENU > CREATE > CONTENT > TEXT*



Once the text content is created, a new tile appears in the Project Explorer.

Drag & drop it into the Sequence Editor.

Select the content tile to edit your text and its properties in the Inspector.

The automatically generated Clip Container will make your text visible in the Render Editor.

- The Inspector setting for *Source Property* can be used to display any value VERTEX processes. If you wish to incorporate any values in addition to your text, please type *{0}* into the text field.
- **Additional fonts can be installed under Windows** in the usual way - double click on the .ttf file and **install on all Session Members.**
  In order to display custom fonts in VERTEX' WebView, you need to **copy the .ttf file to the directory *C:\Users\Public\Documents\ioversal\Vertex\User\Fonts* on the System that is hosting WebView.**

Texture Size

As for all other content items in VERTEX, the texture size defines the pixel size of your text element.

By default this size is set to 1920 x1080 px but can be adjusted to your needs.

4.7 Create your first project

- Whether you are a beginner or an expert - we want your start with VERTEX to be **as easy as possible**.
- When creating a **new project VERTEX** handles some **settings in the background to give you a comfortable start**.
- Both Workspace and Output Settings are **preconfigured based on your Windows System settings**.

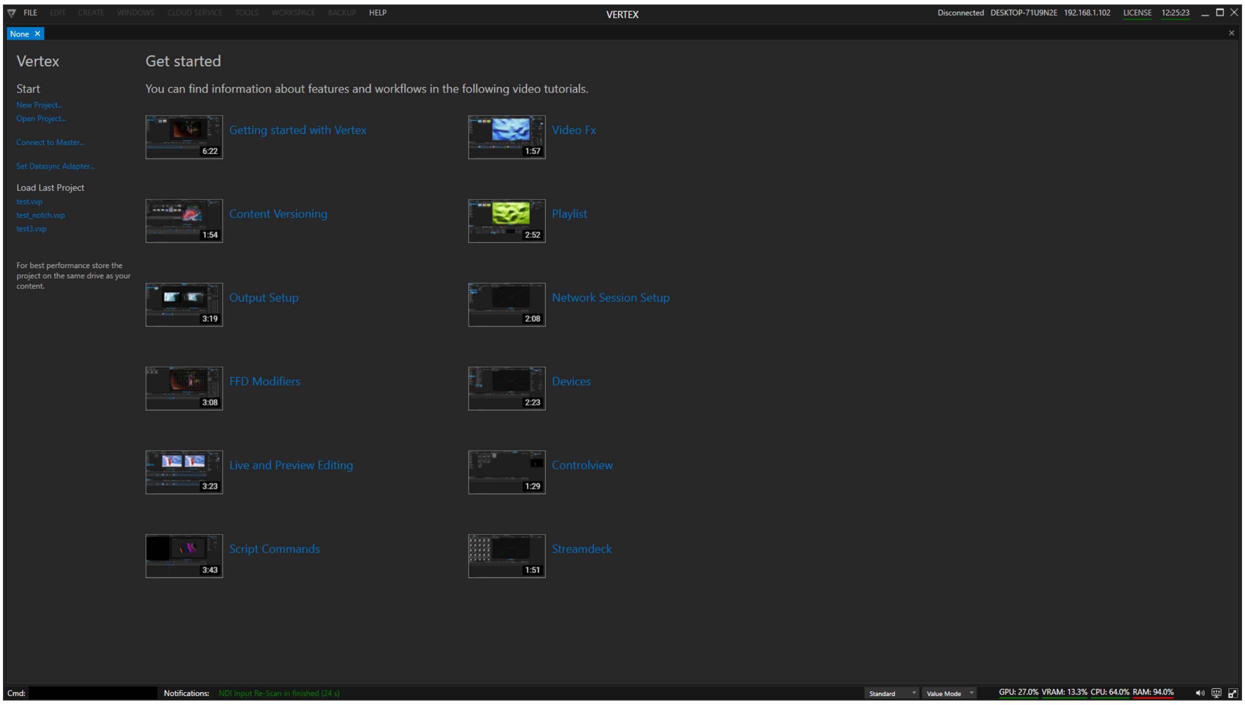
Steps

1. Install VERTEX

Need help? Here is a step by step guide with all information: [Installation](#)

2. Start VERTEX

VERTEX starts with a splash screen that is shown for a short time
The UI is loaded and you will see the Startup Page first



Vertex

Start
New Project...
Open Project...

Connect to Master...

Set Datasync Adapter...

Load Last Project
test.vxp
test_notch.vxp
test3.vxp

For best performance store the project on the same drive as your content.

Get started

You can find information about features and workflows in the following video tutorials.

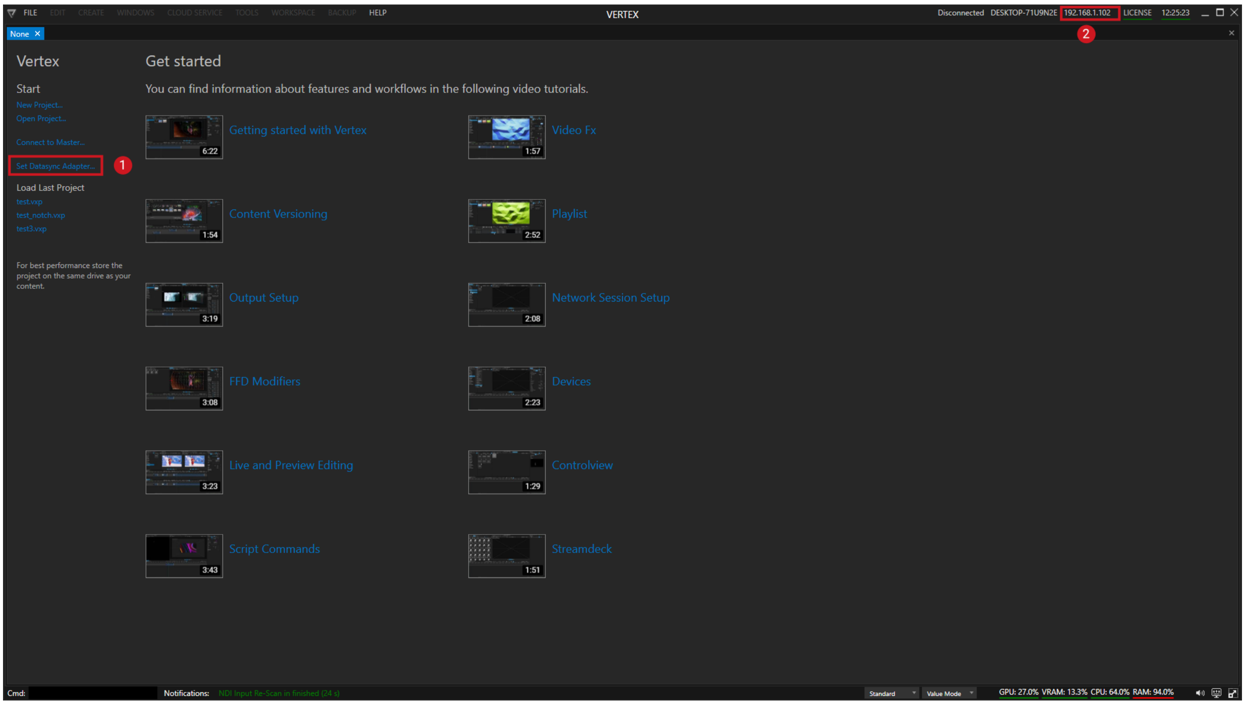
Getting started with Vertex
Video Fx
Content Versioning
Playlist
Output Setup
Network Session Setup
FFD Modifiers
Devices
Live and Preview Editing
Controlview
Script Commands
Streamdeck

Notifications: NDI Input Re-Scan in finished (24 s)

GPU: 27.0% VRAM: 13.3% CPU: 64.0% RAM: 94.0%

3. Check/Set Data Sync Adapter

When you want to use your VERTEX System in a network session with other VERTEX Systems, please double check for the right Data Sync Adapter.
This can avoid hassle later on when setting up a session.



You can find information about features and workflows in the following video tutorials.

For best performance store the project on the same drive as your content.

NDI Input Re-Scan in finished (24 s)

1	Select "Set Datasync Adapter" to initially set your preferred network adapter. If Ethernet is available, we strictly recommend to used a fast and cabled network instead of a wireless one
2	The Data Sync IP is shown at the Top bar. Please check if the correct IP address is displayed there. If no IP is displayed, please set Data sync Adapter again

4. Create a new VERTEX project

Project Path
To run VERTEX with the best playback performance, we strictly recommend to store your VERTEX project folder on the same drive as your content is located.
Please use a fast drive for both to ensure an optimal performance of the software.

5. Wait until the project is created and ready to work on

The project will be loaded and ready to go for your first experience with VERTEX-

You will see:

- **a preconfigured Workspace**
  with the most important tools and windows

- **a preconfigured Canvas and Output Configuration**
  The Canvas size matches with the Windows 10 screen settings of your local System. Canvas 1 is preconfigured with the total pixels of the Windows 10 desktop you have set. For each the outputs that are already connected to your PC a Surface is created and already assigned to your Canvas.

Setup Example
2 Full-HD Screens are connected to your hardware System. Both screens are arranged side by side into your GPU driver/the Windows 10 desktop settings. Your initial Canvas size is 1920 x 2 = 3840 pixel width and 1080 pixels in height.
For each the Screens that are connected to one of your GPU outputs, VERTEX creates a Surface with 1920x1080px. The initial arrangement of this Surface into your VERTEX Canvas should match with the settings you have made for your Windows 10 desktop.

6. Explore and learn VERTEX

Learn the VERTEX basics or **explore** the software by yourself:

a. Check out ioversal's Youtube channel for **quick-start and expert level tutorials**

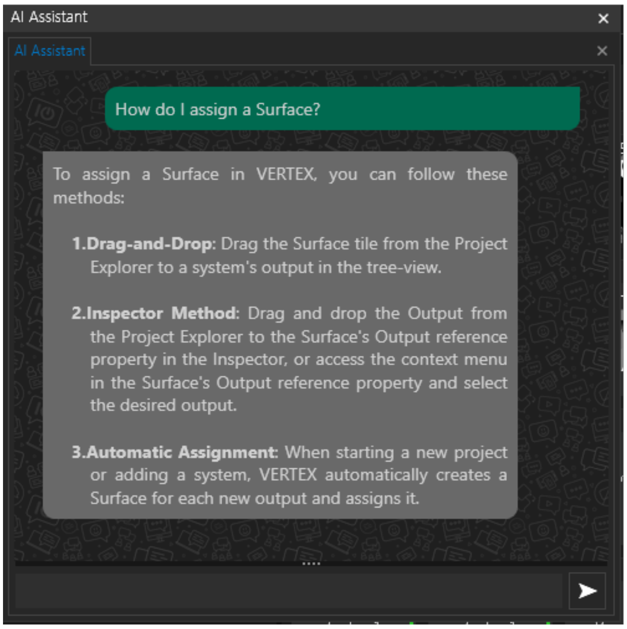
b. **Read this manual** and **follow the next steps**:

- Familiarize yourself with the user interface
- Import Content
- Manage Content
- Arranging Content
- Set Outputs
- Playback Live and/or in Preview

4.7.1 AI-Assistant

To open VERTEX's helpful AI-Assistant, go to MAIN MENU > WINDOWS > AI Assistant

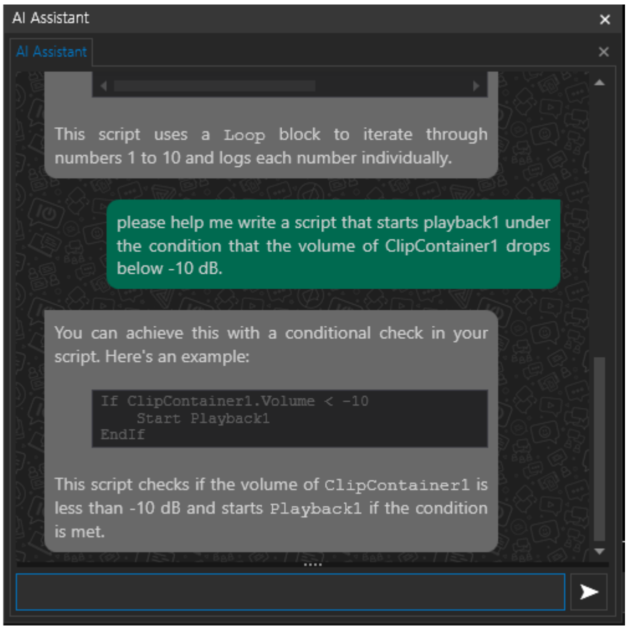
Type in any question on how to use certain features or workflows. The AI will also assist you with script syntax and writing complex script codes for your project.



How do I assign a Surface?

To assign a Surface in VERTEX, you can follow these methods:

1. **Drag-and-Drop**: Drag the Surface tile from the Project Explorer to a system's output in the tree-view.
2. **Inspector Method**: Drag and drop the Output from the Project Explorer to the Surface's Output reference property in the Inspector, or access the context menu in the Surface's Output reference property and select the desired output.
3. **Automatic Assignment**: When starting a new project or adding a system, VERTEX automatically creates a Surface for each new output and assigns it.



This script uses a `Loop` block to iterate through numbers 1 to 10 and logs each number individually.

please help me write a script that starts playback1 under the condition that the volume of ClipContainer1 drops below -10 dB.

You can achieve this with a conditional check in your script. Here's an example:

```
If ClipContainer1.Volume < -10
    Start Playback1
EndIf
```

This script checks if the volume of `ClipContainer1` is less than -10 dB and starts `Playback1` if the condition is met.

4.7.2 Manage Content

- VERTEX offers you **different tools** to support you in **managing and structure** your project assets
- **User Properties** help you to organize each single element into VERTEX **with meta data** and specific color
- With **Collection and Groups**, you are able to structure content and items into the Project Explorer
- VERTEX comes with an easy-going **versioning** feature: Just import a new version and **change the content everywhere into your playbacks**
- **Automate Content Import and Playlist/Sequence creation with WatchFolders**
- Set **Target Systems** to transfer a content only to a certain System

Metadata: User Properties

Set custom User Properties for each item: Content, Clip Containers and Devices. Add personal notes to remember

- Notes
- ID
- Name
- User Color

- Tags

Content Management Window

VERTEX comes with a neat multi-tool to supervise and manage your content across all Systems.
Read more...

Project Explorer

Order Content, Devices and all other items into Project Explorer. Create your own project structure by using Collections as folders for your favorite items:

- Collections
- Groups

Content Versioning

Import new versions of your content and easily switch between versions: The new content version is automatically replaced on all places into your projects where it is used.
Check the Topic below for more details:

- Versioning

WatchFolder

Observe Windows folders. VERTEX automatically imports new files to your project. You are able to let VERTEX create Playlists or Sequences based on this content

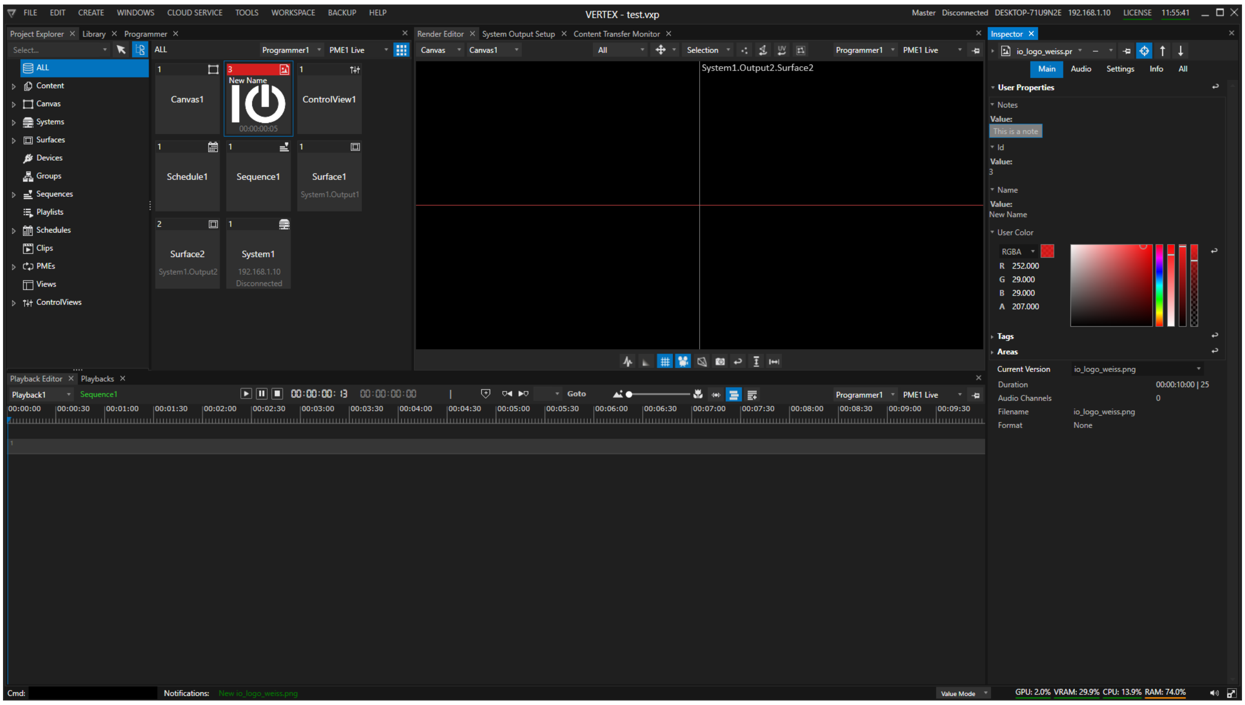
- WatchFolder

4.7.2.1 User Properties

- Users can **customize key properties** of all VERTEX items for ease of management and a convenient workflow.
- User Properties **can be set in the Inspector** and include:
- Name, ID, color and even notes

Notes

- You can add notes for **every item** of your VERTEX Project
- Notes are shown as **child elements of the "User Properties" into [Inspector](#)**
- Just **double click into the value** field to enter a new value



User Properties

Notes
Value:
This is a note

Id
Value:
3

Name
Value:
New Name

User Color
RGBA
R 252.000
G 29.000
B 29.000
A 207.000

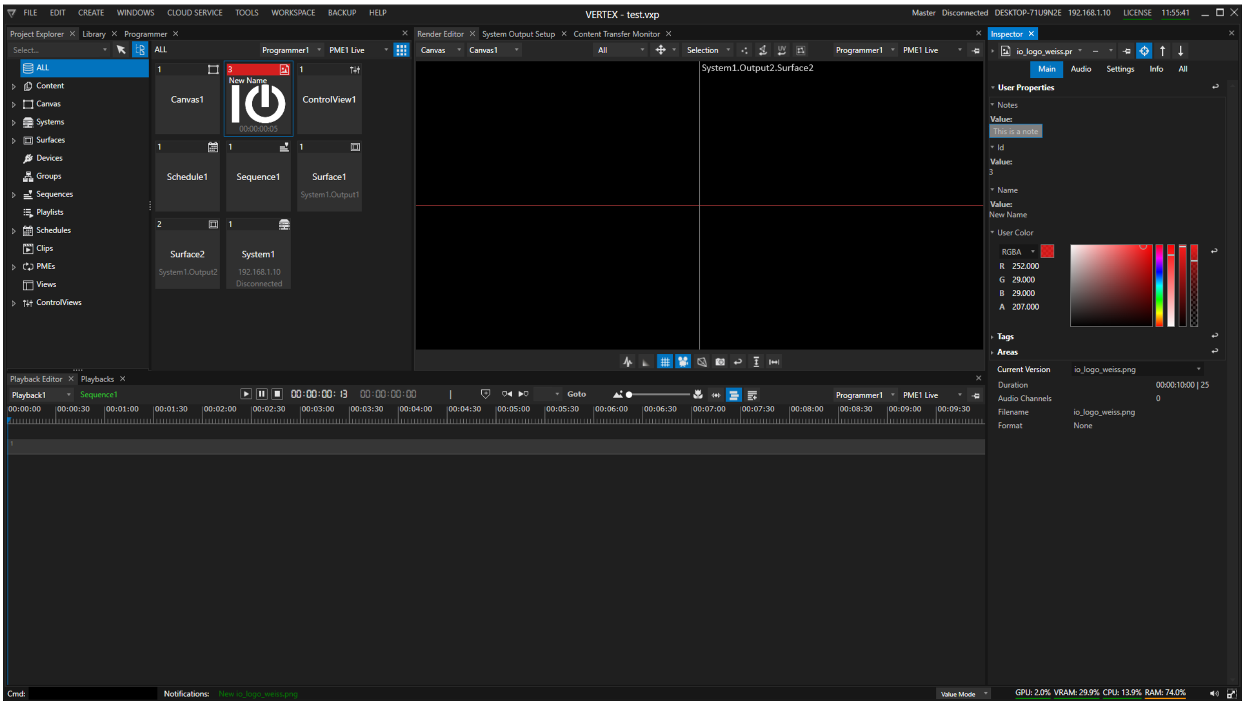
Current Version	io_logo_weiss.png
Duration	00:00:10:00 | 25
Audio Channels	0
Filename	io_logo_weiss.png
Format	None

ID

- The ID of a content is displayed into Project Explorer as number for each item
- For Clip Containers, the ID is displayed as number for each Container into playback editor
- be careful when changing this ID!

Name

- Enter a custom name for your project item
- When rename an item into Project Explorer (via context menu or via Shortcut "F2") this name also is set as name property into User Properties



User Properties

Notes
Value:
This is a note

Id
Value:
3

Name
Value:
New Name

User Color
RGBA
R 252.000
G 29.000
B 29.000
A 207.000

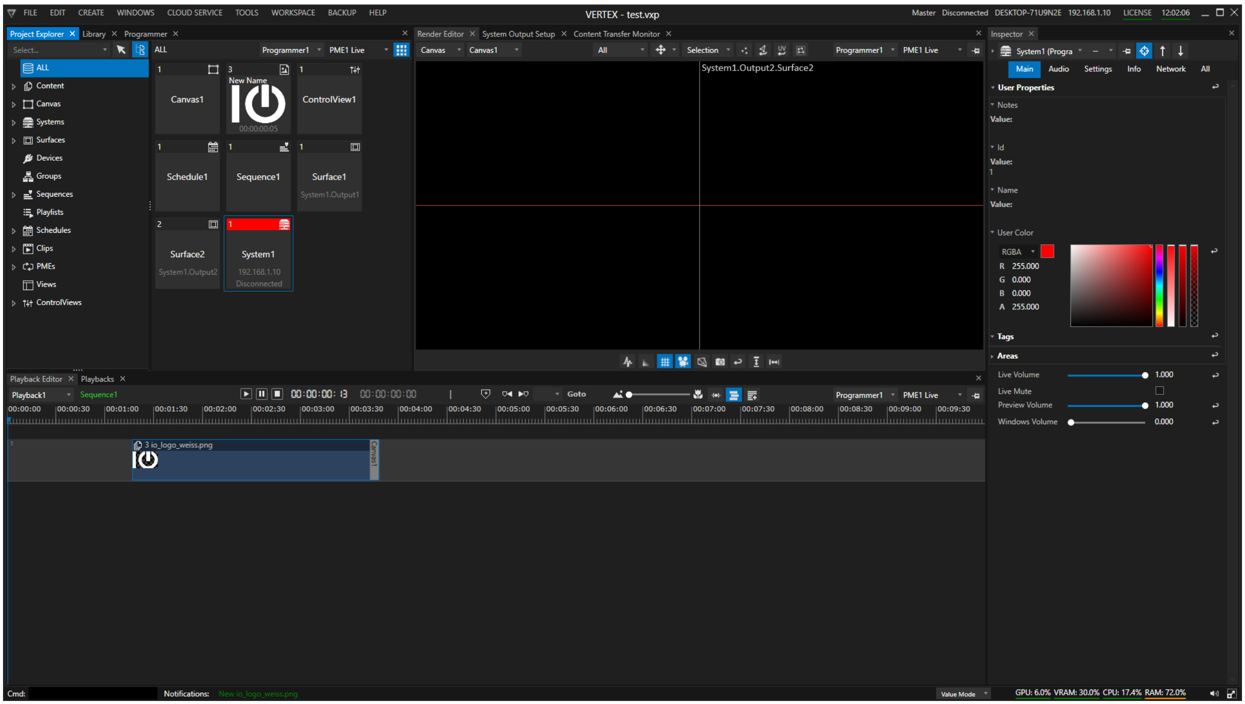
Tags
Areas

Current Version io_logo_weiss.png
Duration 00:00:10:00 | 25
Audio Channels 0
Filename io_logo_weiss.png
Format None

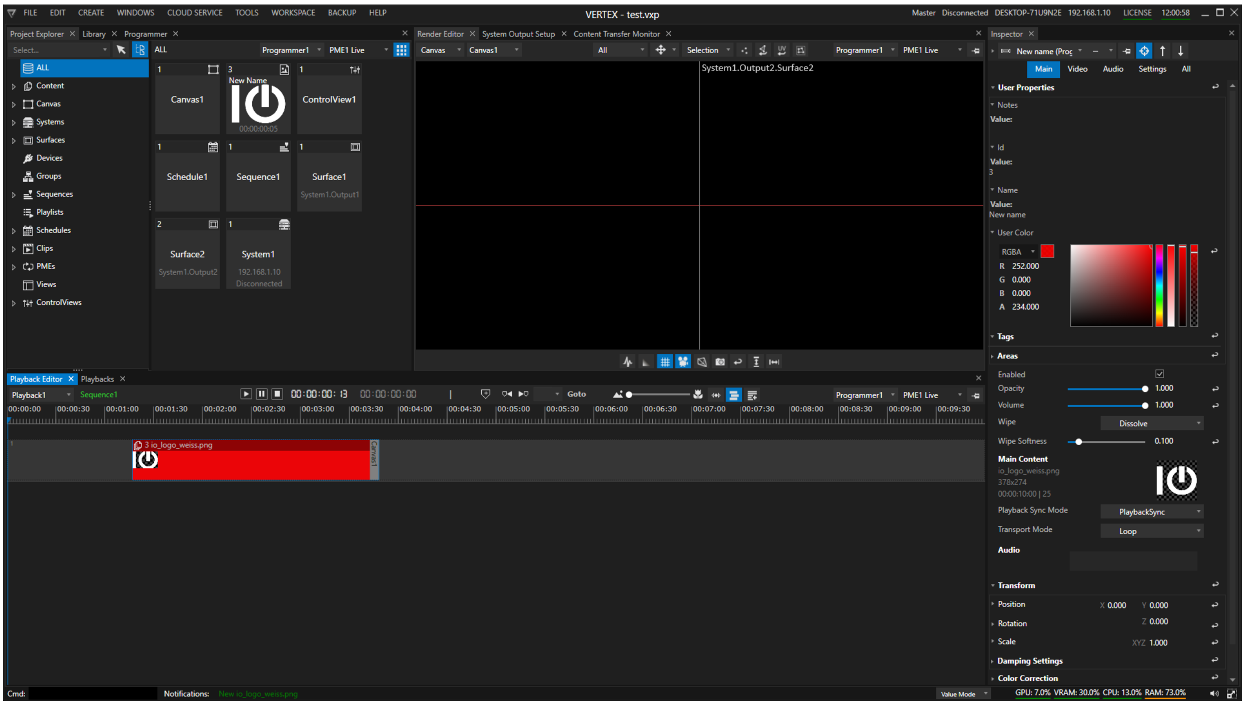
Enter a custom name for your project or content item.
The current Vertex version shows this custom name for most of the items also into Project Explorer. Please note: For some project items this is not implemted yet.

User Color

- Custom User Colors **increase your Project's visual outline in the user interface**
- **Items with a customized User Color are easier to distinguish in the Project Explorer**
- User Colors on **Clip Containers** and **Tracks** will quickly improve your orientation in the layout of a Playback Editor.



Setting User Colors and User Properties in the Inspector



Set a User Color for a Clip Container

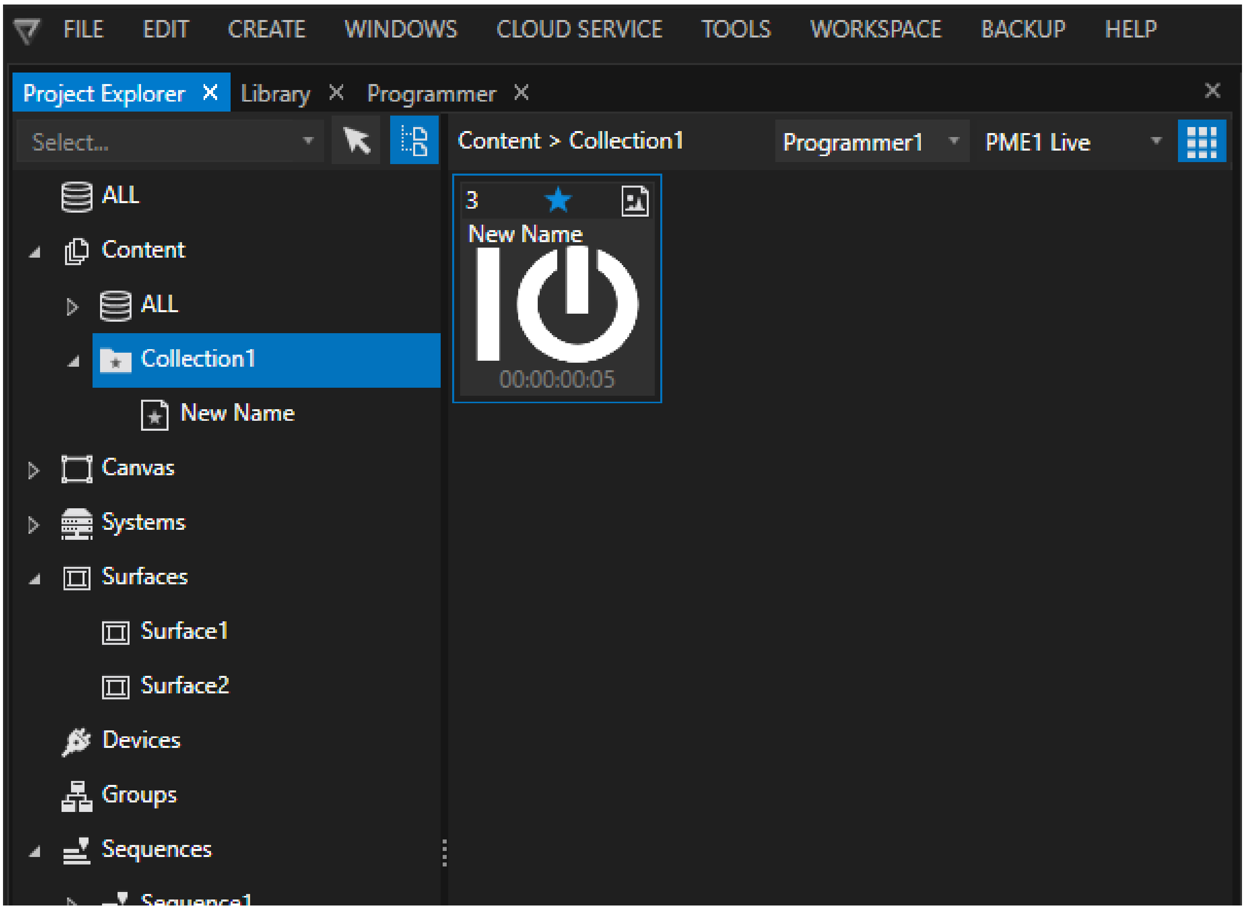
Tags

- Assign Tags to project items to order them by subject

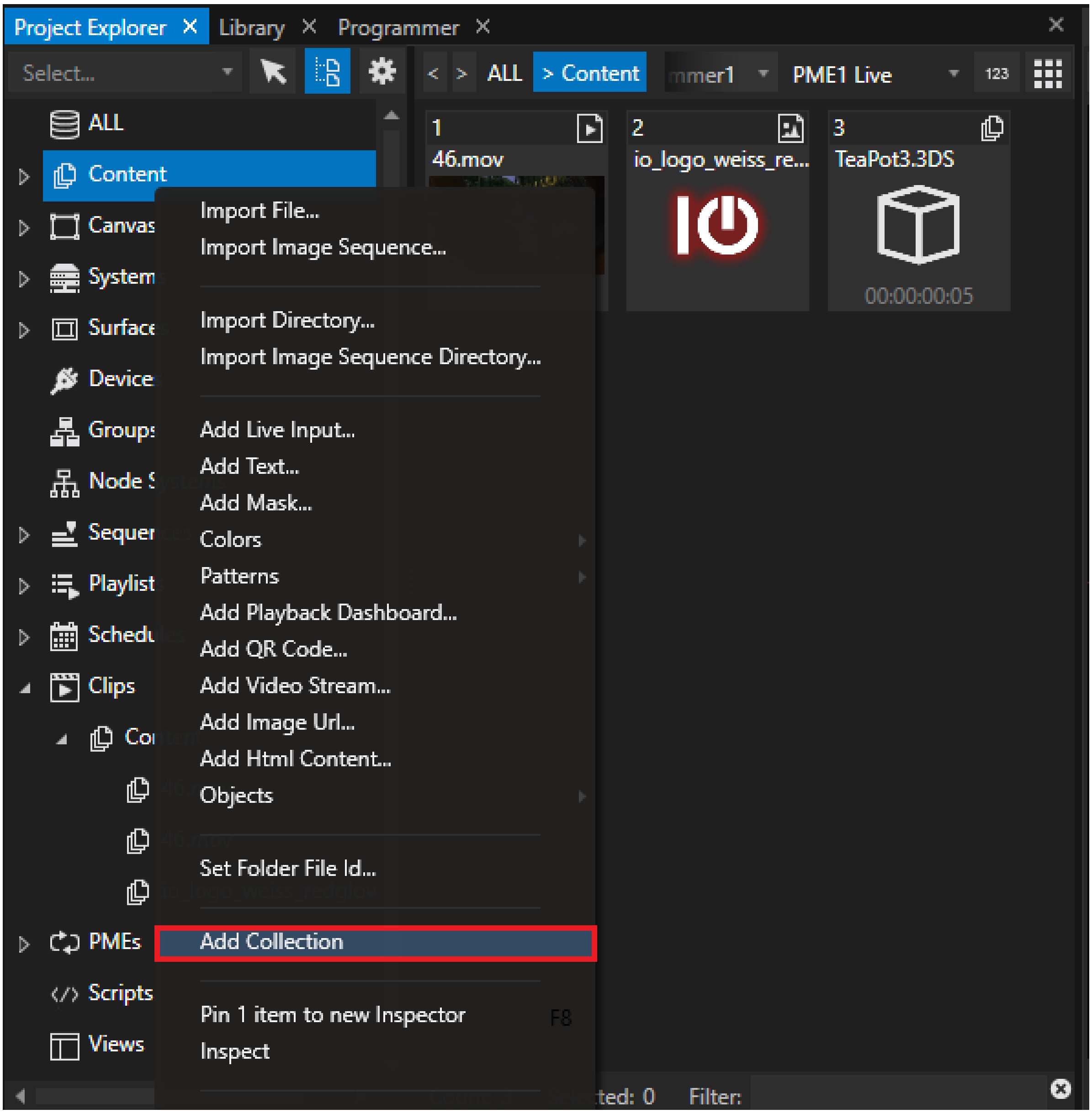
Feature is prepared but will come in a future VERTEX release
This functionality will come with future VERTEX releases and is not fully implemented yet.

4.7.2.2 Collection

- Collections are your **virtual folders**, where content and items can be sorted into and **"Bookmarked**"
- Collections **can be created for every category** into the **Project Explorer**
- When you **delete an item from a favorite folder**, it is **still available into the "All" category** - only the bookmark is deleted



Create a Collection



1. Select with your Mouse a Category into Project Explorer
2. Rightclick and open Context Menu
3. "Add Collection"
4. When a Collection is created into Project Explorer, VERTEX additionally introduces an "All" sub category where all items of your parent Category are sorted in automatically.
5. Select with your mouse an item from this "All" Category and drag it to your Collection "
6. Select the new Collection with your Mouse and enter a custom name with help of the context menu or the shortcut "F2"

- You are able to create a **Collection as a child of another Collection**.
- Create a Collection is possible **for every Category** into Project Explorer, e.g. also for Systems, Canvas, Surfaces

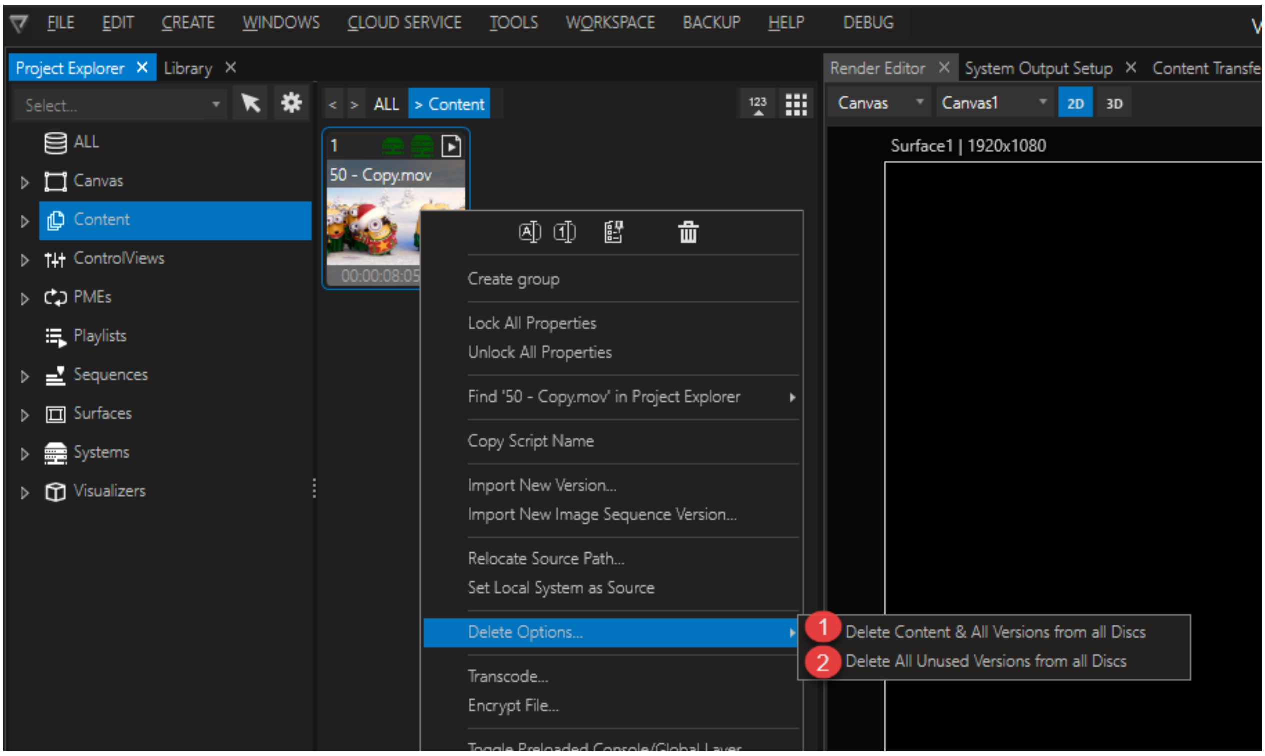
ⓘ When a Collection is created into Project Explorer, VERTEX additionally introduces an "All" sub category where all items of your parent Category are sorted in automatically.

Advanced: Content Sharing to certain Target Systems with help of Collections

- With the help of Collections you are able to create advanced content sharing presets
- Collections that are created into the "All" Category into Project Explorer can host items from different Categories - e.g. Systems and also Content
- When 1 or multiple Systems were added into this kind of Collection, all Content that is imported into this category, only is shared to this Target Systems

4.7.2.3 Delete Options in Advanced Mode

- this is a time saving feature for clean-up tasks and compacting your project
- unlock it by going to the Inspector Mode drop-down menu in the taskbar
- switch from *Standard* to *Advanced*
- then access the *Delete Options* from the Project Explorer's context menu



The two options are self-explanatory:

1 - delete specific content and all of its versions from all connected discs.

2 -only delete unused versions of selected content from all connected discs.

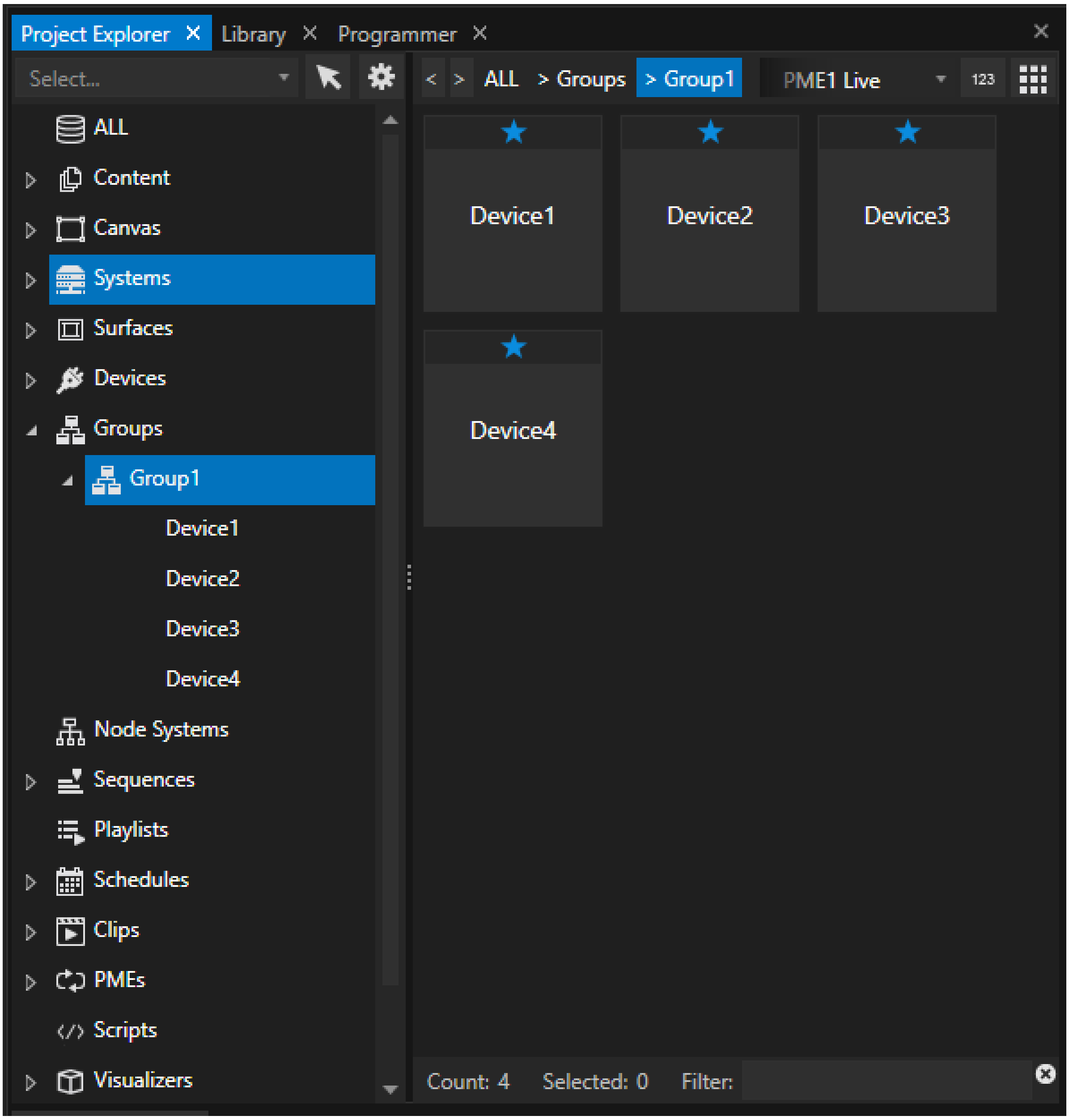
This will affect also source files on source systems. If you have a project with multiple systems, please keep in mind that only active & connected systems will have that content deleted. Once that information is gone with the deleted file, systems re-connected thereafter will not be able to perform that task again.

4.7.2.4 Groups

- Grouping is a good way to **effortless manage a bunch of devices.**
- **Control a large number of devices** with the help of groups.
- With **shared device groups** you are able to control all devices of a group from **only one clip container** in your sequence.

In the current assembly version of VERTEX the group functionality is supported for devices only. More will come with future releases.

Create a group and assign Devices



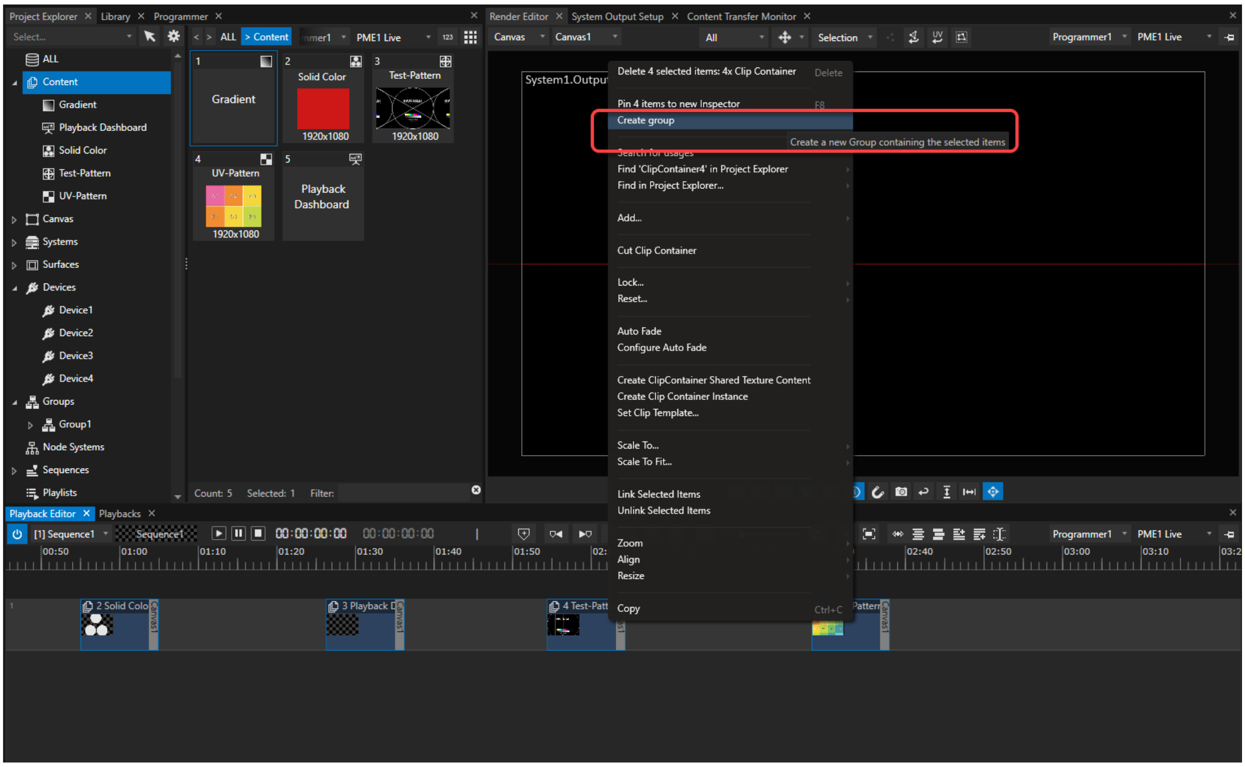
1. navigate to the group section in the project explorer
2. right-click with your mouse on ***Groups*** to open the context menu
3. select ***Create Group***
4. a new group is created
5. rename this new group (with help of the context menu or by pressing the shortcut "f2")
6. go to the device section of the project explorer
7. select all devices that should be into this group
8. drag them with your mouse to the group

or

1. go to the device section of the project explorer
2. select all devices that should be part of a new goup
3. open the context menu with a right click
4. select ***Create Group***
5. a new group is created - all selected devices are part of this new group

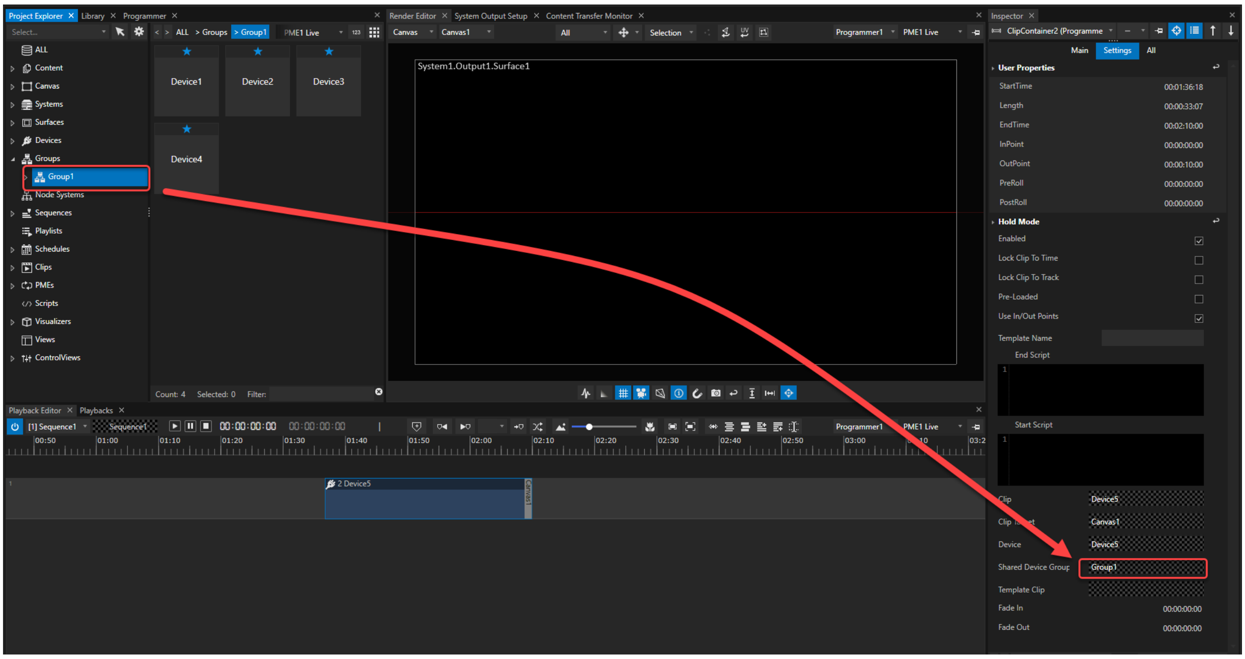
Group of Clip Containers out of Playback Editor

- Select ClipContainers in the Playback Editor
- RightClick an open Context Menu
- Select "Create Group"
- A new group is created in the Project Explorer - Group Section
- All selected Clip Containers are member of this Group
- The Clip Containers are not linked to each other!


Delete 4 selected items: 4x Clip Container Delete
Pin 4 items to new Inspector F8
Create group
Create a new Group containing the selected items
Search for usages
Find 'ClipContainer4' in Project Explorer
Find in Project Explorer...
Add...
Cut Clip Container
Lock...
Reset...
Auto Fade
Configure Auto Fade
Create ClipContainer Shared Texture Content
Create Clip Container Instance
Set Clip Template...
Scale To...
Scale To Fit...
Link Selected Items
Unlink Selected Items
Zoom
Align
Resize
Copy Ctrl+C

Shared Device Group

- Shared Device Groups allow you to **control all items of a group from a single device**
- Shared Device Groups can be can be assigned for each **clip container of a device**
- Shared Device Groups **are assigned in the inspector for a device clip container**



User Properties

StartTime	00:01:36:18
Length	00:00:33:07
EndTime	00:02:10:00
InPoint	00:00:00:00
OutPoint	00:00:10:00
PreRoll	00:00:00:00
PostRoll	00:00:00:00

Hold Mode

Enabled	☑
Lock Clip To Time	□
Lock Clip To Track	□
Pre-Loaded	□
Use In/Out Points	☑
Template Name	

End Script

Start Script

Clip	Device5
Clip Target	Canvas1
Device	Device5
Shared Device Group	Group1
Template Clip	
Fade In	00:00:00:00
Fade Out	00:00:00:00

Set up a Shared Device Group

1. create a clip container for one of your devices: drag the device into the playback editor
2. select this clip container and
3. access its settings in the inspector
4. use your mouse to drag a group from the project explorer into the shared device group property field in the inspector
5. now all settings for this device clip container are shared with all other devices of the group
6. when adding new devices to your group, all settings are also shared with this new devices

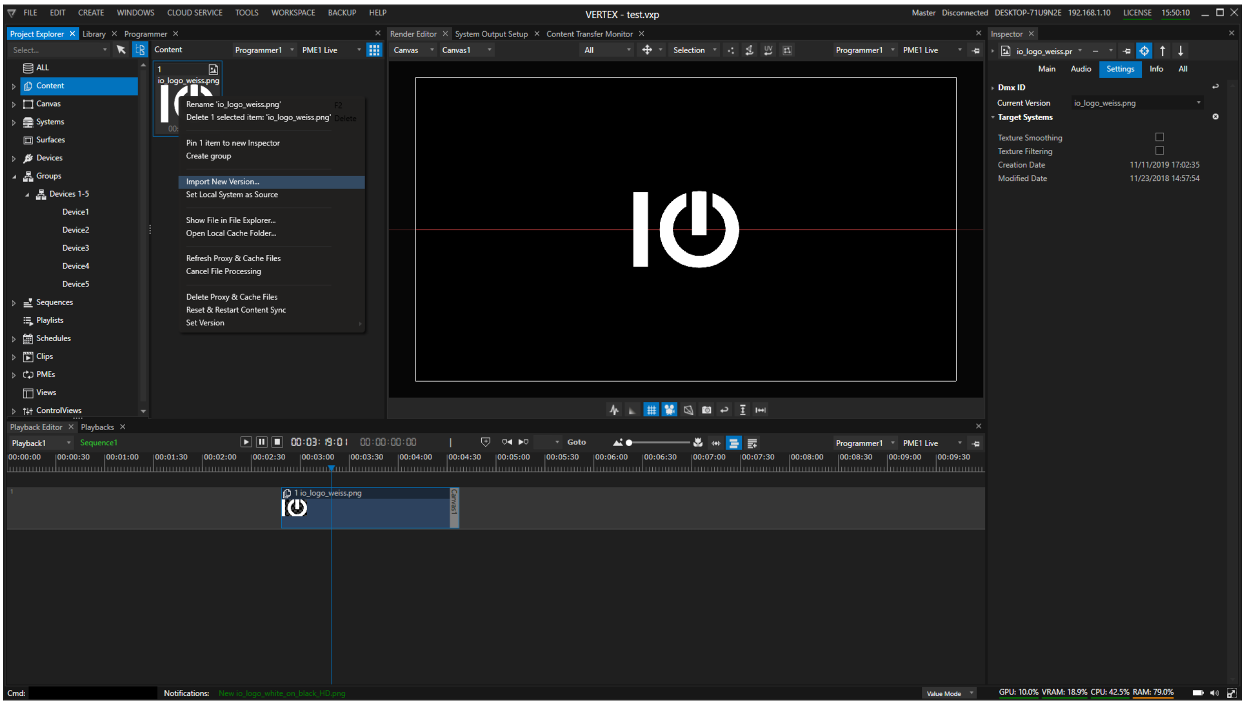
4.7.2.5 Versioning

- VERTEX comes with a **unique version management** that allows you to **handle different content versions with ease.**
- **Import a new version into project explorer** and switch between the different versions of your content back and forth.
- **The version of every content file that is used** in your sequences and playbacks can be changed **with only one click in the inspector or by script.**

Import a new Version

The **import of a new content version differs from the workflow** how regular content is imported into VERTEX

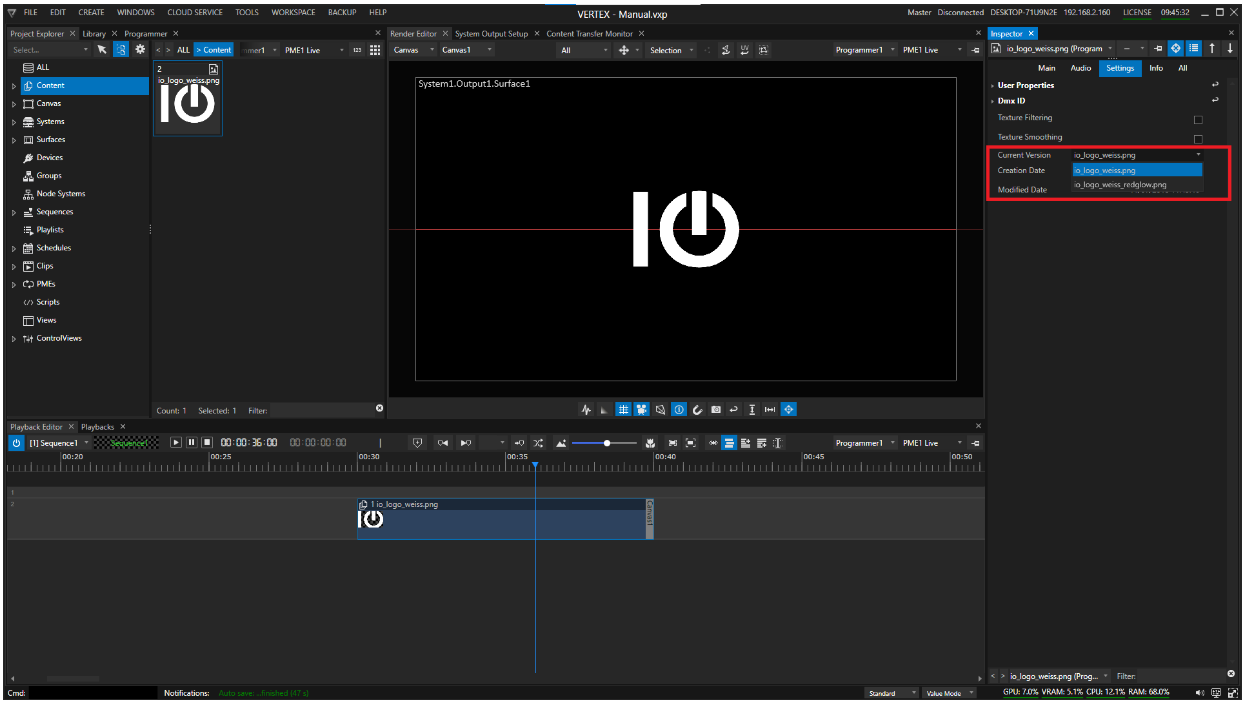
The command **Import New Version** is always related to an already existing content item in your project explorer. Therefore you will find the **version import dialog only in the context menu** of the content item in regard.


VERTEX - test.vxp
Project Explorer
Content
Rename 'io_logo_weiss.png'
Delete 1 selected item: 'io_logo_weiss.png'
Pin 1 item to new Inspector
Create group
Import New Version...
Set Local System as Source
Show File in File Explorer...
Open Local Cache Folder...
Refresh Proxy & Cache Files
Cancel File Processing
Delete Proxy & Cache Files
Reset & Restart Content Sync
Set Version
Inspector
Main
Audio
Settings
Info
All

Current Version: io_logo_weiss.png
Creation Date: 11/11/2019 17:02:35
Modified Date: 11/23/2018 14:57:54

1. select a content item in your project explorer
2. open the context menu by a right click with your mouse on this item
3. select "import new version"
4. a file explorer window pops up - select your new content there and confirm
5. proxy and audio files are generated for this content -
6. the thumbnail in the project explorer is switched to the new content
7. all clip containers or playback clips are changed to the new content.

Switch back and forth between content versions



Current Version io_logo_weiss.png

Creation Date io_logo_weiss.png

Modified Date io_logo_weiss_redglow.png

1. select the content item in the project explorer
2. the item should be shown in the inspector
3. go to the settings tab in the inspector
4. select your preferred versions in the content-version drop menu
5. the content has now been changed in all places of your project to the version you have selected.

Version switching also is possible with Script Commands

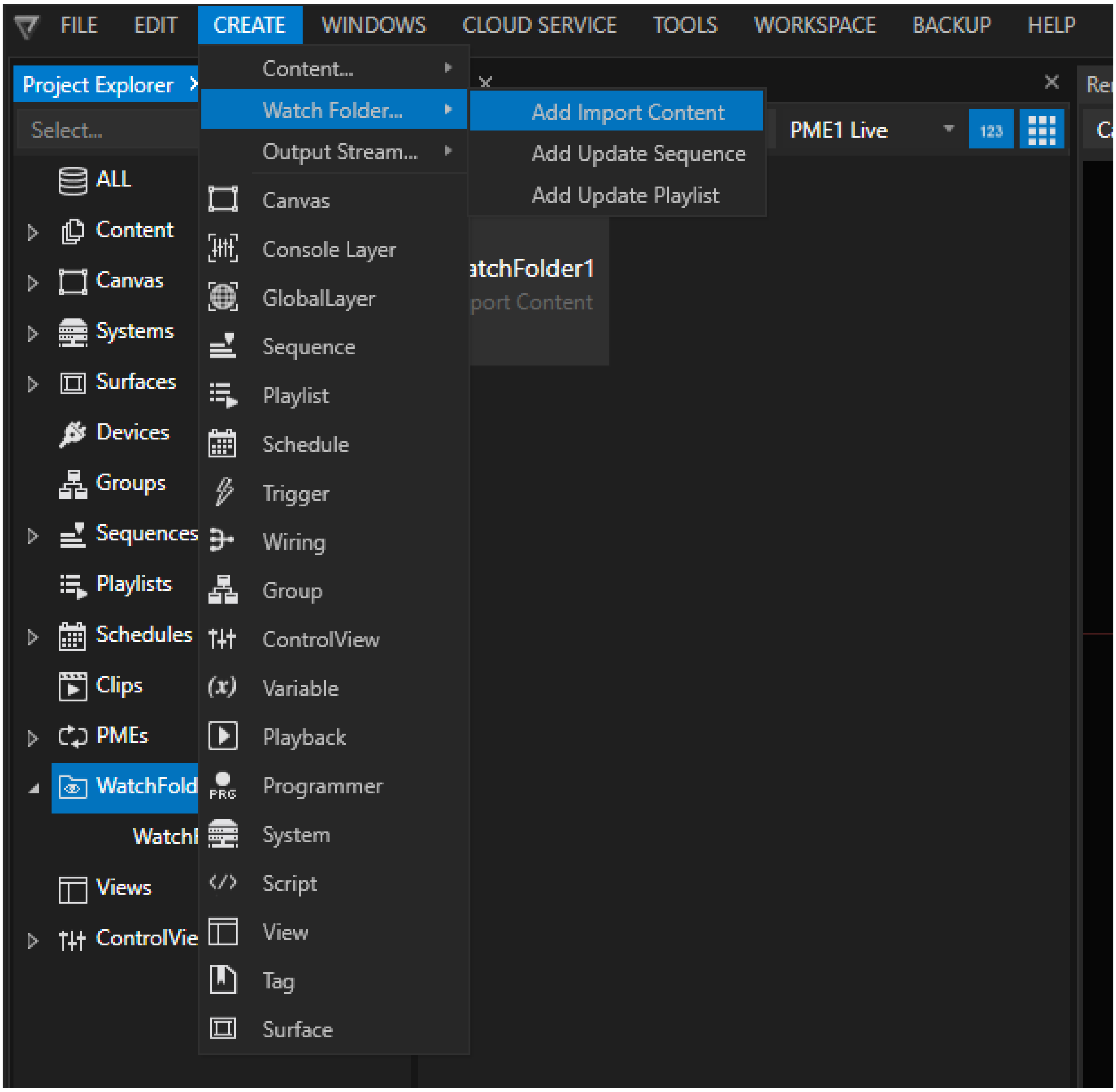
4.7.2.6 WatchFolder

- WatchFolders **observe Windows folders for file changes**
- **Content** from a defined folder/ path can be **automatically imported**
- **There are 3 types of WatchFolders**:
  Import Content (only imports content**),**
  Update Playlist (imports content and automatically adds it to a playlist)
  and **Update Sequence** (imports content and automatically generates a sequence)

Create a WatchFolder

- Go to **MAIN MENU > CREATE > WatchFolder...**

- **Choose a type**
- **A WatchFolder manager appears in the Project Explorer**

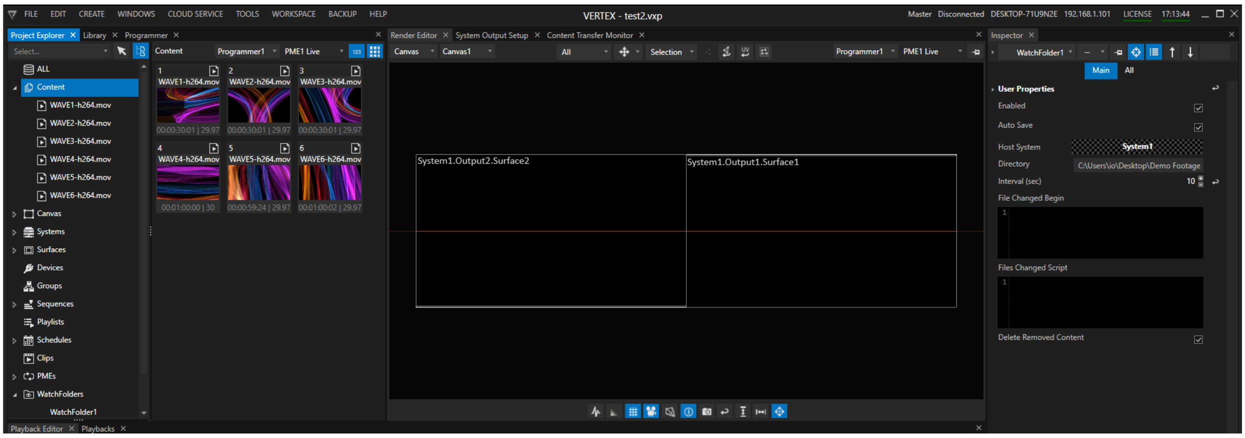


- Select a **WatchFolder in the Project Explorer**
- Do the **settings into the Inspector**

Import Content

- The "Import Content" WatchFolder **automatically loads content** into your project.

- All content files into a Windows directory will be loaded as content items into VERTEX



User Properties

Enabled ☑

Auto Save ☑

Host System System1

Directory C:\Users\io\Desktop\Demo Footage

Interval (sec) 10

File Changed Begin

Files Changed Script

Delete Removed Content ☑

Settings

Auto Save

Saves the project when new content is imported

Delete Removed Content

Removes content from the project if the linked files are deleted in the WatchFolder

Directory

Defines the directory/ path of your WatchFolder

Interval

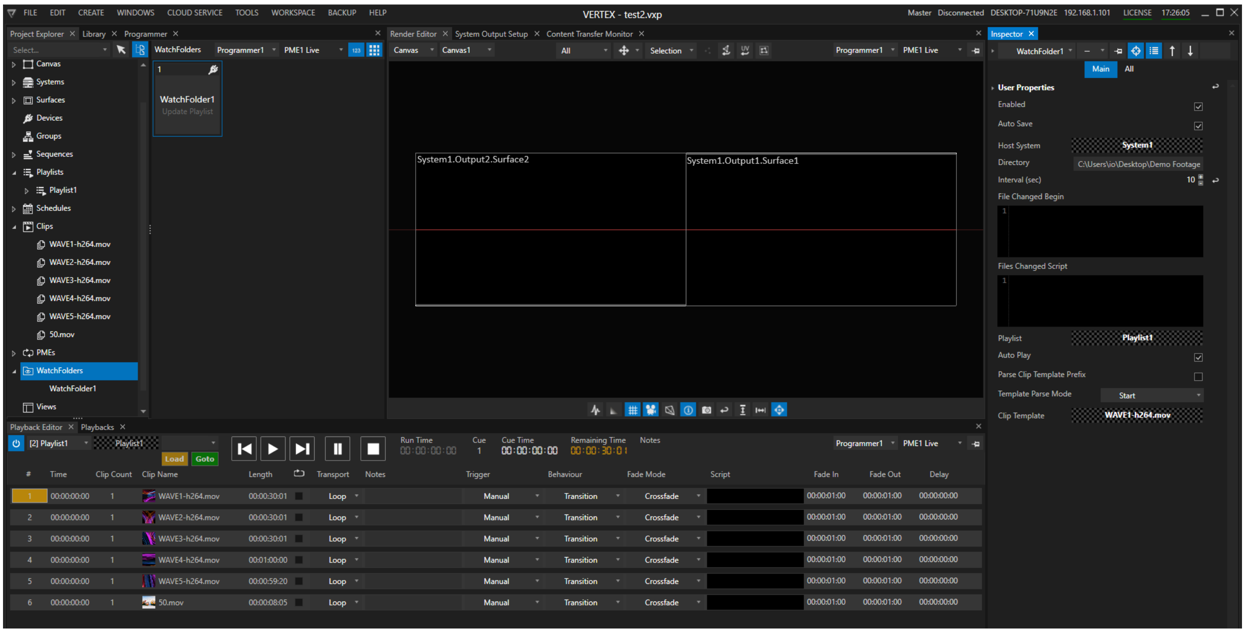
Time period in seconds when the WatchFolder is checked for changes

File Change Scripts

Scripts that will be executed either when a new file is detected (File Changed Begin) or when the import process is completed (File Changed Script)

Update Playlist

- *Update Playlist WatchFolders* automatically load content into your project.
- All content items are added to a playlist of your choice.


VERTEX - test2.vxp
FILE EDIT CREATE WINDOWS CLOUD SERVICE TOOLS WORKSPACE BACKUP HELP
Master Disconnected DESKTOP-71U9N2E 192.168.1.101 LICENSE 17:26:05
Project Explorer Library Programmer
Canvas
Systems
Surfaces
Devices
Groups
Sequences
Playlists
Playlist1
Schedules
Clips
WAVE1-h264.mov
WAVE2-h264.mov
WAVE3-h264.mov
WAVE4-h264.mov
WAVE5-h264.mov
50.mov
PMEs
WatchFolders
WatchFolder1
Views
WatchFolders Programmer1 PME1 Live
WatchFolder1
Update Playlist
Render Editor System Output Setup Content Transfer Monitor
Canvas Canvas1 All Selection Programmer1 PME1 Live
System1.Output2.Surface2
System1.Output1.Surface1
Inspector
WatchFolder1
Main All
Playback Editor Playbacks
[2] Playlist1 Playlist1 Load Goto
Run Time 00:00:00:00 Cue 1 Cue Time 00:00:00:00 Remaining Time 00:00:30:01 Notes
Programmer1 PME1 Live

User Properties

- Enabled ☑
- Auto Save ☑
- Host System: System1
- Directory: C:\Users\io\Desktop\Demo Footage
- Interval (sec): 10
- File Changed Begin
- Files Changed Script
- Playlist: Playlist1
- Auto Play ☑
- Parse Clip Template Prefix ☐
- Template Parse Mode: Start
- Clip Template: WAVE1-h264.mov

#	Time	Clip Count	Clip Name	Length	Transport	Notes	Trigger	Behaviour	Fade Mode	Script	Fade In	Fade Out	Delay
1	00:00:00:00	1	WAVE1-h264.mov	00:00:30:01	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
2	00:00:00:00	1	WAVE2-h264.mov	00:00:30:01	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
3	00:00:00:00	1	WAVE3-h264.mov	00:00:30:01	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
4	00:00:00:00	1	WAVE4-h264.mov	00:01:00:00	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
5	00:00:00:00	1	WAVE5-h264.mov	00:00:59:20	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00
6	00:00:00:00	1	50.mov	00:00:08:05	Loop		Manual	Transition	Crossfade		00:00:01:00	00:00:01:00	00:00:00:00

Settings

Auto Play

Instant playback after import

Auto Save

Saves the project when new content is imported

Clip Template

Select a clip to act as a template for newly imported content

Directory

Defines the directory/ path of your WatchFolder

File Change Scripts

Scripts that will be executed either when a new file is detected (File Changed Begin) or when the import process is completed (File Changed Script)

Interval

Time in sec in which the Watchfolder is checked for updates

Parse Clip Template

Future-use, automatic template assignment by file name

Playlist

Choose an empty Playlist that the imported content will be added to

Template Parse Mode

Future use

Update Sequence

- *Update Sequence WatchFolders* automatically load content into your project.
- All content items are added automatically to a Sequence of your choice.

Settings

Auto Play

Instant playback after import

Auto Save

Saves the project when new content is imported

Clip Template

Select a clip to act as a template for newly imported content

Directory

Defines the directory/ path of your WatchFolder

File Change Scripts

Scripts which can be executed either when a new file is detected (File Changed Begin) or when process of adding files is completed (File Changed Script)

Interval

Time in sec in which the Watchfolder is checked for updates

Overlap Time

Crossfade duration for imported clips

Parse Clip Template

Future-use, automatic template assignment by filename

Sequence

Choose an empty Sequence that the imported content will be added to

Start Time

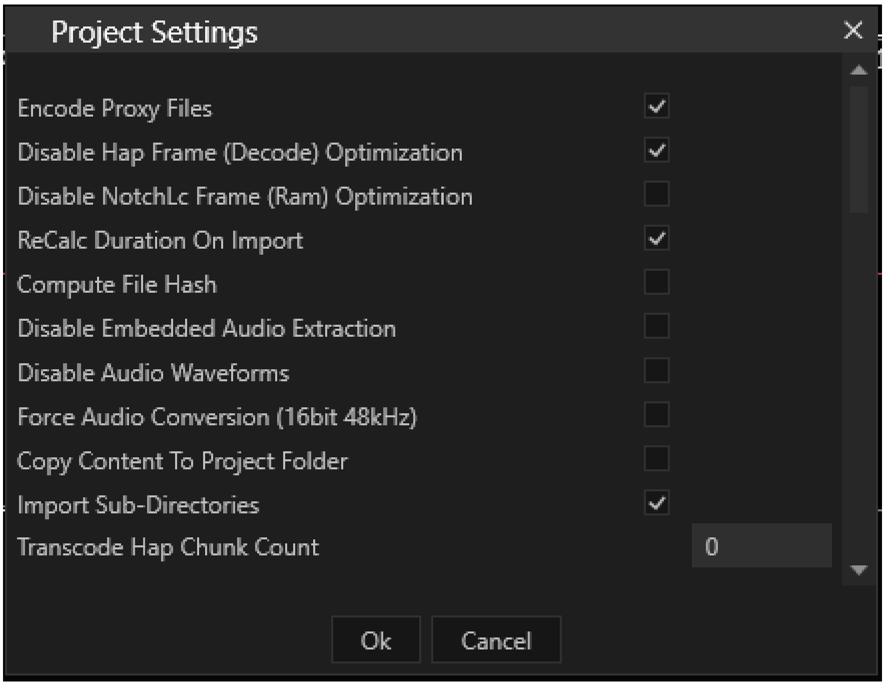
Set the timecode of the sequence at which the WatchFolder automation starts to import clips.

Template Parse Mode

Future use

4.7.3 Project Settings

- Every VERTEX Project has the option **to set global parameters and settings that are valid for the whole project**
- **Be careful -** some changes may have an impact on performance. VERTEX' default project settings are tested and chosen by our experienced team.
- **Some options are related to the workflow you prefer** - e.g. use always Top-Left Coordinates for a Canvas
- **Open the Project Settings window vi**a the "Edit" Tab into Main Menu on Top.



Project Settings

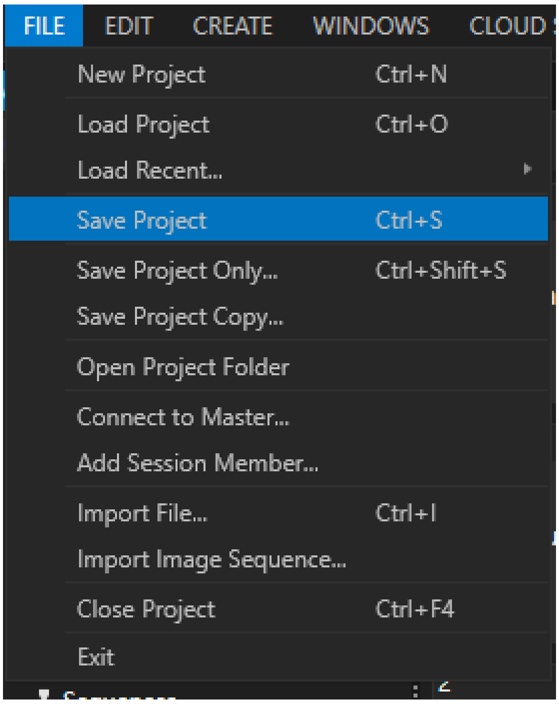
Encode Proxy Files	☑
Disable Hap Frame (Decode) Optimization	☑
Disable NotchLc Frame (Ram) Optimization	□
ReCalc Duration On Import	☑
Compute File Hash	□
Disable Embedded Audio Extraction	□
Disable Audio Waveforms	□
Force Audio Conversion (16bit 48kHz)	□
Copy Content To Project Folder	□
Import Sub-Directories	☑
Transcode Hap Chunk Count	0

4.7.4 Load and Save Project

- Go to **Main Menu > File** to Load or Save a Project
- There are **different ways to save your project,** but the standard shortcut CTRL-S always works.

- **Autosave** is an adjustable feature (project settings) and a keen helper in case of emergencies.

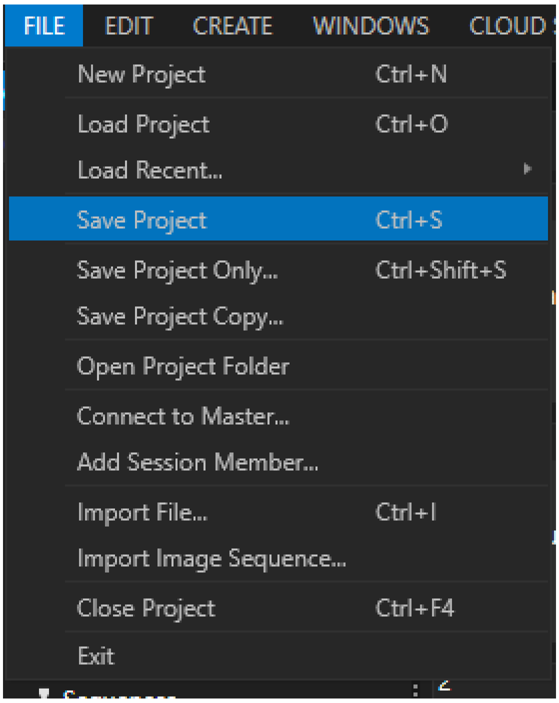
Load Project



- **Load project** opens an Explorer Window to select a VERTEX project File that should be loaded. navigate to your Project Folder and select the *.vxp File
- **Load recent** opens a list of the recent projects you have worked on.

Both options will of course close your current project. Before the project is closed, Vertex prompts you to save your current work.

Save Project



1	**Save Project**	Saves Project at regular location of the Project File. Use Shortcut CTRL + S to save.
2	**Save Project only**	Saves Project File only. Opens an Explorer Dialog to select file location and name. Does not Save the Data Folder of a Project. Use e.g. to Save different project Versions into the same project folder, as a personal backup or if you need only the project file for e.g. support requests
3	**Save Project Copy**	Saves the whole Project Folder - including Proxy Files, Content and Data. Opens an Explorer Dialog to choose a destination and folder name. Take care: depending on settings and assets of your project a bigger amount of data could be saved. Good for personal backups or to exchange a project copy.

Save Project on a Session Member
When working on a Session Member, the save options are different. You have a choice between "Save on Master" and "Save on Local System". Recommended option is to use "Save on Master" and trigger a project save on the Master System.
Session Members always pull the project data from a project file that is opened from the Master System.
Use "Save on local System" to create a local project file or backup on the session Member

Auto Save

- Autosave supports you during your work and **automatically saves your project**
- By default, **autosave is triggered every 5 minutes**. This interval **can be changed** in the Project Settings
- Autosave is **saving up to 4 versions of your project**. After this number is reached, the oldest version is deleted
- The files are **located** in your Project Folder in **subfolder with the name "_bak"**
- The autosave-files all **have a file suffix "*.vas"** - (VERTEX Auto Save)
- To **recover your project**, please rename the file suffix to .vxp or just open the file with VERTEX.

4.8 Multi System Configuration

Prerequisites for a VERTEX Session

1. VERTEX has to run on all Systems in the **same Assembly Version** such as "VERTEX 2023 R1 2023.01.14.0439"
2. **All Systems must have a valid license.**
3. **Network Adapter Settings** and **Default Datasync Adapter** must be set for all systems to the same network.
4. **Vertex Background Services** must run on every System.

VERTEX in Session Mode

A *VERTEX Session* always consist of

- **ONE Master System** where the project file is created, loaded and saved.
  and
- **ANY NUMBER OF Session Members.**
  Session Members are VERTEX systems that connect to the Master System's project.
  The number of Session Members is designed to be unlimited, flexible and scalable:
  it is possible to add new Session Members to a project or delete existing Session Members.

The 5 Cogs in Session Mode:

1. Data Sync

All project data and settings are shared between all systems in real-time, thus creating a true multi-user environment. Every system will have the same data status, regardless on which system a change has been made to the project.

2. Playback Sync

Playbacks are always in sync on all systems in a VERTEX Session.
Any system (both Master or Session Member) can be defined as the *clock master* and will be synchronizing all playbacks of every Session Member.

3. Content Sync

VERTEX Content Sync is designed with a peer to peer technology that results in faster data transfer with increasing number of systems added.

Content can be imported on any system in the session and even so, all data is being shared in the background between all systems.

4. Data Routing

Incoming continuous data is shared between systems in a Session and can be routed: For instance, Incoming DMX-Data on System1 could be routed
as Art-Net™ output on System3. Incoming device data on one system is also shared between all other systems.

5. Backup Scenarios

This modular method of connecting *Session Members* is the foundation for VERTEX's flexible backup possibilities: create a redundant backup or only a partial one.
Session Members can switch render roles and render for another system that drops out. The *Master* role can also be taken over by another *Session Member*.

Information on *Session Mode's* advanced settings can be found here.

4.8.1 Session Management

- Set up a Session with **multiple VERTEX Systems** into a Project: a **Master** an a number of **Session Members**
- The **Master manages the Project Data**. Settings between Session Members and Masters are shared. The **Project File is stored and loaded on Master**
- You are able to **connect and to disconnect a System**.
- **Systems** could be **virtual** or **real**

Master and Session Member

When working with **multiple Systems** into a VERTEX project, each VERTEX license can take **a role called" Master" or a role called "Session Member**"
This role does not depend on the license and can be selected for each new project.

The **Master manages the Project File and all changes**. The system on which a new project was created gets the Master Role by default.
All other Systems that will be connected and added to the Project **are Session Members**.

All Data is shared between Session Members and the Master. A **Master is responsible for handling of this Data Exchange**.
The Master is not necessarily responsible for the Sync Clock for Playbacks.

Session Members can work in **Fullscreen** mode, in **only UI** mode or in **a combination of both**.
You can work with different users together in one Project. All Session Members are allowed to make changes an every Property.

Data and Project Handling

The **Project File** is **loaded and stored on Master**. After a Project File is loaded on a Master, the **Master System pushes all Project Data to the Session Members**. **Content that is already distributed** to Session Members **is not shared again**.

The **main Project File is always saved on the Master**.
Session Members are able to trigger a Project **"Save on Master**" or to save a **"Local Copy**" of the Project File.

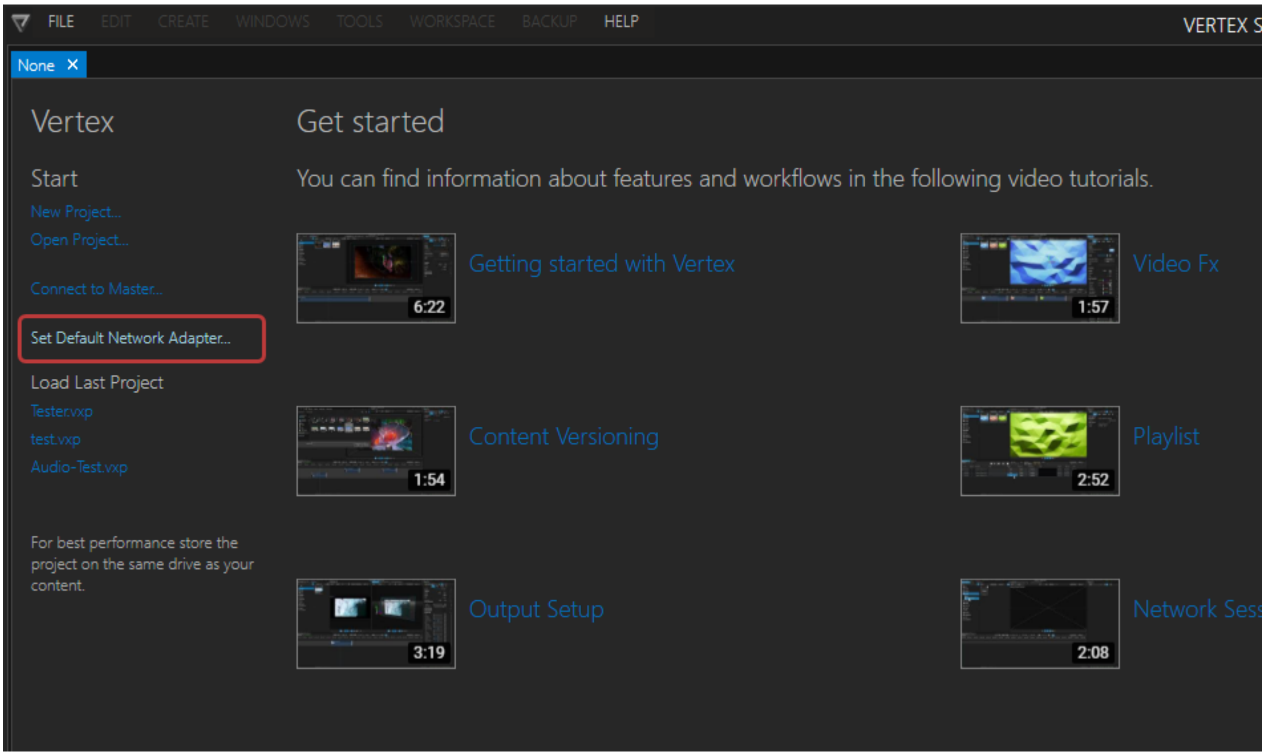
It is **not possible yet to merge offline changes from Session Members to a Master Project**.
Please work on the main Project File from Master and Copy this Project File back to Master again.
When open a VERTEX Project with a System that is not a Master, VERTEX will ask you if you want to map your local System as the Master.

Prerequisites for a VERTEX Session

1. VERTEX has to run on all Systems with the **same Assembly Version** - e.g. "2020_Q1_2020.05.20.1920"
2. **All Systems** must have a **valid license or no system may have a license** and all run with the Trial
3. **Network Adapter Settings** are done - The **Default Datasync Adapter** is set for all Systems into the same network.
4. **Vertex Background Services** must run on every System

Network Adapter Settings

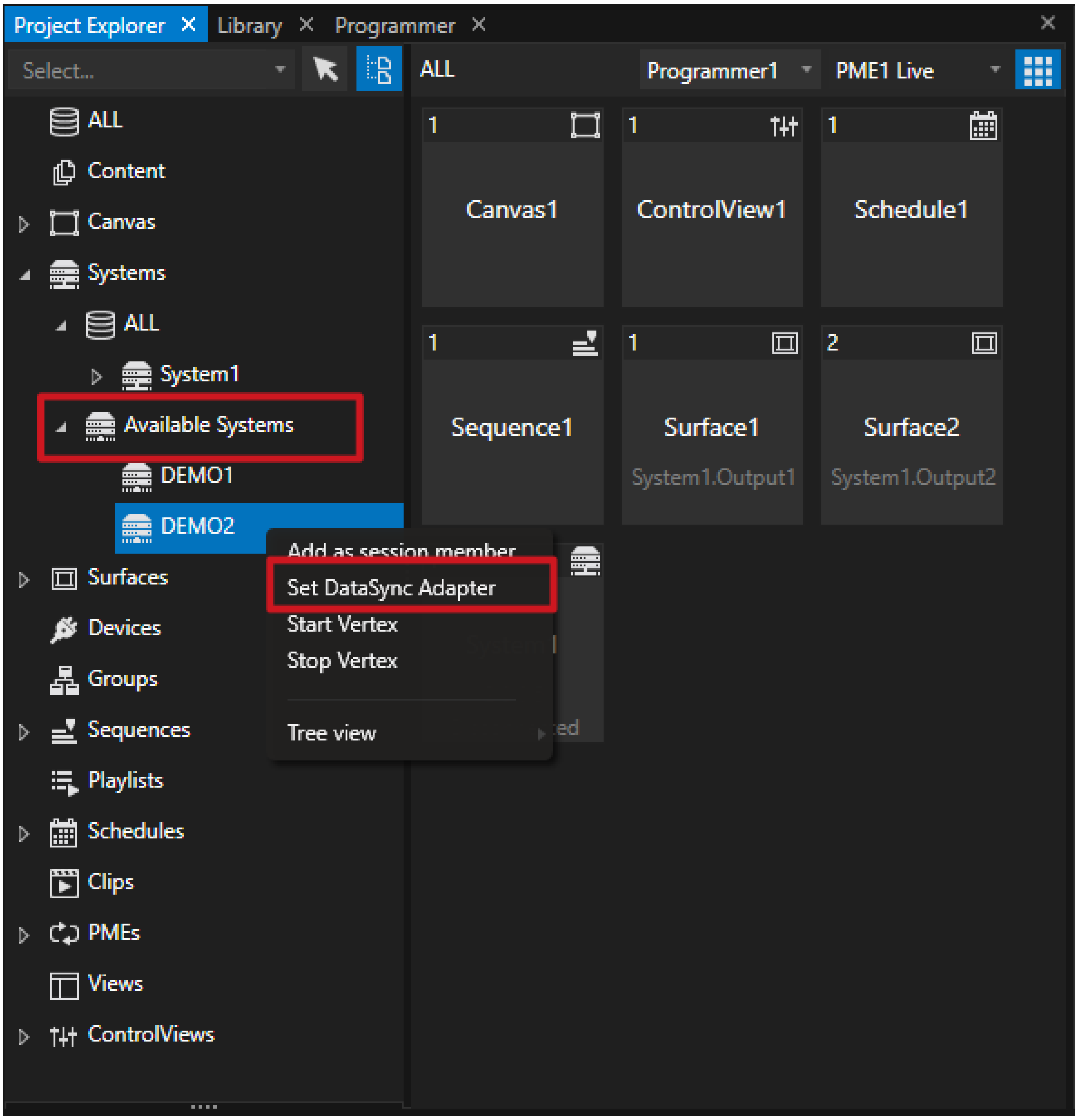
For each System the **Default Network Adapter** has to be set. The easiest way is executing the link on VERTEX' Startup Page:



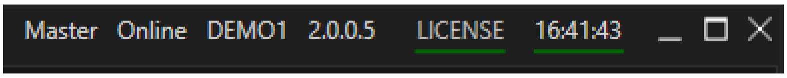
You can find information about features and workflows in the following video tutorials.

For best performance store the project on the same drive as your content.

On a Master System you can go to *Project Explorer > Systems > Available Systems* and right-click on a detected VERTEX System to set the adapter from the context menu.



Once the adapter is correctly set and recognized by VERTEX, the **IP address** will appear in the Top Bar

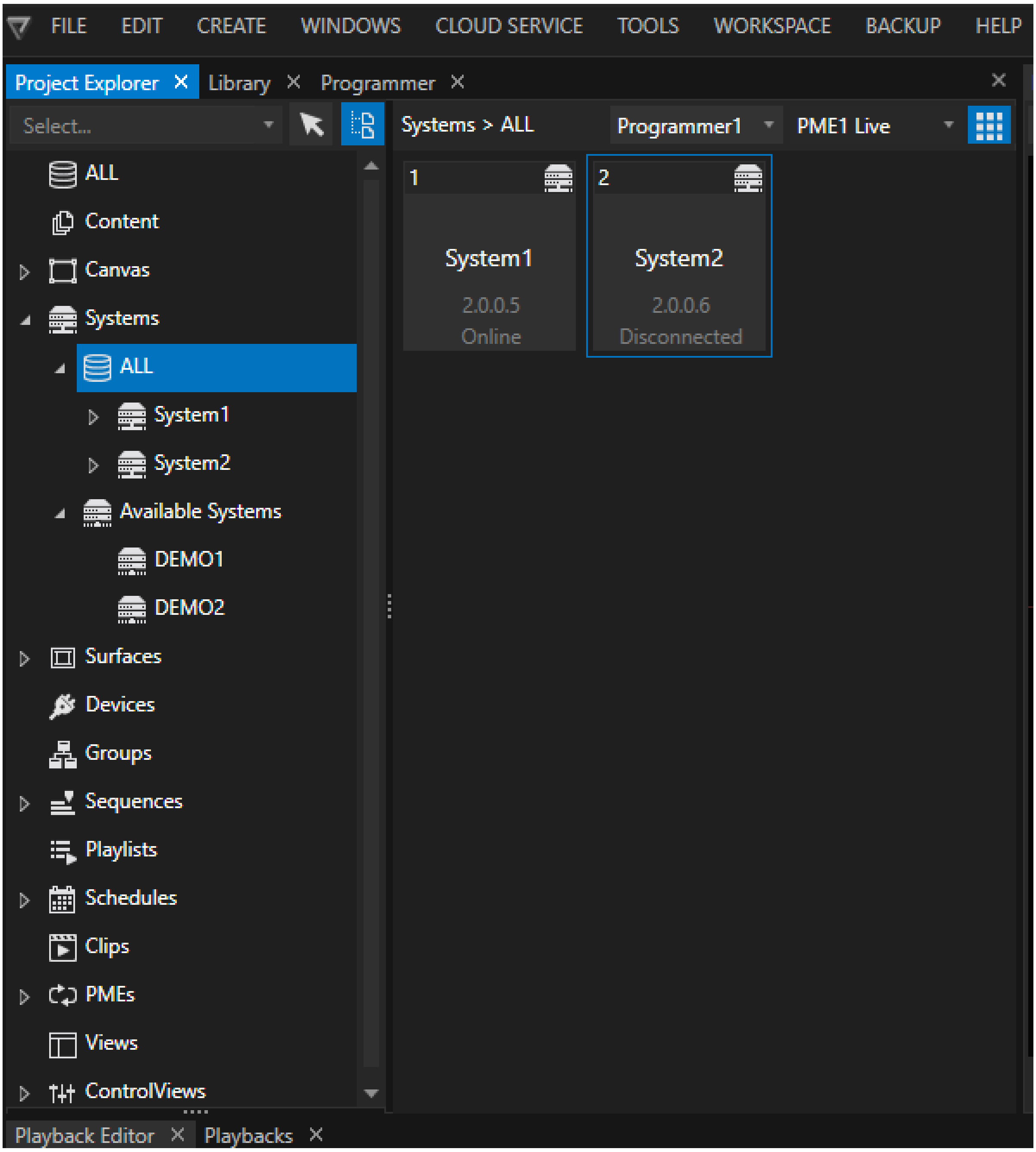


ⓘ **Reboot after Adapter or IP change**
We recommend to first reboot your Windows System after an Network Adapter was changed into Windows 10.
In some cases the VERTEX Background Service can only detect the changes after the System is rebootet

Add a System as Session Member

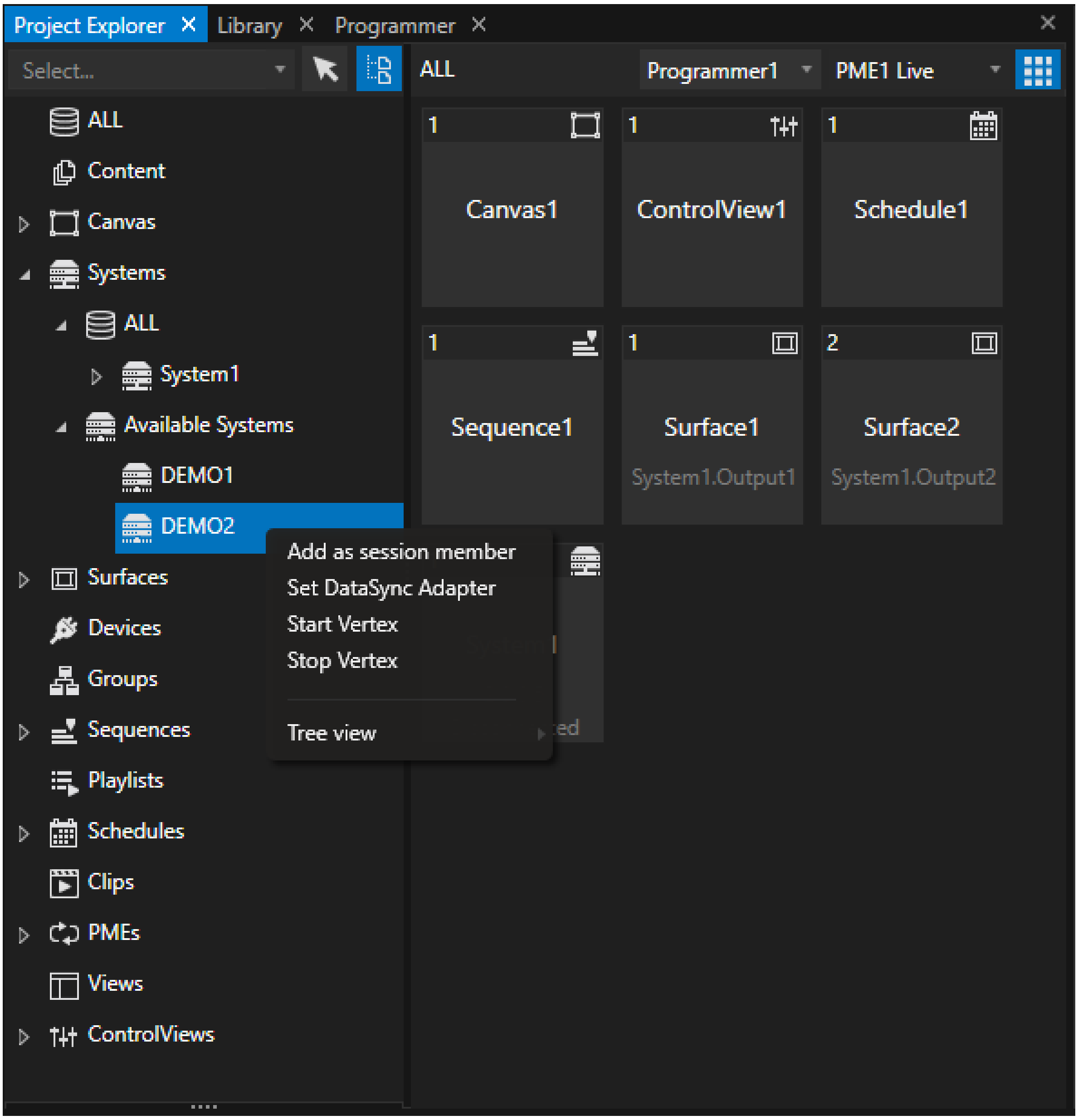
Add a System from Master

Go to **Systems Section** of the **Project Explorer**. **Drag** with your mouse **a System** from the **Available Systems** Section **to "All"**
If the prerequisites are all given, the new system appears in the "all" section and connects automatically.
If not, there should be a notification in the Status-Bar



You can also use the **context menu**.

Just **right-click on a System** listed under **Available Systems** and choose "**Add as Session member**".



Project Explorer
Library
Programmer
Select...
ALL
Content
Canvas
Systems
ALL
System1
Available Systems
DEMO1
DEMO2
Surfaces
Devices
Groups
Sequences
Playlists
Schedules
Clips
PMEs
Views
ControlViews
ALL
Programmer1
PME1 Live
1
Canvas1
1
ControlView1
1
Schedule1
1
Sequence1
1
Surface1
System1.Output1
2
Surface2
System1.Output2
Add as session member
Set DataSync Adapter
Start Vertex
Stop Vertex
Tree view

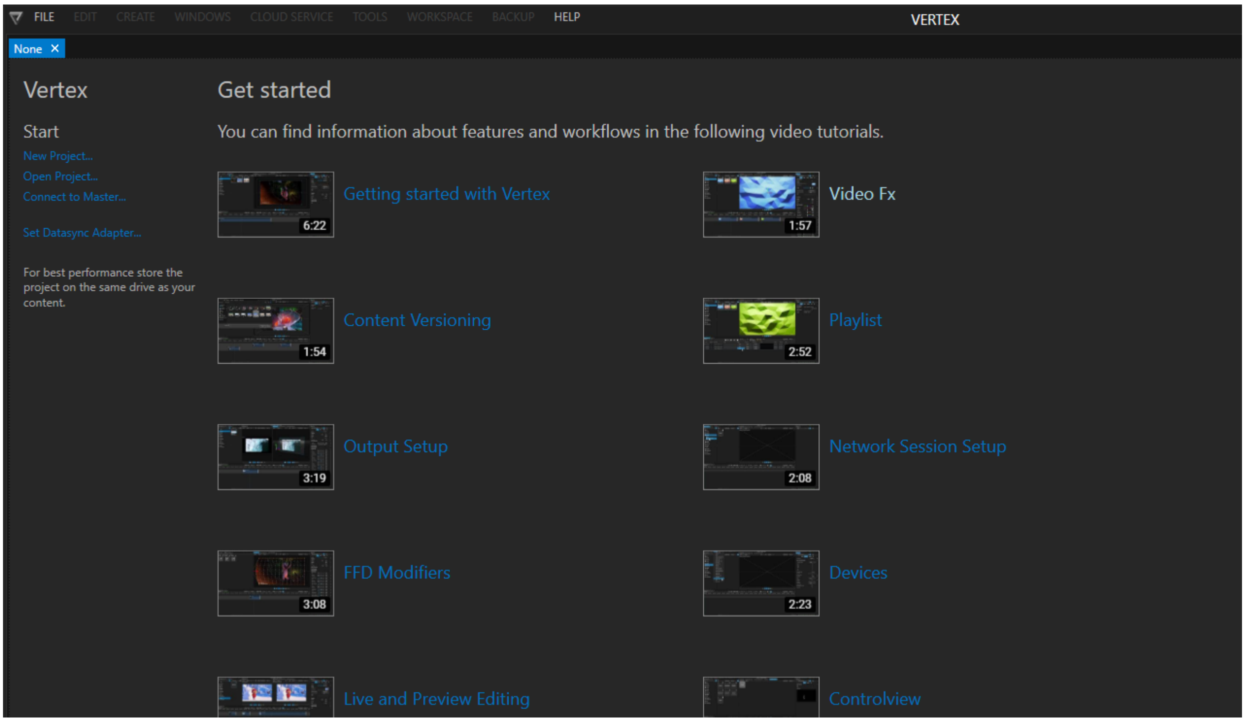
Connect with IP Adress if System is under "Available Systems"

If for some reason a System is not listed under Available Systems, you can connect it with its IP Address

Go to File -Tab into Main Menu and choose "Add session Member" A dialog Window opens where you can enter the IP of the System

Join a Project from Session Member

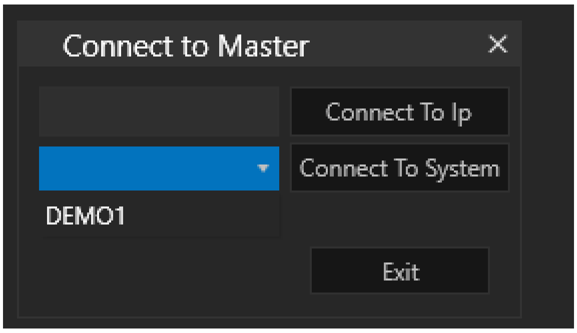
Start Vertex on a Session Member. Click to **"Connect to Master**" on the Startup Page



For best performance store the project on the same drive as your content.

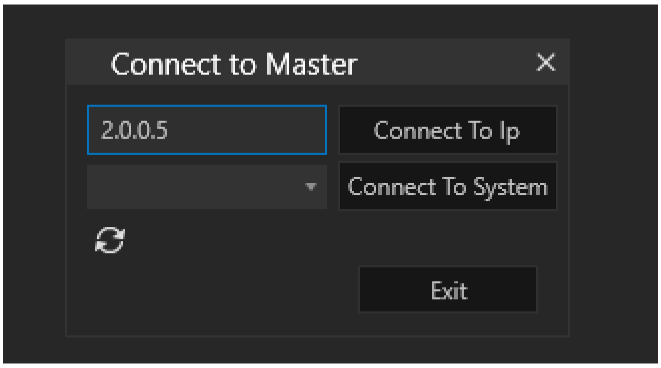
You can find information about features and workflows in the following video tutorials.

A window opens. Select an **available Master from the Dropdown-List** and confirm with **"Connect to System**



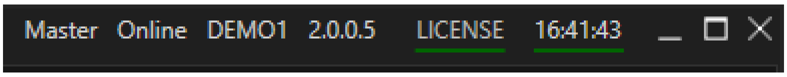
If no Master is displayed into the Dropdown, you can **connect to the IP.**

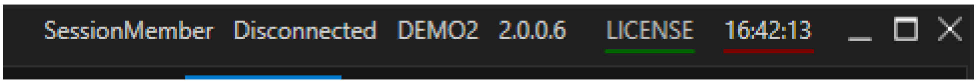
Just enter the **Masters IP Address** and confirm with "**Connect to IP"**



Role and Connection Status

Once a system was successfully added to a Project, its **role** (Master or Session Member) and the **Connection Status** (Online or Disconnected) is shown
in the **Top-Bar**

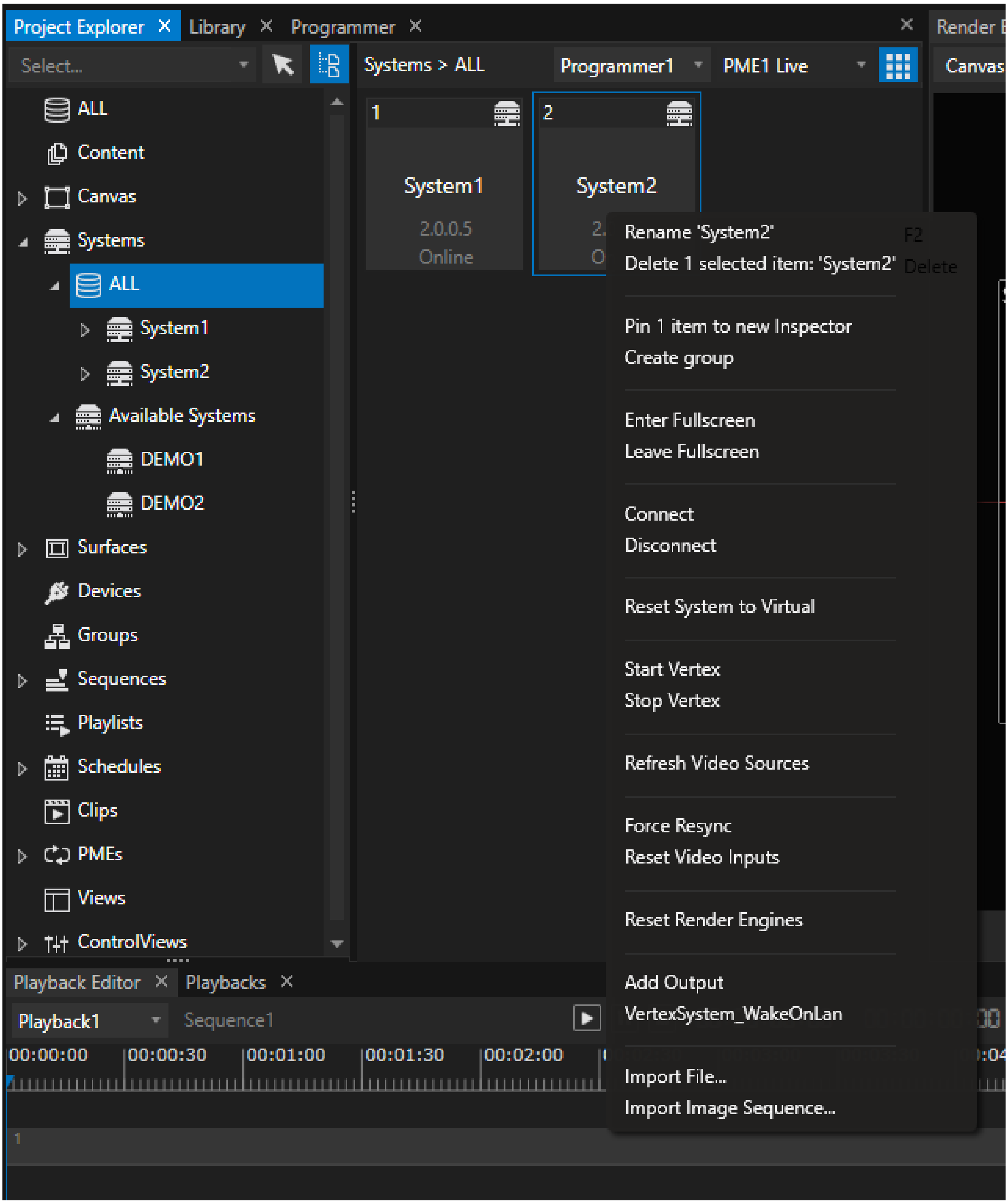




Connect, Disconnect and Autoconnect

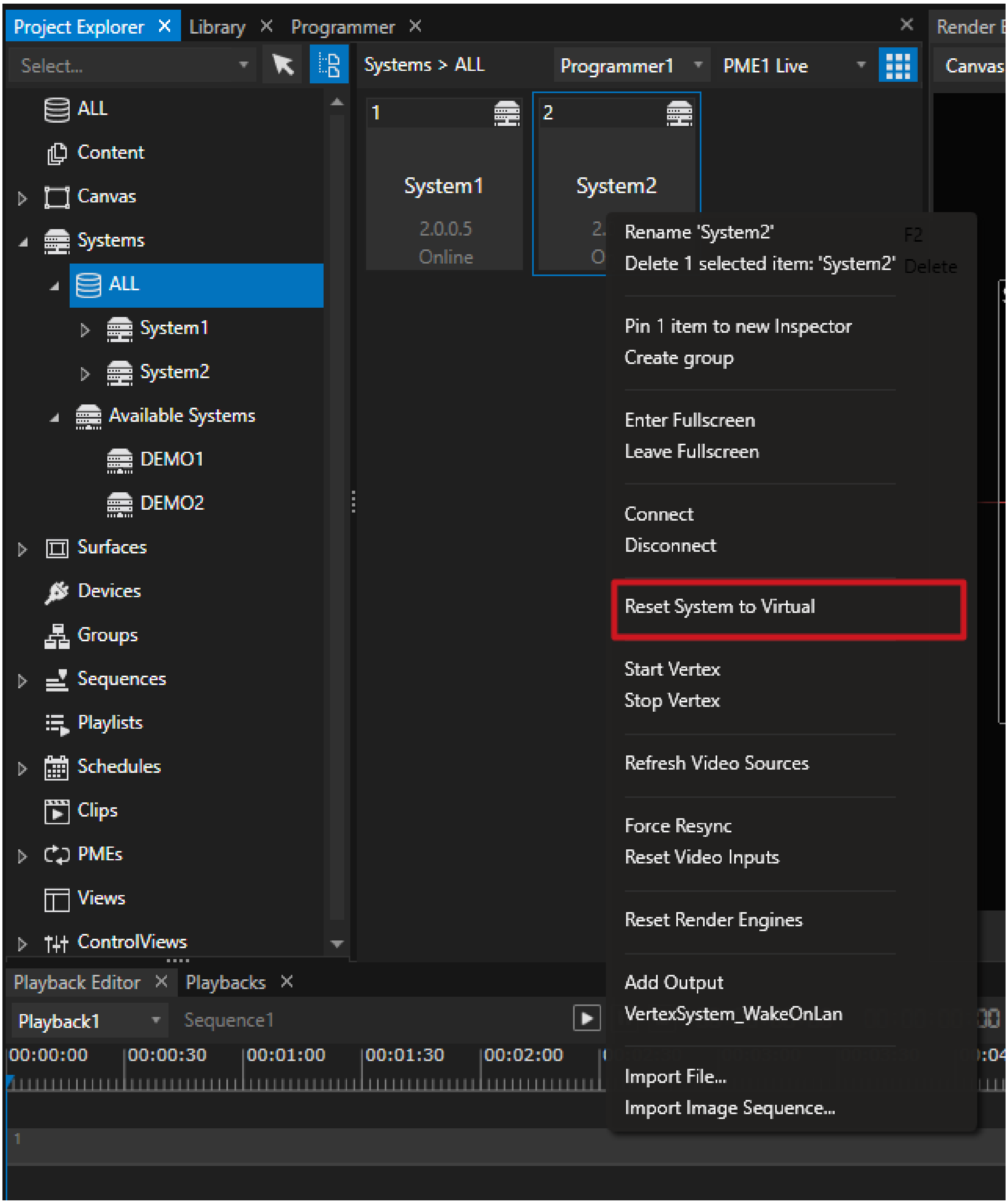
By default **for all Session Members "Autoconnect" is enabled**.
As soon as a Project is loaded on a Master and the VERTEX is running on a Session Member System, The Session Member connects automatically and loads the Project.
Autoconnect **can be disabled for each System in the Inspector Settings**

You can **connect** or **disconnect** Systems **manually.**
Right-Click on a System and select "Connect" or "Disconnect" from the Context Menu


Project Explorer
Library
Programmer
Render E
Select...
Systems > ALL
Programmer1
PME1 Live
Canvas
ALL
Content
Canvas
Systems
ALL
System1
System2
Available Systems
DEMO1
DEMO2
Surfaces
Devices
Groups
Sequences
Playlists
Schedules
Clips
PMEs
Views
ControlViews
1
System1
2.0.0.5
Online
2
System2
Rename 'System2' F2
Delete 1 selected item: 'System2' Delete
Pin 1 item to new Inspector
Create group
Enter Fullscreen
Leave Fullscreen
Connect
Disconnect
Reset System to Virtual
Start Vertex
Stop Vertex
Refresh Video Sources
Force Resync
Reset Video Inputs
Reset Render Engines
Add Output
VertexSystem_WakeOnLan
Import File...
Import Image Sequence...
Playback Editor
Playbacks
Playback1
Sequence1
00:00:00
00:00:30
00:01:00
00:01:30
00:02:00

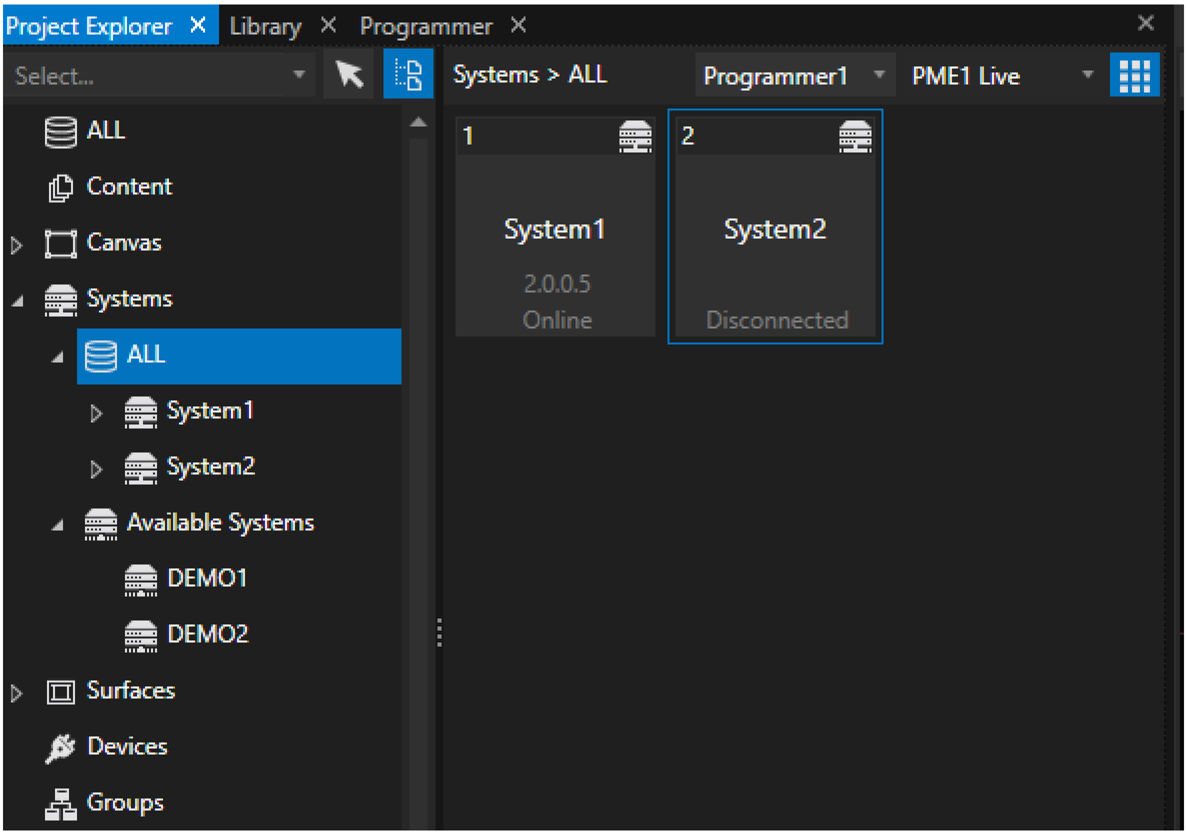
Virtual System

Systems in VERTEX also **can be virtual**. Virtual Systems are not linked to a real System into Network.
You are able to switch a System into your Project back to virtual. **Unlink it from a System** by using
"Reset System to Virtual"



Virtual Systems always have the **connection status Disconnected**

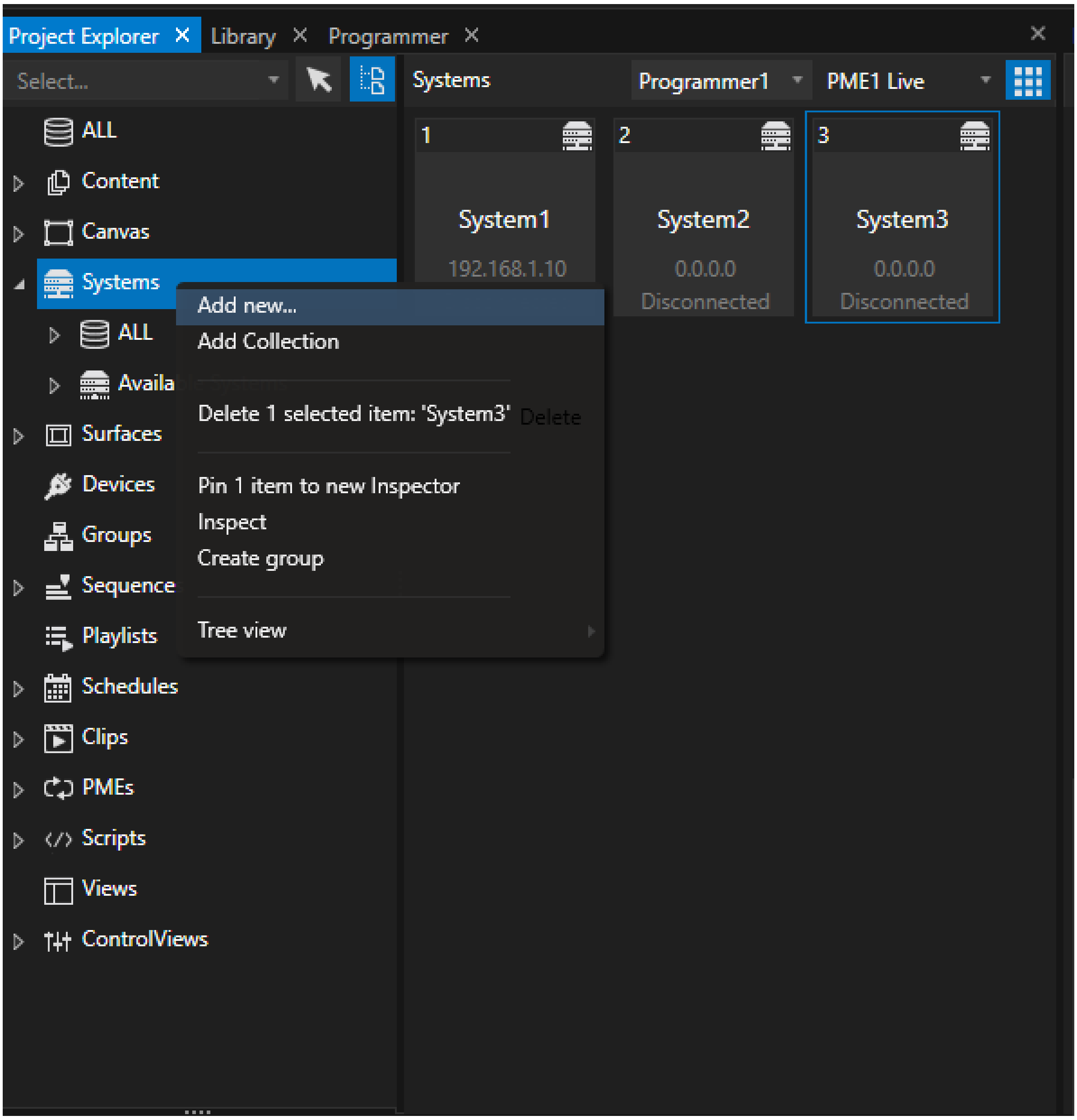
To **link a Virtual System to a real one**, just **drag a System from the "Available Systems"** list to **to Virtual System**



You may also create **new Virtual Systems for your Project.**

Use them for preprogramming or preview, later **convert them into a "real" System**.

Open **Context Menu** on the **Systems** Section of the **Project Explorer and select "Add new..."**



4.8.2 Network Ports & IP Addresses

- VERTEX uses the following network ports and IP addresses:

TimeServerPort = 50001

DataSyncServerPort = 50002

```
ContentSyncServerPort = 50003
WiringMeshServerPort = 50004
SystemTimeServerPort = 50005
DiscoveryPort = 51111
BgsCommunicationPort = 50006
BgsAdminCommunicationPort = 50016
RemotingPort = 50007
DmxRepeaterPort = 50008
EvoRequestReceivePort = 50101
EvoNodePort = 5020

ScriptServerPort = 50009
TimeFrameServerPort = 50010
PptRemoteServicePort = 50011
KioskBrowserPort = 50012
VertexNdiStreamerPort = 50014
ScriptServerUdpPort = 50019
WebAppWebSocketPort = 8080

 BroadcastIP = "255.255.255.255"
 DiscoveryIP = "239.255.11.10"
```

4.8.3 Data Sync

- The VERTEX Data Sync ensures that **all data is shared over all Systems into a Project**
- All Settings into all Editors are shared across all Systems. **Every System has the same data status.**
- This mechanism makes VERTEX to a real **Multi-User Environment**: Changes on Session Members and Master could be done in parallel by different users.

Network Adapter Settings

- Please ensure, that for all Systems into your Project, the **Default DataSync-Adapter** is set.
- Read more about Adapter-Settings here
- We recommend a fast Ethernet-Network for VERTEX Data-sync

Data Sharing over all systems

The unique VERTEX Data-Sync makes sure **that all data is available on all systems**. if you change a setting on the master, this setting is directly available on the session member. The same for Playhead Position when you do a Warping.
Data Sync works in the background and is **deeply embedded in the system architecture**. you don't have to worry about anything

Multi User-Environment

The VERTEX Data-Sync **is the backbone to ensure a true multi-user experience**.
Data is shared over all systems - that also means that User 1 on System A directly can see changes that are made by user 2 on System B.

4.8.4 Playback Sync

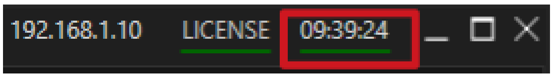
- The VERTEX **Playback Sync** ensures that **all Systems into a Project are clocked and play out Content in sync**.
- The **Sync Clock Source System** generates the **Sync Clock** for all other Systems into a Project an **can be freely defined.**
- For **backup scenarios** there is an option to define a **Backup Sync Clock Source System**

Sync Clock

The Playback-Sync generates a **Sync Clock** that is **shared over Network to all other Systems** hat are part **of the**

Project.
This Sync Clock **ensures that all Playbacks over all Systems are accurately in sync**
The Sync Clock controls all Timecode and the Playheads positions.

When working in Session Mode a **status bar** shows you **if the system receives the playback sync** and is connected to it.



Green: Playback-Sync is received - System is synced
Red: System is not receiving the Sync Clock from Playback-Sync

Sync-Clock Source System

For a simultaneous Playback into a mesh of VERTEX Systems **one of this Systems has to be responsible for generating a Sync Clock**-
This System is called the the **Sync Clock Source System** and generates a **System Clock which clocks all other Systems into your Project**.
By default the Master is set as Sync Clock Source System. You are allowed to **change the Sync Clock Source System to any other System of your Project**.

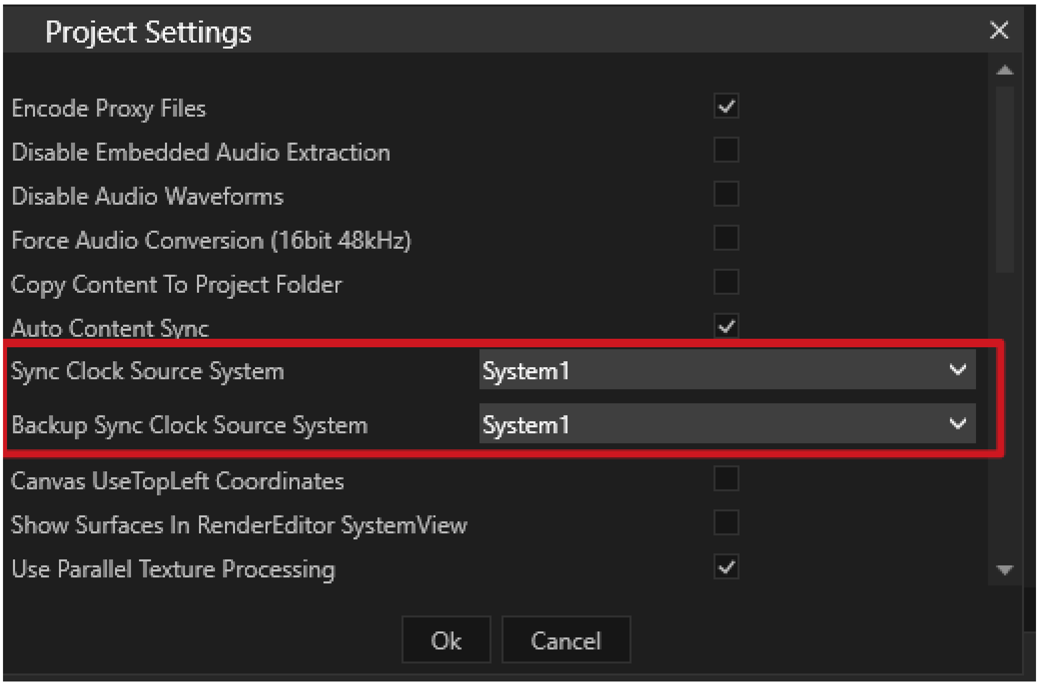
Sync clock and Master role
VERTEX offers great flexibility due to the mesh network structure. this is also reflected in the sync clock: the main clock is not bound to the master. The master can be the system that specifies the clock, but it does not have to be. The clock generator is not bound to the master and can also be taken over by any other session member. In this case, the Session Member is the Sync Clock Master.

Example

A Project with 1 Master and 2 Session Members,
The ASIO Interface for Audio Playout is connected to System 2 (a Session Member)
The Sync-Clock for all Playbacks should be locked to the ASIO Clock.
In this Case System 2 should be the Sync-Clock-Source-System for your Project.

Set Sync Clock Source System

The Sync Clock Source System is globally defined in the **Projects Settings.**



Project Settings

Encode Proxy Files ☑

Disable Embedded Audio Extraction □

Disable Audio Waveforms □

Force Audio Conversion (16bit 48kHz) □

Copy Content To Project Folder □

Auto Content Sync ☑

Sync Clock Source System: System1

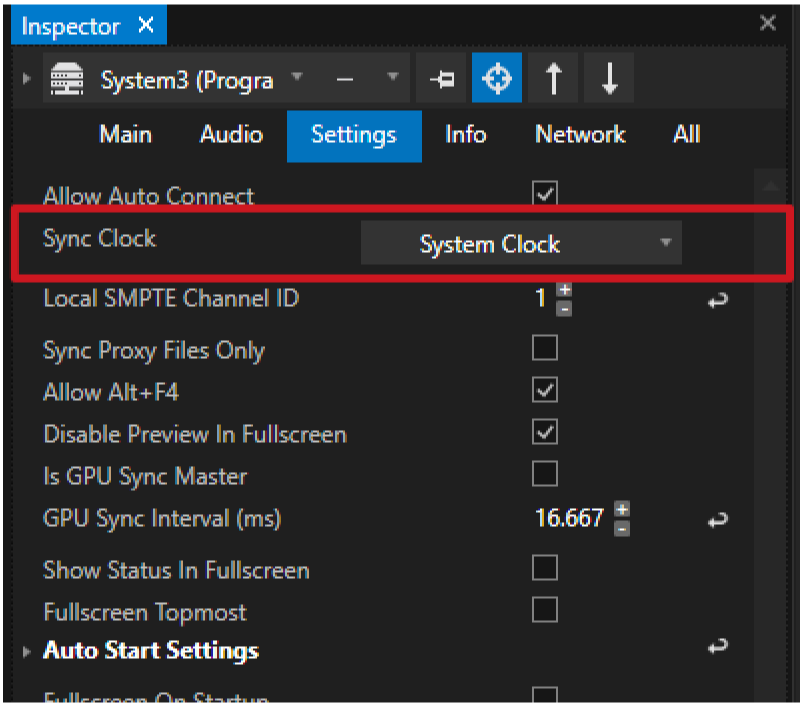
Backup Sync Clock Source System: System1

Canvas UseTopLeft Coordinates □

Show Surfaces In RenderEditor SystemView □

Use Parallel Texture Processing ☑

Sync Clock Settings



Allow Auto Connect ☑
Sync Clock System Clock
Local SMPTE Channel ID 1
Sync Proxy Files Only □
Allow Alt+F4 ☑
Disable Preview In Fullscreen ☑
Is GPU Sync Master □
GPU Sync Interval (ms) 16.667
Show Status In Fullscreen □
Fullscreen Topmost □
Auto Start Settings
Fullscreen On Startup □

For every System into your project there is a **Sync Clock Setting.**
By default this setting is set to **System Clock**.
If there are problems with your Sync clock and simultaneous playback, please check the Sync Clock settings for all Systems

Example

Let's continue with the Example from the previous Topic:

A Project with 1 Master and 2 Session Members,
The ASIO Interface for Audio Playout is connected to System 2 (a Session Member)
The Sync-Clock for all Playbacks should be locked to the ASIO Clock.
In this Case System 2 should be the Sync-Clock-Source-System for your Project.

The Sync Clock Settings in this case are:
Master: System Clock - should get the System Clock from Sync Clock Source System
System 2: ASIO Audio- System 2 is the Sync Clock Source System and should generate the System Clock from ASIO Clock
System 3: System Clock: should get the System Clock from Sync Clock Source System

4.8.5 Content Sync

- VERTEX Content Sync is based on a **P2P file sharing** technology**. The higher the number of connected systems, the faster the network gets.**
- **Content is distributed automatically** to all systems in a project. This process and its progress can be monitored in a window called **Content Transfer Monitor**.
- Content Sync works omni-directionally: **Content can be imported** both **from any system** and **onto any system**, whether working from a *MasterSystem* or *SessionMember*.
- **Sync Modes** and dedicated **Target Systems** can be set **individually.**
- For easy access go to your project's Content Management window

How VERTEX Synchronized Content Transfer Works

In most cases there is no special setup needed, as VERTEX transfers content between systems in the background as soon as a *Session Member* is added.
The exact details of each Content Transfer depend on from where the content has been added to the project. VERTEX distinguishes between *local and remote systems.*

> The system you are working on is your *local system.*
> All other systems in your session are considered *remote systems.*

Default Setup

On your *local system*, **VERTEX will process the original file in its source location**. When adding content to your project, **it will not be copied to the local project folder** (unless you tell VERTEX otherwise).
The files that are being written in your local project's data folder are proxy files and thumbnails generated for preview.
Remote systems**,** however, **will receive copies of the content source** files as well as the proxies, thumbnails etc. in their project data folder.

Personalized Setup

If the aforementioned default mode does not fit your needs, you will find many advanced options in your *project settings, system settings and content item settings*. Here you can define sources, targets and formats of the content sync engine. To **access advanced settings**, switch to Advanced Mode in the status bar.

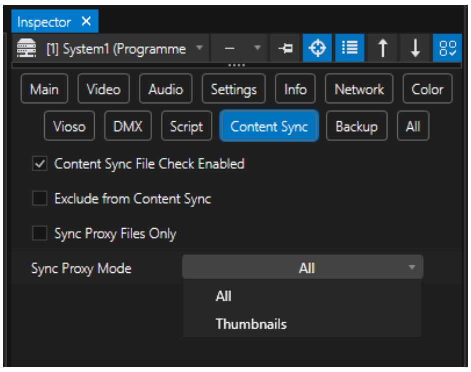
In the planning stage of your project - *before adding any content or session members* - it is wise to sort out the following:

- Know the **difference** between your **local project path** and the **source path of your content** on each system. This is important for both distribution and target of shared content data.
- What systems will render what parts of your content and how? -Some systems may only require a proxy file for preview, and that will save system resources.
- We recommend creating a designated content folder within your project folder and copying all content there before adding it to the project.

Settings

System Settings

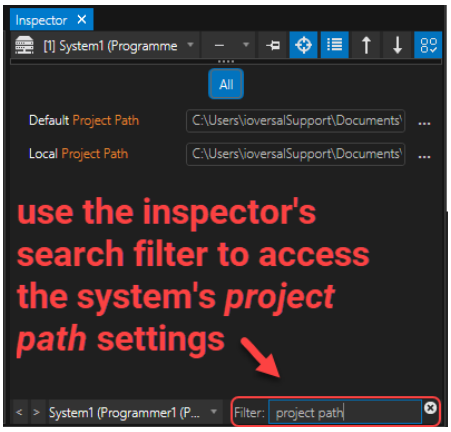
Content Sync Tab

 Inspector [1] System1 (Programme Main Video Audio Settings Info Network Color Vioso DMX Script Content Sync Backup All ☑ Content Sync File Check Enabled □ Exclude from Content Sync □ Sync Proxy Files Only Sync Proxy Mode: All All Thumbnails	**Content Sync File Check Enabled**	When enabled, VERTEX will regularly check on local content source files.
	Exclude from Content Sync	Excludes this system from content sync when enabled.
	Sync Proxy Files Only	Only proxy files will be transferred to this system, when enabled. Don't forget to set this system's Render Editor to proxy-mode if you use this setting.
	Sync Proxy Mode	Choose whether you want to sync all proxies including videos or only thumbnails (still images) as your proxy files to this system.

Network Tab - Content Sync Adapter

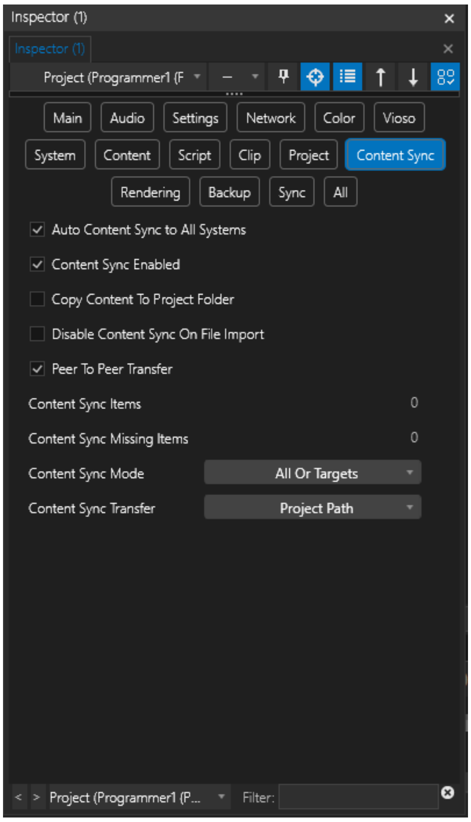
Select a network adapter for content sync transfers.

Use this feature to run Content-Sync on a separate network. This will help to speed things up when working with large amounts of data.

 Default Project Path C:\Users\ioversalSupport\Documents\ Local Project Path C:\Users\ioversalSupport\Documents\ use the inspector's search filter to access the system's *project path* settings Filter: project path	**Default Project Path**	This is the folder that was set during the installation of VERTEX defining the default for your local project path. You can change it here to permanently define a different target folder or drive for all project files.
	Local Project Path	Sets a target folder for all content transfers on your local system.

Project Settings

Global settings for Content Sync

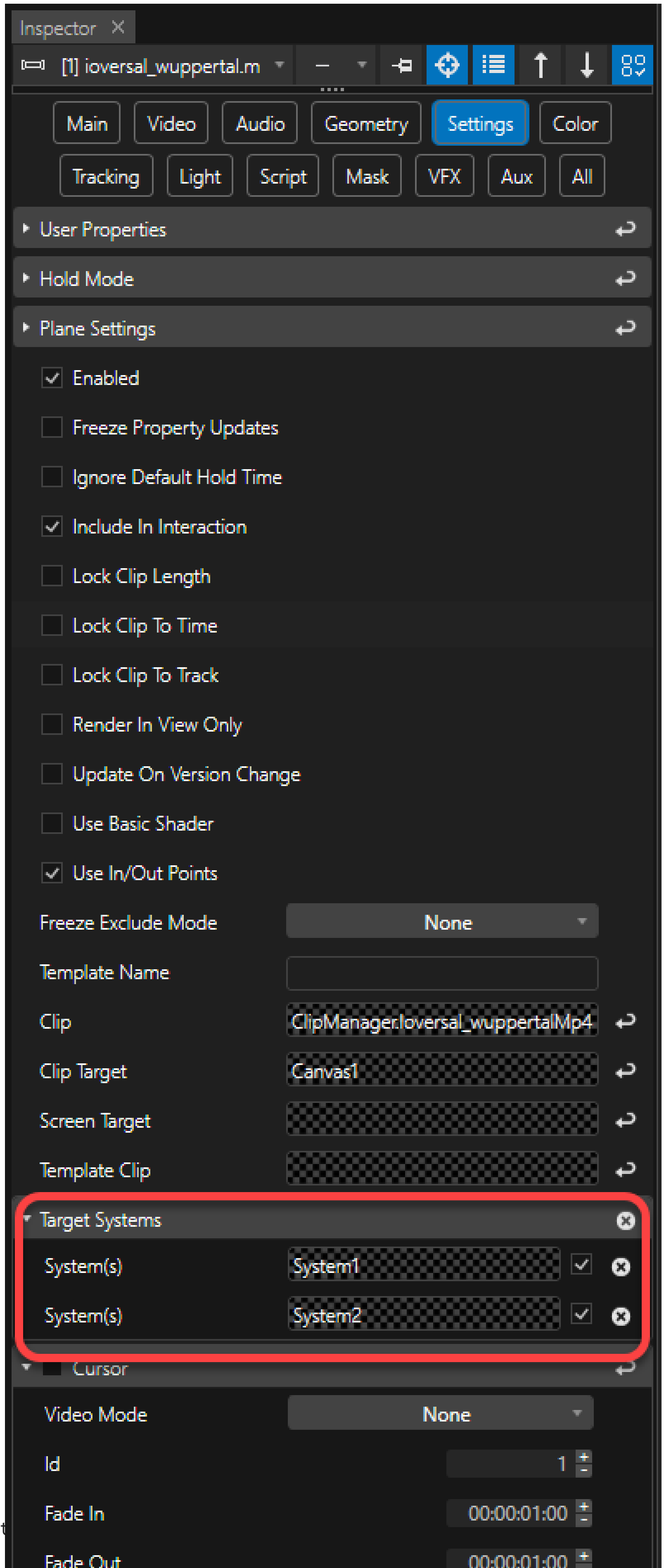
 ☑ Auto Content Sync to All Systems ☑ Content Sync Enabled ☐ Copy Content To Project Folder ☐ Disable Content Sync On File Import ☑ Peer To Peer Transfer Content Sync Items 0 Content Sync Missing Items 0 Content Sync Mode All Or Targets Content Sync Transfer Project Path	**Auto Content Sync To All Systems**	Enabled by default, will be transferred automatically to all Systems.
	Content Sync Enabled	When enabled, content items will be transferred by
	Copy Content To Project Folder	When enabled, the source file will be copied to the project folder. This is important when adding content from an external drive.
	Disable Content Sync on File Import	only a proxy will be transferred on import
	Peer To Peer Transfer	A P2P network is using all Session Members for the fastest possible transfer. When disabled, transfers will be processed one after the other from Source System to Target System.

	Content Sync Items	items currently being transferred
	Content Sync Missing Items	items still missing in current transfer
Content Sync Mode	**No Sync**	no content will be transferred
	All	content will always be transferred to all Systems
	All Or Targets (default)	transfers content to either all systems unless items have specified Target Systems assigned.
	Targets Only	content will only be transferred to Target Systems.
	Proxies & Targets Only	only proxy files will be transferred unless items have specified Target Systems assigned.
Content Sync Transfer target file path for transferred source content	**Project Path** (default)	creates a content folder in the project's data folder - i.e.: C:\Users\USERNAME\Documents\Vertex\Projects\PROJECTNAME\Data\Content
	Relative Path	creates a file path **within the project folder relative to the original path**. Let's say you imported content from *C:\Movies*, then VERTEX will create a file path like this on the other Systems in your Session: *C\....\PROJECTNAME\Resources\C\Movies*
	Source Path	creates a file path exactly like the original source path. When importing from e.g. *C:\Movies*,

		all receiving Systems will have a path called *C:\Movies* created.

Target Systems

This feature allows users to transfer content exclusively to particular Systems, specified as *Target Systems*.
This property is located in the Inspector of *Content Items* as well as *Clip Containers.*
By default, there are no targets assigned: all content will be distributed to all Systems. To assign a *Target System*, drag a *System* from the *Project Explorer* onto this property.



User Properties

Hold Mode

Plane Settings

☑ Enabled

□ Freeze Property Updates

□ Ignore Default Hold Time

☑ Include In Interaction

□ Lock Clip Length

□ Lock Clip To Time

□ Lock Clip To Track

□ Render In View Only

□ Update On Version Change

□ Use Basic Shader

☑ Use In/Out Points

Freeze Exclude Mode	None
Template Name	
Clip	ClipManager.Ioversal_wuppertalMp4
Clip Target	Canvas1
Screen Target	
Template Clip	

Target Systems

System(s)	System1	☑
System(s)	System2	☑

□ Cursor

Video Mode	None
Id	1
Fade In	00:00:01:00
Fade Out	00:00:01:00

Vert

In order for *Target Systems* to work effectively, you need to go to *Project Settings > Content Sync* and set *Content Sync Mode* to any option with *Targets*.
Otherwise your data will be distributed to all Systems and not just to the specified targets.

Target Systems Workflow

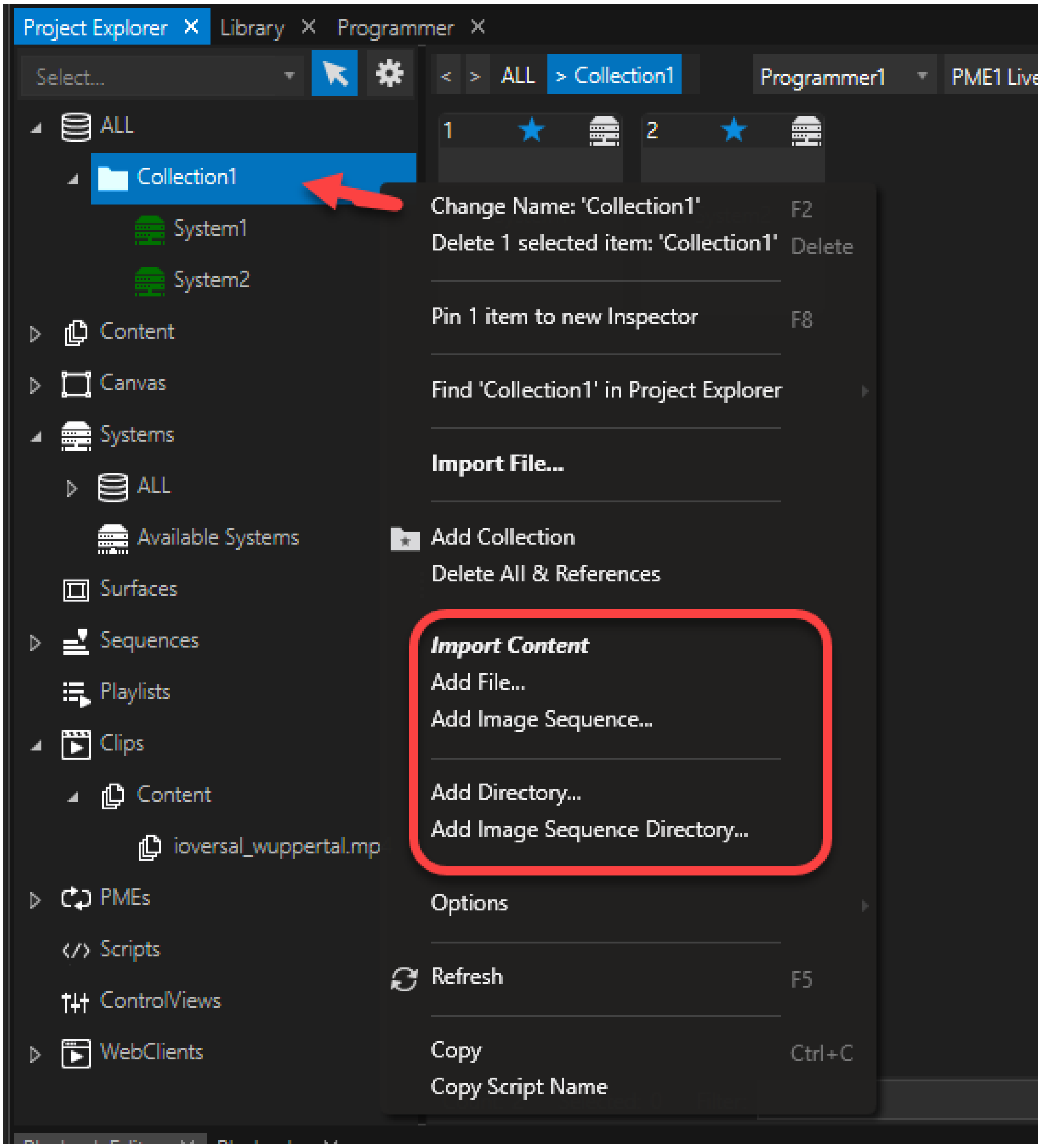
Let's say you have heaps of content to import and would like to route many files to a *Target System*.
To save you the trouble of inspecting and assigning each item individually, you can automatize this process with a choice of two convenient workflows:

Import Content via System > Context Menu

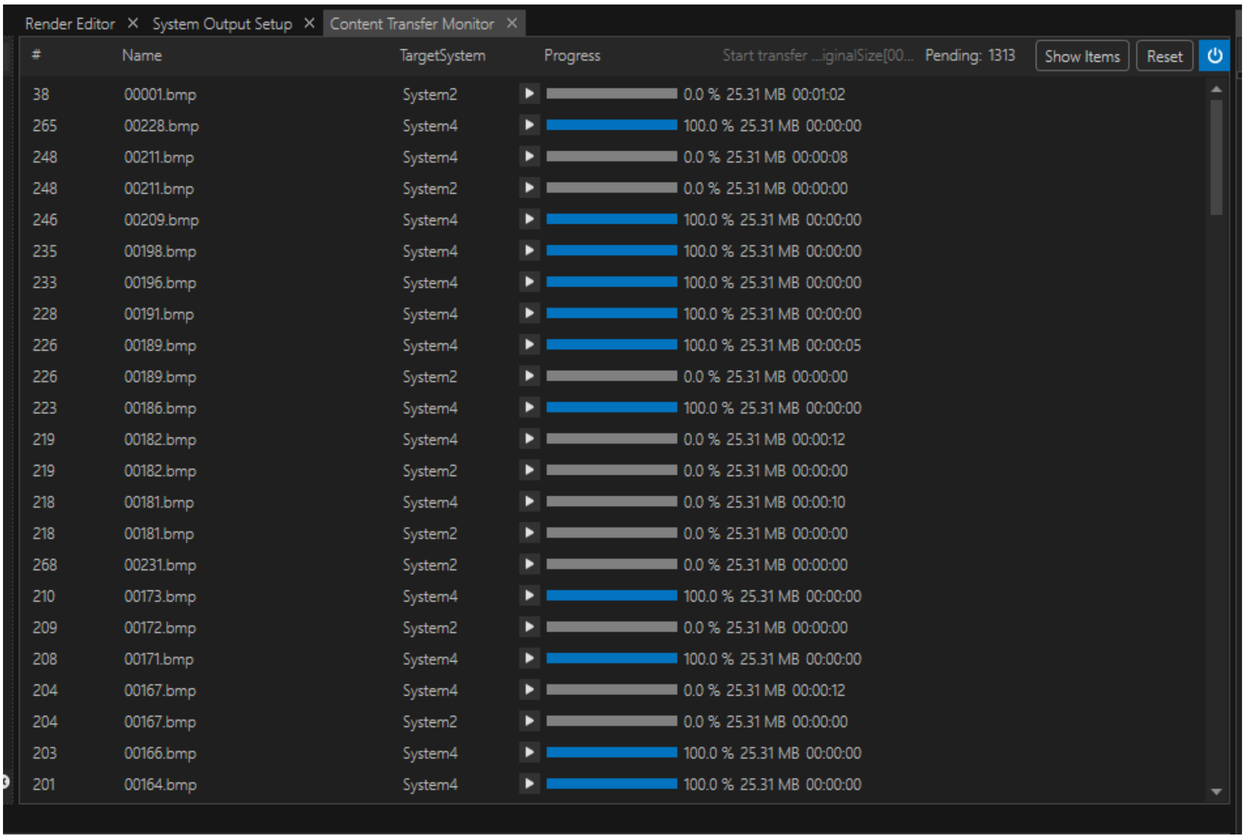
1. right-click on a *System* tile in the *Project Explorer* and select from the *Import Content* options
2. this System will be automatically assigned *Target System* for any content imported this way

Target Systems Assigned To A Collection

1. add a *Collection* to the "All" Section in *Project Explorer* (right-click on *ALL*)
2. drag & drop one or more *Systems* onto this *Collection*
3. access the *Collection's* context menu by right-click and import your content from there
4. all content imported this way will have the Systems within this *Collection* assigned as *Target Systems*
5. the *Systems* within this *Collection* are set as *Target Systems* for all content you import this way



Content Transfer Monitor



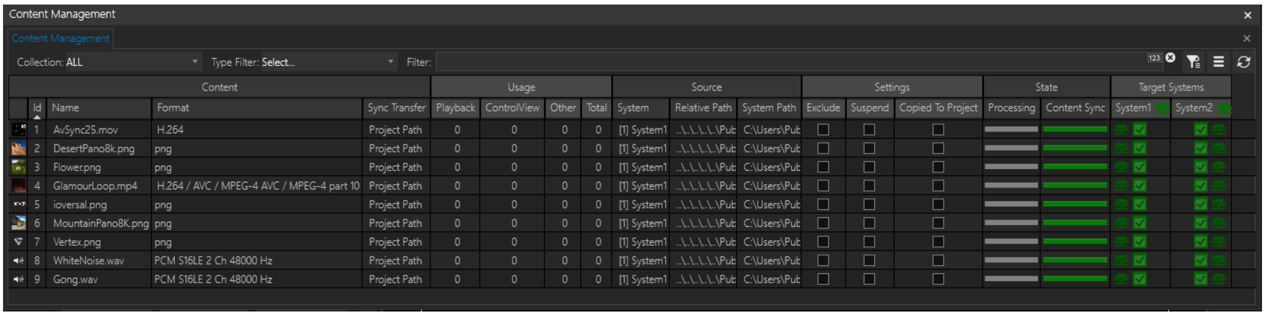
#	Name	TargetSystem	Progress
38	00001.bmp	System2	▶ 0.0 % 25.31 MB 00:01:02
265	00228.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
248	00211.bmp	System4	▶ 0.0 % 25.31 MB 00:00:08
248	00211.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
246	00209.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
235	00198.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
233	00196.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
228	00191.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
226	00189.bmp	System4	▶ 100.0 % 25.31 MB 00:00:05
226	00189.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
223	00186.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
219	00182.bmp	System4	▶ 0.0 % 25.31 MB 00:00:12
219	00182.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
218	00181.bmp	System4	▶ 0.0 % 25.31 MB 00:00:10
218	00181.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
268	00231.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
210	00173.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
209	00172.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
208	00171.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
204	00167.bmp	System4	▶ 0.0 % 25.31 MB 00:00:12
204	00167.bmp	System2	▶ 0.0 % 25.31 MB 00:00:00
203	00166.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00
201	00164.bmp	System4	▶ 100.0 % 25.31 MB 00:00:00

VERTEX Content Transfer Monitor displays all current content transfers in your project. When this window is empty all transfers are either finished or have not started yet.
Its RESET button restarts *VERTEX Content Sync Engine* and should be only used when Systems have been connected or disconnected to the project (see below).

Content Management Window

This window is a great tool to supervise and manage your content across all Systems.
Here you can monitor individual content items and adjust their settings such as:
- usage
- source path
- exclude / suspend from Content Sync
- sync state
- copy to project folder
- set Target Systems
- find specific content items with a filter string (by content type, collection or custom keyword)

Go to MAIN MENU > WINDOWS > Content > Content Management

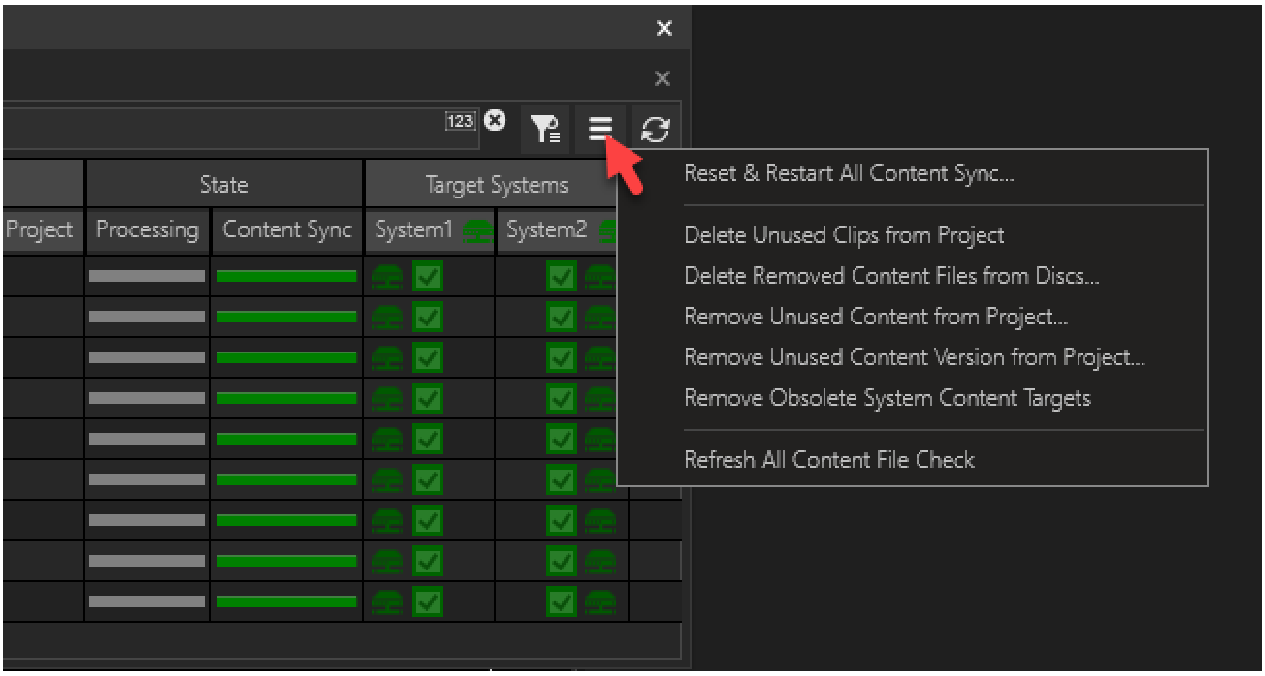


Content Management

Collection: ALL   Type Filter: Select...   Filter:

Content					Usage				Source			Settings			State		Target Systems	
	Id	Name	Format	Sync Transfer	Playback	ControlView	Other	Total	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	Processing	Content Sync	System1	System2
	1	AvSync25.mov	H.264	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	2	DesertPano8k.png	png	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	3	Flower.png	png	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	4	GlamourLoop.mp4	H.264 / AVC / MPEG-4 AVC / MPEG-4 part 10	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	5	ioversal.png	png	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	6	MountainPano8K.png	png	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	7	Vertex.png	png	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	8	WhiteNoise.wav	PCM S16LE 2 Ch 48000 Hz	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑
	9	Gong.wav	PCM S16LE 2 Ch 48000 Hz	Project Path	0	0	0	0	[1] System1	..\..\..\..\..\Pub	C:\Users\Pub	□	□	□			☑	☑

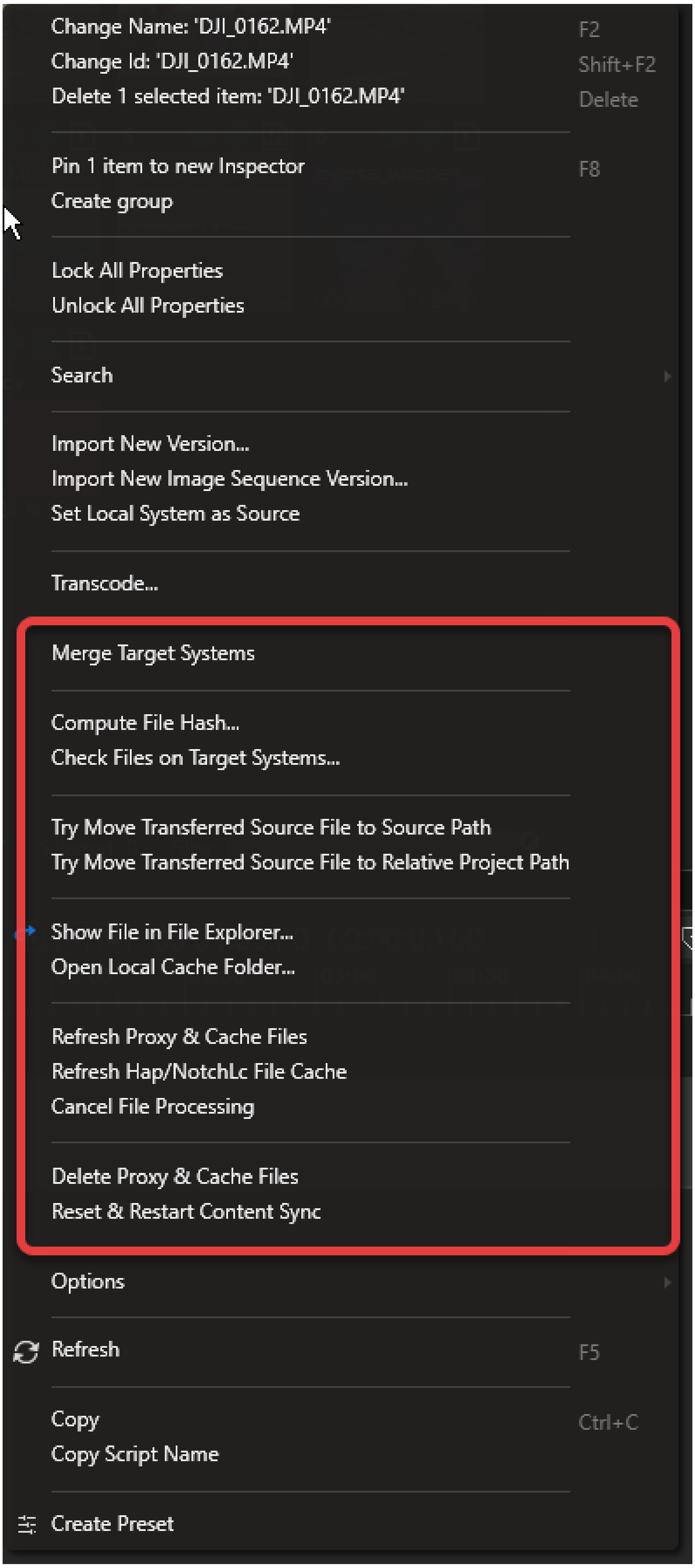
For further actions such as *Delete Unused*, click on the menu icon in the top bar:


123
State
Target Systems
Project
Processing
Content Sync
System1
System2
Reset & Restart All Content Sync...
Delete Unused Clips from Project
Delete Removed Content Files from Discs...
Remove Unused Content from Project...
Remove Unused Content Version from Project...
Remove Obsolete System Content Targets
Refresh All Content File Check

Reset Options For Content Sync

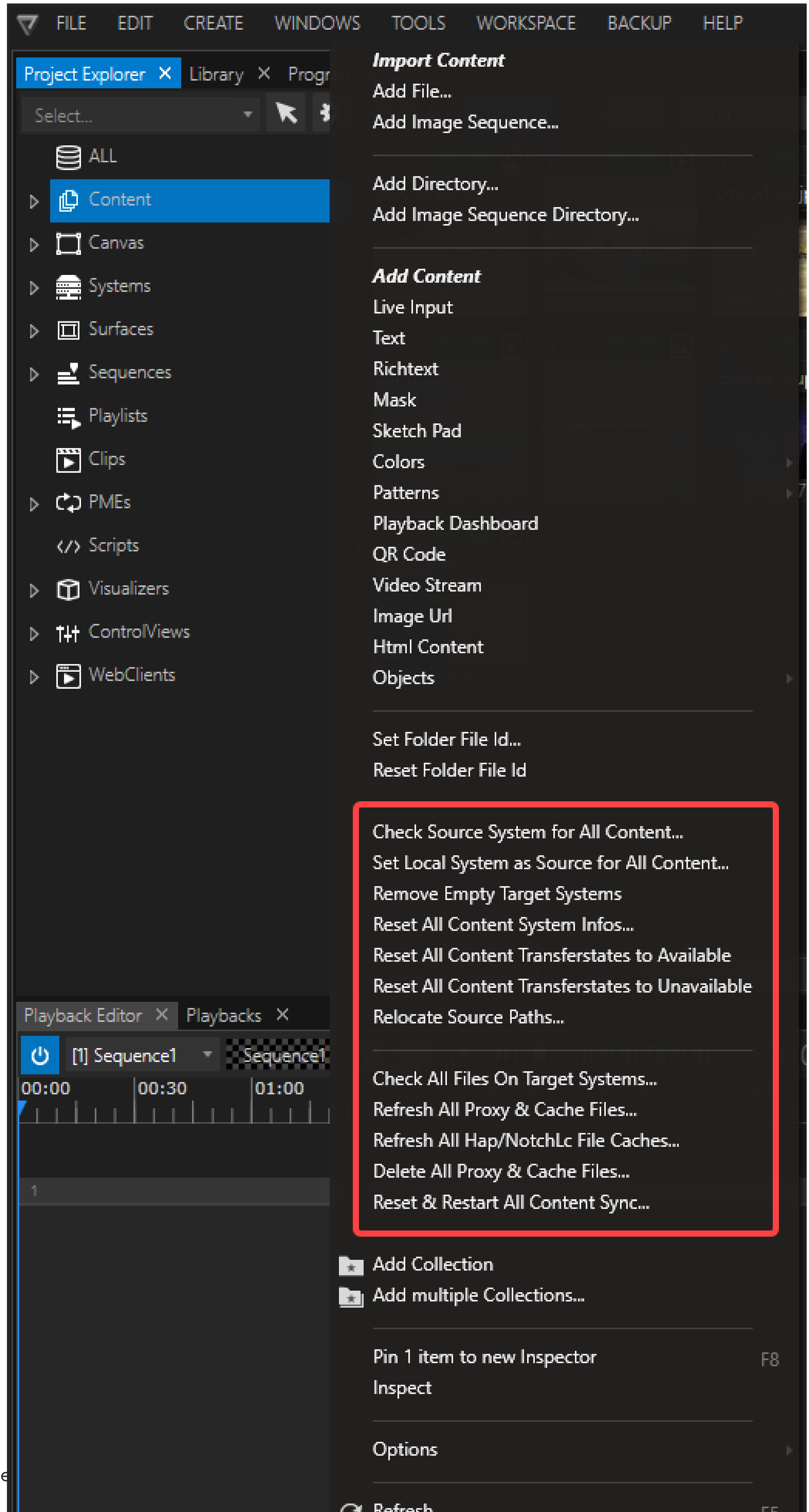
There are many options to refresh, reset and restart Content Sync. Those options will mostly be necessary in case some content is not distributed properly due to Systems being added or disconnected to your Session.
You can command all reset options in the Project Explorer by the context menu on three levels:

- right-click on an individual content item and reset Content Sync for just this item:

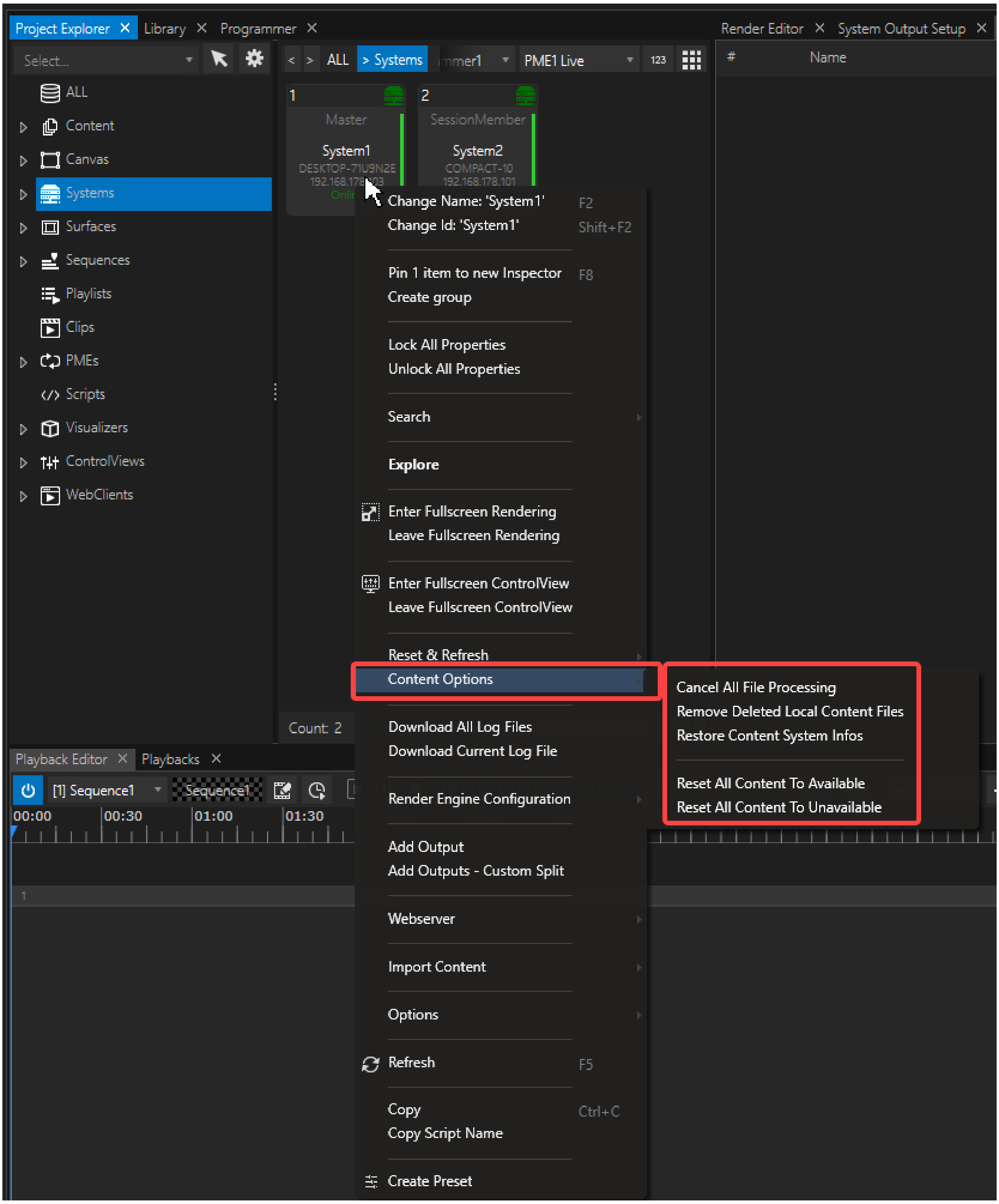

Change Name: 'DJI_0162.MP4' F2
Change Id: 'DJI_0162.MP4' Shift+F2
Delete 1 selected item: 'DJI_0162.MP4' Delete
Pin 1 item to new Inspector F8
Create group
Lock All Properties
Unlock All Properties
Search
Import New Version...
Import New Image Sequence Version...
Set Local System as Source
Transcode...
Merge Target Systems
Compute File Hash...
Check Files on Target Systems...
Try Move Transferred Source File to Source Path
Try Move Transferred Source File to Relative Project Path
Show File in File Explorer...
Open Local Cache Folder...
Refresh Proxy & Cache Files
Refresh Hap/NotchLc File Cache
Cancel File Processing
Delete Proxy & Cache Files
Reset & Restart Content Sync
Options
Refresh F5
Copy Ctrl+C
Copy Script Name
Create Preset

Refresh Proxy & Cache Files, for example, will restart the encoding process and the re-calculated files will be distributed by Content Sync.

- there are similar options for all content items globally, if you right-click on *Content* in Project Explorer's tree view:


FILE
EDIT
CREATE
WINDOWS
TOOLS
WORKSPACE
BACKUP
HELP
Project Explorer
Library
Progr
Select...
ALL
Content
Canvas
Systems
Surfaces
Sequences
Playlists
Clips
PMEs
Scripts
Visualizers
ControlViews
WebClients
Playback Editor
Playbacks
[1] Sequence1
Sequence1
00:00
00:30
01:00
1
Import Content
Add File...
Add Image Sequence...
Add Directory...
Add Image Sequence Directory...
Add Content
Live Input
Text
Richtext
Mask
Sketch Pad
Colors
Patterns
Playback Dashboard
QR Code
Video Stream
Image Url
Html Content
Objects
Set Folder File Id...
Reset Folder File Id
Check Source System for All Content...
Set Local System as Source for All Content...
Remove Empty Target Systems
Reset All Content System Infos...
Reset All Content Transferstates to Available
Reset All Content Transferstates to Unavailable
Relocate Source Paths...
Check All Files On Target Systems...
Refresh All Proxy & Cache Files...
Refresh All Hap/NotchLc File Caches...
Delete All Proxy & Cache Files...
Reset & Restart All Content Sync...
Add Collection
Add multiple Collections...
Pin 1 item to new Inspector
F8
Inspect
Options
Refresh
F5

- and a right-click on a *System* tile will give you options to reset/ refresh Content Sync per individual Systems:



4.8.6 Data Routing

- The **mesh architecture of VERTEX** includes **data routing** which **shares Device Data and Control Protocols**

over all Systems

- Use the e.g the DMX-Routing Editor to **repeat and route Art-Net™, sACN or *DMX-512*** *from one system to one or all other Systems into the Project*

Data Routing Options

With VERTEX handing of your Protocol and Device data will become easy.
Data that comes in on a System can be repeated and used on another System into your Project.

Device Data and Protocols

Device Data that is caught on a System could be used on another System.
Use the Data of a Device which is connected to a System 1 on another System 2.
The **type of the data and the incoming protocol depends on the Device type** into the Library
Learn more about Devices

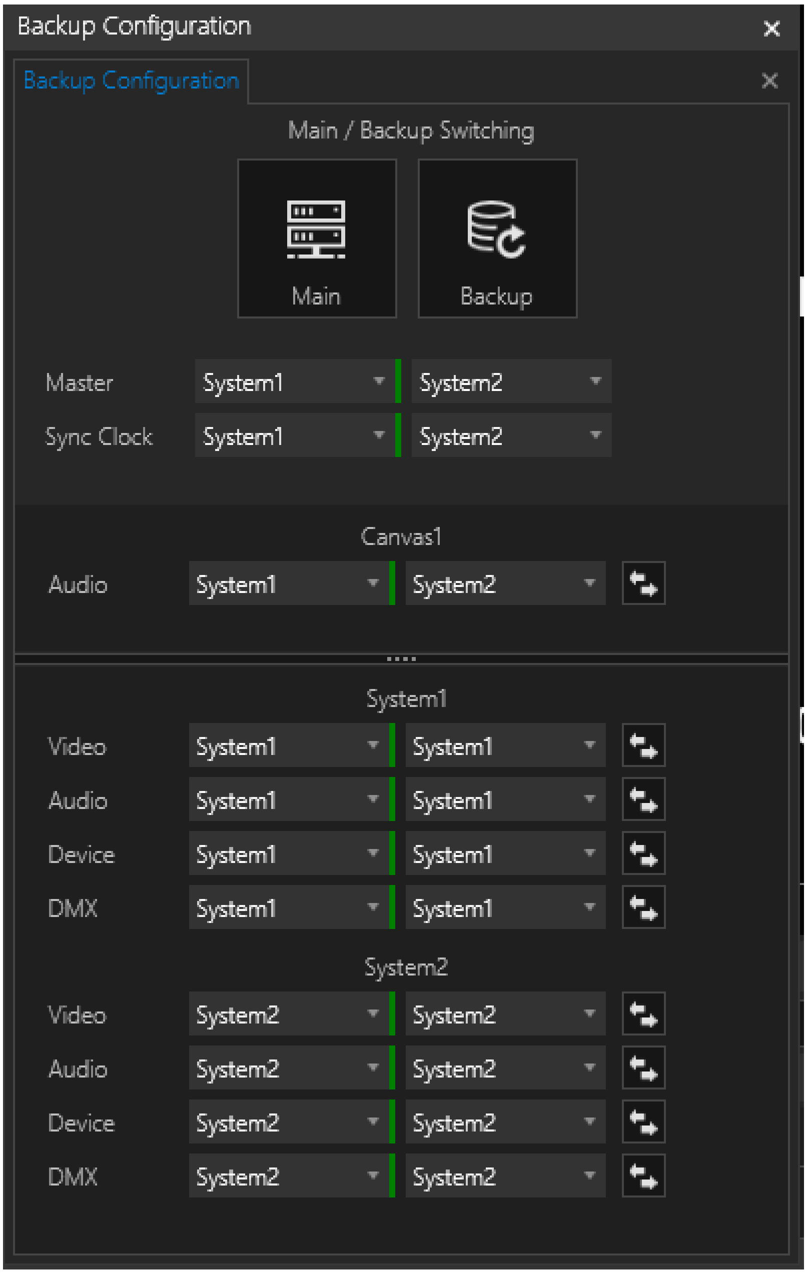
Manage, Route and Transform Control Protocols like DMX-512, Art-Net™ or sACN

Route and Repeat incoming Lighting Control Protocols.
Input e.g. DMX-512 with a ioversal DMX IO on System 1 and output this Data as sACN on System 2
The DMX Routing Editor gives you the full flexibility

4.8.7 Backup Systems

- Generally, there are **2 backup modes** in VERTEX: **partial backup** and **redundant backup.**
- Default backup mode is partial - the **mode can be set in the project settings** or by a **script command.**

Backup Configuration



Master	System1	System2
Sync Clock	System1	System2

Canvas1

Audio	System1	System2

System1

Video	System1	System1
Audio	System1	System1
Device	System1	System1
DMX	System1	System1

System2

Video	System2	System2
Audio	System2	System2
Device	System2	System2
DMX	System2	System2

The Backup Configuration window allows managing the amount of backup systems per project with ease and flexibility.

The buttons *Main & Backup* on the top will switch between the designated system configurations that can be set on the bottom of the window.

Backup Mode

Partial Backup:

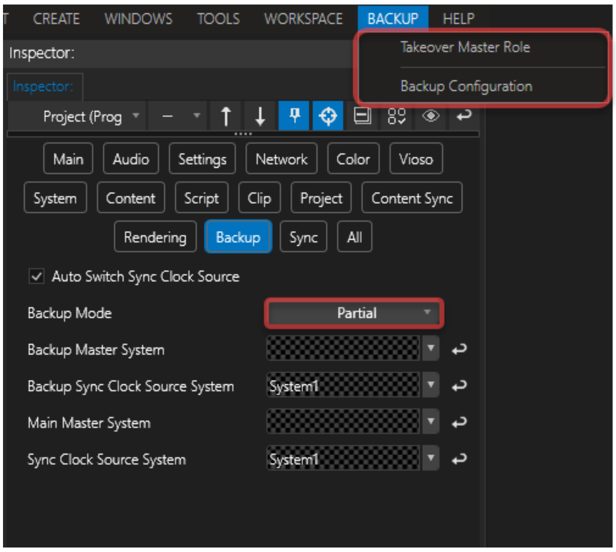
A **backup system** is a **session member** that takes over the **role of another session member** or the **master**.
Any system in your project can become Master **or take over various tasks of another system** such as rendering video, audio, or managing DMX devices.

Redundant

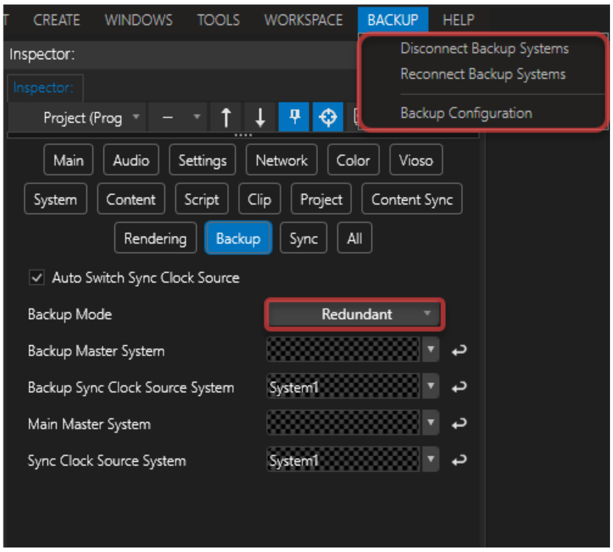
Your cluster of live systems is **mirrored as a whole on a backup group, consisting of the same amount of systems.**

Set Backup Mode

The **default mode** for backups is **Partial**
The mode **can be set** in the Project Settings.
Depending on the selected mode, the menu entries for *Backup* in the main menu will change.



☑ Auto Switch Sync Clock Source
Backup Mode: Partial
Backup Master System:
Backup Sync Clock Source System: System1
Main Master System:
Sync Clock Source System: System1



☑ Auto Switch Sync Clock Source
Backup Mode: Redundant
Backup Master System:
Backup Sync Clock Source System: System1
Main Master System:
Sync Clock Source System: System1

Partial Backup

Master System Backup

Every system in your project - including a backup session member - can take over the master role.

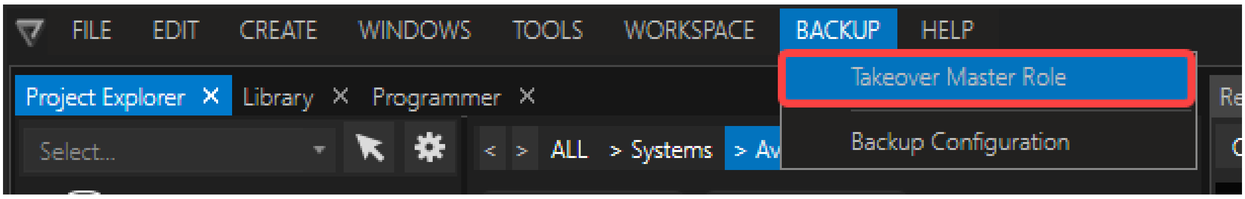
How to take over:

1. **Via the UI**

   Go to the **Session Member System** that should take over the master role,

   Go to **Backup tab** of the **Main Menu** there and select "**Takeover Master Role**"

   The **Session Member** switches its role to **Master** and the former master (if still alive) will become a **Session Member.**



2. Use a Script Command

```
SystemsManager.BackupTakeOverMasterRole
```

This script command can only be triggered from **the local system** and externally via VERTEX API.

Sync-Clock Source System

Switching the Master role will not change the Sync Clock Source System of a project.

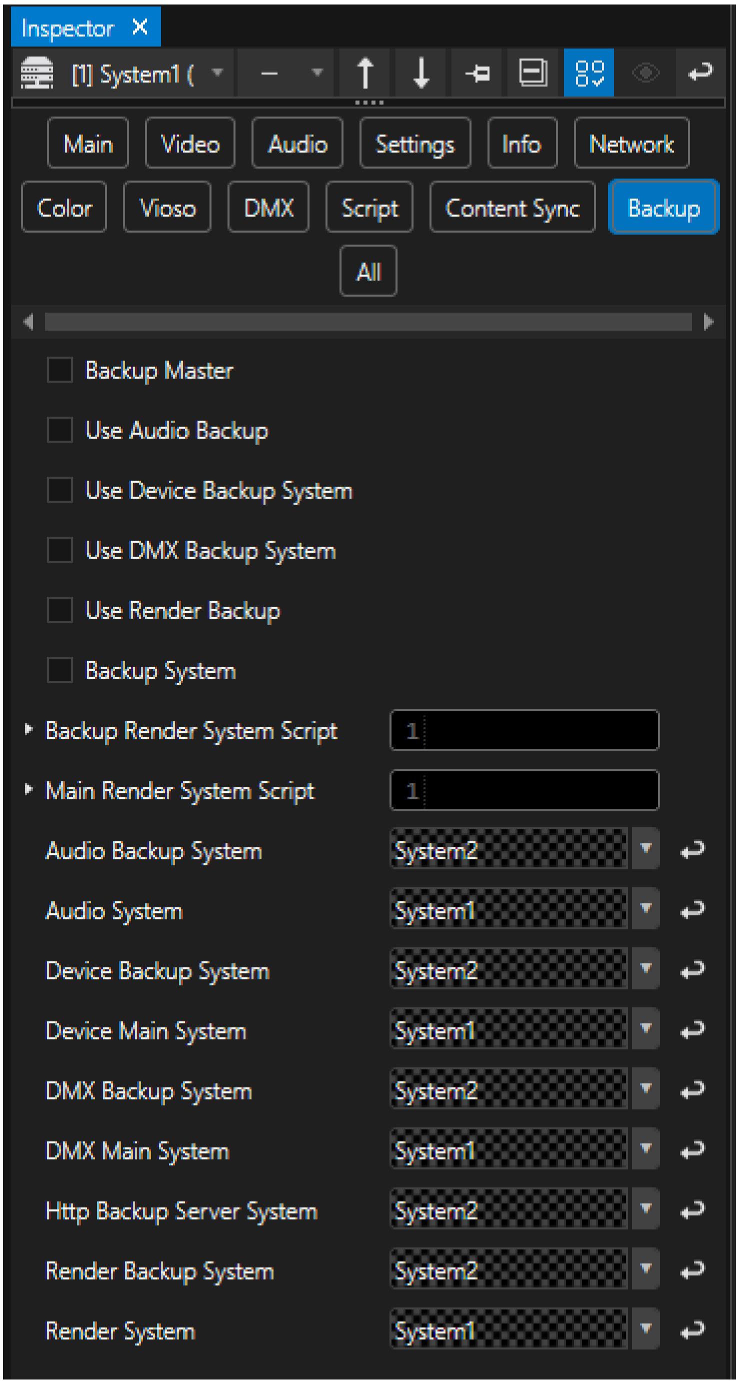
If the former Master is defined as the Sync Clock Source System and is still active, it will keep this function.

If the former Master is inactive or offline, the Backup Sync Clock Source System that is defined in the Project Settings will take over this function.

Please keep this in mind, if you want to change both the Master as well as the Sync Clock Source System. You can do this with an additional script command in a backup script.

Session Member Backup

Your Session Member backup system is already part of your network in a similar role: as just another Session Member.



□ Backup Master

□ Use Audio Backup

□ Use Device Backup System

□ Use DMX Backup System

□ Use Render Backup

□ Backup System

Backup Render System Script	1
Main Render System Script	1
Audio Backup System	System2
Audio System	System1
Device Backup System	System2
Device Main System	System1
DMX Backup System	System2
DMX Main System	System1
Http Backup Server System	System2
Render Backup System	System2
Render System	System1

Each VERTEX system has got in the Inspector a *Backup* tab, visible in *advanced mode.*

Here, you can set all main systems and for various tasks and their backup systems - similar to the Backup Configuration window.

This means that in a non-backup scenario it is possible for a system to outsource its e.g. rendering task.

In a backup scenario, if one system fails, another Session Member can **take over the tasks for video rendering or audio playback,**

if it has got the **same number of outputs** in the **same resolution**.

Setting Backup Systems In The Inspector:

System1 renders video and System2 should be the backup.

Select System1 in the inspector.

Change the **Render Backup System** property by drag and drop of System2 from the project explorer. Alternatively, use the drop-down or context menu for a selection of all available systems.

The same workflow applies to audio systems etc.

Setting Backup Systems By Script Commands

```
// Set System2 as Render and Audio Backup for System1
System1.Settings.RenderSystem.Value = System2
System1.Settings.AudioSystem.Value = System2
```

Redundant Backup

Backup Group

a live group consists of

- live master
- number of live session members

a backup group consist of

- backup master
- number of backup session members

Backup groups can have one of the following two states:

1. **Connected**:
   All changes on the live system are pushed to the backup system.
   When connected, the project state from backup master will be overwritten with the project state from live master.
   Use to update your backup group to the newest project changes. The project state on backup master is overwritten and updated.
   When connected, the live master also acts as master for all members of the backup group.

2. **Disconnected:**
   If the backup group is disconnected, both groups - live and backup - act autonomous.
   The live master controls all session members of the live group.
   The backup master controls all session members of the backup group.
   Changes on the live group will not be pushed to the backup group.
   The project state of the backup group corresponds to the time when the groups were separated.

Define Members for Backup Group

1. **Add all systems as session members** to your Project.
2. **Switch Backup Mode** in your project settings to **"Redundant**".
3. **Select Systems in the Inspector** and enable the following:
   Backup Master: if enabled, this system will become master of the backup group.

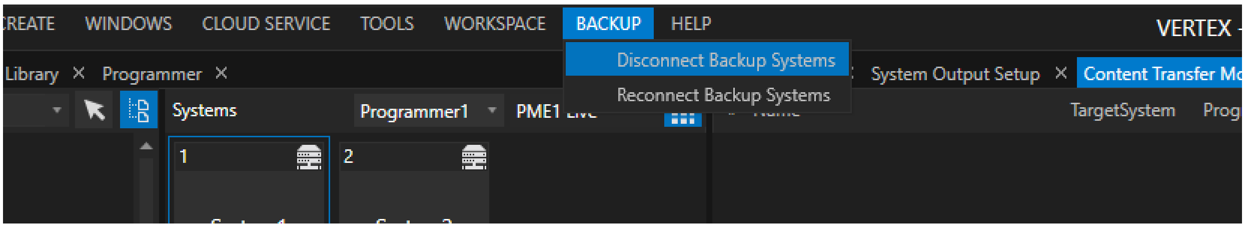
Backup System: enable Backup System for all Session Members of the Backup Group

Use Audio- / Device- / DMX- / Render Backup: enable to use the backup for specific task.

> Please take care, that all members of a Backup Group have assigned the **Content** they need to play back.
> When distributing content exclusively to certain **Target Systems**, please check your system's content settings in the Inspector.

Connect and Disconnect Backup Group

1. **Via User Interface**
   Go to Main Menu > Backup Tab
   Disconnect or Reconnect backup systems



2. **Script Command**

```
SystemsManager.BackupGroupReconnect
Systemsmanager.BackupGroupSeparate
```

This Script Command can only be executed **on the local System** and over the [VERTEX API](#).

4.8.8 Advanced Settings

Live Inputs in a VERTEX Session

A live input allows you to route the signal to any VERTEX system in your session.
This merge functionality enables you to use different live inputs on different systems.

- Go to ***Project Explorer > Systems > System1***

- select your Live Input
- right-click to open the context menu and select ***Add to project***

4.9 Live and Preview Playback

Learn the basics about Live Playback

Playback Mixing Engines (PME)

A PME hosts all Playback and could be Live or Preview.
Mix Levels of a PME defines the final signal that is going out to live
Create as many Preview PMEs as you need.

Preview

Work in Live and in Preview - Switch Editors between PME Live and Preview
Build workspaces that combine Live playback and Preview editing.

Fullscreen Renderer

Enter or Leave Fullscreen
Get information about the Fullscreen options of a System

Output Stream

Stream your rendered Content as an NDI Stream out of VERTEX
NDI is a registered trademark of Vizrt NDI AB

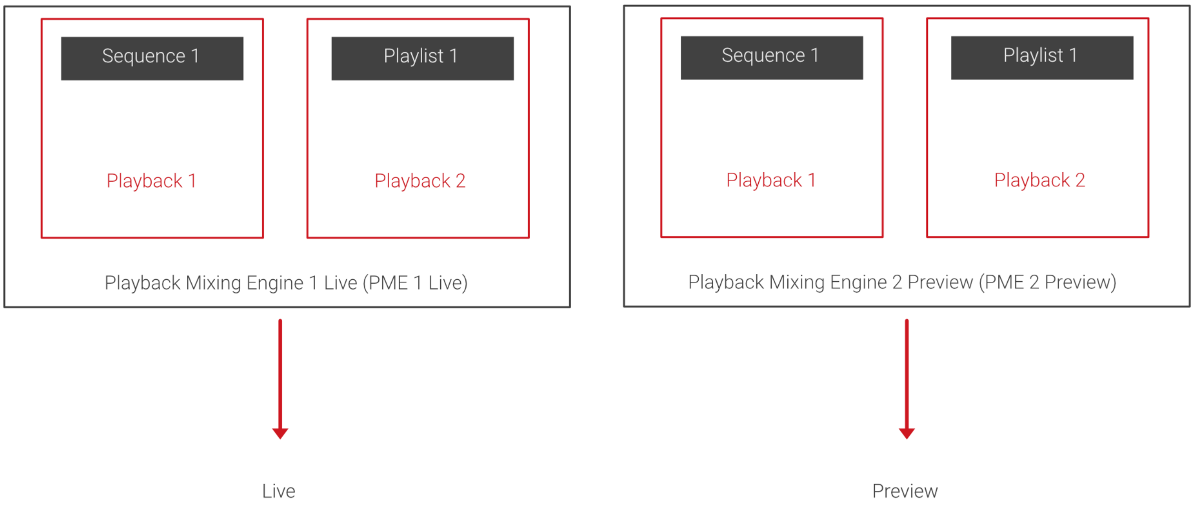
Audio Playback

Audio monitoring options in the environments of Live & Preview

4.9.1 Playback Mixing Engine

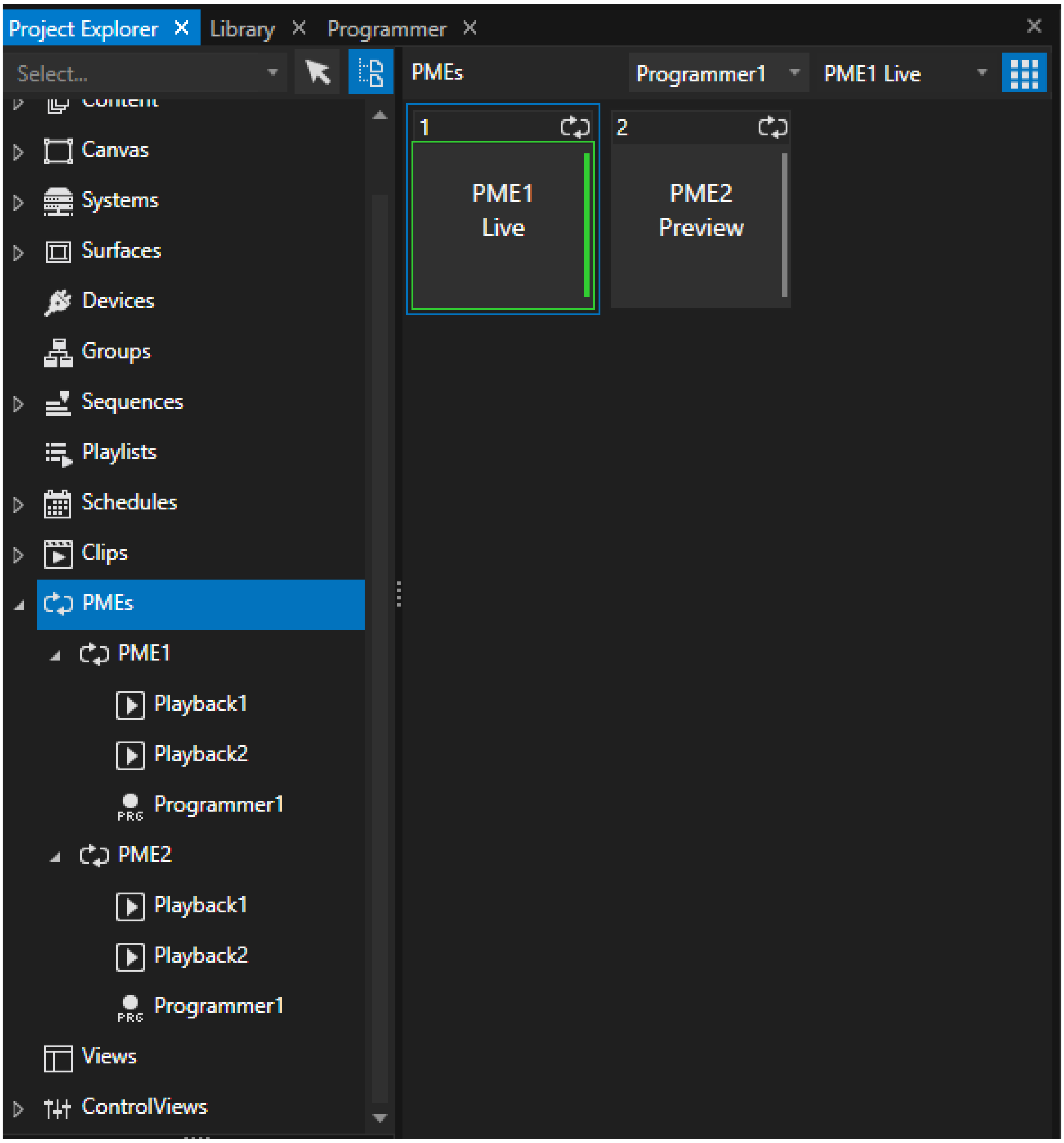
- PMEs into VERTEX **host all Playbacks**
- by default **there are 2 PMEs** - one **for Live** and a second **for a Preview**
- The PMEs into VERTEX are **like Video Master Faders** that define if the final Signal goes out to Live or Preview
- **For every Render Editor and Playback Editor** you can select whether it **should show Live or (one of the) Previews**

Playback Mixing Engines (PMEs)



PMEs are the **lowest level of the Playback** Chain into VERTEX. The **final Result from the PME goes out to Live or Preview Renderer**.

Each PME **hosts all Playbacks of a Project** - With the terms of a video mixer: PMEs are your master groups or faders.



By default there are 2 **PMEs into a VERTEX project:**

- **Live** and
- **Preview**.

Live

Live PME always goes out to Fullscreen Renderer.

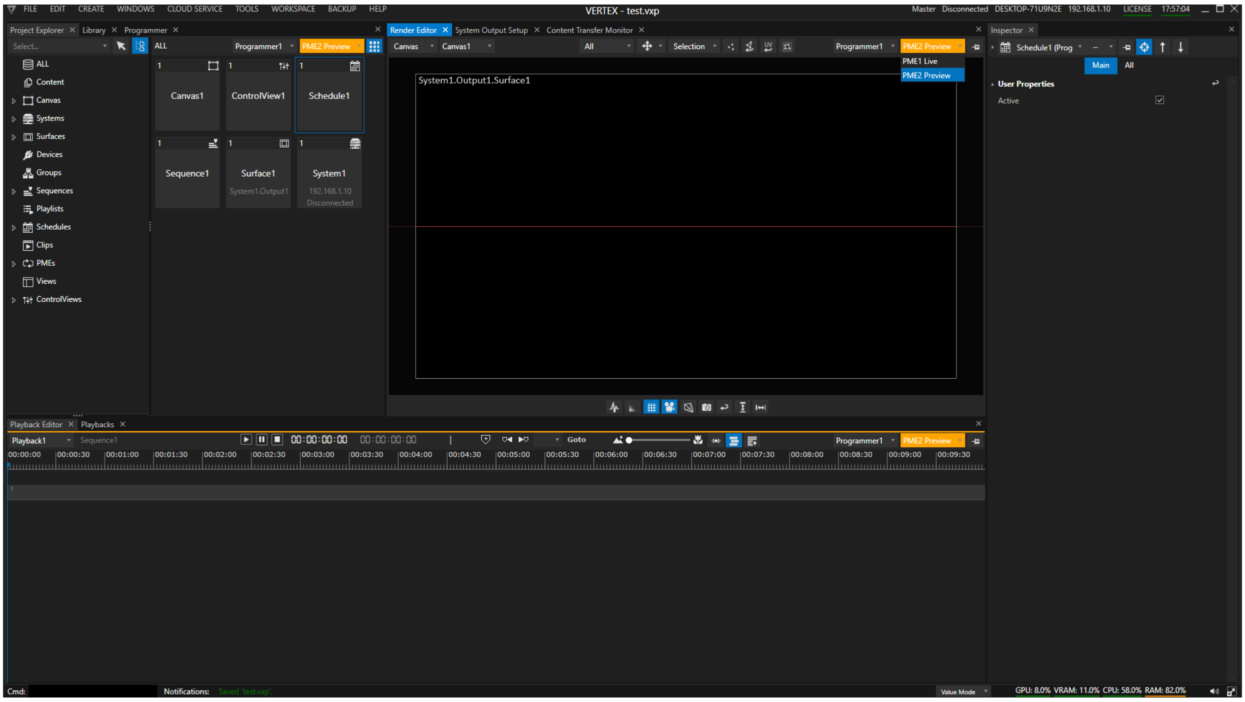
Audio from all playbacks running into PME Live is going out the the Audio Device that was set as live device

Preview

A Preview PME renders a Preview of your Playbacks.

Into each Playback Editor and each Render Editor, you are able to **choose which PME should be shown**.

Switch to e.g. PME 2 to work with the Preview



You are allowed to **create additional PMEs** - depending on how many different Previews you want to have for more. complex projects.

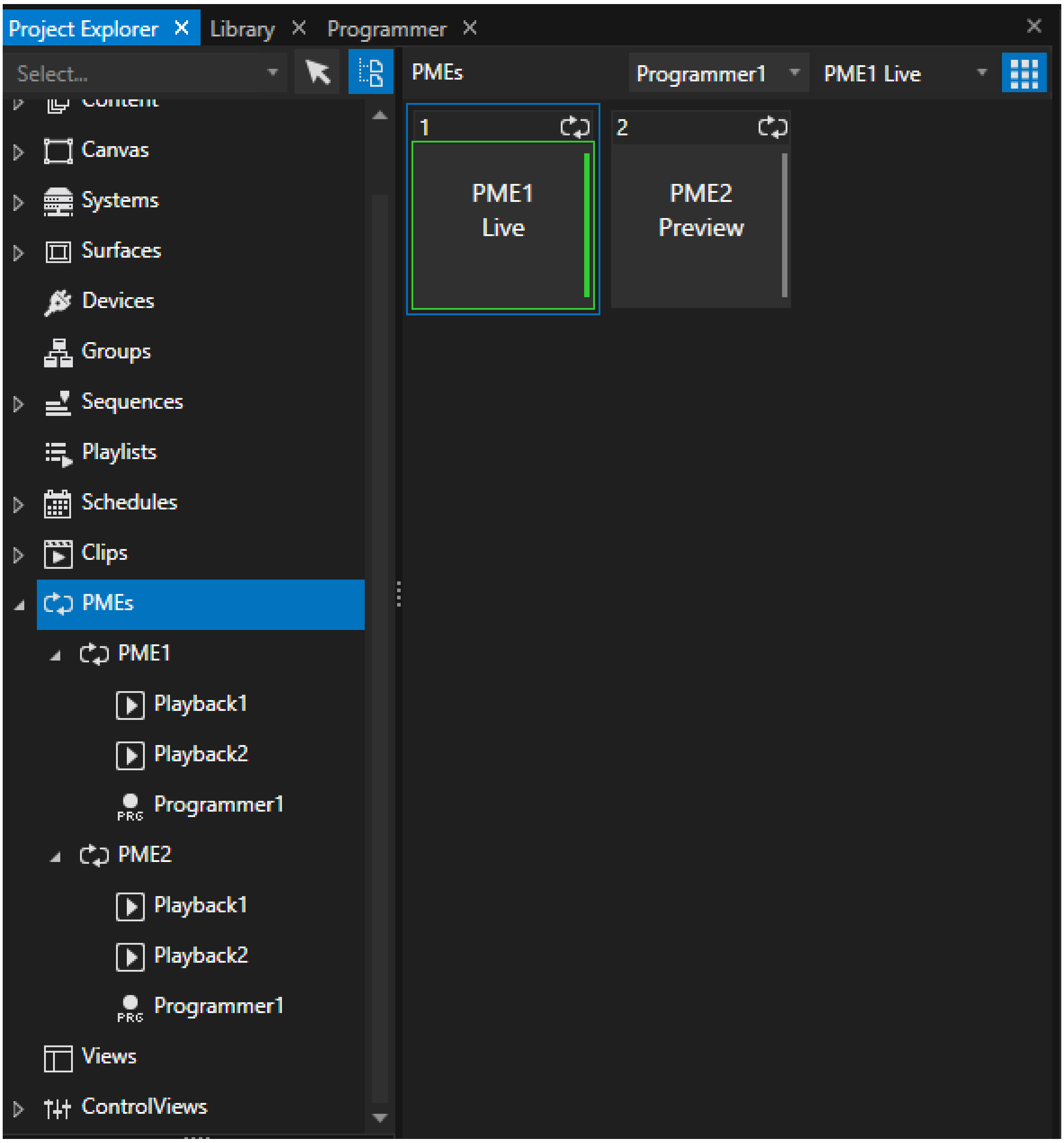
Regardless of the number of your Playback Mixing Engines, **only one PME could be the Live PME**

Programmer and PME

The PMEs also hosts your Programmer(s).

Depending on the selected PME into your Playback Editor, your changes into Preview will be stored as Preview Changes into the Programmer.

Mix Level



Each PME has a Mixing Level - like a Video Mixer has.

The Mixing level **decides about the signal that is sent to your live output. Value 1 is sent to Live, Value 0 not.**

By default the **Mixing Level for Live is set to 1**.

The mixing level for **all Preview PMEs is set to 0**. The signal of a Preview PME is displayed into e.g. a Preview Render Editor, but the signal is not mixed to the live output.

By increasing **the mixing level up to 1 you are able to mix preview into live**

There is also the option to **swap preview and live**

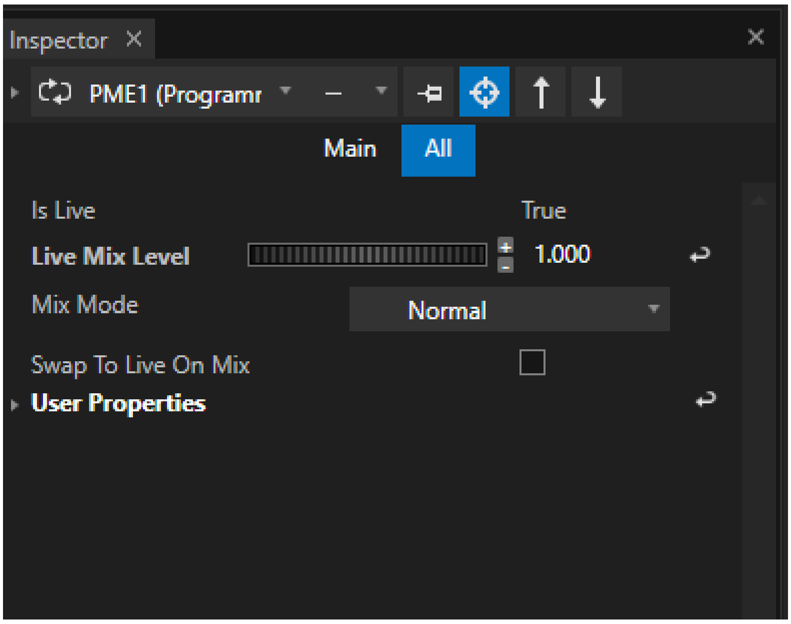
Create a new PME

- Go to Main Menu, open "Create" tab and select "Create PME"

or

- Go to the PME section into Project Explorer, right-click to open the context menu and select "Create new"

Settings



Is Live True

Live Mix Level 1.000

Mix Mode Normal

Swap To Live On Mix □

User Properties

Live Mix Level

If set to 1, signal is sent to Live Output and Fullscreen Renderer

If set to 0, signal is not sent to Live Output and only shown into Preview Render Editors

Mix Mode

Define the Mixmode when fading Live Mix Levels

Options: Normal, Crossfade, None

Swap to Live on Mix

When enabled a Preview PME is swapped from Preview to Live if Mixing Level reaches 1.
The "old" Live PME is swapped to Preview.

4.9.2 Preview

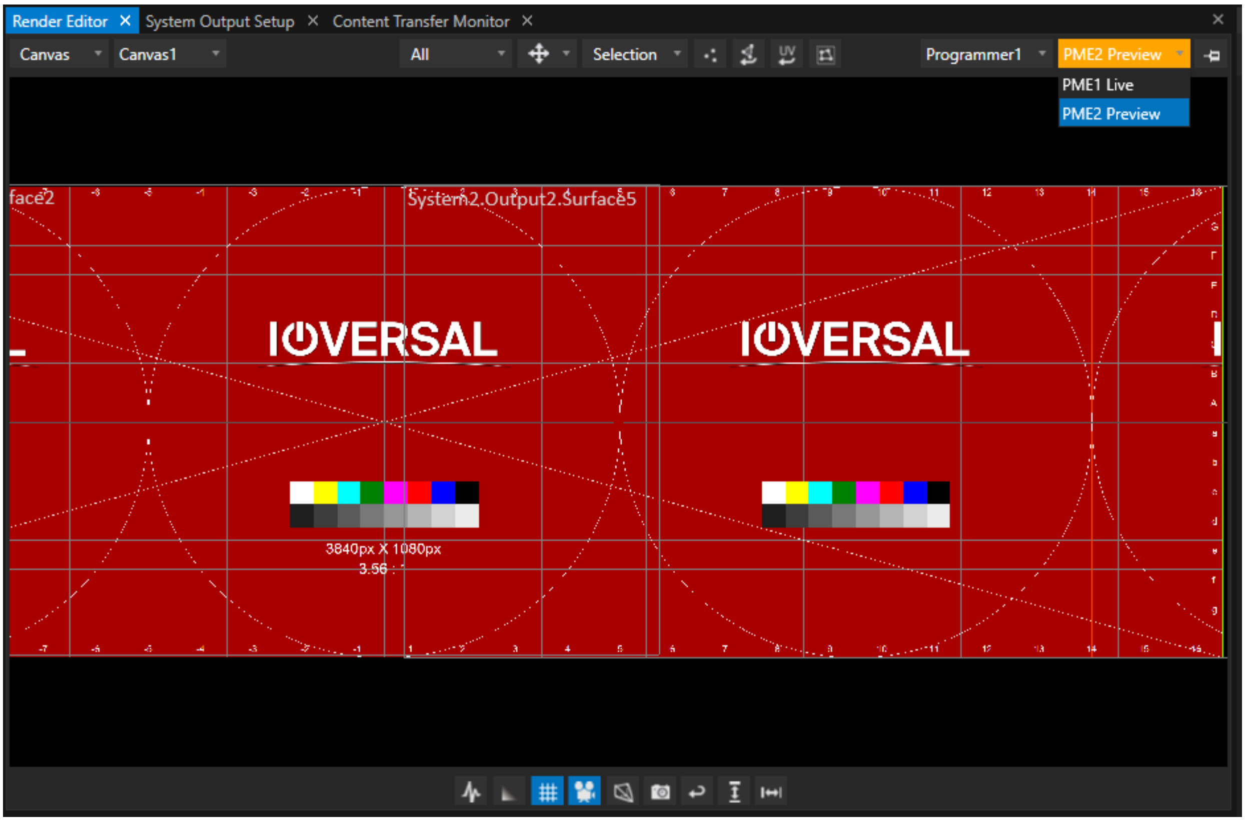
- The concept of Playback Mixing Engines (PME)allows you to work **with an infinite amount of previews**
- **Work live and in previews simultaneously** and **fade your previews to live at any time**.
- Into the **VERTEX Editors you are able to switch between the PMEs**. Or just open multiple editors of the same type to work on live and preview in parallel

Playback Mixing Engines (PME)

PMEs are the lowest level in VERTEX that host all Playbacks and are responsible for a Live or a Preview Mix
Read more about PMEs and their Settings here

ⓘ The number of previews depends on your hardware resource. each render editor and PME takes hardware resources because a new render path is opened.
Total number of PMEs that could be rendered in parallel depends on your hardware setup. It is not limited by VERTEX but by your hardware..

Switch between PMEs from Live to Preview



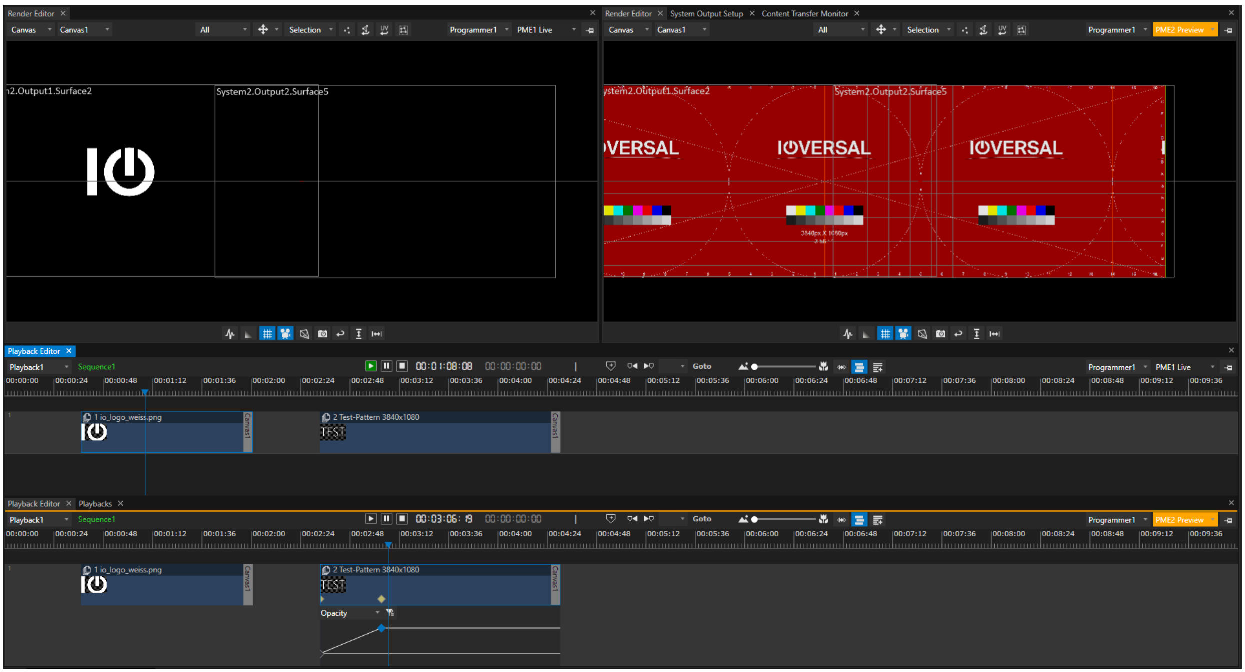
Render Editor is set to Preview PME

In most of the VERTEX editors you find a dropdown on top left with which you switch between Playback Mixing Engines

Preview PMEs are marked in yellow to give you visual feedback that you are working not in live but in preview.

Work live and in preview simultaneously

Using the **modular window concept of VERTEX** you can build your **own workspaces** and save it as view.
These workspaces can **show live and preview simultaneously**.
You are able **to work in preview as well as live** - e.g. if you want to make changes during a rehearsal while live is playing.



Example for a Workspace:
2 Render Editors - one for PME Live, one is set to PME2 (Preview).
2 Playback Editors - one for PME Live, one is set to PME2 (Preview).

Fade Preview to Live

The **mix level of a PME** the defines whether your content is played live or in preview.

Read more about the Mixlevel and its settings

4.9.3 Fullscreen Renderer

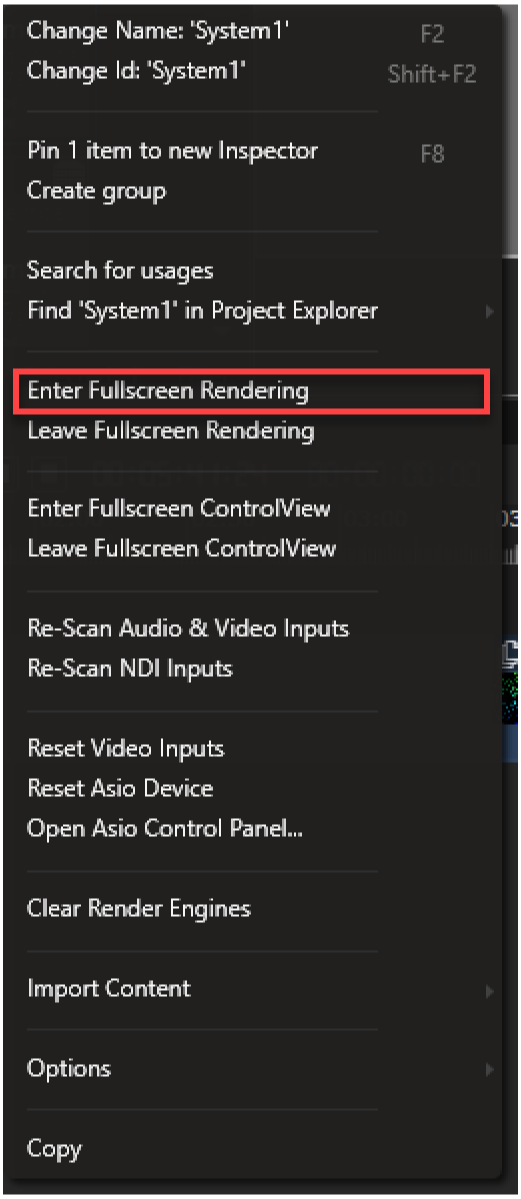
- Each Vertex system can run **in fullscreen mode**, in **UI mode,** or in **a combination of both on different screens**
- There are different ways to **enter the fullscreen mode: shortcuts, context menus, script or buttons**
- Make sure that no **render editor is working in the background-** this may **affect performance.**

Enter Fullscreen

Fullscreen shows black and no content
Check if you have added surfaces to your canvas and assigned them to the correct output.

There are **4 options to enter the fullscreen renderer**:

- Use **shortcut "CTRL + F"** on your local VERTEX system.
- Use the *Fullscreen* **button in the status bar** of your local system.
- Use the **context menu for a system** in the **project explorer** (also works remote for session member systems of a project)
- Use the **script command** `System1.EnterFullScreen`


Change Name: 'System1' F2
Change Id: 'System1' Shift+F2
Pin 1 item to new Inspector F8
Create group
Search for usages
Find 'System1' in Project Explorer
Enter Fullscreen Rendering
Leave Fullscreen Rendering
Enter Fullscreen ControlView
Leave Fullscreen ControlView
Re-Scan Audio & Video Inputs
Re-Scan NDI Inputs
Reset Video Inputs
Reset Asio Device
Open Asio Control Panel...
Clear Render Engines
Import Content
Options
Copy

Combination Of Fullscreen And UI

Here is the workflow to view both the UI and fullscreen renderer simultaneously:

1. Disable the *Topmost* Setting on the local system's settings tab in the inspector. Now the Fullscreen Renderer can operate in the background.
2. Enter fullscreen mode.
3. On your keyboard, hit the shortcut *ALT+TAB* to toggle between applications and windows. Select VERTEX user interface from here.
4. If you have two outputs on your system, you might want to set up the surface-output constellation so that one output displays the rendered content and the other output is free for the UI.

Make sure that the render editor is disabled or not opened

Check settings (Inspector - Settings tab for a System) or manually close the render editor.
If the render editor still renders in the background while in fullscreen mode, there will be a performance drop.

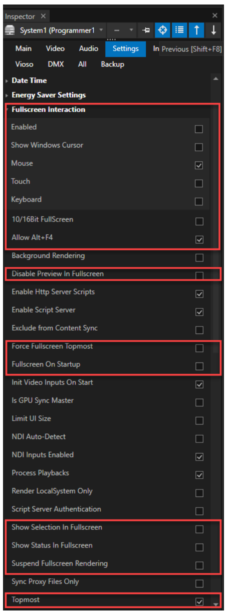
Leave Fullscreen

Leaving fullscreen is possible with:

- The **shortcut CTRL + F** on the local system
- Use the **context menu onto a system** into project explorer (also works for session member systems into a project)
- Use **script command** `System1.LeaveFullScreen`
- If the use of shortcut Alt+F4 is enabled in the system settings, use it just once to leave fullscreem mode. Using the shortcut twice will first close the render editor and then the VERTEX Application without asking you to save your project.

Fullscreen settings for a system

	Fullscreen Interaction	Enables input devices (mouse, keyboard, touch) in fullscreen mode for i.e. click scripts or URL content in interactive displays.
	10/16bit FullScreen	Sets the color bit depth for fullscreen rendering. If you need to run your GPU in a higher resolution than 8bit, please check this setting before instantiating fullscreen mode for the first time. In case you need to change this setting in the middle of a session, VERTEX needs to be restarted.

 Inspector System1 (Programmer1 Main Video Audio Settings In Previous [Shift+F8] Vioso DMX All Backup Date Time Energy Saver Settings Fullscreen Interaction Enabled □ Show Windows Cursor □ Mouse ☑ Touch □ Keyboard □ 10/16Bit FullScreen □ Allow Alt+F4 ☑ Background Rendering □ Disable Preview In Fullscreen □ Enable Http Server Scripts ☑ Enable Script Server ☑ Exclude from Content Sync □ Force Fullscreen Topmost □ Fullscreen On Startup □ Init Video Inputs On Start ☑ Is GPU Sync Master □ Limit UI Size □ NDI Auto-Detect □ NDI Inputs Enabled ☑ Process Playbacks ☑ Render LocalSystem Only □ Script Server Authentication □ Show Selection In Fullscreen □ Show Status In Fullscreen □ Suspend Fullscreen Rendering □ Sync Proxy Files Only □ Topmost ☑	**Allow ALT+F4**	Default: enabled - allows shortcut Alt+F4 for i.e. VNC Clients Pressing once without enabled fullscreen renderer will close the VERTEX application without asking to save your work. Pressing once while in fullscreen will first close the fullscreen renderer. Pressing the shortcut a second time will close VERTEX. Disable to prevent from pressing by mistake.
	Disable Preview in Fullscreen	Default: disabled With this option, the render editor will be disabled when fullscreen is entered. Does not work for a single master system - only for session members. Render editors will be enabled again when leaving the fullscreen renderer.
	Force Fullscreen Topmost	When enabled, this continuously ensures that fullscreen window stays topmost. Pop-up windows will be kept in the background.
	Fullscreen On Startup	When enabled, VERTEX always enters fullscreen on application startup.
	Show Selection In Fullscreen	When enabled, fullscreen renderer will show selected vertices or modifiers when editing surfaces.
	Show Status in Fullscreen	Shows overlay with status information (FPS, uptime, renderer frames) top left of the first screen.
	Suspend Fullscreen Rendering	Pauses fullscreen rendering temporarily.
	Topmost	When enabled the fullscreen window will be on top. Disable to view both UI and fullscreen window simultaneously.

4.9.4 Output-Stream

- VERTEX is capable to **create an Output Stream from a Surface** (NDI, SRT, RTMP, RTSP, RTP, UDP)
- Output-Streams can also save rendered video (Render To File / Record To Disk)
- A **Fullscreen Renderer** has to run on your sender System or your **Sender System** has to be set to **Streaming Mode**

This product uses NDI® (SDK v5.0, 2023)
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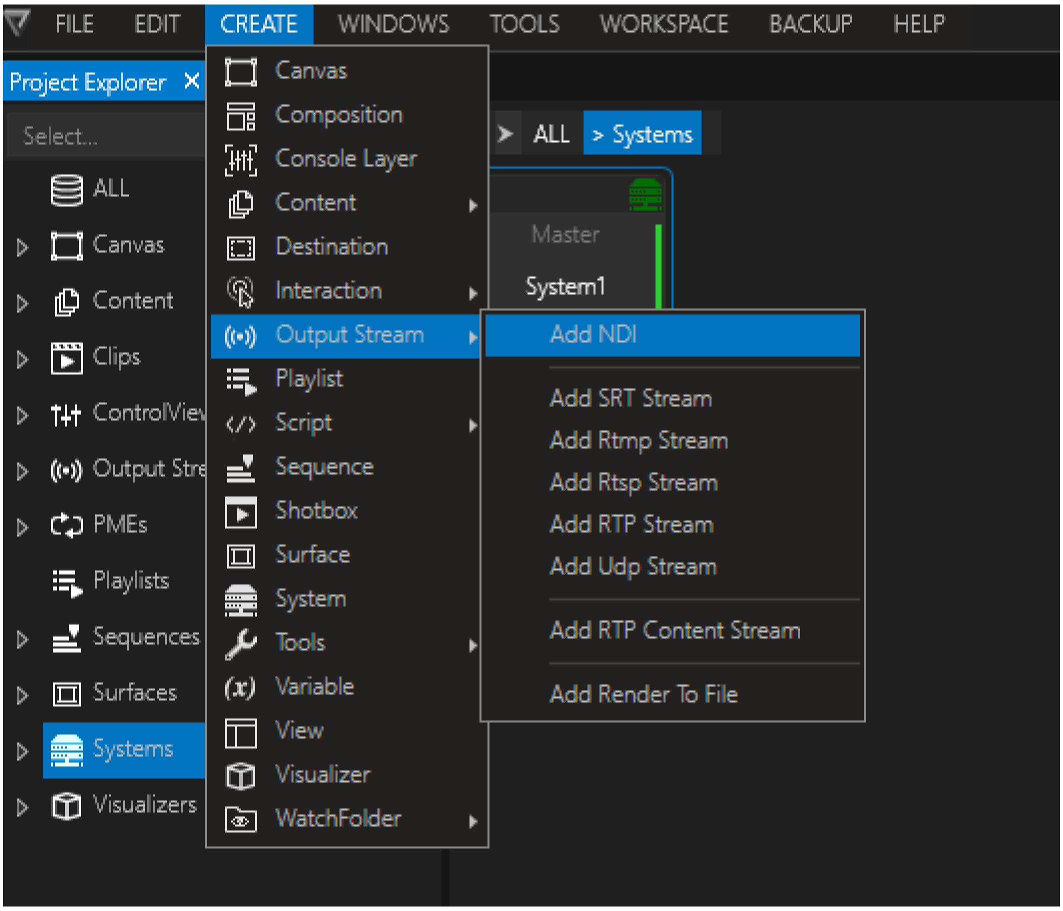
Learn more at https://ndi.video/
NDI® is a registered trademark of Vizrt NDI AB.

Create an Output Stream

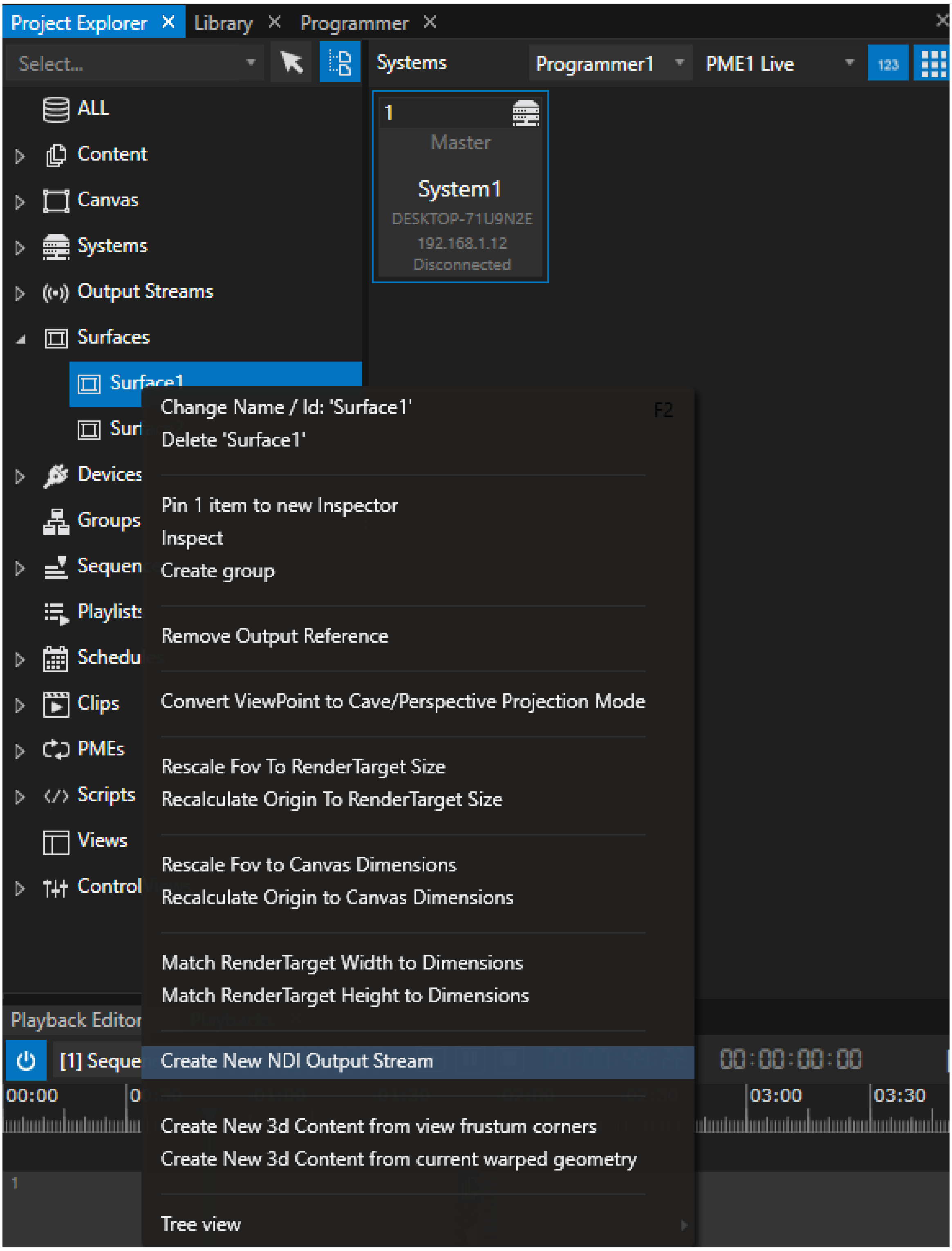
1. Blank Output Stream

- Go to MAIN MENU > CREATE
- Select Output Stream (NDI, SRT, RTMP, RTSP, RTP, UDP, RTP Content or Render To File)
- A blank Output Stream is created ready to be configured: most importantly it needs a Surface assigned.

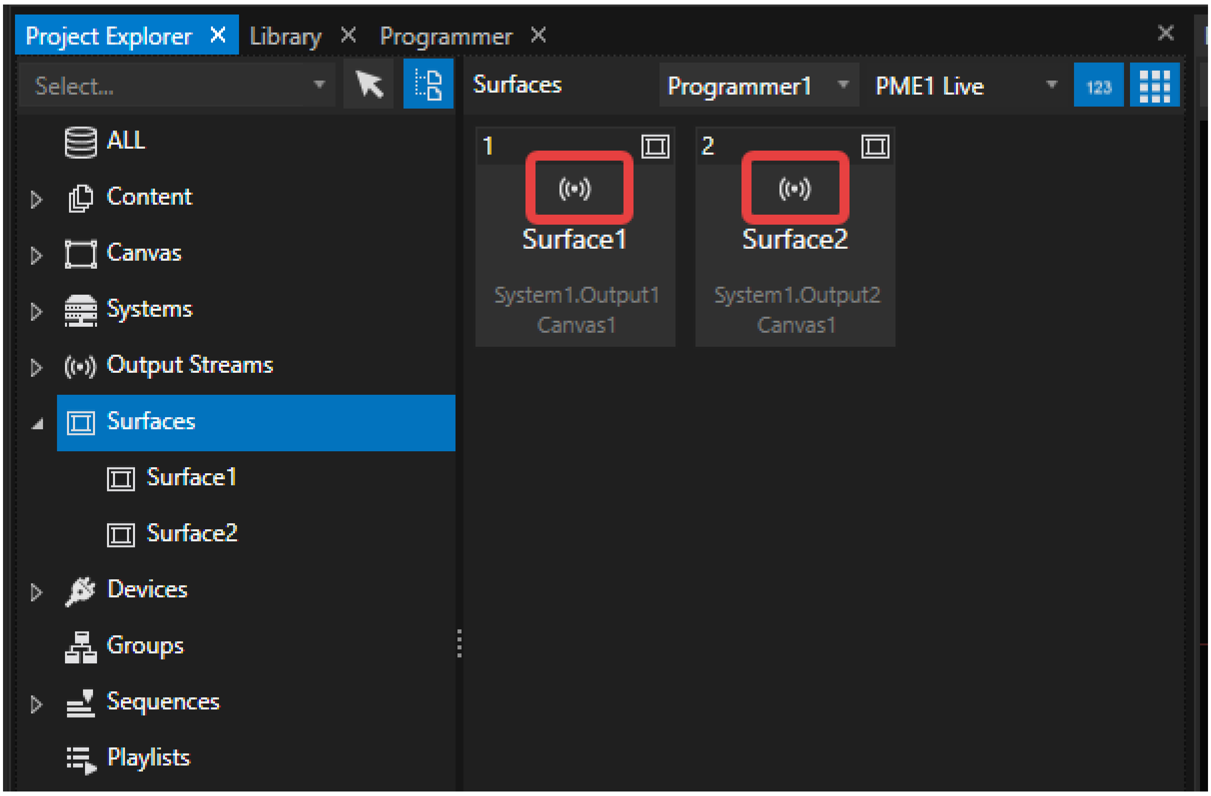


2. Create NDI Output Stream from Surface

- Go to Project Explorer
- Right-click a Surface to open the context menu
- go to *Create... > Create New NDI Output Stream*
- An NDI Output Stream is created with this Surface assigned.

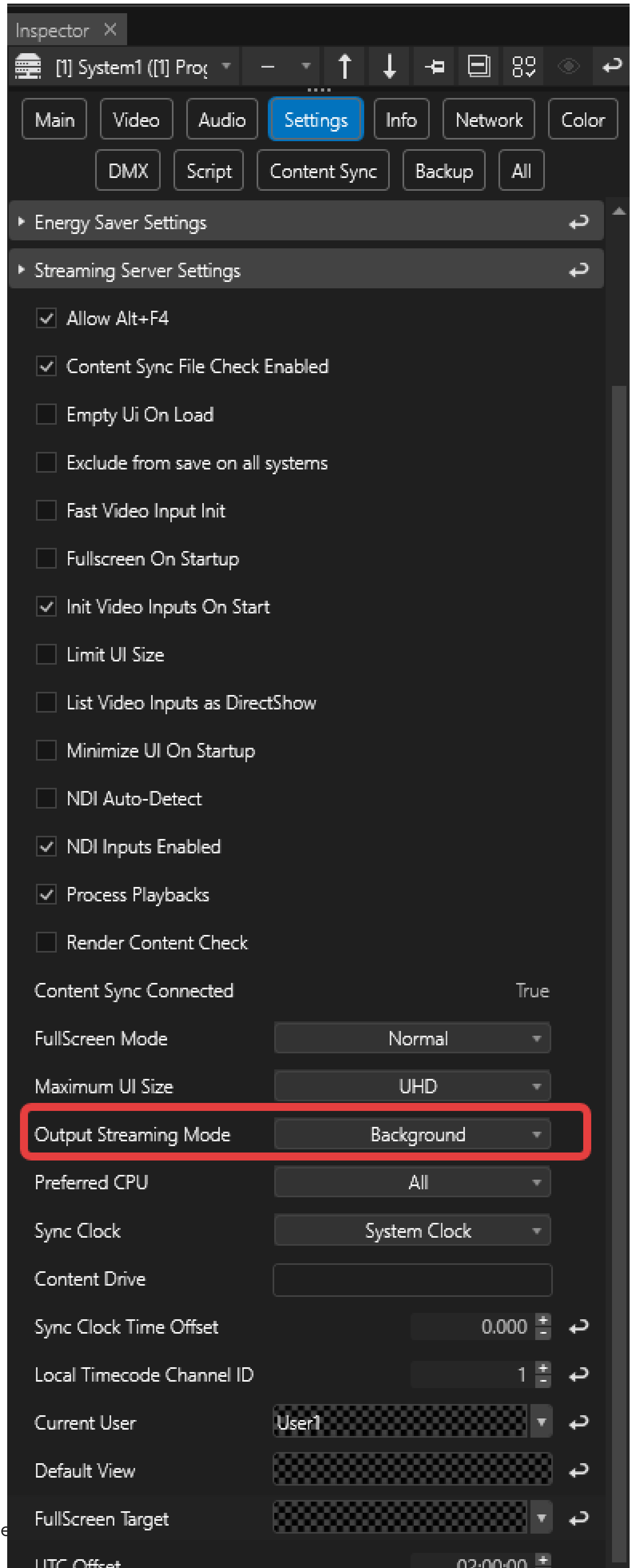

Project Explorer
Library
Programmer
Select...
Systems
Programmer1
PME1 Live
123
1
Master
System1
DESKTOP-71U9N2E
192.168.1.12
Disconnected
ALL
Content
Canvas
Systems
Output Streams
Surfaces
Surface1
Devices
Groups
Playlists
Clips
PMEs
Scripts
Views
Playback Editor
[1] Seque
00:00
03:00
03:30
00:00:00:00
Change Name / Id: 'Surface1'
F2
Delete 'Surface1'
Pin 1 item to new Inspector
Inspect
Create group
Remove Output Reference
Convert ViewPoint to Cave/Perspective Projection Mode
Rescale Fov To RenderTarget Size
Recalculate Origin To RenderTarget Size
Rescale Fov to Canvas Dimensions
Recalculate Origin to Canvas Dimensions
Match RenderTarget Width to Dimensions
Match RenderTarget Height to Dimensions
Create New NDI Output Stream
Create New 3d Content from view frustum corners
Create New 3d Content from current warped geometry
Tree view

Surfaces with assigned Output Stream show a sender icon in Project Explorer:



Output Streaming Mode

- technically, your content needs **to be rendered first before it can be sent as a stream.**
- VERTEX has got **two settings** for rendering what is being streamed: *Background* and *Fullscreen*
- Go to the streaming *System's* inspector settings:



▸ Energy Saver Settings

▸ Streaming Server Settings

☑ Allow Alt+F4

☑ Content Sync File Check Enabled

□ Empty Ui On Load

□ Exclude from save on all systems

□ Fast Video Input Init

□ Fullscreen On Startup

☑ Init Video Inputs On Start

□ Limit UI Size

□ List Video Inputs as DirectShow

□ Minimize UI On Startup

□ NDI Auto-Detect

☑ NDI Inputs Enabled

☑ Process Playbacks

□ Render Content Check

Content Sync Connected	True
FullScreen Mode	Normal
Maximum UI Size	UHD
Output Streaming Mode	Background
Preferred CPU	All
Sync Clock	System Clock
Content Drive	
Sync Clock Time Offset	0.000
Local Timecode Channel ID	1
Current User	User1
Default View	
FullScreen Target	
UTC Offset	02:00:00

Background

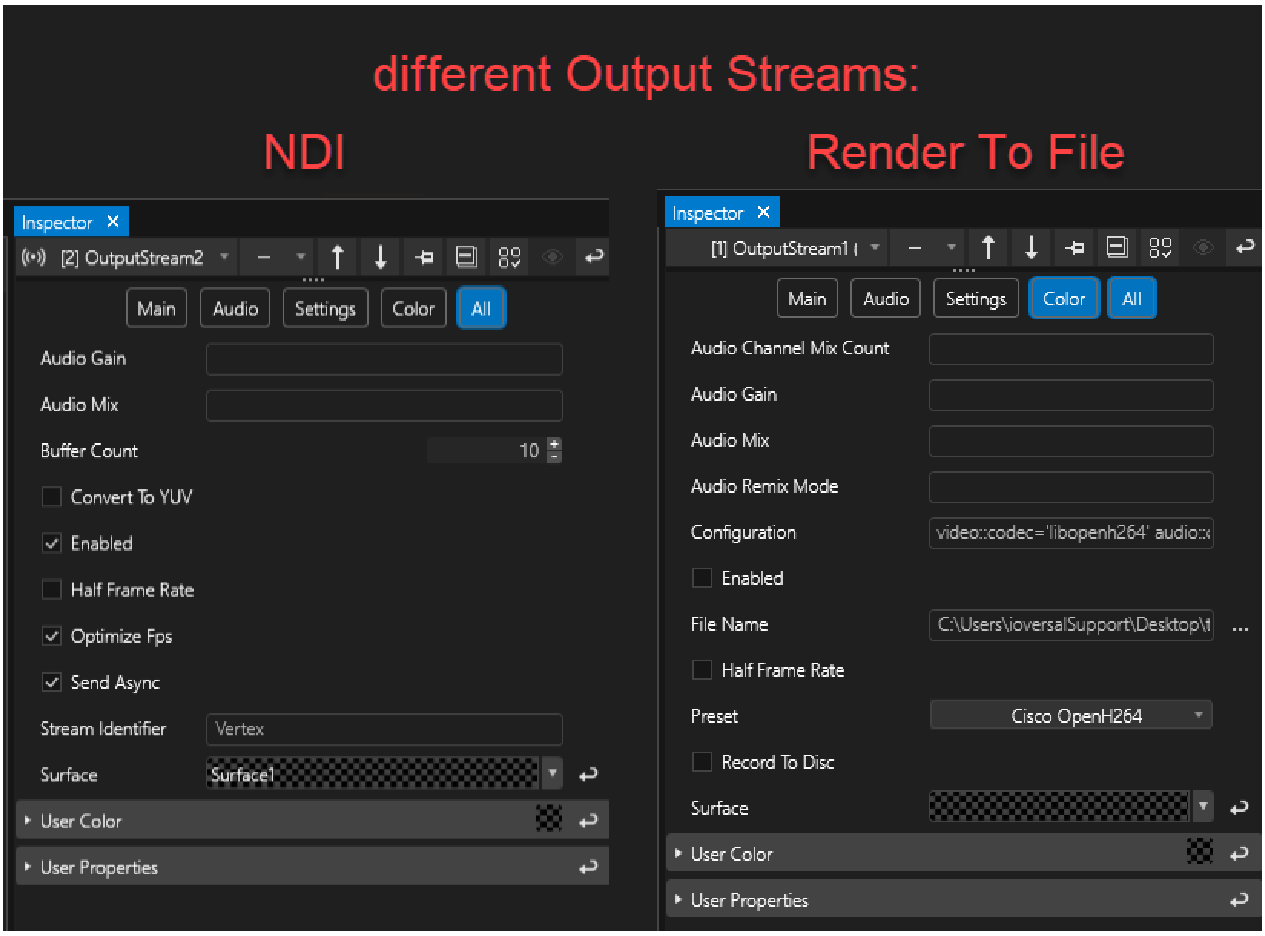
A hidden streaming renderer is working in the background so you do not need VERTEX's Fullscreen Renderer running.

Fullscreen

In this mode, sending the stream is only possible while the Fullscreen Renderer is running on the streaming System.

Settings

- Select an *Output Stream* to view its settings in the **Inspector**



NDI

Audio Gain	
Audio Mix	
Buffer Count	10
☐ Convert To YUV	
☑ Enabled	
☐ Half Frame Rate	
☑ Optimize Fps	
☑ Send Async	
Stream Identifier	Vertex
Surface	Surface1
▸ User Color	
▸ User Properties	

Render To File

Audio Channel Mix Count	
Audio Gain	
Audio Mix	
Audio Remix Mode	
Configuration	video::codec='libopenh264' audio::(
☐ Enabled	
File Name	C:\Users\ioversalSupport\Desktop\t
☐ Half Frame Rate	
Preset	Cisco OpenH264
☐ Record To Disc	
Surface	
▸ User Color	
▸ User Properties	

- Most importantly, you will need to o assign a **Surface** to the Output Stream:
  drag a *Surface* from *Project Explorer* to the *Inspector's Surface target field* or use its dropdown
- Set **Audio Gain and Audio Mix** options as desired, for instance if you need to sum a multichannel output to a stereo stream.
- **Settings specific to the type of Output Stream:**

- **NDI Output Stream:** requires a **Stream Identifier** setting the name of your NDI Stream
- **Render To File Stream:** requires a ***File Name*** and path, as well as a ***Configuration*** that can be also loaded from the ***Preset*** dropdown.
- **Record To Disc:** this check box serves a a record button - once activated, it will start recording the content rendered in the assigned surface the until deactivation.
  This property can be accessed via the following script commands in order to use it for instance with a Control View button:

```
// start recording
OutputStream1.RecordToDisc 1

// stop recording
OutputStream1.RecordToDisc 0
```

4.9.5 Audio Playback

- VERTEX differs between **Live Audio** and **Preview Audio**.
- You can assign a **separate audio device** for live and preview Audio
- You can **define a System** that should render Live Audio **for a Canvas or on System level**.

For a complete guide, please read the topic on ***Audio Output Settings*.**

> Please keep in mind that playing live audio is resource intensive.
> Especially if you play many channels, the CPU will be heavily loaded. If you are using multiple systems in a project as session members, one option is to define a system for playing the audio tracks.
> We recommend using an ASIO interface

Preview and Live Audio

The main difference between **preview audio** and **live audio**:

Preview Audio

- Preview audio monitors all audio signals from all playback mixing engines - That includes all playbacks in PME live

AND preview PMEs.

- Preview audio is played out from every system in your session.

Live Audio

- Live audio plays out only audio from playbacks that are running in PME Live.
- Live audio is played out by a defined audio system that can be set for a canvas and/or for a whole Vertex system.

By default live audio is set to the same system for all canvases. But it is possible to define individual audio systems per canvas.

Default Configuration (System Audio Settings)

The system's built-in Windows Wave device to monitors Preview Audio*: Wave Audio Mode* is set to *Preview.*
Connect an ASIO interface for live audio playout: *ASIO Audio Mode* is set to *Live*.

4.9.6 Sync Clock

- The Sync Clock defines on which **clock source the frame playback is based on**.
- **Different options** for a clock source are: **System Clock, ASIO Audio, Wave Audio, SMPTE IO LTC, GPU Sync and Local Clock**
- Please also read the **Playback Sync- chapter,** when working in session mode.

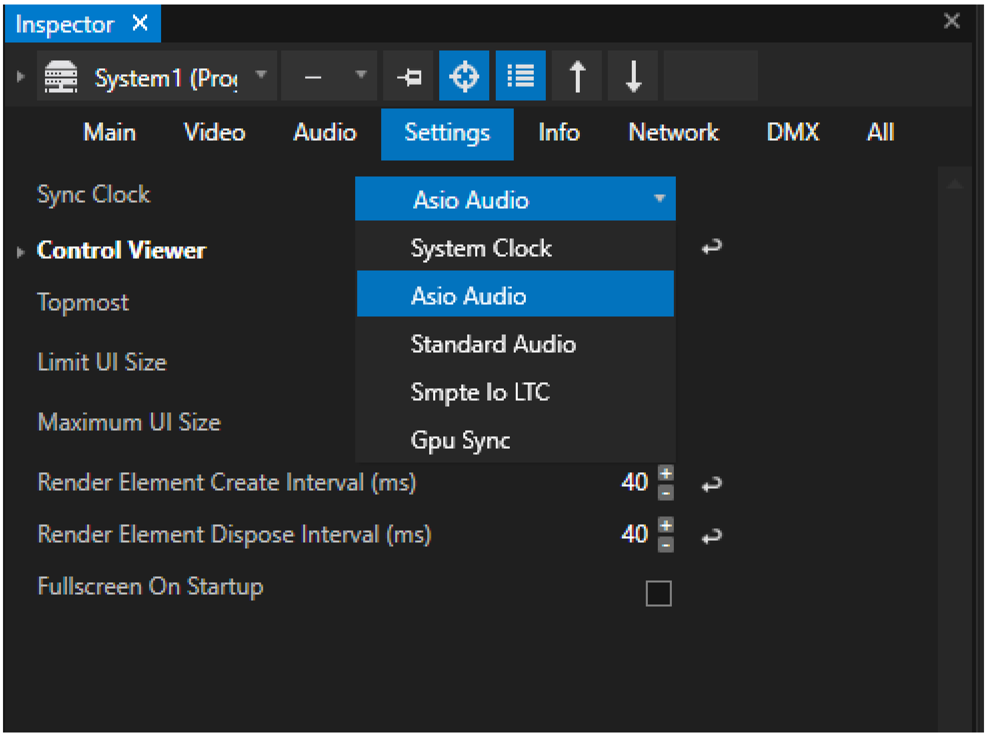
Settings

- Select your System and go to the *Inspector*
- Focus *Settings* tab there
- Select your preferred clock source in the *Sync Clock* dropdown list

Top bar: green underlined clock indicates the system clock is synchronized correctly.

This is especially important for a project in session mode.

If the system clock is underlined red, there is something wrong with Playback Sync and the Sync Clock



Changing Clock Source can affect the Playhead's position

After selecting another clock source, the Playhead could jump to another position in the timeline.

This only happens once directly after a switch of your clock source

System Clock

Playback is locked on the VERTEX System Clock. Recommended when working without audio.

ASIO Audio

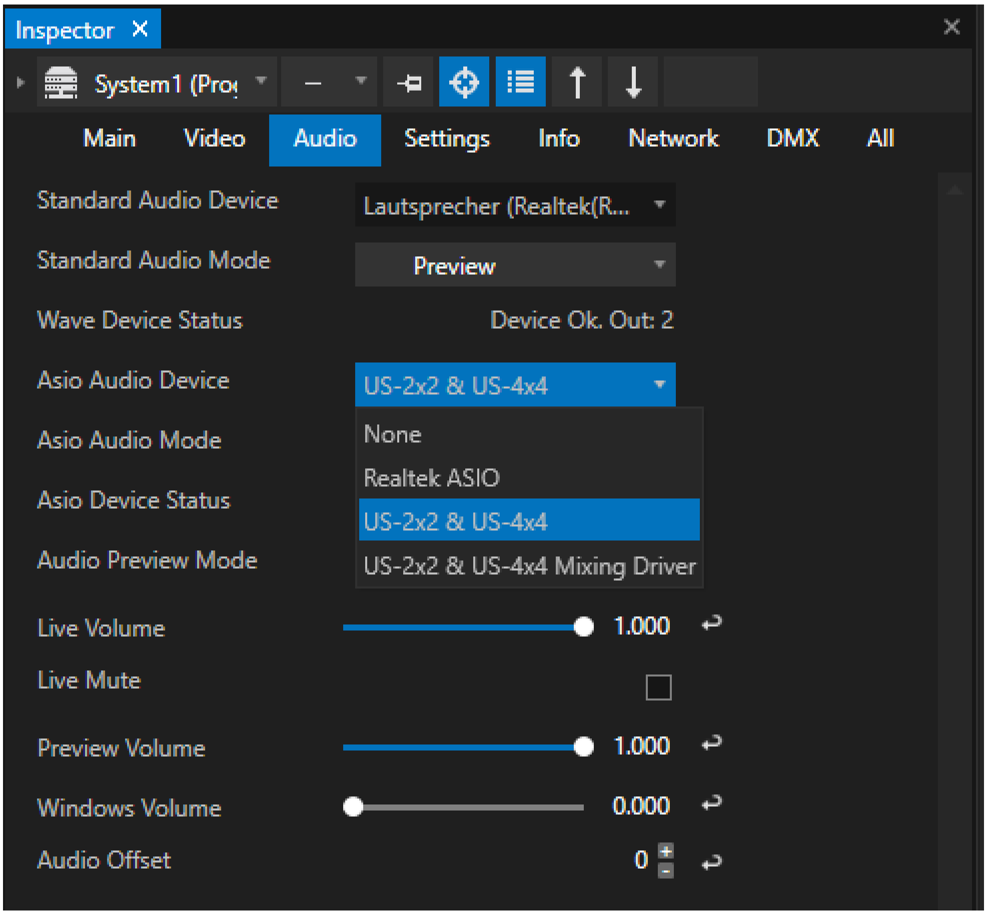
Recommended: plugged and connected Audio device/interface with ASIO driver

VERTEX is clocked by the ASIO devices Clock.

Audio and Video Playback with Audio over ASIO Interface

To prevent from a shift between audio and video we recommended to use the ASIO clock as system clock. The Video Playback and Frame processing in VERTEX is synchronized to the Clock signal from the ASIO device

When you select an ASIO device in the audio settings of a system, VERTEX automatically sets the Sync Clock from *Wave Audio* to *ASIO Audio.*



Standard Audio Device: Lautsprecher (Realtek(R...
Standard Audio Mode: Preview
Wave Device Status: Device Ok. Out: 2
Asio Audio Device: US-2x2 & US-4x4
Asio Audio Mode
Asio Device Status
Audio Preview Mode

Live Volume: 1.000
Live Mute: □
Preview Volume: 1.000
Windows Volume: 0.000
Audio Offset: 0

Wave Audio

By default, VERTEX playback is locked to the clock of your Standard Audio device, which is in most cases your built-in sound card.

In the System Audio Settings, when changing the "Wave Audio Mode" from "Preview" to "Live", the Sync Clock automatically is changed to "Wave Audio"

SMPTE IO LTC

Longitudinal Timecode can be received via ioversals SMPTE IO Interface
Get all information about clock and playback settings in the chapter *SMPTE*

GPU Sync

Syncs VERTEX Playback to the GPU Clock.

When using this option, you have to define a GPU sync master system. Go to *Advanced Mode* in the *Inspector* and search for "Is GPU Master" Property (Setting tab in the Inspector).
There is also an Advanced Property to set the "GPU sync interval" manually.
If there are questions about a GPU sync setup, feel free to drop us an email with your specific questions and a description of your hardware!

Set Sync Clock In A Session Mode Project

Please read also the Multi Systems chapter. The topic Playback Sync explains how to set up the system clock in a Project.

All Systems in a session mode project, excluding the Clock Master System need to be set to the same clock.
The Clock Master generates a System Clock for all other Systems. Please read the chapter Playback Sync.

4.10 User Interface

- All windows and editors can be docked or floating, reordered and repositioned.
- All windows and editors can be opened in multiple instances - the only restriction is your computer's performance.
- Users can customize window layouts per project as ***View***.

The User Interface concept

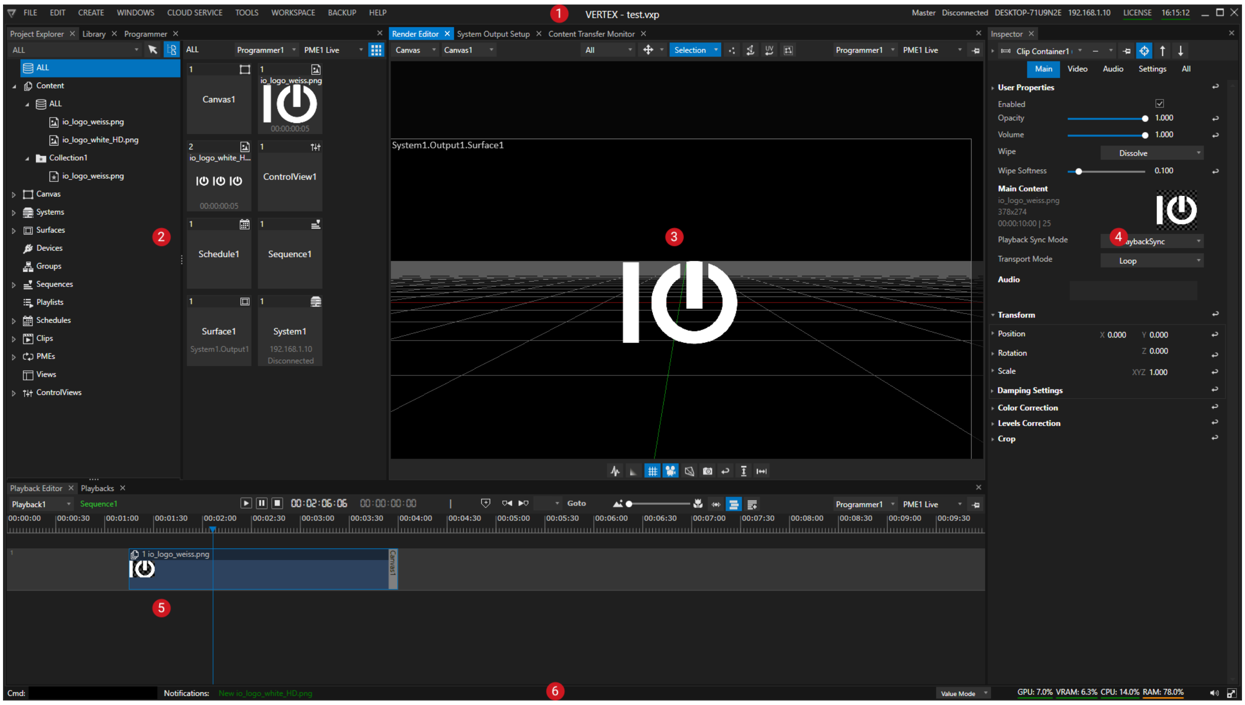
If you have worked before with any media server or video compositing / editing software, VERTEX' user interface might look familiar to you.
VERTEX provides a quick access to the main tools at a glance:

- **features used less frequently** are accessed through **separate editor windows** as needed.
- this flexible workspace concept allows **customized window arrangements** that match your project's needs and your operator's routines.
- multiple instances of **editor windows** with data and settings synchronized.
- **Context menus** give fast access to hidden features.
- Each project item's properties can be accessed in **the Inspector window** (located on the right side by default).

Default Workspace

Every new VERTEX project starts with the default workspace.

This default workspace is subdivided into the task-oriented sections that are described below:



1	[Top Bar](#)	**Main menu** file and project management, project settings, import content, create new project objects like a sequence, a canvas; access to libraries, windows and editors; access to tools and help **Project Name** **System Status** IP, system name, session status, clock **License Management** license status and license options
2	[Content and ProjectManagement](#)	**Project Explorer:** quick access to all local and network resources on the left, all project specific resources on the right **Library** Access to video fx, devices and geometry modifiers
3	[Visual Workspace](#)	**Render Editor** Your working area and preview section in 2D and 3D

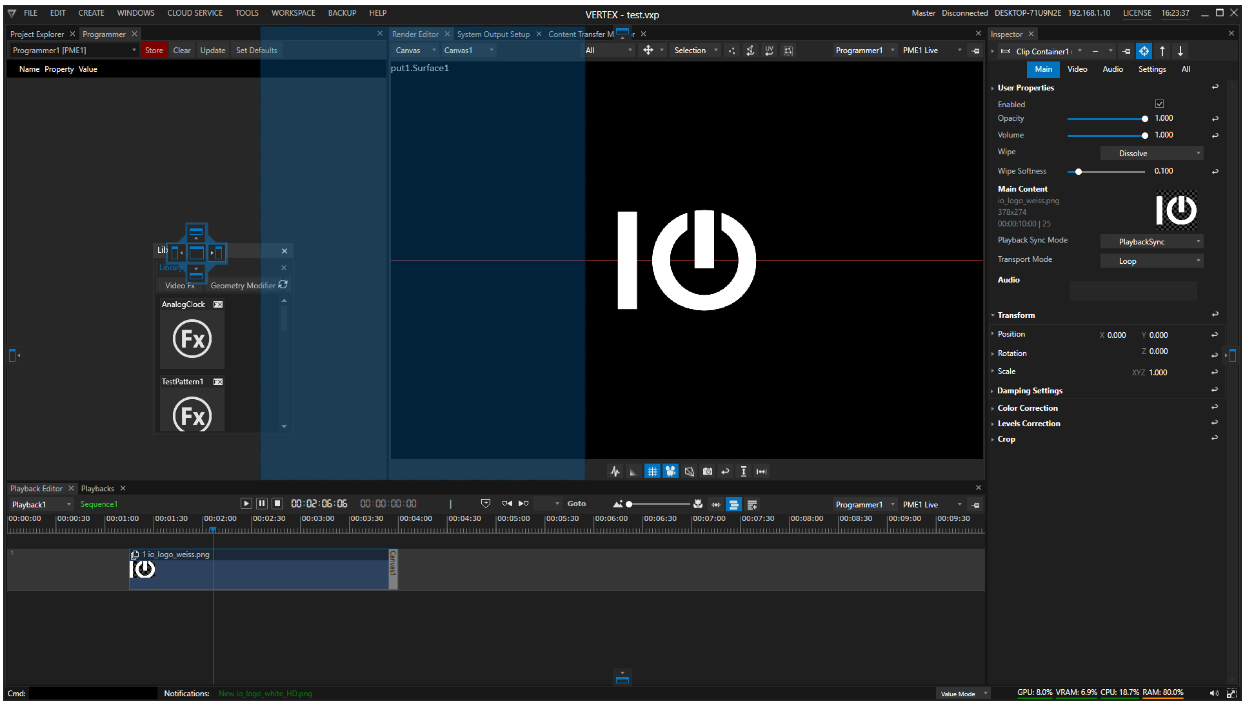
4	Settings and Information	**Inspector:** The inspector bundles all settings, information and parameters. It is the central point to modify parameters and inform about project elements.
5	Playback Editing and Management	**Playback Editor:** Edit clip containers and cues, set keyframes, arrange clip containers on tracks. **Playbacks Window:** Manage and overview all playbacks and their current play status.
6	Status Bar	System health and monitoring, system notifications, quick access and manipulations with script commands, switch between value and programmer mode, set to fullscreen.

Docking and Undocking of Windows and Editors

There **3 different ways** to personalize your workspace and to arrange and to dock windows and editors:

1. **As a tab** into the existing workspace layout
2. **At a new position** into the **applications main frame**
   - between some windows
   - at bottom sides or top
3. As **floating window** that is not docked in the main application frame.
   Such kind of floating windows you can freely move on your desktop.

Blue **helper widgets support you** with docking and suggest positions



When moving a floating window over the main application frame, a blue docking widget helps you and proposes docking positions.

Editors that are once arranged could be undocked again, re-arranged or deleted.
Just click to the windows tab symbol and drag it out of its position.

Multiple Editors of the same type

Your are able to open multiple windows/editors of the same type, such as Inspectors, Render Editors, Project Explorers etc.
Just be mindful of your system performance, as each instance of a window draws resources.

Workspace Views

A customized workspace for a project can be saved as a ***View***.
To build you custom UI from scratch, you may use the following workflow:

Clear a *View*

1. Go to MAIN MENU > WORKSPACE
2. Select *Clear View.*
3. This will clear and empty the current workspace - no editors and windows are displayed.
4. This allows you to create a custom View by opening the editors and windows from MAIN MENU > WINDOWS.

Create a View

1. Once you have all the windows and editors in place, go to MAIN MENU > CREATE > View.
2. This will save your current workspace / UI arrangement as a View.
3. **A new project item** will appear in your Project Explorer called ***View1*** with a broad functionality:

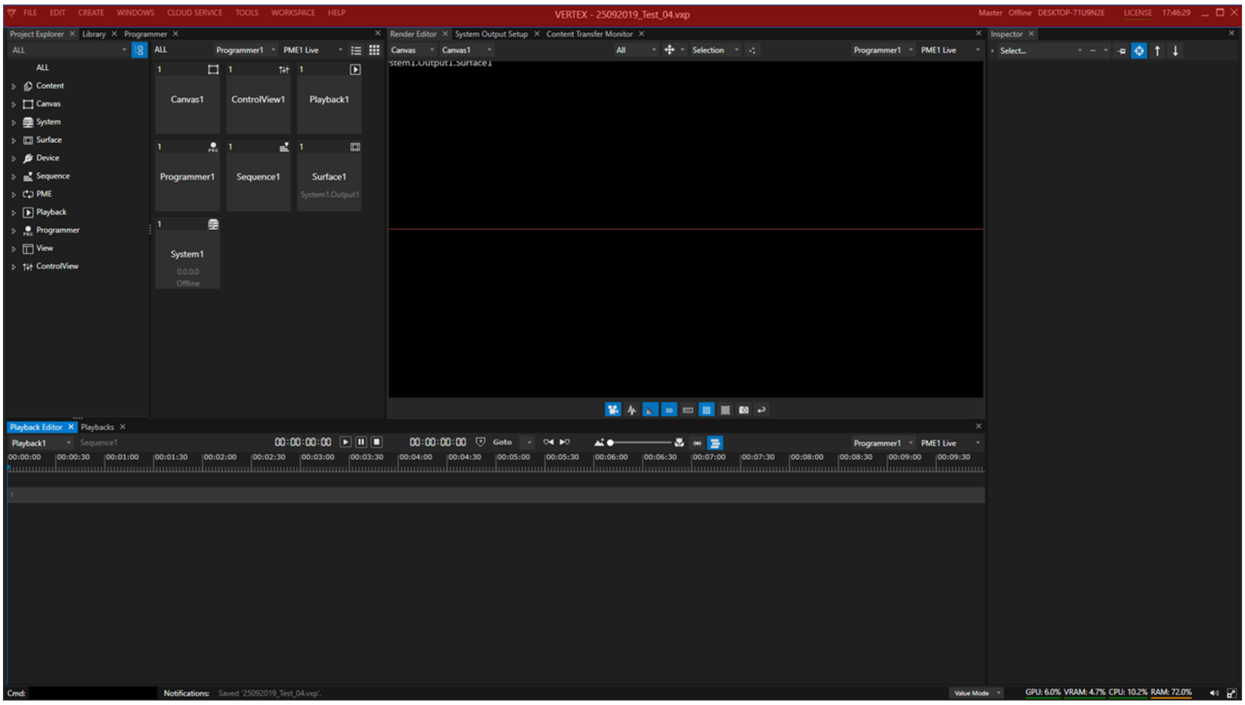
- double-click it to apply the View
- use it in a script: `View1.Apply`
- use that script with a control, to apply the View at the touch of a button

Load/Reset Views

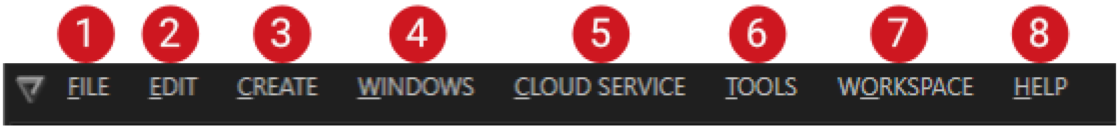
1. Go to MAIN MENU > WORKSPACE
2. select ***Live, Editing or ControlView*** to reset to the default workspaces
3. or select one of your custom views under the ***Views...*** category

4.10.1 Top-Bar

- The top bar gives you access to the **main menu** and the main **system information** - it is split into the following parts:
  - **main menu** on the left
  - current **project name** in the middle
  - **system information** on the right
  - **license management** on the right



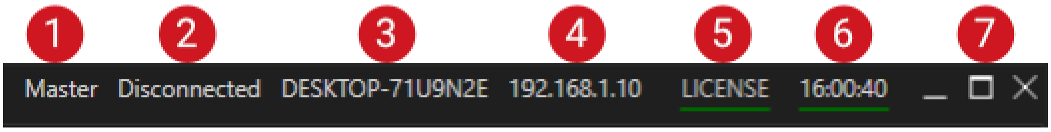
Main Menu



1	**File**	**File Handling:** Save Project Load Project Import Files Connect Systems
2	**Edit**	**Edit options:** Projects Settings Copy/Paste Undo and Redo

3	**Create**	**Create Items** Import Content Import Image Sequences Create Generative Content Create all available Project Items like Surfaces, new Scripts, new Canvas ....
4	**Windows**	**Create new Windows and Editors** Open to create a new Editor or Status Window
5	**Cloud Service**	not available in current VERTEX Version - will come in future releases
6	**Tools**	not available in current VERTEX Version - will come in future releases
7	**Workspac e**	Switch or Reset Workspace
8	**Help**	**Different Support and help options like** Create Ticket Show Serial Open Task Manager Open Log Files ....

System Information

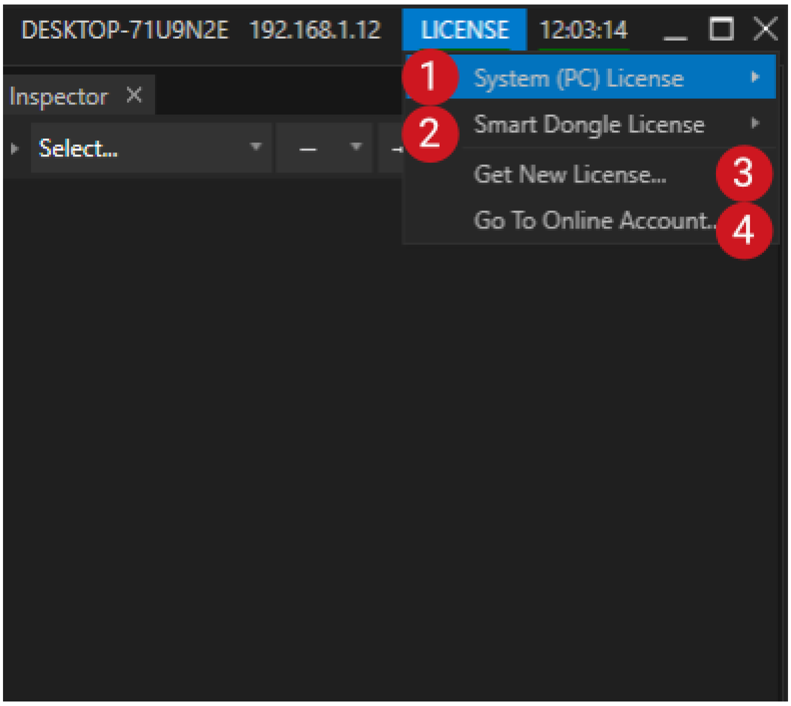


1	**System role**	**Shows the Project Role of a System** When only working with a single System: Always Master. When Working into a Session with multiple VERTEX Systems: Master or SessionMember

2	**VERTEX Session Status**	**Shows the status of your local System when working with multiple VERTEX Clients into a Session** When working with only 1 System: Always Disconnected When working into a Session: Connected or Disconnected **Note:** Please do not mix up with your internet or general Ethernet status. This status field only is related to the project online status for a Session with Multiple VERTEX Systems
3	**Local Computer Name**	Shows your Computer name that was set in Microsoft Windows System Settings for this hardware.
4	**Local System IP Adress**	**IP Address of your local VERTEX System.** Shows the IP settings for the default network adapter that was set into VERTEX. If this field is empty or an IP Address of another, wrong adapter is shown, please check Settings for your VERTEX System into Inspector or check if default network adapter was set for your VERTEX System.
5	**License Management dropdown and license status**	Mouse-click opens Menu for License Management. **Status Colors:** **Green:** Valid and activated License **Red:** No License activated
6	**System Clock**	**Shows current System Time** Or for a Session Member: Shows Project Time from Clock System **Status Colors** (only relevant if working into a VERTEX Session): **Green:** System in Sync - Sync Clock works **Red:** No Sync clock data received - please double check all Sync Clock Settings
7	**VERTEX Window - Minimize,**	Minimize, Maximize or Close VERTEX main Application Window

	Close, reduce	

License Management



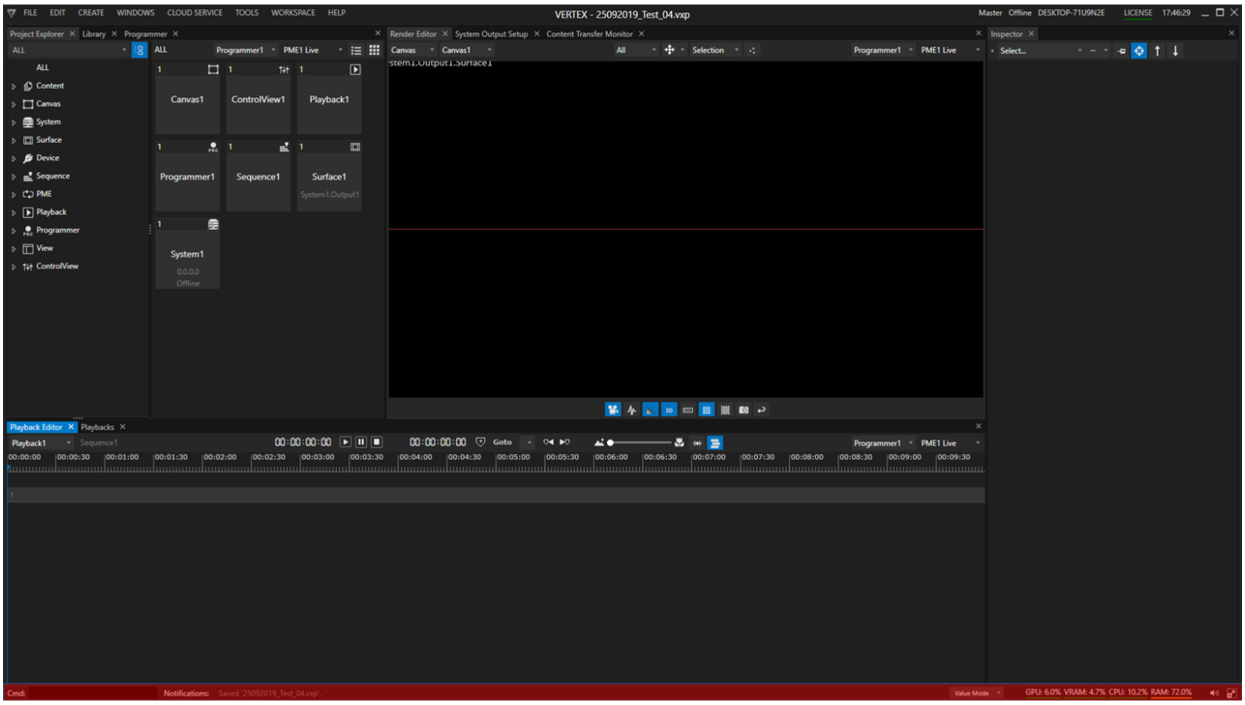
Activate and deactivate your VERTEX License or transfer it to a Dongle.
Please look at License Activation to find a detailed description.

1	**Online License Activation**	For the following 3 points an internet connection is required: License Activation License Update License Deactivation Information about your License State License Info
2	**Dongle Activation**	For the following 3 points an internet connection and a plugged in empty ioversal smart dongle is required:

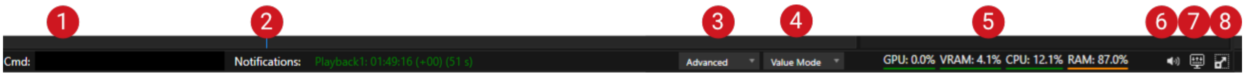
		Dongle Activation Dongle Update Dongle Deactivation Requires a plugged in ioversal smart dongle Dongle Info
3	**Offline License Activation**	No internet Connection but an external USB Stick/SD Card or Drive required for file exchange Export License Activation File Export Dongle Activation File
5	**Online Services**	Internet connection required

4.10.2 Status Bar

- The Status bar gives you a quick overview about **the current System hardware usage** (RAM, CPU, GPU), global **audio levels** and **timecode**
- Quick access to project **notifications** and their history
- **Command line section** to enter **Scripts**
- Switch to enable/disable the **Fullscreen Renderer** and to **mute/activate audio preview**
- Switch between **Value Mode** and **Programmer Mode**



User Interface


1
2
3
4
5
6
7
8
Cmd:
Notifications:
Playback1: 01:49:16 (+00) (51 s)
Advanced
Value Mode
GPU: 0.0% VRAM: 4.1% CPU: 12.1% RAM: 87.0%

1	**Command Line Section**	quick access to the script console.
2	**Notifications**	Notification and information from VERTEX **Actions:** left-click on the notification section to open an overlay window with a chronological history of the last System notifications
3	**Inspector Mode**	Switch to Advanced Inspector Mode to show more properties of an item in the Inspector Most of the properties in Advanced mode are for edge-cases. To keep the Inspector more clean for your daily use-cases, VERTEX offers this

		filter option **Default:** Standard
4	**Value or Programer Mode**	Switch between Value Mode (Default) and Programmer Mode and choose how you prefer to handle and manipulate values
5	**Hardware usage and Performance**	System hardware usage: displays the current usage of your GPU (total sum and VRAM usage), your CPU (total sum of all cores), and your System Memory (RAM). **If the Fullscreen Renderer is enabled** on one of your screens, current render performance is displayed in FPS
6	**Mute Preview Audio VU Meter**	Click on the loudspeaker icon to mute/ un-mute your local Systems preview audio output. Hovering your mouse pointer over the icon will temporarily show VU meters for both WAVE and ASIO audio.
7	**Enter Control Viewer in Full Screen**	Starts the local Control Viewer in Full Screen quit with CTRL + F5
8	**Enter Full Screen Renderer**	starts the Fullscreen Renderer on your local System quit Fullscreen Renderer with CTRL + F or ESC This button is not available in VERTEX Touch Edition

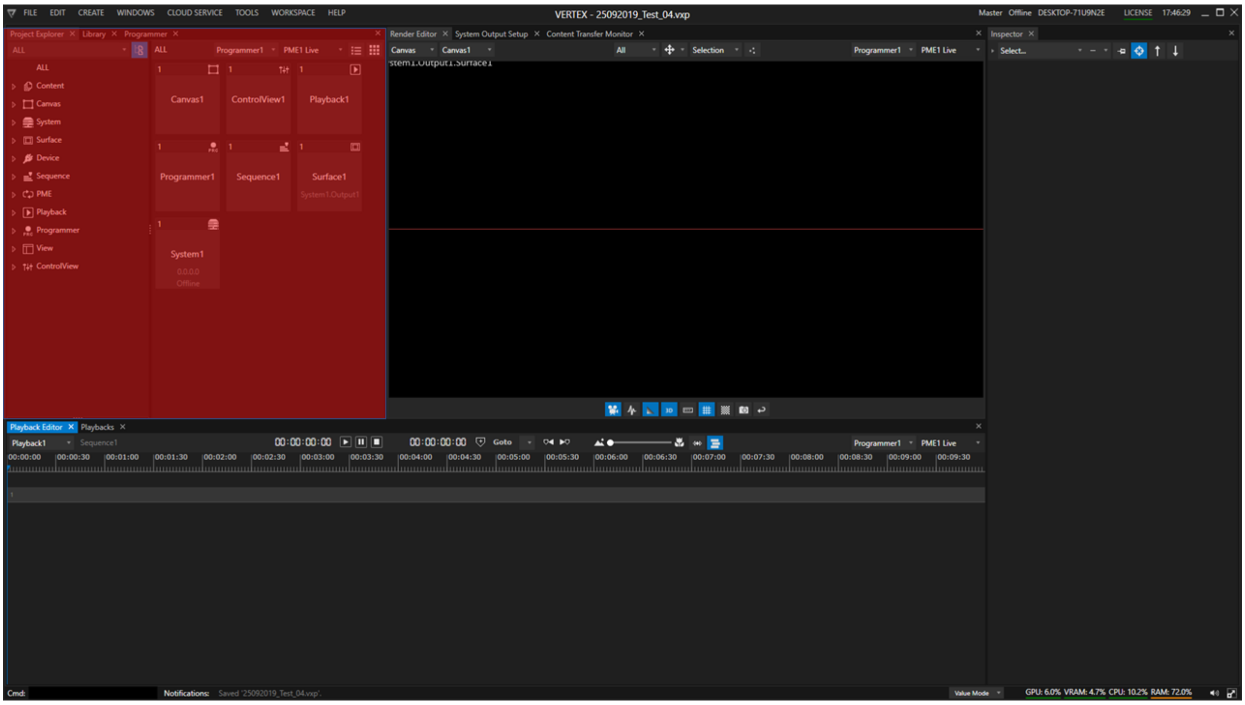
GPU Usage in status bar will not work with AMD and Intel Graphic Cards

When your PC has an AMD GPU inside, the GPU usage information in the status bar is not available.

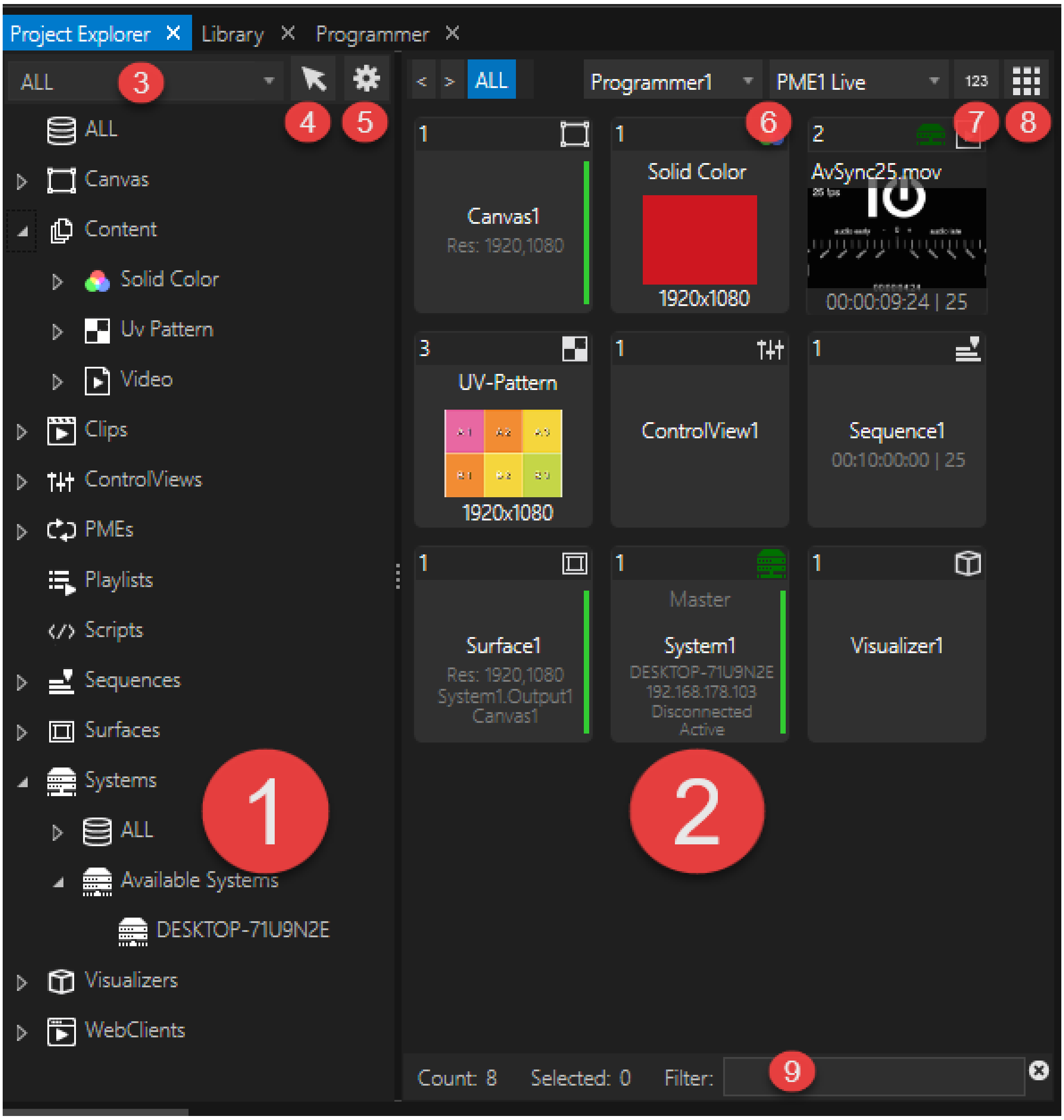
When using an AMD or Intel GPU, VERTEX will only show CPU and RAM usage.

4.10.3 Project Explorer

- The Project Explorer window is the **project browser.**
- The **left pane** lists all categories of your project items in an expandable tree view.
- The **right pane** lists all items of a selected object category.
- **Context Menus** via right-click give access to item-specific functions.



User Interface



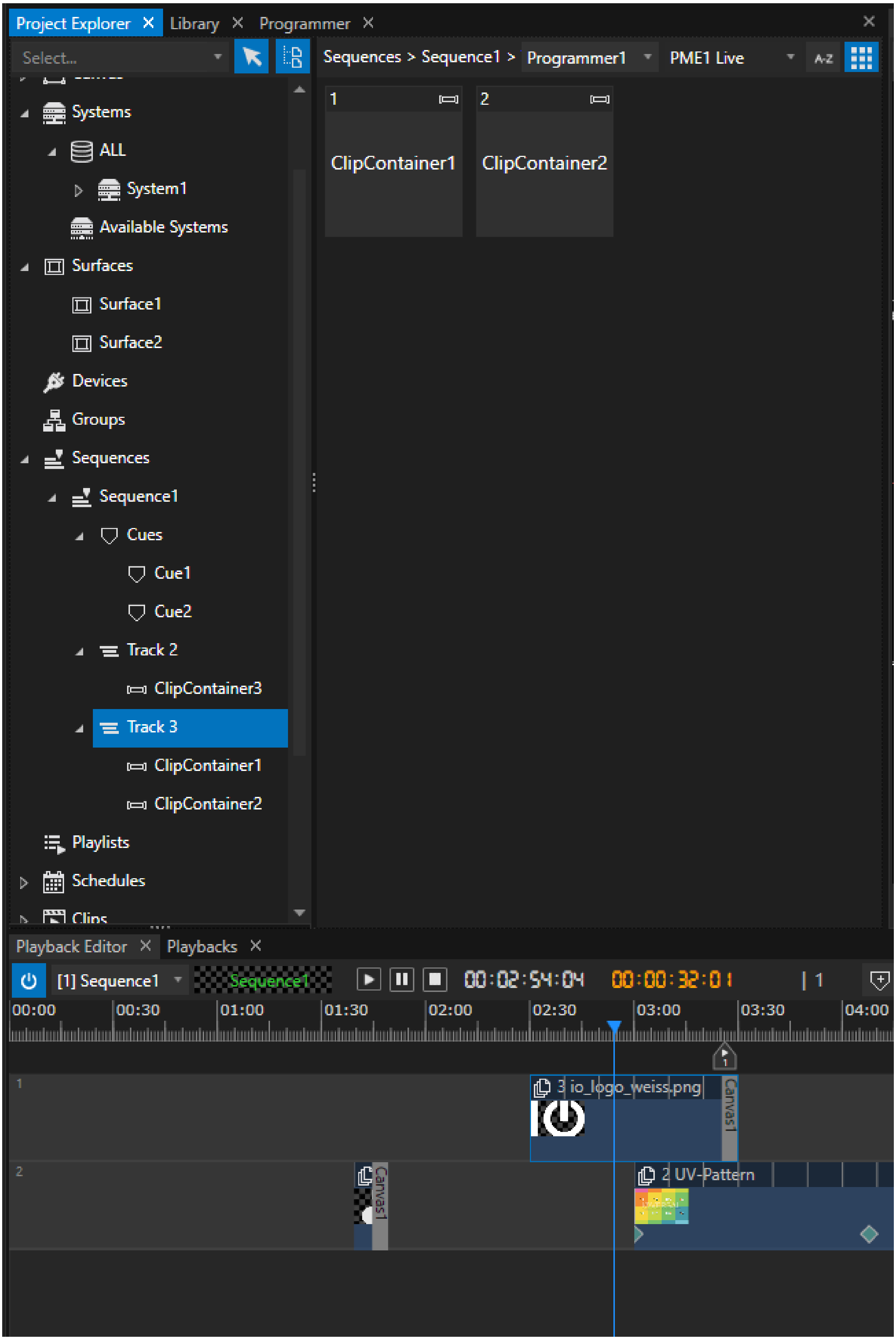
1	**Left Pane** **- Project Tree**	The left pane lists all available resources and elements of your local VERTEX System as well as all items in your project **Actions** • Selection with left mouse buttons to show project related child elements in right project column • Right mouse click to open a context menu with varying options for each element type. • Drag items either within the tree view or to the right pane to assign to / connect with other items (see below). • Select items to access their settings in the Inspector window.

		Style Options • Filter by category ③ **Selection Options** • Focus tree items in the Inspector. Default: off ④ When switched on, items in the Project Tree that are selected with your mouse, will be shown into Inspector **Project Settings** ⑤ • Accesses the project settings and pins them to a new inspector window.
②	**Right Pane - Project items**	Shows all items and assets of your project Organizes assets, items and objects by categories & sub-categories. **Actions:** • Select one or multiple items to set property values in the inspector • Access an item's context menu by right-click • drag and drop elements **Sorting** • by Programmer / PME ⑥ • by Item ID ⑦ • Alphabetically descending **Style Options**: • Tile View (default) / List View toggle ⑧ **Search Filter** ⑨ • Indicates the number of project items total & selected and enables you to search for particular items.

Use **drag & drop in addition to context menus**. For example, drag and drop an NDI stream of System1 from the project tree to the right pane in order to add it to your project.
For those elements where a logical context makes no sense (e.g. drag a System and drop it on another System) you will get visual feedback on the target element next to your mouse pointer
Drag and drop does not only work in the Project Explorer, but also between Project Explorer and Render Editor or Playback Editor. This comes in handy, when dropping content either onto a Canvas or a Sequence. You can also drag content from Windows file explorer to your VERTEX Project Explorer.

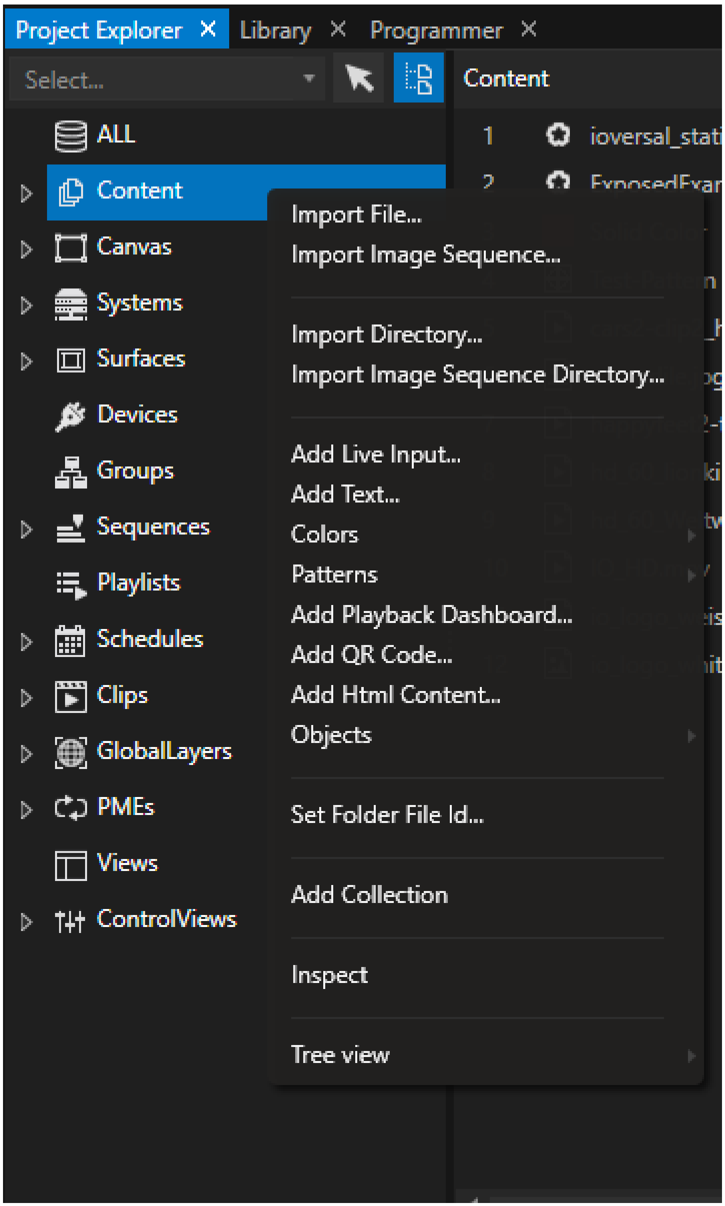
Access to Sub-Items or Child Elements

- The Project Explorer is organized in main object categories that can be expanded and collapsed via context menu.
- With this structure, you are able to access e.g. a track of a sequence to change its specific setting
- Whenever there is an arrow in front a category or item, it show that there is another sub-level in the tree structure.


Project Explorer
Library
Programmer
Select...
Systems
ALL
System1
Available Systems
Surfaces
Surface1
Surface2
Devices
Groups
Sequences
Sequence1
Cues
Cue1
Cue2
Track 2
ClipContainer3
Track 3
ClipContainer1
ClipContainer2
Playlists
Schedules
Clips
Sequences > Sequence1 >
Programmer1
PME1 Live
A-Z
1
ClipContainer1
2
ClipContainer2
Playback Editor
Playbacks
[1] Sequence1
Sequence1
00:02:54:04
00:00:32:01
1
00:00
00:30
01:00
01:30
02:00
02:30
03:00
03:30
04:00
1
3 io_logo_weiss.png
Canvas1
2
Canvas1
2 UV-Pattern

Context Menu(s)

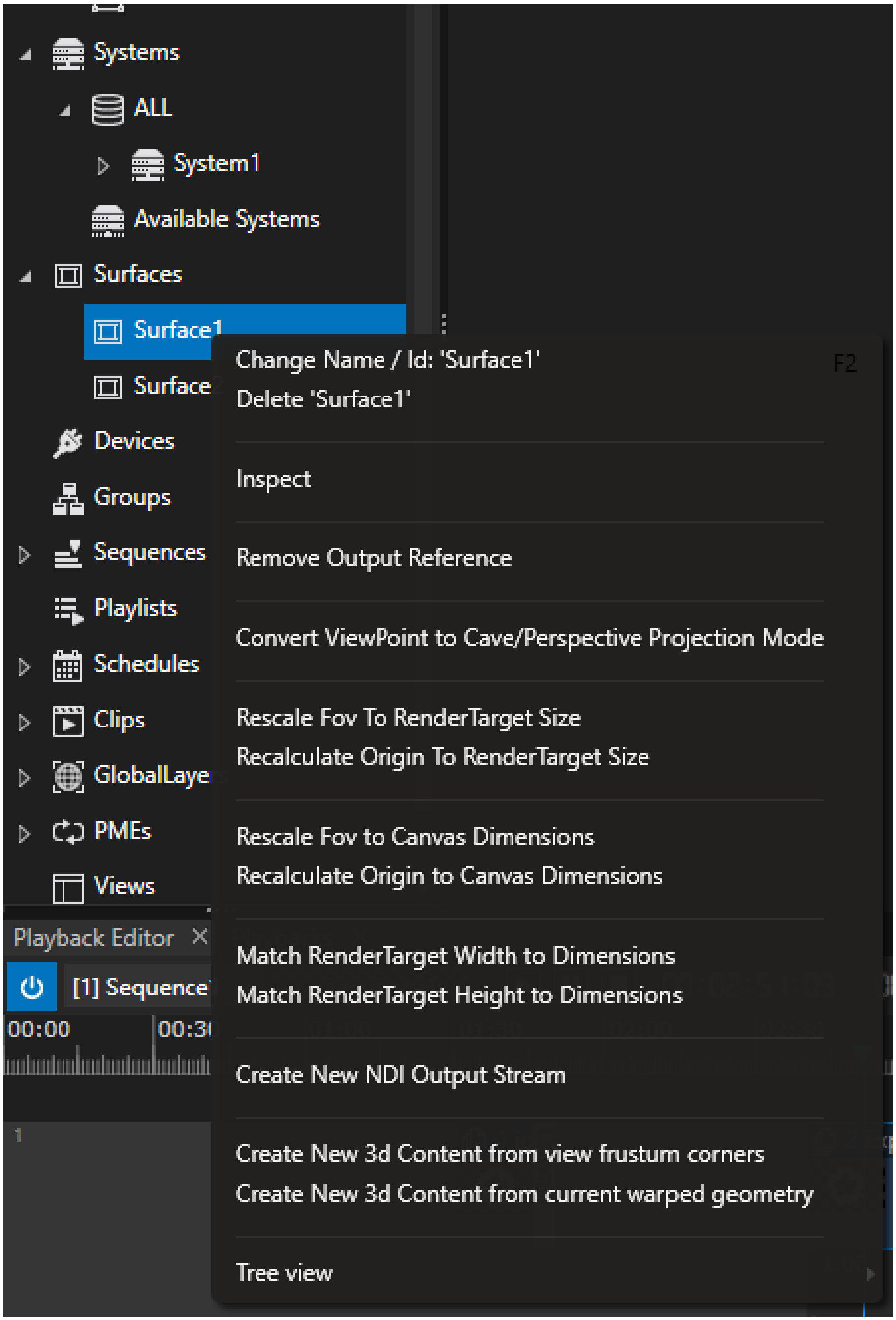
- **Context menus** via right-click give access to item-specific **functions**, **settings, Collections** or to **adding a new element.**
- Context menus **vary in content, depending on the item or context.**
- **Some functions can only be accessed by context menus in the Project Explorer** -e.g. *Re-Scan Video Inputs* of a System (however, this command can also be given by script).



Open the Context menue for Content with a right-click on the Content category.
Add or import Content

Examples

- Select an available System from your network (in the left project tree) and use the context menu to remotely start VERTEX on this System
- Add 4 Surfaces as horizontal/vertical split as child of an output
- Refresh video sources


Systems
ALL
System1
Available Systems
Surfaces
Surface1
Surface
Devices
Groups
Sequences
Playlists
Schedules
Clips
GlobalLaye
PMEs
Views
Playback Editor
[1] Sequence
00:00
00:3
Change Name / Id: 'Surface1'
F2
Delete 'Surface1'
Inspect
Remove Output Reference
Convert ViewPoint to Cave/Perspective Projection Mode
Rescale Fov To RenderTarget Size
Recalculate Origin To RenderTarget Size
Rescale Fov to Canvas Dimensions
Recalculate Origin to Canvas Dimensions
Match RenderTarget Width to Dimensions
Match RenderTarget Height to Dimensions
Create New NDI Output Stream
Create New 3d Content from view frustum corners
Create New 3d Content from current warped geometry
Tree view

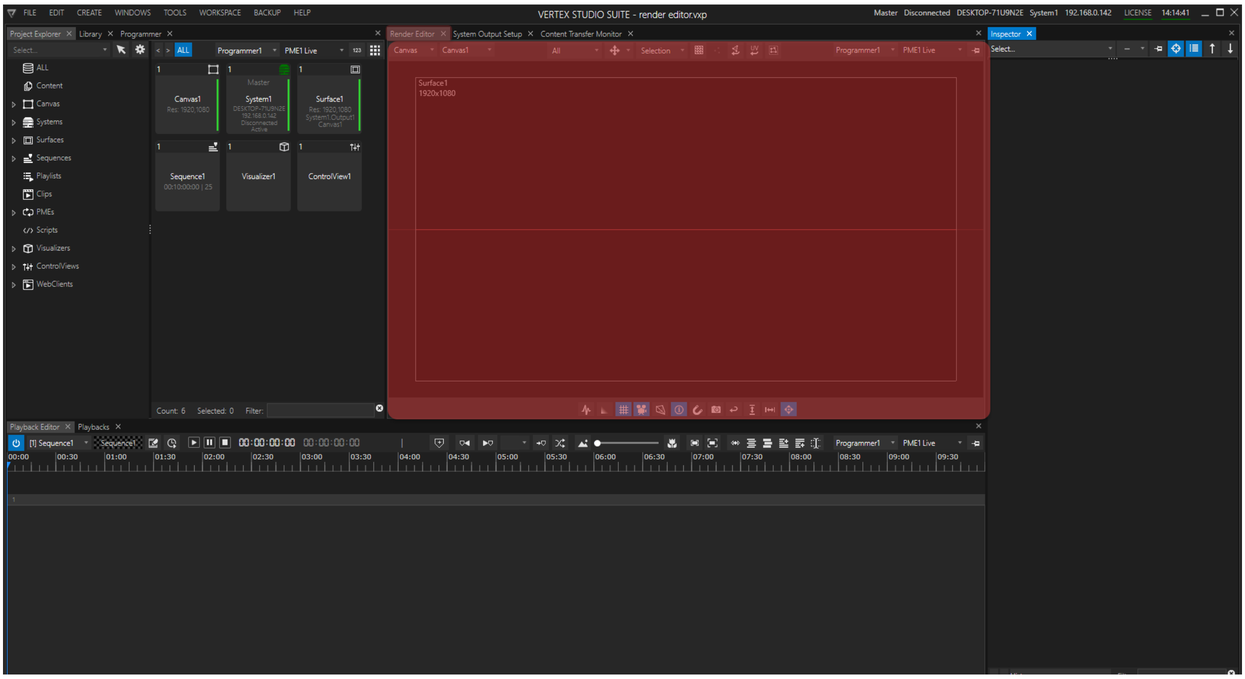
The context menu of a Surface gives quick access to commands such as "Rescale FoV".

Shortcuts

- Each editor window in VERTEX has got a varying set of shortcuts that are **automatically created and updated**.
- **Press the F1 Key** to open a list of shortcuts corresponding to the current window/ editor in focus.

4.10.4 Render Editor

- The Render Editor window **at the center of the UI is the visual preview of VERTEX**: arrange, select and manipulate the contents of your show.
- Select from am drop-down menu **different views** to work with - **focus on your Canvas, monitor your System Outputs, or create a stage mock-up with [Visualizer](#).**
- Open **multiple Render Editors and work with them in parallel** - the performance limit depends on your hardware



Navigation

There are different options to navigate through the 3D/2D space of VERTEX's Render Editor. Depending on your personal preferences, you can use

1. Left Mouse Button and Keys 1,2,3

Left Mouse Button + 1: Pan/Move left/right/up/down

Left Mouse Button + 2 : Zoom/Dolly in and out

Left Mouse Button + 3 : tilt

2. Middle Mouse Button/Wheel (and Alt-Key)

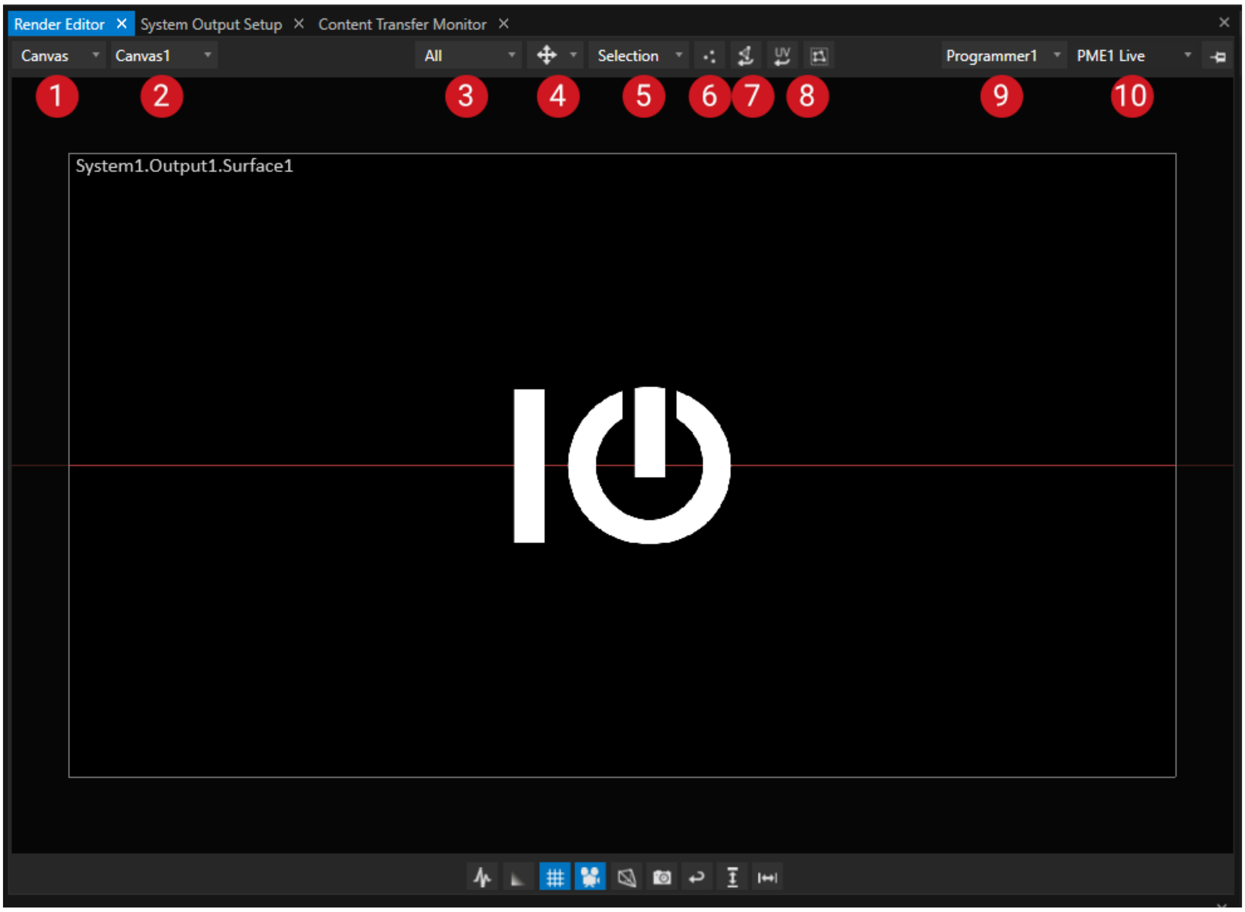
Middle Mouse Button/Wheel pressed: Pan/Move left/right/up/down

Mouse Wheel: Zoom/Dolly in and out
Alt+ Middle Mouse Button/Wheel pressed tilt

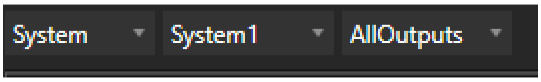
OR

3. WASD - Keys (or Arrow Keys)
W or S Key: Zoom/Dolly in and out
A or D Key: Pan/Move left/right
Q or E Key: Tilt left/right

User Interface

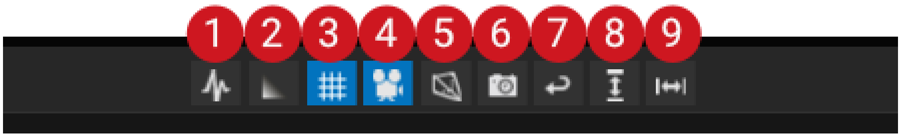


1	**View Mode**	**Default:** Canvas view **Options:** All Canvases, Canvas, System, DMX Mapping, Surface Map, Visualizer

		Select your workspace view: Canvas View lets you select a canvas to work with. Arrange and compose your content and build your scene from here. System View shows the final image of your output(s). Good for controlling the final signal of each output or to make some visual modifications on output/Surface level refine your selection with the "select specific view" dropdown 2
2	**Select specific view**	**For View Mode Canvas:** When you are working with more than 1 Canvas into your project, you can switch between all Canvases of your project **For View Mode Output** when select this view mode another selection box is displayed  System: When working with only one System dont care about this. When working with more than one Systems into your project, you can select the System whose Output you want to modify/show Output Selection: All Outputs - general overview with the content of all outputs of one selected System Output # - shows you one specific output for preview or further modifying (also see. [Canvas, Surface, Output](#))
3	**Element Selection Filter**	Options: All(default), Surface and Content Filter if you want to select and show all elements into a Canvas or select only surfaces or content. Useful when you don't want to accidentally touch some surfaces that already are in final position
4	**Mouse Mode**	Select the functionality/mode your mouse courser should have when working into the Render Editor Select Only Select Content Move Move selected Content (Default) Rotate Rotate selected Content

		Scale selected Content Touch interaction for interactive elements
5	**Select whole element, vertices or Modifiers**	**Options:** Select Whole element select vertices of an element Select Modifiers (c.f. Geometry Modifiers)
6	**Select covered vertices**	**Default:** off When switched to on, also hidden surfaces of a 3d model in the depth axis will be selected
7	**Reset VERTEX Offsets**	Resets all modified Vertice offset to default value
8	**UV Modifiers**	Resets all UV Offsets to default value or Apply UV modification from current View as setting
9	**Programmer selection**	When working in programmer mode: Select programmer where your changes should be assign to
10	**PME (Playback Mixing Engine) Selection**	Select PME (Playback Mixing Engine) you want to display in the Render Editor

Bottom bar

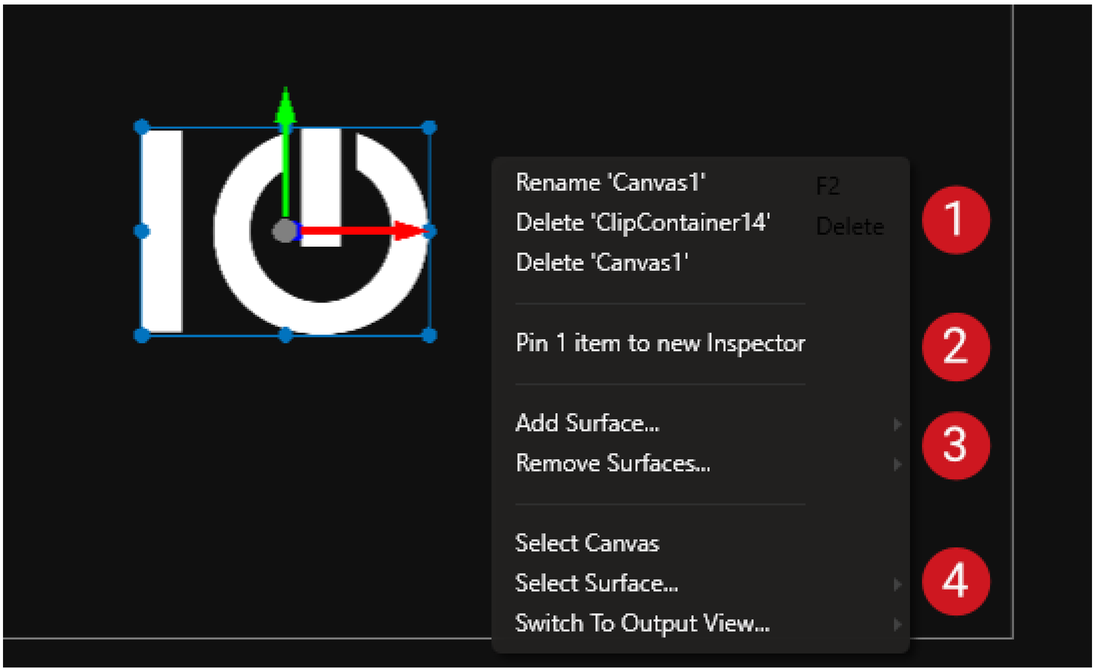


1	**Show Statistics**	**Default:** off **Option: enabled**

		An overlay is displayed in the left upper corner of the Render Editor that shows you • the current render performance of this specific Render Editor in Frames per Second (FPS) • The global sync clocks uptime • a flashing white square for optical sync test This overlayed information is not visible in the Fullscreen Renderer and can be set for every Render Editor separately
2	**Switch between Full Resolution or Proxy Mode with lower resolution**	**Default:** on - Full Resolution Mode is enabled. The content is rendered in its full resolution into the Render Editor **Option:**- off - Proxy Mode with lower resolution The content is shown as Proxy Files with lower resolution. This gives you the options to work and preview even bigger shows with a lot of content in it or to pre-program with lower hardware without the original source files on it. **Keep in mind:** When you has disabled the automated proxy encoding into the Project Settings, no proxy files are available
3	**Show Grid**	**Default: on** **Option:** off - disables base grid into Render Editor
4	**Toggle between free and local camera**	**Default:** on - local the camera of your Render Editors workspace works locally in this window **Option:** disabled - free: - each Render Editor where this option is disabled is synchronized in workspace mouse movements - also on different Systems into a network
5	**Show Surface Frustum**	**Default:** off **Option**: on - shows frustum and viewpoint origin for all Surfaces into Canvas
6	**save snapshot**	Save the current view into your Render Editor as png file and use this to send previews out to clients or add them into a stroryboard

		on click: An explorer window opens, you can select the path and filename.
7	**reset view**	resets the current workspace view to the default values
8	**Vertical fit local view**	Adapts local camera view that it fits to Canvas height
9	**Horizontal fit local view**	Adapts local camera view that it fits to Canvas width

Context Menu

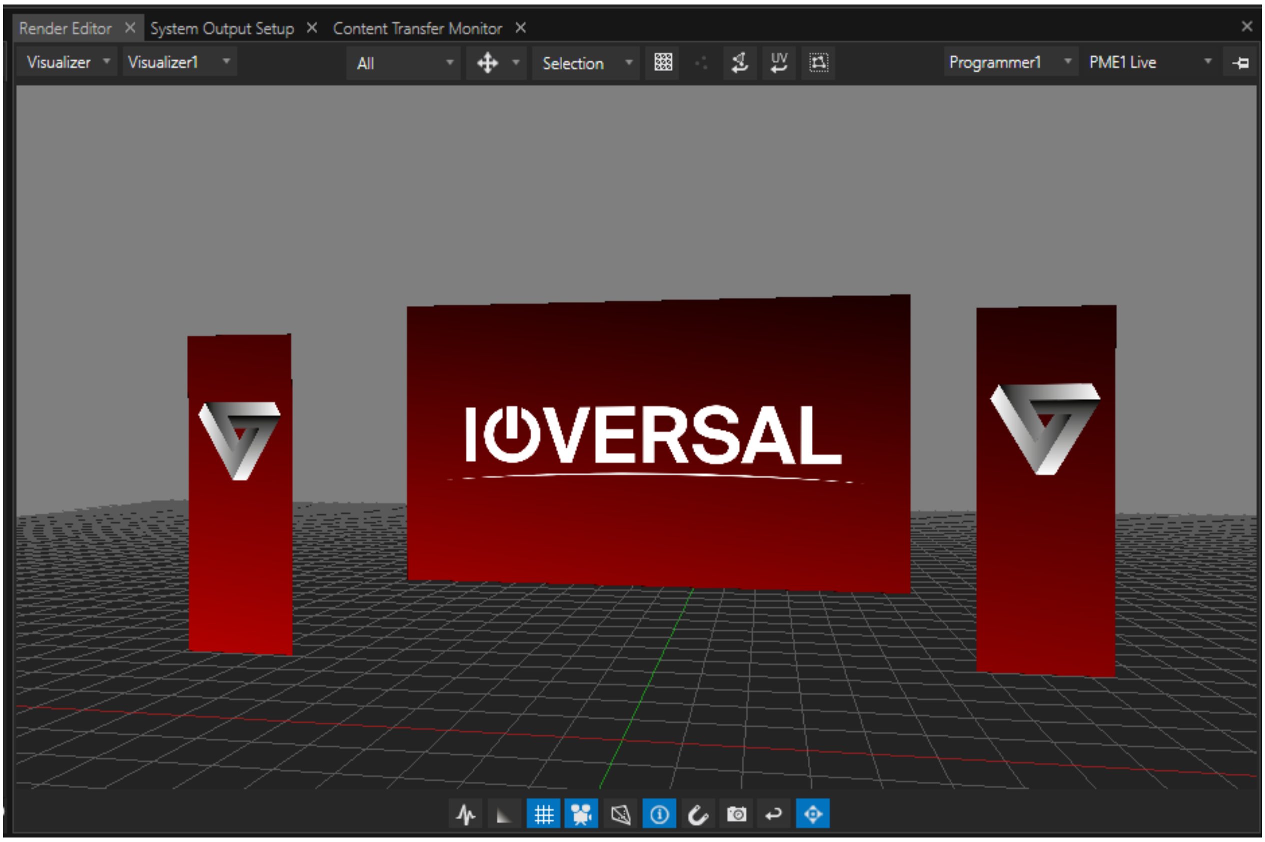


1	**Context related options**	Depending on your selection - e.g. Delete object or rename object
2	**Pin selection to new Inspector**	Pins the selected item to a new Inspector window

3	**Add or Remove Surface(s)**	Add or remove surfaces to your Canvas. Add: shows all surfaces of your project which have not yet been added to your Canvas Remove: shows all surfaces which have already been added to your current Canvas
4	**Quick Selection**	Quick selection options Select Canvas: selects the Canvas of your current Render Editor view in the Inspector Select Surface: selects a surface in Render Editor and in the Inspector Switch to output view: fast switch to show an output without using the Render Editors dropdown lists Change view in Render Editor to Systems- selected output.

4.10.4.1 Visualizer View

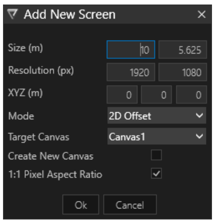
- *Visualizer* is a feature in VERTEX's *Render Editor* creating a **visualization of your stage consisting of any number of screens**
- **create virtual screens with the specifications of your physical hardware** on your real stage**: dimensions, aspect ratio and location**
- any number of *Visualizers* is possible - thus **simulating multiple stages at once**

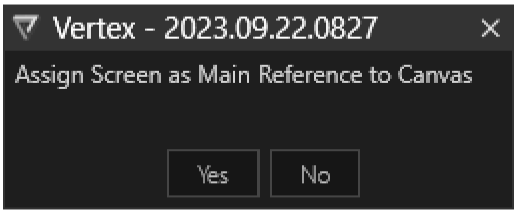


Visualizer Workflow

While creating a visualization of your stage consisting of any number of screens in their dimensions, resolutions, aspect ratios and locations, this workflow also encompasses also one of the many methods in routing content textures to your video outputs. When adding a *Screen* to your Visualizer, VERTEX will automatically create a *Surface* and establish a link to a *Canvas* of your choice. And because you can even add content from here, the Visualizer Workflow is an efficient and powerful way to build your entire show.

1. **Add a Visualizer to your project**
   Go to MAIN MENU > CREATE > Visualizer
2. Start with the creation of a virtual ***Screen*** by right-clicking in the *Visualizer* space and picking ***Create New Screen...*** from the **context menu**.
   The *Screen* represents your physical real-world output. Have your physical screen's size, pixel resolution, aspect ratio handy, as well as its location on stage.
   This data will be needed in the consecutive ***Add New Screen*** dialogue:

 Add New Screen Size (m) 10 5.625 Resolution (px) 1920 1080 XYZ (m) 0 0 0 Mode 2D Offset Target Canvas Canvas1 Create New Canvas ☐ 1:1 Pixel Aspect Ratio ☑ Ok Cancel	Size	sets the physical size of your screen, display, LED wall in meters
	Resolution	sets the pixel resolution
	XYZ	the position on stage in meters
	Mode	choose between a 2D or a 3D perspective
	Target Canvas	choose a Canvas that will send textures to the new screen...
	Create New Canvas	... or check this box to create a new Canvas altogether if needed
	1:1 Pixel Aspect Ratio	check this box if the aspect ratio between physical scr size differs from the one of your screen's pixel density. VERTEX will then interpolate a practical size and aspect.

3. 

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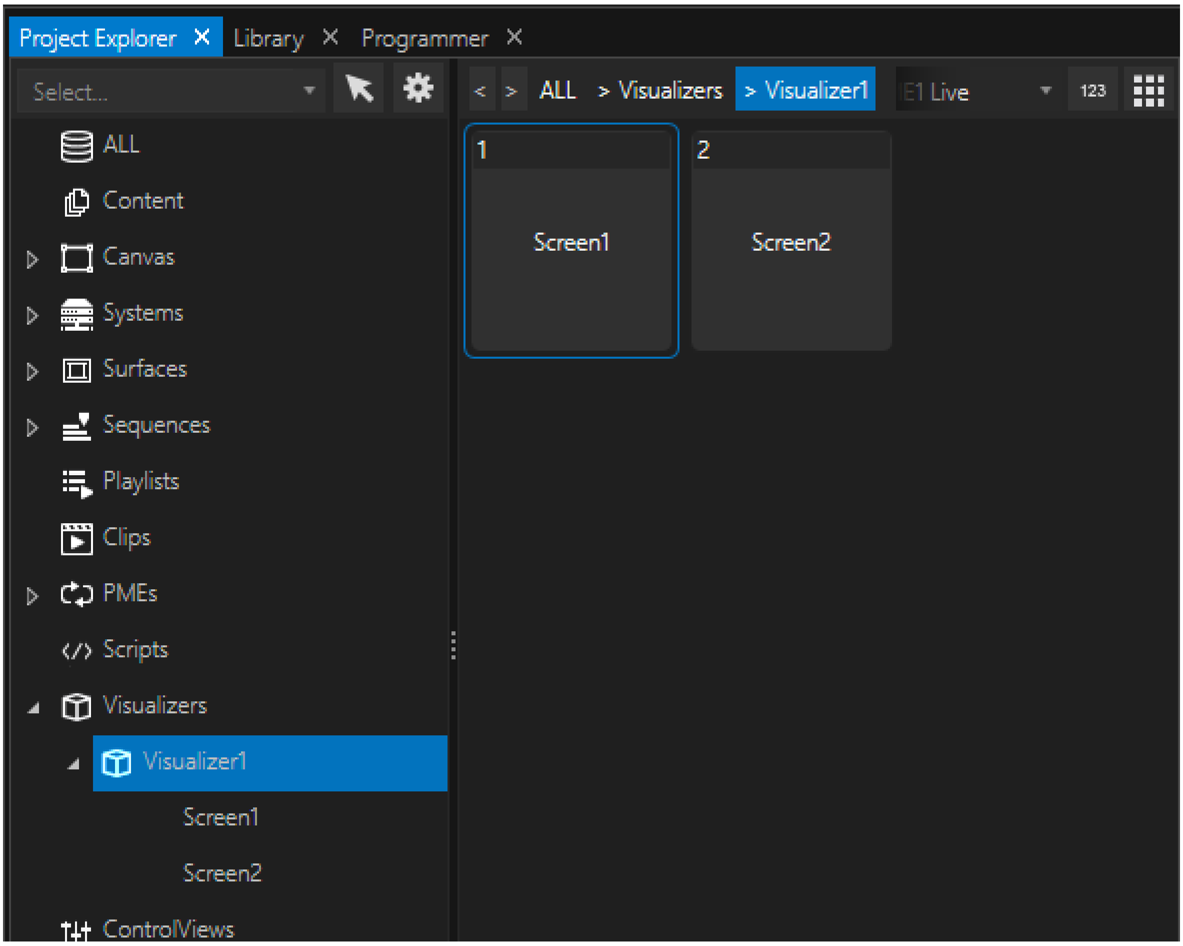
   Assign Screen as Main Reference to Canvas

   If this is your first *Screen* on this *Canvas*, VERTEX will ask you to assign it as Main Reference to Canvas. This will alter your Canvas' dimensions and defines the ratio between physical size and pixels. Any screens created subsequently with the same *Target Canvas* will be added to the Visualizer according to this ratio.

4. Once a Screen has been created, it will appear in the Project Explorer:

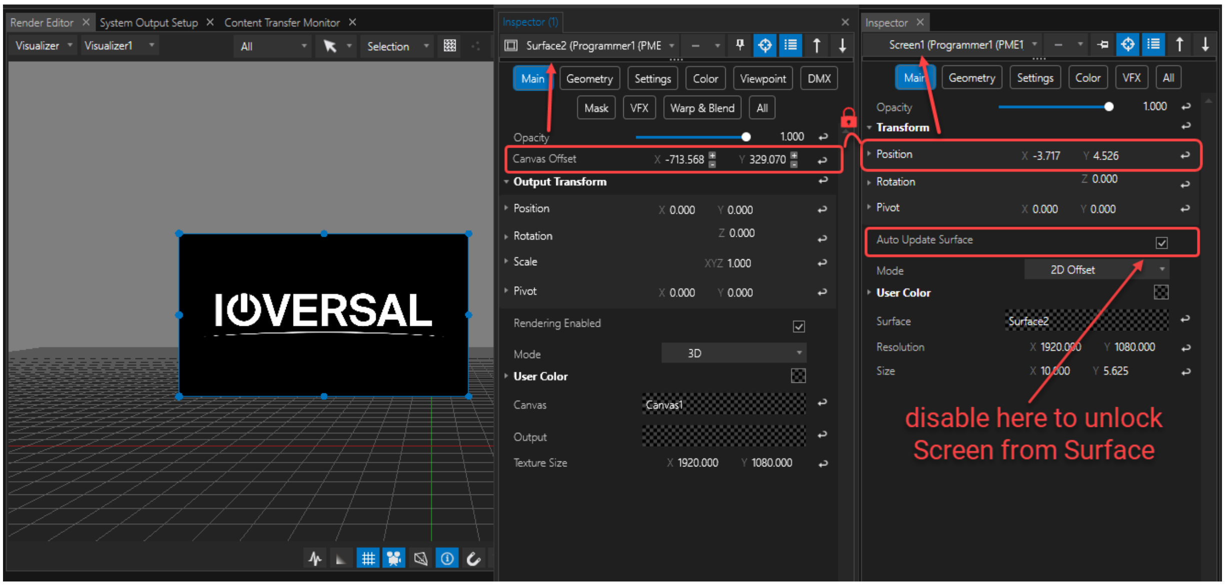


New Surface Added

VERTEX automatically adds a new *Surface* for each newly created *Screen*. Both are assigned to the same *Canvas* for your convenience.

However, the new *Surface* is **not automatically assigned to an *Output*.**

5. If there is already **content on your Canvas**, the new Screen will display it according to its location in the Visualizer. **Click & drag the Screen to position it** in the virtual Visualizer space and you will notice how the screen's texture changes as if you were moving a Surface in Canvas View. That is because the ***Canvas Offset* of the Screen's assigned *Surface* is automatically updated by the Screen's *Position*** property. To unlock the two, inspect the *Screen* and disable *Auto Update Surface* in the *Inspector*'s MAIN tab:



Opacity 1.000
Canvas Offset X -713.568 Y 329.070
Output Transform
Position X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000
Pivot X 0.000 Y 0.000
Rendering Enabled ☑
Mode 3D
User Color
Canvas Canvas1
Output
Texture Size X 1920.000 Y 1080.000

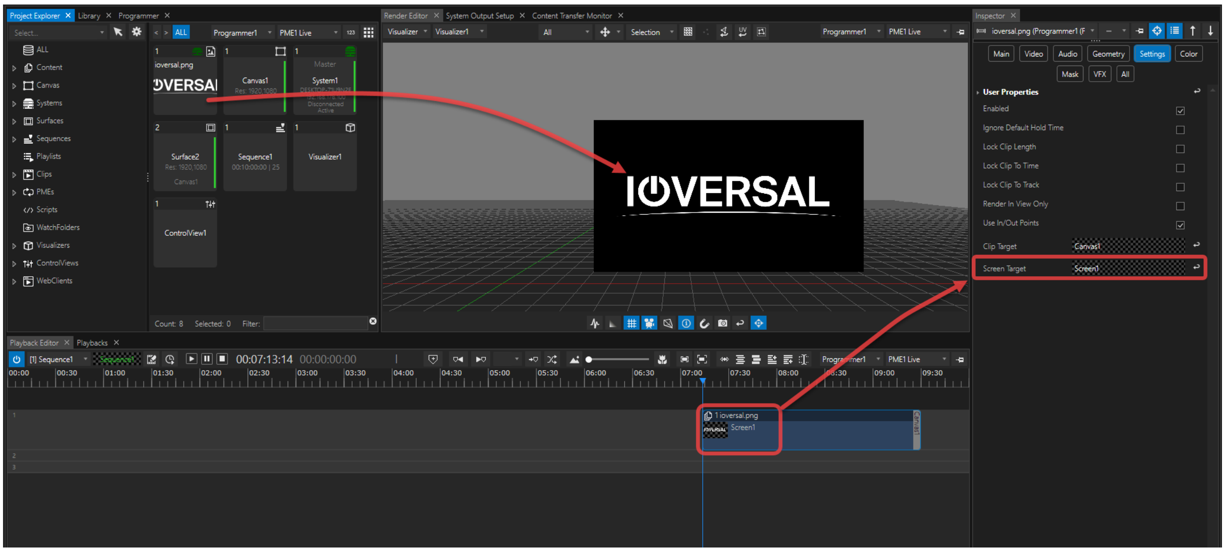
Opacity 1.000
Transform
Position X -3.717 Y 4.526
Rotation Z 0.000
Pivot X 0.000 Y 0.000
Auto Update Surface ☑
Mode 2D Offset
User Color
Surface Surface2
Resolution X 1920.000 Y 1080.000
Size X 10.000 Y 5.625

disable here to unlock Screen from Surface

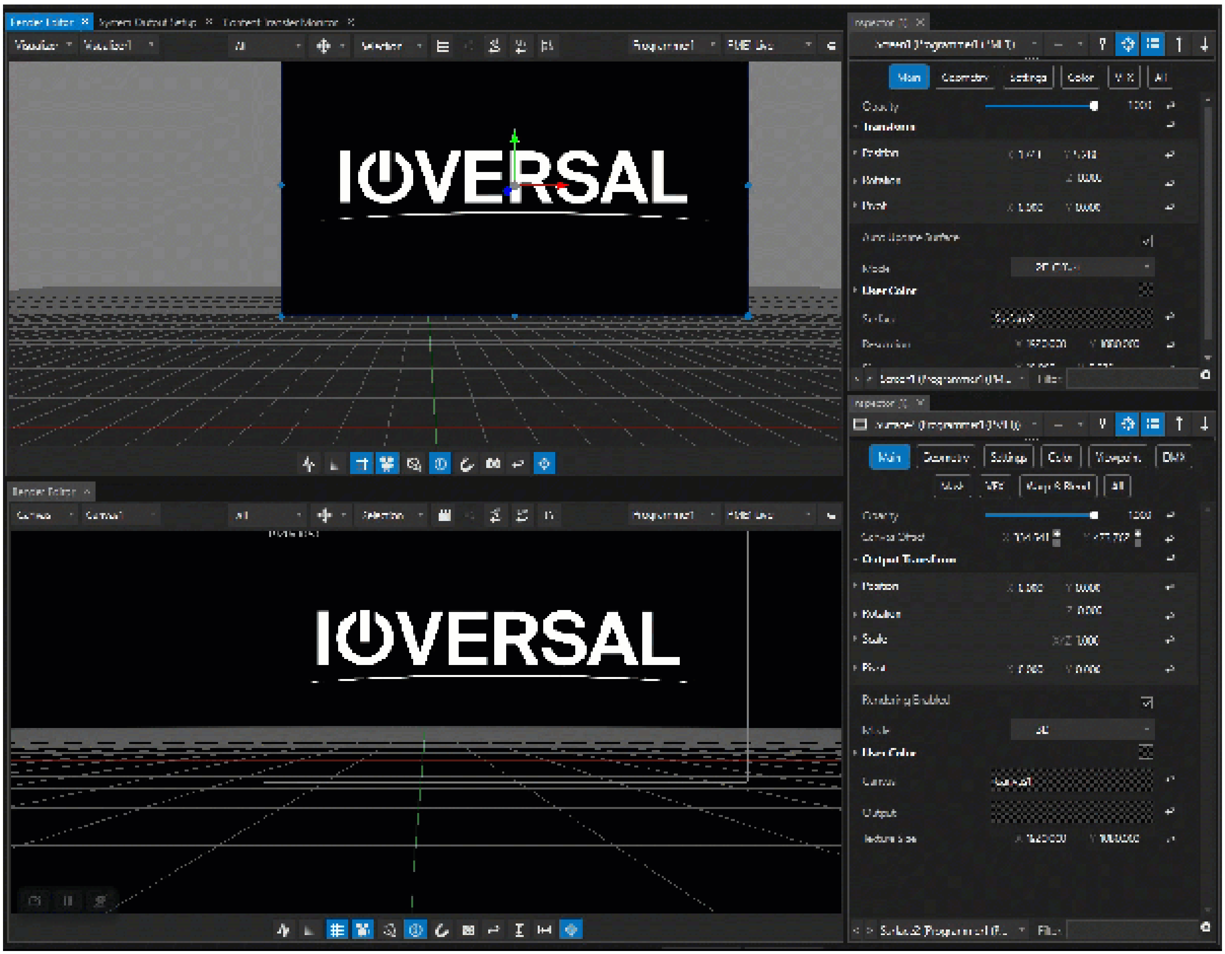
6. If the screen is selected, you can access its context menu with a right-click. Here you will find options to *Select Screen Surface*, a quick *Switch To Canvas View* as well as *Snapping* options.

7. **Some useful navigation shortcuts:**
CTRL+KLICK on the *Screen* to select its displayed content -- either to inspect the ClipContainer or to re-position it with your mouse.
CTRL+RIGHT-KLICK opens an extended context menu with options to *Create Geometry*.

8. **To create watermark-like textures** that are **locked to the position of a Screen's Surface**, just drag content from the *Project Explorer* directly onto the *Screen* in the *Visualizer.*
This will create a *Clip Container* with this particular *Screen* as a *Screen Target*.

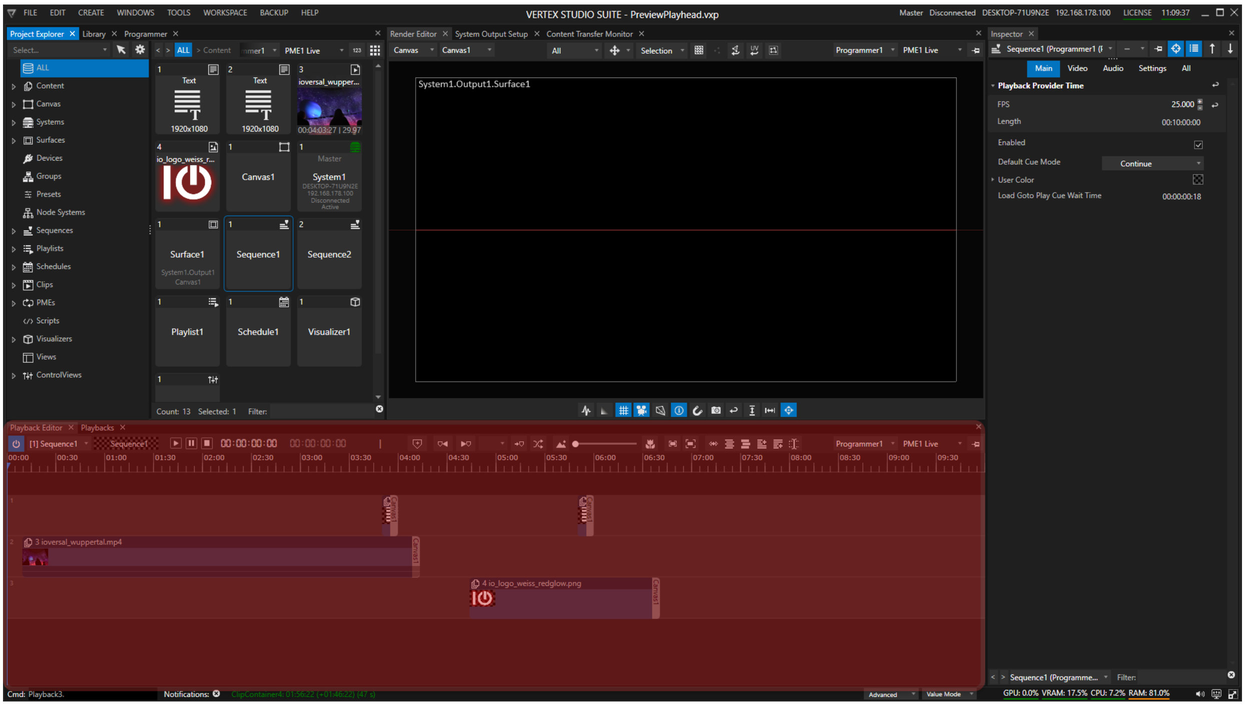


User Properties
Enabled ☑
Ignore Default Hold Time □
Lock Clip Length □
Lock Clip To Time □
Lock Clip To Track □
Render In View Only □
Use In/Out Points ☑
Clip Target Canvas1
Screen Target Screen1


When a ClipContainer has an assigned Screen Target, its position remains locked to the Screen's associated Surface.

4.10.5 Playback Editor

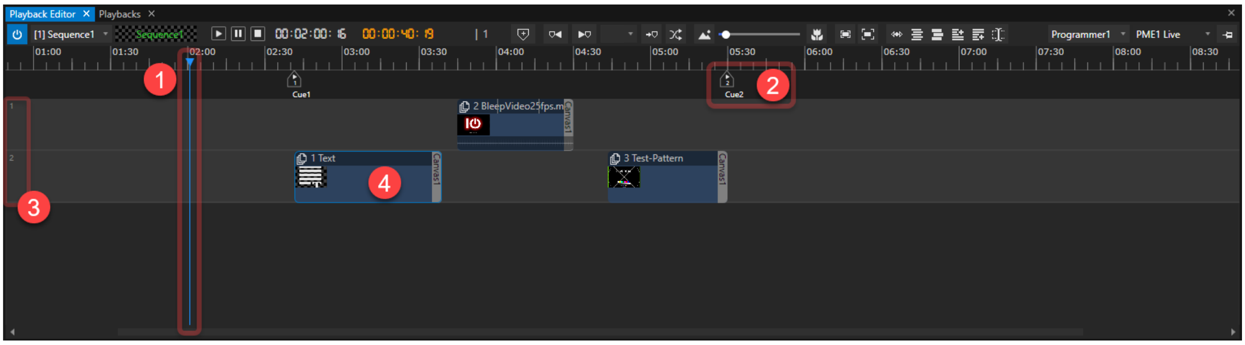
- The Playback Editor is your **main editing** window for building a **timeline and arranging your show**
- All content (audio, video, devices) in a sequence or playlist is arranged in **Clip Containers**.
- **Clip Containers** can be moved around freely, as they are not time-locked like in common video editing suites.
- **Use individual tracks to arrange and layer** your Clip Containers.



User Interface

- The Playback Editors UI is timeline based.
- Arrange and layer your Clip Containers using separate tracks
- Cues are markers that have various functions in show control

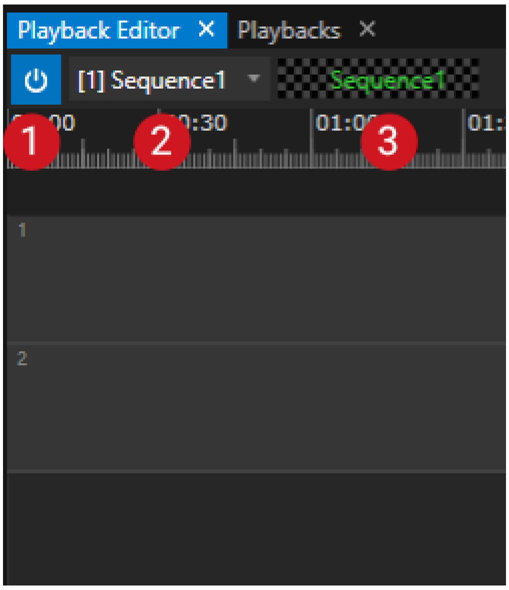
Basics



1	**Playhead**	shows current Playback time/position

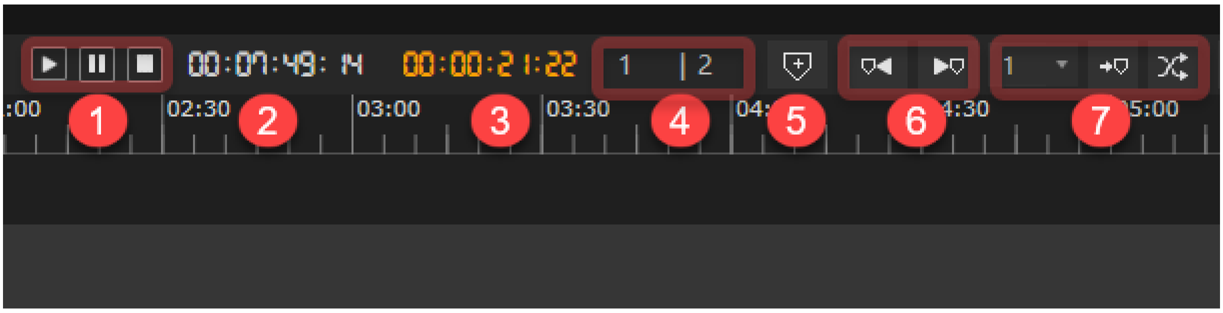
2	Cue	marker/step on the timeline
3	Track	arranging and sorting the layering hierarchy of Clip Containers in a sequence - top track is the first layer, always visible
4	Clip Container	host for different types of content, settings or devices

Playback and Playback Provider Selection

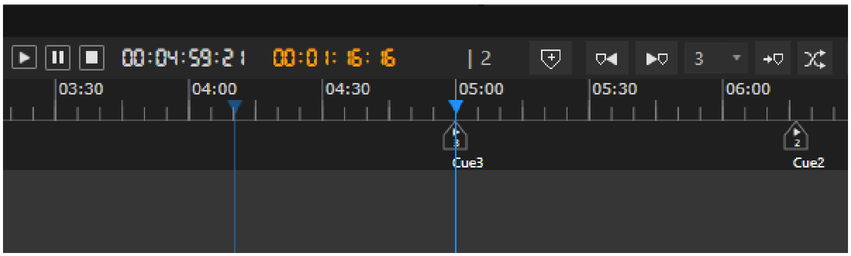


1	**Activate Playback**	Default: on Switch off to deactivate a playback. When deactivated, no content is rendered.
2	**Playback Selection**	Drop-down menu allows the selection of separate playbacks.
3	**Playback Provider**	Shows the playback provider of this playback. Drag a sequence or playlist from Project Explorer and drop them into this field.

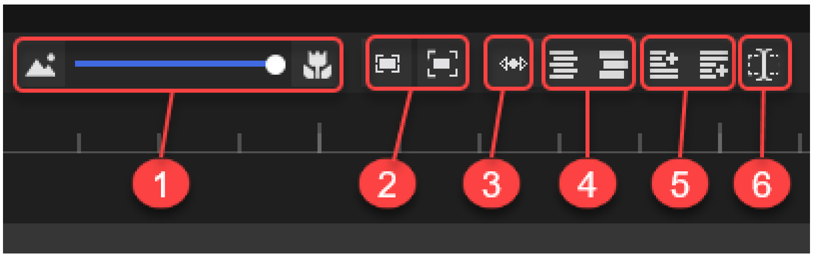
Playback and Cue Control



1	**Transport Buttons: Play, Pause, Stop**	Starts, pauses and stops the playback. Stop button: playhead jumps back to the beginning of the sequence.
2	**Current Playback Time**	Shows the current timecode of the playback / the playhead's current position. Double-click to enter a time and the playhead will jump there.
3	**Count-Down To Next Cue**	Shows the remaining time until the next, upcoming cue.
4	**Cue Number Status: Previous I Next**	Shows the playback's position by cue numbers: Cue number before the playhead **I** and upcoming cue number.
5	**Add Cue**	Click to create a new cue at current playhead position. Continuous numbering of cues starts for each Playback with No 1. Number increases with every additional cue created.
6	**Go to Previous/ Next Cue**	Playback jumps back to previous / or forward to next upcoming cue on the timeline.
7	**Select a Cue Jump to Cue Fade to Cue**	Drop-down selection of a cue to jump or fade to. Alternatively, just enter a cue number and confirm with ENTER to jump. Makes the playhead **jump** to the cue selected in the drop-down menu. Renderer instantly shows content at cue position. Makes the playhead **fade** to the cue selected in the drop-down menu. Renderer crossfades to content at cue position.

		 00:04:59:21 00:01:16:16 2 3 03:30 04:00 04:30 05:00 05:30 06:00 Cue3 Cue2 When using the FadeToCue command, the playhead will jump to the new point on the timeline, while its "ghost" will remain at the old position for the duration of the crossfade. The duration of the crossfade can be set in the sequence's settings in advanced mode inspector under *Fade To Time*. FadeToCue and FadeToTime are essentially the same functions.

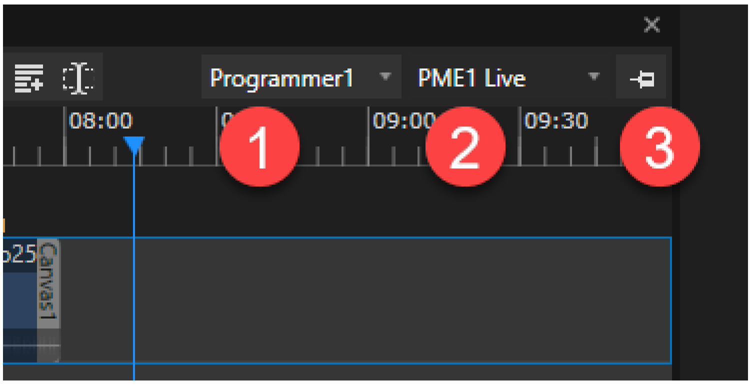
Layout Options and Quick Access



1	**Zoom**	Zooms in or out of the timeline at position of the playhead.
2	**Zoom Reset** **Zoom To Item**	Zooms out completely. Zooms in on selected item(s).
3	**Auto Scroll**	off: default follow: sequence window refreshes when playhead runs past the displayed portion of the timeline. center: the running playhead continuously stays in the center of the sequence window.
4	**Track Height**	click once to minimize/ maximize height of selected track(s), and double-click to adjust all tracks.

5	**Add Track on Top / at Bottom**	Adds a new track above or below.
6	**Cut all Clip Containers**	Edits (cuts) all Clip Containers at current playhead position.

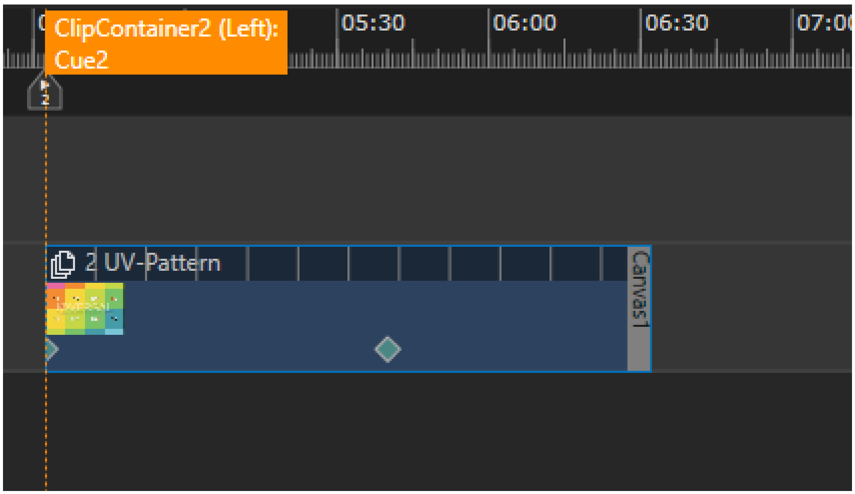
Programmer and Playback Mixing Engine



1	**Programmer Selection**	When working in *Programmer Mode*, select the programmer to work with (e.g. Live or Preview)
2	**Switch Playback Mixing Enginge (PME)** between Live und Preview(s)	Switch whether your Playback editor should show the live environment or if you want to work in a Preview **Colors:** Grey (Default) - Live state Orange: Preview State
3	Track Live PME	When enabled and swapping live and preview PMEs, the editor window always follows the live PME.

Snap

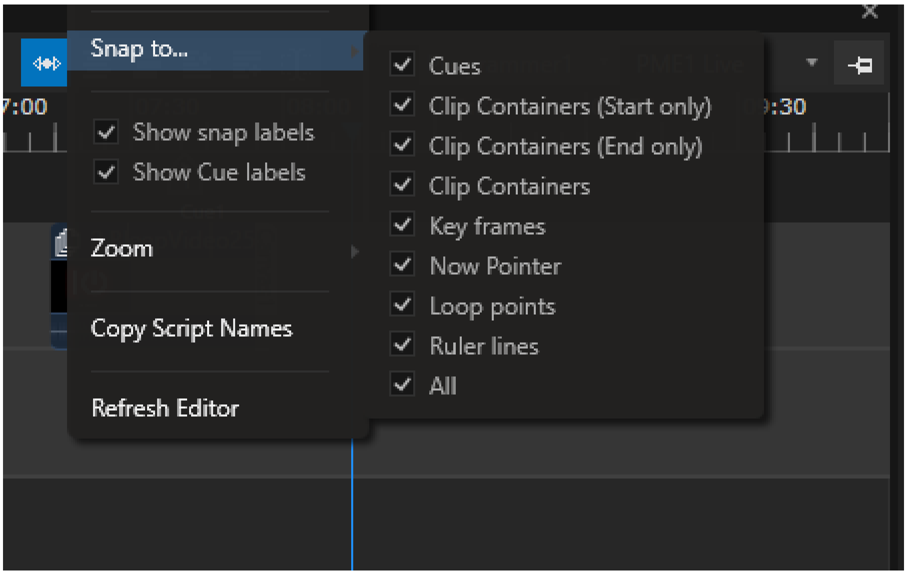
- The Playback Editor comes with an **smart snap function** that will help you with the **correct positioning** of Clip Containers and cues
- **Orange labels** show you the details of what you're currently snapping to.



Clip Container2 snaps to Cue2

Settings

- By default the snapping is enabled to all elements
- You can customize it to your needs

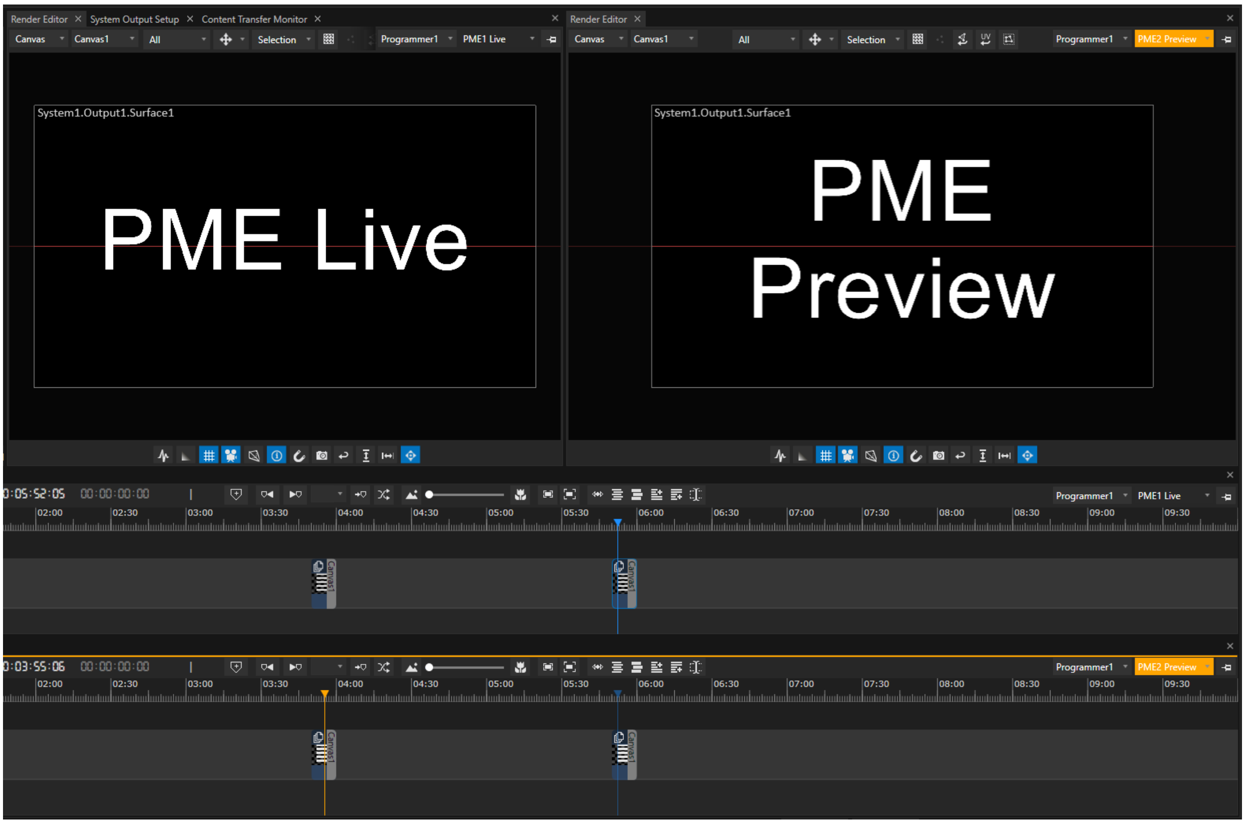


- Right-Click with your mouse at any position into the Playback Editor and open the Context Menu
- Select "Snap to" and customize

Working with the Playback Editor

- all content and all devices are arranged in **clip containers**
- **clip containers** can be plotted and layered **on tracks,** as well as **moved freely** between tracks
- a **Canvas or output** can be assigned **as render target to each clip container** - independent from the clip containers order on a track
- the **top track** is **rendered on top** (when the default settings of a clip container are used)

Live and Preview Mode



As with the render editor, any playback editor has got two possible modes: **live and preview.**

The default mode is **live mode:** a blue colored playhead shows the playback's position at the live output.

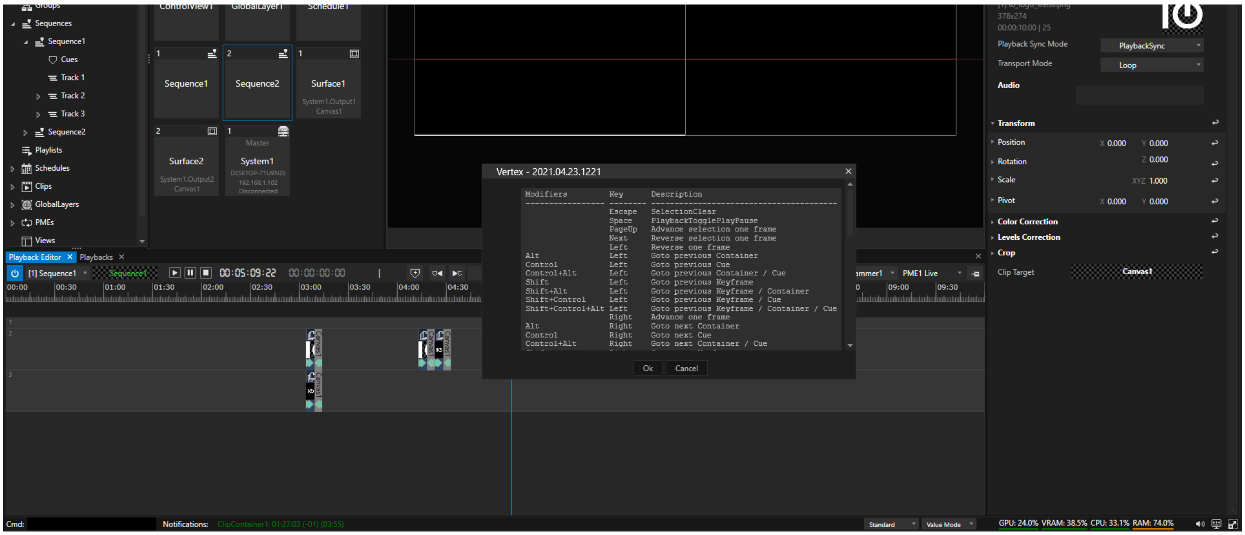
The playback editor in **preview mode**

- is highlighted with **an orange border**
- has got an **orange colored playhead**
- shows the live mode playhead's position in a pale shade of blue.

Click here for further reading on *Playback Mixing Engine* (PME).

Keyboard Shortcuts

- Each editor window in VERTEX has got a varying set of shortcuts that are **automatically created and updated**.
- **Press Shift-F1** to open a list of shortcuts corresponding to the current window/ editor in focus.



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```
Modifiers          Key      Description
------------------ -------- ----------------------------------------
                   Escape   SelectionClear
                   Space    PlaybackTogglePlayPause
                   PageUp   Advance selection one frame
                   Next     Reverse selection one frame
                   Left     Reverse one frame
Alt                Left     Goto previous Container
Control            Left     Goto previous Cue
Control+Alt        Left     Goto previous Container / Cue
Shift              Left     Goto previous Keyframe
Shift+Alt          Left     Goto previous Keyframe / Container
Shift+Control      Left     Goto previous Keyframe / Cue
Shift+Control+Alt  Left     Goto previous Keyframe / Container / Cue
                   Right    Advance one frame
Alt                Right    Goto next Container
Control            Right    Goto next Cue
Control+Alt        Right    Goto next Container / Cue
```

Focus Playback Editor and Press F1 Key.
A window with all available shortcuts for your Sequence opens.

Examples of Common Workflows:

- drag and drop content or devices on a track and automatically create a corresponding Clip Container.
- Video FX or Geometry Modifiers can only be dropped on top of a Clip Container.

- select a Clip Container and edit all properties in the Inspector
- Pin a certain clip container to a new Inspector to edit properties

- add a track (go to context menu by right-click)

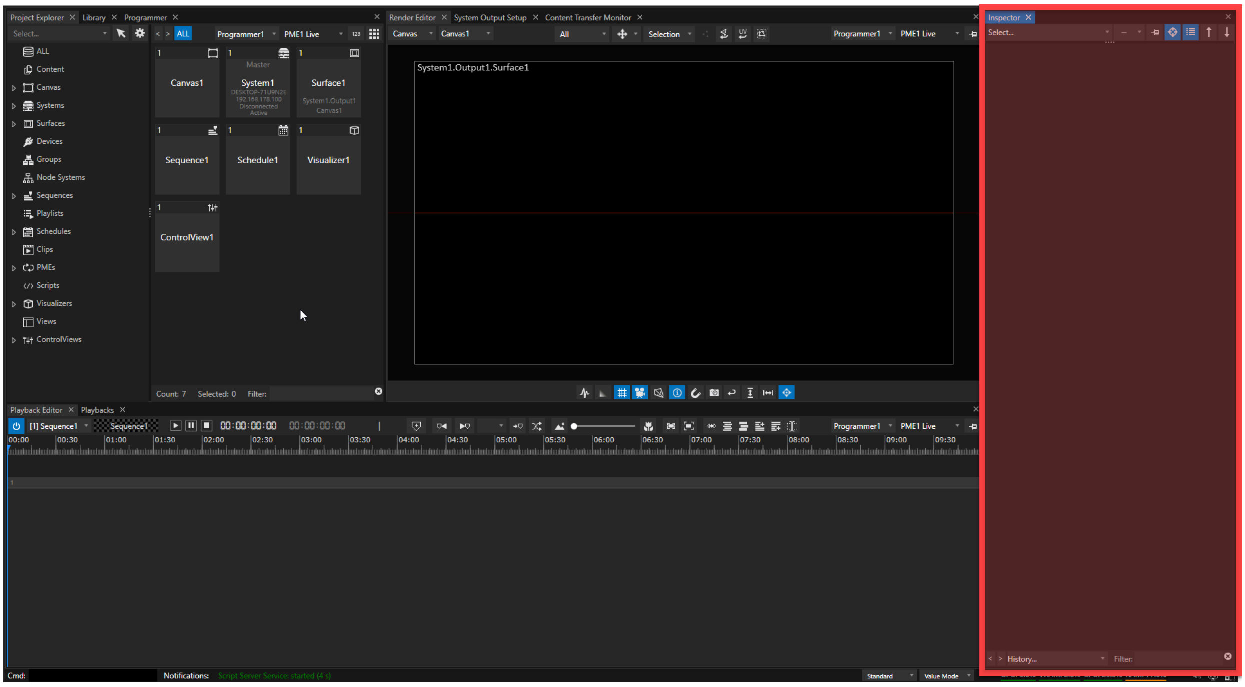
- Move Clip Containers on a track or between tracks (grab Clip Container with your mouse and move it around)
- snap Clip Containers to the playhead

- push or pull with the mouse on the edge of a Clip Container to change its length
- draw a multi selection rectangle with your mouse to select multiple containers to edit
- Copy/ paste Clip Containers (context menu or shortcuts)

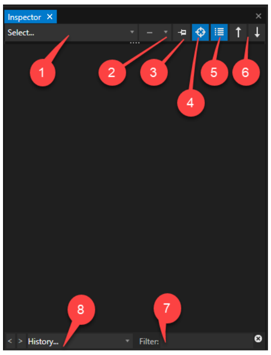
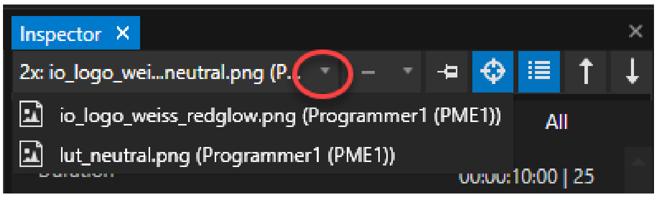
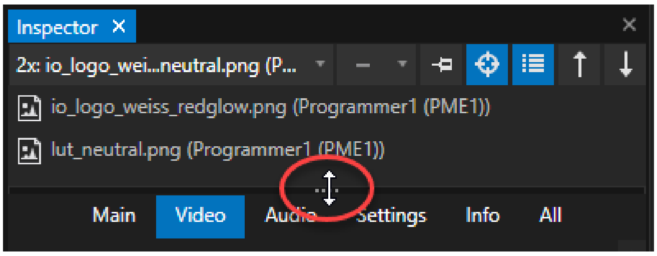
- Double-click on a clip container to edit Keyframes
- insert a specific time between clip containers (go to context menu by right-click)

4.10.6 Inspector

- The Inspector window is the **central hub for all settings and property values in VERTEX.**
- **Click** on **any element** in the project explorer, render editor, sequence editor etc. **in order to inspect** the element's properties and **change its settings**.
- You can **work on multiple inspector windows simultaneously** and **pin items to an inspector.**
- **Tabs** help you **to sort settings.**
- The **viewing modes *standard*** and ***advanced*** filter out distinct properties and keep the view on the inspector neat and clean.



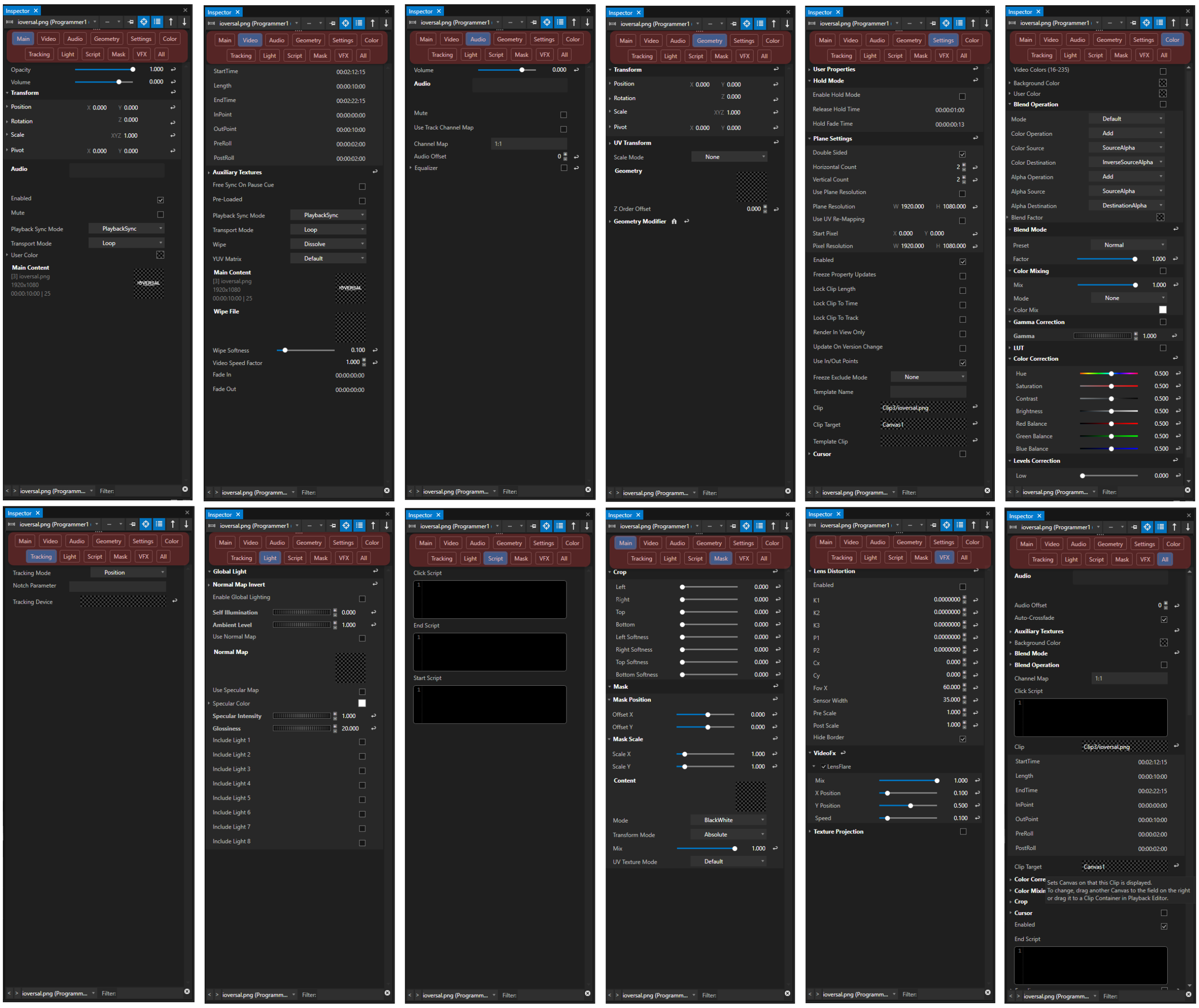
User Interface

 Inspector Select... 1 2 3 4 5 6 7 8 History... Filter:	1	Selection	Displays the selected item's name. This selection is active in the inspector window. **View a list of your multiple selections** by either opening the drop down menu here,  Inspector 2x: io_logo_wei...neutral.png (P... io_logo_weiss_redglow.png (Programmer1 (PME1)) lut_neutral.png (Programmer1 (PME1)) All 00:00:10:00 | 25 or by pulling down the tab at dotted line:  Inspector 2x: io_logo_wei...neutral.png (P... io_logo_weiss_redglow.png (Programmer1 (PME1)) lut_neutral.png (Programmer1 (PME1)) Main Video Audio Settings Info All
	2	Align	Enables different modes to change settings of multiple selected items in relation to one another. See below.
	3	Pin To Inspector	VERTEX's pin function has three modes: 1. *None* is pinned (default) - meaning whenever you select a new item, it appears in the inspector. 2. *Items* are pinned - meaning the current inspected item is pinned to this inspector; a different item selected for edits will not show up in the inspector. 3. *Context* is pinned - meaning only items from the current window/ editor will show up in the inspector.
	4	Selection Focus	Toggles between two selection modes: the target icon enables selections just from the current editing window focus. The globe icon enables across all the different editing windows in VERTEX - for instance, in this mode you can select multiple items from the project explorer, playback editor and render editor simultaneously.
	5	Multiple Selection	The list icon enables multiple selections. The single item icon disables it.

	6	Prev/ Next Arrows	Jump back and forth between multiple selected items in the list view. See instructions above, list view 1.
	7	Filter / Search Function	The filter is a helpful searching tool when working with items that have lots of properties. Gain quick access to the property you need by **typing in a letter or a word** and **confirm your search key with ENTER**. To view all properties again clear the filter either by clicking on the X icon or using the shortcut SHIFT+BACKSPACE.
	. 8	Inspector History	Go back and forth between previously inspected items. Either open a drop down menu with a history list to select from or click on the previous/ next buttons (</>).

Property Tabs

- All properties are **sorted thematically** by tabs.
- The **number and type of tabs vary** depending on the selected item.
- The ***Main*** tab displays a quick overview of the **most important properties** for the selected item.
- The ***All*** tab lists **all available properties** in alphabetical order.



Screenshots of all the available tabs sorting the various settings and properties in a Clip Container's Inspector window.

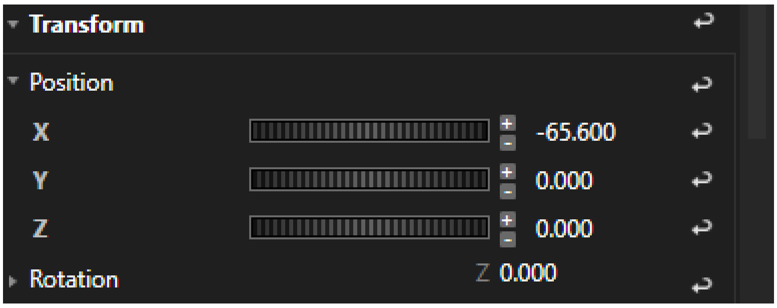
Change Property Values or Settings

- **Double-click** on a value, enter a number and confirm with "Enter".
- **Reset** a value by clicking on the **return symbol** on the right hand side of the inspector.
- A **little arrow head next to a property name** on the left indicates that there are **child elements** available. Click on the arrow to open.
- **Drag and drop** items like masks or a canvas with your mouse into the checkered target field.
- When **multi selecting** items, inspector shows all common properties. Value changes are adopted for all selected elements.

Mathematical Expressions

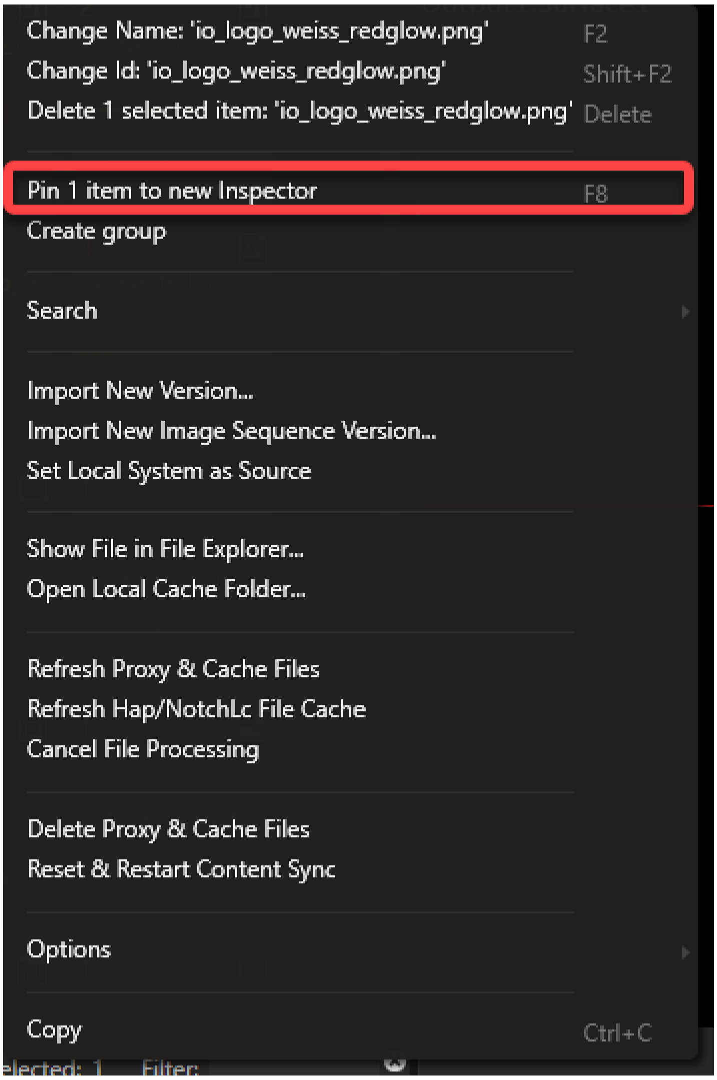
You can use mathematical expression for each value in the inspector.

For instance, enter 1920*2 to double your pixel number. Or just add 100 by using +100.



- For **wheels**: Use **shortkeys** to get more precise results:
  - Hold Alt Key and move wheel with your mouse: increase only whole integer values
  - Hold CTRL Key and move wheel: "Fine Mode"

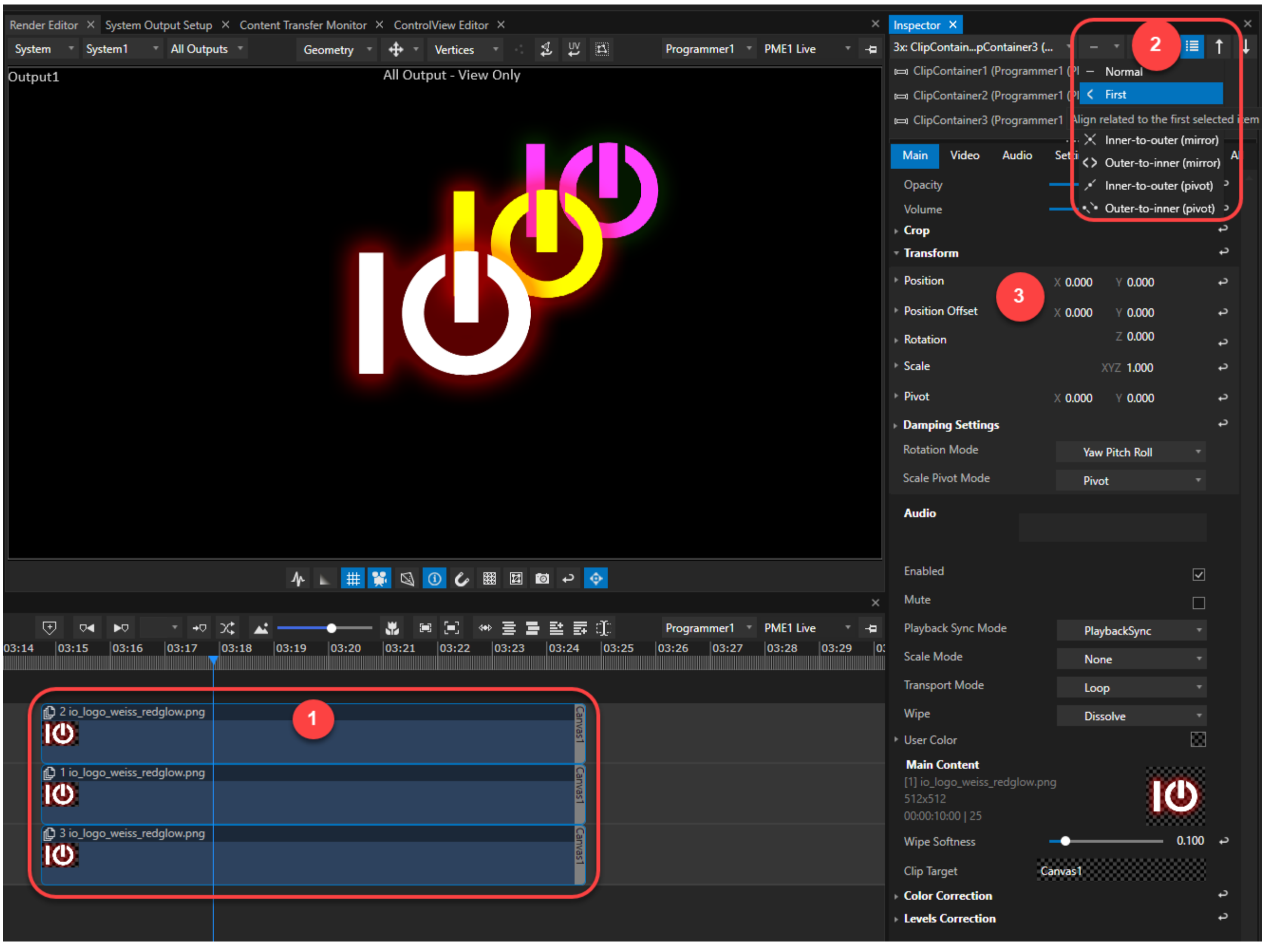
Pin item to new inspector

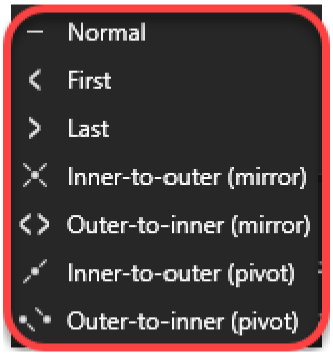

Change Name: 'io_logo_weiss_redglow.png' F2
Change Id: 'io_logo_weiss_redglow.png' Shift+F2
Delete 1 selected item: 'io_logo_weiss_redglow.png' Delete
Pin 1 item to new Inspector F8
Create group
Search
Import New Version...
Import New Image Sequence Version...
Set Local System as Source
Show File in File Explorer...
Open Local Cache Folder...
Refresh Proxy & Cache Files
Refresh Hap/NotchLc File Cache
Cancel File Processing
Delete Proxy & Cache Files
Reset & Restart Content Sync
Options
Copy Ctrl+C
elected: 1 Filter:

- Every item in VERTEX can be accessed with additional and separate inspector windows.
- The item can be optionally **pinned to the new inspector.**
- At times it can be helpful to work with **multiple inspectors to view separate settings distinctly.**

Align Mode

The *Align* function offers a quick way to **edit properties** of multiple selections **in relation to one another**. For instance, you can **fan out items on your canvas** evenly and with ease. Here is an example on how to do it:





This drop-down menu appears when clicking on the "Align" button (no .2 in UI description).

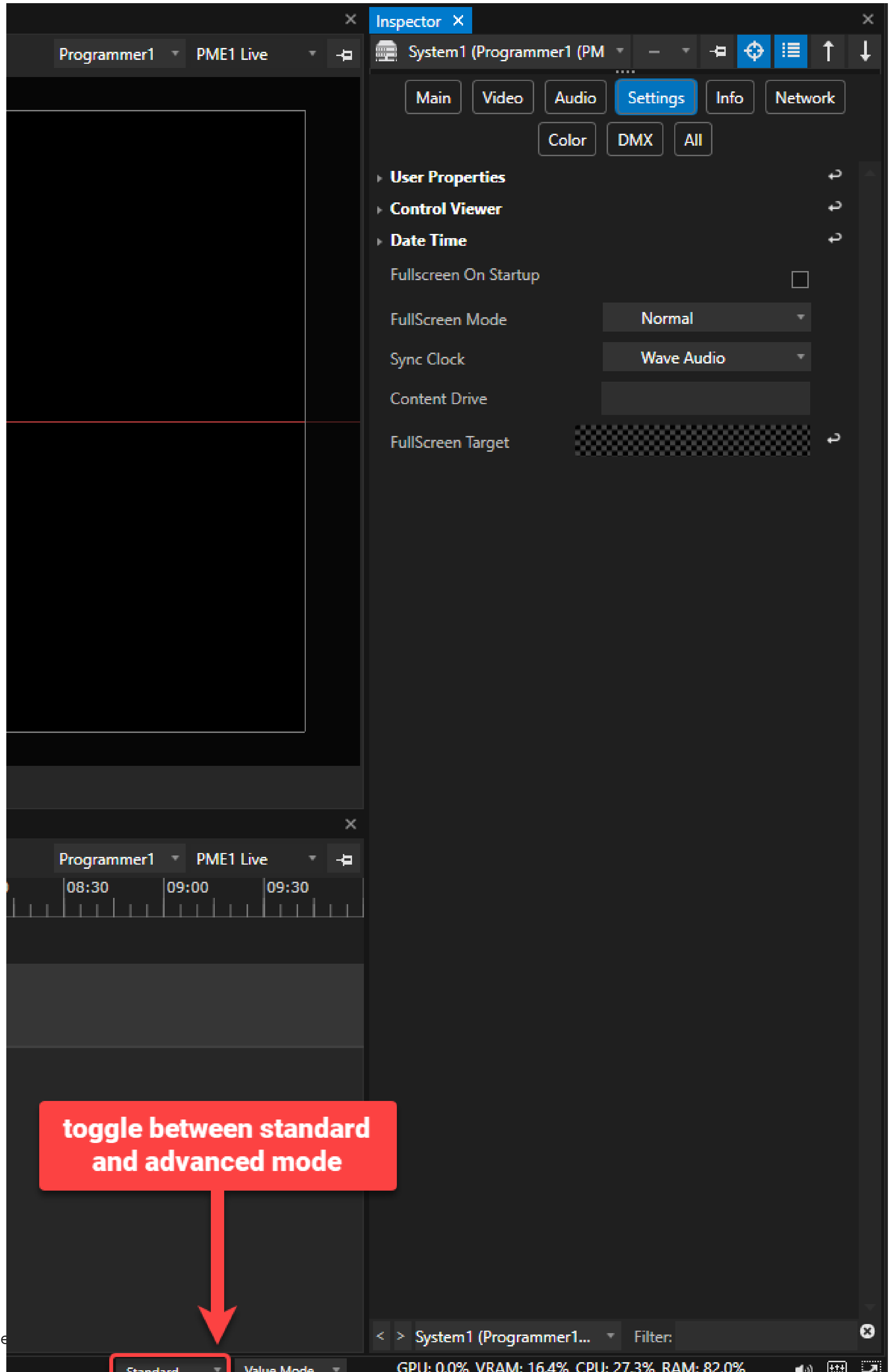
1 Select multiple items such as those three clip containers in the playback editor.

2 Select any of the align modes from the drop down in the inspector.

3 When changing properties such as *position X or Y* all three clip containers will be neatly lined up in exact relation to one another.

Inspector Mode: Standard and Advanced

Select one of the inspector's viewing modes from the **drop down menu at the status bar.** Depending on the inspected item, the number of tabs and the item's properties and options will increase in *advanced mode.*



Fullscreen On Startup □

FullScreen Mode: Normal

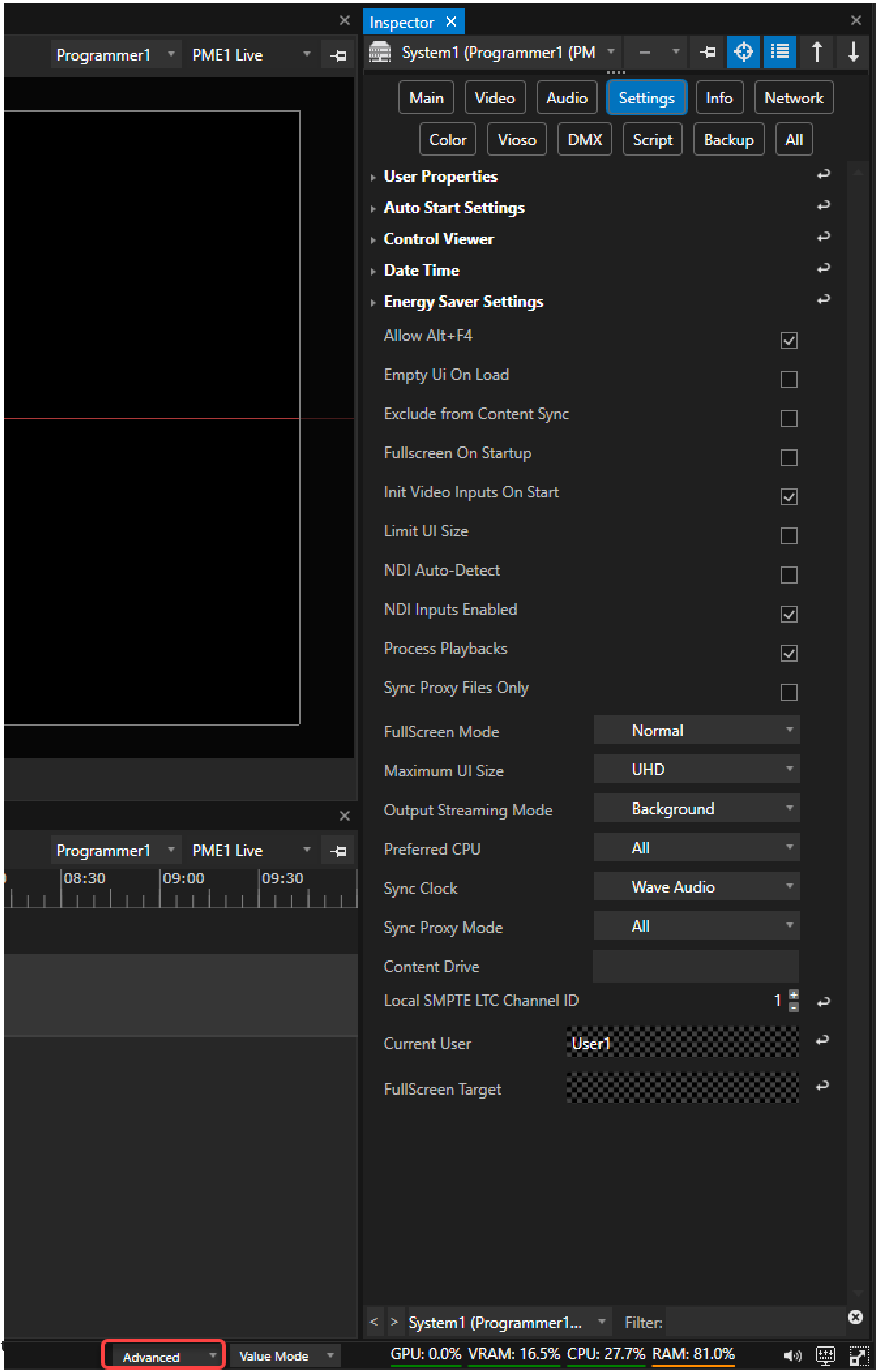
Sync Clock: Wave Audio

Content Drive

FullScreen Target

GPU: 0.0% VRAM: 16.4% CPU: 27.3% RAM: 82.0%

toggle between standard and advanced mode



User Properties

Auto Start Settings

Control Viewer

Date Time

Energy Saver Settings

Allow Alt+F4	☑
Empty Ui On Load	□
Exclude from Content Sync	□
Fullscreen On Startup	□
Init Video Inputs On Start	☑
Limit UI Size	□
NDI Auto-Detect	□
NDI Inputs Enabled	☑
Process Playbacks	☑
Sync Proxy Files Only	□
FullScreen Mode	Normal
Maximum UI Size	UHD
Output Streaming Mode	Background
Preferred CPU	All
Sync Clock	Wave Audio
Sync Proxy Mode	All
Content Drive	
Local SMPTE LTC Channel ID	1
Current User	User1
FullScreen Target	

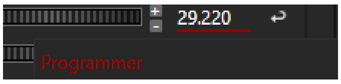
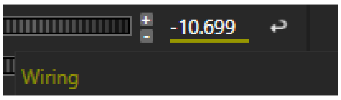
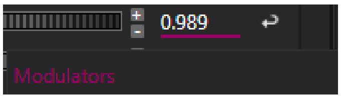
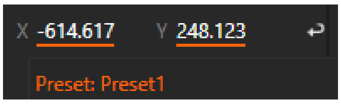
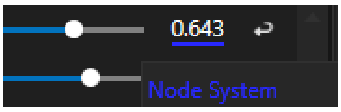
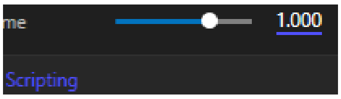
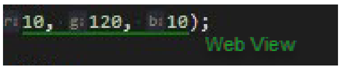
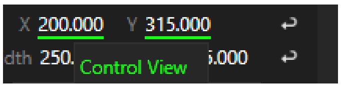
GPU: 0.0% VRAM: 16.5% CPU: 27.7% RAM: 81.0%

Vert

Same system in advanced inspector mode

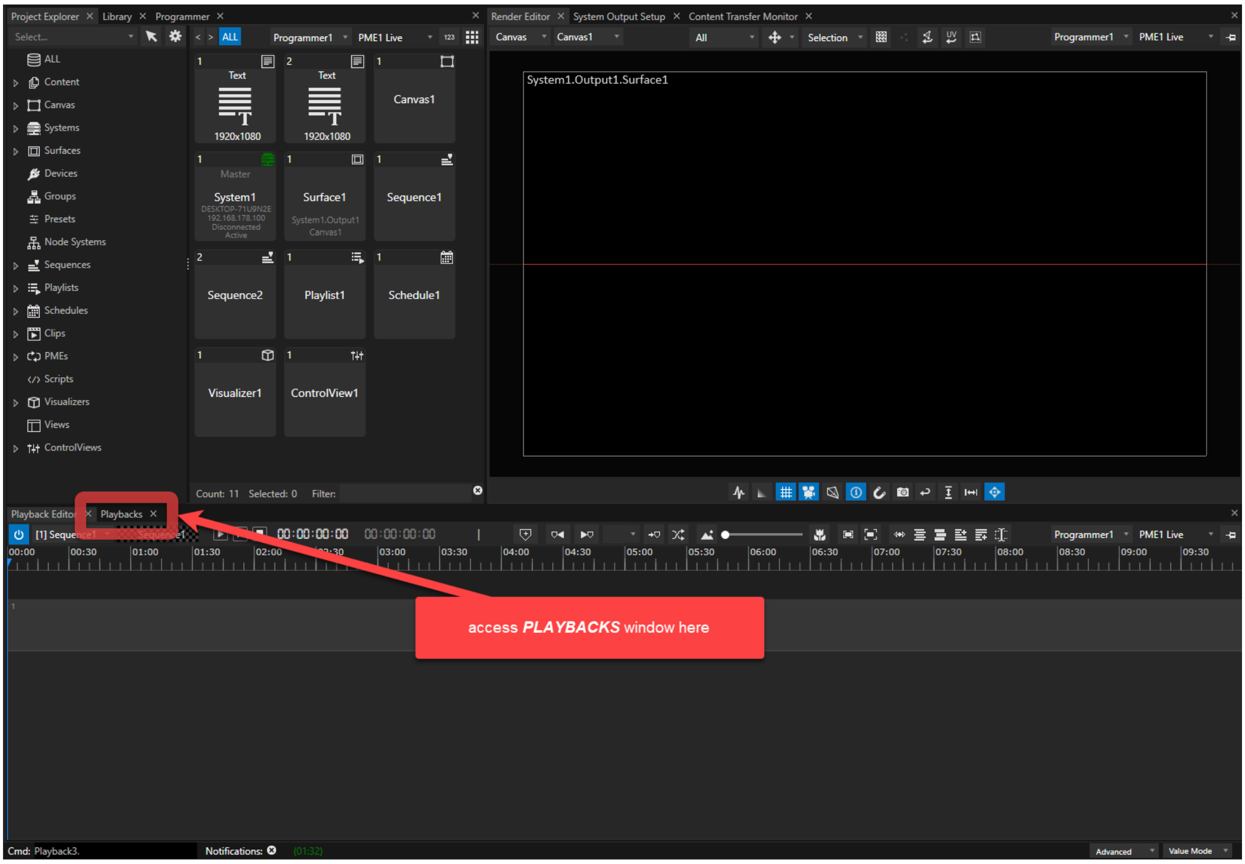
Colors Underlining Value States And Their Meaning

A value state in the inspector can be underlined with a specific color indicating the particular the source of the property value or its changes.
Whenever a parent property entry is underlined, open its drop down to see what child property value is being changed.

	**Red** indicates the source of value state changes is the **programmer mode**. A darker shade of red indicates multiple programmers.
	**Yellow** indicates the source of value state changes is a **wiring**. A brighter shade of yellow indicates multiple wirings.
	**Magenta** indicates the source of value state changes is **modulators** from within a node system such as oscillators, sine waves etc.
	**Orange** indicates the source of value state changes is coming from a **preset**.
	**Blue** indicates the source of value state changes is a **node** system.
	**Dark blue** indicates the source of value state changes is a **script**.
	**Dark green** indicates the source of value state changes is coming from a **web view**.
	**Bright green** indicates the source of value state changes is coming from a **control view**.

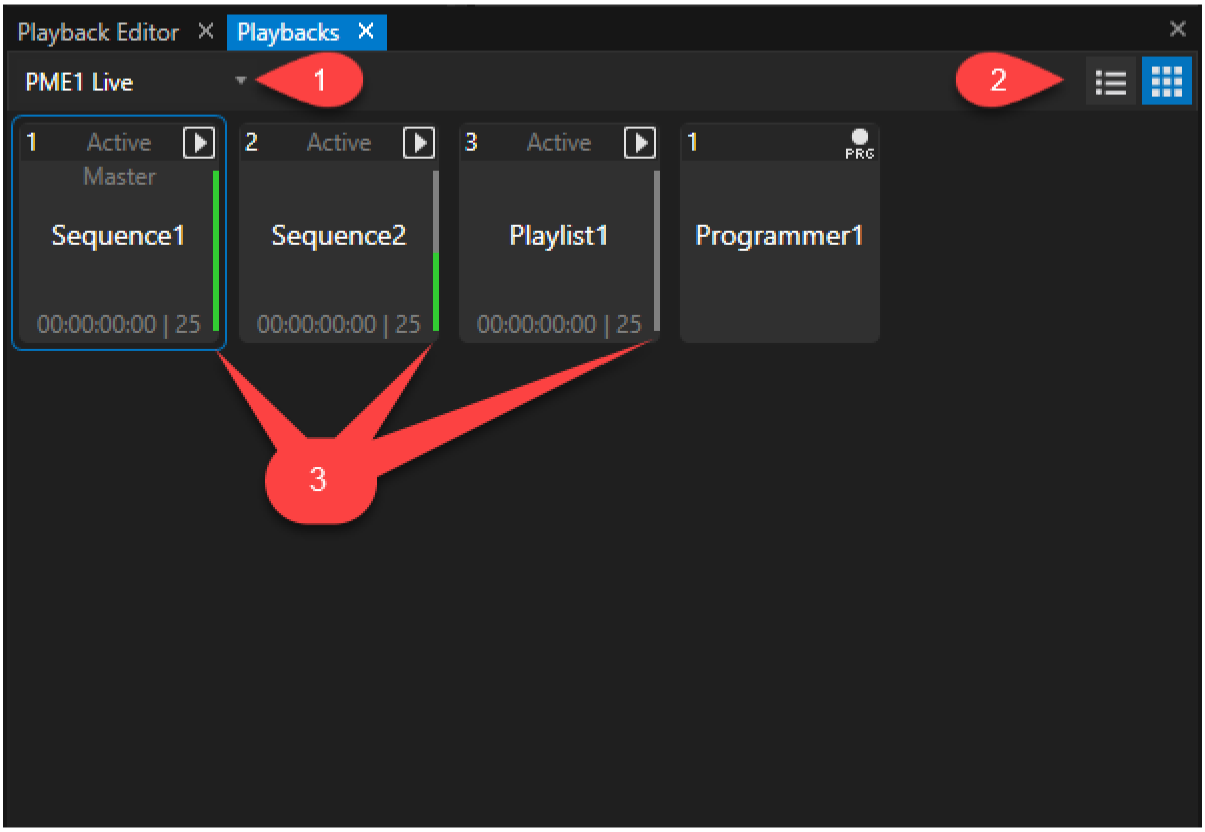
4.10.7 Playbacks

- The ***Playbacks*** window gives you an organized and **quick view on all your playbacks** and their **status**
- There are two views with different focus: A tile view for a fast and good overview and a detailed with with controller buttons for play, pause and cues
- **switch** between **live and preview** playback



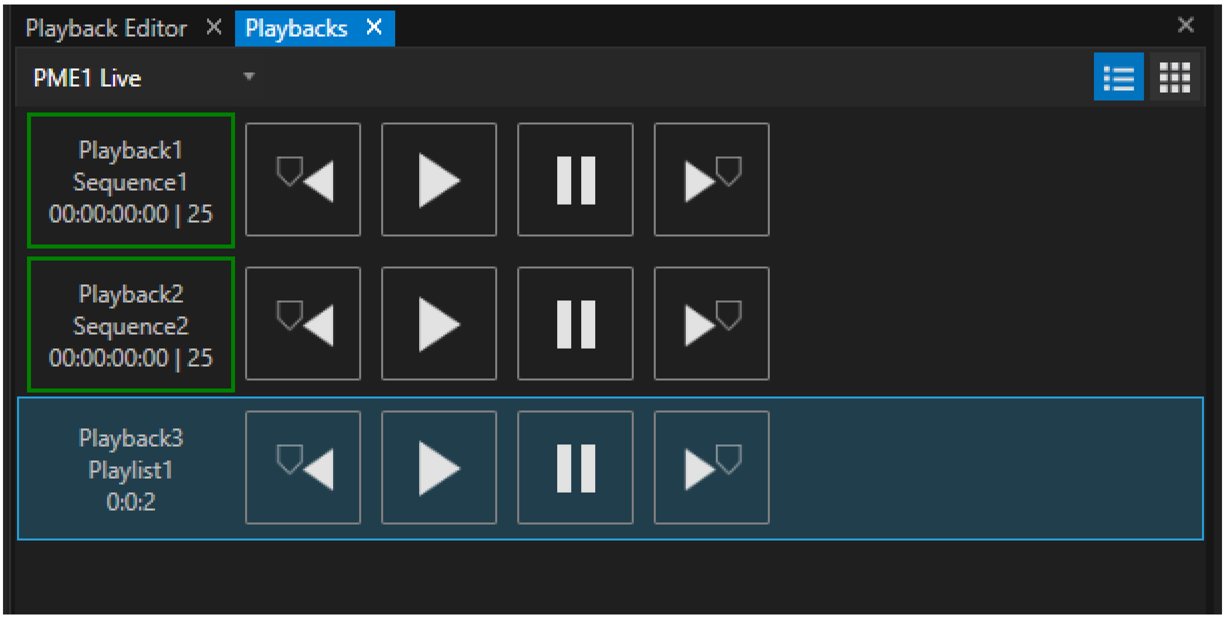
User Interface

Tile View


Playback Editor
Playbacks
PME1 Live
1
2
1 Active Master Sequence1 00:00:00:00 | 25
2 Active Sequence2 00:00:00:00 | 25
3 Active Playlist1 00:00:00:00 | 25
1 PRG Programmer1
3

1	**PME Selection**	Select between discrete Playback Mixing Engines: live or preview(s) Default: live
2	**Window Layout**	Select between a tile and a list view
3	**Mix Level**	green status bar showing mix levels Playback1: 100% (default) Playback2: 50 % Playback3: 0 %

Detailed View



On the left side are all playbacks listed with infos on playback provider, current playhead position and FPS.
On the right are transport controls for each playback: previous cue, play, pause, next cue.

4.10.8 Value Mode and Programmer Mode

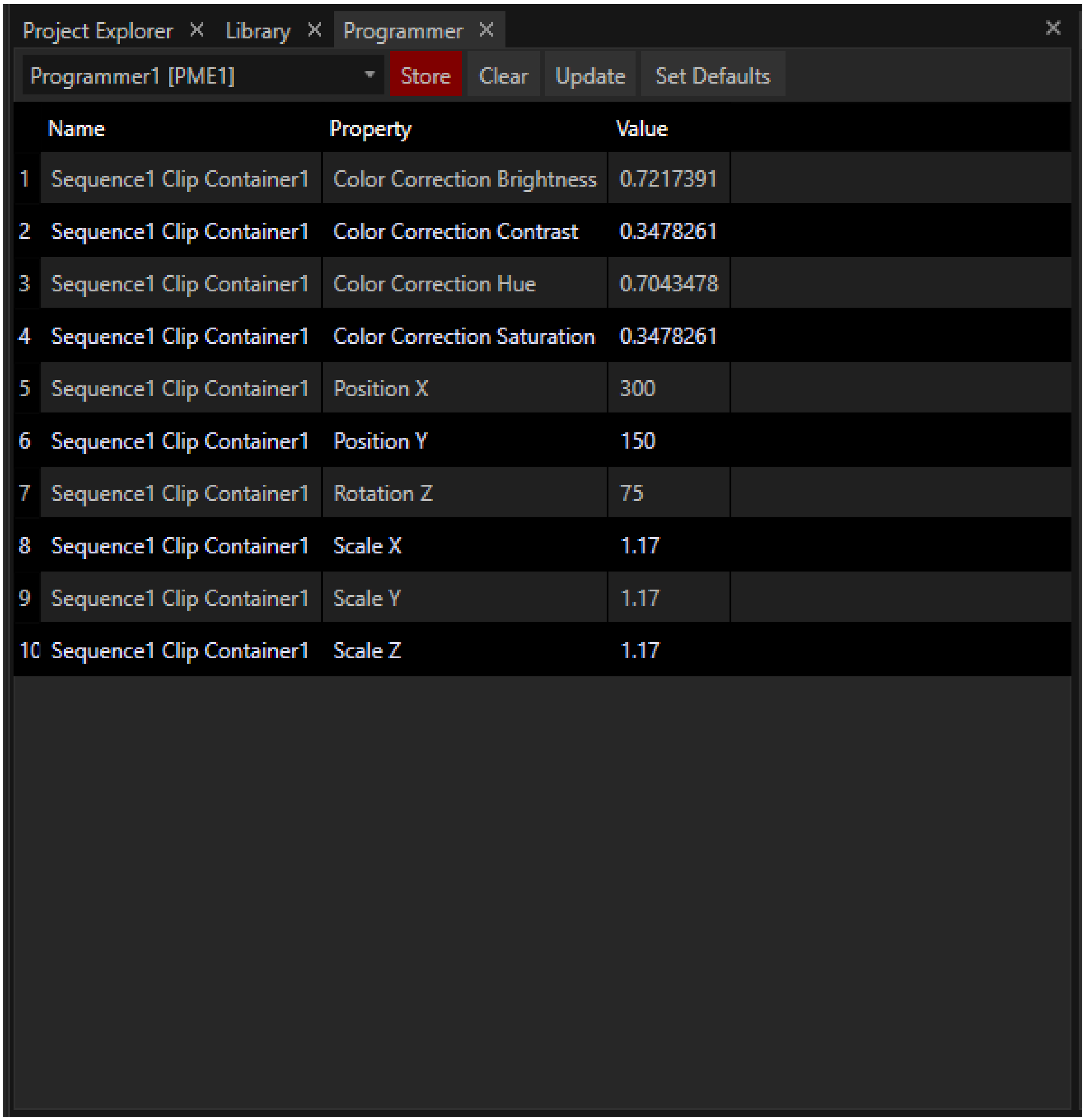
- VERTEX **combines the advantages of both worlds**: **Video editing /compositing and lighting console programming**.
  Choose you preferred workflow - or efficiently combine both.
- By default VERTEX is set to **Value Mode:** Each value change in the setting of a project item has a direct effect. Particular settings are animatable with **keyframes.**
- In **Programmer Mode** your property changes are stored temporarily in a programmer cache allowing you to program whole scenes, make adjustments and save all settings as the final result.

Value Mode

- **Default mode** in VERTEX
- **Global values** for each clip container and item. A value or property change in the Inspector will take effect for the entire duration of the sequence.
- **Automation for settings & values** is achieved via keyframes or script commands.

Programmer Mode

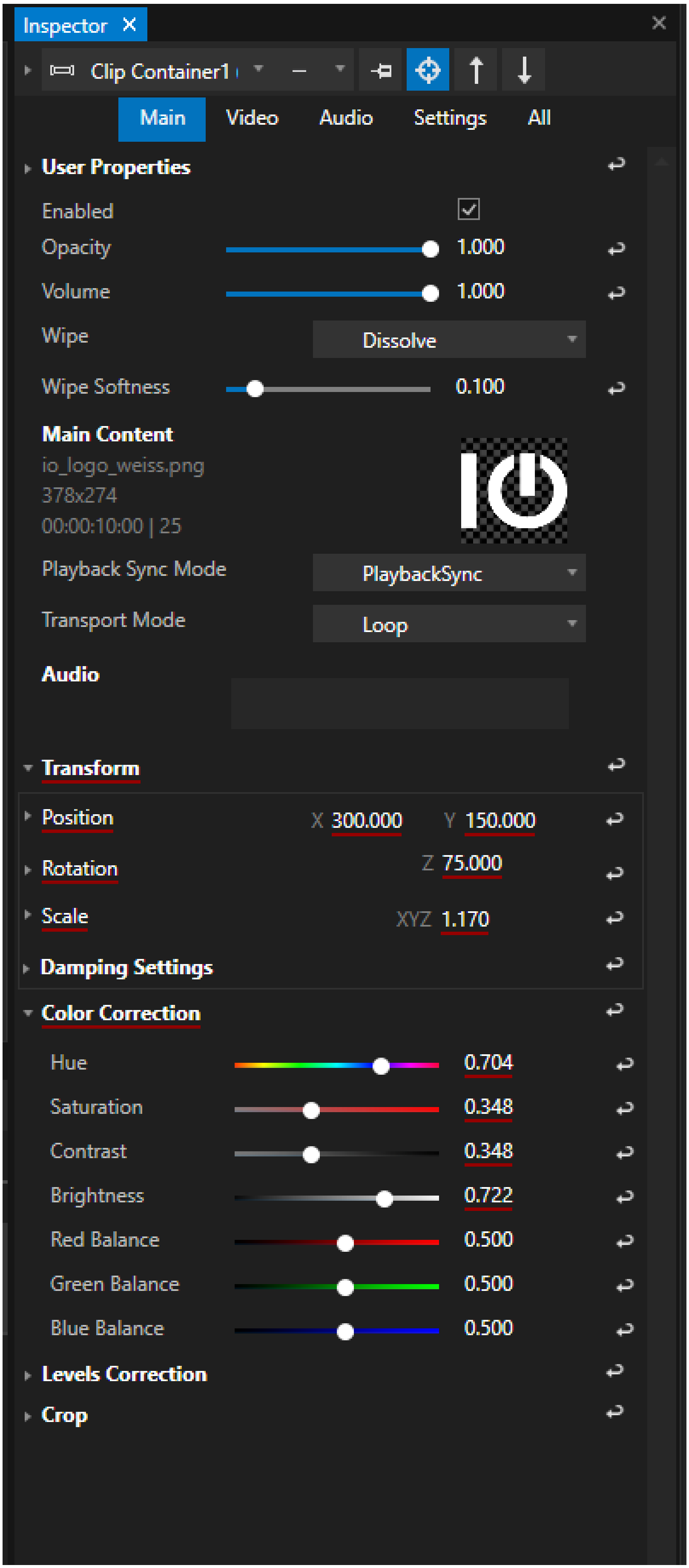
- The Programmer is a **temporary buffer that caches your value changes**. VERTEX **holds** these changes **until you save or clear them.**
- Property changes for Clip Containers and items **are eventually saved as keyframes** in the project **only after you click the *SAVE* button in the Programmer window.**
- When you store a Programmer list, **VERTEX automatically creates keyframes**.
- You can **clear, revert or just update** single parameters and values in your scene.
- You can **work on a whole scene**, make changes and only **store the final result**. People from the world of lighting consoles might be familiar with this workflow.



	Name	Property	Value
1	Sequence1 Clip Container1	Color Correction Brightness	0.7217391
2	Sequence1 Clip Container1	Color Correction Contrast	0.3478261
3	Sequence1 Clip Container1	Color Correction Hue	0.7043478
4	Sequence1 Clip Container1	Color Correction Saturation	0.3478261
5	Sequence1 Clip Container1	Position X	300
6	Sequence1 Clip Container1	Position Y	150
7	Sequence1 Clip Container1	Rotation Z	75
8	Sequence1 Clip Container1	Scale X	1.17
9	Sequence1 Clip Container1	Scale Y	1.17
10	Sequence1 Clip Container1	Scale Z	1.17

Programmer with a list of values

- All properties and values that are currently affected by a Programmer list, are underlined red in the Inspector. Read more about the visual feedback on all inspector properties.



User Properties

Enabled ☑

Opacity 1.000

Volume 1.000

Wipe Dissolve

Wipe Softness 0.100

Main Content

io_logo_weiss.png

378x274

00:00:10:00 | 25

Playback Sync Mode PlaybackSync

Transport Mode Loop

Audio

Transform

Position X 300.000 Y 150.000

Rotation Z 75.000

Scale XYZ 1.170

Damping Settings

Color Correction

Hue 0.704

Saturation 0.348

Contrast 0.348

Brightness 0.722

Red Balance 0.500

Green Balance 0.500

Blue Balance 0.500

Levels Correction

Crop

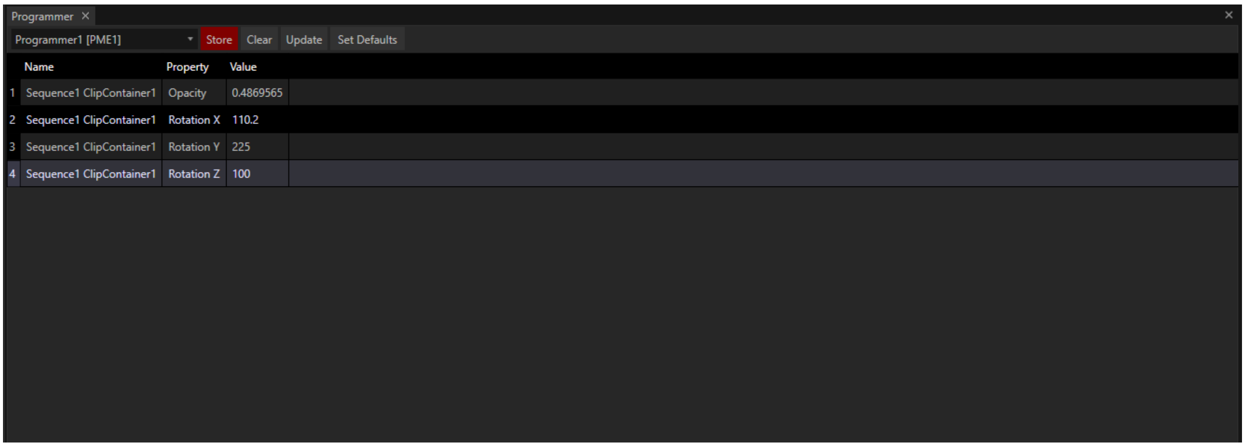
Inspector with active Programmer Values and Properties

- You can create multiple Programmers - For example, one for preview, one for live, one for another user in a multi-client session.

4.10.9 Programmer

- The Programmer is a **temporary buffer that caches your value changes**. VERTEX **holds** these changes **until you save or clear them.**
- VERTEX has to be set to Programmer Mode manually.
- You are able to **use multiple Programmers** in your project.

Workflow



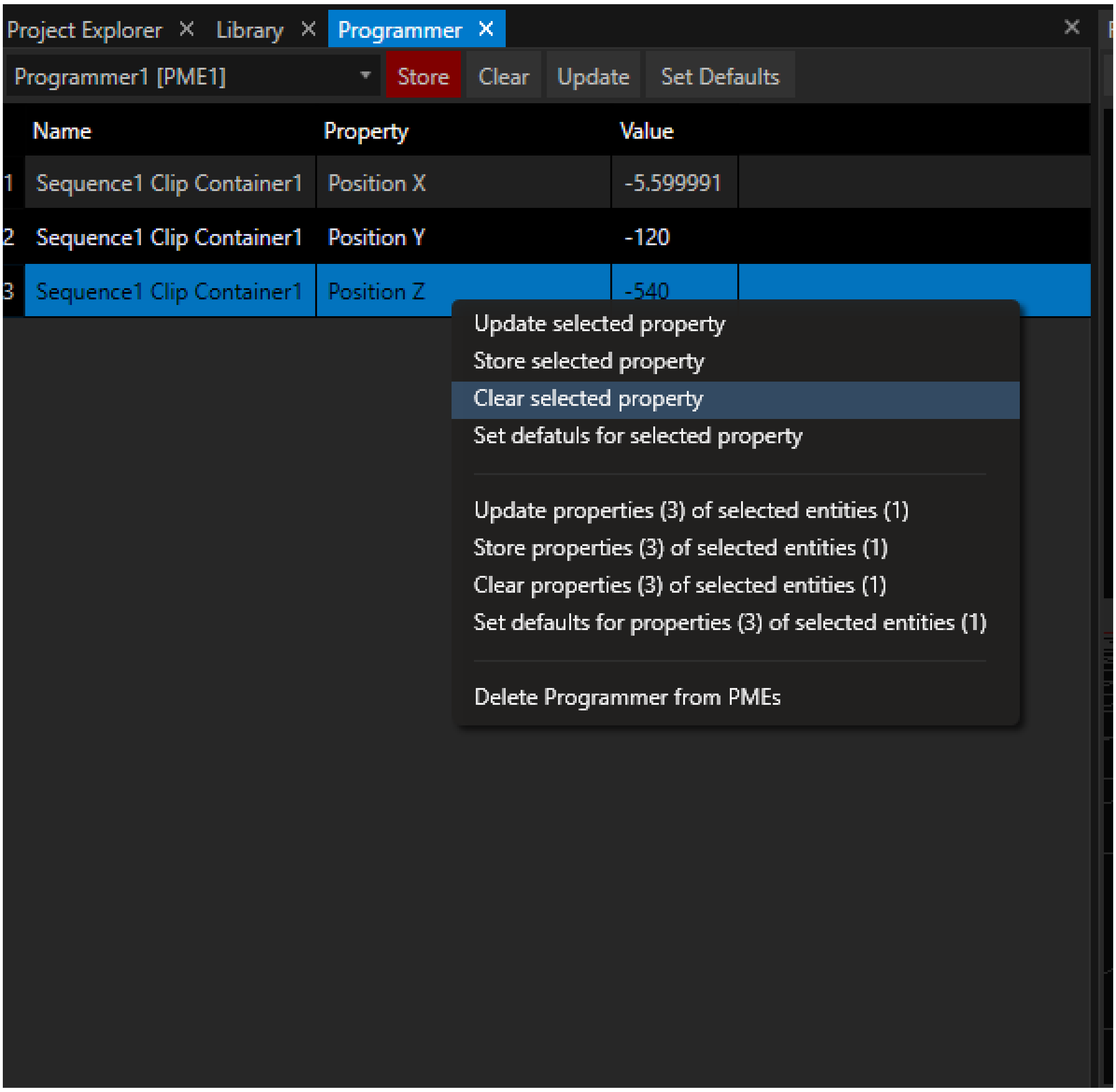
	Name	Property	Value
1	Sequence1 ClipContainer1	Opacity	0.4869565
2	Sequence1 ClipContainer1	Rotation X	110.2
3	Sequence1 ClipContainer1	Rotation Y	225
4	Sequence1 ClipContainer1	Rotation Z	100

- Property changes for Clip Containers and items **are eventually saved as keyframes** in the project **only after you click to the save button in the Programmer window.**
- You can **work on a whole scene**, make changes and only **store the final result**. People from the world of lighting consoles should be familiar with this workflow.
- All properties and values that are currently affected by a Programmer list, are underlined red in the Inspector.

Switch from Value to Programmer Mode first

VERTEX is set to **Value Mode** by default. Go to **Status Bar**: **bottom-right drop down** to switch between the modes.

Clear or Delete Values

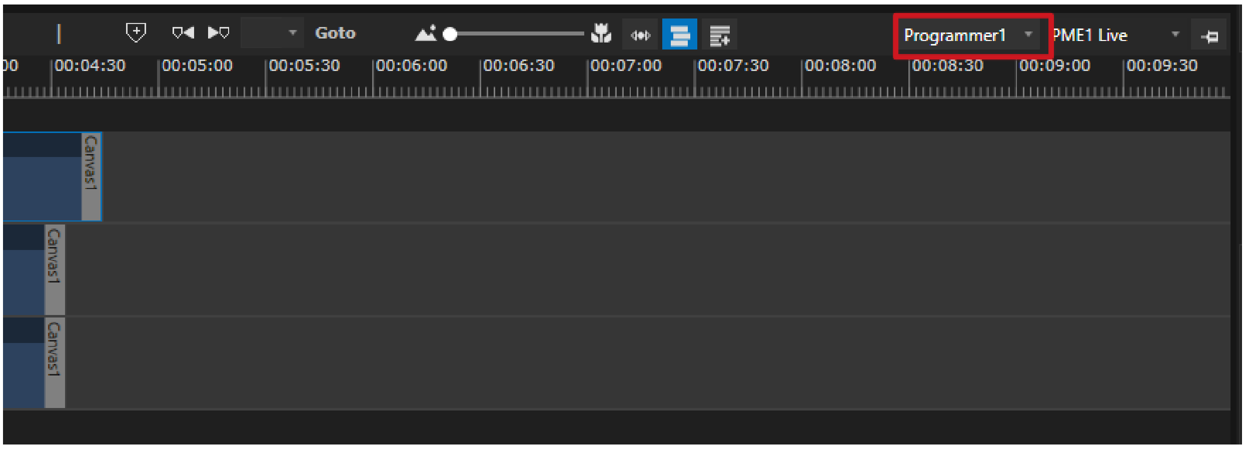

Project Explorer ✕
Library ✕
Programmer ✕
Programmer1 [PME1]
Store
Clear
Update
Set Defaults
Update selected property
Store selected property
Clear selected property
Set defatuls for selected property
Update properties (3) of selected entities (1)
Store properties (3) of selected entities (1)
Clear properties (3) of selected entities (1)
Set defaults for properties (3) of selected entities (1)
Delete Programmer from PMEs

	Name	Property	Value
1	Sequence1 Clip Container1	Position X	-5.599991
2	Sequence1 Clip Container1	Position Y	-120
3	Sequence1 Clip Container1	Position Z	-540

- You can **clear, revert or just update** single parameters and values in your scene.
- Just select a listed entry and **open the context menu** with a right-click.

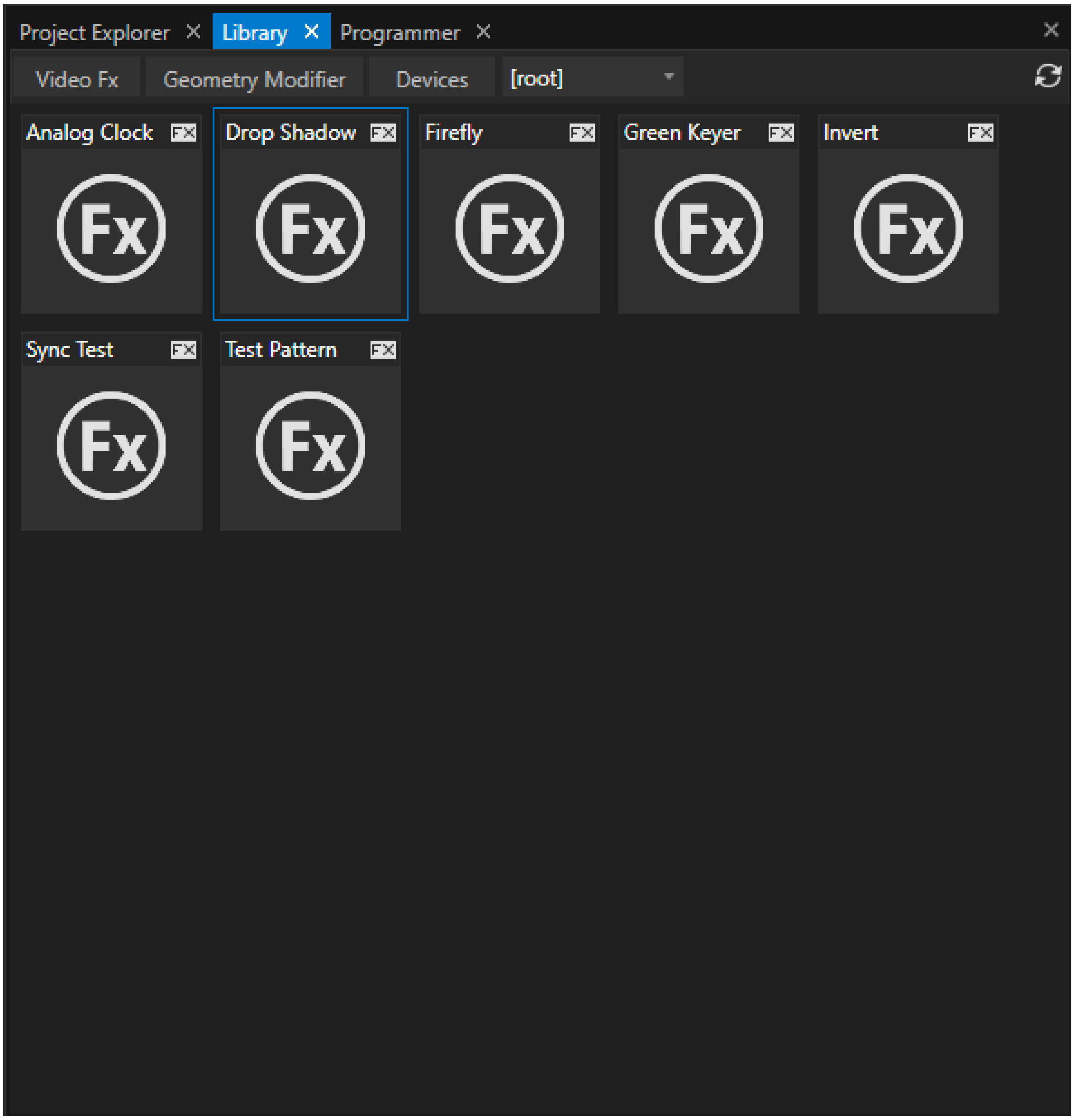
Select a Programmer to work with

- Create **multiple Programmers:** every editing window can be set to a Programmer of your choice.



4.10.10 Library

- The Library Editor gives you access to **Video FX**, **Geometry Modifiers** and **Devices**
- The Library types are **sorted by tabs**
- **Depending on** the Library elements **type** , **different user actions** are possible.



Geometry Modifier

- could be assigned to Clip Containers or Surfaces

Add Geometry Modifiers to an object :

- drag it on a selected surfaces or Content directly into the Render Editor
- drag it in the Playback Editor on a Clip Container

Devices

- could be added as project elements to the project

Add Devices to the project:

- with help of the context menu (right-click with your mouse on the device)
- by drag the device from the Library into another project Explorer window
- by drag the device from the Library as Clip Container to the Playback Editor

> **Directory and Folder for Devices**
> You are able to write your own device templates and add them to the VERTEX library.
> You have to save your custom devices with the file extension .vxdi
> Devices that come with VERTEX are encrypted in .vxdx format
>
> **Directory and Folder:**
> C:\Users\Public\Documents\ioversal\Vertex\[Vertex Assembly Version]\Devices
>
> You are allowed to create own subfolders or copy your device into an already existing subfolder

Video FX

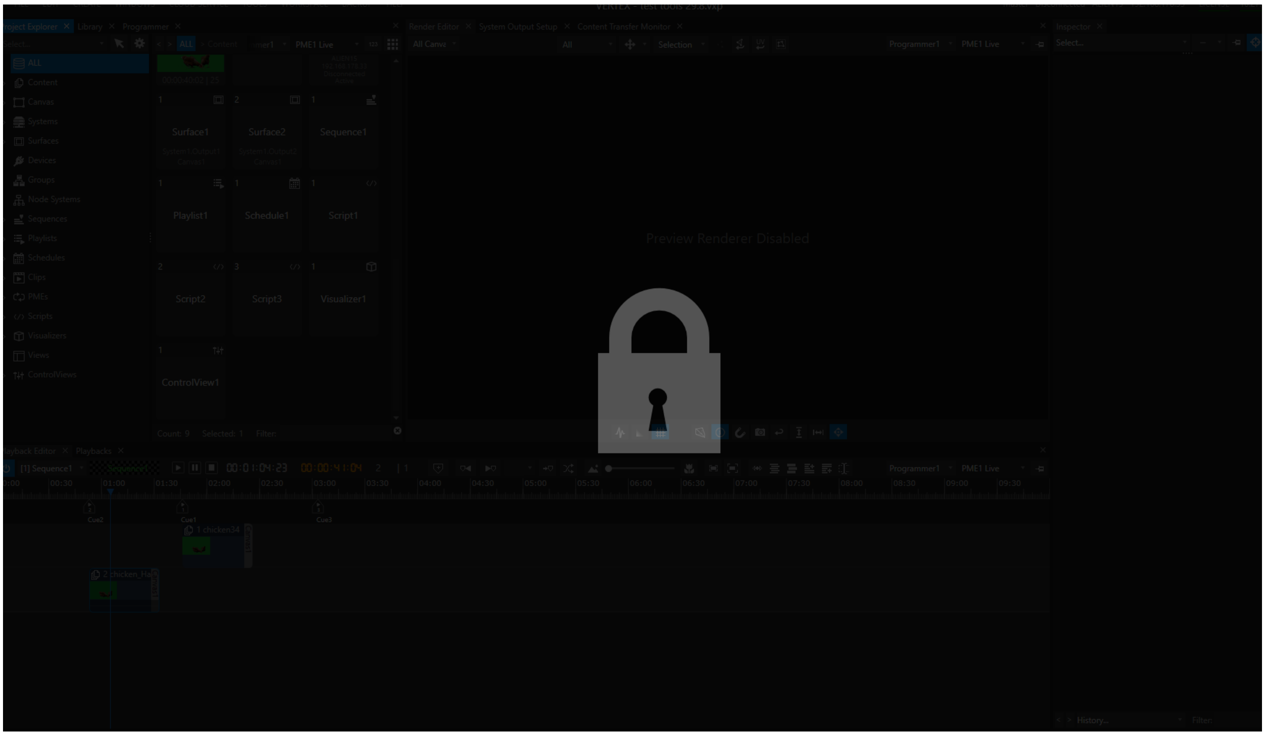
- Need a video texture as base - could be added to a clip container with a texture (3d, video, still, text)

Add Video FX

- drag the FX Shader from Library Editor to a Clip Container in the Playback Editor

4.10.11 Lock Screen

To prevent unintentional changes in your project - for instance by accidentally touching mouse or keyboard - you can lock the screen of your user interface.
To do so press the key shortcut CTRL+DELETE. A lock will appear on your screen prohibiting you from interfering with VERTEX until you unlock by pressing CTRL+DELETE again.

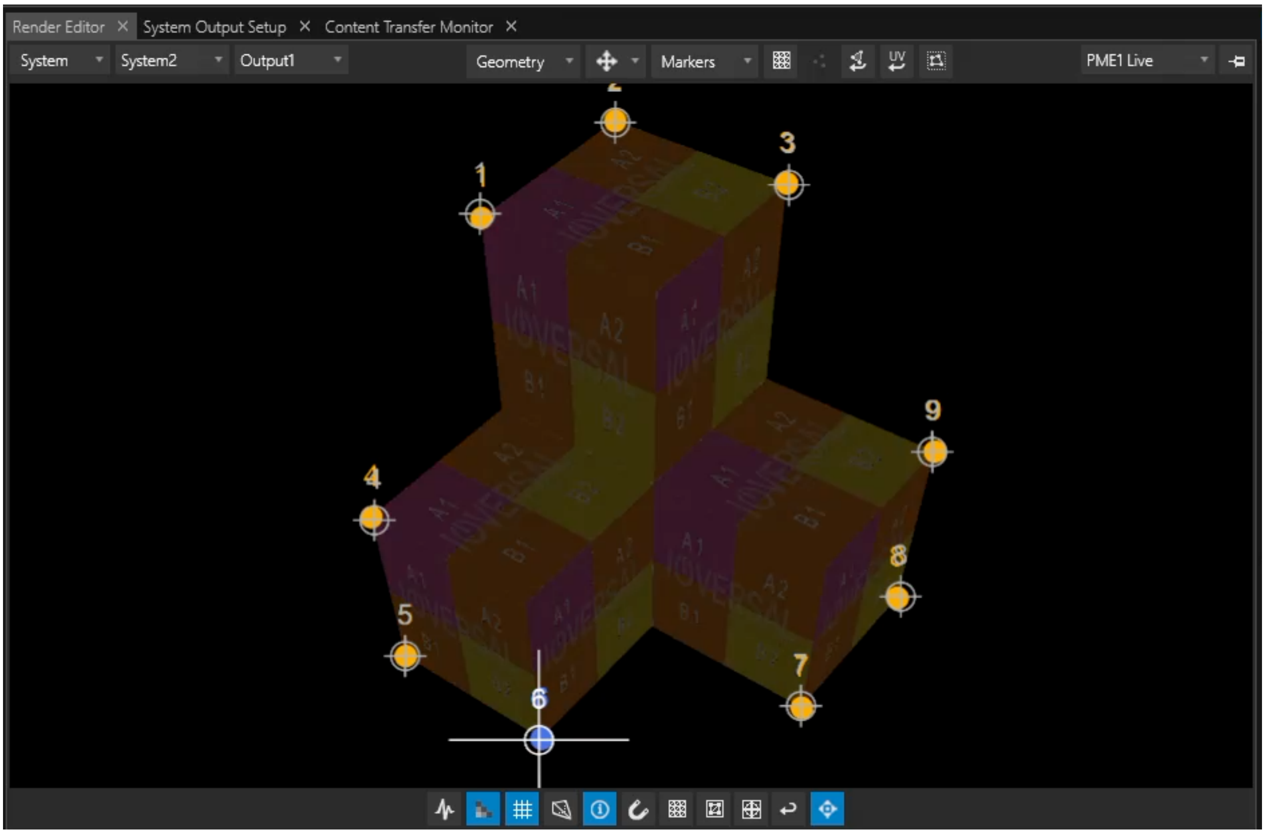

Project Explorer
Library
Programmer
Render Editor
System Output Setup
Content Transfer Monitor
Inspector
ALL
Content
Canvas
Systems
Surfaces
Devices
Groups
Node Systems
Sequences
Playlists
Schedules
Clips
PMEs
Scripts
Visualizers
Views
ControlViews
PME1 Live
Surface1
Surface2
Sequence1
Playlist1
Schedule1
Script1
Script2
Script3
Visualizer1
ControlView1
Count: 9
Selected: 1
Filter:
Preview Renderer Disabled
Playback Editor
Playbacks
[1] Sequence1
00:01:04:23
00:00:41:04
Programmer1
Cue2
Cue1
Cue3
1 chicken34
History...

Advanced Features

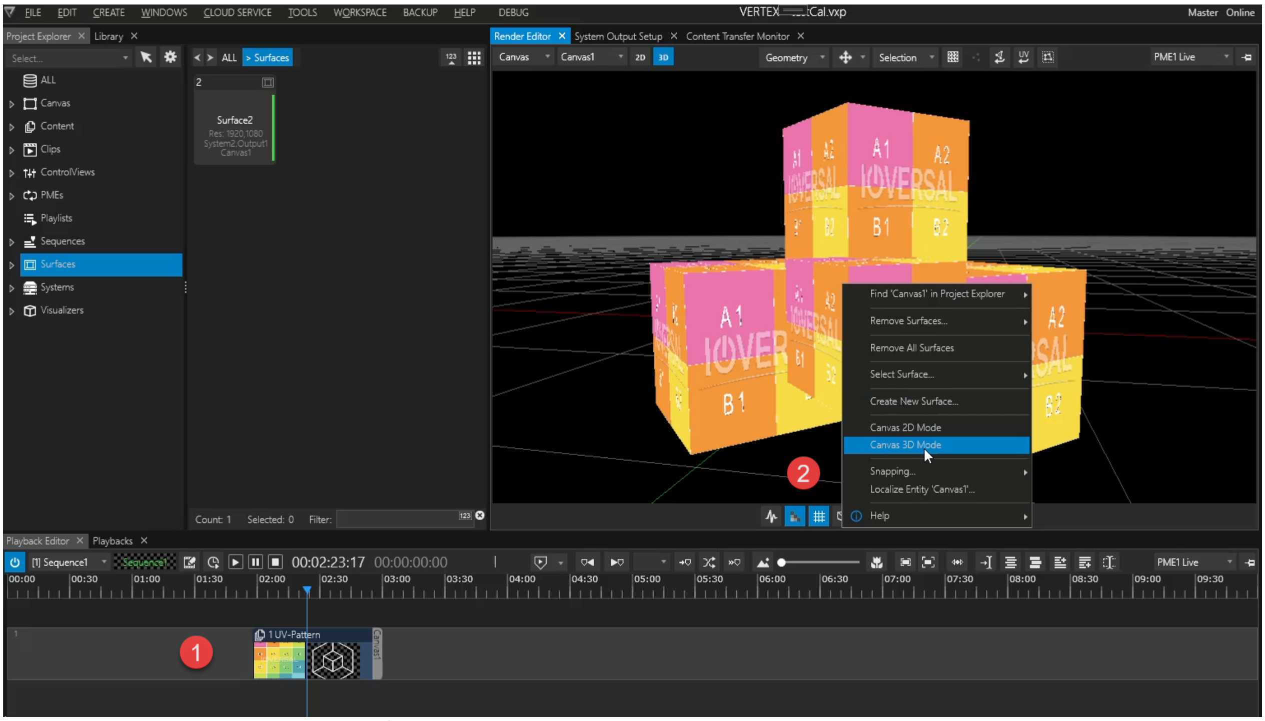
5 Advanced Features

5.1 3D Marker Calibration

- Calibrate projected textures on 3D objects with the help of Calibration Markers
- Add Calibration Markers on Surface level
- Compensate lens distortion by warping with geometry modifiers

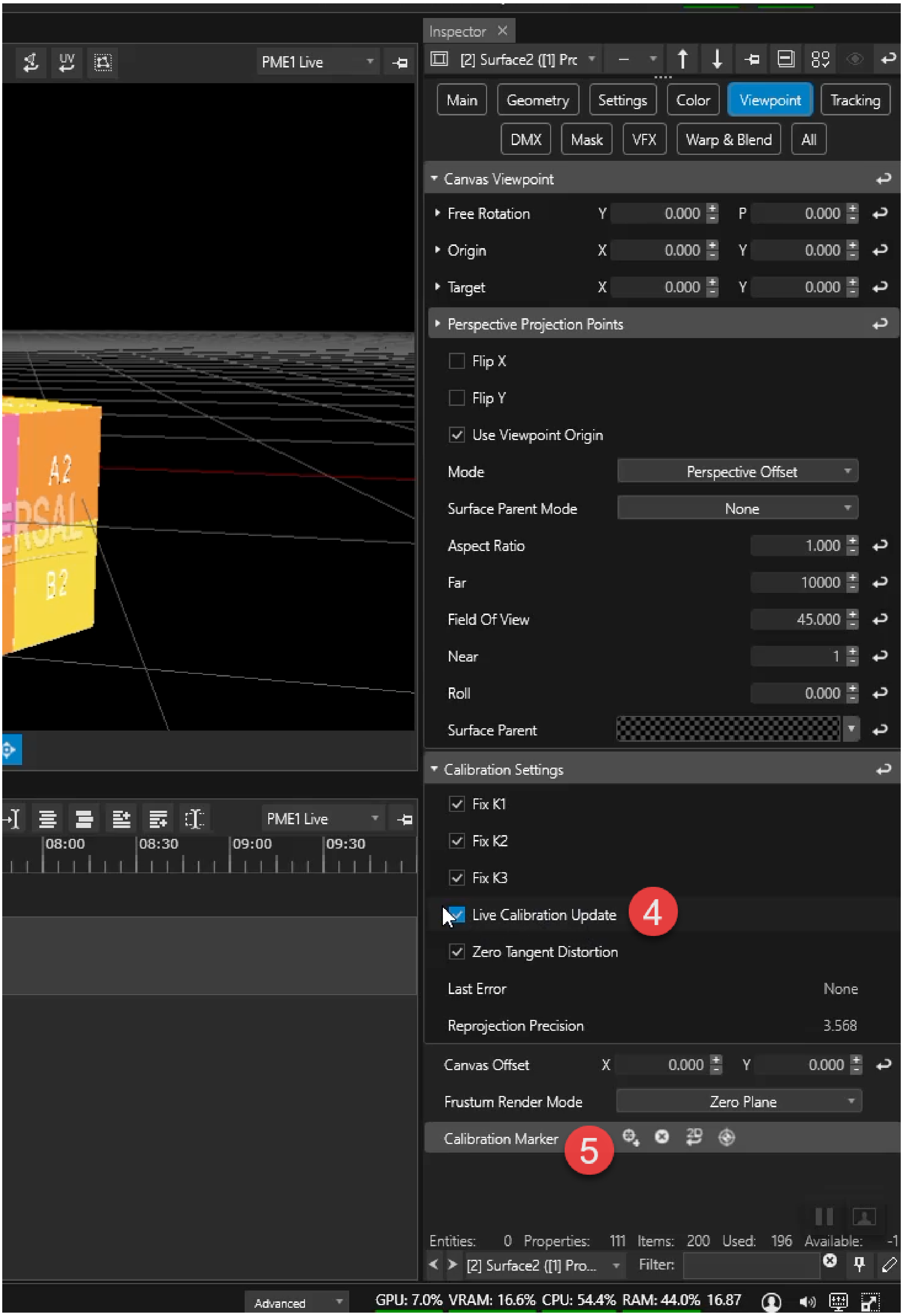


Workflow



1. Add a 3D object to your project & add it to your Playback Provider - in this example we've added a UV-Pattern to the geometry as well.
2. Go to Render Editor in Canvas Mode & ***Switch To 3D*** via Render Editor context menu.

3. Disable Canvas Outline in Canvas Inspector. (optional)



Canvas Viewpoint

Free Rotation Y 0.000 P 0.000

Origin X 0.000 Y 0.000

Target X 0.000 Y 0.000

Perspective Projection Points

□ Flip X

□ Flip Y

☑ Use Viewpoint Origin

Mode: Perspective Offset

Surface Parent Mode: None

Aspect Ratio 1.000

Far 10000

Field Of View 45.000

Near 1

Roll 0.000

Surface Parent

Calibration Settings

☑ Fix K1

☑ Fix K2

☑ Fix K3

☑ Live Calibration Update

☑ Zero Tangent Distortion

Last Error None

Reprojection Precision 3.568

Canvas Offset X 0.000 Y 0.000

Frustum Render Mode: Zero Plane

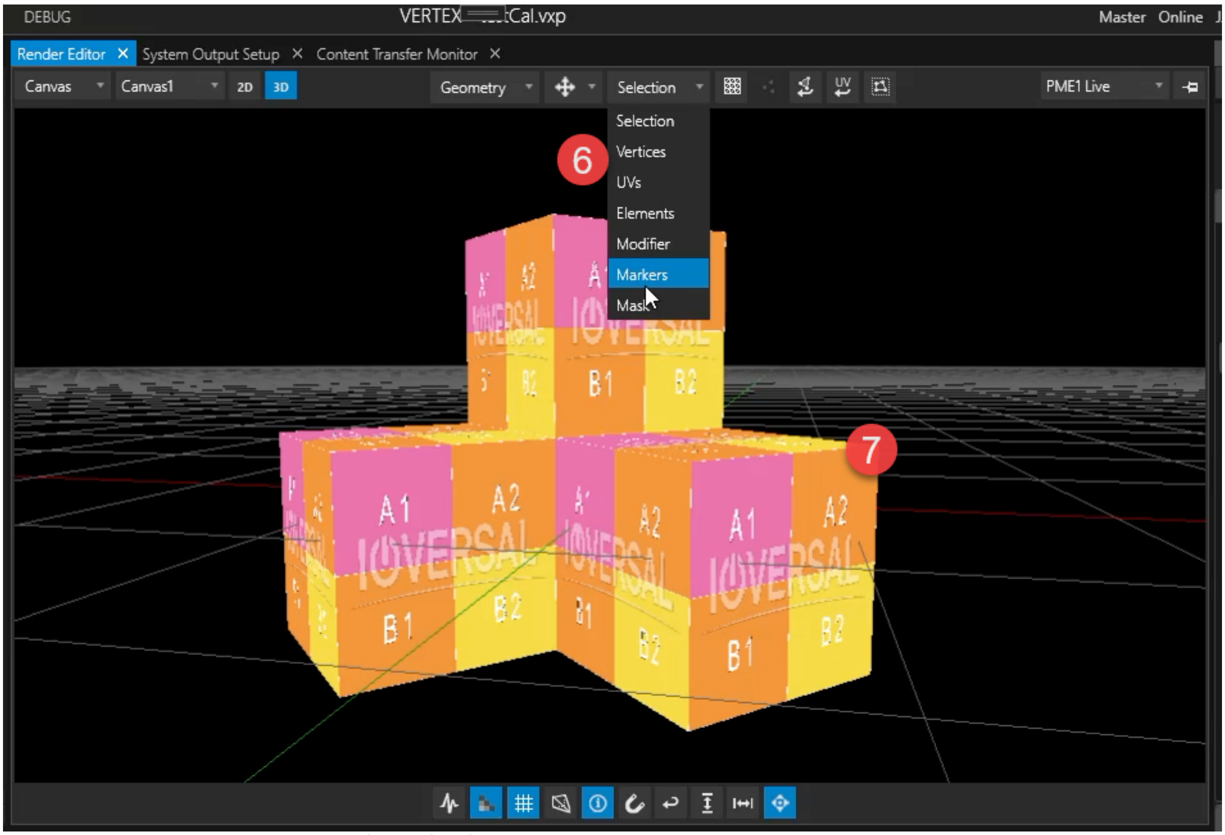
Calibration Marker

Entities: 0 Properties: 111 Items: 200 Used: 196 Available: -1

[2] Surface2 ([1] Pro... Filter:

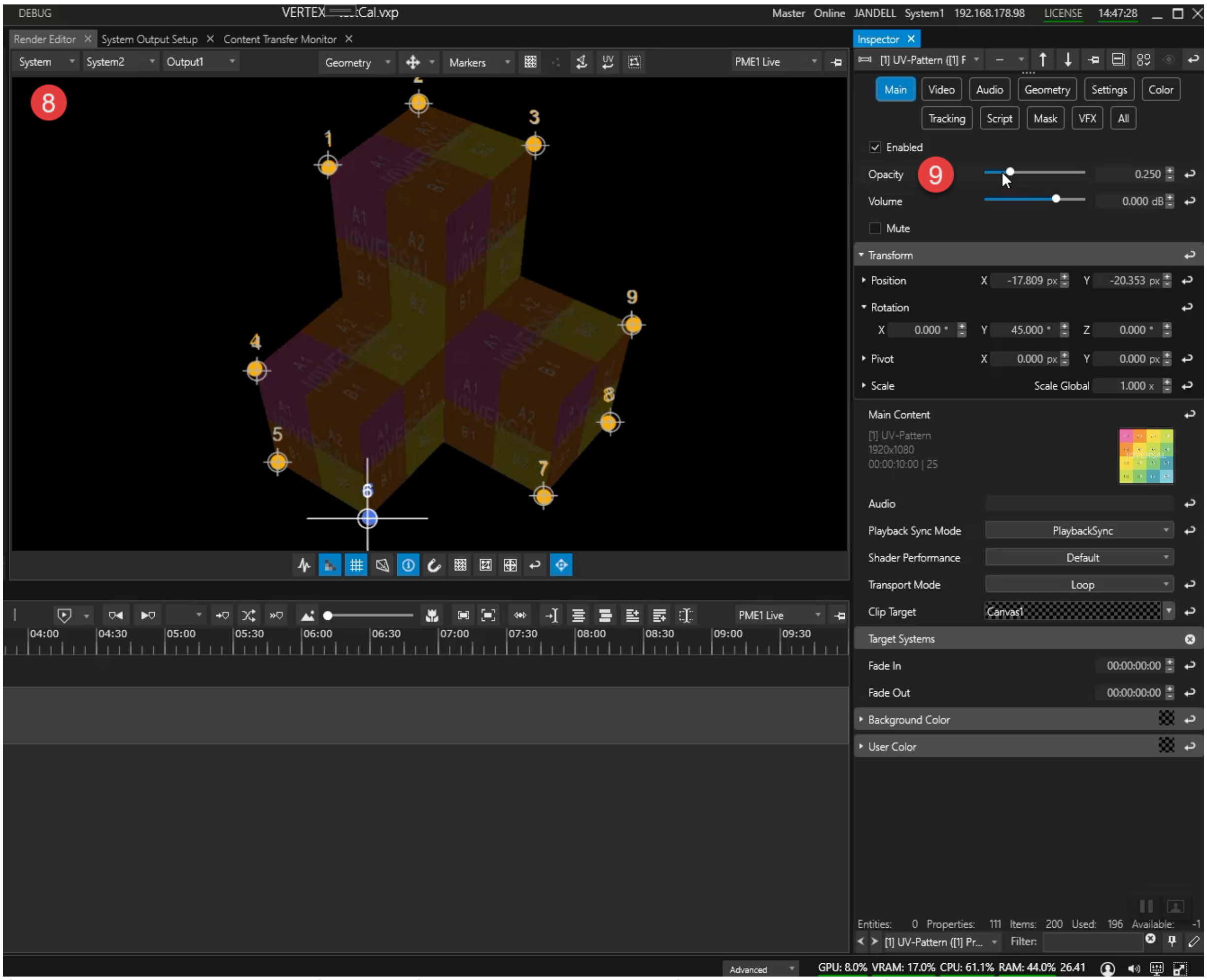
GPU: 7.0% VRAM: 16.6% CPU: 54.4% RAM: 44.0% 16.87

4. Inspect the Surface connected to your projector output and go to VIEWPOINT tab > Calibration Settings. Disable Live Calibration Update for now.
5. Go to the > *Calibration Markers* section and click "*Add*" to add Markers.



6. In the Render Editor switch EDIT SELECTION to *Markers.*
7. Select the Calibration Markers in Render Editor and position them onto your object's corners with CTRL-Click, one by one; markers will snap to the next vertex of your object.

A minimum of 6 non coplanar points is required, i.e. 6 markers with different levels of depth or distances.



☑ Enabled
Opacity 0.250
Volume 0.000 dB
□ Mute
Transform
Position X -17.809 px Y -20.353 px
Rotation X 0.000 ° Y 45.000 ° Z 0.000 °
Pivot X 0.000 px Y 0.000 px
Scale Scale Global 1.000 x
Main Content [1] UV-Pattern 1920x1080 00:00:10:00 | 25
Audio
Playback Sync Mode PlaybackSync
Shader Performance Default
Transport Mode Loop
Clip Target Canvas1
Target Systems
Fade In 00:00:00:00
Fade Out 00:00:00:00
Background Color
User Color
Entities: 0 Properties: 111 Items: 200 Used: 196 Available: -1
[1] UV-Pattern ([1] Pr... Filter:
GPU: 8.0% VRAM: 17.0% CPU: 61.1% RAM: 44.0% 26.41

8. Switch your Render Editor to Systems Output View to align the Calibration Markers from the 2D projection space with the real world projection.
9. For better visibility of your markers, reduce the clip's opacity. **Calibration Markers can be fine-tuned with pixel accuracy using your arrow keys.**
10. Check your level of accuracy with the help of *Reprojection Precision* property (found under Viewpoint > Calibration Settings)

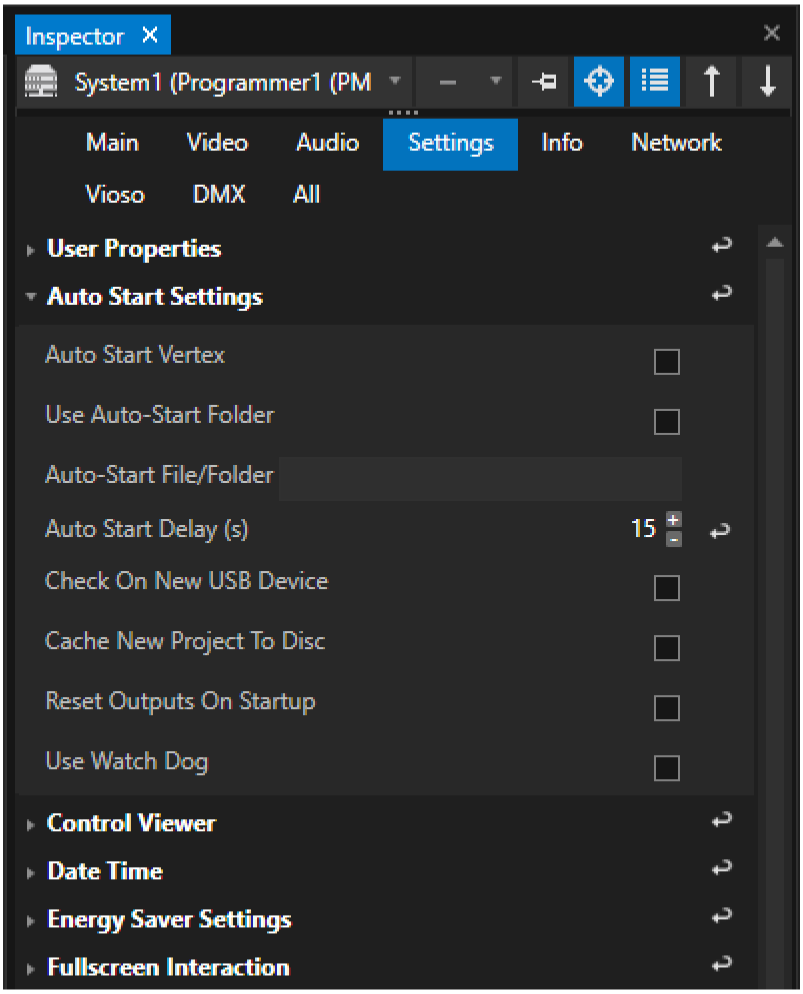
Tips for use of projectors with wide-angle lenses

lens distortion may occur and can be compensated with with the help of Geometry Modifiers. Add an FFD from the library using VERTEX'S warping workflow.

5.2 Autostart

- VERTEX offers an easy way to **autostart the application in Windows .**
- Select a System and go to **advanced settings in the Inspector** to **pick your Auto Start Settings** in order to automatically start just the application, load a project from a watch folder or load a certain project file.

Auto Start Settings and Options



Auto Start Vertex □

Use Auto-Start Folder □

Auto-Start File/Folder

Auto Start Delay (s) 15

Check On New USB Device □

Cache New Project To Disc □

Reset Outputs On Startup □

Use Watch Dog □

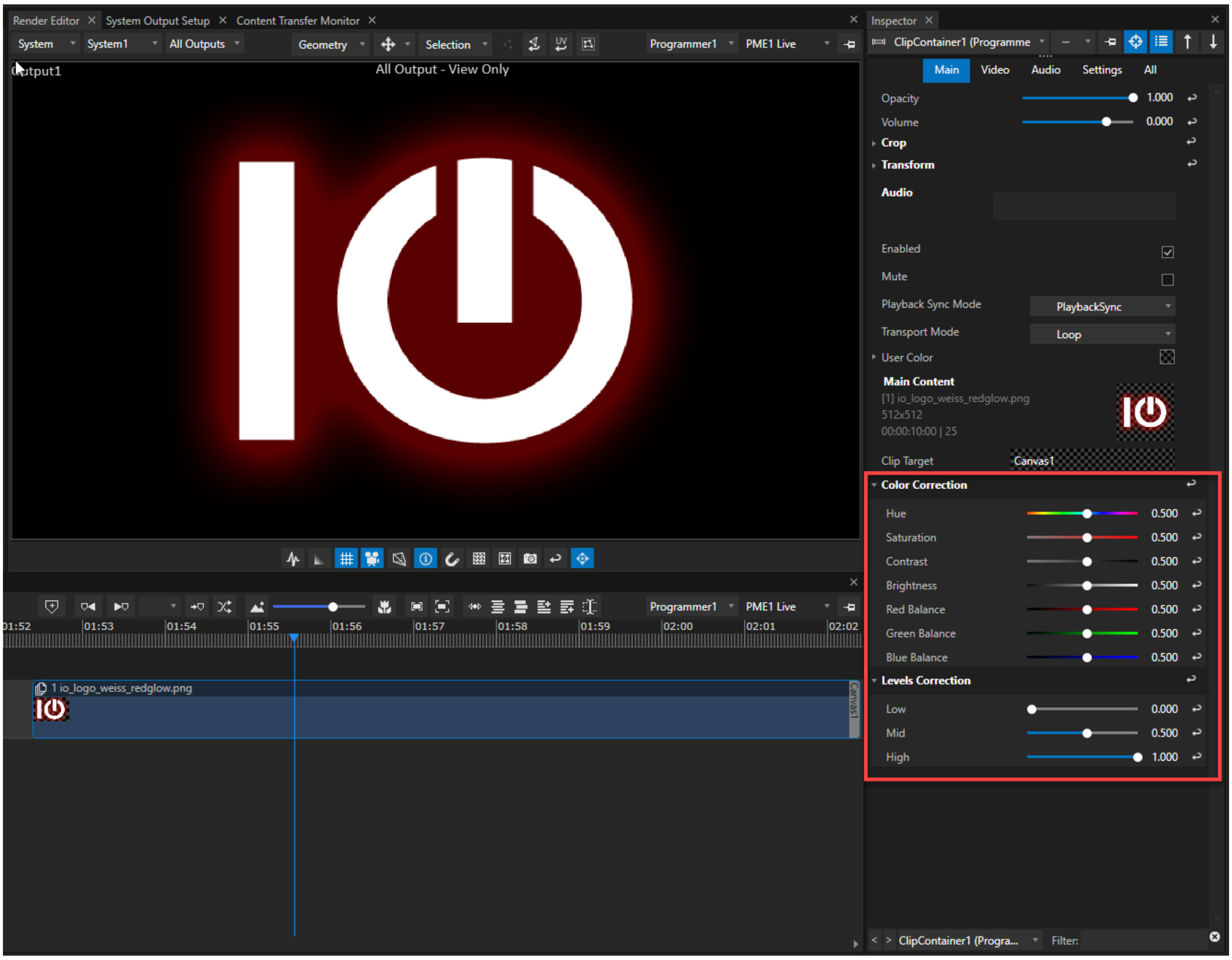
Auto Start VERTEX	**Default: Disabled**

	When enabled, VERTEX will automatically start after Windows startup. Use this setting without any specified file or folder in instances where session members are being connected to a master after Windows startup. Specify a folder or project for standalone systems or for a master system (see below).
Use Auto Start Folder	If enabled, VERTEX will look for .vxp project files in the selected folder after auto start.
Auto Start File/Folder	**There are 3 options to specify VERTEX behavior and project loading during auto start:** 1) Set a folder: VERTEX will look for a project file in that folder and will load the first project file. This is like a watch folder where VERTEX will always look for a project file. 2) Set a path to a specific VERTEX Project File: VERTEX will load the specified .vxp project file. This usage is for master systems starting always with a specific show. 3) Set a path to a specific hard drive - for instance: "E://" VERTEX will search this external drive for a VERTEX project file to load. For this, please also enable " Check on new USB device".
Auto Start Delay (s)	Sets the time delay between Windows startup and VERTEX's auto start. Default time is set to 15 seconds.
Check on New USB Device	Enable if VERTEX should check for a new external USB devices on auto start to load an existing project from. Please specify the external drives path in the Auto Start File/Folder field.
Cache New Project to Disc	Enable to cache a project from an external drive to disk. Use to prevent your installation or show from being disrupted by someone accidentally un-plugging the external USB drive. Recommended setting when loading projects from external drives.
Reset Outputs On Startup	If enabled, all outputs and surfaces will be reset to match the current desktop output configuration of your system. Recommended if you run a project on different hardware scenarios.

Use Watch Dog	If enabled, VERTEX process is monitored and automatically restarted if not responding.

5.3 Color Correction

- Color correction and color grading are important and powerful tools in post-production video editing and image editing software.
- VERTEX offers those tools for your live production.
- Color correction can be applied to correct underexposure or balance different clip containers in order to avoid color clashes between different clips.



Opacity 1.000
Volume 0.000
Crop
Transform
Audio
Enabled ☑
Mute □
Playback Sync Mode PlaybackSync
Transport Mode Loop
User Color
Main Content
[1] io_logo_weiss_redglow.png
512x512
00:00:10:00 | 25
Clip Target Canvas1

Color Correction
Hue 0.500
Saturation 0.500
Contrast 0.500
Brightness 0.500
Red Balance 0.500
Green Balance 0.500
Blue Balance 0.500

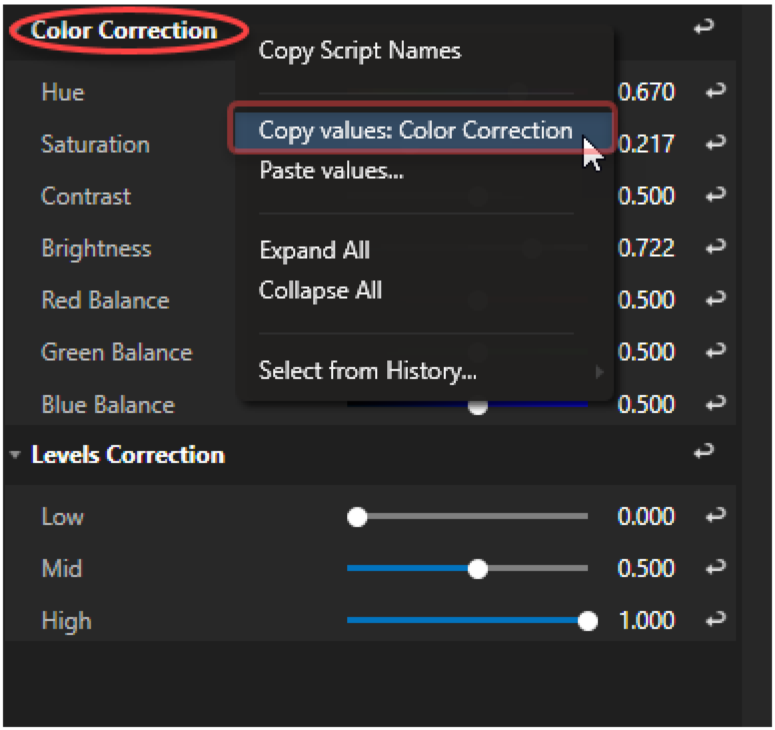
Levels Correction
Low 0.000
Mid 0.500
High 1.000

Color correction can be done from the inspector of a clip container:

- **Select a clip container** in your sequence.
- **Go to** the settings for *Color Correction* in **the inspector** at the bottom of the main tab. This can be useful to fix issues with color saturation or skin tones.
- Underneath you'll find the settings for *Level Corrections* to for example adjust white balance or fix underexposure.

Copy and paste correction values with the help of the right-click context menu:

- Open the context menu with a right-click on the parent setting *Color Correction* **to copy all** values.
- Right-click on a single setting (i.e. *Saturation*) to copy just this setting's value.



copying entire sets of color correction values can be a real time saver working on multiple clip containers

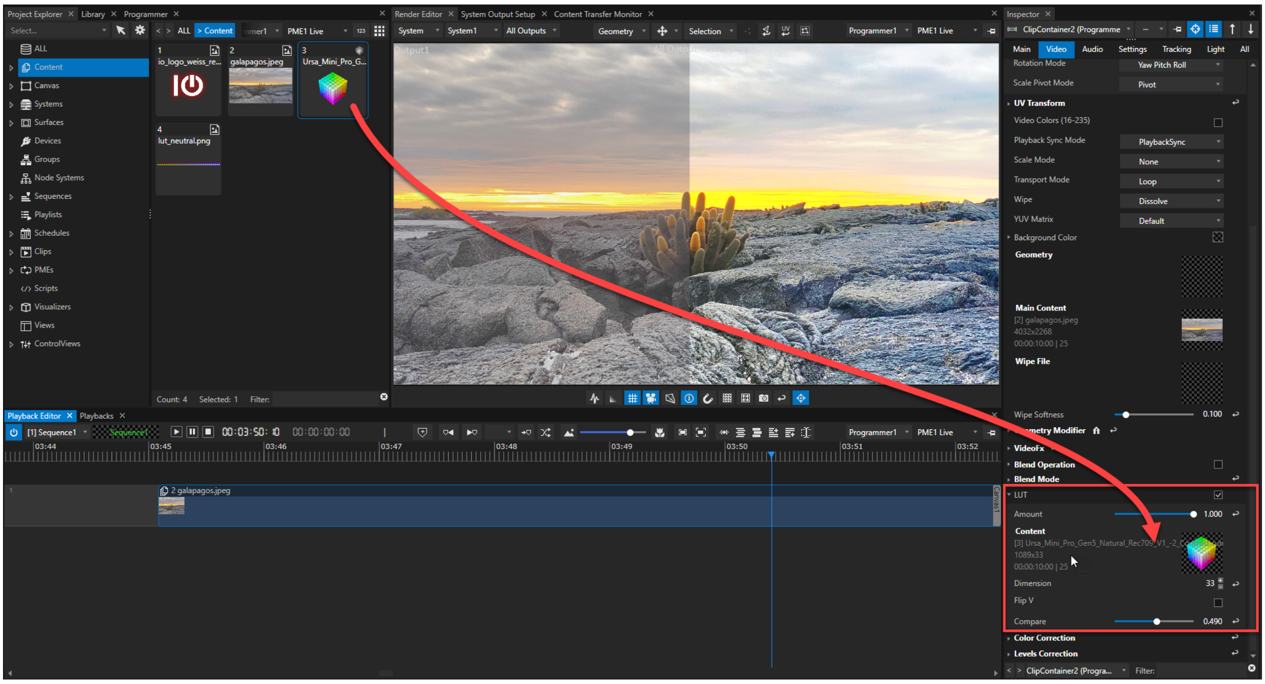
5.4 Color Grading

- Whereas color correction fixes issues in your source material, color grading would be the next step in giving your project a unified look in a certain style.
- If you choose to add color grading to your project, it generally should be applied after color correction.
- Color grading can also be applied from the Video FX Library.

Color Grading with LUTs

- **LUT** stands for *Look-Up Table* - **a table of numerical values that transforms an image's contrast and color**. LUTs are commonly used by filmmakers and video editors to efficiently control the aesthetic or look of their footage.
- **Color grading with LUTs** can be **applied to individual clip containers** as well as to **entire surfaces** at the output end of your rendering pipeline.
- VERTEX supports 3D LUTs in the file format .cube and custom horizontal PNG strips.

How to apply a LUT to a clip container:

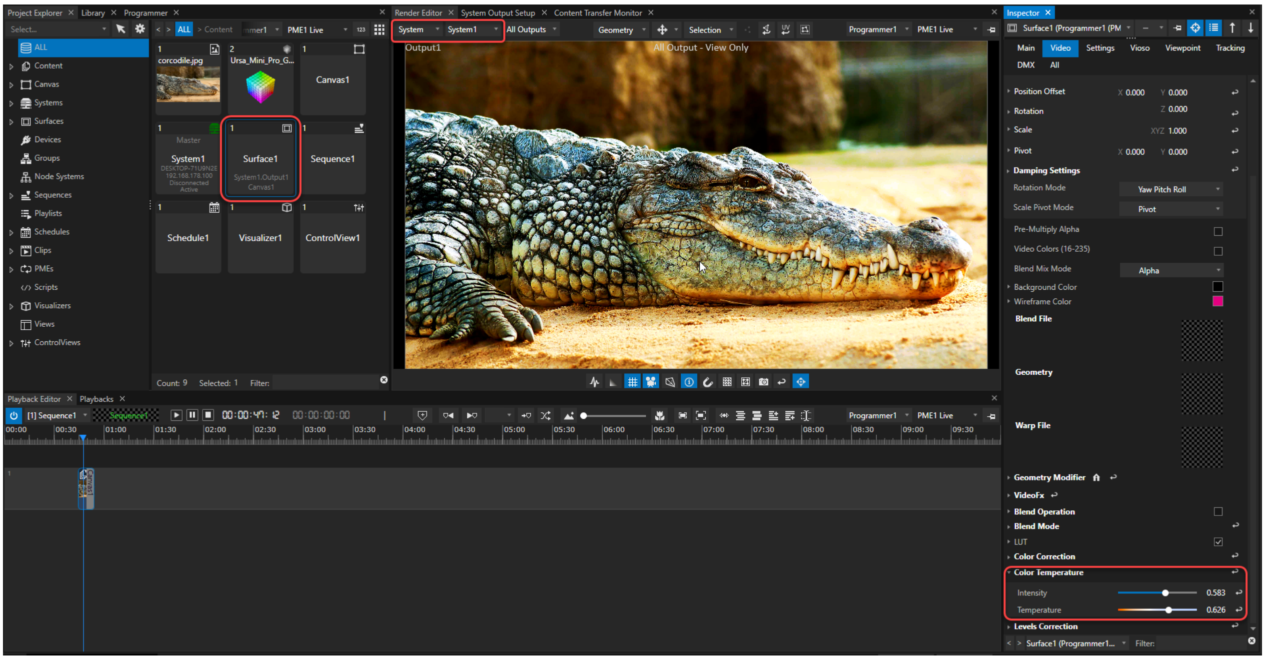


Rotation Mode: Yaw Pitch Roll
Scale Pivot Mode: Pivot
UV Transform
Video Colors (16-235) □
Playback Sync Mode: PlaybackSync
Scale Mode: None
Transport Mode: Loop
Wipe: Dissolve
YUV Matrix: Default
Background Color
Geometry
Main Content: [2] galapagos.jpeg, 4032x2268, 00:00:10:00 | 25
Wipe File
Wipe Softness: 0.100
Geometry Modifier
VideoFx
Blend Operation □
Blend Mode
LUT ☑
Amount: 1.000
Content: [3] Ursa_Mini_Pro_Gen5_Natural_Rec709_V1_-2_C..., 1089x33, 00:00:10:00 | 25
Dimension: 33
Flip V □
Compare: 0.490
Color Correction
Levels Correction

- **Import the LUT** into the content folder of your project explorer (right-click context menu, or *MAIN MENU -> FILE -> File...* or press *CTRL+I).*
- **Select the clip container** you want to apply the LUT to and go to the *Video* tab **in the inspector**.
- **Drag the LUT** from the project explorer **into the inspector** and drop it into the **field labeled *Content*** in the LUT settings.
- If the colors show abnormal results try flipping the LUT vertically (*Flip V* setting).
- Control the blend between the original and the graded colors with the *Amount* fader.
- Use the *Compare* fader to split the image into original and graded to compare your results.
- Alternatively, use the LUT enable check box.
- The *Dimensions* setting allows for values up to 128 when adding a horizontal PNG strip instead of a .cube file.

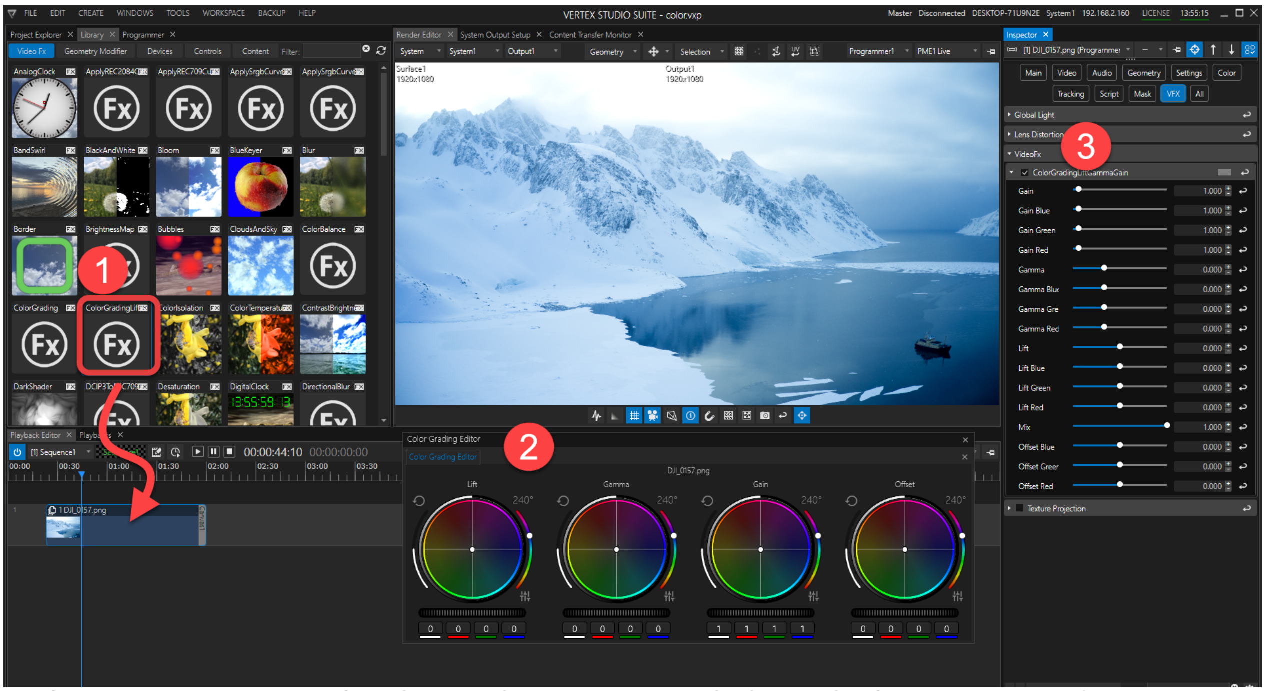
Color Grading On Surface Level

- On the top level of VERTEX's rendering engine you can change the color parameters for the entire surface/ output.
- First, **change the view mode in your render editor** from *Canvas* **to *System***, *DMX Mapping* or *Surface Map* ; the render editor won't show you any results in *Canvas View* if your color editing took place on the surface level.
- **Select a surface** in your project explorer and **go to** the ***Video* tab in the inspector**.
- Here you can either do color corrections or apply LUTs for the entire surface as described previously.
- Furthermore you can **pick a color temperature** and adjust its intensity for the surface/output.



Position Offset X 0.000 Y 0.000
Rotation Z 0.000
Scale XYZ 1.000
Pivot X 0.000 Y 0.000
Damping Settings
Rotation Mode: Yaw Pitch Roll
Scale Pivot Mode: Pivot
Pre-Multiply Alpha □
Video Colors (16-235) □
Blend Mix Mode: Alpha
Blend Operation □
LUT ☑
Intensity 0.583
Temperature 0.626

Color Grading Editor



ColorGradingLiftGammaGain

Gain	1.000
Gain Blue	1.000
Gain Green	1.000
Gain Red	1.000
Gamma	0.000
Gamma Blue	0.000
Gamma Gre	0.000
Gamma Red	0.000
Lift	0.000
Lift Blue	0.000
Lift Green	0.000
Lift Red	0.000
Mix	1.000
Offset Blue	0.000
Offset Greer	0.000
Offset Red	0.000

1. Go to Library > Video FX > ColorGradingLift and assign it to a Surface or ClipContainer per drag & drop.
2. Go to Main Menu > Windows > Tools > Color Grading Editor to open the floating & dockable editor tab. Once the editor tab is opened, select the Clip Container or Surface in order to activate it in the editor.
3. Color grading settings adjusted in the editor can also be accessed in the inspector.

5.5 Console Layer

- Controlling Vertex from a DMX console with Console Layers allows users to **control video as if it were a lighting fixture**
- A Console Layer is **independent from a Sequence or a Playlist**. It is only assigned to a Canvas.
- **192 DMX channels per Console Layer** offer a wide range of control for video playback and fine tuning VFX such as iris or shaper.
- Use **Console Layers as ClipContainers** to **temporarily overwrite global values** during your show.

Channel Map

- Each Console Layer **has 192 DMX-Channels**
- The following channel maps may be used as a reference for a lighting console library fixture.

DMX Channel Map for a Console Layer

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
1	Mix Level	opacity coarse	1	16bit	0	16bit opacity 1 mode for crossfade wipe modetexture
2		opacity fine	1			
3		opacity wipe mode	1		0	0-255 where 0 no wipe/ cross-fade
4		opacity wipe softness	2	16bit	0	
5		fine				
6		volume coarse	2	16bit	0	
7		volume fine				
8	Position	xpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel
9		xpos fine				

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
10		ypos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel
11		ypos fine				
12		zpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel
13		zpos fine				
14	Rotation	xrot coarse	2	16bit	32768	mode crossfade from absolute to continuous value
15		xrot fine				128 = no motion 255=fastForward 0= fastReverse
16		xrot XFade	2	16bit		2 abs rotation 1 mode 1 rotation speed
17		fine				
18		xrot speed	2	16bit		
19		fine				
20		yrot coarse	2	16bit	32768	
21		yrot fine				
22		yrot XFade	2	16bit		mode crossfade from absolute to continuous value

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
23		fine				128 = no motion 255=fastForward 0= fastReverse
24		yrot speed	2	16bit		2 abs rotation 1 mode 1 rotation speed
25		fine				
26		zrot coarse	2	16bit	32768	
27		zrot fine				
28		zrot Xfade	2	16bit		
29		fine				
30		zrot speed	2	16bit		
31		fine				
32	Scale	xscale	2	16bit	32768	
33		xscale fine				
34		yscale	2	16bit	32768	
35		yscale fine				
36		zscale	2	16bit	32768	
37		zscalefine				
38		OutputFit	1			0= 1to1 Pixel 10-19 Fill, 20-29 Fit, 30-39 Horizontal Fit, 40-49 Vertical Fit
39	Playback	PlayModes	1			0-7 Pause In Frame
						8-15 PlayOnce Continue On Dimmer Zero

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
						16-31 PlayLoop Continue On Dimmer Zero
						32-47 PingPong Continue On Dimmer Zero
						48-63 PlayOnce Pause On Dimmer Zero
						64-79 PlayLoop Pause On Dimmer Zero
						80-95 PingPong Pause On Dimmer Zero
						122-134 Pause On Current Frame
						136-140 PlayOnce Seek To Inpoint on Dimmer Zero
						142-148 PlayLoop Seek To Inpoint on Dimmer Zero
						150-156 PingPong Seek To Inpoint on Dimmer Zero
						157-164 PlayReverse Once

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
						Continue on Dimmer Zero
						166-173 PlayReverseLoop Continue on Dimmer Zero
						175-182 PlayReverse Once Seek To Outpoint on Dimmer Zero
						184-191 PlayReverseLoop Seek To Outpoint on Dimmer Zero
						240 Play Once Reset SeekToInpoint on Dimmer Zero
						241 Play Once Reset Reverse SeekToInpoint on Dimmer Zero
						242 Play Once Reset Continue on Dimmer Zero
						243 Play Once Reset Reverse Continue on Dimmer Zero
						244 Play Reverse Once Reset SeekToInpoi

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
						nt on Dimmer Zero
						245 Play Reverse Once Reset Forward SeekToInpoint on Dimmer Zero
						246 Play Reverse Once Reset Continue on Dimmer Zero
						247 Play Reverse Once Reset Forward Continue on Dimmer Zero
						248-255 Pause On OutFrame
40		Playback Speed	2	16bit	49152	0-32768 slowest / pause 32769-49152 slow to normal factor 0-1.0 49152 normal play factor 1 49153 to 65534 normal to fast fwd 1x-8x
41		fine				
42		In Frame	2	16bit	0	65535 frames from first frame in

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
43		fine				
44		Out Frame	2	16bit	0	65535 frames from last frame in
45		fine				
46		Gobo MixMode	1		0	Mode to determine if gobo2 is mask or how it is multiplied over gobo1, 0 BlackWhite, 1 BwInv,2 Alpha,3 AlphaInv,4 Overlay
47		Gobo MixLevel	2	16bit	0	Mix Level for Gobo Blend Mode
48		fine				
49	Gobo1	Content Folder	1		0	
50		Content File	1		0	
51		Content UV Mode	1			Texture Wrap Mode: Default, Tile, No Tile, Mirror
52		Content UV Xoffset	2	16bit	32768	Left to right
53		fine				
54		Content UV Yoffset	2	16bit	32768	bottom to top
55		fine				
56		Content UV X Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
57		fine				
58		Content UV Y Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
59		fine				
60	Gobo2	Mask Folder	1		0	
61		Mask File	1		0	
62		Mask Transform Mode	1			Relative or Absolute Mode - Link Sizing and position to Content
63		Mask UV Mode	1			Texture Wrap Mode:Default,Tile, No Tile, Mirror
64		Mask UV Xoffset	2	16bit	32768	Left to right
65		fine				
66		Mask UV Yoffset	2	16bit	32768	bottom to top
67		fine				
68		Mask UV X Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
69		fine				
70		Mask UV Y Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
71		fine				
72		Geometry Folder	1			

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
73		Geometry File	1			
74		res	1			reserved for Geometry playmode
75		res	2	16bit		reserved for Geometry playspeed
76		res fine				
77		res	2	16bit		reserved for Geometry InFrame
78		res fine				
79		res	2	16bit		reserved for Geometry OutFrame
80		res fine				
81	Iris	Iris Mode	1		255	Black Black Inv, Alpha, Alpha Inv, White, White inv
82		Iris Size	2	16bit	65535	Default 65535
83		fine				
84		Iris Softness	2	16bit	3300	Default 3300
85		fine				
86		Iris X	2	16bit	32768	Default 32768
87		fine				
88		Iris Y	2	16bit	32768	Default 32768
89		fine				
90	Shaper	Shaper Mode	1		255	Black Black Inv, Alpha, Alpha Inv, White, White inv

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
91		Shaper Softness	2	16bit	2000	Default 2000
92		fine				
93		SL	2	16bit		
94		fine				
95		SL Rot	2	16bit	32768	Default 32768
96		fine				
97		SR	2	16bit		
98		fine				
99		SR Rot	2	16bit	32768	Default 32768
100		fine				
101		ST	2	16bit		
102		fine				
103		ST Rot	2	16bit	32768	Default 32768
104		fine				
105		SB	2	16bit		
106		fine				
107		SB Rot	2	16bit	32768	Default 32768
108		fine				
109	Color Mix	Color Mix Mode	1			Normal, Add, Multiply, InverseMultiply, Highlights
110		Color Mix Level	2	16bit		
111		fine				
112		Red	2	16bit		
113		fine				
114		Green	2	16bit		

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
115		fine				
116		Blue	2	16bit		
117		fine				
118		Alpha	2	16bit		
119		fine				
120	Color Correction	Hue	2	16bit	32768	
121		fine				
122		Saturation	2	16bit	32768	
123		fine				
124		Contrast	2	16bit	32768	
125		fine				
126		Brightness	2	16bit	32768	
127		fine				
128		Red Balance	2	16bit	32768	
129		fine				
130		Green Balance	2	16bit	32768	
131		fine				
132		Blue Blanace	2	16bit	32768	
133		fine				
134		Levels Min	2	16bit	0	
135		fine				
136		Levels Value	2	16bit	32768	
137		fine				
138		Levels Max	2	16bit	65535	
139		fine				
140		BlendMode	1			reserved
141	FX1	FX1 Select	1			
142		FX1 Mix	2	16bit		
143		fine				
144		FX1 C1	2	16bit		

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
145		fine				
146		FX1 C2	2	16bit		
147		fine				
148		FX1 C3	2	16bit		
149		fine				
150		FX1 C4	2	16bit		
151		fine				
152		FX1 C5	2	16bit		
153		fine				
154	FX2	FX2 Select	1			
155		FX2 Mix	2	16bit		
156		fine				
157		FX2 C1	2	16bit		
158		fine				
159		FX2 C2	2	16bit		
160		fine				
161		FX2 C3	2	16bit		
162		fine				
163		FX2 C4	2	16bit		
164		fine				
165		FX2 C5	2	16bit		
166		fine				
167	FX3	FX3 Select	1			
168		FX3 Mix				
169		fine	2	16bit		
170		FX3 C1	2	16bit		
171		fine				
172		FX3 C2	2	16bit		
173		fine				
174		FX3 C3	2	16bit		
175		fine				

DMX Addresss	Category	Parameter Name		Type	Default Value	Notes
176		FX3 C4	2	16bit		
177		fine				
178		FX3 C5	2	16bit		
179		fine				
180	FX4	FX4 Select	1			
181		FX4 Mix	2	16bit		
182		fine				
183		FX4 C1	2	16bit		
184		fine				
185		FX4 C2	2	16bit		
186		fine				
187		FX4 C3	2	16bit		
188		fine				
189		FX4 C4	2	16bit		
190		fine				
191		FX4 C5	2	16bit		
192		fine				

ChamSys

ChamSys consoles enforce a maximum DMX channel count per library fixture. Consequently, a VERTEX Console Layer is represented as two separate ChamSys fixture profiles to comply with this limitation. Refer to the ChamSys channel map below for detailed channel allocation. When using Console Layers with ChamSys, set the DMX Mode of each Console Layer to ChamSys. This parameter can be configured in the Console Layer's Inspector panel under DMX → DMX Mode.

DMX-Channel Map for Console Layers with ChamSys Consoles

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
Fixture 1 A							
1	1	Mix Level	opacity coarse	1	16bit	0	16bit opacity 1 mode for crossfade

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
							wipe modetexture
	2		opacity fine	1			
1	3		opacity wipe mode	1		0	0-255 where 0 no wipe/Cross fade
1	4		opacity wipe softness	2	16bit	0	
	5		fine				
1	6		volume coarse	2	16bit	0	
	7		volume fine				
1	8	Position	xpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = - 16.000 pixel
	9		xpos fine				
1	10		ypos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = - 16.000 pixel
	11		ypos fine				
1	12		zpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = - 16.000 pixel
	13		zpos fine				
1	14	Rotation	xrot coarse	2	16bit	32768	mode crosse fade

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
							from absolut to continous value
	15		xrot fine				128 = no motion 255=fastForward 0= fastReverse
1	16		yrot coarse	2	16bit	32768	
	17		yrot fine				
1	18		zrot coarse	2	16bit	32768	
	19		zrot fine				
1	20	Scale	xscale	2	16bit	32768	
	21		xscale fine				
1	22		yscale	2	16bit	32768	
	23		yscale fine				
1	24		zscale	2	16bit	32768	
	25		zscalefine				
1	26		OutputFit	1			0= 1to1 Pixel 10-19 Fill, 20-29 Fit, 30-39 Horizontal Fit, 40-49 Vertical Fit
1	27	Playback	PlayModes	1			0-7 Pause In Frame
							8-15 PlayOnce Continue On Dimmer Zero
							16-31 PlayLoop Continue On Dimmer Zero

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
							32-47 PingPong Continue On Dimmer Zero
							48-63 PlayOnce Pause On Dimmer Zero
							64-79 PlayLoop Pause On Dimmer Zero
							80-95 PingPong Pause On Dimmer Zero
							122-134 Pause On Current Frame
							136-140 PlayOnce Seek To Inpoint on Dimmer Zero
							142-148 PlayLoop Seek To Inpoint on Dimmer Zero
							150-156 PingPong Seek To Inpoint on Dimmer Zero

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
							157-164 PlayReverseOnce Continue on Dimmer Zero
							166-173 PlayReverseLoop Continue on Dimmer Zero
							175-182 PlayReverseOnce Seek To Outpoint on Dimmer Zero
							184-191 PlayReverseLoop Seek To Outpoint on Dimmer Zero
							240 Play Once Reset SeekToInpoint on Dimmer Zero
							241 Play Once Reset Reverse SeekToInpoint on Dimmer Zero
							242 Play Once Reset Continue

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
							on Dimmer Zero
							243 Play Once Reset Reverse Continue on Dimmer Zero
							244 Play Reverse Once Reset SeekToInpoint on Dimmer Zero
							245 Play Reverse Once Reset Forward SeekToInpoint on Dimmer Zero
							246 Play Reverse Once Reset Continue on Dimmer Zero
							247 Play Reverse Once Reset Forward Continue on Dimmer Zero
							248-255 Pause On OutFrame
1	28		Playback Speed	2	16bit	49152	

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
	29		fine				0-32768 slowest / pause 32769-49152 slow to normal factor 0-1.0 49152 normal play factor 1 49153 to 65534 normal to fast fwd 1x-8x
1	30		In Frame	2	16bit	0	65535frames from first frame in
	31		fine				
1	32		Out Frame	2	16bit	0	65535frames from last frame in
	33		fine				
1	34		Gobo MixMode	1		0	Mode to determine if gobo2 is mask or how it is multiplied over gobo1, 0 BlackWhite, 1 BwInv,2 Alpha,3 AlphaInv,4 Overlay
1	35		Gobo MixLevel	2	16bit	0	Mix Level for Gobo Blend Mode
	36		fine				

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	37	Gobo1	Content Folder	1		0	
1	38		Content File	1		0	
1	39		Content UV Mode	1			Texture Wrap Mode: Default, Tile, No Tile, Mirror
1	40		Content UV Xoffset	2	16bit	32768	Left to right
	41		fine				
1	42		Content UV Yoffset	2	16bit	32768	bottom to top
	43		fine				
1	44		Content UV X Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
	45		fine				
1	46		Content UV Y Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
	47		fine				
1	48	Gobo2	Mask Folder	1		0	
1	49		Mask File	1		0	
1	50		Mask Transform Mode	1			Relative or Absolute Mode - Link Sizing and position to Content

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	51		Mask UV Mode	1			Texture Wrap Mode:Default,Tile, No Tile, Mirror
1	52		Mask UV Xoffset	2	16bit	32768	Left to right
	53		fine				
1	54		Mask UV Yoffset	2	16bit	32768	bottom to top
	55		fine				
1	56		Mask UV X Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
	57		fine				
1	58		Mask UV Y Scale	2	16bit	32768	32768 =0 0 = maxTiling 65535 maxScaling
	59		fine				
1	60		Geometry Folder	1			
1	61		Geometry File	1			
1	62	Iris	Iris Mode	1			Black Black Inv, Alpha, Alpha Inv, White, White inv
1	63		Iris Size	2	16bit	65535	Default 65535
	64		fine				
1	65		Iris Softness	2	16bit	3300	Default 3300
	66		fine				

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	67		Iris X	2	16bit	32768	Default 32768
	68		fine				
1	69		Iris Y	2	16bit	32768	Default 32768
	70		fine				
1	71	Shaper	Shaper Mode	1			Black Black Inv, Alpha, Alpha Inv, White, White inv
1	72		Shaper Softness	2	16bit	2000	Default 2000
	73		fine				
1	74		SL	2	16bit		
	75		fine				
1	76		SL Rot	2	16bit	32768	Default 32768
	77		fine				
1	78		SR	2	16bit		
	79		fine				
1	80		SR Rot	2	16bit	32768	Default 32768
	81		fine				
1	82		ST	2	16bit		
	83		fine				
1	84		ST Rot	2	16bit	32768	Default 32768
	85		fine				
1	86		SB	2	16bit		
	87		fine				
1	88		SB Rot	2	16bit	32768	Default 32768
	89		fine				

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	90	Color Mix	Color Mix Mode	1			Normal, Add, Multiply, InverseMultiply, Highlights, ...
1	91		Color Mix Level	2	16bit		
	92		fine				
1	93		Red	2	16bit		
	94		fine				
1	95		Green	2	16bit		
	96		fine				
1	97		Blue	2	16bit		
	98		fine				
1	99		Alpha	2	16bit		
	100		fine				

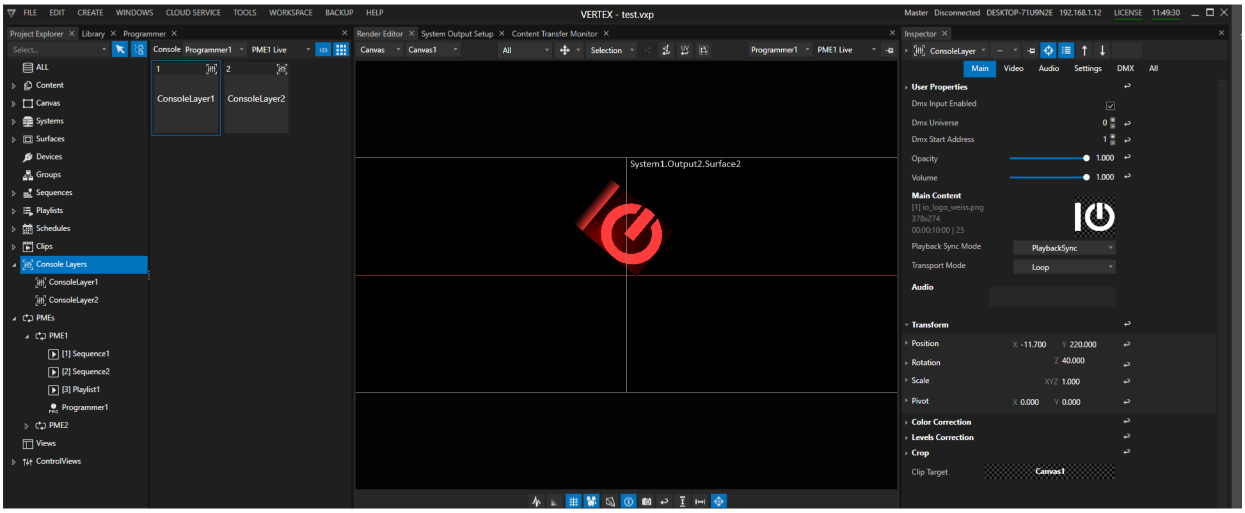
58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
Fixture 1 B							
1	1	Color Correction	Hue	2	16bit	32768	
	2		fine				
1	3		Saturation	2	16bit	32768	
	4		fine				
1	5		Contrast	2	16bit	32768	
	6		fine				
1	7		Brightness	2	16bit	32768	
	8		fine				
1	9		Red Balance	2	16bit	32768	
	10		fine				

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	11		Green Balance	2	16bit	32768	
	12		fine				
1	13		Blue Blanace	2	16bit	32768	
	14		fine				
1	15		Levels Min	2	16bit	0	
	16		fine				
1	17		Levels Value	2	16bit	32768	
	18		fine				
1	19		Levels Max	2	16bit	65535	
	20		fine				
1	21		BlendMode	1			reserved
1	22	FX1	FX1 Select	1			
1	23		FX1 Mix	2	16bit		
	24		fine				
1	25		FX1 C1	2	16bit		
	26		fine				
1	27		FX1 C2	2	16bit		
	28		fine				
1	29		FX1 C3	2	16bit		
	30		fine				
1	31		FX1 C4	2	16bit		
	32		fine				
1	33		FX1 C5	2	16bit		
	34		fine				
1	35	FX2	FX2 Select	1			
1	36		FX2 Mix	2	16bit		
	37		fine				
1	38		FX2 C1	2	16bit		
	39		fine				

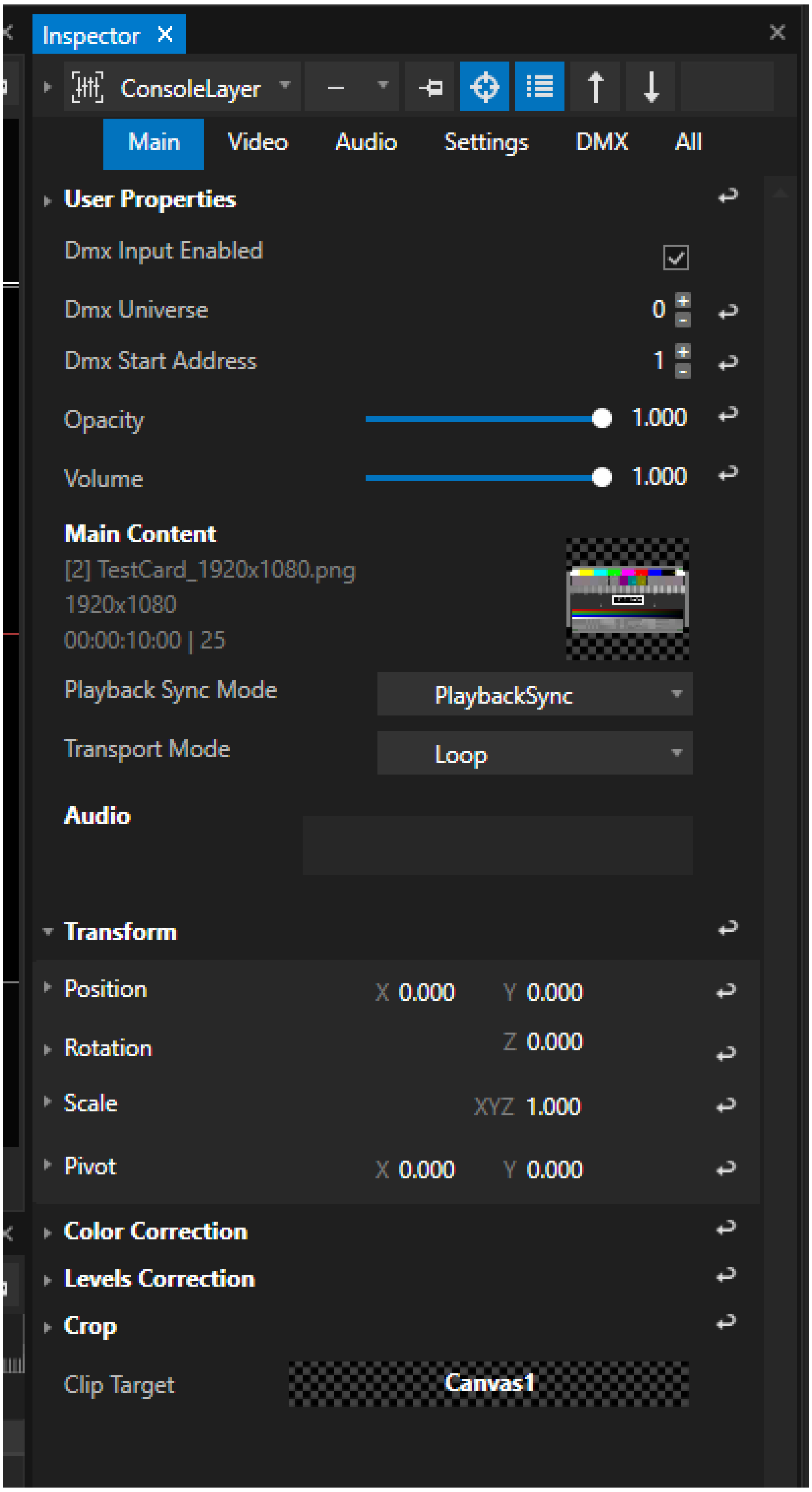
58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
1	40		FX2 C2	2	16bit		
	41		fine				
1	42		FX2 C3	2	16bit		
	43		fine				
1	44		FX2 C4	2	16bit		
	45		fine				
1	46		FX2 C5	2	16bit		
	47		fine				
1	48	FX3	FX3 Select	1			
1	49		FX3 Mix				
	50		fine	2	16bit		
1	51		FX3 C1	2	16bit		
	52		fine				
1	53		FX3 C2	2	16bit		
	54		fine				
1	55		FX3 C3	2	16bit		
	56		fine				
1	57		FX3 C4	2	16bit		
	58		fine				
1	59		FX3 C5	2	16bit		
	60		fine				
1	61	FX4	FX4 Select	1			
1	62		FX4 Mix	2	16bit		
	63		fine				
1	64		FX4 C1	2	16bit		
	65		fine				
1	66		FX4 C2	2	16bit		
	67		fine				
1	68		FX4 C3	2	16bit		
	69		fine				
1	70		FX4 C4	2	16bit		

58	DMX Addresss	Category	Parameter Name		Type	Default Value	Note
	71		fine				
1	72		FX4 C5	2	16bit		
	73		fine				
39							

Working with a Console Layer



- Use the "Create " tab of the Main Menu to create a new Console Layer
- Right-Click on the ConsoleLayer section into Project Explorer and use the Context Menu the create a new one



User Properties

Dmx Input Enabled ☑

Dmx Universe 0

Dmx Start Address 1

Opacity 1.000

Volume 1.000

Main Content
[2] TestCard_1920x1080.png
1920x1080
00:00:10:00 | 25

Playback Sync Mode PlaybackSync

Transport Mode Loop

Audio

Transform

Position X 0.000 Y 0.000

Rotation Z 0.000

Scale XYZ 1.000

Pivot X 0.000 Y 0.000

Color Correction

Levels Correction

Crop

Clip Target Canvas1

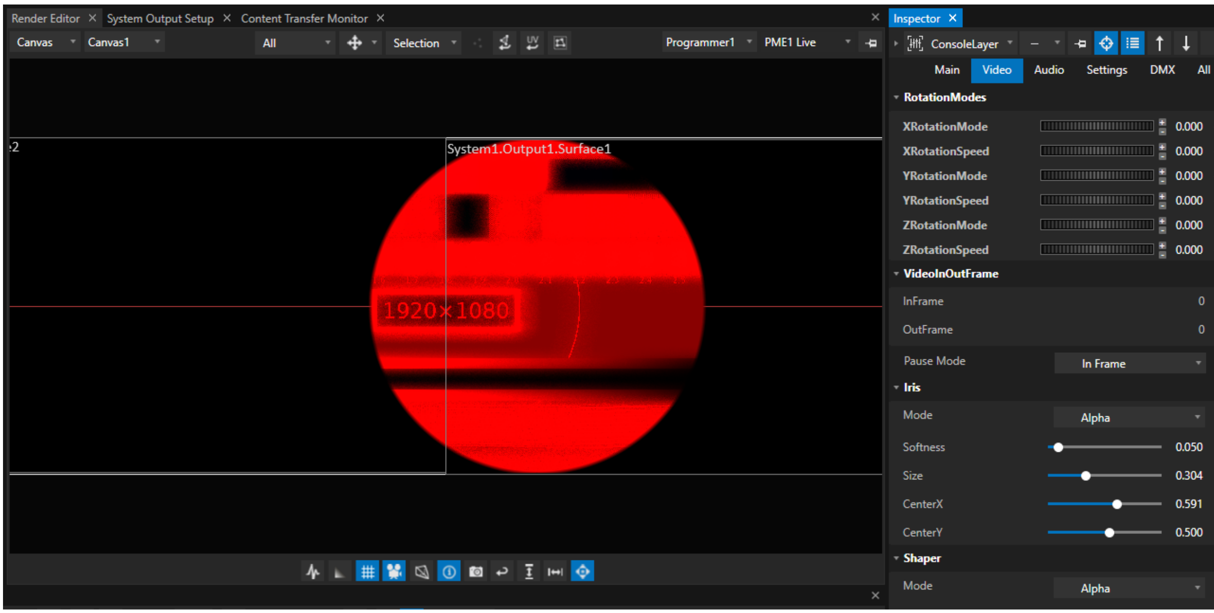
- Select Console Layer into **Inspector** and do **initial settings**:
- Set the **target Canvas** on which the Content should be rendered

- Set the **DMX universe** and **start address** if the console layer should be controlled by a lighting desk. Please do a **DMX-Routing first**. **Check the Channel** Map for a Console Layer in detail and learn more about which DMX-512 channel controls which parameter

Unique start address for each Console Layer
please keep in mind to change the start addresses for every console layer.
To be control separately, each console layer must have it's unique DMX start address

- If you want to use DMX-Values to select Content from Project Explorer like a Gobo, **set DMX File and Folder IDs for your Content.**

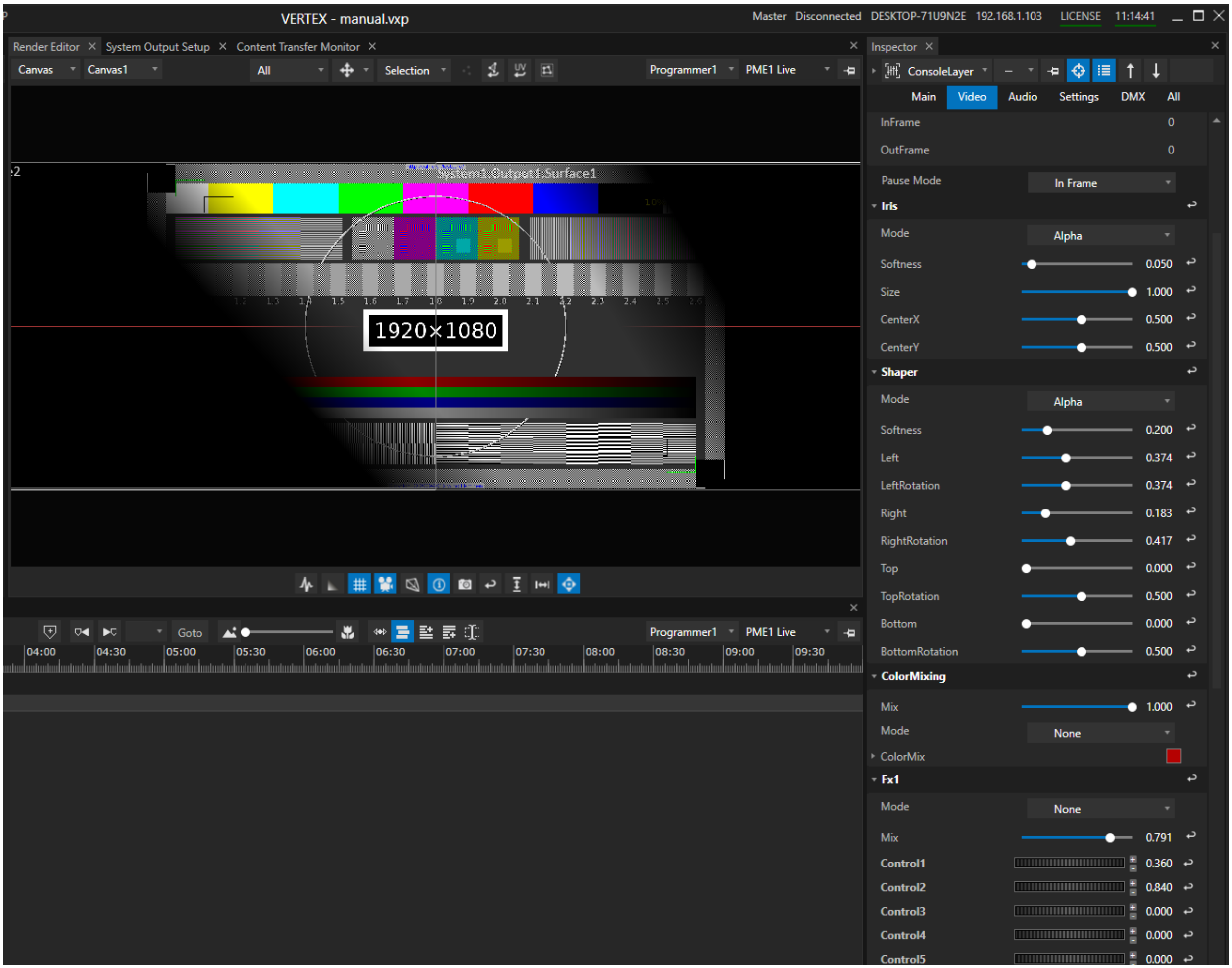
Channel Map: Gobo 1 and Gobo 2
Gobo 1 in Channel Map is Property "Main Content" (Video tab in the Inspector)
Gobo 1 in Channel Map is Property "Mask" (Video tab in the Inspector)



RotationModes
XRotationMode 0.000
XRotationSpeed 0.000
YRotationMode 0.000
YRotationSpeed 0.000
ZRotationMode 0.000
ZRotationSpeed 0.000
VideoInOutFrame
InFrame 0
OutFrame 0
Pause Mode In Frame
Iris
Mode Alpha
Softness 0.050
Size 0.304
CenterX 0.591
CenterY 0.500
Shaper
Mode Alpha

iris and color mixing on a test pattern

- Control Console Layer by external DMX or use the Inspector to do settings for all parameters



InFrame 0

OutFrame 0

Pause Mode In Frame

Iris

Mode Alpha

Softness 0.050

Size 1.000

CenterX 0.500

CenterY 0.500

Shaper

Mode Alpha

Softness 0.200

Left 0.374

LeftRotation 0.374

Right 0.183

RightRotation 0.417

Top 0.000

TopRotation 0.500

Bottom 0.000

BottomRotation 0.500

ColorMixing

Mix 1.000

Mode None

ColorMix 🟥

Fx1

Mode None

Mix 0.791

Control1 0.360

Control2 0.840

Control3 0.000

Control4 0.000

Control5 0.000

Shaper for a Test pattern Content

DMX Folder and File ID

- Each Console Layer is able to host Video Content and an Content Item as a Mask.
- With the concept of folder and file IDs you are able to select your content based on a DMX Value between 0 and 255.

- Each Console Layer has a DMX Channel/Address for Content Folder ID and Content File ID (Channels 49/50) and two Channels/Addresses for Mask Content Folder and Mask Content File (Channels 60/61). Please also compare with the full channel map of a console Layer

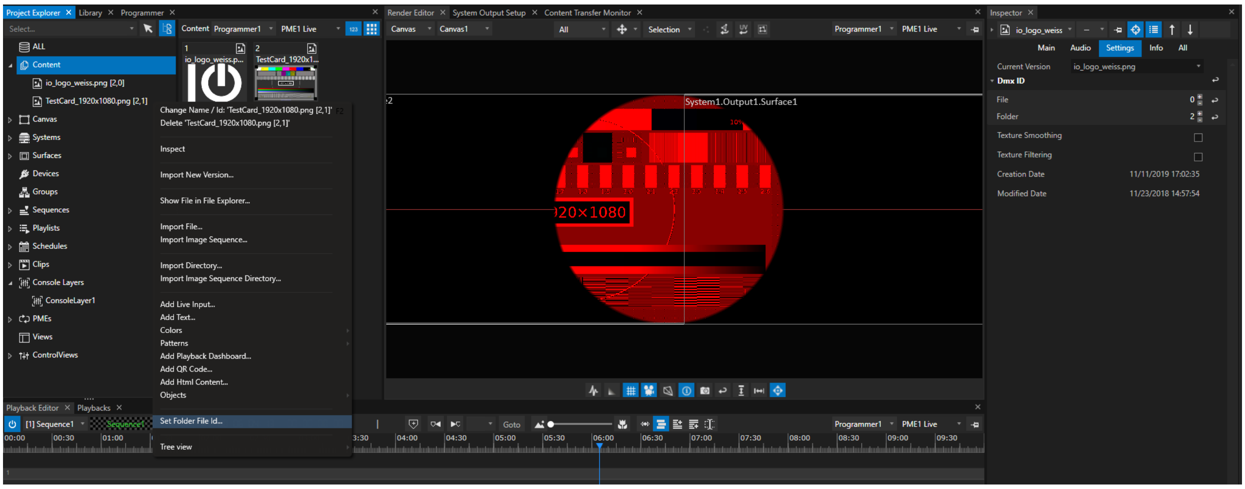
Example:

- Your Console Layer into VERTEX has DMX Start Address 1 (For universe routing, please read topic DMX-Routing before)
- Your lighting desk has a library element for a VERTEX Console Layer, also on Start Address 1
- you want to select a Content Item from the VERTEX Project Explorer with File ID 5 and Folder ID 2 as Video

Content for this Console Layer

- you have to set DMX-channel 49 of your lighting desk to value 2 and DMX channel 50 to value 5
- The content item is selected as video content for the VERTEX Console Layer

Set File and Folder ID

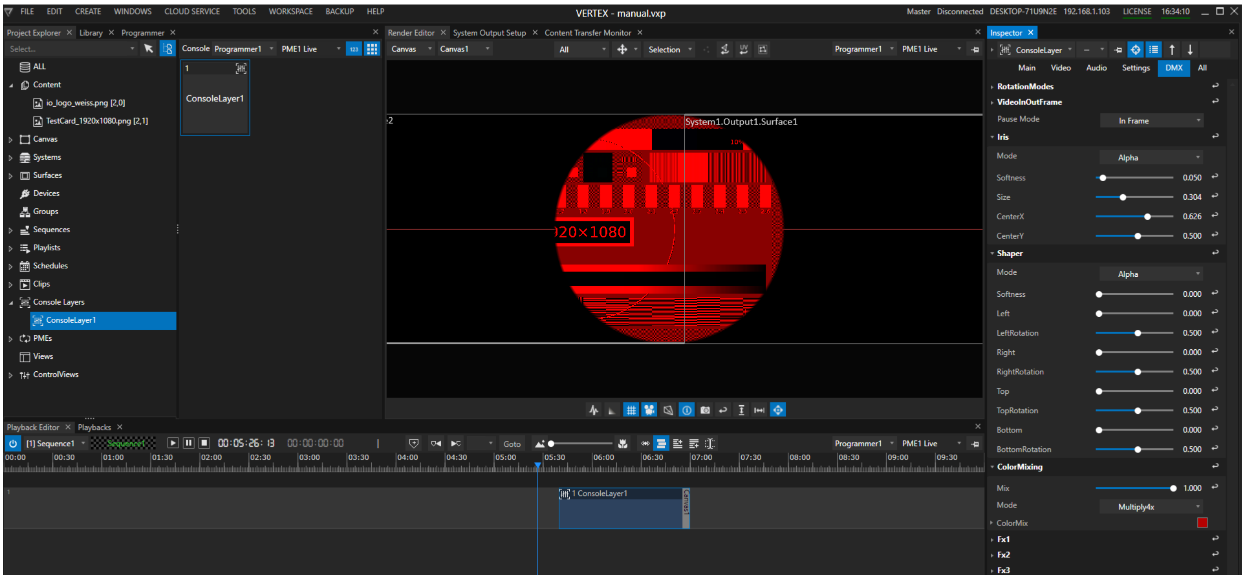


Current Version: io_logo_weiss.png
Dmx ID
File: 0
Folder: 2
Texture Smoothing □
Texture Filtering □
Creation Date: 11/11/2019 17:02:35
Modified Date: 11/23/2018 14:57:54

- Select a Content item into Project Explorer and go to the Inspector
- Go to the Tab "Settings" and Select "DMX ID"
- Set File and Folder ID for a Content. Each value has to be into the DMX parameter range from 0 to 255

Clip Container for a Console Layer

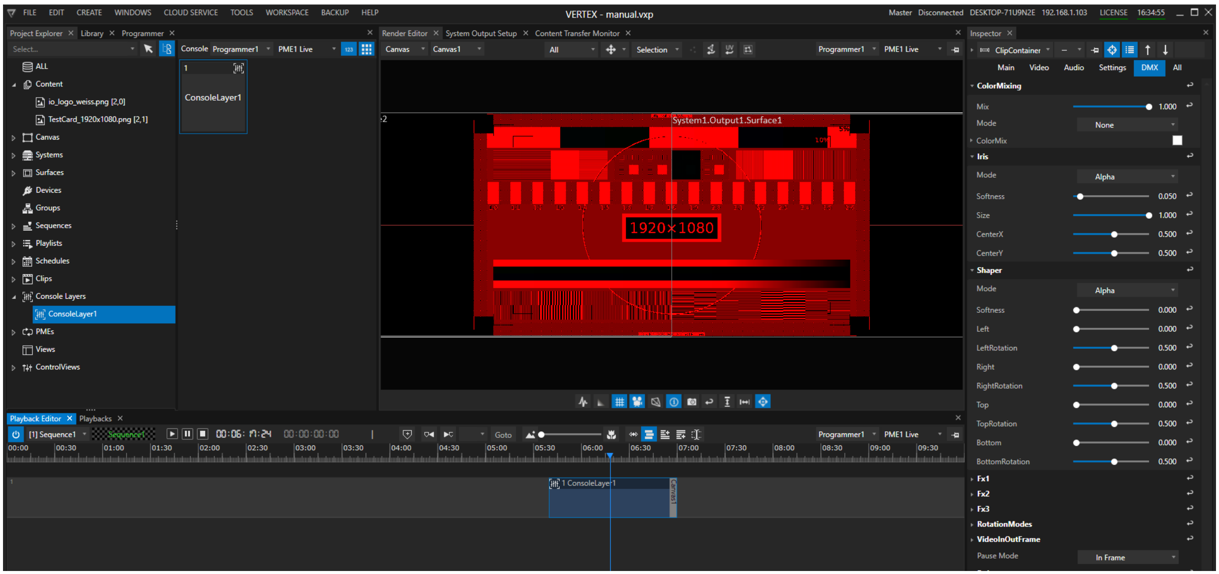
- Even for Console Layers you can create a Clip Container
- Used in a Playback, Clip Containers for a Console Layer overwrite the global value of the Console Layer



RotationModes		
VideoInOutFrame		
Pause Mode	In Frame	
Iris		
Mode	Alpha	
Softness		0.050
Size		0.304
CenterX		0.626
CenterY		0.500
Shaper		
Mode	Alpha	
Softness		0.000
Left		0.000
LeftRotation		0.500
Right		0.000
RightRotation		0.500
Top		0.000
TopRotation		0.500
Bottom		0.000
BottomRotation		0.500
ColorMixing		
Mix		1.000
Mode	Multiply4x	
ColorMix	🟥	
Fx1		
Fx2		
Fx3		

Global Setting for ConsoleLayer 1: Iris is set

- Drag a Console Layer from Project Explorer into the Playback Editor: A new Clip Container is created into your Sequence
- Assign Content to your Clip Container and set Values



ColorMixing		
Mix		1.000
Mode	None	
ColorMix	⬜	
Iris		
Mode	Alpha	
Softness		0.050
Size		1.000
CenterX		0.500
CenterY		0.500
Shaper		
Mode	Alpha	
Softness		0.000
Left		0.000
LeftRotation		0.500
Right		0.000
RightRotation		0.500
Top		0.000
TopRotation		0.500
Bottom		0.000
BottomRotation		0.500
Fx1		
Fx2		
Fx3		
RotationModes		
VideoInOutFrame		
Pause Mode	In Frame	

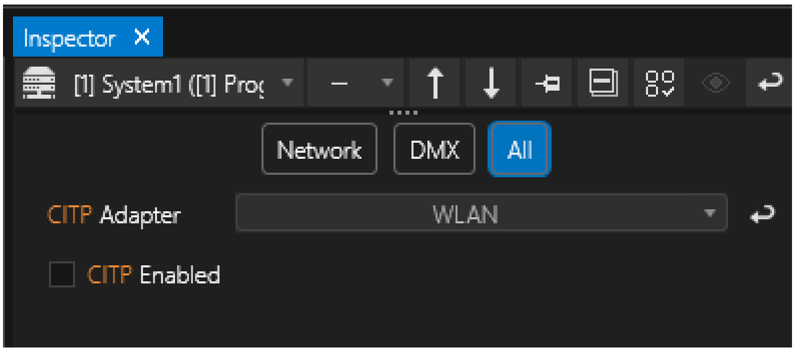
Clip Container with Console Layer 1 inside overwrites the global values of Console Layer 1: in this example, all values for the iris are reset to default values.
Don't forget to also assign the same Main Content as the global Console Layer has to the Clip Container

Use case example:

You are able to e.g. temporary take control back from a lighting desk control and to set all content to black.

5.6 CITP & Content Folder File Banks

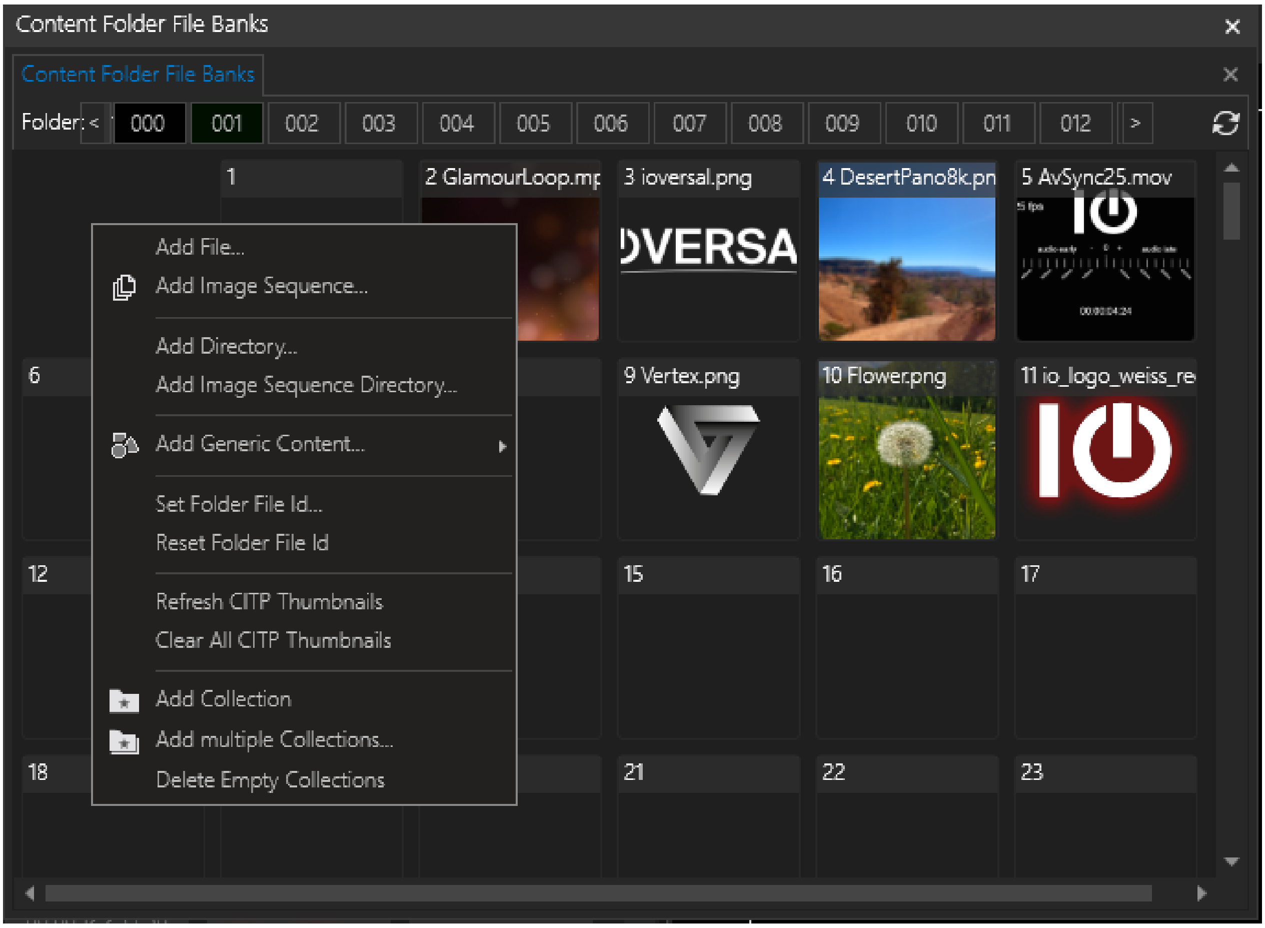
Content info and thumbnails are transmitted between VERTEX and consoles via CITP.
In order to use this protocol, enable it first in the System Settings. Here you can also choose the correct network adapter.
Use the Inspector's search filter and type in CITP to locate these settings:



CITP Adapter: WLAN

□ CITP Enabled

Then go to MAIN MENU > WINDOWS > Content > Content Folder File Banks to open this window to set your content banks:



In this window users can drag and drop content from Project Explorer into folders/ banks to be used in conjunction with connected lighting consoles.
Right-click for a context menu with further options.

5.7 Control View

- ControlView is a **fully customizable graphical user interfaces** programmed by the user.
- **Design and build** your own graphical user interface. No programming skills needed.
- ControlViews can **run in fullscreen mode** on any VERTEX System
- VERTEX' Web View feature makes a ControlView accessible in any web browser connected to your local network.

Basics

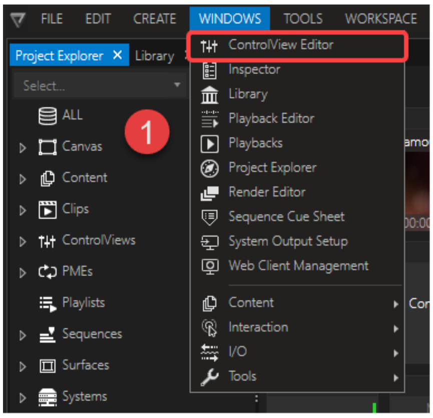
- VERTEX is shipped with extensive library of various control elements - find them at *Library > Controls* and drag them into the Control View Editor window.
- Detailled **layout parameters** allow you to build a ControlView fitting e.g. a client's cooperate design
- Control Views can be run in either the **ControlView Editor** as part of VERTEX' UI or in **fullscreen mode**. The fullscreen display is called **Control Viewer.**
- Fullscreen touch interfaces can also be used **as transparent overlay on** a desktop or even **on top of a Fullscreen Renderer.**
- **Every control element** can be accessed by **a script command or API.**

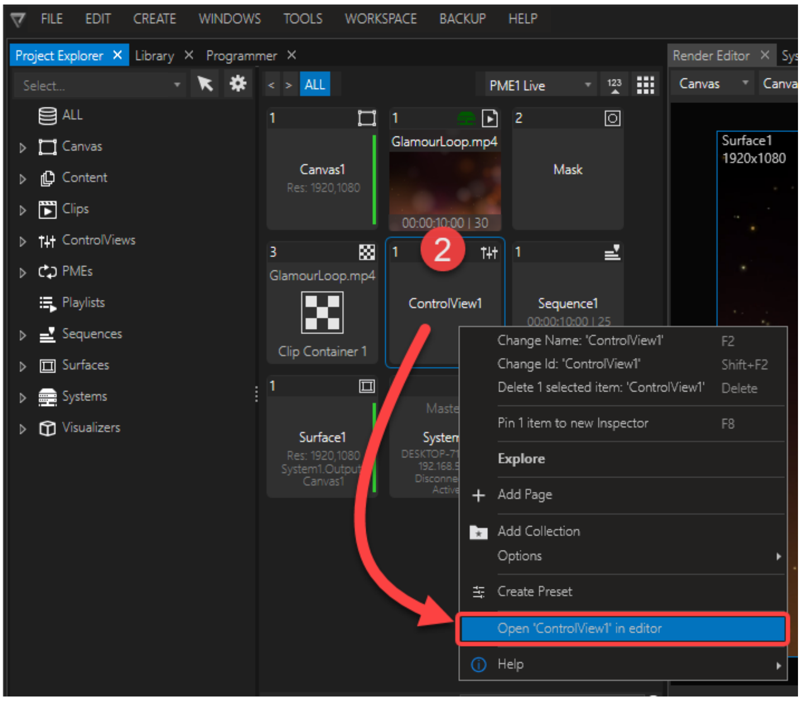
ControlView Workflow

- When you create a *New Project,* Vertex automatically adds a first ControlView by default.
- You can create further ControlViews from the *Main Menu > Create* or context menu by right clicking on *Control View Manager* in the *Project Explorer.*
- ControlView Editor has got **two different modes**: ***Edit*** (interface design) or ***Run*** (interface use).

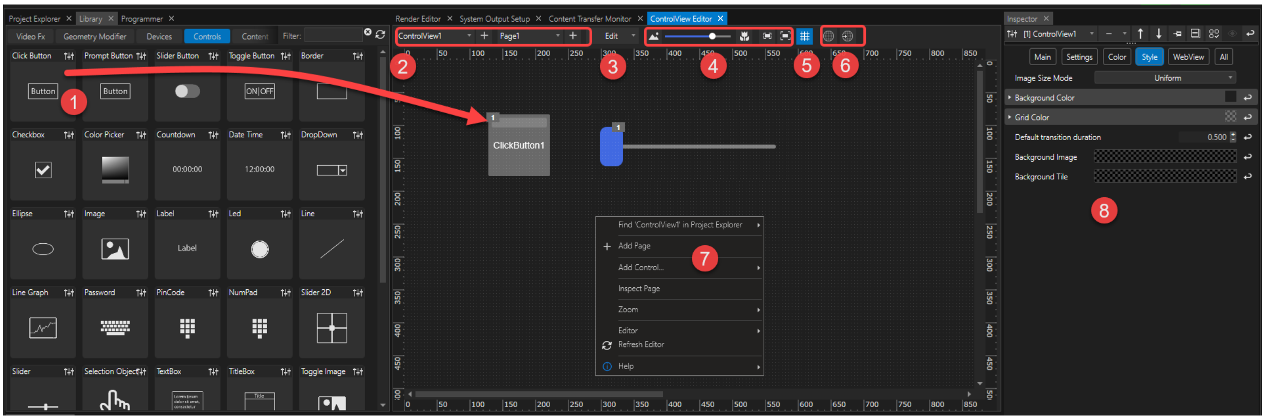
Open ControlView Editor

1. Either go to Main Menu > Windows > ControlView Editor
2. or open the ControlView Editor from the context menu (right-click) of the particular ControlView in the ProjectExplorer.





Edit Mode

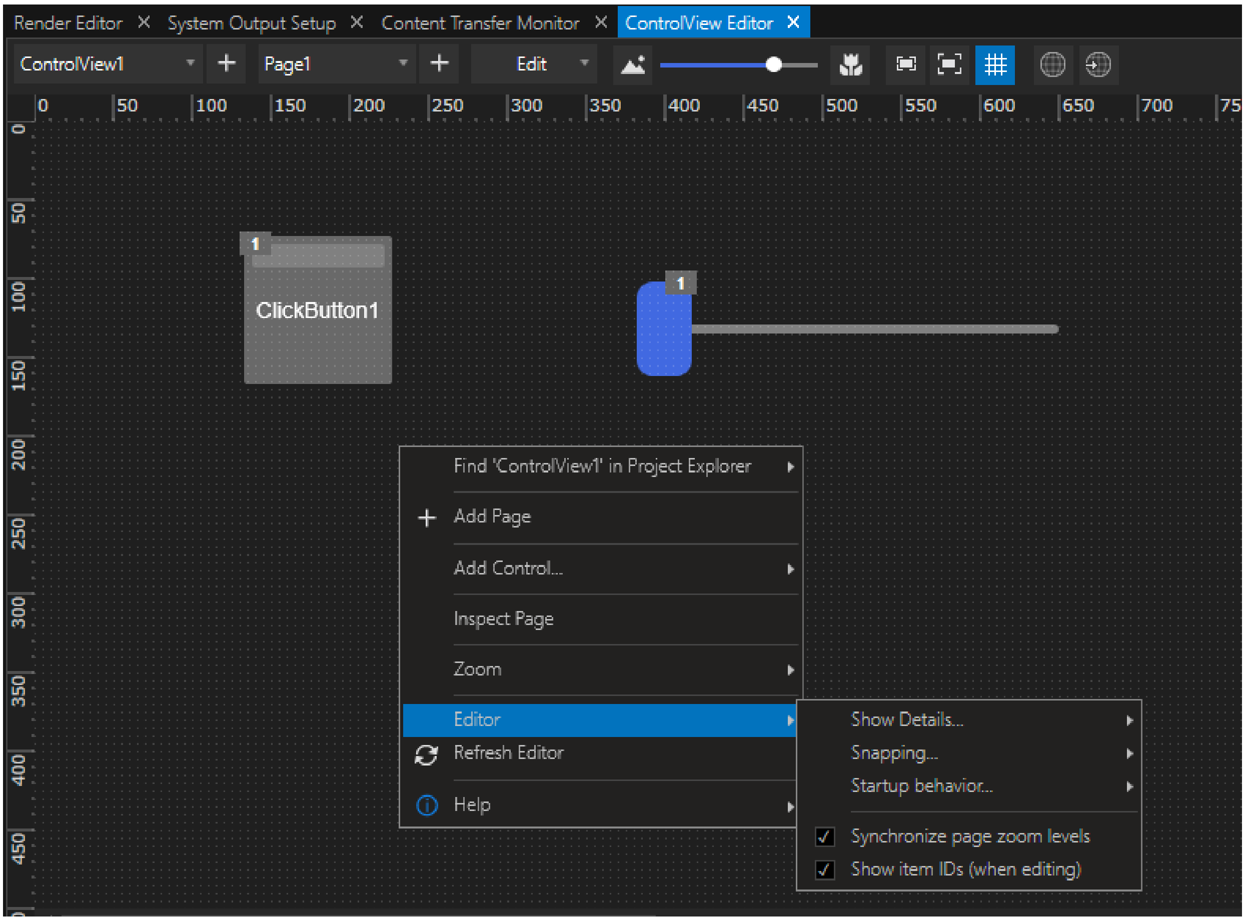


1. **Add controls** such as buttons or sliders by dragging them from the library and dropping the onto the desired location. In edit mode Controls can be moved around by click and drag.
2. **Selection *ControlViews* and *Pages*** for your current edit from the drop-downs. Add more with the *+ Button,* because your VERTEX project may contain multiple *ControlViews* which may contain multiple *Pages.*
3. Use this drop-down to switch between *Edit* and *Run* mode - alternatively you can run ControlViewer in fullscreen.
4. Options for **zooming** in and out or to individual controls.
5. Show/ hide the ruler grid. **Snapping is enabled by default and other layout helpers can be accessed from the context menu.**
6. Buttons for enabling WebView and opening it in a browser.

7. Add ControlViews or Pages from the editor's context menu.
8. Adjust style and settings for ControlView or individual Controls in the inspector - select to inspect.

Editor Settings

- Open the context menu with a right click in edit mode and go to *Editor* to set the ControlView Editor's layout helpers, snapping or the startup behavior.



Pages

- The use of multiple ControlView Pages allow a creative design with submenus thematically sorted in order to keep your ControlView neat and clean.

Run Mode

- all objects are locked
- all rulers and context menus are deactivated

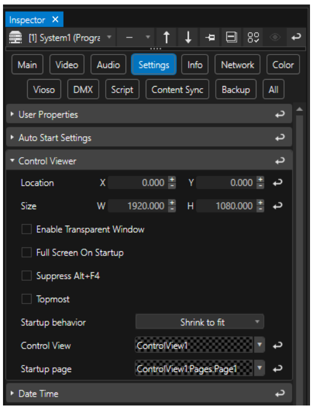
- Controls cannot be selected to inspect

ControlViewer

- Each VERTEX System can display **ControlViews in fullscreen** - this fullscreen window is called **Control Viewer.**
- Depending on your VERTEX license, it is possible to **run both on the same system: a Control Viewer and a video rendering fullscreen window for your System Output.**
- It is also possible to have **a transparent ControlView layer on top of** your **fullscreen video rendering window** or on your Windows desktop.

Settings

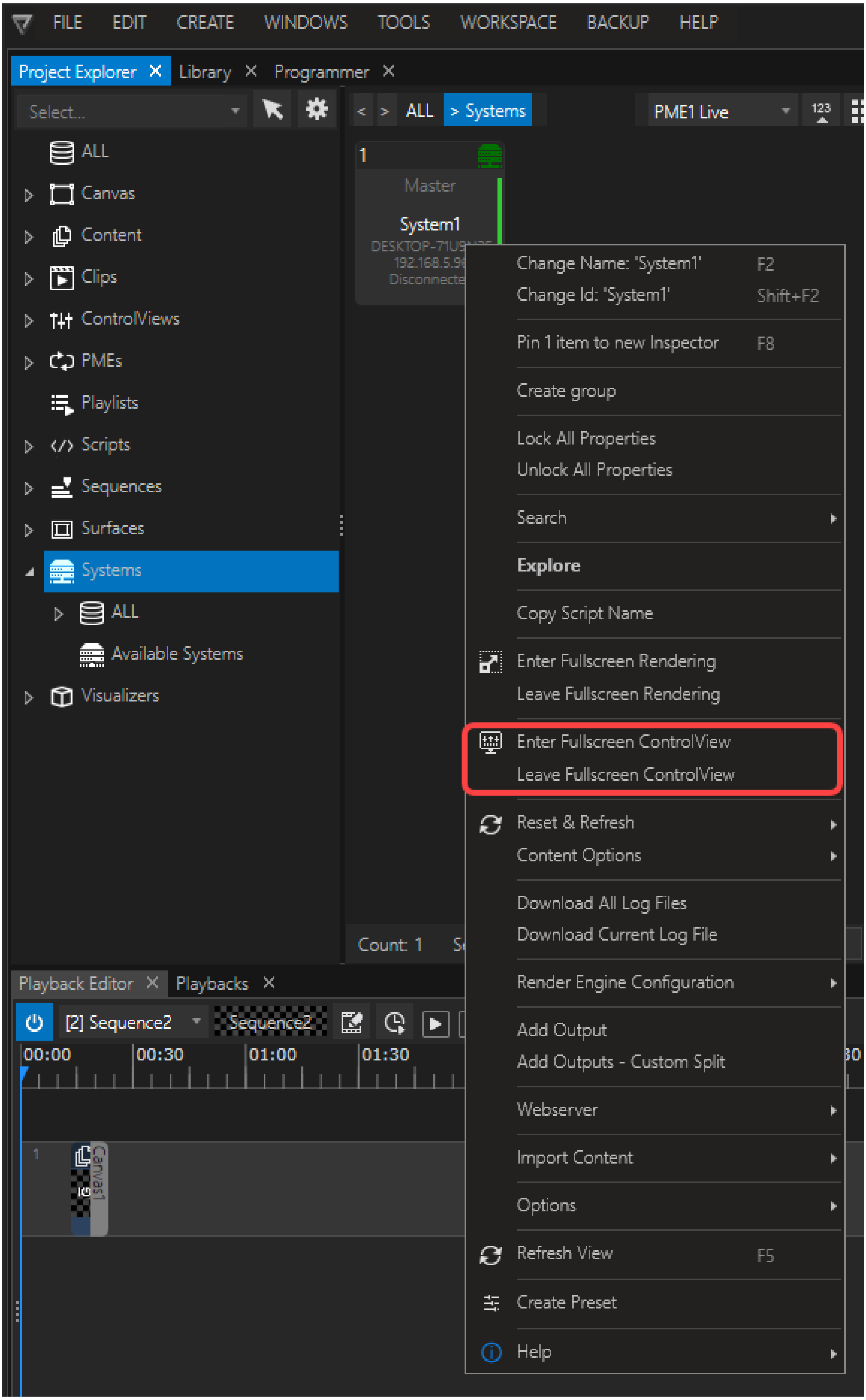
Go to System > Settings > Control Viewer

 Inspector [1] System1 (Progra Main Video Audio Settings Info Network Color Vioso DMX Script Content Sync Backup All User Properties Auto Start Settings Control Viewer Date Time Location X 0.000 Y 0.000 Size W 1920.000 H 1080.000 □ Enable Transparent Window □ Full Screen On Startup □ Suppress Alt+F4 □ Topmost Startup behavior Shrink to fit Control View ControlView1 Startup page ControlView1.Pages.Page1	Location	positions the fullscreen ControlViewer on your virtual Windows desktop in top-left start coordinates.
	Size	sets the Control Viewer's size.
	Enable Transparent Window	allows for the Control Viewer to act as a transparent layer. Prerequisite for this transparency, however, is a transparent background color. Access the ControlView's *Style* tab in the Inspector and set the *Background Color* alpha channel to transparent.
	Full Screen On Startup	ControlViewer goes to fullscreen immediately when the project is loaded
	Suppress ALT+F4	disables this shortcut to prevent the accidental closing of ControlViewer in FS
	Topmost	enables FS Control Viewer to remain topmost window - this setting is essential, if you would like to keep using a transparent ControlViewer window on top of other applications.
	Startup Behavior	options for scaling & focusing of the FS Control Viewer on startup
	Control View	select the particular ControlView for startup behavior
	Startup Page	select the particular ControlView Page for startup

		behavior

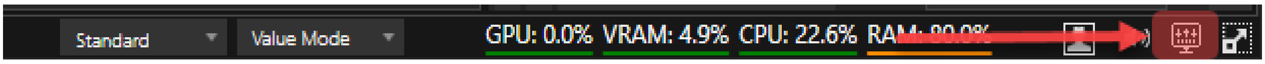
Open Control Viewer In Fullscreen With These Options:

- **Project Explorer > System > context menu**
  Right-click on any system and select "Enter Fullscreen ControlView"
  If working with multiple Systems in a session, you can remotely set another System's Control Viewer to fullscreen mode.
  Also, there is a menu entry in the same location for leaving fullscreen mode.


FILE
EDIT
CREATE
WINDOWS
TOOLS
WORKSPACE
BACKUP
HELP
Project Explorer
Library
Programmer
Select...
ALL
Canvas
Content
Clips
ControlViews
PMEs
Playlists
Scripts
Sequences
Surfaces
Systems
ALL
Available Systems
Visualizers
< > ALL > Systems
PME1 Live
123
1
Master
System1
DESKTOP-71U
192.168.5.9
Disconnecte
Change Name: 'System1' F2
Change Id: 'System1' Shift+F2
Pin 1 item to new Inspector F8
Create group
Lock All Properties
Unlock All Properties
Search
Explore
Copy Script Name
Enter Fullscreen Rendering
Leave Fullscreen Rendering
Enter Fullscreen ControlView
Leave Fullscreen ControlView
Reset & Refresh
Content Options
Download All Log Files
Download Current Log File
Render Engine Configuration
Add Output
Add Outputs - Custom Split
Webserver
Import Content
Options
Refresh View F5
Create Preset
Help
Count: 1
Playback Editor
Playbacks
[2] Sequence2
Sequence2
00:00
00:30
01:00
01:30
30
1
Canvas1

- The **shortcut CTRL + F5** opens the Control Viewer **on your local System.**
  Press the same shortcut on your local System to close.

- **Control Viewer Button in Status Bar**
  opens the Control Viewer on your local System in Full Screen.
  Use the shortcut CTRL+ F5 to close.



- Script Commands to open and close the Control Viewer on any system in your session:

```
System1.ControlViewer.Open
System1.ControlViewer.Close
```

or just for your *local system:*

```
ControlViewer.Open
ControlViewer.Close
```

Access a ControlView with a Script

Like most things into VERTEX also ControlViews are accessible with **a Script Command.**

Please note the difference between:
- a ***ControlView*** that contains pages with controls (buttons, sliders, labels etc.) and is accessed via the **ControlView Editor** window
- and the ***ControlViewer***, that is the full screen window hosting the current *ControlView.*
It is crucial to keep this detail in mind when using VERTEX script commands with ControlView.

Difference between ControlView and ControlViewer

To access a ControlView's layout elements and settings, start your Script with the VERTEX Object ControlView (i.e. "ControlView1")

```
ControlView1.Pages.Page1.Label1.Delete
```

Change the current page that is being displayed in the full screen ControlViewer with the *GoToPage* script command. In this case you will need to start your Script with the ControlViewer object like so:

```
ControlViewer.GotoPage Page2
```

Some controls like a *ClickButton* have a *GoToPage* property in their Inspector's *Settings* tab, which can be used in addition to the control's main function.
Using a script to set the *GoToPage*-target requires to call the page's name by its full path - as in this example of a ClickButton:

```
ControlView1.Controls.ClickButton1.GotoPage.Value =
ControlView1.Pages.Page2
```

Script examples

Change the label text of Label 1 in ControlView1

```
ControlView1.Controls.Label1.Settings.Caption.Text.Value = "this is a
new label text"
```

Perform a Click on Button 1 of ControlView1

```
ControlView1.Controls.ClickButton1.Click
```

Return the current Page that is displayed by ControlViewer1

```
ControlViewer.GetPage
```

Set ControlViewer to display Page 2 of the ControlView currently in use. This also works as a script for controls like a ClickButton.

```
ControlViewer.GotoPage Page2
```

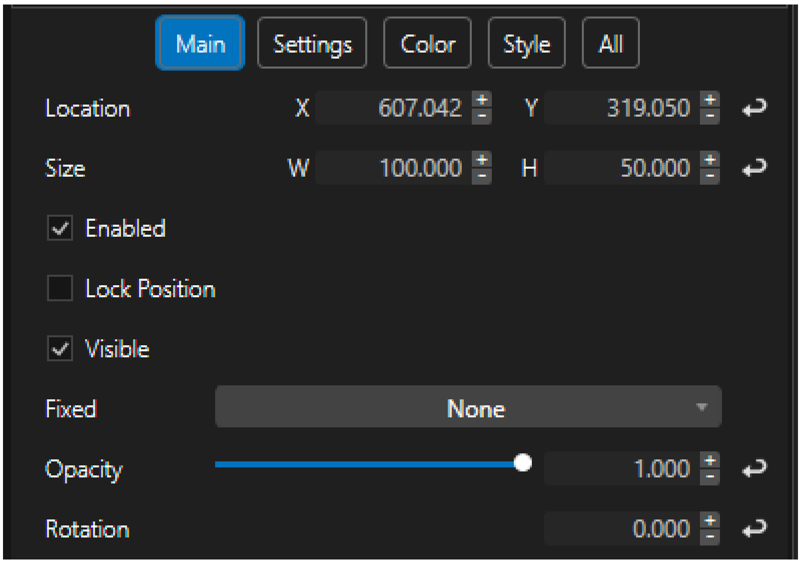
Delete Label 1 on Page 1 of ControlView1

```
ControlView1.Pages.Page1.Label1.Delete
```

5.7.1 Individual Controls Explained

Common Properties

All Controls in Vertex come with a basic set of properties. They can be accessed in their inspector’s *Main* tab.



Location X 607.042 Y 319.050

Size W 100.000 H 50.000

☑ Enabled

☐ Lock Position

☑ Visible

Fixed None

Opacity 1.000

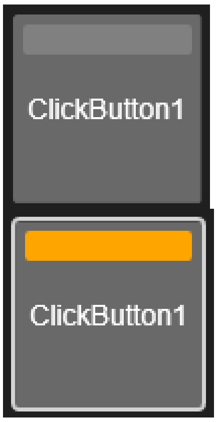
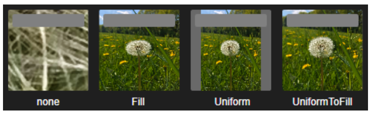
Rotation 0.000

Location X	X coordinate of the Control
Location Y	Y coordinate of the Control
Size W	Width of the Control
Size H	Height of the Control
Note: ControlViews are working in a “top-left” mode. Thus a 0/0 coordinate of a control describes the upper-left corner of your ControlView. The position- and scale-pivot of every control is also in its own upper left corner, while it's rotation pivot is in its center.	
Enable	Activates/deactivates the functionality of the Control. Once disables, the Control will not be click-able by the user, but it will remain control-able via Scripting!
Lock Position	If activated, the position and scale handles inside the ControlView editor will not be accessible to prevent unintentionally redesign of the Control. Location- and

	Size-Properties in the inspector as well as Scripting is still activated to change the position and scaling.
Visible	If deactivated, the Control will be hidden and can not be accessed /clicked in ControlView Run-Mode anymore. Controls that have been placed behind the hidden control will become visible and click-able! Although the Control is hidden, it can still be accessed and controlled via Scripting! To create an invisible (but control-able) Control, see property “Opacity”!
Fixed	Options: None, Background, Foreground This feature is made for ControlViews with multiple Pages. Design elements (like Borders, Images, Labels etc.) or Controls (page navigation, Master Volume fader etc.) can be made visible and/or accessible from all pages of your ControlView. - If “Background” is selected from the dropdown menu, the Control will remain present on all ControlViews pages, but will be orientated in the background (behind the other pages own controls) - If “Foreground” is selected from the dropdown menu, the Control will remain present on all ControlViews pages, but will be orientated in the foreground (in front of other pages own controls) - If “None” is selected from the dropdown menu, the Control will only be present on its individual page
Opacity	Opacity value of the Control. If the Opacity is set to 0, the Control will not be visible, but will remain fully control-able by the user. Use this for invisible control-overlays. To create an invisible (and not control-able) Control, see property “Visible”!
Rotation	Rotation of the Control.

Buttons

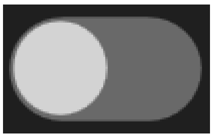
ClickButton		

Buttons		
	The ClickButton is a simple control to execute Scripts in Vertex. To remotely click a ClickButton via scripting (and to execute the ClickButtons “ScriptCode”, use the following script: ControlViewID.Controls.ClickButtonID.Click	
	Show MouseOver Frame	Activate/ deactivate a visible Frame that appears when the Cursor hovers the Control. (UI only) Color can be individualized with property “Mouse Over Color”.
	Show Status Indicator	Activate/ deactivate status indicator bar (top bar lights up orange when pressed. UI only)
	Image Content	Select or drag’drop any Content from the Vertex project to be displayed in the button
	Image Size Mode 	Refers to Property “Image Content” Options: - None: Image Content will be displayed in button in native resolution. Positioned in center - Fill: Image Content will be stretched to fit the buttons size - Uniform: Image Content will be scaled proportionally to fit the buttons size - UniformToFill: Image Content will be scaled proportionally to fill the buttons size
	Caption	(parent property)

Buttons		
	Show Caption	Activate/ deactivate Caption
	Text	Text to be displayed in the button
	Source Property	Value of any other Vertex objects property to be displayed as Text. Please make sure to empty the “Text” property to see the Source Property Value. Manually typed Text will overwrite any incoming Source Property Value.
	Font	Select one Font from the dropdown menu
	Font Decoration	Select one Font Decoration from the dropdown menu
	Font Style	Select one Font Style from the dropdown menu
	Font Weight	Select one Font Weight from the dropdown menu
	Font Color	Color property (Font)
	Font Size	Define the Font Size
	Trim End	Qty of characters to trim the Text (or Source Property Value) at the end
	Trim Start	Qty of characters to trim the Text (or Source Property Value) at the beginning
	Multiline Text	Alignment of the Text
	Shadow	(parent property) Activate/ deactivate s Shadow for the Text
	Color	Color property (Shadow)

Buttons		
	Softness	Softness of the Shadow
	Offset X	X Offset of the Shadow
	Offset Y	Y Offset of the Shadow
	Web Link	Link to an external Web Page the browser shall be directed to when clicking the button (WebView only)
	Goto Page	Select any Page of the current ControlView to navigate the ControlViewer to when clicking the button
	ScriptCode	ScriptCode that is executed on releasing the button
	DownScript	ScriptCode that is executed on pressing the button
	HoldScript	ScriptCode that is executed on holding the button (according to “Hold Time” property)
	WebScript	ScriptCode that is executed exclusively when releasing the button in WebView
	Down WebScript	ScriptCode that is executed exclusively when pressing the button in WebView
	Hold Time	Time (in seconds) after pressing the button to execute the HoldScript

Buttons		
	Timeout	Time (in seconds) to lock the button after releasing the button to prevent further clicking
ToggleButton		
 	The ToggleButton has two states. It can be active/On (Value=1) or inactive(Off (Value=0). Depending on it's state it uses a specific set of Caption- and Style-Properties as well as executes a specific Script when clicked. For information on Properties, see "ClickButton". Properties are almost the same. Most of them are existing twice – once for each state of the ToggleButton. "ScriptCode", "Down Script" and "Hold Script". "Hold Time", "Status Indicator", "Show Mouse Over Frame" and "Mouse Over Color" are not available for ToggleButtons. To remotely switch On/Off a ToggleButton via scripting (and to execute the ToggleButtons "On/Off Script", use the scripts: ControlViewID.Controls.ToggleButtonID.SwitchOn ControlViewID.Controls.ToggleButtonID.SwitchOff	
	Value	Status of the ToggleButton [0/1]
	Source Property	Another Vertex Objects Property to link this ToggleButtons "Value" to. E.g. when connected with a Clips "Mute" property, the ToggleButton will switch the Mute-Property from

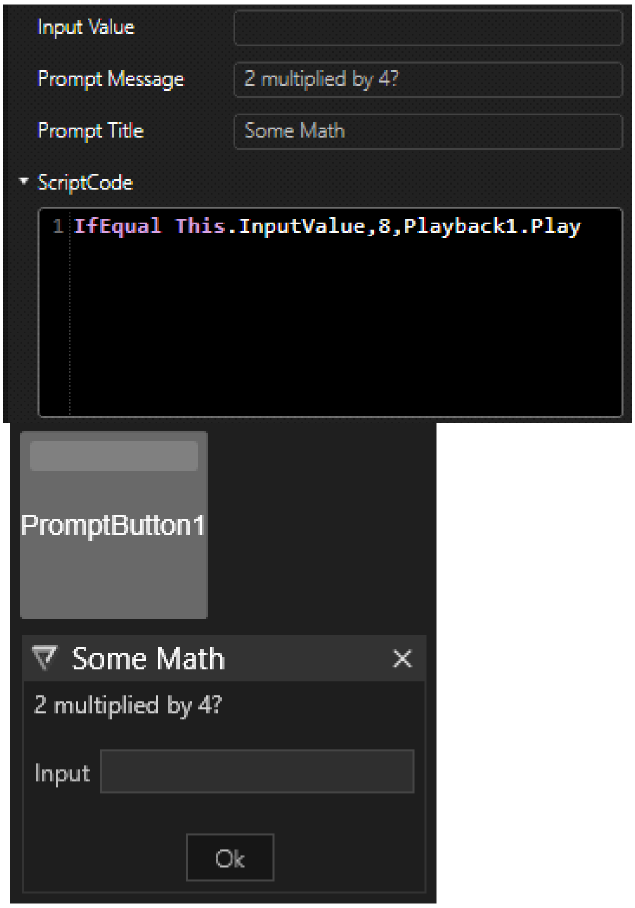
Buttons		
		Unmuted to Muted when clicking the ToggleButton and vice versa.
	Off Script	Script to be executed when pressing the button while it is in “On”-State
	On Script	Script to be executed when pressing the button while it is in “Off”-State
SliderButton		
	The SliderButton is comparable to the ToggleButton. It is a more intuitive Control to switch between two states and to execute appropriate Scripts. For information on Properties, see “ToggleButton”. Button- and Caption related properties are not existing for SliderButtons. To remotely switch On/Off a SliderButton via scripting (and to execute the SliderButtons “On/Off Script”, use the scripts: ControlViewID.Controls.SliderButtonID.SwitchOn ControlViewID.Controls.SliderButtonID.SwitchOff	
	Orientation	Select between Horizontal and vertical orientation of the Control

Buttons		
	Active Background	Color property (slider when active)
	Inactive Background	Color property (slider when inactive)
	Thumb Active	Color property (thumb when active)
	Thumb Inactive	Color property (thumb when inactive)
	Background Border	Color property (background border)
	Border Color	Color property (slider border)
	Background Color	Color property (background)
	Thumb Border	Color property (thumb border)
	Border Thickness	Border Thickness of Slider
	Background Border Thickness	Border Thickness of Background
	Thumb Border Thickness	Border Thickness of Thumb
	Corner Radius	Slider Corner Radius
	Background Corner Radius	Background Corner Radius

Buttons

PromptButton

Use a PromtButton to validate a user’s intention to really click a button or request additional input.
In contrast to a ClickButton, the ScriptCode will not get executed immediately, but a prompt with an optional Input-Textbox will appear first.
A PromptButton is based on a ClickButton. It has the same properties, except “Down Script”, “Hold Script” and “Hold Time” , plus additional.



Input Value

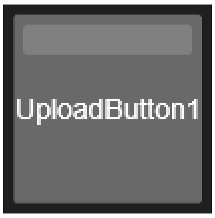
Prompt Message: 2 multiplied by 4?

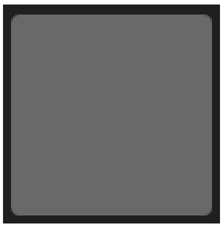
Prompt Title: Some Math

ScriptCode

```
IfEqual This.InputValue,8,Playback1.Play
```

Show Input Value	Activates/ deactivates the

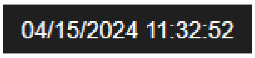
Buttons		
		Input-Textbox inside the prompt
	Prompt Mode	Select between - None (“Ok” button ony) - Ok Cancel (“Ok” and “Cancel” button) - Yes No (“Yes“ and “No“ button)
	Input Value	Value that has been typed in by the user in the optional Input-Textbox (if “Show Input Value” is enabled
	Prompt Message	Message inside prompt
	Prompt Title	Title of prompt
UploadButton		
	Use an UploadButton to import one or multiple content to the Vertex project. Once clicked, a File dialog opens to navigate to local files. Imported Files will optionally get assigned to a Collection and to a Clips Main Content. A UploadButton is based on a ClickButton. It has the same properties, except “Down Script”, “Hold Script” and “Hold Time”, plus additional.	

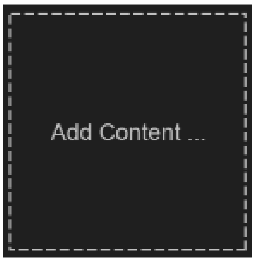
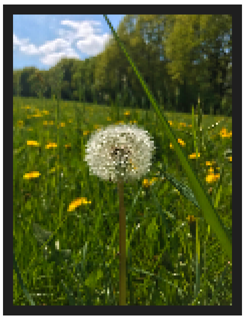
Buttons		
	Target Collection	Uploaded files will get assigned to the selected Content Collection
	Upload Target	An uploaded file can get automatically assigned to any Vertex Clips “Main Content” property. Thus the uploaded file could get rendered immediately after uploading and file synchronization without any further scripting.
SelectionObject		
	When dragging any Vertex Object onto a ControlViews Page, Vertex will create a SelectionObject. Use a SelectionObject to enable a quick selection to a single Object (or a Group). (UI Only!)	
	Select On Click	Activated / deactivated the feature of selecting the referenced Object
	Selection Object	Objects to select when clicking the

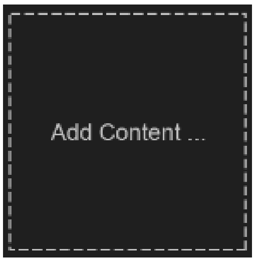
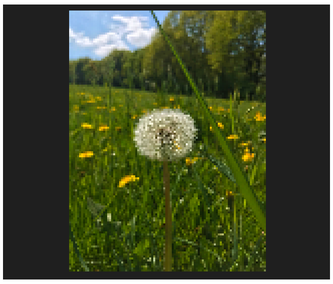
Buttons		
		button

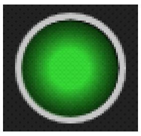
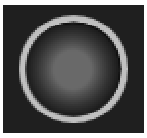
Design		
Label		
Label1	A Label is a control to display a text inside a ControlViews Page. Note: Once dragging any Vertex objects property onto a ControlViews Page, Vertex can automatically create a Label with a reference (assigned Source Property) to this property.	
	Caption	(parent property)
	Show Caption	Activate/ deactivate Caption
	Text	Text to be displayed in the label
	Source Property	Value of any other Vertex objects property to be displayed as Text. Please make sure to empty the “Text” property to see the Source Property Value. Manually typed Text will overwrite any incoming Source Property Value.
	Font	Select one Font from the dropdown menu
	Font Decoration	Select one Font Decoration from the dropdown menu
	Font Style	Select one Font Style from the dropdown menu
	Font Weight	Select one Font Weight from the dropdown menu
	Font Color	Color property (Font)

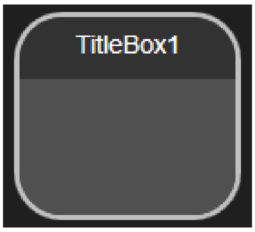
Design		
	Font Size	Define the Font Size
	Trim End	Qty of characters to trim the Text (or Source Property Value) at the end
	Trim Start	Qty of characters to trim the Text (or Source Property Value) at the beginning
	Multiline Text	Alignment of multiline Text
	Shadow	(parent property) Activate/ deactivate s Shadow for the Text
	Color	Color property (Shadow)
	Softness	Softness of the Shadow
	Offset X	X Offset of the Shadow
	Offset Y	Y Offset of the Shadow
	Horizontal Alignment	Horizontal alignment of the Text
	Vertical Alignment	Vertical alignment of the Text
	Background Color	Color property (Background of the label (default: transparent!))
	Border Color	Color property (Border of the label control (default: transparent!))
	Border Thickness	Thickness of control’s border
	Corner Radius	Corner radius of the controls background

Design		
	Web Link	Link to an external Web Page the browser shall be directed to when clicking the Label (WebView only)
DateTimeLabel		
 04/15/2024 11:32:52	A DateTimeLabel shows the current date and time. A DateTimeLabel is based on a Label. It has the same properties, except “Web Link”, plus additional.	
	Current Value	Value generated by the Control based on the selected “Format”
	Format	Select any Date & Time, Date or Time format from the dropdown menu
CountdownLabel		
02:20:20	A CountdownLabel shows the remaining time to a specified target date. A CountdownLabel is based on a Label. It has the same properties, except “Web Link”, plus additional.	
	Current Value	Value generated by the Control based on the selected “Format” and “Target Date”
	Format	Select any Time format from the dropdown menu - HH:MM:SS - MM:SS - Hours (total hours left to “Target Date”) - Minutes (total minutes left to “Target Date”)) - Seconds (total seconds left to “Target Date”))

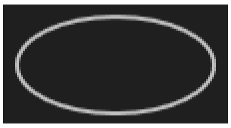
Design		
	Target Reached Text	Text to be displayed in the Label when the “Target Date” is reached
	Target Date	Target Date/Time to count down to. Format: MM/DD/YYY HH:MM:SS
Image		
	Adds an image file to ControlView.	
		
	Size Mode	Refers to Property “Content” Options: - None: Image Content will be displayed in the controls frame in native resolution. Positioned in center - Fill: Image Content will be stretched to fit the control frames size - Uniform: Image Content will be scaled proportionally to fit the control frames size - UniformToFill: Image Content will be scaled proportionally to fill the control frames size
	Content	Select or drag’drop any Content from the Vertex project to be displayed in the control
	Background Color	Color property (Background of the control (default: transparent!))

Design		
	Border Color	Color property (Border of the control (default: transparent!))
	Border Thickness	Thickness of control's border
	Corner Radius	Corner radius of the controls background
ToggleImage		
	Switches between two Images based on the Controls "Value". A ToggleImage control is based on an Image control. It has the same properties plus additional.	
	 OFF image	ON image
	Value	State of the toggle (activated or deactivated)
	Off Image	Image to be displayed when "Value" is off
	On Image	Image to be displayed when "Value" is on
	Source	Source Property. Assign any Vertex Objects property. This property will be the reference for the ToggleImage "Value" property.
LED		
	A LED can be used to indicate a properties state (Off/On, 0/1).	

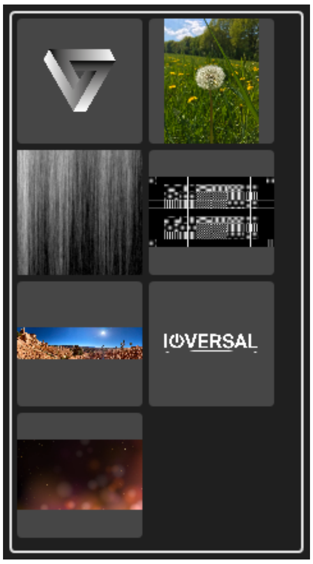
Design		
 		
	Value	State of the control
	Mode	Select from the dropdown menu: - Continous (default value. LED will represent the Values-state) - Temp Hold (if activated, LED will change the color shortly for the time defined in “Temp Hold Time” on Value change)
	Fade In Time	Time to fade to “On Color”
	Fade Out Time	Time to fade to “Off Color”
	Temp Hold Time	Refers to “Mode: Temp Hold”. Time to temporarily hold the “On Color” on “Value” change
	Source Property	Source Property. Assign any Vertex Objects property. This property will be the reference for the LEDs “Value” property
	Background Color	Color property (controls background)
	Border Color	Color property (Controls border)
	Led Background Color	Color property (LED background. Default: transparent)
	LED Border Color	Color property (LED Border. Default: transparent)
	Off Color	Color property (LED center if Value = off)
	On Color	Color property (LED center if Value = on)
	Border Thickness	Controls border thickness
	Corner Radius	Controls corner radius

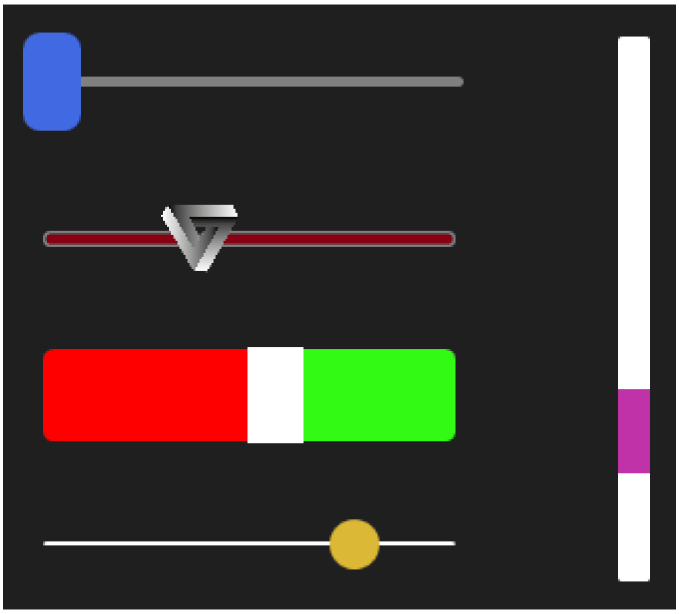
Design		
	LED Border Thickness	Thickness of LED border
TitleBox		
	Design element to entitle and surround other controls.	
	Caption	(parent property)
	Show Caption	Activate/ deactivate Caption
	Text	Text to be displayed in the TitleBox's title
	Source Property	Value of any other Vertex objects property to be displayed as Text. Please make sure to empty the "Text" property to see the Source Property Value. Manually typed Text will overwrite any incoming Source Property Value.
	Font	Select one Font from the dropdown menu
	Font Decoration	Select one Font Decoration from the dropdown menu
	Font Style	Select one Font Style from the dropdown menu
	Font Weight	Select one Font Weight from the dropdown menu
	Font Color	Color property (Font)
	Font Size	Define the Font Size
	Trim End	Qty of characters to trim the Text (or Source Property Value) at the end

Design		
	Trim Start	Qty of characters to trim the Text (or Source Property Value) at the beginning
	Multiline Text	Alignment of multiline Text
	Shadow	(parent property) Activate/ deactivate s Shadow for the Text
	Color	Color property (Shadow)
	Softness	Softness of the Shadow
	Offset X	X Offset of the Shadow
	Offset Y	Y Offset of the Shadow
	Body Background	Color property (body)
	Title Background	Color property (title)
	Titlebox Border Color	Color property (border)
	Titlebox Border Thickness	Border Thickness
	Titlebox Corner Radius	Corner Radius
Border		
	Design element to surround other controls. Can also be used to draw a line if width or height is small enough.	

Design		
	Background Color	Color property (background)
	Border Color	Color property (border)
	Border Thickness	Border Thickness
	Corner Radius	Corner Radius
Ellipse		
	Design element.	
	Background Color	Color property (controls background)
	Border Color	Color property (controls border)
	Ellipse Fill Color	Color property (ellipse’s background)
	Ellipse Border Color	Color property (ellipse’s border)
	Border Thickness	Controls border thickness
	Corner Radius	Controls corner radius
	Ellipse Border Thickness	Ellipse’s border thickness

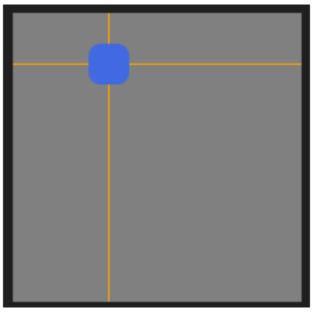
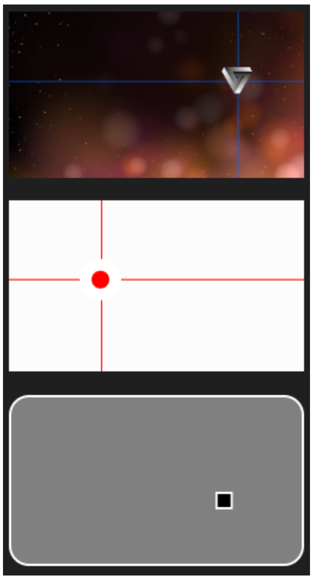
Input
ContentPanel

Input		
	Overview of all Contents of a selected Collection. The last selected Content item is stored in a control’s property for further utilization. This control can be used for an end-user friendly content management system.	
	Size Mode	Size Mode of the content items Options: - None: Image Content will be displayed in the items in native resolution. Positioned in center - Fill: Image Content will be stretched to fit the items size - Uniform: Image Content will be scaled proportionally to fit the items size - UniformToFill: Image Content will be scaled proportionally to fill the items size
	Item Height	Height of the single content items
	Item Width	Width of the single content items
	Max Count	Maximum content items in this ContentPanel
	StartIndex	Start-Offset of Content items
	Content Collection	Select a Content Collection to be used as source for the ContentPanel
	Selected Content	This property stores the last selected item. Value is a Content Object (IDs etc. can be read out via Scripting, e.g. ControlViewID.Controls.ContentPanelID.SelectedContent.GetId)
	Target Content Property	A selected content item can get automatically assigned to any Vertex Clips “Main Content” property. Thus, the selected file could get rendered immediately after clicking without any further scripting.
	Background Color	Color property (controls background)
	Border Color	Color property (controls border)

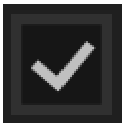
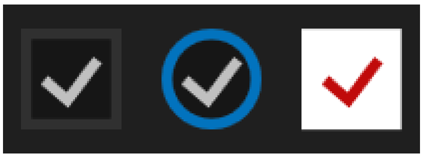
Input		
	Item Background Color	Color property (Items background)
	Item Border Color	Color property (Items border)
	Border Thickness	Controls border thickness
	Corner Radius	Controls corner radius
	Item Border Thickness	Items border thickness
	Item Border Corner Radius	Items border corner radius
	Item Gap Size	Size of the gap in between items
Slider		
	Change a value by moving a Slider’s handle in a specified range. Note: Once dragging any Vertex objects property onto a ControlViews Page, Vertex can automatically create a Slider with a reference (assigned Source Property) to this property.	
		

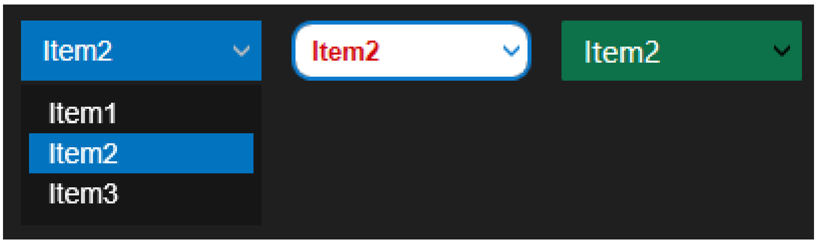
Input		
	Value	Value generated by the slider in a linear range in between the “Min” and “Max” value
	Orientation	Select from dropdown menu: - Horizontal (left – right) - Vertical (down - up)
	Value Changed Script	Script will get executed every time the value changes
	Value Changed WebScript	Script will get executed every time the value changes in Web only
	Source Property	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value” property
	Invert Property	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value” property, but will receive an inverted Value
	Invert	Invert the value
	Increment	Increment that will be applied to the Value when clicking on the sliders track instead of dragging the handle
	Max	Maximum Value of the slider
	Min	Minimum Value of the slider
	Handle Size W	Width of the handle
	Handle Size H	Height of the handle
	Background Content	Select or drag’drop any Content from the Vertex project to be displayed in the sliders background
	Handle Content	Select or drag’drop any Content from the Vertex project to be displayed in the sliders handle

Input		
	Background Size Mode	Size Mode of the Background Content Options: - None: Image Content will be displayed in the sliders background in native resolution. Positioned in center - Fill: Image Content will be stretched to fit the sliders background - Uniform: Image Content will be scaled proportionally to fit the sliders background - UniformToFill: Image Content will be scaled proportionally to fill the sliders background
	Handle Size Mode	Size Mode of the Handle Content Options: - None: Image Content will be displayed in the sliders Handle in native resolution. Positioned in center - Fill: Image Content will be stretched to fit the sliders Handle - Uniform: Image Content will be scaled proportionally to fit the sliders Handle - UniformToFill: Image Content will be scaled proportionally to fill the sliders Handle
	Background Color	Color property (controls background)
	Border Color	Color property (controls border)
	Handle Border	Color property (handle border background)
	Handle Color	Color property (handle color border)
	Track Max Border	Color property (color of track-border above handle)
	Track Max Color	Color property (color of track above handle)
	Track Min Border	Color property (color of track-border below handle)
	Track Min Color	Color property (color of track below handle)
	Border Thickness	Controls border thickness

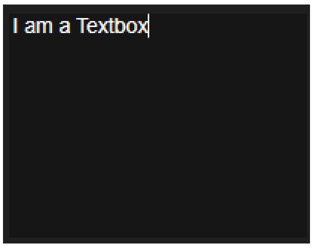
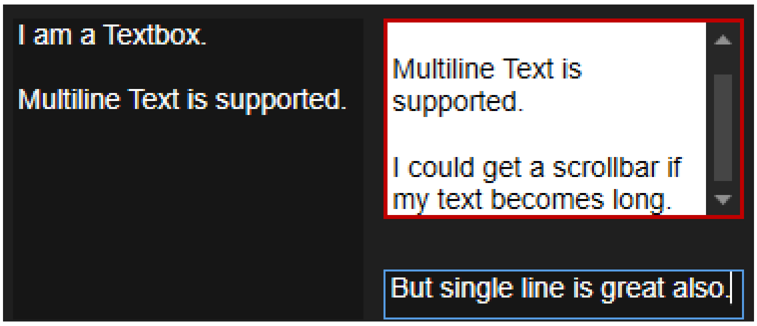
Input		
	Corner Radius	Controls corner radius
	Handle Border Size	Border size of the sliders handle
	Handle Corner Radius	Corner radius of the sliders handle
	Track Border Size	Border size of the track
	Track Corner Radius	Corner radius of the track
	Track Size	Size of the track
Slider2D		
	Change two values by moving a Slider’s handle in a specified range for both axis. The Slider2Ds property-set is pretty much comparable to the basic Sliders properties but offers additional properties to support a second axis. Use this Control to e.g. work with transform X/Y properties of Clips or with coordinates of Geometry Modifier FFD points for simple re-calibration.	
	Value X	X- Value generated by the slider in a linear range in between the “Min X” and “Max X” value
	**Value Y**	Y- Value generated by the slider in a linear range in between the “Min Y” and “Max Y” value
	Source X	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value X” property
	Source X Invert	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value X” property, but will receive an inverted Value
	Source Y	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value Y” property

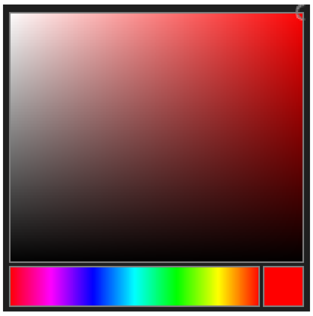
Input		
	Source Y Invert	Source Property. Assign any Vertex Objects property. This property will be the reference for the Sliders “Value Y” property, but will receive an inverted Value
	Invert X	Invert the Value X
	Invert Y	Invert the Value Y
	Min X	Minimum ValueX of the slider
	Max X	Maximum ValueX of the slider
	Min Y	Minimum ValueY of the slider
	Max Y	Maximum ValueY of the slider
	Show Cross	Deactive/ active the lines leading to the handle
	Cross Color	Color property (cross)
Swiper		
	The Swiper generates relative Delta Values for two axis on pressing, holding and moving the mouse. Use this Control similar to a Slider2D, but without an absolute value range.	
	Delta X	X Delta value
	Delta Y	Y Delta value
	Source X	Source Property. Assign any Vertex Objects property. This property will be fed with the Swipers Delta X values
	Source Y	Source Property. Assign any Vertex Objects property. This property will be fed with the Swipers Delta Y values

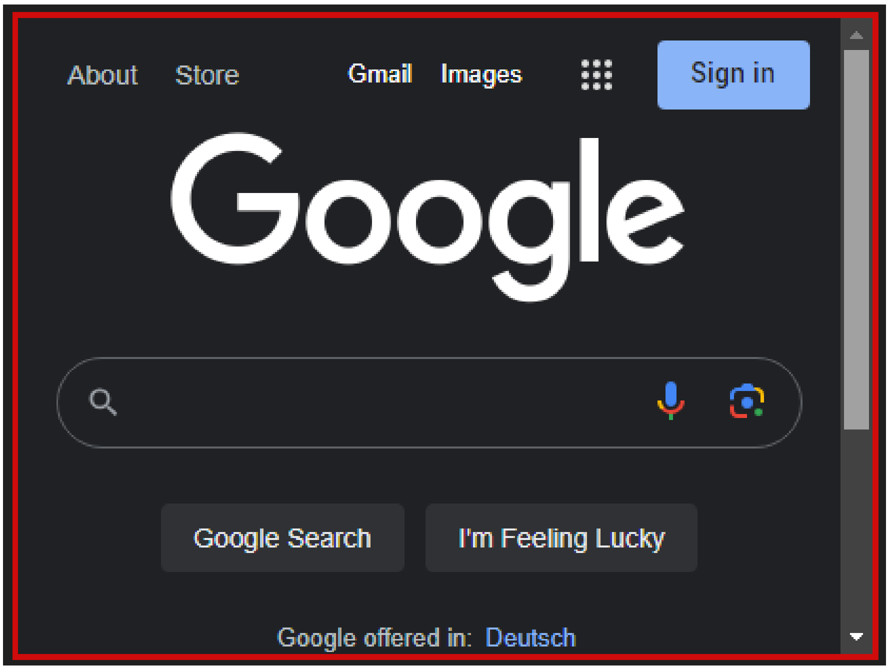
Input		
	Invert X	Invert the Value X
	Invert Y	Invert the Value Y
	Factor X	Factor to be applied on Delta X value
	Factor Y	Factor to be applied on Delta Y value
	Background Color	Color property (controls background)
	Border Color	Color property (controls border)
	Border Thickness	Controls border thickness
	Corner Radius	Controls corner radius
Checkbox		
	Select between two states: Checked and Unchecked. The event can trigger specific scripts or change a source properties value directly.	
		
	Value	Current value of the control
	Checked Script	Script Code to be executed when the Checkbox gets checked
	Unchecked Script	Script Code to be executed when the Checkbox gets unchecked
	Source	Another Vertex Objects Property to link this Checkbox “Value” to. E.g. when connected with a Clips “Mute” property, the Checkbox will switch the Mute-Property from Unmuted to Muted when checking the Checkbox and vice versa.

Input		
	Check Box Background Color	Color property (Background)
	Check Box Border Color	Color property (Border)
	Check Marker Color	Color property (Check Marker)
	Focus Color	Color property (Focus)
	Mouse Down Color	Color property (Mouse Down event)
	Mouse Over Color	Color property (Mouse over event)
	Border Thickness	Border thickness of the control
	Corner Radius	Radius of the Control
Dropdown		
	Control with a dynamic quantity of selectable values. The Dropdown control provides both, the Value of the selected item and the Index of the selected item: ControlViewID.Controls.DropDownID.SelectedValue ControlViewID.Controls.DropDownID.SelectedIndex	
		
	Selected Value	Value of the selected Item
	Items	List of items to be selectable
	On Change Script	Script to be executed once the value has changed
	Index Offset	Index Offset of the Items (e.g. when the first entry should have an Index of 0, set “Index Offset” to -1)

Input		
	Selected Index	Index of the selected item
	Source	Another Vertex Objects Property to link this Dropdowns “Selected Index” to.
	Font	(parent property)
	Style	Style of the font
	Weight	Weight of the font
	Size	Size of the font
	Font	Font Type
	Background	Color property (Background of static title)
	Border	Color property (Border of static title)
	Glyph	Color property (Glyph/ Arrow)
	List Background	Color property (List Background)
	List Border	Color property (List Border)
	List Highlight	Color property (List Hightlight)
	List Text Color	Color property (List Text)
	Text Color	Color property (Static Title Text)
	Border Thickness	Thickness of static title border
	Corner Radius	Corner Radius of static title
	List Border Thickness	Thickness of list border
	List Corner Radius	Corner Radius of list

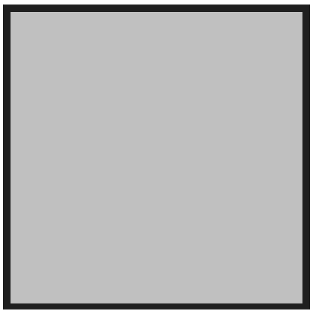
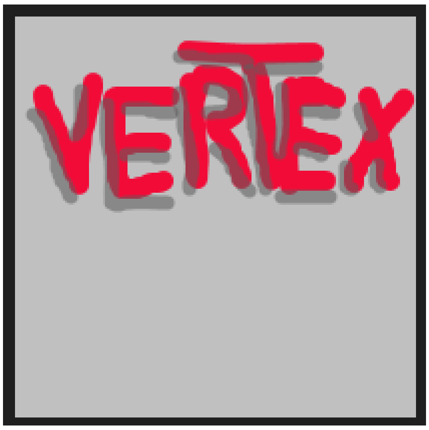
Input		
	List Highlight Corner Radius	Corner Radius of highlighted list items
Textbox		
 I am a Textbox	Input Textbox for single- or multiline text. Text could get passed directly toother Vertex objects (e.g. Text-Content) by utilizing Source Properties without further scripting.	
	 I am a Textbox. Multiline Text is supported. Multiline Text is supported. I could get a scrollbar if my text becomes long. But single line is great also.	
	Horizontal Alignment	Alignment of text in the Textbox. Select from the Dropdown menu: - Left - Center - Right
	Text	Text (Value of the Control)
	Source Property	Another Vertex Objects Property to link this Textbox “Text” value to. (e.g. Text-Property of Text Content)
	Accepts Return	If activated, pressing the keyboard return-key will be ignored when typing into the Textbox
	Show Vertical Scrollbar	If activated, a vertical scrollbar will appear in the Textbox
	Font	(parent property)
	Style	Style of the font

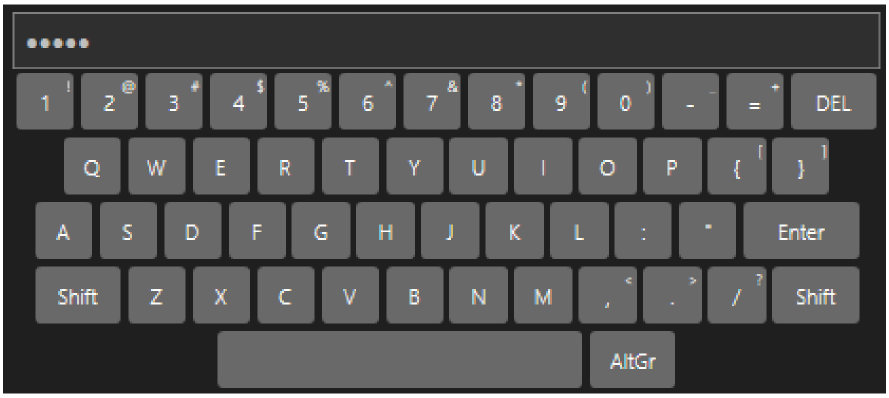
Input		
	Weight	Weight of the font
	Size	Size of the font
	Font	Font Type
	Caret Color	Color property (Caret)
	Selected Text Color	Color property (Selected Text)
	Text Color	Color property (Text)
	Textbox Background Color	Color property (Background)
	TextBox Border Color	Color property (Border)
	Textbox Border Thickness	Border Thickness of Textbox
ColorPicker		
	Intuitive Color selection. An additional slider for the Alpha channel could get activated as an option.	
	Show Alpha Slider	Slider for Alpha channel
	Color Changed	Script to be executed on change of color
	Color	Color property (selected color)
	Source Property	Another Vertex Objects Property to link this ColorPickers “Color” value to.
WebBrowser		

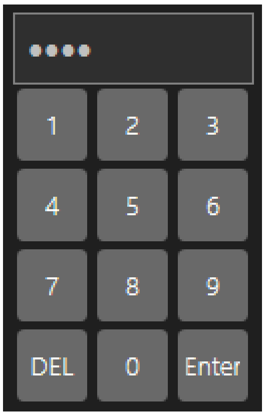
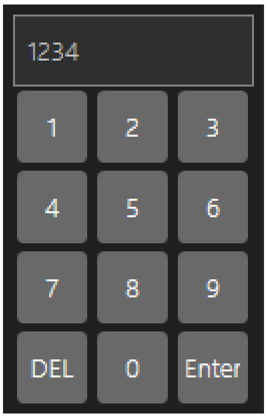
<table>
<tr><th colspan="3">Input</th></tr>
<tr><td rowspan="7"> </td><td colspan="2">WebBrowser control to embed any HTML-Site into a ControlViews Page.
Note: some websites suppress the feature to be embedded as an iframe on other pages. This will result in a blank page or an error message when using the ControlView in a Webbrowser (WebView).</td></tr>
<tr><td colspan="2">

About
Store
Gmail
Images
Sign in
Google
Google Search
I'm Feeling Lucky
Google offered in: Deutsch

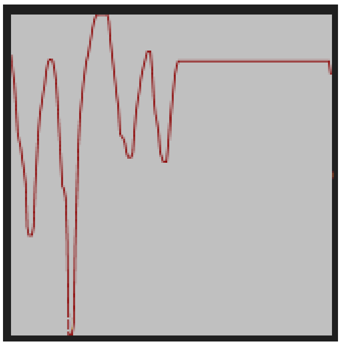
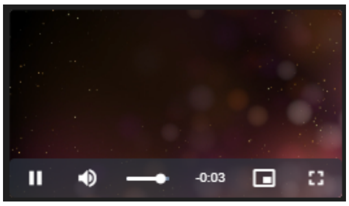
</td></tr>
<tr><td>Url</td><td>Adress of the page (LAN or web)</td></tr>
<tr><td>Background Color</td><td>Color property (Background)</td></tr>
<tr><td>Border Color</td><td>Color property (Border)</td></tr>
<tr><td>Border Thickness</td><td>Thickness of border</td></tr>
<tr><td>Corner Radius</td><td>Radius of Corners</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="3">Whiteboard</td></tr>
</table>

Input		
	The Whiteboard is an interactive control to draw on a blank canvas. Every ControlViewer and every WebClient has it’s own blank Whiteboard and instances are not synchronized. Drawn results can be stored on hard drive and optionally get imported as Content into the Vertex project.	
		
	Fit To Curve	Curve optimization
	Highlighter	Hightlight-Feature of the Pen
	Pen Color	Color property (Pen)
	Pen Size	Size of the Pens tip
	Snap Shot Path	Path on local hard drive to store the images
	Web Snapshot Overwrite	When set, alle web snapshots will use the same path and overwrite each other
	Show Web Clear Button	Clear Button below Whiteboard (WebView only)
	Show Web Controls	Controls below Whiteboard (WebView only)
	Show Web Save Button	Save Buttun below Whiteboard (WebView only)
	Webview Save Add Content	Add content to vertex project at Save (WebView only)
	Background Color	Color property (Background)

Input		
	Border Color	Color property (Border)
	Border Thickness	Thickness of border
	Corner Radius	Radius of Corners
Password		
	Keyboard Control to type in a password. If the password matches the “Password”-Value of the Control, the Script gets executed.	
	 ••••• 1 ! 2 @ 3 # 4 $ 5 % 6 ^ 7 & 8 * 9 (0) - _ = + DEL Q W E R T Y U I O P { [}] A S D F G H J K L : " Enter Shift Z X C V B N M , < . > / ? Shift AltGr	
	Language	Select a keyboard layout from the dropdown menu
	Script Code	Script Code to be executed if the password is correct
	Password	Password to be typed in
	Background Color	Color property (Background)
	Border Color	Color property (Border)
	Key Background Color	Color property (Key Background)
	Border Thickness	Thickness of Control Border
	Corner Radius	Radius of Control Corners
	Key Corner Radius	Radius of Key Corners

Input		
PinCode		
	PinCode Control to type in a pin code. If the pin code matches the “Pin Code”-Value of the Control, the Script gets executed.	
	Script Code	Script Code to be executed if the pin code is correct
	Pin Code	Pin Code to be typed in
	Background Color	Color property (Background)
	Border Color	Color property (Border)
	Key Background Color	Color property (Key Background)
	Border Thickness	Thickness of Control Border
	Corner Radius	Radius of Control Corners
	Key Corner Radius	Radius of Key Corners
KeyPad		
	KeyPad Control to type in a numerical value.	
	Script Code	Script Code to be executed when pressing “Enter” in the control
	Current Value	Code Value typed in
	Background Color	Color property (Background)
	Border Color	Color property (Border)
	Key Background Color	Color property (Key Background)
	Border Thickness	Thickness of Control Border

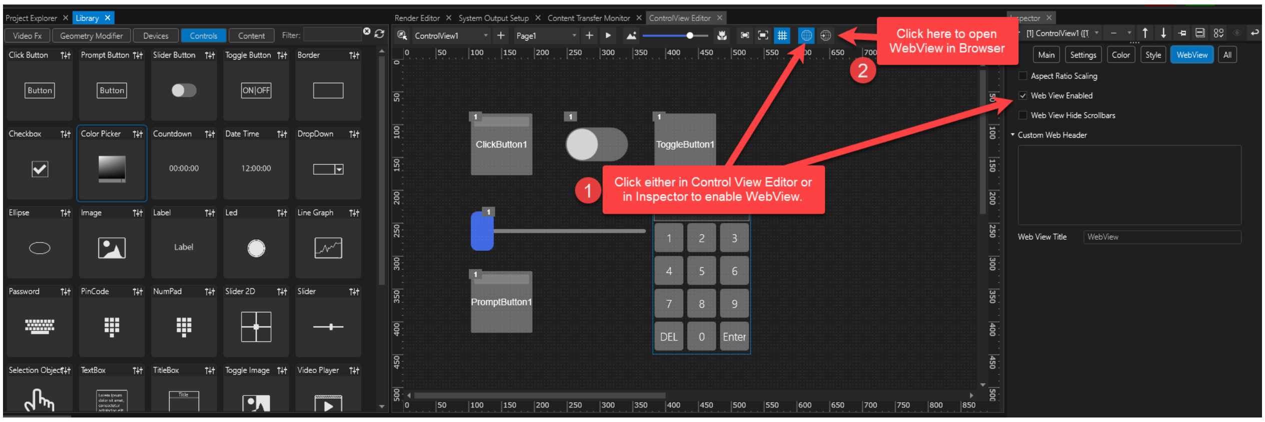
Input		
	Corner Radius	Radius of Control Corners
	Key Corner Radius	Radius of Key Corners

Output		
Line Graph		
	Control to plot values on a time scale.	
	Source Property	Assign any Vertex objects property to this control to plot it's value changes.
	Background Color	Color property (Background)
	Border Color	Color property (Border)
	Border Thickness	Thickness of Control Border
	Corner Radius	Radius of Control Corners
Video Player		
 	Embeds video content of a Vertex Project.	
	Size Mode	Size Mode of the content items Options: - None: Video Content will be displayed in native resolution. Positioned in center inside the controls boundaries - Fill: Video Content will be stretched to fit the controls size - Uniform: Video Content will be scaled proportionally to fit the controls size

Output		
		UniformToFill: Video Content will be scaled proportionally to fill the controls size
	Transport	Select from the dropdown menu: - Stop - Play (and loop) - Pause
	Volume	Volume of the VideoPlayer
	Video Content	Content Property
	Show Playback Controls	Activates/ deactivates the Playback Control Buttons (WebView only)
	Background Color	Color property (Background)
	Border Thickness	Thickness of Control Border
	Corner Radius	Radius of Control Corners

5.7.2 WebView

- **Web View** allows VERTEX' **Control View** to be **accessed by any device in the same local network through any web browser**.
- Web View's URL needs to start with `https://www.`
- Control View and Web View are passing values in **java script for WebScripts only.**



1 Click either in Control View Editor or in Inspector to enable WebView.

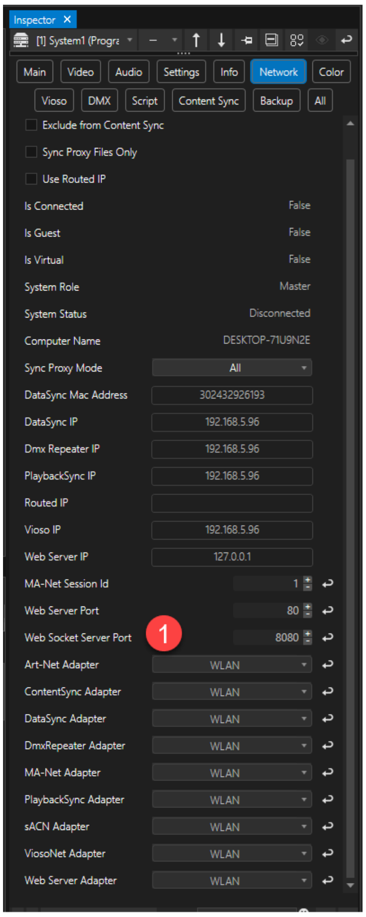
2 Click here to open WebView in Browser

☑ Web View Enabled

Use of Custom Fonts in ControlView and WebView

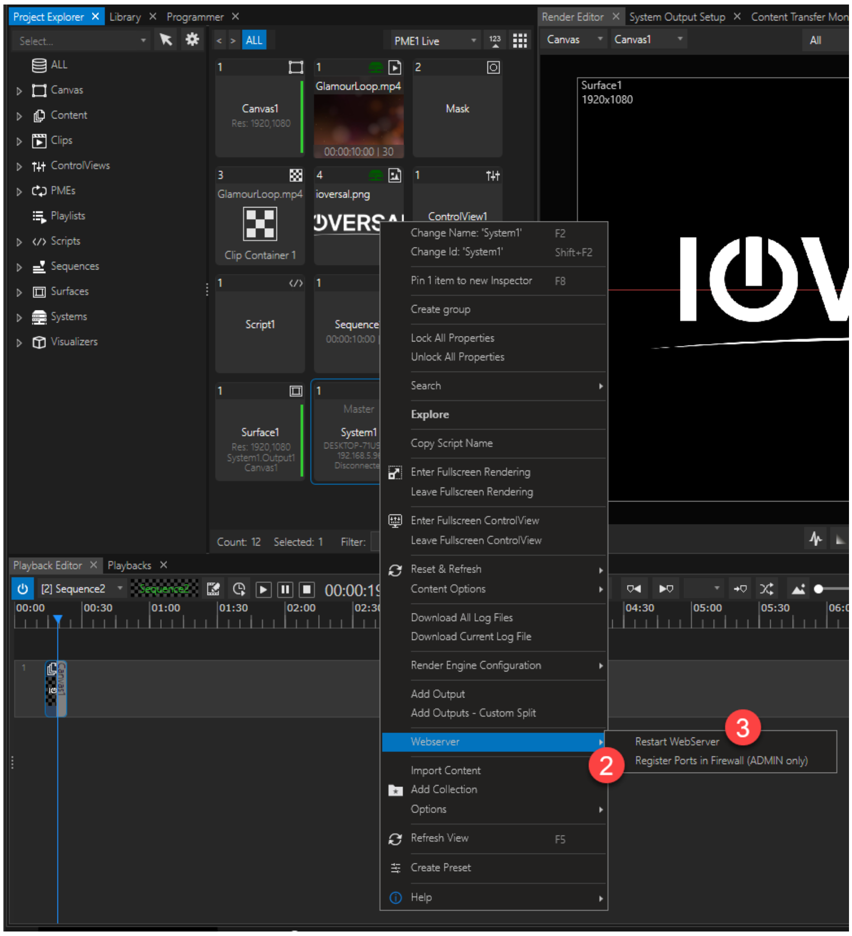
Custom fonts added to the master system and appear correctly throughout your Vertex Session in ControlView, may not be displayed correctly in WebView. To ensure fonts are delivered to devices that do not have them installed locally, they must be placed in the following directory: `C:\Users\Public\Documents\ioversal\Vertex\User\Fonts`. This folder must exist on all systems used as web servers.

Change WebServer and Websocket Port (if needed)



☐ Exclude from Content Sync
☐ Sync Proxy Files Only
☐ Use Routed IP

Is Connected	False
Is Guest	False
Is Virtual	False
System Role	Master
System Status	Disconnected
Computer Name	DESKTOP-71U9N2E
Sync Proxy Mode	All
DataSync Mac Address	302432926193
DataSync IP	192.168.5.96
Dmx Repeater IP	192.168.5.96
PlaybackSync IP	192.168.5.96
Routed IP	
Vioso IP	192.168.5.96
Web Server IP	127.0.0.1
MA-Net Session Id	1
Web Server Port	80
Web Socket Server Port	8080
Art-Net Adapter	WLAN
ContentSync Adapter	WLAN
DataSync Adapter	WLAN
DmxRepeater Adapter	WLAN
MA-Net Adapter	WLAN
PlaybackSync Adapter	WLAN
sACN Adapter	WLAN
ViosoNet Adapter	WLAN
Web Server Adapter	WLAN



1. Select your System in Project Explorer and go to *Inspector > Settings > Network* to set Web Server Port (default 80) and Websocket Server Port (default 8080).
2. After you change the default ports you will need to go to *Project Explorer > System > Context Menu (right-click)> Webserver* and *Register Port in Firewall*...
3. ...then *Restart WebServer* in order for the changes to take effect.

Button Controls (ClickButton, Slider, Toggle, Upload etc) have an Inspector tab called WebView which allows the use of WebScripts such as:

```
Controls.ButtonSlider1.GetState()
Controls.ButtonSlider1.SetState(value)
Controls.Label1.GetText()
Controls.Label1.SetText(value)
Controls.Textbox1.GetText()
Controls.Textbox1.SetText(value)
Controls.Slider1.GetValue()
Controls.Slider1.SetValue(value)
Controls.Whiteboard1.ShowColorButton(value)
Controls.Whiteboard1.ShowColorPicker()
Controls.Whiteboard1.ShowPenSizeControl(value)
Controls.Whiteboard1.SetPenSize(size)
Controls.Whiteboard1.SetPenColor(color)
Controls.Whiteboard1.ShowEraser(value)
Controls.Whiteboard1.ToggleEraser()
Controls.Whiteboard1.ShowClearButton(value)
Controls.Whiteboard1.ShowSaveButton(value)
Controls.Whiteboard1.Save()
Controls.Whiteboard1.Clear()
Controls.Led1.GetState()
Controls.Led1.SetState(value)
Controls.ColorPicker1.GetColor()
Controls.ColorPicker1.SetColor(value)
Controls.CheckBox1.GetState()
Controls.CheckBox1.SetState(value)
Controls.ToggleImage1.GetState()
Controls.ToggleImage1.SetState(value)
Controls.WebBrowser1.SetUrl(value)
Controls.DropDown1.GetSelectedIndex()
Controls.DropDown1.SetSelectedIndex(value)
Controls.DropDown1.GetSelectedText()
Controls.ToggleButton1.GetState()
Controls.ToggleButton1.SetState(value)
WebView.Reload()
WebView.GotoPage(page)
WebView.Goto(webView, page)
```

5.8 Devices

- Control **different types of external devices** directly from VERTEX
- Select a device from **library** and add it to your project
- Set device parameters with **script commands or from the Inspector window**

Workflow

VERTEX features an **abstract device model** that enables users to **control various types of devices.** Some of the device properties can be animated via keyframes like the ones of DMX-Devices for instance. Also, all device parameters are accessible with VERTEX script commands.

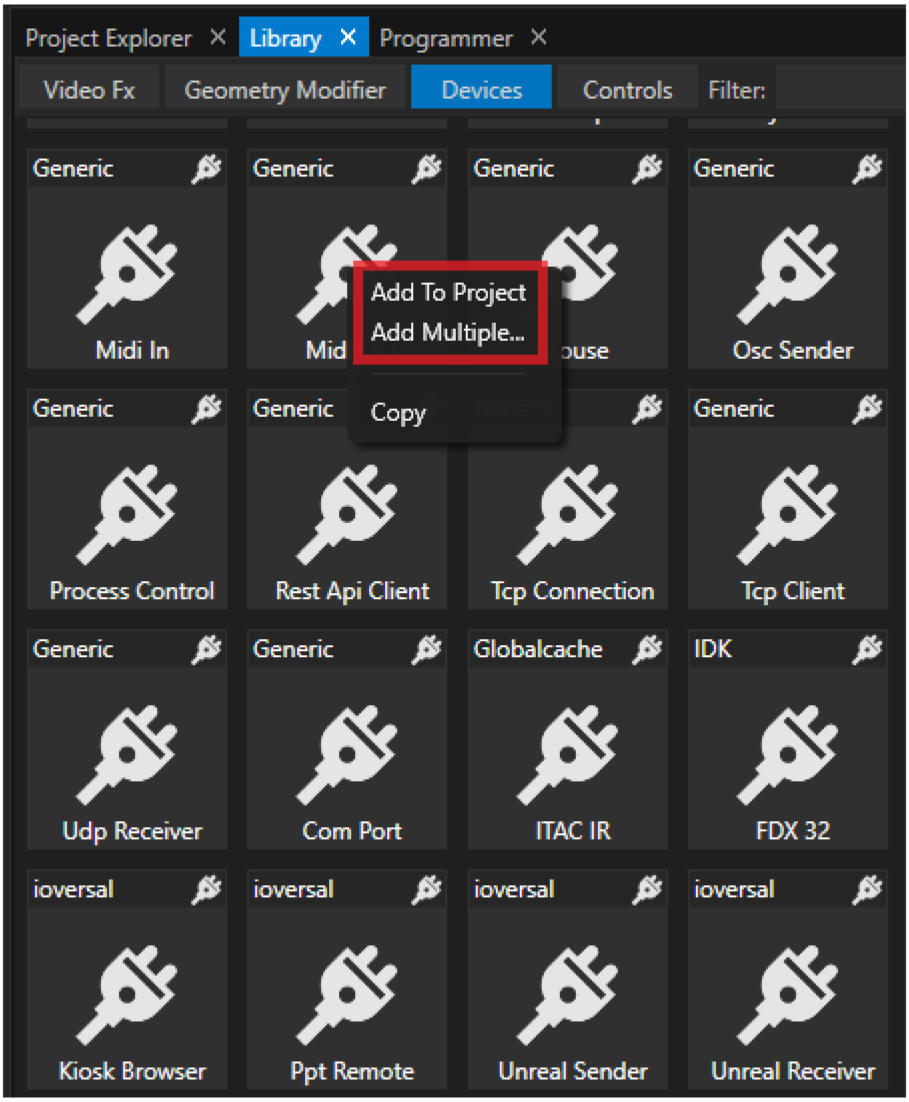
Regardless of the device type and its range of parameters, the basic workflow is always the same:

1. **Open the library editor and search for a device**
2. **Add the device to your project**
3. **Select device in the project explorer**
4. **Do connectivity and protocol settings in Inspector**
5. **Access device parameters with vertex script commands**

   or
6. **use a device in a clip container**

Troubleshooting: Reconnect a Device

Devices in Library Editor



- **Open the library**
- **Search for the device** you want to use
  use the search filter and search by names
- **Right-click with your mouse** and select whether you want to **add only one or multiple devices** to your project

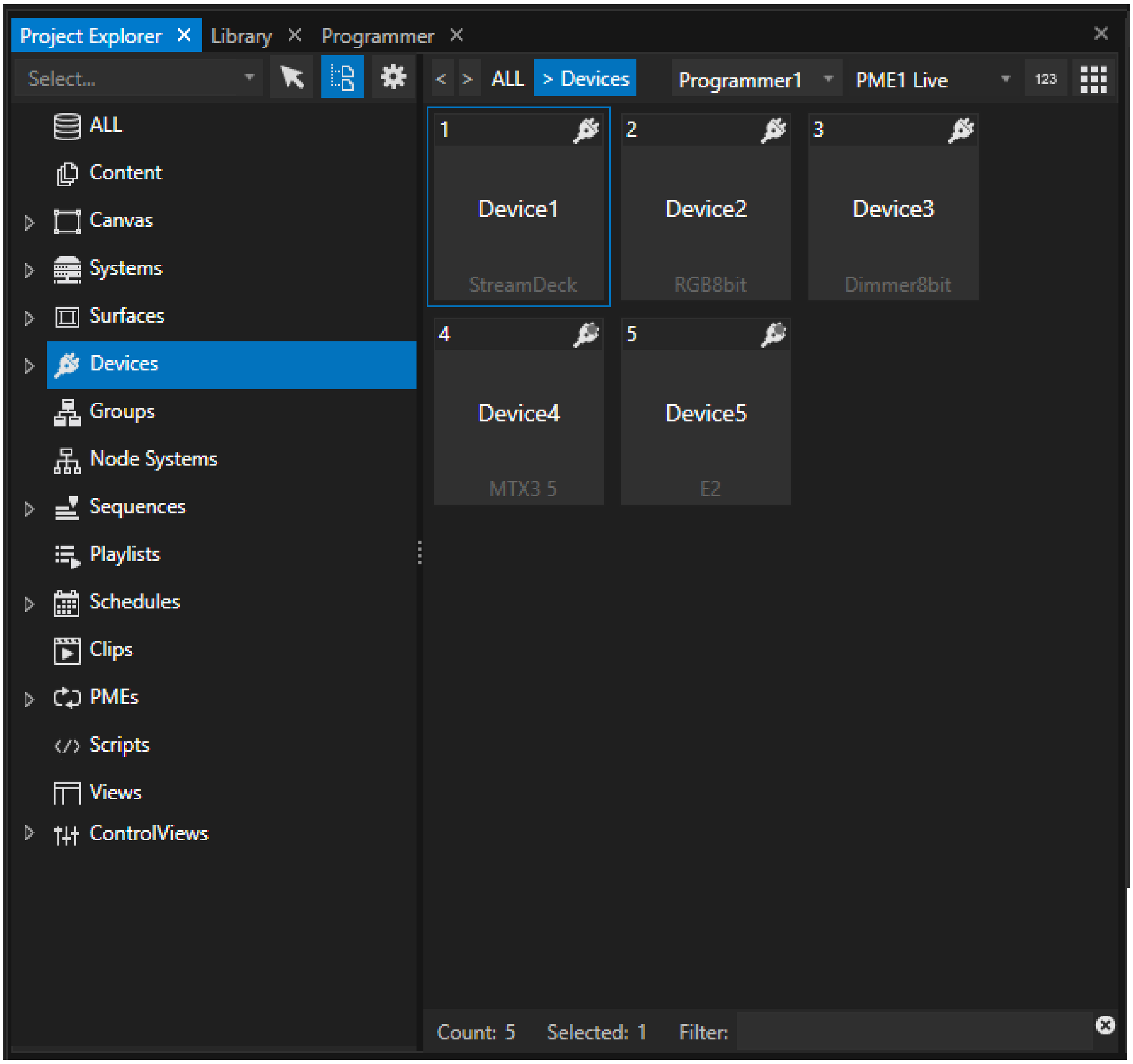
ⓘ **Directory and Folder for Devices**

You are able to write your own device templates and add them to the VERTEX library.
You have to save your custom devices with the file extension .vxdi
Devices that come with VERTEX are encrypted in .vxdx format

Directory and Folder:
C:\Users\Public\Documents\ioversal\Vertex\[Vertex Assembly Version]\Devices

You are allowed to create own subfolders or copy your device into an already existing subfolder

Devices in Project Explorer



The **Devices manager in the Project Explorer** contains every device that has been added to your project .

Depending on the device type, a connection status is shown:
Red: connection refused or not possible
Orange: trying to establish connection
Green: connected

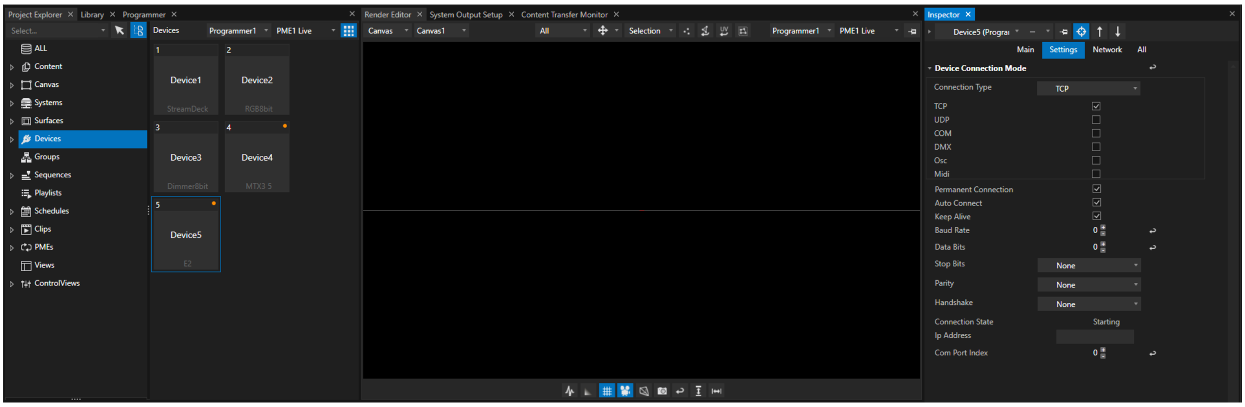
Connection settings like ports or IP Address could be done in the **inspector.**

Connection status into Project Explorer only for certain types of Devices

Some device types like DMX Devices or TCP Senders do not have a connection status by device design

For this Devices the status is not shown into Project Explorer

Connectivity and Protocol Settings



Device Connection Mode

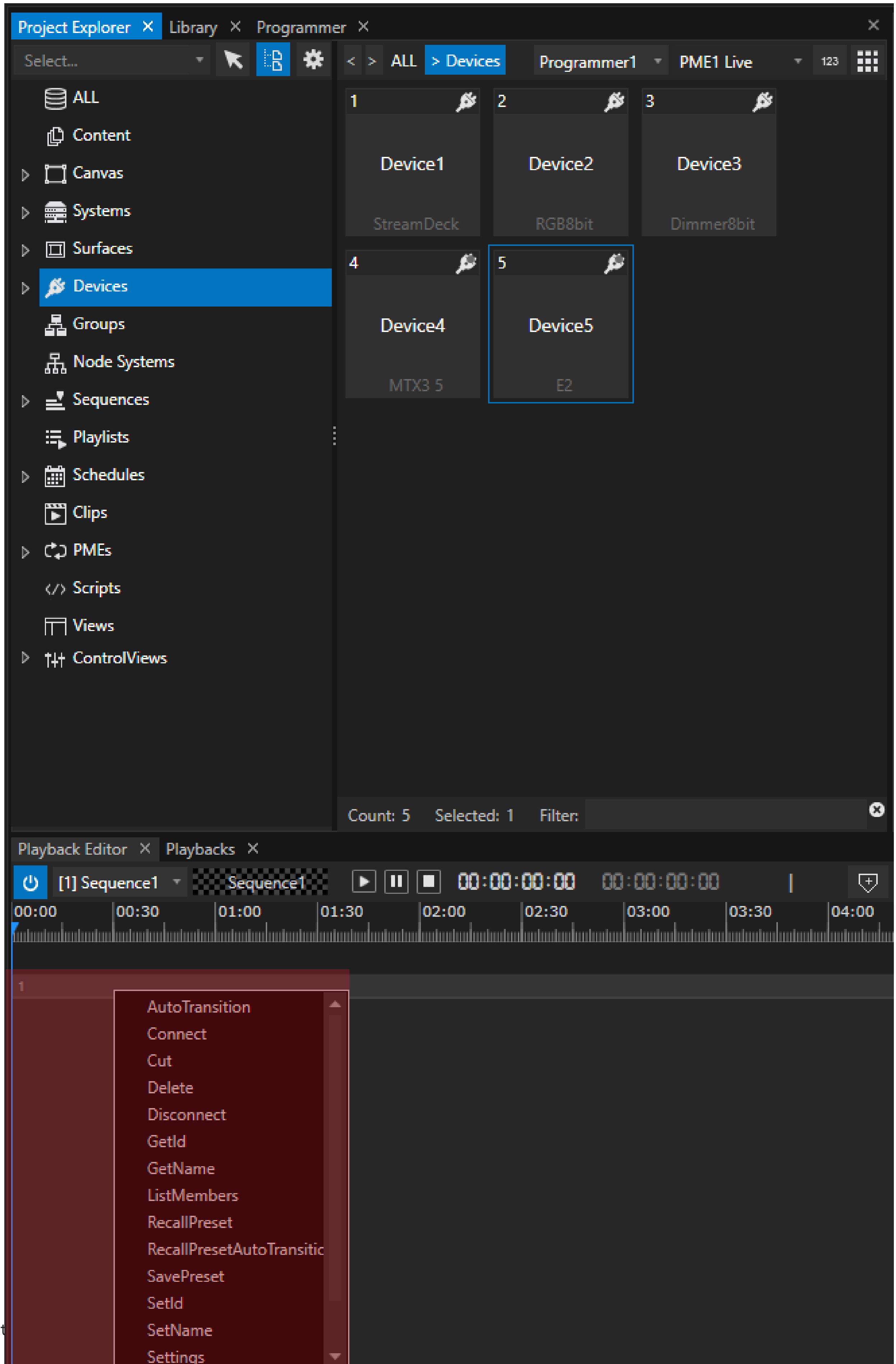
Connection Type	TCP
TCP	☑
UDP	☐
COM	☐
DMX	☐
Osc	☐
Midi	☐
Permanent Connection	☑
Auto Connect	☑
Keep Alive	☑
Baud Rate	0
Data Bits	0
Stop Bits	None
Parity	None
Handshake	None
Connection State	Starting
Ip Address	
Com Port Index	0

Select a Device in the project explorer and do the **connectivity and protocol settings in the inspector.**

Within the device library that is shipped with VERTEX, our team has tested the connectivity for most of the included devices. **All connectivity and protocol settings are set according to the manufacturer's specification**.

If you have problems to connect one of the devices, don't hesitate to contact VERTEX Support (vertex.support@rossvideo.com) or open a ticket directly from within VERTEX (Main Menu -> help --> Create new Ticket).

Use Devices with Script Commands

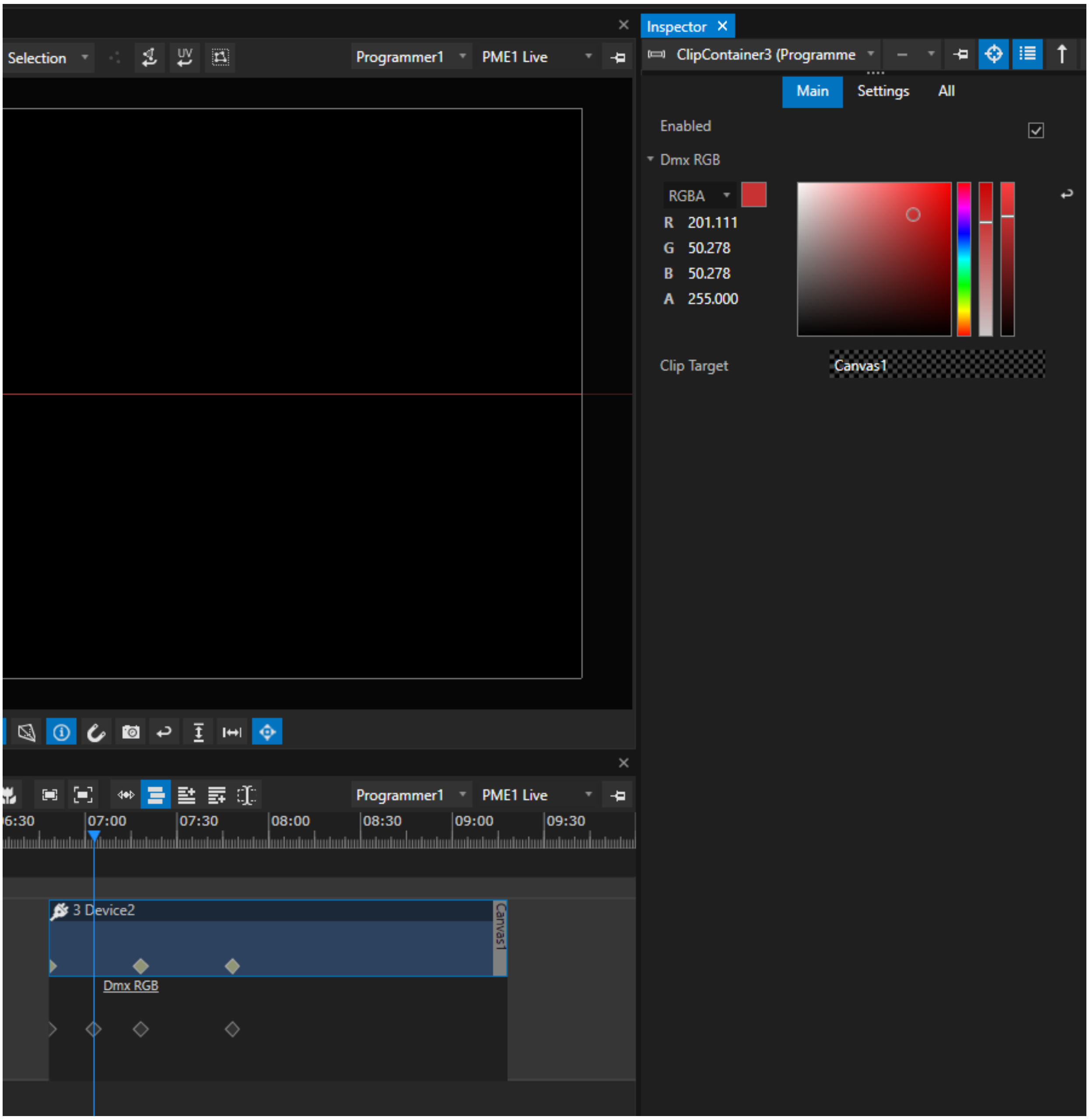

Project Explorer
Library
Programmer
Select...
ALL
Content
Canvas
Systems
Surfaces
Devices
Groups
Node Systems
Sequences
Playlists
Schedules
Clips
PMEs
Scripts
Views
ControlViews
< > ALL > Devices
Programmer1
PME1 Live
123
1 Device1 StreamDeck
2 Device2 RGB8bit
3 Device3 Dimmer8bit
4 Device4 MTX3 5
5 Device5 E2
Count: 5
Selected: 1
Filter:
Playback Editor
Playbacks
[1] Sequence1
Sequence1
00:00:00:00
00:00:00:00
00:00
00:30
01:00
01:30
02:00
02:30
03:00
03:30
04:00
1
AutoTransition
Connect
Cut
Delete
Disconnect
GetId
GetName
ListMembers
RecallPreset
RecallPresetAutoTransitic
SavePreset
SetId
SetName
Settings

Each device from a manufacturer has its own parameters and options.
This **options and parameters** are **accessible with VERTEX Script commands**.

Use script commands in cues, clip containers, on system startup, in a playlist,
or in a trigger editor to script your device interaction.

For some kind of devices - like DMX Devices also **keyframe animation** is possible.
For **some devices** (like e.g. the Elgato Stream Deck) **you only have to do the global settings into Inspector to work with.**

Use Device as a Clip Container



Enabled ☑

Dmx RGB

RGBA

R 201.111

G 50.278

B 50.278

A 255.000

Clip Target Canvas1

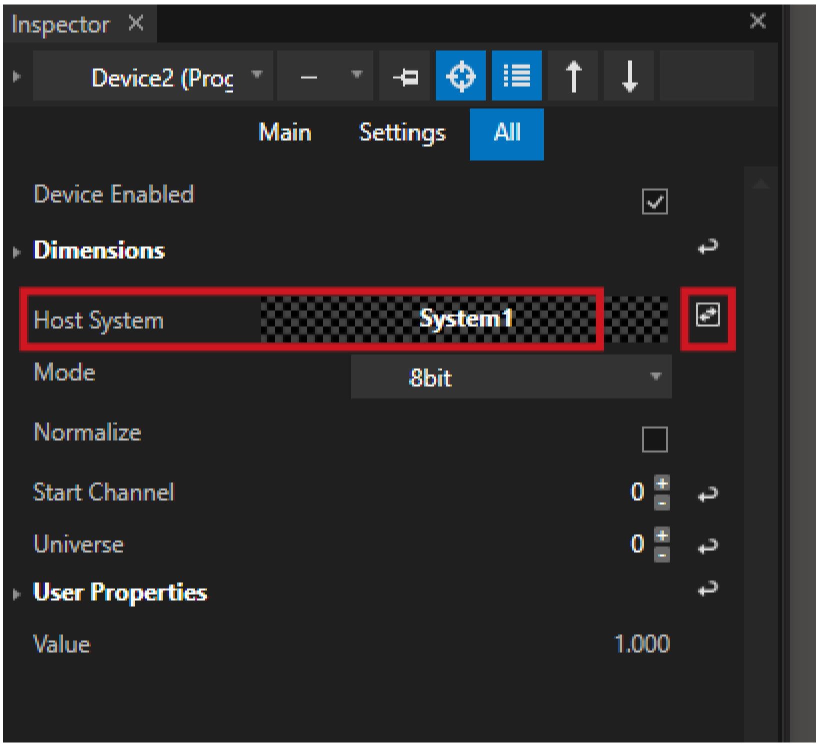
Some Devices like **DMX Dimmer and DMR RGB** devices could be **animated with keyframes.**

Just drag the device from project explorer with your mouse and drop it **into the playback editor.**

A **clip container** is created.

Connection Problems - Host System and Reconnect

- If there are **connection problems with your device**, please try a **reconnect** first of all.



Device Enabled ☑

Dimensions

Host System System1

Mode 8bit

Normalize □

Start Channel 0

Universe 0

User Properties

Value 1.000

- Select your device in the **inspector**
- Every Device has a **property for Host System** (The VERTEX system your device is connected to). Please first check is this is correctly set
  If not and if you are working with **multiple systems**, drag another system from project explorer to this property field.
- Next to this property, there is a **reconnect button** that refreshes to connection to this device.

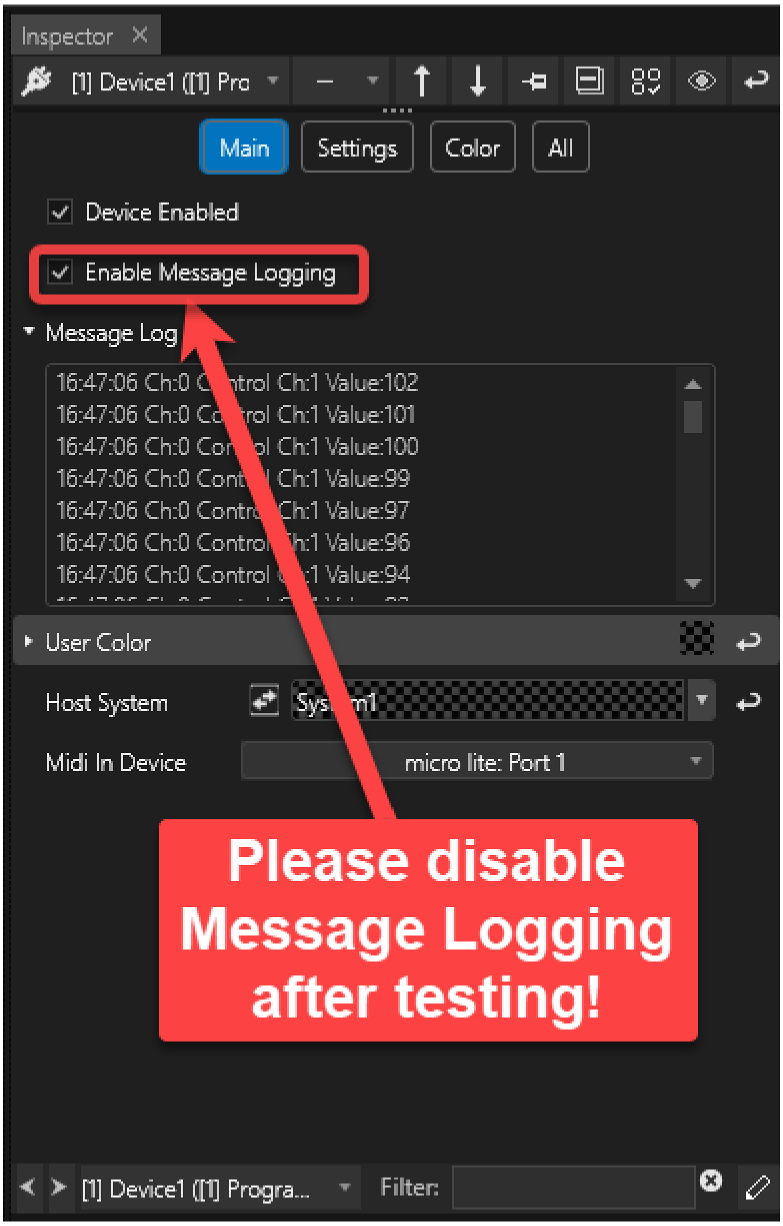
Reconnect by Script

- A reconnect also is possible by script with the command **ResetConnection**

```
Device1.ResetConnection
```

Logging Device Data

Some devices can *log incoming messages for testing purposes*. However, **we strongly recommend to disable this feature when going live** so that you won't use too much bandwidth for all that controller data. This is especially important for CAN-Bus, Ixxat, KNX & MIDI INPUT devices.



☑ Device Enabled

☑ Enable Message Logging

Message Log

```
16:47:06 Ch:0 Control Ch:1 Value:102
16:47:06 Ch:0 Control Ch:1 Value:101
16:47:06 Ch:0 Control Ch:1 Value:100
16:47:06 Ch:0 Control Ch:1 Value:99
16:47:06 Ch:0 Control Ch:1 Value:97
16:47:06 Ch:0 Control Ch:1 Value:96
16:47:06 Ch:0 Control Ch:1 Value:94
```

User Color

Host System: System1

Midi In Device: micro lite: Port 1

Please disable Message Logging after testing!

5.8.1 Powerpoint Remote

- VERTEX is able to **control a Microsoft Powerpoint application remotely** over network
- **A background service** is able to start Microsoft Powerpoint, load a .pptx-file, jump to a slide or set a presentation into full screen
- The background service can be controlled by a **PPT Remote Device** that is part of the **VERTEX device library**

Use Cases

- You need to integrate Powerpoint with its full functionality into your project and not even import and read Powerpoint files
- Use VERTEX as master control system to remote start and control a PC with Powerpoint in your installation
- Capture the output of a Powerpoint PC as Live Input into VERTEX and control slide changes from your VERTEX timeline
- Read out notes of a Powerpoint file and display this notes as text on another screen - e.g. backstage

What you need

- a PC with Microsoft Powerpoint installed and Microsoft Windows as operating system
- a PC with VERTEX installed
- a network connection between both PCs (Wireless LAN or cabled LAN)

> **VERTEX and Powerpoint on the same PC**
> For Tests or even smaller projects with only one PC, you are even able to remote control a Microsoft Powerpoint application on the same PC on which VERTEX is running. Just use your local IP address as IP address of the PPT Remote Device

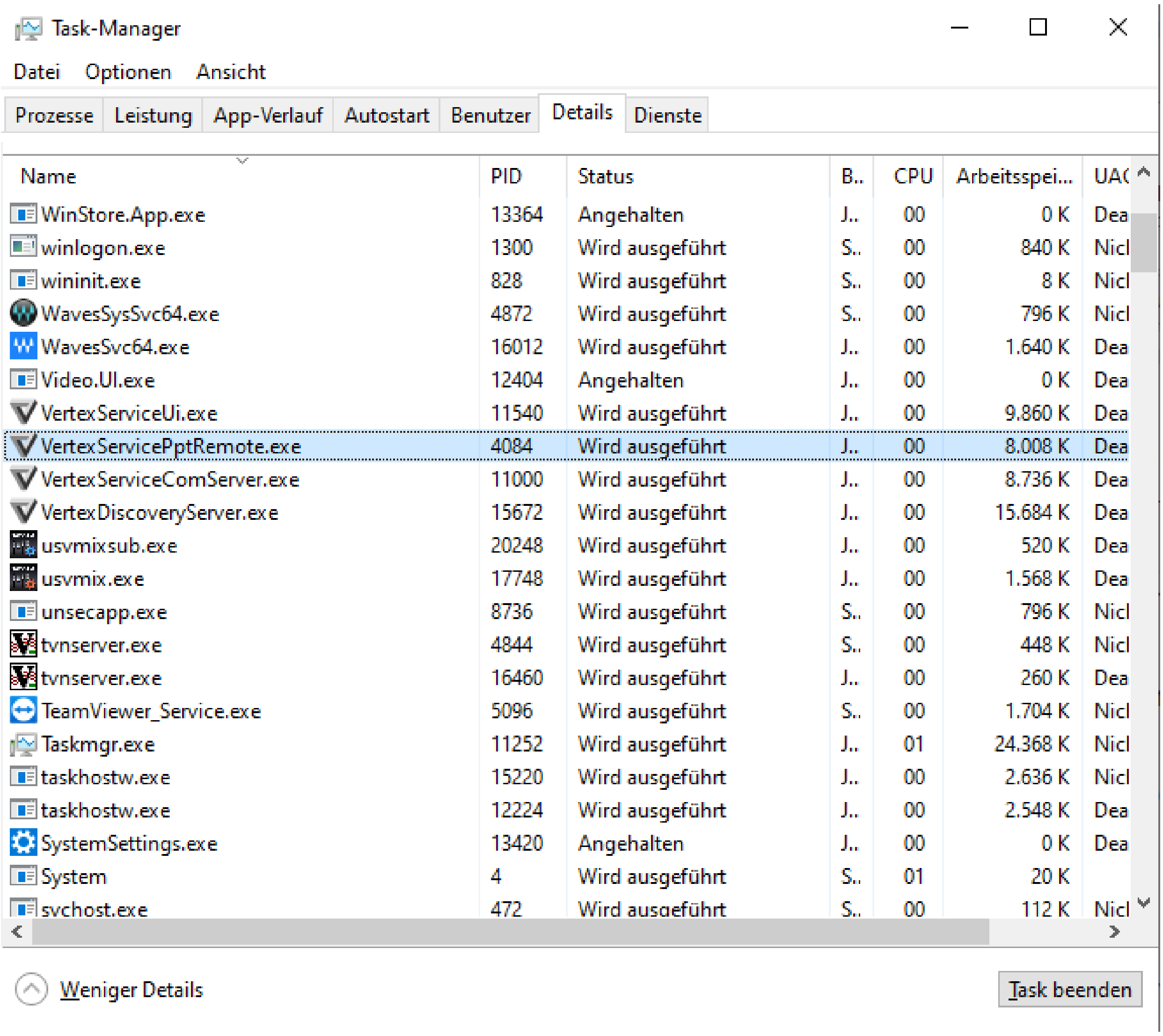
Setup

1. Prepare Powerpoint PC

- **Install Vertex on the PC where Microsoft Powerpoint already is installed.**
- **Check your Network settings,** prefer a static IP address to avoid address changes after a reboot

> **VERTEX Trial Version is enough**
> You don't need any Vertex license on the Powerpoint PC. The Vertex Trial version is enough. The Vertex installer will install a Windows background service to remote control Microsoft Powerpoint on this PC.

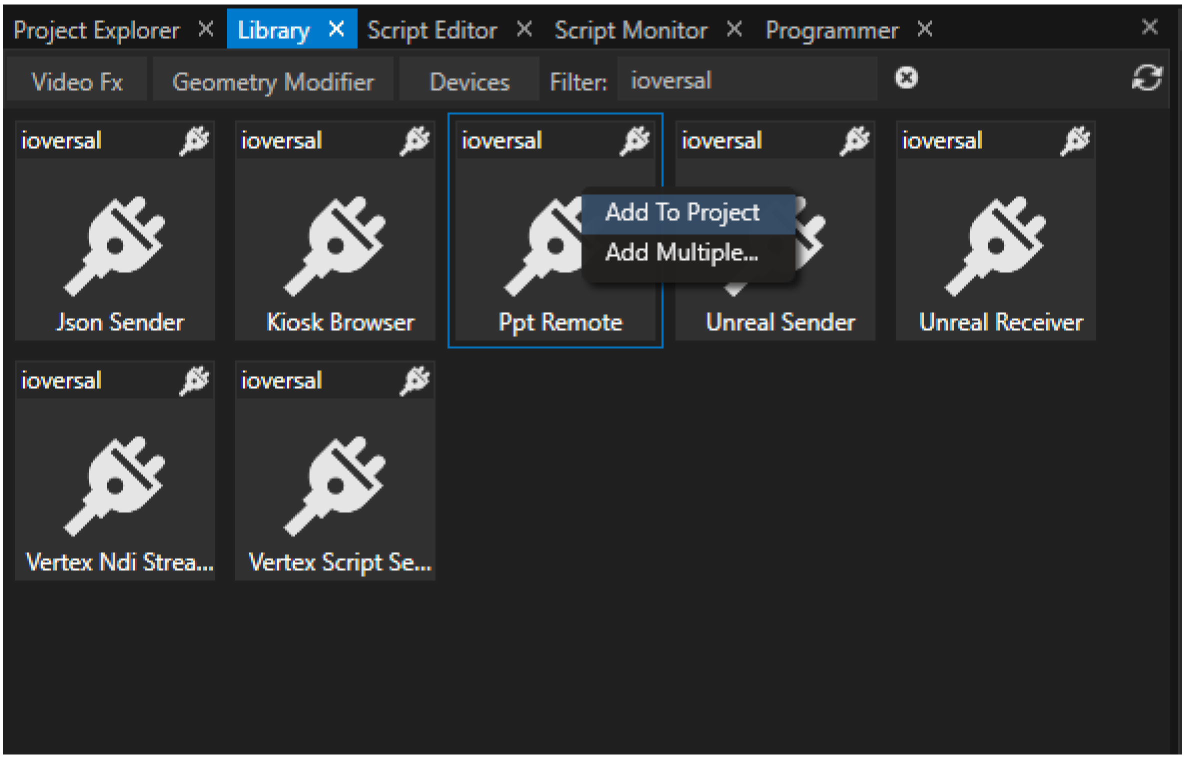
- **Reboot** the PC after installation
- Open Windows Task Manager and Check if VertexServicePptRemote.exe is running into background
- You don't have to start the main Vertex application on this computer. To remote control Powerpoint it is only necessary that all VERTEX background services are running.



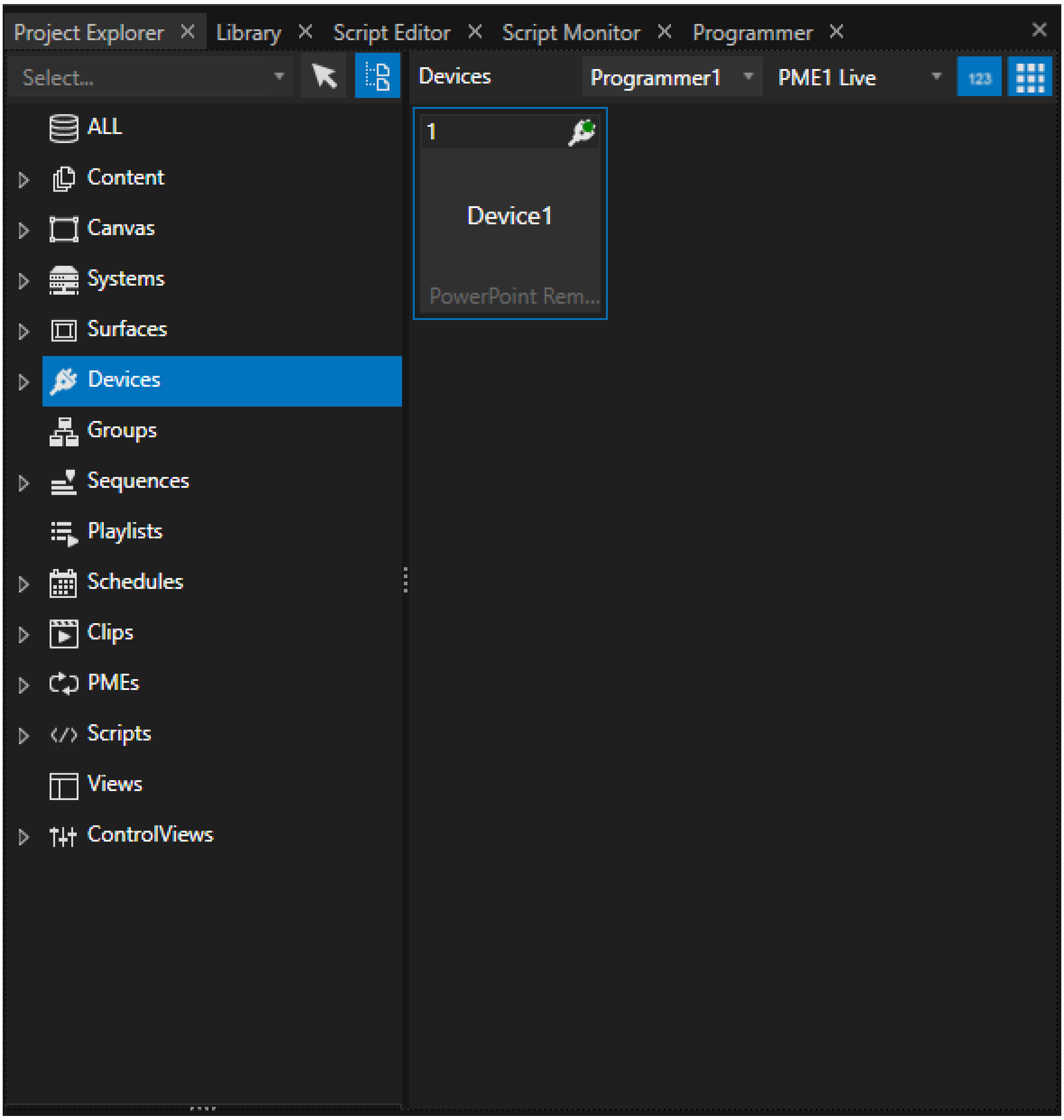
Name	PID	Status	B..	CPU	Arbeitsspei...	UA(
WinStore.App.exe	13364	Angehalten	J..	00	0 K	Dea
winlogon.exe	1300	Wird ausgeführt	S..	00	840 K	Nicl
wininit.exe	828	Wird ausgeführt	S..	00	8 K	Nicl
WavesSysSvc64.exe	4872	Wird ausgeführt	S..	00	796 K	Nicl
WavesSvc64.exe	16012	Wird ausgeführt	J..	00	1.640 K	Dea
Video.UI.exe	12404	Angehalten	J..	00	0 K	Dea
VertexServiceUi.exe	11540	Wird ausgeführt	J..	00	9.860 K	Dea
VertexServicePptRemote.exe	4084	Wird ausgeführt	J..	00	8.008 K	Dea
VertexServiceComServer.exe	11000	Wird ausgeführt	J..	00	8.736 K	Dea
VertexDiscoveryServer.exe	15672	Wird ausgeführt	J..	00	15.684 K	Dea
usvmixsub.exe	20248	Wird ausgeführt	J..	00	520 K	Dea
usvmix.exe	17748	Wird ausgeführt	J..	00	1.568 K	Dea
unsecapp.exe	8736	Wird ausgeführt	S..	00	796 K	Nicl
tvnserver.exe	4844	Wird ausgeführt	S..	00	448 K	Nicl
tvnserver.exe	16460	Wird ausgeführt	J..	00	260 K	Dea
TeamViewer_Service.exe	5096	Wird ausgeführt	S..	00	1.704 K	Nicl
Taskmgr.exe	11252	Wird ausgeführt	J..	01	24.368 K	Nicl
taskhostw.exe	15220	Wird ausgeführt	J..	00	2.636 K	Nicl
taskhostw.exe	12224	Wird ausgeführt	J..	00	2.548 K	Dea
SystemSettings.exe	13420	Angehalten	J..	00	0 K	Dea
System	4	Wird ausgeführt	S..	01	20 K	
svchost.exe	472	Wird ausgeführt	S..	00	112 K	Nicl

2. Prepare your VERTEX Project

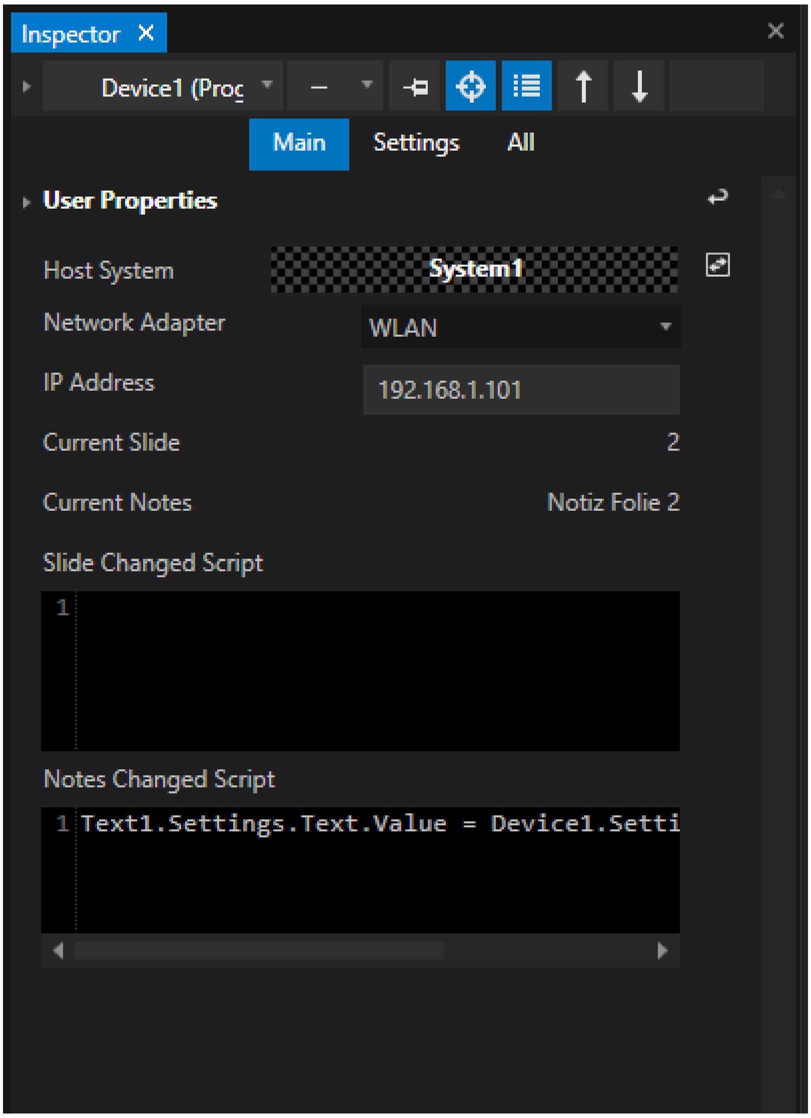
- Search for the "**Ppt Remote**" device into the Library Editor
- **Open the context** menu by a right click
- **Add** this device to your project



- Select the device into Project Explorer



- First configure the **Network Adapter of the Ppt Remote Device** in the **Inspector**
- Use the reconnect button and test the connection



Host System: System1

Network Adapter: WLAN

IP Address: 192.168.1.101

Current Slide: 2

Current Notes: Notiz Folie 2

Slide Changed Script

Notes Changed Script

```
Text1.Settings.Text.Value = Device1.Setti
```

- Now the Device should be ready to work with

Examples

Launch a specific Powerpoint file and go into presentation mode

```
Device1.Launch C:\Users\User1\Desktop\test.pptx
```

Quit whole Microsoft Powerpoint application

```
Device1.Quit
```

End presentation mode of Powerpoint but keep Powerpoint application running

```
Device1.EndPresentation
```

Go to Slide 2

```
Device1.GotoSlide 2
```

Example for a more complex start script

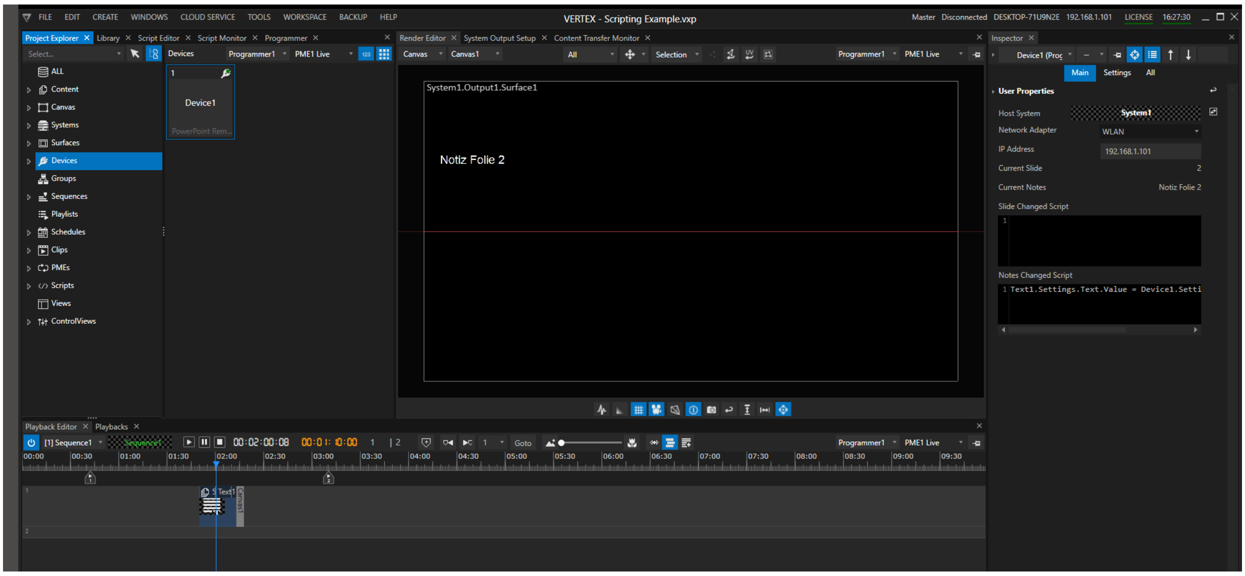
- Reset Connection (to be sure that connection is ready and working) and wait 1 second
- Set Volume of Powerpoint PC to 0 and wait 1 second
- Launch test.pptx file from Desktop of User1 and wait 3 seconds
- Go to next slide

```
Device1.ResetConnection
wait 1
Device1.SetVolume 0
wait 1
Device1.Launch C:\Users\User1\Desktop\test.pptx
Wait 3
Device1.NextSlide
```

Show Notes from Powerpoint file as text content in VERTEX

- The current powerpoint notes should be displayed as text content into VERTEX
- For our usecase, the text content into VERTEX should only be changed when the notes of the pptx are changed
- The Ppt Remote Device offers 2 options: "Slide Change Script" and "Notes Changed Script". For our usecase, add the following code snippet as Notes Changed Script

```
Content1.Settings.Text.Value = Device1.Settings.CurrentNotes.Value
```



User Properties

Host System: System1

Network Adapter: WLAN

IP Address: 192.168.1.101

Current Slide: 2

Current Notes: Notiz Folie 2

Slide Changed Script

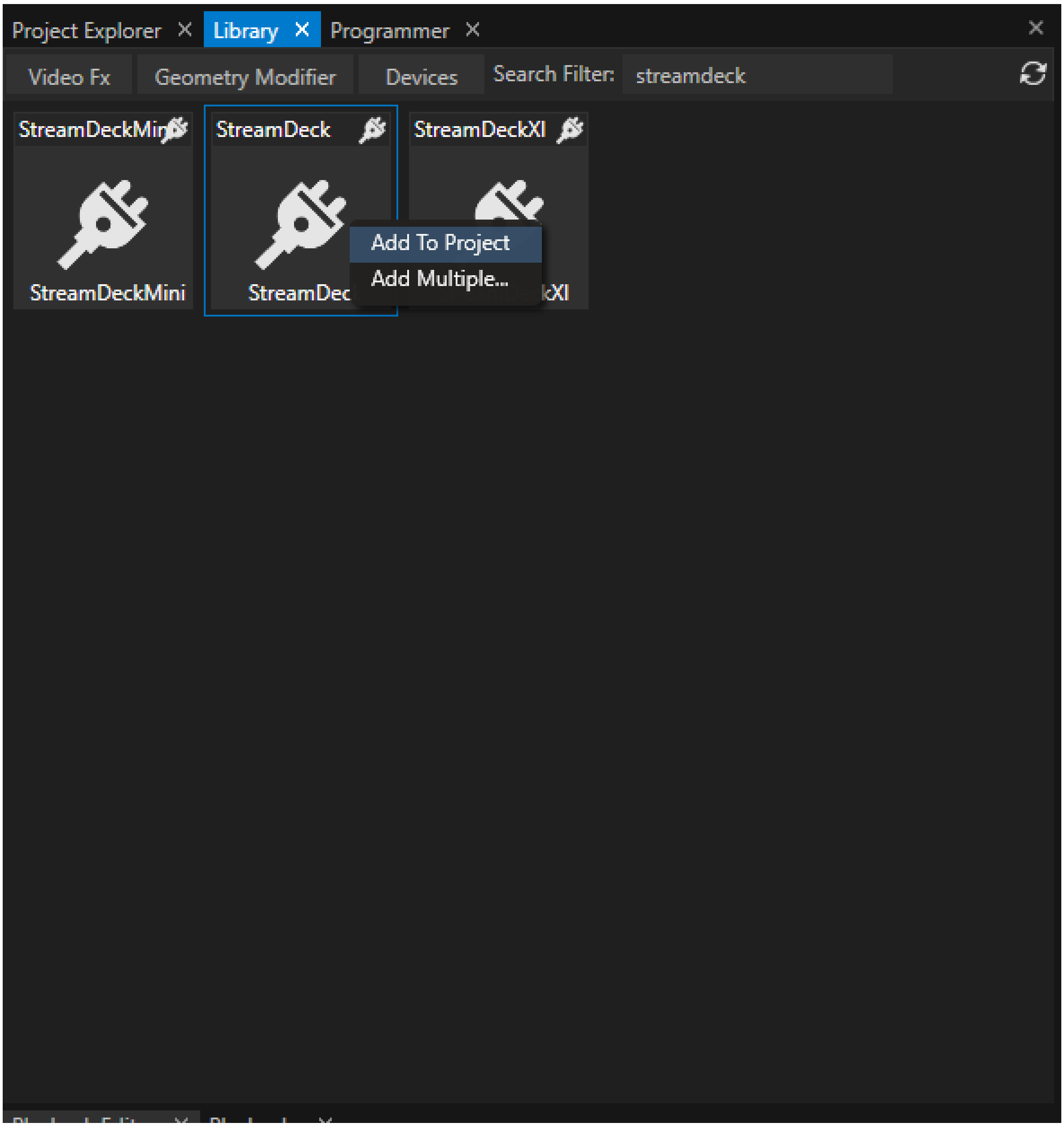
Notes Changed Script

```
Text1.Settings.Text.Value = Device1.Setti
```

5.8.2 Stream Deck

- VERTEX is shipped with **device Library elements** for the **Elagato Stream Deck**, **Stream Deck XL** and **Stream Deck mini**
- **No Driver installation** is required, just plug in the Stream Deck and start VERTEX
- **Settings for all Buttons are done in VERTEX - Script Commands** are used to trigger actions

How to add a Stream Deck



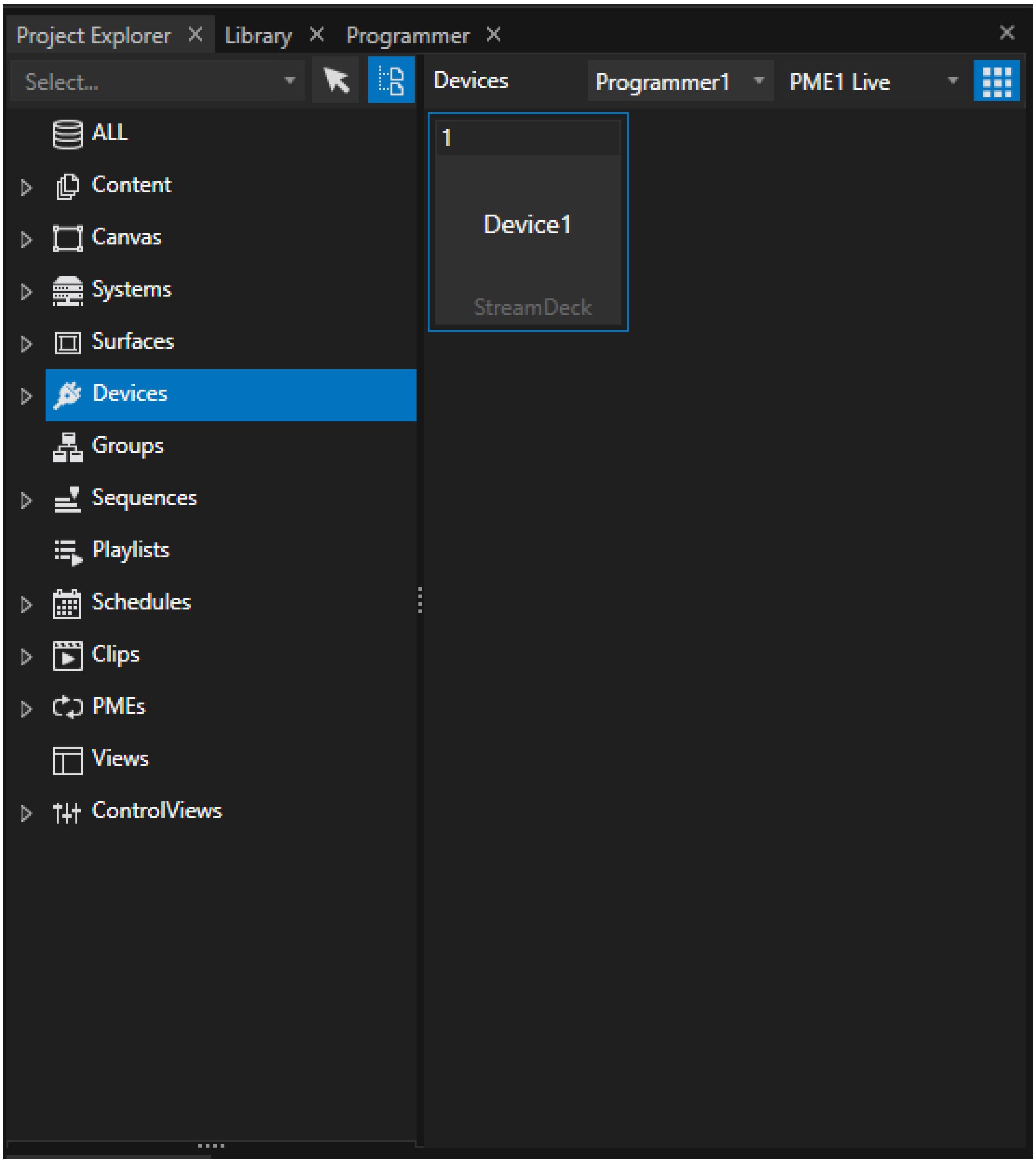
1. **Connect the Stream Deck** to your PC#

Close Elgato "Stream Deck for Windows"Application and all other Applications that access your Stream Deck

VERTEX directly accesses and talks to your Stream Deck device. Avoid side effects from other applications - like overwritten button designs - by closing all other applications before.!

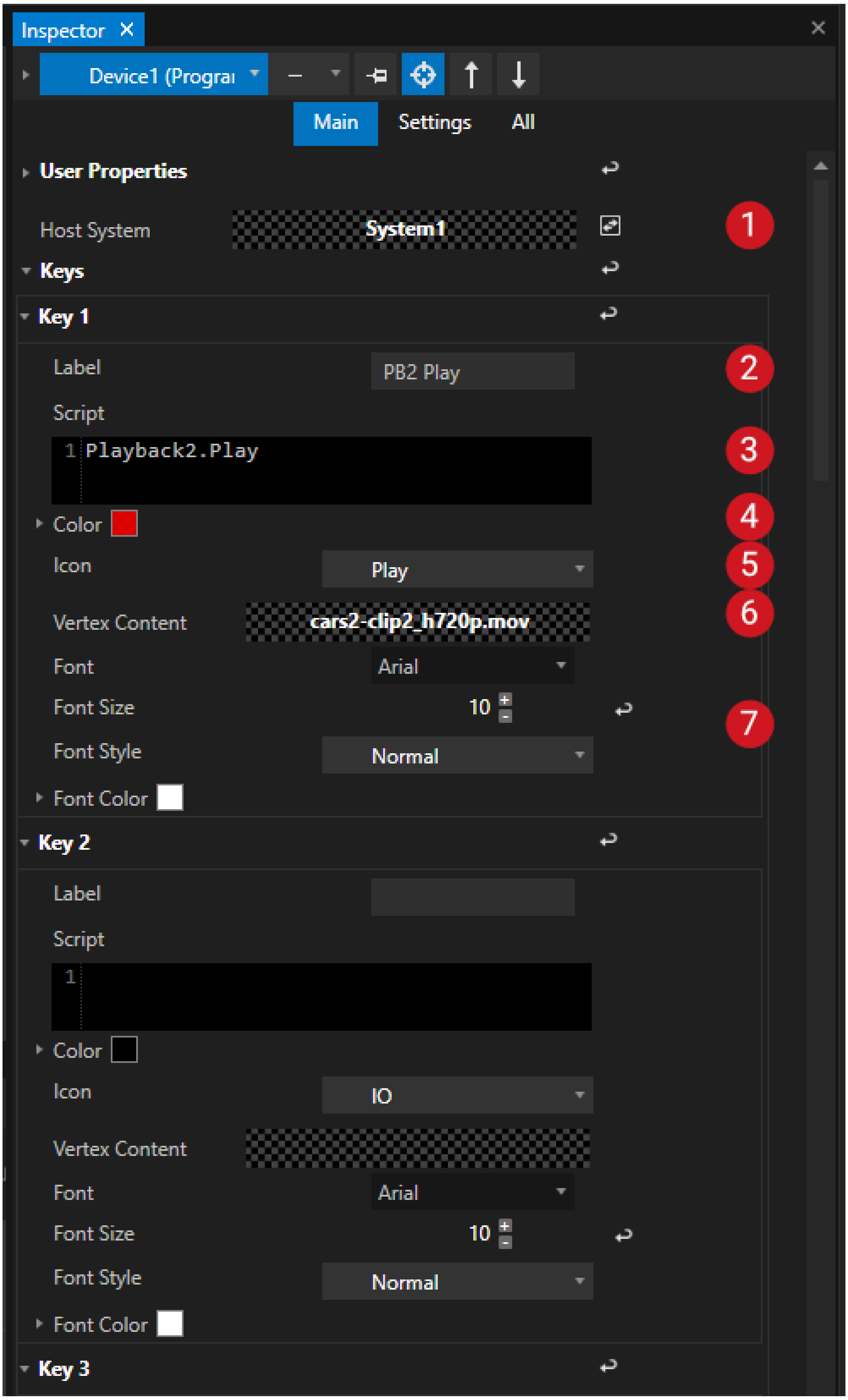
Especially the "Stream Deck for Windows" application from Elgato influences a Stream Deck that is used within VERTEX. Please also terminate this application before you start with your VERTEX project.

2. **Start VERTEX**
3. Open **Library Editor** and search for the **Stream Deck Device**
4. Right-click with you mouse on the Device and **add it to your Project**
5. **Select the device** in the **Project Explorer**
6. Go to the **Inspector and set the values** for each button



Your Stream Deck device and all settings ar stored into your VERTEX project file. When you load the Project, just connect the Stream Deck to your PC and go ahead with your work.

Settings



User Properties

Host System: System1

Keys

Key 1

Label: PB2 Play

Script

```
Playback2.Play
```

Color: 🟥

Icon: Play

Vertex Content: cars2-clip2_h720p.mov

Font: Arial

Font Size: 10

Font Style: Normal

Font Color: □

Key 2

Label

Script

```

```

Color: ■

Icon: IO

Vertex Content

Font: Arial

Font Size: 10

Font Style: Normal

Font Color: □

Key 3

1	**Host System**	Defines the host System into your Project **where your Stream Deck physically is connected to.** Only change when working into a project with Session Member Systems.
2	**Label**	Set a **Label** that is **displayed as text** for your Stream Deck button.
3	**Script**	Enter **Script Commands that should be executed when the Stream Deck Button is pressed** Focus with your Mouse and use Shortcut "CTRL + Space"to show a list of all Commands
4	**Color**	Sets a **background color** for the Stream Deck **button**.
5	**Icon**	**Choose an icon for your button. VERTEX comes up with predefined Icons for the most common use cases**
6	**Vertex Content**	Show a **thumbnail from a content asset of your project as background of the button.** Drag an video or image content with your mouse from Project Explorer to this property field Set Icon to "None". Right-click and open context menu to clear background image
7	**Font Settings**	**Font** settings for the button **Label**

Button Count

The Stream Deck buttons are counted in rows, starting from top left

Further Settings

- Select the "Settings"-Tab of the Inspector to set the global brightness of the Stream Deck or to check if the Stream Deck is connected to your PC.

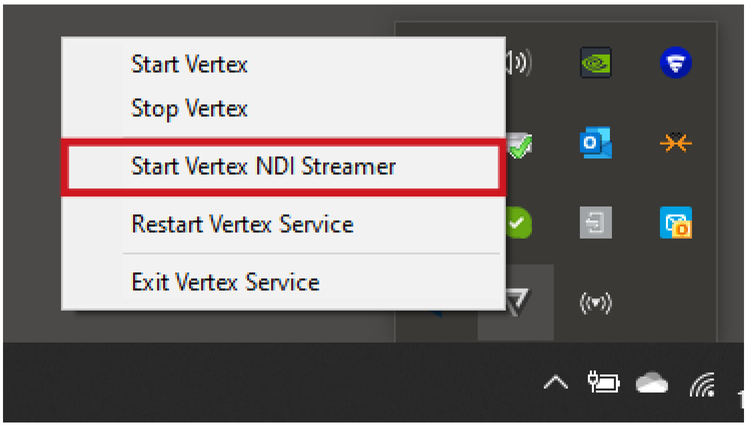
5.8.3 Vertex NDI Streamer

- VERTEX NDI Streamer is a **multi source NDI toolkit**
- VERTEX NDI Streamer is **capable to stream up to 2 desktop regions and 1 live input** as a NDI Stream
- The NDI Streamer **is free** and fully **works without a valid VERTEX license**
- **In addition, all settings and streams** can be **controlled remotely out of VERTEX (with a license)**

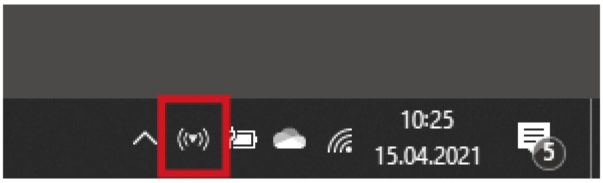
This product uses NDI® (SDK v5.0, 2023)
Licensed for free and commercial use under the terms in effect for this version.
Learn more at https://ndi.video/
NDI® is a registered trademark of Vizrt NDI AB.

Start NDI Streamer

- The VERTEX NDI Streamer comes up in a package with the VERTEX installer
- Just download and install an up-to-date Version of VERTEX
- Right-click with your Mouse on the VERTEX Tray Icon on the Windows taskbar
- Start Vertex NDI Streamer

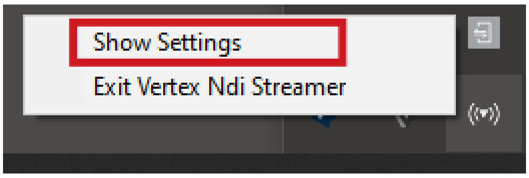


- When the NDI Streamer is started, a new Icon appears into the windows tray bar



Set up NDI Streams

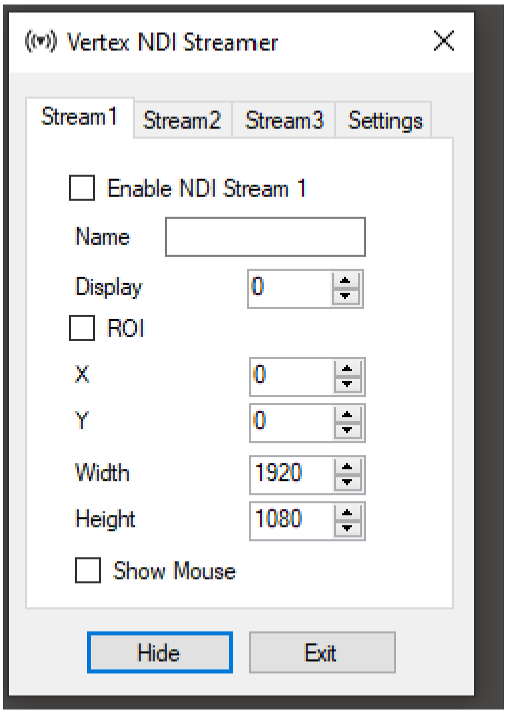
- Right-Click on the VERTEX NDI Streamer tray icon in the windows taskbar
- Select "Show Settings"



- Now you can enable up to 3 NDI Streams from your PC

Stream 1 + 2

enable you to set up two NDI streams that capture a display (or only a region) of your PC.



□ Enable NDI Stream 1

Name

Display 0

□ ROI

X 0

Y 0

Width 1920

Height 1080

□ Show Mouse

Name

Name of the stream that is shown for all NDI applications

Display

Select the display number of your PC that should be sent as NDI stream.

ROI

Region of Interest. Default: disabled

Enable to capture only a region of the selected display as NDI stream

Enter pixel coordinates (starting at top left) and width/height to define the ROI

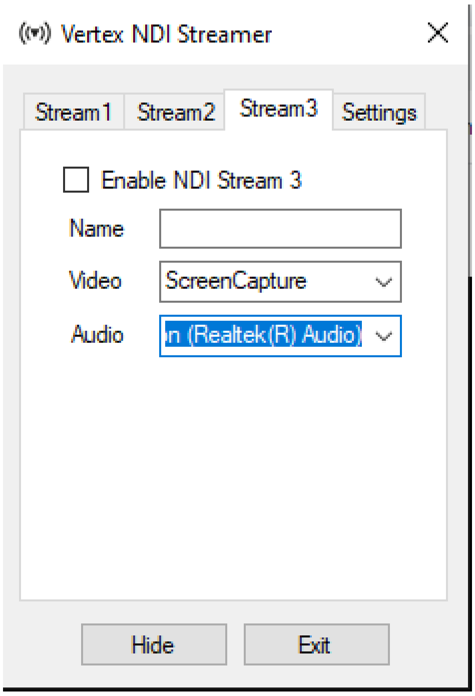
Show Mouse

Show mouse pointer in NDI stream

Stream 3

Stream 3 differs from the first ones. Here, you are able to send a video source (e.g. a webcam) and audio source (like a a microphone)

from your Windows PC as NDI stream.



□ Enable NDI Stream 3

Name

Video ScreenCapture

Audio n (Realtek(R) Audio)

Name

Name of the stream that is shown for all NDI applications

Video

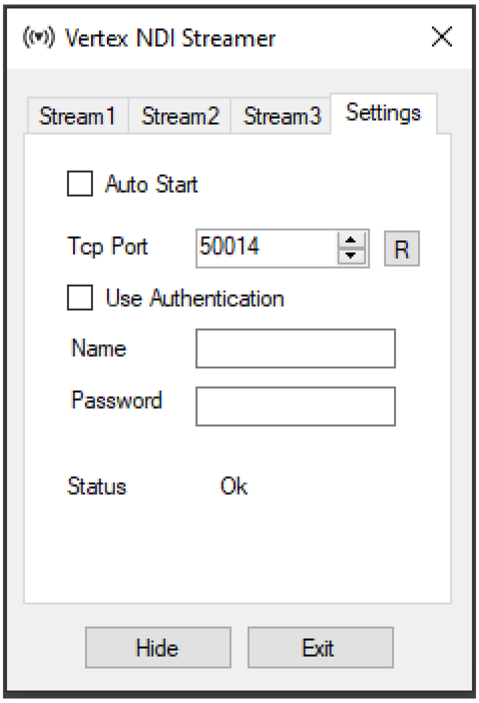
Select from a list of video sources.

Depending on your PC hardware and configuration the list of available sources may vary

Audio

Select from a list of audio sources.
Depending on your PC hardware and configuration the list of available sources may vary

Settings



Vertex NDI Streamer

Stream1 | Stream2 | Stream3 | Settings

□ Auto Start

Tcp Port 50014 R

□ Use Authentication

Name

Password

Status Ok

Hide | Exit

Auto Start
Enable to add the NDI Streamer to Microsoft Windows autostart

TCP Port
Change port number for remote controlling the NDI streamer over TCP.
Use the R-Button to restart the TCP Servers after a port change.

R Button
Reset and Restart the TCP Server for all network adapters after you have changed the TCP Port

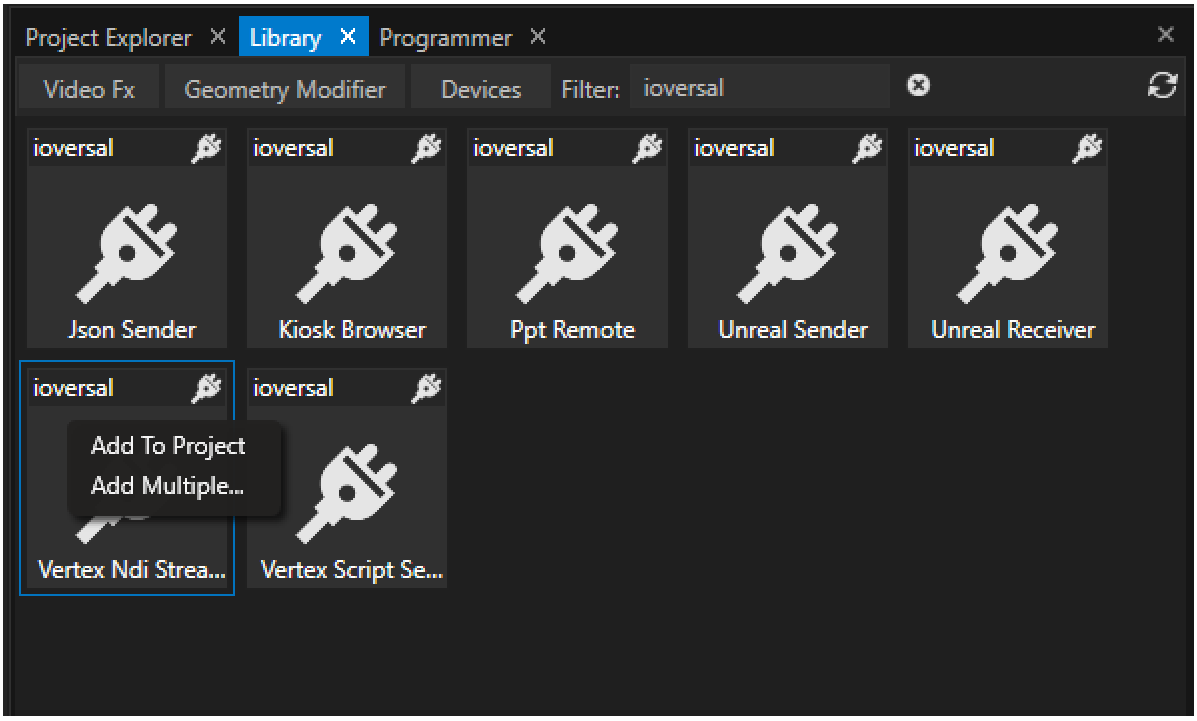
Use Authentication
Set User Name and Password for TCP Authentication

Remote Control out of VERTEX

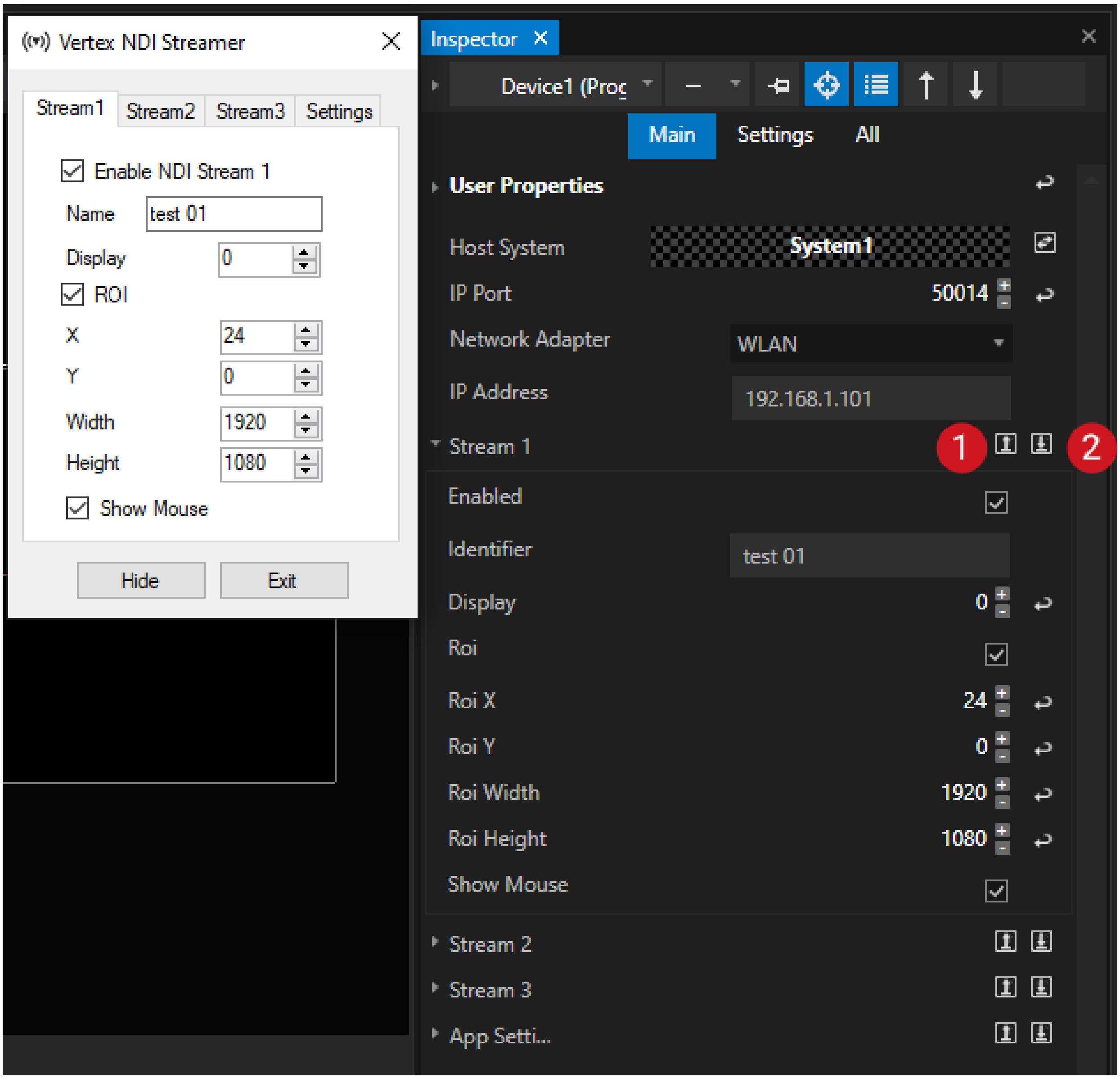
- You can **remote control all settings of the VERTEX NDI Streamer** on a PC in your network **out of VERTEX**

- Just add a **"Vertex NDI Streamer" Device** from the [Library](#) into your current project
- Once configured, you have **access to all settings of the NDI Streamer application** and are able to automate your NDI workflow

Setup



- Open the **[Library](#)**
- Select **Devices** and **filter for "ioversal**"
- Right-click to the **device "Vertex NDI Streamer**"
- **"Add to project"**
- **Select the device in the [Project Explorer](#)** and set the initial properties in the **[Inspector](#)**
- Once the connection is set up, you are able to upload and download all application and stream settings.



☑ Enable NDI Stream 1
Name: test 01
Display: 0
☑ ROI
X: 24
Y: 0
Width: 1920
Height: 1080
☑ Show Mouse

User Properties
Host System: System1
IP Port: 50014
Network Adapter: WLAN
IP Address: 192.168.1.101
Stream 1
Enabled: ☑
Identifier: test 01
Display: 0
Roi: ☑
Roi X: 24
Roi Y: 0
Roi Width: 1920
Roi Height: 1080
Show Mouse: ☑
Stream 2
Stream 3
App Setti...

Comparision: All settings from the NDi Streamer application (on the left) you will also find into the Inspector when selecting the corresponding Device "Vertex NDI Streamer" (on the right)

IP Port

Enter here the same IP Port as set in the NDI Streamer application

Network Adapter

Choose a network adapter from your local VERTEX instance

IP Address

Enter IP address of the PC on that the Vertex NDI Streamer application is running and should be remote controlled

Upload Settings 1

Upload all current settings from VERTEX to the NDI Streamer application

Download Settings 2

Download all current settings from NDI Streamer application to Inspector

Scripting

As with every Device in VERTEX, you can control an NDI Streamer Device with a Script.
For the following examples the NDI-Streamer Device was added as "Device1" to a project

Enable and disable Stream 1 on the remote PC

```
Device1.Settings.Stream1.Enabled.Value = true
Device1.Settings.Stream1.Enabled.Value = false
```

Show Mouse Cursor in NDI Stream 1

```
Device1.Settings.Stream1.ShowMouse.Value = true
```

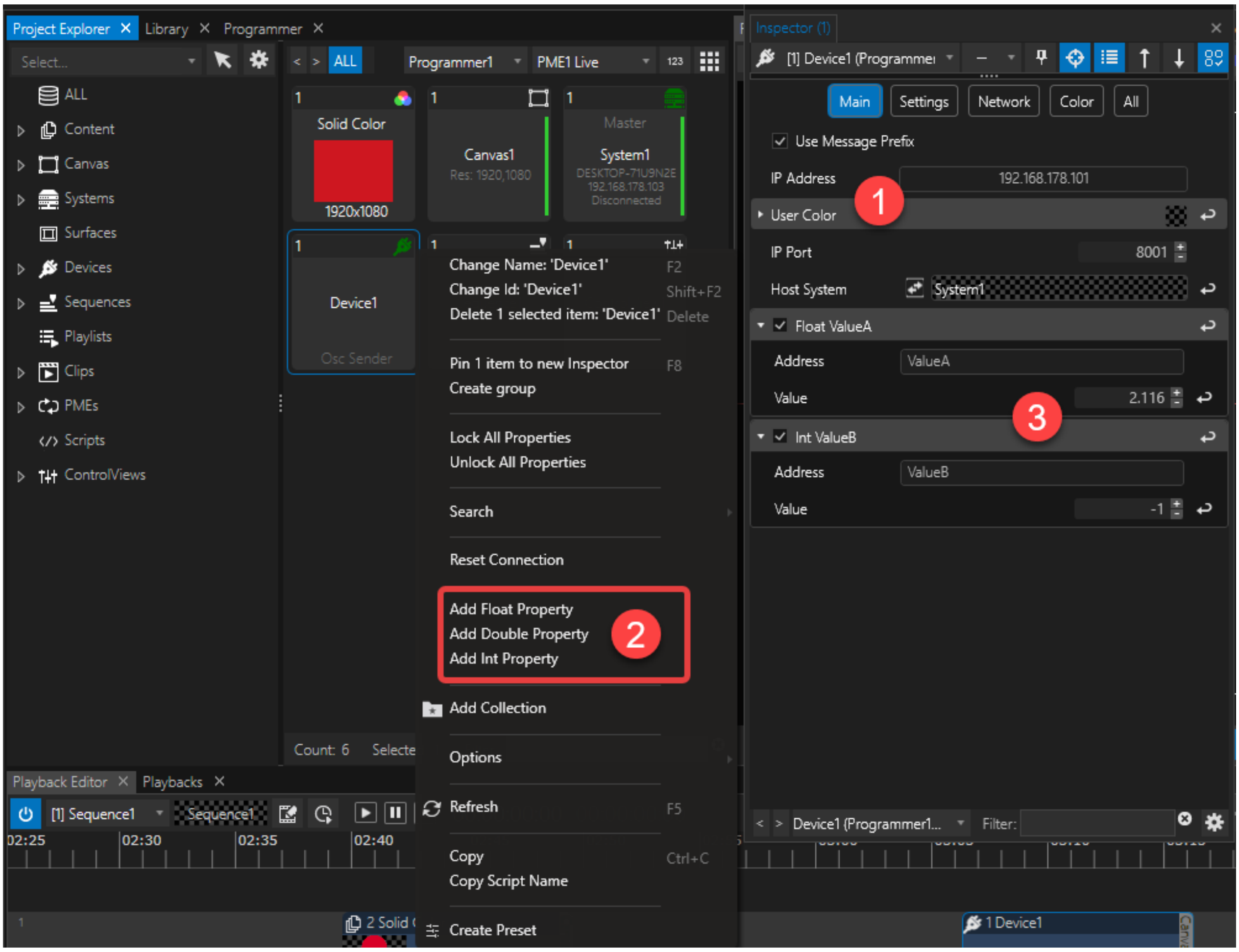
5.8.4 OSC Devices

- **O**pen **S**ound **C**ontrol protocol can be employed to control property values in VERTEX
- Device Library holds both an **OSC Sender**- and **Receiver Device**
- Value changes transmitted by OSC Sender Devices can be animated with keyframes, whereas received value changes can be used in controls, nodes, scripts etc.

Workflows

Go to ***Library > Devices*** and type *OSC* into the search filter. Then add the desired OSC Device to your project.

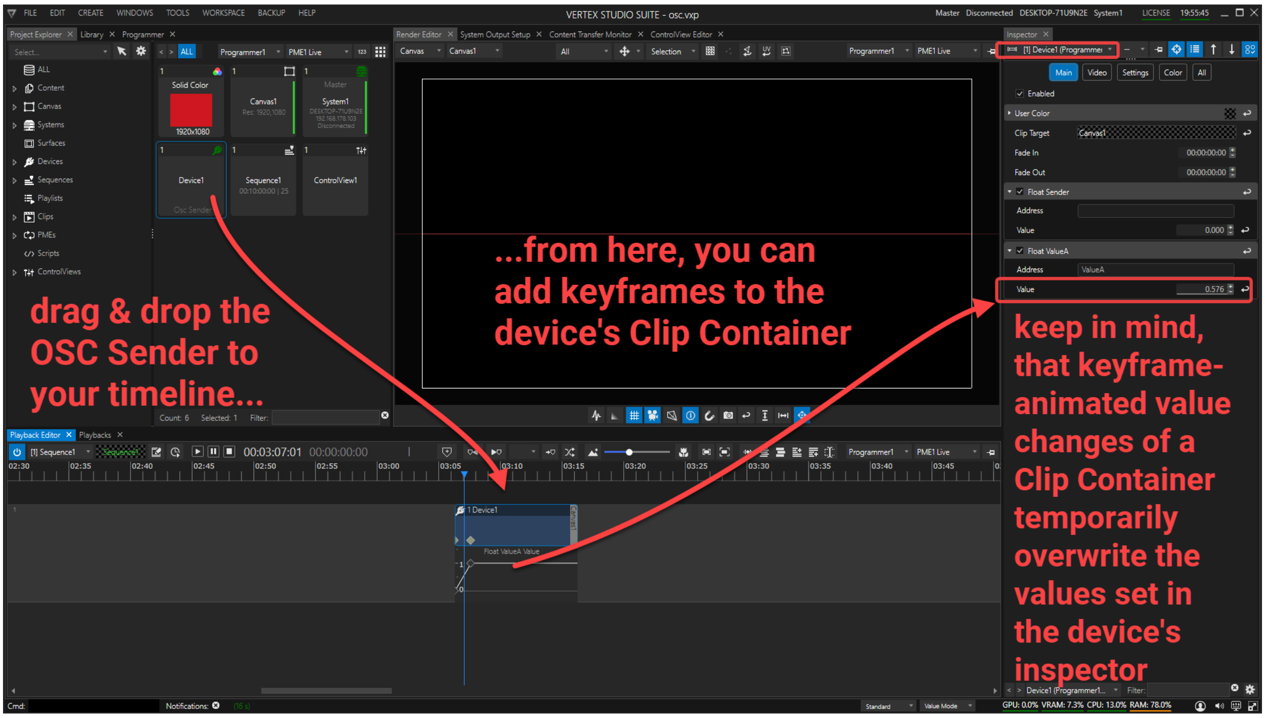
OSC Sender



1. **Connect the Device:** Once an *OSC Sender Device* has been added to your project, go to *Project Explorer* and select to inspect the device.
   Go to the Inspector and enter the *IP Address* of the target system. Also, set the corresponding *IP Port*. Then, hit the *Connect Button of the Host System*.
2. **Add Value Properties:** go to *Project Explorer and* right-Click on the OSC Sender Device to access its context menu. Here you can choose the data format (floating-point number / double-precision floating-point number / integer number) for the values you'd like to send out.
3. **Assign and label a target address:** for each property, you can choose a customizable target.

To alter the values, you can either:

- set prarmeters in the Inspector
- connect a Control View Input Slider
- drag the device onto your timeline to animate values with the help of keyframes.

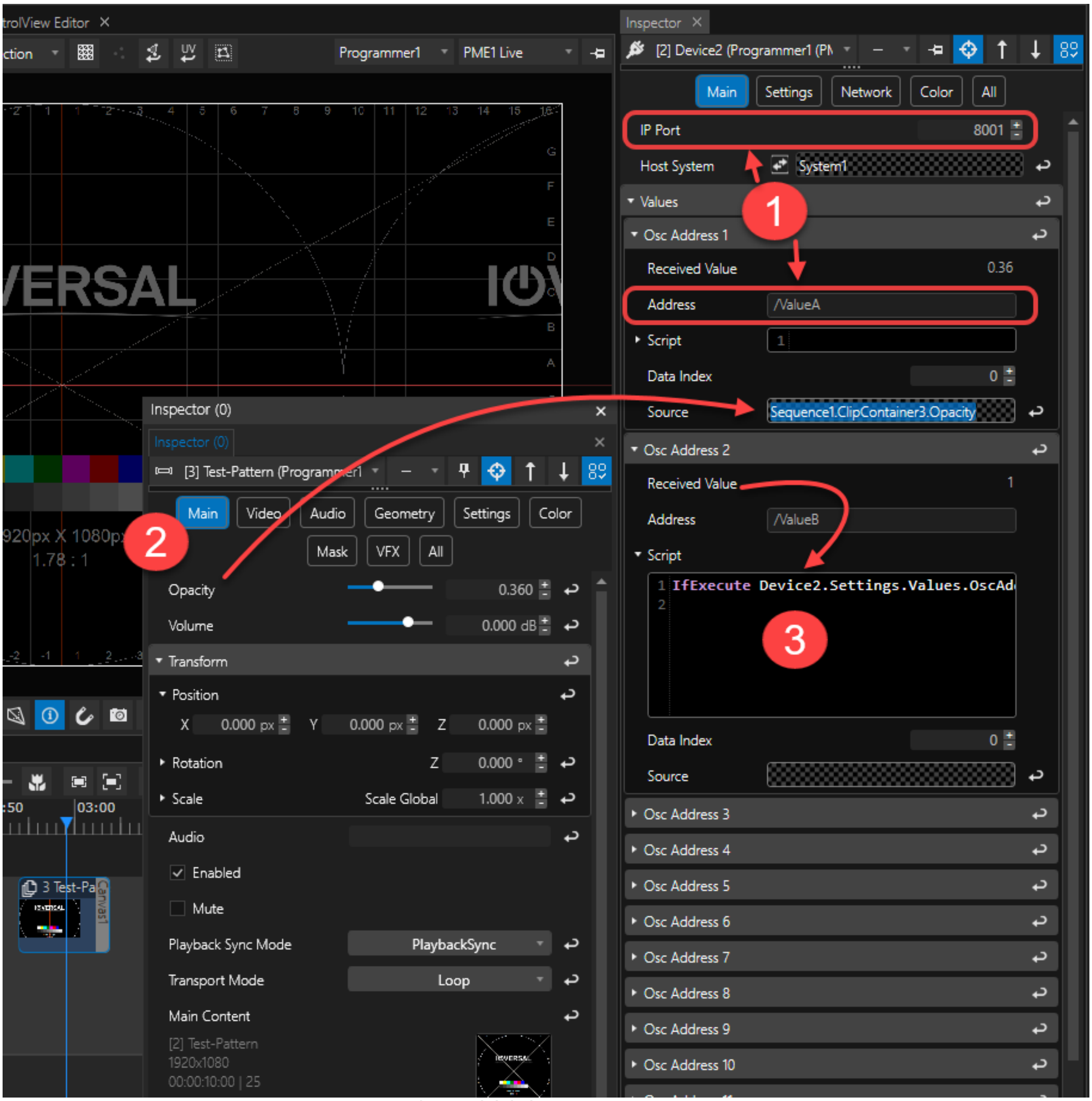


drag & drop the OSC Sender to your timeline...

...from here, you can add keyframes to the device's Clip Container

keep in mind, that keyframe-animated value changes of a Clip Container temporarily overwrite the values set in the device's inspector

OSC Receiver



IP Port 8001

Host System System1

Osc Address 1: Received Value 0.36; Address /ValueA; Script 1; Data Index 0; Source Sequence1.ClipContainer3.Opacity

Osc Address 2: Received Value 1; Address /ValueB; Data Index 0

```
IfExecute Device2.Settings.Values.OscAd
```

Opacity 0.360

Volume 0.000 dB

Position X 0.000 px Y 0.000 px Z 0.000 px

Rotation Z 0.000 °

Scale Scale Global 1.000 x

Audio ☑ Enabled □ Mute

Playback Sync Mode PlaybackSync

Transport Mode Loop

Main Content [2] Test-Pattern 1920x1080 00:00:10:00 | 25

1. Make sure the IP Port matches the one of your OSC Sender Device.

   Also, type in the custom OSC address of your OSC Receiver Device, starting with a `/` .

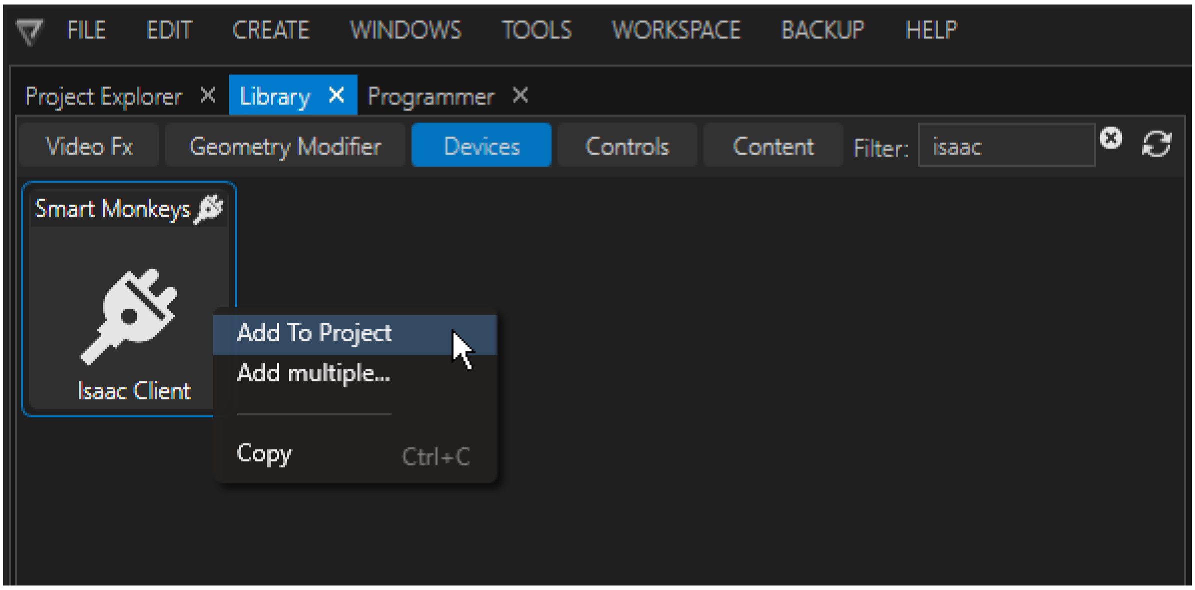
   If the custom address of your OSC Sender was `ValueA` , then the one in your OSC Receiver needs to be `/ValueA` .
2. Possible application for incoming OSC data: any item's property such as opacity to be controlled by the received value can be assigned per drag & drop into the *Source* field of the OSC Address.
3. Also, the Received Value can be dropped into the script box and be further processed by a script.

5.8.5 Smart Monkeys Isaac Client

- VERTEX can be integrated into Smart Monkeys' AV systems monitoring and content management platform ISAAC.
- Communication is being exchanged through the ISAAC device found in the library.
- Monitor and manage VERTEX Scripts, Control Views, Playbacks and Variables.

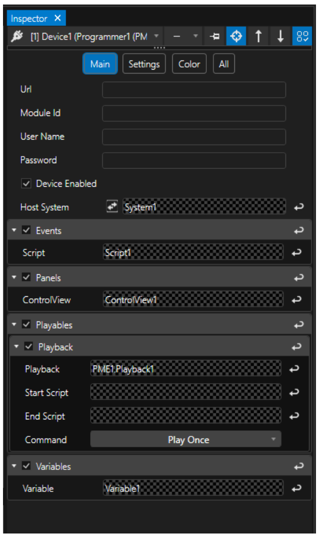
Setup & Workflow

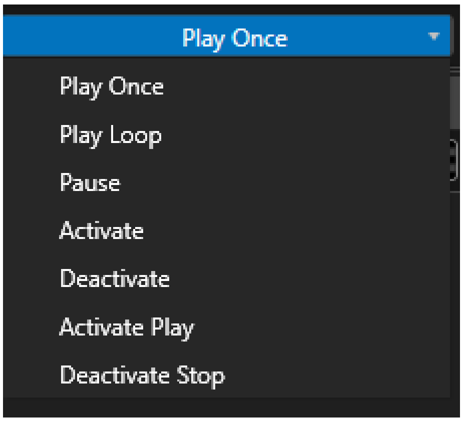
1) Go to Library > Devices and enter ISAAC into the search filter to locate the ISAAC device and add it to your project from the context menu (right-klick):



Filter: isaac

2) Once the device has been added, its properties can be accessed in the Inspector:

 Inspector [1] Device1 (Programmer1 (PM Main Settings Color All Url Module Id User Name Password ☑ Device Enabled Host System: System1 ☑ Events Script: Script1 ☑ Panels ControlView: ControlView1 ☑ Playables ☑ Playback Playback: PME1.Playback1 Start Script End Script Command: Play Once ☑ Variables Variable: Variable1	URL	**Enter the specific URL** that is unique to your ISAAC workspace / system.
	Module ID	VERTEX needs to be added as a module in your ISAAC workspace. **Enter the unique string** used to identify the **connected VERTEX module.**
	User Name & Password	**enter Username and Password** associated with your ISAAC account / system
	Device Enabled	Check this box to **enable / disable the device.**
	Host System	**Select your VERTEX system** connected to the ISAAC device and press the connect button.
	Events in ISAAC = Scripts in VERTEX	**Add Events** via the context menu via right-klick on parent directory *Events.* **Add Scripts** by either drag & drop or select from context menu of the source property field.
	Panels in ISAAC = ControlViews in VERTEX	**Add Panels** via the context menu via right-klick on parent directory *Panels.* **Add ControlViews** by either drag & drop or select from context menu of the source property field. VERTEX's **Control Views must be WebView-enabled** in order to being processed by ISAAC.
	Playables in ISAAC = Playbacks in VERTEX	**Add Playables** via the context menu via right-klick on parent directory *Playables.* **Add Playbacks** by either drag & drop from **PME tree** / **Playbacks window** or select from context menu of the source property field. **Specify** optional scripts at the instance of the Playback (**Start Script** / **End Script**). Specify one of the following **Commands** associated with the Playback (default: *Play Once*):

		 Play Once Play Once Play Loop Pause Activate Deactivate Activate Play Deactivate Stop
	Variable in ISAAC = Variable in VERTEX	**Add Variables** via the context menu via right-klick on parent directory *Playables.* **Add Variables** by either drag & drop or select from context menu of the source property field.

Context Menu for ISAAC Data Management

Data exchanged between VERTEX and ISAAC can be managed from within VERTEX via the following context menu commands:

- *Refresh Isaac Server Data* - forces a refresh of all data for the particular parent property category.
- *Remove All ISAAC Events/ Panels/ Playables/ Variables from Server* - removes all entries of the particular parent property category.
- *Update on ISAAC Server* - updates single entries in case of property changes while ISAAC server is offline.

5.9 DMX-512

- VERTEX holds **different input and output options** when working with **DMX-512**.
- All **popular ethernet-based protocols for DMX-data are supported**: Art-Net™, sACN or DMX-512 with Ross Video / ioversal's <%DMX_IO>- Interface. Additionally MA-Net2 is supported only as Input
- VERTEX' **DMX-Routing Editor** defines the incoming or outgoing DMX-protocol and sets DMX-Universe routing.

Create a DMX-Routing and define the Input and output settings

Always start by creating a DMX-Routing. This is where you define in- & output settings and protocols:
DMX Routing

Ross Video / ioversal offers a driverless USB-DMX Interface - the DMX io to work with DMX-512 into VERTEX. Read more about the configuration:
Dmx IO

Output DMX Data

Use Devices to Output DMX-Data.
Route incoming protocols into a VERTEX network and output it on another System

Use Incoming DMX-Data to Control

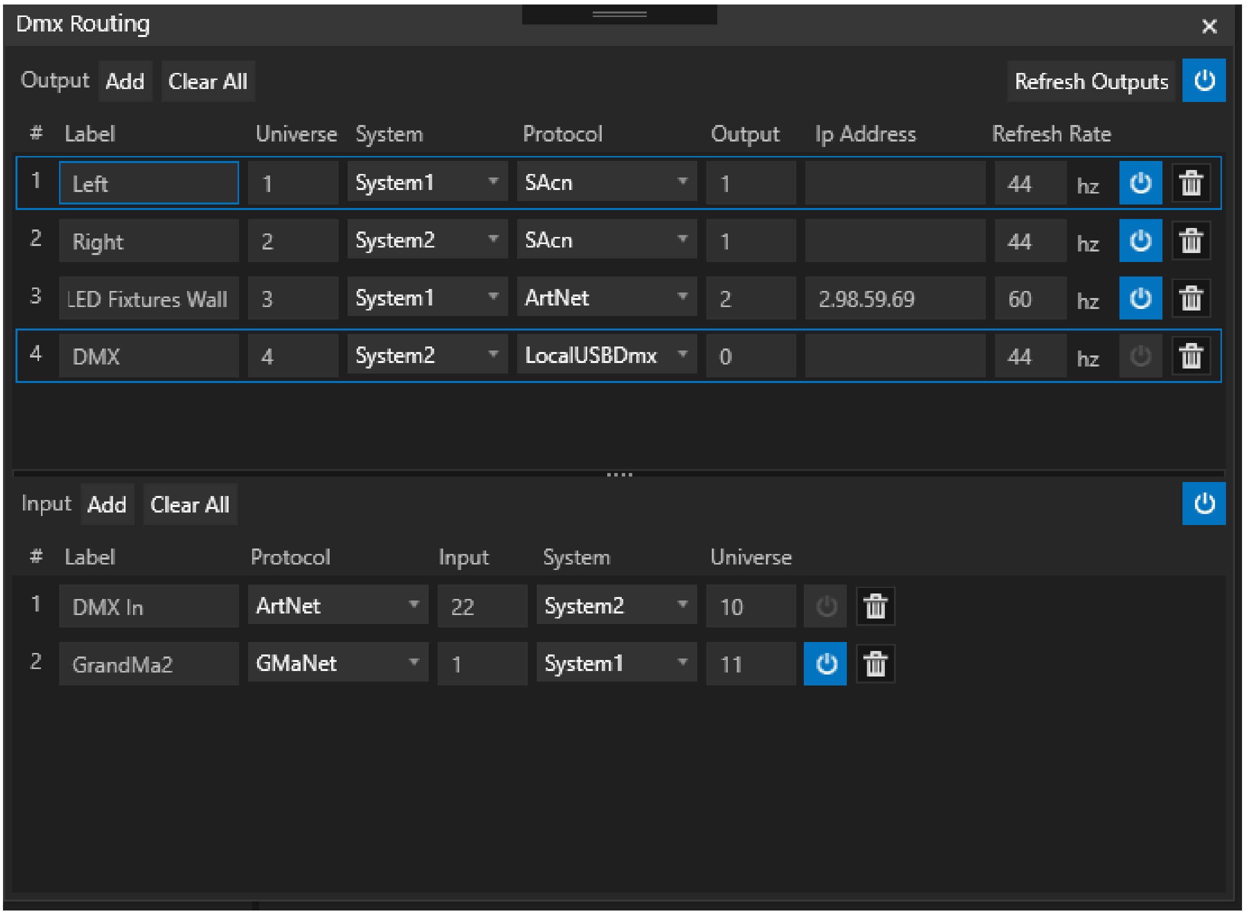
There a **different options** to control VERTEX **with DMX-512**.
Choose between or mix the following ones:

Control a Playback with DMX-512
Control a System with DMX-512
Manipulate and Control a Surface with DMX-512
Use VERTEX like a digital lighting Fixture with Console Layers
Use DMX-Input Devices for scripts, conditions and/or triggers based on incoming DMX-Data

5.9.1 DMX Routing

- The DMX-Routing Window is the place for a **central management** of **all DMX-over-Ethernet Inputs** and **Outputs** for your project
- Vertex works with an **internal decimal universe count** - that gives you the freedom to map, route and split those universes to different protocols, output universe numbers and Systems. Until your final patching, the internal programming in VERTEX **is independent from your final output** routing.

- Manage **all your Systems** in one window and **split** the physical **Ethernet output** up to **other Systems** of your project.



#	Label	Universe	System	Protocol	Output	Ip Address	Refresh Rate	
1	Left	1	System1	SAcn	1		44	hz
2	Right	2	System2	SAcn	1		44	hz
3	LED Fixtures Wall	3	System1	ArtNet	2	2.98.59.69	60	hz
4	DMX	4	System2	LocalUSBDmx	0		44	hz

#	Label	Protocol	Input	System	Universe
1	DMX In	ArtNet	22	System2	10
2	GrandMa2	GMaNet	1	System1	11

Output

1	Label	Free Label Name
2	Universe	Decimal VERTEX Universe number: VERTEX is working with an internal and decimal Universe Count for Lighting Control Data. Independent from e.g. the DMX Start address of your device, you could give all devices a Universe number that stays consistent in your whole project
3	System	Defines the System on which Ethernet Card the control data should be sent. For e.g different rooms or room situations, you could e.g. send out 2 Universes from your Master System. For the Art-Net™ Control data for e.g. some LED-Fixtures you could use the

		network card and network from your client System2 that is e.g located in another area...
4	Protocoll	Select the Protocol for your Lighting Control data. You can select for every universe between Art-Net™, sACN or DMX over a connected USB-DMX-Output device
5	Output	Defines the universe, on which your control data will be send out. So you could e.g route and output VERTEX Universe 1 to Art-Net™ Universe 1, or even VERTEX Universe 1 to sACN Universe 2
6	IP-Address	By Default, if there is no entry, Art-Net™ data will be broadcasted and sACN-Data will be multicasted. When you enter an IP address into this field, Art-Net™ or sACN -Data will be unicasted to the device with this IP.
7	Frames per Second	Per default this field is set to 44,1 Hz (DMX-Standard). You can individually increase or decrease the protocol frames per second by entering your custom values. The maximum number is limited to 100, in most cases the ethernet-setup limits the maximum to around 80 frames.
8	Single Mute	Disables the network connection of a single column
9	Global Mute	Disables all DMX-over-Ethernet connections

Input

7	Label	Free Label Name
8	Protocol	Input protocoll on that VERTEX will listen
9	Input	Input Universe of the lighting protocol that VERTEX should listen/Read
10	System	VERTEX System on your Project Network that should read/listen to the incoming protocoll.

		This System should have physical access to the protocoll, of course ..
11	Universe	VERTEX Universe on which the incoming control data is mapped

Supported Protocols

Output Protocols:

- Art-Net™
- sACN
- DMX-512 over USB-Adaptor

Input Protocols:

- Art-Net™
- sACN
- MA-Net2, could only be received as Input and not send out as output protocol
- DMX-512 over USB-Adaptor

Good to know: Broadcast, Unicast, Multicast
Art-Net™ supports per default specification broadcast or unicast.
sACN supports per default specification unicast or multicast. Please note: multicast is very effective for a larger amount of control data into a network.
When planning to sending data with multicast: Please be aware that your network-switch has to support this. Not all hardware does.

Advanced: Universe Numbering with Art-Net™ and sACN

- Within the **VERTEX** **DMX Patching** , we are using a **decimal numbering** for all control **universes**. This includes our internal numbering as well as the Art-Net™ and sACN numbering.
- **By default, Art-Net™** is defined by using a combination of **subnets and universes within hexadecimal numbering**. To make it easier to switch between output protocols and to simplify your patching, **VERTEX internally uses only decimal numbers** for ethernet based Control-Data.
- The **output for Art-Net™ matches of course to the protocol specifications**. VERTEX takes over the conversion into subnet and universes for you under the hood.

Comparison between hexadecimal and decimal numbering

VERTEX Universe Numbering (Decimal) for interal as for ethernet based control universes	**sACN Universe Numbering**	**Default Art-Net™ Universe Numbering with subnets and universes (Hexadecimal)**	
		subnet	**universe**
0	0 is reserved by default and not used	0	0
1	1	0	1
2	2	0	2
3	3	0	3
4	4	0	4
5	5	0	5
6	6	0	6
7	7	0	7
8	8	0	8
9	9	0	9
10	10	0	A
11	11	0	B
12	12	0	C
13	13	0	D
14	14	0	E
15	15	0	F
16	16	1	0
17	17	1	1
18	18	1	2
19	19	1	3
20	20	1	4

21	21	1	5
22	22	1	6
23	23	1	7
24	24	1	8
25	25	1	9
26	26	1	A
27	27	1	B
28	28	1	C
29	29	1	D
30	30	1	E
31	31	1	F
32	32	2	0
33	33	2	1
34	34	2	2
35	35	2	3
36	36	2	4
37	37	2	5
38	38	2	6
39	39	2	7
40	40	2	8
41	41	2	9
42	42	2	A
43	43	2	B
44	44	2	C
45	45	2	D
46	46	2	E
47	47	2	F
48	48	3	0
49	49	3	1
50	50	3	2
51	51	3	3

52	52	3	4
53	53	3	5
54	54	3	6
55	55	3	7
56	56	3	8
57	57	3	9
58	58	3	A
59	59	3	B
60	60	3	C
61	61	3	D
62	62	3	E
63	63	3	F
64	64	4	0
65	65	4	1
66	66	4	2
67	67	4	3
68	68	4	4
69	69	4	5
70	70	4	6
71	71	4	7
72	72	4	8
73	73	4	9
74	74	4	A
75	75	4	B
76	76	4	C
77	77	4	D
78	78	4	E
79	79	4	F
80	80	5	0
81	81	5	1
82	82	5	2

83	83	5	3
84	84	5	4
85	85	5	5
86	86	5	6
87	87	5	7
88	88	5	8
89	89	5	9
90	90	5	A
91	91	5	B
92	92	5	C
93	93	5	D
94	94	5	E
95	95	5	F

Universes 96-191

VERTEX Universe Numbering (Decimal) for interal as for ethernet based control universes	sACN Universe Numbering	Default Art-Net™ Universe Numbering with subnets and universes (Hexadecimal)	
		subnet	**universe**
96	96	6	0
97	97	6	1
98	98	6	2
99	99	6	3
100	100	6	4
101	101	6	5
102	102	6	6
103	103	6	7
104	104	6	8
105	105	6	9

106	106	6	A
107	107	6	B
108	108	6	C
109	109	6	D
110	110	6	E
111	111	6	F
112	112	7	0
113	113	7	1
114	114	7	2
115	115	7	3
116	116	7	4
117	117	7	5
118	118	7	6
119	119	7	7
120	120	7	8
121	121	7	9
122	122	7	A
123	123	7	B
124	124	7	C
125	125	7	D
126	126	7	E
127	127	7	F
128	128	8	0
129	129	8	1
130	130	8	2
131	131	8	3
132	132	8	4
133	133	8	5
134	134	8	6
135	135	8	7
136	136	8	8

137	137	8	9
138	138	8	A
139	139	8	B
140	140	8	C
141	141	8	D
142	142	8	E
143	143	8	F
144	144	9	0
145	145	9	1
146	146	9	2
147	147	9	3
148	148	9	4
149	149	9	5
150	150	9	6
151	151	9	7
152	152	9	8
153	153	9	9
154	154	9	A
155	155	9	B
156	156	9	C
157	157	9	D
158	158	9	E
159	159	9	F
160	160	10	0
161	161	10	1
162	162	10	2
163	163	10	3
164	164	10	4
165	165	10	5
166	166	10	6
167	167	10	7

168	168	10	8
169	169	10	9
170	170	10	A
171	171	10	B
172	172	10	C
173	173	10	D
174	174	10	E
175	175	10	F
176	176	11	0
177	177	11	1
178	178	11	2
179	179	11	3
180	180	11	4
181	181	11	5
182	182	11	6
183	183	11	7
184	184	11	8
185	185	11	9
186	186	11	A
187	187	11	B
188	188	11	C
189	189	11	D
190	190	11	E
191	191	11	F

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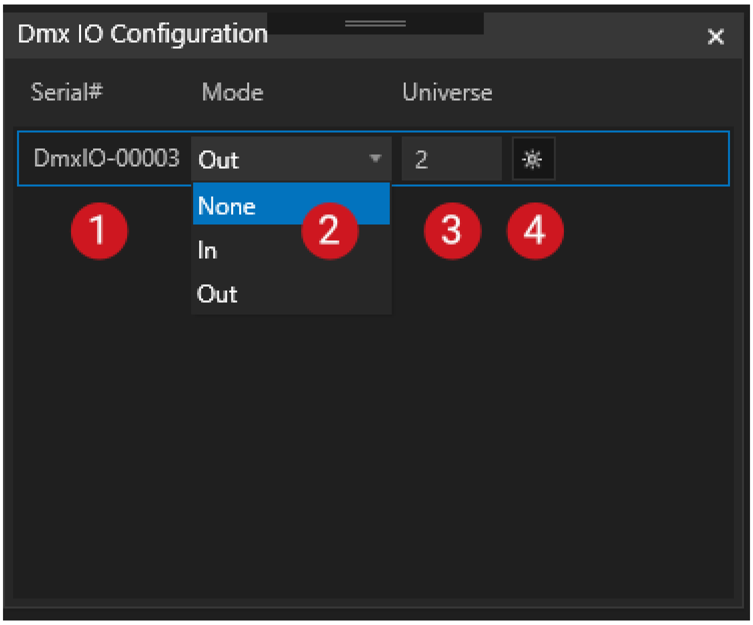
5.9.2 DMX IO

- As an **USB-DMX Interface**, the ioversal DMX IO can operate **either as DMX-Input** or as **DMX-Output**
- **No special Windows hardware driver is required** - just plug in the ioversal DMX IO into the USB-interface of your PC
- **Multiple interfaces could operate independently on one PC** or in a Vertex network

Set-up and Configuration

1. Plug a ioversal DMX IO into a USB-interface of your PC (both USB 2 or USB 3 are supported)
2. You don't need to install any specific driver, Windows detects the USB device and uses a standard USB driver for generic devices
3. The Status-LED of the ioversal DMX IO should glow
4. Start Vertex and create a new project or open your recent project file
5. Go to the "Windows"- tab in the top main menu
6. Open "DMX IO Configuration" there



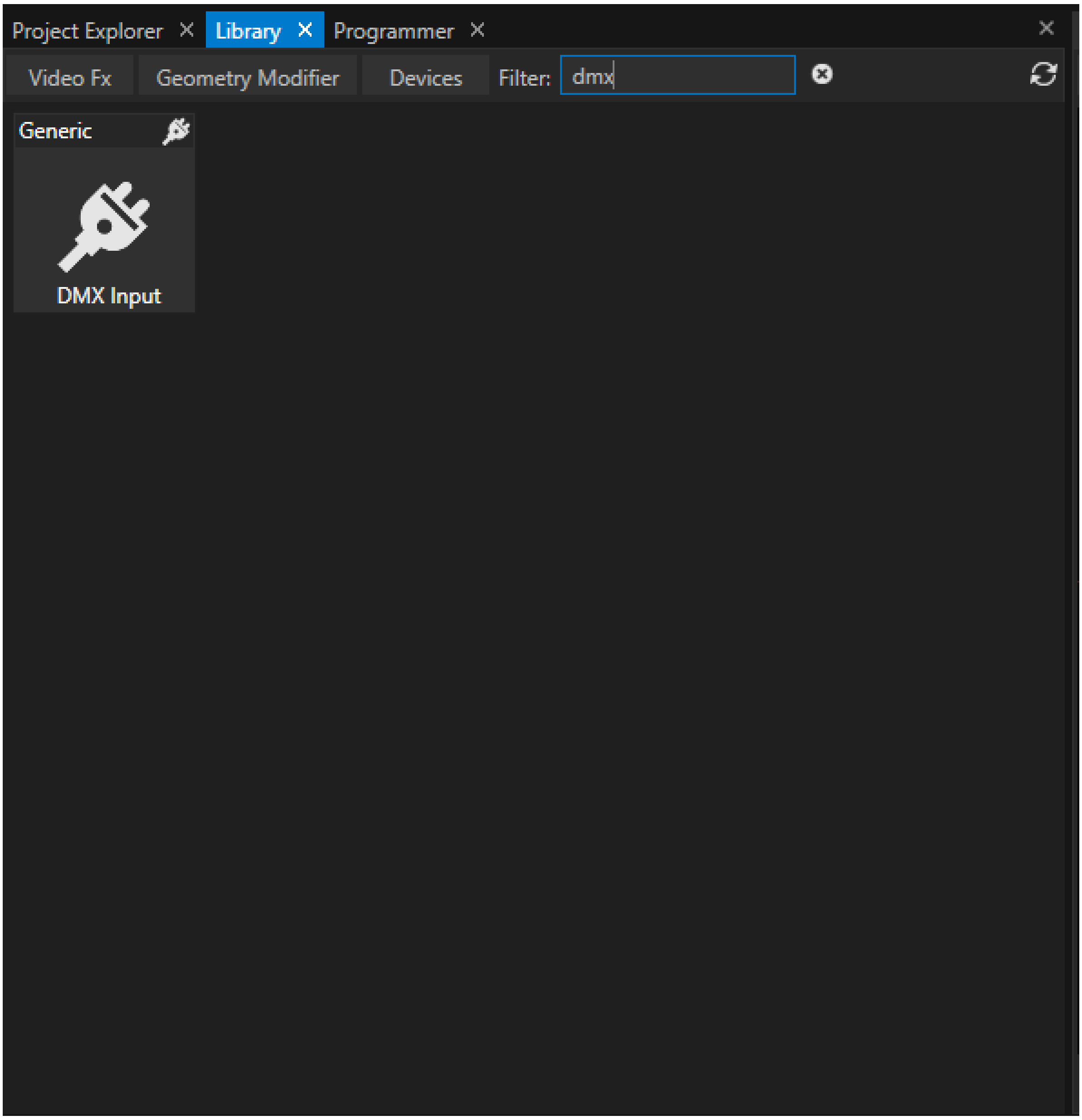
1	**Serial Number**	Unique Serial Number of the detected ioversal DMX IO Device
2	**Mode**	Mode Selection - Select between DMX In or OUT - this Mode is saved into the attached ioversal DMX IO. The Interface will remember this setting System independently when it is plugged in again -
3	**Universe**	Universe Settings For Mode = In: Select the VERTEX internal Universe, the incoming DMX Signal is routed to. For Mode = Out: Number of VERTEX-internal Universe that should send as DMX. The interface will hear for data on this universe number This Number is saved into the attached ioversal DMX IO. The Interface will remember this setting System independently when it is plugged in again - Fore more details about routing, please also read: DMX-Patch
4	**Identify**	Highlight- Button for Identification: When pushing the Highlight-Button, the LED of the corresponding ioversal DMX IO- Interface will blink. Especially helpful when working with multiple Interfaces at the same PC.

ⓘ **Universe Number and Mode are internally stored in the interface**
You can Plug on and Off the ioversal DMX IO and they will work again in the same Mode and grabbing/sending out the same VERTEX Universe Number. Once configured, you are able to plug in the Interface on any System of your project and it will remember on your settings.

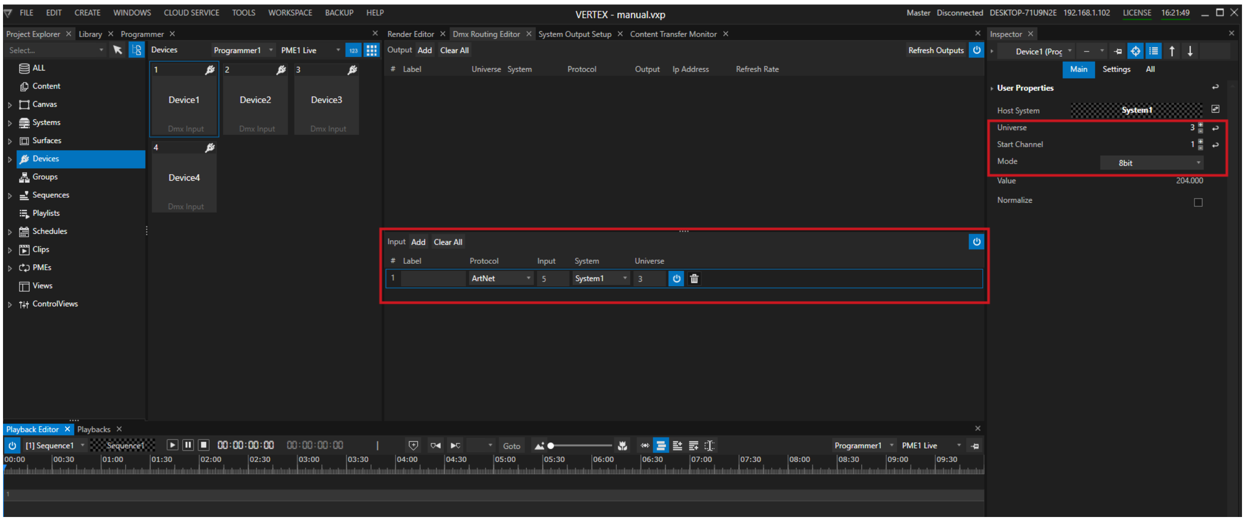
5.9.3 DMX Input Device

- Use DMX Input Devices to **trigger, wire or script interactions based on values of a DMX Channel**
- You are able to **listen on DMX Values** of a predefined DMX Start Address and Universe
- Use the **incoming DMX Values to influence other properties into VERTEX** or to trigger an action

Workflow



- Go Library > Devices
- Search for "DMX Input"
- Right-Click on the device and add one or multiple to your project



Host System System1
Universe 3
Start Channel 1
Mode 8bit
Value 204.000
Normalize □

#	Label	Protocol	Input	System	Universe
1		ArtNet	5	System1	3

Example of a DMX Device Setting: There is DMX Input Routing. VERTEX is listening on Art-Net Universe 5. Date from this Universe is internally routed to VERTEX Universe 3.
DMX Input Device 1 is set to VERTEX Universe 3, Start Channel 1.

- Go to Project Explorer > Devices
- Select one or multiple DMX Input Devices
- Set VERTEX universe number and start channel and define the DMX mode (Default 8 Bit, 16 Bit. 32 Bit...)

Normalize Input

Enable "Normalize" in the Device settings, if you want to control or wire a property into VERTEX that has a value range from 0 to 1 (e.g. opacity).

All incoming DMX Data is normalized into the range from 0 to 1.

- Ensure, that a valid DMX Input Routing exists.

Working with DMX Input Devices

As for every Device, there are different options to work with the incoming Data.

Here some Examples:

1. **Scripting**
   The Opacity of Clip Container 1 is controlled by the incoming DMX Data from Device 1
   The opacity value range is 0 to 1. The "Normalize" data option is enabled for the input Device
   A Script Command for this scenario could be like this:

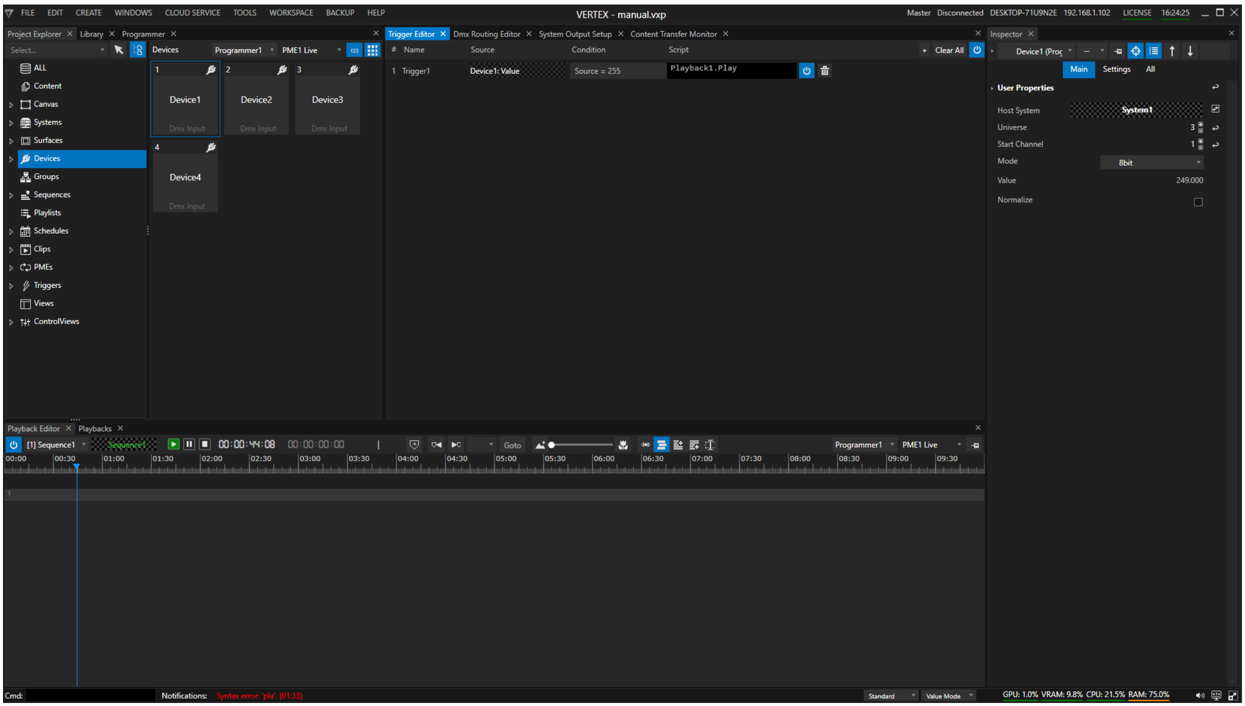
```
Sequence1.ClipContainer1.Opacity.Value = Device1.Settings.Value.Value
```

2. **Trigger**

With help of the Trigger Editor you can easily build Triggers. An defined action is executed if a condition for a source is reached

Of course this also works with DMX Input Devices

- Open the Trigger Editor
- Drag the e.g. Value property from Inspector to the Source field
- Enter a Condition
- Enter a Script that should be executed



#	Name	Source	Condition	Script
1	Trigger1	Device1: Value	Source = 255	Playback1.Play

User Properties

Host System: System1
Universe: 3
Start Channel: 1
Mode: 8bit
Value: 249.000
Normalize: □

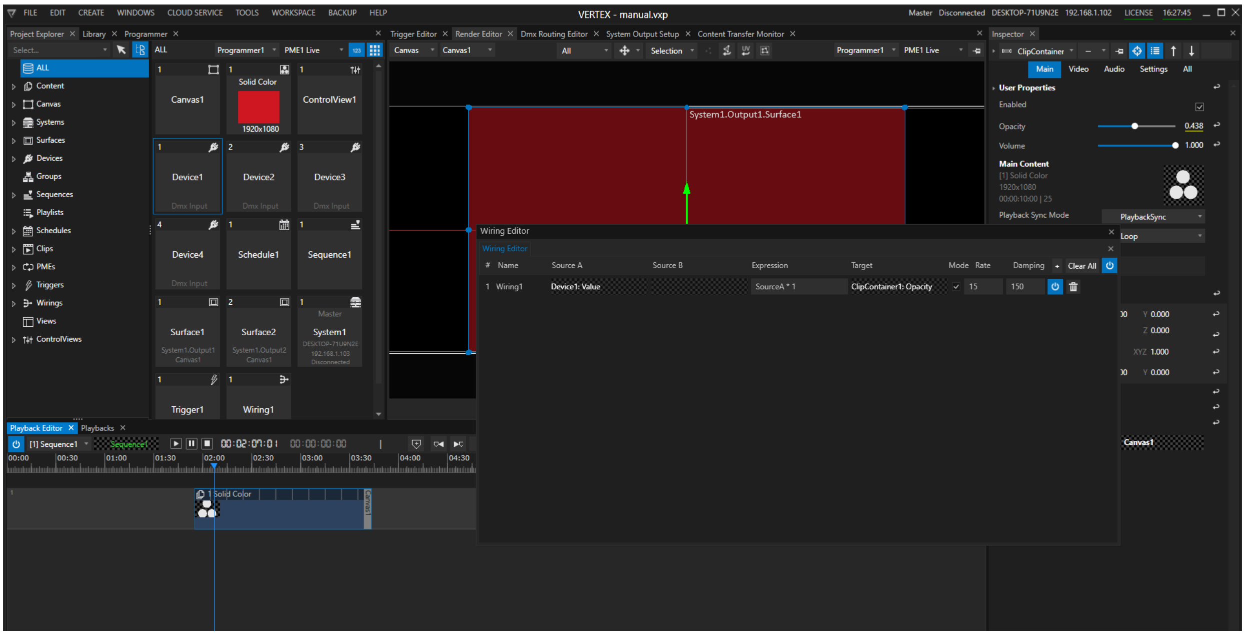
Example for the usage of a DMX Input Device:
If DMX-Value of Universe 3/Startchannel 1 is 255, Playback 1 is started

3. Wiring

Wiring gives you the option to connect Values of different properties.

Of course this also works for DMX-Input Devices

- Open the Wiring Editor
- Drag a DMX Device Property from Inspector to e.g. the Source field
- Drag another property into target field
- Add an expression



#	Name	Source A	Source B	Expression	Target	Mode	Rate	Damping
1	Wiring1	Device1: Value		SourceA * 1	ClipContainer1: Opacity	✓	15	150

Example of a Wiring
The Value of the DMX Input Device 1 (Normalized) is wired to the Opacity of Clip Container 1.
The Opacity now is controlled by a DMX Channel.

5.9.4 DMX Output Devices

- With **different types of DMX Output Devices** you are able to send out DMX Data
- Integrate DMX Devices to your show, **program lighting scenarios based on keyframes** or work with them in **programmer mode**
- Create a **group of Devices** and **control them together** with only one Clip Container

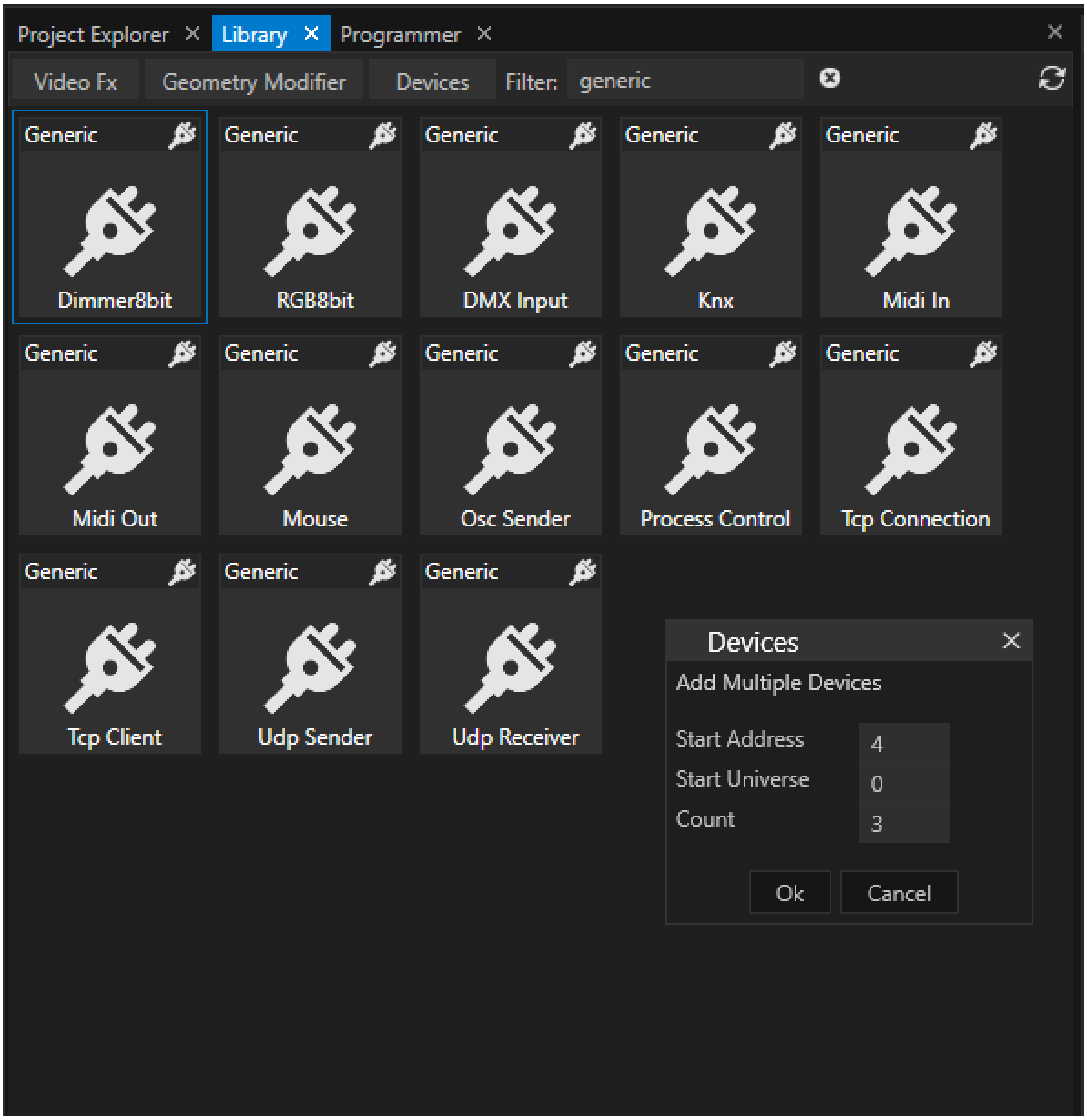
Workflow

Add from Library

- Open the **Library Editor**
- Select the **Devices** Filter there
- **Search for** your DMX Device

DMX Devices and VERTEX Library
Depending on the VERTEX Assembly version, the available number of different DMX Devices could change. Basically, VERTEX is shipped with Generic standard devices: a 8 Bit Dimmer and and 8 Bit RGB Device. If you require other DMX Devices for your project, just write us an email to vertex.support@rossvideo.com with type and in the most ideal case directly with the DMX table :-)

- **Right-Click** on the Device you want to add
- Select "**add to project**" or "**add multiple"**
- If you only have **added one device**: select the device into Inspector to set DMX Universe and Start address
- If you have select **"added Multiple**", a dialog window opens. Just add the **start address and universe** there and the number of devices you want to add.
  The first device will start with start address and universe you have set. For all other devices, start address and universe are automatically set by VERTEX.



Filter: generic

Devices

Add Multiple Devices

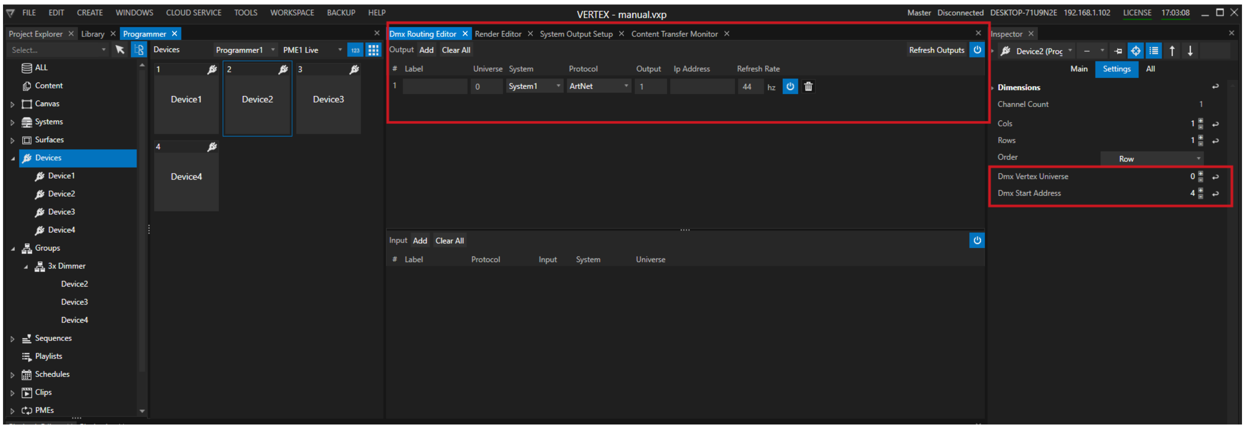
Start Address 4

Start Universe 0

Count 3

Check DMX Routing and Start Addresses

- Remember that a DMX output only will work, when a **valid DMX routing** is created. If this has not been set up already, please create a routing now.
  You can define the protocol to send out DMX data in the DMX Routing Editor. To send physical DMX-512, Ross Video / ioversal provides a USB-DMX interface, the <%DMX_IO%>
- Go to Project Explorer > Devices and select to inspect a DMX device from there. Set or check the **DMX Start Address** or the **Start Universe** in the Inspector window.

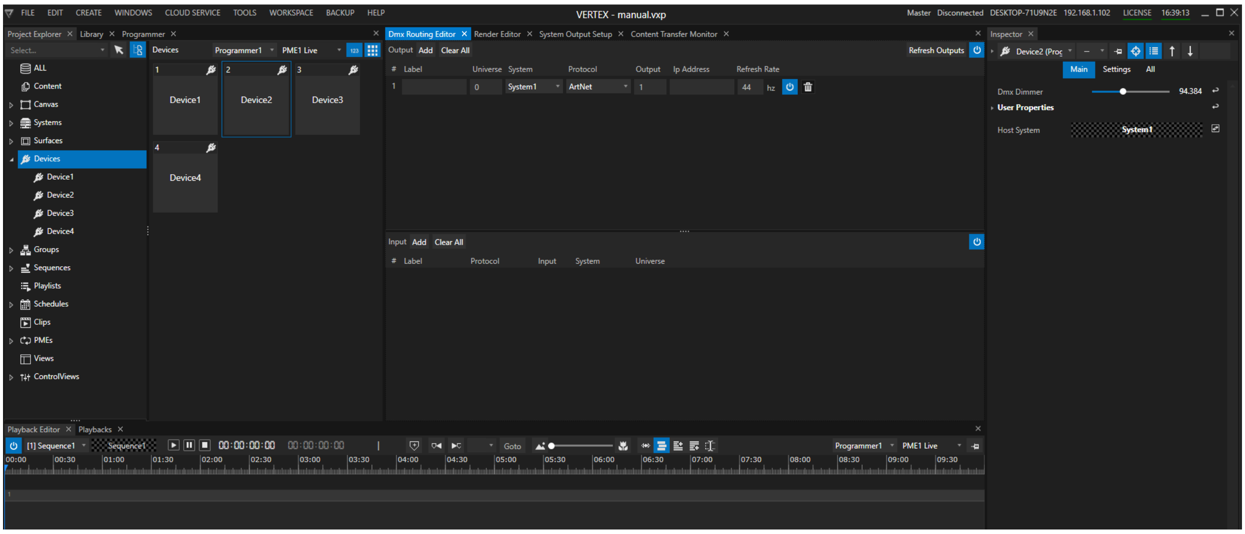


Dimensions
Channel Count 1
Cols 1
Rows 1
Order Row
Dmx Vertex Universe 0
Dmx Start Address 4

#	Label	Universe	System	Protocol	Output	Ip Address	Refresh Rate
1		0	System1	ArtNet	1		44 hz

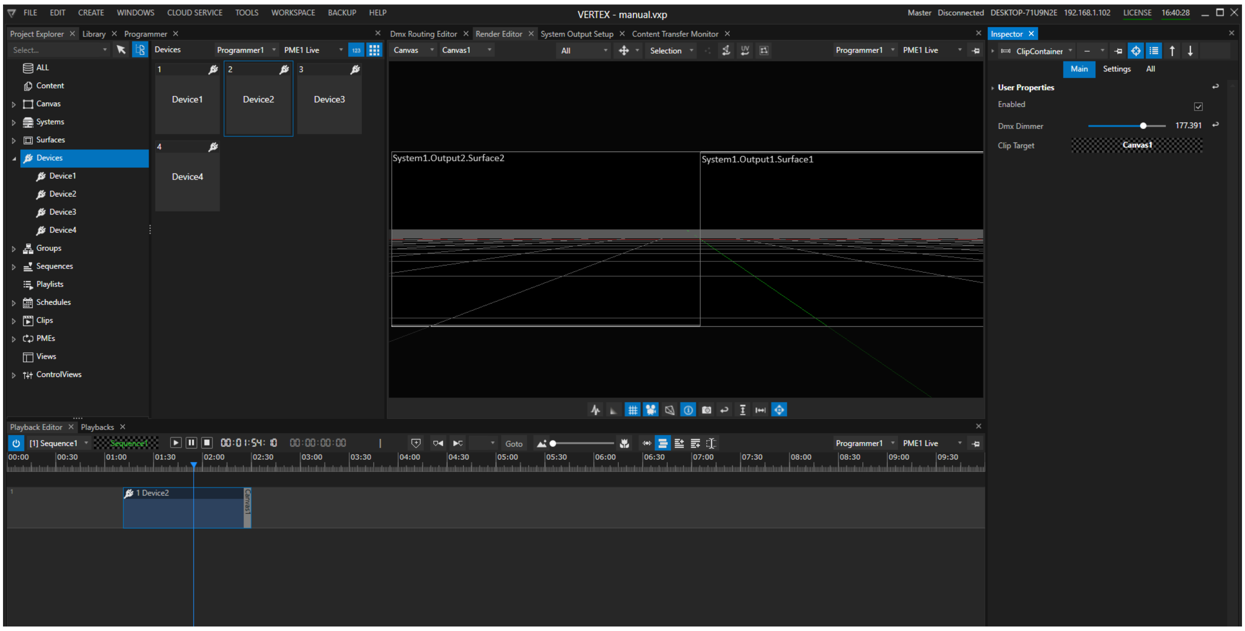
Send Out Global Values

- You are able to send out a global value for your DMX device, e.g. for testing or if there generally should be a minimal value for such devices all the time.
- To set values globally, select a device directly into Project Explorer and set the DMX Value in the Inspector.
- This value is sent by vertex permanently

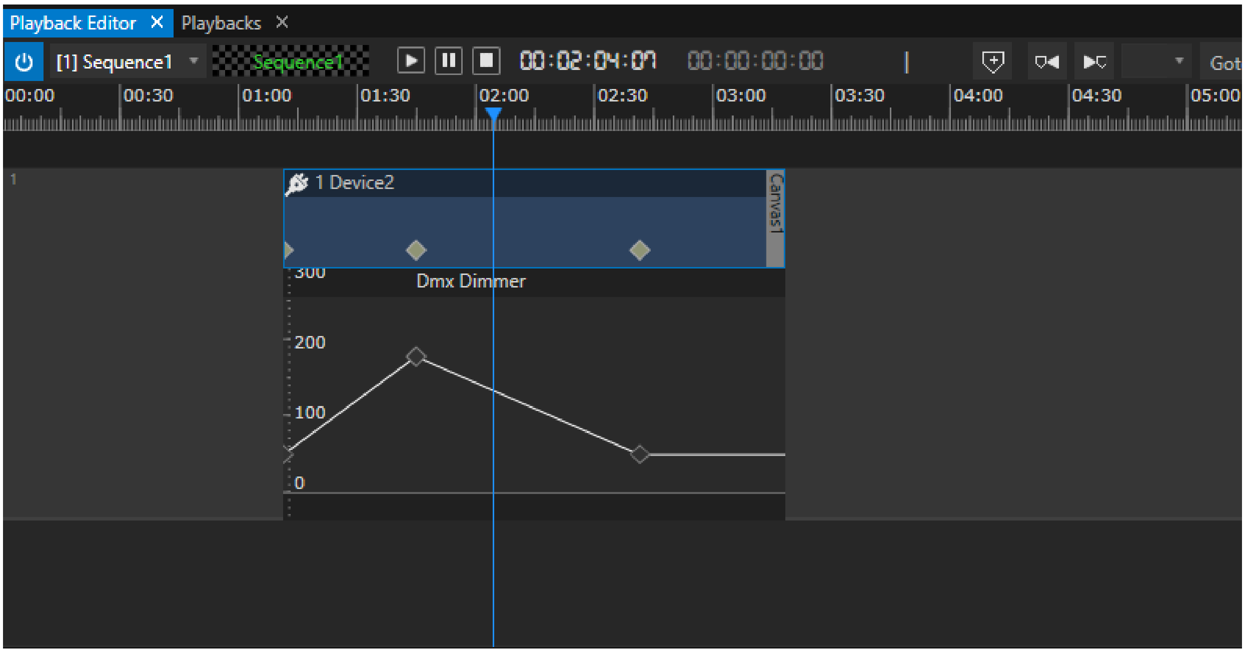


Dmx Dimmer 94.384
User Properties
Host System System1

Work with Clip Containers and Keyframes



- A combination of Clip Containers with Keyframes allows you to create more complex lighting scenarios, color transitions or an integration of lighting into your video show.
- Device values from a Clip Container temporary **overwrites** **global values** (if such are set)
- Just drag a device from Project Explorer into the playback Editor to **create a new Clip Container**
- Double click on the Clip Container to open the **Keyframe Editor** (to learn more about Keyframe animation, please read the topic Keyframes



- If you prefer a **workflow from a Lighting Desk** - you can also work in **Programmer Mode**:
  Change all values and create your scene. All changes are temporarily stored as a list in the Programmer. When your scene is final, you can save the programmer list as a scene: VERTEX automatically creates the Keyframes for all changed values at the Playhead position.

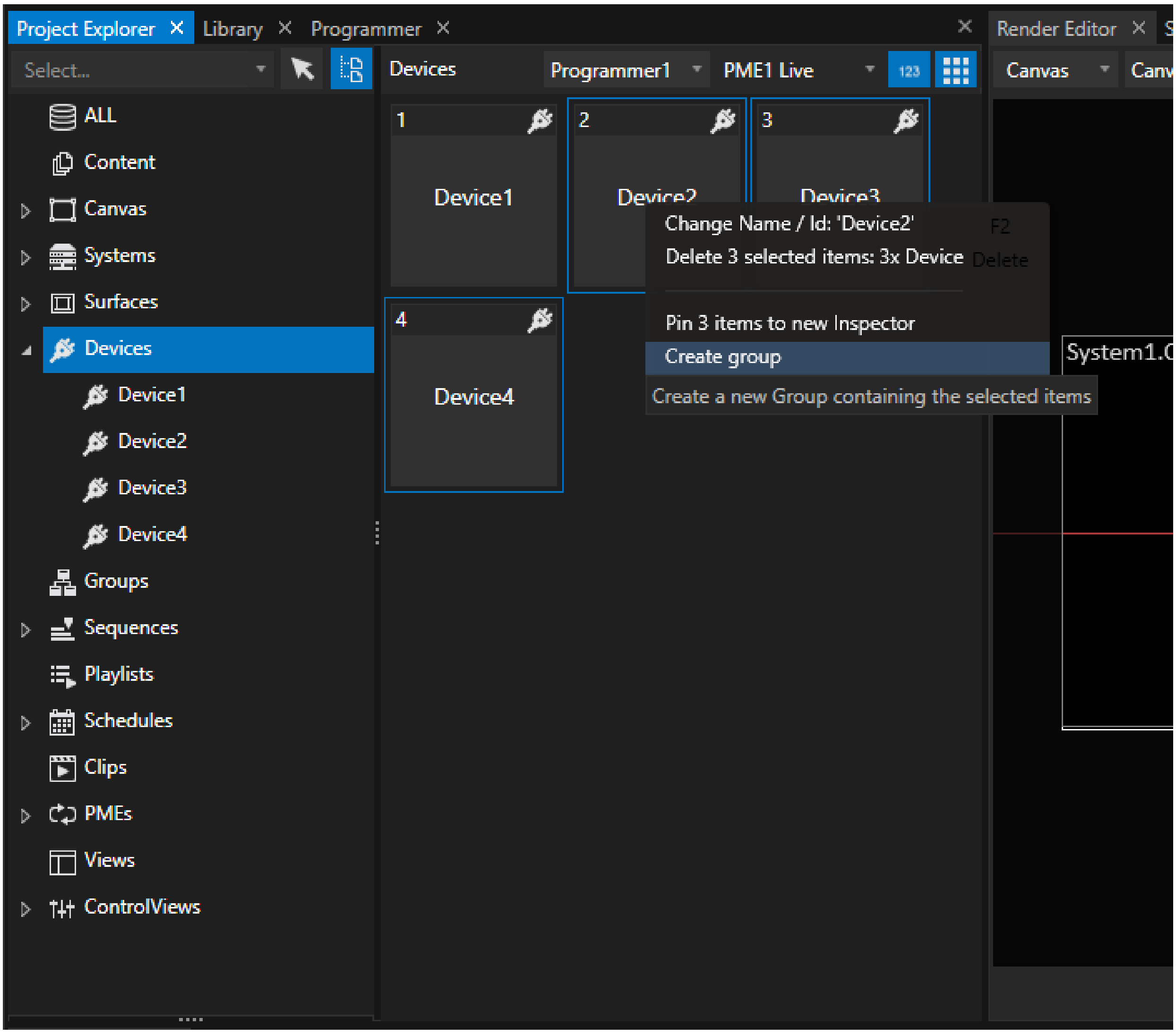
Groups

- Manage and summarize your DMX Output Devices in Groups. Make value changes for all devices of a group

Create a Group

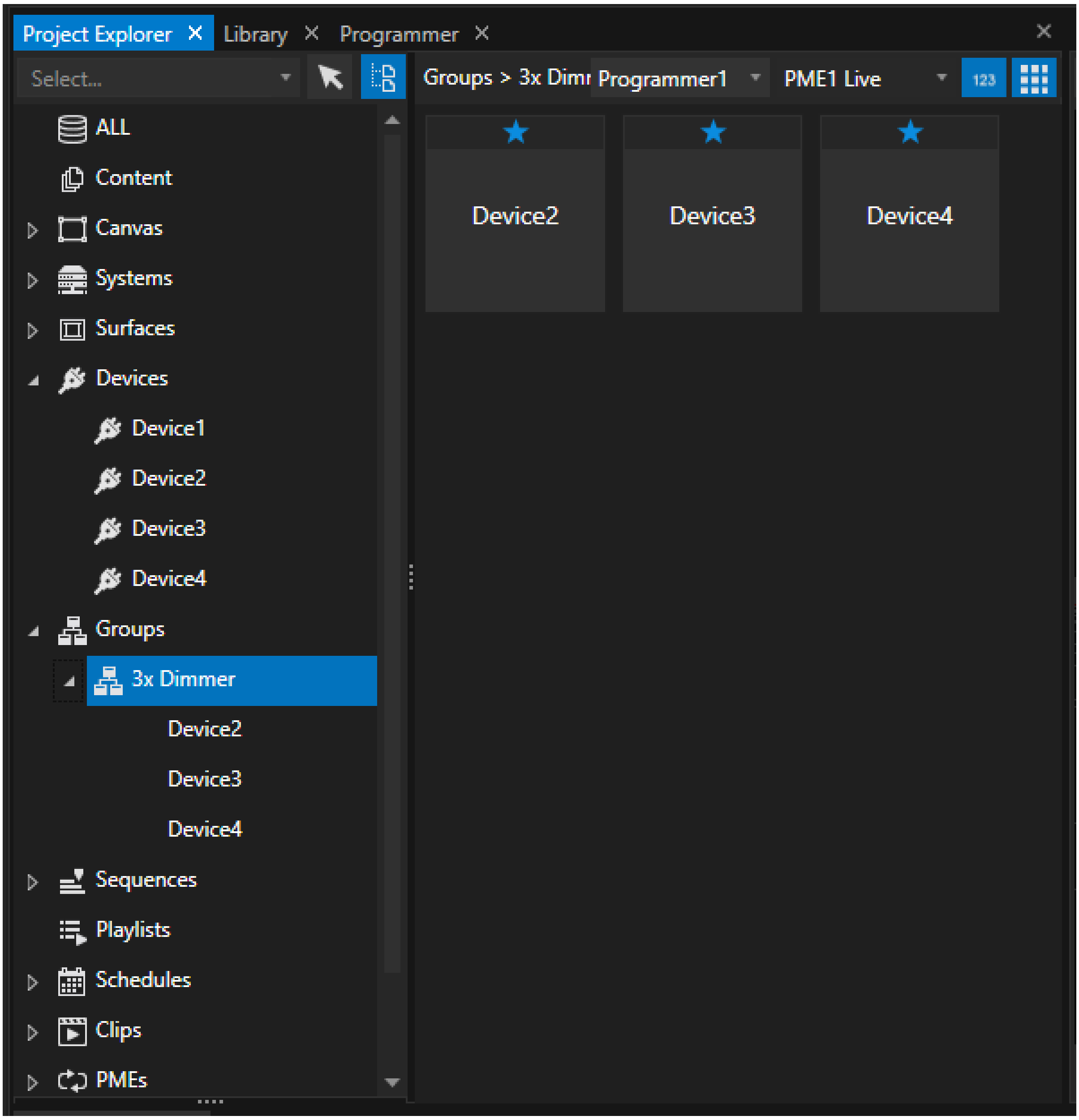
There are 2 ways to create a group and assign Devices to it:

- go to *Project Explorer > Devices*
- select all devices that should be member of a group
- access the context menu via right-click and select **Create group**
- A new group containing the selected Devices is created. You can find, select or rename the group in the "Group" section of the Project Explorer



or:

- Go to the "Groups" section in the Project Explorer
- Right-Click and open the context menu
- Choose "Add new" there
- Drag devices from Device section of the Project Explorer to this group

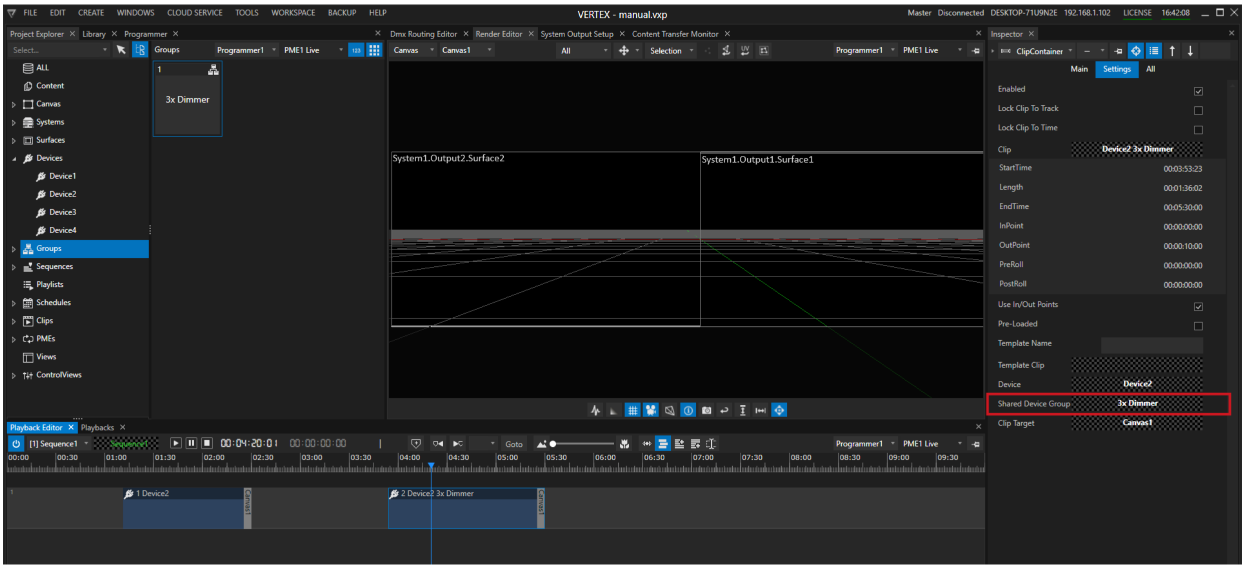


Work with a Group of DMX-Devices

When working with a group, you are able to set DMX Values for all group members with only one Clip Container.

- Drag a Group from Project Explorer to the Playback Editor
- All changes you do for this Clip Container are adopted for all devices of this Group
- If values apply to a group, you can identify this with the "SharedDevice Group" Property. If there is a group set, all values of the clip container are also assigned to the group members.

- You can also transfer the settings for a DMX Device to a Group afterward by dragging a Group from Project Explorer to the "SharedDevice Group" field of an already existing Clip Container (that already hosts a DMX Device)



Enabled ☑
Lock Clip To Track □
Lock Clip To Time □
Clip: Device2 3x Dimmer
StartTime: 00:03:53:23
Length: 00:01:36:02
EndTime: 00:05:30:00
InPoint: 00:00:00:00
OutPoint: 00:00:10:00
PreRoll: 00:00:00:00
PostRoll: 00:00:00:00
Use In/Out Points ☑
Pre-Loaded □
Template Name
Template Clip
Device: Device2
Shared Device Group: 3x Dimmer
Clip Target: Canvas1

5.9.5 DMX Control

- There are **different options** to control VERTEX with **incoming DMX-Data**
- Just **control Playbacks** or **Systems** or make use of DMX-512 to make a more complex **Surface** modulation
- VERTEX additionally introduces the concept of a **Console Layer** that gives you the options to control **VERTEX like a lighting fixture**
- With a **DMX-Input Device** you are able to use DMX data into scripts or into e.g. the Trigger-Editor

DMX Routing

To make use of all options below, **you first have to create a DMX Routing**. Use the DMX Routing Editor to set up your incoming DMX protocol (Art-Net™, sACN, MA-Net2 or DMX-512 with ioversals ioversal DMX IO)

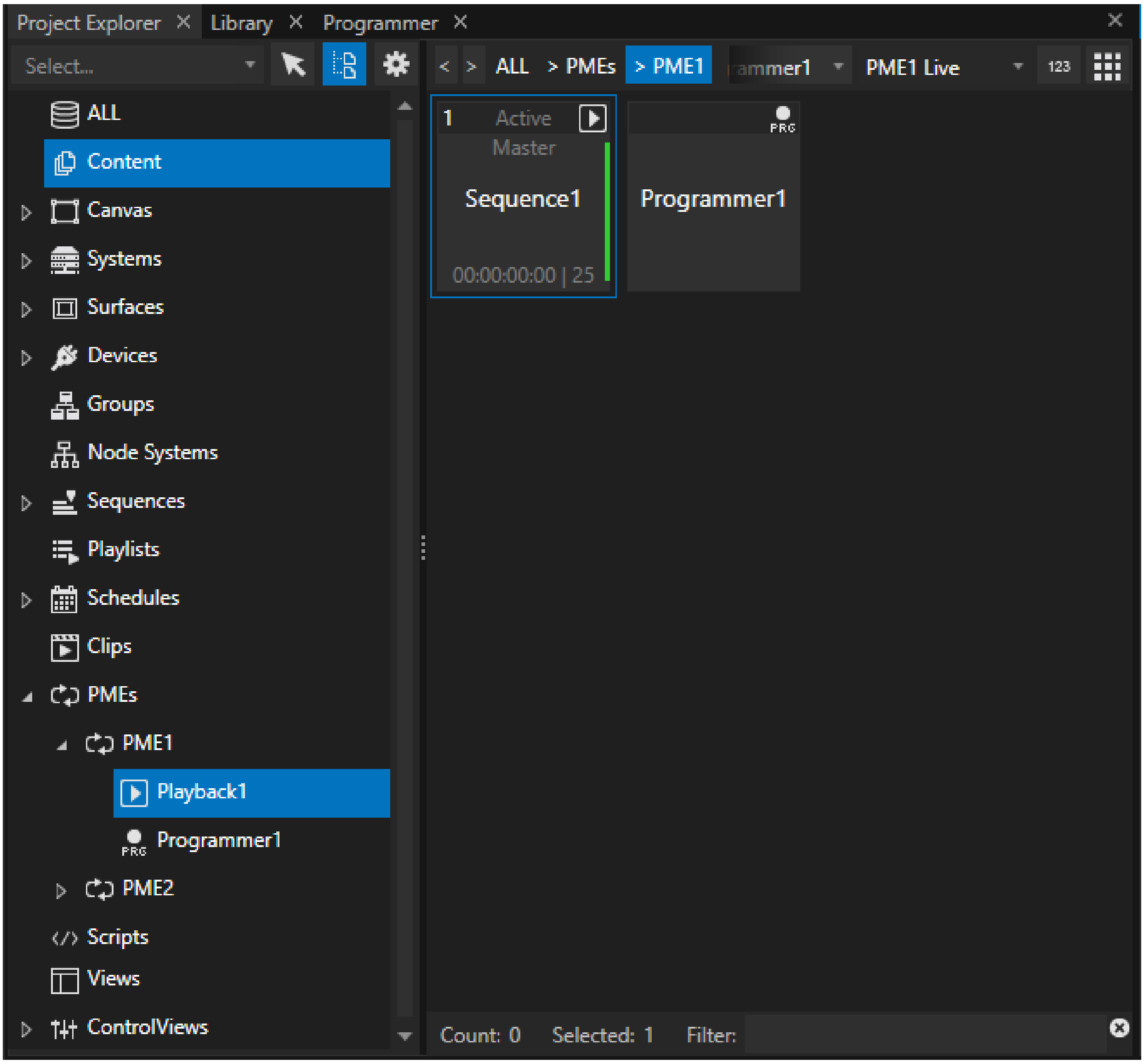
You have to do **this setup once**.

Control a Playback with DMX-512

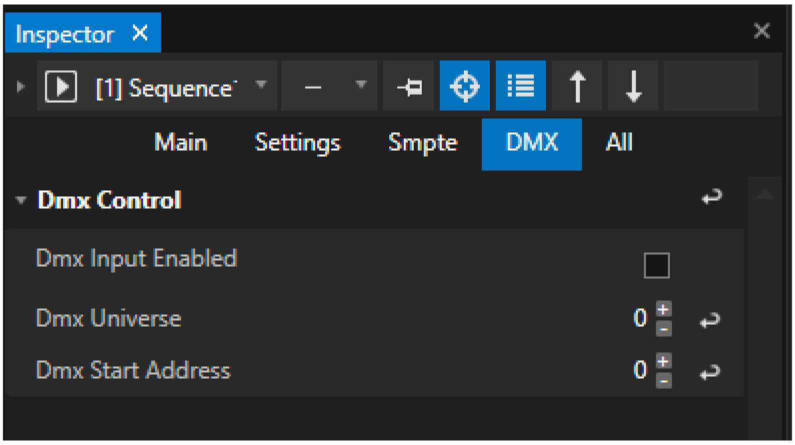
- Once a DMX Routing is created, **a *Playback* can be controlled by incoming DMX-Data**
- **8 DMX-Channels** allow controlling e.g. opacity, play/pause or jump to a cue
- DMX-512 **settings** for playback control are **located in the PME** (Playback Mixing Engine).

Settings

- Go to Project Explorer > PMEs
- Select PME1 (live)
- Select the Playback to be controlled by DMX



- Go to *Inspector > DMX* and set the start address and universe
- Don't forget to enable the DMX Input for this Playback



Dmx Control

Dmx Input Enabled □

Dmx Universe 0

Dmx Start Address 0

DMX Channel Map

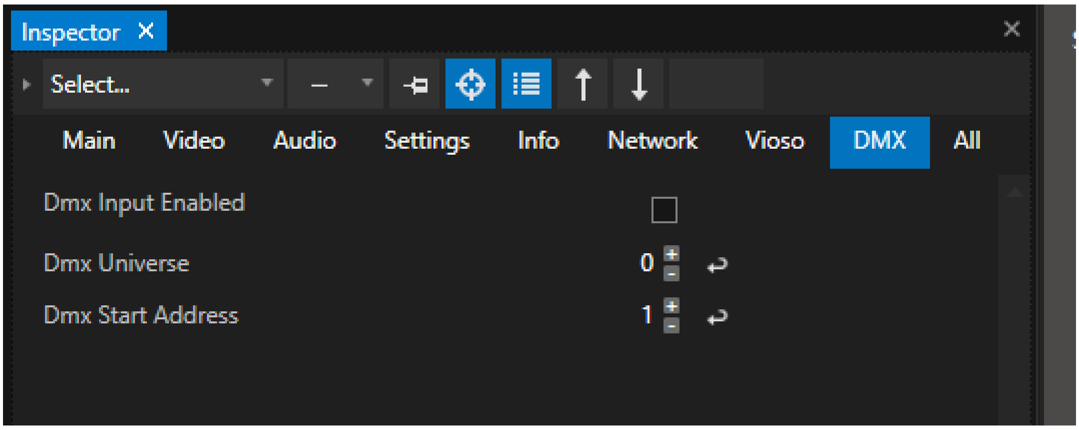
DMX Address	Parameter Name	Type	Default Values	Values				
1	Opacity	16bit	65535	0-65535				
3	On/Off	8bit	255	0-127 Off	128-255 On			
4	Play Pause Stop	8bit	45	0-10 Idle/None	11-20 Play Once	21-30 Play Loop	31-40 Pause	41-50 Stop
5	Speed Factor	8bit	128	0-124 0x - 1x	125-130 1x	131-255 1x - 4x		
6	Cue Selection	16bit	0	0-65535				
8	Frame Selection	16bit	0	0-65535				

Control a System with DMX-512

- Once a DMX Routing is created, **VERTEX can be controlled by incoming DMX-Data**
- **6 DMX-Channels** allow controlling various elements in your project: i.e opacity, system volume, triggering Scripts by ID and many more functions.

Settings

- Select your System and go to Inspector



Dmx Input Enabled □

Dmx Universe 0

Dmx Start Address 1

- Select the DMX Tab into Inspector and do your settings for start address and universe
- Don't forget to activate the DMX Input for this System

DMX Channel Map

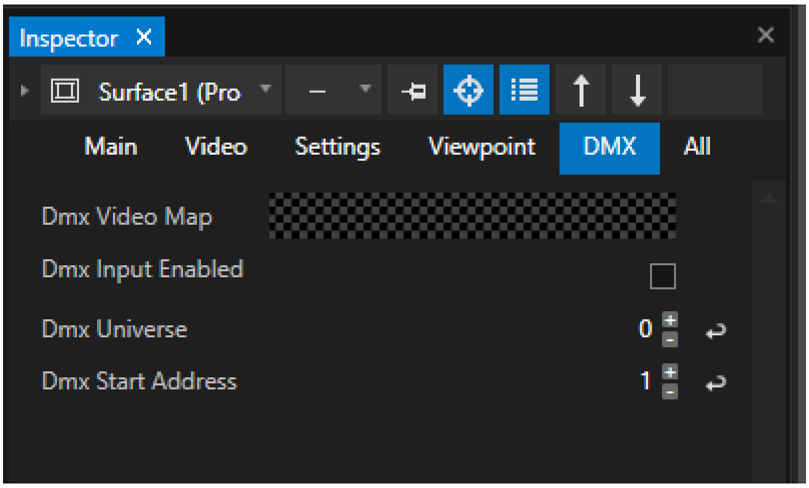
DMX Addresss	Parameter Name	Type	Default Value	Note
1	Live Master	16bit	0	16bit opacity 1 mode for crossfade wipe modetexture
2	fine			
3	Live Volume	16bit	0	
4	fine			
5	Script Control	8Bit	0	0=idle 1-254 Script Id 255 Take after 1sec
6	Function Control	8Bit	0	0=idle 255 Take after 1sec values: 1 Enter Fullscreen, 2 Leave Fullscreen, 3 Take Over master, 4 Init Ndi, 5 init Video Inputs, 6 Reset Video Inputs, 7 Reset RenderEngines

Control a Surface with DMX-512

- Once a DMX Routing is created, VERTEX offers you the option to **control a Surface by incoming DMX-Data**
- With **104 DMX-Channels** your are able to control most parameters of a Surface

Settings

- Select your Surface and go to Inspector



Dmx Video Map

Dmx Input Enabled □

Dmx Universe 0

Dmx Start Address 1

- Select the DMX Tab into Inspector and do your settings for start address and universe
- Don't forget to activate the DMX Input for this System

DMX Channelmap for a Surface

DMX Address	Category	Parameter Name		Type	Default Value	Note
1		opacity coarse	1	16bit	0	16bit opacity 1 mode for crossfade wipe modetexture
2		opacity fine	1			
3	Position	xpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel

DMX Address	Category	Parameter Name		Type	Default Value	Note
4		xpos fine				
5		ypos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel
6		ypos fine				
7		zpos coarse	2	16bit	32768	32768 = 0 65535 = + 16.000 pixel 0 = -16.000 pixel
8		zpos fine				
9	Rotation	xrot coarse	2	16bit	32768	mode crosse fade from absolut to continous value
10		xrot fine				128 = no motion 255=fastForward 0= fastReverse
11		yrot coarse	2	16bit	32768	
12		yrot fine				
13		zrot coarse	2	16bit	32768	
14		zrot fine				
15	Scale	xscale	2	16bit	32768	
16		xscale fine				
17		yscale	2	16bit	32768	
18		yscale fine				
19		zscale	2	16bit	32768	
20		zscalefine				
21		Geometry Folder	1		0	
22		Geometry File	1		0	

DMX Address	Category	Parameter Name		Type	Default Value	Note
23		Blend Folder	1			
24		Blend File	1			
25		Col Temp Intensity	2	16bit	0	
26		fine				
27		Col Temp Value	2	16bit	32768	
28		fine				
29	Color Correction	Hue	2	16bit	32768	
30		fine				
31		Saturation	2	16bit	32768	
32		fine				
33		Contrast	2	16bit	32768	
34		fine				
35		Brightness	2	16bit	32768	
36		fine				
37		Red Balance	2	16bit	32768	
38		fine				
39		Green Balance	2	16bit	32768	
40		fine				
41		Blue Blanace	2	16bit	32768	
42		fine				
43		Levels Min	2	16bit	0	
44		fine				
45		Levels Value	2	16bit	32768	
46		fine				
47		Levels Max	2	16bit	65535	
48		fine				

DMX Address	Category	Parameter Name		Type	Default Value	Note
49		ViewPoint OffsetX	2	16bit	32768	
50		fine				
51		ViewPoint OffsetY	2	16bit	32768	
52		fine				
53		ViewPoint OriginX	2	16bit	32768	
54		fine				
55		ViewPoint OriginY	2	16bit	32768	
56		fine				
57		ViewPoint OriginZ	2	16bit	30161	
58		fine				
59		ViewPoint TargetX	2	16bit	32768	
60		fine				
61		ViewPoint TargetY	2	16bit	32768	
62		fine				
63		ViewPoint TargetZ	2	16bit	32768	
64		fine				
65		Field Of View	2	16bit	0	Default 45° 0_65535 = 0 - 180
66		fine				
67		Roll	2	16bit	32768	
68		fine				
69		Aspect Ratio	2	16bit	65535	
70		fine				

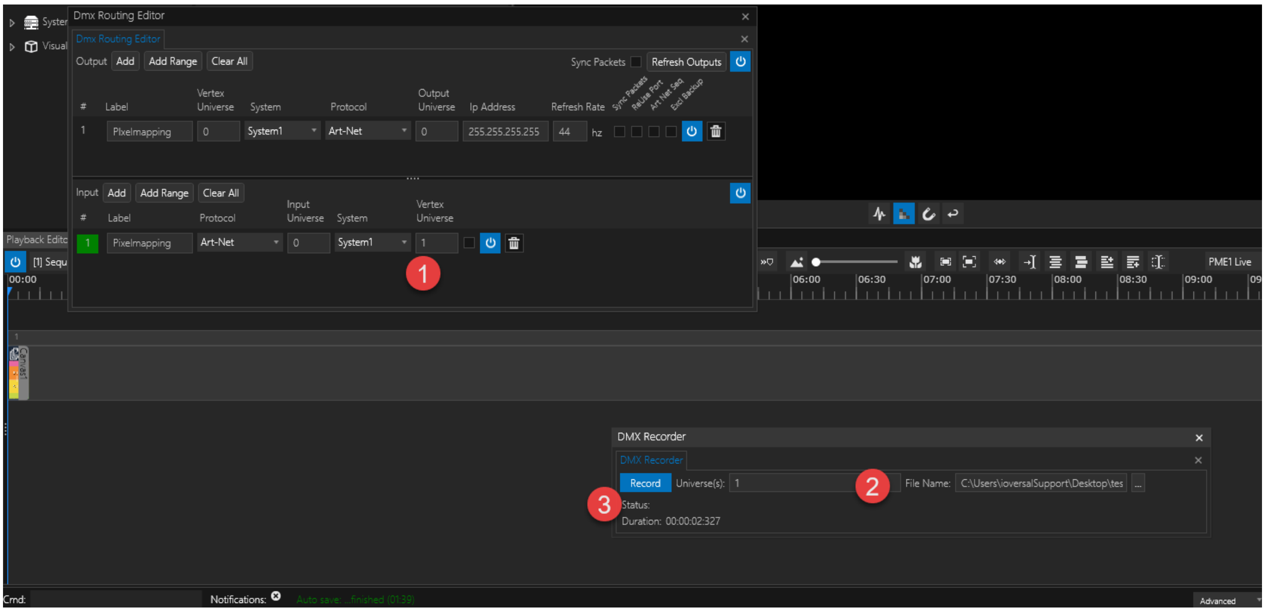
DMX Address	Category	Parameter Name		Type	Default Value	Note
71		ViewPoint Mode	1			
72		ViewPoint Ctrl	1			
73	Edge Blending	Left	2	16bit	0	
74		fine				
75		Left Start	2	16bit	0	
76		fine				
77		Left Gamma	2	16bit	0	
78		fine				
79		Left Luminance	2	16bit	32768	
80		fine				
81		Right	2	16bit	0	
82		fine				
83		Right Start	2	16bit	0	
84		fine				
85		Right Gamma	2	16bit	0	
86		fine				
87		Right Luminance	2	16bit	32768	
88		fine				
89		Top	2	16bit	0	
90		fine				
91		Top Start	2	16bit	0	
92		fine				
93		Top Gamma	2	16bit	0	
94		fine				
95		Top Luminance	2	16bit	32768	
96		fine				
97		Bottom	2	16bit	0	

DMX Address	Category	Parameter Name		Type	Default Value	Note
98		fine				
99		Bottom Start	2	16bit	0	
100		fine				
101		Bottom Gamma	2	16bit	0	
102		fine				
103		Bottom Luminance	2	16bit	32768	
104		fine				

5.9.6 DMX Recorder

- VERTEX' DMX Recorder captures incoming Digital Multiplex signals allowing you to record lighting sequences
- these are stored in a designated VDMX file for later use
- DMX recordings require a valid DMX Routing

DMX Recording Workflow



Dmx Routing Editor

Output

#	Label	Vertex Universe	System	Protocol	Output Universe	Ip Address	Refresh Rate		Sync Packets	ReUse Port	Art Net Seq	Excl Backup
1	Pixelmapping	0	System1	Art-Net	0	255.255.255.255	44	hz	□	□	□	□

Input

#	Label	Protocol	Input Universe	System	Vertex Universe
1	Pixelmapping	Art-Net	0	System1	1

DMX Recorder

Universe(s): 1

File Name: C:\Users\ioversalSupport\Desktop\tes

Status:

Duration: 00:00:02:327

1. Make sure your DMX Routing is properly set up.

2. To open the DMX Recorder go to MAIN MENU > WINDOWS > I/O > DMX Recorder.
   Next, select the VERTEX Universe(s) that you'd like to record the signal from. Multiple universes can be separated by comma or a space (e.g. '1,2' or '1 2'). Ranges from '1-5' are supported.
   Klick on the ...-button to set a name and location for the VDMX file to be created.
3. Klick the Record/ Stop button to start/ stop recording.

DMX Recorder Script Commands

- There are 3 Vertex script commands that start & stop the recording of DMX input signals.
- They can be found on System level.
- The START command requires setting parameters for the file path and the ID of the Vertex Universe(s). Ranges from 1-5 are supported.

```
System1.StartDmxRecording C:\Users\...\Desktop\RecDmx.vdmx, 1
```

```
System1.StopDmxRecording
```

```
System1.StopDmxRecordingAddToProject
```

- The third script command adds the finished recording to your content items. You can conveniently drag it from the Project Explorer into your Sequence, Playlist etc.

5.10 Interaction

- VERTEX offers you **Solutions and Editors** to **make Interaction as simple and fast as possible**
- Connect Properties with help of **Wirings** or **trigger** an action based on incoming data

Wiring Editor

Connect Properties and do a mathematical Operation

Trigger Editor

Execute Script Commands based Conditions, triggered by Property Values or incoming Data

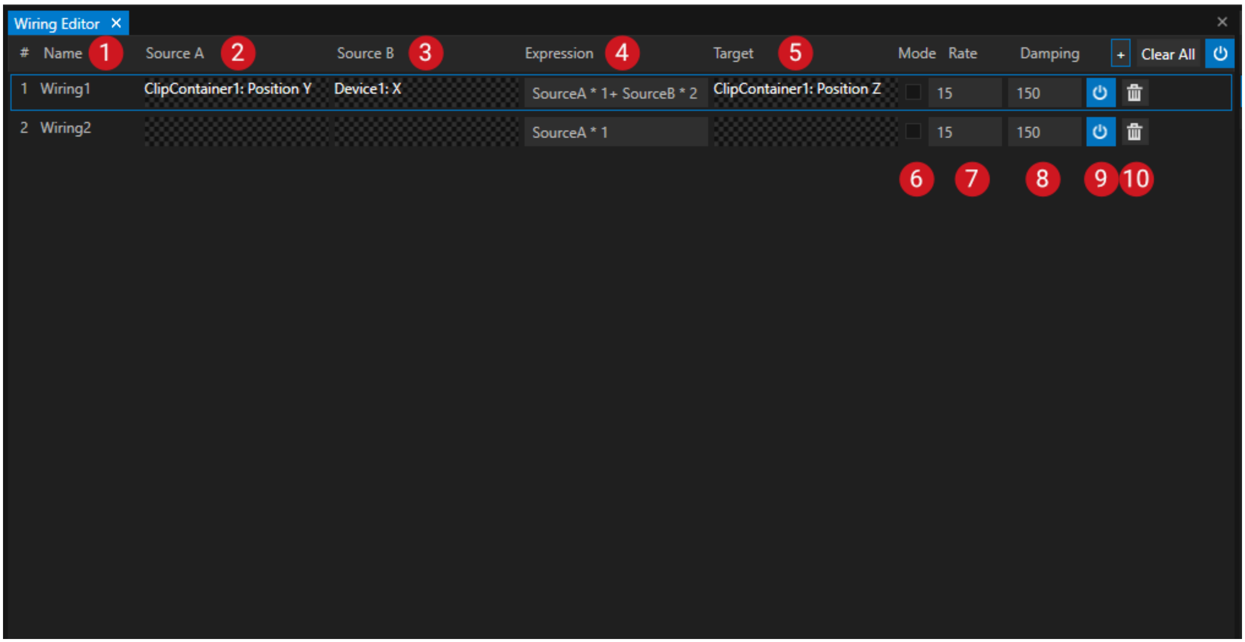
Script Commands

Most items into VERTEX do have a Script Window to write and enter Scripts.
Use this Script Commands to built interaction or write Scripts that combine several Commands
Get more information about Script Commands

5.10.1 Wiring Editor

- Wiring assists you to **create simple interactive logic** and to **connect different Properties that influence each other**
- **The Wiring Editor** follows **a easy table scheme**: Define 1 or 2 Sources, enter an Expression that influence a Target Property - do expression- influence target parameter
- Sources are assigned by **drag and drop them from Inspector** - wired Properties are **underlined in yellow color** in the Inspector

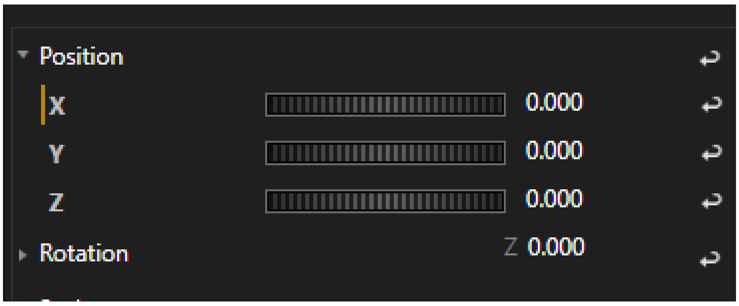
User Interface

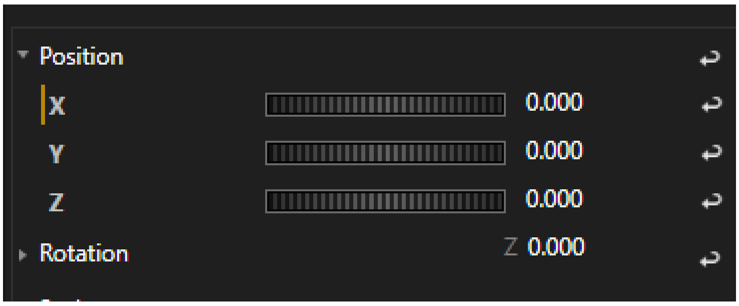


Wiring Editor

#	Name	Source A	Source B	Expression	Target	Mode	Rate	Damping
1	Wiring1	ClipContainer1: Position Y	Device1: X	SourceA * 1+ SourceB * 2	ClipContainer1: Position Z	□	15	150
2	Wiring2			SourceA * 1		□	15	150

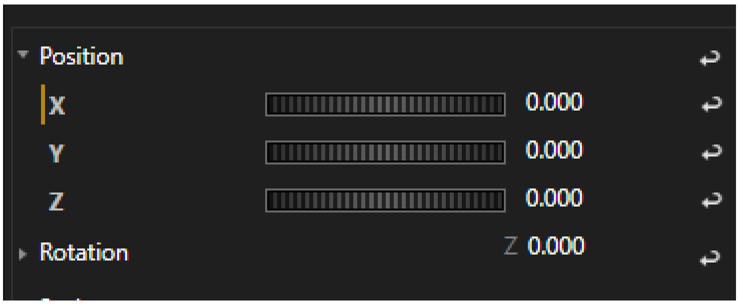
Example for Wiring:Y-Position of Clip Container1 is Source 1.A Mouse device that Captures the mouses x position is Source B. Both influcenses the z-Position of Clip Container 1. The Expression defines how the values for the Clip Containers Z position are calculated.

1	**Name**	Enter a custom Name for your wiring
2	**Source 01 and Source 02**	Add a Source by drag a Property Name from Inspector to the Source field of the Wiring Editor. A yellow mark shows whether if this Property could be wired or not.  Position X 0.000 Y 0.000 Z 0.000 Rotation Z 0.000 **Clear Sources:** Right-Click with your mouse into a Source field. A context menu with a "Clear" option is shown.
3	**Expression**	Enter a mathematical Expression. Use **Variables "SourceA" and/or "SourceB**" into your

		Expressions If only using 1 Source, only use 1 of them for your Expression
4	**Target**	Add a Target by drag a Property Name from Inspector to the Target field of the Wiring Editor. A yellow mark shows whether if this Property could be wired or not.  Position X 0.000 Y 0.000 Z 0.000 Rotation Z 0.000 **Clear Targets:** Right-Click with your mouse into a Target field. A context menu with a "Clear" option is shown.
5	**Mode**	**Default:** Disabled - Updates for Target Property is only done if Source Value changes **When enabled**, the Target is permanently updated, independent from Source Value changes **Disabled is recommended** for most cases to preserve performance: disables
6	**Rate**	**Property Update Rate:** Value updates per seconds
7	**Damping**	Enter a damping for your target to avoid jitter or fast movements of your target **Damping Values are set in Milliseconds**
8	**Activate or Mute**	Switch Wiring on or mute your Wiring
9	**Delete**	Click to delete

Create a Wiring

1. **Open the Wiring Editor** from Main Menu (Main Menu -> Windows)
2. Click on the "+ "Symbol to create a new Wiring
3. Select the **Item that includes your Source Property into Inspector**
4. Move with your Mouse to the Property Name into Inspector
5. When there is a **yellow mark** next to the Properties Name, **drag with your Mouse the Property Name to the Source field into Wiring** Editor

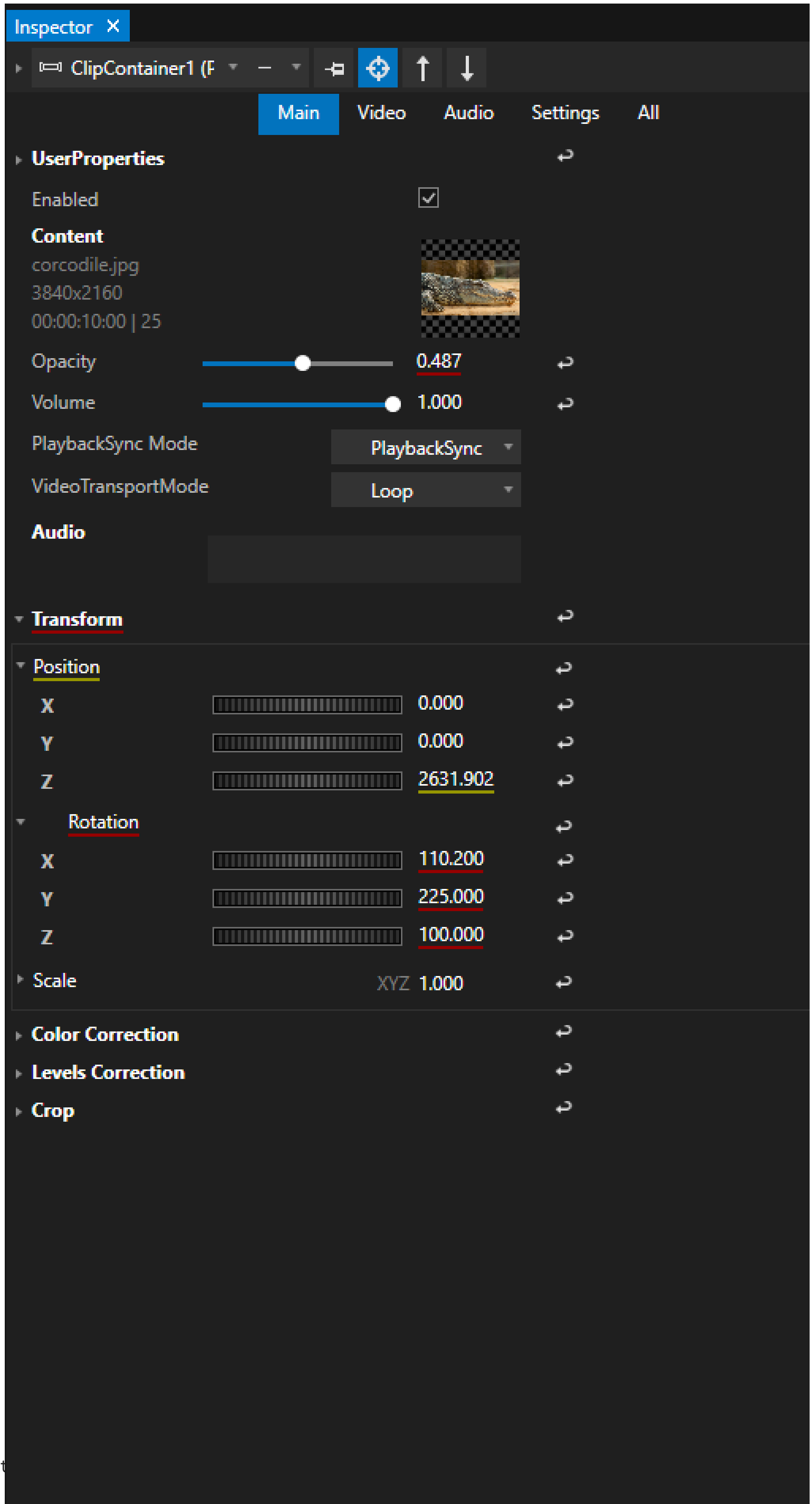


Position
X 0.000
Y 0.000
Z 0.000
Rotation Z 0.000

6. **Enter an Expression - **e.g SourceA + 1000
7. Select a **Target Property** by **repeating Step 3 to 5** and Drag Property into the Target field of the Wiring Edditor

Yellow lines for active Target Properties into Inspector

- When a Wiring is active and running, the **Target Property into Inspector is underlined in yellow Color**



UserProperties

Enabled ☑

Content

corcodile.jpg
3840x2160
00:00:10:00 | 25

Opacity 0.487

Volume 1.000

PlaybackSync Mode PlaybackSync

VideoTransportMode Loop

Audio

Transform

Position

X 0.000

Y 0.000

Z 2631.902

Rotation

X 110.200

Y 225.000

Z 100.000

Scale XYZ 1.000

Color Correction

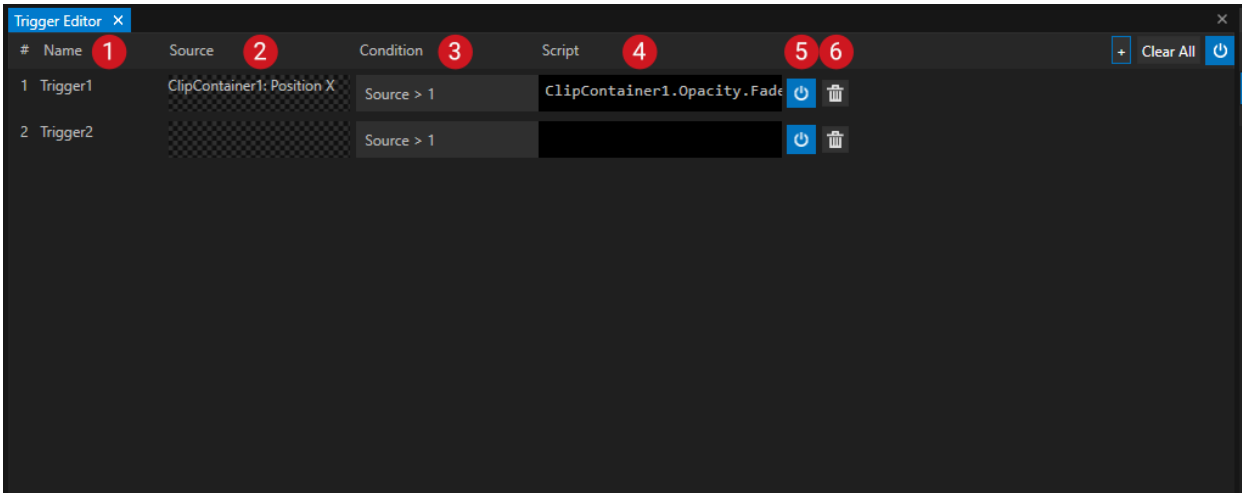
Levels Correction

Crop

5.10.2 Trigger Editor

- Triggering in VERTEX is an **simple way to run Script Commands based on a Condition**
- **The Trigger Editor** follows **a easy table scheme**: Define 1 Data Source, enter a Condition and a Script Command that should be executed when the Condition is reached
- Sources are assigned by **drag and drop them from Inspector.**

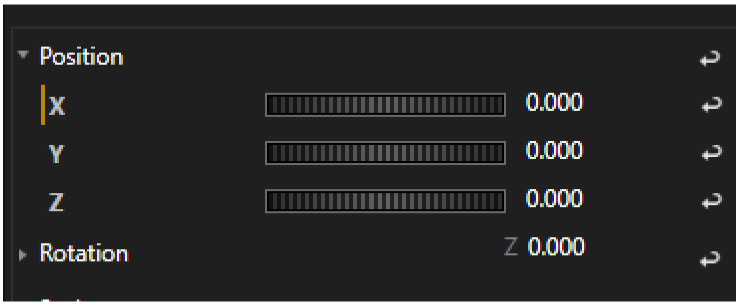
User Interface



#	Name	Source	Condition	Script
1	Trigger1	ClipContainer1: Position X	Source > 1	ClipContainer1.Opacity.Fade
2	Trigger2		Source > 1	

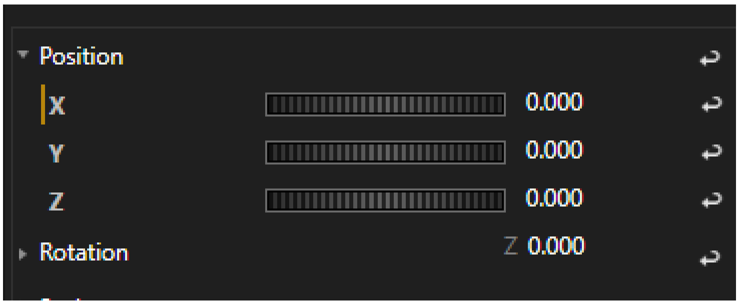
Example for Triggering:
The X-Position of Clip Container 1 triggers the Opacity of this Clip Container. If The X-Position is bigger than Value 1, the Opacity is set to 0.

1	**Name**	Enter a custom Name for your Trigger
2	**Source**	Add a Source by drag a Property Name from Inspector to the Source field of the Trigger Editor. A yellow mark shows whether if this Property could be wired or

		not.  Position X 0.000 Y 0.000 Z 0.000 Rotation Z 0.000 **Clear Sources:** Right-Click with your mouse into a Source field. A context menu with a "Clear" option is shown.
3	**Condition**	Enter a mathematical Condition . Use **Variable "Source"** into your Condition to reference the Trigger Source
5	**Script**	Enter a VERTEX [Script Command]() that should be executed when the Condition is reached Press "CTRL and Space" Keys to display a list of all available Commands and Items
6	**Activate or Mute**	Switch Trigger on or mute Trigger
7	**Delete**	Click to delete a Trigger

Create a Trigger

1. **Open the Trigger Editor** from Main Menu (Main Menu -> Windows)
2. Click on the "+ "Symbol to create a new Trigger
3. Select the **Item that includes your Source Property into Inspector**
4. Move with your Mouse to the Property Name into Inspector
5. When there is a **yellow mark** next to the Properties Name, **drag with your Mouse the Property Name to the Source field into Trigger Editor**



X 0.000

Y 0.000

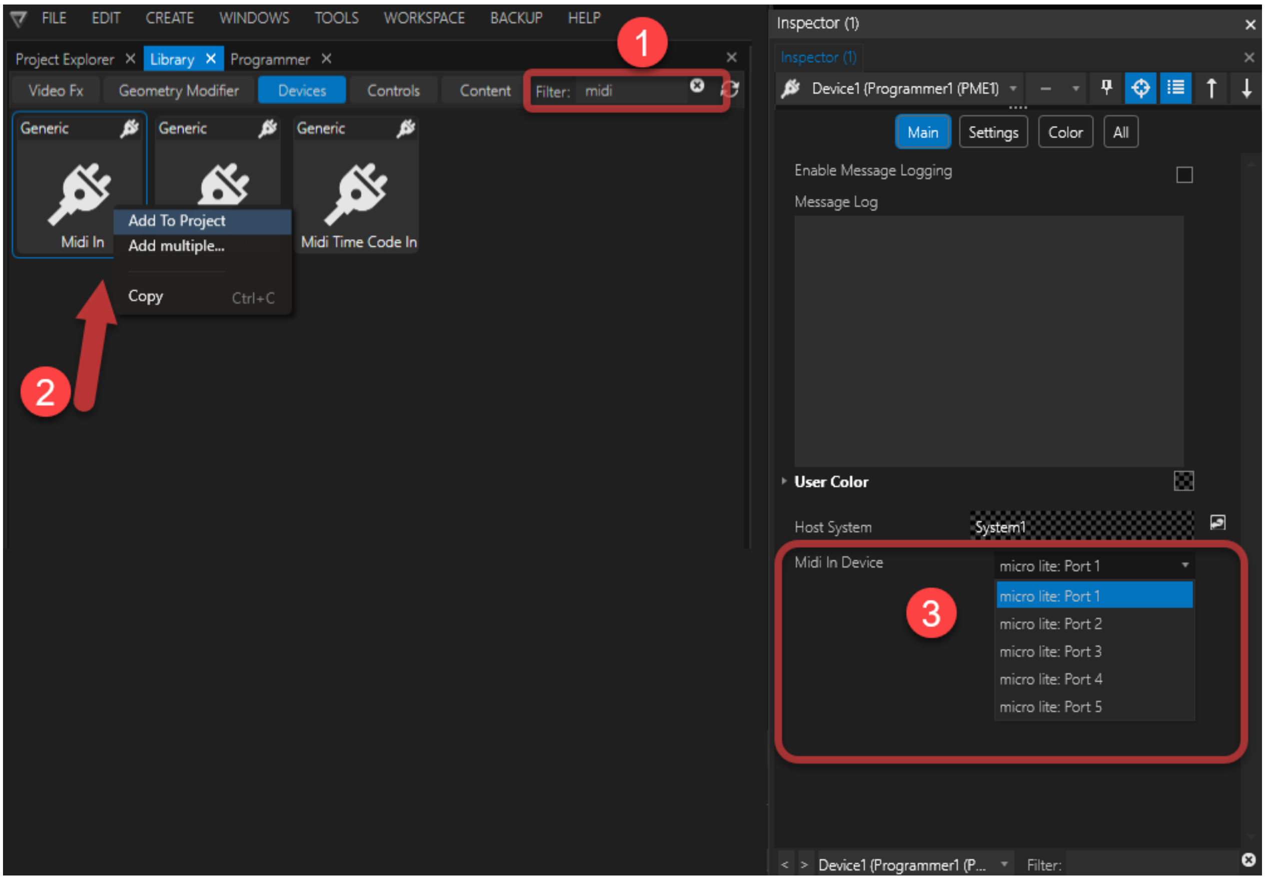
Z 0.000

Rotation Z 0.000

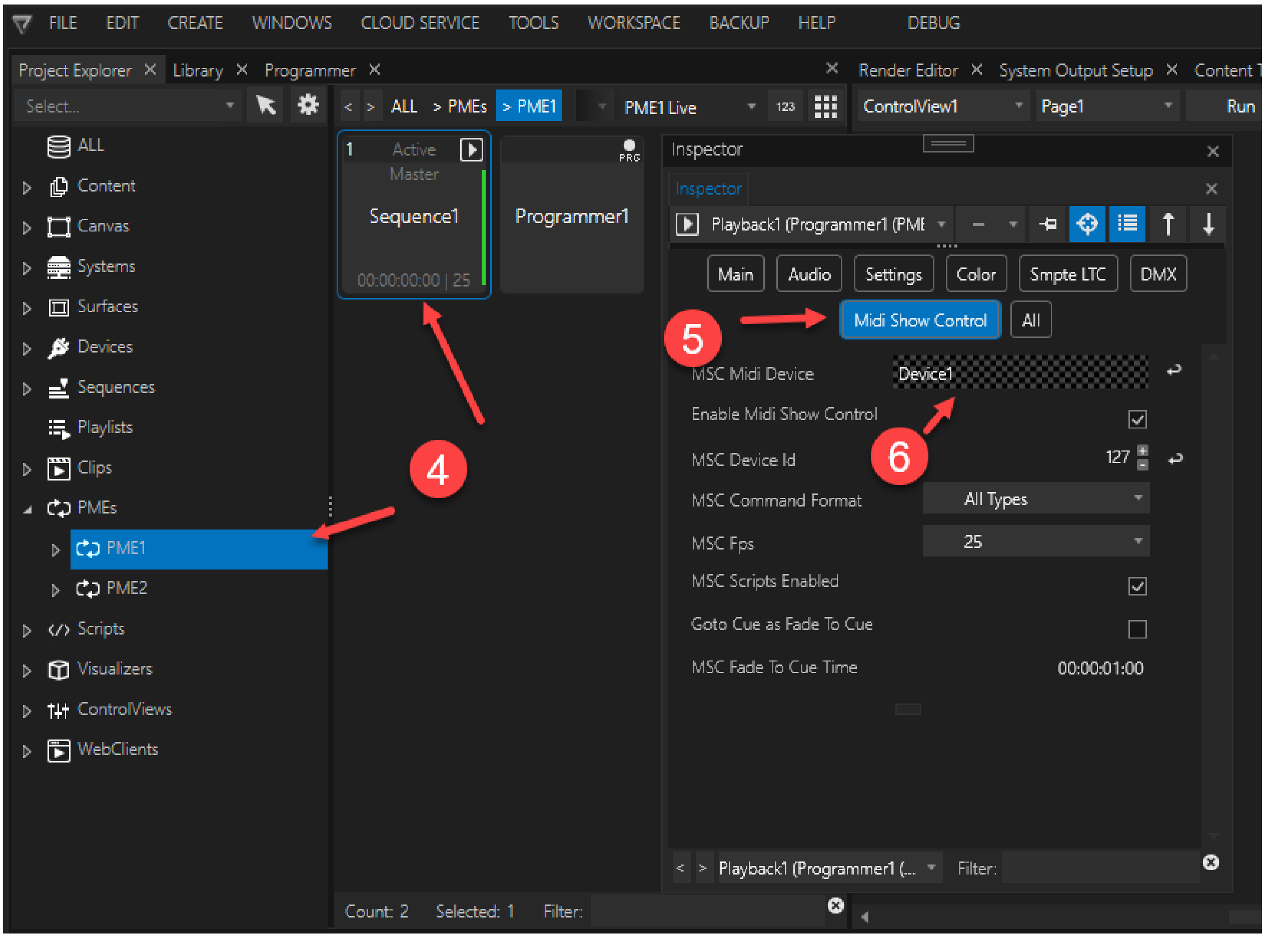
6. **Enter an Condition - ** e.g Source > 1000
7. Enter a Script Command that should be executed when the Condition is reached e.g. Playback1.Play

5.11 MIDI Show Control

- VERTEX is able to process **MIDI Show Control (MSC)** messages and commands.
- MSC allows you to control your *Playback* from a lighting console or similar hardware with MSC integration.
- Transmit MSC messages out of VERTEX to control other MSC enabled rigs.



1. **Go to** *Library > Devices* and use the search filter to find all MIDI related devices.
2. **Add** a *MIDI In* device to your project.
3. Inspect the new device and pick the MIDI device (and its corresponding MIDI port/ cable) connected to your system from the drop-down.



MSC Midi Device: Device1
Enable Midi Show Control ☑
MSC Device Id: 127
MSC Command Format: All Types
MSC Fps: 25
MSC Scripts Enabled ☑
Goto Cue as Fade To Cue □
MSC Fade To Cue Time: 00:00:01:00

4. Go to *Project Explorer* and inspect the *Playback* that needs to be controlled by MSC.
5. Go to the tab with *MIDI Show Control* settings.
6. Add your new MIDI In device either per drag and drop or from the context menu (right-click)

Further possible settings are:

- enable/ disable MSC for this particular playback.
- set a MSC Device Id
- determine if only specific MSC Command Formats should be received (Lighting, Video, Pyro etc).
- set a MSC framerate
- enable execution of MSC Scripts
- determine if *Go To Cue* shall be executed as *Fade To Cue*
- set a default MSC Fade To Cue Time

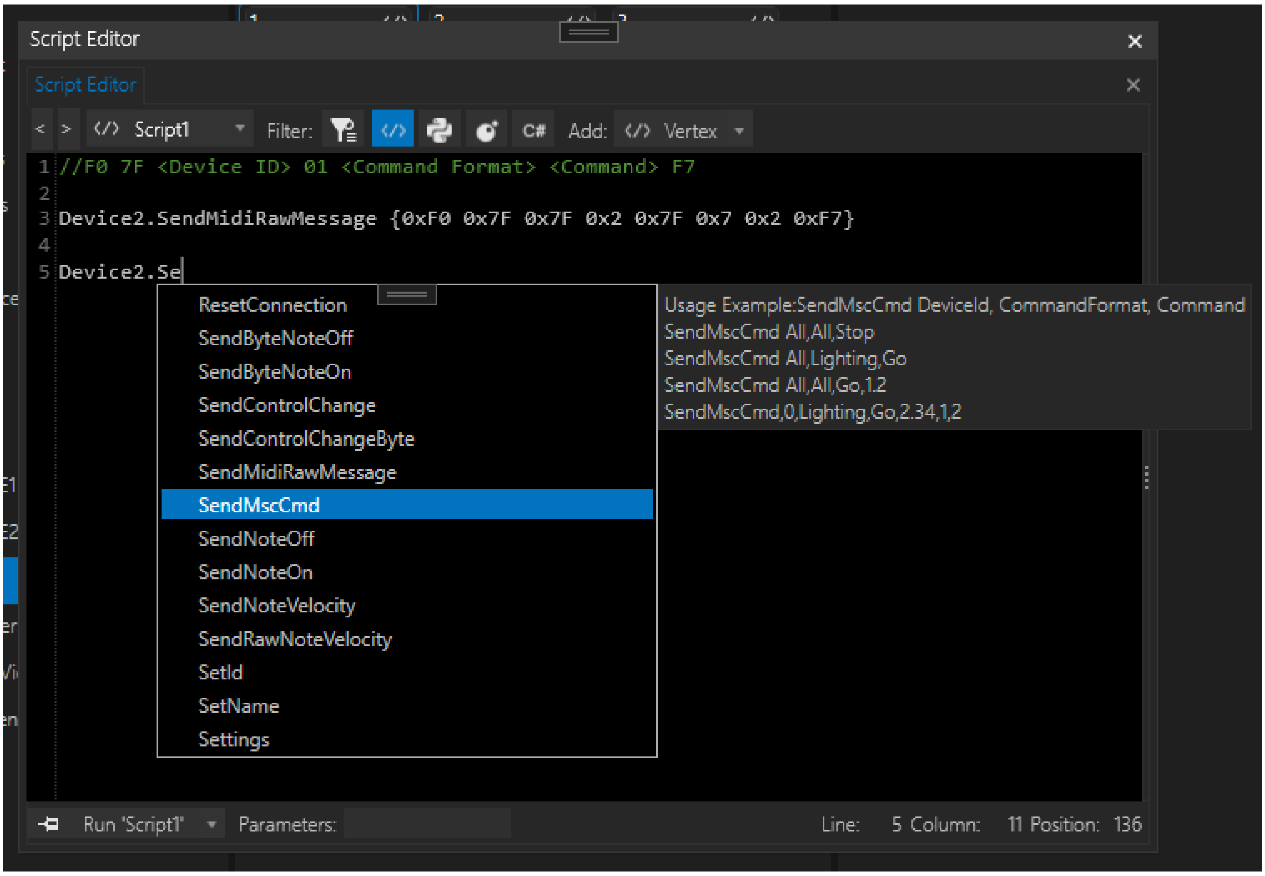
MSC enabled playbacks will process MSC messages in the following manner:

MSC message	VERTEX command
Go	Play
Go with CueId	GotoCuePlay or FadeToCue Play

Stop	Pause
Resume	Play
GoOff	Stop Goto Time 0:0:0:0
AllOff	Deactivate Playback
Restore	Activate Playback
Fire	call Vertex Scripts
TimedGo	*- to be verified soon -*

If you would like to use VERTEX for transmitting MSC or any SysEx Message you can add a MIDI Output device (Library > Devices > MIDI Out) and use scripts like these ones:

```
Device2.SendMidiRawMessage {0xF0 0x7F 0x7F 0x2 0x7F 0x7 0x2 0xF7}
```



```
//F0 7F <Device ID> 01 <Command Format> <Command> F7

Device2.SendMidiRawMessage {0xF0 0x7F 0x7F 0x2 0x7F 0x7 0x2 0xF7}

Device2.Se
```

Usage Example:SendMscCmd DeviceId, CommandFormat, Command
SendMscCmd All,All,Stop
SendMscCmd All,Lighting,Go
SendMscCmd All,All,Go,1.2
SendMscCmd,0,Lighting,Go,2.34,1,2

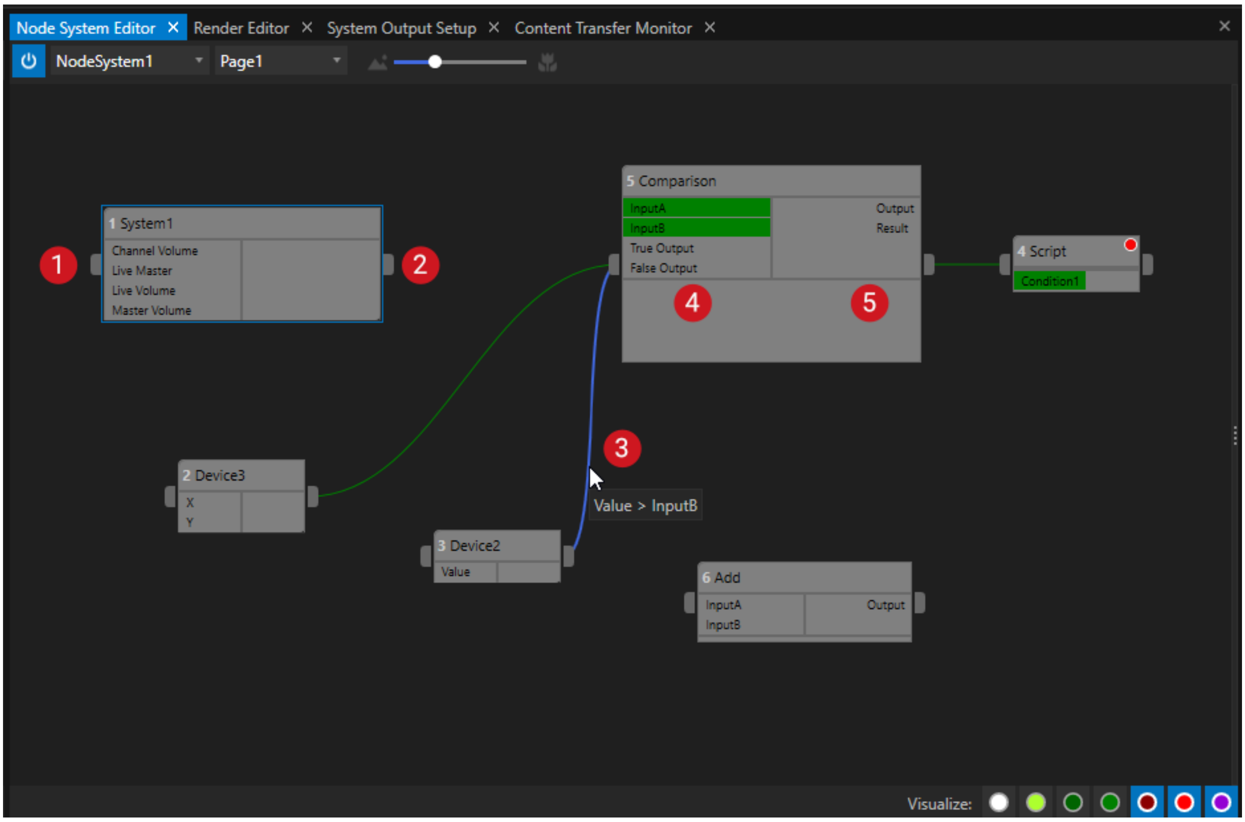
5.12 Node System

- Learn about the **Basics of Node programming** with a Node System in VERTEX
- A Node System is working with a **Pulse** to calculate data for each node. Learn about the different settings and options of this Pulse
- There are 2 Editors for Node programming: The **Node System Editor** and the **Node System Monitor**
- Learn about the **Node programming workflow** and what **Parameters** and **Conditions** are.
- Create a Sub-Composition from a group of Nodes and use it as **Compositing Nodes**

Node System Basics

Data Flow - Input and Output

- Node Systems give you the possibility **to program complex logic** on an **easy visual way** without writing code.
- All data is **directly processed**, results are directly visible.
- All data flow and data processing is represented via **Nodes** which have a **Data Input (on the left)** and an **Data Output (on the right).**
- You can **draw with your mouse a connection line** from an **Output** of a Node 1 to an I**nput** of another Node 2. A connection line **enables the data flow** between the two nodes: Information always flows from an output of Node 1 to an input of Node 2.
- Some Nodes can manipulate or generate data. Others represent parameters from an VERTEX item (e.g. a Clip Container, a Canvas or a System). And there are Nodes that compare data or start a script command.



1	**Input of a Node**	Connection for incoming data
2	**Output of a Node**	Connection for outgoing data
3	**Connection Line**	Connects an Output of a Node with an Input of another Node. Data always flows from an Output to an Input
4	**Input Parameter**	Data Parameter of this Node. For Nodes with only Properties and values (and no own data manipulation or generation): there is no extra output parameter. the data of the parameters are directly on the output
5	**Output Parameter**	Generates own values by manipulating data applied to an input or by generating own data Nodes, where only the left column is filled, do not manipulate any data but only return values of the specified parameters.

Types of Nodes

- VERTEX offers a wide range of different Nodes.
- Some are shipped with VERTEX out of the box, some you can assemble yourself from properties of items and devices.
- Or you combine different Nodes to a Composite Node.

Number and type of available Nodes depends on release version
Depending on the VERTEX release version, the number of nodes will increase step by step.
The Node System is introduced with VERTEX Release 2021 R2.
With all upcoming releases the number and also the functionality of Nodes will increase.

To give you a **first impression and overview** - nodes can **basically be classified according to the following scheme**:

Input (active)
These nodes must be triggered externally to update their values and trigger a pulse if necessary, e.g. for a keyboard device or TCP Receiver device added as item from the Library

Input (passive)
These Nodes provide values from external sources, e.g. a mouse input device, which are retrieved at any time (without event and "live"). They supplies current values at any time.

Output (active)
These Nodes trigger external events during processing, e.g. log output or script.
An active Input is necessary to generate an external event

Output (passive)
These Nodes provide current values at any time, which they determine from their inputs based on a specific implementation, e.g. mathematical Nodes or filters like add, multiply, normalize...They supplies current values at any time.

Special Node Types

Property Nodes
These Nodes are based on properties of a project item (e.g. the height of a Canvas, the position of a Clip Container, the Opacity of a Surface, the Master Volume of a System).
These Nodes are first reading the current value of a property.
Or they are modulate a Property value based on the incoming Node Input.
Your are able to build own property Nodes and combine properties from different items into a single Node.

Composite Nodes
Nodes that are a Sub-Composition of other Nodes

Pulse(s): Polling, Push and Pull

- A Node System works with an internal Pulse. With this timing all data from all Nodes is calculated.
- In other words: The Pulse of a Node System is its heart.
- There are different options and settings to optimize a Node System based on this Pulses
- There are options to throttle and slow down a chain of Nodes to safe performance

Learn more about all basics, settings and options into this chapter: Pulse(s): Polling, Push and Pull

Editors

Node System Editor

The Node System Editor is your main working area where you build up and connect a Node System
Get all information about the User Interface and the Workflow here: Node System Editor

Node System Monitor

The Node System Monitor helps you with debugging a Node System.
Select Nodes to monitor their data or observe errors.
Get all information about the Node System Monitor into this chapter: Node System Monitor

Working With Nodes

- There are different ways how to create Nodes - all ways are straight up and deeply integrated in the software workflow of VERTEX.
- Connect different Nodes with connection lines or disconnect them
- Get to know the basic workflow, learn tricks and tips.
- Advanced users will also learn in this chapter how Node Systems behave in a Session of multiple Systems

Here we go: Working with Nodes

Parameters and Conditions

- Most of the Nodes are working with **Parameters**. Parameters could have **different sources for their values**.
  And of course, there are some advanced settings for them.
  Start with learning about Parameters here: **Parameters and Conditions**

- Some Nodes are working with **Conditions**. With one or more of them into a Node, you are able to **program simple or even complex logical decisions.**
  Get all information about the basics and also the advanced options here: **Parameters and Conditions**

Composite Node

- With the **Composite Node** feature of VERTEX you can **combine an arrangement of Nodes to only one node**.
- You can then treat this **sub-composition as just one node**.
- You are able to **decompose** a Composite Node again.

  Get all information about the workflow into this chapter: Composite Nodes

5.12.1 Pulse(s):Polling, Push, Pull

- **Pulses are the heart of a Node System**: A Pulse defines the timing with which the data of all Nodes is processed
- There is a basic Pulse, called a **Poll** (respectively Polling)
- Some Nodes are able to **Push** their data into a chain of Nodes or to **Pull** data from a chain of Nodes
- **Throttling** gives you the option to slow down specific parts of your Node System and save performance

Pulse

- A Node System **has to collect and sync several data flows between Nodes**.
- **Data for each Node has to be calculated** and, above all, it has to be **ensured that the correct data is available at each Node** into a chain at all times.

- A Node System works with a **basic Pulse - called "Polling"** - that defines the timing for the whole Node System. On every Poll, the data of all Nodes into a Node System is calculated.
- **Some Nodes are able to generate their own Pulse**. Some can **push** their data into a chain of Nodes behind. Some Nodes are able to **pull** data from a chain of Nodes ahead.

Too much theory?
We deliver VERTEX with default values for the 3 types of Pulses. These are basic values for timing and there are default settings for push and pull with which you can simply start working. **If you don't want and don't need to, you don't have to deal with complicated settings.**
However, with larger projects and a lot of data, the pulse setting options allow you to adjust the system load and also the signal chains very precisely.

Advanced Options

- **There are settings for Push and Pull** with which you are able to build different **chains of Nodes in a Node System that work with their own Pulse**. For example in some cases you need more precise data, in other cases a slower Pulse is sufficient and saves performance.
- For advanced users, there are **adjusting screws for the behaviour of every Node**. This is how you can keep a good performance also for the largest and most complex Node Systems .

Poll

- Each Node System works with a **basic "Pulse"**, an **internal timing** with which data into a Node System is sampled and processed.
- This **basic Pulse** of a Node System in VERTEX **is called "Polling"**.

Push

- Some Nodes are able to **push their data** from their output to a chain of upcoming Nodes.
- With the "**Pulse Mode" settings** you are able do define the behaviour of a Node and how this Node generates its own Pulse.
- Use **Throttling** to for example slow down the pulse and save performance on calculating all data.

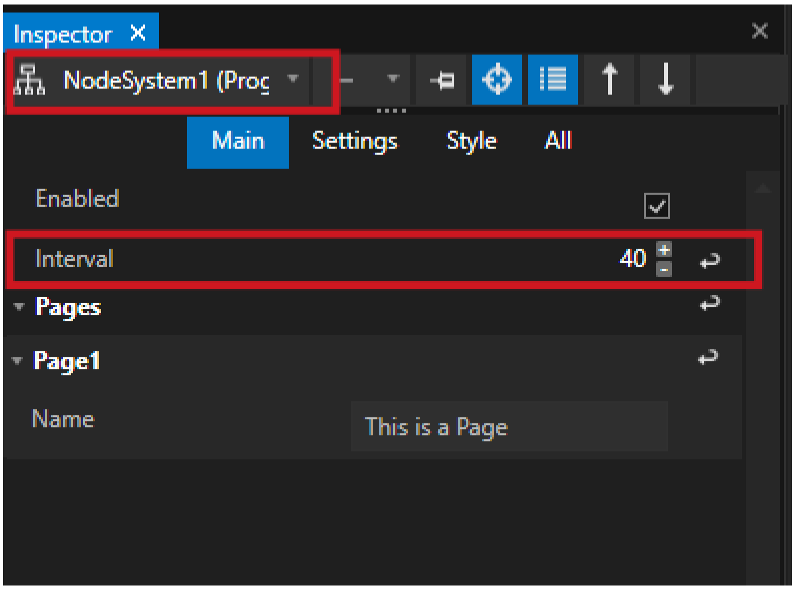
Pull

- Some Nodes are able to **pull their data** from a chain of Nodes ahead to their Input.
- With the **"Pulse Mode" settings** you are able do define the behaviour of a Node and how this Node generates its own Push Pulse.
- Use **Throttling** to for example slow down the pulse and save performance on calculating all data.

Polling

- Each Node System works with a **basic "Pulse"**, an **internal timing** with which data into a Node System is sampled and processed
- This **basic Pulse** of a Node System in VERTEX **is called "Polling"**

You are able to change the Polling time for each Node System in the Inspector.



Enabled ☑

Interval 40

Name This is a Page

Default Value for Polling Interval

The default value for the polling of a Node System is based on the default FPS of a sequence (25 FPS = 40 ms).

Pulse Mode

- The Pulse Mode **determines how data is processed from a Node.**
- The Pulse Mode and the **available options depend on the Node type** and the **way how a Node internally works with its data**

Passive Nodes - Filter and mathematical operations

Mathematical Nodes that only manipulate incoming data into a chain do not have a Pulse Mode setting. They are only passive and just manipulate or filter incoming data with a defined rule set.

- Nodes with an available Pulse Mode option are **able to generate own Pulses**. In this case all data in the chain will be processed according to the pulse of this Node.

There are basically **two different Pulse Mode types** for Nodes:

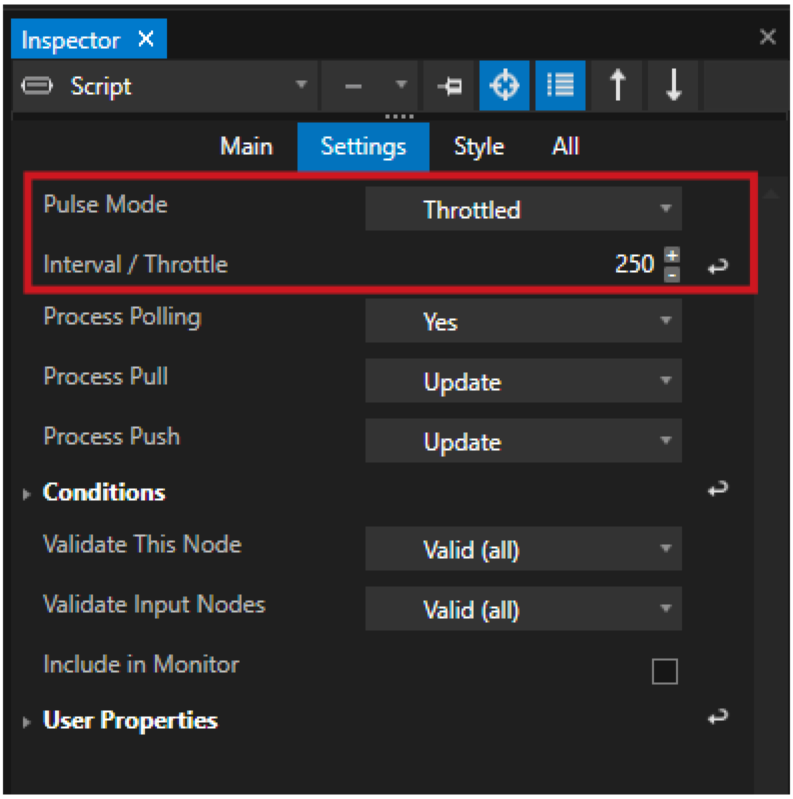
1. **Push**
   This kind of Nodes pushes its data into a chain chain of Nodes that is connected to its output
2. **Pull**
   This kind of Nodes is actively requesting data on its Input(s).
   Data is pulled from a chain of Nodes that is connected to the Input.

Throttling

- For Nodes that are able to **generate their own Pulse**, you are **able to set an own timing**, an own Pulse Interval.
- **"Throttled"** means that the Node and its data is not processed more times than **specified by the defined interval**
- **Events occurring in the meantime are ignored**

Default Values for Throttling Interval

The default value for the Throttling Interval for a Node is set to 250 ms



Pulse Mode: Throttled

Interval / Throttle: 250

Process Polling: Yes

Process Pull: Update

Process Push: Update

Conditions

Validate This Node: Valid (all)

Validate Input Nodes: Valid (all)

Include in Monitor: □

User Properties

Throttling saves system performance

Throttling gives you a lot of adjusting screws to optimize the performance of large Node System. Into a Chain of Nodes you have the possibility to save performance and reduce calculations. Depending on your Project this could be on different places: less CPU usage because throttling brings less calculation, less Network traffic, less GPU usage.....

Simplified Example:

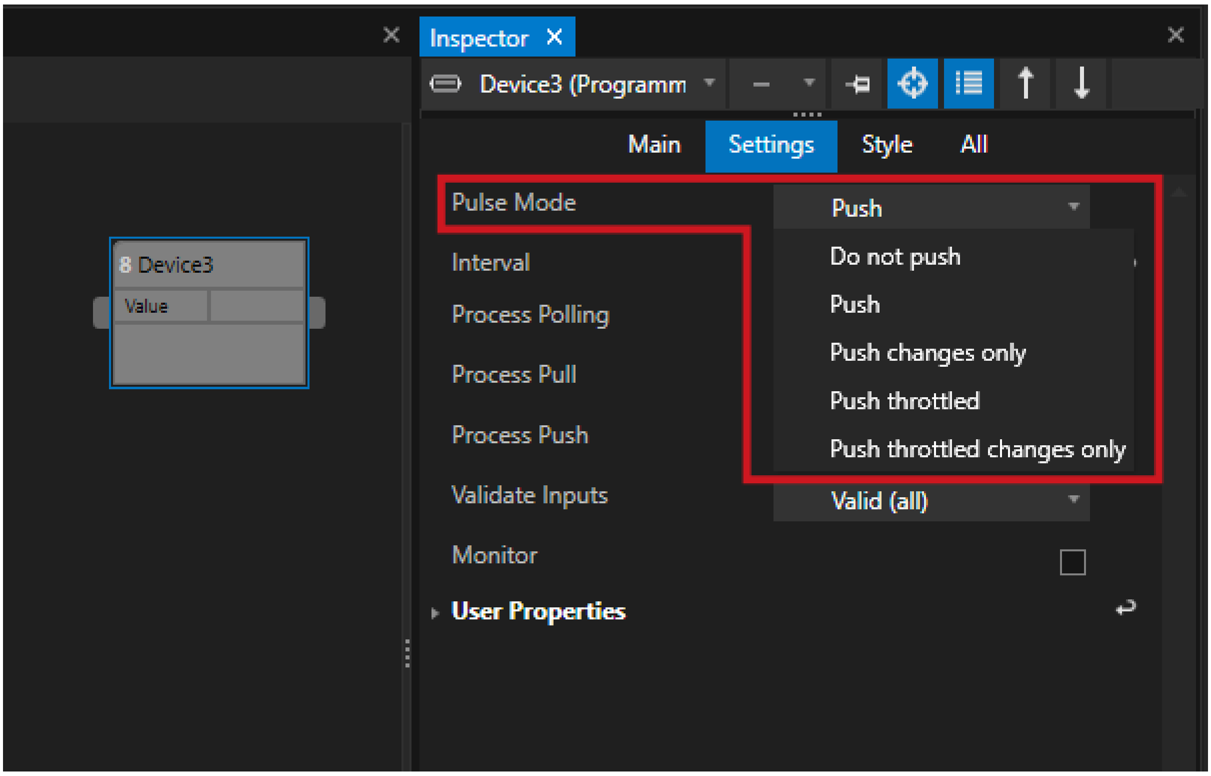
An UDP Device should receive a status from an UDP-sending 3rd-party Device. This status should be displayed as label of a ControlView. Because the status only changes between " i am here" and " i am off" - it is sufficient to calculate and change it for e.g. every second. In this case it make sense to throttle the Node from the TCP receiver. This Node should push the data throttled with an interval of 1000ms.

For more detailed options, please also read the follow up chapter "Settings".

Settings

For Push or Pull there are different settings, to fine adjust the Pulse Mode

Push



Pulse Mode: Push

Interval

Process Polling

Process Pull

Process Push

Validate Inputs: Valid (all)

Monitor □

Do Not Push:

This Node does not trigger a Push

Push:

This Node triggers a Push (default setting)

Push changes only:

This Node triggers a Push, but only if the output values have been changed

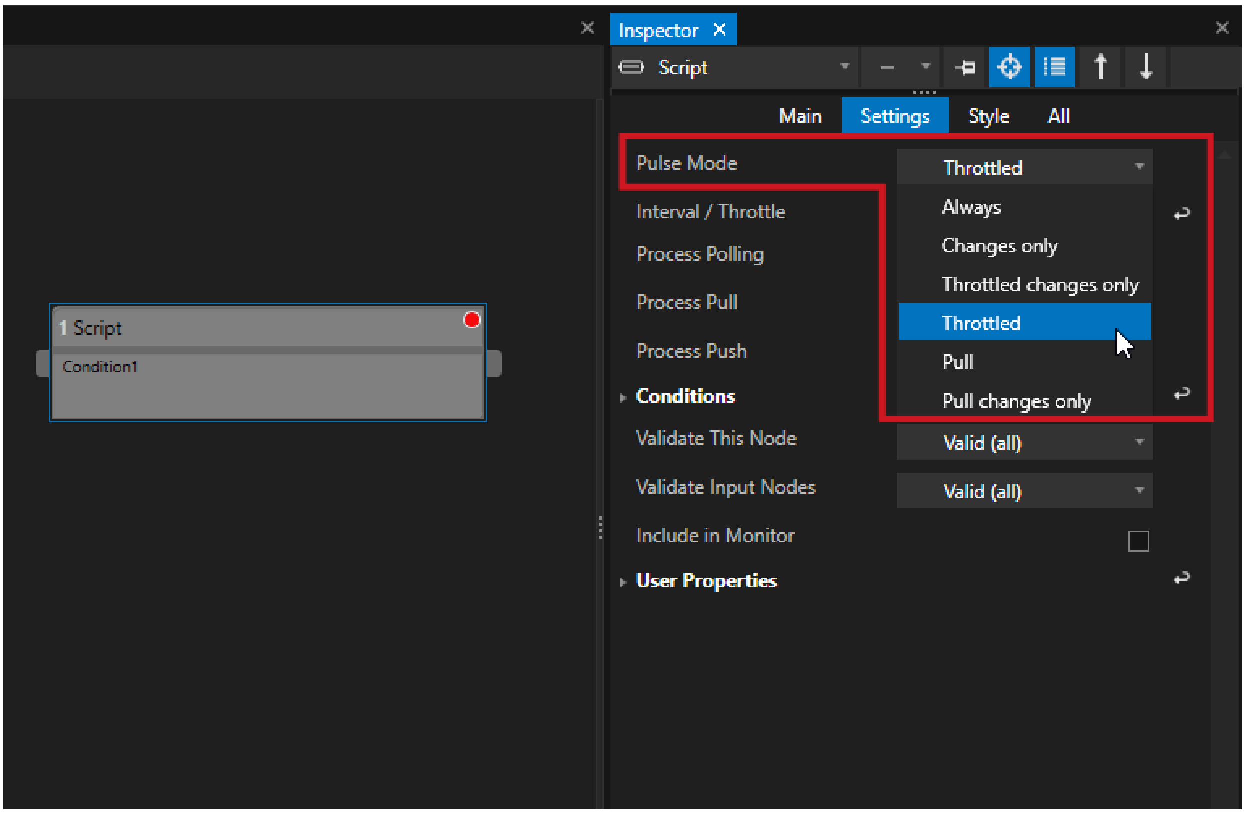
Push throttled:

This Node triggers a Push but only with the throttled interval that is set

Push throttled changes only:

This Node triggers a Push with the throttled interval that is set and only when the values on its output has been changed

Pull



Pulse Mode: Throttled
Interval / Throttle
Process Polling
Process Pull
Process Push
Conditions
Validate This Node: Valid (all)
Validate Input Nodes: Valid (all)
Include in Monitor: □
User Properties

Always:

Process this Node and always execute - regardless of changes and without any throttling

Changes only:

Process this Node but only execute, if the the resulting output values have changed

Throttled changes only:

Process and execute this node with the throttling interval but only if the resulting output values have been changed

Throttled:

Process and execute this node with the throttling interval

Pull:

This Node triggers a Pull request with the Interval that was set (--> throttling interval)

Pull Changes only:

This Node triggers a Pull request but only if the resulting output values have changed

Advanced Settings

- For Advanced users there are options to define a **Node's behavior for each o the three Pulse types**: Polling, Push and Pull
- Your are able to set, **if and how a Node should be processed** for those three Pulse cases

Process Polling:
Defines the behaviour of a Node on the main polling pulse
Process Push:
Defines the behaviour of a Node for Pushes
Process Push:
Defines the behaviour of a Node for Pulls

Settings:
No: This Node will not be processed
Yes: This node is processed, but its input values (if connected to outputs of other nodes) are not updated.
Update: This node will be processed - but it specifies that its inputs will be updated first, by processing upstream nodes as well.

5.12.2 Node System Editor

- The Node System Editor helps you to **create, arrange, control and order** your Nodes
- With different **monitoring tools** you are able to get an overview about the data flow or the state
- **Snapping tools**, **rulers** but also **layout controls** like labels or tile boxes help you to keep the overview into your Node System

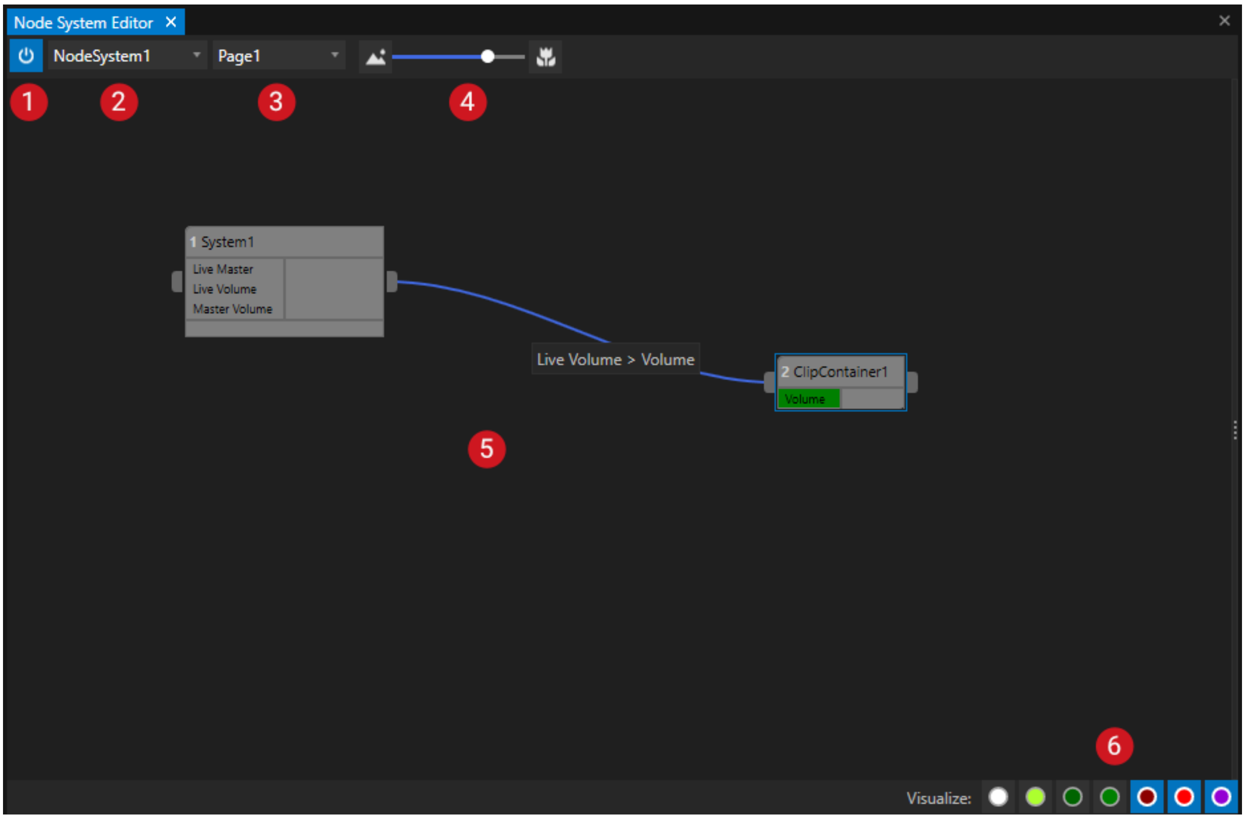
User Interface

Create an new Node System first:

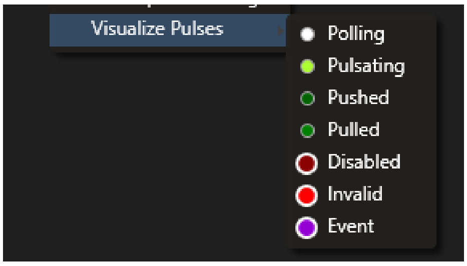
- Go to the Main Menu on top, select "Create" there and "Node System"
  or
- Go to the "Node System" category into Project Explorer, open the context menu by a right-click and create a new Node System

Open a Node System Editor:

- Go to *Main Menu > Windows*
- Open a new Node System Editor



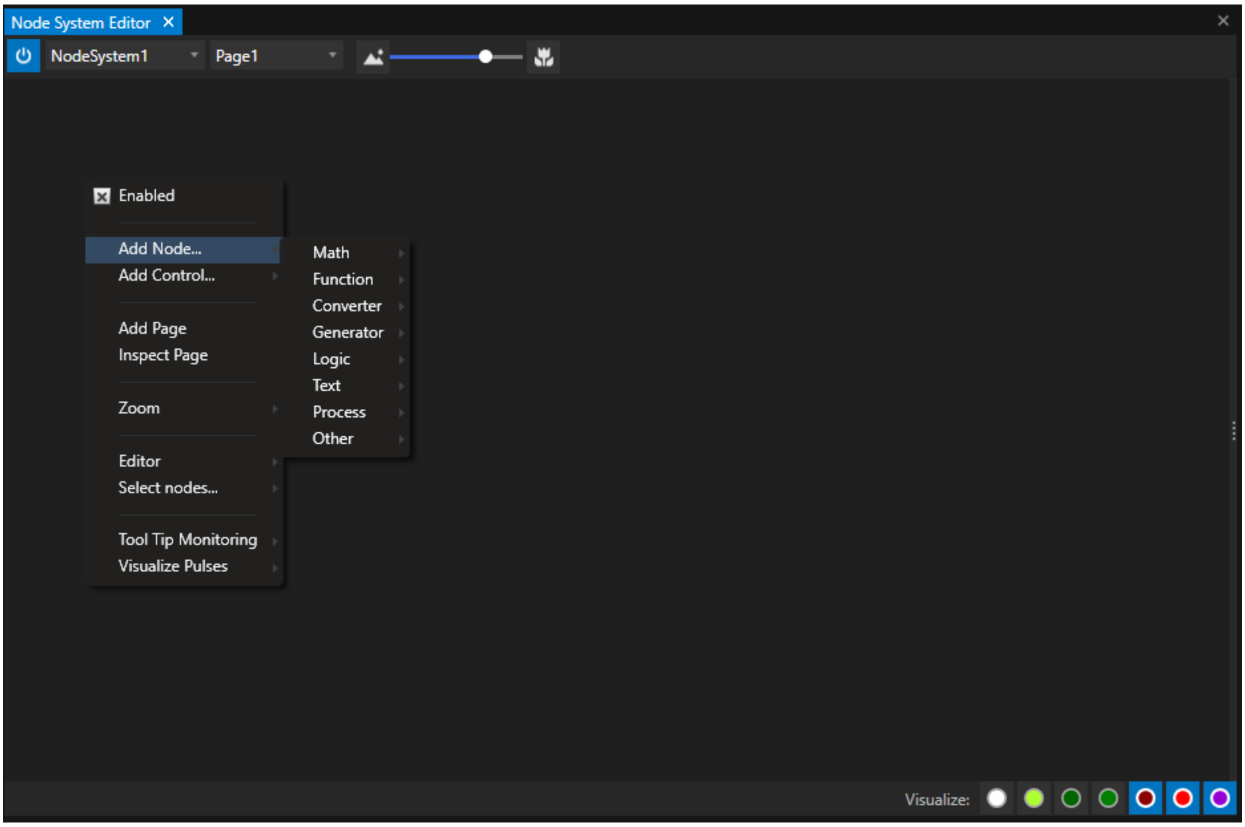
1	**Enable/Disable Node System**	Default: Enabled Click to disable the selected Node System - also for debugging or if system load increases too much
2	**Select a Node System**	Select a Node System or a [Composite Node]() to show this into Editor
3	**Select a Page**	Select a Page of your Node System Default: only one Page is available - more are displayed if they have been previously created via e.g. the context menu in the Node Editor
4	**Zoom in/out**	Zooms working area in and out Alternative: use Keys "+" and "-" on your Keyboard
5	**Working Area**	Main working area to create and wire your Nodes
6	**Visualize Pulses**	Different options to monitor the data flow and the data pulses of your Node System: Blinking Dots are displayed into

		every Node. They visualizes if/when data is pulled, pushed, if nodes are disabled or actions are triggered. The Pulse visualization help you to debug your Node System. You are able to select and enable/disable the selected types by color. The tool tips help you to explain the different types. Also could be switched on/off into Context Menu  Visualize Pulses Polling Pulsating Pushed Pulled Disabled Invalid Event

Context Menu

With a right-click into an empty space of the working area, you open the context menu. This menu gives you access to the most common actions like:

- Add a Node
- Add Controls as visual helpers for your node layout or labels
- Add and Inspect Pages
- Do zoom settings
- Select one of your nodes from a list
- Do settings for the Node System Editor, the editors behaviour or for monitoring data



Context Menu for Nodes

If you right-click on a Node, an extended context menu opens.

This contains additional options for the Node, but also the settings for the Node System Editor.

Create and Connect Nodes

Node Systems are deeply integrated into VERTEX.

The **workflow** of the Node Systems Editor corresponds to **the one you already know** in other places in the software:

- You e.g. can create Nodes by drag and drop items from Project Explorer or from the Playback Editor to the Node System Editor
- The same works for Properties from the Inspector (you might already know this from e.g. the Wiring or Triggering Editor). Just drag a Property from Inspector to the Node System Editor and a contect menu opens to create a Node

There are a lot of other **possibilities and option**s. All you will find summarized in the extra topic **Working with Nodes**

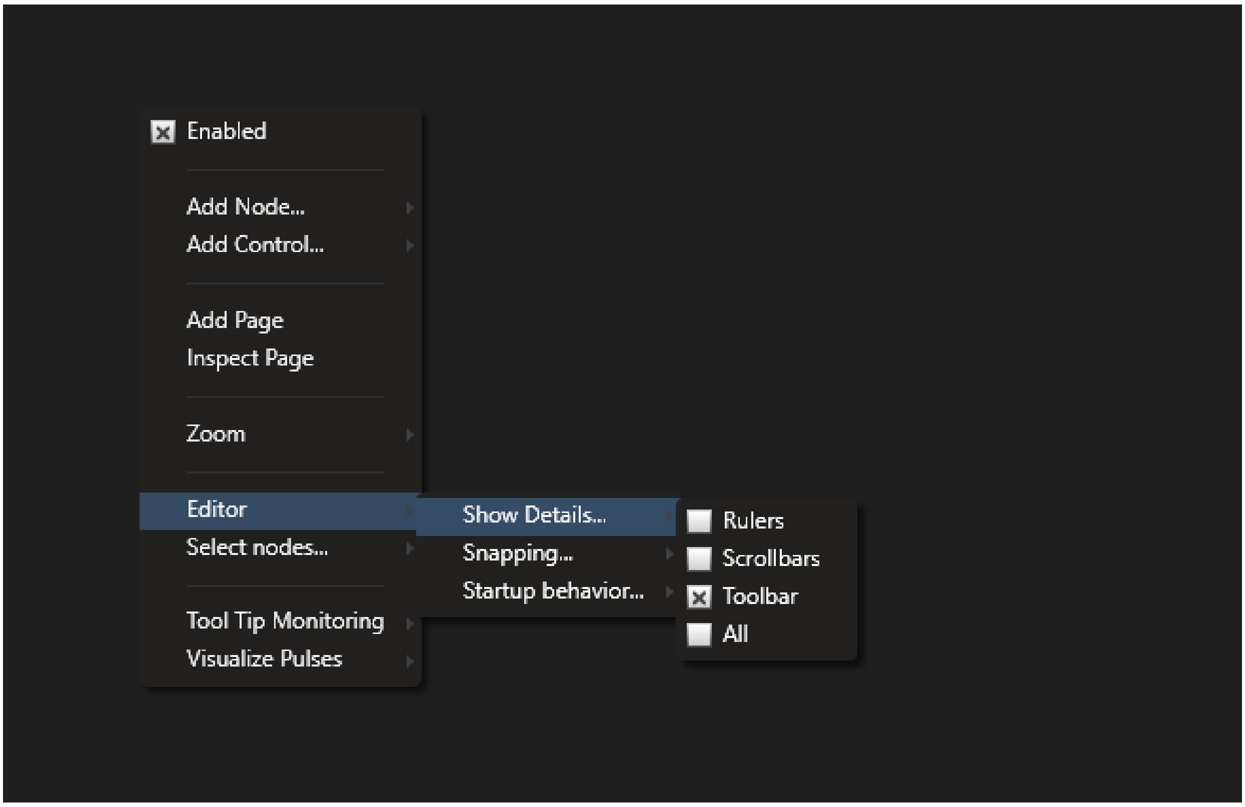
Expand/collapse Node(s) with a double click

Double-click with your mouse on a Node to collapse or expand it. Select multiple Nodes, hold the SHIFT-Key and double-click to expand or collapse multiple Nodes.

Editor Settings

There are different options for the Node System Editors **layout**, the **snapping** and **startup behaviour**.

- Right-click into the working area
- open the Context Menu
- select one of the entries and
- set your enabled or disabled flag there.

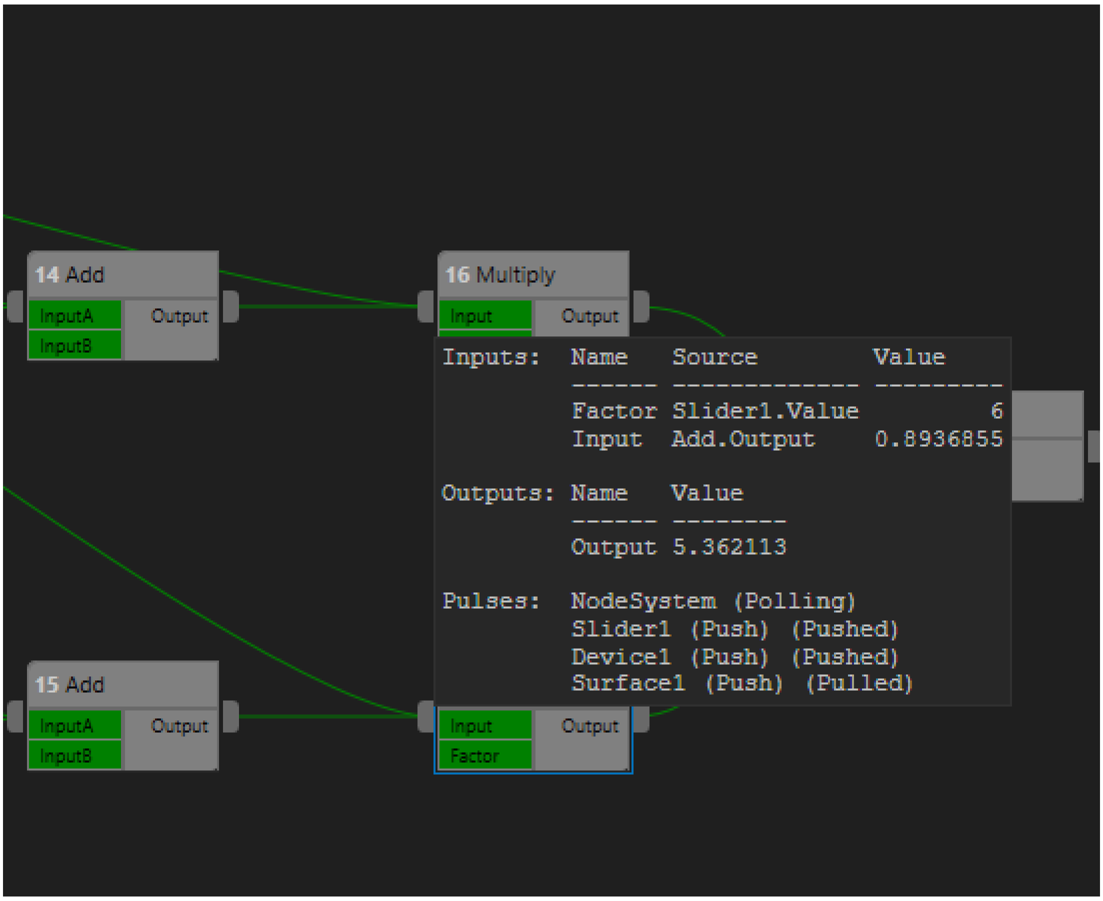


Data Monitoring

The Node System Editor offers you a **Tooltip Monitoring** to quickly check:

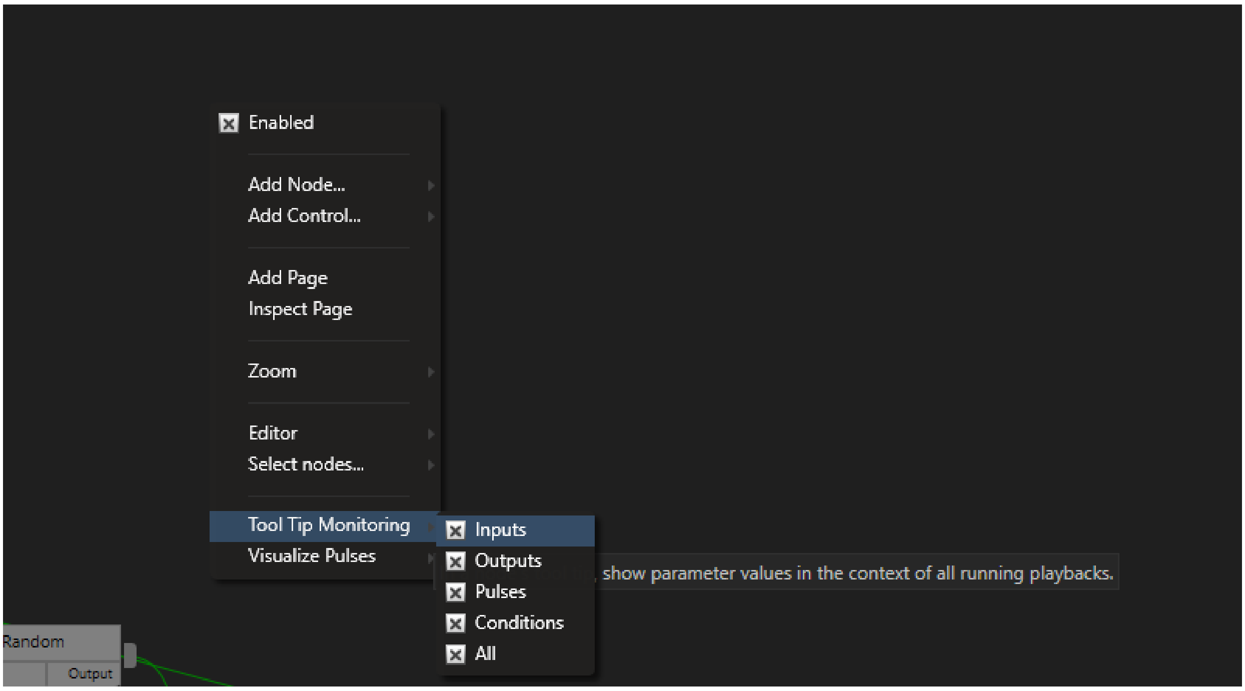
- Input and Output Data of a Node
- Conditions of a Node
- Pulse types of a Node

Just **move your mouse above a Node**. The Tooltip Monitoring **pops up** and **shows** you the **current values** and **all information.**



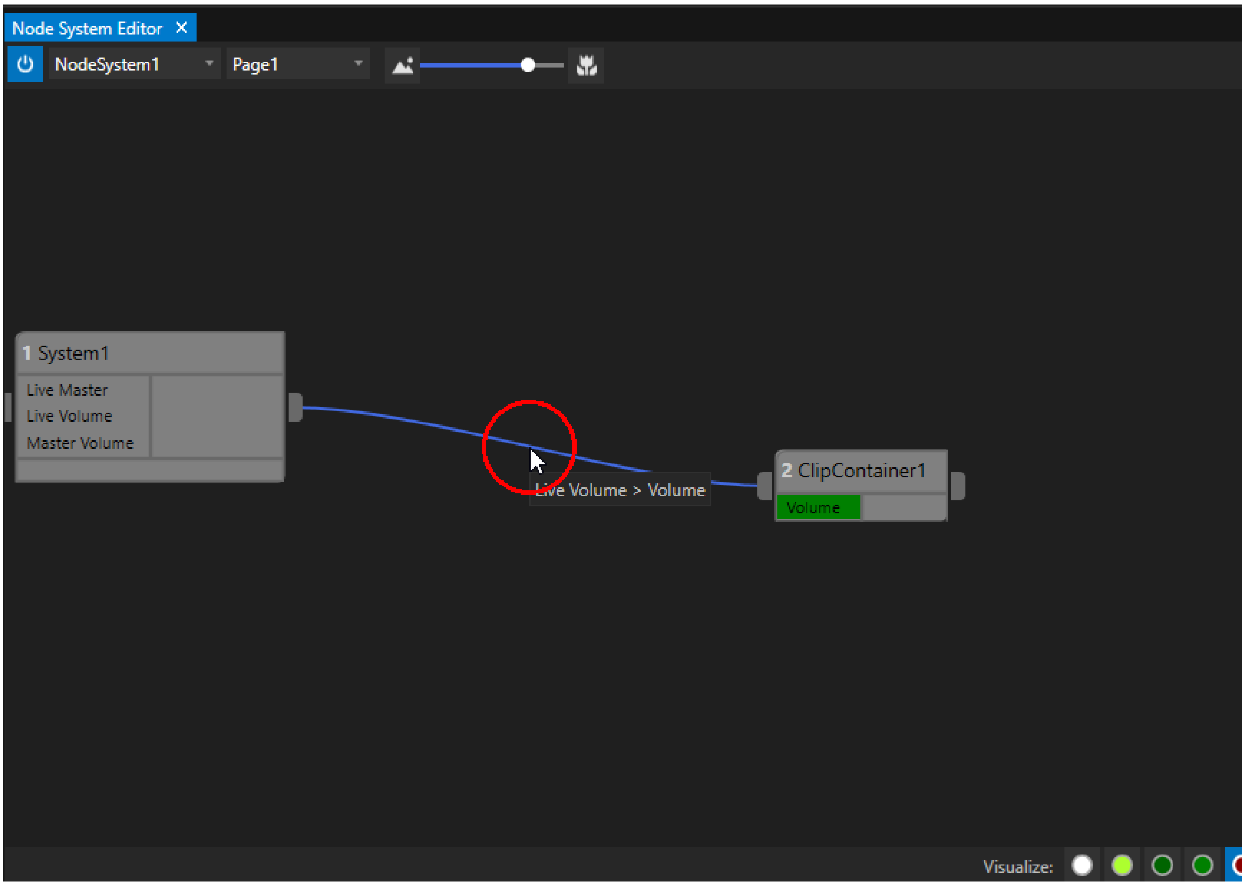
```
Inputs:  Name   Source         Value
         ------ -------------- ---------
         Factor Slider1.Value          6
         Input  Add.Output     0.8936855

Outputs: Name   Value
         ------ --------
         Output 5.362113

Pulses:  NodeSystem (Polling)
         Slider1 (Push) (Pushed)
         Device1 (Push) (Pushed)
         Surface1 (Push) (Pulled)
```

To specify and customize the information that should be displayed into the tooltips:
There is a entry into your Context Menu where you are able to select the information that should be displayed.



show parameter values in the context of all running playbacks.

When you move the mouse over the connection lines the connected properties will be displayed as a tooltip:



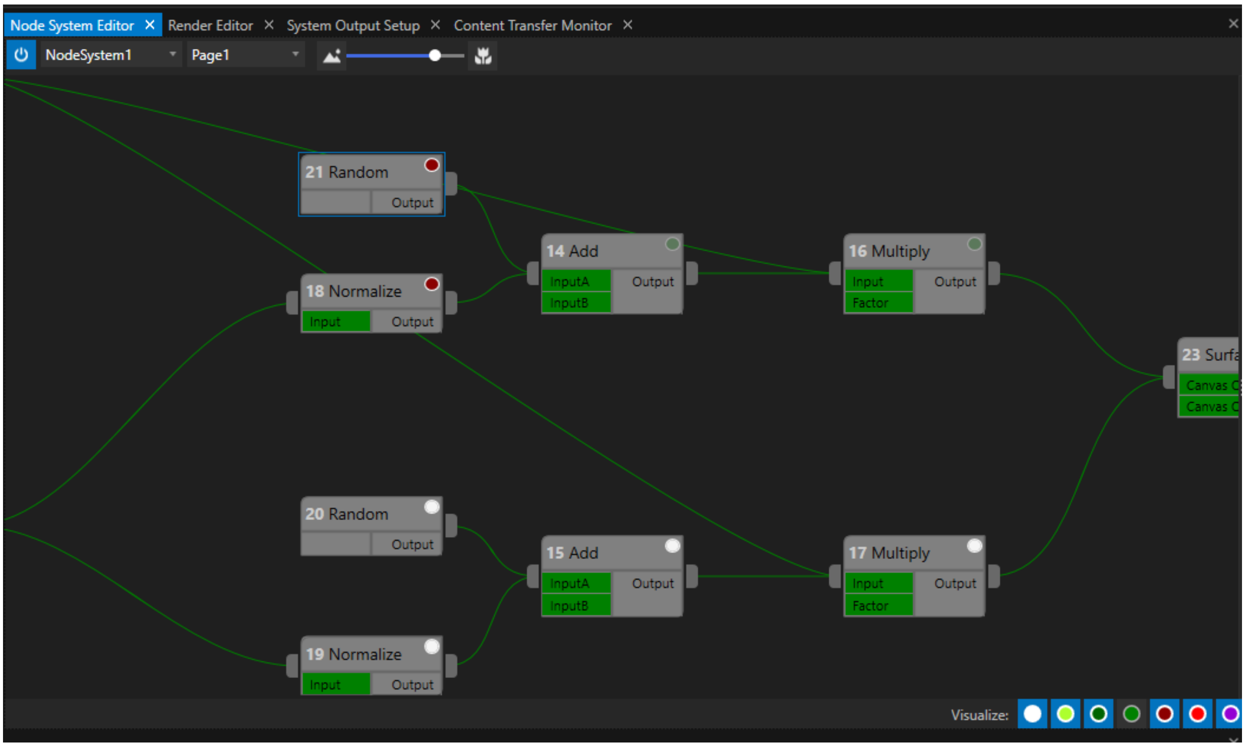
Pulse Monitoring

For testing, debugging or just to get an overview our Node System Editor offers you different types or data pulse visualizations for your Nodes.
Data is pushed to Nodes and/or pulled from Nodes with a Pulse. Sometimes it could be helpful to animate this different types of Pulses or the current Node state.

The build-in Pulse visualization **helps you to e.g. check**

- if/when data is **polled**
- if or when data is being **pushed**
- if or when data is being **pulled**
- if data is **invalid**
- if the node is **disabled**
- or when an **event** - like a script execution **is triggered**

The pulses are displayed as blinking dots into every Node.



There are two ways to set :

- Visualize menu at the footer/right-bottom of the Node System Editor
- "Visualize Pulses" into the Context Menu (open with a right-click into the Node System Editor)

Both ways always enable the pulse visualization type **globally for all Nodes.**

5.12.3 Node System Monitor

- The Node System Monitor helps you with **debugging your Node System**
- Monitor and observe **incoming and outgoing data of a selection of Nodes**
- Get informed about **wrong incoming data and/or errors**

User Interface

There are **2 ways to open** a Node System Monitor

1. Open as an extra editor window

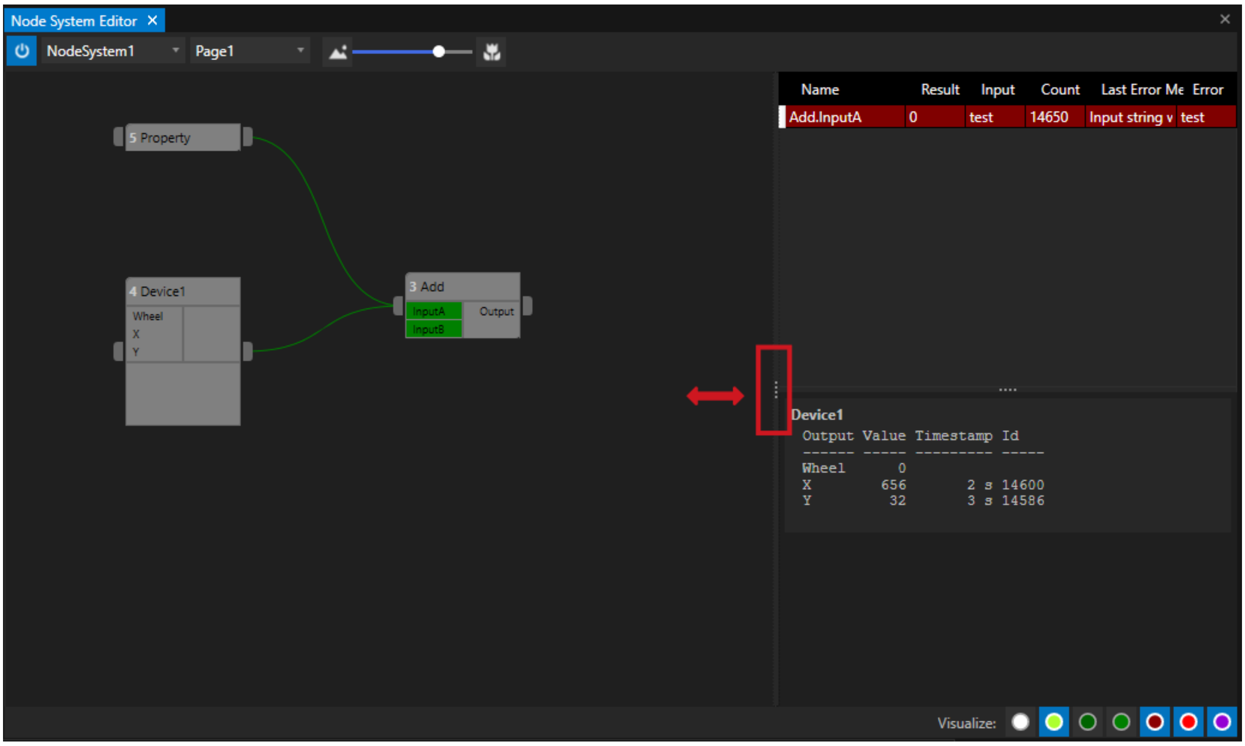
As for all other editors and windows:

- Go to the "Windows" tab at Main Menu on top
- Open a new "Node System Monitor" window

2. Quick Access - move out of Node System Editor

If you work with the Node Systems Editor and want to have just a quick access to the Node System Monitor:

- Move your mouse to the 4 dots on the right side of the Node System Editor window
- Drag to the left with pressed mouse button
- The Node System Monitor window opens as a "split screen"

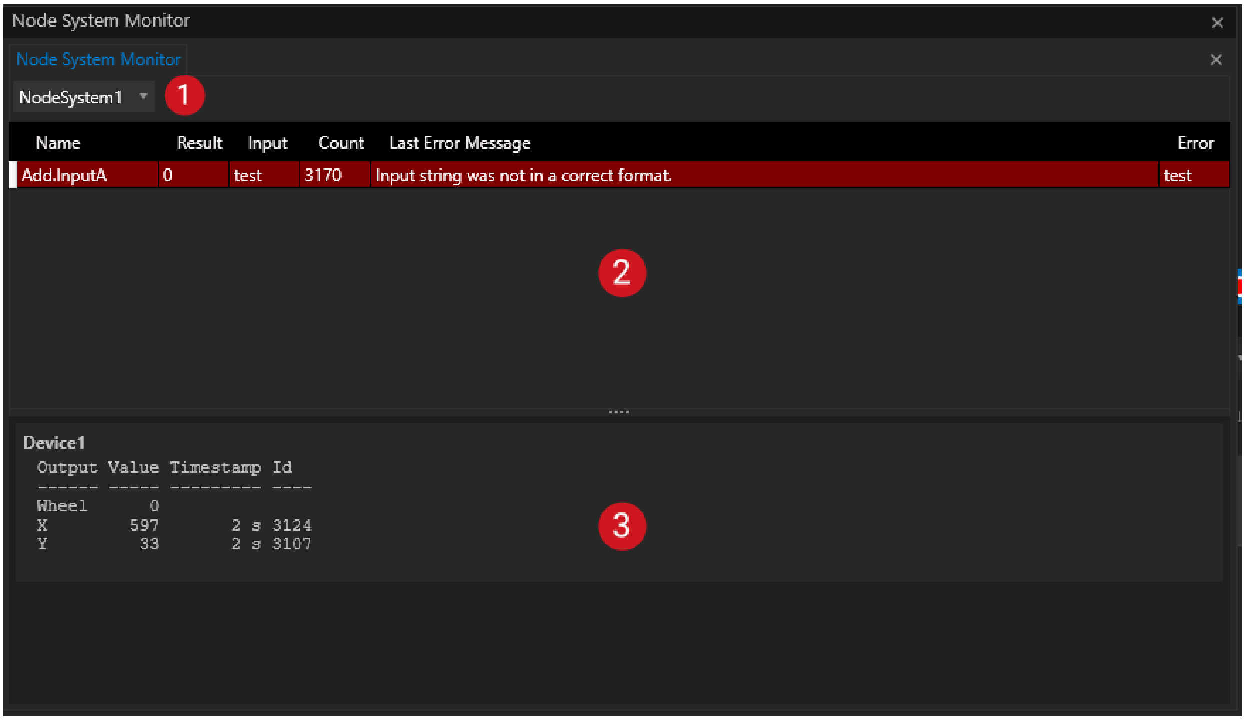


Name	Result	Input	Count	Last Error Me	Error
Add.InputA	0	test	14650	Input string v	test

Device1

```
Output Value Timestamp Id
------ ----- --------- -----
Wheel      0
X        656       2 s 14600
Y         32       3 s 14586
```

Window Layout



Name	Result	Input	Count	Last Error Message	Error
Add.InputA	0	test	3170	Input string was not in a correct format.	test

```
Device1
  Output Value Timestamp Id
  ------ ----- --------- ----
  Wheel      0
  X        597       2 s 3124
  Y         33       2 s 3107
```

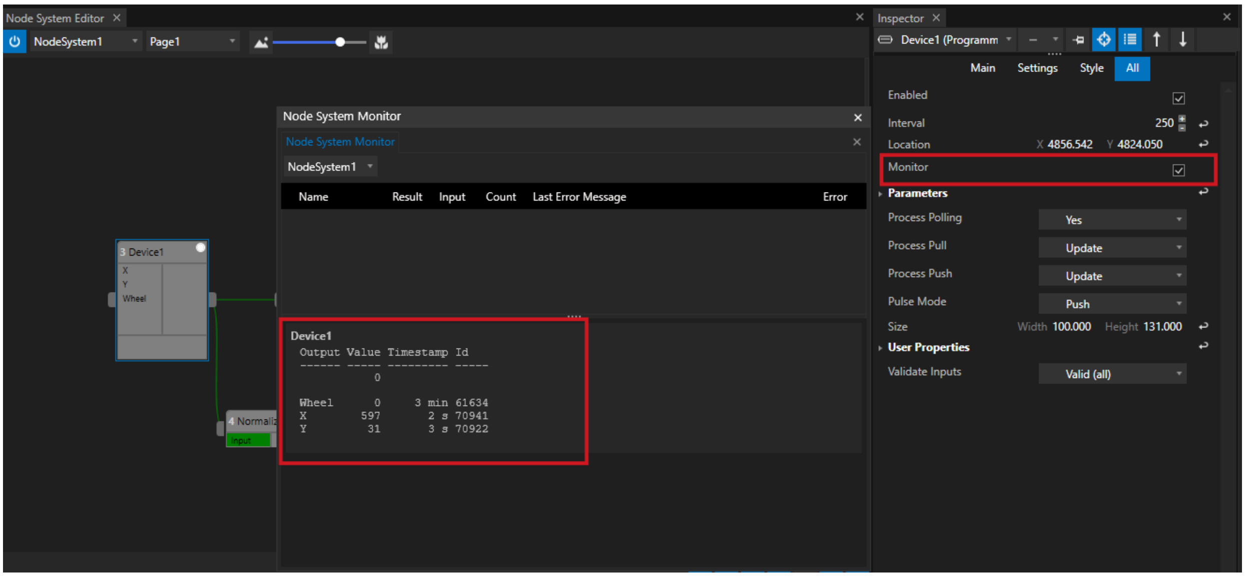
1	**Select Node System**	Select one of your Node Systems which you want to monitor
2	**Error Log**	Displays all data errors that occur during your Node System is running. **Colored in Red** if an data processing error occurs. **Colored in green** when correct values arrive again after a previous data error. **Columns** **Name:** the name of the Node or Parameter where the error occurred **Result:** the value that this Parameter currently outputs **Input:** the currently incoming data **Count:** how often the current input has already been used - number of internal calculating pulses - low number: error has just happend, high number: incorrect value has been on for a long time **Last Error Message:** last error message **Error**: input that triggered the error.
3	**Node Monitoring**	Displays the outputs of preselected Nodes. All Nodes where the monitor flag is set in the Inspector are displayed here.

		Columns **Output:** Output Parameter name **Value:** Current value of the output Parameter **Timestamp:** Time that has passed since the Parameter was last changed **ID:** Pulse id where the Parameter's value was last changed

Add a Node to the Node System Monitor

- Select a Node into the Inspector
- Search for the "Monitor" Property
- Enable the Monitor flag in the Inspector

All Nodes with enabled "Monitor" flag are listed with its output information into the Node System Monitor



```
Device1
  Output Value Timestamp Id
  ------ ----- --------- -----
             0

  Wheel      0     3 min 61634
  X        597       2 s 70941
  Y         31       3 s 70922
```

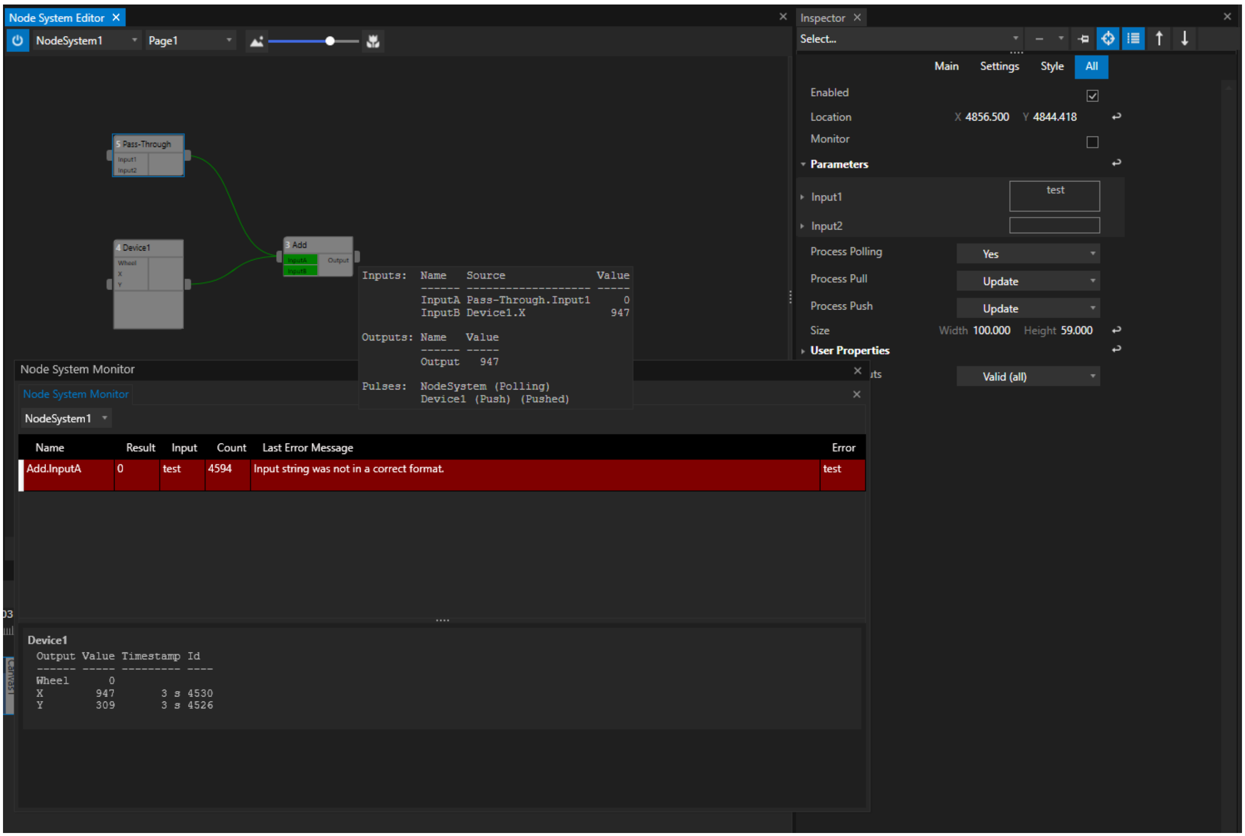
Enabled ☑
Interval 250
Location X 4856.542 Y 4824.050
Monitor ☑
Parameters
Process Polling Yes
Process Pull Update
Process Push Update
Pulse Mode Push
Size Width 100.000 Height 131.000
User Properties
Validate Inputs Valid (all)

Interpret Errors

The Error log of the Node System Monitor should help you to interpret and collect errors that are thrown while your Node System is "running" and calculates data.

There are 3 types of entries possible:

1. **No entry:** There is currently no error and no errors have occurred since the Node System was started.
2. **A red entry:** There is currently an error. There are incorrect values at a Node input.
3. **A green entry:** An error has occurred in the past and an incorrect value has been applied to an input. This value is now correct again. The error is nevertheless recorded.



```
Inputs:  Name   Source               Value
         ------ -------------------- -----
         InputA Pass-Through.Input1      0
         InputB Device1.X              947

Outputs: Name   Value
         ------ -----
         Output   947

Pulses:  NodeSystem (Polling)
         Device1 (Push) (Pushed)
```

Enabled ☑

Location X 4856.500 Y 4844.418

Monitor □

Parameters

Input1 test

Input2

Process Polling Yes

Process Pull Update

Process Push Update

Size Width 100.000 Height 59.000

User Properties

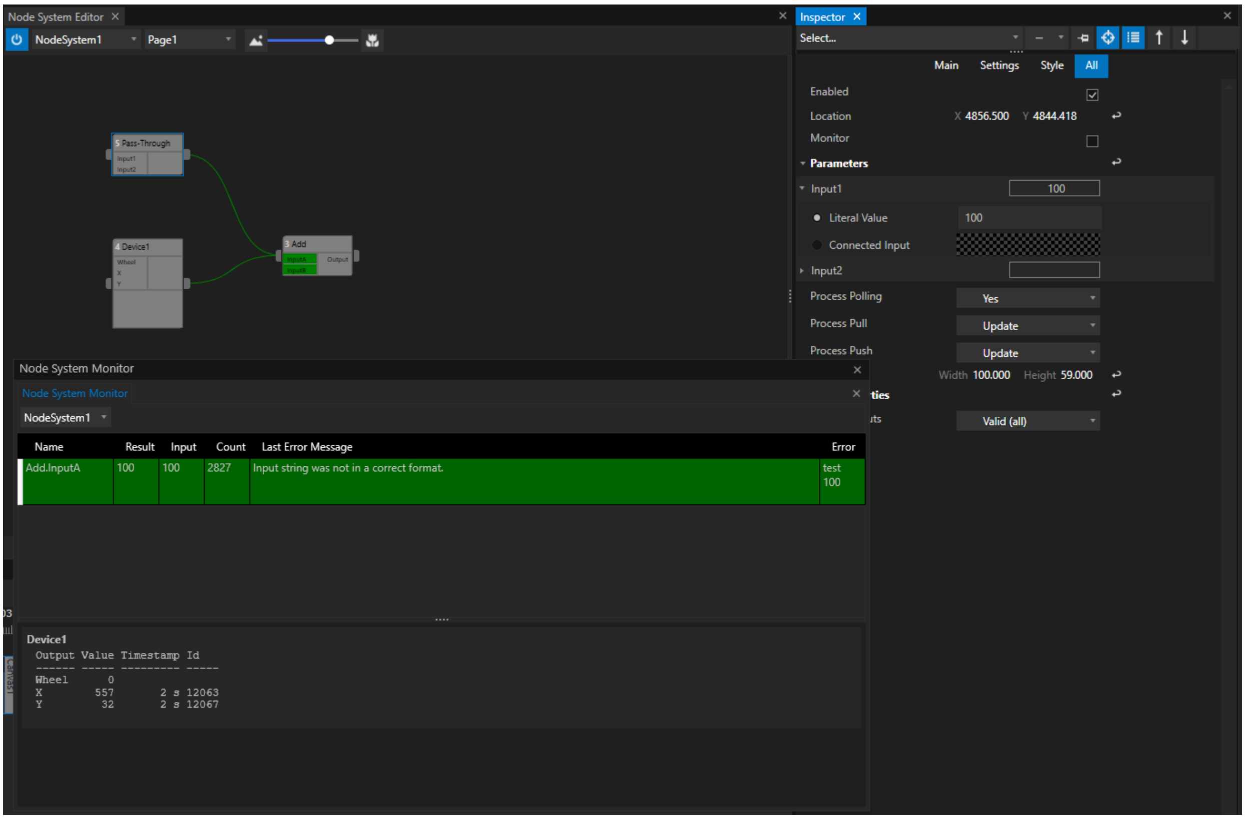
Valid (all)

Name	Result	Input	Count	Last Error Message	Error
Add.InputA	0	test	4594	Input string was not in a correct format.	test

Device1

```
Output Value Timestamp Id
------ ----- --------- ----
Wheel      0
X        947       3 s 4530
Y        309       3 s 4526
```

The example of the screenshot shows a Node for a Mouse Device that is connected to aPass Through Node with two Parameters added: The values of the Parameters are passed through from input to output (In ihis example case the pass through device is only used to generate some values and connect them to the input of the "Add Node")
The" Add Node" expects two decimal numbers as an input. The Mouse Device Node gives an decimal x coordinate as an Input B. Input A of the Add-Node is connected to an Output of the Pass-Through Node. The value of its output is a text - not a decimal number. An error is thrown.: The Input is not in the expected range.



Enabled ☑

Location X 4856.500 Y 4844.418

Monitor □

Parameters

Input1 100

● Literal Value 100

○ Connected Input

Input2

Process Polling Yes

Process Pull Update

Process Push Update

Width 100.000 Height 59.000

Valid (all)

NodeSystem1

Name	Result	Input	Count	Last Error Message	Error
Add.InputA	100	100	2827	Input string was not in a correct format.	test 100

```
Device1
 Output Value Timestamp Id
 ------ ----- --------- -----
 Wheel      0
 X        557       2 s 12063
 Y         32       2 s 12067
```

Pass-Through Node: The value from the Input 1 Parameter) was changed from a text "test" to a decimal number "100". Now the expected value range applies on the Input of the "Add" Node. The calculation of the "Add" Node can be processed. In the Node System Monitor the line with the logged Error changes to a green color. The old wrong text value "test" still is listed above the correct new value "100"

Errors are "expensive" for real-time node systems

Node systems that calculate and process data directly ("real-time") are built to calculate large amounts of data - over and over again. Errors are usually very "expensive" - they block resources that are needed to calculate other data. They should not be undetected and therefore they even remain as "green colored" entries in the Node System Monitor until the Node System is stopped and restarted. Sometimes it is helpful to observe such cases, especially when the error has "become obsolete" because valid values have arrived in the meantime.

5.12.4 Working with Nodes

- Learn the **different ways** how **to create Nodes** in VERTEX
- There are various options how to **combine Parameters from different Properties in a single Node**
- **Connect** Nodes and enable a **data flow** between them, **disconnect** them or just **deactivate** the data connection

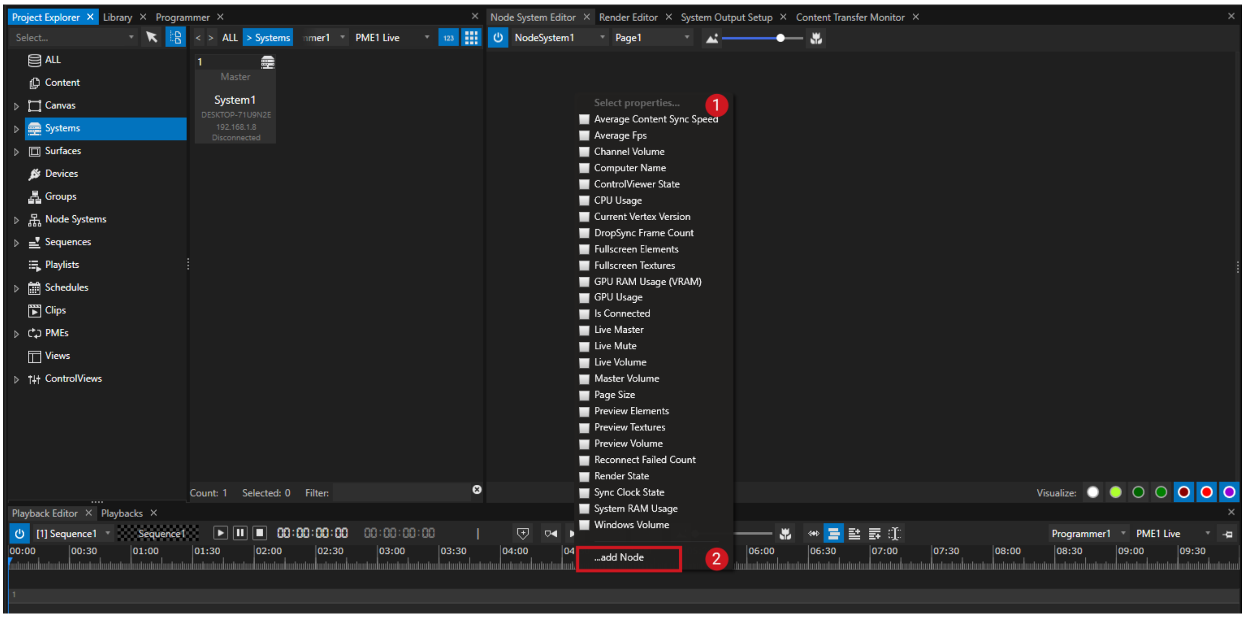
Create a Node

VERTEX offers you **different ways to create a new Node** into a Node System. All ways are **deeply integrated into the VERTEX UI** and adapted to the workflow of our software

Drag an item from Project Explorer to the Node System Editor

Create a new Node by simply drag and drop an item from Project Explorer to a Node System Editor:

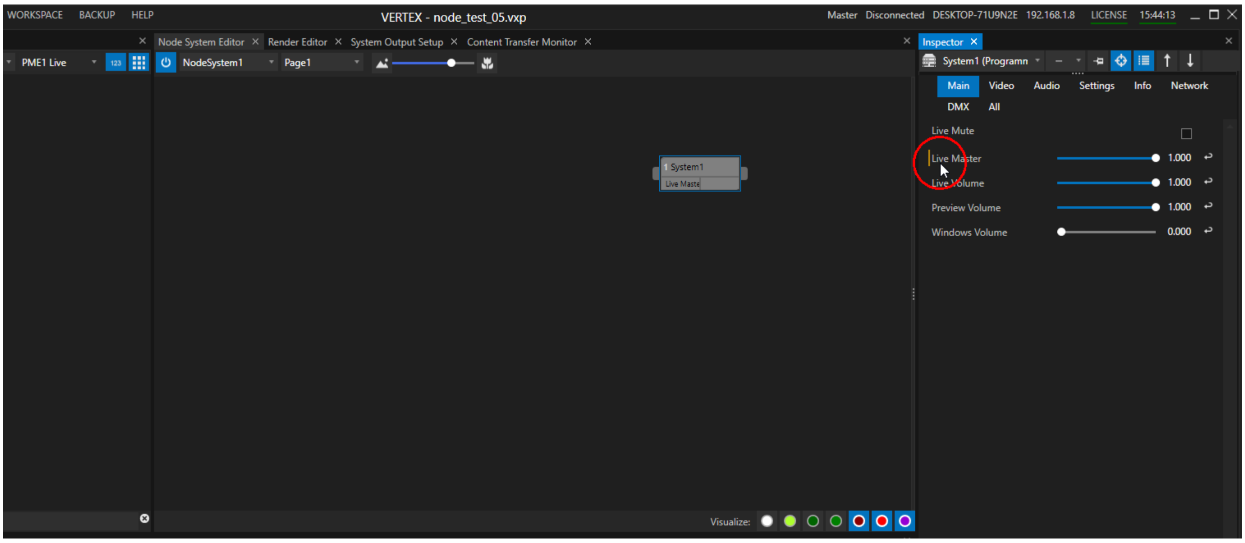
- **Select an item** (e.g. Content, a System, a Surface) in the Project Explorer
- **Drag this** item with your mouse to **the Node System Editor**
- A **context menu opens** where you can **choose from a list of all available properties**,
- **Select one or multiple properties** from the list (1)
- **Confirm** your property selection **with "Add Node" (2)**
- A new Node with the selected properties is created



Drag Properties from Inspector to the Node System Editor

- Select an item
- Go to the **Inspector**

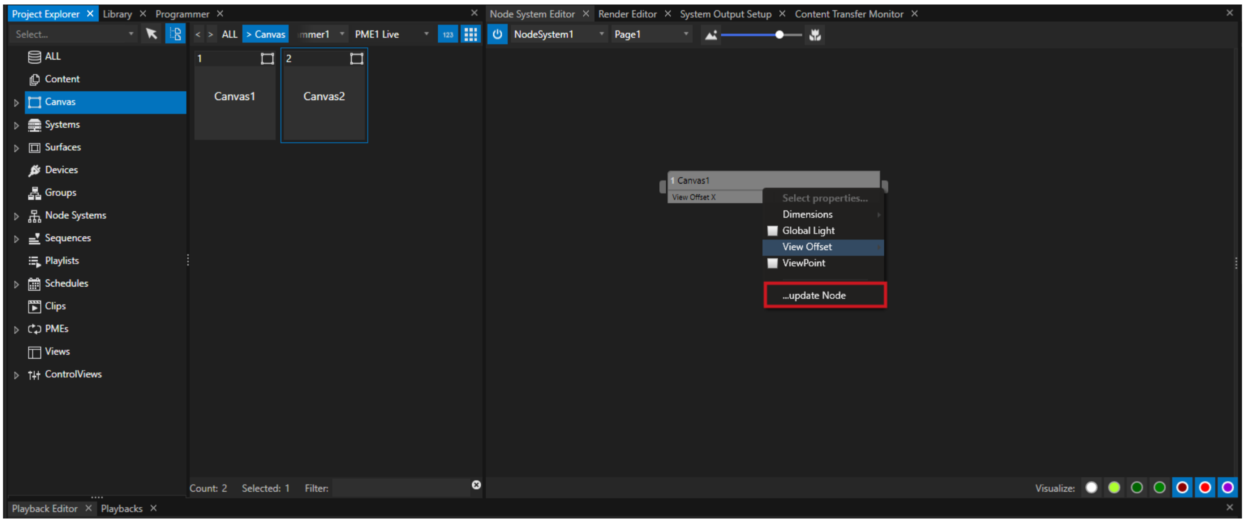
- **Select a property** in the Inspector.
  Like you may known from Wiring or Triggering, properties that could be used are marked with a **yellow vertical line**.
- **Drag this property** with your Mouse **to the Node System Editor**
- A **new Node** with the selected property as parameter is created



Combine different properties and create custom Nodes

VERTEX gives you the option to create **custom Nodes** that **combine Properties from different items**.

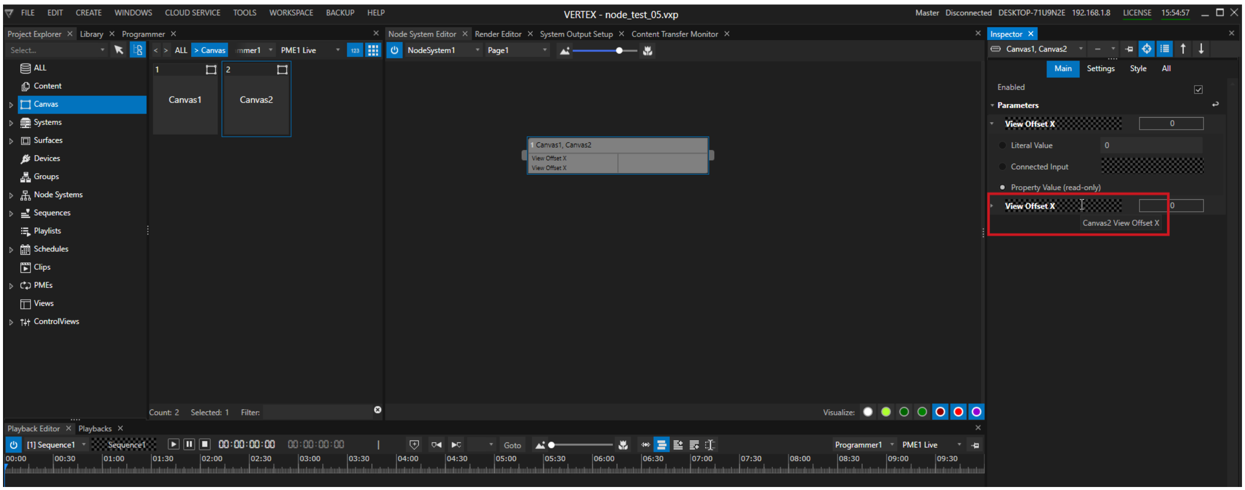
- **Create a Node** with properties **from a first item** (e.g Canvas 1)
- Select a **second item** (e.g. Canvas 2)
- Drag a **property of this item from Inspector to the already created Node**
- Or drag the item from Project Explorer to the already created Node. When the mouse button is released, a context menu pops up where you can select the properties you want to add.
- Select **"update Node"**
- The already existing Node is updated and converted to a Node that combines properties from different items (e.g. Canvas 1 and Canvas 2)



Show full property source of a Node Parameter

For a better and cleaner overview - the property fields of a Node in the Inspector show reduced information: They only shows the property name but not the full origin. When working with combined Nodes, a **tooltip displays you the whole property source.**

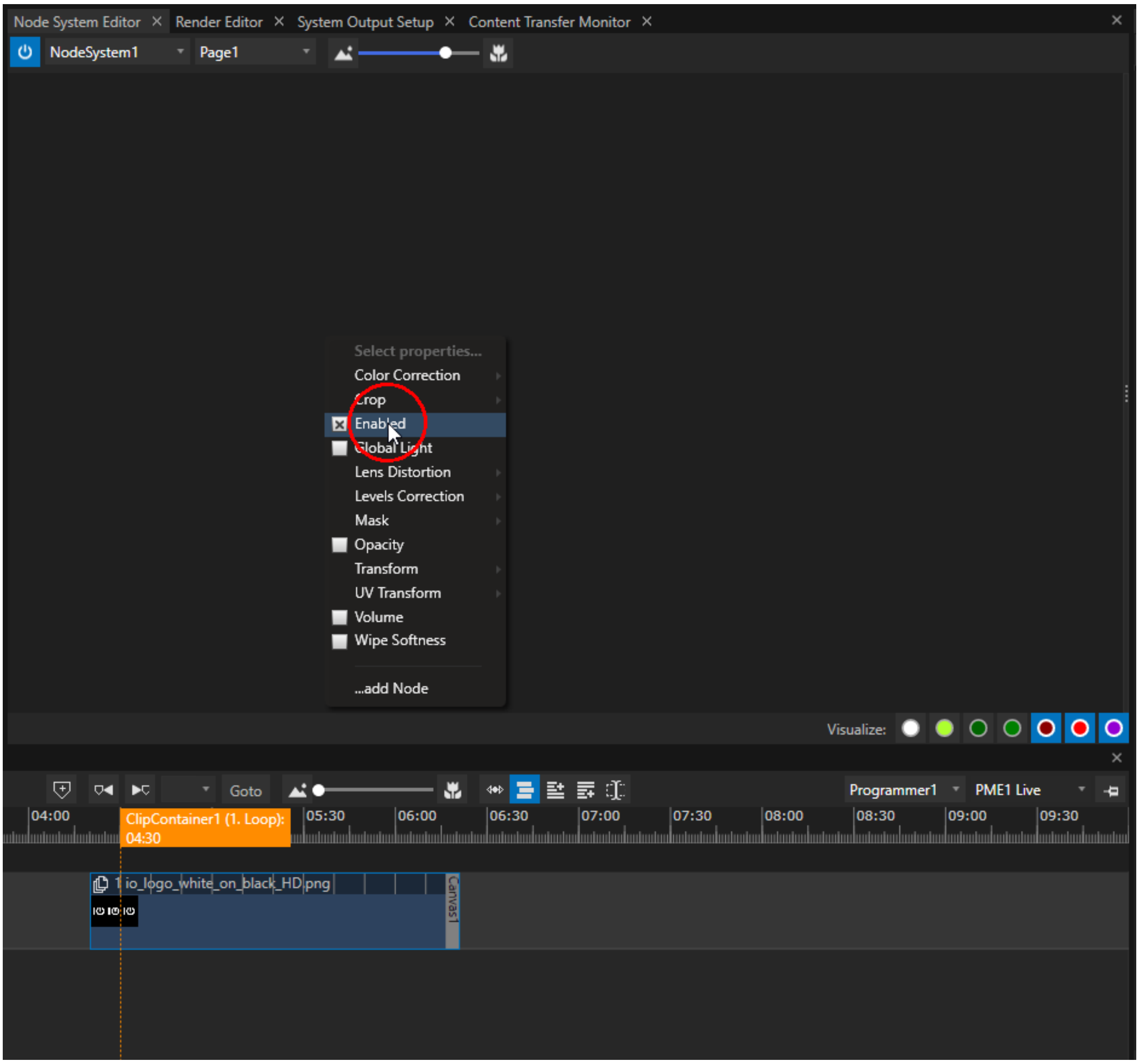
To show this tooltip, **hover with your mouse over the parameter field into Inspector** or over the parameter field of the Node into Node Systems Editor.



Tooltip with full source of a Parameter property

Drag a Clip Container to the Node System Editor

- **Select a Clip Container** into Playback Editor
- Hold **CTRL + SHIFT** on your keyboard
- **Drag the Clip Container** with your mouse **from the Playback Editor to the Node Systems Editor** (continue to hold down CTRL+SHIFT)
- **Release the mouse button and the keys** and a **property selection menu is displayed**
- Select the properties you want to have as parameters for your Node
- Confirm with **"Add Node"** on the bottom of the context menu window



Drag and Drop from any other Editor

Creating Nodes via drag and drop is also possible for other some other VERTEX Editors.
Hold CRTL and SHIFT and drag e.g. a Control from the Control View Editor to the Node System Editor.
Or Drag an DMX-Routing from the DMX-Routing Editor to the Node Systems Editor

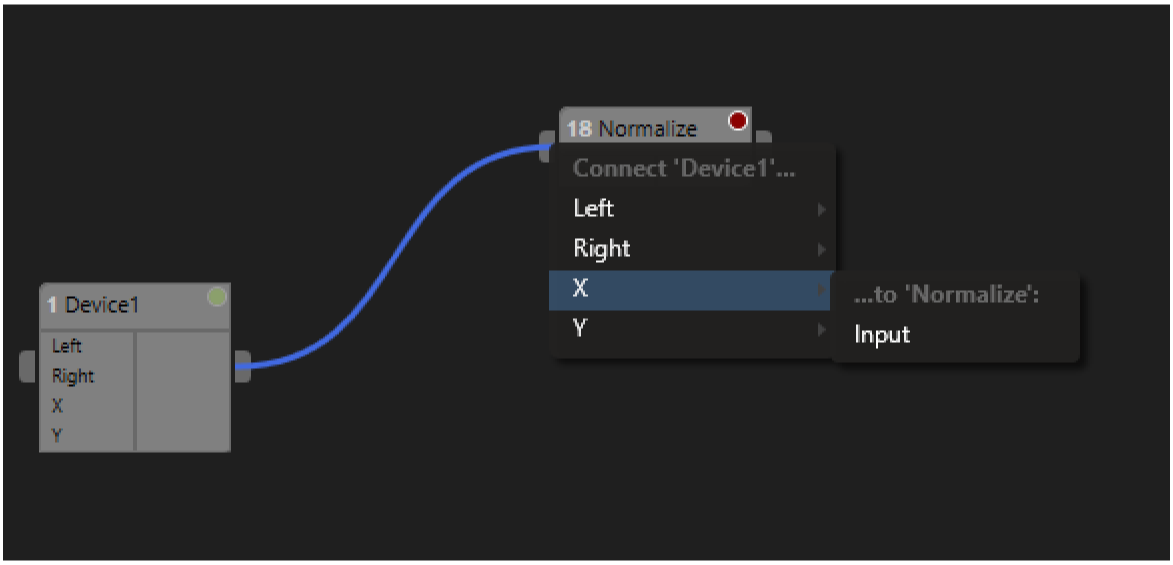
Devices and Nodes

Remember that you first have to add Devices from the Library to your Project.
Once added, you are able to drag them from the Project Explorer to the Node System Editor.
Creating Nodes directly out of the Library will not work.

Connect and Disconnect Nodes

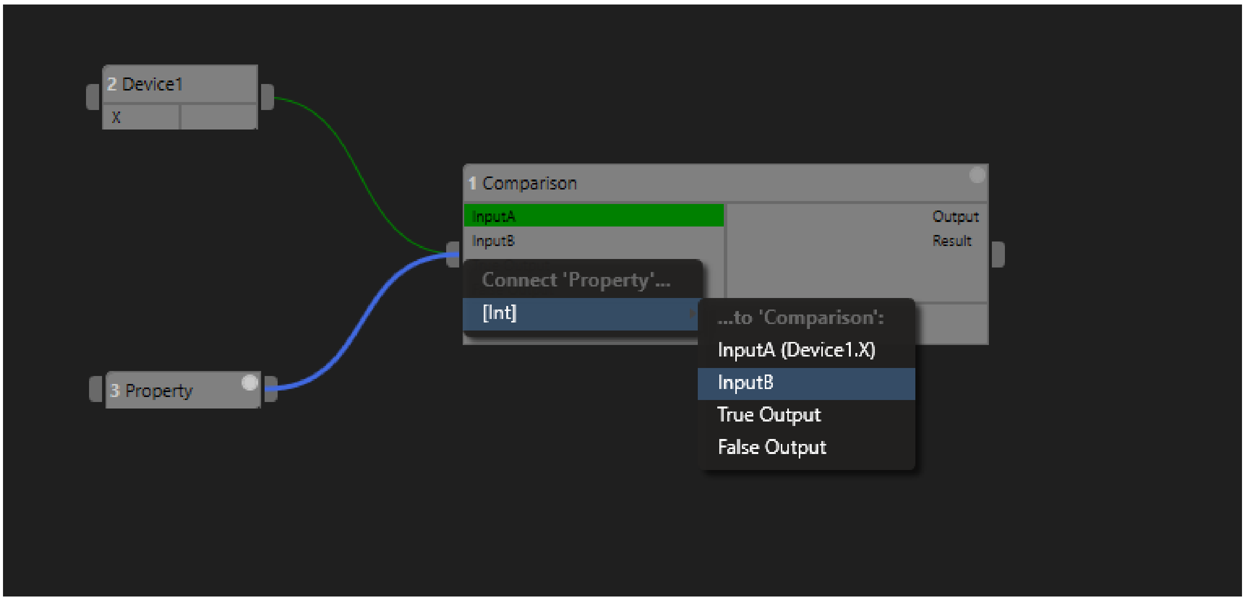
To enable a data exchange between your nodes, they have to be connected with a Connection Line.
Without Connection Line there is no data flow between an output of a Node and the input of another Node.
Connections are elementary for a Node System to work.

Connect



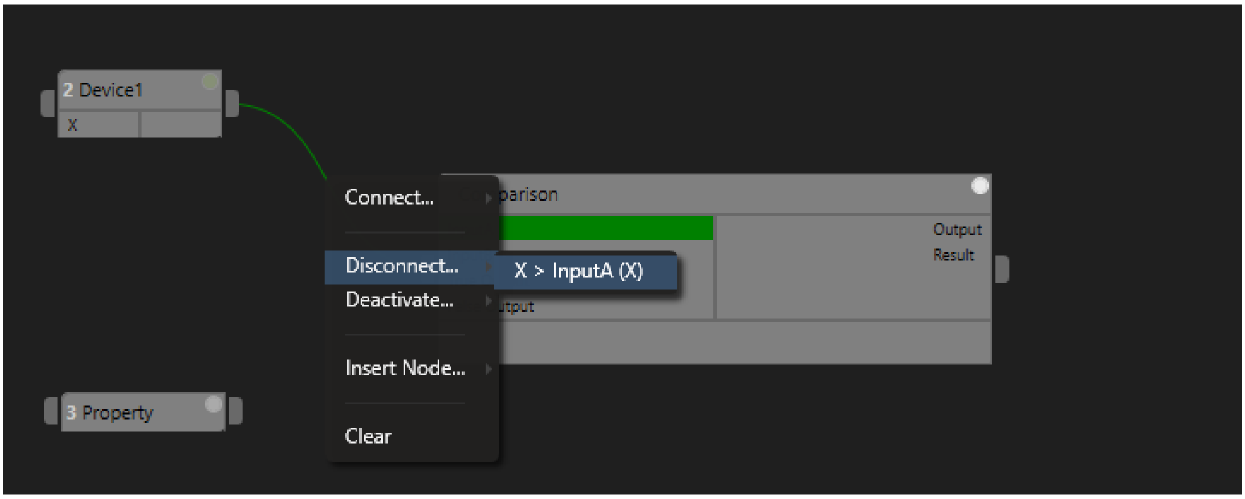
- Select the **Output pin** on the right side of a Node and **move your mouse**
- A **blue Connection Line is drawn**
- **Drag the mouse** with the blue Connection Line **to an Input pin of another Node** (on the left side of a Node)
- When you have reached the Input pin, **a context menu opens**:
  - Select the **Output from the first Node** into this context menu and
  - then select the **input or condition** of the target **Node**

- When the **connection is successful**, the **connection line turns into green** color and the **Input Parameter of the second Node is highlighted green**



Disconnect

- **Right-Click** with your mouse **on a connection line**
- The **context menu** opens
- Select **"Disconnect..."**
- **Select the Connection** you want to disconnect

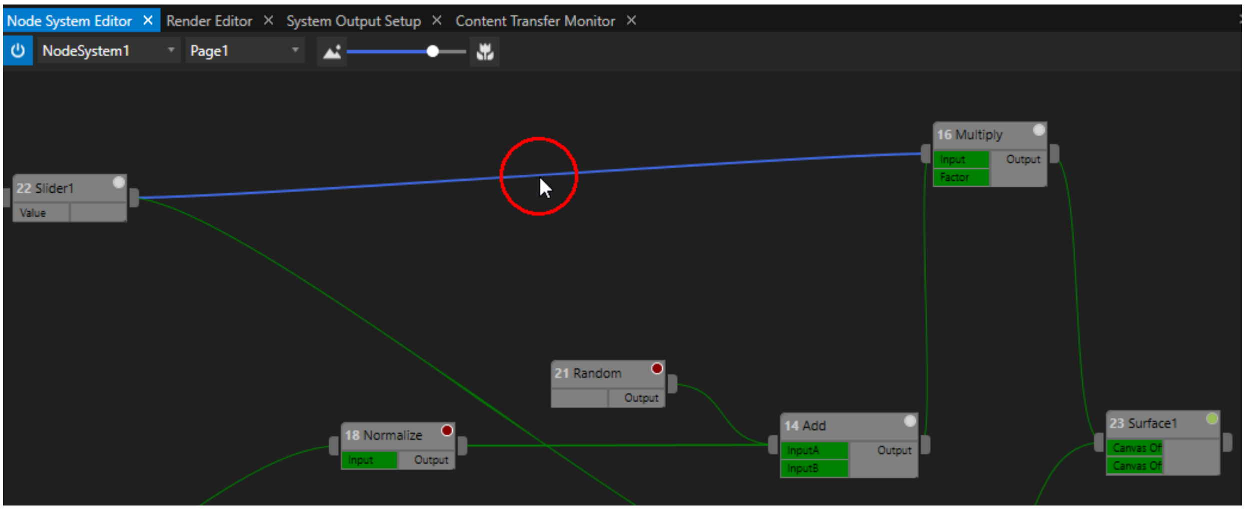


A single Connection Line and more than one data connection
No matter how many Parameters are wired between two nodes. there is always only one Connection Line. If there is more than one parameter connected, the disconnect menu offers you several options. If there are e.g. two data connections between Nodes and only one of this connections is disconnected, the green Connection Line is of course kept

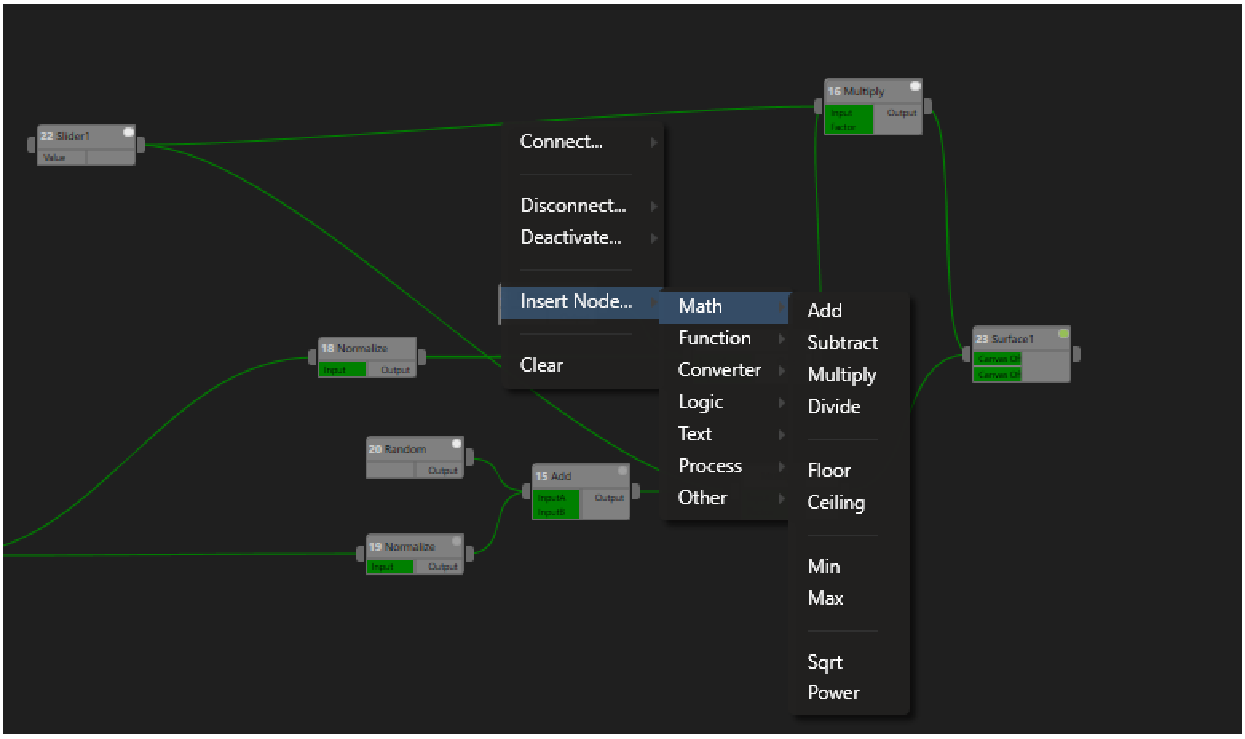
Insert a Node

- It is possible to insert a Node between two already connected Nodes.

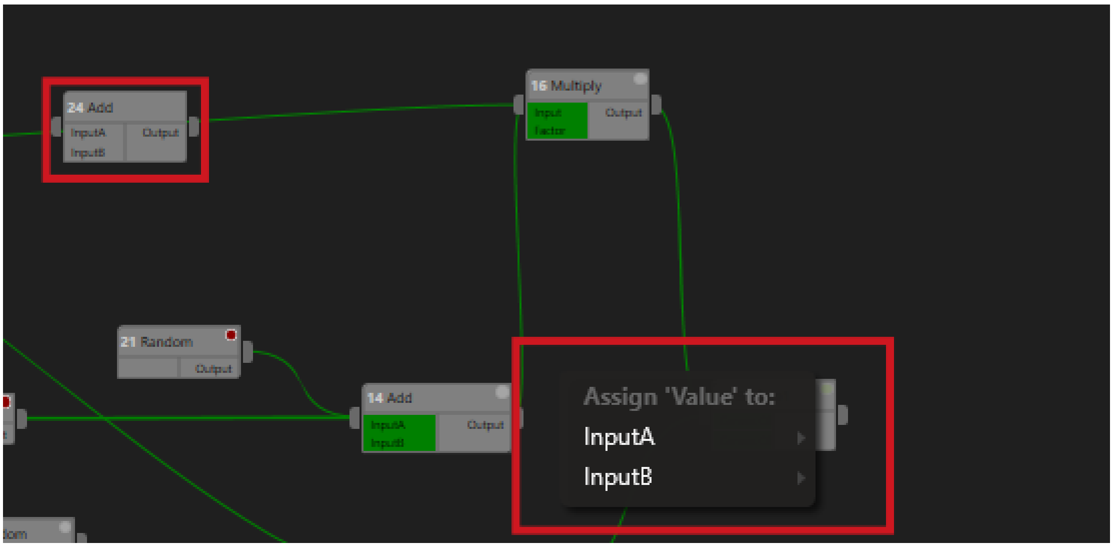
Steps



1. **Right-Click** with your mouse on a connection line between two nodes
2. A **context menu** opens
3. Select "**Insert Node**"
4. Select a Node you want to insert



- The selected Node will be inserted between the two initial Nodes
- Depending on the inserted Node type, a**nother context menu opens where you can assign the values to the input parameters** of the new and inserted Node



Depending on inserted Node type: Last step is to connect the data to the inputs of the inserted node. After a new node is inserted between, a context menu to assign opens

Deactivate or activate a Data Connection

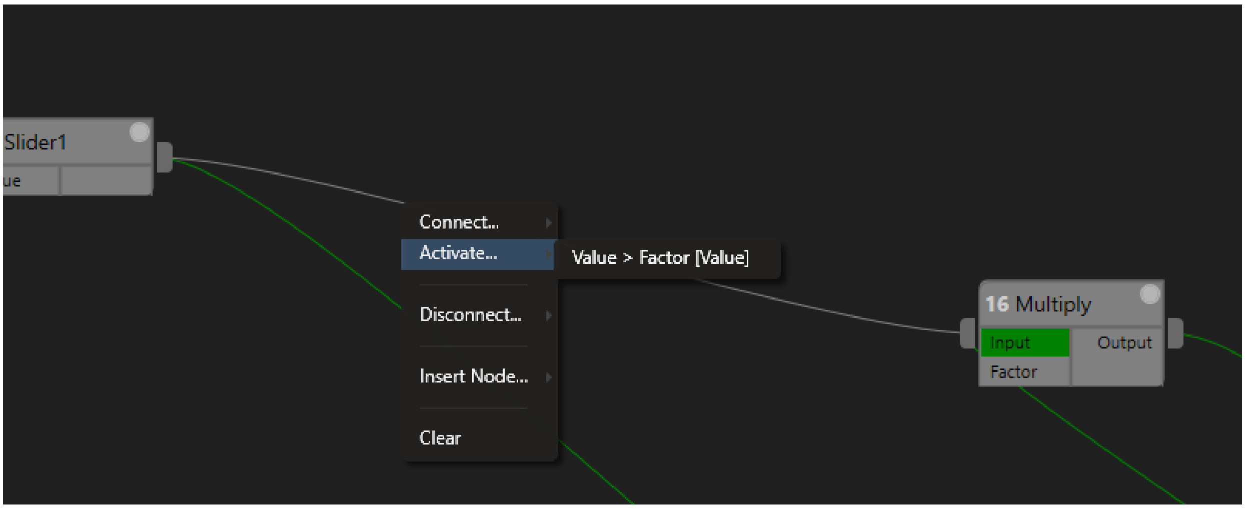
To stop a data flow between two Nodes, you are able to deactivate a data connection.
Of course you are also able to activate connections again

Deactivate

- **Right-Click** with your mouse on a connection line
- The **Context Menu** opens
- select **"Deactivate**..."

Deactivated Connections are gray instead of green
You can recognize deactivated data connections by the gray color of the connection line.
If the connection is deactivated, no data flows between the two Nodes.

Activate



- **Right-Click** with your mouse on a deactivated an gray connection line
- The **Context Menu** opens
- Select "**Activate..**"
- Select the Connection you want to activate

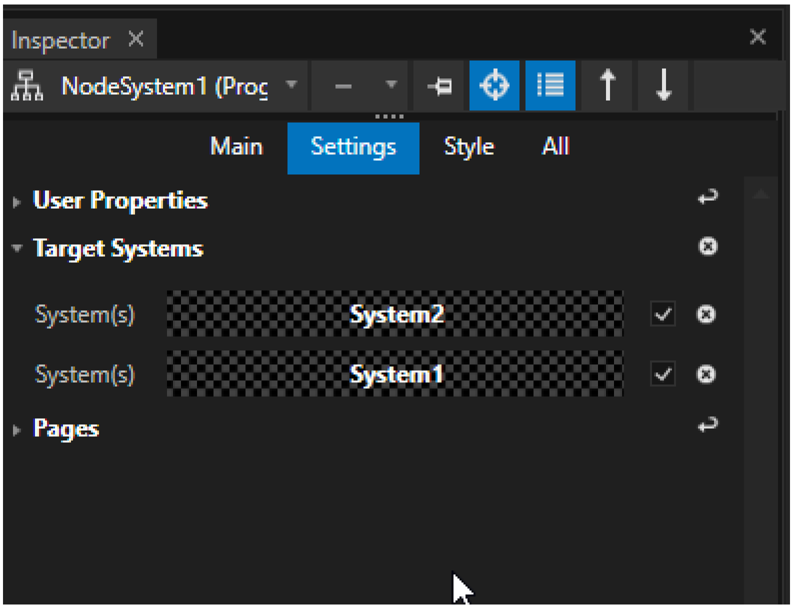
Composite Node

VERTEX offers you the possibility to **build Nodes that contains a logic of other Nodes.**
We call this kind of Nodes "Composite Nodes". You are able to built your own nodes as a subcomposition of other nodes. You can work them like normal Nodes and use them in your Node System.
Read more about here: **Composite Node**

Advanced:Target Systems for Node Systems

- If working with **multiple Systems into a Project**, you can define **on which of this Systems a Node System should be executed**
- **By default**, a Node System first is only executed and running **on Master**
- If a Node system should run on multiple Systems into your Project, you can define this with the **Target Systems Tab**
- The **Node System Editor** displays on which Systems your Node System is currently executed and running

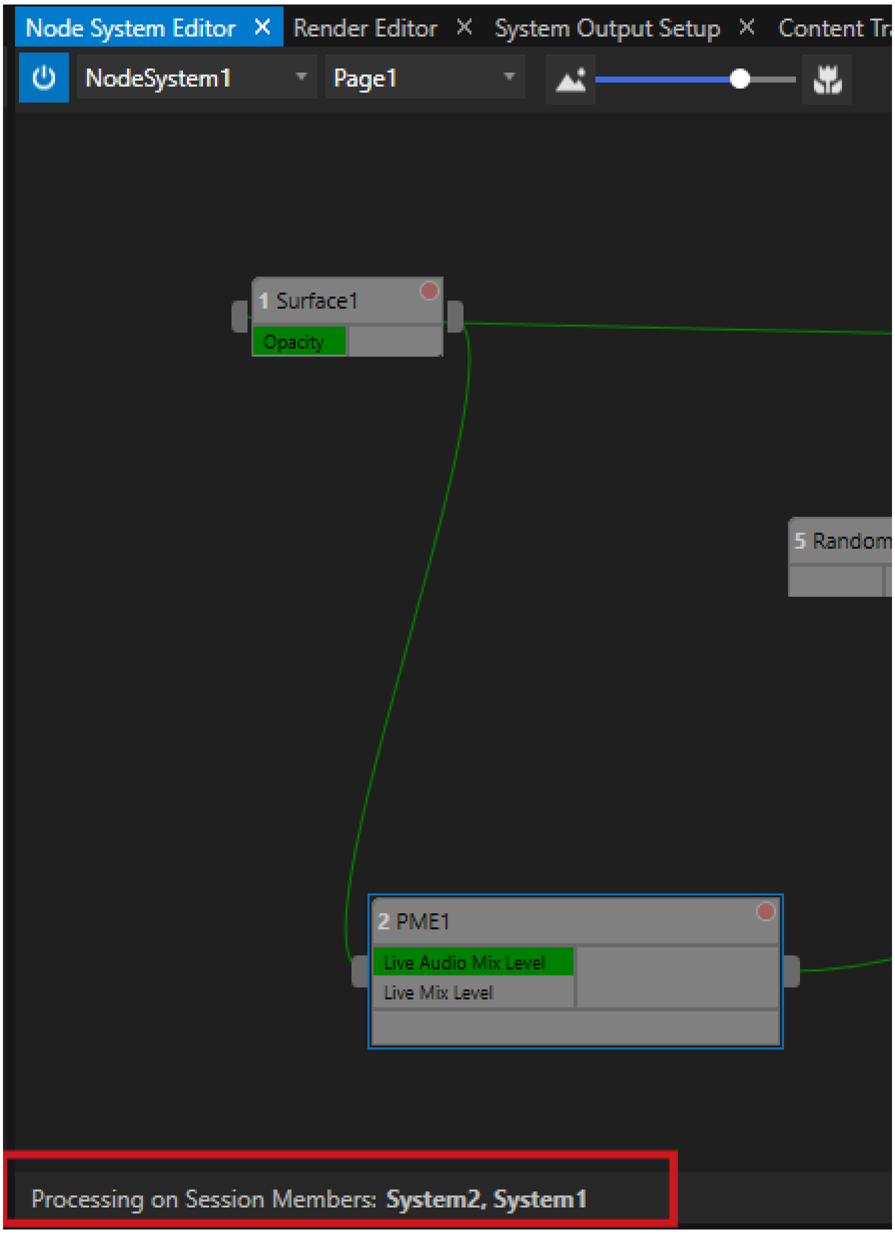
Define Target Systems



System(s) System2 ✓
System(s) System1 ✓

- First switch to the Advanced Mode of The Inspector
- Select a Node system into Project Explorer
- Open the "Target Systems" tab into the Inspector
- Drag a System from the Project Explorer to the Target Systems Tab
- Repeat the last step for all Systems on which you want to run the Node System

There is an information into Node Systems Editor on which Systems of your Project your Node System is currently processed:



Processing on Session Members: **System2, System1**

5.12.5 Parameters and Conditions

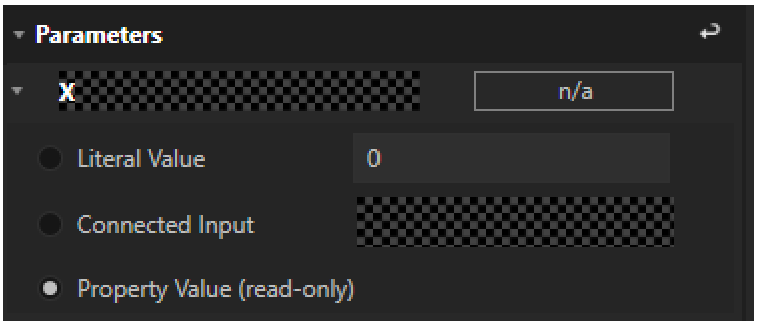
- Most Nodes have **Parameters** where the data source is defined: This could be a **Connected Input**, A **Literal value** or a **Property Value**
- Some Nodes are working with **one or multiple conditions** that could be true or false
- There are **different options to validate conditions**

Parameters

Most of the Nodes are working with Parameter(s) for data. Depending on the type of the Node, there are different options.

A Parameter could be:

- A **Connected Input** that is connected to an output of another Node and receives data
- A **Literal Value:** a fix value that is manually added by you
- A **Property Value:** a Property Value of an item. This could e.g. be an Input Value of a Device, a Dimension x-coordinate of a Canvas, an Opacity of a Surface, a Position of a Clip Container,...
  For every item into VERTEX, properties are listed into the Inspector. Most of them (not all) could be used as Parameter Inputs of a Node.



Parameters

X n/a

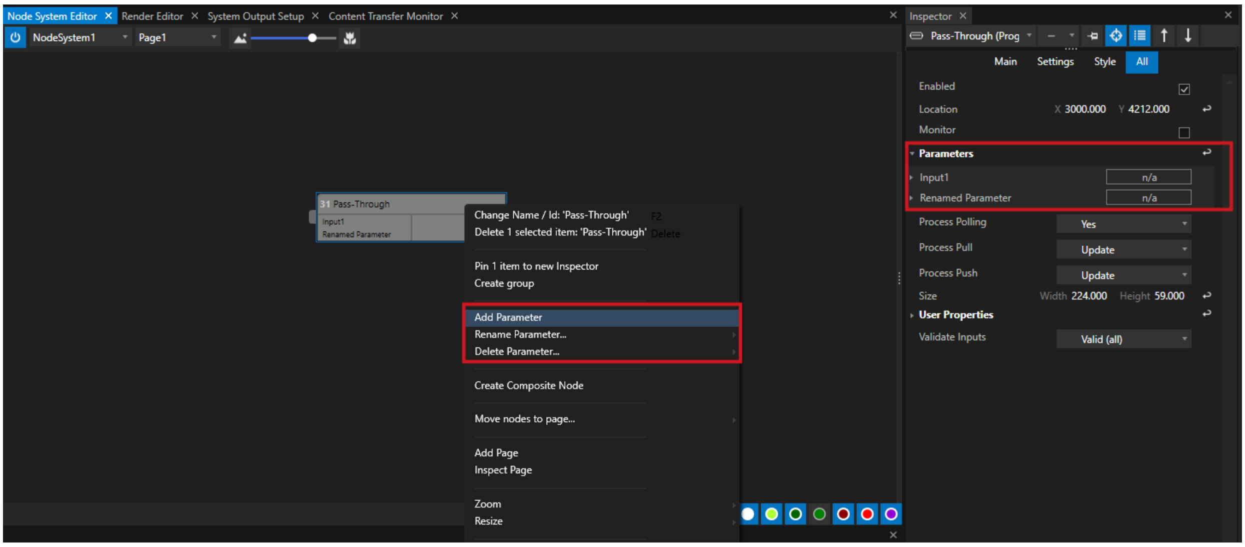
○ Literal Value 0

○ Connected Input

● Property Value (read-only)

Add a Parameter

In most cases during your work with Nodes, Nodes already have parameters after they have been created. Furthermore, there is an option to manually add another Parameter.



Enabled ☑

Location X 3000.000 Y 4212.000

Monitor □

Parameters

Input1 n/a

Renamed Parameter n/a

Process Polling Yes

Process Pull Update

Process Push Update

Size Width 224.000 Height 59.000

User Properties

Validate Inputs Valid (all)

- **Right-Click** on a Node
- The Context Menu opens
- Select **"Add Parameter"**
- For some types of Nodes, you can select between "Text", "Float", "Integer" and "Boolean"
- A new Parameter is added to the selected Node

A New parameter is not displayed in a Node or not shown in the Inspector?

Please enlarge the node downwards by dragging the lower edge of the node with the mouse. The new parameter should now be visible.

If the new Parameter is not displayed into the Inspector, please refresh the Inspector by selecting the same Node again.

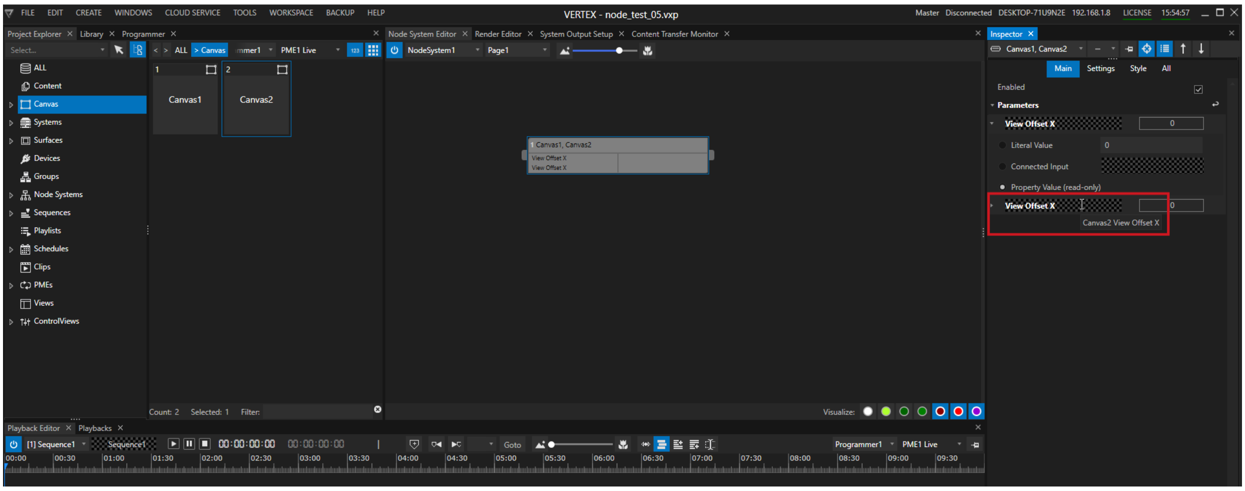
Rename a Parameter

- For some Nodes (e.g. the Pass-Through Node) it is possible to rename a Parameter.
- Click on the Node, open the Context Menu and select "Rename"

Delete a Parameter

- Right-Click on a Node
- The Context Menu opens
- Select "Delete Parameter"

Show full Parameter source



Show full property source of a Node Parameter

For a better and cleaner overview - the property fields of a Node in the Inspector show reduced information: They only shows the property name but not the full origin. When working with combined Nodes, a **tooltip displays you the whole property source.**

To show this tooltip, **hover with your mouse over the parameter field into Inspector** or over the parameter field of the Node into Node Systems Editor.

Advanced: Input Mode for Property Parameters

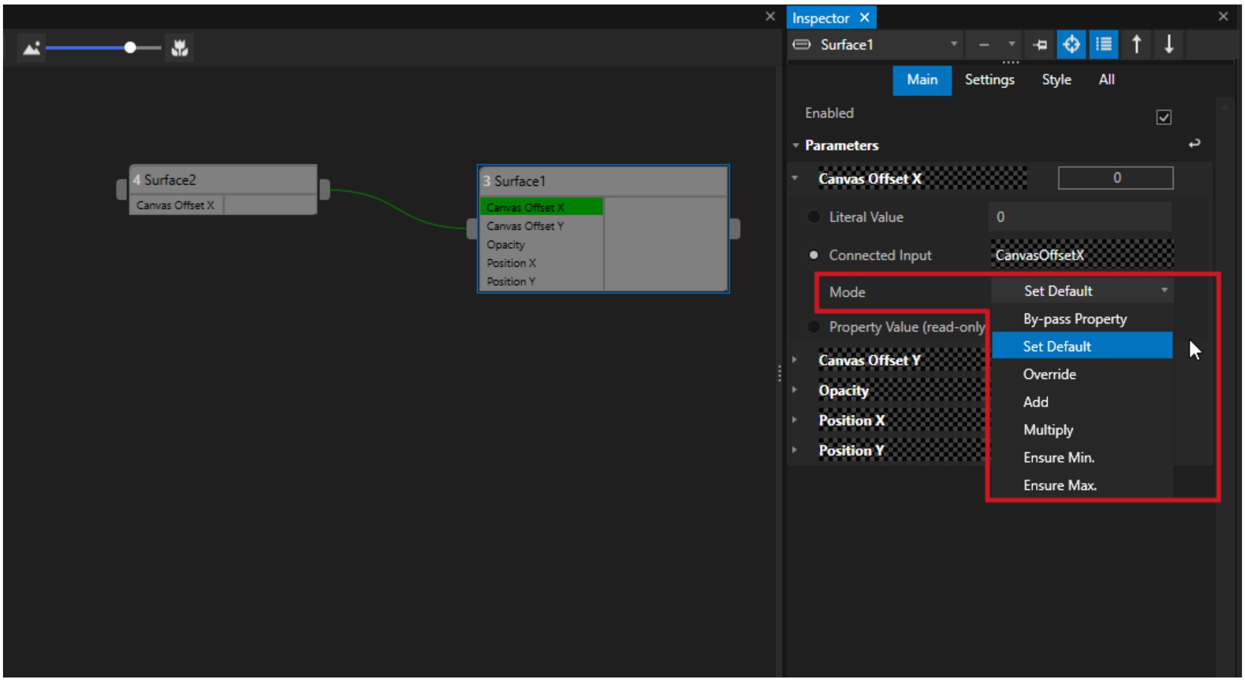
- There are special and advanced settings for Parameters that have a Property from a Project Item (e.g. a Clip Container, a System, a Surface) as source
- You are able to define a **mode how the property modulation from a node will relate to data for this property** that is used and modified on other places into VERTEX

Data Modulation for Properties and the processing chain in VERTEX

In VERTEX there are many different ways for you to model the data of a property (e.g. the opacity of a surface). Manually with the Fader in the Inspector, but also with e.g. Wiring, Triggering or with values, which are written into the Programmer.

In VERTEX internally all these influences are processed on a value. Because it is software and complex math this must happen after a certain order. Node Systems are the last part of such an internal processing chain under the hood of VERTEX.

The result of a node system - a **so-called Modulator** - is considered and added last, before a property value is finally rendered or output.



Enabled ☑

Canvas Offset X: 0

○ Literal Value: 0

● Connected Input: CanvasOffsetX

Mode: Set Default

○ Property Value (read-only

Bypass:

The property will not be affected. Consuming Nodes will use the input's value, regardless of the property's value.

Set Default:

The default value of the property will be changed according to the Node's Input value.

Override:

The modulator for the property will override the previously evaluated value with the input value of this Node

Add:

The modulator for the property will add the input value of this Node to the previously evaluated value

Multiply:

The modulator for the property will multiply the input's value with the previously evaluated value.

EnsureMax:

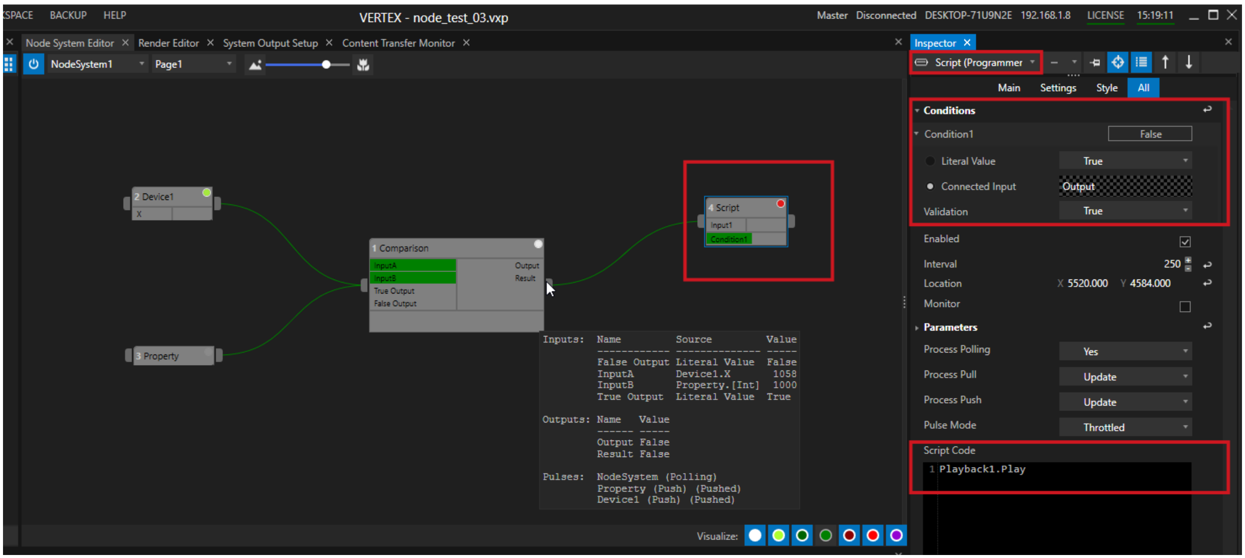
The modulator for the property will ensure that the resulting value is not greater than the input's value.

EnsureMin:
The modulator for the property will ensure that the resulting value is not lesser than the input's value.

Conditions

- A condition can be **true or false**
- When the selected validation applies, a **Script is triggered**
- You can **choose from a list of validation options** - the default validation is true (if the input is "true", a Script is triggered)

Accepted Input Values
Nodes with a Condition expect only values at the input that are either true or false or the equivalent numbers 1 and 0.
Other numbers and other values are therefore not accepted.



```
Inputs:  Name         Source         Value
         ------------ -------------- -----
         False Output Literal Value  False
         InputA       Device1.X       1058
         InputB       Property.[Int]  1000
         True Output  Literal Value  True

Outputs: Name   Value
         ------ -----
         Output False
         Result False

Pulses:  NodeSystem (Polling)
         Property (Push) (Pushed)
         Device1 (Push) (Pushed)
```

Conditions
Condition1: False
○ Literal Value: True
● Connected Input: Output
Validation: True
Enabled: ☑
Interval: 250
Location: X 5520.000 Y 4584.000
Monitor: □
Parameters
Process Polling: Yes
Process Pull: Update
Process Push: Update
Pulse Mode: Throttled
Script Code

```
Playback1.Play
```

Example for a Condition:
A "Compare" Nodes compares two incoming Values. If Input 1 is bigger than Input 2 it returns a "False".
This logical result is connected to a Script Node that expects a "True" or a"False" as Condition.
Because "False" is the incoming data, the Script Code is not executed. The "Viszualize Pulse" Monitor shows a red dot.

How to do

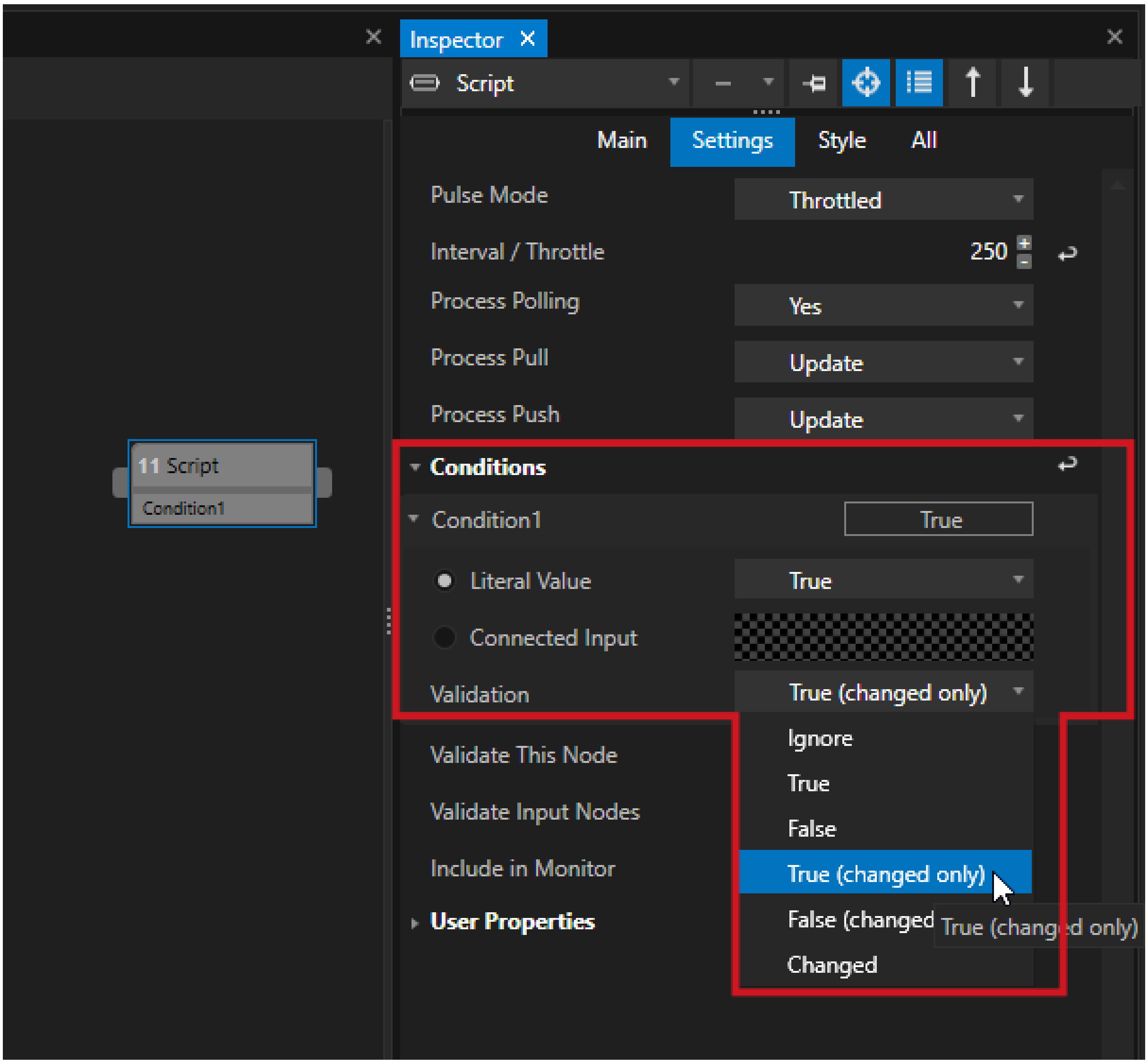
- Create a Node that works with a Condition (e.g. a Script Node)
- Or add a condition to an already existing Node (use the context menu with a right click)

- Connect the Node with a valid data connection - the incoming data from another Node has to be a Boolean "True" or "False"
- Select the Node into Inspector
- Fold out the "Conditions" Section there - check the options for validation
- Go to Inspectors Main Tab
- Enter some Script Code that should be executed when the validation is reached

Change to Advanced-Mode to see added Conditions for some Nodes
Basically you are allowed to add conditions to almost all type of Nodes - also those that a first created with only Parameters.
If "Add Conditions" is offered into the Context Menu of a Node (right-click with your Mouse on a Node), it is possible to add a Condition to this Node. Depending on the Node type it it could be that you have to change the Inspector Mode to Advanced to see the Condition for your node in the inspector besides the Parameters

Validation

You are able to change the validation type of a Condition.
Just expand the menu from a Condition into the Inspector.



Pulse Mode Throttled

Interval / Throttle 250

Process Polling Yes

Process Pull Update

Process Push Update

Condition1 True

● Literal Value True

○ Connected Input

Validation True (changed only)

Validate This Node

Validate Input Nodes

Include in Monitor

There is a dropdown where you can set one of the following validation options:

Ignore:

Ignore incoming Data

True:

Execute Script if Incoming data has the Boolean value "True"

False:

Execute Script if Incoming data has the Boolean value "False"

True (Changed only):

Execute Script if Incoming data has the Boolean value "True" and has changed from "False"

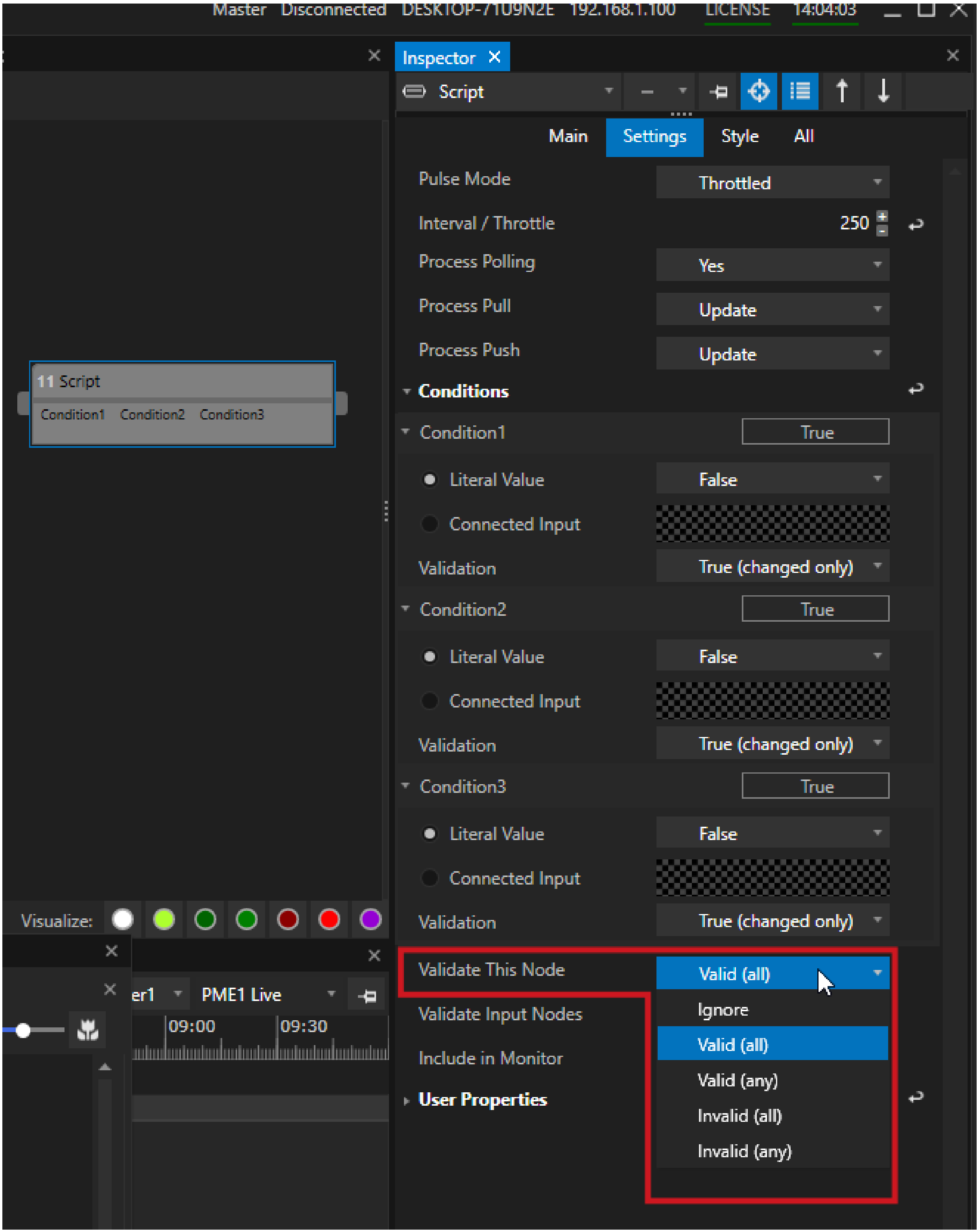
False (Changed only):

Execute Script if Incoming data has the Boolean value "False" and has changed from "True"

Changed:
Execute Script is incoming Boolean has changed its value

Validate This Node

- If working **with multiple Conditions in the same Node**, "Validate this Node" gives you the option to make the N**ode behavior dependent on several incoming conditions**



Master Disconnected DESKTOP-71U9N2E 192.168.1.100 LICENSE 14:04:03
Inspector
Script
Main
Settings
Style
All
11 Script
Condition1 Condition2 Condition3
Visualize:
er1
PME1 Live
09:00
09:30

Pulse Mode: Throttled

Interval / Throttle: 250

Process Polling: Yes

Process Pull: Update

Process Push: Update

Conditions

Condition1: True
- ● Literal Value: False
- ○ Connected Input
- Validation: True (changed only)

Condition2: True
- ● Literal Value: False
- ○ Connected Input
- Validation: True (changed only)

Condition3: True
- ● Literal Value: False
- ○ Connected Input
- Validation: True (changed only)

Validate This Node: Valid (all)
- Ignore
- Valid (all)
- Valid (any)
- Invalid (all)
- Invalid (any)

Validate Input Nodes

Include in Monitor

User Properties

A Script Node with 3 Conditions as Input

Ignore:

Ignore the validation of all conditions
Valid (all):
Node is only executed if all of the conditions are valid
Valid (any):
Node is only executed if in minimum one of the conditions is valid
Invalid (all):
Node is only executed if all of the conditions are invalid
Invalid (any):
Node is only executed if in minimum one of the conditions is invalid

Advanced: Validate Input Nodes

- To control whether nodes are processed in order to conserve performance, nodes can be "validated", i.e. they are only executed if certain conditions are met.
- These can be own conditions (Validate this Node) or conditions of nodes connected as input, which they "inherit".
- "Validate Input Nodes" ensures that all Nodes or a chain of Nodes that are connected to this Node are valid or even not.
- If the validation fails, the Node will not be processed

5.12.6 Composite Node

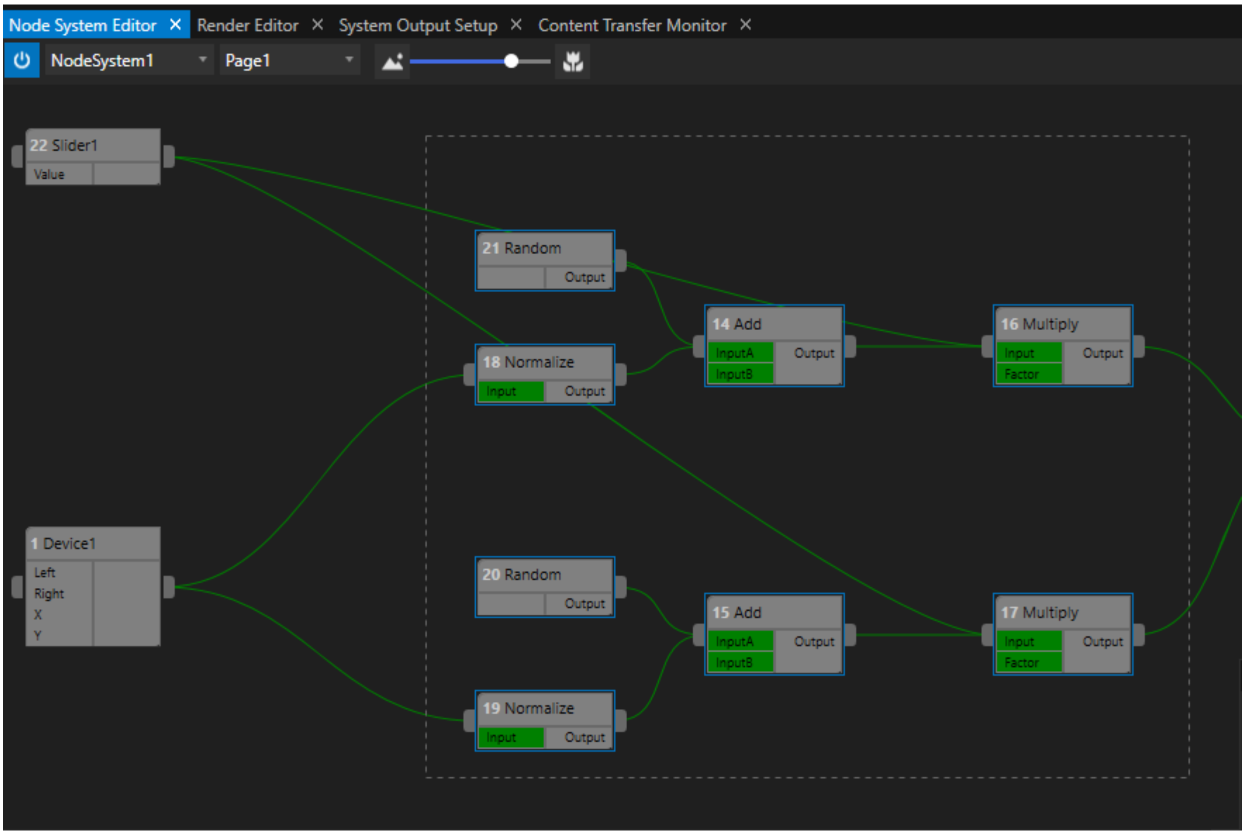
- With the **Composite Node** feature of VERTEX you can **combine an arrangement of Nodes to only one single Node**.
- You can then work with this **sub-composition as just one Node**.
- You are able to **decompose** a Composite-Node again.

Create a Composite Node

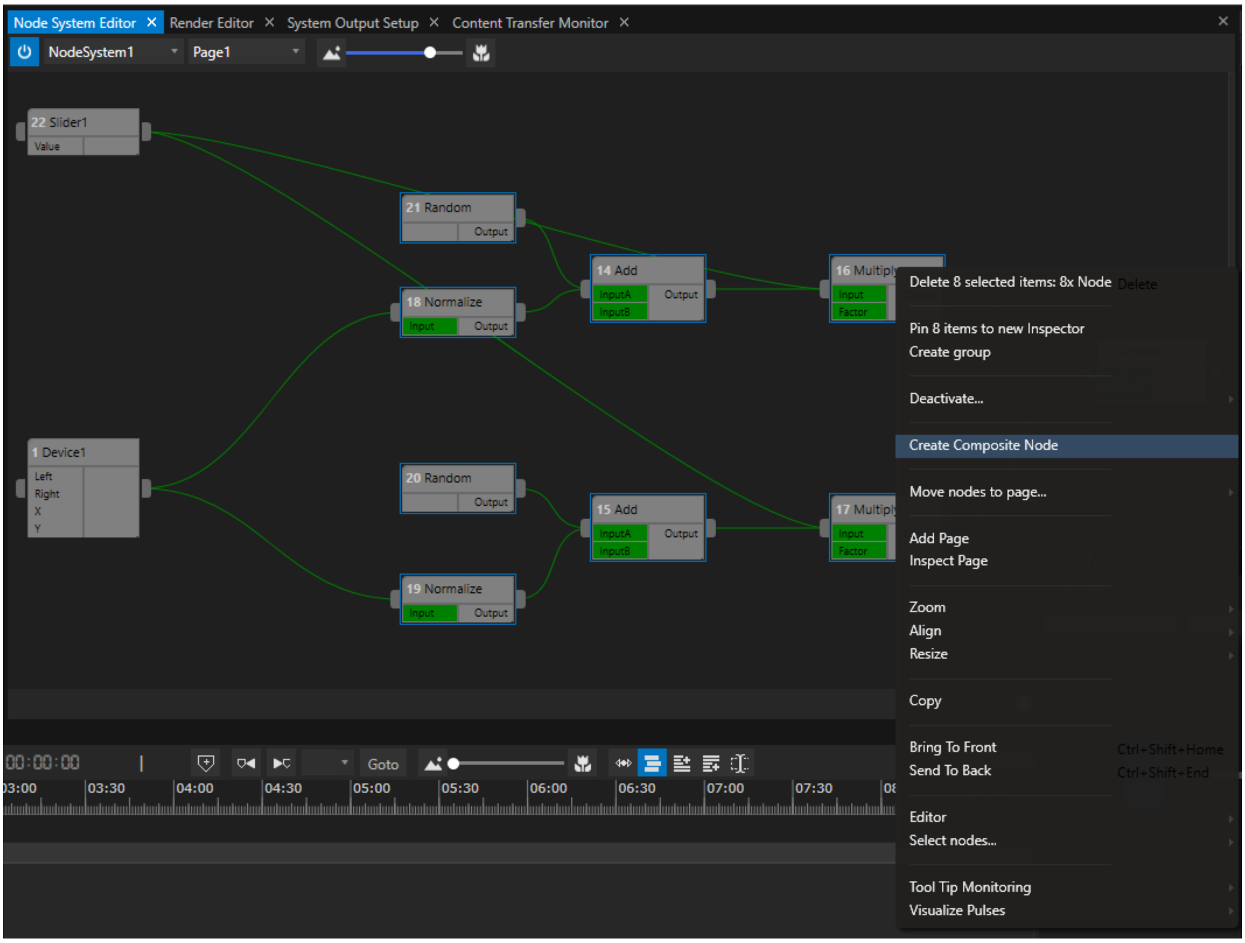
- **Hold your left mouse button and draw with your mouse a selection** around the nodes you want the Composite to contain
- **Release the mouse button**: the selected nodes now are outlined in blue

or

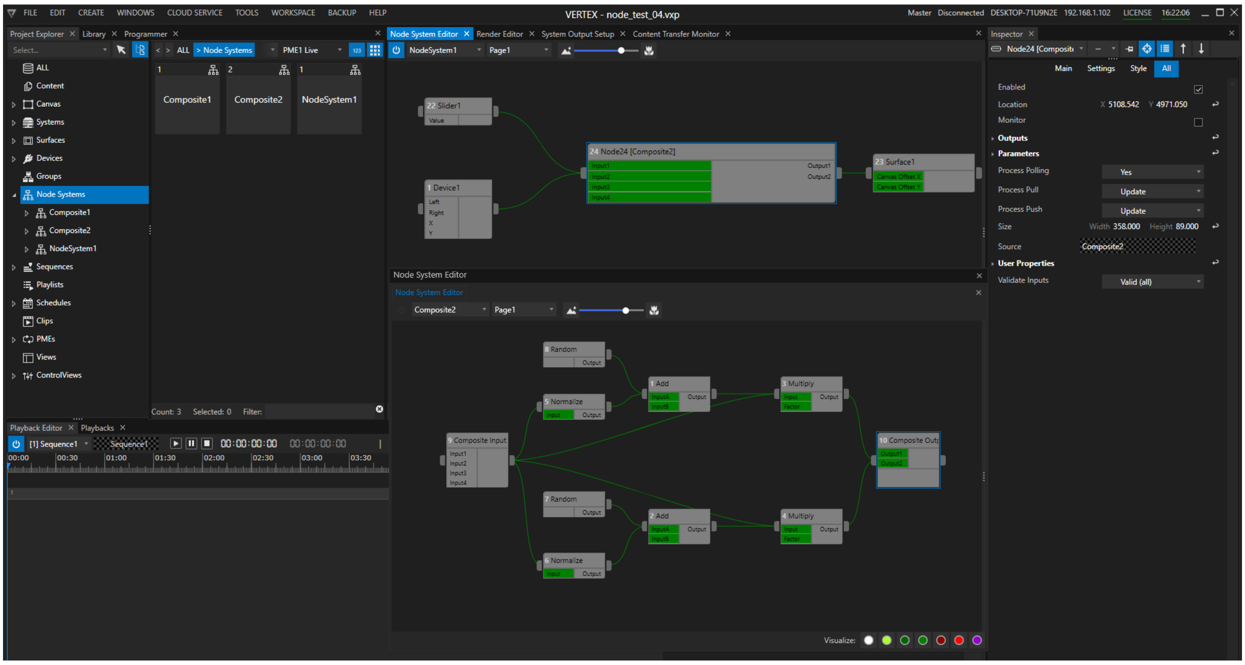
- **Hold the CTRL- Key**, select single Nodes **to a multi-selection**



- **Right-Click with your mouse** inside the Node System Editor
- The **context menu** opens
- Select "**Create Composite Node**" there



- A new Composite Node is created. The **input and output Parameters** of this Composite **are automatically created** out of the Node selection
- You can display the Composite and all of it child Nodes over the **Node System selection dropdown of the Node System Editor**
- You also are able to **access the Composite** and its child Nodes **over the Project Explorer**. If you want to use the Composite Node twice, just **drag it from Project Explorer to a Node System Editor**



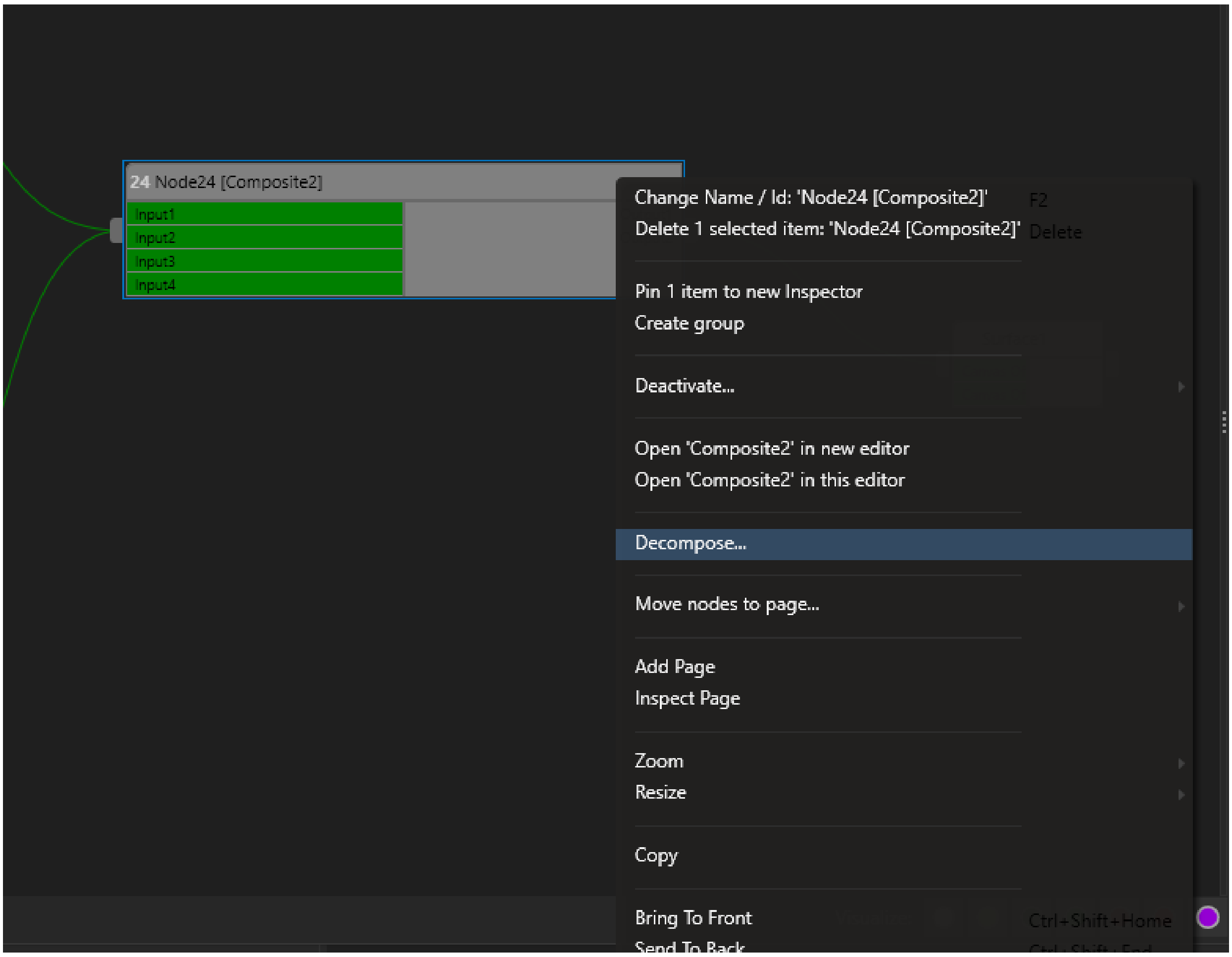
No Undo for Composites

There is no Undo possible (with e.g. CTRL+Z) for Composite. If created accidentally a wrong Composite, you are able to decompose it

(see below)

Decompose

- Select the Composite Node into Node System Editor
- Right-Click on it to open the Context Menu
- Select "Decompose"
- Confirm with OK


24 Node24 [Composite2]
Input1
Input2
Input3
Input4
Change Name / Id: 'Node24 [Composite2]' F2
Delete 1 selected item: 'Node24 [Composite2]' Delete
Pin 1 item to new Inspector
Create group
Deactivate...
Open 'Composite2' in new editor
Open 'Composite2' in this editor
Decompose...
Move nodes to page...
Add Page
Inspect Page
Zoom
Resize
Copy
Bring To Front Ctrl+Shift+Home
Send To Back

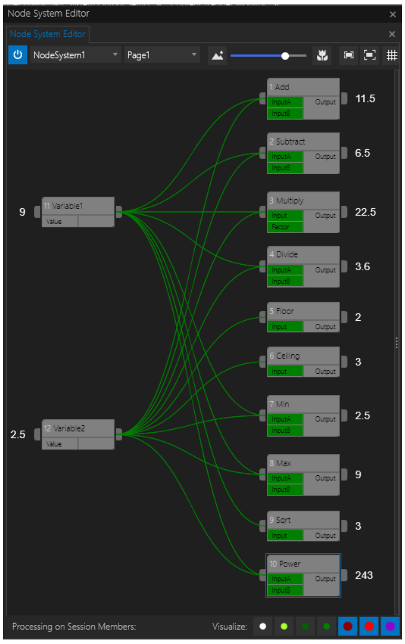
Composites live on

If you do a decompose of one of your Composites this only will be done into your current Node System.

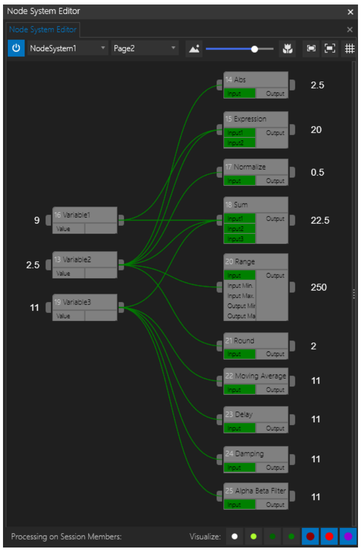
The Composite still exists into Project Explorer until you will delete it there. As long as it is alive, it can also be selected via the dropdown list in the Node System Explorer.

5.12.7 Node Types Explained

Detailed Description Of Math Nodes

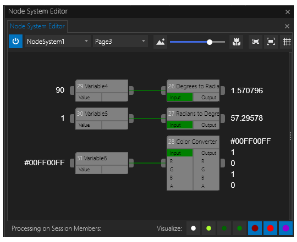
	**Name**	**Description**	**Inputs**	**Outputs**
	Add	Adds two Values	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value
	Subtract	Subtracts InputB from InputA	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value
	Multiply	Multiples Input with Factor	Input (Literal or Connected Input) Factor (Literal or Connected Input)	Value
	Divide	Divides Input A by InputB	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value
	Floor	Rounds the Input down to integer	Input (Literal or Connected Input)	Value
	Ceiling	Rounds the Input up to integer	Input (Literal or Connected Input)	Value
	Min	Determines the lowest value of all Inputs	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value
	Max	Determines the highest value of all Inputs	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value
	Sqrt	Square root of the Input	Input (Literal or Connected Input)	Value
	Power	InputA to the power of InputB	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Value

Detailed Description Of Function Nodes

	Name	Description	Parameters	Sample	Individual Settings
 Node System Editor Node System Editor NodeSystem1 Page2 14 Abs Input Output 2.5 15 Expression Input1 Input2 Output 20 17 Normalize Input Output 0.5 18 Sum Input1 Input2 Input3 Output 22.5 20 Range Input Input Min. Input Max. Output Mir Output Ma Output 250 21 Round Input Output 2 22 Moving Average Input Output 11 23 Delay Input Output 11 24 Damping Input Output 11 25 Alpha Beta Filter Input Output 11 9 16 Variable1 Value 2.5 13 Variable2 Value 11 19 Variable3 Value Processing on Session Members: Visualize:					
	Abs	Generates Absolute Value from Input	Input (Literal or Connected Input)	Input: -2.5 **Output: 2.5**	
	Expression	Applies individual math expression to Inputs	n Inputs (Literal or Connected Input)	Expression: (Input1*Input2)-Input2 Input1: 9 Input2: -2.5 **Output: -20**	
	Normalize	A dynamically changing Input with an unknown (or dynamic) range will be adjusted to an Output value between 0 and 1 based on a dynamic scale	Input (Literal or Connected Input)		
	Sum	Summarizes all Inputs	n Inputs (Literal or Connected Input)	Input1: 9 Input2: 2.5 Input3: 11 **Output: 22.5**	
	Range	A dynamically changing Input with a known range will be adjusted to an Output value in another range	Input (Literal or Connected Input) Input Min. (Literal or Connected Input) Input Max. (Literal	Input: 2.5 Input Min.: 0 Input Max.: 10 Output Min.:0 Output Max.: 1000 **Output: 250**	

			or Connected Input) Output Min. (Literal or Connected Input) Output Max. (Literal or Connected Input)		
	Round	Rounds the Input to the nearest integer	Input (Literal or Connected Input)	Input: 2.5 **Output: 2**	
	Moving Average	A moving average of a dynamically changing Input will be generated	Input (Literal or Connected Input)		Factor [0-1]
	Delay	The output of the node will be delayed by the specified Delay Time	Input (Literal or Connected Input)		Delay Time [seconds]
	Damping	The output of the node will be damped according to the specified damping time	Input (Literal or Connected Input)		Damping Time
	Alpha Beta Filter	Applies an Alpha beta filter to the Input.	Input (Literal or Connected Input)		Mode Alpha Gain Beta Gain Dt

Converter Nodes

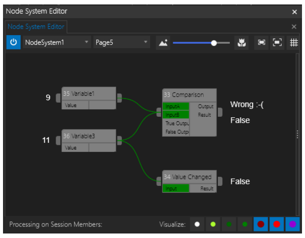
 Node System Editor Node System Editor NodeSystem1 Page3 90 29 Variable4 Value 26 Degrees to Radia Input Output 1.570796 1 30 Variable5 Value 27 Radians to Degre Input Output 57.29578 #00FF00FF 31 Variable6 Value 28 Color Converter Input Output R G B A #00FF00FF 1 0 1 0 Processing on Session Members: Visualize:	Name	Description	Parameters	Output	Sample	Individual Settings
	Degrees to Radians	Converts a degree value to a radians value	Input (Literal or Connected Input)	Value	Input: 90 **Output: 1.570796**	
	Radians to Degrees	Converts a radians value to a degree value	Input (Literal or Connected Input)	Value	Input: 1 **Output: 57.29578**	
	Color Converter	Color parameters (Hex, Bytes [8bit] or Normalized [0-1] will get converted into Hex and normalized values.	Input (Literal or Connected Input) [Hex Color Code] R (Literal or Connected Input) G (Literal or Connected Input) B (Literal or Connected Input) A (Liter	Output (Hex Color Code) R (Red normalized) G (Green normalized) B (Blue normalized) A (Alpha normalized)	Input: #00FF00FF **Output: #00FF00FF** **Output R: 1** **Output G: 0** **Output B: 1** **Output A: 0**	Input Range

			al or Connected Input)			

Generator Nodes

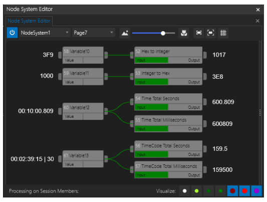
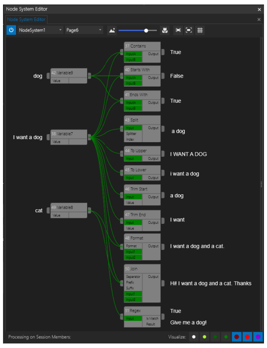
Name	Description	Parameters	Individual Settings
Generator - Sine Wave - Cosine Wave - Pulse - Linear - Random - Random (Pulse) - Random (Linear)	Generates values based on the nodes individual settings in the interval of the specific NodeSystem.	none	Type Interval Time Offset Value Factor Value Offset Steps Use Absolute Value

Comparison Nodes

	**Name**	**Description**	**Parameters**	**Output**	**Sample**	**Individual Settings**
	Comparison	Compares two inputs based on a selected expression. Output is an individually defined value and a Boolean.	InputA (Literal or Connected Input) InputB (Literal or Connected Input) True Output (Literal or Connected Input) False Output (Literal or Connected Input)	Output Result (True/False)	Expression: A = B InputA: 9 InputB: 11 True Output: Correct :-) False Output: Wrong :-(	Expression

					Output: Wrong :-(**Result: False**	
	Value Changed	Checks if the input value has changed.	Input (Literal or Connected Input)	Result (True/False)		

Text Nodes

 Node System Editor NodeSystem1 Page7 3F9 58 Variable10 52 Hex to Integer 1017 1000 59 Variable11 53 Integer to Hex 3E8 00:10:00.809 60 Variable12 54 Time Total Seconds 600.809 55 Time Total Milliseconds 600809 00:02:39:15 | 30 61 Variable13 56 TimeCode Total Seconds 159.5 57 TimeCode Total Milliseconds 159500 Processing on Session Members: Visualize:	**Name**	**Description**	**Parameters**	**Output**	**Sample**	**Individual Settings**
 Node System Editor NodeSystem1 Page6 dog 42 Variable9 I want a dog 38 Variable7 cat 49 Variable8 37 Contains True 40 Starts With False 41 Ends With True 43 Split a dog 44 To Upper I WANT A DOG 45 To Lower i want a dog 46 Trim Start a dog 47 Trim End I want 48 Format I want a dog and a cat. 50 Join Hi! I want a dog and a cat. Thanks 51 Regex True Give me a dog! Processing on Session Members: Visualize:	Contains	Check if InputB is part of InputA.	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Output (True/False)	InputA: I want a dog InputB: dog **Output: True**	
	Starts With	Check if InputA starts with InputB	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Output (True/False)	InputA: I want a dog InputB: dog **Output: False**	
	Ends With	Check if InputA ends with InputB	InputA (Literal or Connected Input) InputB (Literal or Connected Input)	Output (True/False)	InputA: I want a dog InputB: dog **Output: True**	

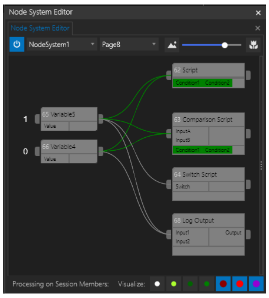
	Split	Splits an Input at a specified character. Assign any of the splits to the output by defining the Index.	Input (Literal or Connected Input) Splitter (Literal or Connected Input) Index (Literal or Connected Input)	Output	Input: I want a dog Splitter: t Index: 1 **Output: “ a dog”**	
	To Upper	Changes the Input to Uppercase.	Input (Literal or Connected Input)	Output	Input: I want a dog **Output: I WANT A DOG**	
	To Lower	Changes the Input to Lowercase	Input (Literal or Connected Input)	Output	Input: I want a dog **Output: I want a dog**	
	Trim Start	Trims the Input by a specified qty of characters at the beginning.	Input (Literal or Connected Input) Value (Literal or Connected Input)	Output	Input: I want a dog Value: 7 **Output: a dog**	
	Trim End	Trims the Input by a specified qty of characters at the end.	Input (Literal or Connected Input) Value (Literal or Connected Input)	Output	Input: I want a dog Value: 6 **Output: I want**	
	Form at	Combines multiple Inputs in a flexible Format. Inputs can be recalled by {InputID} (ID starting at 0).	n Inputs (Literal or Connected Input) Format (Literal or Connected Input)	Output	Format: {0} and a {1}. Input1: I want a dog Input2: cat	

		Add additional Inputs by right clicking the Node in the Node System Editor and selecting “Add Parameter”.			**Output: I want a dog and a cat.**	
	Join	Combines multiple Inputs. All inputs are separated with a specified Seperator. A Prefix and a Suffix can be added as an option. Add additional Inputs by right clicking the Node in the Node System Editor and selecting “Add Parameter”.	n Inputs (Literal or Connected Input) Prefix (Literal or Connected Input) Suffix (Literal or Connected Input) Seperator (Literal or Connected Input)	Output	Input1: I want a dog Input2: cat Prefix: “Hi! “ Suffix: “. Thanks” Seperator: “ and a “ **Output: Hi! I Want a dog and a cat. Thanks**	
	Regex	Applies a Regular Expression to an Input. Define a Pattern and a Replacement.	Input (Literal or Connected Input)	Is Match (True/False) Result	Sample1: Input: I want a dog Pattern: (dog|dawg|dok) Replacement: bird **Is Match: True** **Result: I want a bird** Sample2: Input: I want a dog	Pattern Replacement

					Pattern: I want a (.*) Replacement: Give me a $1! **Is Match: True** **Result: Give me a dog!**	
	Hex to Integer	Converts a hexadecimal Input into an Integer Output	Input (Literal or Connected Input)	Output	Input: 3F9 **Output: 1017**	
	Integer to Hex	Converts an integer Input into a hexadecimal Output	Input (Literal or Connected Input)	Output	Input: 1000 **Output: 3E8**	
	Time Total Seconds	Converts an Input in Time-Format (hh:mm:ss:msc) into total quantity of seconds	Input (Literal or Connected Input)	Output	Input: 00:10:00.809 **Output: 600.809**	
	Time Total Milliseconds	Converts an Input in Time-Format (hh:mm:ss:msc) into total quantity of milliseconds	Input (Literal or Connected Input)	Output	Input: 00:10:00.809 **Output: 600809**	
	Time Code Total Seconds	Converts an Input in TimeCode-Format (hh:mm:ss:ff | FPS) into total quantity of seconds	Input (Literal or Connected Input)	Output	Input: 00:02:39:15 | 30 **Output: 159.5**	
	Time Code	Converts an Input in	Input (Literal or	Output	Input: 00:02:39	

	Total Milliseconds	TimeCode-Format (hh:mm:ss:ff | FPS) into total quantity of milliseconds	Connected Input)		:15 | 30 **Output: 159500**	

Process Nodes

 Node System Editor Node System Editor NodeSystem1 Page8 62 Script Condition1 Condition2 1 65 Variable5 Value 0 66 Variable4 Value 63 Comparison Script InputA InputB Condition1 Condition2 64 Switch Script Switch 68 Log Output Input1 Input2 Output Processing on Session Members: Visualize:	**Name**	**Description**	**Parameters**	**Output**	**Sample**	**Individual Settings**
	Script	The Script Code of this Node gets executed when all Conditions of this node are validated. Manage the Conditions of this Node and their individual Validation in the “Settings” Category. Add additional Conditions by right clicking the Node in the Node System Editor and selecting “Add Condition”.	n Conditions (Literal or Connected Input) [True/False, 1/0]	None	Sample1: Script Code: Playback1.Play Condition1: 1 Condition2: 0 Condition1 Validation: True Condition2 Validation: True **Result: Script NOT executed, as Condition2 was not validated (0 is NOT “True”)** Sample2: Script Code: Playback1.Play Condition1: 1 Condition2: 0 Condition1 Validation: True Condition2 Validation: False **Result: Script**	Script Code Interval/Throttle (ms)

					executed, as both Conditions have been validated	
	Comparison Script	Two Inputs is compared in various ways and individual Scripts will be executed if validated. Conditions can be added optionally as an addition (see Script Node). Add additional Script Cases by right clicking the Node in the Node System Editor and selecting “Add Script Case”. Add additional Conditions by right clicking the Node in the Node System Editor and selecting “Add Condition”.	InputA (Literal or Connected Input) InputB (Literal or Connected Input) n Conditions (Literal or Connected Input) [True/False, 1/0]	None	InputA: 1 InputB: 0 Case1: A = B Case1 Script: Playback1.Play Case2: A ≠ B Case2 Script: Playback1.Pause **Result: Script of Case2 will get executed**	n Script Cases with Case-Selection and ScriptCode Interval/Throttle (ms)
	Switch Script	One Switch Value is compared to multiple Case values.	Switch (Literal or Connect	None	Switch: 4 Case1: 1 Case2: 2 Case3: 3 Case4: 4	N Script Cases with individual Case-Text (Change

		If the Switch Values equals any of the individual Case values, the cases Script gets executed. Conditions can be added optionally as an addition (see Script Node). Add additional Script Cases by right clicking the Node in the Node System Editor and selecting “Add Script Case”. Add additional Parameters by right clicking the Node in the Add additional Conditions by right clicking the Node in the Node System Editor and selecting “Add Condition”.	ed Input) n Conditions (Literal or Connected Input) [True/False, 1/0]		Case1 Script: Playback1.GotoCue 1 Case2 Script: Playback1.GotoCue 2 Case3 Script: Playback1.GotoCue 3 Case4 Script: Playback1.GotoCue 4 **Result: Script of Case4 will get executed**	“True” to individual value) Interval/Throttle (ms)
	Log Output	Inputs are logged in the Vertex logging system or	n Inputs (Literal or Connect	Value	Input1: 1 Input2: 0 Format: First Input1 and Second Input2	Format Interval/Throttle (ms)

		optionally to Vertex Script Monitor. Combines multiple Inputs in a flexible Format. Inputs can be recalled by Input1, Input2 etc. Conditions can be added optionally as an addition (see Script Node). Add additional Conditions by right clicking the Node in the Node System Editor and selecting “Add Condition”.	ed Input) n Conditions (Literal or Connected Input) [True/False, 1/0]		**Output: First 1 and Second 0**	

Other Nodes

Name	**Description**	**Parameters**	**Output**	**Individual Settings**
Property - Text - Integer (32bit) - Float (32bit) - Boolean - Integer (64bit) - Float (64bit) - Time	Assign any Vertex object’s property to this node to process it in a node system either as an Input or Output. Add additional Properties by right clicking the Node in the Node	Object’s Property (Literal or Connected Input or Property Value (read-only))	Value	Interval/Throttle (ms)

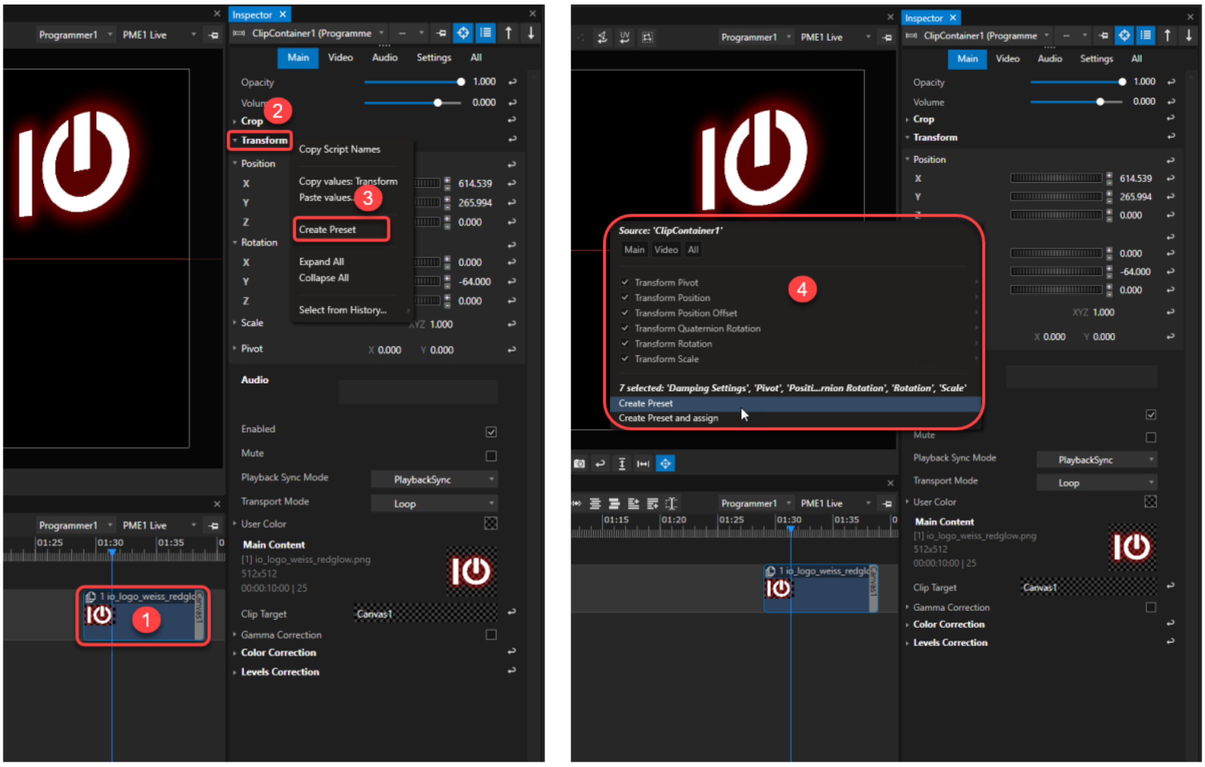
- TimeCode - DateTime - Color	System Editor and selecting “Add Property”. Note: Drag’n’Drop of a Vertex object’s property into a node system will automatically generate a property node.			
Asio Channel Volume		Channel Id (Literal or Connected Input)	Value	Interval/Throttle (ms)
Wave Channel Volume		Channel Id (Literal or Connected Input)	Value	Interval/Throttle (ms)
Mouse Input		None	X (Mouse X coordinate) Y (Mouse Y coordinate)	Interval/Throttle (ms)
Keyboard Input		None	Key (last pressed Keyboard key	Interval/Throttle (ms)

5.13 Presets

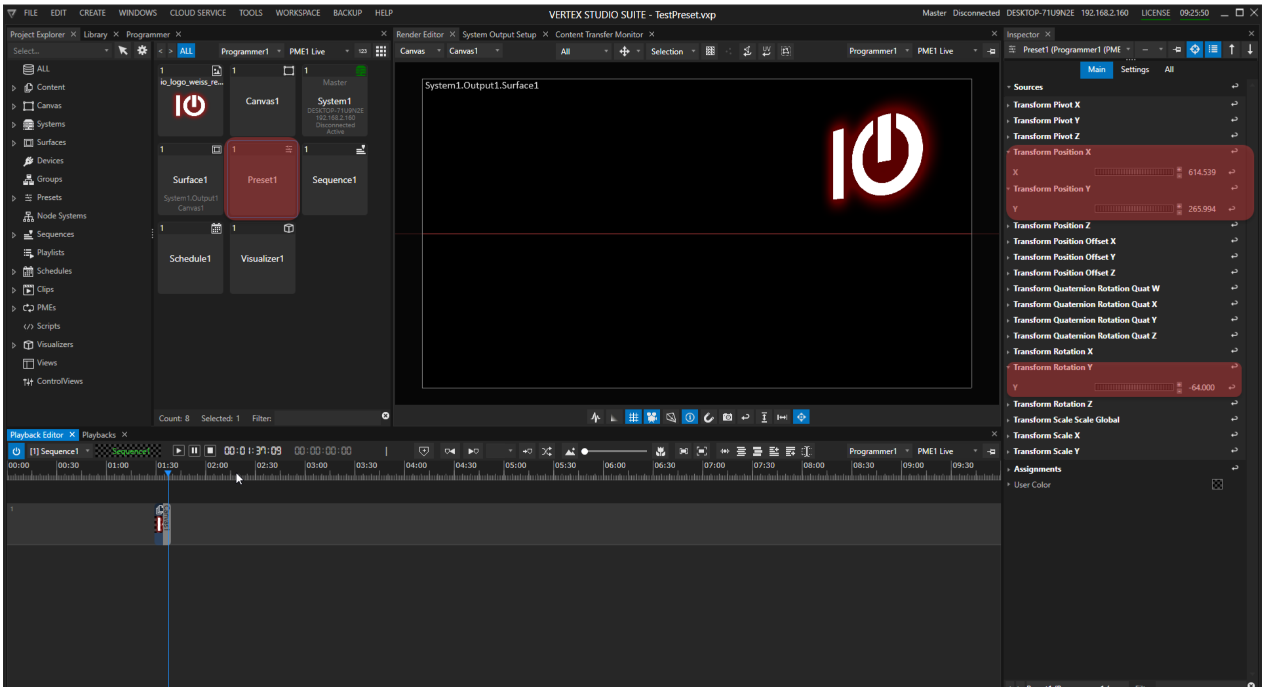
- VERTEX offers a quick and efficient way to **store multiple inspector settings as a whole in presets**.
- Presets can be **assigned to multiple project items with one click** - a real time-saver when preparing lots of content for your show.
- At the time of VERTEX R3 in 2022, **all properties that are controllable by animation keyframes can be stored as a preset.**

Creating a Preset

Let's say, you have an image on your canvas in a certain position that you would really like to use more often. To to store its *Transform* properties in a preset, just follow the next four steps:



1. Select the item and access its properties in the inspector.
2. Right-click on the *Transform* properties to open the context menu and...
3. ...select *Create Preset*
4. A new dialogue window will ask you to select what particular properties you want to include in your new preset.



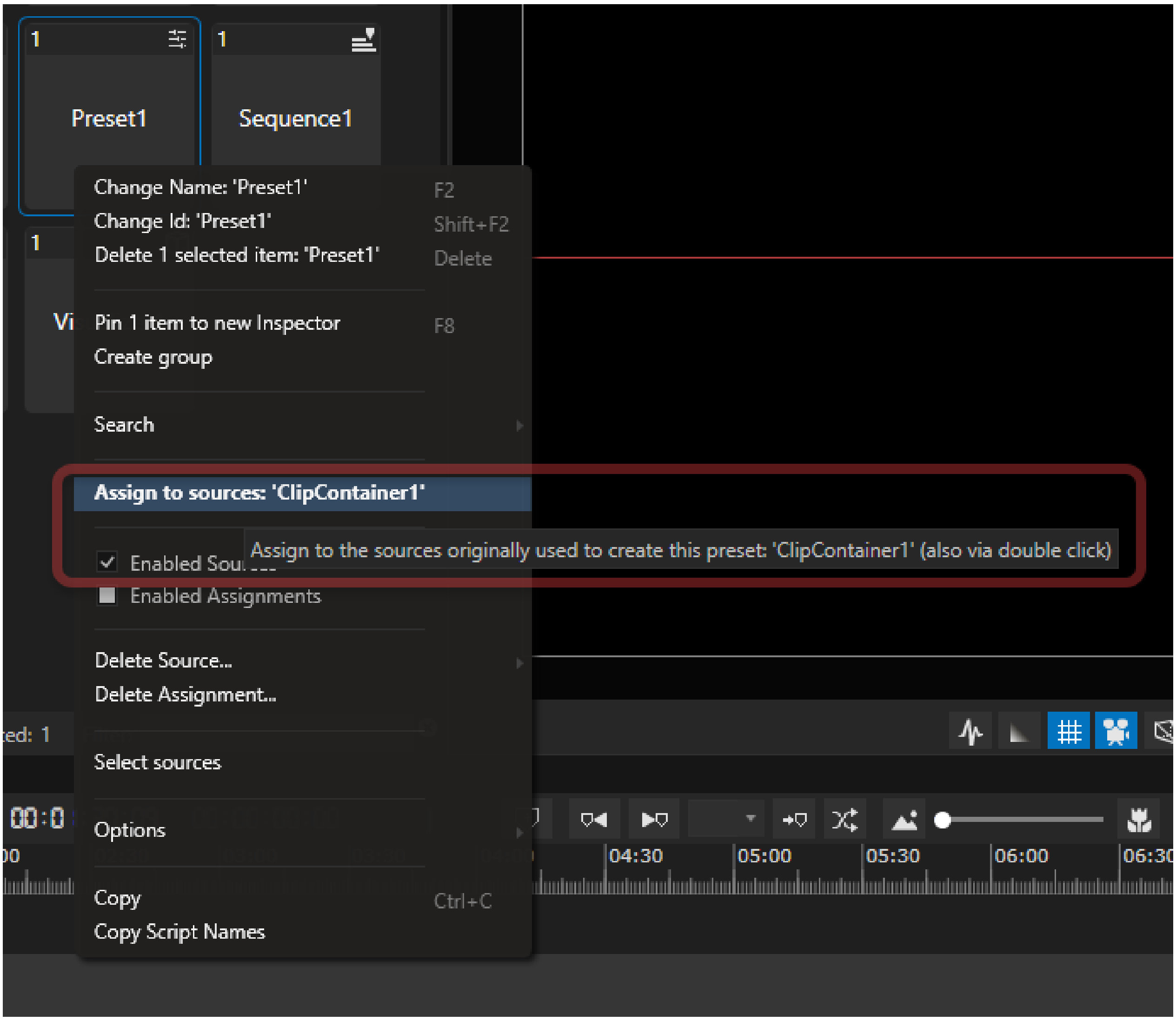
A new preset has been created. If you select it in the project explorer, the inspector window will show all the source properties that have been stored in the new preset.

Assigning Source & Destination

Now you have created a new preset from the *transform* properties of *clip container 1*.

If you change those properties in the clip container for some reason and need to go back to what you stored as a preset, you can assign the preset back to its source:

Either by double clicking on the preset or via the right-click context menu:

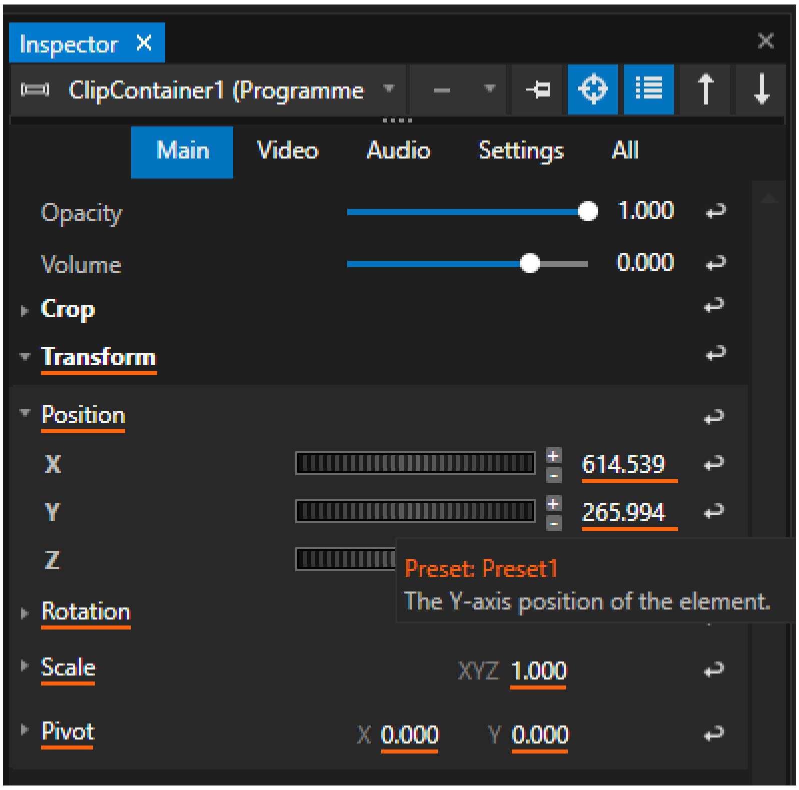


Assign to the sources originally used to create this preset: 'ClipContainer1' (also via double click)

There's also a third option to assign the preset. Just drag it from the project explorer and drop it into the clip container you want to assign it to.

At any rate, if you take a look at the inspector window, you will notice how the *Transform* properties of *Clip Container 1* are now underlined in orange.

This is to indicate that the property values now come from a preset and no longer from the operator in *Value Mode.*



Opacity 1.000

Volume 0.000

X 614.539

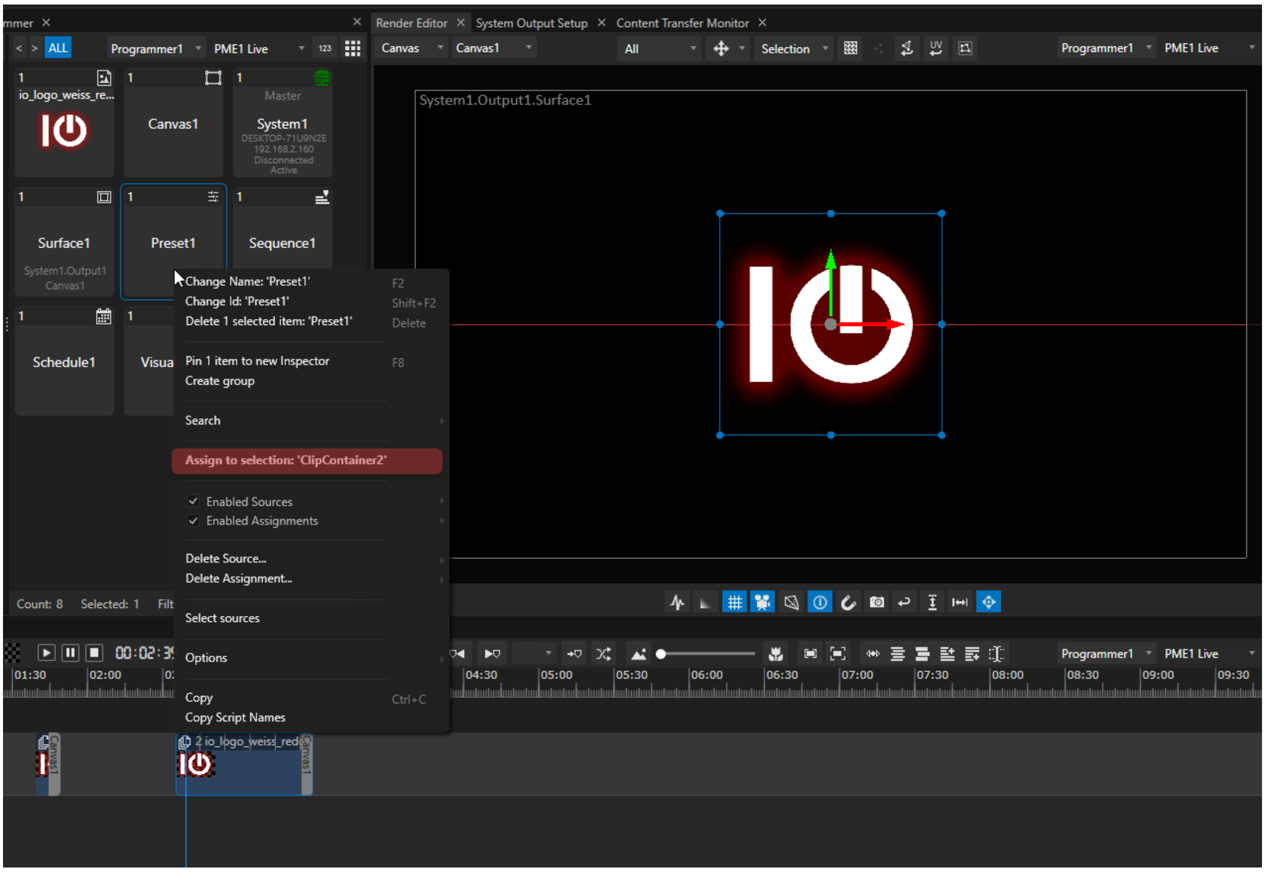
Y 265.994

Preset: Preset1
The Y-axis position of the element.

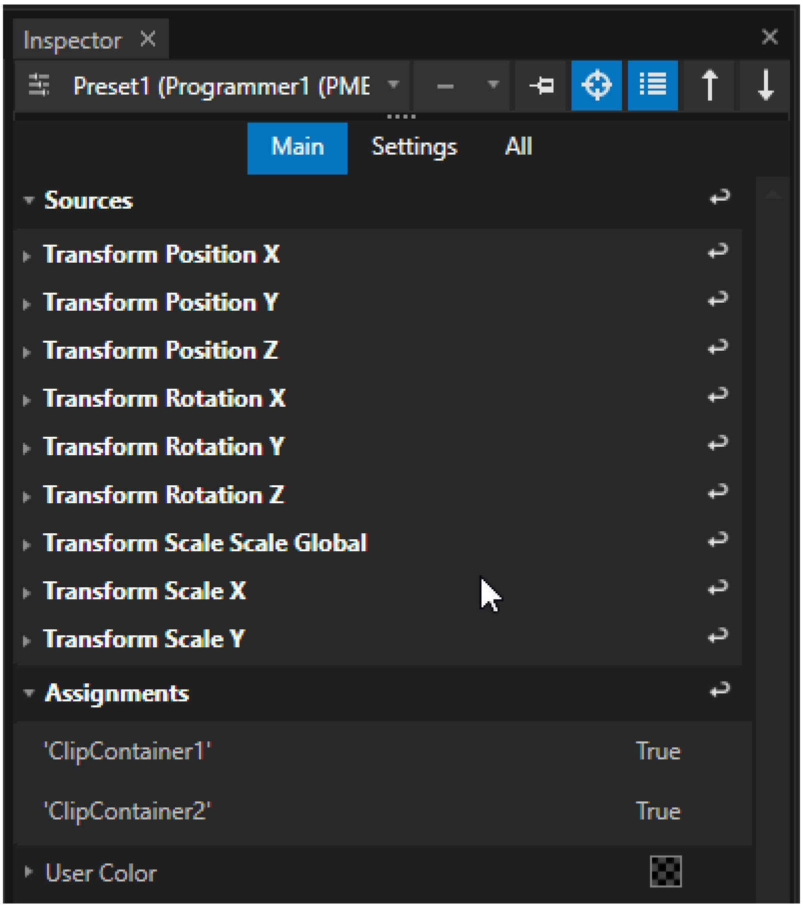
Scale XYZ 1.000

Pivot X 0.000 Y 0.000

Assigning the preset to a different clip container works like the same way mentioned above:
Select the clip container in your sequence and access the preset's context menu with a right-click where you choose *Assign to selection:*



Notice how the preset's *Assignments* list in the inspector has grown by one item.



Sources

- Transform Position X
- Transform Position Y
- Transform Position Z
- Transform Rotation X
- Transform Rotation Y
- Transform Rotation Z
- Transform Scale Scale Global
- Transform Scale X
- Transform Scale Y

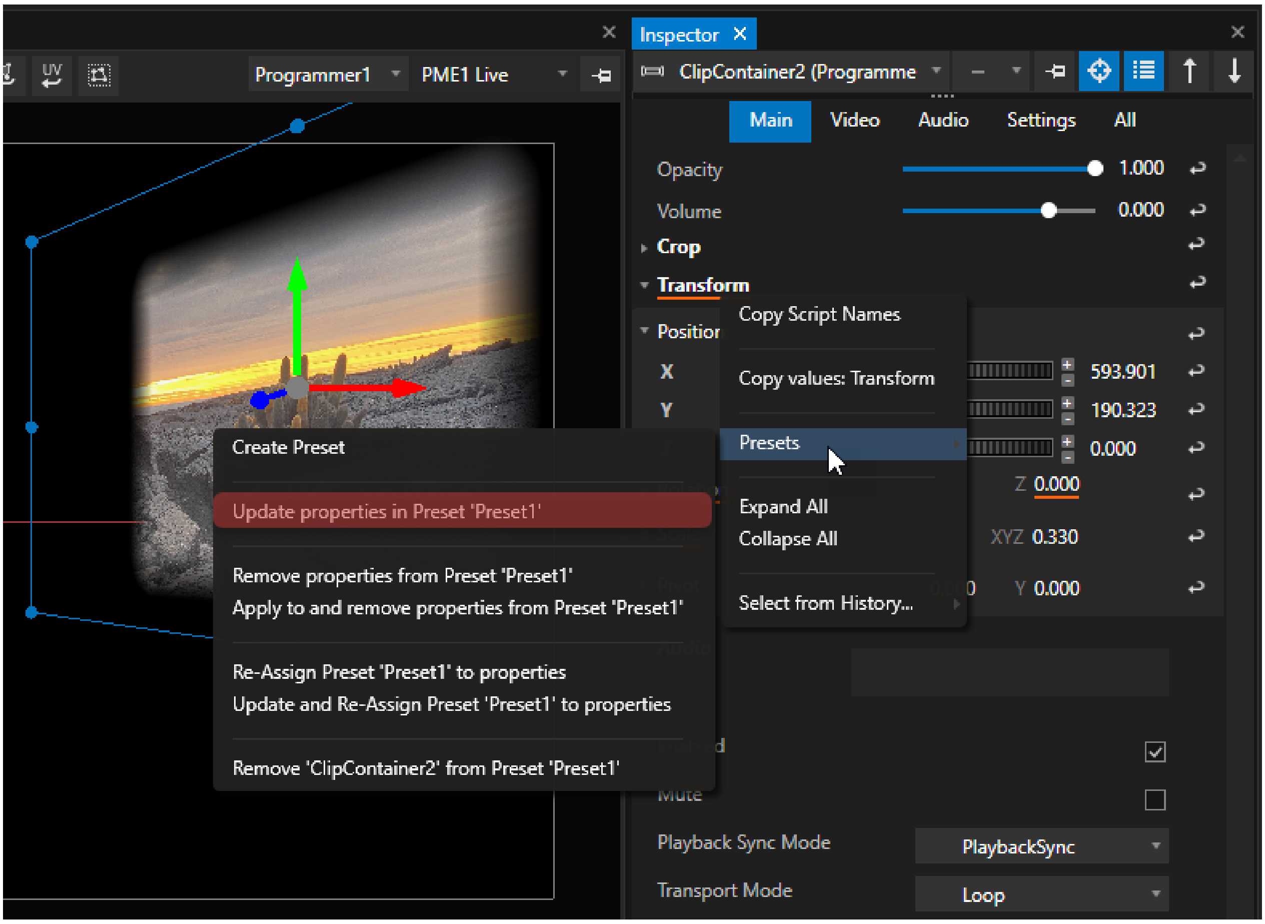
Assignments

'ClipContainer1'	True
'ClipContainer2'	True

User Color

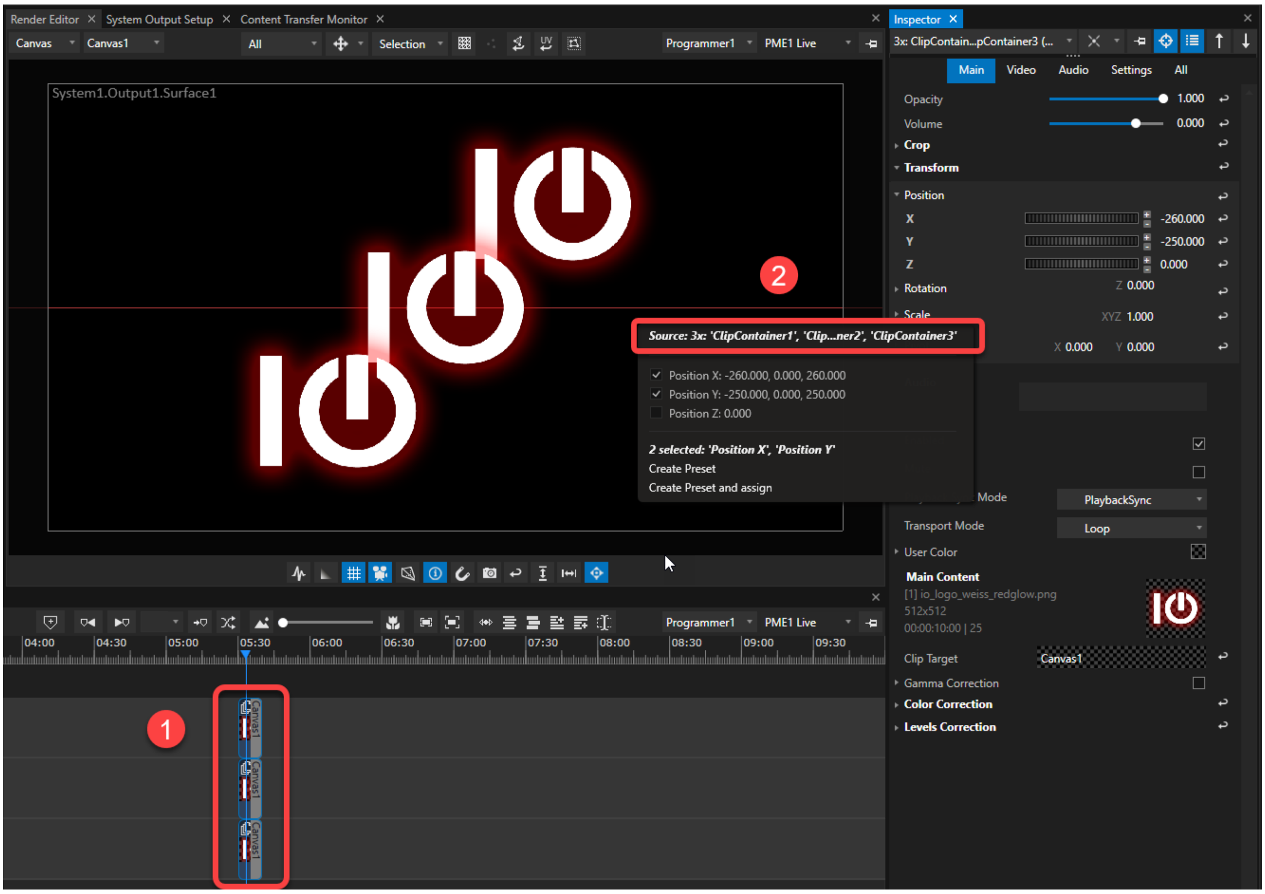
Updating a Preset

If you need to change the property values stored in a preset, simply access the *Presets* context menu in the inspector by right-clicking on the values that have been changed and choose *Update properties in Preset* from there:



Group Presets

A preset can not only store properties for one single item, but also for multiple items in a group:



Source: 3x: 'ClipContainer1', 'Clip...ner2', 'ClipContainer3'

☑ Position X: -260.000, 0.000, 260.000
☑ Position Y: -250.000, 0.000, 250.000
□ Position Z: 0.000

2 selected: 'Position X', 'Position Y'

1) To create a group preset first select a group of items (clip containers, DMX devices etc.)

2) Access the context menu of a property in the inspector. The preset source will now name a group of items (3 clip containers in the example above).

Position and offset of this group can now be assigned to any other group of items. Keep in mind, that **if the assigned group is larger than the source**, VERTEX will automatically **stop interpolating at the last or highest value.**

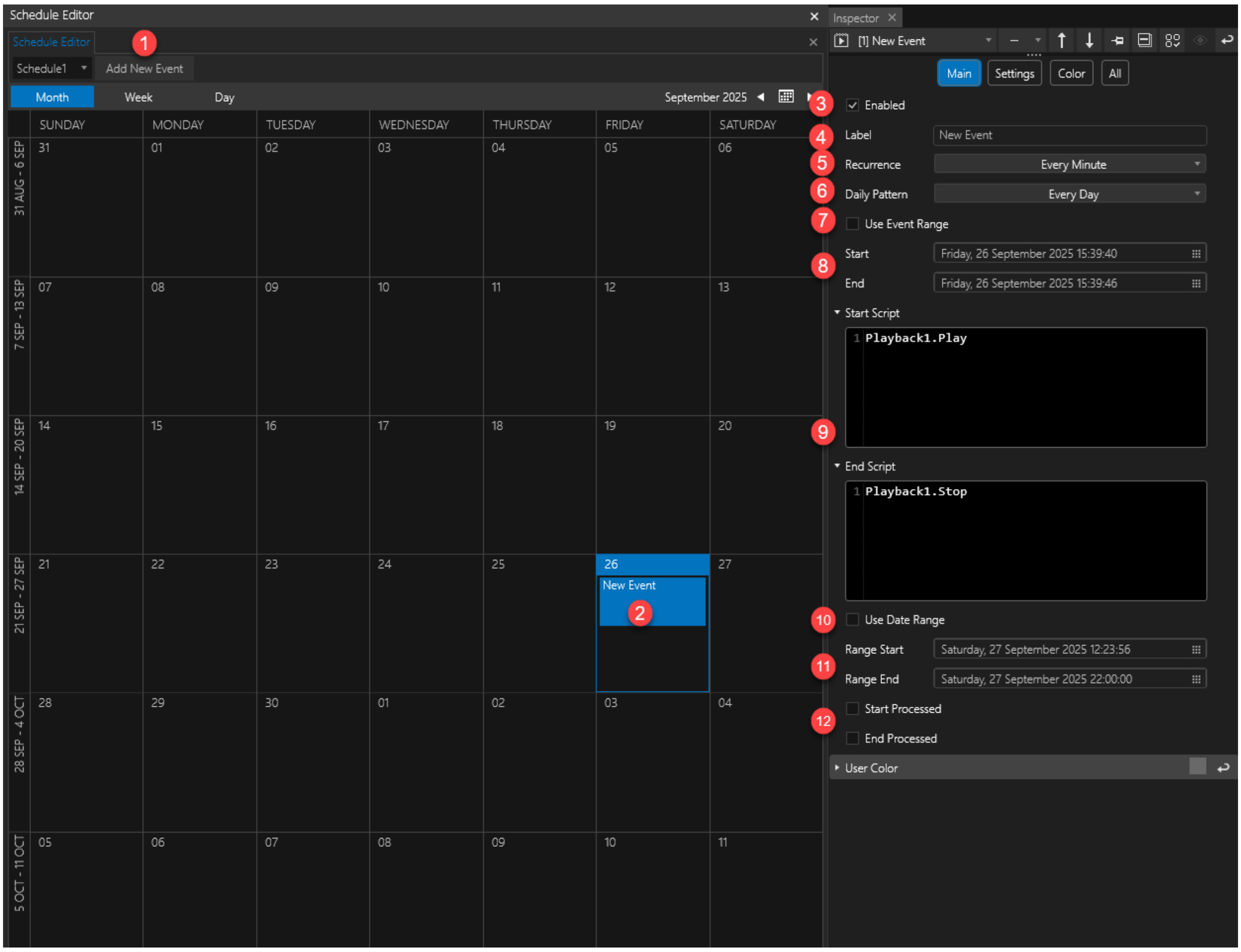
5.14 Schedule Editor

- A **Schedule** is a tool that **executes script commands by a specified time and date.**
- The **Schedule Editor** displays a **calender based user interface.**
- After the creating a scheduled event, its settings are accessed in the inspector.

Create a Schedule with an Event

1. Go to *MAIN MENU > Create > Tools* and select **Schedule**
2. Go to the **"Windows" tab into Main Menu** and open a new Schedule Editor
3. **Select a Schedule you want to edit** in the dropdown of the Schedule Editor
4. **Select a date** into calender.
5. Click to the **"Add new Event" button**
6. Select the new Event in the calendar and adjust settings in the *Inspector.*

User Interface



☑ Enabled

Label: New Event

Recurrence: Every Minute

Daily Pattern: Every Day

□ Use Event Range

Start: Friday, 26 September 2025 15:39:40

End: Friday, 26 September 2025 15:39:46

Start Script

```
Playback1.Play
```

End Script

```
Playback1.Stop
```

□ Use Date Range

Range Start: Saturday, 27 September 2025 12:23:56

Range End: Saturday, 27 September 2025 22:00:00

□ Start Processed

□ End Processed

1	**Add New Event**	creates an event in the cell selected in calendar.
2	**Event**	Calendar cell holding the events created. Click on the event to inspect its properties.
3	**Enabled**	Enable or disable an event.
4	**Label**	Add a custom label for your event. This Label is also displayed as the event's name in calender view.
5	**Recurrence**	Sets how often the event shall occur. Default: Once - event will be triggered only once Optional settings: from recurring each minute to yearly

6	**Daily Pattern**	refines the above setting ranging from every day, weekdays only to weekend days only
7	**Use Event Range**	Event Range is defined by the *Start* and *End* properties below. If enabled, the event's start and end is defined exactly by set Start Date & Time and End Date & Time, ignoring any recurrence settings.
8	**Start (day, month, year, time)** **End (day, month, year, time)**	Sets the start date & time of your event, sets the end date & time. Both Start and End trigger individual scripts (below)
9	**Script Commands**	**Start Script** List a Script item or enter single Script Commands to be be executed at the ***start*** of your event **End Script:** List a Script item or enter single Script Commands to be executed at the ***end*** of your event
10	**Use Date Range**	Default: Disabled Enable to use a time range in which the event will reoccur. If enabled AND Use Event Range is also enabled, Event Range must be within Date Range! If Use Event Range is disabled, and Date Range is enabled, Date Ranges outside of Event Range are valid.
11	**Range Start** **Range End**	Start date for the time span. First date on which the event is executed End date for the time span. Last date on which the event is executed
12	**Start Processed and** **End Processed**	Logging *if* and *when* an event was executed. The check is set by vertex when the event start has been executed. Useful to supervise if the event start has taken place, when working with a recurring event. **Start Processed** Will be checked when event start is processed **End Processed** Will be checked when event end is processed

5.15 Scripting

- VERTEX comes with its own script language which is super easy to learn.
- **Many places in VERTEX have a script command field** (cues, systems, clip containers, etc.) from which you can **control virtually anything with a script command**.
- You can **combine multiple script commands into one script.**

Steps to start with Scripting in VERTEX

VERTEX Scripting

Learn how VERTEX script commands are structured and how their basic syntax works.
Get to know how to assign values and how to fade to values.
Use tags to jump inside scripts. Learn how to operate local variables.

Script Editor and Script Monitor

VERTEX offers you two tools to make scripting as simple as possible.
Use the SCRIPT EDITOR to write, access and edit all scripts your project contains.
The SCRIPT MONITOR shows all detailed information about status, execution and errors of script commands and helps debugging your scripts.

Scripts

Scripts may contain multiple script commands.
In one script you can bundle a list of script commands and execute them from top to bottom.
There is an option to define one or more parameters for a script. Values for those parameters will be set on script execution.

Variable

Define variables with a value and use them for recurring operations.
Learn more about the difference between global and local variables.

Show a list of all available Script Commands.
VERTEX comes with a dynamic script language: its commands follow the same logical process as working with the GUI.
To show a list of all available script commands, just click into one of the script fields or the command section in the status bar at the bottom and **press "CTRL and Space"**. A list of all available commands opens. Select an item into list and press ENTER. To show **all available commands for the next deeper level, enter a decimal point "."**

5.15.1 Vertex Scripting

- Script Commands are **GUI-oriented** in regards to VERTEX's structure and workflow.
- You can **trigger simple actions, switch settings,** or **operate with values.**
- Get to know the **basic structure & syntax** and familiarize yourself with some simple script examples**.**
- To **learn how to create a script** go to the topic *Scripts*.

Simple Actions

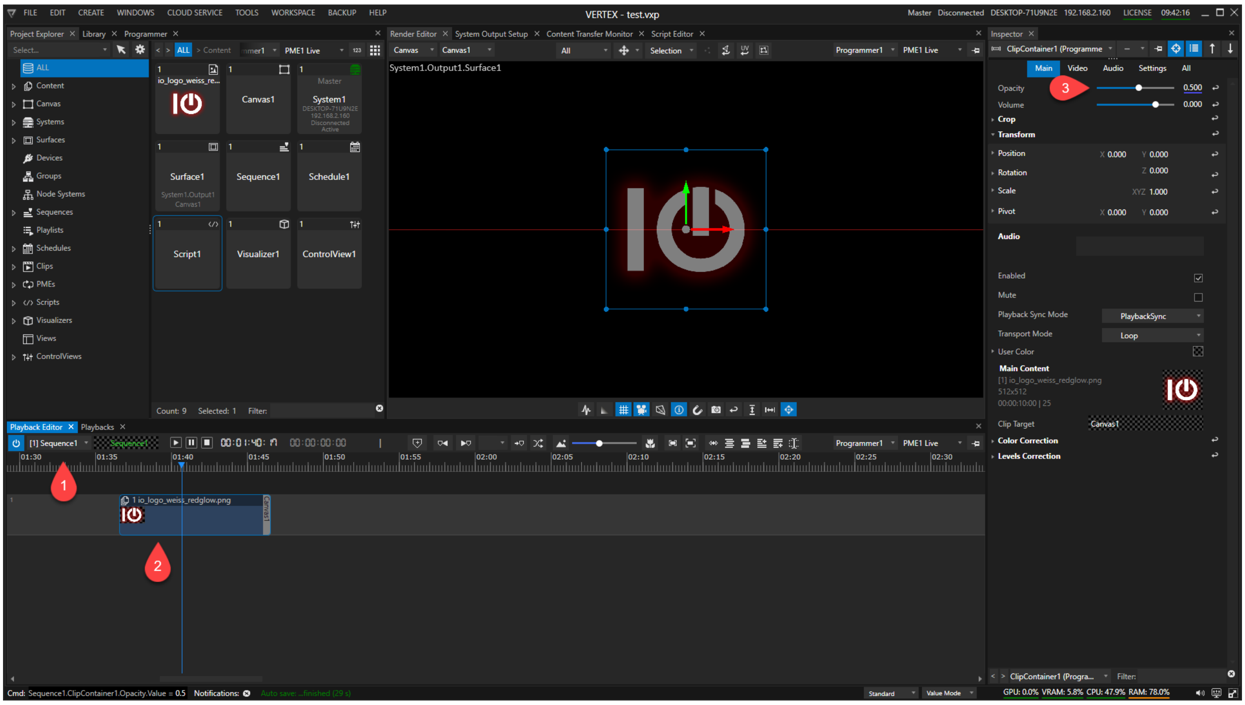
Enter short and simple commands into a scripting field or into the command line and trigger an action.

```
Playback1.Play
Playback2.Stop
Playback3.GotoCue 1
```

GUI-Oriented Structure

Script Commands are **tailored to resemble working with VERTEX's graphical user interface**.
The syntax and structure should look very familiar to you if you already know how to work with the GUI.
Almost every property in VERTEX can be scripted.

Example: Set Opacity of ClipContainer1 in Playback1 to a Value



Opacity 0.500

Volume 0.000

Playback Sync Mode: PlaybackSync

Transport Mode: Loop

Clip Target: Canvas1

Cmd: Sequence1.ClipContainer1.Opacity.Value = 0.5

Follow the numbered markers in the screenshots to understand the order in which script commands are composed and what structure in the GUI they represent.

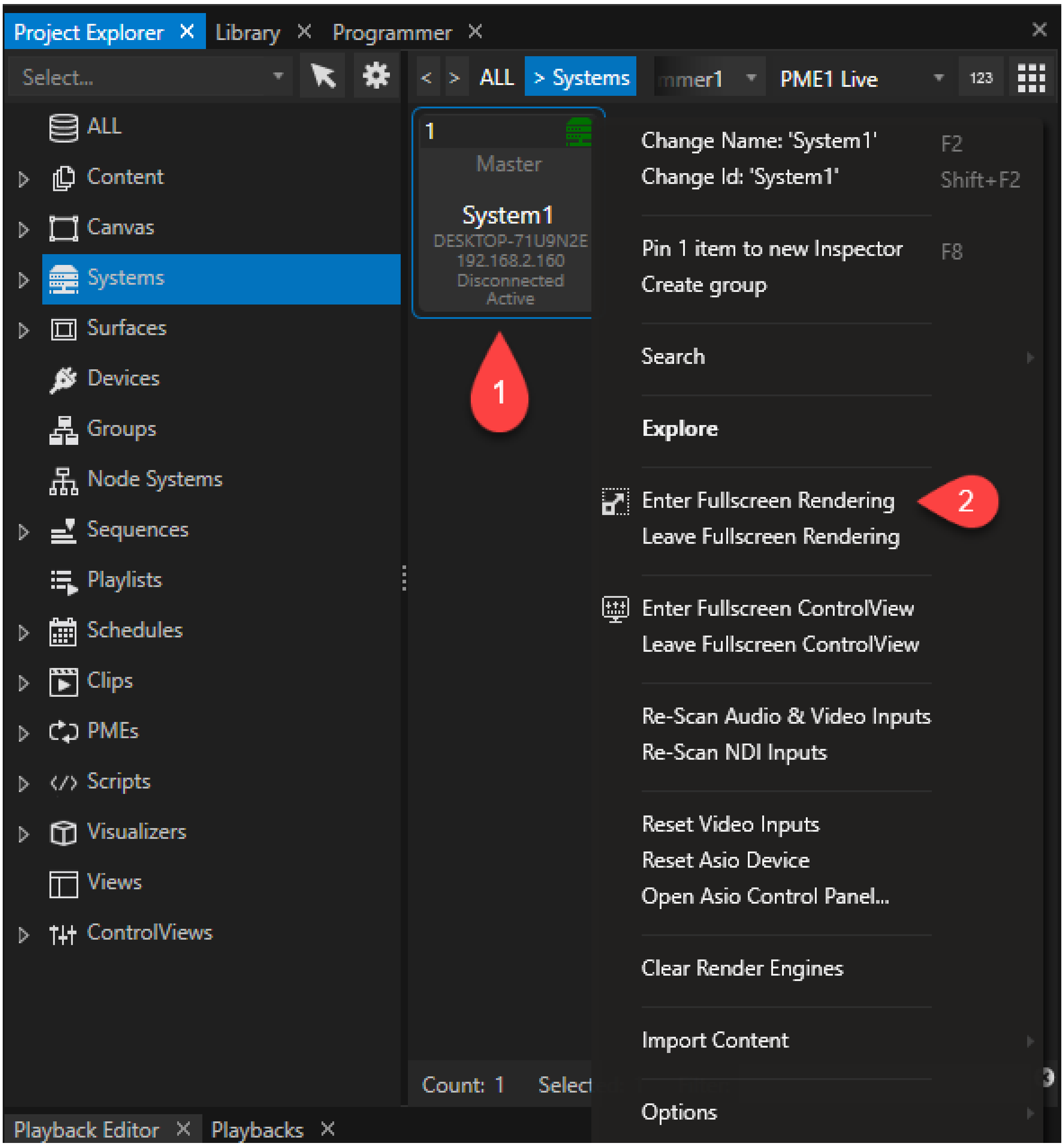
For example: In *Sequence1*, *ClipContainer1* set *opacity value to 0.5:*

1 + 2 + 3

Script Command:

```
Sequence1.ClipContainer1.Opacity.Value = 0.5
```

Set System 1 to Fullscreen



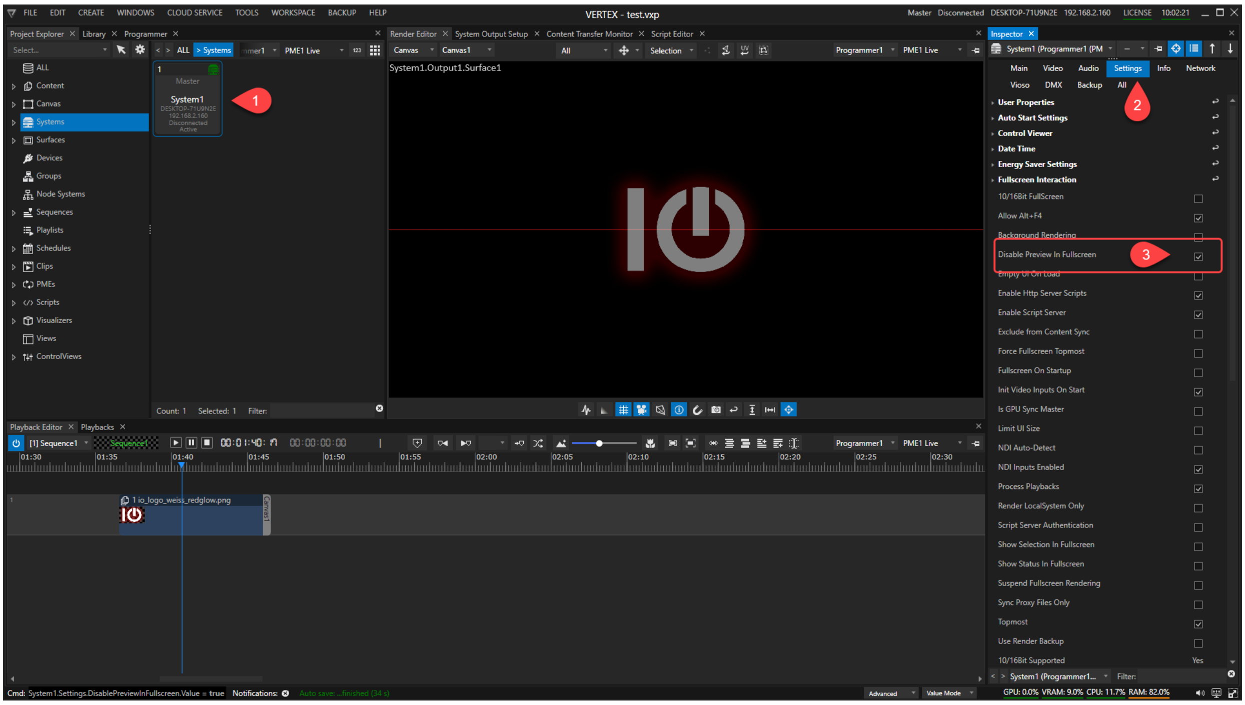
Set System 1 to Fullscreen

1 + 2

Script Command:

```
System1.EnterFullScreen
```

Disable Preview in Fullscreen for System1


FILE EDIT CREATE WINDOWS CLOUD SERVICE TOOLS WORKSPACE BACKUP HELP
VERTEX - test.vxp
Master Disconnected DESKTOP-71U9N2E 192.168.2.160 LICENSE 10:02:21
Project Explorer Library Programmer
Systems
System1
1
Render Editor System Output Setup Content Transfer Monitor Script Editor
System1.Output1.Surface1
Inspector
System1 (Programmer1 (PM
Main Video Audio Settings Info Network
Vioso DMX Backup All
2
3
Playback Editor Playbacks
1 io_logo_weiss_redglow.png

User Properties
Auto Start Settings
Control Viewer
Date Time
Energy Saver Settings
Fullscreen Interaction
10/16Bit FullScreen □
Allow Alt+F4 ☑
Background Rendering □
Disable Preview In Fullscreen ☑
Empty UI On Load □
Enable Http Server Scripts ☑
Enable Script Server ☑
Exclude from Content Sync □
Force Fullscreen Topmost □
Fullscreen On Startup □
Init Video Inputs On Start ☑
Is GPU Sync Master □
Limit UI Size □
NDI Auto-Detect □
NDI Inputs Enabled ☑
Process Playbacks ☑
Render LocalSystem Only □
Script Server Authentication □
Show Selection In Fullscreen □
Show Status In Fullscreen □
Suspend Fullscreen Rendering □
Sync Proxy Files Only □
Topmost ☑
Use Render Backup □
10/16Bit Supported Yes

Cmd: System1.Settings.DisablePreviewInFullscreen.Value = true

Disable Preview in Fullscreen for System1

1 + 2 + 3

Script Command:

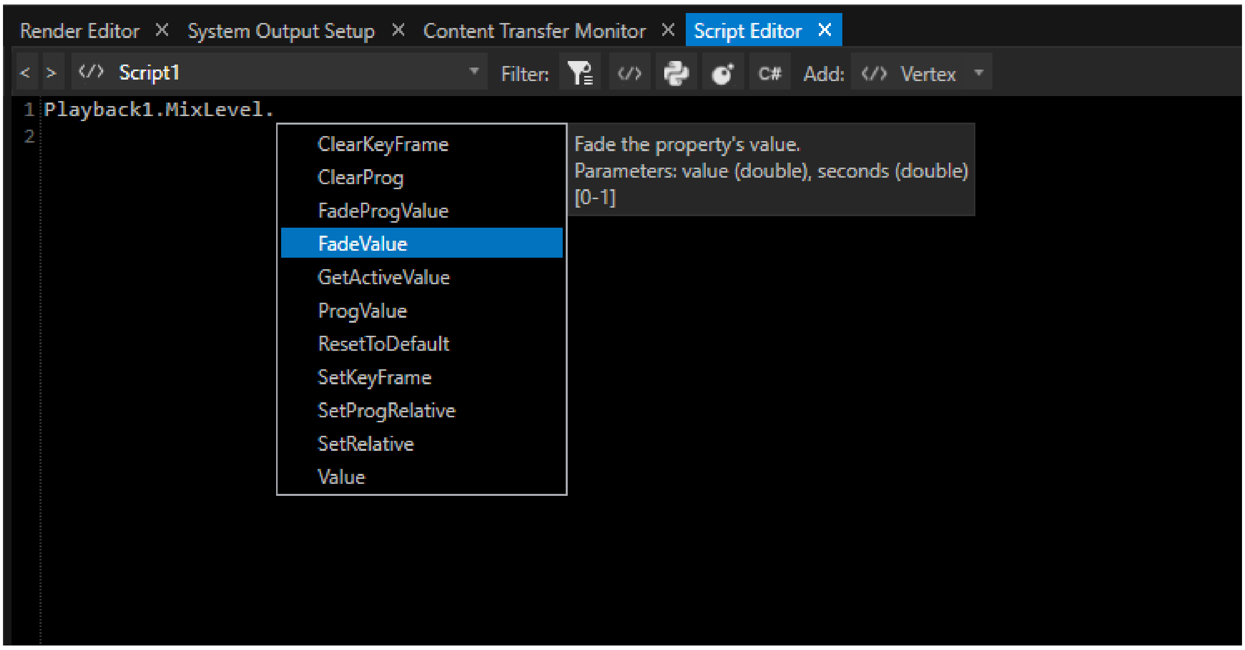
```
System1.Settings.DisablePreviewInFullscreen.Value = true
```

Autocomplete ScriptWizard

In every scripting field VERTEX's ScriptWizard will provide you with a list of all available items, commands and actions.

Use the shortcut **"CTRL+ Space"** in an empty line to open a full list of all available elements.
Enter a decimal point to open a list of all available child options and elements.
For every list item the **expected parameters are shown**.

Confirm your choice with **ENTER** for the created script to take effect.



```
Playback1.MixLevel.
```

Fade the property's value.
Parameters: value (double), seconds (double)
[0-1]

Structure and Syntax

The availability of script commands and syntax options depends on your current VERTEX version.
With every version, we improve and extend the software feature set - including script commands. Not all script commands or options like local variables or script tags are supported by older versions.

Basic structure

The next deeper level is initiated by a decimal point.

```
Firstlevel.Secondlevel.Thirdlevel.
```

One script command per line, use a new line for the next script command .

```
Playback1.Play
System1.Settings.DisablePreviewInFullscreen.Value = false
```

Comments are preceded by a double slash.

```
//This is a comment
```

Value Operations

Value

Set or read a value:

```
Playback1.ClipContainer1.Opacity.Value = 0
```

Set properties with multiple values in one line:

```
Canvas2.Size 1920, 1080
```

FadeValue

Fade to a new value in a defined time- first parameter is value, second parameter is time in seconds.

```
Playback1.ClipContainer1.Opacity.FadeValue 1,2
```

ProgValue

Read or create a value in programmer mode:

```
Playback1.ClipContainer1.Opacity.ProgValue = 0
```

FadeProgValue

Sets a new value in programmer and fades to this value - first parameter is value, second parameter is time in seconds.

```
Playback1.ClipContainer1.Opacity.FadeProgValue 1,2
```

Assign Values

Use an equal sign for the following value operations:

Value

```
Value = 1
Value = 2000
Value = 0.5
Value = 0,1,0.1   // <-- for e.g. DMX Values that consist of r,g,b
```

Colors

```
//RGB
Value = #123 111 100
//ARGB
Value = #50 100 100 100
//RGB as Hex
Value = #FFFFFF
//ARGB as Hex
Value = #30FF00FF
//normalized RGB
Value = 0.5,0.5,0.5
//normalized ARGB
Value = 0.5,1,1,1
//normalized RGB
Value = {R:1.0,G:0.1,B:0.5}
//normalized ARGB
Value = {A:0.5,R:1.0,G:0.1,B:0.5}
Value = {R:10,G:100,B:50}
Value = {A:255,R:10,G:100,B:50}
```

Checkboxes

true and false

```
Value = true
Value = false
```

Settings

Use the name that is used in inspector dropdowns and property fields.

```
Value = FreeSync
Value = System2
```

Allocate Text or URLs

```
Value = Hello World
Value = www.ioversal.com
```

Return A Current Value

Value (without equals)

Entering *Value* (or *ProgValue*) returns the current value of an item.

```
Playback1.Clipcontainer1.Opacity.Value
```

- the return value is e.g 0.5 when clip container's opacity currently is 0.5

- use return values also for an external request over the API

Return A Value From An Item & Assign To Another Item

You can combine both variants - assign and return - to read out one item's value and assign it to another item.
Set notes from Clip Container 1 as Text into Text Content2

```
Content2.Settings.Text.Value =
playback1.ClipContainer1.UserProperties.Notes.Value
```

Trigger Actions

- for example in a system:

```
System2.ControlViewer.Open
```

```
System1.WindowsShutdown
```

Local Variables

When setting a local variable, there must be a single value (not a formula like the syntax for "Eval") on the right side of the equation.

```
Set cnt = 1
Set cnt = Thisisatext
```

Assigning a value from a property to your local variable.

```
Set cnt = Playback1.ClipContainer1.Opacity.Value
```

Eval
Defines, evaluates or updates a local variable, property or method. The right side of the equation is evaluated as a formula (called "expression").

```
Eval cnt = cnt + 1
```

Assign values of other variables.

```
Set max = 100
Eval cont = cnt <= max
```

Assign values to properties or methods: The evaluated expression is assigned to the property on the left side of the equation - or passed as a parameter to a method.

```
Eval Surface2.CanvasOffset.X = [Surface1.CanvasOffset.X] + 1920

Eval Sequence1.ClipContainer2.Opacity =
[Sequence1.ClipContainer1.Opacity] * 2
```

Nested elements require square brackets (unlike the syntax for *Set*).

Specify strings with single quotes.

```
Eval cnt = 'CNT: ' + Round([Playback1.ClipContainer1.Opacity.Value], 2)
// the variable cnt gets the (new) value based on a string and the
rounded
// opacity value from ClipContainer1
```

The script command `Eval` also returns the assigned value, which allows complex programming in e.g. C#:

```
//This assignes a new value to Sequence1.ClipContainer2.Opacity and
returns this value to Script.Run in C# and its variable 'opacity'.
var opacity = Script.Run<int>("Eval Sequence1.ClipContainer2.Opacity =
[Sequence1.ClipContainer1.Opacity] * 2");
```

Rule of thumb:

Whenever a parameter needs to be assessed, start the line with Eval. This parses the whole parameter (everything on the right side of the equation) as an expression.

Expression-/Eval-Commands

These self-explainatory commands can also be found in the Expressions-Node:

ToInt

ToDouble

ToString

ToFloat

ToByte

ToBool

Local variables can use the same methods as the Variable core objects (if applicable):

- ReadSplitString
- ParseJsonMember
- CreateJson
- AddRawText
- AppendRawText
- AddText
- CombineText
- AppendText
- AddAsText
- CombineAsText
- AppendAsText
- FormatNumber
- GetSplitString
- GetContainsString
- GetSubString
- GetSubStringRegion
- GetReplaceString
- GetTextLine
- GetFileTimeName
- AddNumber
- SubtractNumber
- MultiplyNumber
- DivideNumber
- FloorNumber
- CeilingNumber
- RoundNumber
- AbsNumber
- MinNumber
- MaxNumber
- RangeNumber
- GetRangeNumber
- HttpRawRequestDownloadToDisc
- HttpRequestDownloadToDisc
- ExecuteAsObjectScript
- ExecuteAsScript
- HttpPostRequest
- HttpPostRequestAuth
- HttpPut
- HttpPost
- HttpDelete
- SetRawValue
- Clear
- AddLine
- AddEmptyLine
- IsNullOrEmpty

Conditions

In the fashion of easy script commands, we have implemented simple conditional operations.

IfEqual

Executes a specified script if parameter a = b. Parameters: a, b, Script

```
IfEqual Sequence1.ClipContainer1.Opacity.Value, 0, Script2
```

IfExecute

Executes a specified script if the specified expression is true.

```
IfExecute myval, Script1
```

IfGreater

Executes a specified script if parameter a > b. Parameters: a, b, Script

```
IfGreater  Sequence1.ClipContainer1.Opacity.Value, 0, Script2
```

IfLesser

Executes a specified script if parameter a < b. Parameters: a, b, Script

```
IfLesser  Sequence1.ClipContainer1.Opacity.Value, 1, Script2
```

IfUnequal

Executes a specified script if parameter a is not b. Parameters: a, b, Script

```
IfUnequal  Sequence1.ClipContainer1.Opacity.Value, 0, Script2
```

Tags

Defining and jumping to tags in a script:

:Tag

Identifies and tags a line in a script. By using the *Goto Tag* command, script execution will be able to jump between tagged lines instead of going through the script lines top to bottom.

```
:start
:part3
:marker2
```

The tag name is preceded by a colon without a space. Tags must be placed at the beginning of the line that is supposed to be tagged. Examples can be found here.

Goto Tag

Jumps to the tagged line inside a script - in the actual script command, the tag name must be specified without a colon.

```
Goto part3
```

IfGoto variable, tag

Continues to a specified tag if the specified expression is true.

```
Set Variable1= true
IfGoto Variable1, start
```

Special Commands

Wait

Wait´## seconds

```
Wait 10
```

WaitAll

Wait for all executing child scripts to finish.

```
WaitAll 10
```

Cancel

Cancels all running scripts.

```
Cancel
```

log

logs the returned value - the result is shown in script monitor's console and notification window

use for e.g testing commands, preparing commands for the API...

```
log Playback1.Clipcontainer1.Opacity.Value
```

log a text

```
log thisisatext
```

```
log this is a text
```

logs a local variable or script parameter

```
Set variable1=50
log variable1
```

Call renamed items

An item can be called from a script by either its type-ID or its name. Both will be accepted.

Example:

Device1 (a 8 Bit Dimmer) was renamed to "Dimmer1"
The device can be called by both names:

```
Dimmer1.Settings.StartAddress.Value = 3
Device1.Settings.StartAddress.Value = 3
```

Indexers

In the context of Vertex scripts, indexers refer to a syntax that allows accessing several items at once, e.g.:

```
Playback[1-2].Play
```

Internally this is resolved to several script lines:

```
Playback1.Play
Playback2.Play
```

This feature can be used as a powerful way to remote control multiple items with the touch of one button, for instance if indexers were used in a *Control View* script for a button/ slider etc..

Several Indexers can be used together, e.g.:

```
Sequence[1-2].ClipContainer[1-2].Opacity.Value = 1
```

This will be resolved to:

```
Sequence1.ClipContainer1.Opacity.Value = 1
Sequence2.ClipContainer1.Opacity.Value = 1
Sequence1.ClipContainer2.Opacity.Value = 1
Sequence2.ClipContainer2.Opacity.Value = 1
```

Indexers can be used to access any scriptable objects. Even if a custom name is not specified, the objects are always accessible by their generic script name appended by their Script Id.

The indexer expression is enclosed in "[ ]" brackets and appended to the common or *generic* script name, as in the examples above.

An indexer expression can consist of several filter expressions, each separated by one or more spaces.

A filter expression can represent either a single value or a value range. To specify a range, concatenate the two values using "-" as seen in the examples above.

Important: do not add any spaces between the two range values!

Valid values are either integers for filtering by Id or time codes for filtering Clip Containers by their playback position.

Value ranges must be of the same type, i.e., combining Id and time filters is not possible.

If the entire indexer expression or a value expression is a valid token expression (e.g. "Variable1.Value"), it will be evaluated before being further examined.

Tokens that can be used in this context are:

- Any **properties** that return a value that can be evaluated here e.g.: 1, "1-2", "3:00:00“.
- A **Playback** for filtering items using the current playback time.
- A **Sequence Cue** for filtering items using the cue’s position.

Note: Local variables and parameters cannot be used, because the Indexers are evaluated before actually executing the script, using a common, global scope.

Each filter expression can optionally start with a prefix that acts as a „modifier“ and impacts how the expression is evaluated:

Modifier	Effect	Comments
-	Exclude value or range	Legacy syntax, identical to "!"
!	Exclude value or range	
+	Include value or range	Legacy syntax, obsolete
>	Include values greater than (or equal to)…	Not for ranges
<	Include values lesser than (or equal to)…	Not for ranges

*	Include selected items	

When using several filter expressions, an object is accepted if it matches at least one inclusive filter and not any exclusive filters.

Empty Indexer expressions will include all members (with the specified generic script name).

Invalid Indexer expressions will prevent the entire script from executing and throw an exception.

Valid Indexer expressions that yield no results during execution will be logged as a warning.

Notes regarding Clip Container filtering by time:

- Single time values will match if the time is within the Clip Container’s range.
- “Greater than” filters will match if the Clip Container starts after the specified time.
- “Lesser than” filters will match if the Clip Container ends before the specified tine.
- A specified time range will match if it overlaps with the Clip Container in any way.

Examples

```
Sequence1.ClipContainer[].Opacity.Value=1

Sequence1.ClipContainer[1-5].Opacity.Value=0.2

Sequence1.ClipContainer[7 9].Opacity.Value=0.2

Sequence1.ClipContainer[<5].Opacity.Value=0.2

Sequence1.ClipContainer[1-2 9-10 4-7 -5-6].Opacity.Value=0.2

Sequence1.ClipContainer[5:0:0].Opacity.Value=0.2

Sequence1.ClipContainer[-Sequence1.Cue2].Opacity.Value=0.2

Sequence1.ClipContainer[Sequence1.Cue2].Opacity.Value=0.2

Sequence1.ClipContainer[>Playback1].Opacity.Value=0.2
```

Setting new opacity value on selected items:

```
Sequence1.ClipContainer[*].Opacity.Value=0.1
```

Setting new opacity value on all clip containers on a specified track.

```
Sequence1.ClipContainer[Sequence1.Tracks.Track2].Opacity.Value=0.1
```

Changing size value of all click buttons on a specified ControlView page.

```
ControlView1.Controls.ClickButton[ControlView1.Pages.Page1].Settings.Si
ze.Width.Value = 200
```

Changing size value of all click buttons on ControlView page1 and higher.

```
ControlView1.Controls.ClickButton[>ControlView1.Pages.Page1].Settings.S
ize.Width.Value = 200
```

Changing size value of all click buttons on ControlView page1 and page2. Pages listing separated by space.

```
ControlView1.Controls.ClickButton[ControlView1.Pages.Page1
ControlView1.Pages.Page2].Settings.Size.Width.Value = 200 è auf
Page1,Page2; Page-Auflistung mit Space getrennt
```

5.15.2 Vertex Script Examples

Find below a list of the most common scripting commands available for VERTEX CORE objects as a reference.

Jump to Categories:

- Top/Root Level
- General Property Scripts
- System
- Systems Manager
- Backup Service
- Clip Container
- Programmer
- PME Playback
- Content
- Webbrowser Content
- Control View
- Devices

ⓘ **Show a list of all available script commands.**
VERTEX comes with a dynamic script languages. Script commands are GUI-oriented in regards to the workflow.
To show a list of all available script commands, just click one of the script fields or into command section at the bottom and **press "CTRL and Space"**. A list of all available commands opens. Select an item from the list and press ENTER.
To show **all commands available on the next level, enter a decimal point after the last command "."**

TOP/ROOT LEVEL

ProjectClose
ProjectLoad
ProjectSave

ProjectSaveBackup
ProjectLoadPreviousBackup
ProjectLoadPreviousAutoSave

ProjectSettings

MainWindowMinimize
MainWindowMaximize
MainWindowExit
This will immediately exit & close VERTEX without saving.

Wait
Wait for a specified amout of time. Parameters: seconds (double)

Return
Stop script execution and return the specified result. Parameters: result

Log
Write to the script monitor's output window. Parameters: message

Clear
Clear the script monitor's output window.

WaitAll
Wait for all executing child scripts to finish. Parameters: timeout/seconds (double)

ListAllItems

Return a list of all scriptable (top-level) items.

Cancel

Cancel all running scripts.

ListItems

Returns a list of all items of a specific type.

Conditional Script Commands

IfEqual

Executes the specified script if a = b. Parameters: a, b, script

IfEqualEqual

Executes the specified script if a = b and c = d. Parameters: a, b, c, d, script

IfEqualGreater

Executes the specified script if a = b and c > d. Parameters: a, b, c, d, script

IfEqualLesser

Executes the specified script if a = b and c < d. Parameters: a, b, c, d, script

IfEqualUnequal

Executes the specified script if a = b and c ≠ d. Parameters: a, b, c, d, script

IfExecute

Executes a specified script if a local variable has a Boolean value of *1 or true*

IfGoto

Jumps to a tag if the condition - the value of the local variable - is true.

IfGreater

Executes the specified script if a > b. Parameters: a, b, script

IfGreaterGreater

Executes the specified script if a > b and c > d. Parameters: a, b, c, d, script

IfGreaterLesser

Executes the specified script if a > b and c < d. Parameters: a, b, c, d, script

IfLesser

Executes the specified script if a < b. Parameters: a, b, script

IfLesserLesser

Executes the specified script if a < b and c < d. Parameters: a, b, c, d, script

IfUnequal

Executes the specified script if a ≠ b. Parameters: a, b, script

IfUnequalGreater

Executes the specified script if a ≠ b and c > d. Parameters: a, b, c, d, script

IfUnequalLesser

Executes the specified script if a ≠ b and c < d. Parameters: a, b, c, d, script

IfUnequalUnequal

Executes the specified script if a ≠ b and c ≠ d. Parameters: a, b, c, d, script

PopupNotification

Create a popup notification on top of the user interface. Usage: PopupNotification WarningMessage

PopupNotificationWithClose

Create a popup notification with close button on top of the user interface. Usage: PopupNotificationWithClose WarningMessage

GENERAL PROPERTY Scripts

ProgValue

Get/set the property's value in the current programmer.

FadeProgValue

Fade the property's value in the current programmer. Parameters: value (double), seconds (double)

SetProgRelative

Add a relative value to the property's value in the current programmer.

Value

Get/set the property's value.

FadeValue

Fade the property's value. Parameters: value (double), seconds (double)

SetRelative

Add a relative value to the property's value.

SYSTEM

EnterFullScreen

LeaveFullScreen

FullScreenToFront

SmpteIoSetMode

SmpteIoSetTime

RunProcess

RunProcessArgs

KillProcess

WindowsShutdown

WindowsRestart

ResetVideoInputs

ForceResync

ResetAsioDevice

MouseMove

MouseLeftClick

StartVertex

StopVertex

ReconnectTimeServers

RefreshNetworkAdapterList

Connect

Disconnect

NotchPurgeVRam

RefreshDmxOutputs

GetStatus

LogStatus

WriteToLog

ScriptServerSendMessage

Send message as string. Byte or hex codes can be included like this {{72 101 108 108 111 32 0x57 0x6f 0x72 0x6c 0x64 0x13}}

ScriptServerSendMessageToIp

Send message as string. Byte or hex codes can be included like this {{72 101 108 108 111 32 0x57 0x6f 0x72 0x6c 0x64 0x13}}

SYSTEMS MANAGER

GetStatus

AllSessionMembersEnterFullScreen

AllSessionMembersLeaveFullScreen

BACKUP SERVICE

Reconnect

Separate

TakeOverMasterRole

CLIP CONTAINER

TempPreload

TempUnload

PROGRAMMER

StoreAllData

ClearAllData

PME / PLAYBACK

GotoCue

Transports playback to the specified cue. Parameters: cue number (int)

GotoCuePlay

Transports playback to specified cue and switches to Play. (Useful for Pause Cues)

GotoTime

Set Transport playback to the specified time.

GotoFrame

Transport playback to the specified frame.

IgnoreNextCue

EnableAllCues

GotoPrevCue

GotoNextCue

GotoFirstCue

GotoLastCue

GotoPreviousFrame

GotoNextFrame

Pause

Play

Stop

TogglePlay

GetPlaybackTime

GetPlaybackCurrentCueTime

GetPlaybackRemainingCueTime

GetPlaybackTransport

GetCurrentCue

GetNextCue

FadeToCue

FadeToCueHold

FadeToCueHoldPlay

FadeToCuePlay

FadeToNexCue

FadeToNexCuePlay

FadeToPreviousCue

FadeToPreviousCuePlay

FadeToTime

FadeToTimeHold

FadeToTimeHoldPlay

FadeToTimePlay

CONTENT

SetVersion

SetNextVersion

SetPreviousVersion

SetNextCycleVersion

SetPreviousCycleVersion

WEBBROWSER CONTENT

NavigateTo

Navigate to new Url.

Back

Navigate back.

Forward

Navigate forward.

Reload

Reload current Url.

ReloadCache

Reload current Url and Cache.

SendKey

Send Key: Left Right Up Down PageUp PageDown.

SendJs

Send JavaScript Code to current page.

CONTROL VIEW

Close
Open
MoveBackward
MoveForward

GotoPage

Navigates to the specified page within the current control view. Parameters: page name (full path: *ControlView1.Pages.Page3*), transition duration (seconds, optional)

SetView

Navigates to the specified view (and page). Parameters: view name (string), page name (string, optional), transition duration (seconds, optional)

GetPage
GetView

DEVICES

General Device Commands:

Connect

Disconnect

StreamDeck:

SetKeyColor

UDP Sender:

ResetConnection
SendMessage

TCP Client:

ResetConnection
SendMessage

TCP Connection:

ResetConnection
Resets the connection.

SendMessage
Sends a string message to all connected endpoints. Byte or Hex Codes can be included like this {72 101 108 108 111 32 0x57 0x6f 0x72 0x6c 0x64 0x13} Use \{ or \} to send curly brackets.

SendMessageToIp

Sends a string message to a specifc endpoints.

Process Device:

Start Start the process.

Stop Stop the process.

Maximize

Maximize the process main window.

Minimize

Minimize the process main window.

Restore

Restore the process main window.

PPT Device:

ResetConnection

CloseConnection

NextSlide

PreviousSlide

GotoSlide

SetVolume

Launch

Quit

StartPresentation

EndPresentation

OSC Sender:

ResetConnection

Resets the connection.

SendMessage

Sends an Osc message with one or multiple value. Usage: Address,Value,Value,...

SendBundle

Sends an Osc Bundle with one or multiple values. Usage: Address,Value,Value,...

KNX:

ResetConnection

SendTrue

SendFalse

SendDpt9

SendDpt14

Kiosk Browser:

Start

Stop

Maximize

Minimize

Restore,

NavigateTo

Back

Forward

Home

Reload

ReloadCache

Examples

Start Playback1

```
Playback1.Play
```

Stop Playback 3

```
Playback2.Stop
```

Pause Playback3

```
Playback3.Pause
```

Run Script 1

```
Script1
```

Show the notes of clip container 6 from sequence1 as text of text-content item "Text1"

```
Text1.Settings.Text.Value =
Sequence1.ClipContainer6.UserProperties.Notes.Value
```

Fade mix level of playback1 in PME live to full - fade time shall be 2 seconds

```
pme1.Playback1.MixLevel.FadeValue 1,5
```

Set opacity for clip container 1 to value 1

```
ClipContainer1.Opacity.Value = 1
```

Set background color of clip container 1 to color red =0.5, blue= 1, green = 1, alpha = 1

```
Sequence1.ClipContainer1.BackgroundColor.Value = 0.5,1,1,1 //normalized
ARGB
```

Fade mix level of playback1 in PME live from to full - fade time should be 2 seconds

```
PME1.Playback1.MixLevel.FadeValue 1,5
```

Set network adapter for Art-Net™ on system 1 to "ETHERNET2"

```
System1.Settings.ArtNetAdapter.Value = ETHERNET2
```

Reset video inputs of system 2

```
System2.ResetVideoInputs
```

Reset video inputs of system 2.

```
System2.ResetVideoInputs
```

Change the label text of label 1 in control view 1.

```
ControlView1.Controls.Label1.Settings.Caption.Text.Value = "this is a
new label text"
```

Perform a click on button 1 of control view 1.

```
ControlView1.Controls.ClickButton1.Click
```

Return the current page that is displayed by control viewer 1.

```
ControlViewer.GetPage
```

Switch to page 2 of the current control view. Also works as script for e.g. button in control view editor (run mode).

```
ControlViewer.GotoPage Page2
```

Delete label 1 on page 1 of control view1.

```
ControlView1.Pages.Page1.Label1.Delete
```

Assign content to a clip container:

```
Playback1.ClipContainer1.MainContent.Value = Content1
```

5.15.3 Conditional Scripts

- If-Blocks can be nested.
- An If-Block must be closed by either EndIf, Else or ElseIf.
- See also: “[condition] ” below.

[condition] Expressions

Examples:

value
a > b
a < b
a = b
a <= b
a >= b
a != b
a > b || c > d && e > f

- A condition is evaluated to either true or false.
- The result can be either a parsed value or a comparison of two parsed values, using one of these operators: >, <, =, <=, >=, !=

- Conditions can be combined using a logical AND (&&) or a logical OR (||).
- AND operators take precedent over OR operators, i.e. “a > b || c > d && e > f” is equivalent to “a > b || (c > d && e > f)” – but the latter syntax with parentheses is not supported!

Vertex **If Script**

Syntax:

```
If [condition]
    [condition true statements]
EndIf
```

If-Script Example1:

```
//Check if Vertex Global Variable Object "Variable1" Value equals 1000.
If true, set Playback1 Transport state to Play

If Variable1.Value = 1000
      Playback1.Play
EndIf
//End of Example1
```

If-Script Example2:

```
//This will write "trueA" to the Log

Set condition1=true
If condition1
      Log trueA
EndIf
//End of Example2
```

Vertex **If and Else Script**

Syntax:

```
If [condition]
    [condition true statements]
Else
    [condition false statements]
EndIf
```

If and Else Script Example1:

```
//Check if Systems1 LiveVolume is higher or equal than 0. If true, set
Controlview1 LED1 to ON. If false, set Controlview1 LED1 to OFF

If System1.Volume >= 0
           Controlview1.Controls.LED1.Value 1
Else
           Controlview1.Controls.LED1.Value 0
EndIf
//End of Example1
```

If and Else Script Example2:

```
//This will write "falseB" to the Log

Set condition1=true
If condition1
     Log trueB
Else
     Log falseB
EndIf
//End of Example2
```

Vertex **If,ElseIf and Else Script:**

Syntax:

```
     If [condition1]
          [condition1 true statements]
     ElseIf [condition2]
          [condition2 true statements]
     Else
          [statements]
     EndIf
```

If, ElseIf and Else Script Example1:

```
//Check if Vertex Global Variable Object "Variable1" Value equals 0.5.
If true, set  global Variable "Variable2" Value to TRUE.
//If Variable1 Value is lesser than 0.5, set Variable2 Value to False
and set global Variable "Variable3" Value to "lesser".
//Else set Variable2 Value to False and set Variable3 Value to
"greater".

If Variable1.Value = 0.5
     Variable2 TRUE
ElseIf Variable1.Value < 0.5
     Variable2.Value FALSE
```

```
      Variable3.Value = "lesser"
Else
      Variable2 0
      Variable3.Value = "greater"
EndIf
//End of Example1
```

If, ElseIf and Else Script Example2:

```
//This will write "trueC" and "trueC2" to the Log

Set condition1=true
Set condition2=true
If condition1
      Log trueC
ElseIf condition2
      Log trueC2
Else
      Log elseC
EndIf
//End of Example2
```

Vertex Nested **If Script**

Syntax:

```
If [condition1]
      If [condition2]
            [condition2 true statements]
      Else
            [condition2 false statements]
      EndIf
EndIf
```

Nested If Script Example1:

```
//Check if Controlview1 SliderButton1 is set to ON.
//If true, check if Playback1 current cue is Cue2.
//If True, set Playback1 to Play, wait 1 seconds and fade to Cue3.
//If false, goto Playback1 Cue2 and set Playback1 to Play

If ControlView1.Controls.SliderButton1.Value = 1
      If Playback1.CurrentCueID = 2
            Playback1.Play
            Wait 1
            Playback1.FadeToCue 3,0.5,1 // Fade to Cue 3. 0.5 Seconds
PreloadTime, 1 Second fade Time
      Else
```

```
           Playback1.GotoCue 2
           Playback1.Play
      EndIf
EndIf

//End of Example1
```

Nested If Script Example2:

```
//This will write "trueD" to the Log

Set condition1=true
Set condition2=true
If condition1
      If condition2
           Log trueD
      Else
           Log falseD
      EndIf
EndIf
//End of Example2
```

Vertex Single-Line **If/Else/ElseIf**

- Block-If and Single-Line-Else/ElseIf can be combined, with the latter closing the previous If-Block.
- A Single-Line-If cannot be followed by an Else/ElseIf-Block or Single-Line-Else/ElseIf.

Vertex Single-Line **If Script**

Syntax:

If [condition] ? [true statement]

Single-Line If Script Example1:

```
//Check if Vertex Global Variable Object "Variable1" Value is true. If
true, fade Sequence1 ClipContainer1 to an Opacity of 100% in 3 seconds

If Variable1 1 ? Sequence1.ClipContainer1.Opacity.FadeValue 1,3
//End of Example1
```

Single-Line If Script Example2:

```
//This will write "trueE" to the Log
Set condition1=true
Set condition2=trueIf condition1 ? Log trueE
//End of Example2
```

Vertex Single-Line **If Else Script**

Syntax:

If [condition] ? [true statement] : [false statement]

Single-Line If Else Script Example1:

```
//Check if Vertex Global Variable Object "Variable1" Value is False. If
True, Goto Playback1 Cue2. If False, Goto Playback1 Cue3

If Variable1 0 ? Playback1.GotoCue 2 : Playback1.GotoCue 3
//End of Example1
```

Single-Line If Else Script Example2:

```
//This will write "trueF" to the Log

Set condition1=true
If condition1 ? Log trueF : Log falseF
//End of Example2
```

Vertex **Single-Line If-ElseIf Script**

Syntax:

```
If [conditionA]
        [conditionA true statements]
ElseIf [conditionB] ? [conditionA true statement] : [condition false statement]
```

Single-Line If-ElseIf Script Example1:

```
//Check if PME1 MixLevel is set to 1 (100% visibility). If true, FadeIn
PME2 MixLevel to 1 in 2 Seconds.
//If false, check if PME2 MixLevel is greater than 0.If True, set
Variable1.Value to 1. If False, set Variable1.Value to 0

IF PME1.MixLevel = 1
      PME2.MixLevel.FadeValue 1,2
ElseIf PME2.MixLevel > 0 ? Variable1 True : Variable1.Value = 0
//End of Example1
```

Single-Line If- ElseIf Script Example2:

```
//This will write "trueG" and "trueH" to the Log

Set condition1=true
Set condition2=true
If condition1
      Log trueG
ElseIf condition2 ? Log trueH : Log falseH
//End of Example2
```

Single-Line and Multi-Line Combination **If Else Script**

Syntax:

```
If [condition]
      [condition true statements]
Else [condition false statement]
```

Single-Line and Multi-Line Combination If Else Script Example1:

```
//Check if the Opacity of Surface1 is lesser than 1. If True, set it to
1 and write "Done" to the log. Else set it to 0

If Surface1.Opacity < 1
      Surface1.Opacity = 1
      Log Done
Else Surface1 0
//End of Example1
```

Single-Line and Multi-Line Combination If Else Script Example2:

```
//This will write "trueI" to the Log

Set condition1=true
If condition1
      Log trueI
Else Log falseI
//End of Example2
```

Vertex Loop-Block, EndLoop, ExitLoop Scripts

- [varname] is the name of the local variable that will be used for iterating; this can be accessed within [loop statements].
- [varname] must consist of word-characters (a-z,0-9) only (like all local variables).

- The local variable is not restricted to the loop block’s scope
- [start] and [finish] will be parsed as Integer values that determine the range for iterating. The expressions may not contain spaces; functions cannot be evaluated here.
- For each iteration [varname] will be increased/decreased by 1 (depending on [start] being larger/smaller than [finish].
- ExitLoop will exit the latest running loop, which means that in nested loops, it can be called several times to break out of several levels.

Syntax for Loop-Block

```
Loop [varname] From [start] To [finish]
    [loop statements]
EndLoop
```

Loop Block Script Example1:

```
//This will move the Playhead of Playback1 from Cue1 to Cue5 in single
steps with a wait time of 3 seconds in between each step.

Loop x From 1 To 5
     Playback1.GotoCue x
     Wait 3
EndLoop
//End of Example1
```

Loop Block Script Example2:

```
//This will write "1 2 3 4 5 6 7 8 9 10" (in individual lines) to the
Log

Loop x From 1 To 10
     Log x
EndLoop
//End of Example2
```

VERTEX Loop-Block with ExitLoop

Syntax:

```
Loop [varname] From [start] To [finish]

    If [condition] ? ExitLoop
EndLoop
```

Loop-Block with ExitLoop Script Example1:

```
//This will move the Playhead of Playback1 from Cue1 to Cue15 in single
steps with a wait time of 3 seconds in between each step.
//The script will force the loop to Exit in Case the Controlview2
SliderButton3 value is TRUE.

Loop x From 1 To 15
      If ControlView2.Controls.SliderButton3.Value = 1 ? ExitLoop
      Playback1.GotoCue x
      Wait 3
//End of Example1
```

Loop-Block with ExitLoop Script Example2:

```
//This will write "1 2 3 4" (in individual lines) to the Log. Stopping
at 4, because condition is true

Set limit=4
Loop x From 1 To 10
      Log x
      If limit = x ? ExitLoop
EndLoop
//End of Example2
```

Nested Loop-Block with ExitLoop Script Example1:

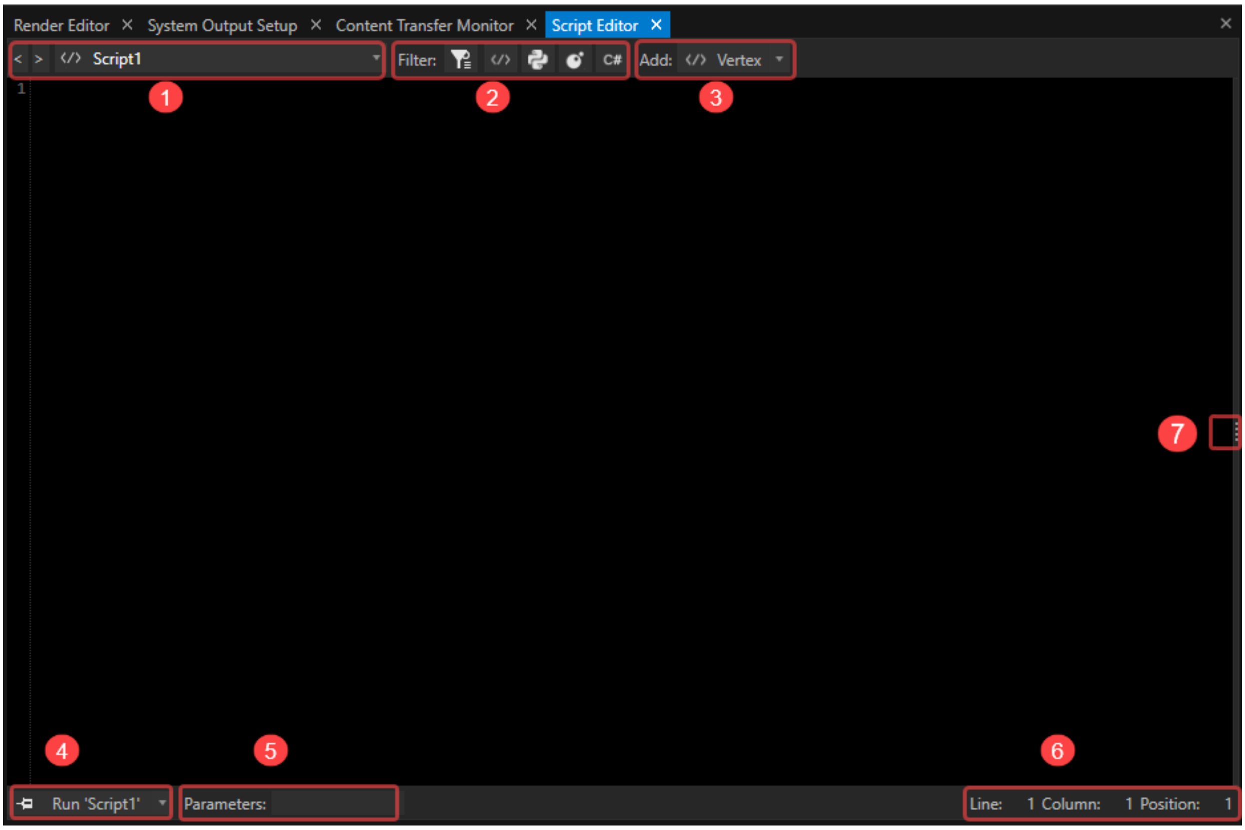
```
//This will write "1 11 12 13 2 3 11 12 13 4 5 11 12 13 Finished" (in
individual lines) to the Log.

Loop x From 1 To 5
      Log x
            Loop y From 11 To 13
                  If x=2
                        ExitLoop
                  ElseIf x=4
                        ExitLoop
                  EndIf
                  Log y
            EndLoop
      EndLoop
Log Finished
//End of Example1
```

5.15.4 Script Editor and Script Monitor

- VERTEX comes with **two powerful tools** that let you **write and manage scripts.**
- Create, write and run scripts in the **Script Editor.**
- Debug, monitor or log script commands and scripts with help of the **Script Monitor.**

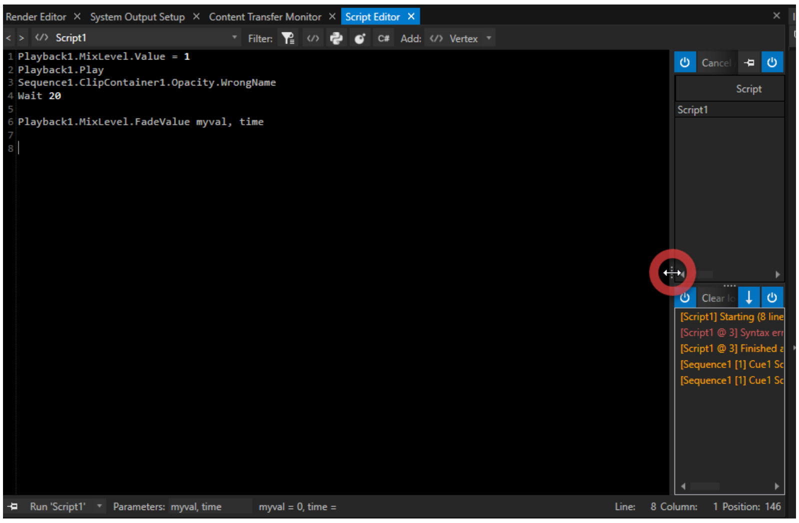
Script Editor

- This is where you write, test and edit your scripts.
- Let our ScriptWizard guide you through all available script commands.



1	**History / Selection**	Select from a list of scripts or your history and display the script inside the editor.

2	**Filter Stand-Alone Scripts and Script Languages**	Disabled by default - script code from all elements in VERTEX is shown in the list. Read more here. Enable to show only stand-alone scripts.
3	**Create a Script**	Select your preferred scripting language from the drop-down menu and create a new script.
4	**Pin Script for Running**	Pins the currently selected script to the *Run* command button right next to it.
	Run Selected Script	The currently selected script is started.
	Run (with prompt)	If there are defined parameters for this script, you can assign values to them. A pop-up dialogue box will open to set values and optionally clear the cache.
5	**Parameters**	Enter Parameters for a Script. This is an easy way to set custom values that can be reused. Read more about parameters in the topic *Scripts*. This field is only availabe in stand-alone scripts. When you run a script with parameters, use the following syntax in the script command field: `ScriptName Parameter1,Parameter2,Parameter3`
6	**Cursor Orientation**	This information on the whereabouts of your cursor will come in handy when writing long scripts.
7	**Sidebar with Script Monitor**	Pull out the Script Monitor for a fast debugging and monitoring of your Scripts

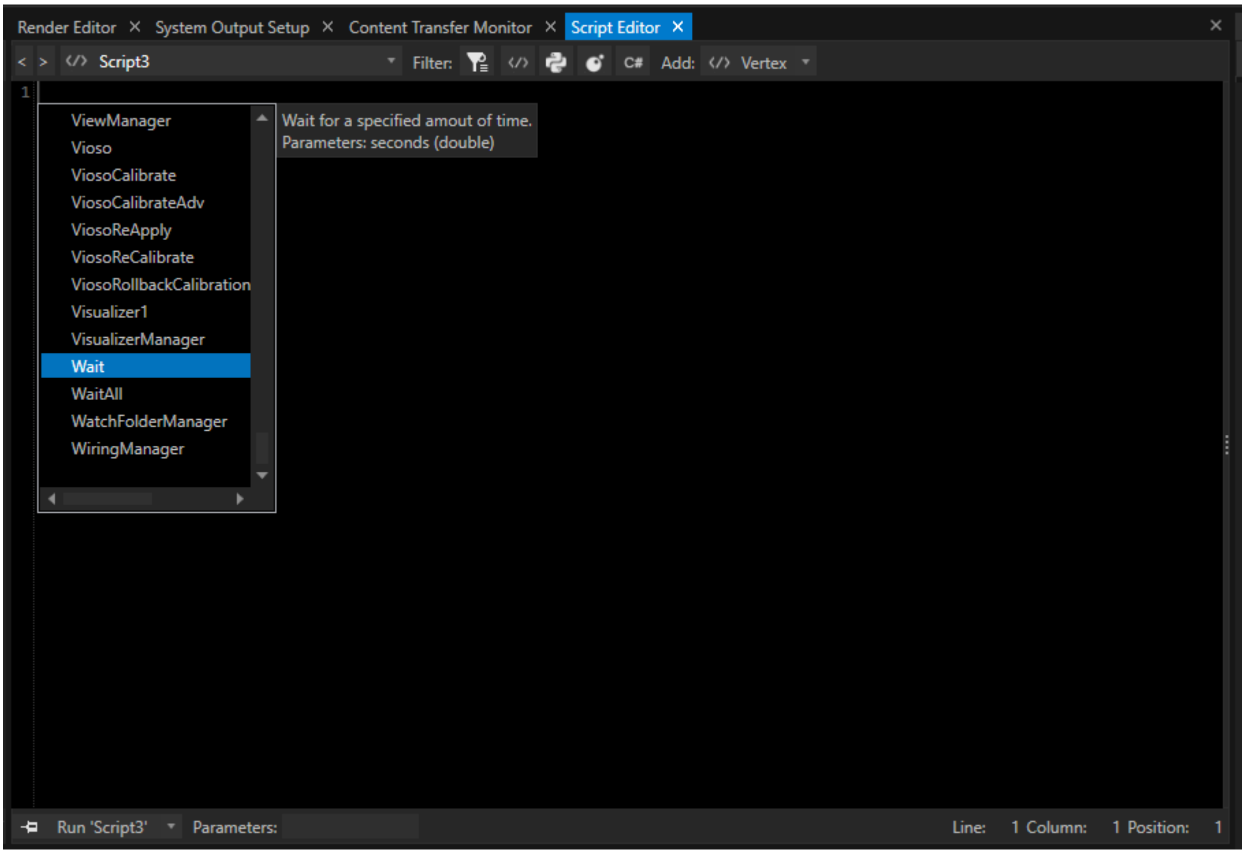
		

```
Playback1.MixLevel.Value = 1
Playback1.Play
Sequence1.ClipContainer1.Opacity.WrongName
Wait 20

Playback1.MixLevel.FadeValue myval, time

```

```
[Script1] Starting (8 line
[Script1 @ 3] Syntax err
[Script1 @ 3] Finished a
[Sequence1 [1] Cue1 Sc
[Sequence1 [1] Cue1 Sc
```

Run 'Script1' Parameters: myval, time myval = 0, time = Line: 8 Column: 1 Position: 146

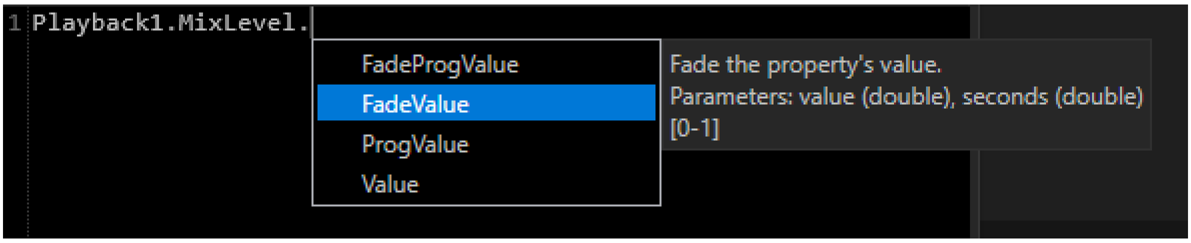
Working with the Script Editor



Wait for a specified amout of time.
Parameters: seconds (double)

Run 'Script3' Parameters: Line: 1 Column: 1 Position: 1

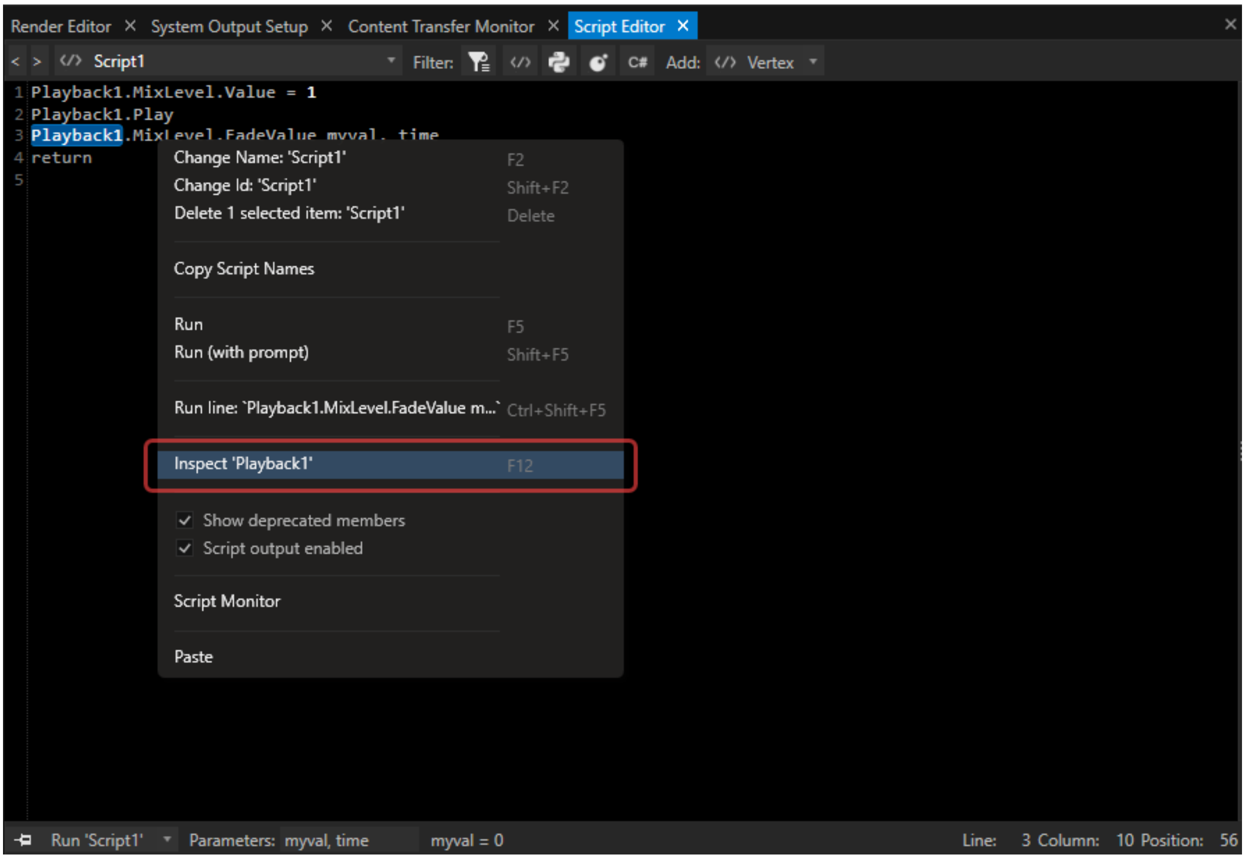
- The shortcut **"CTRL + SPACEBAR"** in an empty line opens a list of all available items and commands
- Navigate through the list with **UP/ DOWN ARROW KEYS or your mouse.** A tooltip will pop up showing expected parameters, syntax and range.
- Confirm your selection with **ENTER.**



```
Playback1.MixLevel.
```

Fade the property's value.
Parameters: value (double), seconds (double)
[0-1]

- **Enter a decimal point** "." **to open a list of all available child items** and commands on the next deeper level.



Render Editor ✕ System Output Setup ✕ Content Transfer Monitor ✕ Script Editor ✕
< > Script1
Filter:
C#
Add: Vertex

```
Playback1.MixLevel.Value = 1
Playback1.Play
Playback1.MixLevel.FadeValue myval, time
return
```

Change Name: 'Script1' F2
Change Id: 'Script1' Shift+F2
Delete 1 selected item: 'Script1' Delete
Copy Script Names
Run F5
Run (with prompt) Shift+F5
Run line: `Playback1.MixLevel.FadeValue m...` Ctrl+Shift+F5
Inspect 'Playback1' F12
✓ Show deprecated members
✓ Script output enabled
Script Monitor
Paste
Run 'Script1'

Parameters: myval, time myval = 0 Line: 3 Column: 10 Position: 56

- Right-Click with your Mouse on a line - you directly can **inspect the main element**.
  The selected Element is shown in the Inspector.

Run a Script with the help of Shortcuts

F5: Run

Shift+F5: Run (with prompt)

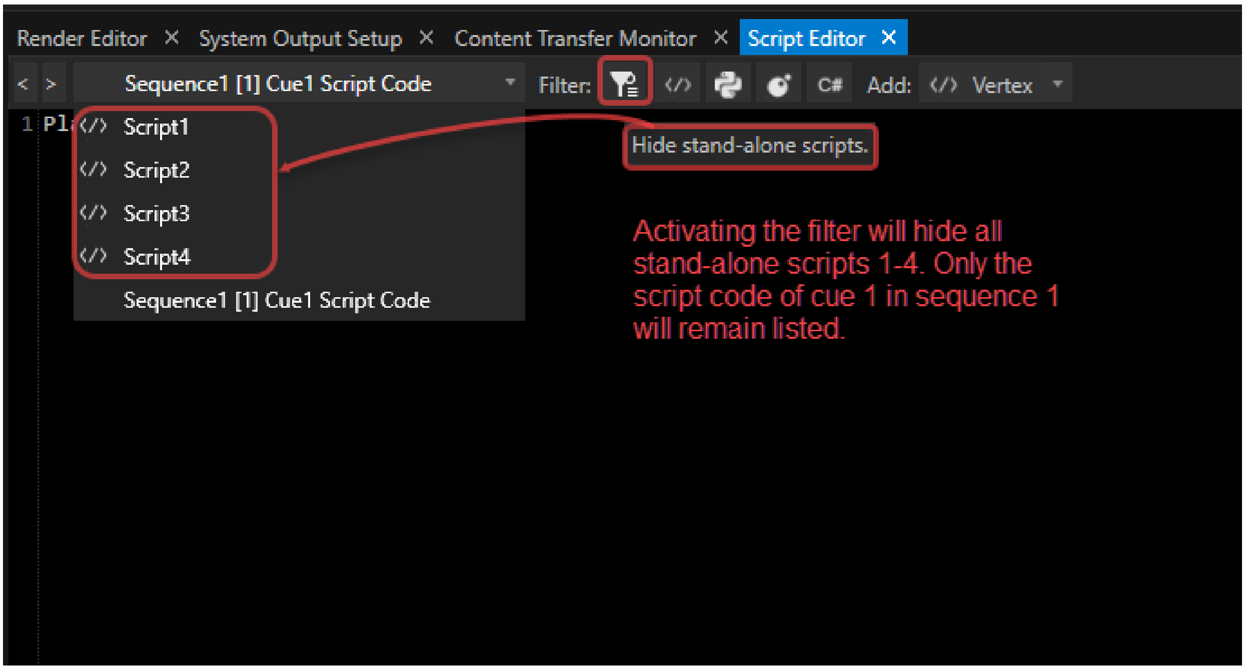
Show Code From Other Script Command Fields in Script Editor

When the **filter symbol** in the **menu bar is deactivated**, the script editor shows **all scripts** that have been created in your project.

This includes the ones that are not stand-alone scripts but **connected to** other items in your project such es **cues, triggers, scheduled events and timers**.

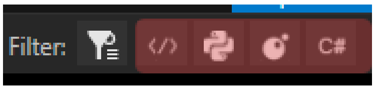
The **dropdown list** of the script editor is now extending to all other available scripts in your project.

The **name of such a script** is **composed of the main and child element** - for example: "*Sequence1 Cue1 Script Code*":



Activating the filter will hide all stand-alone scripts 1-4. Only the script code of cue 1 in sequence 1 will remain listed.

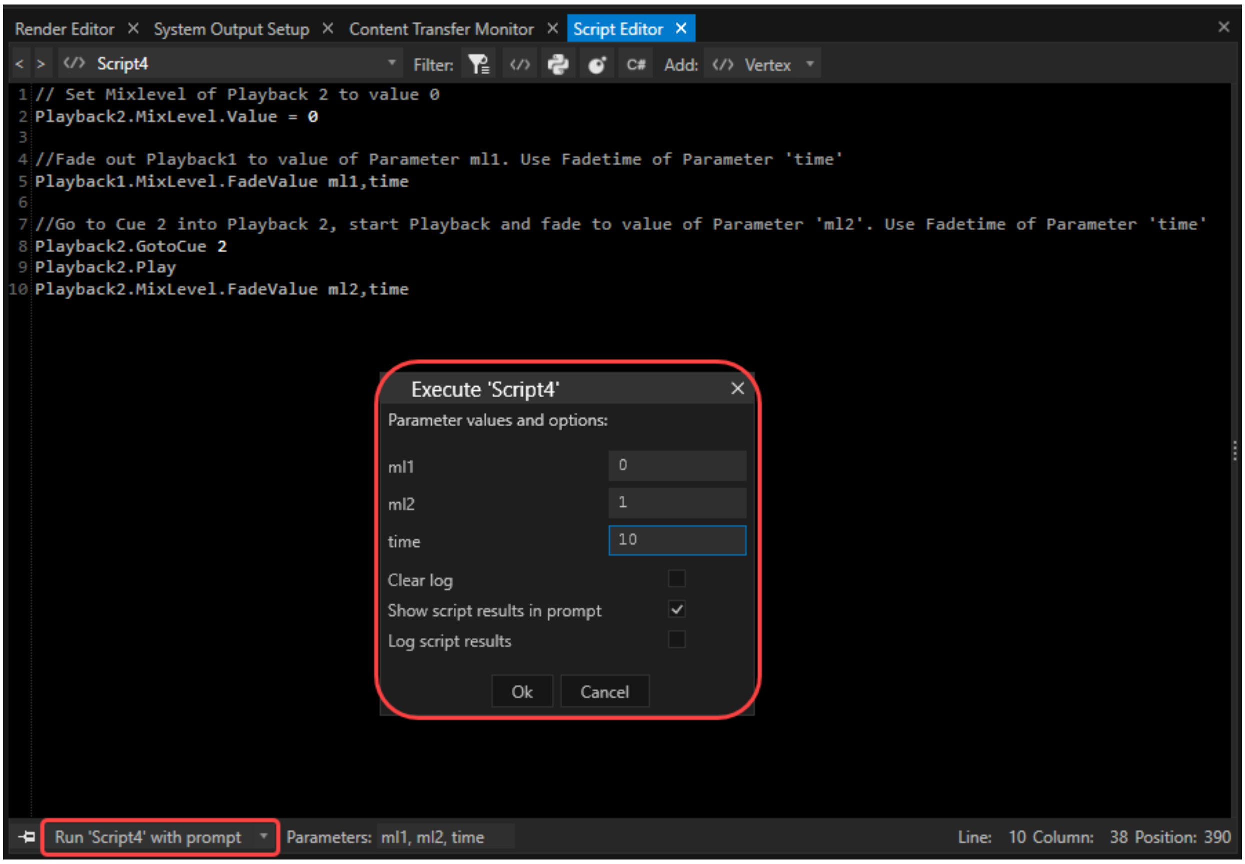
Likewise, you can show/ hide scripts of all available scripting languages by activating their respective filter symbols:



Run Scripts with Prompt

For testing purposes, you can add parameters directly from inside the script editor by using the button: *Run 'Script' with prompt*.

A popup window opens, where you can add values for all expected parameters.



```
// Set Mixlevel of Playback 2 to value 0
Playback2.MixLevel.Value = 0

//Fade out Playback1 to value of Parameter ml1. Use Fadetime of Parameter 'time'
Playback1.MixLevel.FadeValue ml1,time

//Go to Cue 2 into Playback 2, start Playback and fade to value of Parameter 'ml2'. Use Fadetime of Parameter 'time'
Playback2.GotoCue 2
Playback2.Play
Playback2.MixLevel.FadeValue ml2,time
```

Execute 'Script4'

Parameter values and options:

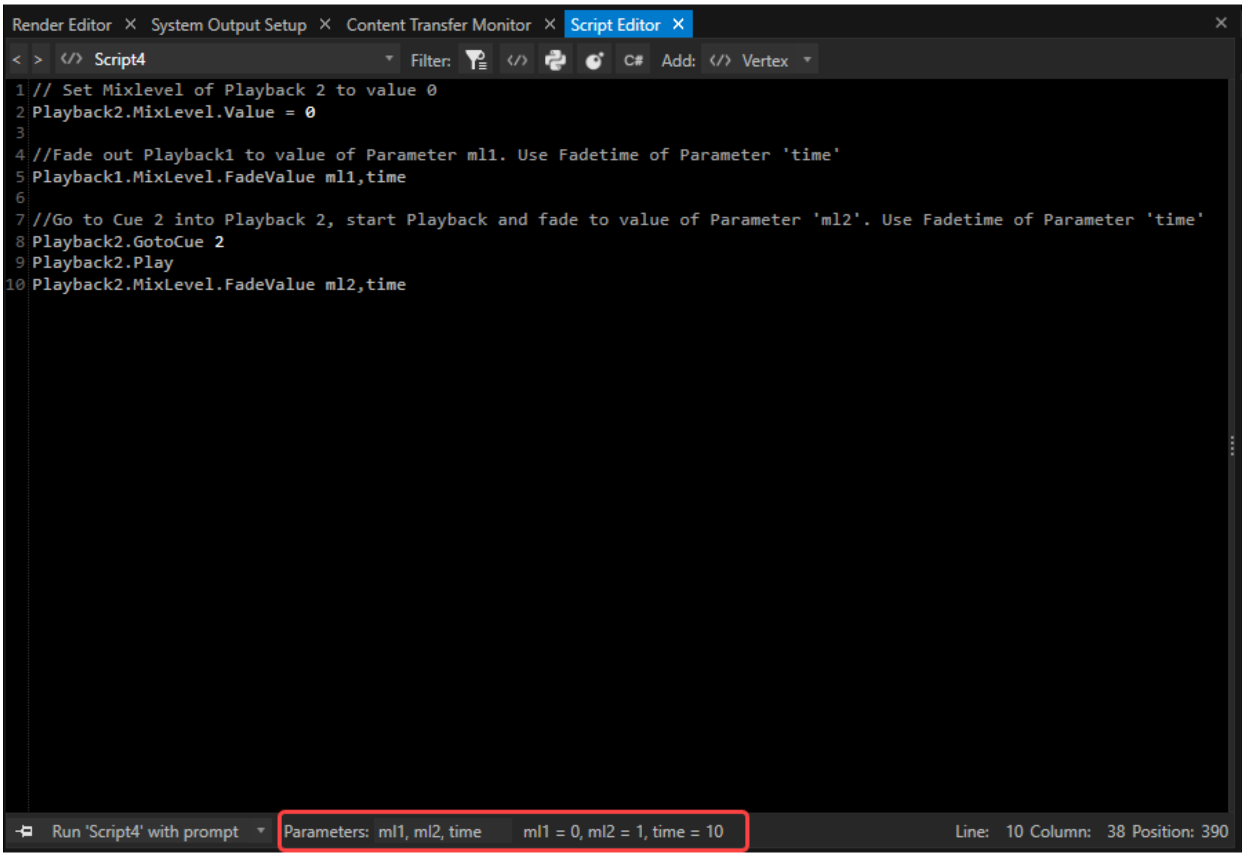
ml1: 0
ml2: 1
time: 10

Clear log □
Show script results in prompt ☑
Log script results □

Parameters: ml1, ml2, time

Line: 10 Column: 38 Position: 390

Once parameters are assigned via the prompting window, their values are listed next to the *Parameters* field:



```
// Set Mixlevel of Playback 2 to value 0
Playback2.MixLevel.Value = 0

//Fade out Playback1 to value of Parameter ml1. Use Fadetime of Parameter 'time'
Playback1.MixLevel.FadeValue ml1,time

//Go to Cue 2 into Playback 2, start Playback and fade to value of Parameter 'ml2'. Use Fadetime of Parameter 'time'
Playback2.GotoCue 2
Playback2.Play
Playback2.MixLevel.FadeValue ml2,time
```

Parameters: ml1, ml2, time ml1 = 0, ml2 = 1, time = 10

Line: 10 Column: 38 Position: 390

Script Monitor

- **all scripts that are currently running** can be monitored
- **cancel, pause or resume** any running script
- a **console** window lists events, status and errors
- a log script command passes values as lines into the **script monitor console**.

Open the Script Monitor

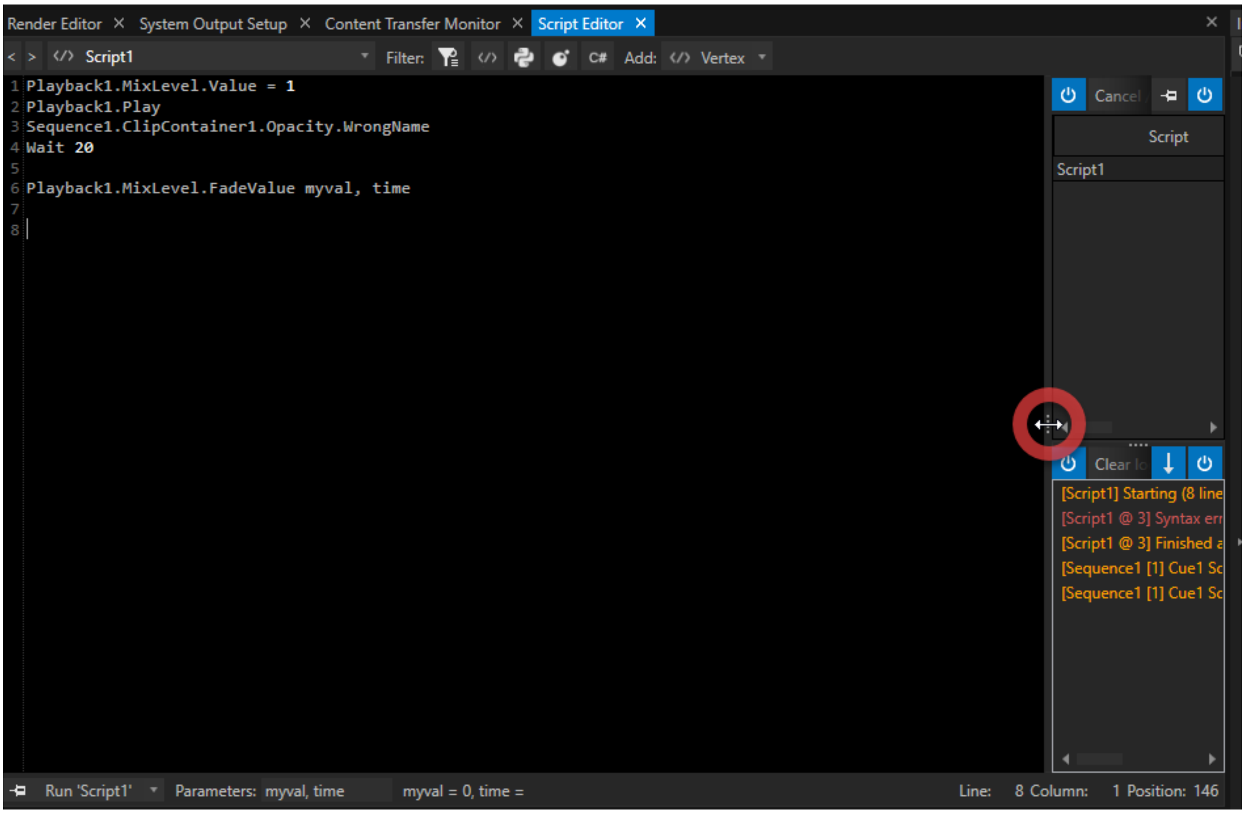
There are two ways to open a Script Monitor:

1. As an additional window

- go to the "Windows" Tab of the main menu on top
- open a new Script Monitor Window

2. Pull out as Sidebar in Script Editor

- move the mouse to the right edge of the script editor
- touch the symbol with the four dots there
- hold the mouse and drag it to the center of the editor

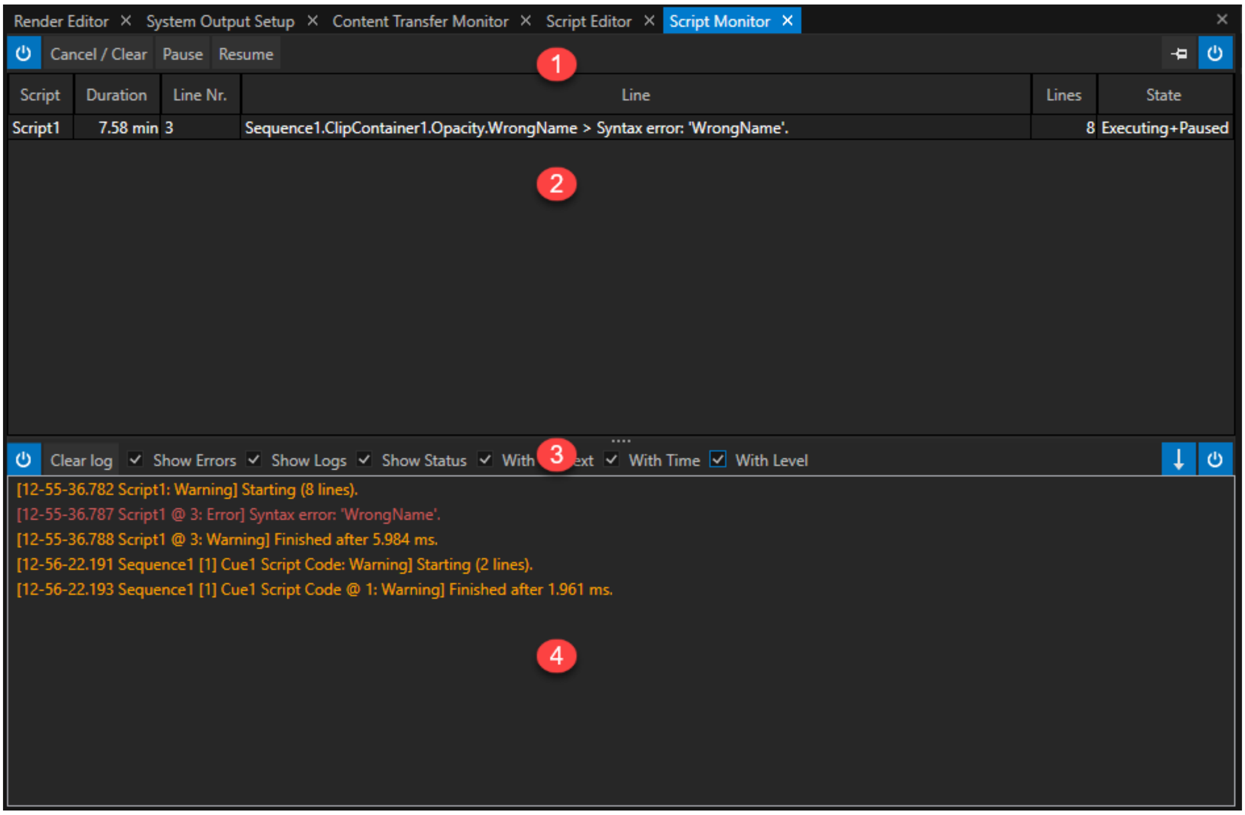


```
Playback1.MixLevel.Value = 1
Playback1.Play
Sequence1.ClipContainer1.Opacity.WrongName
Wait 20

Playback1.MixLevel.FadeValue myval, time

```

```
[Script1] Starting (8 line
[Script1 @ 3] Syntax err
[Script1 @ 3] Finished a
[Sequence1 [1] Cue1 Sc
[Sequence1 [1] Cue1 Sc
```

Run 'Script1' Parameters: myval, time myval = 0, time = Line: 8 Column: 1 Position: 146

User Interface



Script	Duration	Line Nr.	Line	Lines	State
Script1	7.58 min	3	Sequence1.ClipContainer1.Opacity.WrongName > Syntax error: 'WrongName'.	8	Executing+Paused

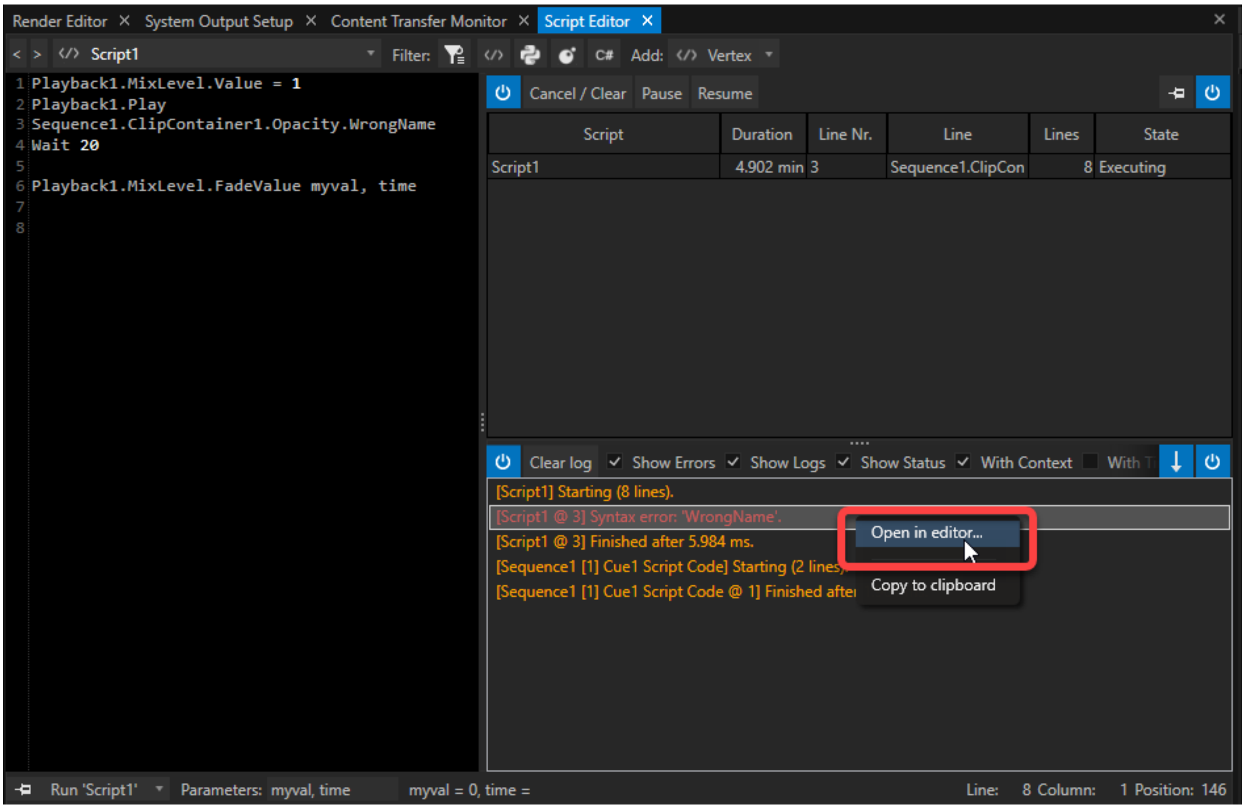
```
[12-55-36.782 Script1: Warning] Starting (8 lines).
[12-55-36.787 Script1 @ 3: Error] Syntax error: 'WrongName'.
[12-55-36.788 Script1 @ 3: Warning] Finished after 5.984 ms.
[12-56-22.191 Sequence1 [1] Cue1 Script Code: Warning] Starting (2 lines).
[12-56-22.193 Sequence1 [1] Cue1 Script Code @ 1: Warning] Finished after 1.961 ms.
```

1	**Script Monitor Control**	**Power Button** enables/disables script monitor **Cancel** script processing /clear monitor **Pause** a selected script **Resume** a selected script
2	**Active Scripts**	- lists all active scripts that are running, paused or stopped at an error - finished scripts are no longer displayed in the list
3	**Console Control**	**Power Button -** enables the script monitor console - disable to save processing power **Clear** the console and restart with an empty console **Filter** information to be logged from the console: **Errors** (in red) **Logs** (e.g. Script 4@5) **Status** (yellow script lines with only information) **With Context** (what Script and line) **With Time** (show/ hide timestamps) **With level** (e.g. warning)

4	**Script Console**	area where script execution info is logged

ScriptMonitor as a sidebar in ScriptEditor enables you to **directly jump to the relevant line** in a script:

1. **rightclick on** a script monitor or a console **entry**
2. select "**open in editor**"



```
Playback1.MixLevel.Value = 1
Playback1.Play
Sequence1.ClipContainer1.Opacity.WrongName
Wait 20

Playback1.MixLevel.FadeValue myval, time
```

Script	Duration	Line Nr.	Line	Lines	State
Script1	4.902 min	3	Sequence1.ClipCon	8	Executing

```
[Script1] Starting (8 lines).
[Script1 @ 3] Syntax error: 'WrongName'.
[Script1 @ 3] Finished after 5.984 ms.
[Sequence1 [1] Cue1 Script Code] Starting (2 lines)
[Sequence1 [1] Cue1 Script Code @ 1] Finished after
```

Run 'Script1' Parameters: myval, time myval = 0, time = Line: 8 Column: 1 Position: 146

5.15.5 Scripts

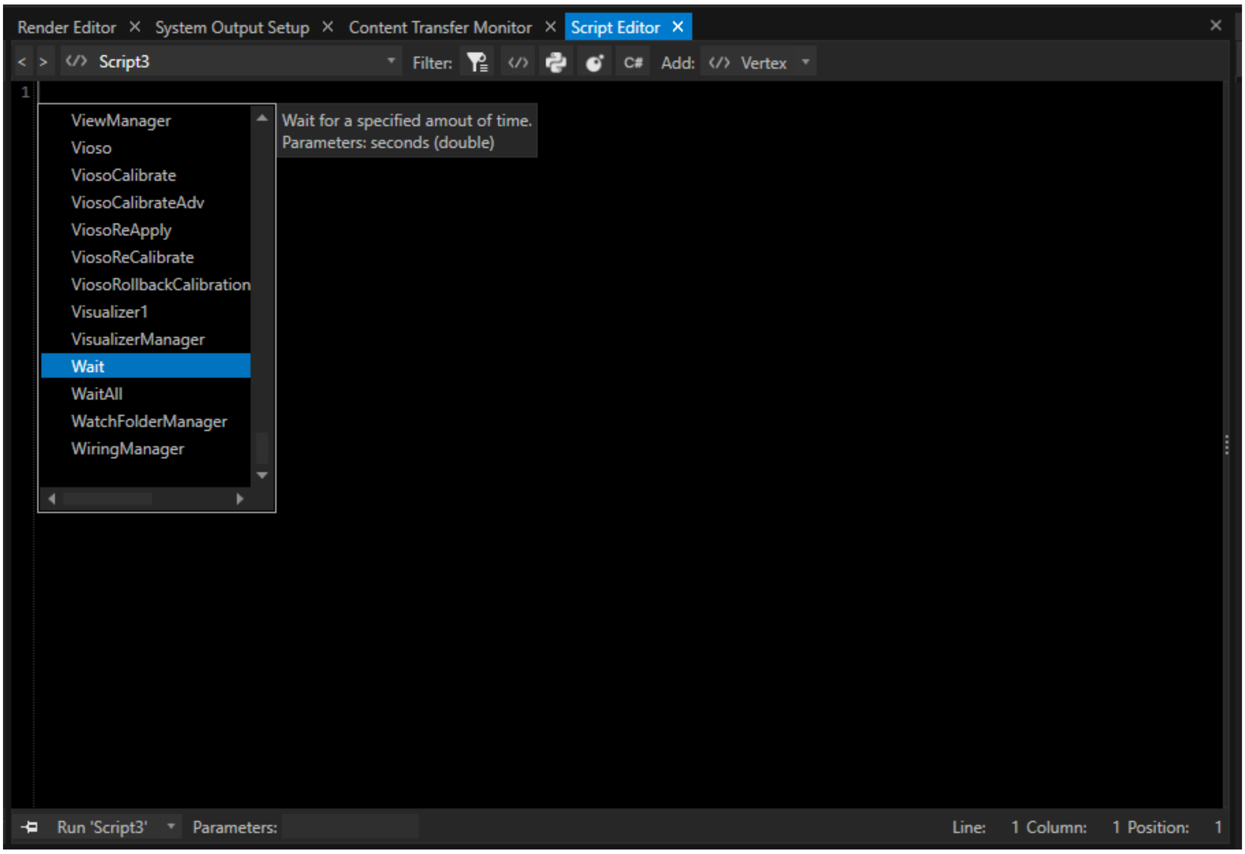
- Combine **any number of script commands into one script.**
- Write **complex tasks** and trigger them by script with only one command.
- **Define parameters** and run a script with their respective values.

How To Create Scripts In VERTEX

- create a new script via the main menu CREATE tab

or

- open a new **Script Editor** from main menu WINDOWS tab
- Create a new script by clicking on the **"Add" button**



Wait for a specified amout of time.
Parameters: seconds (double)

You are allowed to **rename a script from its default name** to a custom name such as *PlayAll.*

If renamed, you can use either `Script1` or `PlayAll` to call and run the script.

Script Names

Script names must contain at least one letter. Allowed are letters [a-z], numbers [0-9] and _

Not allowed are mathematical operators like *,+,-, /

Press **Shortcut CTRL+ Space** at the start of an empty line to open the *ScriptWizard:* a list of all available commands and elements will be displayed.

Enter a dot after to show a list of all available properties or command for this item.

For **detailed syntax and structure**, please read the topic **Vertex Scripting**.

Examples

Below you will find examples to help you getting started with scripting.

The prefix // separates comments from script commands.

```
//Assign a new URL to HTML Content 3
Content3.Settings.Url.Value = www.ioversal.com

//Wait 3 Seconds
Wait 3

// Go to Cue 2 in Playback1 and start playback
Playback1.GotoCuePlay 2
```

```
// Set Mixlevel of Playback 2 to 0
Playback2.MixLevel.Value = 0

//Fade out Playback1 with fade time 3 seconds
Playback1.MixLevel.FadeValue 0,3

//Go to Cue 2 into Playback 2, start Playback and fade in
Playback2.GotoCue 2
Playback2.Play
Playback2.MixLevel.FadeValue 1,3
```

```
//Backup Script Example for a Session Member

// Set System2 as Render and Audio Backup for System1
System1.Settings.RenderSystem.Value = System2
System1.Settings.AudioSystem.Value = System2

//wait 3 seconds
wait 3

// Lightware Matrix as Device from Library - switch Input 4 to Output 2
Device1.Connect
Device1.RouteInputToOutput 4,2
```

```
//Working with tags inside a script and jump to tags inside a script

Playback1.Play
wait 2
```

```
//jump to tag start
Goto Start

//tag position3
:position3
wait 1
Playback1.GotoCue 3
wait 2
//jump to tag end
Goto End

//tag start
:Start
Playback1.GotoCue 2
wait 3
Goto position3

//tag end
:End
Playback1.Stop
```

The Script Monitor helps you with debugging your scripts and the search for errors.

Run a Script

There are **different options** how to run scripts in VERTEX suiting your project and workflow:

1. Run a Script directly out of the **script editor** by pressing the "**Run**" button
2. Use the **script's name** in **each scripting field in VERTEX**
3. Type the script's name into the **command line** and confirm with ENTER.

Running scripts that have been renamed

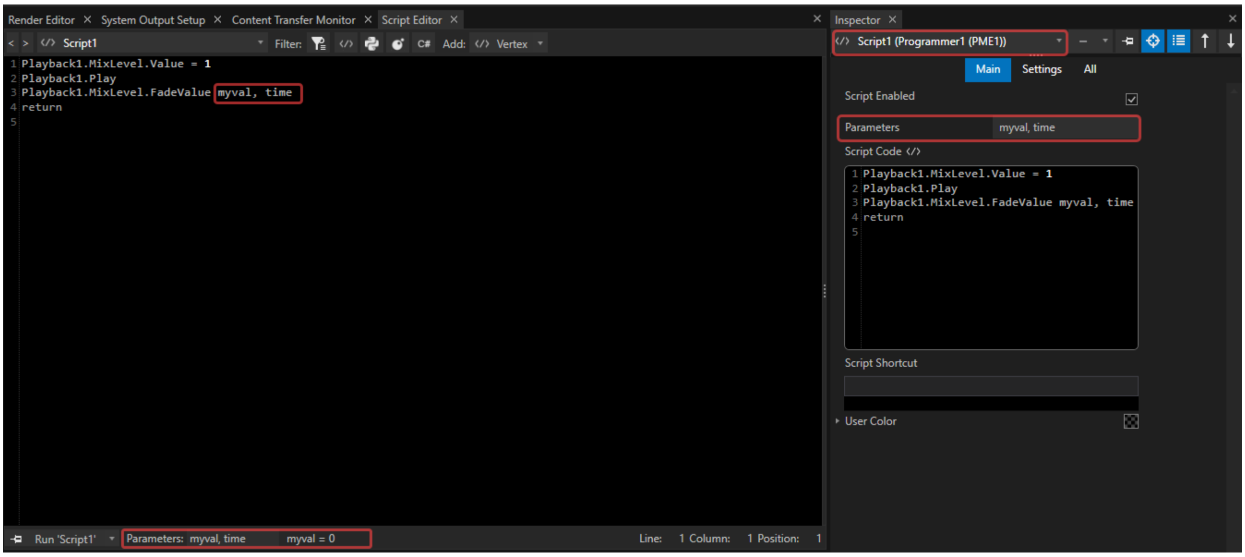
If a script has been renamed, use either the default name of the script or its new name.

For example: `Script1` was renamed to `PlayAll`. To run it, type into a scripting field or the command line either `Script1` or `PlayAll`.

Parameters

- If you **define one or multiple parameters for a script,** you have the option **to turn over values when running a script.**
- Parameters can be used **with their name as** [local Variables](#) **inside a Script.**

Define Parameter Names



```
Playback1.MixLevel.Value = 1
Playback1.Play
Playback1.MixLevel.FadeValue myval, time
return
```

Parameters: myval, time myval = 0

Script Enabled ☑

Parameters myval, time

- Use the ***Parameters* field in the script editor** to define the parameters for the selected script.

  or
- Select a script **in the inspector** and enter the parameters there.

Define and use
Multiple Parameter names must be separated by a comma followed by a space character.
Parameter names can be used in the same way like local variables inside a Script

Example for Parameters and their use as local Variable inside a Script:

Script 1 has the parameters "ml1", "ml2" and "time" assigned

```
// Set Mixlevel of Playback 2 to value 0
Playback2.MixLevel.Value = 0

//Fade out Playback1 to value of Parameter ml1. Use Fadetime of
Parameter 'time'
Playback1.MixLevel.FadeValue ml1,time

//Go to Cue 2 in Playback 2, start Playback and fade to value of
Parameter 'ml2'. Use Fadetime of Parameter 'time'
Playback2.GotoCue 2
```

```
Playback2.Play
Playback2.MixLevel.FadeValue ml2,time
```

Run a Script with Parameter Values

When you run a script with parameters, use the following syntax in every script command field:

```
ScriptName Parameter1,Parameter2,Parameter3
```

For example the script above with 3 parameters "ml1, "ml2" and "time":

```
Script1 0,1,5
//Assigns the Values 0 for parameter 'ml1', 1 for 'ml2' and 5 for
parameter 'time'
```

For testing purposes, you can add parameters directly from inside the script editor by using the button: *Run 'Script' with prompt* .

A popup window opens, where you can add values for all expected parameters.

5.15.6 Other Scripting Langauges

Here are a few examples on how to work with other scripting languages in VERTEX:

- Lua Scripting
- Python Scripting
- C# Scripting

5.15.6.1 Lua Scripting

Sample Code

```
-Vertex Lua Sample Code
-- Pass input123 parameter to variable
var1 = input1

-- Run Vertex Script
Script.Run ('Log Hello Lua')

-- Get a return value from Vertex Scripting
```

```
var2 = Script.Run('Return SystemsManager.GetStatus')

--[[Return a value to Vertex Scripting]]
return var1
```

Script.Run lets you interact from Lua with VERTEX scripting.

5.15.6.2 Python Scripting

Sample Code

```
#Vertex Python Sample Code
#Pass input parameter to variable
myVar = input1

#Call a Vertex Script from Python script code
Script.Run('Log Hello Python')

myVar2 = 'System Status'

#Get a return value from Vertex Scripting
myVar3 = Script.Run('SystemsManager.GetStatus')

#Use returnValue to return a value to Vertex Scripting
myVar4 = 12
returnValue = myVar * 2
```

Script.Run lets you interact from Python with VERTEX scripting.

5.15.6.3 C# Scripting

Sample Code

```
//Vertex C# Sample Code
//Pass input parameter to variable
var input = input1;

for(int i = 0; i < 10; i++)
{
        //Call a Vertex Script from C# script code
        Script.Run("Log Hello C# " + i);
        System.Threading.Thread.Sleep(500);
}
```

```
//Get a return value from Vertex Scripting
var r = Script.Run("Return SystemsManager.GetStatus");

//Return a value to Vertex Scripting
return "Return from C#";
```

C# Engine interacts with VERTEX Script commands.

Script.Run lets you interact from C# with VERTEX scripting.

Compiling Script.Run Calls

Script.Run allows the passing of multi line scripts.

```
previous code:
    Script.Run("Playback1.Active.Value = true");
    Script.Run("Playback2.Active.Value = true");
    Script.Run("Playback3.Active.Value = false");
    Script.Run("Playback4.Active.Value = false");

new code:
    Script.Run(@"Playback1.Active.Value = true
                 Playback2.Active.Value = true
                 Playback3.Active.Value = false
                 Playback4.Active.Value = false");
```

The "@" (verbatim string literal) is important for adding multilines inside String-Literals. Alternatively you can combine them instead of the "@" with "\n" .

Script.Run Calls With Parameters

Script.Run has now got its signature changed allowing for optional parameters:

```
    public static object Run(string script, params object[] parameters)

previous code:
    Script.Run("Playback1.FadetoCuePlay " + newMessage.ToString());

new code:
    Script.Run("Playback1.FadetoCuePlay", newMessage);
```

Currently, this just saves the time to concatenate the strings manually. In the future we'll be able to optimize these calls efficiently.
However, his does not work with multiline scripts.

void Log(text)

The use of Script.Log command is simpler and more efficient than before:

```
previous code:
    Script.Run("Log Status: "+message);

new code:
    Script.Log("Status: "+message);
```

Omit the "Log" before "Status".

void Script.SetVariable(name, value)

```
previous code:
    Script.Run("Var_MyVal.value = My Value");

new code:
    Script.SetVariable("Var_MyVal", "My Value");
```

object Script.GetVariable(name)

T GetVariable<T>(string name, T defaultResult = default)

```
previous code:
    String MyValreturn = Script.Run("return
Var_MyReturnVal.Value").ToString();

new code:
    var  MyValreturn = Script.GetVariable<string>("Var_MyReturnVal");
```

The generic variant takes over the necessary value conversion (by internal converters).

bool Script.TryGetVariable<T>(name, out T value)

This is another function helping to avoid extensive concatenations of Script.Run strings as well as avoiding IfExecute from within C#.
It is just way more efficient using C#'s native logic:

```
previous code:
    Script.Run("IfExecute Var_MyVal.Value, Device1.SendMessage
"+message);

new code:
    if(Script.GetVariable<bool>("Var_MyVal"))
Script.Run("Device1.SendMessage", message");
```

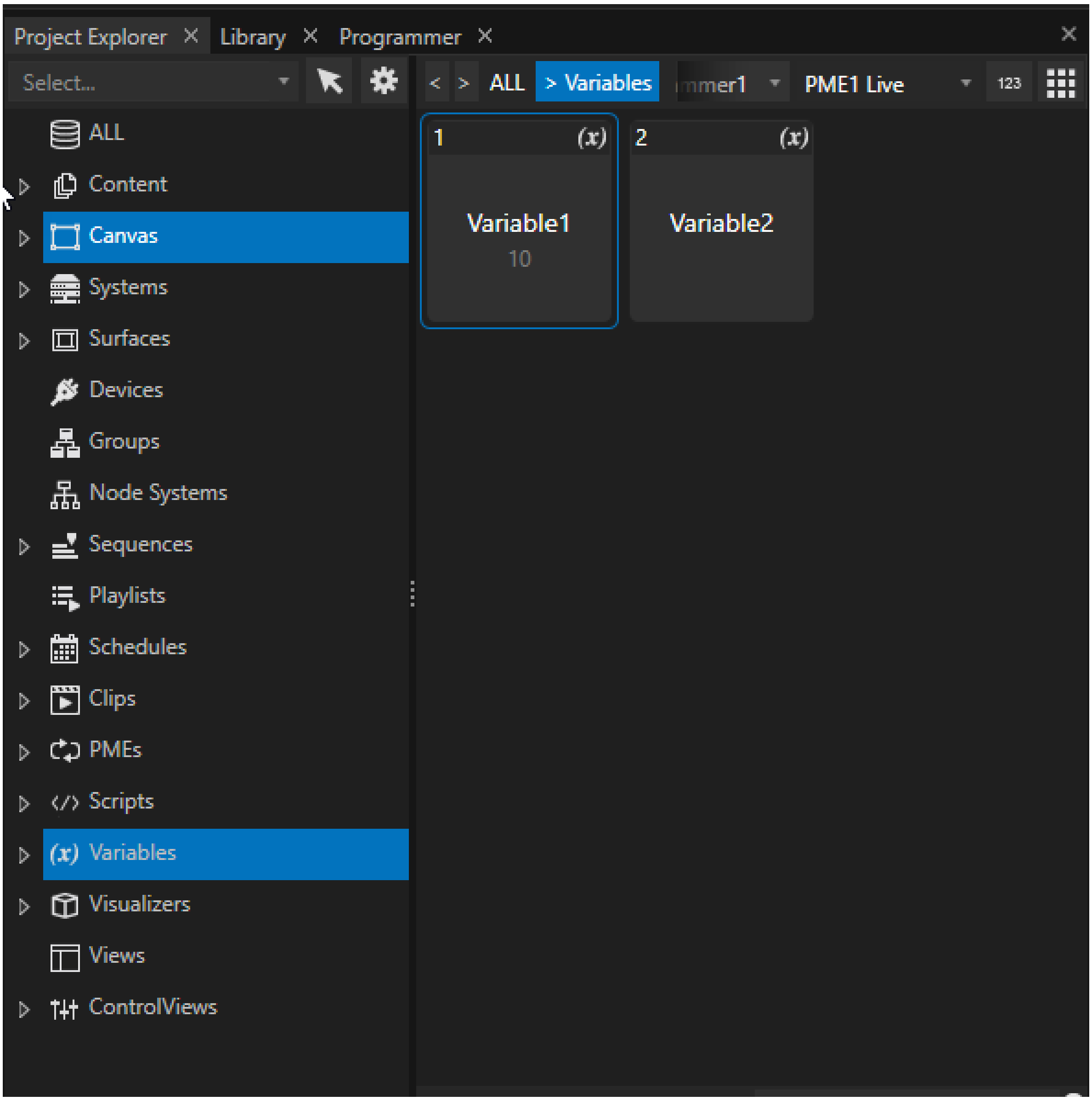
5.15.7 Variable

- Use a variable to store data (values, strings etc.) for **recurring tasks**
- **Global variables** are listed in the **project explorer.**
- **Local variables** are only used in a **single script**.
- Use variables **in script commands** instead of fixed numbers.

Global Variables

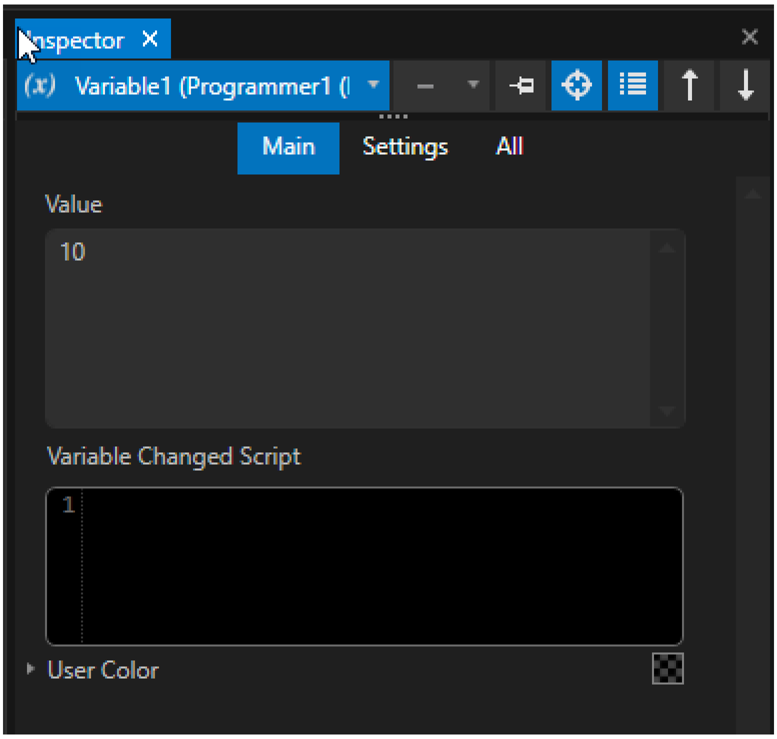
Creating a Variable:

- Go to *MAIN MENU -> CREATE -> Variable*
- A new section is created in the project explorer called *Variables.*
- This is where the newly created variable is listed.



Assign a Value

The current value of a variable can be assigned in the inspector:



Value

10

Variable Changed Script

Of course, you can assign **values** to a variable **via script commands** in any **scripting field** or in the **command section** of the status bar:

VariableName.Value = ##

```
Variable1.Value = 10
```

Use a Variable

Use a variable in script commands instead of the expected value:

Without Variable

```
Playback2.MixLevel.FadeValue 1, 10
```

With Variable

```
Playback2.MixLevel.FadeValue 1, Variable1.Value
```

You are allowed to **rename a variable from default name** to let's say *FadeInTime.*

If renamed, you can use either `Variable1.Value` or `FadeInTime.Value` in script commands.

Local Variables

- Local Variables are only valid in a single script.
- You can assign a value to your local variable and use it on different lines in a script.

Create a Variable in a Script Command

- All the information about **syntax** can be found here: **Script Command - Local Variables**
- Local variables **are only valid in their particular script.** Unlike global variables, it is impossible to use them in other scripts or with other script commands.
- The variable's name is only valid for this particular script.

Script Parameters

- It is possible assign parameters to a script.
- These parameters can be used as local variables in the script.
- Read more about parameters for scripts: Run a Script with Parameters.

5.15.8 Advanced Scripting

VERTEX power users who like to delve into specifics of the Vertex Scripting Language - please read on, this is for you.
If you are starting out and/ or are getting by fine without knowing these intricacies, then you may skip this topic. However, if you are experiencing problems and the code is not behaving as expected, this documentation shall aide you in finding the right answers and straighten out the kinks in your programming.

Advanced Variables

This chapter covers an in-depth reading on variables with extensive examples and how to apply them.

Dynamic Scripting

Apply dynamic values tailored to specific use cases. Streamline your workflows and enhance operational efficiency.

Loops

Use loops for automating repetitive scripts that can be nested within one another for hyper-complex operations.

5.15.8.1 Advanced Variables

What is a variable?

A variable is a scripting token that allows you to access a value using a custom name of your choice.

Examples:

```
//assign 1.23 to a global variable name Variable1
Variable1 = 1.23

//define a local variable named MyName and assign the value John
Set MyName = John
```

There are several types of variables within Vertex that differ in the way they are created, assigned, or used.

Global Variables

- Global variables are managed just like other so-called “core objects”: they can be created via the Create menu and are listed in the Project Explorer where they can be organized into collections or selected for editing in the Inspector.
- The generic name of global variables in the Project is “Variable”.
- The value of a global variable is synchronized between alle Session Members, just like the properties of other core objects.
- This is called a “global scope” because the variable’s value can be accessed/shared globally between all scripts and Session Members. In contrast to “local scope variables” that are only accessible within the script for which they have been defined.

Global variables cannot be created within a script, they must be added to the Project manually. Once they have been created, they can be accessed as follows:

Assumptions: Project contains Variable1 with the custom name “MyValue”, Variable2

```
//assign a value using the `Value` member of the Variable object:
Variable1.Value = First Value

//assign a value using the shorthand-syntax
Variable2 = Second Value

//log the value using the full syntax
Log Variable1.Value

//log the value using the shorthand-syntax
Log Variable2
```

```
//assign the value using the custom name and the full syntax
MyValue.Value = First Value Override

//log the value using the custom name and the shorthand-syntax
Log MyValue
```

The value of a global variable is essentially always a String because it must be synchronized between Session Members and be easily editable in the Inspector – it cannot contain a reference to a core object, e.g. Sequence. Every value assigned to a global variable will be converted to its String representation – in the case of a Sequence, the sequence's name. Consider this example:

Assumption: Project contains Sequence1 with the custom name " MySequence" , Variable1

```
Variable1 = Sequence1
Log Variable1
```

Output:

```
MySequence
```

While object references cannot be resolved, several other "value types" can be converted to Strings and back again. This includes but is not limited to Numeric, Json, Array and Dictionary values.

Notes for upcoming chapters:

- Global variables can be used in Indexers because their value is available during the pre-processing stage of a Script in which the Indexers are evaluated.
- Global variables support type-specific features by using the "As…" members of the variable.

Local Variables

Local variables are variables that are defined within a script and that can only be used/accessed during the execution of that script.
Local variables are defined using the `Set` method:

Assumption: Project contains Sequence1 with the custom name " MySequence"

```
//define a local variable and assign a value
Set MyVar = 1.23

//change the value to string
MyVar = Example Text

//assign Sequence1
MyVar = Sequence1

Log MyVar
```

Output:

```
MySequence
```

In contrast to global variables, local variables are not restricted by their String representation: local variables can reference any type of object; when the value is consumed it will be converted if and as required.
In the above example, using `Set`, a local variable is declared without specifying a type. Later, Sequence1 is assigned to the variable and the value is logged: the result is “MySequence” which is the default string representation of a Sequence (custom or default name).
It is also possible to specify the type using one of the `Set` members as in this example:

```
Set.Text a = 0001.23000
Log a

Set.Numeric b = 002.3400
Log b
```

Output:

```
0001.23000
2.34
```

As you can see, specifying the type during declaration changes the way the value is parsed and stored.
Local variables declared with a specific type will always convert all input into that type (if possible) and return a value of that type. These variables also have type-specific members, e.g.:

```
Set.Text a = 0001.23000
Log a
Log a.Contains 23

Set.Numeric b = 002.3400
Log b
Log b.Ceiling
```

Output:

```
0001.23000
True
2.34
3
```

Local variables are available within the scope of the script once they have been defined. If used before, they will be parsed as literal values as shown here:

```
log a
set a = 123
log a
```

Output:

```
a
123
```

Notes from upcoming chapters:

- Local variables cannot be used in Indexers because their value is not available during the pre-processing stage of a Script in which the Indexers are evaluated.
- Local variables declared without a specific type support type-specific features by using the “As…” members of the variable.

- Local variables declared with a specific type only support the type-specific features of that type.

Script Parameter Variables

Script Parameter Variables are variables with a „slightly larger than local" scope: they are only valid within the script for which they are defined, but are initially set from the outside – via parameters that are passed to a custom Script.

Once the parameters have been defined for a Script, the associated variables can be used just like normal local variables that were defined without a specific type.

Script Parameter Variables are only available for custom Scripts that define one or more parameters. This can be done in the Inspector when inspecting a custom Script or in the Script Editor: when the script is selected, an input box for specifying the parameters is shown in the status bar at the bottom of the editor.

Consider the following when defining parameters:

- The parameters are entered into a single-line text input box, with multiple parameters separated by a non-word character, e.g. space, comma, semicolon.
- The names are case-insensitive (as all script processing is).
- You can enclose a parameter name in double-quotes to declare the parameter will not be parsed, but instead used as a literal string; see the output in the following example:

Script1, without parameters:

```
Set V1 = 1.234
Set V2 = 5.678

Script2 V1, V2
```

Script2, with parameters *"Para1", Para2*:

```
Log Para1
Log Para2
```

Output when running Script1:

```
V1
5.678
```

Due to the first parameter being defined by a name in double quotes, "Para1", not like Para2, the parameter (here: V1) is not parsed, but used as a literal for the value of the script parameter variable.

Notes from upcoming chapters:

- Script parameter Variables can be used in Indexers because their value is available during the pre-processing stage of a Script in which the Indexers are evaluated.
- Script parameter variables support type-specific features by using the "As…" members of the variable.

Type-Specific Members

Certain value types are supported by offering type-specific methods and properties for evaluating or modifying values because, e.g., a method for splitting strings is not useful for numeric values.

These are the types currently supported:

Array	several items that can be accessed by the 0-based-index position within the items.
Dictionary	several key-value-pairs, i.e. values that can be accessed by their associated key.
Json	a JObject or JArray instance.
Numeric	a numeric value; internally stored as `double`.
Url	a string that represents a Url (http://...).
Xml	a string that represents a Xml element.

As described before, these types can be assigned when declaring a local variable as also shown in this example:

Assumption: Project contains Sequence1 with the custom name "MySequence", Sequence2

```
set.Array a = Sequence1, Sequence2
log a

set.Dictionary d = one:1,two:2,three:3
log d

set.Json j = {"Name":"John", "Age":23}
log j

set.Numeric n = 0123.456000
log n

set.Text t = 0123.45600
log t

set.Url u = http://www.google.de/search?q=ioversal
log u

set.Xml x = <root><item id="1"/><dawg test="3"/> <item
id="2"/></root>
log x
```

Output:

```
MySequence, Sequence2
one: 1, two: 2, three: 3
{"Name":"John","Age":23}
123.456
0123.45600
http://www.google.de/search?q=ioversal
<root>\r\n  <item id="1" />\r\n  <dawg test="3" />\r\n
<item id="2" />\r\n</root>
```

Note how converting the values to loggable strings effects the output:

- Sequence1 is logged as “MySequence”.
- Numeric types do not store leading/trailing zeros.
- Text type maintains leading/trailing zeros.
- Xml elements are formatted when serialized.

For local variables without a specific type or global variables there are helper methods that convert the value to the required type and offer the same methods as type-specific local variables, e.g. “AsJson”:

```
set.Json a = [{"Name":"John", "Age":23}, {"Name":"Bob", "Age":24},
{"Name":"Pete", "Age":20}]

log a.Get 0/Name
log a.Get 0/Age

set b = a
log b.AsJson.Get 1/Name
log b.AsJson.Get 1/Age
```

Output:

```
John
23
Bob
24
```

DynamicValue Member

Local variables that do not have a specific type, including Script Parameter Variables, offer a helper method, DynamicValue, for accessing members of the value referenced by the variable:

Assumptions: Project has Sequence1 with ClipContainer1

```
set s = Sequence1.ClipContainer1

log s.DynamicValue.Opacity

set p = Sequence1.ClipContainer1.Transform.Position

log p.DynamicValue.X
log p.DynamicValue.Y
log p.DynamicValue.Z
```

As you can see, you can assign any object or property to a local variable and then access that instance using `DynamicValue`.

Notes from upcoming chapters:

- DynamicValue is often used when working with Loops.

Comparing Global and Local Variables

Consider these examples that demonstrate the difference between local variables (incl. script parameter variables) and global variables.

Example1: Storing a core object in a global.

Assumptions: Project contains Variable1, Sequence1

```
Variable1 = Sequence1

Set s = Variable1
//since the dynamic value cannot be resolved for the string stored
within Variable1, the literal expression will be logged

Log s.DynamicValue.AudioOffset

Set s = Sequence1
//the dynamic value can be resolved because a local variable can
reference the actual object

Log s.DynamicValue.AudioOffset

Set s2 = s
//the dynamic value can be resolved because a local variable can
reference the actual object

Log s2.DynamicValue.AudioOffset
```

Output:

```
s.DynamicValue.AudioOffset
0
0
```

The above example demonstrates that **an object reference cannot be stored and retrieved from a global variable:** when assigning Sequence1 to Variable1 only the string representation is stored – and this is not converted back to an object when being used.

During the processing of `Set s = Variable1` the assignment expression (`Variable1`) is parsed resulting in the stored string ("Sequence1"). A recursive/nested parsing of the string result is not done at this point.

Example2: Storing a Dictionary in a global variable.

Assumptions: Project contains Variable1

```
//the expression is parsed and stored as an actual dictionary
set.Dictionary d = a:1,b:2,c:3
```

```
//a string representation of the dictionary is stored
Variable1 = d

//an actual dictionary is parsed from the value
set.Dictionary d2 = Variable1

log d2.Count

//the actual value is maintained (not converted) when assigning to
an unspecific local variable
set d3 = d2

//use the AsDictionary member to access the methods for this type
log d3.AsDictionary.Count
```

Output:

```
3
3
```

The above example demonstrates that **certain supported types**, e.g., a Dictionary, **can be converted to and from a global variable successfully.**

Working with enumerable values (Array, Dictionary, JSON)

Enumerable values, represented by Array, Dictionary and JSON have a few special methods that are worth looking into.

Note: Enumerable values are commonly used in connection with Loops (s. below) and the DynamicValue member (s. above). This chapter focuses solely on the special methods available for enumerables.

These methods are Where, OrderByAsc, OrderByDesc, and Select as shown in the following example (details will be explained further below):

Assumptions: Project contains contents RedPng, GreenPng, BluePng

```
set.Array items = RedPng, GreenPng, BluePng
log items

set a = items.Select i => i.UserProperties.Id
log a

set b = items.OrderByAsc i => i.UserProperties.Id
log b

set c = items.OrderByDesc i => i.UserProperties.Id
log c

set d = items.Where i => i.UserProperties.Id < 33
log d
```

Output (example):

```
Red.png, Green.png, Blue.png
34, 32, 2
```

```
Blue.png, Green.png, Red.png
Red.png, Green.png, Blue.png
Green.png, Blue.png
```

What makes these methods “special” is the use of a so-called “anonymous function”, e.g.: `i => i.UserProperties.Id`

In the Vertex Scripting context “anonymous functions” are nameless, single-line functions that have one parameter and a return value:

- The name of the parameter (that is to be used in the function) is an arbitrary custom name, specified on the left-hand side of `=>`, in the example above: `i`
- The function is defined by the remaining text on the right-hand-side of `=>`, in the example above: `i.UserProperties.Id`

These functions, used by the methods mentioned above, which are all only applicable to variables representing enumerable items (Array, Dictionary, JObject, JArray) are called for each item, assigning the item to the defined parameter (in the example above: `i`) so that it can be used for evaluation. The way, in which the functions are evaluated, and their results used, depends on the method context.

In all cases, the methods do not alter the source variable, but instead return a new enumerable instance:

- **Where**: The result is expected to be true or false, and only items for which the result was true will be added to the result set.
- **OrderByAsc, OrderByDesc**: The results (of all items) are used to return a version of the original items, sorted in ascending or descending order, respectively.
- **Select**: A new Array is created, using the function results as items.

Since the contents of the enumerable variables can be of any (and different) types, the Script Editor cannot offer Code Completion support. All members of the anonymous function parameter (in the example above: `UserProperties.Id`) will be parsed as if they had been amended to the source of the parameter (here: a content core-object).

Note: There are other members (e.g. Count, Take, Skip, ByIndex, ByKey) that also only apply to enumerable variables, but they do not require anonymous functions.

5.15.8.2 Dynamic Sripting

In this context, Dynamic Scripting refers to features that allow dynamically accessing objects, i.e. without necessarily specifying them in code explicitly. The concrete instances will be determined during execution and may well depend on run-time values.

Note: While Loops (in combination with the DynamicValue member, see above) may also be considered a way of “dynamic scripting”, they are conceptually not a part of the features described here and will be covered in their own chapter (see below).

In this context, there are two features for dynamic scripting support: **Indexers** and **Inline Placeholders**. To understand the different possibilities and limitations, keep the following “execution pipeline” in mind:

- Load all script lines
- Create local Script Parameter Variables (if required for custom Scripts).
- **Evaluate Indexers**
- Iterate over all evaluated script lines and for each line:
- **Evaluate Inline Placeholders**
- Process line

Indexers

Indexers were primarily implemented to allow dynamic access to *several* objects:

```
Sequence1.ClipContainer[1-3].Opacity = 0.2
```

The “Indexer” is the [1-3] in the example above. When evaluating the script code, during “**pre-processing**”, for all upcoming execution steps this one line *will be replaced* with the following lines:

```
Sequence1.ClipContainer1.Opacity = 0.2
Sequence1.ClipContainer2.Opacity = 0.2
Sequence1.ClipContainer3.Opacity = 0.2
```

Note: This essentially also leads to code repetition, like in Loops, but the technical approach is very different, see Loops below.

Since Indexers are evaluated **before the actual script is processed**, the Indexer expressions **can** contain Global Variables and Script Parameter Variables – but **cannot** contain Local Variables, because these will not have been evaluated, yet.

This example demonstrates the use of Script Parameter Values as Indexers:

Assumptions: Project contains Sequence1 with several ClipContainers

Script1, without parameters:

```
Set min = 1
Set max = 3
HideContainers min,max
```

Script, named “HideContainers”, with parameters `min, max`:

```
Sequence1.ClipContainer[min-max].Opacity = 0
Sequence1.ClipContainer[min-max].Transform.Position 0,0,0
```

Since Indexers do not rely on run-time information for their evaluation, the Script Editor is able to offer rudimentary code completion support for members after the Indexer. This may lead to unexpected (and, frankly, wrong) suggestions, because for editing the Script Editor supplies the members of the first item that could be a possible match for the Indexer expression, i.e. in the example above the first Clip Container of the Sequence.

Inline Placeholders

Inline Placeholders were implemented to allow easy, dynamic access to objects, methods or properties as demonstrated in this example:

Assumptions: Project contains Sequence1 with ClipContainer1

```
Set p1 = x
Set p2 = Position
Set p3 = Position.X

Log Sequence1.ClipContainer1.Transform.Position.{p1}
Log Sequence1.ClipContainer1.Transform.{p2}.X
Log Sequence1.ClipContainer1.Transform.{p3}
```

Since Inline Placeholders are evaluated **"just in time" before executing each line**, they can use almost any kind of input, not just local or global variables, as the contrived and not recommended approach in this example demonstrates:

Assumptions: Project contains Sequence1 with ClipContainer1 and Variable1

```
Variable1 = Clip
Set i = 1
Set x = Container
Set y = 1

Log Sequence{Eval String(i, '.', Variable1, x, y)}.Opacity
```

In this example, the highlighted expression within the inline placeholder uses the `` `Eval` `` method which is evaluated as "`1.ClipContainer1`" and inserted into "`log Sequence{}.Opacity`" resulting in "`log Sequence1.ClipContainer1.Opacity`", which is a valid statement.

5.15.8.3 Loops

- In coding context "loops" are blocks of code that are executed several times, often in conjunction with a local variable whose value changes for each iteration.
- There are **three different types of loops** which will be described below. Further, additional features common to all three types will be explained.
- Each loop definition begins with one of the loop methods (see below), followed by one or several lines of code, followed by an `EndLoop` statement. Loops can also be nested.

Loop From To

The "Loop From To" construct allows defining a loop for iterating over a range of integer numbers.

Example1:

```
Loop X From 1 To 3
    Log X
Endloop
```

Output:

```
1
2
3
```

In this example a loop is defined with a code-block (in this case only one line) that will be executed three times; for each iteration a local variable named “X” will be provided with the values 1,2 and 3, respectively.
The “**Loop From To**“ construct **has three obligatory parts**: the ***custom name of local variable***, the ***designated integer value*** for the ***first*** and ***last***. The local variable will start with the first value.

Each iteration will be incremented (or decremented, if the first value is larger than the last) by 1.

Example2:

Assumptions: Project contains Sequence1 with several Clip Containers.

```
Set.Array containers = Sequence1.ClipContainers

Loop i From 0 To containers.MaxIndex
    Eval pos = i * 100

    Set cc = containers.ByIndex i

    cc.DynamicValue.Transform.Position.X = pos
    cc.DynamicValue.Transform.Position.Y = pos

    Log i
    Log cc
    Log pos
EndLoop
```

Output:

```
0
Blue.png
0
1
Red.png
100
2
Green.png
200
```

A walk-through of the code:

- An Array named `containers` is defined that contains all Clip Containers of Sequence1.

- A loop is started which iterates from 0 to the maximum index (= count – 1, because Arrays have a 0-based index), assigning the value to the local variable `i`.
- Then, for each iteration:
  - A new position is calculated and assigned to the local variable `pos`using the `eval` keyword for evaluating the mathematical expression.
  - A reference to a Clip Container is assigned to the local variable `cc` using the Array method `ByIndex`.
  - Using the `DynamicValue` member of the local variable `cc`, the X and Y position of the Clip Container are modified.
  - The values for `i`, `cc` and `pos` are logged.

LoopEach In

The "LoopEach In" construct allows defining a loop for iterating over enumerable values.
Consider the following example that repositions Clip Containers depending on their sizes:

Assumptions: Project contains Sequence1 with several Clip Containers.

```
Set.Array containers = Sequence1.ClipContainers

Set x = 0
Set y = 0

LoopEach cc In containers
    cc.DynamicValue.Transform.Position.X = x
    cc.DynamicValue.Transform.Position.Y = y

    x += cc.DynamicValue.MainContent.Size.Width
    y += cc.DynamicValue.MainContent.Size.Height
EndLoop
```

A walk-through of the code:

- An Array named `containers` is defined that contains all Clip Containers of Sequence1.
- Two local variables, `x` and `y` are defined for storing and calculating a position offset.
- A loop is started that iterates over all items in `containers` and assigns each item to the local variable `cc` for each iteration.
- Then, for each iteration, using the `DynamicValue` member of the local variable `cc`:
  - The X and Y position of the Clip Container are modified.
  - The offsets are updated by adding the Clip Container's width and height respectively.

The **"LoopEach In"** construct **consists of two parts**: the ***custom name of local variable*** and a ***reference to the enumerable values***.

LoopWhile

- The **“LoopWhile”** construct **does not offer a local variable** that is redefined for each iteration, in contrast to the other loop types.
- Instead, it simply repeats a code block as long as the specified condition is true.

Consider the following example that runs an endless loop as long as a Clip Container is visible:

Assumptions: Project contains a Sequence1 with a ClipContainer1

```
Set i = 0
LoopWhile Sequence1.ClipContainer1.Opacity > 0
    i += 1
    Log i
Endloop
```

The **“LoopWhile”** construct only **has one parameter which is evaluated as a boolean condition**.

> Be cautious of unintendedly created endless loops running undetected in the background, as they can consume considerate resources!

Common Loop Features

As shown in the examples above, every loop definition ends with an `EndLoop` statement. It will often be a requirement not to process all lines within the loop block for every iteration, depending on custom business logic.

There are two methods to address these requirements:

- **ExitLoop**: skips execution of any code following within the loop block and then exits the loop, aborting execution of any further iterations
- **ContinueLoop**: skips execution of any code following within the loop block and continues loop execution with the next iteration.

In addition to influencing the loop block, in which these methods are used, they can also impact potential outer loops. This is done by specifying how many levels are to be exited/continued; the default value is 1.

The following examples should help demonstrate the behavior of these methods. First, consider this nested loop construct that logs the values while iterating, **including an additional action, if `Col = 2`:**

```
Loop Row From 1 to 3
    Log.Values Row, StartRow

    Loop Col From -1 to -3
        Log.Values Col, StartCol
```

```
            If Col = 2 ? Log XXXXX

            Log.Values Col, EndCol
        Endloop

        Log.Values Row, EndRow
    Endloop
```

The negative range for the inner loop was chosen only because it makes comparing the outputs in the table below easier.

Now, imagine replacing the highlighted **additional action** with the following variants of ExitLoop and ContinueLoop.

The following table displays the output for the different substitutions. Empty lines have been inserted to help illustrate which lines were executed.

Log XXXXX	**ContinueLoop**	**ContinueLoop 2**	**ExitLoop**	**ExitLoop 2**
1, StartRow	1, StartRow	1, StartRow	1, StartRow	1, StartRow
-1, StartCol	-1, StartCol	-1, StartCol	-1, StartCol	-1, StartCol
-1, EndCol	-1, EndCol	-1, EndCol	-1, EndCol	-1, EndCol
-2, StartCol	-2, StartCol	-2, StartCol	-2, StartCol	-2, StartCol
XXXXX				
-2, EndCol				
-3, StartCol	-3, StartCol	-3, StartCol		
-3, EndCol	-3, EndCol	-3, EndCol		
1, EndRow	1, EndRow		1, EndRow	
2, StartRow	2, StartRow	2, StartRow	2, StartRow	
-1, StartCol	-1, StartCol	-1, StartCol	-1, StartCol	
-1, EndCol	-1, EndCol	-1, EndCol	-1, EndCol	
-2, StartCol	-2, StartCol	-2, StartCol	-2, StartCol	
XXXXX				
-2, EndCol				
-3, StartCol	-3, StartCol	-3, StartCol		
-3, EndCol	-3, EndCol	-3, EndCol		
2, EndRow	2, EndRow		2, EndRow	
3, StartRow	3, StartRow	3, StartRow	3, StartRow	
-1, StartCol	-1, StartCol	-1, StartCol	-1, StartCol	
-1, EndCol	-1, EndCol	-1, EndCol	-1, EndCol	
-2, StartCol	-2, StartCol	-2, StartCol	-2, StartCol	
XXXXX				
-2, EndCol				
-3, StartCol	-3, StartCol	-3, StartCol		
-3, EndCol	-3, EndCol	-3, EndCol		
3, EndRow	3, EndRow		3, EndRow	

Apart from terminating loop executions as described above, it is, of course, also possible to use the `return` statement to finish/abort the execution of the entire script.

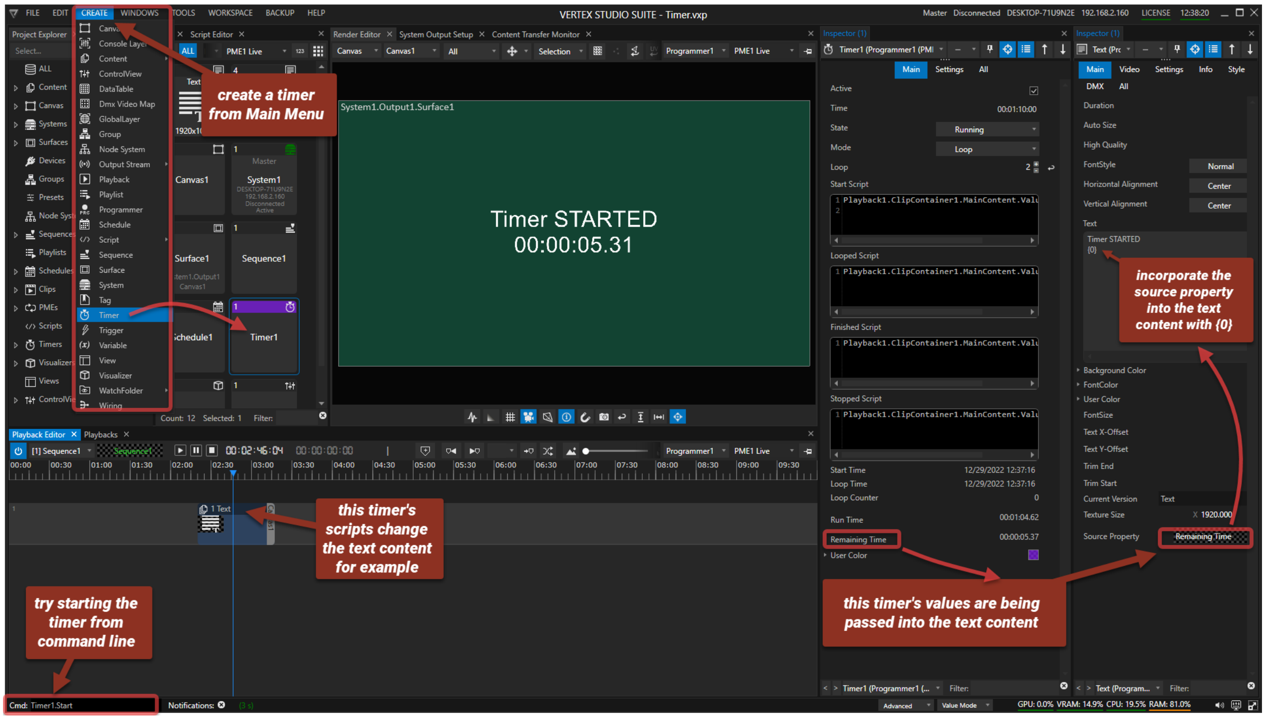
5.16 Timer

VERTEX's timer function allows the display of running and remaining time, as well as triggering 4 separate scripts by countdown:

- at the start of a timer
- once the timer is finished
- if the timer is set to restart the countdown in a loop
- for when the timer is stopped

An example for a possible application would be a museum setup, where visitors pass a triggering device that starts the timer prompting a cue or playback. Or a Clip Container's end script can trigger the start of a timer to tell the audience the time remaining until the next show during an intermission.

How It Works



create a timer from Main Menu

this timer's scripts change the text content for example

try starting the timer from command line

this timer's values are being passed into the text content

incorporate the source property into the text content with {0}

Cmd: Timer1.Start

Timer STARTED
00:00:05.31

Timer1 (Programmer1 (PMI

Active	☑
Time	00:01:10:00
State	Running
Mode	Loop
Loop	2
Start Script	1 Playback1.ClipContainer1.MainContent.Valu
Looped Script	1 Playback1.ClipContainer1.MainContent.Valu
Finished Script	1 Playback1.ClipContainer1.MainContent.Valu
Stopped Script	1 Playback1.ClipContainer1.MainContent.Valu
Start Time	12/29/2022 12:37:16
Loop Time	12/29/2022 12:37:16
Loop Counter	0
Run Time	00:01:04.62
Remaining Time	00:00:05.37

Text (Pro

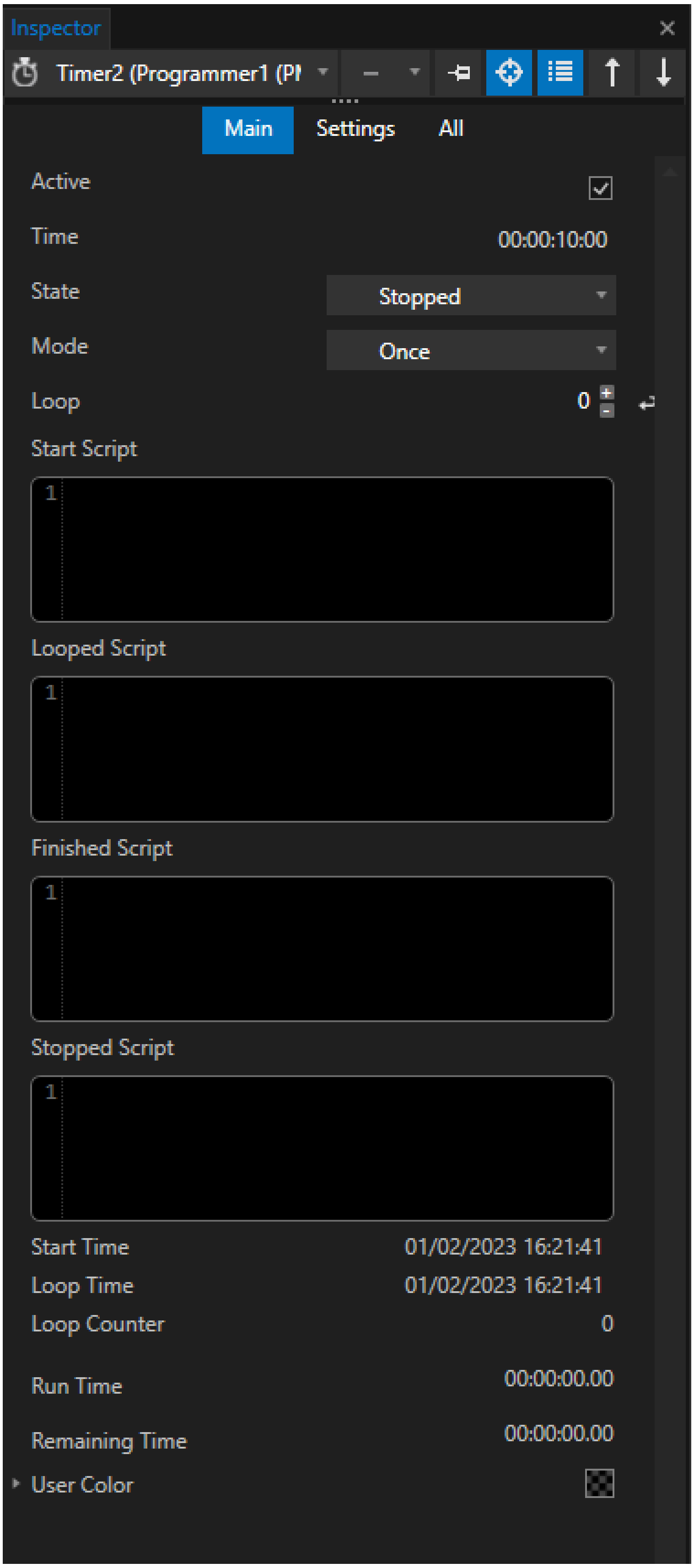
FontStyle	Normal
Horizontal Alignment	Center
Vertical Alignment	Center
Text	Timer STARTED {0}
Current Version	Text
Texture Size	X 1920.000
Source Property	Remaining Time

The example above explained:

- A **timer** is being **created** by going to *MAIN MENU > CREATE > TIMER.*
- Pin the timer to a new Inspector via the context menu (right click on the timer tile in Project Explorer).
- Create a **text content** (either *MAIN MENU > CREATE > CONTENT* or context menu on *Content* in Project Explorer).
- Go to the **timer's Inspector,** drag *Run Time* or *Remaining Time* and drop it into the **text content's Inspecor** *Source Property* field.
- Drag & Drop the text content into the Sequence and the timer will now be displayed as text content. If you wish to write additional text, it will override the source property display. Incorporate the value back into the text body by adding "*{0}" .*
- Create more text content to display all timer states from *Started (running)* to *Stopped.*
- Each timer-script in this example changes the text content of ClipContainer1 so that the displayed text will reflect the changed timer status (started, finished, etc.):
  Start Script: `Playback1.ClipContainer1.MainContent.Value = Content1` - text content says TIMER STARTED plus time display.
  Finished Script: `Playback1.ClipContainer1.MainContent.Value = Content2` - different text content says TIMER FINISHED plus time display.
- Start the timer with the command line: `Timer1.Start` or use this script command elsewhere- i.e. in a Control View Editor on a button.

Settings

In the **timer's Inspector**, the following settings are available:



Active ☑

Time 00:00:10:00

State Stopped

Mode Once

Loop 0

Start Script

Looped Script

Finished Script

Stopped Script

Start Time 01/02/2023 16:21:41

Loop Time 01/02/2023 16:21:41

Loop Counter 0

Run Time 00:00:00.00

Remaining Time 00:00:00.00

User Color

Active check box	enables / disables the timer.
Time	sets the duration of the countdown with a double-click on the digits.
State	drop-down menu automatically updates the current status of the timer and allows for manual changes as well. Possible timer states are: **Running**, **Paused**, **Finished** and **Stopped**. Changes in a timer's status will execute the timer's scripts.
Mode	has got two possible settings: **Once** (default) and **Loop.** If set to *Loop,* the timer will start again after it has finished counting down. ***Loop*** sets the number of times the cycle restarts.
Start Script	is executed at the start of the timer.
Looped Script	is executed at the beginning of each loop cycle.
Finished Script	is executed once the countdown is finished.
Stopped	is executed when the timer is stopped.
Start Time	captures date and time when the timer was last started.

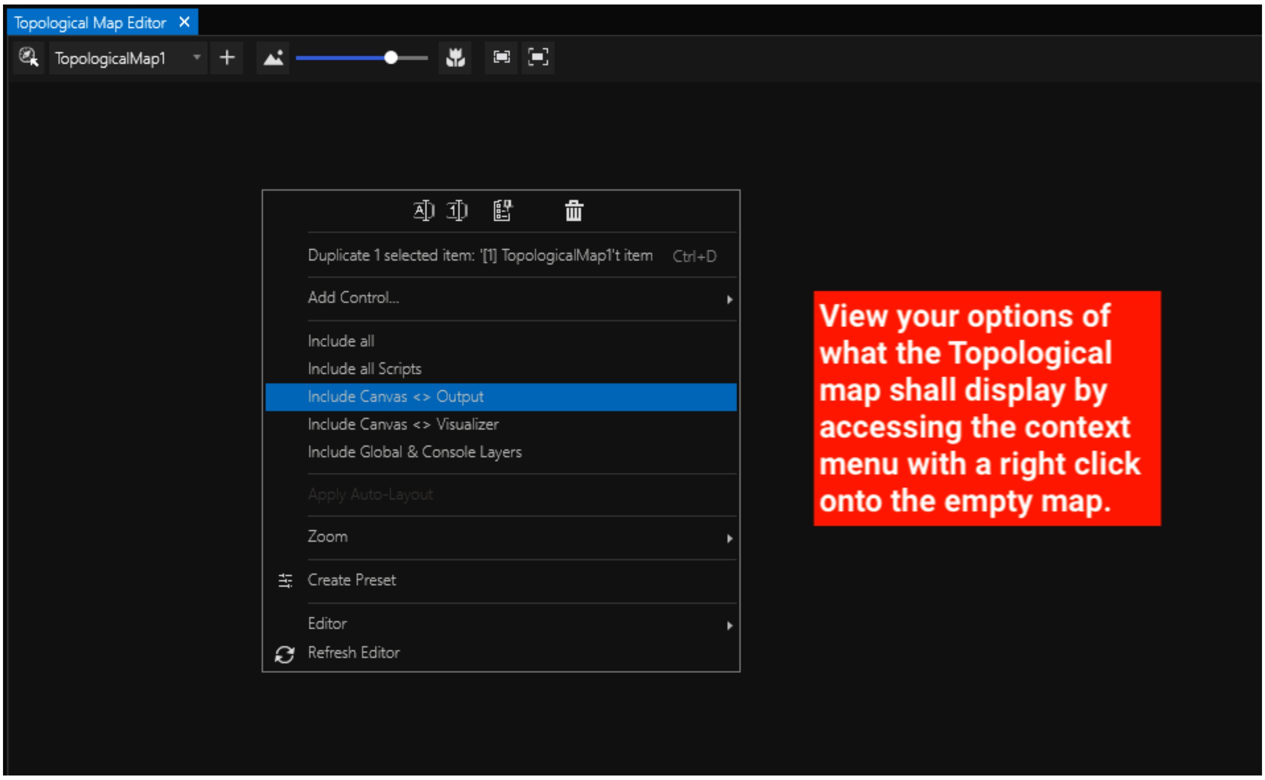
Loop Time	captures date and time when the last loop cycle was started.
Loop Counter	counts the number of loop cycles executed.
Run Time / Remaining Time	captures the current running /remaining time which **can be exported as a value** in scripts or be simply displayed in text content.
User Color	customizes the timer tile's color.

5.17 Topological Map

- Survey all Canvases, Surfaces, Screens and Outputs in your entire cluster with the help of a Topological Map
- Review any interconnections between all your project's Scripts
- Add labels, shapes and images to annotate your map

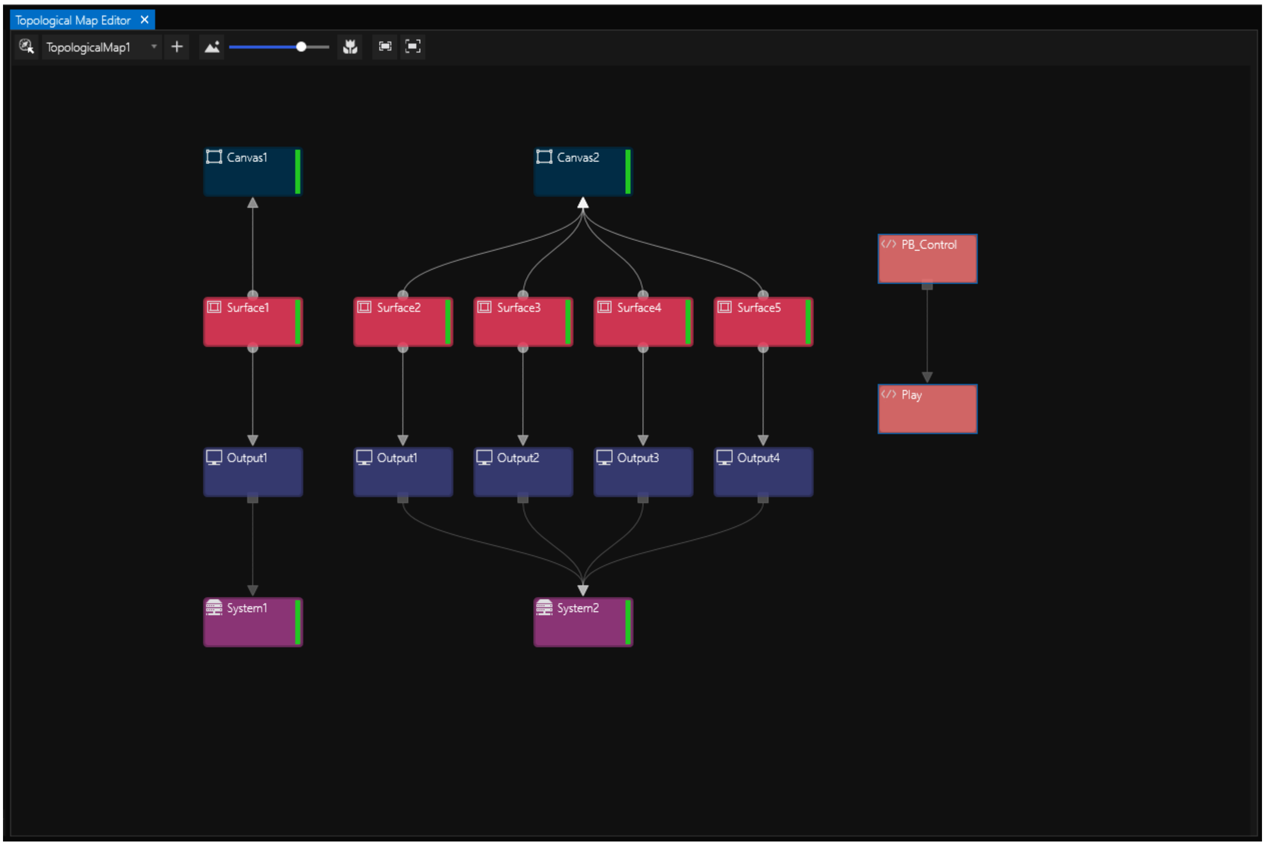
Create A Topological Map

Go to MAIN MENU > CREATE > Topological Map
The new item will appear in the Project Explorer.
View it in its editor window which can be accessed either via its context menu ...
... or by going to MAIN MENU > WINDOWS > Tools > Topological Map Editor.

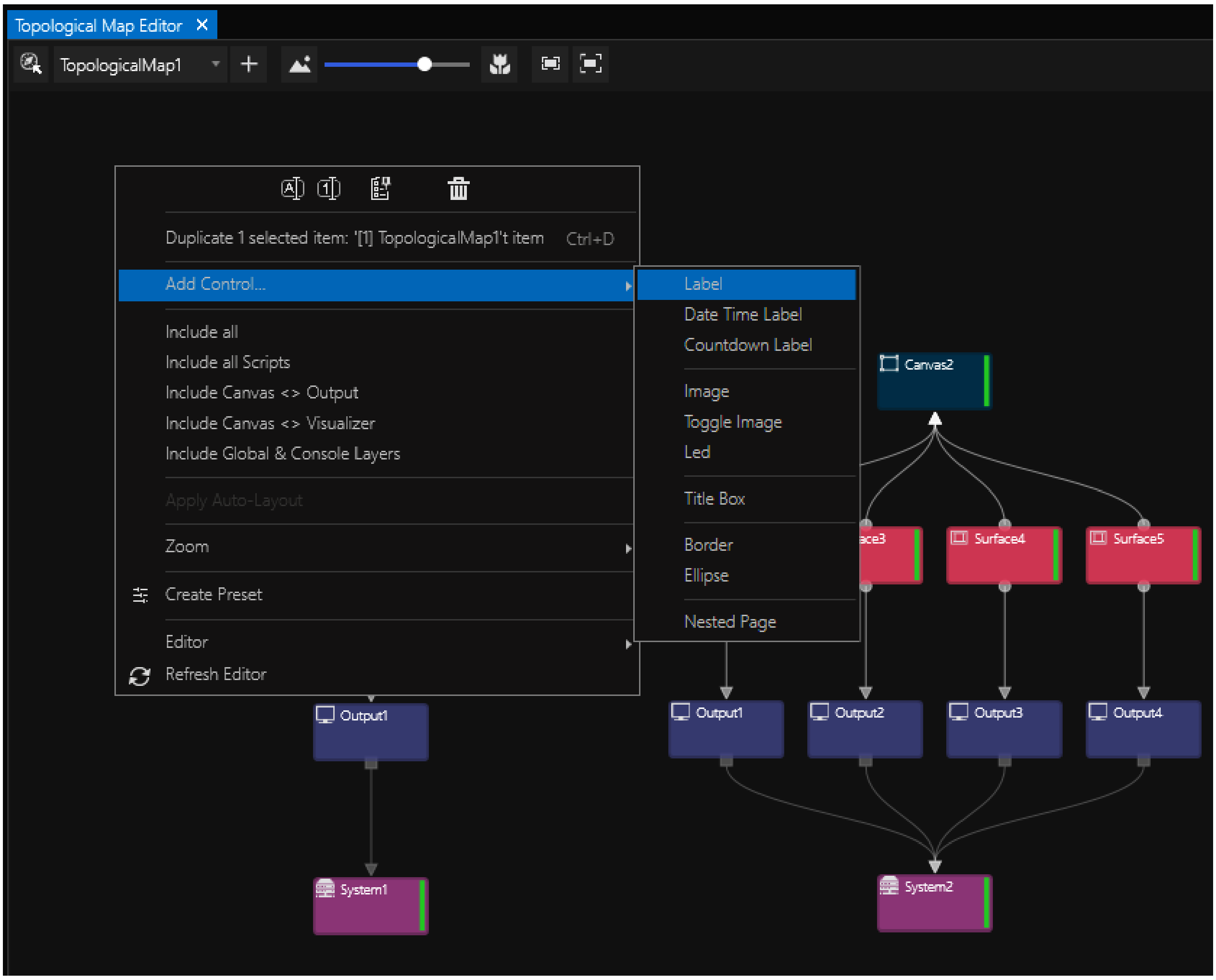


View your options of what the Topological map shall display by accessing the context menu with a right click onto the empty map.

Once you have decided what to include in your Topological Map, the window will be filled with a chart according to your choice:



Use the context menu again for adding controls such as labels, shapes and images:


Topological Map Editor ×
TopologicalMap1
Duplicate 1 selected item: '[1] TopologicalMap1't item Ctrl+D
Add Control...
Include all
Include all Scripts
Include Canvas <> Output
Include Canvas <> Visualizer
Include Global & Console Layers
Apply Auto-Layout
Zoom
Create Preset
Editor
Refresh Editor
Label
Date Time Label
Countdown Label
Image
Toggle Image
Led
Title Box
Border
Ellipse
Nested Page
Canvas2
ace3
Surface4
Surface5
Output1
Output1
Output2
Output3
Output4
System1
System2

5.18 SMPTE Timecode

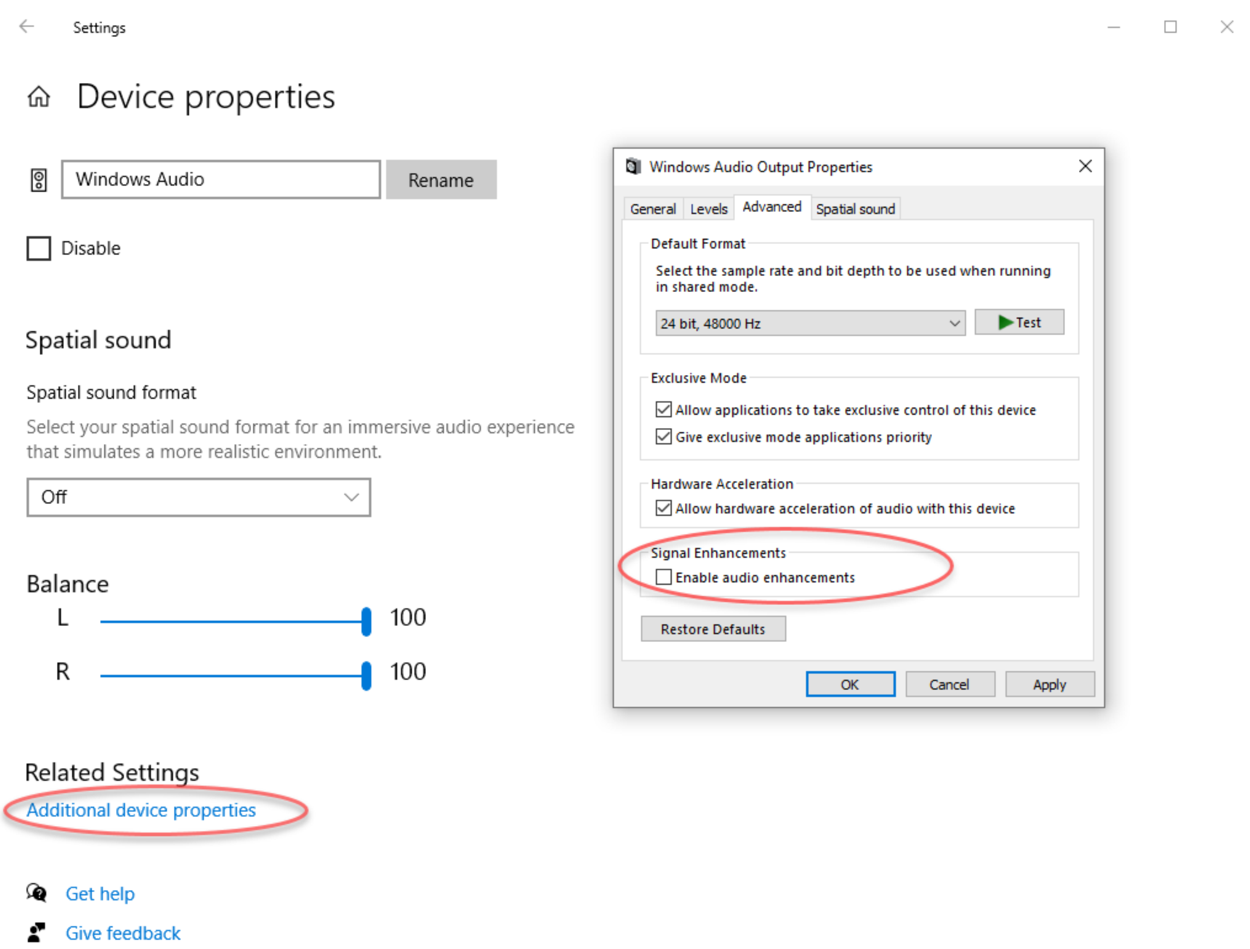
- ioversal's **SMPTE Timecode LTC** USB Interface is designed to receive or transmit timecode and is available through our website.
- Synchronize your playback to incoming timecode. VERTEX can resolve to both **longitudinal timecode (LTC)** and **MIDI timecode (MTC)**.
- Generating timecode with **SMPTE clip containers** out of your sequence has never been easier.
- The acronym *SMPTE* stands for *Society of Motion Picture and Television Engineers* and is a common synonym for timecode.

> **Timecode must always be processed on the Master System when working in Session Mode!** When working with multiple Systems, please connect your LTC & MTC I/O devices only to your Master System, as timecode processing is not supported for Session Members. The Master System will process all timecode and distribute synchronization to all Session Members.

LTC from "Audio" .WAV Files

Beware, if you cannot avoid some edge cases that may require working with timecode that comes from a .WAV file. While it is not impossible synching to LTC that is coming from an audio file and output, caution is well advised regarding the following:

- Sample rate & format needs to match from source to target. Meaning, if the source system's audio interface is running with 48kHz/ 16bit, the target system should do the same.
- Moreover, the .WAV file that contains LTC should be created in 48kHz/16bit as well.
- When routing LTC to your Windows audio outputs, go to *Windows Sound Settings > Device Properties > Additional Device Properties* and make sure to disable the *Signal Enhancements* of your output device.



Settings

Device properties

Windows Audio

☐ Disable

Spatial sound

Spatial sound format

Select your spatial sound format for an immersive audio experience that simulates a more realistic environment.

Off

Balance

L 100

R 100

Related Settings

Additional device properties

Get help

Give feedback

Windows Audio Output Properties

Default Format

Select the sample rate and bit depth to be used when running in shared mode.

24 bit, 48000 Hz

Exclusive Mode

☑ Allow applications to take exclusive control of this device

☑ Give exclusive mode applications priority

Hardware Acceleration

☑ Allow hardware acceleration of audio with this device

Signal Enhancements

☐ Enable audio enhancements

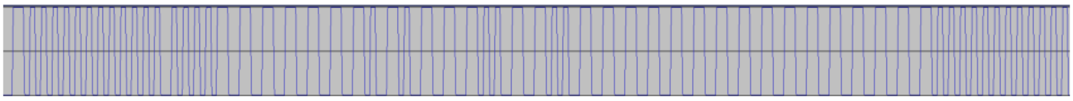


Fig. 1 shows what the waveform looks like generated by ioversal's SMPTE Timecode LTC USB Interface.

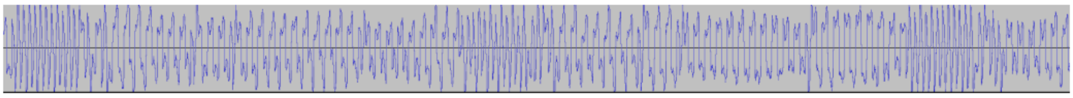


Fig. 2 shows a waveform from sampled audio input originating from timecode in a .WAV file.

Timecode Generator Waveform vs .WAV File Timecode

Bottom line: **the best** results in frame-tight **accuracy is achieved with** a special **timecode interface** or generator. Beware of the possible issues when working timecode via audio routes.

5.18.1 SMPTE IO Interface Configuration

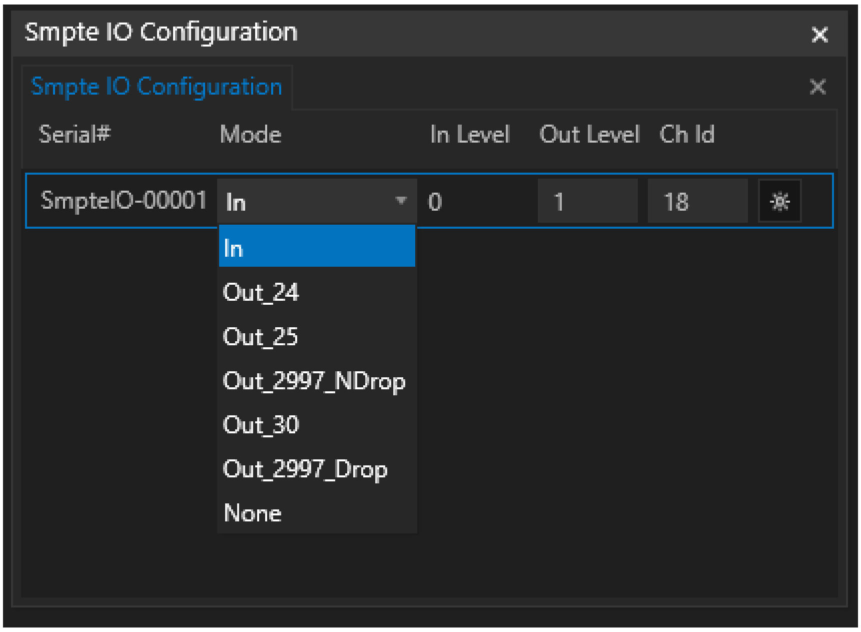
ioversal offers a driverless plug and play USB SMPTE interface to input or output SMPTE timecode:

Purchase a SMPTE LTC USB Interaface

You can buy a SMPTE IO directly on www.ioversal.com through one of our affiliates.

- ioversal's SMPTE interface needs to be configured before first use**.**
- Channel ID Settings are stored on the USB-Interface. Once configured for a project, the interface can be plugged and played.

1. go to *Main Menu -> Windows -> SMPTE IO Configuration*
2. connect the SMPTE IO interface to one of your local Systems USB ports and this interface will now be listed
3. go to *Mode* drop-down and select "***In"*** if you you want to receive timecode. For generating timecode, all ***Out*** options allow you to **choose the correct frame format**.
4. **set a Channel ID for the interface** - you will need this ID later to specify which interface sends or receives your timecode.
   When working with more than one SMPTE IO Interfaces, each interface needs a unique ID.



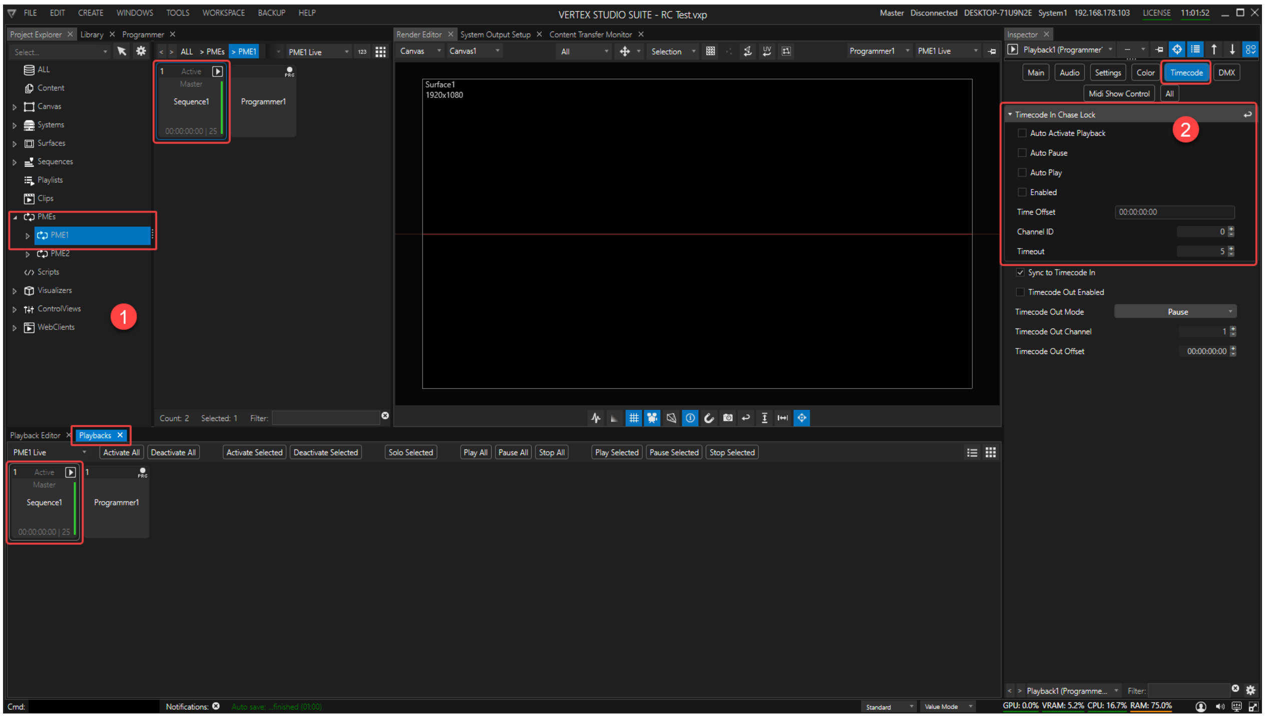
Serial#	Mode	In Level	Out Level	Ch Id
SmpteIO-00001	In	0	1	18

5.18.2 Receiving Timecode

Synchronize VERTEX with *Timecode In Chase Lock*

- This feature enables VERTEX to continuously chase external SMPTE LTC or MTC and lock to it.
- No need to synchronize your system clock to external SMPTE IO - your system can still sync to your favorite clock while the playback is resolving to external timecode.
- Super efficient and fast when running in session mode - session members will be able to re-synchronize to timecode changes in <1sec.

Important notice when running in session mode:
the **SMPTE IO USB interface** receiving external timecode **needs to be connected to** (and configured for) **the master system.**



Timecode In Chase Lock

☐ Auto Activate Playback
☐ Auto Pause
☐ Auto Play
☐ Enabled

Time Offset 00:00:00:00
Channel ID 0
Timeout 5

☑ Sync to Timecode In
☐ Timecode Out Enabled

Timecode Out Mode Pause
Timecode Out Channel 1
Timecode Out Offset 00:00:00:00

Let's walk you through the settings for ***Timecode In Chase Lock*** in 3 little steps:

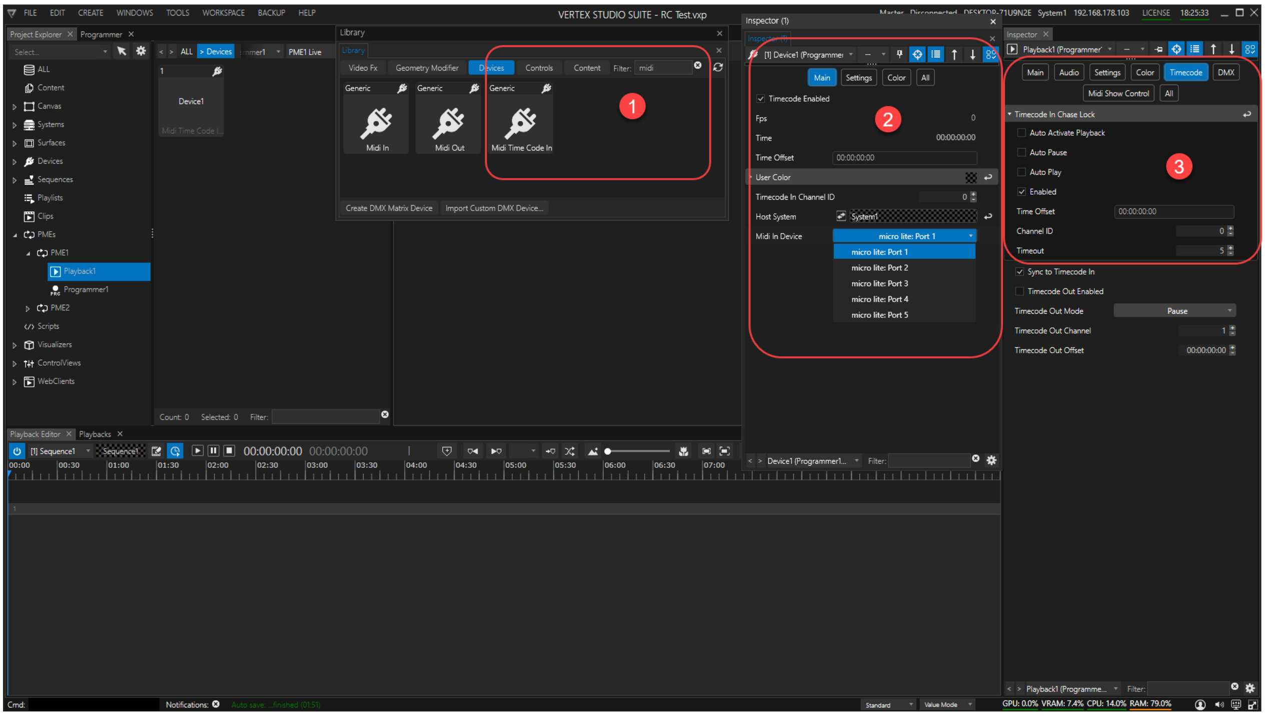
1) select your active playback either from Project Explorer -> PMEs or *Playback* tab next to the playback/ sequence editor

2) go to its *Inspector* and select the *Timecode* settings tab, where you open the parent item ***Timecode In Chase Lock.*** Here you can adjust the following settings:

- *Auto Activate Playback* - when enabled, a de-activated playback will respond to incoming timecode and automatically activate.enable / disable this feature
- enable automatic play & pause to ensure continuous playback after a jump in the timecode
- set a timecode offset
- select a Timecode channel ID corresponding to your interface.
- set a timeout delay (in milliseconds)

Synchronize your playback to external MIDI timecode (MTC):

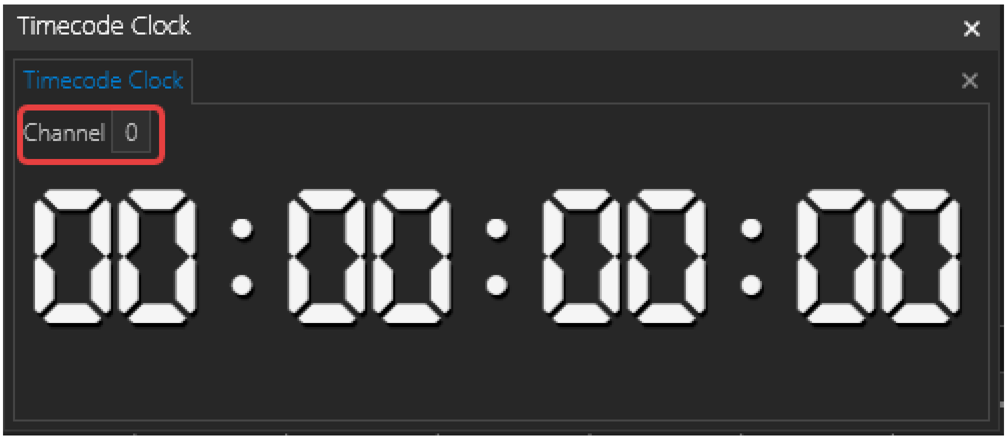
Outside of VERTEX, make sure that your external MTC signal is being routed to a **MIDI interface** connected to your system.



1. In VERTEX**, go to *Library > Devices***, type "MIDI" into the search filter and find a device called *MIDI Time Code In* and select *Add To Project* from the context menu.
2. **Inspect your *MIDI Time Code In - Device***, enable the checkbox *Timecode Enabled* and select your connected MIDI interface (including its correct MIDI port) from the dropdown.
3. **Inspect the Playback** you want to resolve to external MTC, go to the ***Timecode*** tab and open the properties ***Timecode In Chase Lock***, where you check *Enabled, Auto Play, Auto Pause.* Set the *Channel ID*.

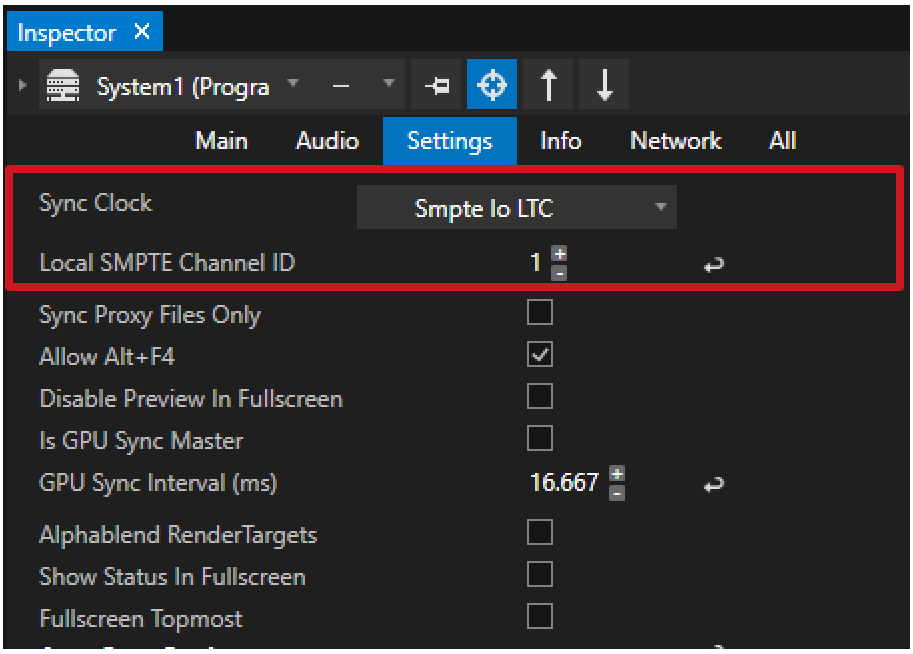
Since VERTEX can process multiple inputs of timecode simultaneously, make sure to set the correct *Timecode Channel ID*. For instance, you can synch Playback1 to LTC coming via SMPTE IO interface on SMPTE channel 0, and have Playback2 synch'ed to MTC coming via a MIDI interface and routed to SMPTE channel 1.

You can monitor incoming timecode with a scalable timecode clock. Go to MAIN MENU > WINDOWS > Timecode Clock and select the Timecode Channel you would like to monitor:



For legacy support and in special cases do the following to synch the entire system to external SMPTE LTC:

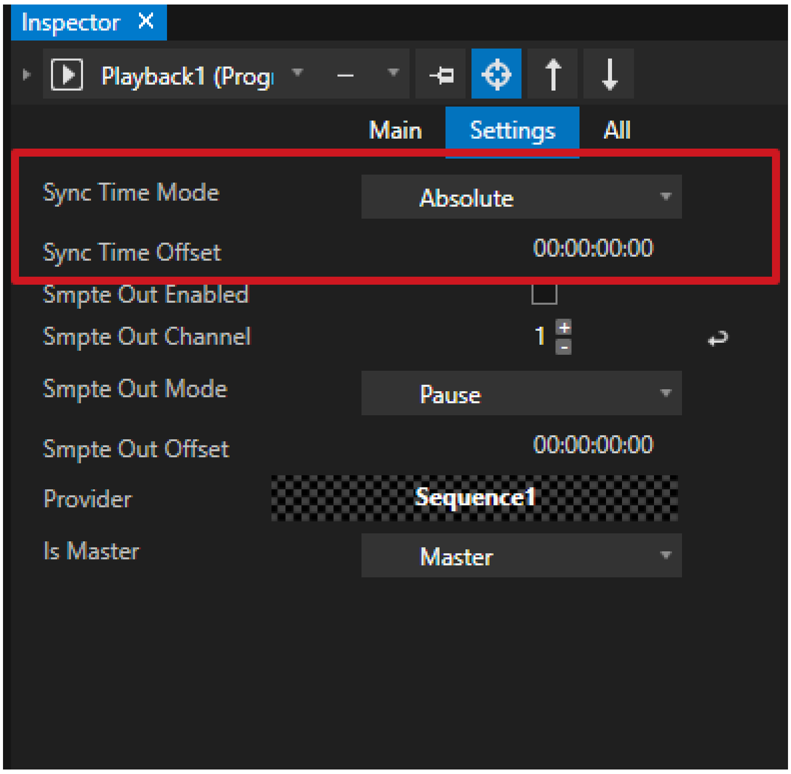
1. [Configure your SMPTE-IO]() Interface
   Set Interface to *In*, define a Channel ID
2. Inspect the System connected to SMPTE-IO USB Interface
3. Check if [Inspector Property Mode]() is set to "Advanced"
4. Go to Settings Tab
5. Set Sync Clock to "SMPTE IO LTC"



Sync Clock: Smpte Io LTC
Local SMPTE Channel ID: 1
Sync Proxy Files Only: □
Allow Alt+F4: ☑
Disable Preview In Fullscreen: □
Is GPU Sync Master: □
GPU Sync Interval (ms): 16.667
Alphablend RenderTargets: □
Show Status In Fullscreen: □
Fullscreen Topmost: □

6. Go to Project Explorer - navigate to PME Section there
7. Select a Playback as Child of PME LIVE and show Properties in Inspector
8. Set Sync Time Mode of this Playback to "Absolute"

9. Now this Playback is clocked by the Timecode from SMPTE-IO
10. Repeat steps 5-8 for every other Playback you want to lock to the incoming timecode



Sync Time Mode Absolute
Sync Time Offset 00:00:00:00
Smpte Out Enabled □
Smpte Out Channel 1
Smpte Out Mode Pause
Smpte Out Offset 00:00:00:00
Provider Sequence1
Is Master Master

A Playback's *Sync Time Mode*
The setting to *Absolute* can come in handy, if the playback needs to be synched to the actual time of the day.

Temporary Pre-Load

If you need to synchronize VERTEX to a **discontinuous** or **intermittent external timecode** that leads to playback **jumps right into clip containers**, keep in mind that the clip container's **pre-roll time cannot be executed**.
To still ensure that all necessary data is buffered and ready for a smooth playout, create a cue with the script command *TempPreLoad* before the jump. The clip container will be temporarily pre-loaded.

Example:

1. The external timecode pauses at *00:01:00.00* then continues at *00:01:30.00*
2. In VERTEX a clip container is lined up to start at *00:01:30.00*

3. Before the pause at *00:01:00.00, y*ou will need to create a cue with the scripted pre-load command:

```
Playback1.ClipContainer1.TempPreload
```

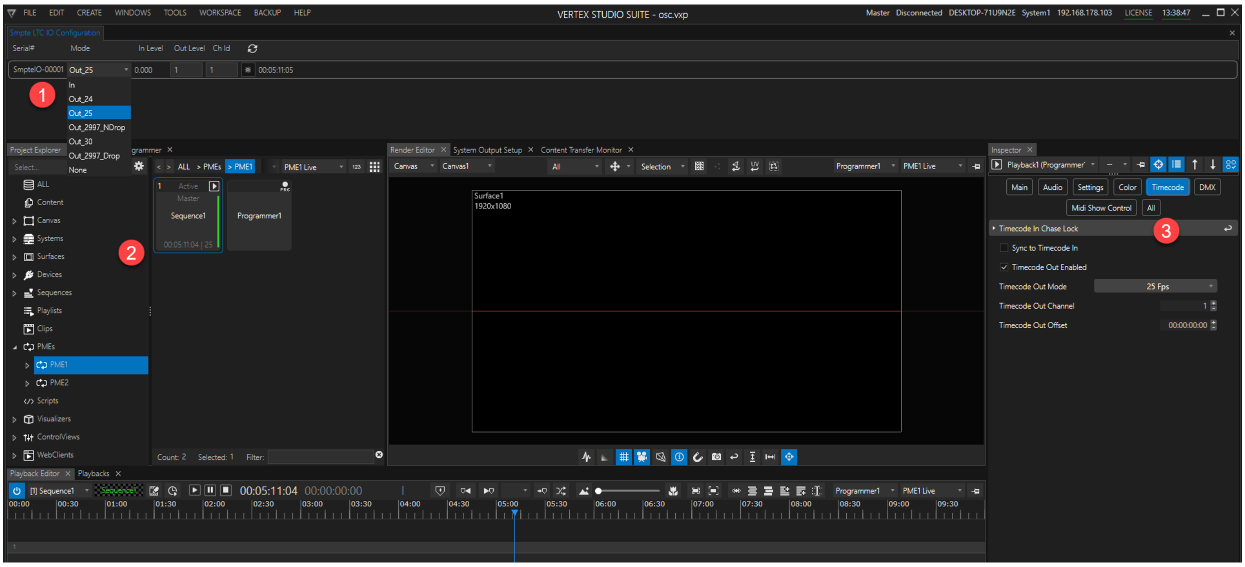
4. VERTEX will load all necessary data from *ClipContainer1* at *00:01:00.00* and have it ready for immediate playback after the jump.

5.18.3 Sending Timecode

There are **two options to transmit SMPTE timecode from VERTEX:**

1. Send timecode out from **a playback**
2. Generate SMPTE Timecode **with a SMPTE clip container**

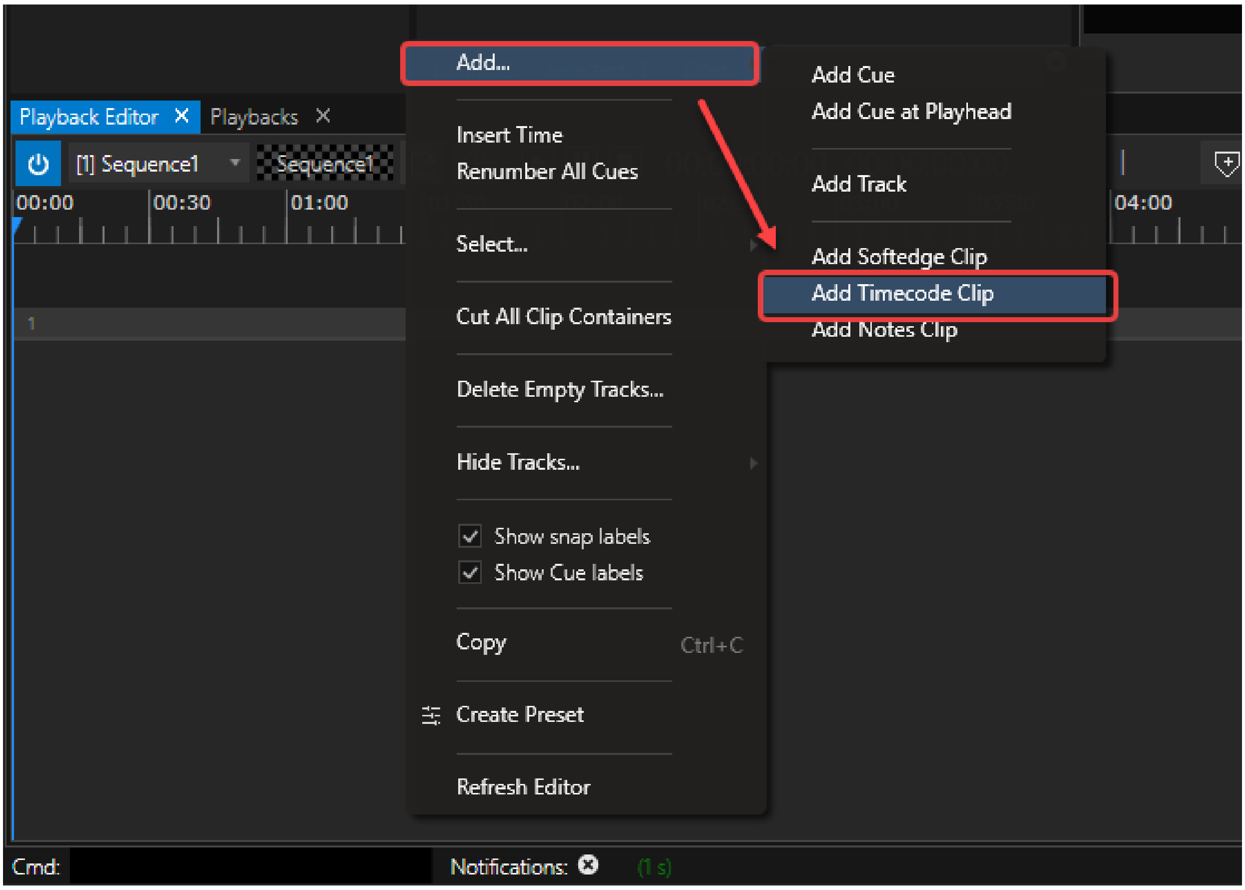
1) Send Timecode Out From A Playback



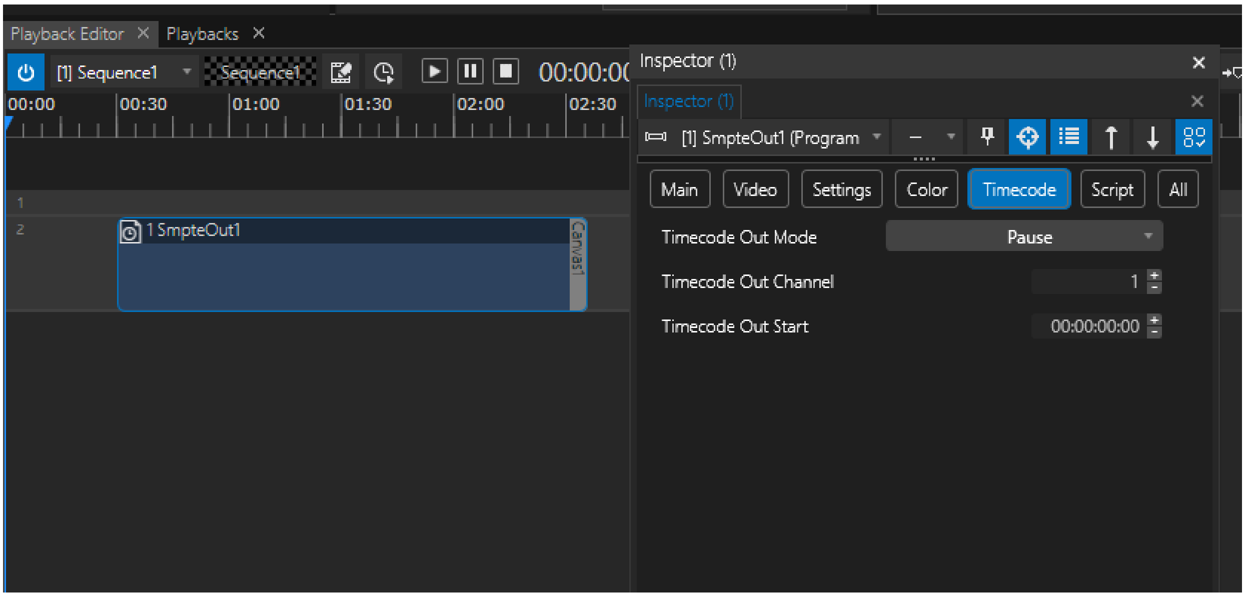
1. set your SMPTE IO Interface to transmitting timecode in the desired frame-rate-format from the *Mode* dropdown menu
2. go to *Project Explorer-> PMEs -> PME1* and select a Playback - for instance *Playback1*
3. Navigate to the *Inspector SMPTE tab,* **set *Timecode Out Enabled*** and **select a *Timecode Out Mode*** from the dropdown menu.
   The frame rate needs to match both your Sequence and the selected mode of your SMPTE IO interface.
   Also, set the ***Timecode Out Channel*** according to the configuration of your SMPTE IO interface.

2) Generate Timecode With A SMPTE Clip

Generating custom timecode from within a sequence has got the advantage, that you can program one or multiple points in your timeline when you would like VERTEX to send out timecode.
The flexibility granted by VERTEX' Sequence Editor even allows you to send out multiple timecodes at the same time of your sequence.



1. Plug in and configure your SMPTE IO Interface
2. Go to the Sequence Editor an open the context menu with a right-click on a track.
3. Choose *Add Timecode Clip*
4. a new clip container called *SmpteOut* will be created



Timecode Out Mode: Pause
Timecode Out Channel: 1
Timecode Out Start: 00:00:00:00

5. select the clip container and go to the *Timecode* tab in its inspector
6. set the desired Timecode Out Mode - corresponding to your SMPTE-IO interface.
7. the output channel needs to match the channel of your SMPTE-IO interface
8. Timecode Out Start sets the transmitted start time

5.19 Unreal Engine Plugin

- Vertex provides a **PlugIn for Epic's Unreal Engine** that enables users to **link and control properties** Unreal and VERTEX **bidirectionally**
- It is consisting of a **Sender and Receiver**.
- The **Beta Version** is available in the **download section of your VERTEX user account**: Go to www.ioversal.com and log in, then navigate to "**Support" or "My Support**" and select "Downloads".

The documentation for the advanced feature-set of VERTEX is in progress and will be updated step by step.
Until then: Please drop us an E-Mail with your "How-to-do-this-in-VERTEX" question to
vertex.support@rossvideo.com

5.20 Vertex Remote Script API

- the **VERTEX Script API** allows you to control VERTEX via third party applications or to built your own service that controls VERTEX
- The **API is based on TCP**
- The script server **listens to all VERTEX Script Commands**

Details and Settings

Protocol: TCP
Port: 50009
IP Address: Every VERTEX System in your Project has his own Script Server. Choose the IP from that System you want to connect to

Protocol: UDP
Port: 50019
IP Address: Every VERTEX System in your Project has his own Script Server. Choose the IP from that System you want to connect to

You can use all script commands and send them from external over the API to VERTEX
Script Commands **have to be terminated with a carriage return**
VERTEX terminates their answers also with a Carriage return.

> **Carriage return**
> Depends on how your external application works and the carriage return is translated.
> Could be \r, CR, or ASCI Code 0D (Hex) or 13(Decimal)

Examples

- The VERTEX API ist based on the VERTEX own Script Command Language
- Each Script Command that exists in your current VERTEX assembly version could be sent via TCP to the VERTEX API

- Read to Scripting Topic to learn more about how to write and use VERTEX Script Commands

Set Parameters

Opacity for Clip Container 1

```
ClipContainer1.Opacity.Value = 1\r
```

Mix Level of Playback1 in PME Live from to full - fade time should be 2 seconds

```
PME1.Playback1.MixLevel.FadeValue 1,5\r
```

Set Network Adapter for Art-Net™ on System 1 to "ETHERNET2"

```
System1.Settings.ArtNetAdapter.Value = ETHERNET2\r
```

Reset Video Inputs of System 2

```
System2.ResetVideoInputs\r
```

Start and stop actions

Start Playback1

```
Playback1.Play\r
```

Stop Playback 3

```
Playback2.Stop\r
```

Pause Playback3

```
Playback3.Pause\r
```

Run Script 1

```
Script1\r
```

Return Values

Return current Timecode of Playback 1

```
return Playback1.TimeCode.Value\r
```

Answer from VERTEX:

```
{"TimeSpan":"00:00:00","Days":0,"Hours":0,"Minutes":0,"Seconds":0,"Fram
es":0,"FPS":25.0,"TotalFrames":0}\r
```

Return a list of all Playbacks in current Project

```
return ListItems.Playback\r
```

Answer from VERTEX e.g.:

```
["Playback1","Playback2"]\r
```

Return Values Via HTTP

Please keep in mind that web browsers do not process TCP directly. To request a return via HTTP, please use the following syntax:

`http://192.168.178.666/VertexScript/return_script1`

Change Values

Show notes of clip container 6 in sequence 1 as Text of Textcontent item "Text1"

```
Text1.Settings.Text.Value =
Sequence1.ClipContainer6.UserProperties.Notes.Value\r
```

Fade Mix Level of Playback1 in PME Live to full - fade time should be 2 seconds

```
PME1.Playback1.MixLevel.FadeValue 1,5 \r5
```

Advanced Settings

Script Server Authentication

For each Systems script server, you can activate an authentication by username and passwort
Both can be set for each System in the Inspector.
When enabled, the script server only will execute scripts, when a valid authentication was sent before.

Syntax for Authentication

```
Authenticate:username,password\r

e.g.
Authenticate:Admin,1234\r
```

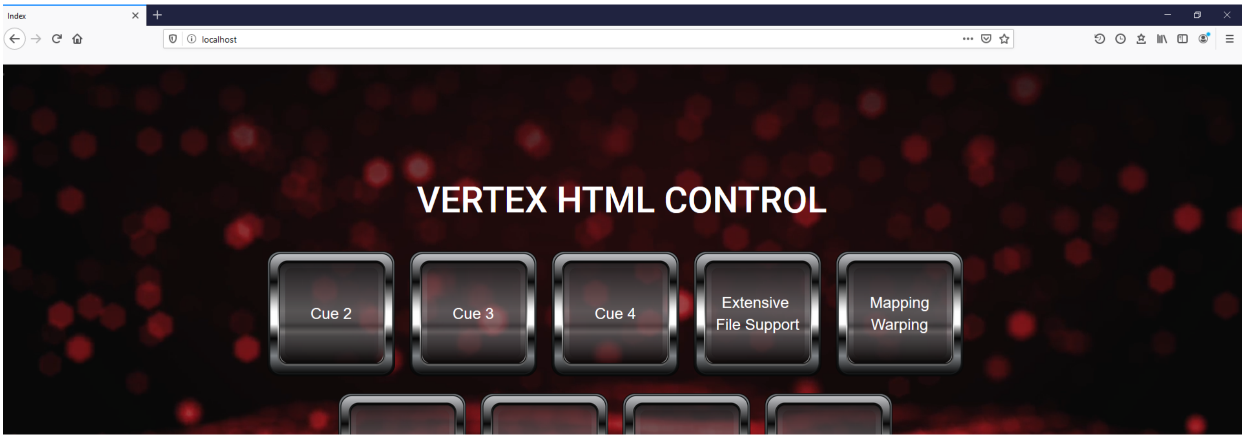
Doublecheck, that there is no blank space between the characters!

5.21 Webserver

5.21.1 HTML5 Server Custom Pages

- VERTEX comes up with an **integrated local HTML5 webserver** that can host a **HTML page.**
- Integrate **HTML5 based control panels** and trigger VERTEX with **script commands** with ease**.**
- To use the webserver **VERTEX has to be started as Windows administrator.**

Host Websites with Controls



VERTEX comes with a built in webserver that can host HTML5 Content with Javascript and CSS.
With this toolkit on board, you are able to write HTML5 based control panels that can send script commands via a HTML5 form and the post-method.
With the built in webserver you are able to control e.g. a VERTEX project with an tablet computer in the same network.

- HTML-Form
- Method: Post
- Action: Empty
- Element Name = "Script"
- Value ="[ScriptCommand]" eg Value="Playback1.Play"

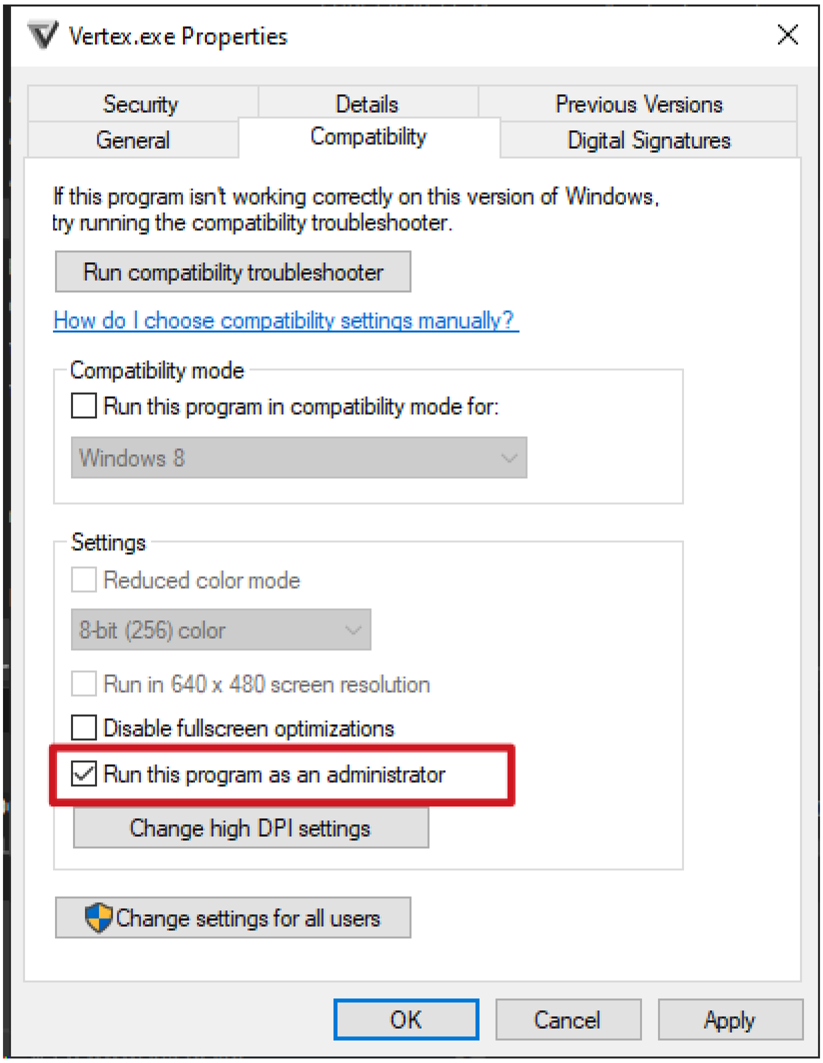
Simplified Example

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
</head>
<body>
<form action="/" method="post" target="">
<button name="Script" value="Playback1.Play">Play</button>
</form>
</body>
</html>
```

Workflow

1. Start VERTEX as Admin

The integrated webserver is the only functionality that requires that **VERTEX as application is started with administrator rights**.
To permanently start as admin, set the check mark for the Vertex.exe as in the picture below.



If this program isn't working correctly on this version of Windows, try running the compatibility troubleshooter.

How do I choose compatibility settings manually?

Compatibility mode

☐ Run this program in compatibility mode for:

Windows 8

Settings

☐ Reduced color mode

8-bit (256) color

☐ Run in 640 x 480 screen resolution

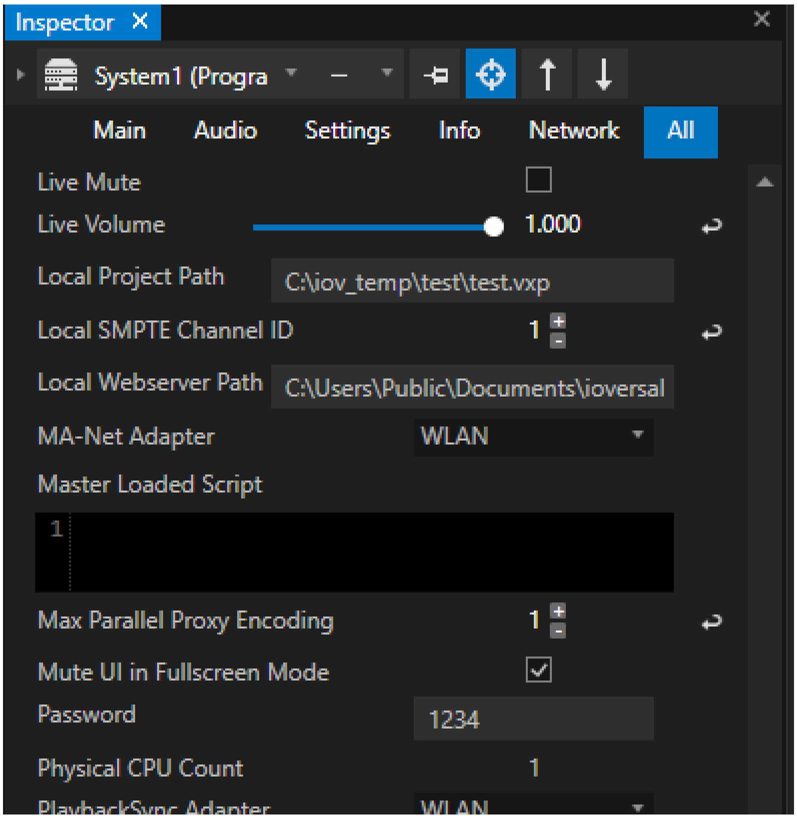
☐ Disable fullscreen optimizations

☑ Run this program as an administrator

2. Set Local Webserver Path for HTML Content

Set the local webserver path in your project and copy your HTML files into this path or use the **standard path** VERTEX sets for every project: C:\Users\Public\Documents\ioversal\Vertex\WebServerData

The webserver path can be changed for a system in the inspector. Select **"All" tab** there and scroll to "Local Webserver Path".



Live Mute □

Live Volume 1.000

Local Project Path C:\iov_temp\test\test.vxp

Local SMPTE Channel ID 1

Local Webserver Path C:\Users\Public\Documents\ioversal

MA-Net Adapter WLAN

Master Loaded Script

Max Parallel Proxy Encoding 1

Mute UI in Fullscreen Mode ☑

Password 1234

Physical CPU Count 1

PlaybackSync Adapter WLAN

3. Copy HTML Files into this Path

Copy your HTML files into this path.

4. Test with Local Browser

Enter "Localhost" into the address bar of your local webbrowser.
The HTML content should be loaded.

Firewall-Settings

If you plan to access the HTML website from another device in the same network, please set a firewall rule for TCP on port 80.

Inbound data receiving has to be allowed on this port.

How To Export Project Bundles

6 How To Export Project Bundles

A helpful tool for keeping track of content-related topics is our **Content Management Window** *(MAIN MENU > WINDOWS > Content > Content Management).*

Here you find a consolidated overview of all content files in your project with relevant information on:

- where the content comes from,
- where it is supposed to be,
- and where it actually is now.

Additionally, in this window you can reach the relevant tools to clean up content items (CleanUp) or change assignments.

Case A: Standalone SystemA to Standalone SystemB

Let's assume you have prepared the project on *SystemA* and want to transfer it to *SystemB* using a hard drive. The following sample project contains four content files, each given distinct characteristics to demonstrate different effects.

Content1 was imported from a unique directory, which will not be accessible on other systems via an absolute path. It also won't be found through the relative path since, relatively speaking, it won't be discoverable from the project file due to its deep location in the system-specific folder structure.

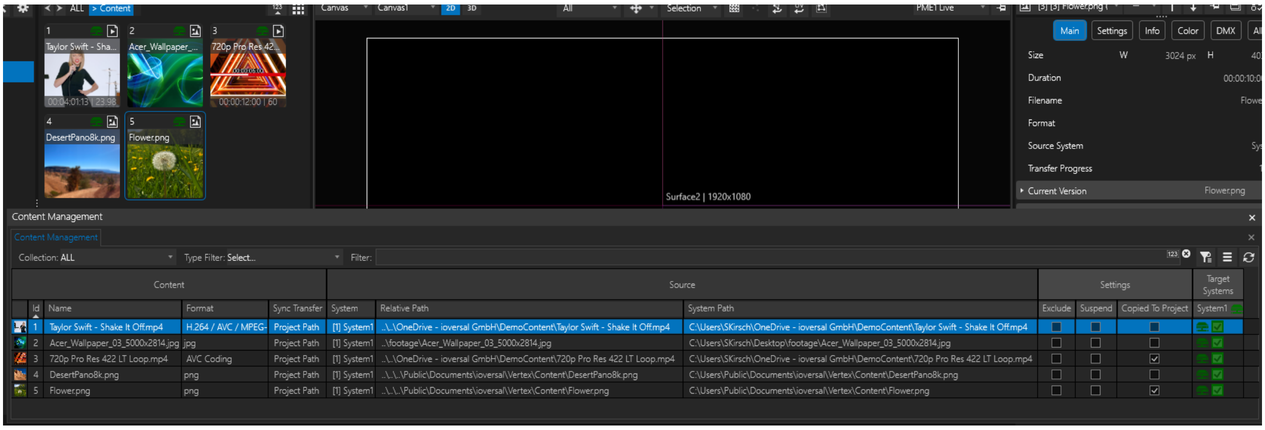
Content2 is also in a directory inaccessible by absolute path on other systems. However, in this case, the relative path from the ProjectFile is easily accessible. For example, the content is just one level higher in a "footage" folder. This offers a good chance that the file might be stored identically on *SystemB* relatively.

Content3, like *Content1*, is in a directory that won't exist on *SystemB* both absolutely and relatively. However, the "Copied to Project" property has been activated. This ensures the file is placed in the data directory of the project folder, thus easily archived together with the project. If the property is activated after import, the file is copied into the project directory if the source file is still available on the source system. A good use case here is importing files directly from an external hard drive. "Copy Content to Project Folder" can be activated in the "Content" category of the ProjectSettings and will apply to all subsequently imported contents from the moment of activation.

Content4 is in a directory that exists absolutely on both *SystemA* and *SystemB*. *SystemB* will find the file directly here.

Content5 is also in a directory existing on *SystemB* just like *Content4*. Additionally, "Copied to Project" is also enabled here.

Here is a screenshot showing the state in the Content Management Window on *SystemA:*



Content Management

Collection: ALL · Type Filter: Select... · Filter:

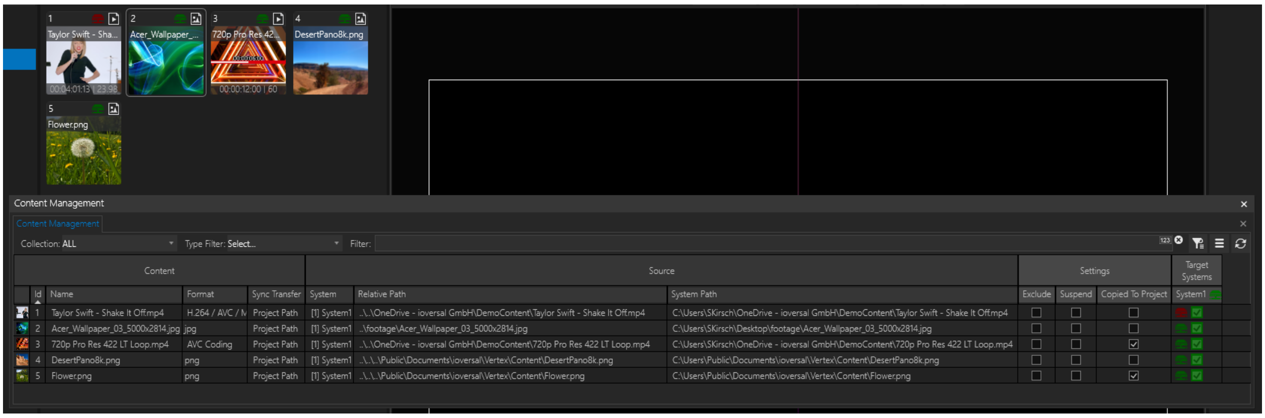
Content					Source			Settings			Target Systems
Id	Name	Format	Sync Transfer	System	Relative Path	System Path		Exclude	Suspend	Copied To Project	System1
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / MPEG-	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4		□	□	□	🟢 ☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpaper_03_5000x2814.jpg	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg		□	□	□	🟢 ☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4		□	□	☑	🟢 ☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png		□	□	□	🟢 ☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\Flower.png	C:\Users\Public\Documents\ioversal\Vertex\Content\Flower.png		□	□	☑	🟢 ☑

Opening a Vertex project file on another system:

When opening the project from *SystemA* on *SystemB*, Vertex will ask in a popup, "Do you want to map the Local System to the Master System?". By answering "Yes" to this, the project's Master System (originally *SystemA*) will now be reassigned to *SystemB*. If you were to answer "No", *SystemA* would remain Master in the project, and *SystemB* would only be added as a SessionMember. The latter method is well-suited for making offline changes to the project that you want to transfer back to the original Master later. Example: you have an event with stationary Vertex systems and want to continue working on the project off-site on your laptop - like from your hotel room in the evening.

The entire project directory, including project files and the Data folder with all subfolders, was copied to the hard drive. Additionally, the "footage" folder and the individual file "*Content1*" were also copied. *Content4* and *Content5* were not copied to the disk for transfer because they already exist on *SystemB* under the same path (in this case, the contents were from the Vertex Library). All files from the hard drive were placed in any directory on *SystemB*, without altering the relative folder structure.

The following screenshot shows the state after opening the project on *SystemB:*



Content Management

Collection: ALL · Type Filter: Select... · Filter:

Content					Source			Settings			Target Systems
Id	Name	Format	Sync Transfer	System	Relative Path	System Path		Exclude	Suspend	Copied To Project	System1
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / N	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4		□	□	□	🔴 ☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpaper_03_5000x2814.jpg	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg		□	□	□	🟢 ☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4		□	□	☑	🟢 ☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png		□	□	□	🟢 ☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\Flower.png	C:\Users\Public\Documents\ioversal\Vertex\Content\Flower.png		□	□	☑	🟢 ☑

- *Content1* could not be found for the reasons mentioned. The red icon in the Project Explorer content tile and in the Content Management Window indicates this.

However, *Content2 through 5* could be found directly on *SystemB:*

- *Content2* could not be found via the absolute path because it does not exist on *SystemB*. However, the file could be found via the relative path.
- *Content3* could neither be found via the absolute path nor the relative path. Since the file was transferred as a copy to the project directory on *SystemB* due to the activated Property "Copied to Project", Vertex was still able to find and assign the file in the project directory on *SystemB*.
- *Content4* could be found absolutely, relatively, and via CopiedToProject.
- *Content5* could be found both absolutely and relatively.

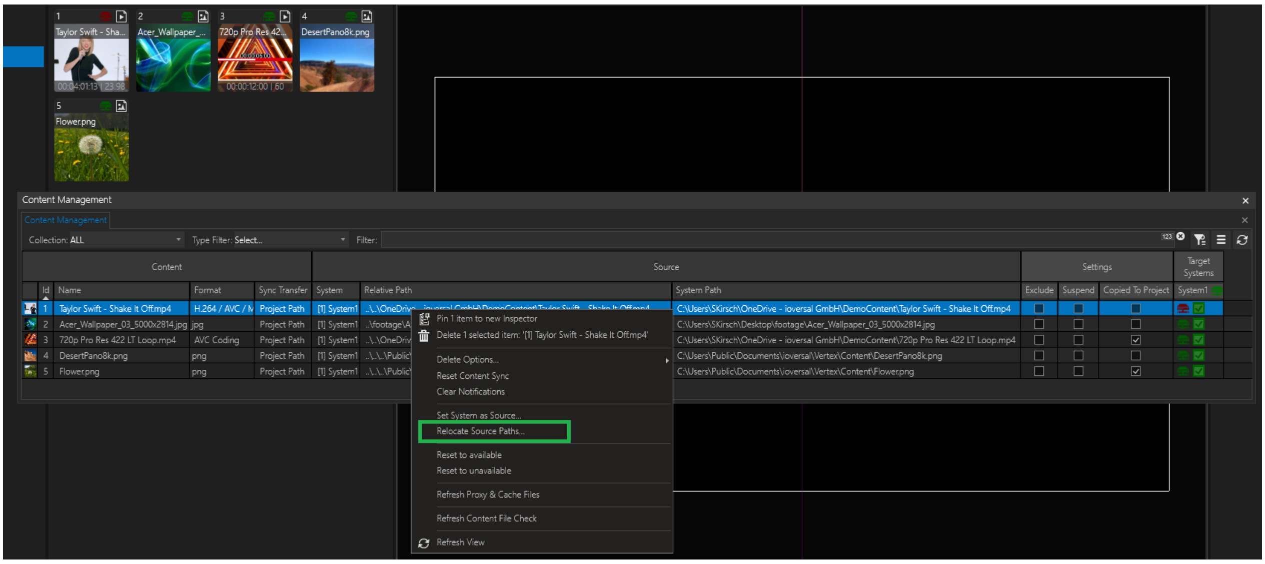
Content Path?

The question arises as to which particular file Vertex uses in case the file can be accessed via a relative path, system path (absolute path), and "Copied To Project" path:

The "Copied To Project" path takes precedence! Even if the file is available absolutely or relatively, the copy automatically stored in your Project folder's Data directory is used, provided that it exists and the "Copied To Project" property is activated in the content. If one of the two conditions is not met, Vertex will attempt to revert to the relative or absolute path.

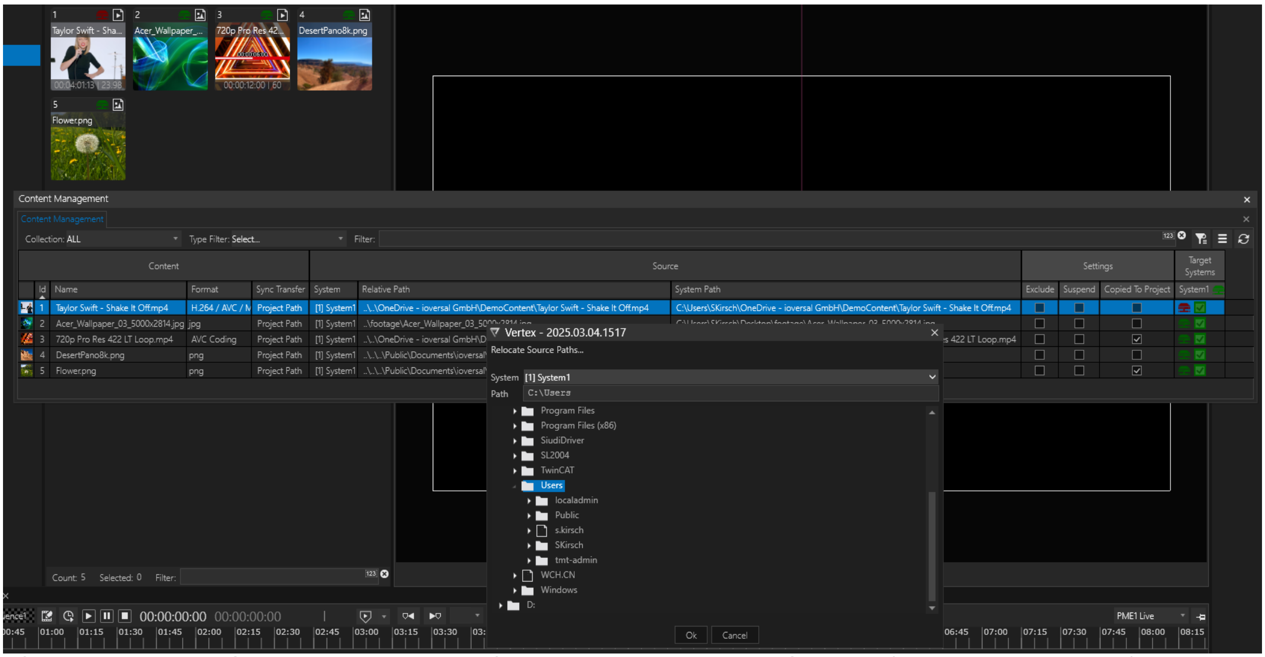
In the Project Settings, under the "Content" category, the property "Default File Source Mode" (currently only visible in Advanced Mode) can be used to define how or in what order Vertex searches for the file. Our default is "Original Path First," which refers to the "System Path" or the absolute path. Other options include "Project Path First" (relative path or local cache file on Session Members), "System Path Only," and "Project Path Only."

To establish the link to *Content1* on *SystemB* (the file was copied from the hard drive to *SystemB*, but the path is not yet known to Vertex), please use the *"Relocate Source Paths..."* option from the context menu:



Content				Source			Settings			Target Systems
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / M	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	□	□	□	🟥 ☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\A	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg	□	□	□	🟩 ☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDriv	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	□	□	☑	🟩 ☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	□	□	□	🟩 ☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\	C:\Users\Public\Documents\ioversal\Vertex\Content\Flower.png	□	□	☑	🟩 ☑

In this dialog, you can use the remote file explorer to select the appropriate folder on a system where the file can be found on *SystemB* (see screenshot). This dialog can also be executed on a multiple selection of contents, and it is not necessary to select the final folder. The system traverses through the folder tree starting from the selected folder until it finds a file with the desired file name to link it with the content in Vertex. After using the Relocate tool, a refresh of the view in the Content Management Window might be necessary. It may also take a few minutes for the red icon to turn green because this file check is performed in an internally specified cycle. This "Content File Check" can also be triggered manually via the context menu in the *Content Management Window* of a content by selecting "Refresh Content File Check."



Content Management

Collection: ALL   Type Filter: Select...   Filter:

	Content				Source			Settings			Target Systems
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / M	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	□	□	□	🟥 ☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpaper_03_5000x2814.jpg	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg	□	□	□	🟩 ☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\D	s 422 LT Loop.mp4	□	□	☑	🟩 ☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\		□	□	□	🟩 ☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\		□	□	☑	🟩 ☑

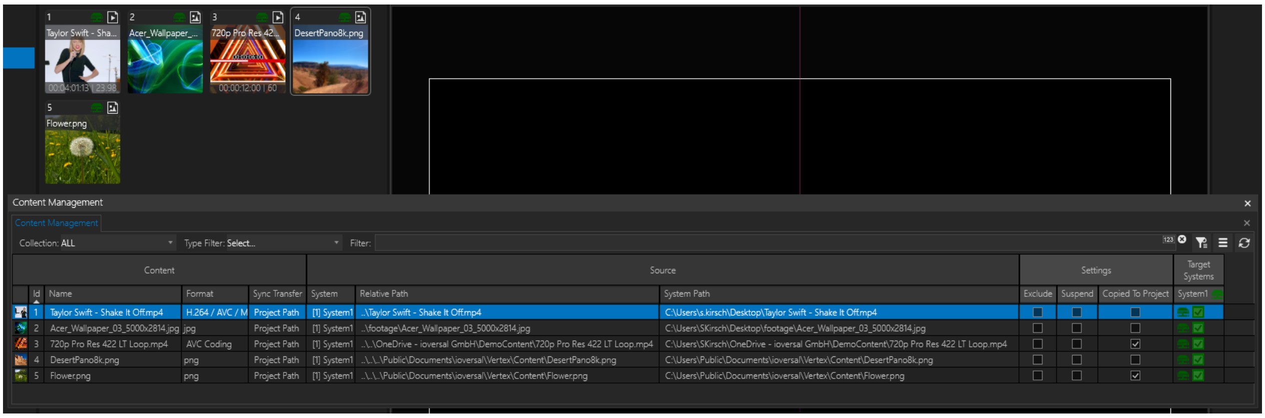
Vertex - 2025.03.04.1517

Relocate Source Paths...

System [1] System1

Path C:\Users

After using Relocate Source Path, all content files are linked correctly on SystemB (see screenshot below).



Content Management

Collection: ALL   Type Filter: Select...   Filter:

	Content				Source			Settings			Target Systems
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / M	Project Path	[1] System1	..\Taylor Swift - Shake It Off.mp4	C:\Users\s.kirsch\Desktop\Taylor Swift - Shake It Off.mp4	□	□	□	🟩 ☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpaper_03_5000x2814.jpg	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg	□	□	□	🟩 ☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	□	□	☑	🟩 ☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	□	□	□	🟩 ☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\Flower.png	C:\Users\Public\Documents\ioversal\Vertex\Content\Flower.png	□	□	☑	🟩 ☑

Summary:

You have different options to transfer the project and its content files:

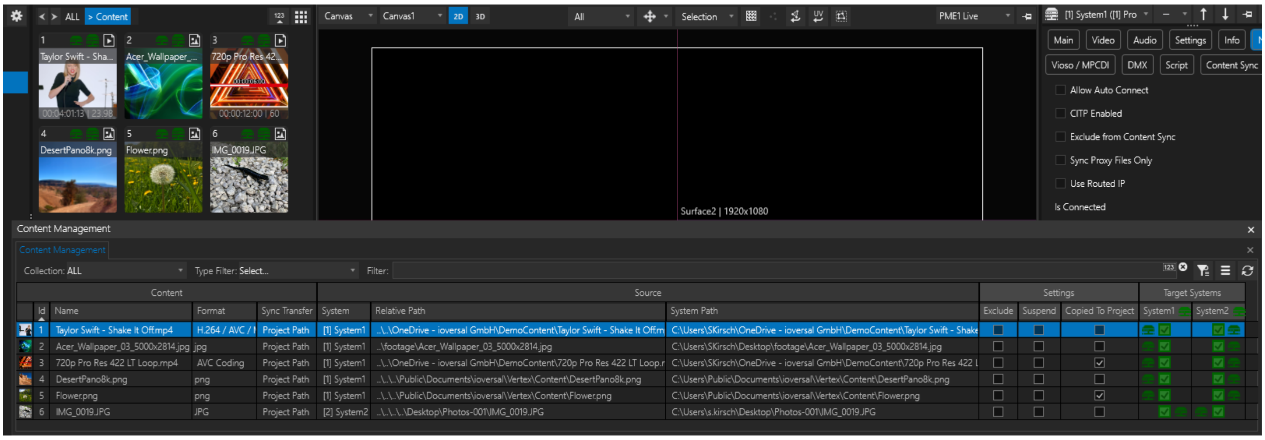
1) Place all contents on *SystemA* either in a directory that is also accessible as an absolute or relative path from the project storage location on *SystemB* and manually copy the content there.
2) Activate the "Copied To Project" property for contents on *SystemA* that are inaccessible from *SystemB* before saving, or activate the property at the beginning of the project on *SystemA* in the project settings.

3) Use "Relocate Source Path" after loading the project on *SystemB* to assign the new and correct paths to the contents

Case B: Archiving a project where content from different systems has been added to the project.

- Vertex allows content from any system to be added to the project.
- The corresponding "Source System" is therefore stored as a property in each content.
- These contents may not be available on all other systems, as targeted assignment of contents to systems was made with target systems, or some systems (e.g., operator laptops) may have received only proxy files or thumbnails, but not the original files.
- Therefore, it cannot be guaranteed that every system has every content at all times, meaning the complete project cannot be archived from every system at all times.

To correctly archive a project, it must be ensured that this export is carried out on a system where all content is available.
We recommend using the Master System for this and assigning the Master System as the "Source System" of each content:
The following screenshot outlines a case where *Content1-5* was imported from *System1*, while *Content6* was from *System2*.
There are also absolute and relative paths for *Content6* that match *System2* but not *System1*.



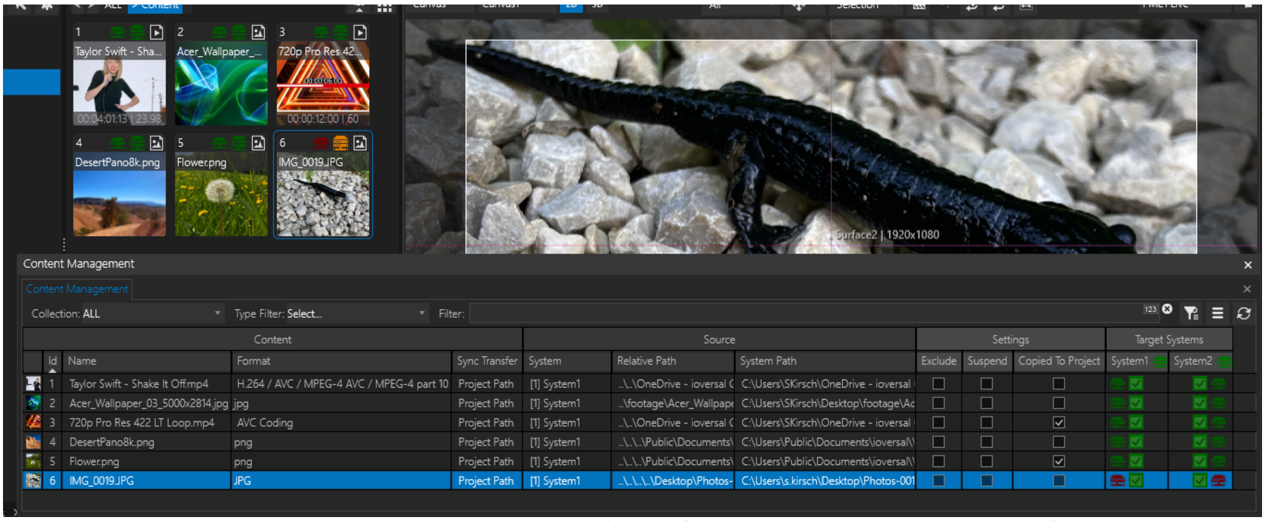
□ Allow Auto Connect
□ CITP Enabled
□ Exclude from Content Sync
□ Sync Proxy Files Only
□ Use Routed IP
Is Connected

Content Management

Collection: ALL   Type Filter: Select...   Filter:

Content				Source			Settings			Target Systems	
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1	System2
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / I	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.m	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake	□	□	□	☑	☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpaper_03_5000x2814.jpg	C:\Users\SKirsch\Desktop\footage\Acer_Wallpaper_03_5000x2814.jpg	□	□	□	☑	☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.r	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 L	□	□	☑	☑	☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	□	□	□	☑	☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\ioversal\Vertex\Content\Flower.png	C:\Users\Public\Documents\ioversal\Vertex\Content\Flower.png	□	□	☑	☑	☑
6	IMG_0019.JPG	JPG	Project Path	[2] System2	..\..\..\..\Desktop\Photos-001\IMG_0019.JPG	C:\Users\s.kirsch\Desktop\Photos-001\IMG_0019.JPG	□	□	□	☑	☑

Content6 is in the local project path of *System1* and can be rendered; however, this does not initially help establish the reference to the content. Assigning "System1" as the source system to the content means the file couldn't be linked with the content, as the given absolute and relative paths still refer to the file on System2 (see screenshot).

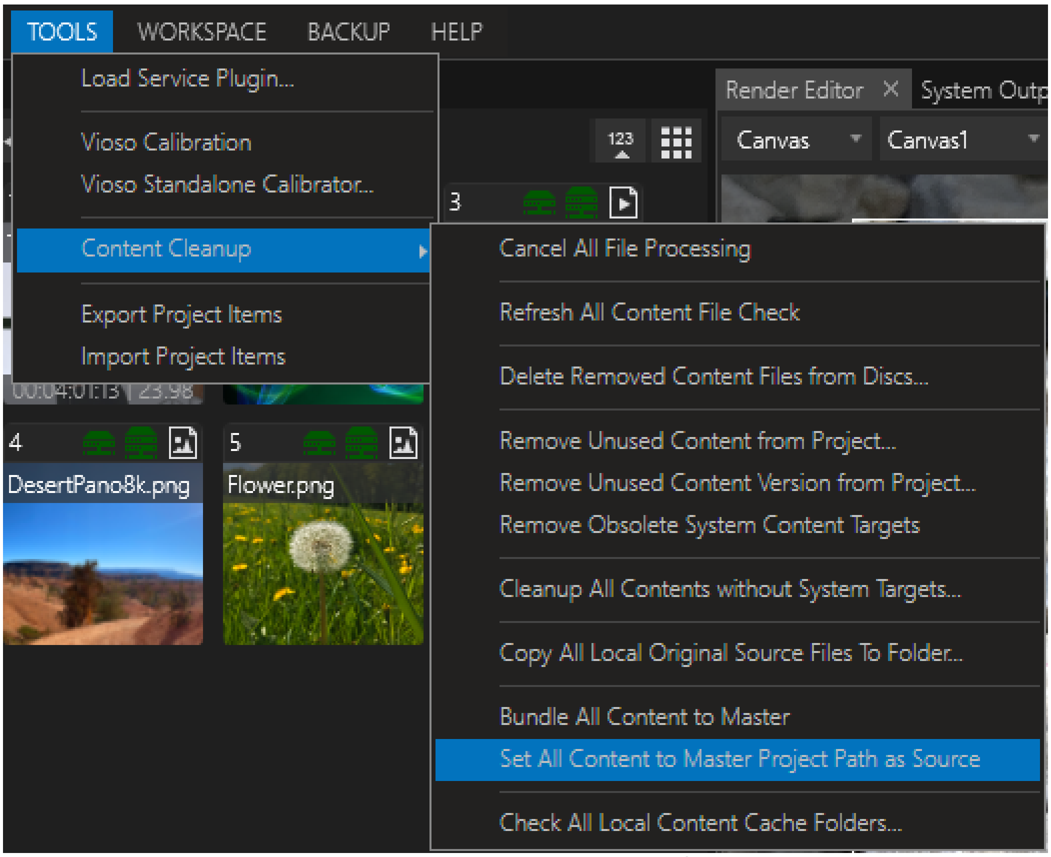


Content Management

Collection: ALL Type Filter: Select... Filter:

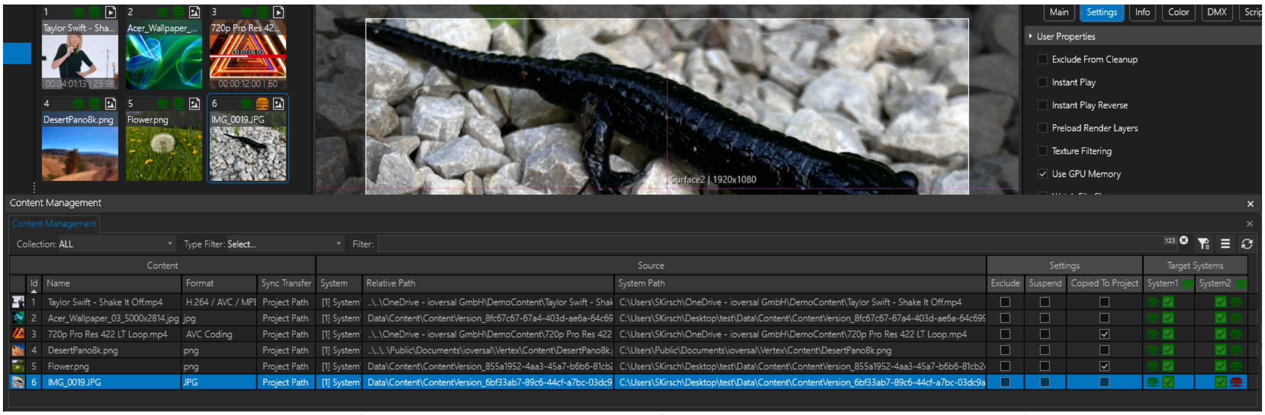
Content					Source			Settings			Target Systems	
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1	System2
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / MPEG-4 AVC / MPEG-4 part 10	Project Path	[1] System1	..\..\OneDrive - ioversal C	C:\Users\SKirsch\OneDrive - ioversal	□	□	□	☑	☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System1	..\footage\Acer_Wallpape	C:\Users\SKirsch\Desktop\footage\Ac	□	□	□	☑	☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System1	..\..\OneDrive - ioversal C	C:\Users\SKirsch\OneDrive - ioversal	□	□	☑	☑	☑
4	DesertPano8k.png	png	Project Path	[1] System1	..\..\..\Public\Documents\	C:\Users\Public\Documents\ioversal\	□	□	□	☑	☑
5	Flower.png	png	Project Path	[1] System1	..\..\..\Public\Documents\	C:\Users\Public\Documents\ioversal\	□	□	☑	☑	☑
6	IMG_0019.JPG	JPG	Project Path	[1] System1	..\..\..\..\Desktop\Photos-	C:\Users\s.kirsch\Desktop\Photos-001	□	□	□	☑	☑

To correctly resolve these paths, you can now execute "Set All Content to Master Project Path as Source" MAIN MENU >TOOLS > Content Cleanup (see screenshot).



TOOLS
WORKSPACE
BACKUP
HELP
Load Service Plugin...
Vioso Calibration
Vioso Standalone Calibrator...
Content Cleanup
Export Project Items
Import Project Items
Render Editor
System Outp
123
Canvas
Canvas1
3
00:04:01:13 | 23.98
4
DesertPano8k.png
5
Flower.png
Cancel All File Processing
Refresh All Content File Check
Delete Removed Content Files from Discs...
Remove Unused Content from Project...
Remove Unused Content Version from Project...
Remove Obsolete System Content Targets
Cleanup All Contents without System Targets...
Copy All Local Original Source Files To Folder...
Bundle All Content to Master
Set All Content to Master Project Path as Source
Check All Local Content Cache Folders...

As a result, content items are now automatically linked with the files stored in the Master's local cache folder, provided these match the original file in resolution and quality (see screenshot).



User Properties

- □ Exclude From Cleanup
- □ Instant Play
- □ Instant Play Reverse
- □ Preload Render Layers
- □ Texture Filtering
- ☑ Use GPU Memory

Content Management

Collection: ALL Type Filter: Select... Filter:

Content				Source			Settings			Target Systems	
Id	Name	Format	Sync Transfer	System	Relative Path	System Path	Exclude	Suspend	Copied To Project	System1	System2
1	Taylor Swift - Shake It Off.mp4	H.264 / AVC / MPE	Project Path	[1] System	..\..\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shak	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\Taylor Swift - Shake It Off.mp4	□	□	□	☑	☑
2	Acer_Wallpaper_03_5000x2814.jpg	jpg	Project Path	[1] System	Data\Content\ContentVersion_8fc67c67-67a4-403d-ae6a-64c69	C:\Users\SKirsch\Desktop\test\Data\Content\ContentVersion_8fc67c67-67a4-403d-ae6a-64c69	□	□	□	☑	☑
3	720p Pro Res 422 LT Loop.mp4	AVC Coding	Project Path	[1] System	..\..\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422	C:\Users\SKirsch\OneDrive - ioversal GmbH\DemoContent\720p Pro Res 422 LT Loop.mp4	□	□	☑	☑	☑
4	DesertPano8k.png	png	Project Path	[1] System	..\..\..\Public\Documents\ioversal\Vertex\Content\DesertPano8k.	C:\Users\Public\Documents\ioversal\Vertex\Content\DesertPano8k.png	□	□	□	☑	☑
5	Flower.png	png	Project Path	[1] System	Data\Content\ContentVersion_855a1952-4aa3-45a7-b6b6-81cb2	C:\Users\SKirsch\Desktop\test\Data\Content\ContentVersion_855a1952-4aa3-45a7-b6b6-81cb2	□	□	☑	☑	☑
6	IMG_0019.JPG	JPG	Project Path	[1] System	Data\Content\ContentVersion_6bf33ab7-89c6-44cf-a7bc-03dc9	C:\Users\SKirsch\Desktop\test\Data\Content\ContentVersion_6bf33ab7-89c6-44cf-a7bc-03dc9a	□	□	□	☑	☑

You may optionally activate the "Copied To Project" property for all content items to ensure the files are included in the project folder's Data directory.

Alternatively, decide to manually archive contents that may still be stored in other directories along with the project. However, care must be taken to ensure the correct relative folder structure and reachability of the file from the project's file location.

Miscellaneous

7 Miscellaneous

- Collection point for helpful topics, additional information and miscellaneous issues

List of Script Commands

A list of all Script Commands

VERTEX Data Formats and File Suffixes

Get an overview of all file formats that are used in or created by VERTEX

Keyboard Shortcuts

Information about access to keyboard shortcuts

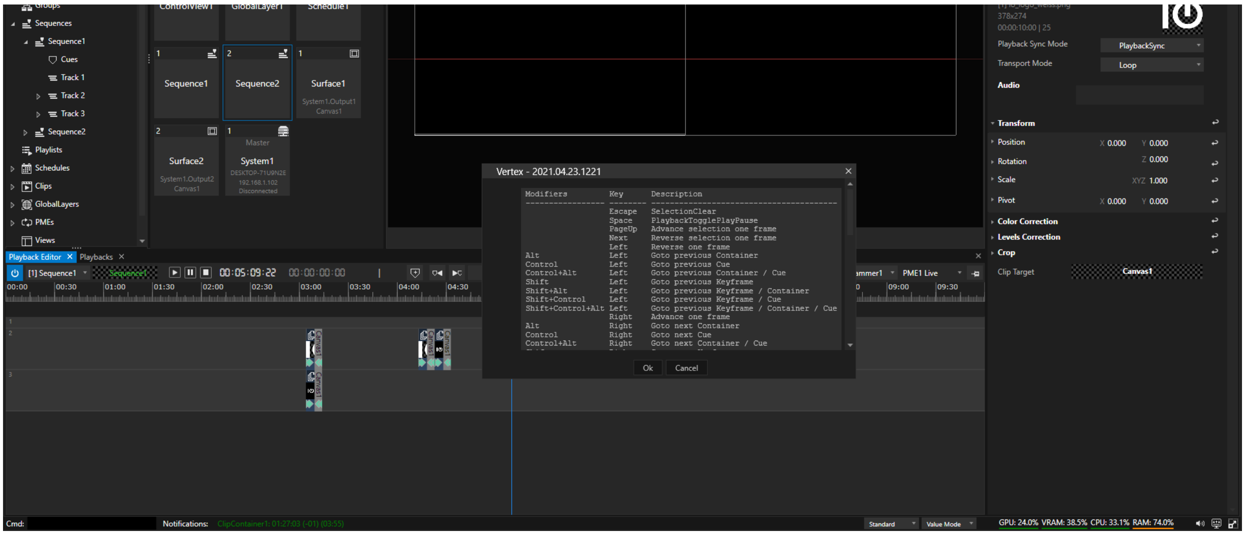
7.1 VERTEX Data Formats and File Suffixes

Quick Overview about the data formats and file extensions that are used in or created by VERTEX:

File extension	Usage	Description
.vxp	**VERTEX Project File**	Your VERTEX project is saved as Project File by default. This file includes all of your project data and settings
.vxdi	**VERTEX Device**	This file contains all information and possible control settings about an 3rd Party device, e.g. Matrix switcher, Projectors or DMX Devices
.vxdx	**VERTEX Device (encrypted)**	Same like .vxdi, but encrypted and protected. Library elements that come with VERTEX are encrypted and protected against Copy.
.vas	**VERTEX Autosave File**	Project File that is located into subfolder "_bak" into your Project Folder. VERTEX autosaves Project Files with this file suffix.To recover a Project File, rename this File to .vxp again or just open the file with VERTEX.
.vwf	**Vioso Warping File**	This file contains all warping information for a Surface. For each of your selected Surfaces one Vioso Warping Files should be generated.
.sps	**Vioso Project File**	contains all information on displays and warping - all calibration data is stored there.
.iovi	**ioversal image sequence format**	Proprietary format for image sequences.Selectable option during image sequence import. Keeps all data from original file format but saves the picture information in an optimized internal order to guaranty the best performance for image sequence playback

7.2 Keyboard Shortcuts

- Each editor window in VERTEX has got a varying set of shortcuts that are **automatically created and updated**.
- **Press Shift-F1** to open a list of shortcuts corresponding to the current window/ editor in focus.



Vertex - 2021.04.23.1221

```
Modifiers         Key      Description
----------------- -------- ----------------------------------------
                  Escape   SelectionClear
                  Space    PlaybackTogglePlayPause
                  PageUp   Advance selection one frame
                  Next     Reverse selection one frame
                  Left     Reverse one frame
Alt               Left     Goto previous Container
Control           Left     Goto previous Cue
Control+Alt       Left     Goto previous Container / Cue
Shift             Left     Goto previous Keyframe
Shift+Alt         Left     Goto previous Keyframe / Container
Shift+Control     Left     Goto previous Keyframe / Cue
Shift+Control+Alt Left     Goto previous Keyframe / Container / Cue
                  Right    Advance one frame
Alt               Right    Goto next Container
Control           Right    Goto next Cue
Control+Alt       Right    Goto next Container / Cue
```

Focus Playback Editor and Press F1 Key.
A window with all available shortcuts for your Sequence opens.

VERTEX NDI Streamer

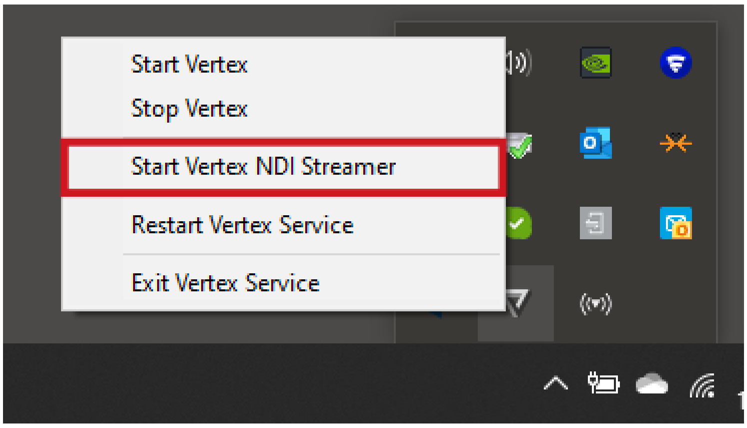
8 VERTEX NDI Streamer

- VERTEX NDI Streamer is a **multi source NDI toolkit**
- VERTEX NDI Streamer is **capable to stream up to 2 desktop regions and 1 live input** as a NDI Stream
- The NDI Streamer **is free** and fully **works without a valid VERTEX license**
- **In addition, all settings and streams** can be **controlled remotely out of VERTEX (with a license)**

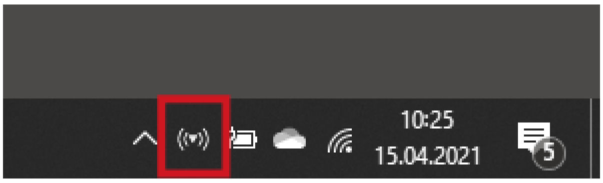
This product uses NDI® (SDK v5.0, 2023)
Licensed for free and commercial use under the terms in effect for this version.
Learn more at https://ndi.video/
NDI® is a registered trademark of Vizrt NDI AB.

Start NDI Streamer

- The VERTEX NDI Streamer comes up in a package with the VERTEX installer
- Just download and install an up-to-date Version of VERTEX
- Right-click with your Mouse on the VERTEX Tray Icon on the Windows taskbar
- Start Vertex NDI Streamer

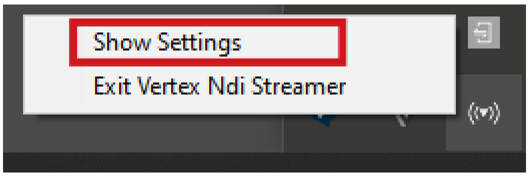


- When the NDI Streamer is started, a new Icon appears into the windows tray bar



Set up NDI Streams

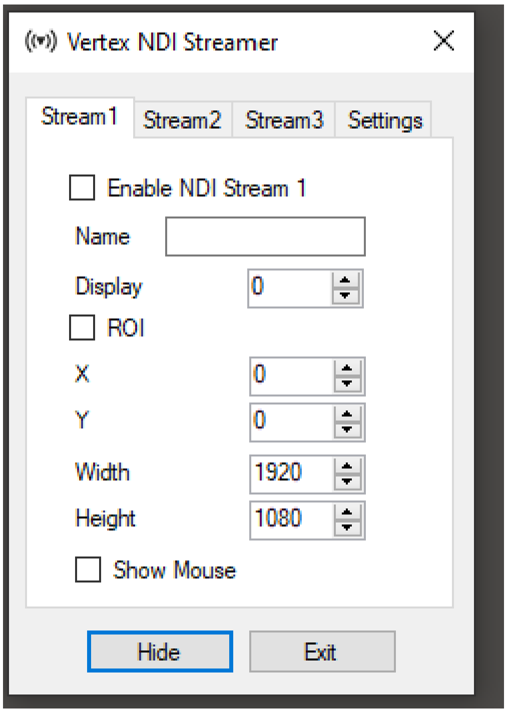
- Right-Click on the VERTEX NDI Streamer tray icon in the windows taskbar
- Select "Show Settings"



- Now you can enable up to 3 NDI Streams from your PC

Stream 1 + 2

enable you to set up two NDI streams that capture a display (or only a region) of your PC.



□ Enable NDI Stream 1

Name

Display 0

□ ROI

X 0

Y 0

Width 1920

Height 1080

□ Show Mouse

Name

Name of the stream that is shown for all NDI applications

Display

Select the display number of your PC that should be sent as NDI stream.

ROI

Region of Interest. Default: disabled

Enable to capture only a region of the selected display as NDI stream

Enter pixel coordinates (starting at top left) and width/height to define the ROI

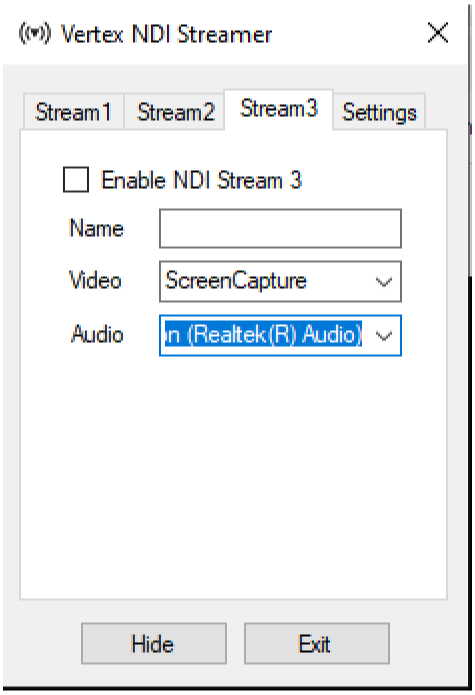
Show Mouse

Show mouse pointer in NDI stream

Stream 3

Stream 3 differs from the first ones. Here, you are able to send a video source (e.g. a webcam) and audio source (like a a microphone)

from your Windows PC as NDI stream.



□ Enable NDI Stream 3

Name

Video ScreenCapture

Audio n (Realtek(R) Audio)

Name

Name of the stream that is shown for all NDI applications

Video

Select from a list of video sources.

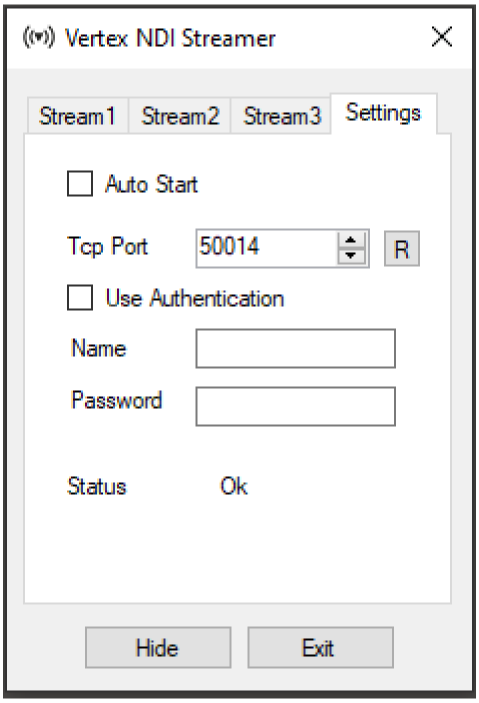
Depending on your PC hardware and configuration the list of available sources may vary

Audio

Select from a list of audio sources.

Depending on your PC hardware and configuration the list of available sources may vary

Settings



Vertex NDI Streamer

□ Auto Start

Tcp Port 50014

□ Use Authentication

Name

Password

Status Ok

Auto Start

Enable to add the NDI Streamer to Microsoft Windows autostart

TCP Port

Change port number for remote controlling the NDI streamer over TCP.

Use the R-Button to restart the TCP Servers after a port change.

R Button

Reset and Restart the TCP Server for all network adapters after you have changed the TCP Port

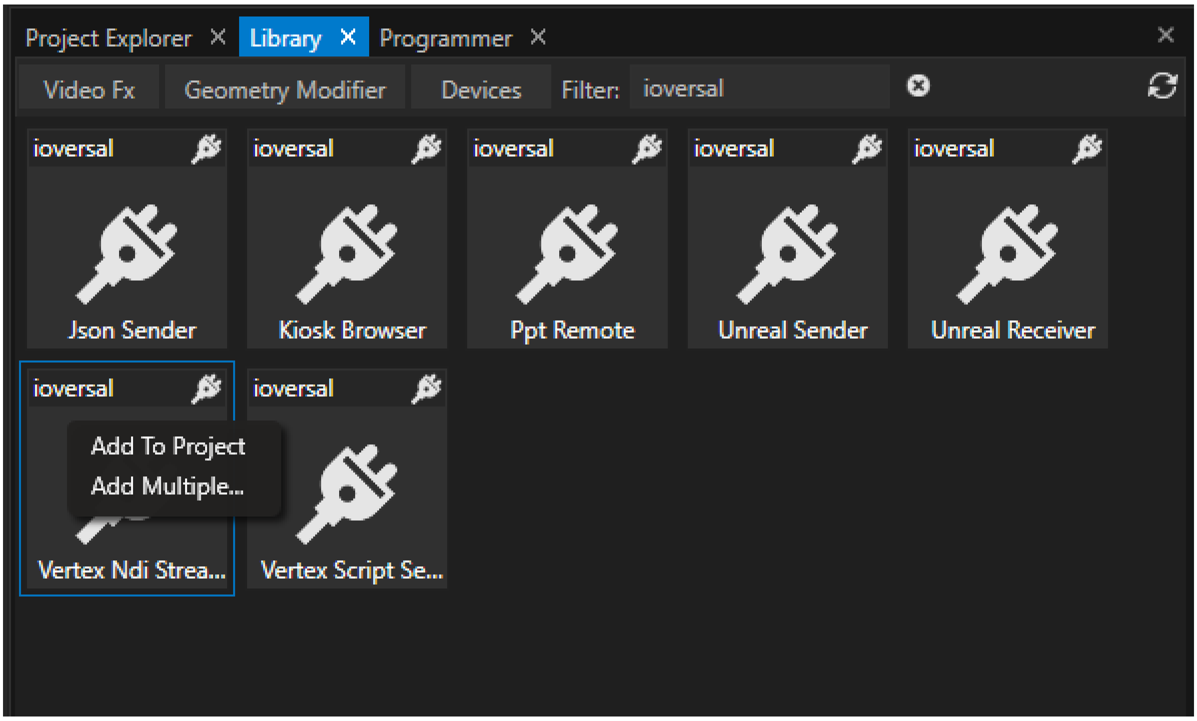
Use Authentication

Set User Name and Password for TCP Authentication

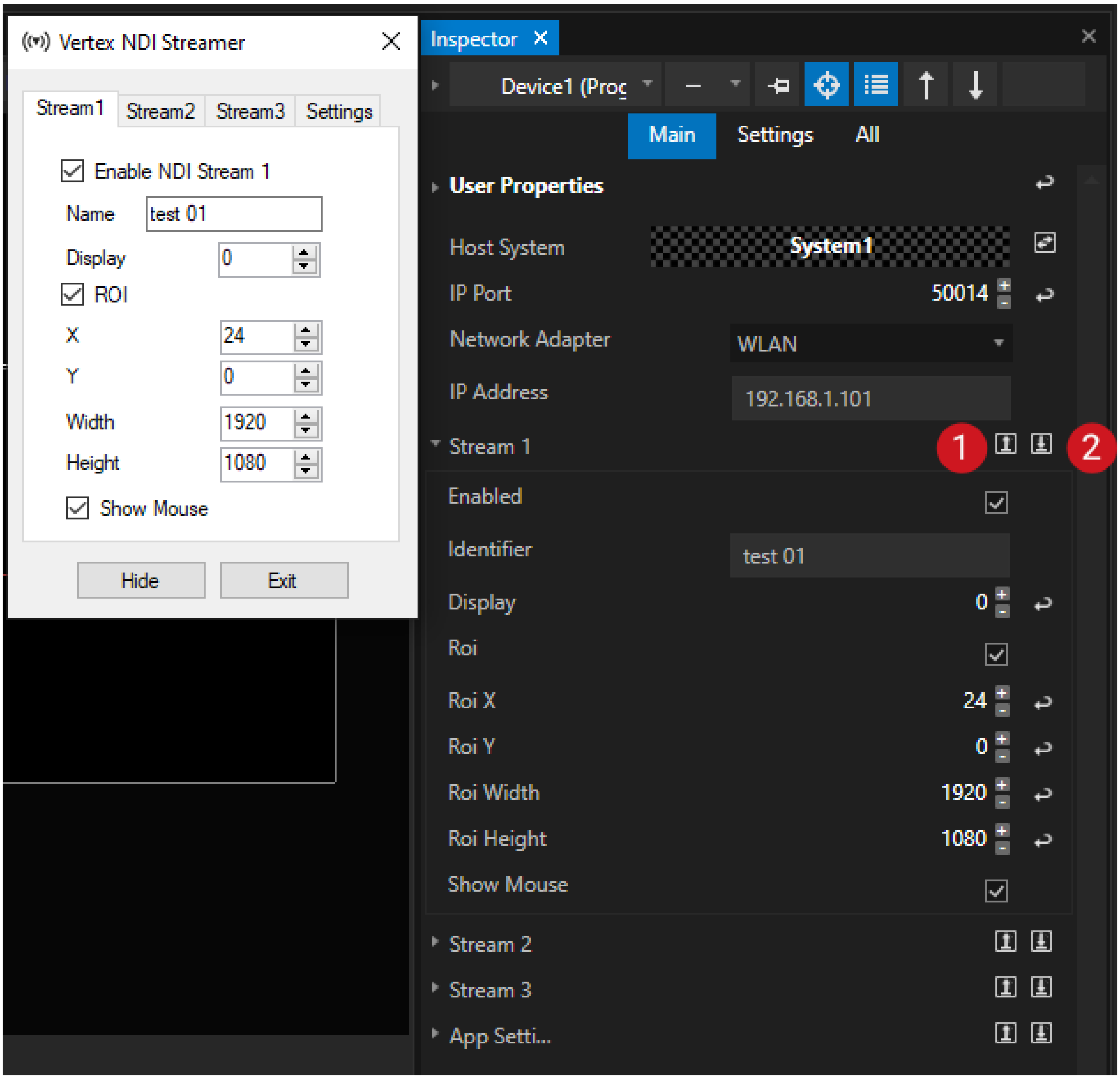
Remote Control out of VERTEX

- You can **remote control all settings of the VERTEX NDI Streamer** on a PC in your network **out of VERTEX**
- Just add a **"Vertex NDI Streamer" Device** from the Library into your current project
- Once configured, you have **access to all settings of the NDI Streamer application** and are able to automate your NDI workflow

Setup



- Open the [Library]
- Select **Devices** and **filter for "ioversal**"
- Right-click to the **device "Vertex NDI Streamer**"
- **"Add to project"**
- **Select the device in the [Project Explorer]** and set the initial properties in the **[Inspector]**
- Once the connection is set up, you are able to upload and download all application and stream settings.



☑ Enable NDI Stream 1

Name: test 01

Display: 0

☑ ROI

X: 24

Y: 0

Width: 1920

Height: 1080

☑ Show Mouse

User Properties

Host System: System1

IP Port: 50014

Network Adapter: WLAN

IP Address: 192.168.1.101

Stream 1

Enabled: ☑

Identifier: test 01

Display: 0

Roi: ☑

Roi X: 24

Roi Y: 0

Roi Width: 1920

Roi Height: 1080

Show Mouse: ☑

Stream 2

Stream 3

App Setti...

Comparision: All settings from the NDi Streamer application (on the left) you will also find into the Inspector when selecting the corresponding Device "Vertex NDI Streamer" (on the right)

IP Port

Enter here the same IP Port as set in the NDI Streamer application

Network Adapter

Choose a network adapter from your local VERTEX instance

IP Address

Enter IP address of the PC on that the Vertex NDI Streamer application is running and should be remote controlled

Upload Settings 1

Upload all current settings from VERTEX to the NDI Streamer application

Download Settings 2

Download all current settings from NDI Streamer application to Inspector

Scripting

As with every Device in VERTEX, you can control an NDI Streamer Device with a Script.
For the following examples the NDI-Streamer Device was added as "Device1" to a project

Enable and disable Stream 1 on the remote PC

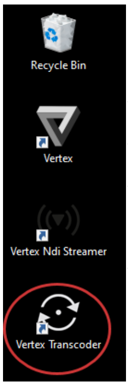
```
Device1.Settings.Stream1.Enabled.Value = true
Device1.Settings.Stream1.Enabled.Value = false
```

Show Mouse Cursor in NDI Stream 1

```
Device1.Settings.Stream1.ShowMouse.Value = true
```

VERTEX Transcoder

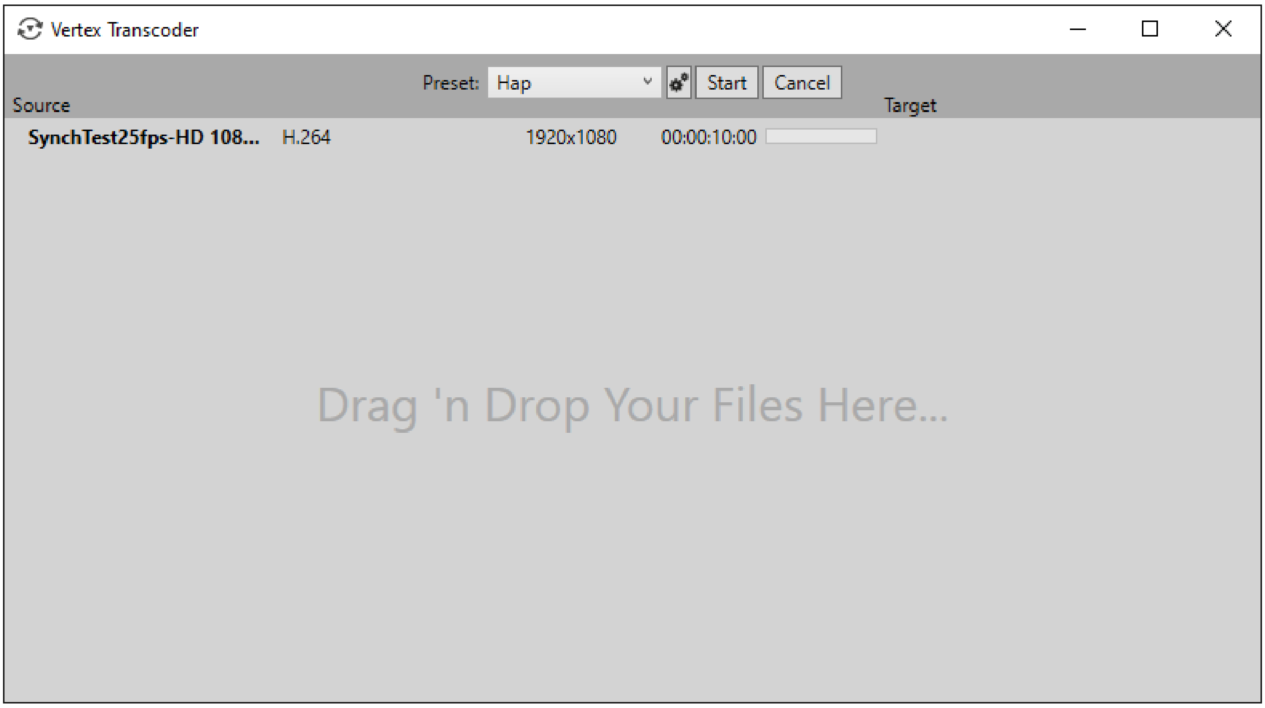
9 VERTEX Transcoder



- VERTEX comes with a separate application for video transcoding. Here's why:
- While similar to transcoding from within VERTEX, the separate app offers some more options.
- Also, at times when VERTEX itself is using most systems resources for complex tasks, it can be beneficial to outsource transcoding large chunks of video to another app or system.
- Transcoder is located in VERTEX program folder. The installer creates a shortcut of the Transcoder app and places it in the desktop folder.
- transcode to various HAP and Pro Res codecs (HAP, HAP Q, HAP Alpha, Pro Res 422 including LT & HQ)

Ease Of Use

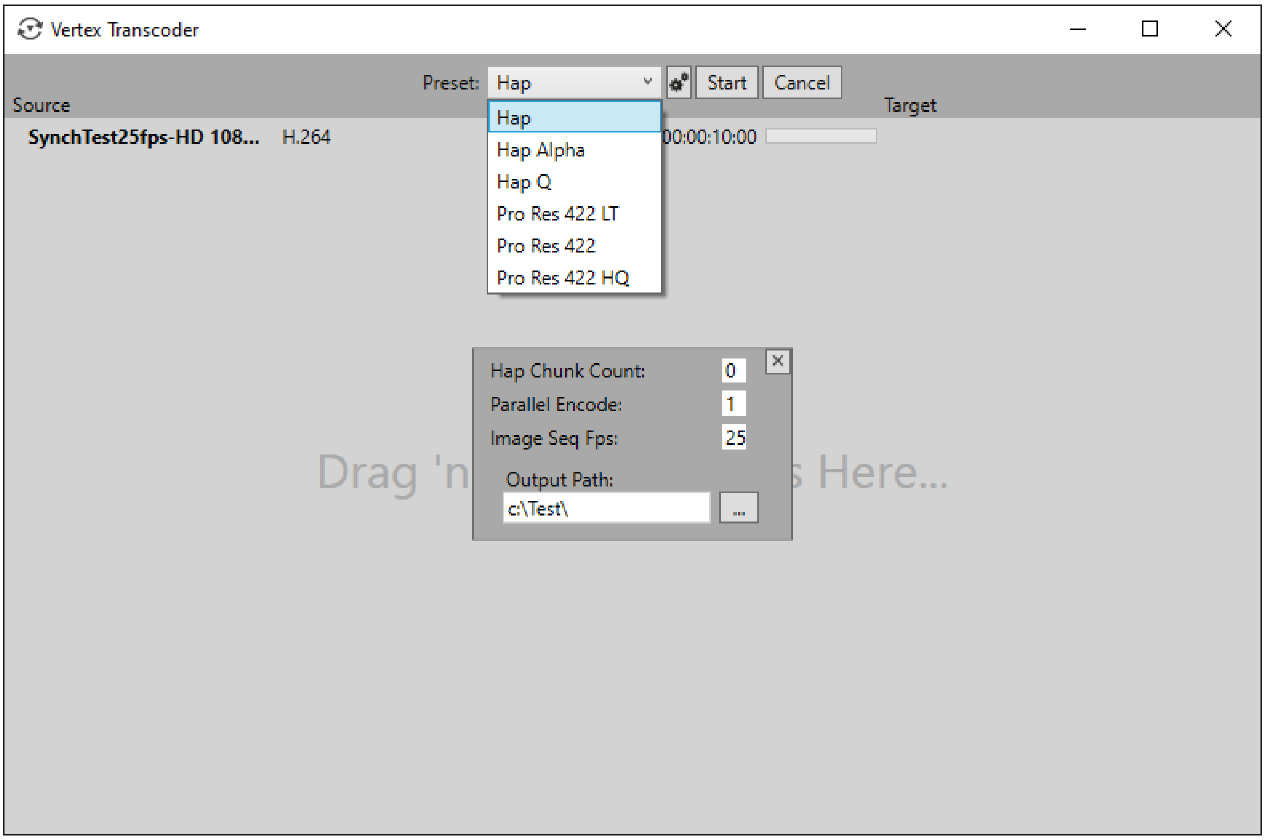
Open VERTEX Transcoder from your desktop. And just drag and drop video files into VERTEX Transcoder, choose the transcoding preset from the drop-down menu and click START.



Preset: Hap

SynchTest25fps-HD 108... H.264 1920x1080 00:00:10:00

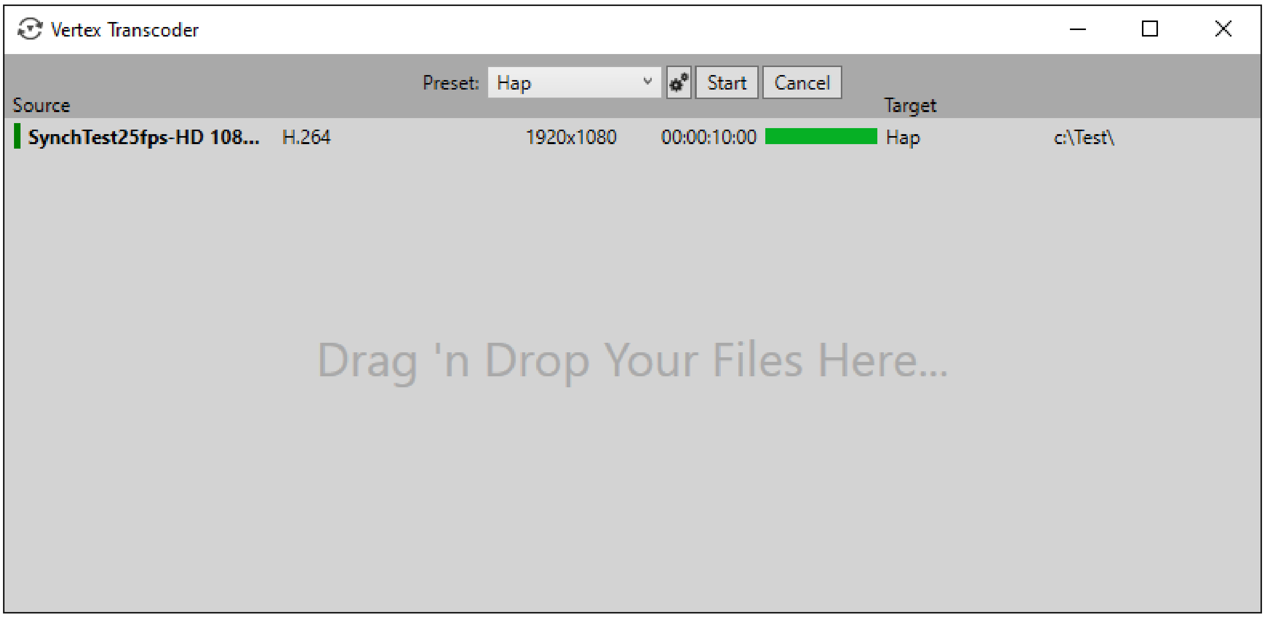
A click on the gear icon on the top bar reveals additional settings:



Hap Chunk Count: 0
Parallel Encode: 1
Image Seq Fps: 25
Output Path: c:\Test\

- **Hap Chunk Count**: When chopping each frame of the movie into separate chunks, please keep in mind that the number of chunks should not exceed the number of the rendering system's processor cores.
- **Parallel Encode**: less parallel threads lead to lesser latency, but performance will suffer slightly and vice versa.
- **Image Seq Fps**: set the frames per second when transcoding an image sequence
- **Output Path**: choose the target directory

A green progressive status bar accompanies the transcoding process:



SynchTest25fps-HD 108... H.264 1920x1080 00:00:10:00 Hap c:\Test\