Hippotizer V4

4.8.1 — Last update: 4 April 2023

Green Hippo

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Contacting us

We strive to ensure this manual is an inclusive guide to all of Hippotizer's features, though there inevitably will be places in the software that are not fully documented or are being used in a new way. For additional information, Green Hippo maintains a user forum, holds training sessions, webinars, operates telephone and email support, and benefits from a network of knowledgeable distributors and users world-wide: help is never far away.

There are different ways to contact Green Hippo depending on the nature of the Inquiry:

Sales and marketing inquires:

- [Green Hippo Offices](#)

Support and training:

- [Support](#)

Questions about the software or hardware:

- [User Forum](#)

Feedback and suggestions:

- [Feedback](#)

Green Hippo Offices

Green Hippo is a tvONE brand, specializing in the design & manufacture of hardware and software for real-time manipulation of video in the AV industries.

Our Support, Research and Development (R&D), Sales and Manufacture occur worldwide:

London Office (R&D, Support and Sales)

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L.A Office (Support)

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425 East Colorado Street, Suite 610
Glendale, CA
91205
United States
+ 1 818 239 4778

Support

The Hippotizer Media Server is a tool set used by media professionals world wide. With a wide range of skills and requirements, Green Hippo customers have a host of support methods at there disposal.

Local Distributor

Your local Hippotizer Distributor is frequently the best way to quickly answer questions.

Green Hippo support

Green Hippo operates a support system. For assistance, visit the support website:

[Green Hippo Support](#)

From here you can search support topics or create a support ticket.

Support tickets monitored seven days a week, with urgent queries answered as fast as possible, often within an hour. Please be sure to include the exact nature of your problem, the Hippotizer software version and hardware you are using.

User Forum

Green Hippo forum

With hundreds of users worldwide active, the Green Hippo forum is an invaluable resource. Green Hippo technical staff also monitor the forum and can help to answer questions.

http://forum.green-hippo.com/

Feedback

If you have a suggestions or feedback you would like to send to us, please email:

HippoFeedback@green-hippo.com

All feedback is read by Hippotizer's Product Management and we may contact you to request more information.

Software Information

The Hippotizer software package is comprised of different elements developed both by Green Hippo and third parties. Some parts are covered by an End User License Agreement (EULA) these are below. Other software polices such as the Software Assurance Policy are also noted below.

End User License Agreements

- [Hippotizer and SHAPE EULA](#)
- [3rd Party Licenses](#)

Other important software information

- [Software Assurance Policy](#)
- [Beta Software](#)

V4 and V4+ Software Compatibility

V4 Hardware

- Runs V3 In compatibility mode
- Runs V4 Software Version 4.0 and greater limited by Software Assurance

V4+ Hardware

- Runs V4 Software Version 4.3 and greater limited by Software Assurance
- Compatible with V4 systems running Software version 4.3 and greater.

Software Assurance Policy

The Software Assurance Policy details which versions of software a Hippotizer can install.

Software Assurance is determined by Feature Release number and time; a Hippotizer system's Software Assurance will set the number of future Feature Releases that may be installed. New Hippotizer systems include four Feature Releases and three years. This means that if 4.5 is the currently released version when a new system is activated it is entitled to run the next four Hippotizer Feature Releases regardless of their release date. If more than four feature releases are released within the three year period those extra releases will also install as they fall within the Software Assurance time.

Installed software will continue to work for the life of the Hippotizer system.

New Hippotizer systems include 3 Years and 4 Feature Releases of Software Assurance pre-loaded at the factory. Software Assurance extensions may be purchased from Green Hippo or its dealers or distributors. Software Assurance extensions require a software license created by Green Hippo to be loaded onto the Hippotizer system, once the license has been updated no further action is required; applicable software will install normally.

The provision for Feature Releases was added to Software Assurance as of Hippotizer Version 4.6. It is being back-dated to include all current V4 and V4+ systems.

Software Assurance entitles a Hippotizer system to install and run all released version(s) of Hippotizer software released within the Software Assurance period as established by Date or Feature Release. The timing of software releases and included feature-set are decided solely at Green Hippo's discretion; Software Assurance in no way obligates Green Hippo to release new software or add specific functionalities.

Each software version is assigned a Feature Release number, for improvement releases the feature release matches it's parent.

Software Assurance Dates of Hippotizer Software Versions

The Software Assurance Dates and Feature Releases of Hippotizer Software is listed below.

Version	Software Assurance Date	Feature Release
4.1.0	16-Mar-2016	0
4.2.0	2-Feb-2017	1
4.3.0	13-Dec-2017	2
4.4.0	11-Sep-2018	3
4.4.1 etc.	11-Sep-2018	3

4.5.0	28-Feb-2019	4
4.5.1 etc.	28-Feb-2019	4
4.6.0	02-Feb-2020	5
4.6.1 etc.	02-Feb-2020	5

Hippotizer and SHAPE EULA

HIPPOTIZER V4 & SHAPE EULA

Please read carefully all the terms of this agreement for the use of Hippotizer V4 and SHAPE software. If you do not agree to all the terms please do not click Accept and return the Hippotizer to the location you purchased it.

GREEN HIPPO LTD ("The Company") hereby gives you a non-exclusive, perpetual license to use Hippotizer-V4 and SHAPE ("The Software").
The software is for use only in conjunction with a Hippotizer Media Server and a valid use license from Green Hippo Ltd. Any attempt to use this software under any other circumstances will result in legal action.
Should the software be a BETA version it must only be used by individuals or companies aware that BETA software may not function as advertised and should only be used in test environments.

You may
• use the Software on the single media server for which it was supplied;
• copy the Software for archival purposes, provided any copy contains all of the original Software's proprietary notices.
You may not
• modify, translate, reverse engineer, decompile, disassemble in whole or in part (except to the extent applicable laws specifically prohibit such restriction),
• create derivative works based on the Software;
• copy the Software (except as specified above);
• rent, lease, transfer or otherwise transfer rights to the Software to a third party unless as part of rental hire-stock and on the Hippotizer server to which the software was purchased;
• remove any proprietary notices or labels on the Software.
TERMINATION
The license to use will terminate automatically if you fail to comply with the limitations described above. On termination, you must destroy all copies of the Software and Documentation.

DATA COLLECTION
The Company will collect user information about you (name, email address, location) for the purpose of licensing the software correctly. This information may be stored on servers located in Europe.
System usage and performance data may be collected for the purposes of improving the product, providing support and other services.

DISCLAIMER OF WARRANTY
The Software is provided on an AS IS basis, without warranty of any kind, including without limitation the warranties of merchantability, fitness for a particular purpose and non-infringement.
The Supplier does not warrant that the use of the Software will be uninterrupted or error-free.

The entire risk as to the quality and performance of the Software is borne by you. Should the Software prove defective, you and not GREEN HIPPO LTD assume the entire cost of any service and repair.
The above disclaimer does not affect your warranty agreement on any hardware supplied by the

Company. The above disclaimer does not affect your rights to technical support and response to bug-reporting. The software will be supported for an initial 3 years from purchase, and then on

LIMITATION OF LIABILITY

GREEN HIPPO LTD IS NOT RESPONSIBLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY CHARACTER INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, OR ANY AND ALL OTHER COMMERCIAL DAMAGES OR LOSSES.

Title, ownership rights and intellectual property rights in and to the Software shall remain in GREEN HIPPO LTD. The Software is protected by international copyright treaties.

This agreement and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the law of England and Wales.

If you have any questions on this agreement please contact Green Hippo Limited.

[3rd Party Licenses and EULAs](#)

Beta Software

A note about Beta versions:

Green Hippo frequently uses Beta releases to pre-view features with users and to garner feedback. A Beta release may contain known critical issues within the Zookeeper application including crashes. Those issues that are known at the time of a Beta release will be noted in the release notes as a known limitation. We will not release a Beta version with a known crash in the engine unless we can ensure users will work around it, though certainty of stability only comes with more testing. Please use Beta versions with caution being sure to test required functionality outside of a live environment. If you discover an issue, it would be helpful to feed this back to us by emailing: beta@green-hippo.com with a description of the issue and how to reproduce it.

Green Hippo's Beta testers are an open and growing group of users worldwide. If you would like to help us test our next version of software please get in touch by emailing: beta@green-hippo.com

Hardware Information

Hippotizer is a specialised media playback appliance

Below is some important information about the hardware and good practice for mounting and maintenance.

- FCC Declaration
- Rack Mounting
- Ventilation
- Power
- Hardware Changes
- Restore Utility
- Hardware Warranty
- SSD Refresh Tool
- Capture Cards
- V4+ System Information
- V4 System Information
- Audio
- EDID Emulation
- Genlock

FCC Declaration

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Rack Mounting
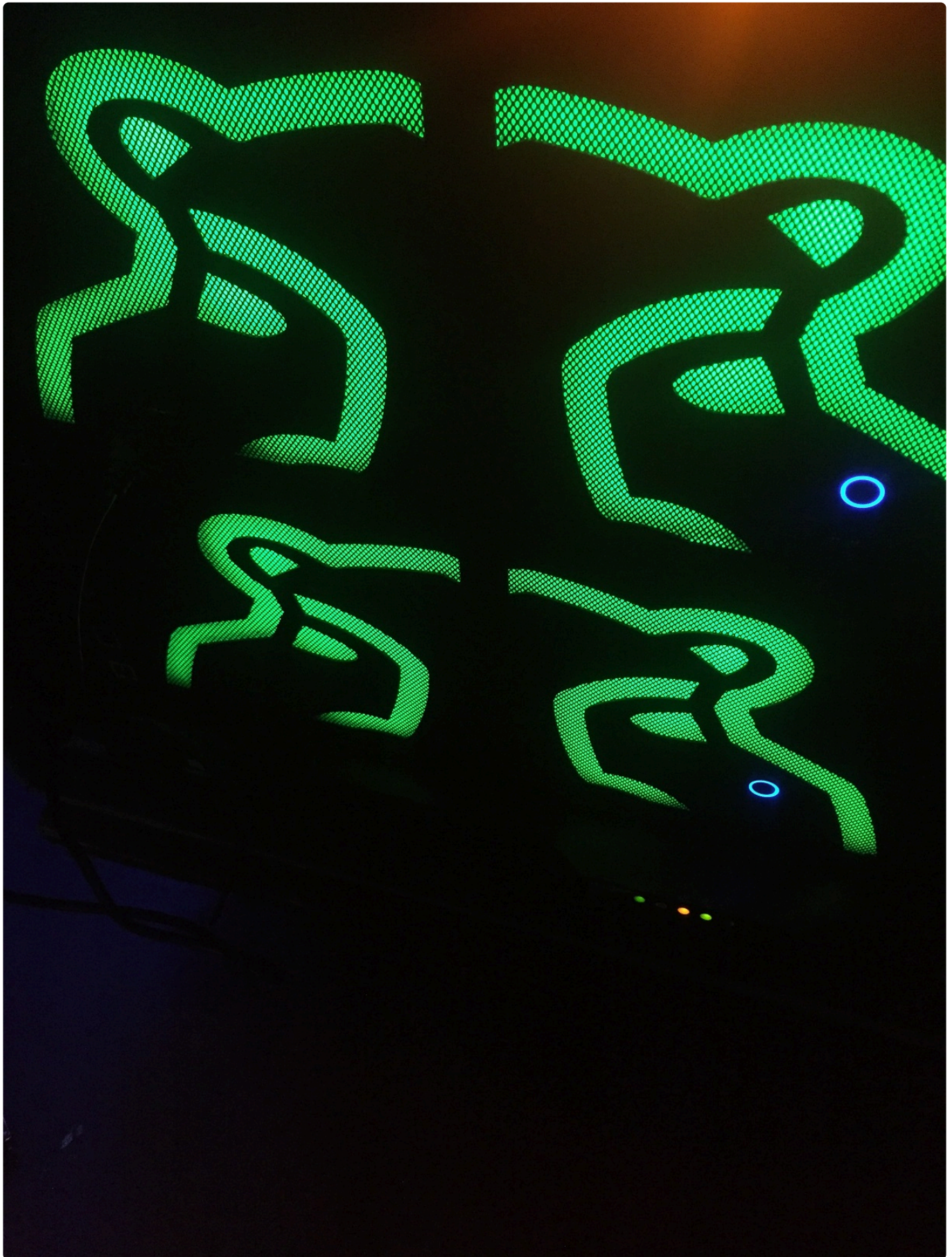
Hippotizer V4 systems are purpose built rack-mounted computers that are 1, 2 or 4 rack units (RU).

Included with each unit are front and back rack ears. It is important to ensure the units are properly supported with either a rack shelf or both front and back rack ears.

> **!** Do not only rely on the front rack ears only to support the entire system. Use the back rack ears or shelves to distribute the load.

Accu-ride rails are available as an option from Green Hippo, please contact your distributor for details.

With the Nevis+ model, there are multiple rack mounting methods. 2 units can use the supplied hook and eye system and small rack ears to mount in a 1RU space. Alternatively you can use larger ears to mount a single unit in a 1RU space.

Green Hippo strongly suggests using shock mounted flight cases to reduce the risk of vibration damage to Hippotizer systems.

Ventilation

All V4 units use temperature controlled, forced air cooling. Air is ingested into the cases through filters on the front of the unit and ejected out the back. A single system can generate a significant amount of heat under normal operating conditions; it is imperative to ensure there is adequate ventilation in the front and back of the cases. Do not operate the units in a closed environment and do not obstruct any of the intake or exhaust vents.

> **!** The top of the Karst and Amba can get quite warm [up to 50 Degrees C] under normal operating conditions. Take care when handling systems after they have been running and allow them to cool completely before moving.

Over time the intake filters will become dusty; a regular regime of vacuuming the filters out is strongly recommended. Simply pass a vacuum nozzle over the front of the intake filters to remove trapped dust.

Alternatively, the filters can be removed and washed with soap and water. Spare filters are available if required from your Green Hippo distributor.

The fans in all V4 systems are controlled with a temperature monitoring system. This works by varying fan speed with temperature measured from points within the case. It is normal for fan speeds to vary with usage. In the event of a failure of a temperature sensor, the fans will automatically go to full power.

> Note: During power up, it is normal for the fans to go to full power for a few seconds. This is in order to eject dust.

Hippotizer systems are designed to operate with an external ambient temperature from 0 – 40 Degrees Centigrade (32 – 104 degrees Fahrenheit).

> **!** Do not operate Hippotizer systems in wet or damp conditions

Power

Hippotizer V4 systems use an auto-sensing switch mode power supply that is capable of handling 110-250v 50/60hz power.

> Note: The switch mode power supplies are sensitive to fluctuations in power supply voltage and power loss. Green Hippo strongly recommends using an Uninterruptible Power Supply (UPS) on all Hippotizer systems.

In common with all computers; allow the Hippotizer to boot down completely before removing the mains supply to the system.

> Note: The Hippotizer Taiga and Boreal uses PCIe based solid state storage that must be shut down correctly. In the event that power is lost abruptly, the D: drive on a Taiga may not appear in Windows for several minutes on the next start-up. (Up to 10 minutes) This is normal as the drive re-builds itself. There is no data loss from this process. On a Boreal after an abrupt power loss the D: Drive may not appear in Windows without a further restart of the system.

The power inlet on a Karst, Boreal and Taiga are Neutrik PowerCon True1 with a pass through. Take care not to overload the input power by using the through connections: a Taiga for example uses 1100VA, which at 120v would mean only two systems can be connected to a 20Amp feed.

As an option, Taiga and Boreal can be fitted at the factory with a redundant power supply. This provides the system with two separate, hot-swappable power modules. In the event one of the supplies fails, an audible alarm will sound and the failed supply should be replaced as soon as possible.

> Note: Taiga and Boreal use different wattage power supplies and can not be inter-changed.

> ❗ Hazardous voltage is contained within the enclosure. Do not open the case with mains power connected.

Take care when handling the Power supply as it may retain hazardous voltages long after being unplugged from a power source.

Never attempt to disassemble or repair a power supply.

> Note: Hippotizer systems contain delicate electronic equipment that is sensitive to electrostatic discharge (ESD). Take appropriate ESD precautions before handling internal components of the system.

Hardware Changes

The Hippotizer V4 system is a purpose built computer designed and optimized for video playback.
Green Hippo cannot support after-market changes to the hardware specification of a Hippotizer.
Please do not attempt to change or upgrade components within the system.
Hardware changes are likely to cause the Hippotizer software to stop working, and Green Hippo support
will only be able to re-license the software once the machine is returned to the original configuration.
In the event of a component failure please contact Green Hippo support for assistance.

Restore Utility

Every Hippotizer unit ships with a restore partition on the C: drive to enable the quick restoration of factory settings. This is accessed at boot-up, before Windows starts up by pressing F12 when prompted.

The F12 restore will delete all data from the C: drive and restore the factory loaded software and defaults. It is therefore important to store newer versions of Hippotizer software on an external drive or the D: drive for fast system rebuild.

3rd party back-up and restore tools may destroy the F12 restore function. If additional back-ups are required, please use the included Acronis software.

Included with the Hippotizer is also a single license for Acronis True Image, an easy to use imaging and restoration tool. Green Hippo strongly recommends regularly backing up each Hippotizer machine's C: Drive to external storage to facilitate rapid recovery in the event of a hardware or software fault.

On Amba, Karst and Boreal the F12 menu is accessed from the prompt during boot-up. On a Taiga, press F8 during boot up and set the boot device to be the Acronis Boot loader.

> **!** It is critical to remove all USB and removable hard drives from the Hippotizer system BEFORE beginning an F12 restore. Failure to do so will result in the F12 failing to restore correctly.

V4+ System Recovery

Hippotizer V4+ servers feature a back-up and restore function called System Recovery.

System Recovery is accessible every time the computer starts up

> Note: The System Recovery screen will appear for several seconds before the system continues to boot normally into Windows. On certain monitors or KVM switches it may take too long for the display to initialise to see this screen. In this case, move the mouse during boot up as this will halt the automatic start of Windows.
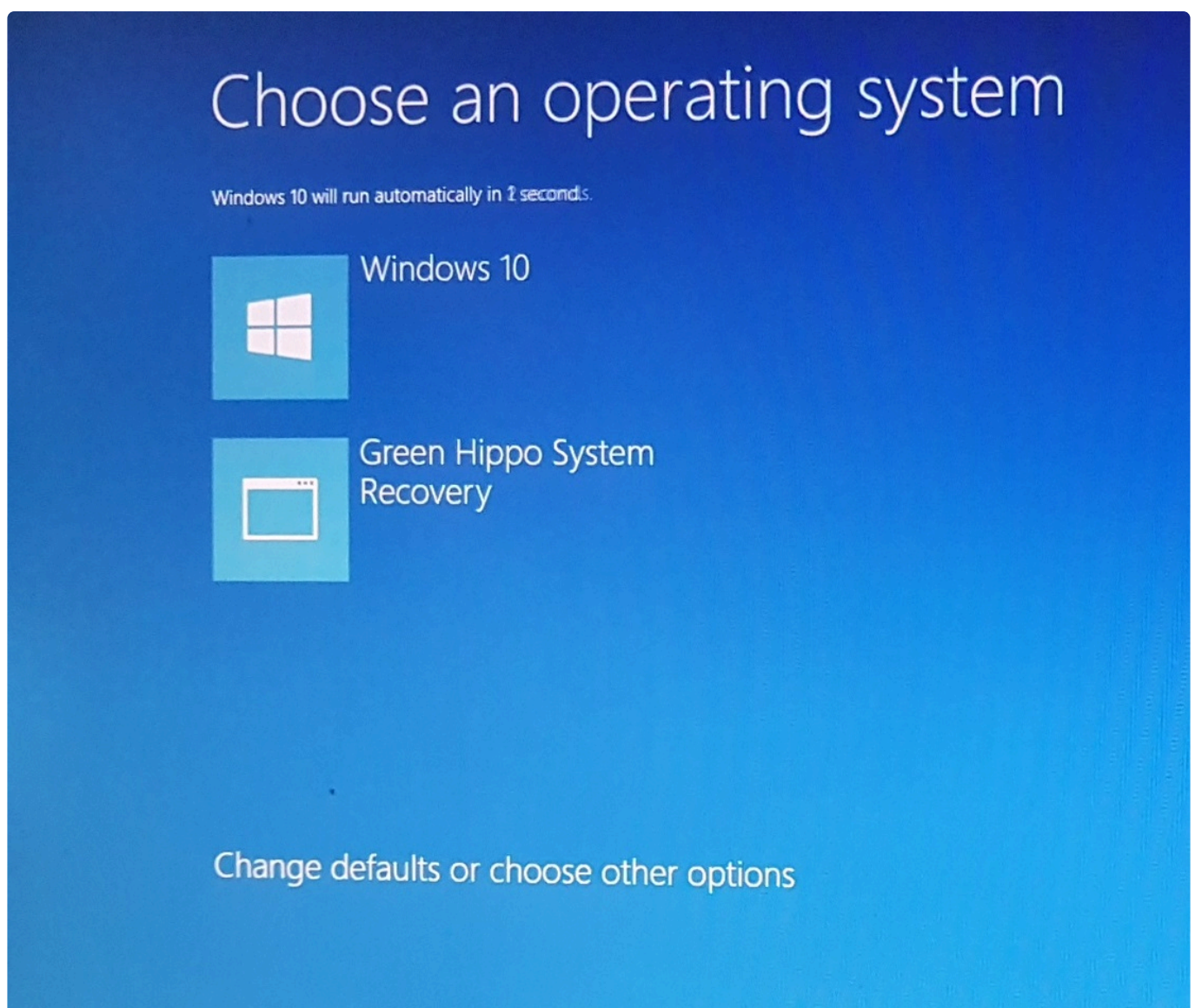
To access System Recovery, choose **Green Hippo System Recovery**.

System recovery offers two basic options: Restore a backup or Create/Edit a Backup
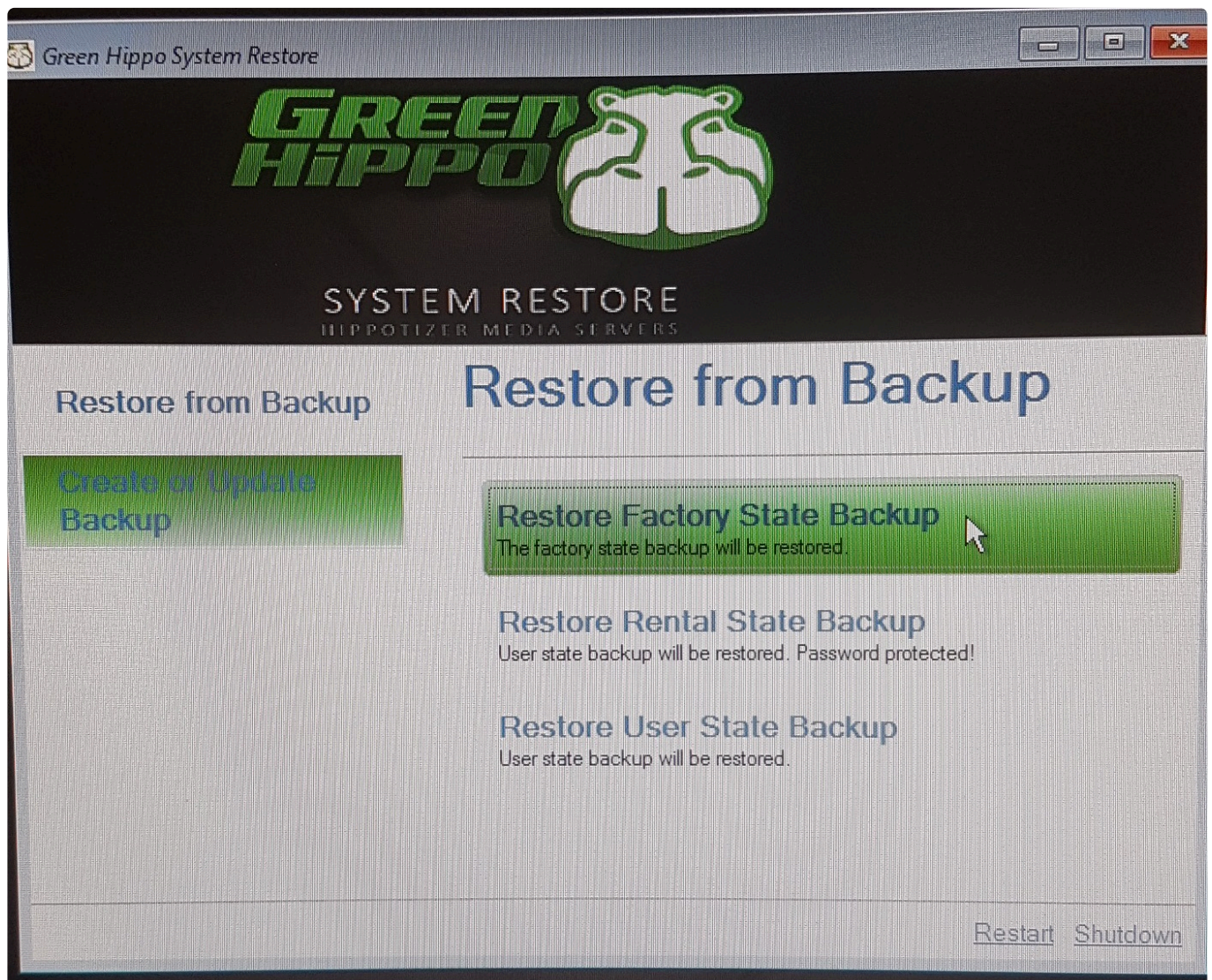
Each system has the capability of storing three Backups: Factory, Rental and User

- The **Factory** Backup is created when the system is manufactured and cannot be overwritten or edited.
- The **Rental** Backup is intended for the system owner to create and edit and is accessed by a password.
- The **User** Backup is for general use and does not have any password protection.

System restore backs up and restores the contents of the C: Drive only. Anything stored on the media drive will NOT be saved or overwritten.

Software assurance dates are stored on a hardware dongle and are not affected by system restoration.

V4 Acronis

Every V4 Hippotizer unit ships with a restore partition on the C: drive to enable the quick restoration of factory settings. This is accessed at boot-up, before Windows starts up by pressing F12 when prompted.

The F12 restore will delete all data from the C: drive and restore the factory loaded software and defaults. It is therefore important to store newer versions of Hippotizer software on an external drive or the D: drive for fast system rebuild.

3rd party back-up and restore tools may destroy the F12 restore function. If additional back-ups are required, please use the included Acronis software.

On Amba, Karst and Boreal the F12 menu is accessed from the prompt during boot-up. On a Taiga, press F8 during boot up and set the boot device to be the Acronis Boot loader.

> **!** It is critical to remove all USB and removable hard drives from the Hippotizer system BEFORE beginning an F12 restore. Failure to do so will result in the F12 failing to restore correctly.

Hardware Warranty

Hippotizer V4 and V4+ hardware carries a warranty against defects in material or workmanship for a period of one (1) year from the initial date of purchase.

This limited warranty protects the original and any subsequent owner(s) of the product for the warranty period.

Green Hippo Ltd does not warrant its products against any or all defects arising from unreasonable use, accidents, improper service or any other causes not arising from defects in materials and workmanship.

During the warranty period Green Hippo Ltd, its agents or subsidiaries will supply all parts and labor to repair or replace (at our discretion) defects covered by this limited warranty provided the equipment is returned to an approved Green Hippo repair centre or distributor.

All repairs must be accompanied by a Return Merchandise Authorization (RMA) and be approved by Green Hippo prior to any repairs being carried out.

Products must be returned with transportation costs and full insurance prepaid each way by the customer.

Liability of Green Hippo Ltd, its agents or subsidiaries is limited to the repair or replacement of any defective part or product and shall not include incidental damages of any kind.

V4+ MK2 System Information

Each Hippotizer V4+ has a distinct output configuration. Maximum resolution, supported standards and other information can be found below.

- [General BIOS](#)
- [Amba+ MK2](#)
- [Mayon+ MK2](#)
- [Karst+ MK2](#)
- [Boreal+ MK2](#)
- [Tierra+ MK2](#)

General BIOS

BIOS Access

General MK2

The following units have professional video output back panels for ZooKeeper:

Mayon+ MK2

Karst+ MK2

Boreal+ MK2

Tierra+ MK2

With these units, please use the DisplayPort ZooKeeper connection when attempting to access the BIOS. Results on the HDMI ZooKeeper output vary due to hardware emulation.

Amba+ MK2

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.6.3 or greater.

Maximum Software Date

V4+ MK2 Systems can, subject to Software Assurance, install and run software released until November 1st, 2027.

Outputs

Zookeeper:

The Amba+ MK2 has several output connectors for use with Zookeeper. These use the motherboard on-board graphics system. Multiple displays may be used at once; however, these will consume CPU resources so it is advised to connect a single zookeeper display only when the system is in production use.

Output

The Amba+ MK2 has DVI-I and Display Port Outputs from the main graphics card. The Amba+ MK2 supports the use of a single display output at a time.

DVI-I:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **4096×2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **Yes**
Supports Display Port to DVI adaptor (active): **Yes**

EDID Emulation:
N/A

Genlock:

N/A

Mayon+ MK2

Software

Minimum Software Version

V4+ MK2 Systems must run Hippotizer Version 4.6.3 or greater.

Maximum Software Date

V4+ MK2 Systems can, subject to Software Assurance, install and run software released until November 1st, 2027.

Zookeeper outputs:

The Mayon+ MK2 has two Zookeeper video outputs: One HDMI and one DisplayPort.

HDMI:

Max Resolution: **4096×2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Adaptor to DVI or HDMI: **No**

Output:

Mayon+ MK2 Outputs:

The Mayon+ MK2 has two HDMI 2.0 outputs:
Max Resolution: **4096 × 2160@60**
Supports Splitters: **Yes**

EDID Emulation:

- AMD EDID Emulation

Genlock:

N/A

Karst+ MK2

Software

Minimum Software Version

V4+ MK2 Systems must run Hippotizer Version 4.6.3 or greater.

Maximum Software Date

V4+ MK2 Systems can, subject to Software Assurance, install and run software released until November 1st, 2027.

Zookeeper outputs:

The Karst+ MK2 has two Zookeeper video outputs: One HDMI and one DisplayPort.

HDMI:

Max Resolution: **4096×2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Adaptor to DVI or HDMI: **No**

Output:

Karst+ MK2 Outputs:

HDMI:

The Karst+ MK2 HDMI has two HDMI 2.0 outputs:
Max Resolution: **4096 × 2160@60**
Supports Splitters: **Yes**

DisplayPort:

The Karst+ MK2 DisplayPort has two DisplayPort outputs:
Max Resolution **3840×2160@60**

Supports Splitters: **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use only Vesa certified DP1.2 cable. A full list of which is available [on the Vesa website.](#)

EDID Emulation:

- [NVidia EDID Emulation](#)

Genlock:

- [NVidia Genlock Emulation](#)

Boreal+ MK2

Software

Minimum Software Version

V4+ MK2 Systems must run Hippotizer Version 4.6.3 or greater.

Maximum Software Date

V4+ MK2 Systems can, subject to Software Assurance, install and run software released until November 1st, 2027.

Zookeeper Outputs:

The Boreal+ has a HDMI 2.0 and DisplayPort ZooKeeper video output.

Output:

Boreal+ MK2 Outputs:

HDMI:

The Boreal+ MK2 HDMI has two HDMI 2.0 outputs:
Max Resolution: **4096 × 2160@60**
Supports Splitters: **Yes**

DisplayPort:

The Boreal+ MK2 DisplayPort has two DisplayPort outputs:
Max Resolution **3840×2160@60**
Supports Splitters: **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length

(normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use only Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

EDID Emulation:

- NVidia EDID Emulation

Genlock:

- NVidia Genlock Emulation

Tierra+ MK2

Software

Minimum Software Version

V4+ MK2 Systems must run Hippotizer Version 4.6.3 or greater.

Maximum Software Date

V4+ MK2 Systems can, subject to Software Assurance, install and run software released until November 1st, 2027.

Zookeeper Outputs:

The Tierra+ has a HDMI 2.0 and DisplayPort ZooKeeper video output.

Output:

Tierra+ MK2 Outputs:

HDMI:

The Tierra+ MK2 HDMI has four HDMI 2.0 outputs:
Max Resolution: **4096 × 2160@60**
Supports Splitters: **Yes**

DisplayPort:

The Tierra+ MK2 DisplayPort has four DisplayPort outputs:
Max Resolution **3840×2160@60**
Supports Splitters: **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length

(normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use only Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

EDID Emulation:

- NVidia EDID Emulation

Genlock:

- NVidia Genlock Emulation

V4+ System Information

Each Hippotizer V4+ has a distinct output configuration. Maximum resolution, supported standards and other information can be found below.

- [Nevis+](#)
- [Amba+](#)
- [Karst+](#)
- [Boreal+](#)
- [Taiga+](#)
- [Montane+](#)
- [Montane+ RTX](#)
- [Tierra+](#)
- [Prep](#)
- [Getting the most from V4+ Hardware](#)

Nevis+

Hardware

I/O Back Panel

1 x DisplayPort 1.4 ZooKeeper
1 x DisplayPort 1.4 Output
2 x USB2
1 x Stereo Line In
1 x Stereo Line out
2 x Gigabit Ethernet

I/O Front Panel

1 x USB3.1

Physical

Size RU: **1/2U wide, 1U high**
Size mm: **220×220×42**
Weight: **<5kg**
Power Input: **IEC**
Voltage: **100-240V 50/60Hz**
Power Consumption: **150W**

System Spec

Operating System: **Windows 10**
CPU: **AMD Ryzen**
Cores(Threads): **4(8)**
Core Speed: **3.6 GHz**
RAM: **8GB DDR4 3200MHz**
System Drive: **500GB SSD**
Media Drive: **500GB SSD**
Hardware Warranty: **1 Year**

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.5.4 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st,

2024.

Drivers

Please refer to release notes for the most up to date drivers and where they can be found.

Outputs

ZooKeeper:

Nevis+ has a single DisplayPort 1.4 ZooKeeper port.
Maximum Resolution: **3840 × 2160 @ 60**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

Output:

Nevis+ has a single DisplayPort 1.4 Output port.
Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use Vesa certified DisplayPort cables. A full list of which is available on the Vesa website.

Amba+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Outputs

Zookeeper:

The Amba+ has several output connectors for use with Zookeeper. These use the motherboard on-board graphics system. Multiple displays may be used at once; however, these will consume CPU resources so it is advised to connect a single zookeeper display only when the system is in production use.

Output

The Amba has DVI-I and Display Port Outputs from the main graphics card. The Amba supports the use of a single display output at a time.

DVI-I:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **4096×2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **Yes**
Supports Display Port to DVI adaptor (active): **Yes**

Karst+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Zookeeper outputs:

The Karst+ has two Zookeeper Video outputs: One DVI and one display port.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Adaptor to DVI or HDMI: **No**

Output:

There are several variants of the Karst+

Karst+ DVI:

The Karst+ DVI has two DVI-DL outputs and one Display Port 1.2 output.

Max Pixel Clock:: **330 MHz**
Example Supported Resolutions:

- 1920 × 1080 at 50/60HZ
- 2048 × 1080 at 50/60HZ
- 1920 × 1200 at 50/60HZ
- 3840 × 1080 at 50/60HZ

- 3840 × 2160 at 30HZ
- Other resolutions will likely work provided they are within the maximum pixel clock.

Supports Splitters: **Yes**
Supported Splitters:

- Datapath X4
- Matrox DVI Dual Head to Go.

Supports Conversion to Analogue (VGA): **No**
Supports Genlock: No.

HDMI Connection

Each DVI output has an HDMI output in parallel. The HDMI is limited to 1920 × 1080. If the DVI resolution is set higher the HDMI will not output.

[For instructions on using the EDID emulator please see here.](#)

Display Port:

Max Resolution: **4096 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Adaptor to DVI or HDMI: **No**

Karst+ SDI

The Karst+ SDI-2 has two HD-SDI output and one Display Port 1.2 output

HD-SDI:

Max Resolution: **2048 × 1080 @ 60p (Supports SD/HD/3G SDI)**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**
Supports Genlock: Yes.

Display Port:

Max Resolution: **4096 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Adaptor to DVI or HDMI: **No**

Karst+ Display Port:

The Karst+ DP has two Display Port outputs

Max Resolution: **4096 × 2160 @ 60p**
Supports Splitters: **Yes**
Supported Splitters:

- Datapath FX-4.

Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use only Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

Boreal+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Zookeeper Outputs:

The Boreal+ has two DVI-D Zookeeper connections.

The Zookeeper output configuration is the same for all Boreal+ output types.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output:

There are several variants of the Boreal+

Boreal+ DVI:

Max Pixel Clock:: **330 MHz**
Example Supported Resolutions:

- 1920 × 1080 at 50/60HZ
- 2048 × 1080 at 50/60HZ
- 1920 × 1200 at 50/60HZ
- 3840 × 1080 at 50/60HZ
- 3840 × 2160 at 30HZ
- Other resolutions will likely work provided they are within the maximum pixel clock.

Supports Splitters: **Yes**
Supported Splitters:

- Datapath X4

- Matrox DVI Dual Head to Go.

Supports Conversion to Analogue (VGA): **No**
Supports Genlock: Yes.

Boreal+ SDI

The Boreal+ SDI-4 has four HD-SDI outputs:

HD-SDI:

Max Resolution: **2048 × 1080 @ 60p (Supports SD/HD/3G SDI)**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**
Supports Genlock: Yes.

Display Port:

The Boreal+ DP has four Display Port outputs

Max Resolution: **4096 × 2160 @ 60p**
Supports Splitters: **Yes**
Supported Splitters:

- Datapath FX-4.

Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use only Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

Taiga+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Outputs

The Taiga has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Taiga DVI-DL):

The Taiga DVI-DL supports 6 concurrent DVI-DL Outputs;

DVI-DL:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Output (DP-6):

Display Port (Powered):

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

> **Note::** The Graphics card is limited to how many active and passive DP to DVI adaptors it can support. If you are using more than 4 adaptors, they MUST all be active DVI convertors. For less than 4 total outputs,

any mix of active and passive adaptors will work.

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use Vesa certified DP1.2 cable. A full list of which is available [on the Vesa website.](#)

Montane+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Outputs

Zookeeper:

The Montane+ has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Montane DP):

The Montane supports 2 Concurrent Display Port connections.

DP:

Max Resolution: **4096 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

Montane+ RTX

The Montane+ RTX is the second generation of Montane+, using latest generation technology for maximum Notch Performance.

Montane+ can be Hardware Replaced with Montane+ RTX. Please contact Sales@green-hippo.com for details.

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Outputs

Zookeeper:

The Montane+ RTX has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Montane+ RTX DP):

The Montane+ RTX supports 2 Concurrent Display Port connections.

DP:

Max Resolution: **4096 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use Vesa certified DP1.2 cable. A full list of which is available on the Vesa website.

Tierra+

Software

Minimum Software Version

V4+ Systems must run Hippotizer Version 4.5.2 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

Outputs

The Tierra has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Display Port):

Display Port (Powered):

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **Yes**

A Note about Display Port Adaptors and cables

Compatibility with all Display Port devices can never be guaranteed. Green Hippo has tested many cables, adaptors and displays to determine what works best with Hippotizer systems. The findings show that **Active** adaptors from Display Port to DVI are the most reliable with those made by Bizlink, Accell or Startech to be of consistent quality. Similarly, **Active** VisionTek, Startech or Tripplite Display Port to HDMI adaptors have also proven to be among the most reliable. The quality and availability of adaptors varies hugely. Always test a specific adaptor before attempting to use it.

Display Port connections directly from the Hippotizer to a Display Port display or signal handling equipment also relies on a good quality cable. Do not exceed the maximum recommended cable length (normally 6ft or 1.8m) especially when working at UHD or 4K resolutions. Use Vesa certified DP1.2

cable. A full list of which is available [on the Vesa website.](#)

Prep

Software

Minimum Software Version

Prep must run Hippotizer Version 4.3 or greater.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2024.

To extend Software Assurance for Prep please contact your Green Hippo representative – Software Assurance extensions are issued free for Prep.

Outputs

Zookeeper:

Prep Supports an unlimited number of Zookeeper outputs based on the hardware.

Output

Prep Supports an unlimited number of outputs.

> Note: Prep Outputs will be watermarked with a grey Hippo Head and Pixelmapper output will occasionally flash

Recommended Hardware

Hippotizer Prep will work on many Windows 8.1 and 10 machines, including Apple's running Bootcamp.

The performance of Prep is closely linked to hardware capabilities, specifically the Graphics card (GPU) and media drive.

Prep will generally run well on machines designed for high-resolution gaming. High-end and desktop replacement laptops are preferable to tablets.

Recommended GPUs:

For Desktops:

- AMD FirePro or WX Series (eg. WX7100)
- AMD R7, R9 and RX Series. (eg. RX580)

- NVIDIA GTX (eg. 1070 or 1080)
- NVIDIA Quadro (eg. P4000)

For Laptops:

Discrete Graphics are critical for desirable laptop performance.

- AMD or NVIDIA mobile GPU with at least 2GB of dedicated memory.

Media Drive considerations

The media drive speed and latency will partially determine how much media can be played back at once.

- Solid State Drives (SSD) are considerably faster than traditional drives and should be used wherever possible.
- For HD playback, the SATA interface is often fast enough.
- For 4K or uncompressed playback, the NVMe interface offers far higher read speeds. (M.2 or PCIe work)
- RAID arrays can be used to increase effective drive speed and size. (RAID is not used in Hippotizer hardware due to higher failure incidence)

Other considerations:

- Green Hippo has only tested Intel Processors (CPU). AMD will probably work, though it's stability and performance is unknown.
- CPU core frequency is more important than core count. So faster cores (even fewer of them) will be better then more slower cores.
- Intel i5 and i7 CPUs offer the best performance. Generation 5 and higher are recommended.
- A minimum of 8GB System RAM is recommended, up to 16GB can aid performance.
- Faster RAM (eg. DDR4 and / or multi-channel RAM) also will help performance.
- Always ensure the system is properly ventilated and cooled. Hippotizer software can draw maximum power from the CPU and GPU when in use.
- Avoid virtual machines such as VMware, or Parallels as hardware resource sharing frequently leads to instability.

Example Prep machine:

- Z270 Motherboard
- Intel i5-7600 CPU
- 16GB DDR4-2133 RAM
- 512GB SSD (SATA 6)
- AMD RX570 GPU

Capturing video into Prep

Hippotizer support Datapath capture cards only. Any Datapath Vision or Vision AV capture cards will work.

Getting the most from V4+ Hardware

Over time Green Hippo discovers optimisations that improve the reliability and performance of the hardware. They are documented here.

Disable "Large Send Offload" on the network card to ensure Mix previews work correctly.

V4 System Information

Each Hippotizer has different output configurations with associated resolution limits.

- [Amba](#)
- [Karst](#)
- [Boreal](#)
- [Taiga](#)

Amba

Software

Minimum Software Version

V4 Systems must run Hippotizer Version 4.0 or greater. Version 3.2.4 Can be run in compatibility mode.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2021.

Outputs

Zookeeper:

The Amba has several output connectors for use with Zookeeper. These use the motherboard on-board graphics system. Multiple displays may be used at once; however, these will consume CPU resources so it is advised to connect a single zookeeper display only when the system is in production use.Output

The Amba has DVI-I and Display Port Outputs from the main graphics card. The Amba supports the use of a single display output at a time.

DVI-I:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **Yes**

Display Port:

Max Resolution: **4096×2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **Yes**
Supports Display Port to DVI adaptor (active): **Yes**

Karst

Software

Minimum Software Version

V4 Systems must run Hippotizer Version 4.0 or greater. Version 3.2.4 Can be run in compatibility mode.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2021.

Outputs

Zookeeper

The Karst has two connections for Zookeeper: a DVI-I and Display Port.

DVI-I:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **Yes**

Display Port:

Max Resolution: **4096 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **Yes**
Supports Display Port to DVI adaptor (active): **Yes**

Output (Karst DVI-2):

The Karst DVI has two DVI-DL outputs with a parallel HDMI and a Display Port (unpowered) connection:

DVI-DL:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

HDMI:

Max Resolution: **1920 × 1080 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **No**

Output (Karst DVI-2 Genlock):

The Karst DVI has two DVI-D outputs with a parallel HDMI and a Display Port (unpowered) connection:

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

HDMI:

Max Resolution: **1920 × 1080 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **No**
Supports Display Port to DVI adaptor (active): **No**

Output (Karst SDI-2):

The Karst SDI-2 has two HD-SDI outputs and a Display Port (unpowered) connection:

HD-SDI:

Max Resolution: **2048 × 1080 @ 60p (Supports SD/HD/3G SDI)**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Display Port:

Max Resolution:* 3840 × 2160 @ 60Hz*

Supports Splitters: **Yes**

Supports Conversion to Analogue (VGA): **No**

Supports Display Port to DVI adaptor (passive): **No**

Supports Display Port to DVI adaptor (active): **No**

Boreal

Software

Minimum Software Version

V4 Systems must run Hippotizer Version 4.0 or greater. Version 3.2.4 Can be run in compatibility mode.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2021.

Outputs

Zookeeper:

The Boreal has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Boreal DVI-4):

The Boreal supports 4 concurrent Outputs; each has parallel DVI-D and HDMI connections.

DVI-D:

Max Resolution: **1920 × 1080 @ 60Hz** Supports Splitters: **No** Supports Conversion to Analogue (VGA): **No**

HDMI:

Max Resolution: **1920 × 1080 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Boreal SDI-4):

The Boreal SDI-4 has four HD-SDI outputs:

HD-SDI:

Max Resolution: **2048 × 1080 @ 60p (Supports SD/HD/3G SDI)**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Taiga

Software

Minimum Software Version

V4 Systems must run Hippotizer Version 4.0 or greater. Version 3.2.4 Can be run in compatibility mode.

Maximum Software Date

V4+ Systems can, subject to Software Assurance, install and run software released until November 1st, 2021.

Outputs

The Taiga has two DVI-D Zookeeper connections.

DVI-D:

Max Resolution: **1920 × 1200 @ 60Hz**
Supports Splitters: **No**
Supports Conversion to Analogue (VGA): **No**

Output (Taiga DVI-DL):

The Taiga DVI-DL supports 6 concurrent DVI-DL Outputs;

DVI-DL:

Max Resolution: **2560 × 1600 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**

Output (DP-6):

Display Port (Powered):

Max Resolution: **3840 × 2160 @ 60Hz**
Supports Splitters: **Yes**
Supports Conversion to Analogue (VGA): **No**
Supports Display Port to DVI adaptor (passive): **Yes**
Supports Display Port to DVI adaptor (active): **Yes**

> **Note::** The Graphics card is limited to how many active and passive DP to DVI adaptors it can support. If you are using more than 4 adaptors, they MUST all be active DVI convertors. For less than 4 total outputs,

any mix of active and passive adaptors will work.

Audio

Hippotizer Version 4 supports playback of audio containing video clips as well as audio only files. Stereo audio playback is supported on Karst, Boreal and Taiga systems through the XLR output connectors. These are electrically isolated by way of a transformer from the Hippotizer system and the earth (ground) can be disconnected with the earth lift switch.

Please Note: It is considered best practice to leave earth connected to the sound source whenever possible in audio systems as leaving the earth lifted on both source and destination can cause interference.

On the Amba, Audio output is from the Stereo Line out 3.5mm jack by default.

- [Multichannel Audio](#)

Multichannel Audio

In order to output multi-channel audio, an outboard audio interface must be used.

Green Hippo recommends the **Motu 828x USB** interface as a tested, and readily available product. In order to install the Motu, it must be designated as the default device and configured correctly:

- Stop the Hippotizer Engine and Zookeeper
- Run the included Motu Driver installer.
- Goto: Hippotizer (C:) > Program Files(x86) > MOTU > Audio

- Open MOTU Audio Console.
- Change audio sample rate to 48k (not crucial but recommended).
- Untick "Use Stereo Pairs for Windows Audio" .
- Close MOTU Audio Console.

- Plug in your MOTU 828x USB cable.
- Goto: Control Panel > Sound
- Select MOTU Analog and click Set Default.
- Close Control Panel.
- Launch Hippotizer

Other Windows compliant multi-channel audio devices should also work, though we do not test them. In every case, the device must be designated as the default playback device before starting Hippotizer.

Dante Virtual Soundcard

Dante Virtual soundcard configuration can be launched via the 'Dante Virtual Soundcard' application. This is an optional extra for the Hippotizer server range. Configuration should be set to WDM in order to be detectable by the Hippotizer software. Configuring to WDM, selecting a network adapter and starting the service will show the DVS outputs in Windows and Hippotizer Mix Master audio devices.
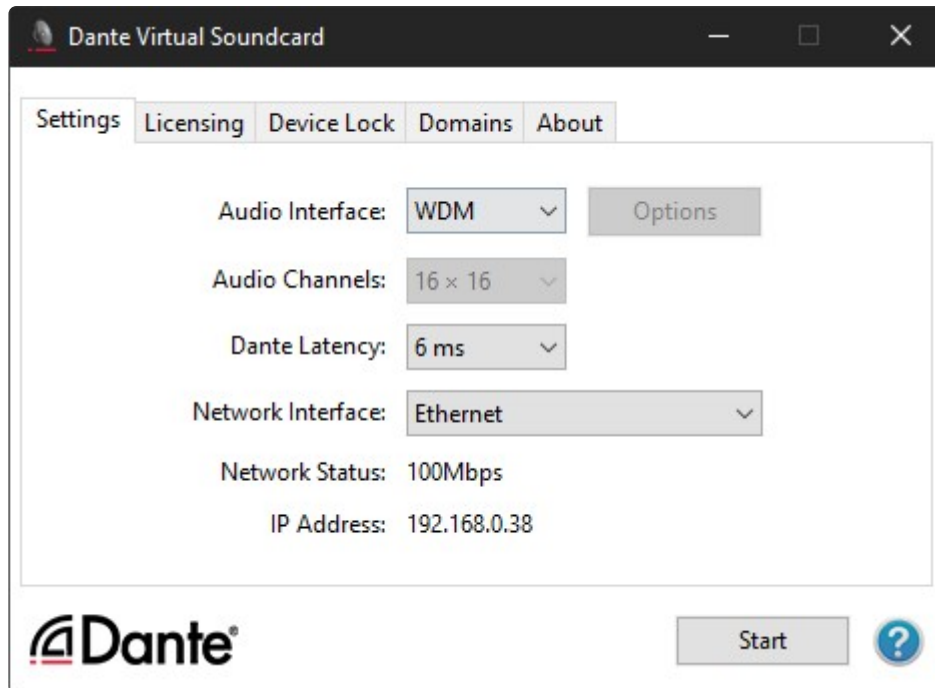
✱ Hippotizer is limited to the 8 stereo outputs DVS creates in Windows. Multichannel audio is not supported in Hippotizer using DVS due to the stereo pair limitation.

Sound   ✕

Playback | Recording | Sounds | Communications

Select a playback device below to modify its settings:

DVS Transmit 1-2
Dante Virtual Soundcard
Ready

DVS Transmit 3-4
Dante Virtual Soundcard
Ready

DVS Transmit 5-6
Dante Virtual Soundcard
Ready

DVS Transmit 7-8
Dante Virtual Soundcard
Ready

DVS Transmit 9-10
Dante Virtual Soundcard
Ready

Configure   Set Default ▼   Properties

OK   Cancel   Apply

EDID Emulation

Connecting and disconnecting displays from a Windows computer causes a complete re-discovery of all other displays. This process results in output flashing and can lead to Hippotizer becoming confused about output location. One method of ensuring this does not happen is to ensure that the computer does not see a display being disconnected which can be accomplished with **EDID Emulation**.

> **Note:** Extended Display Identification Data (EDID) technically refers to information carried by DVI and HDMI connections to describe displays to the computer. (The display tells the computer what resolutions it can handle). Though display port uses a different signalling standard it is colloquially refereed to as EDID as well.

Hippotizer uses three types of EDID emulation, depending on the system:

Hardware Emulation — DVI

Used by:

- Karst DVI
- Karst DVI Genlock
- Boreal DVI Single Link
- Boreal DVI Genlock

Hardware Emulation — SDI

Used by:

- Karst SDI
- Boreal SDI
- Taiga SDI

Software Emulation

Used by:

- Amba
- Boreal DVI-DL and Boreal DP
- Taiga DVI-DL

Hardware Emulation DVI Output

The Hippotizer Karst DVI and Boreal DVI feature a hardware EDID manager called a Mimic, on all production DVI outputs. This allows the system to emulate attached displays after they have been disconnected.

The Mimic can learn the EDID profile of a monitor connected to either its HDMI or DVI port. HDMI is limited to HDMI 1.3 (1080p) while the DVI extends to all supported DVI-DL resolutions.

> **Note:** The Mimic can only learn from one display, so if both outputs are being used, disconnect one of them while learning.

Learning the EDID can be triggered from the emulator by pressing and holding the learn button for 2 seconds.. While the unit is in emulating mode, the LED will show Green. When bypassed, the LED shows Red.

Controls:
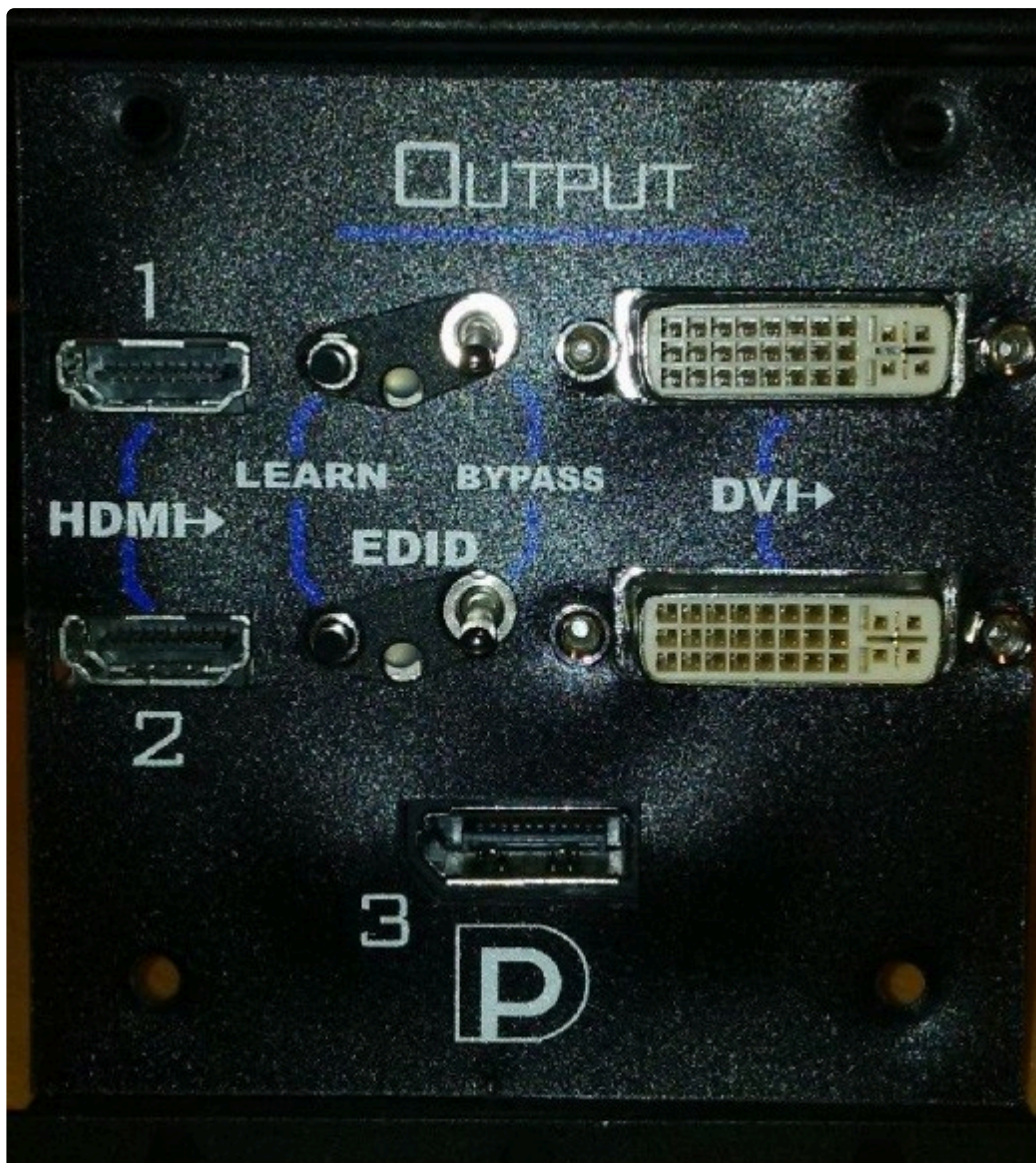
Toggle Switch

The switch controls the state of the emulator, Up enables the board, Down Disables it

Learn Button

Press and hold the black learn button for 2 seconds to trigger the emulator to learn the EDID from the attached display

LED Colour Codes

Green: Emulating EDID

Red: Bypassed, so EDID will pass directly from the attached display.

Flashing Amber: Learning EDID

Flashing Red: EDID Learn failed

Splitting the signal to HDMI and DVI

The EDID board can also be used as a Distribution amp, sending the video signal to both the HDMI and DVI output at the same time. The only limitation is that of the HDMI which cannot go above HD resolutions. If higher resolutions are used them the HDMI will not output video.

SDI Outputs

As an option, some Hippotizer V4 units are fitted with an SDI output as standard. This accomplished by converting the output as an HDMI signal to SDI. Each output is individually controlled, accessed by three buttons on each output.
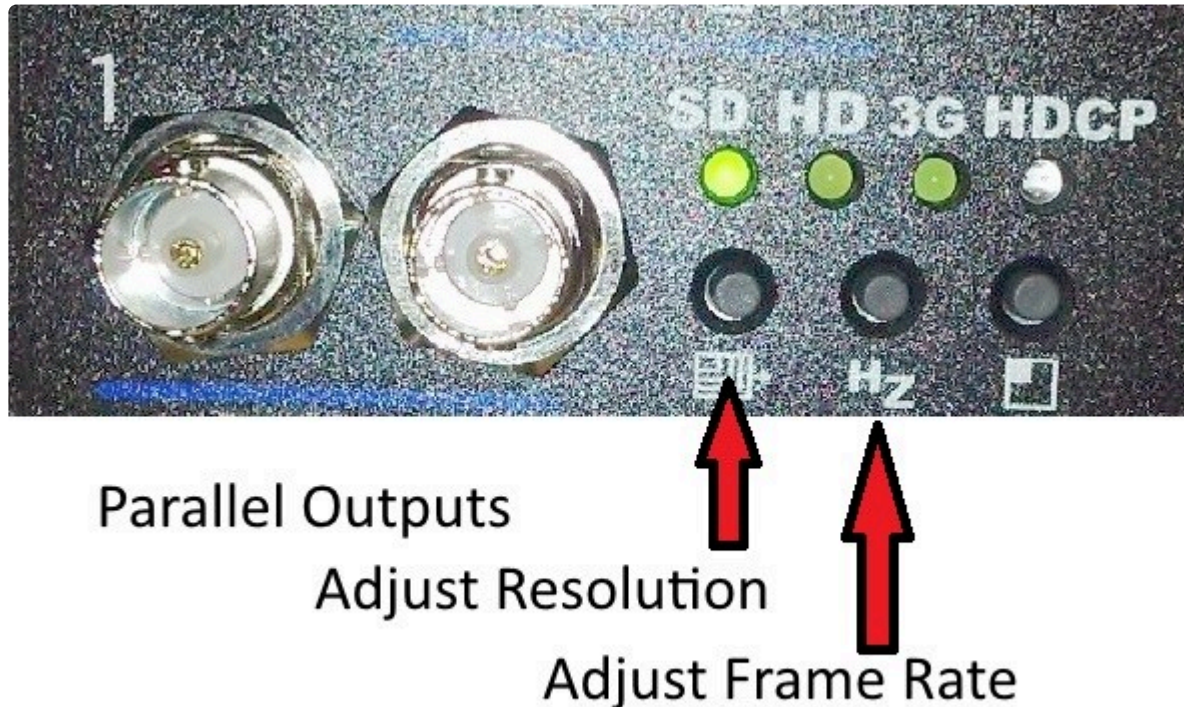
Genlock

The SDI output has two modes of frame generation: Free-Run and Self Genlock. In Free-Run mode, any single can be scaled to any resolution. However multiple outputs will not be in-sync with each other. In order to ensure all outputs are synchronised, set the boards to Self Genlock. In Self Genlock mode, the outputs lock to the vertical refresh of the incoming signal. This means that as long as the outputs are Genlocked then the SDI will be as well.

To toggle the Genlock Mode, hold the centre button for several seconds. A window will appear on screen to say "Self Genlock" or "Free Run".

> **Note:** For Genlock to work correctly, the Graphics card must also be Genlocked through the ATI FirePro control centre.

In Genlock Mode, the scaling is limited:

With Self Genlock enabled the Hippo and SDI output frame rates must match.

An input of 720×480, Can be output as: 720×480i, 1280×720p, 1920×1080i and 1920×1080p

An input of 1280×720 can only output 1280 × 720p

An Input of 1920 × 1080 can output as: 1280 × 720p, 1920 × 1080i or 1920 × 1080p

An Input of 2048 × 1080 can output as 2048 × 1080 only.

Changing Resolutions

To change the resolution, press the adjust resolution button. This will toggle between output resolutions. The output is capable of scaling any input resolution to any output resolution using an on-board scaler.

As the button is pressed, the resolution light will change to indicate which SDI standard is being used: SD, HD or 3G. A small box appears on the output to indicate what the output resolution is being sent.

> **Note:** There are several resolutions within each SDI standard, so it takes several button presses to move from SD to HD.

Supported SDI output Resolutions

- 720 × 480i

- 1280 × 720P

- 1920 × 1080i

- 1920 × 1080p

- 2048 × 1080p

LED Codes for resolutions

	SD LED	HD LED	3G LED
BY PASS	●	●	●
720 x 480	○	○	●
720 x 576	○	●	○
1280 x 720	○	●	●
1920 x 1080i	●	○	○
1920 x 1080p	●	○	●

● : LED ON

○ : LED OFF

Changing Frame Rate

To change the frame rate, press the centre button. This will cycle between 50 and 60hz. It is advised to match the input and output framerates.

Output frame rates of 25, 30, 50, 59.97 and 60 are supported.

RES	FRAME RATE	FRACTION
1	2	3
By Pass		
720x480	60i	59.94i
	60p	59.94p
720x576	50i	
	50p	
1280x720	60p	59.94p
	50p	
1920x1080i	60i	59.94i
	50i	
1920x1080p	60p	59.94p
	50p	
	30p	29.97p
	25p	
	24p	23.97p

Note: All output frame-rates and resolutions are available in free run mode only.

As the centre button is pressed, the LEDs will indicate the output frame rate:

a. Output Mode:

Resolution	SD LED	HD LED	3G LED	HDCP LED
NTSC / PAL	●	○	○	○
720p / 1080i / 1080 [24p, 25p, 30p]	○	●	○	○
1080 [50p,60p]	○	○	●	○
HDCP Content	○	○	○	●

Software EDID Emulation

On systems with Genlock and Amba, the Graphics drivers provide a software based EDID emulation. This allows the computer to read connected displays and retain them even after the display has been unplugged.

To enable EDID emulation go to the advanced AMD control centre by right click on the computer's desktop and selecting **AMD Firepro Advanced**.

Select EDID Emulation from the left side menu.

Tick the displays to manage from the list and click **Manage EDID**

The EDID can be learned from one display and applied to others, or or retrieved from a file saved on the machine.

> **Note:** In order to genlock outputs they must have the same EDID. EDID emulation is the best way to guarantee this. Learn the EDID from one display to be Genlocked and save it to the others.

EDID Emulation

EDID emulation may affect any existing AMD Eyefinity configurations that include emulated displays. To minimize this impact, configure EDID emulation before configuring AMD Eyefinity.
Any existing EDID emulation settings for the selected connections will be lost.

Apply EDID emulation to these connections:

⊞ **AMD FirePro W8100 3**

Select EDID:

◉ From Display:

U28D590(AMD FirePro W8100 3 Port 1 - DisplayPort)   ˅

○ From File:

[   ]   Browse

🔍 View Raw EDID

Connection Properties:

Emulation	Emulate always
Connection	DisplayPort
Lanes	4
Bit Rate	5.4 GHz

Discard   Apply

❗ When trying to emulate a UHD or more resolution EDID make sure that the Bitrate is set to 5.4GHz in the connection properties.

EDID Emulation will continue to work if the system has been restarted.

Removing Emulation

As long as HippoLauncher is running, the global shortcut of CTRL+SHIFT+'e' will remove all emulation from the setup

V4 Software EDID Emulation

V4+ Software EDID Emulation

Karst+ (Non DVI)/Boreal+/Taiga+/Mayon+MK2 Software EDID Emulation

To enable EDID emulation go to the advanced AMD control centre by right click on the computer's desktop and selecting **AMD Radeon Pro Settings**.

Select the **Display** tab at the top.
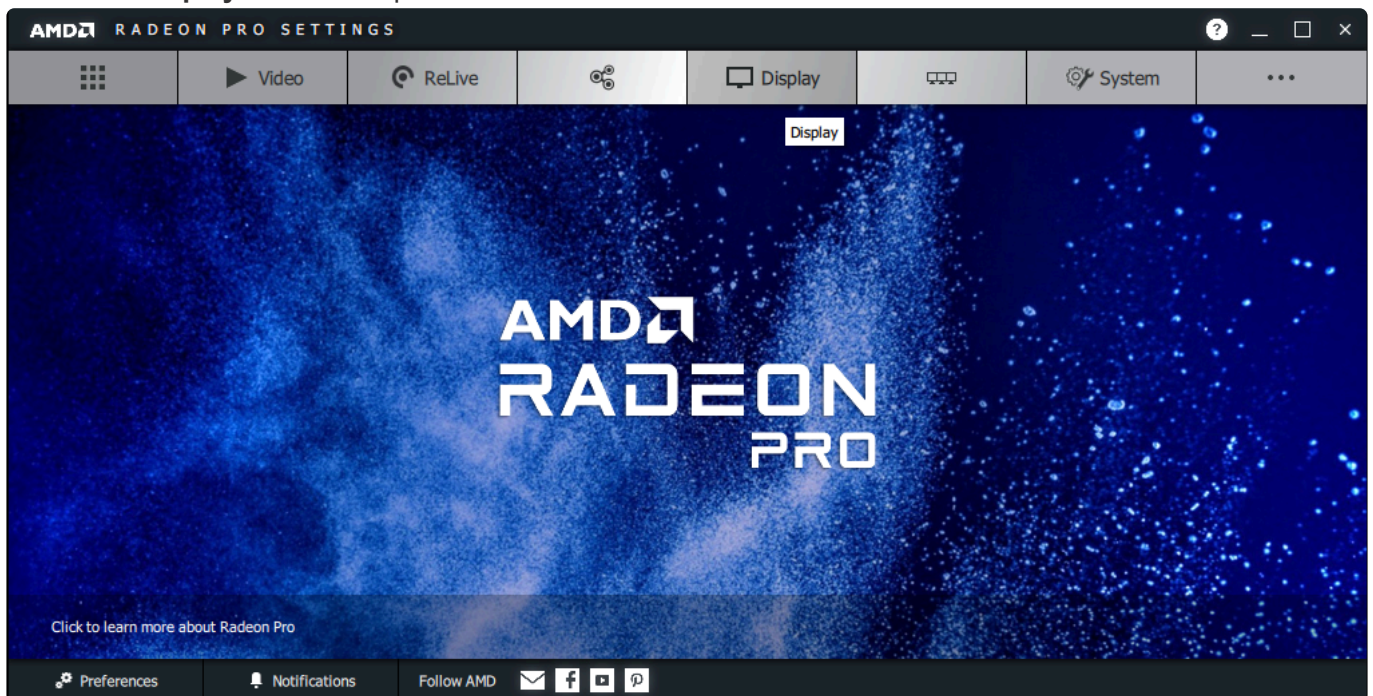
Select the **EDID Emulation** tab.
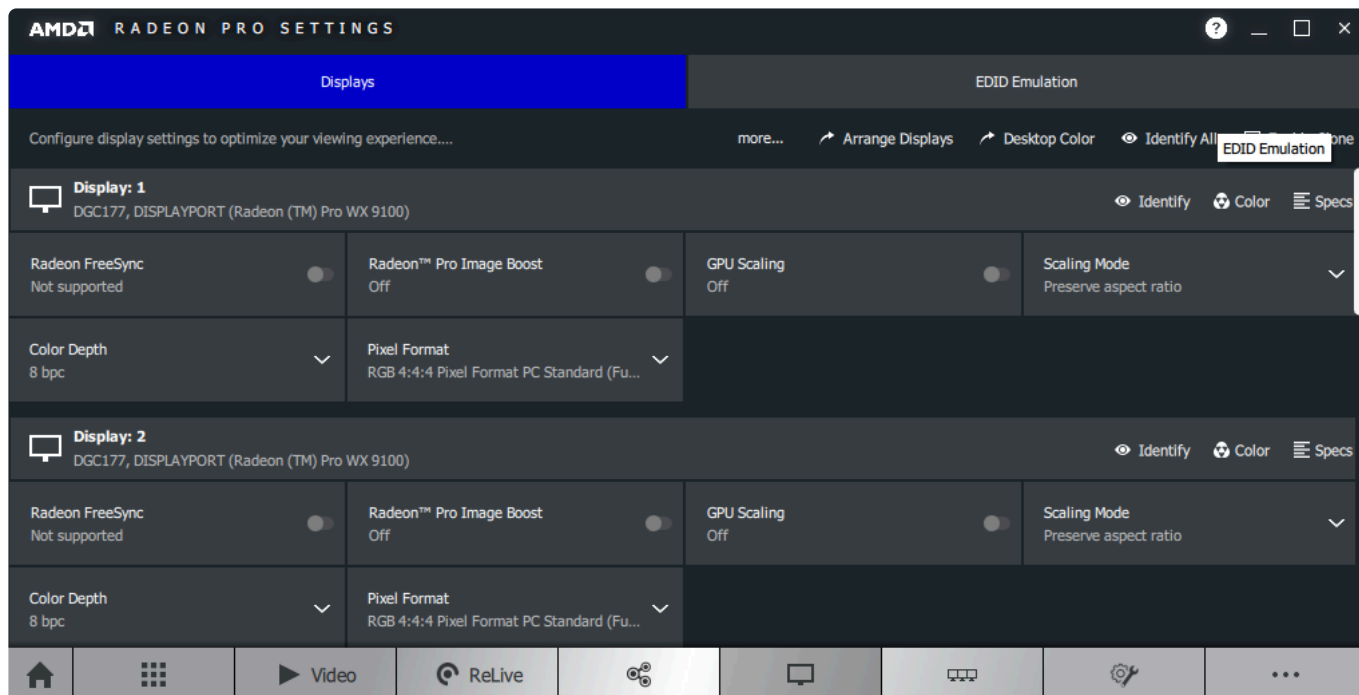
Select the Kebab menu icon next to the output you wish to emulate on.
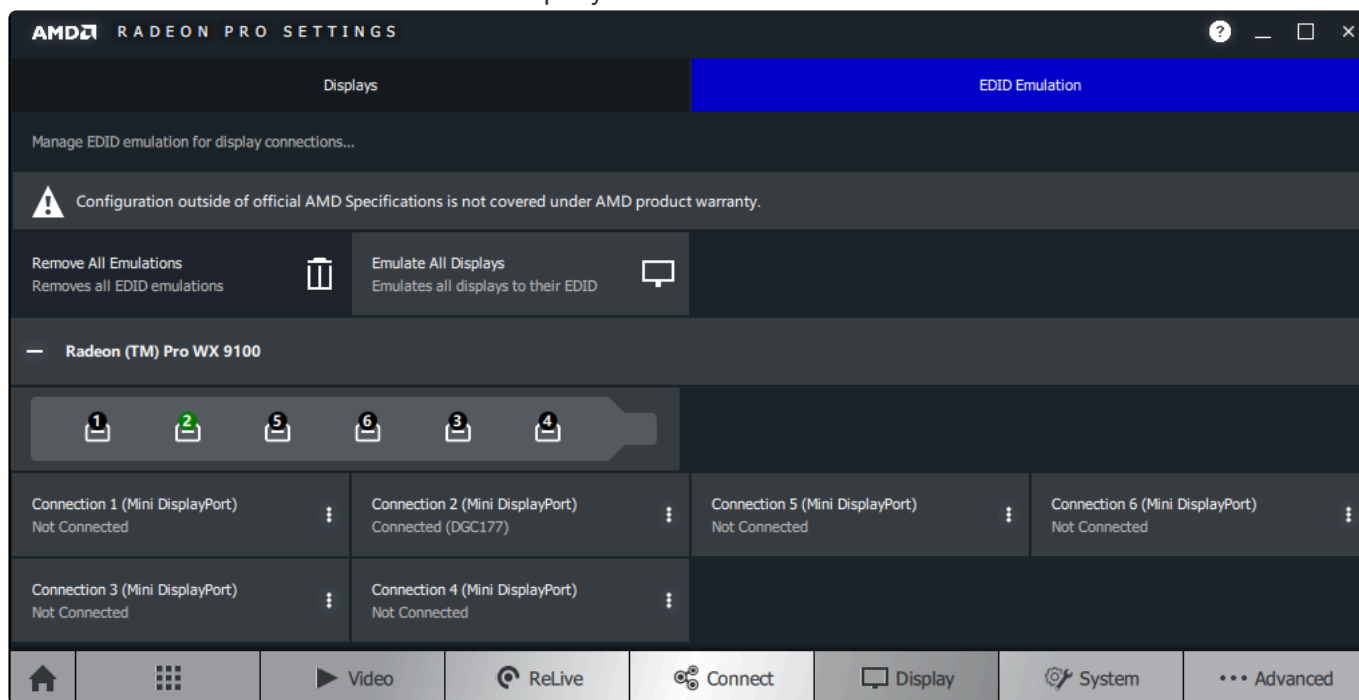
Here you need to select the source of the EDID you are going emulate. This can be from a EDID file, or from a currently connected/emulated connection on the graphics card. You will also need to confirm that the destination is correct and that the settings match what signal you are trying to emulate. For example, UHD@60 need to be at 5.4Ghz.
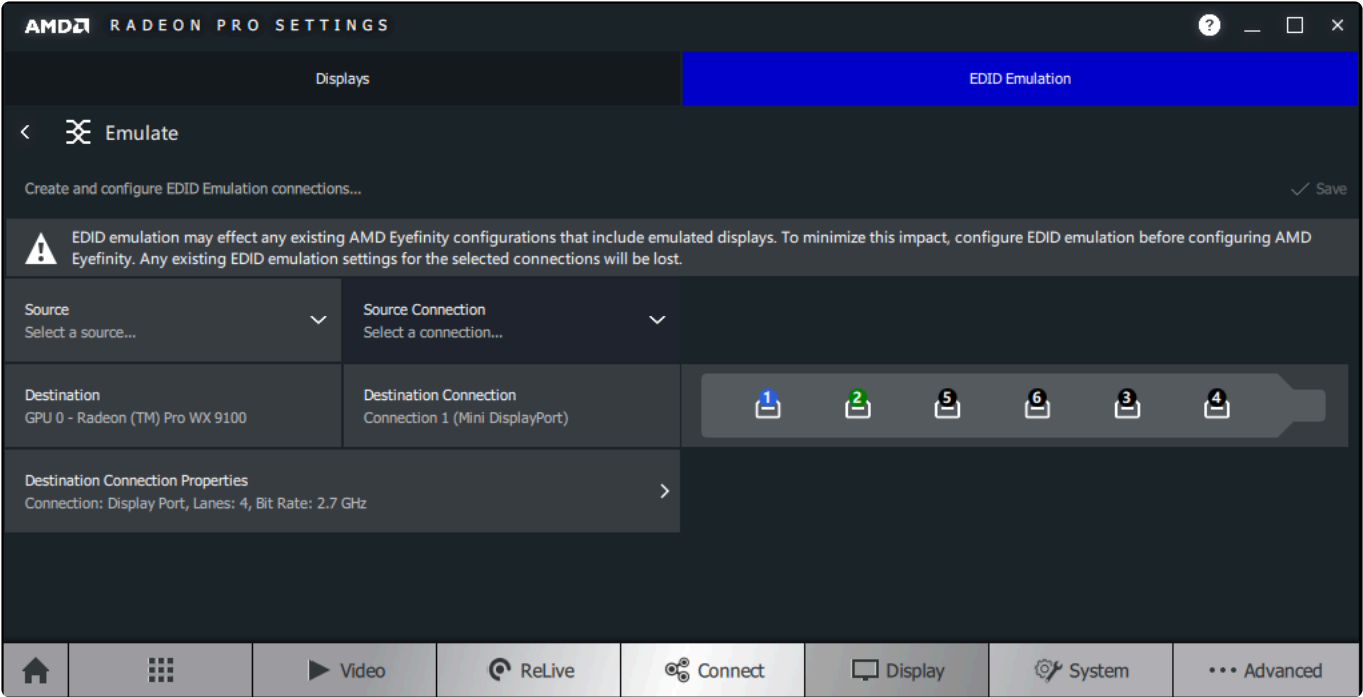
Once everything is set up, click **Save** in the top right.
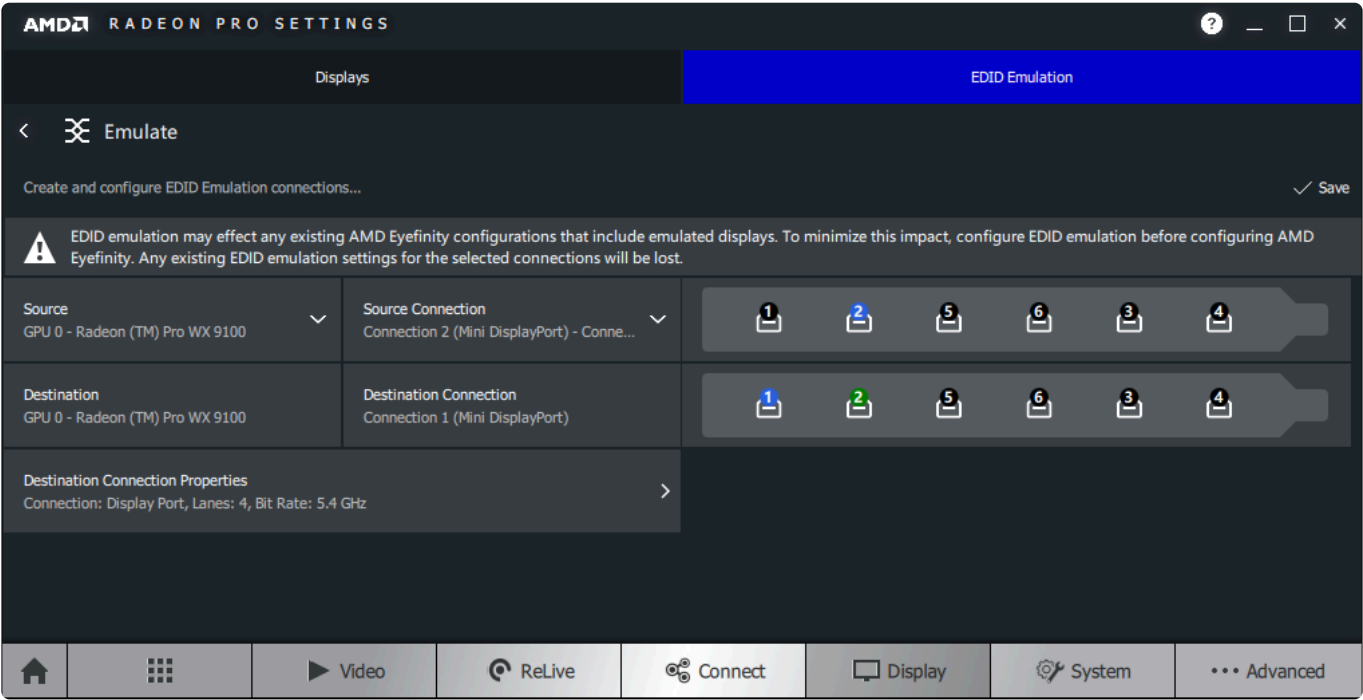
Here you can see that the emulation has been applied exactly as set up in the previous steps.
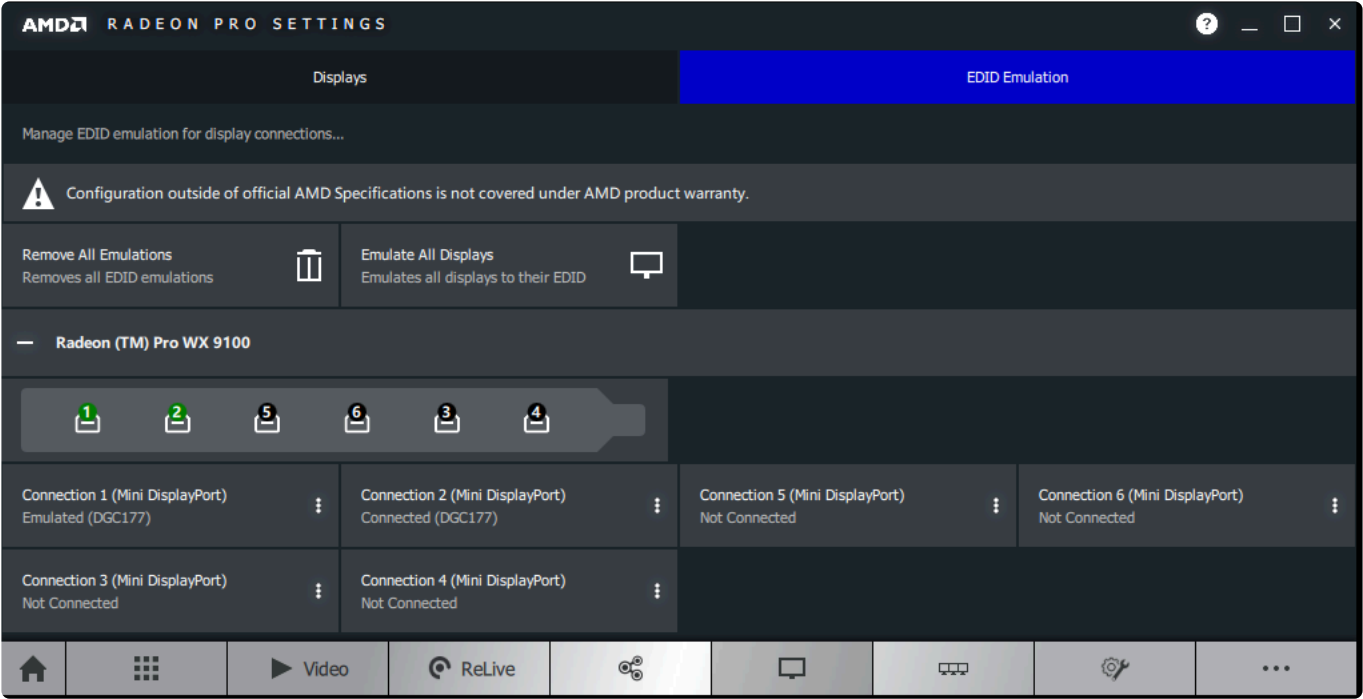
EDID Emulation will continue to work if the system has been restarted.

Removing Emulation

As long as HippoLauncher is running, the global shortcut of CTRL+SHIFT+'e' will remove all emulation from the setup

Boreal+/Taiga+ SDI Output Software EDID Emulation

To enable EDID emulation go to the advanced AMD control centre by right click on the computer's desktop and selecting **AMD Firepro Advanced**.

Select EDID Emulation from the left side menu.

Tick the displays to manage from the list and click **Manage EDID**

The EDID can be learned from one display and applied to others, or or retrieved from a file saved on the machine.

> **Note:** In order to genlock outputs they must have the same EDID. EDID emulation is the best way to guarantee this. Learn the EDID from one display to be Genlocked and save it to the others.

EDID Emulation

⚠️ EDID emulation may affect any existing AMD Eyefinity configurations that include emulated displays. To minimize this impact, configure EDID emulation before configuring AMD Eyefinity.

Any existing EDID emulation settings for the selected connections will be lost.

Apply EDID emulation to these connections:

⊞ **AMD FirePro W8100 3**

Select EDID:

◉ From Display:

U28D590(AMD FirePro W8100 3 Port 1 - DisplayPort)   ⌄

○ From File:

[   ]   Browse

🔍 View Raw EDID

Connection Properties:

Emulation	Emulate always
Connection	DisplayPort
Lanes	4
Bit Rate	5.4 GHz

Discard   Apply

EDID Emulation will continue to work if the system has been restarted.

Removing Emulation

As long as HippoLauncher is running, the global shortcut of CTRL+SHIFT+'e' will remove all emulation from the setup

Tierra+ / Karst+ MK2 / Boreal+ MK2 / Tierra+ MK2 Software EDID Emulation

Opening Control Panel

Right click on the desktop and select 'NVidia Control Panel'
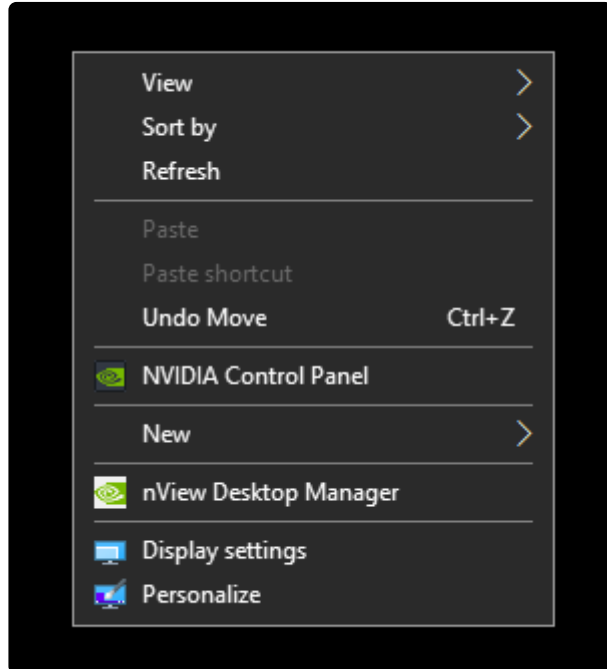
Opening Topology

On the left hand side menu, select 'System Topology'. This page gives a breakdown port by port for each GPU in the machine

Click the 'EDID' link next to any of the ports on either of the GPU's

Exporting an EDID

Select the port with the EDID you wish to export into a file. Then click the 'Export EDID' button

Manage EDID

Export | Load | Unload

Select Connector to Export EDID:

Connector	Display	Status	Video signal
Quadro RTX 4000(1)			
DisplayPort (1)	1920x1080@60	File	DisplayPort (Digital)
DisplayPort (2)		Not Connected	VGA (Analog)
DisplayPort (3)		Not Connected	VGA (Analog)
USB-C		Not Connected	VGA (Analog)
Quadro RTX 6000(2)			
DisplayPort (1)	3840x2160@60	File	DisplayPort (Digital)
DisplayPort (2)		Not Connected	VGA (Analog)
DisplayPort (3)		Not Connected	VGA (Analog)
USB-C		Not Connected	VGA (Analog)
DisplayPort (4)		Not Connected	VGA (Analog)

Export EDID | Cancel

Choose the destination and name of the EDID file. This will be done in a .txt format

Save As

This PC > Documents >

Search Documents

Organize ▾   New folder

- comp
- new_file_format
- Tierra-27-03-202
- tmp
- This PC
- 3D Objects
- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- Hippotizer (C:)
- Media (D:)

Name	Date modified	Type	Size
Green Hippo	24/03/2020 16:42	File folder	

File name:

Save as type: Text Files (*.txt)

Hide Folders   Save | Cancel
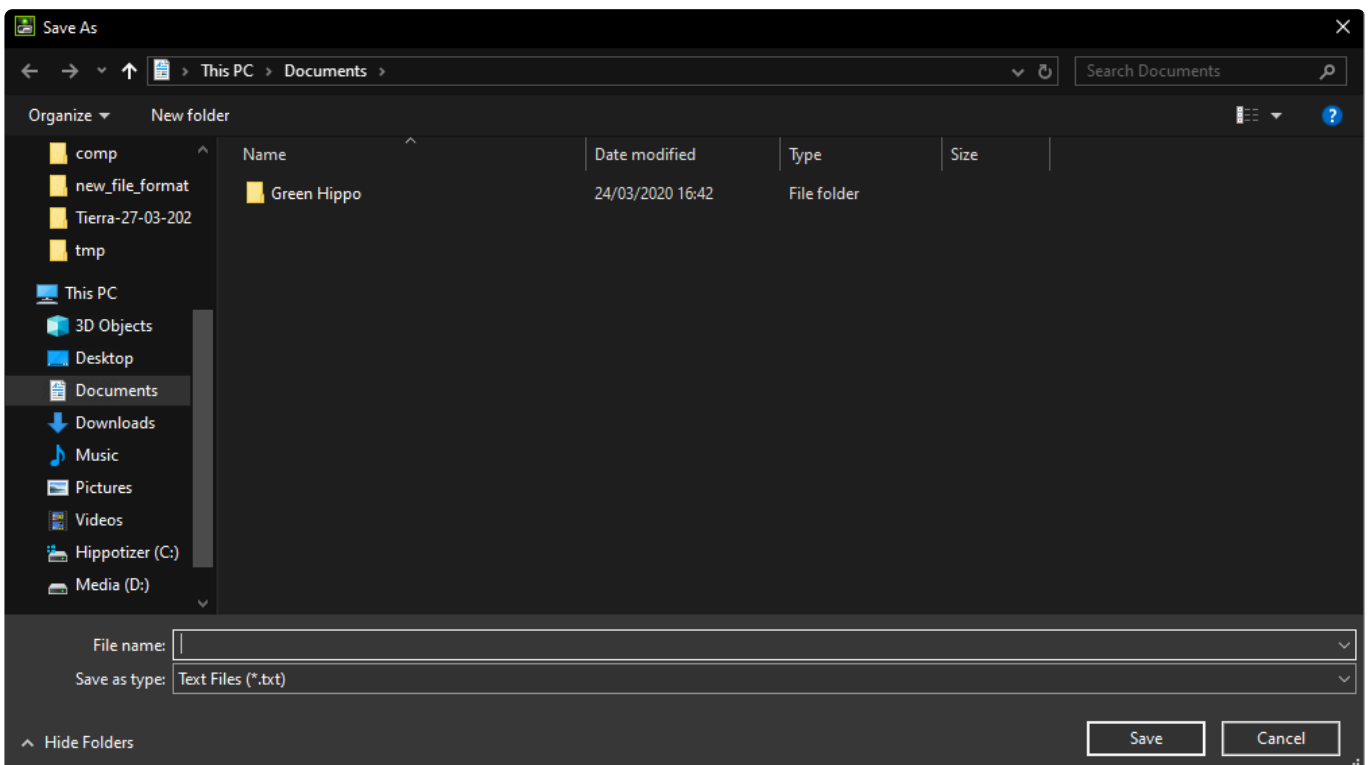
Loading an EDID (Emulation)

On the Load tab, click Browse and find the EDID file you wish to load (must be in a .txt format)

Manage EDID

Export | **Load** | Unload

EDID file:

[_____] [Browse]

Select Connector to force EDID:

☐	Connector	Display	Status	Video signal	Comments*
☐	DisplayPort (1)	1920x108...	File	DisplayPort (Dig...	
☐	DisplayPort (2)		Not Connected	VGA (Analog)	
☐	DisplayPort (3)		Not Connected	VGA (Analog)	
☐	USB-C		Not Connected	VGA (Analog)	
	Quadro RTX 6000(2)				
☐	DisplayPort (1)	3840x216...	File	DisplayPort (Dig...	
☐	DisplayPort (2)		Not Connected	VGA (Analog)	
☐	DisplayPort (3)		Not Connected	VGA (Analog)	
☐	USB-C		Not Connected	VGA (Analog)	
☐	DisplayPort (4)		Not Connected	VGA (Analog)	

* ☐ I have read the warning messages and want to load EDID on selected monitors

[Load EDID]   [Cancel]

With the file path selected, you can now select which ports you wish to emulate with this EDID

Manage EDID

Export | **Load** | Unload

EDID file:

[C:\Users\Hippo\Documents\edid.txt] [Browse]

Select Connector to force EDID:

☐	Connector	Display	Status	Video signal	Comments*
	Quadro RTX 4000(1)				
☐	DisplayPort (1)	1920x108...	File	DisplayPort (Dig...	
☑	DisplayPort (2)		Not Connected	VGA (Analog)	
☐	DisplayPort (3)		Not Connected	VGA (Analog)	
☐	USB-C		Not Connected	VGA (Analog)	
	Quadro RTX 6000(2)				
☐	DisplayPort (1)	3840x216...	File	DisplayPort (Dig...	
☐	DisplayPort (2)		Not Connected	VGA (Analog)	
☑	DisplayPort (3)		Not Connected	VGA (Analog) ⌄	
☐	USB-C		Not Connected	VGA (Analog)	

* ☐ I have read the warning messages and want to load EDID on selected monitors

[Load EDID]   [Cancel]

Remember to set the signal type to be what you wish to be outputting as

Unloading EDID's

On the Unload tab, select the ports you wish to remove emulation from and then select 'Unload EDID'. This may take up to a minute before the unit becomes fully responsive again

Manage EDID   ✕

Export   Load   **Unload**

Select Connector to Unload EDID:

☐	Connector	Display	Status	Video signal
Quadro RTX 4000(1)				
☐	DisplayPort (1)	1920x1080@60	File	DisplayPort (Digital)
☑	DisplayPort (2)	3840x2160@6...	File	DisplayPort (Digital)
☐	DisplayPort (3)		Not Connected	VGA (Analog)
☐	USB-C		Not Connected	VGA (Analog)
Quadro RTX 6000(2)				
☐	DisplayPort (1)	3840x2160@6...	File	DisplayPort (Digital)
☐	DisplayPort (2)		Not Connected	VGA (Analog)
☑	DisplayPort (3)	3840x2160@6...	File	DisplayPort (Digital)
☐	USB-C		Not Connected	VGA (Analog)
☐	DisplayPort (4)		Not Connected	VGA (Analog)

Unload EDID   Cancel

Automated EDID Emulation

With the Nevis+ unit, additional EDID management features are released to help manage and maintain this aspect of output configuration within the Hippotizer software. **This is only available on Nevis+ units.**

HippoLauncher Automation Process

On HippoLauncher start-up the EDID Emulation process is automatic and is configured by the currently connected emulated outputs. Below is a table explaining the configuration during HippoLauncher start-up and what happens:

ZooKeeper Connected	ZooKeeper Emulated	Output Connected	Output Emulated	What Happens
No	No	No	No	ZooKeeper will be emulated as 1920×1080@60Hz
Yes	No	No	No	The connected EDID for ZooKeeper will be emulated
No	Yes	No	No	No change
Yes	Yes	No	No	No change
No	No	Yes	No	ZooKeeper will be emulated as 1920×1080@60Hz. Connected Output EDID will be emulated
Yes	No	Yes	No	The connected EDID for ZooKeeper will be emulated. Connected Output EDID will be emulated
No	Yes	Yes	No	Connected Output EDID will be emulated
Yes	Yes	Yes	No	Connected Output EDID will be emulated
No	No	No	Yes	ZooKeeper will be emulated as 1920×1080@60Hz
Yes	No	No	Yes	The connected EDID for ZooKeeper will be emulated
No	Yes	No	Yes	No change
Yes	Yes	No	Yes	No change
No	No	Yes	Yes	ZooKeeper will be emulated as 1920×1080@60Hz
Yes	No	Yes	Yes	The connected EDID for ZooKeeper will be emulated
No	Yes	Yes	Yes	No change
Yes	Yes	Yes	Yes	No change

In short the software will ensure there is always a ZooKeeper present even if a screen cannot be left physically connected. This is to ensure that in the case of a Windows pop-up, it will be posted onto the emulated ZooKeeper screen and not post over the output. It also means that units can be remotely accessed via a VNC solution and will have a virtual canvas within Windows for the ZooKeeper software instead of just having the outputs viewable remotely. In regards to the output connector, it will only

automatically emulate if there is a physical connection and no current emulation on it.

Removing Emulation

The automated EDID emulation process will **never** remove emulation, so it is recommended practice to remove all emulation at the end of the show/installation so the machine is fresh on the next setup. This can be done in a numbers of ways including using the new Screen Management system in HippoLauncher, or with HippoLauncher open using the global shortcut CTRL + SHIFT + E to remove all emulation.

Whilst Engine Is Running

The process will also not run whilst the engine is started to prevent output manager being disrupted in a live setting.

Turning off Automated EDID Emulation

On the Advanced Tab in HippoLauncher you can also set the process to no longer run on HippoLauncher start. In ver4.5.4 and above the autmated EDID emulation is off by default and must be turned on in the Advanced Tab.
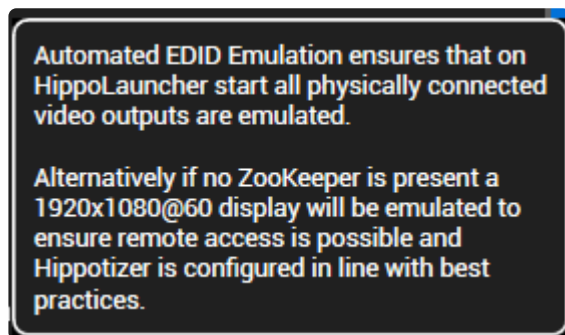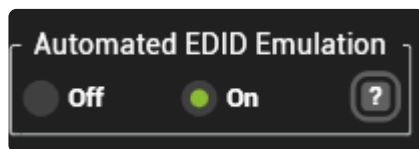
HippoLauncher Screen Management

As well as the addition of Automated EDID Emulation functionality with the Nevis+ unit, there is an extension of Output management on the main tab of HippoLauncher. In this UI on the Nevis+ model it is possible to control both the ZooKeeper and Output EDID's. A library of EDID's is provided containing a 1920×1080 and a 3840×2160 EDID for 30Hz, 50Hz & 60Hz. It is also possible to pull the EDID directly from the connected monitors. This is packaged with a UI allowing you to quickly see and understand information regarding the port's status.

Screen Management UI
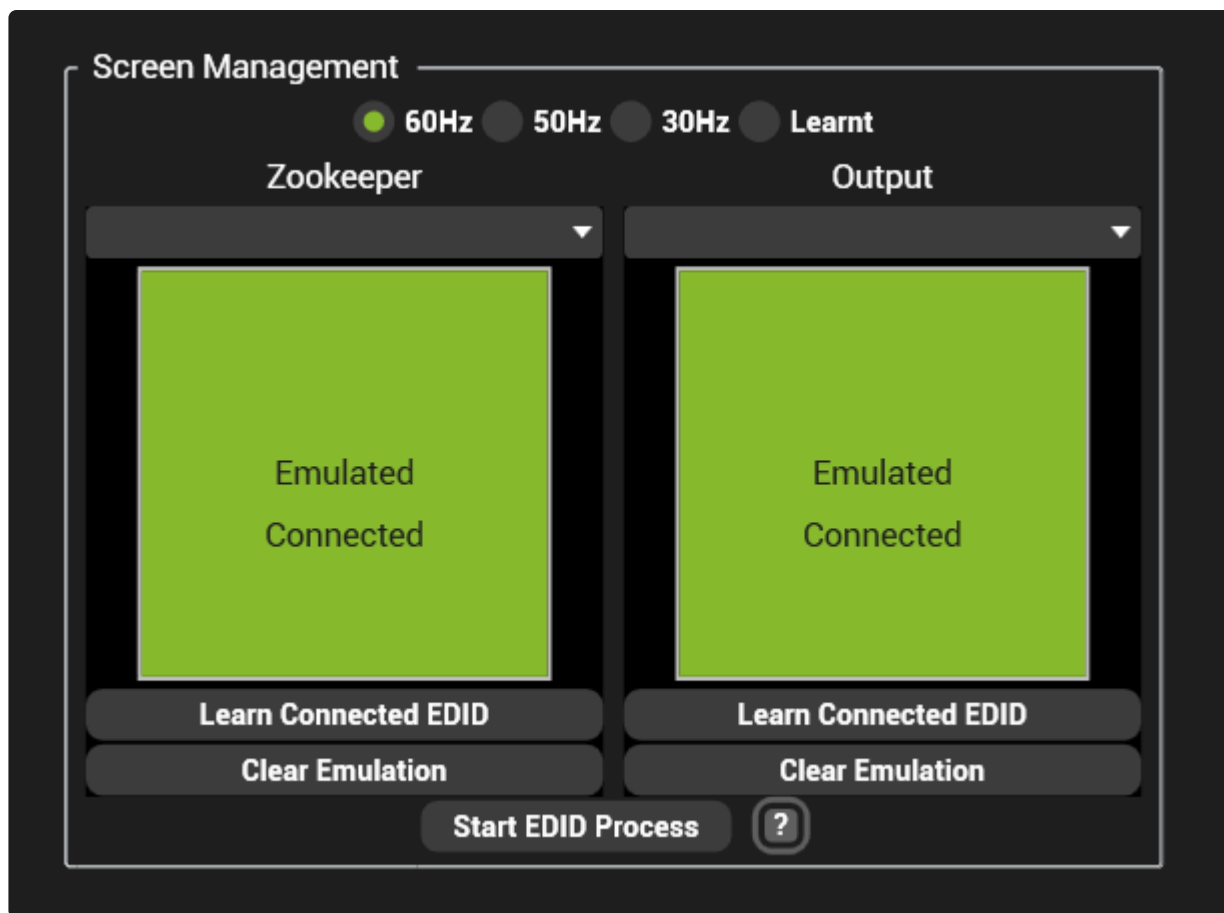
Above is the standard view once the Automated EDID Emulation has run

As seen above, the Screen Management system gives you a full view of the state of emulation and physical connection to the ZooKeeper and Output port. Using the radio buttons at the top allows you to move between subsections of the EDID library. Once a refresh rate has been decided on the drop down's will only show the EDID's using that refresh rate. You can also view which EDID's have been learnt from a physical connection. See below for further information.
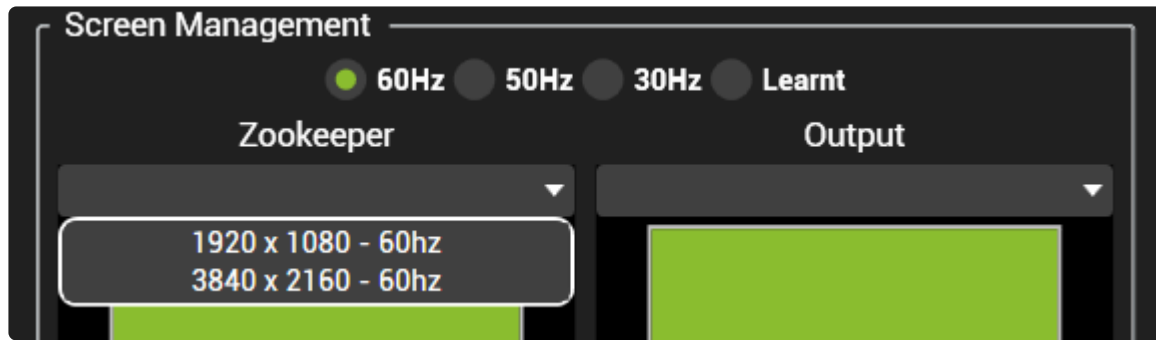
Above is a example drop down showing the 60Hz EDID's in the library

Upon selecting one of the option's, the EDID will be applied automatically (this may cause a brief frame of black to the output as the GPU is re-configuring).

Learning EDID's and Using Them

To learn EDID's from a connected screen you need to follow the below outlined process.

1. Ensure there is no emulation on the port. We recommend using the port specific 'Clear Emulation' button
2. Plug in the wanted screen to the Nevis+ port.
3. Use the 'Learn Connected EDID Button'.
4. Select the 'Learnt' radio button at the top.
5. Using the drop down's you can see the 2 options of 'Learnt Output' & 'Learnt ZooKeeper'.
6. Selecting the one that matches the port you learnt from will now emulate the EDID.

Alternative UI States

The UI has the ability to show you both whether there is a physical connection to the port and also whether it is emulated with an EDID.
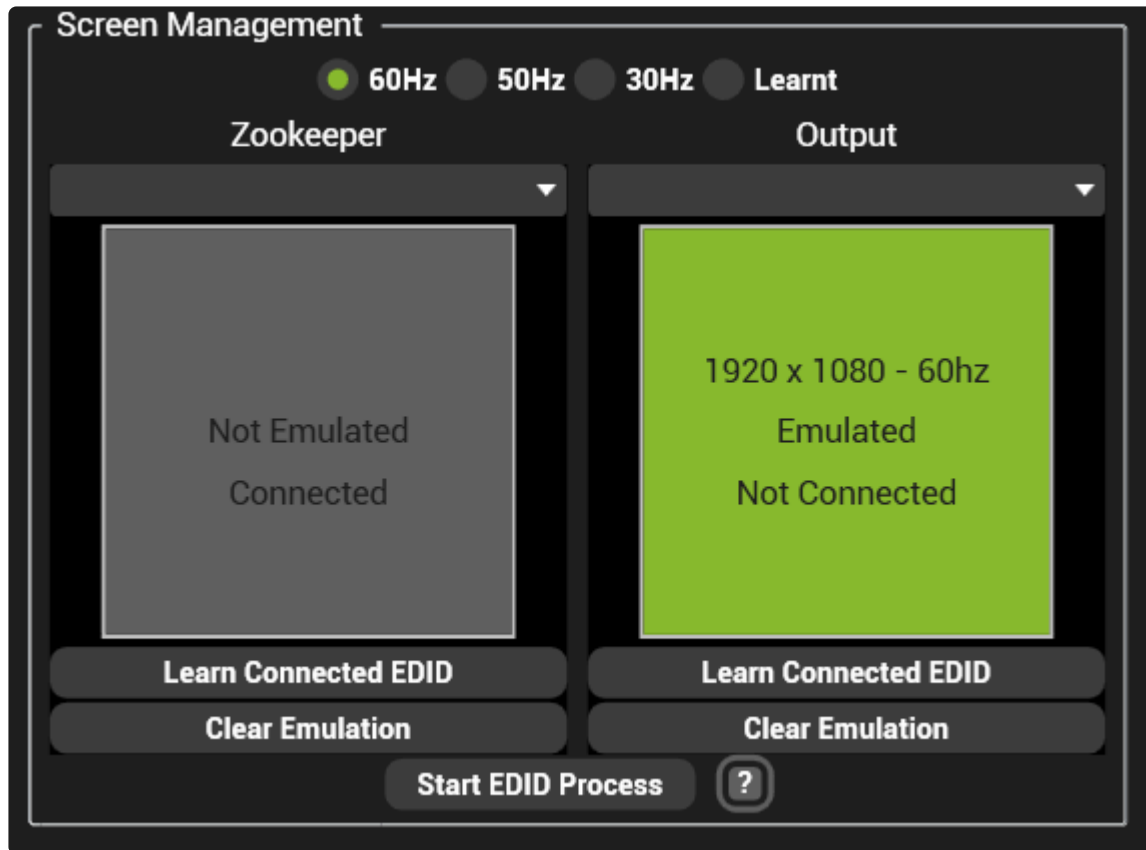
Above is a example showing a non-emulated but physically connected ZooKeeper and a emulated Output that has no physical connection

When the port has no emulation, the UI will turn grey and state it.

With the physical connection check there is no colour change, but the UI does state either 'Connected' or 'Not Connected'

If emulated from the EDID library then the UI will also show the resolution and refresh rate that it was set as.

Trouble-shooting

Removing Emulation

To remove emulation you can:

- Use the singular 'Clear Emulation' buttons
- CTRL + SHIFT + E removes all emulation
- In the driver itself
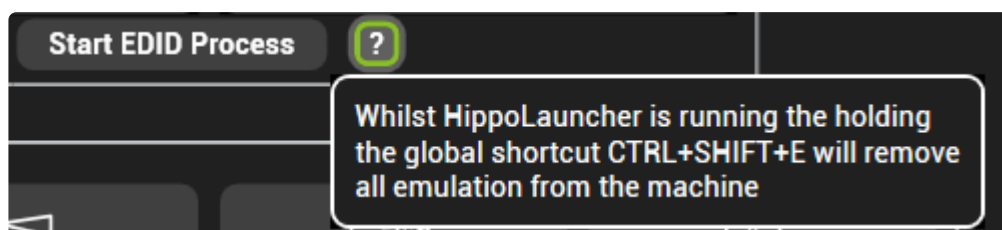
EDID Refresh Rate Management

We maintain that the best practice whilst using Hippotizer Media Servers is to ensure that all refresh rates match. This information is used by our processing engine to set the rate of frames we will render. Having a mismatch causes inconsistent playback FPS due to the mismatch.

Output Incorrect Resolution After Emulation

This happens occasionally due to a feature on the Windows 10 platform. To rectify either go to the Screen Management page by right clicking the Windows desktop and set the display to the correct resolution (this will be marked as the recommended one). Alternatively, a system restart will fix the issue.

Genlock

Many Hippotizer system have the ability to use an external Genlock signal in order to ensure the vertical refresh occurs in sync across multiple systems.

> **Note:** Genlock synchronises the vertical refresh only; synchronising frame playback is handled by timecode.

Genlock can be taken from an external source, refered to as **house sync**, or sourced from a display output. Where multiple systems are being used an external sync source must be used.

House Sync

The Genlock input on Hippotizer is compatible with sync signals including:

- Black Burst
- Tri-Level
- SD/HD/3G SDI signals.

Only displays that have identical resolutions and EDIDs can be synced together. It is strongly advised to emulate the same EDID on displays that are to be Genlocked. Information on EDID emulation can be found here.

V4 Genlock

Configuration Process

Note: This process has been documented and tested on the recommended driver 15.201.

1. Navigate to the Firepro Control Centre by right clicking on the desktop
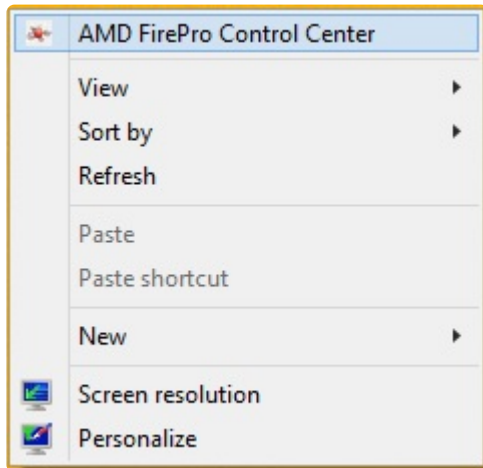
2. Navigate to the Sync settings in the Firepro tab
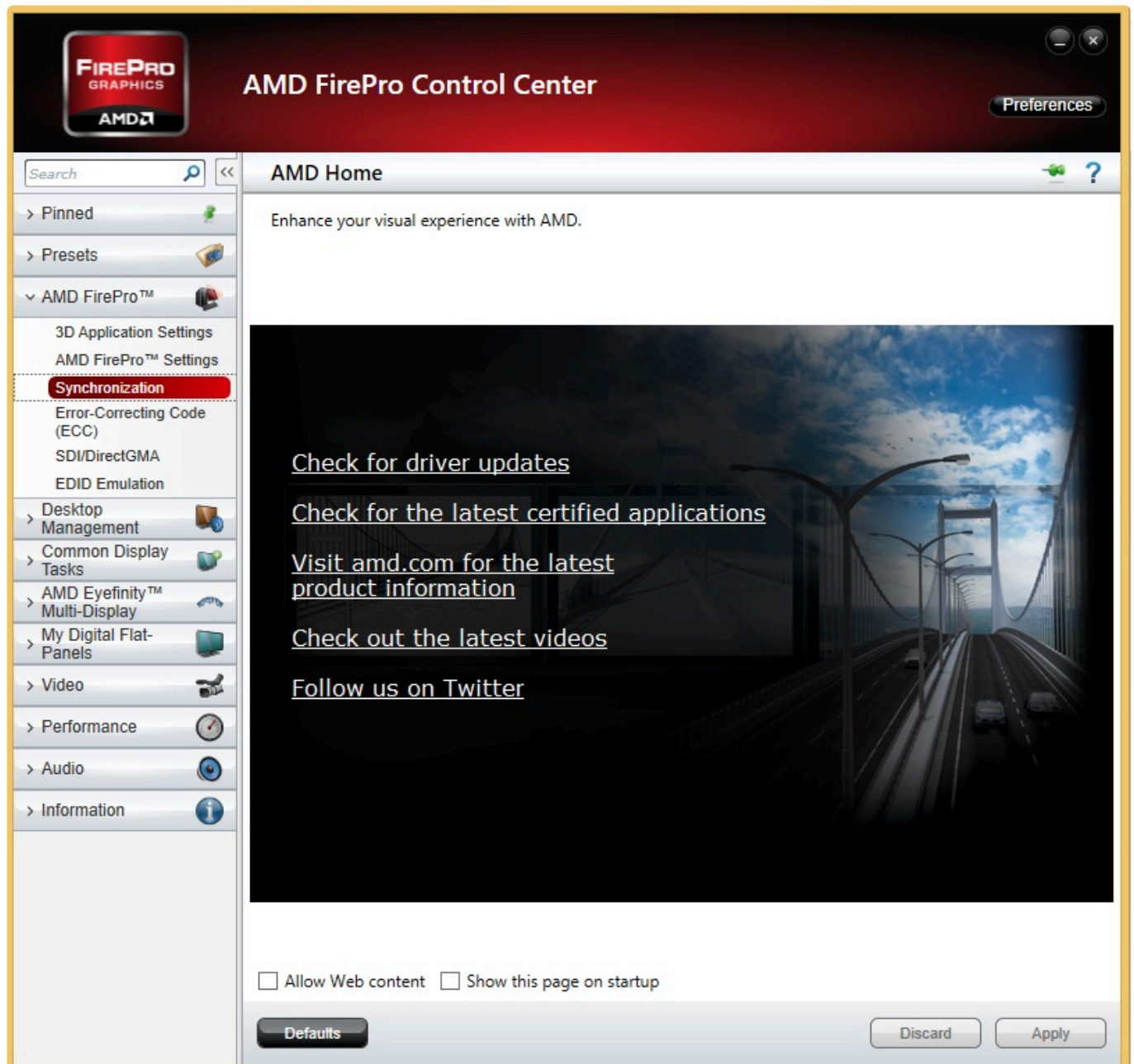
3. The Sync window shows all attached displays and house sync (if present).
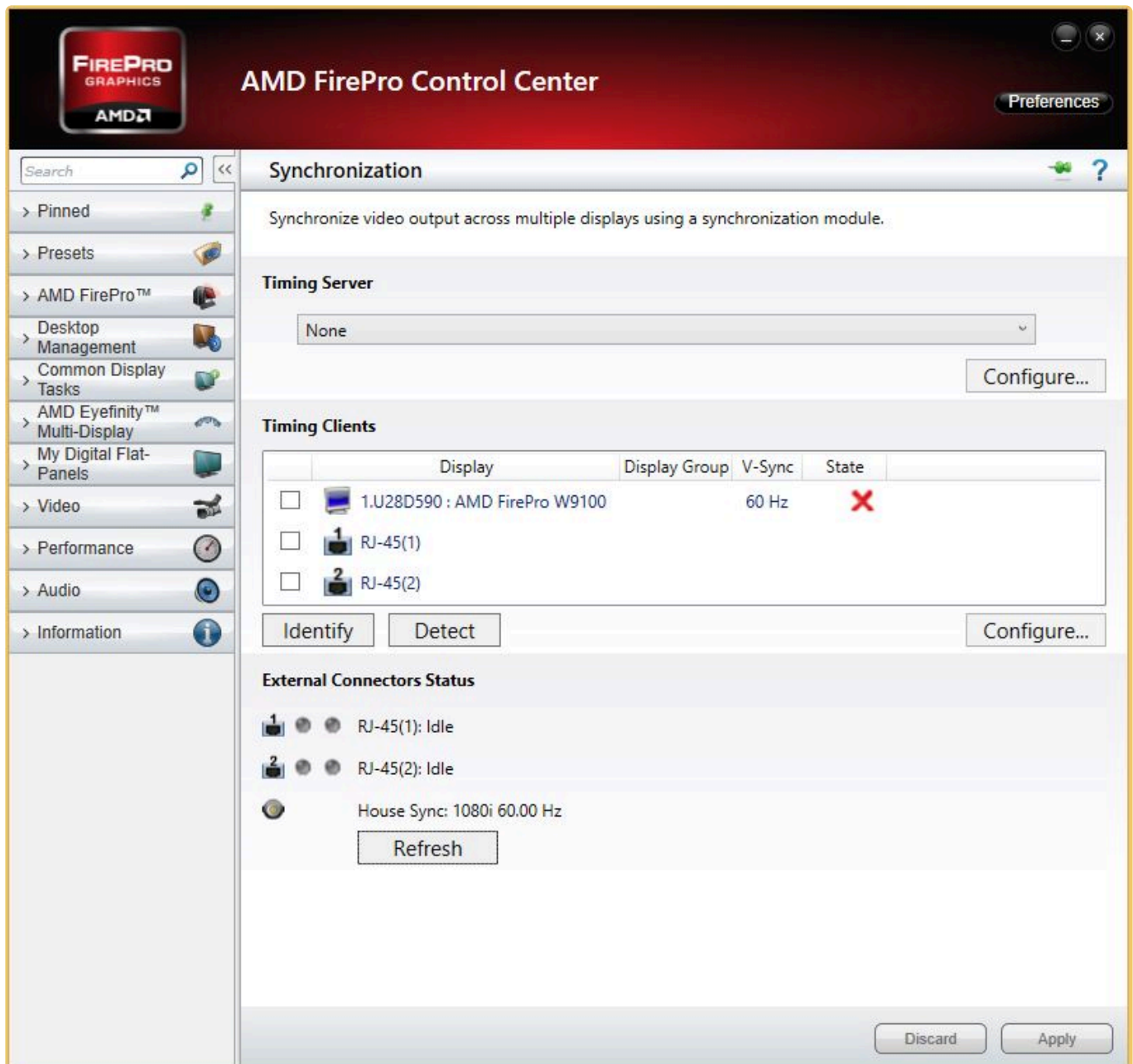
4. To set sync, in the timing server drop down menu select a display and press configure.

Configure Timing Server

1.U28D590 : AMD FirePro W9100 (60 Hz) Display Group 3

Timing Signal Source:

House Sync (Genlocked)

Signal configuration

Signal Type:	1080i 60.00 Hz	☐ Sync to field 1
Triggering Edge:	Rising	
Scan Rate Coefficient:	1:1	
Sync Delay (µs):	0	

OK   Cancel
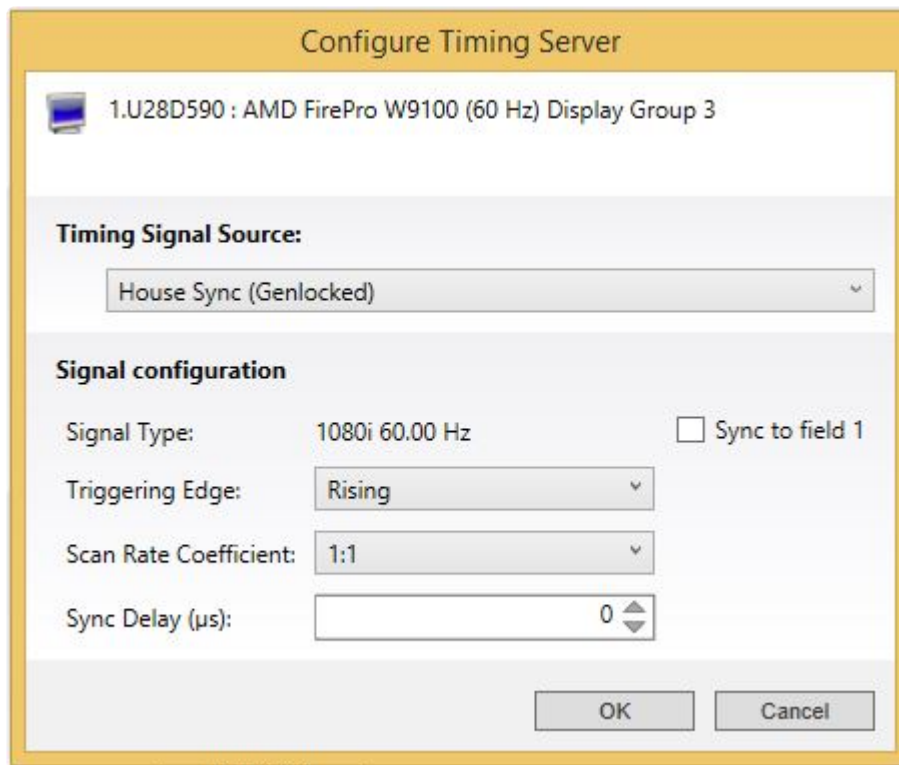
5. Set the timing source to either house sync or the display and press ok.

6. The timing server should now show a green check.
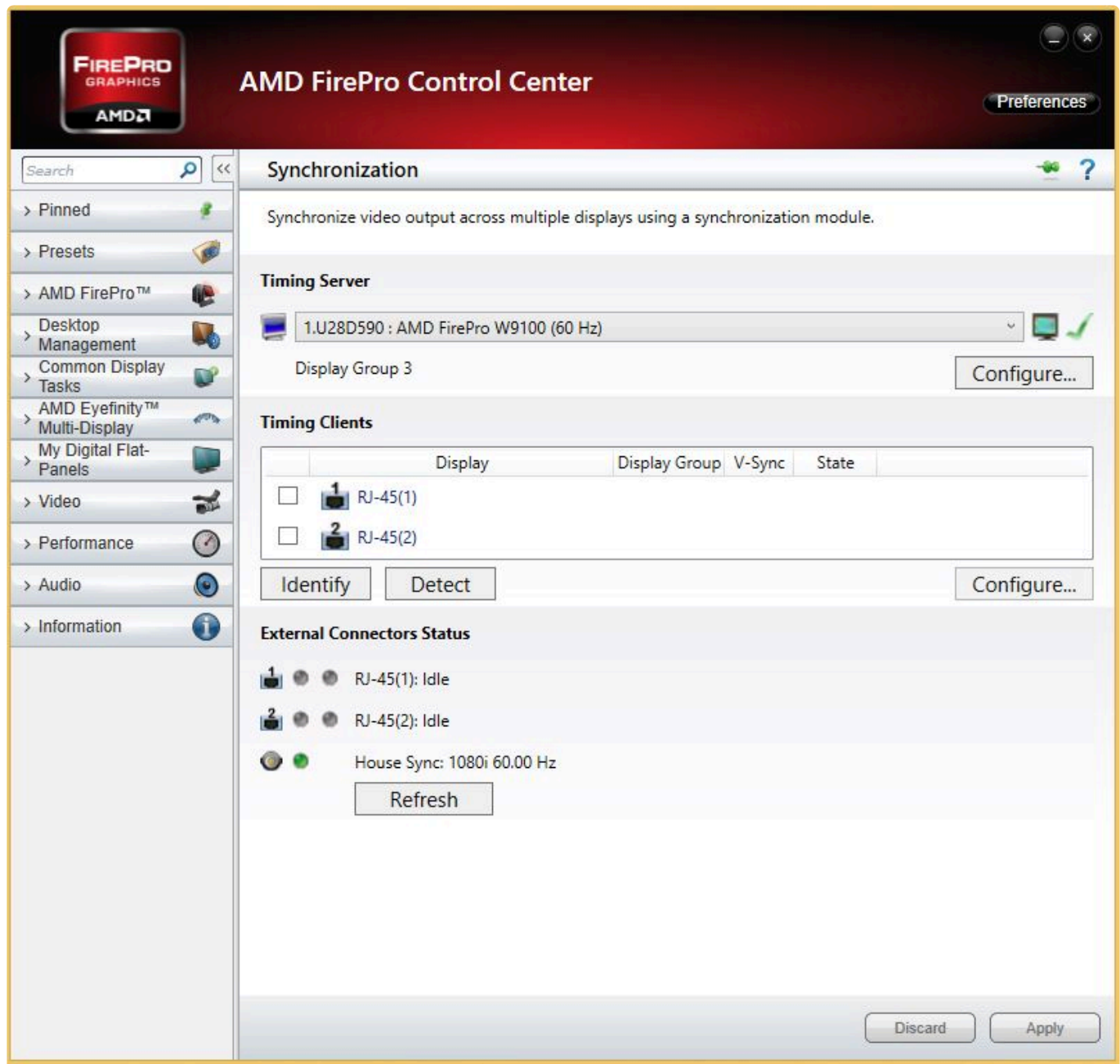
7. To add displays to sync to the timing server tick the box next to them and press apply.

> **Note:** It is common to have a long pause (up to a minute) after pressing apply, meanwhile the catalyst window will become unresponsive. Please wait until it responds again before closing it.

Only displays that have identical resolutions and EDIDs can be synced together. It is strongly advised to emulate the same EDID on displays to be Genlocked. Information on EDID emulation can be found here.

V4+ Genlock

Karst+(Non DVI)/Boreal+/Taiga+ Genlock

Configuration Process For Frame Lock & Genlock

Note: This process has been documented and tested on the recommended driver 20.Q3.1.

1. Navigate to the AMD Radeon Pro Settings by right clicking on the desktop
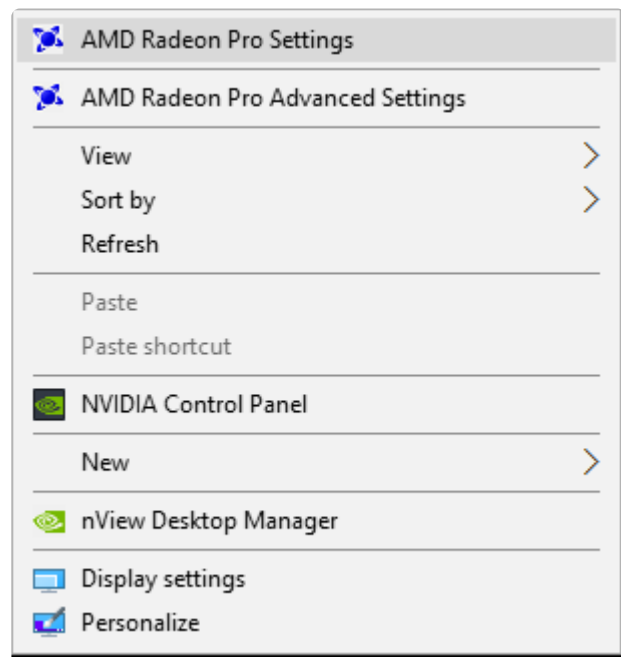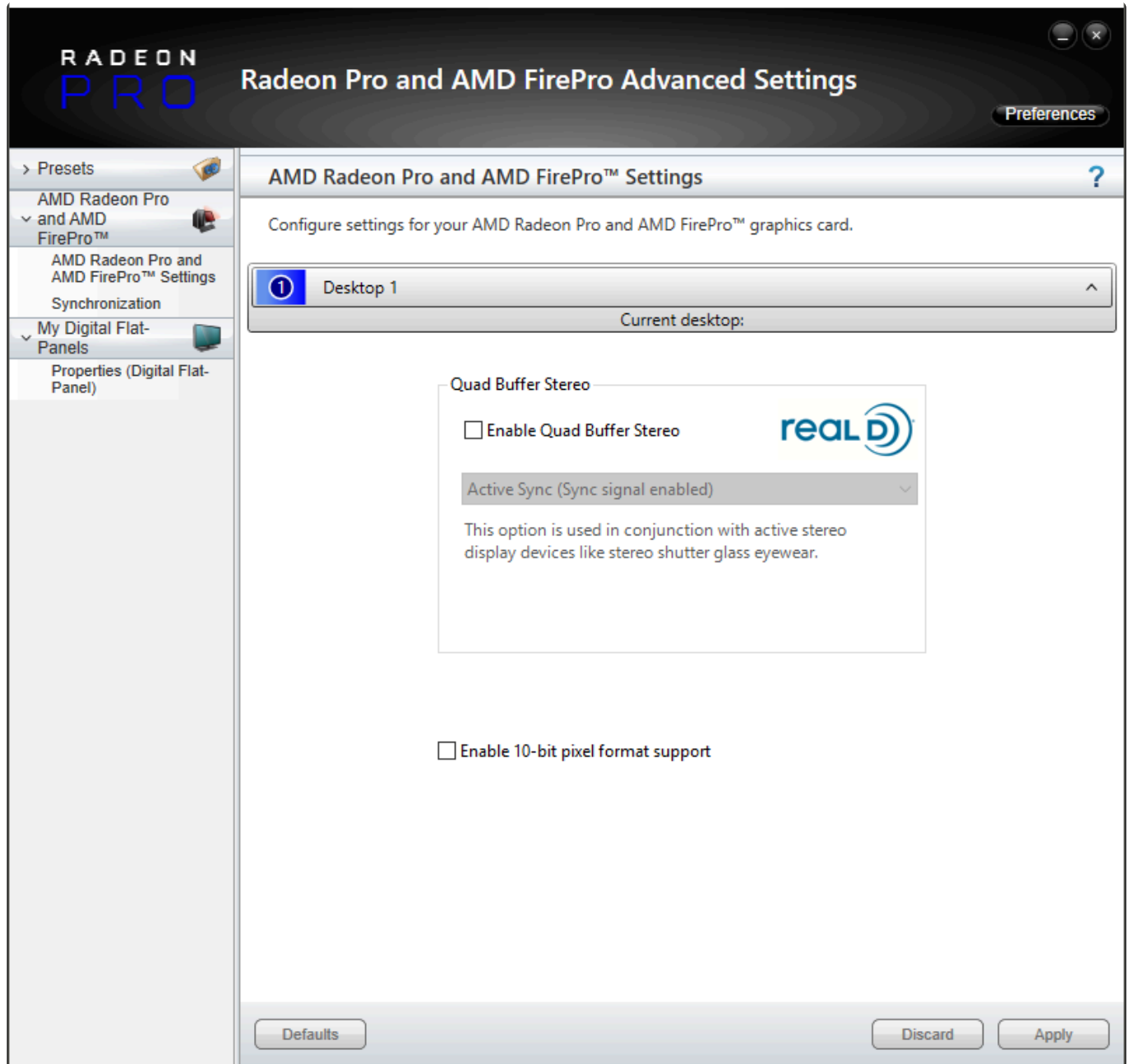
2. On the left hand menu, select Synchronization

3. The screen will now show all the outputs currently available (via emulation or physical connection) for the outputs of the unit. At the bottom it will also have information for any external genlock signals that the system receives.
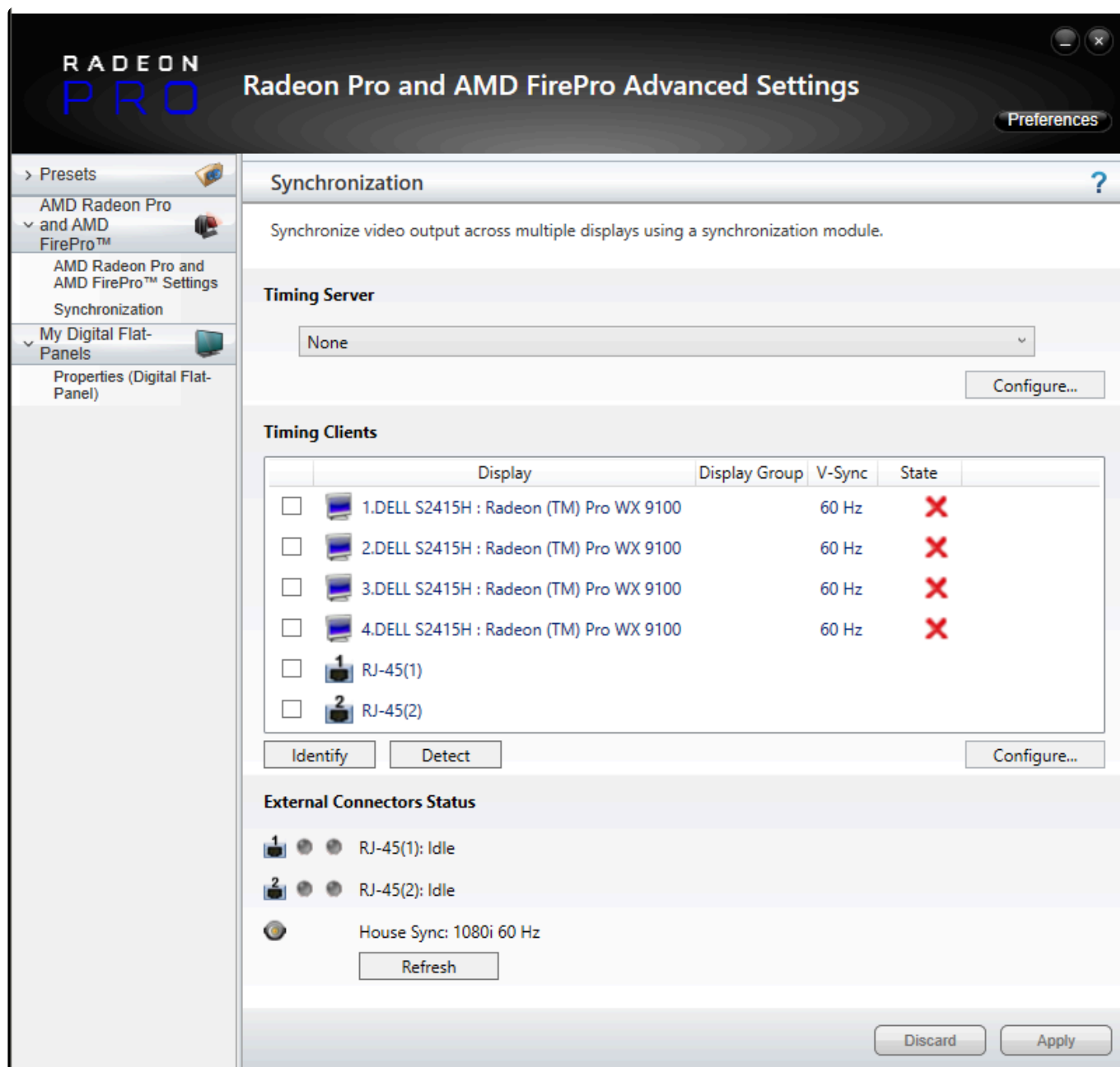
4. Select the Timing Server drop down and select the first output
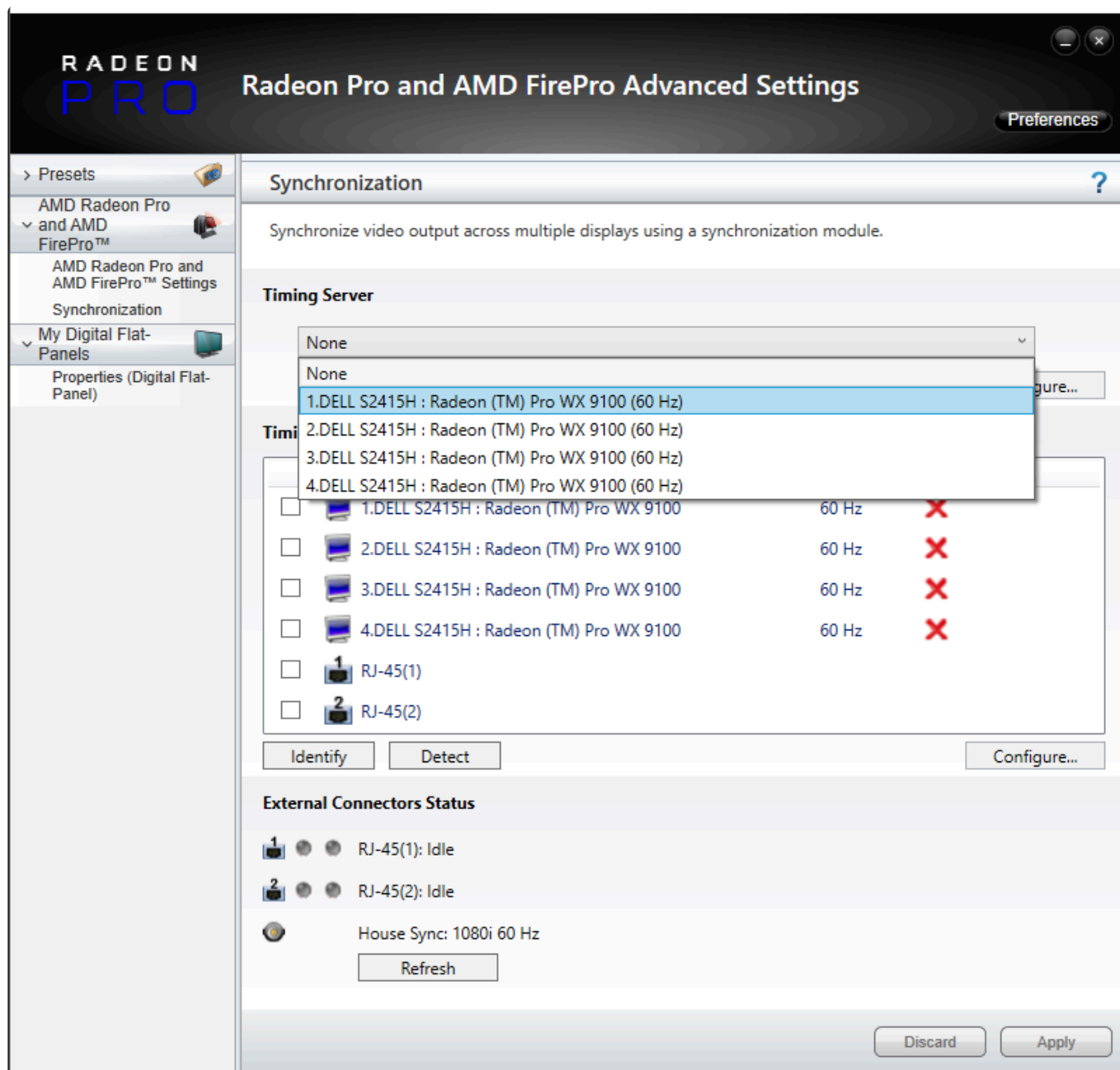
5. The screen will now look like this. If you are using an external Genlock signal follow step 6 otherwise skip it.
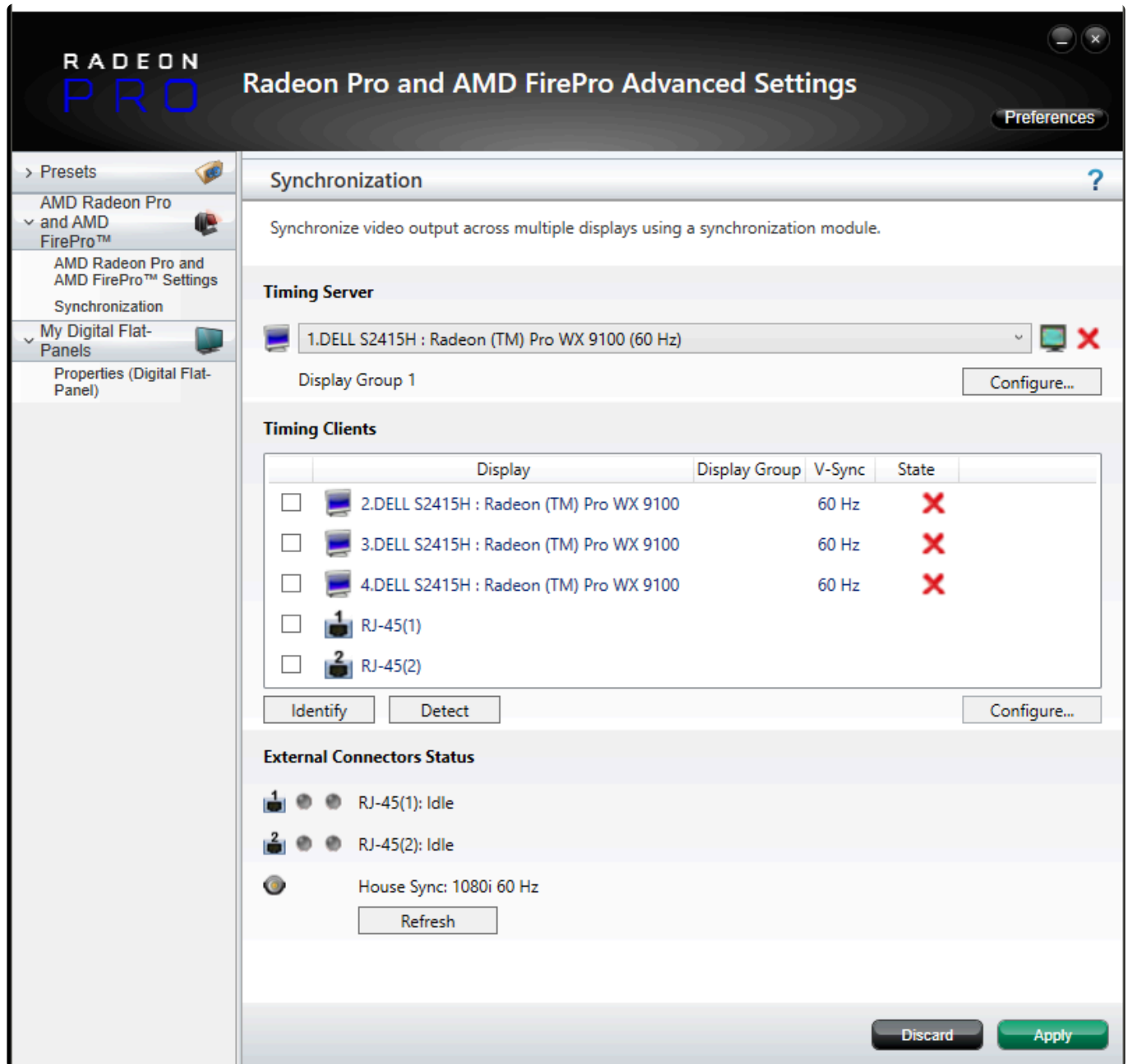
6. Click the Configure button next to the Timing Server drop down. Then set the Timing Signal Source to House Sync (Genlocked) and click OK

Configure Timing Server

1.DELL S2415H : Radeon (TM) Pro WX 9100 (60 Hz) Display Group 1

Timing Signal Source:

House Sync (Genlocked)

Signal configuration

Signal Type: 1080i 60 Hz   ☐ Sync to field 1

Triggering Edge: Rising

Scan Rate Coefficient: 1:1

Sync Delay (µs):   0

OK   Cancel

7. Now click Apply, after a few minutes the machine will become fully responsive again at the screen will look similar to below

8. Tick all other outputs you wish to add to the lock group

    Note: If the output tick boxes are greyed out, then they do not match the Timing Server and therefore cannot be locked together.

9. Hit Apply. After a few minutes the machine will become fully responsive again. The system is locked when it looks like below

Alternative Genlock Configuration Method

Alternatively, if the above method is not giving consistent successful results with external Genlock signals, the below method can be tried

1. Follow the first 2 steps that have previously been outlined so you see a screen that looks like below

2. Tick all the outputs you wish to lock to the incoming Genlock Signal.

Note: If the output tick boxes are greyed out, then they do not match and therefore cannot be locked together.

3. Hit Apply. After a few minutes the machine will become fully responsive again. The system is locked when it looks like below

Only displays that have identical resolutions and EDIDs can be synced together. It is strongly advised to emulate the same EDID on displays to be Genlocked. Information on EDID emulation can be found here.

Boreal+/Taiga+ SDI Output Genlock

Configuration Process For Frame Lock & Genlock

Note: This process has been documented and tested on the recommended driver 20.Q3.1.

1. Navigate to the AMD Radeon Pro and AMD FirePro Advanced Settings by right clicking on the desktop
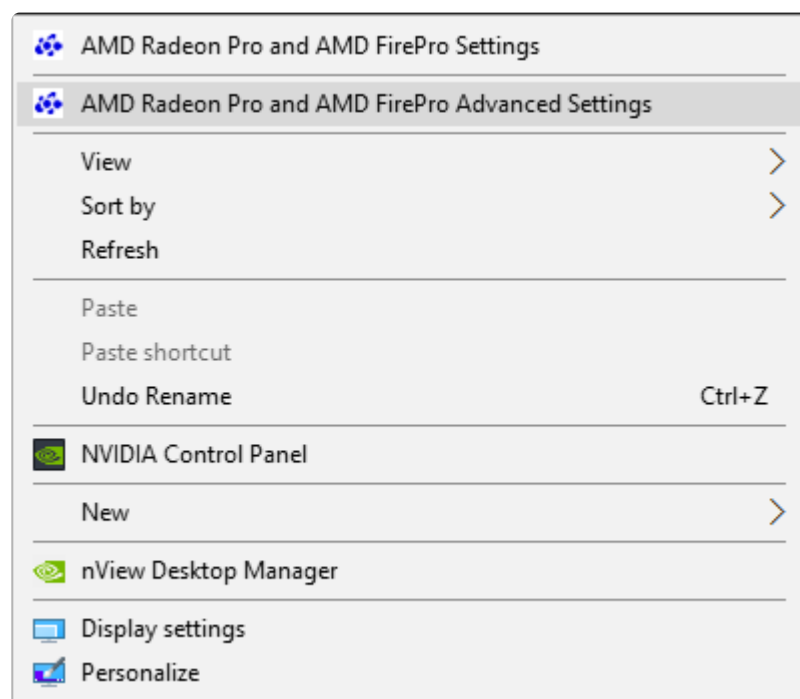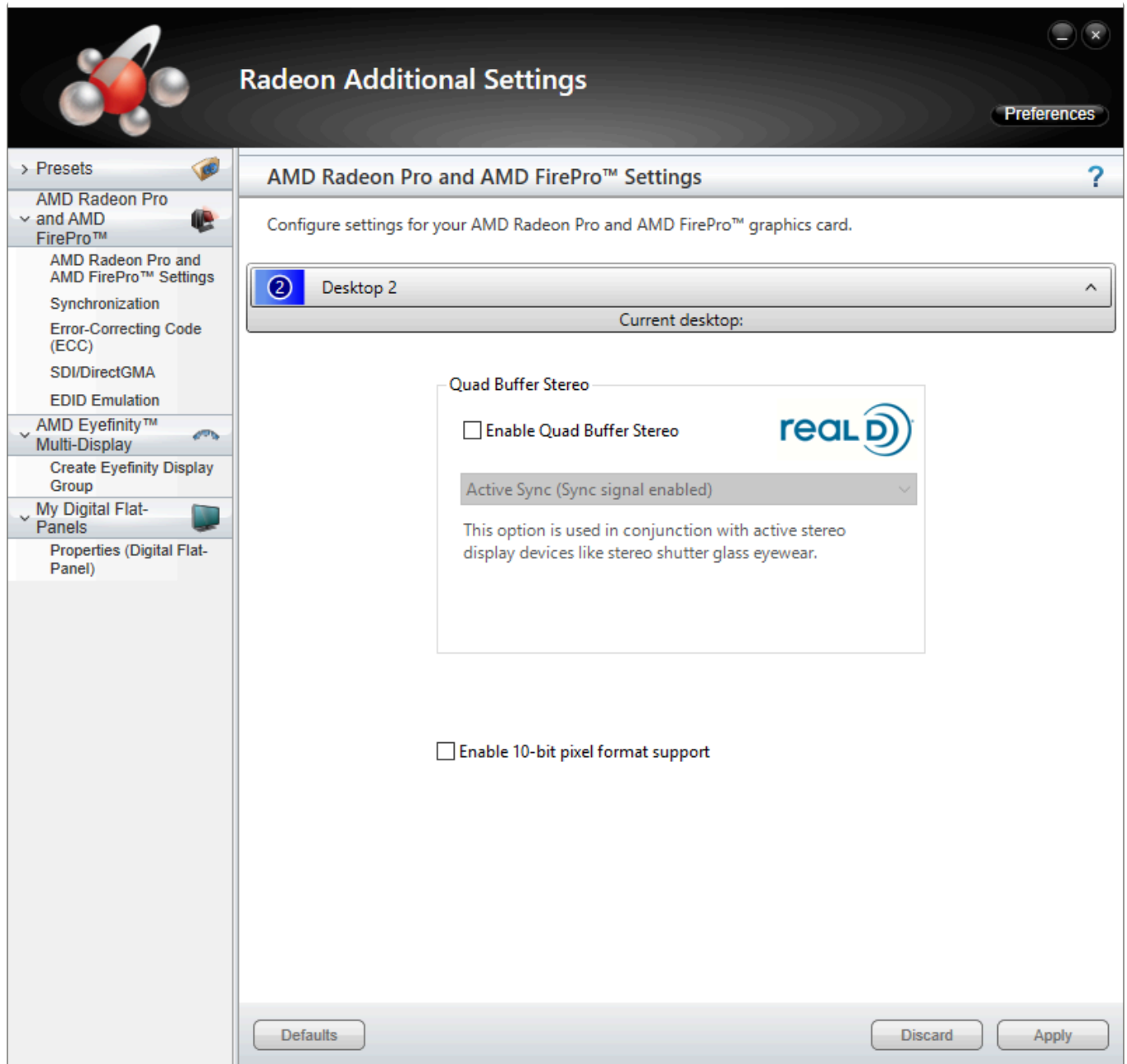
2. On the left hand menu, select Synchronization

3. The screen will now show all the outputs currently available (via emulation or physical connection) for the outputs of the unit.. At the bottom it will also have information for any external genlock signals received by the system.

4. Select the Timing Server drop down and select the first output

5. The screen will now look like this. If you are using an external Genlock signal follow step 6 otherwise skip it.

6. Click the Configure button next to the Timing Server drop down. Then set the Timing Signal Source to House Sync (Genlocked) and click OK

7. Now click Apply, after a few minutes the machine will become fully responsive again at the screen will look similar to below

8. Tick all other outputs you wish to add to the lock group

Note: If the output tick boxes are greyed out, then they do not match the Timing Server and therefore cannot be locked together.

9. Hit Apply. After a few minutes the machine will become fully responsive again. The system is locked when it looks like below

Alternative Genlock Configuration Method

Alternatively, if the above method is not giving consistent successful results with external Genlock signals, the below method can be tried.

1. Follow the first 2 steps that have previously been outlined so you see a screen that looks like below

2. Tick all the outputs you wish to lock to the incoming Genlock Signal.

> **Note:** If the output tick boxes are greyed out, then they do not match and therefore cannot be locked together.

3. Hit Apply. After a few minutes the machine will become fully responsive again. The system is locked when it looks like below

Only displays that have identical resolutions and EDIDs can be synced together. It is strongly advised to emulate the same EDID on displays to be Genlocked. Information on EDID emulation can be found here.

Tierra+/Karst+ MK2/Boreal+ MK2/Tierra+ MK2 Genlock

The Tierra+ model uses a different GPU solution to the other genlock compatible models in the V4+ range.

In V4+ MK2, all Genlock-able systems use this same system. The steps are below:

Open the NVidia Control Panel through right clicking the Desktop, navigate to the Synchronisation tab on the left.
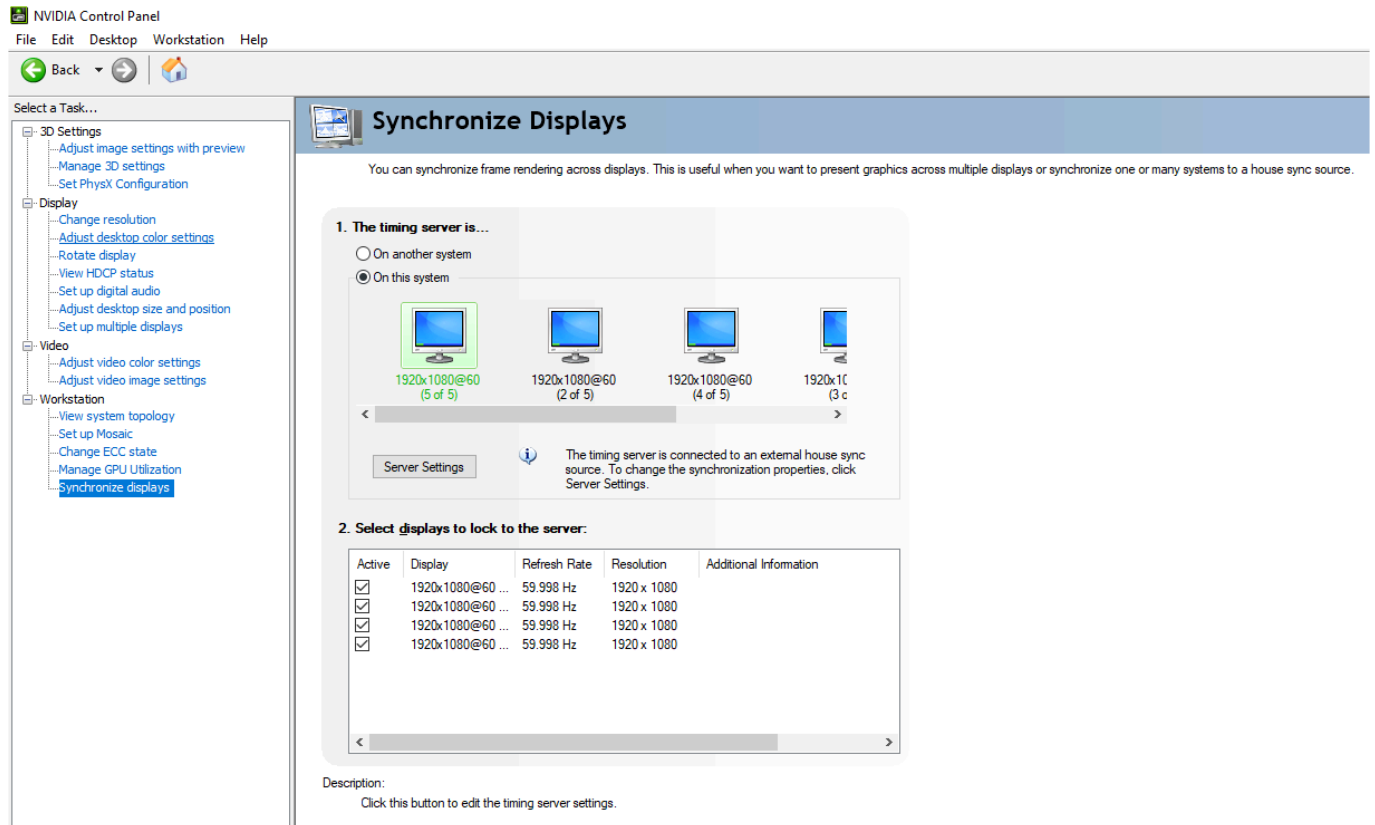
In this menu, select which of the outputs you wish to become the timing server
Remember, to genlock outputs must all be identical, EDID Emulation is a good method to help ensure this
Tick all the other outputs that will be locked to our Timing Server and then select 'Server Settings'

In this menu you will be able to swap the Timing Server to listen to an external house sync signal as well as accounting for any delay etc

Server Settings

Edit the properties of the frame synchronization pulses generated by the timing server.

⚠ Server refresh rate: **60.00 Hz**

The synchronization pulses are based on:

○ The server refresh rate (Internal timing)

○ The server refresh rate with BNC output enabled

⦿ An external house sync signal

Sync frequency: **60.00 Hz**

Sync signal detection: [Composite ▼]

☐ The signal is interlaced

Trigger sync pulses from the frame start signal using:

○ Leading edges

⦿ Falling edges

○ Both edges (applies to TTL signals only)

Outgoing sync interval: Sync delay:

[0]   [0.00] µs

⚠ Some settings have been automatically updated to match the incoming house sync signal.

[OK] [Cancel] [Apply]

Once done hit apply and wait whilst the server configures itself

SSD Refresh Tool

As part of ongoing product testing, Green Hippo has discovered a fault with Solid State Drives used in certain Hippotizer V4 systems; this fault can severely impact playback performance and should be addressed urgently. While the drives will ultimately require warranty replacement, we have created a software based tool to ensure all systems in the field continue to operate normally indefinitely. This tool is available from 4.0.2 Beta 4. We want to make our distributors and users aware of this issue and distribute contact information to ensure free replacement of the affected drives.

All Hippotizer V4 systems use multiple Solid State Drives (SSDs), for media storage (media drive) and one for general system use (OS Drive). Throughout the Hippotizer V4 line, Green Hippo uses several different makes and models of SSD. This bulletin concerns a specific type of SSD used as the media drive in Amba and Karst systems.

This affects Karst with serial numbers: 210036 – 210074
This affects Amba with serial numbers: 240038 – 240092

Testing has shown that files written on the drive for longer than two months can suffer from vastly reduced read speeds. For media files, this will manifest as un-even playback and jumping on the output. Often times the stock content will be the first files to be affected. Long running shows with the same content (such as tours) could also be affected by this issue.

Using the Refresh Tool

The refresh media tool is part of the STRATA dialogue in Media Manager's settings.
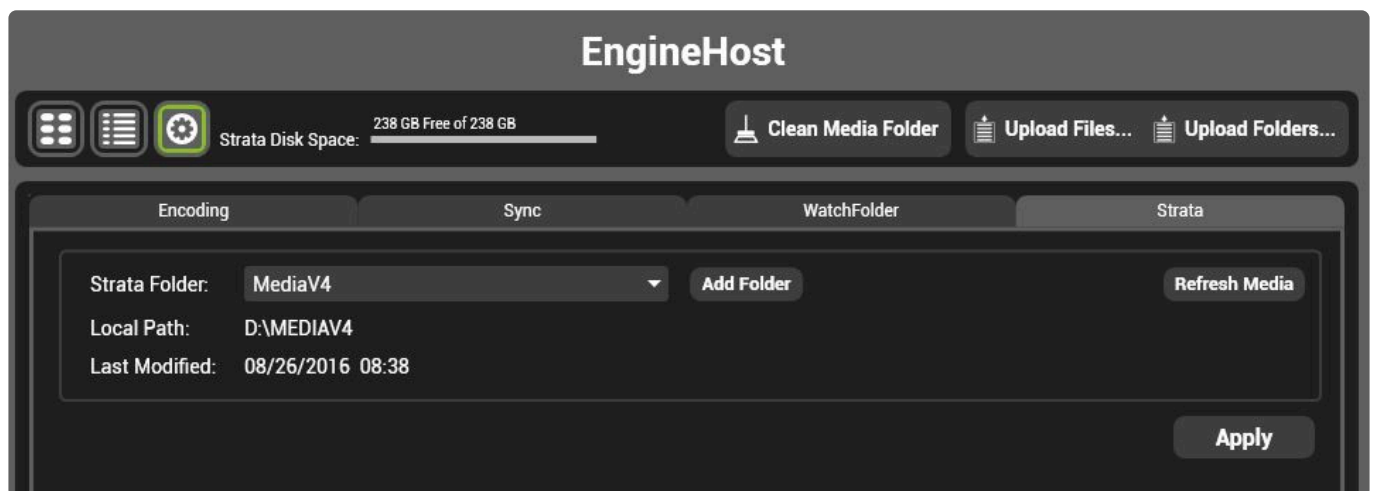
Note: While the Media Refresh is being carried out the engine will be stopped. The refresh process can take a long time: up to a minute per gigabyte of media.

Capture Cards

V4 offers several hardware based video capture options to bring SDI, DVI and Display Port signals into Hippotizer systems. Capture cards are available fitted when the server is built, or can be fitted afterwards by a qualified technician. For Karst, Boreal and Taigas a capture card also requires new back plates which can be ordered from Green Hippo.

Note: Green Hippo strongly recommends sourcing cards from your local distributor to ensure compatibility.

Capture Cards per system

Each model Hippotizer system supports different numbers of capture cards based on the space available:

Amba or Amba+

- 1 x Capture Card or Accessory Card

Note: Amba and Karst does not support Quad SDI or Dual Display Port capture Cards

Karst or Karst+

- 1 x Capture Card or Accessory Card

Note: Amba and Karst does not support Quad SDI or Dual Display Port capture Cards

Boreal or Boreal+

- 2 x Capture Cards

and

- 1 x Accessory Card

Taiga+

- 2 x Capture Cards

and

- 1 x Capture Card and 1 x Accesory Card

Taiga

- 2 x Capture Cards

or

- 1 x Capture Card and 1 x Accesory Card

Montane +

- 2 x Capture Cards

or

- 1 x Capture Card and 1 x Accesory Card

Supported Capture Cards

The following lists supported capture cards:

- **Data Path VisionSDI2** — Dual 3G-SDI Capture
- **Data Path VisionSC-SDI4** — Quad 3G-SDI Capture
- **Data Path VisionSC-DP2** — Dual Display Port 1.2 Capture
- **Data Path VisionAV-SDI** — SDI, DVI and Composite Capture
- **Data Path VisionRGB-E2S** — Dual DVI Single Link Capture

Capture Drivers

Using the correct software driver for Hippotizer is critical to ensure proper function of the capture cards. Please refer to the release notes of the specific Hippotizer software version for guidance on which driver to use.

Note: The firmware of each capture card is updated during driver installation. For this reason it may be required to run the driver installation after a factory restore to ensure card firmware matches software.

Serial Numbers

The serial numbers are included on a Green Hippo branded sticker usually located on the side of the system. The Serial number is combined of the model of the system followed by a 6 digit number. (Tierra-470001) Serial numbers may be requested by the Green Hippo team to assess suppport cases.

Serial Format V4

V4 Units	UK	USA
TAIGA	TAIGA-260xxx	TAIGA-100xxx
BOREAL	BOREAL-250xxx	BOREAL-100xxx
KARST	KARST-210xxx	KARST-100xxx
AMBA	AMBA-240xxx	AMBA-100xxx

Serial Format V4+

V4+ Units	UK	USA
TAIGA+	TAIGA-450xxx	TAIGA_PLUS-100xxx
MONTANE+	MONTANE-460xxx	MONTANE_PLUS-100xxx
BOREAL+	BOREAL-440xxx	BOREAL_PLUS-100xxx
KARST+	KARST-430xxx	KARST_PLUS-100xxx
AMBA+	AMBA-420xxx	AMBA_PLUS-100xxx

| TIERRA+ | TIERRA-350xxx | TIERRA-0xxx |
| NEVIS+ | NEVIS-00039 | (Refer to UK) |

| TIERRA+ | TIERRA-350xxx | TIERRA-0xxx |
| NEVIS+ | NEVIS-00039 | (Refer to UK) |

MIDI Over USB

There is a known issue with MIDI over USB devices interfacing with AMD or Apple CPU based products.

This effects the Nevis+, Tierra+ and Tierra+ MK2 products.

The most common device with effects in Hippotizer workflows is the Rosendahl MIF4. Unfortunately the issue can only be fixed with an updated driver from the devices manufacturer.
We have worked with Rosendahl to get a new version of firmware for the MIF4 that fixes this issue. All MIF4's with serial number >M9650 come preloaded with firmware 3.1, whilst older devices can be updated using the files and processes found at https://rosendahl-studiotechnik.com/mif4.html

With the MIF4 going EoL in 2022, we have test a few replacements.
Green Hippo recommend the CB Electronics TC-5 which has been tested with all our units. We have also tested the Nemesis TCD-2 which we have found not to be compatible with AMD based systems.

Welcome To Hippotizer

Welcome to Hippotizer!

Hippotizer combines the flexibility of a real-time media server with the power of a fully integrated 3D workflow. Designed to be intuitive to learn and use, yet powerful and flexible enough for the largest events. Hippotizer's open structure allows it to be controlled seamlessly from a variety of sources such as Lighting desks, Timelines, show controllers or the Zookeeper Interface. Combined with SHAPE, Hippotizer is a fully configurable 3D media tool box.

Eurovision Song Contest 2016.
Video Design: Mikki Kunttu
Technical Manager Video: Morgan Brown
Video Operators: Fraser Walker, Pekka Martti, Neil Trenell
Hippotizer Technicians: Anders Granström,Magnus Grönberg
Photo Credit: Ralph Larmann
All Rights Reserved

Hippotizer software is continuously updated. Please visit our website for the most up to date software and manual.

Using this manual.

Hippotizer V4 is comprised of three pieces of software with more than a dozen component plugins, presenting a challenge in finding a logical order of explanation. To improve readability, this manual seeks to address functionalities in context of where they appear in the software.

Many sections of Hippotizer and SHAPE are interdependent or appear in multiple places. Videomapper for example is a component with it's own control interface, but also has selection interfaces in the viewport and layer. Each of these interfaces are explained from the point of view of where it is in the manual — the layer UI explains Videomapper on layer but not the component. Where possible, links to other relevant sections are provided.

If you find a section to be ambiguous or unclear please, leave feedback so that we can fix it.

Important information before starting the software

- [What is Hippotizer?](#)
- [Before you start](#)
- [Starting Up](#)
- [Contacting us](#)
- [Software Information](#)
- [Hardware Information](#)

What is Hippotizer?

Hippotizer is a real-time media server designed for the live events industry.

Lowlands festival 2016 – Bravo Stage
Hippos Supplied and Operated by: tenfeet
Photos: Bart Heemskerk, De fotomeisjes

Born from visual jockey software first developed 15 years ago, Hippotizer uniquely combines ease of use and flexibility with the industries' most powerful 3D mapping engine; SHAPE.

Known as a real-time media server, Hippotizer reacts to changes from many different control sources instantly from DMX to Zookeeper. Built for stability and flexibility, Hippotizer is used to drive video on some of the largest live events worldwide.

Hippotizer is comprised of dedicated media server hardware running the Hippotizer V4 software.

The Hippotizer software is made of three applications: the Engine, Zookeeper and SHAPE.

- The **Engine** renders video. It runs on every Hippotizer machine and communicates over the network.

- **Zookeeper** is a remote management program creating an interface to Engine(s) on the network.

- **SHAPE** is a projection mapping tool-set that sits inside the Engine as a plugin. SHAPE has a

separate network based management application.

Hippotizer separates 2D and 3D workflows for the simple reason that content is 2D. Media Management, playback and manipulation is handled within the Hippotizer and Zookeeper applications. Increasingly however, content is being mapped onto 3D objects through projection mapping, this is where SHAPE comes in. SHAPE is the 3rd dimension of Hippotizer V4. 3D in Hippotizer is made up of two pieces: a plugin within the Engine and a management application called SHAPE.

SHAPE enables the user to import a model and apply video from a Hippotizer V4 machine to the model. SHAPE allows you to edit model meshes, UV map and is able to assist with aligning, blending, masking and warping the projector(s).

SHAPE communicates via the network to the Engine running on Hippotizer hardware allowing real time manipulation. Once the model is configured, all settings are saved to the Hippotizer which then handles all content play back; the SHAPE application is then no longer required.

SHAPE's manual can be found here: SHAPE Manual

Before you start

Hippotizer systems are designed to 'work by default' for easy and fast setup. Setting up the hardware and software for the first time correctly will ensure a better experience.

- [Installing Hippotizer and Zookeeper](#)
- [Minimum system requirments](#)
- [Networking](#)
- [Disable Windows DPI Scaling](#)

Installing Hippotizer and Zookeeper

All Hippotizer V4 systems come from the factory pre-installed with Hippotizer Version 4 software and Compatibility Mode (V3) software. The Hippotizer system contains a license that allows any Hippotizer Version 4 software to be installed. Only Green Hippo Hippotizer Version 4 hardware can operate the entire system and output video.

Note: The system type (V4 or V4+) and Software Assurance determines which versions can run on a given Hippotizer. All V4 systems can run software version 4.0 to 4.5 (higher versions may be compatible subject to purchase date and Software Assurance) V4+ can run from 4.3 onward.

The Hippotizer V4 system is comprised of two separate pieces of software: The Engine, and Zookeeper.

- The Engine is the core of the Hippotizer system and carries out all video rendering, as well as running all components (such as DMX or Media Manager).

- Zookeeper is the user interface that talks to the engine. Zookeeper talks to the engine over the network and can be run anywhere on the local network to control one or many Hippotizers.

The Engine and Zookeeper are installed from the same installer. You do not need a separate piece of software to install Zookeeper only.

Note: The latest version of Hippotizer V4 can be found [Here](#)

The Hippotizer V4 installer will also install several other pieces of software that are critical with normal operation of Hippotizer systems including the Hippo Launch Application. This program manages Hippotizer V4, Compatibility Mode and SHAPE installations on the system.

Note: Zookeeper is a free application, to install it.simply run the Hippotizer installer and when the system requests a license key press ok, leaving the license field blank.

Minimum system requirements

All Hippotizer V4 systems use hardware designed for video playback. Zookeeper and Hippotizer Play however are often used on other hardware. The specification of this hardware can have a dramatic effect on performance.

ZooKeeper Minimum Specs

- Windows 8 or 10, 64bit
- 4GB RAM
- 8GB Drive space on system drive
- 1Gb Networking
- English Windows (UK or US)
- English Keyboard (UK or US)
- 1920 × 1080 Display
- Disable Screen Scaling

ZooKeeper Recommended Specs.

- Intel 4th Gen CPU or newer
- 8GB RAM
- SSD System Drive
- AMD or NVIDIA Discrete graphics with 1GB GDDR5 RAM
- English Windows (UK or US)
- English Keyboard (UK or US)
- 1920 × 1080 Display or greater
- Disable Screen Scaling

Hippotizer Play or Prep Minimum Specs

- Windows 8 or 10, 64bit
- 8GB RAM
- 8GB Drive space on system drive
- Intel i5 or i7 4th Gen CPU
- English Windows (UK or US)
- English Keyboard (UK or US)
- OpenGL 4.5
- 1920 × 1080 Display
- Disable Screen Scaling

Hippotizer Play or Prep Recommended Specs

- Intel 5th Gen i5 or i7 CPU or newer.
- 8GB RAM
- SSD System Drive with 20GB free space
- AMD Discrete graphics with 2GB GDDR5 RAM

- English Windows (UK or US)
- English Keyboard (UK or US)
- OpenGL 4.5
- 1920 × 1080 Display or greater
- [Disable Screen Scaling](#)

Windows on a Mac

Hippotizer Play and Zookeeper will run on Mac based hardware that has installed Windows 10 in [Boot Camp](#)

Note: Other methods of installing Windows onto a Mac (Such as Parallels) are not supported by Hippotizer due to resource sharing conflicts.

Networking

Hippotizer relies on the network to control systems, carry DMX data, synchronize playback and many other vital functions.

Computer networking is a complex topic that extends far beyond the scope of this manual. Simple best practice suggestions are offered here. If in doubt, it is strongly advised to to seek professional advice. A faulty network can lead to system instability.

Green Hippo strongly suggests using only static IPV4 networking.

In general, there are two networks to consider: HippoNet and Data.

HippoNet

HippoNet is the backbone of the Hippotizer system; it carries all the media previews, pin data and synchronization between Hippotizer and Zookeeper systems.

Data Network

The data network everything except HippoNet is carried. This is commonly ArtNet for DMX control, Pixelmapping output, CITP, and external triggers (such as TCP)

Firewalls

Firewalls are a software or hardware application that blocks specific data on a network. All Hippotizer systems ship with the firewalls configured correctly however, Zookeeper or Play systems may need to be set up manually.

HippoNet

Setting up a solid HippoNet Network is perhaps the most important aspect of a system design.

A malfunctioning network can result in slow user interfaces in Zookeeper, delayed or slow media uploads and many other undesirable behaviors.

What should be on HippoNet?

- All Hippotizer systems
- Remote Zookeeper systems
- Network Storage for watchfolders

HippoNet uses a mixture of UDP and TCP data to communicate with all Hippotizers and Zookeepers on the network.

Requirements

- Switched gigabit network
- Cat5e or better network cable
- Switching capable of handling high UDP loads (eg. Cisco SG series, Netgear or Luminex 1Gb switches).
- Static IP addresses for each system. (IPV4, Class C, eg. 192.168.0.xxx with a sub net of 255.255.255.0)
- Disable IGMP snooping on all managed switches

Recommendations and best practice

- HippoNet should only contain Hippotizer systems
- Physically separate HippoNet and other networks where possible avoiding virtual networks.
- Do not connect HippoNet network to the internet
- Avoid Cat5e cable run lengths greater than 90m (300ft) as packet loss can occur. For longer runs use fibre optic network cable.
- Where large media synchronizations are going to occur, consider using 10Gb networking.

Data Network

The Data Network is the 'everything else' connection.

What should be on the Data Network?

- DMX Control of HIppotizer over ArtNet
- Ma-Net
- CITP
- Remote Management
- TCP or other remote control protocols
- Internet connections
- Pixelmapper output
- Remote wake-up / magic packets

Recommendations and best practice

- ArtNet and Pixelmapper can generate high volumes of Multicast and Broadcast traffic; switches that are capable of handling this is important in larger setups.
- Large pixel-mapping projects should try to use sACN instead of ArtNet due to better traffic handling.
- If connecting to the internet, ensure there is firewall protecting the network

Firewalls

It is important to ensure that Hippotizer is given full access to the network by Windows firewalls.

Ensure all Hippotizer applications are allowed on both Public and Private networks.

Hippotizer sends and receives data over the network relying on a mixture of TCP and UDP data. In order for this to work, Firewalls must allow data through certain ports:

Hippo Launch
Port 9009

Hippotizer Engine and Zookeeper
Port 6091, 6092

MongoDB
Port 27017

> **!** Network connectivity is critical to Hippotizer's normal function and may require ports not listed here. Green Hippo STRONGLY advises disabling all firewalls on show networks.

Setting a Static IP address

Every device on a network must have a unique IP address. Though automatic methods exist to set address (DHCP most commonly), it is considered best practice to manually set unchanging IP addresses (Static IPs) to avoid potential problems should the DHCP server fail.

IP addresses are set in Windows Network Configuration. This can be quickly accessed from within Hippolaunch's advanced tab.
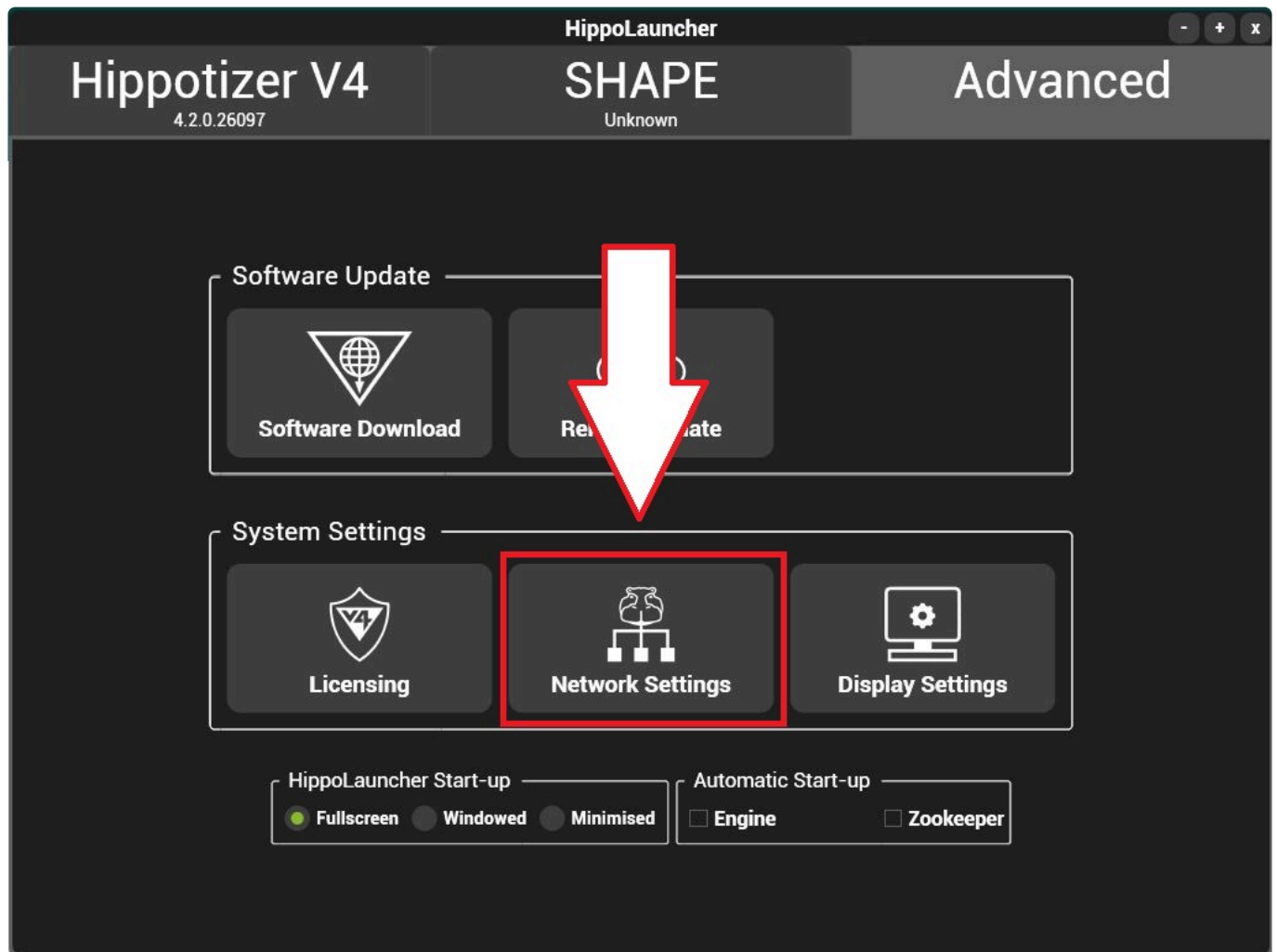
The Windows Dialogue for all Network interfaces will be shown
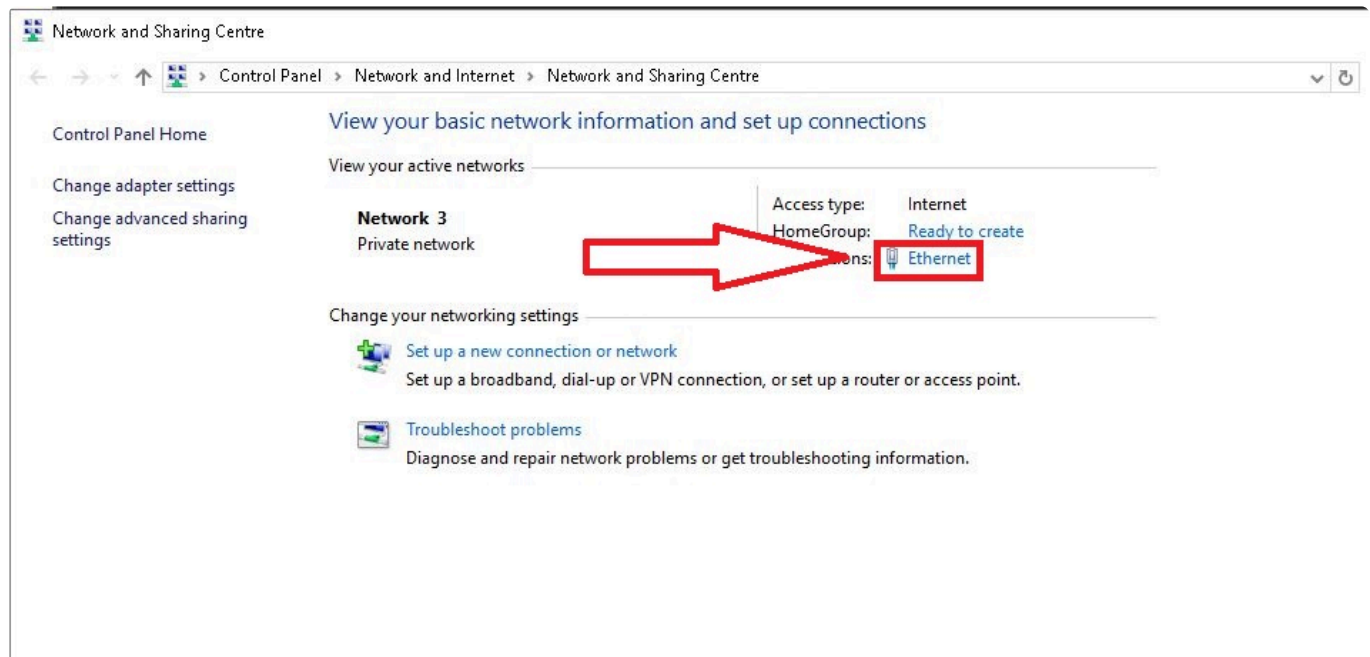
Note: Only network connections that are plugged in and enabled will appear in the list of connections.

Clicking on the desired interface will open it's properties.
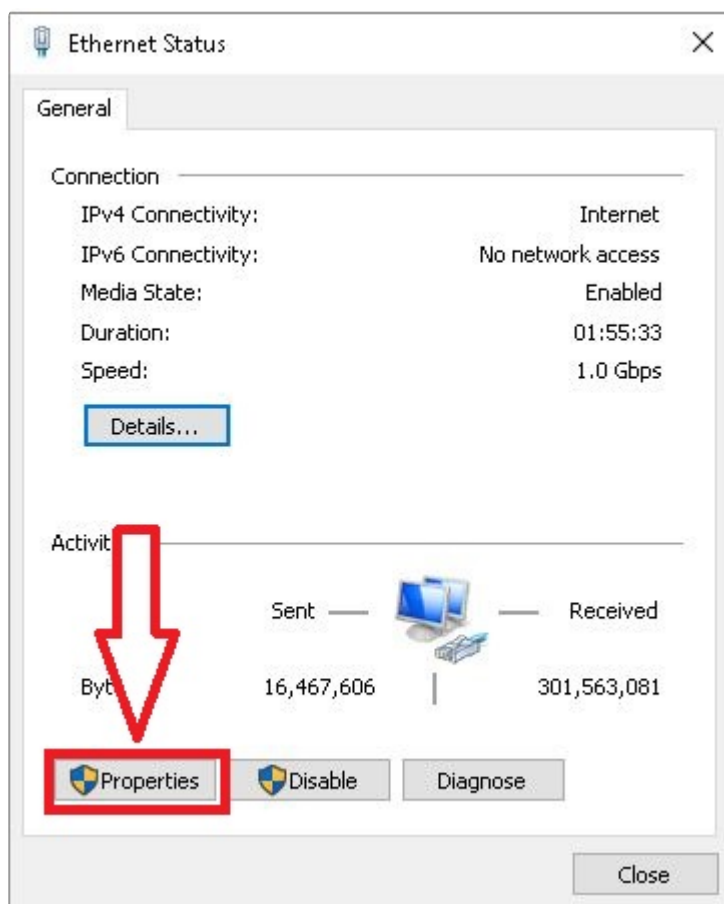
Click on the properties button.
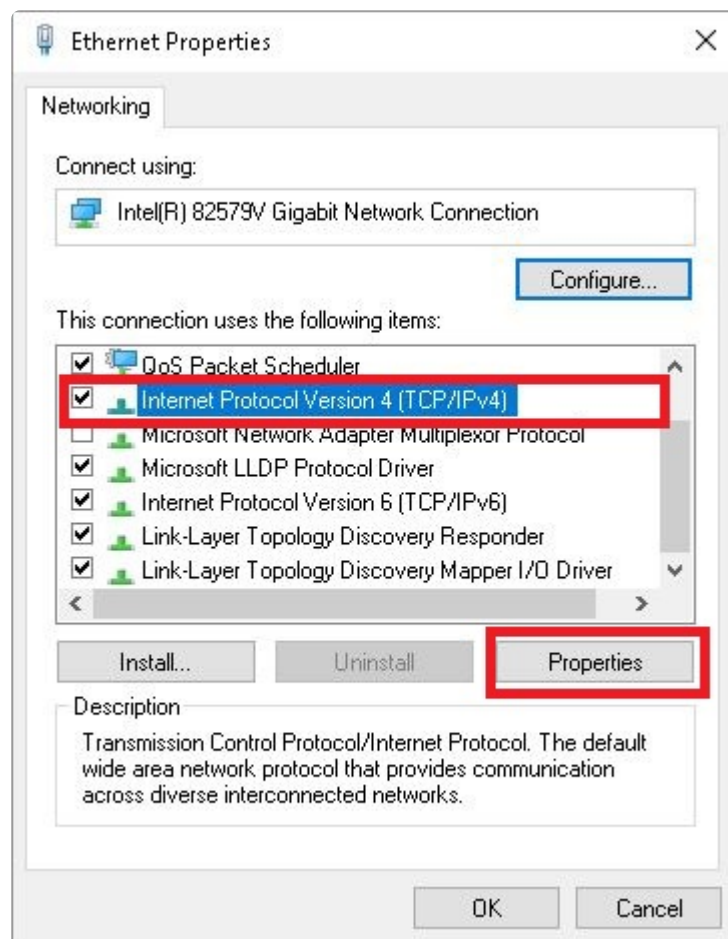
Select **Internet Protocol Version 4** (IPV4) and the properties button to set an address.
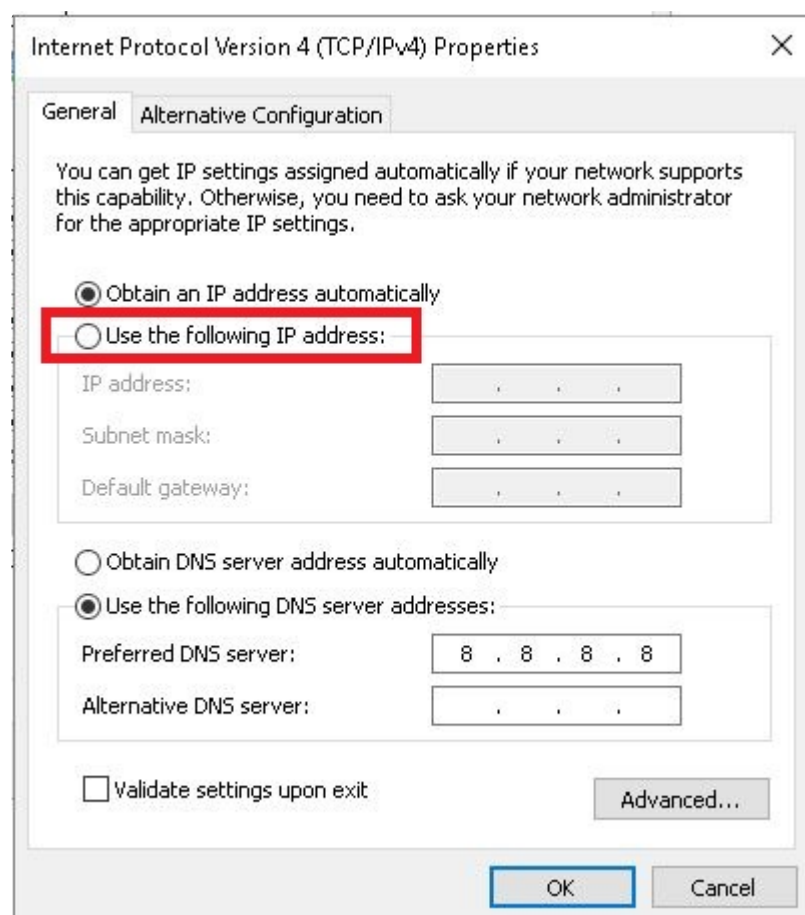
Finally, select **Use the following address**, set an IP and subnet mask.

Default Gataway and DNS settings can remain blank in most cases.

In general, a HippoNet Network should have an IP address similar to: `192.168.1.xxx` and a Subnet mask of `255.255.255.0` with each system having a unique number in the **XXX** field of the IP address.

Usually a Data Network carrying Art-Net will have an IP Address similar to: `2.0.0.xxx` and a Subnet mask of `255.0.0.0` with each system having a unique number in the **XXX** field of the IP address.

> **!** This guide covers only the most simple network setups and should not be used in place of expert advice in any situation. Incorrect network configuration is the single largest cause of support calls that Green Hippo receives.

Disable Windows DPI Scaling

Windows 8 and 10 will scale outputs automatically to match pixel size between dissimilar resolution displays. This will cause the problems with Zookeeper and Output manager as they rely on pixel size to lay out screens. To solve this, disable DPI Scaling.

To Disable DPI Scaling:

Right Click on the desktop and select **Display Settings**
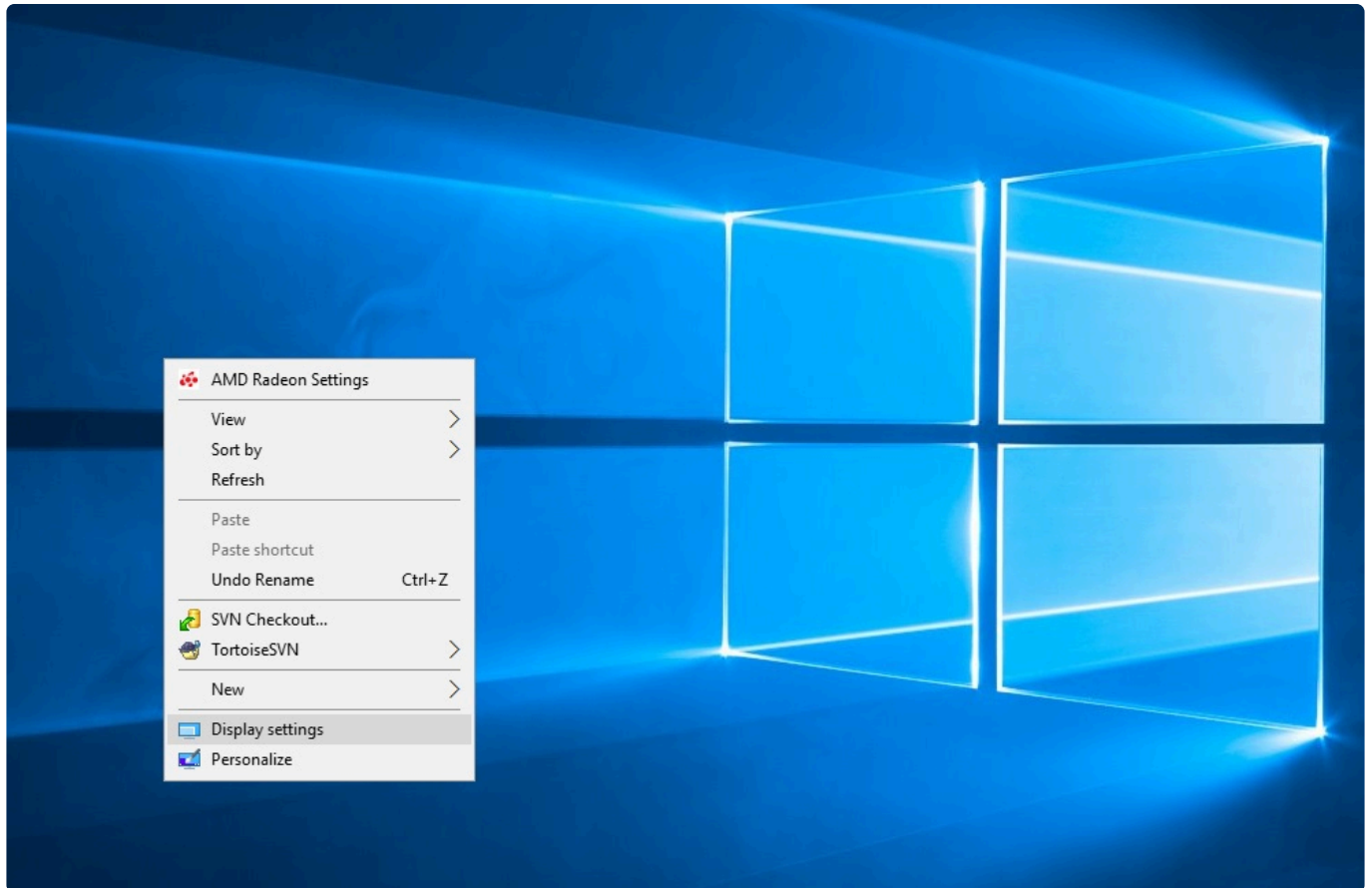
Select each display and ensure the scaling slider is set to 100%.

Settings

Home

Find a setting

System

Display

Apps & features

Default apps

Notifications & actions

Power & sleep

Storage

Offline maps

Tablet mode

Multi-tasking

Projecting to this PC

Apps for websites

About

Customise your display

1

Identify   Detect

Change the size of text, apps and other items: 100% (Recommended)

Orientation

Landscape

Apply   Cancel

Advanced display settings

Starting Up

Hippotizer V4 is comprised of three applications:

Hippolaunch

HippoLauncher is a management application for the Engine and Zookeeper, helping to start and stop the programs as well as provide some useful features.

More information on HippoLaunch can be found here

To Start Hippotizer, use Hippolaunch.

Hippolaunch will start two other applications automatically:

The Engine

The core of the system: the **Engine** renders video and receives external control (such as DMX).

More information about the Engine can be found here.

Zookeeper

Zookeeper is the user interface for Hippotizer; it controls all engines on the local network.

More information about Zookeeper can be found here.

HippoLauncher
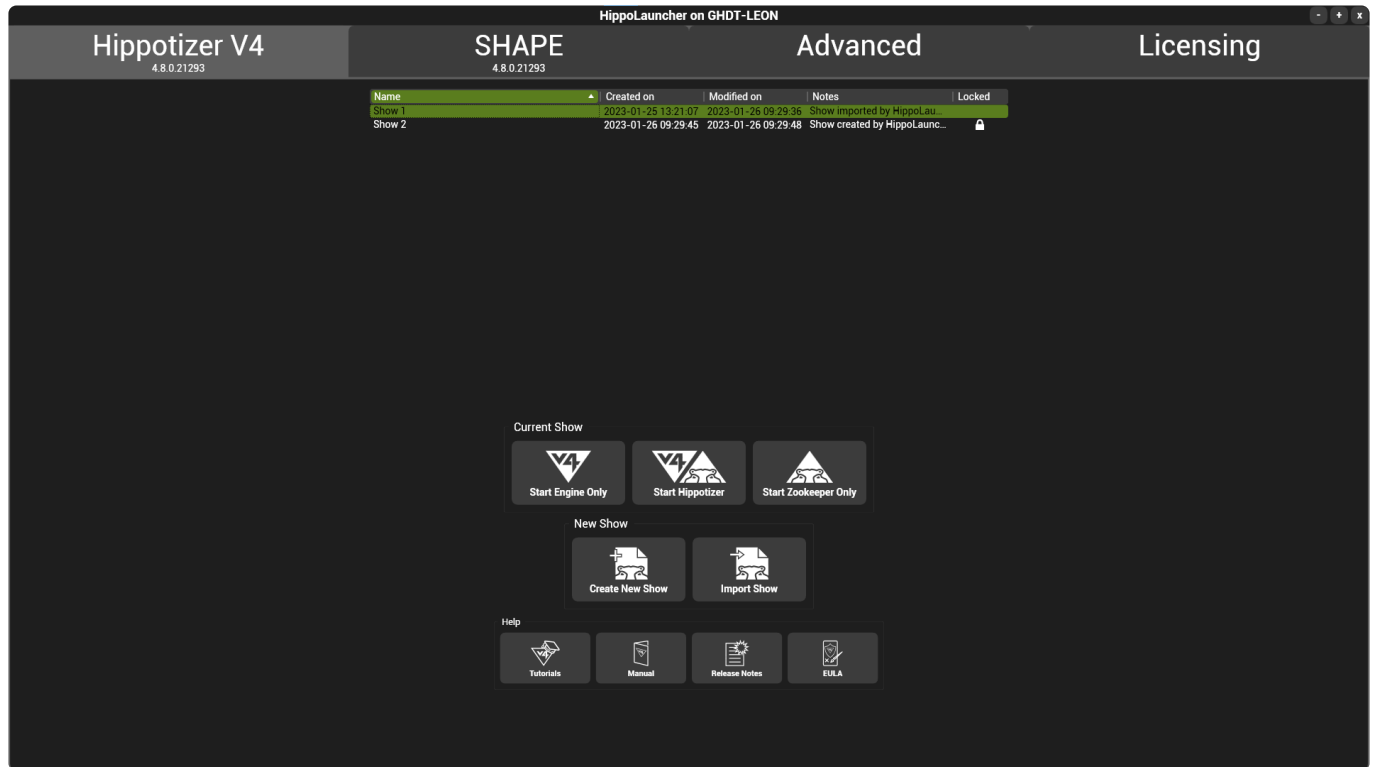
On a Hippotizer machine Hippolauncher will startup by default once the system completes boot-up.

Hippolaunch contains four or five tabs:

- Hippotizer V4 Tab
- Compatibility Mode Tab
- SHAPE Tab
- Advanced Tab
- Licensing Tab

Hippolaunch also contains important information about versions

Hippotizer V4 Version

The version of Hippotizer can be found below the 'Hippotizer V4' tab title.

SHAPE Version

The version of SHAPE installed. This must match that of Hippotizer. If it does not, navigate to the SHAPE tab and install from the **Copy Shape Installer button**.

Hippotizer V4 Tab
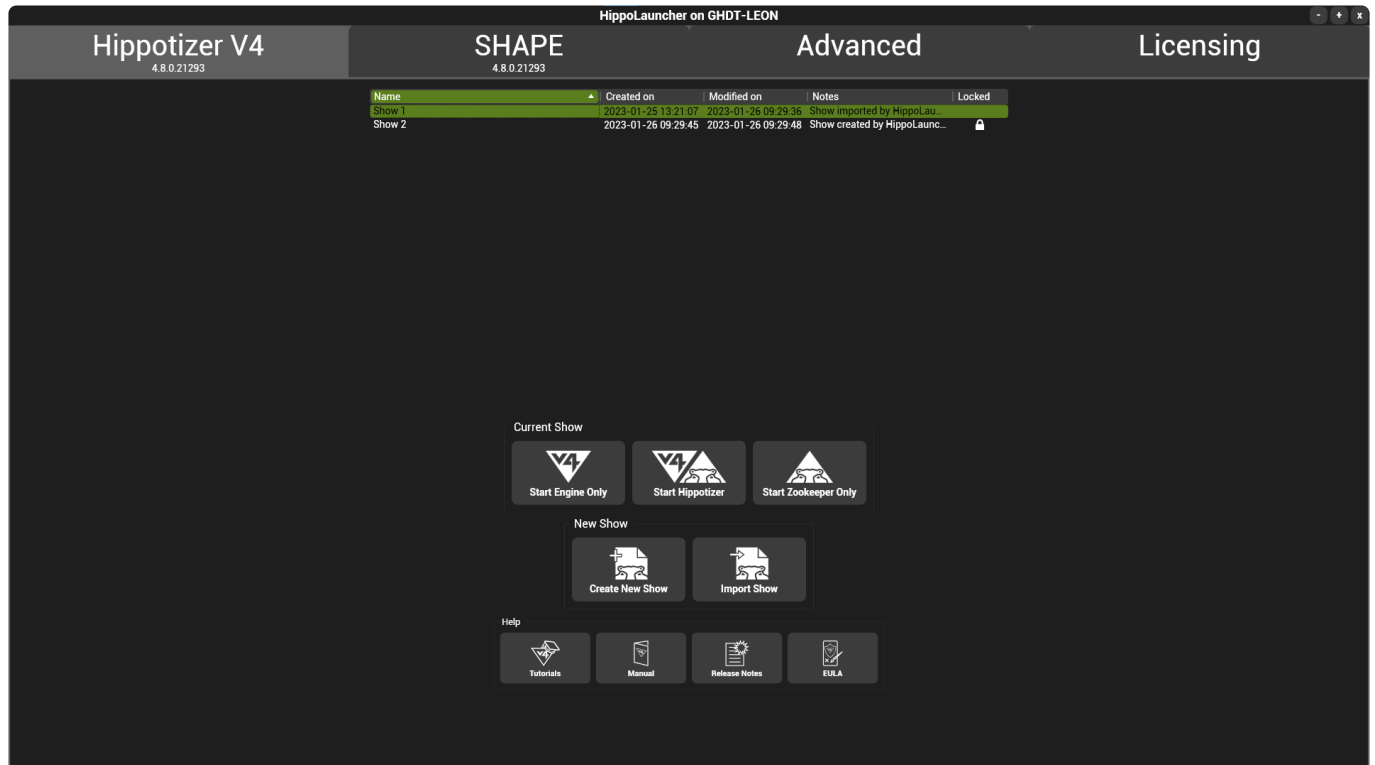
To start the currently installed Hippotizer V4 there are 2 groups of options:

Current Show

- Starts Hippotizer using the settings stored in the selected show.
- Use this option to 'pick up where you left off'

New Show

- Create a new show with default settings.
- Import settings from external show component files into a new show.
- Use this option when starting a new project or show.

Help

Hippolauncher also provides links to the Green Hippo tutorial Youtube channel, the manual and release notes.

Show Manager

The show manager is where a user can select from a list of Hippotizer instances for quick access to different show programming. You can add a show to the show manager list by selecting the 'Create New Show' button in the New Show section of the window. New shows can have a user defined name and description. Right clicking on a show within the list will open options for the selected show.
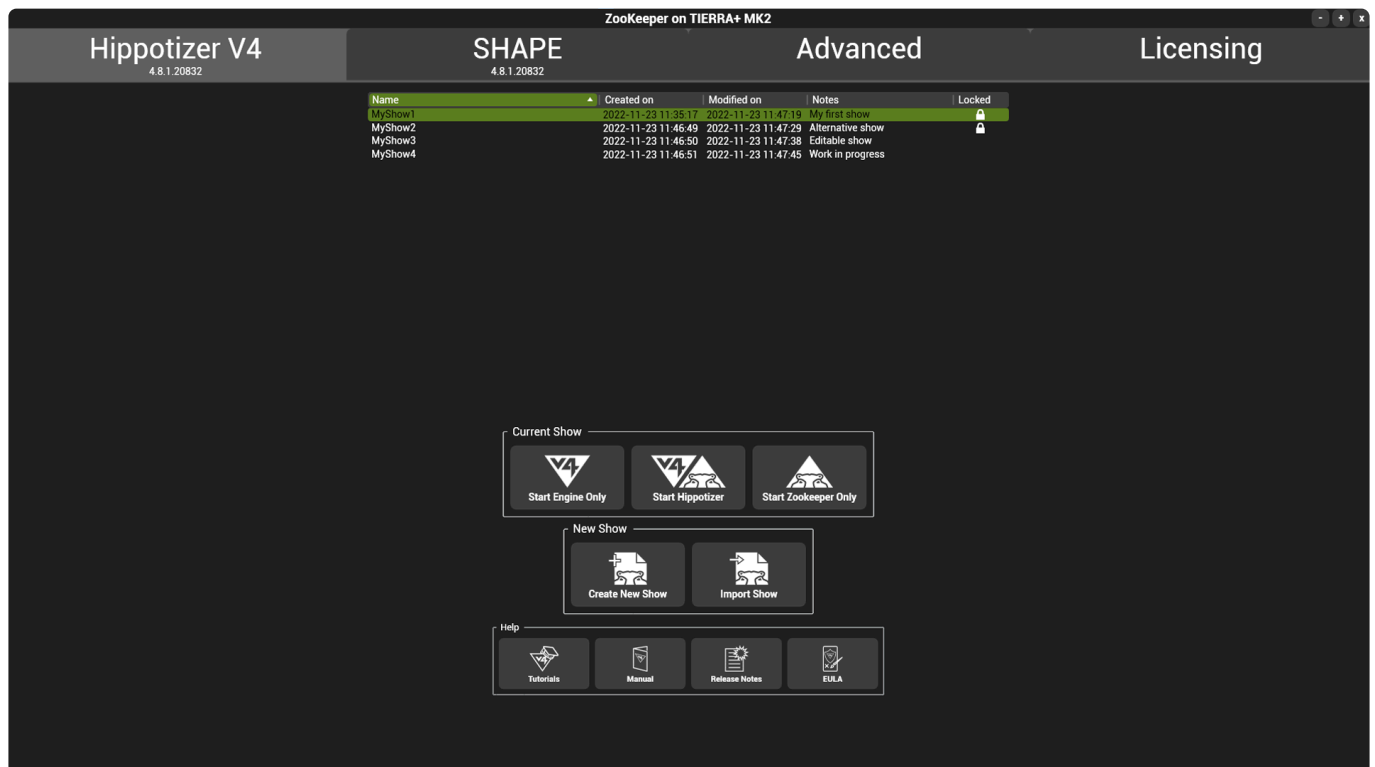
Show options menu

Edit

Opens the edit show window where the show can be renamed, have its description editted or change the locked status

Duplicate

Create a duplicate with user defined show name.

Export

Export show components into a user defined directory. These components can be used to load show onto other servers.

Refresh

Update the show manager list with any changes to show directory.

Delete

Delete the show from the list. Locked shows can not be deleted until unlocked.

Locked Shows
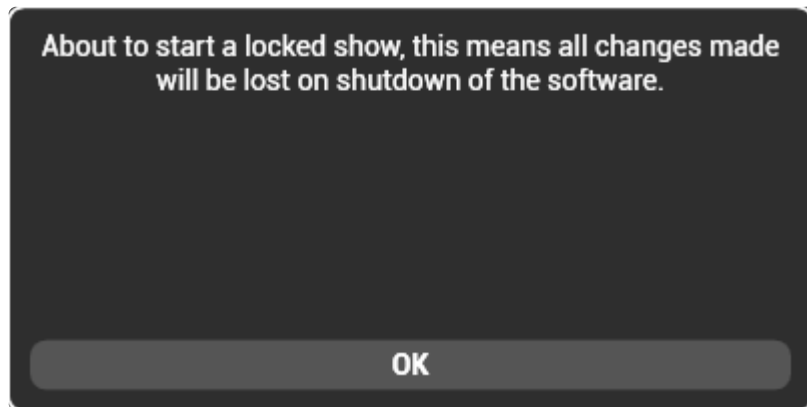
A locked show can still be loaded into Hippotizer, however the show configuration changes will not be saved. Any changes made during a locked show will be lost upon closing the engine hosting that show.

During show start there is a warning to the user that any changes will be lost while the show is locked.

Current Show
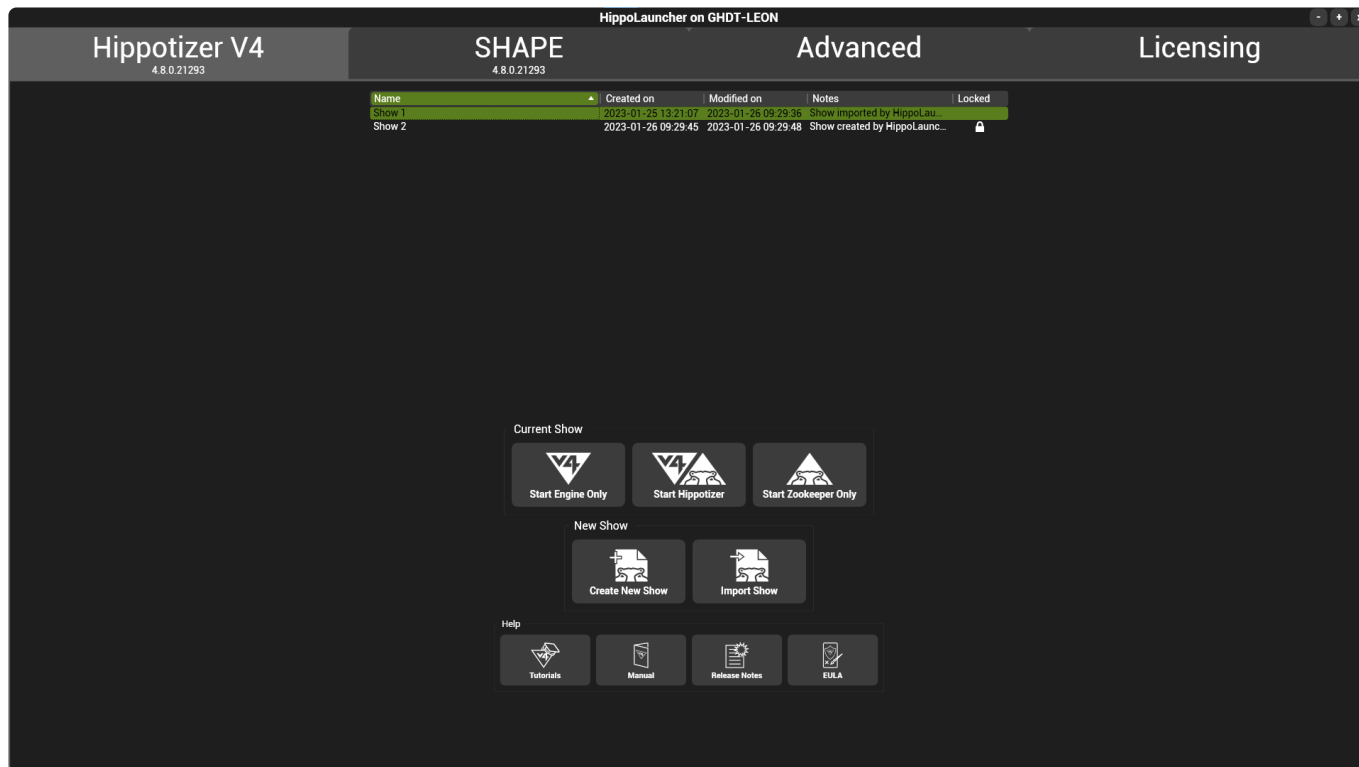
Starts Hippotizer with the settings that it had on last shut down.

Start Engine only

 Start the Hippotizer Engine Application only; allows rendering, receiving DMX and control over the network.

Start Zookeeper Only

 Starts Zookeeper for remote control from computers that are not outputting video.

Start Zookeeper and the Engine

 Starts both the Hippotizer Engine and Zookeeper

New Show
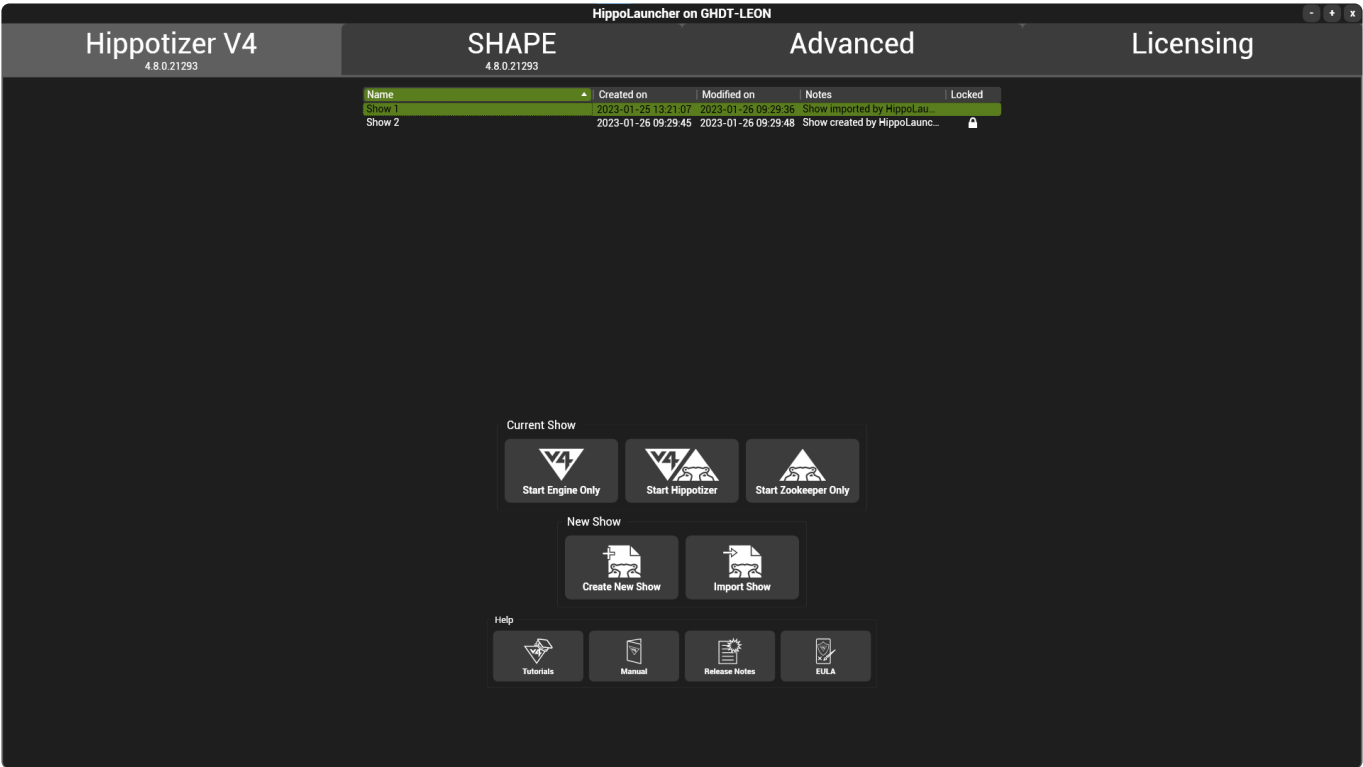
Import Show

Import show starts and loads all components from a directory into a new show file.

Individual components can also be imported through the component import in Zookeeper's configuration.

[Saving and Loading Components from Zookeeper](#)

Selecting import show will shut down Zookeeper (if it is running) and launch again, prompting the user to select the directory containing the exports.
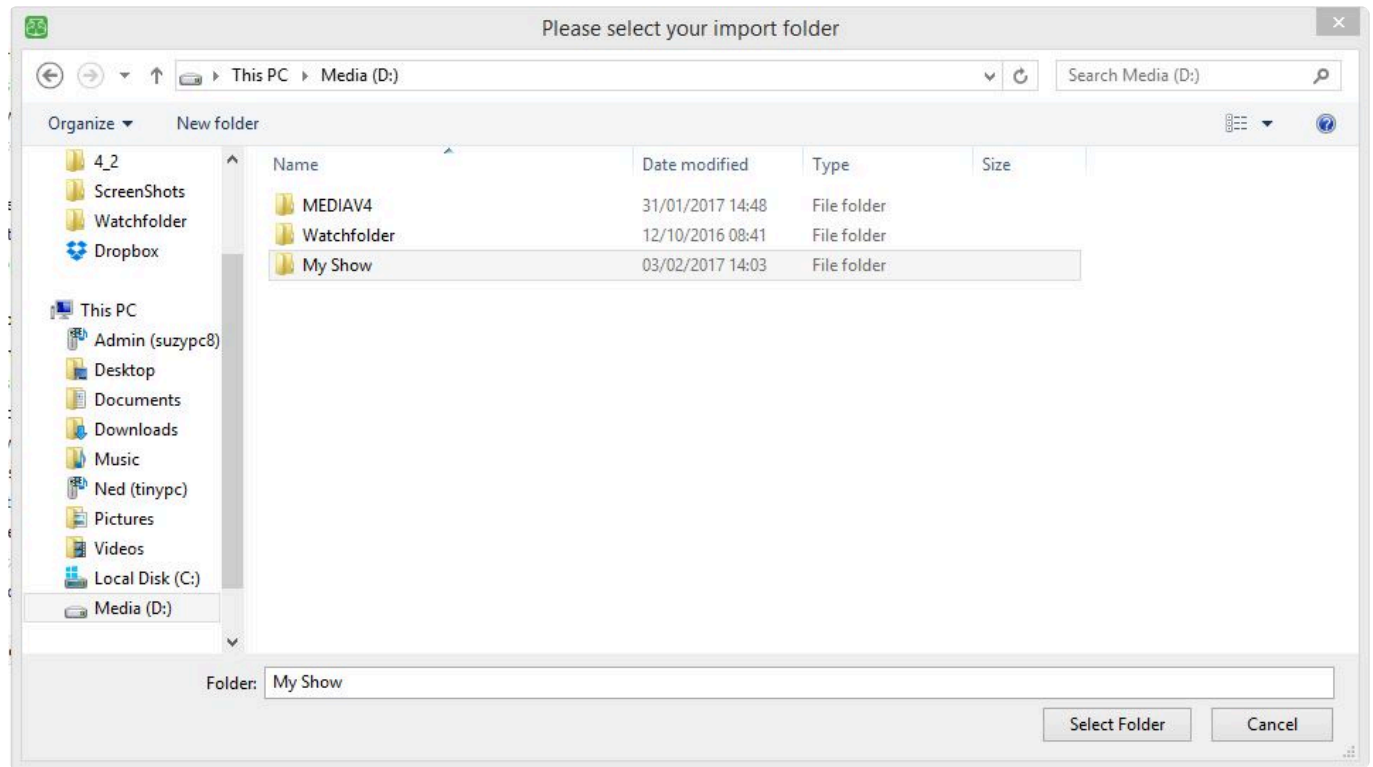
Shows are a collection of component exports in a folder. Importing the folder is the same as importing each component separately.

Export Show

A show can be exported from HippoLaunch or from the component settings of Zookeeper.

[Saving and Loading Components from Zookeeper](#)

Compatibility Mode Tab
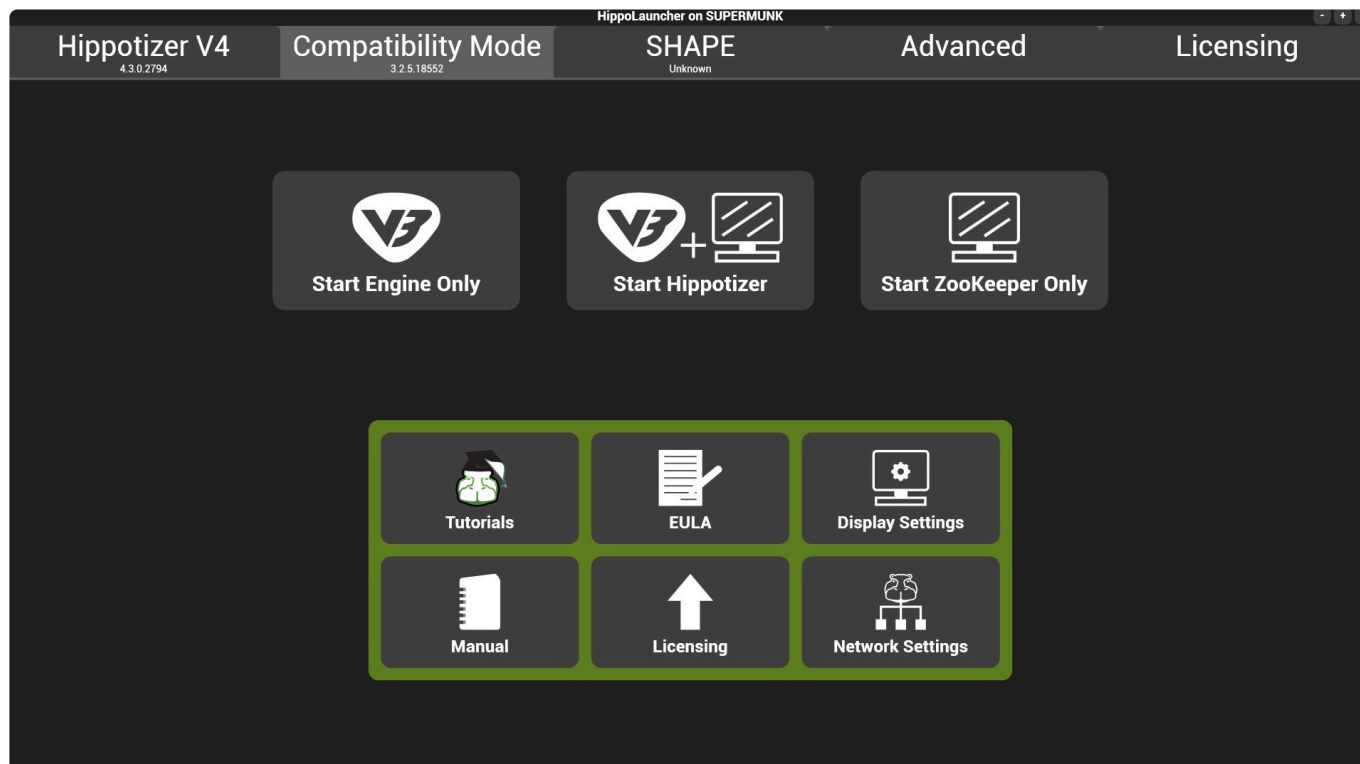
Compatibility mode starts V3 Hippotizer on a V4 machine.

> ❗ Compatibility mode is available only for Hippotizer V4 systems and not V4+.

SHAPE Tab
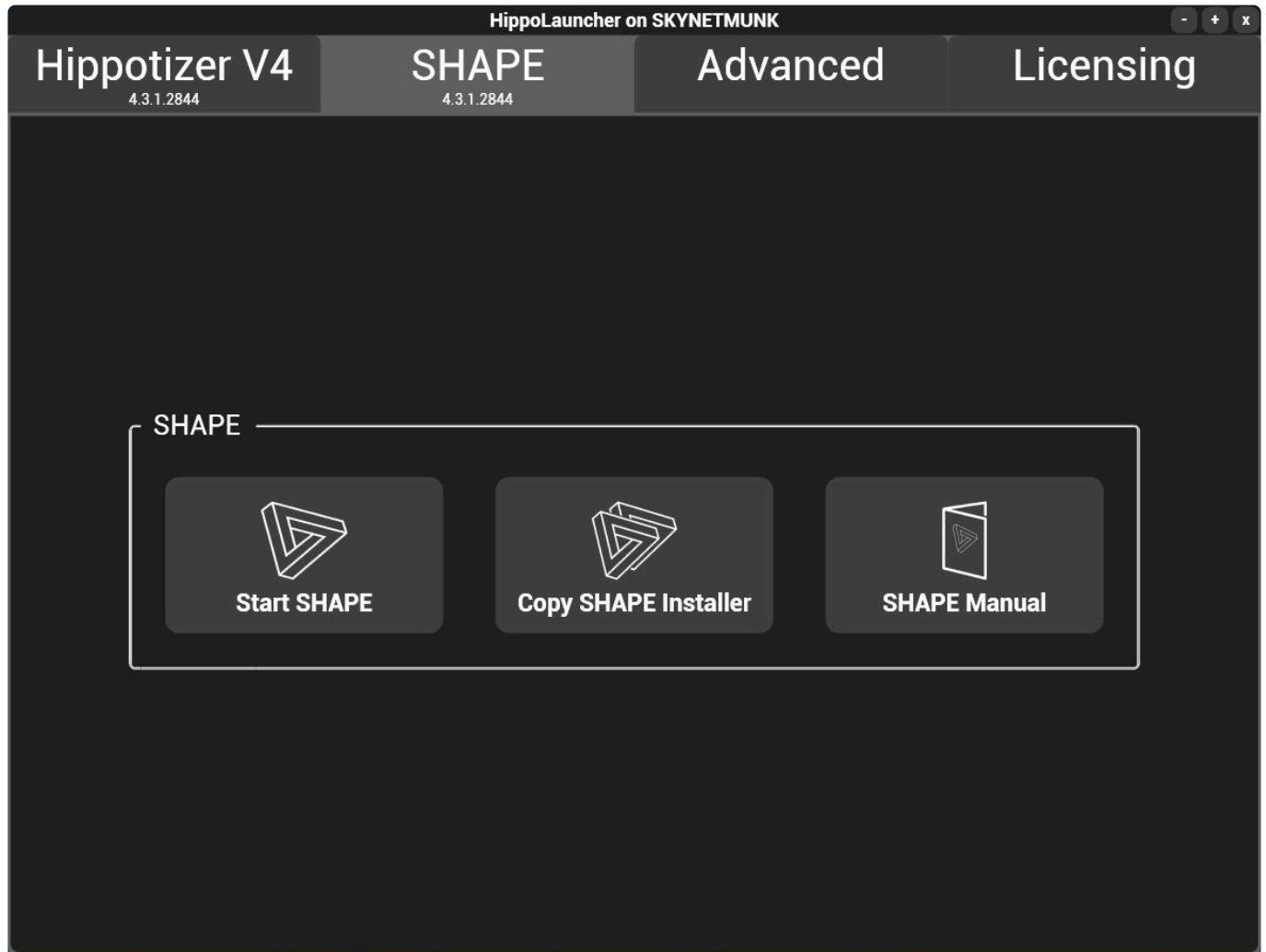
Start / Install SHAPE

- If SHAPE is not already installed, the Install SHAPE button will show. Press this to Install SHAPE.
- If SHAPE is already installed then the option to Start SHAPE is shown.

> ❗ Take care that the SHAPE version always matches the Hippotizer V4 version.
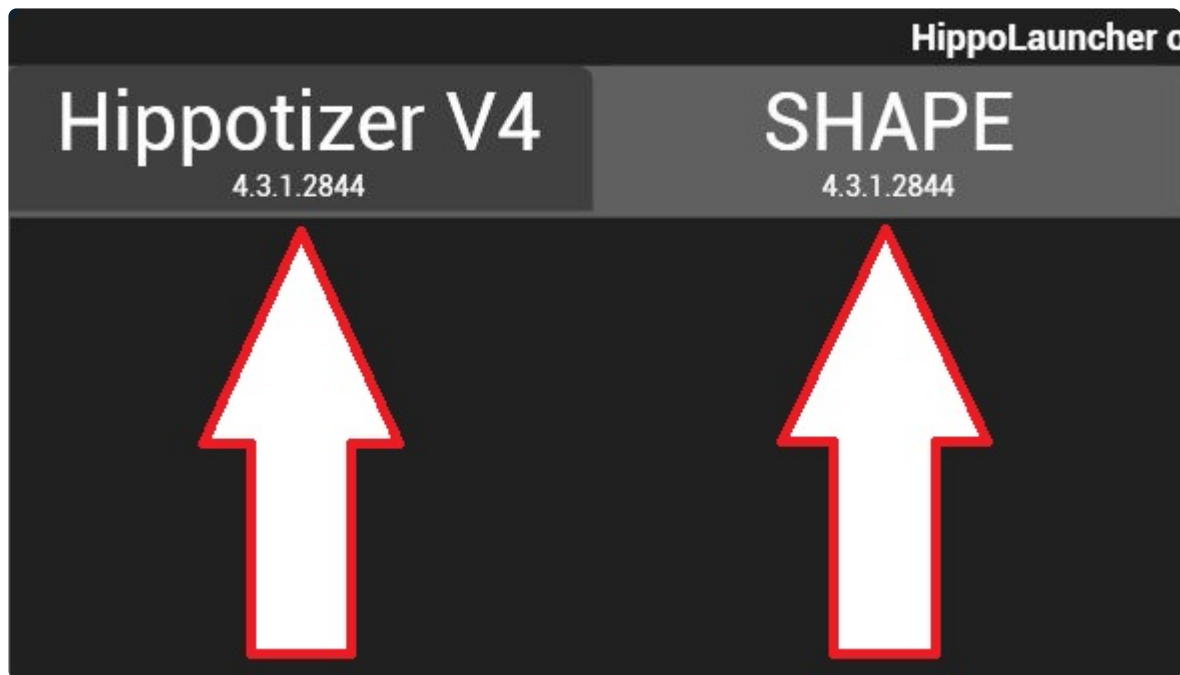
Copy SHAPE Installer

- Opens a file browser with the SHAPE installer selected so it can be quickly copied to a new location.
- Use this function to install the correct version of SHAPE on remote machines.

SHAPE Manual

- Opens a local copy of the SHAPE Manual

Advanced Tab

HippoLauncher's Advanced tab contains tools to make system setup easier

HippoLaunch's advanced functions are intended to be used only when the Engine and Zookeeper are not running.

Software Update

Remote Update

Install new software remotely on other Hippotizers on the local network.

Software Download

Link to the Hippotizer software download website

System Settings

Display Settings

Opens the windows display settings dialogue. This is the recommended method for configuring outputs before starting the engine.

Network Config

Opens the windows network settings dialogue.

EDID Manager

Loads and unloads software EDID on supporting hardware.

Additional Tools

Mpeg Conversion

Opens the mpeg converter tool to automatically transcode mpeg based media libraries to FlexRes.

Zip Debug Files

Opens a file explorer to collate and compress all log files. Hippotizer support may request log files as part of diagnostic procedures.

TCP/IP Launcher

Creates a TCP/IP receiver to control the HippoLauncher show manager over a network.

Remote Update

The launch application includes the ability to remotely update other Hippotizer systems on the network. This is accessed from the advanced tab of the launch app.

Note: In order for Remote update to function, Hippo Launch must be running on all target machines.

The remote update button will launch a separate application to set up and process the network updates.

Simple Installer Update
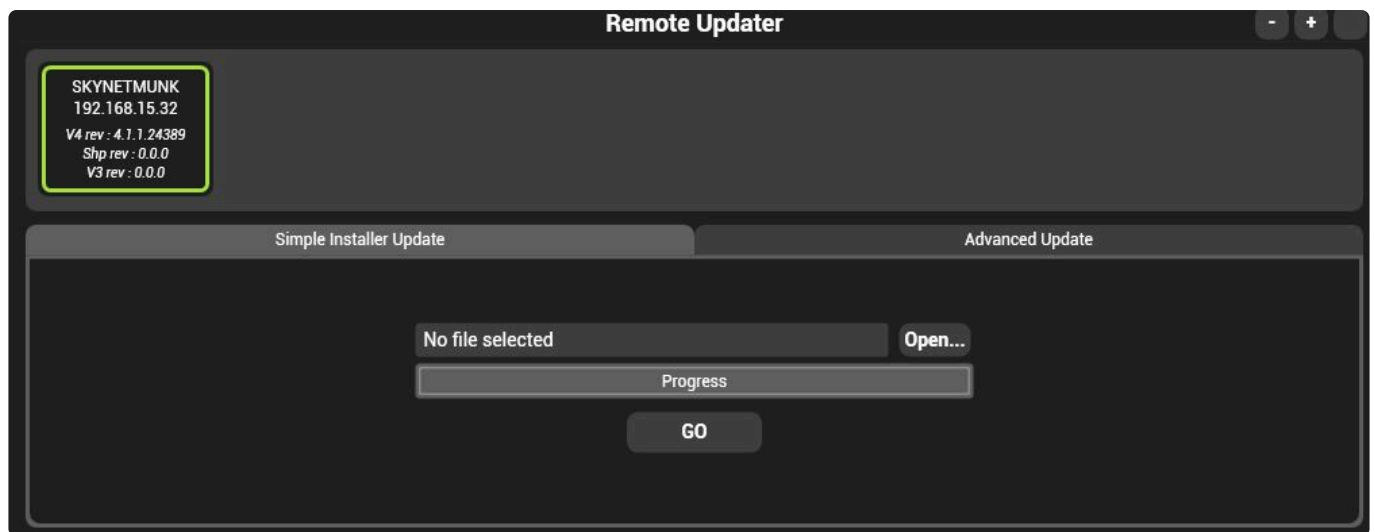
To quickly update remote machines to a new Hippotizer version, simple update is the best way.

To update:

- Select the target machines in the top bar
- Select the installer to use for update
- Press Go

Advanced Update
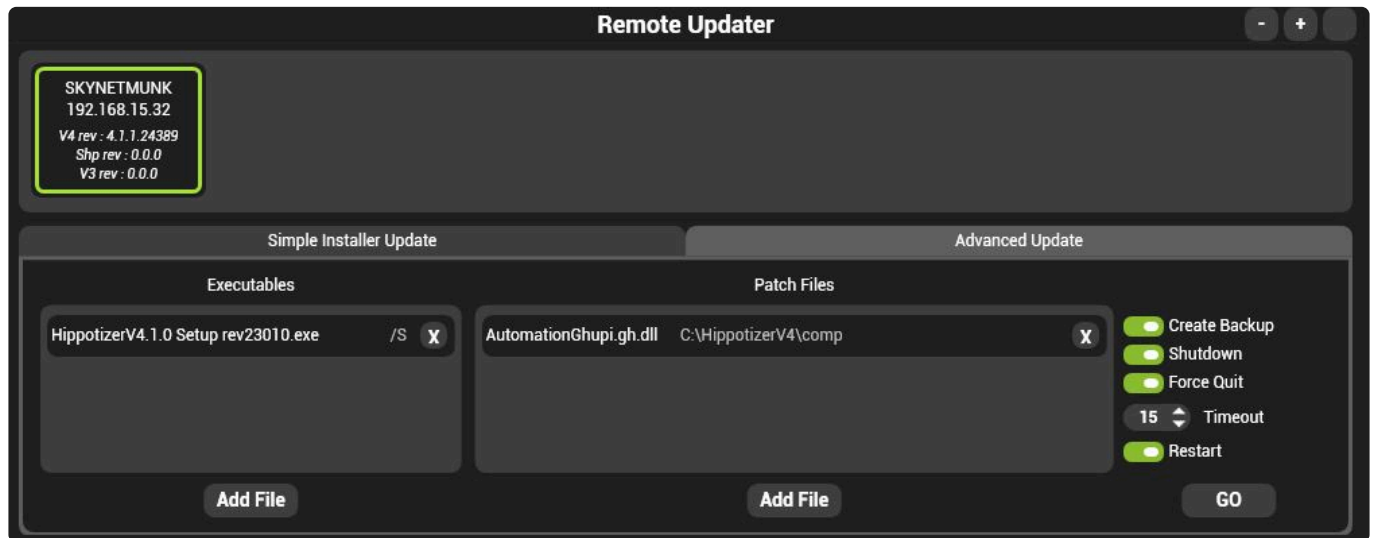
Where patches need to be applied, advanced update allows for other files to be specified with the upload.

Create Backup

Copies Hippotizer directory to a backup directory before updating

Shutdown

Stops Hippotizer and Zookeeper on target machines they are running (required for update to occur)

Force Quit

Will kill the Hippotizer Application if it does not shut down (may result in data loss)

Timeout

How long to wait (seconds) before killing the application after requesting shutdown

Restart

Restart the application after updating

Software Download

Hippotizer V4 software is updated constantly, with a new release frequently available two or three times per year. The software download option will launch a web browser to Green Hippo's update site.

Update Site

Software Versioning

Each software version has a unique number in the format of **W.X.Y.Z**

- **W** = Product Number: indicating what product version the software is compatible with.

- **X** = Major Version Number: indicating that new features and fixes have been added to the software.

- **Y** = Minor Version Number: indicating that only fixes have been applied to the software.

- **Z** = Revision Number:used for debug and beta builds primarily, the revision number tells Green Hippo technical staff precisely when the software was created.

For example: 4.1.0.23010

- Installs onto Hippotizer Version 4 Hardware
- Is Major Version 1 indicating that new features were added from the previous 4.0 version.
- Is the first Minor version in 4.1
- Is Revision 23010.

Display Settings
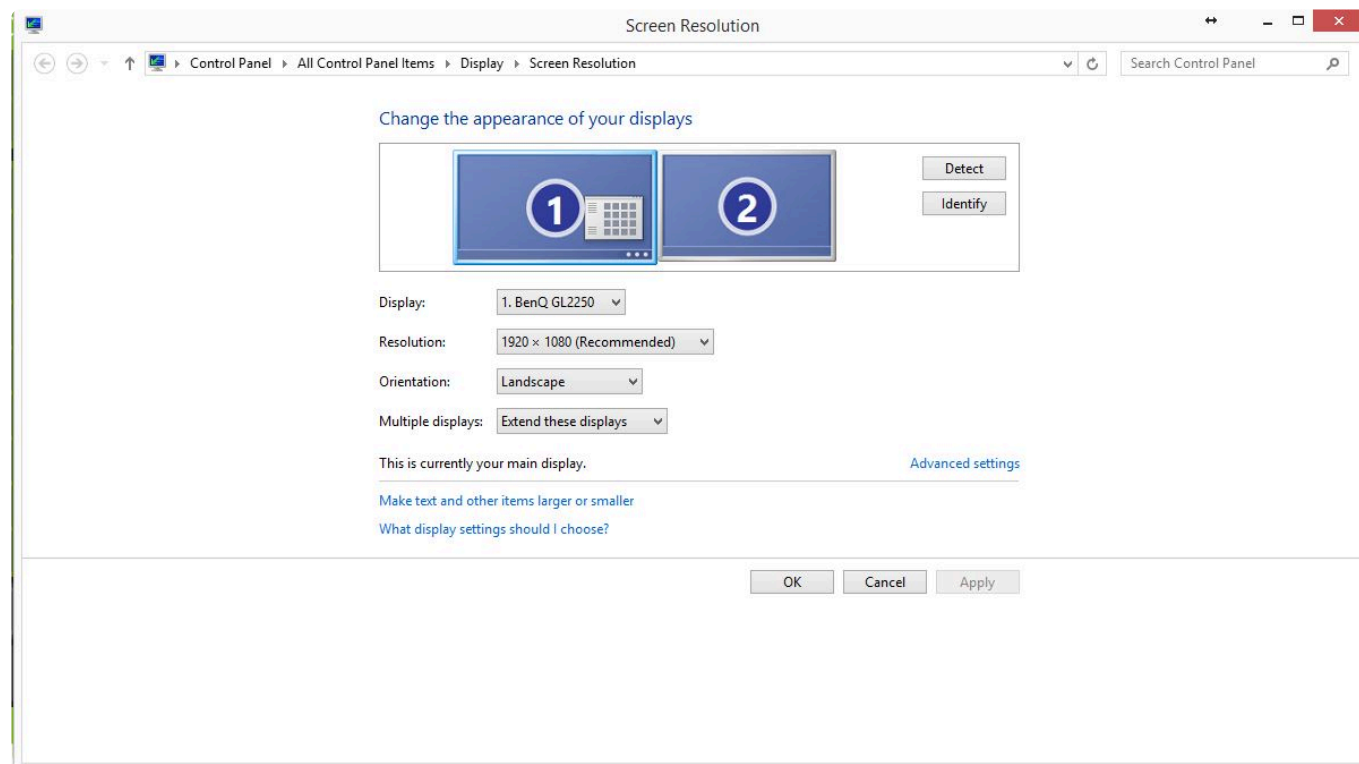
Opens the Windows dialogue for display settings.

Before starting Hippotizer, it is important to ensure the displays are correctly configured.

The Zookeeper display should be the Primary, and it should be placed to the left of all other displays.

Network Config
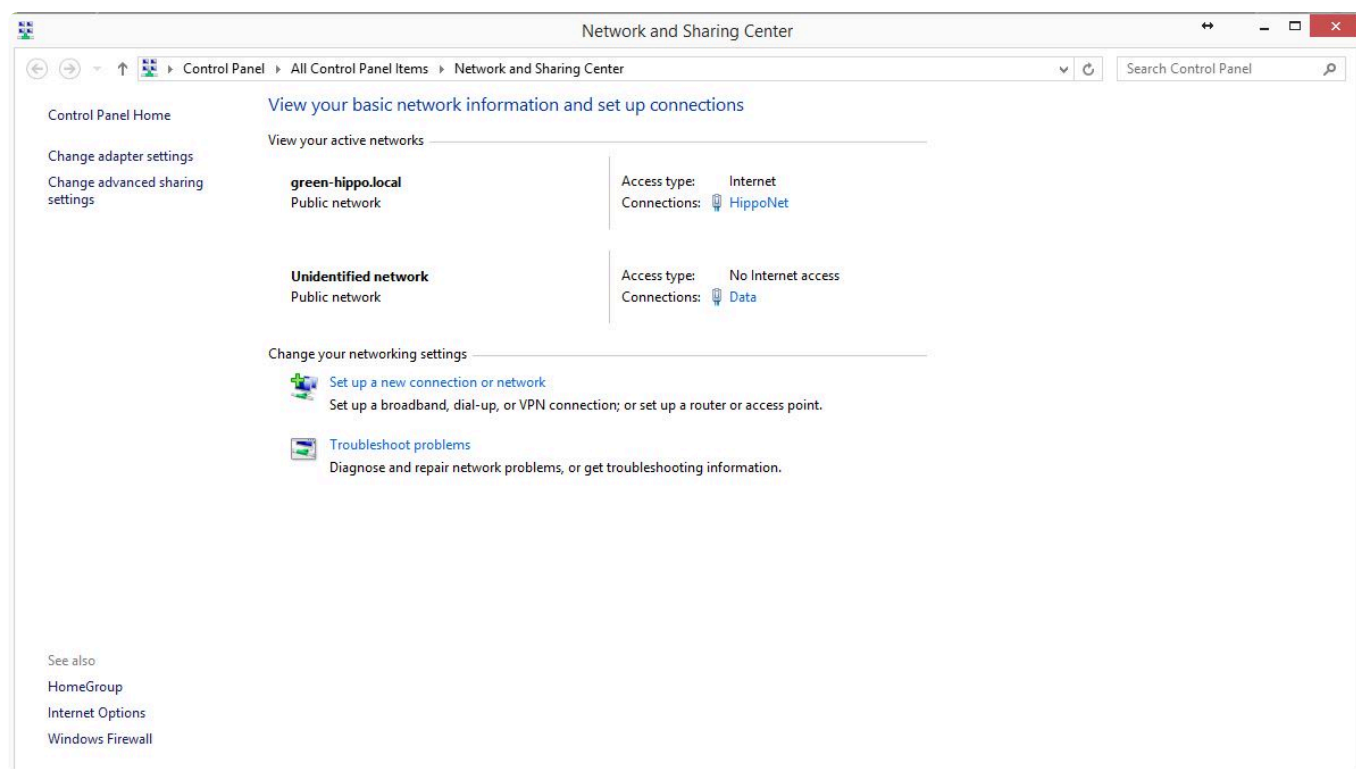
Opens the Windows Network Dialogue.

[More information about Networking and Hippotizer Can be found here.](#)

Zip Debug Files
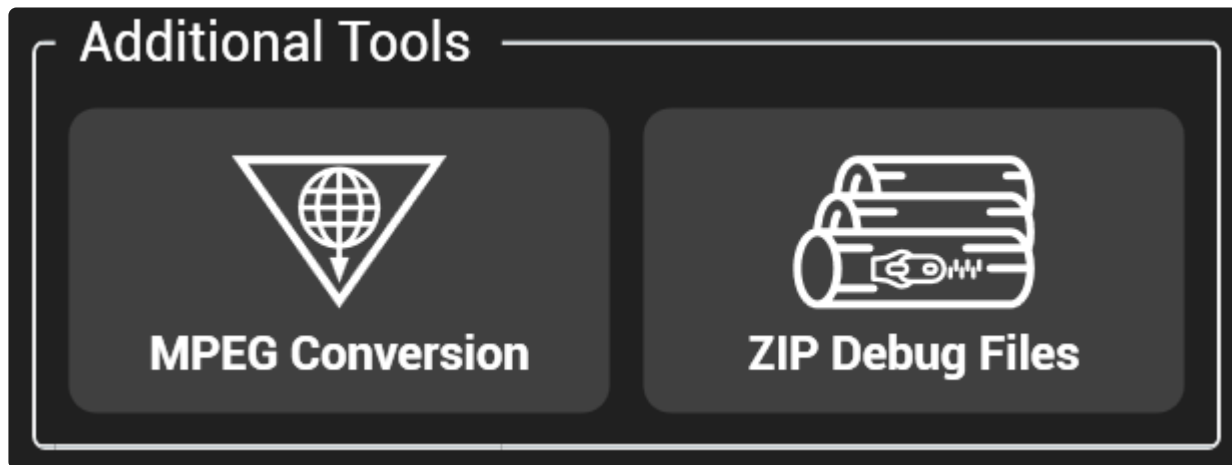
This button packages all of the debug files into a compressed zip and saves to a user defined location. This will often be requested for technical support cases.

EDID Manager

The EDID Manager loads and clears software EDID Emulation

Note: The EDID Manager works with Hippotizer V4+ systems fitted with FirePro Graphics cards only.

Systems that support EDID Manager

V4

- None

V4+

- Karst SDI
- Karst DP
- Boreal (All Types)
- Taiga (All Types)

Using EDID Manager

The EDID Manager communicates with the AMD Firepro Graphics drivers; changes made in EDID Manager can be viewed in the EDID Emulation section of the graphics drivers.

The EDID manager can be in three different states:

Not Emulating
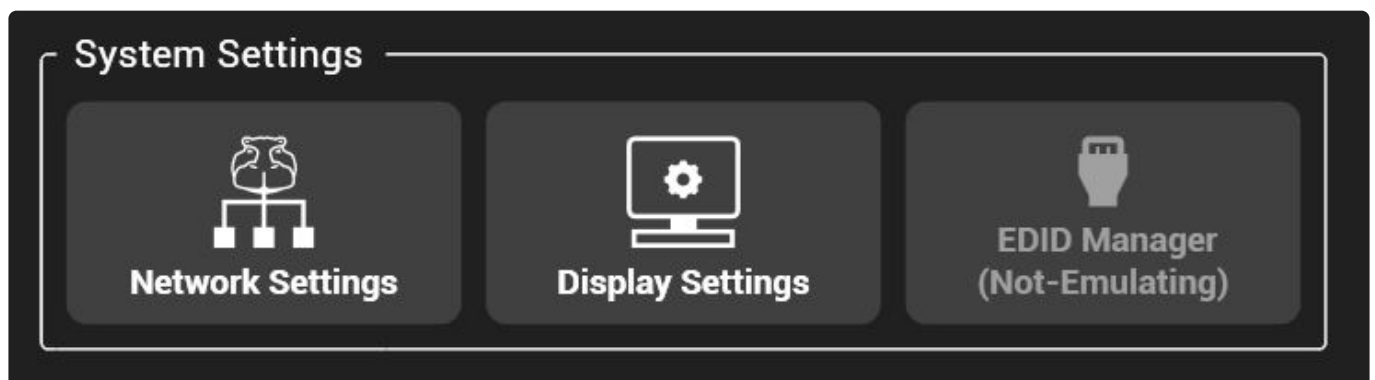
EDID emulation is disabled. Clicking the button will open a menu to allow an EDID to be loaded.

EDID files are text files that can be created from Fire Pro control centre. For more info, please see here.

Emulating
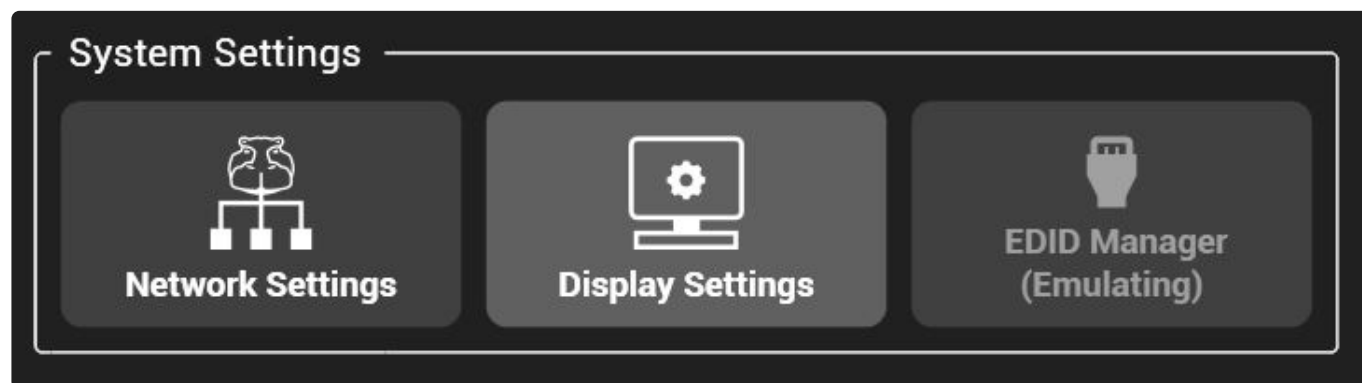
EDID emulation is running. Clicking the button will open a menu to remove emulation.

Removing Emulation

As long as HippoLauncher is running, the global shortcut of CTRL+SHIFT+'e' will remove all emulation from the setup

Zookeeper Priority

Zookeeper Priority sets the amount of CPU power Zookeeper can use.

Zookeeper's default behaviour of using only a portion of the computer's CPU resource may not be ideal for all scenarios.
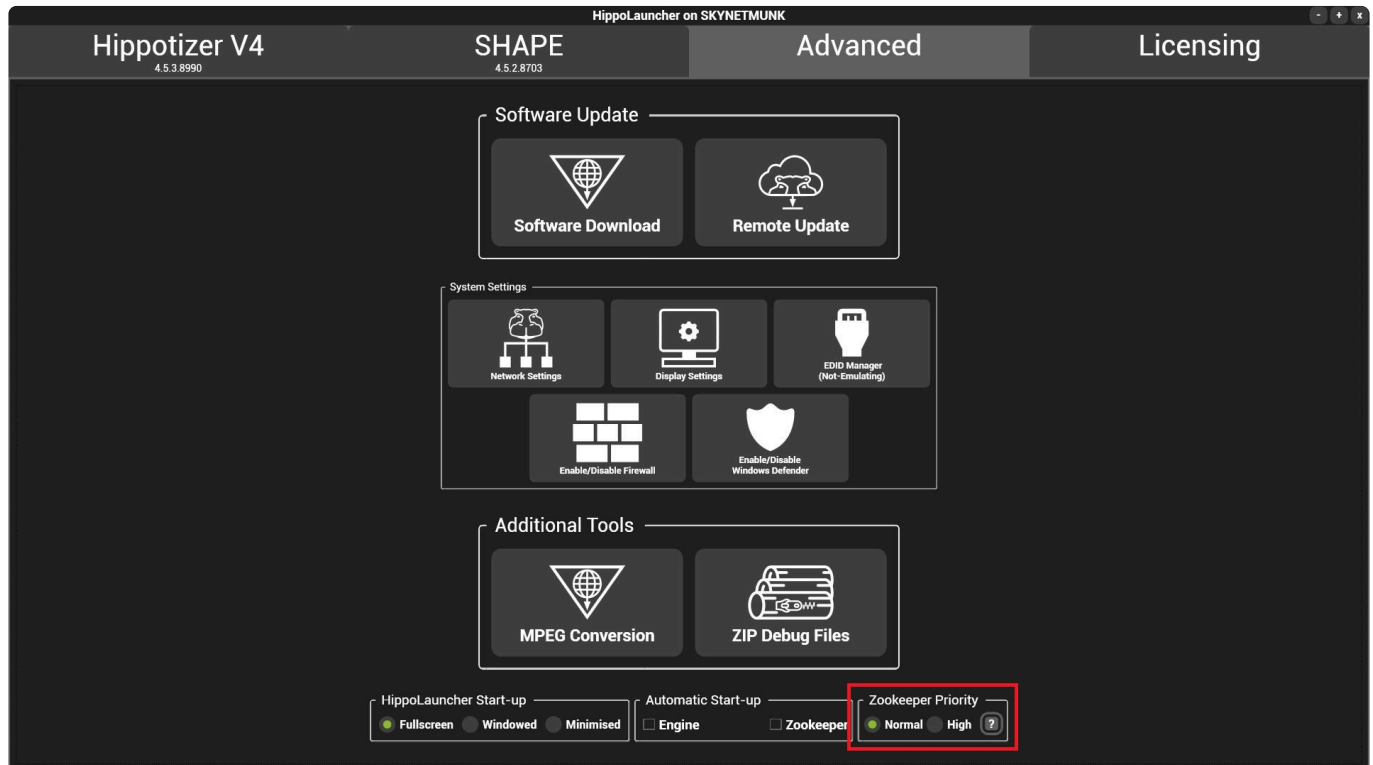
Zookeeper connects to all Hippotizer machines on the local network and maintains a cache of data for each one. The CPU overhead of this work can be significant, especially for larger networks with substantial media libraries. Zookeeper uses other computer resources such as memory and GPU though these are not a limiting factor in most cases.

The total load of a Hippotizer system is determined by many factors, the most important are:

- The total number of Zookeepers on the network – each Zookeeper adds load, especially if the Zookeeper is running on a slow computer.
- Number of clips in the media library (not size). In testing, libraries with greater than >15,000 clips or images add load
- The total number of layers and mixes on the network.
- Network infrastructure bottle-necks: HippoNet will work only as fast as the slowest segment. A damaged cable, bad NIC or wireless hop will degrade the entire network.

Setting Zookeeper Priority should be considered a second option to optimising the show setup as it is potentially hiding an underlying issue instead of fixing it.

Zookeeper Priority

By default, Zookeeper uses only a fraction of the computer's CPU resources in order to allow other

applications (or the Hippotizer Engine) enough time to operate normally. There are situations where this may not be the desired behaviour:

- All the above optimisations have been made and Zookeeper is still running slowly.
- The Zookeeper machine is reporting single core CPU Saturation (some CPU cores are consistently running at >75% while others remain low or idle).
- Zookeeper is running on a stand-alone machine not running the Hippotizer Engine or other important applications (such as a visualiser)

- **Normal** The default. Zookeeper will use 50% or less of the available CPU cores.
- **High** Zookeeper will use all available CPU cores

> ❗ Setting Zookeeper Priority to High on a system running the Hippotizer Engine will degrade playback performance. Set to High only on remote Zookeeper systems.

TCP/IP Launcher

The TCP/IP launcher can be used to control a Hippotizer server using TCP/IP strings to carry out a number of system functions. Primarily you can launch different shows from the show manager or choose to close ZooKeeper or Engine applications.
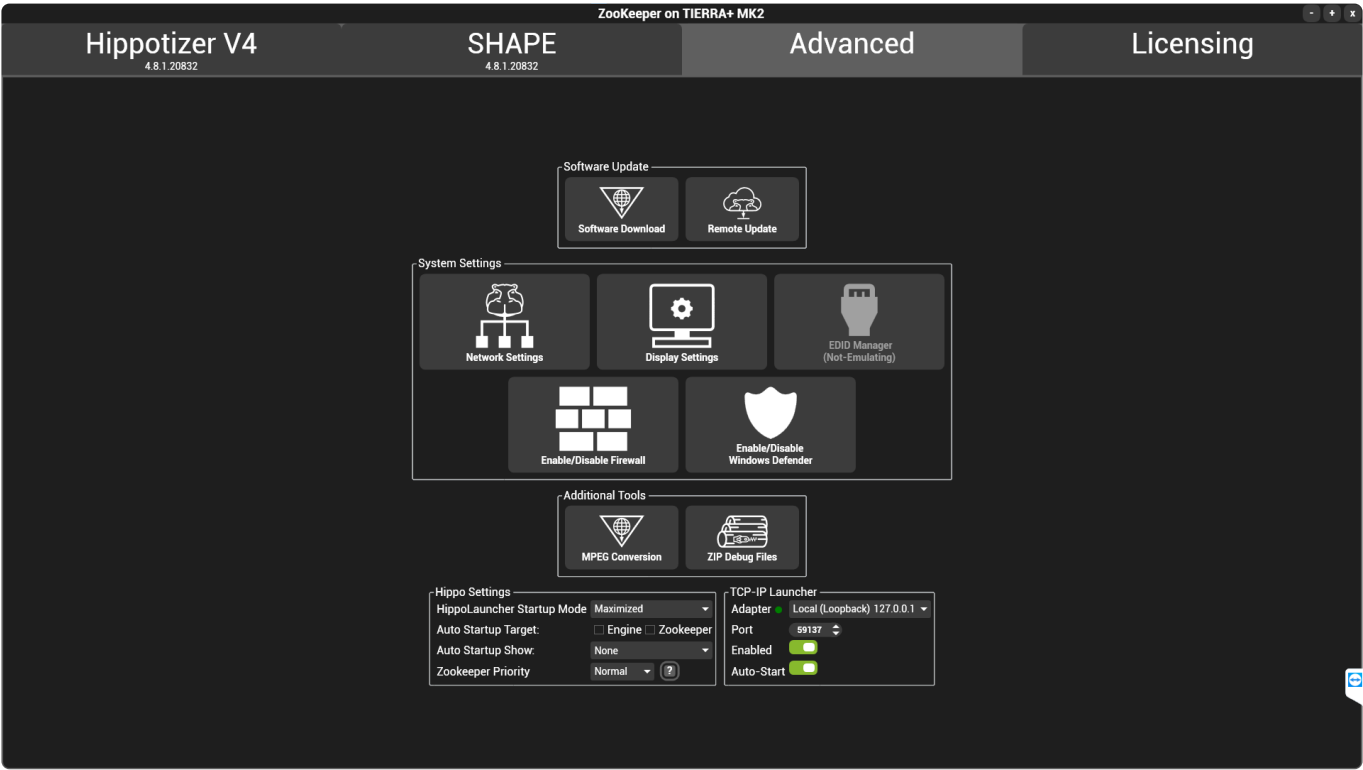
Adapter

Select network adapter for the TCP/IP launcher to listen on.

Port

Select a port for the TCP/IP launcher to listen on.

Enabled

Toggle the TCP/IP launcher On/Off

Auto-Start

Have the TCP/IP launcher start with the hippo launcher or only through manually enabling.

TCP/IP Launcher Syntax

Command	TCP String	Example

Start Engine	`<StartEngine:%SHOW-NAME%>`	`<StartEngine:MyFirstShow>`
Start ZooKeeper	`<StartZookeeper:%SHOW-NAME%>`	`<StartZookeeper:MyFirstShow>`
Start Show	`<StartShow:%SHOW-NAME%>`	`<StartShow:MyFirstShow>`
Shutdown Show	`<ShutdownSoftware>`	`<ShutdownSoftware>`
Show current show	`<CurrentShow>`	`<CurrentShow>`
Show all available shows	`<AvailableShows>`	`<AvailableShows>`
Help Documentation	`<Help>`	`<Help>`

Licensing Tab

The licensing tab details the system information and Software Assurance state of the system
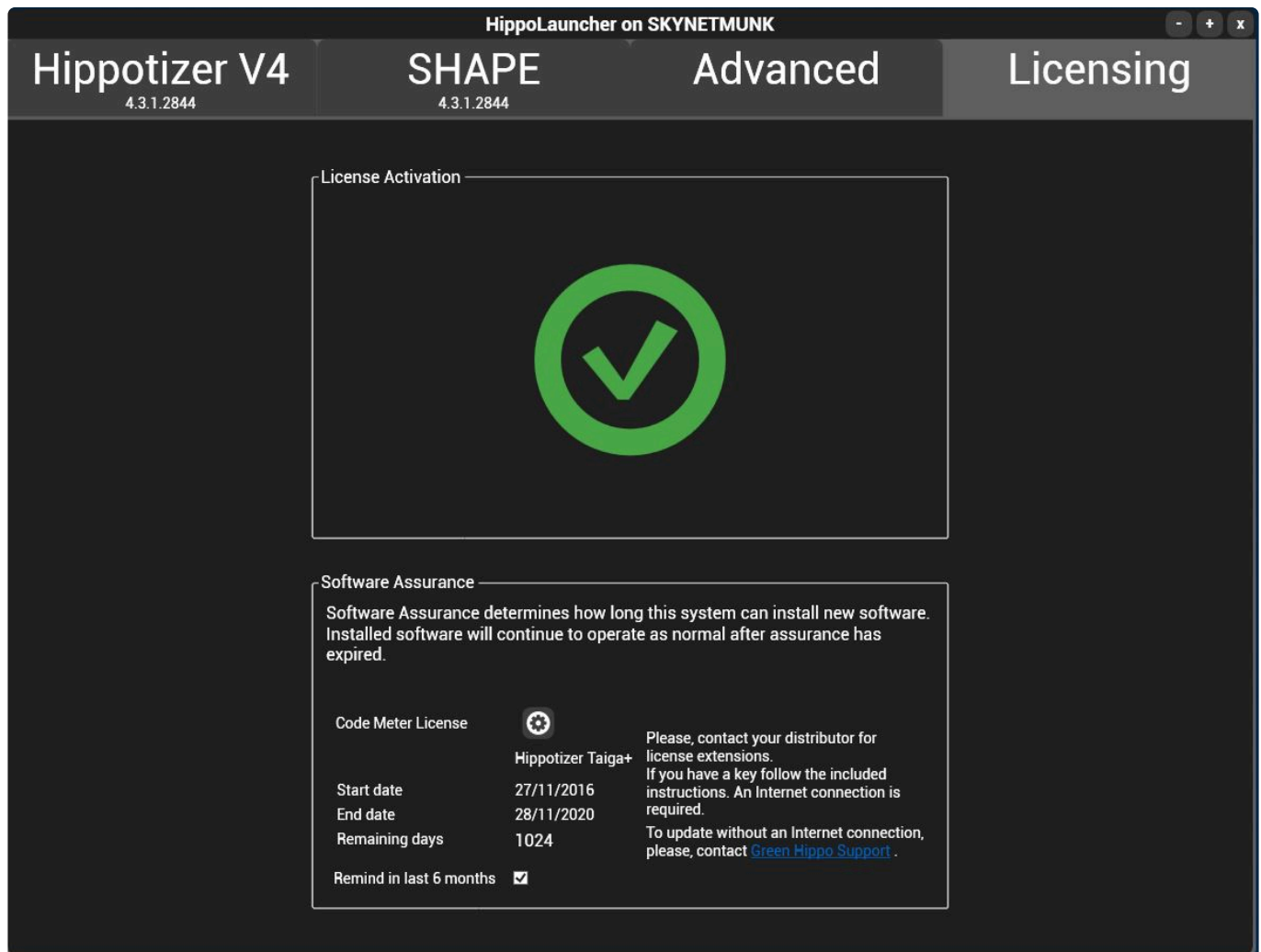
Hippotizer uses either a software based or dongle based licensing system.

- All new units ship from the factory fully licensed and ready to use.
- The license is not transferable. If drastic hardware changes occur, the Hippotizer software will cease functioning. Please contact Green Hippo for more details.

Hippotizer V4

Hippotizer V4, Compatibility mode and Play use a software based licensing system. For more information, please see here.

Hippotizer V4+

Hippotizer V4+ and Prep use a dongle based licensing system.

Software Activation.

New systems ship de-activated and must be activated before first use. This is instant and does not require an internet connection. For more information please see here.

Software Assurance

Software Assurance determines how long a system can install new software. Installed software will continue to operate as normal after assurance has expired.

For more information about Software Assurance please see here.

Software Licensing

Hippotizer V4 uses a software based Licensing system. Under normal circumstances there is no user action required; the license is not affected by changes to the Hippotizer software or a system restore.
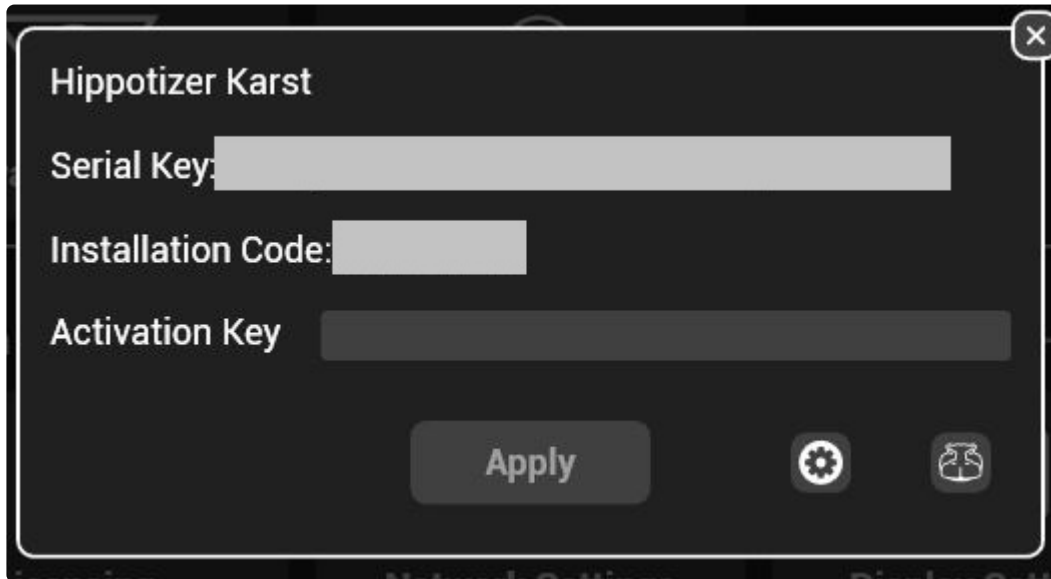
If required, Green Hippo may ask to see the Licensing diagnostics window which is accessed by pressing the settings cog in the licensing window.

> **!** The license locks the Hippotizer software to the specific computer hardware that it was installed on to. Drastic changes to the hardware (such as a new motherboard) may cause licensing to stop the Hippotizer software from working. It is important to consult Green Hippo Support before attempting hardware changes on a Hippotizer machine. On a non-Hippotizer machine (such as for Zookeeper or Play) a hardware change may require a re-install of Hippotizer software to repair.

License Activation

License Activation

New V4+ systems will arrive with a de-activated license:
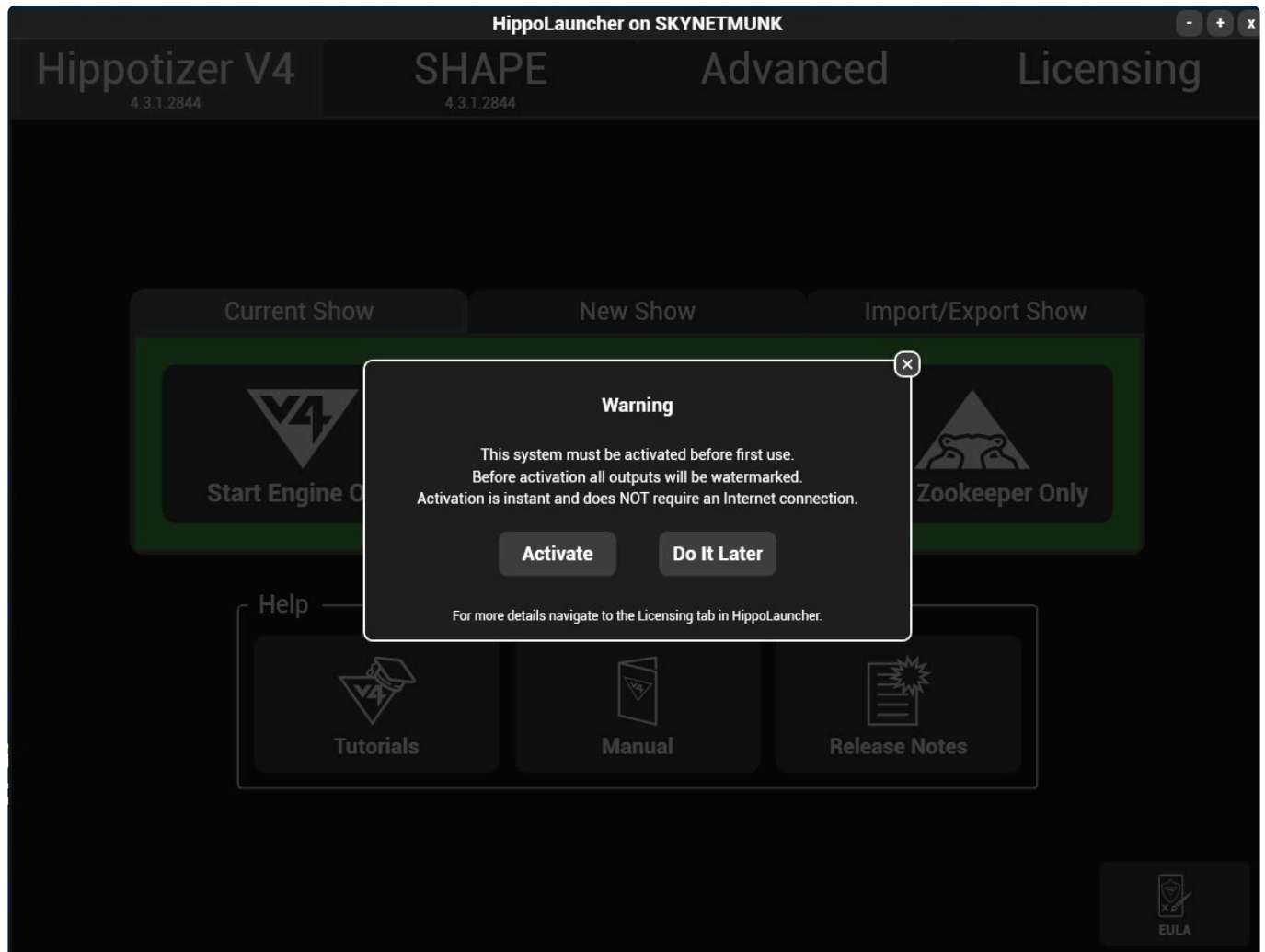
While the system is de-activated it will have watermarks on all outputs.

To activate the Hippotizer, simply click activate when prompted as Hippolaunch starts or navigate to the licensing tab and click where indicated.

Activation is instant, does not collect any personal information and does not require an internet connection.

Whats New In Version 4.8.1

Hippotizer Version 4.8.1 adds new features and functionality to V4 and V4+ systems.

Software Assurance This version will install on all V4 and V4+ systems even if they report having expired Software Assurance, however when expired the output will be watermarked. Please see [the Software Assurance section of this manual for more information](#) for more info. Software Assurance on Hippotizer PREP and PLAY does not expire.

> ❗ Green Hippo recommends always backing up all programming before carrying out any software changes.

- Systems currently running 4.4.X, 4.5.X, 4.6.X, or 4.7.X should export all programming, carry out a clean install and then import data into 4.8.X.
- Systems currently running 4.3.3 or older software must clean install 4.8.1; all existing programming and settings will be lost.

Installation Notes:

- The recommended capture card driver version has been updated. If you have a capture card fitted, please select 'Yes' when asked during installation to update your drivers to the correct version.

Features added in 4.8.1

- Added Object Output UV Toggle: **SHAPE Object Output UV Toggle**: allows for changing between only the Objects UV area, or utilizing the full 0-1 UV space.
- Compositions mappings in SHAPE can now be nudged in X and Y by using the arrow keys on the keyboard
- Fractional Pixel locations are now supported in the composition's UI of SHAPE

Functionality Changes In 4.8.1

- **5353**: New dedicated Sync Options button in Media Manager, it is no longer found under the settings button

Fixes in 4.8.1

- **5505**: Fixed some issues related to MogoDB stopping the engine from starting
- **5539**: Fixed an issue with the engine crashing while trying to encode non valid flexres files
- **5236**: Fixed an issue with CITP crashes the engine when the same pin path is patched twice in DMX
- **5453**: Improved REST API control of Int pins

- **4141**: Videomapper tiles now rotate to negative values properly on the output
- **5481**: Scaling rotated composition mappings in SHAPE now respects uniform scaling.
- **5523**: Improved pinboard item placement when DPI scaling is not 100%

For a full list of changes and fixes please see the release notes.

4.8.1 Release Notes

Hippotizer is continuously being developed and improved; please read these notes carefully to understand the changes and limitations with each version.

Software Assurance determines what version of Hippotizer will install and run on a system. Once installed, software will continue to function indefinitely. Please see the Software Assurance Policy section of this manual for more information.

Installation Notes:

- The recommended capture card driver version has been updated. If you have a capture card fitted, please select 'Yes' when asked during installation to update your drivers to the correct version.

Features added in 4.8.1

- Added Object Output UV Toggle: **SHAPE Object Output UV Toggle**: allows for changing between only the Objects UV area, or utilizing the full 0-1 UV space.
- Compositions mappings in SHAPE can now be nudged in X and Y by using the arrow keys on the keyboard
- Fractional Pixel locations are now supported in the composition's UI of SHAPE

Functionality Changes In 4.8.1

- **5353**: New dedicated Sync Options button in Media Manager, it is no longer found under the settings button

Fixes in 4.8.1

- **5484**: Sampling outside of UV space should be black, not repeat last pixel.
- **5481**: Scaling rotated composition mappings now respects uniform scaling.
- **5480**: Tolerance between scale and rotation for compositions has been improved
- **5236**: CITP crashes the engine when the same pin path is patched twice in DMX
- **5523**: Improved pinboard item placement when DPI scaling is not 100%
- **5501**: Visual update to the All Media selector in Media Manager
- **5453**: Improved REST API control of Int pins
- **5358**: Added adjustment to Host Selector panel in Media Manager
- **5357**: Sync button is now always visible with long folder names in Media Manager
- **5352**: Visual updates to selections Videomapper GUI
- **4141**: Videomapper tiles now rotate to negative values properly on the output
- **5521**: Horizontal scroll bars no longer hide the last element in a list
- **5465**: HippoLauncher now remembers size and position from last it was open
- **5466**: Fixed a potential Zookeeper crash when loading extremely large media managers and clicking a used media slot before it was done loading
- **4893**: Clean Keyframes Now no longer removes the keyframe after a floating keyframe if they are the same value

- **5505**: Fixed some issues related to MogoDB stopping the engine from starting
- **5539**: Fixed an issue with the engine crashing while trying to encode non valid flexres files
- **5238**: When adding a ZooKeeper track to a timeline ZooKeeper sofware will no longer crash.

Known issues in 4.8.1

- **3125**: Audio track starts always from the in-point when scrubbing through a timeline in Timeline+.
- **3146**: ZooKeeper SHAPE visualiser shows selections made in SHAPE software when ZooKeeper is part of group
- **4176**: Virtualised Viewports settings is not applied from an imported OutputManager component.
- **4244**: Renaming the system could result in an Engine crash. Workaround: Reinstall software or * rename system back to the default name.
- **4439**: Host colour does not change to orange when Engine is configuring layers.
- **4518**: MediaMaps of remote hosts does not display thumbnails in TimelinePlus.
- A previous error in the manual stated that shows from 4.7.X would import to 4.8 automatically when selecting the update option on installation. This is not the case and shows wishing to upgrade from any previous version of software to 4.8 should export all components to be imported into 4.8

Deprecation Notice

Timeline Component As of 4.6.0 the Timeline component will no longer be supported by future developments.
Any timeline exports can be imported into the new Timeline+ component with minimal programming changes required for identical playback. The component will be completely removed from the Hippotizer software as of 4.8.0 and any future shows should transfer to the Timeline+ component for ongoing support.

Multicontroller Component: Automation Control Sources Instead of using a control source per automation protocol, we now include one automation reader control source as a replacement for all the protocols. This automation control source will replace any of the individual control sources included in the following:

- Test Data
- GHAP
- DEAP
- PosiStageNet
- Kinesys
- PRG Automation
- StageTech SiMotion
- Artnet
- LevDev360
- PT5232
- BlackTrax
- NMEA (GPS)

Future programming should use the automation reader as a control source for future support. Protocols

not included in the list will remain as individual control sources and all others will be contained in the automation reader from Hippotizer version 4.8.0.

Current DMX Personalities

	Recommended Hippo Personality	Also will work	Tested MA2 personality	Notes
Layer	4.8 Layer	4.6/4.7 Layer	Included* 4.8 Layer	
Layer Presets	4.8 Layer Presets	4.6/4.7 Layer Presets	Included* 4.8 Layer Presets	
Layer Performance	4.8 Layer Lite		Included* 4.8 Layer Lite	
Mix	4.8 Mix	4.6/4.7 Mix	Included* 4.8 Mix	
Mix Presets	4.8 Mix Presets	4.6/4.7 Mix Presets	Included* 4.8 Mix Presets	
Notch Mix	4.8 Notch Mix		Included* 4.8 Notch Mix	
TouchEngine Mix	4.8 TouchEngine Mix		Included* 4.8 TouchEngine Mix	
SHAPE	4.8 Shape		Included* 4.8 Shape	
Viewport	4.8 Viewport	4.6/4.7 Viewport	Included* 4.8 Viewport	
SHAPE Viewport	4.8 Shape Viewport		Included* 4.8 Shape Viewport	
TimelinePlus	TimelinePlus		Included* 4.8 TimelinePlus	

*Included in the Hippotizer installer and software download site.

Installation Notes

- When moving between feature version (eg. 4.3 to 4.4) always uninstall the previous version before installing new software.
- The minimum supported Datapath capture driver has changed. At least version 7.19.4 must be installed.
- Datapath drivers are now installed as part of the installer. Select yes when prompted to install them.
- 4.3 Is the minimum version of software supported by V4+ hardware .
- 4.6.4 Is the minimum version of software supported by V4+ MK2 hardware .
- From version 4.2 Onward the Hippotizer data is stored in new locations to comply with Microsoft Windows security guidelines.
- The binaries (executable files) are stored in: C:\Program Files\GreenHippo\HippotizerV4
- The settings are stored in: C:\Users\\AppData\Local\GreenHippo\4_5
- The Media folder by default on Portamus and Play is: C:\ProgramData\GreenHippo\MediaV4

- The Media folder by default on all other V4 and V4+ systems is D:\MediaV4

SHAPE Project file compatibility

- Project files created in SHAPE 4.3 and later are compatible with SHAPE 4.7.0
- Project files created in SHAPE 4.3 are compatible with SHAPE 4.3.1.
- Project files created in SHAPE 4.2 or 4.2.1 are compatible with SHAPE 4.3.1
- Project files created or edited in SHAPE 4.3.1 will **not** load in older versions of SHAPE.

Current Codec Support

Resolution restrictions by Codec:

Codec	Width	Height	Max Height	Max Width	Min Height	Min Width
FlexRes Performance	Divisible by 4	Divisible by 4	16,384	16,384	64	64
FlexRes Quality (All Colour spaces)	Divisible by 4	Divisible by 4	16,384	16,384	64	64
FlexRes Lossless 4:2:0	Divisible by 4	Divisible by 4	16,384	16,384	64	64
FlexRes Lossless 4:2:2	Divisible by 4	Any	16,384	16,384	64	64
FlexRes Lossless 4:4:4	Divisible by 4	Any	16,384	16,384	64	64

[Content that does not fit within these restrictions can still be encoded through resizing.](#)

Version 4.2.1 Removes Support for MPEG-2 Playback; please re-encode all content to FlexRes.

Video File Types

The following codecs and wrappers have been tested for their compatibility with Hippotizer's built in transcoding system.
On encode, the content is converted to the FlexRes codec chosen. **Encoding interlaced content is not supported.**

Codec	Extension	Status
Mpeg2	.mpg	Does Not Work
Mpeg2	.m2v	Works
Mpeg4	.mp4	Works
Mpeg4	.m4v	Does Not Work

ProRes422	.mov	Works
ProRes420	.mov	Works
ProRes444	.mov	Works
ProRes4444	.mov	Works
FlexRes	.fxr	Works
AVI	.avi	Works
Animation RGB	.mov	Works
Animation RGB + Alpha	.mov	Works
h.264	varies	Works
HAP	.mov	Works
DXV	.mov	Works
HEVC (H.265)	.mp4	Works
NotchLC	.mov	Works

Image File Types

Codec	Extension	Status
Tiff	.tiff	Works
PNG	.png	Works
Jpeg	.jpg	Works
Targa	.tga	Works
DPX	.dpx	Works

Image Sequences

Codec	Extension	Status
Tiff	.tiff	Works
PNG	.png	Works
Jpeg	.jpg	Works
Targa	.tga	Works

Audio Encoding

Codec	Channels	bit depth	Status
Wav	1	16b	Works

Wav	2	16b	Works
Wav	4	16b	Works
Wav	6	16b	Works
Wav	8	16b	Works
Wav	2	24b	Works
Wav	2	32b	Works
.mp3	Any	Any	Does Not Work
.aif	Any	Any	Does Not Work
.mpa	Any	Any	Does Not Work
.wma	Any	Any	Does Not Work

Martin P3-PC compatibility

Hippotizer can send video directly to the Martin P3-PC application running on the same machine, this requires a P3 Dongle.

The version of P3-PC and Hippotizer is important to ensure correct operation:

Hippotizer Version	P3-PC Version
4.1	4.2
4.2 – 4.2.2	4.2.2
4.3	4.3.1
4.3.1 – 4.5.3	4.3.1

Current CITP Support

! CITP Thumbnail exchange and streaming previews is currently unreliable in 4.6.0 and 4.6.1. We are urgently working to fix this for 4.6.2. If you require CITP please contact support and we may be able to offer a Beta of 4.6.2 pre-release.

CITP (Capture Interface Transport Protocol) is an open network protocol to allow visualisation software and lighting desks to exchange thumbnails and streaming previews from media servers. Green Hippo # works to ensure CITP is working correctly with as many 3rd party applications as possible. Here is a list of currently tested systems against this version.

Desk or Software	Version Tested	Thumbnail Exchange	Streaming Previews
Grand MA2	3.3.4.3	Works	Works

MA-3D	3.3.4.3	N/A	Works
MSD	3.2.2.3	N/A	Works – Inverted about Y Axis
Martin M-PC	3.50.645.641	Works	N/A
Capture Argo	21.1.30	N/A	Works
Hog 4	3.2.5 (Beta)	Works	N/A
Avolites	Titan (9/10)	Works	N/A
WYSIWYG	R38	N/A	Does not Work
Chamsys	1.7.8.1	N/A	Works

Current Datapath Drivers

- If using Dual DVI, Dual SDI or AV-SDI capture cards, we recommend Datapath Driver version **V7.25.1**
- If using Quad SDI and Dual DP capture cards we recommend Datapath Driver version **V7.25.1**

Capture drivers are now included with the installer.

When installing Hippotizer software you will be asked if capture card(s) are fitted. If yes, the installer will automatically deploy the correct drivers.
If a copy of the driver installer is needed, it will be placed on the Hippotizer at this location:

C:\Program Files\GreenHippo\HippotizerV4\ThirdParty\Datapath_Vision_V7.25.1

Current Display Drivers

Hippotizer Media servers use one of several type of graphics card, which are tested with current and former display drivers.

V4 System	Driver
V4 Taiga (All Types)	FirePro 15.201
V4 Boreal (All Types except Boreal DVI-SL)	FirePro 15.201
V4 Boreal DVI-SL	Radeon 15.7.1
V4 Karst SDI or DP	Firepro 15.201
V4 Karst DVI	Radeon 15.7.1
V4 Amba (S/N: 240037 or Greater)	Fire Pro 15.201
V4 Amba (S/N: 240000 – 240036)	Radeon 15.7.1

V4 Drivers are available for download here: Download Site

V4+ System	Driver	Secondary Driver
V4 Tierra+	Nvidia Quadro 431.94	
V4 Taiga+ SDI Genlock	Radeon Pro 17 Q4.1	Nvidia Quadro 390.65
V4 Taiga+	Radeon Pro 19.Q4.1 *	Nvidia Quadro 390.65
V4 Montane+	Nvidia 419.67	
V4 Montane+ RTX	Nvidia 419.67	
V4 Boreal+ SDI Genlock	Radeon Pro 17 Q4.1 (WX9100*)	Radeon Pro 19.Q4.1 (WX8200*)
V4 Boreal+	Radeon Pro 19.Q4.1 (WX9100**)	Radeon Pro 19.Q4.1 (WX8200*)
V4 Karst+ SDI	Radeon Pro 17 Q4.1	
V4 Karst+ DP	Radeon Pro 19.Q4.1	
V4 Karst+ DVI	Radeon 17.7.2	
V4 Karst+ DVI (S/N: 430143, Karst_Plus_100052 or later)	Radeon 19.6.2	
V4 Amba+	Radeon 17.10.1	
V4 Amba+ (S/N: 420090, Amba_Plus_100027 or later)	Radeon 19.6.2	
V4 Nevis+	Radeon Adrenaline 19.40.01.18	

- * The GPU model installed in the server.

- ** Please contact support for GPU firmware update procedures as these models have hardware specific requirements.

V4 Drivers are available for download here: Download Site

V4+ MK2 System	Driver
Amba V4+ MK2	Radeon 17.11.4
Karst V4+ MK2	Quadro RTX 471.11
Mayon V4+ MK2	Radeon Pro 21.Q1.2
Boreal+ MK2	Quadro RTX 471.11
Tierra+ MK2	Quadro RTX 471.11

! Drivers for V4+ Systems are extremely specific and will result in system instability if listed versions are not adhered to. **Do not deviate from the recommended drivers**.

DMX Personality Changes

All changes to DMX personalities are listed here:

✳ No functionality changes have been made to the 4.8 personalities from 4.7

A complete list of current DMX charts can be found here:

DMX Charts

✳ Matching MA2 personalities can be downloaded from our support site or once installed from C:\Program Files\GreenHippo\HippotizerV4\documentation\3rdParty

Special note about Notch

Using Notch in Hippotizer requires specific considerations: please read this warning carefully.

Notch is a 3rd party tool allowing for ground breaking generative and real-time effects.

To accomplish this, Notch utilises the Hippotizer's graphics card to calculate and render video in real time.

> **!** **Rendering Notch effects can be computationally intensive, and may lead to system instability including render failure at show time. Green Hippo strongly recommends thoroughly testing all Notch effects and cueing before use**.

All effort has been taken to ensure system stability, though the flexible nature of Notch makes any guarantee impossible. For this reason Green Hippo strongly recommends the following:

- Notch effects running within Hippotizer have the ability to disrupt or stop video rendering. Carefully plan the use of Notch and avoid switching blocks rapidly.
- Fully test all Notch effects and blocks before use in a live environment.
- Carefully plan and test Notch usage regarding performance; a single Notch effect can dramatically slow even the fastest system.
- Do not load new blocks during show time as it will effect the output. Pre-load all blocks. If multiple blocks are to be used, use cached resources.
- In the event of a Notch Crash, **Restart the entire machine before continuing use**. Where the graphics drivers have crashed, a full system restart is the only way to continue regular operation.

More information about Notch in Hippotizer can be found here.

More information about the Notch application can be found here.

Hippotizer V4 and V4+ Notch Performance

Notch Marks	V4	V4+
Amba	3300	3700
Karst	8600	12500
Boreal	9500	15000
Taiga	10300	17000
Montane	NA	27300
Montane RTX	NA	37140
Tierra	NA	39816

Zookeeper

Zookeeper is the interface to Hippotizer; it allows for real-time control of the engine and all of it's components, communicating with all Hippotizers on the local network.
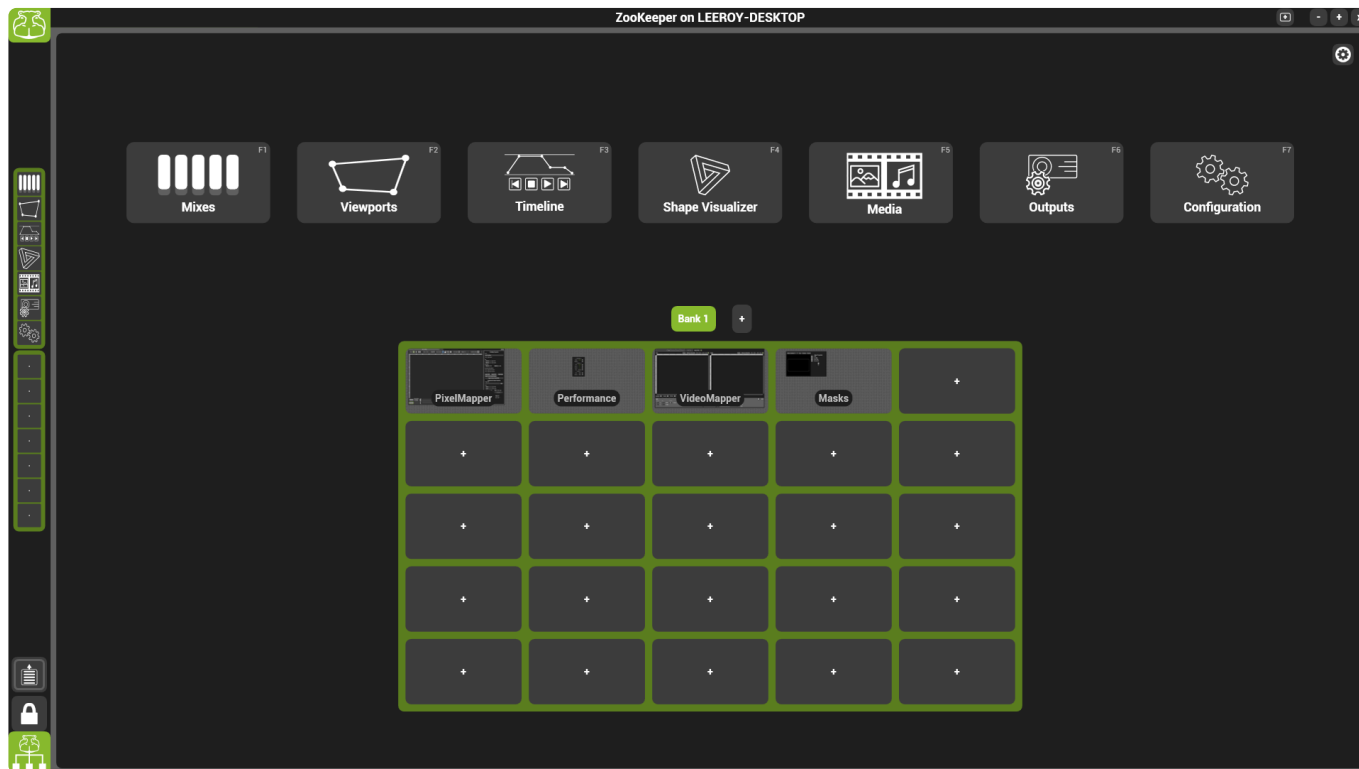
The home screen offers the six most common actions as fixed buttons:

Mixes Page

Opens the default layer and mixes page

Viewports Page

Opens the default viewports page.

Shape Visualiser

Opens Zookeeper's built in 3D Visualiser.

Media Page

Opens Media Manager. Use this to upload media, manage the media map and synchronise media between systems.

Outputs Page

Opens Output Manager. Use this to configure how many mixes, layers and outputs are used.

Configuration Page

Opens the host manager. Use this to start and stop components.

Additional Zookeeper Functions

- Advanced Startup options
- Customizing the Interface
- Layer Controls
- High Performance Mode

Installing Zookeeper

Zookeeper is installed automatically on every Hippotizer and Play system. It is also possible to use Zookeeper only, for free, on many Windows 8 and 10 computers. Simply run the Hippotizer installer and do not enter a license key when prompted to install Zookeeper.

> Note: Zookeeper installations can be upgraded to Play after install by entering a license key.

Mixes Page

The mixes page is where layers and mix master controls are accessed.

The mixes page is a **default layout** that can be reset from within [Zookeeper Settings](#)

The mixes page is comprised of four main sections:

Mix Selector

The mix selector chooses which set of layers are shown in the layer selector. By default, the local mix will be selected if one is present. If no local mix is present then no mix will be selected.

Layer Selector

The layer selector chooses which layer the layer controls below are shown.

Mix Master

The mix master contains controls such as Pixelmapper and Master Presets that are applied to the entire mix.

More information about the Mix Master is here.

Layer controls

The layer contains controls such as media players, geometry and effects that are preset on each media layer.

More information about the [Layer Controls are here](#)

Layer Controls

The heart of the Hippotizer Media Server is the layer controls; here media is played, colour and geometry can be manipulated and effects are applied.

Each media Hippotizer runs mixes comprised of layers; this configuration is set in Output Manager.

Layer Signal Flow

Each layer is an independent video processing system that is then composited by the mixer. The flow through that processor is described below.

Source: Media Player, Live Capture etc.   Content Output   Other Outputs

Source Preview
Send

Effects and Notch
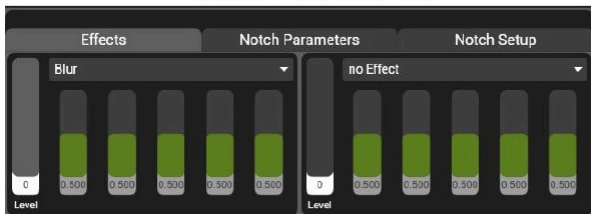
Relay Send

FX Preview Send
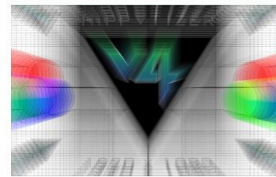
Geometry and Keystone

Livemask

PreMix Preview
Send

Output to Layer Compositor

Relay sends

As shown above, Relays are sent just before Geometry, Keystone and Masking, but after effects. The result is relays can have unexpected behaviour, which is by design:

- Geometry (Including Keystone on layer) has no bearing on the relay send
- Relays are sent pre-layer level – so if media playback is required with the level down pause on dark must be disabled.
- Livemask will not affect relay sends. If a relay with masking is required use the mask effect.

Other components of Hippotizer that rely on relays as a source (such as SHAPE's inputs 2-8) must consider the details of relays.

The parts of the layer are discussed in detail here

- [The Source](#)
- [Geometry](#)
- [Notch](#)
- [Mixer](#)
- [Effects](#)
- [Livemask](#)
- [Colour](#)
- [Media Select](#)

The Source

The source originates audio and video for the media layer.

To choose what the layer will use, choose the source type:
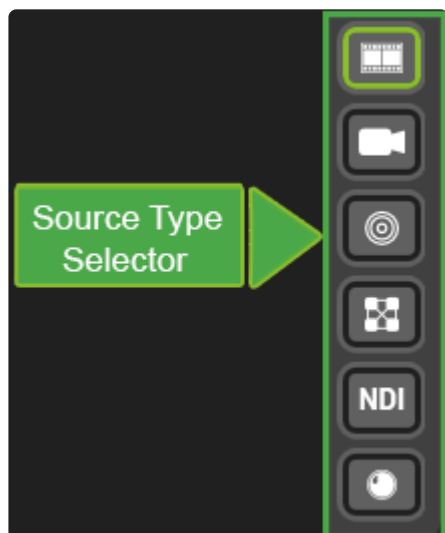
A source can play media stored locally, display video captured from an input card, generate effects, relay video from another layer or use display video from the network.

 Media Player

Plays video, audio or images from the Media Manager

 Live Capture

Displays video captured from a hardware capture card.

Relays

Displays video from other layers, mix or viewports on the same system

Generators

Creates video based on generative effects.

NDI

Displays video from a network source based on Newtek's NDI protocol.

Spout

Displays video from other programs on the same machine using the Spout interface.

Media Player

The Media Player represents an independent playback engine for each layer in Hippotizer.

Each media player is capable of playing movies, images and audio files.

Any content to be played by the media player must first be encoded in [Media Manager](#)

Basic Media player controls include:

- [Transport Controls](#)
- [Media Info](#)
- [Playback Display](#)

Additional Functionalities of the Media Player are in tabs
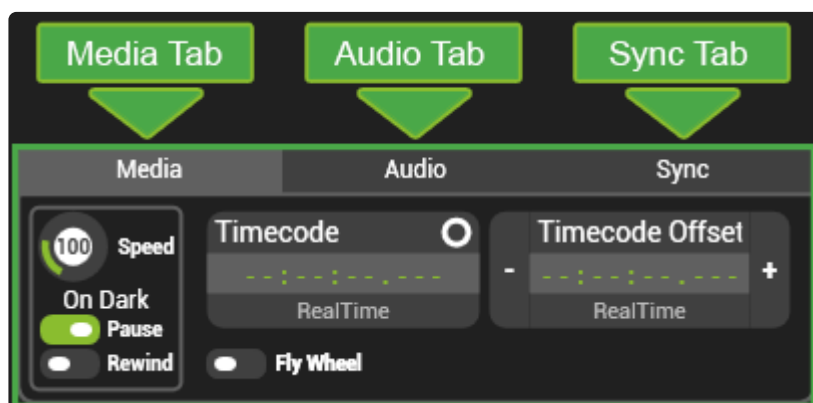
- [Media Tab](#)
- [Audio Tab](#)
- [Sync Tab](#)

Transport Controls

The Transport Controls dictate the playmode of audio and video clips in the media player

Media Player Controls

The media player controls determine how a layer responds to timecode as well, that behavior is noted below.

In Frame Plays the first frame of the clip only. Use this play-mode to pre-load a clip before it is required.

Timecode: With Timecode, the clip will remain on the In-Frame.

Play Forward Plays from In to Out-Point and stops at the Out-Point.

Timecode: The clip will play to timecode. If Timecode exceeds the Out-Point the clip will hold on the out-frame.

Play Forward Loop Plays the clip forward and loops when it hits the out-frame.

Timecode: The clip will play to timecode and play to multiples of the clip length if Timecode exceeds the Out-point. For example, on a 5 minute clip a timecode value of 9 minutes will place the play-head at 4 minutes.

Pause: Stops playback at the current position.

Note: Pause can be triggered automatically when Pause on Dark is enabled which can clash with DMX. It is therefore advisable to either not use Pause from DMX (and use speed set to 0 instead) or set it to update only in the personality. Update only is the default setting in factory personalities.

Timecode: Pause does effect media playback when the layer is under timecode control

Play Backward Plays the clip from the Out-Point to the In-Point stopping at the In-Point

Timecode: Plays in time with timecode from the Out-Point to the In-Point.

Play Backward Loop Plays the clip from the Out-Point to the In-Point looping back to the Out-Point.

Timecode: Plays in time with timecode from the Out-Point to the In-Point looping at the In-Point.

Ping Pong Plays forwards to the Out-Point then backwards to the In-Point and repeats.

Timecode: Plays in time with timecode bouncing at the In-Point and Out-Point.

Random Plays random frames from between the In-Point and Out-Point.

Timecode: Plays random frames while receiving time code.

Out Frame Plays the Out-Point frame and holds on that frame.

Timecode: With Timecode, the clip will remain on the Out-Frame.

Inner Loop

Inner Loop playmode is a second set of loop points for a clip, commonly used to separate an intro or outro sequence from a repeating section.

Inner Loop In-Point Plays in-point frame of the inner loop.

Inner Loop Play Plays from the inner loop in-point to the inner loop out-point and loops.

Inner Loop Out-Point Plays the out-point frame of the inner loop.

Using Inner Loop Play Mode

To use Inner Loop Playmode, first set the playmode to inner loop in-point and move the in-point to the beginning of the repeating section of content. Next, set the playmode to inner loop out-point and move

the out-point to the end of the repeating section of content, choosing a frame that closely matches the inner loop in-point.

Now, play the clip from the beginning by selecting in-frame playmode and then choosing Inner Loop Play. This will play from the beginning and then loop endlessly between the inner loop points.

To complete the clip select play forward once playmode.

The inner loop in and out-points can be changed by either dragging the play bar handles or setting the values in the indicator boxes.

Media Info

Media Info provides details of the currently loaded clip

- **Media:** The Name of the clip loaded

Tip: Hovering the mouse over the media name will provide the whole folder path.

- **Type:** The codec the media is encoded with

- **Size:** The resolution of the media

- **Length:** The length and frame-rate of the clip

Note: Hippotizer automatically handles clips of different frame rates. The media frame rate does not need to match the output frame rate.

- **Date:** Date the content was encoded.

- **Map:** The media map location.

Playback Display

The Playback display indicates the current state of the media player.
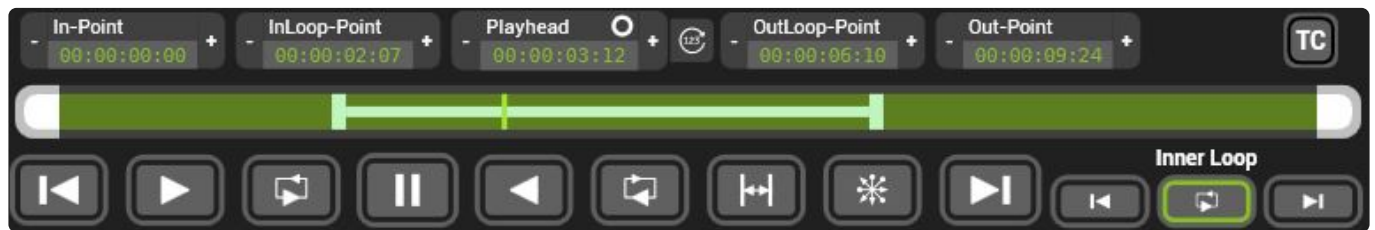
Each layer's media player is an independent playback engine with it's own set of controls:
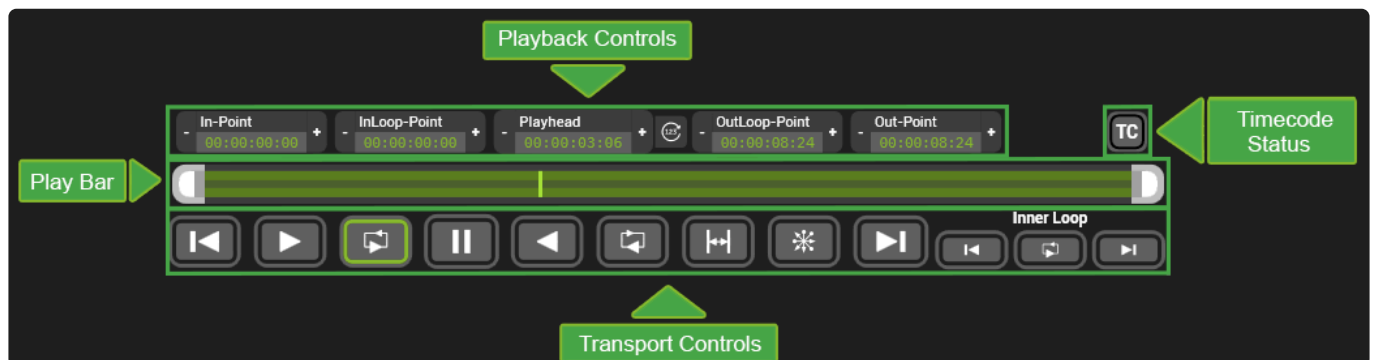
Frames or time

From version 4.4, all playback controls by default work in **Hours:Minutes:Seconds:Frames** and work by frame number instead of time.

Previously, playback controls were defined by time: the outpoint for example was set to 34 seconds, and the corresponding frame number was deduced. If (as was common at 30 FPS) the calculation yielded a non-integer (not a whole number) then the frame displayed would be blended from the two adjacent frames. This approach made it very difficult to play a clip from specific frames: a workflow that is becoming more common.

To address this, the system has been changed to work from frames to derive time. The user specifies a frame number and the media player calculates time from it. In Zookeeper there is little difference as the calculations are carried out automatically and the displays can show either frames or time. For external controllers however this represents a significant change. All in and out-points are now defined by frame number instead of time on a single integer pin.

The frame rate of a clip is defined at encode; the media player will always play a clip back at its intrinsic frame rate independent of the frame rate of the engine, other media players or timecode received.

The time of the playback controls is a function of the frame rate of the clip; for example, at 25 FPS, a 1,000 frame clip would be 40 seconds long. The same 1,000 frame clip played at 30 FPS would be 33.33 seconds long. Setting the outpoint of these two clips to the same frame will correctly result in different lengths.

DMX and external controllers

In DMX, the out-point pin indicates frame number. The pin can either be controlled as a 16-bit pin yielding a maximum of 65,535 (18 minutes at 30 FPS) or 24-bit for a maximum value of 16,777,216 (or over 24 hours at 60 FPS).

For the out-point, and inner loop out-point setting the value to 0 moves the outpoint to the end of the clip.

Playback Controls

In-Point

The frame the clip will start from and loop to.

InLoop-Point

The frame the clip will start from in inner loop in Frame, and will loop to in inner loop play mode

Playhead

The current location of the play head.

> Note: The play-head is somewhat unique in that it is a pin you should not control from DMX or any other external controller as by it's nature it constantly changes. If a specific starting point for the playhead is desired, use in frame play mode and set the in point to that frame number.

OutLoop-Point

The frame the clip will return to the inner loop in-point when in inner loop playmode.

Out-Point

The frame the clip will stop playing on with play once, or loop on in play and loop.

Playbar

Frame 0   In-Point   InLoop-Point   Playhead   OutLoop-Point   Out-Point Clip End

The playbar is a visual representation of the Playback controls. All controls in the playbar be dragged around as an alternative to setting values in the playback controls.

Timecode Status

Timecode on layer indicates it's status with one of three colours:

 The layer is not listening to timecode

 The layer is locked to timecode

 The layer is waiting for timecode

[Transport Controls](#).

Media Tab

The media tab contains all basic controls for the media player
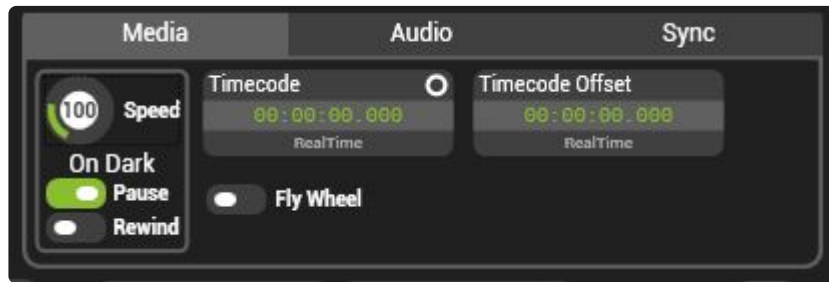
Media Speed

The playback speed can be set from 0 (Paused) to 400 (4x Speed).

| Note: The default speed of 100 may not fall onto a whole number for DMX personalities. See here for details |.

Pause on Dark

Pauses media playback when the layer level is set to zero.

- **Disabled** When the layer level is set to zero the clip will continue to play.

- **Enabled** The default. When the layer level goes to zero the clip will pause. Rewind on dark takes precedence over the layer pause — toggling pause when the layer level is set to zero will have no effect.

Rewind on Dark

Sets the media play-head to the In-Point when the layer level is set to zero.

- **Disabled** The default. Setting the layer level to zero has no effect on the play head position.

- **Enabled** Setting the layer level to zero moves the play head to the in-point.

Fly Wheel

Determines media player behaviour in the event that timecode it is following stops.

If the media player is not receiving timecode the fly wheel setting has no effect.

- **Disabled** The default. When timecode stops, the media player will also stop. Due to smoothing, there will be a delay between loss of timecode and playback stopping of up to several seconds.

- **Enabled** When timecode stops, the media player will continue playing using an internal clock. If timecode is resumed the media player will transition back to timecode.

Interframe Blending

The media player will by default always render a new frame for each render loop of the engine. This means that if the engine is running at 60 frames per second (FPS) and the media player is playing 30 FPS content, it will interpolate every other frame by blending the two adjacent frames, a process called interframe blending. In most cases this is desirable; content will look smoother especially when played at slow speed. However, there are cases where interframe blending is not ideal, such as when media frame rate matches engine frame rate.

Interframe blending is controllable on each layer with a pin:

- Engine ○
- Mix1
  - Layer1
    + Colour ○
    + FX1 ○
    + FX2 ○
    + Geometry ○
    + Key ○
    + LiveMask ○
    + Mixer
    + Notch ○
    + Presets ○
    + Preview ○
    - Source ○
      + Generator ○
      + LiveInput
      - MediaPlayer ○
        + Audio
        FramesSuccessRate
        InfoOverlay ○
        InLoopPoint ○
        InPoint ○
        ▶ InterframeBlend ○
        MediaOffset ○
        MediaSelect ○
        OutLoopPoint ○
        OutPoint ○
        Pause ○
        PauseWhenDark ○
        PerfLog ○
        PlayMode ○
        Position ○
        RewindWhenDark ○
        Speed ○
      + Sync
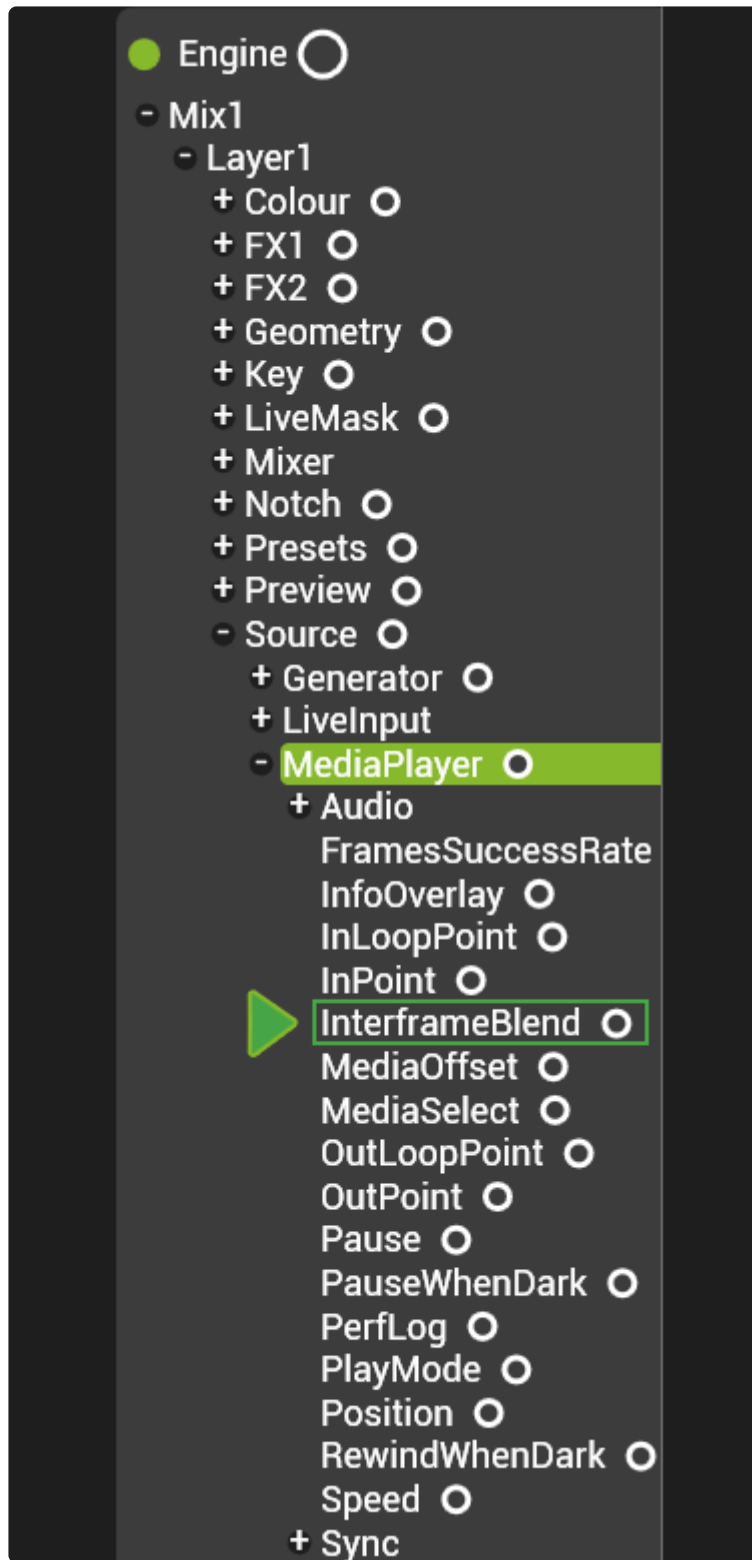
Audio Tab

The Audio tab controls advanced aspects of audio playback
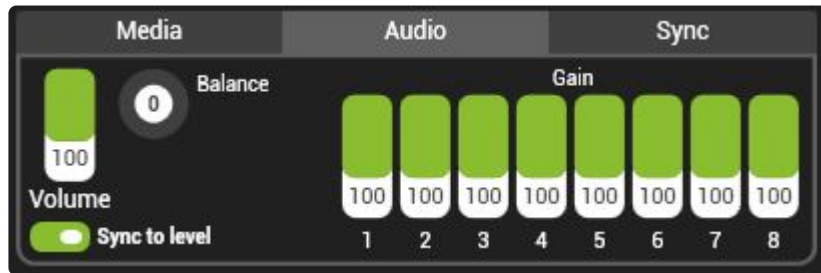
Each Media player is capable of playing stereo or multi-channel audio.

Volume

Sets the overall audio level of the clip.

Gain 1 – 8

Sets the gain (relative volume) of each audio channel of an audio clip

Sync To Level

Synchronises the layer level with it's volume.

- **Disabled** Volume control is independent of layer level.

- **Enabled** The Default. The volume control will follow layer level.

> Note: When the volume is linked to layer level and controlling from DMX, it is advised to set the volume to update only.

Audio Output

All Hippotizer V4 systems are fitted with stereo audio outputs on either XLR or 1/8" mini jack. For multi-channel audio, an output interface is required. Hippotizer supports most common Windows 8 compatible interfaces. Green Hippo recommends the Motu 828x

Hippotizer uses the Windows default playback device to output audio. This is configured from within the Windows audio control panel;
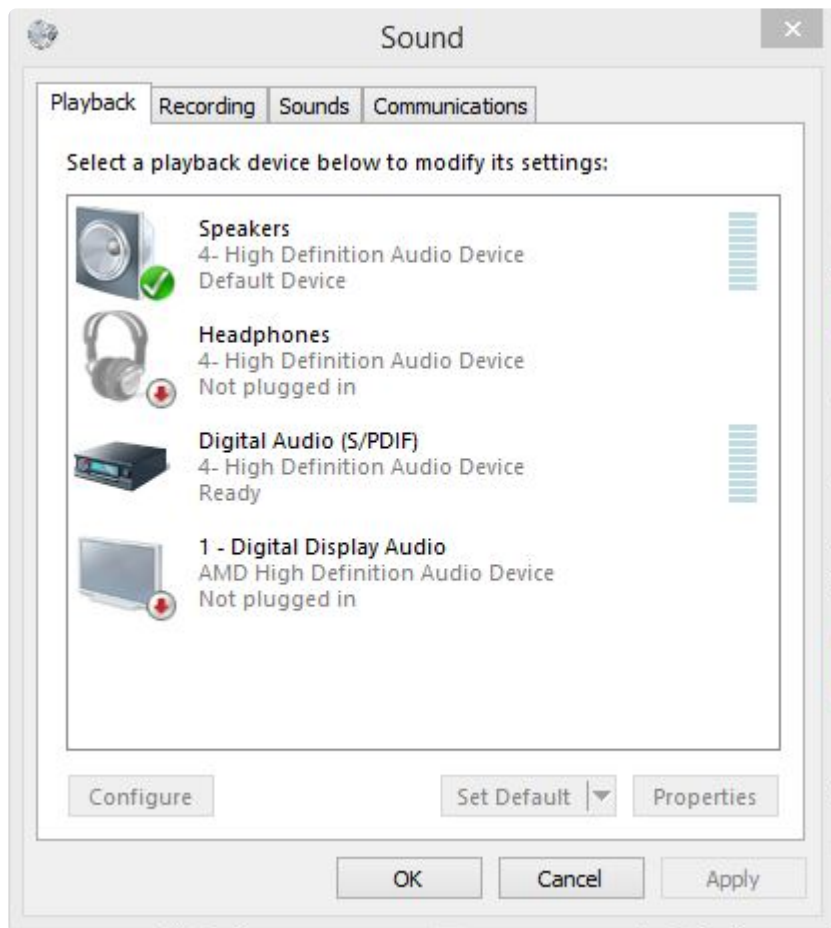
Sync Tab

The Sync tab contains timecode and synchronisation controls for the media player
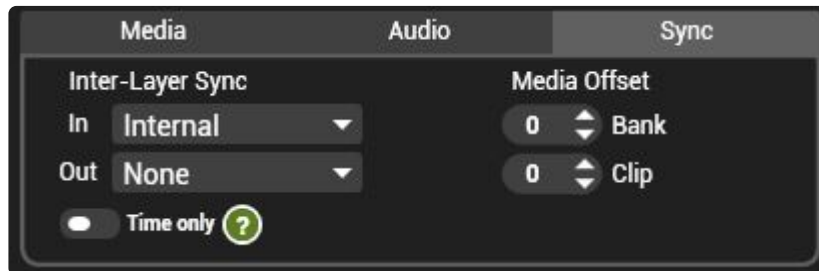
Inter-Layer Sync

The layer sync system controls how a media player receives **timecode** and sends **sync packets** including **time** and **sync state**.

[For a more detailed discussion of time and timecode in Hippotizer please see here.](#)

Sync In

Sets the source of time or timecode for the media player.

- **Internal** uses the media player's built-in clock. Each player has it's own clock so two media players started at the same instant will naturally drift over time.

- **Sync Bus 1-16** sets the media player to use the sync state of the bus number selected. Two layers connected by sync bus are said to be in frame-lock and can be expected to be playing the same frame at the same time.

- **Timecode 1 or 2** sets the media player to use time from the designated Timecode bus. Timecode buses are generated in the Sync Manager and can either be from an external source or generated locally. A media player under timecode control is said to be in frame-lock and can be expected to be playing the same frame at the same time

Sync Out:

The media player can also send time and sync state for other media players to use — this is called Sync Out.

There are 16 channels, or busses, to carry the information.

- **None** No information is sent

- **Sync Bus 1-16** sets the media player send to the selected bus. Each bus should have only one sender, but it can contain multiple receivers.

Time Only

Sets the media player to ignore the sync state if it is listening to a Sync Bus.

- **Disabled** The default. The media player will use time and sync state if listening to a sync bus.

- **Enable** The media player will use only time when listening to a sync bus.

Media Offset

When the media player is listening to a sync bus as a source and time only is disabled, the Media Offset provides an offset of clip selection. That is, if the source clip was Bank 2, Clip 2 and an offset of Bank = 1, Clip = 100, then the local media player will select Bank 3, Clip 102.

The offset is applicable to the target or slave media player; set the desired offset on media players receiving sync.

Live Capture

Live capture brings external video sources into Hippotizer using a hardware capture card.

Live video from external sources such as cameras or computers may be brought into Hippotizer and used as a video source. A capture card is required.

Before using Live Capture

Before using live capture, it is important to ensure the card has been properly detected by Hippotizer. This information is best accessed within the Live Capture Tab in the configuration page of Zookeeper.

In the above image an SDI capture card has been detected.

> Note: If an installed capture card is not detected, this is commonly due to a driver issue. To fix it, stop the engine and Zookeeper and re-install the Datapath drivers. See the Hippotizer release notes for the currently supported driver version.

Once detected, live capture inputs will appear as a list of buttons in layer source.

De-interlace

The De-interlace setting in the Live Capture source window triggers the **Software De-Interlace**. Software de-interlace should not be used as well as the hardware de-interlacing found in the Video Capture tab of the configuration page.

- **Disabled** The default. No changes are applied to captured signals.

- **Enabled** Interlaced signals are converted to progressive adding one frame of latency.

Using Live Capture

Acquiring a capture stream will take some time (several frames). For this reason, we recommend capturing onto a dedicated mix and using relays to send captured video around the system.

Delay in Live Capture

It is often desired to have as little latency in live capture as possible. Properly configured, Hippotizer will add 4-5 frames of delay.

For best practice guidelines please see the section on reducing live delay

Relays

Relays allow video from one layer, viewport or mix to be sent to other layers as a source on the same machine.

 To access relays, select the relay icon in the Source of the desired layer.

Relay Select is two integer pins.

Note: The relay select pin has changed from Hippotizer Version 4.4 from one pin to two.

Mix / Viewport

A layer can use any local layer, mix or viewport as a video source.

0: **Disabled** Not relay source used
1: **Mix 1** If master is set on the Layer Relay pin, Mix 1 will be used.
2: **Mix 2** If master is set on the Layer Relay pin, Mix 2 will be used.
…
127: **Mix 127** If master is set on the Layer Relay pin, Mix 127 will be used.
128: **Viewport 1** If master is set on the Layer Relay pin, Viewport 1 will be used.
129: **Viewport 2** If master is set on the Layer Relay pin, Viewport 2 will be used.
255: **Viewport 128** If master is set on the Layer Relay pin, Viewport 128 will be used.

Layer

0: **Master** Use the Mix or Viewport selected on the Mix/Viewport pin
1: **Layer 1 (Visible)** Use Layer 1's visible layer
2: **Layer 1 (Hidden)** Use Layer 1's hidden layer
3: **Layer 2 (Visible)** Use Layer 2's visible layer
4: **Layer 2 (Hidden)** Use Layer 2's hidden layer
…
32: **Layer 16 (Visible)** Use Layer 16's visible layer

33: **Layer 16 (Hidden)** Use Layer 16's hidden layer

Relay Rendering

Relays do not carry geometry

Relays are located after the media player and effects, but before colour, geometry and the layer level in the render sequence. Meaning a relay will convey clip information and effects but ignore colour, geometry and layer level.

Relays are before X-Fade

Relays use layers as a source before the X-Fade engine. As a result, if the visible layer is used as a relay source the content will not fade — it will snap at the midway point of the X-Fade.

Common uses for Relays:

- **Adding Effects to a Layer**

1. On Layer 1, leave the level down and play a clip
2. On Layer 2, set the Layer source to relay from Layer 1 and put the level up.
3. Use Layer 1's media select and effects
4. Use Layer 2's Geometry, colour, level and effects.

- **Sending a whole mix to a Pixelmapping mix**

1. Start 2 Mixes, using one to output to the Pixelmapper only and the other outputting video to screen
2. Set Layer 1 on the Pixelmapper mixes to relay from Mix the Mix Master of the output mix.
3. Pixelmapper will now exactly follow the output and corrections can be applied to pixel mapper (Geometry, Colour, Level etc.)

- **Multiple Inputs into SHAPE**

1. Patch SHAPE
2. Navigate to the Viewports page of Zookeeper and click the SHAPE viewport
3. Inputs 2-8 of SHAPE are relays and can be changed in real time.

For more information about SHAPE in Hippotizer please see here.

Generators

Generators are effects that render video in realtime.
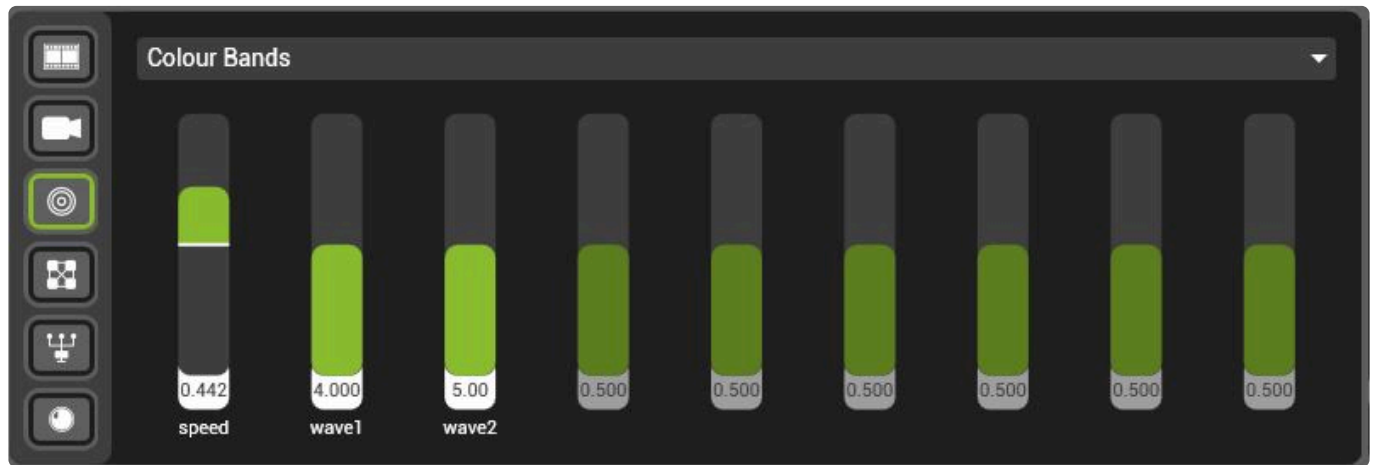
Generators range from simple colours to geometric patterns, clouds or wave forms.

To use a generator, choose generator in the source of the desired layer.

Each generator has up to nine attributes, shown as faders.

Using the generator **Colour Bands** yields the below output.
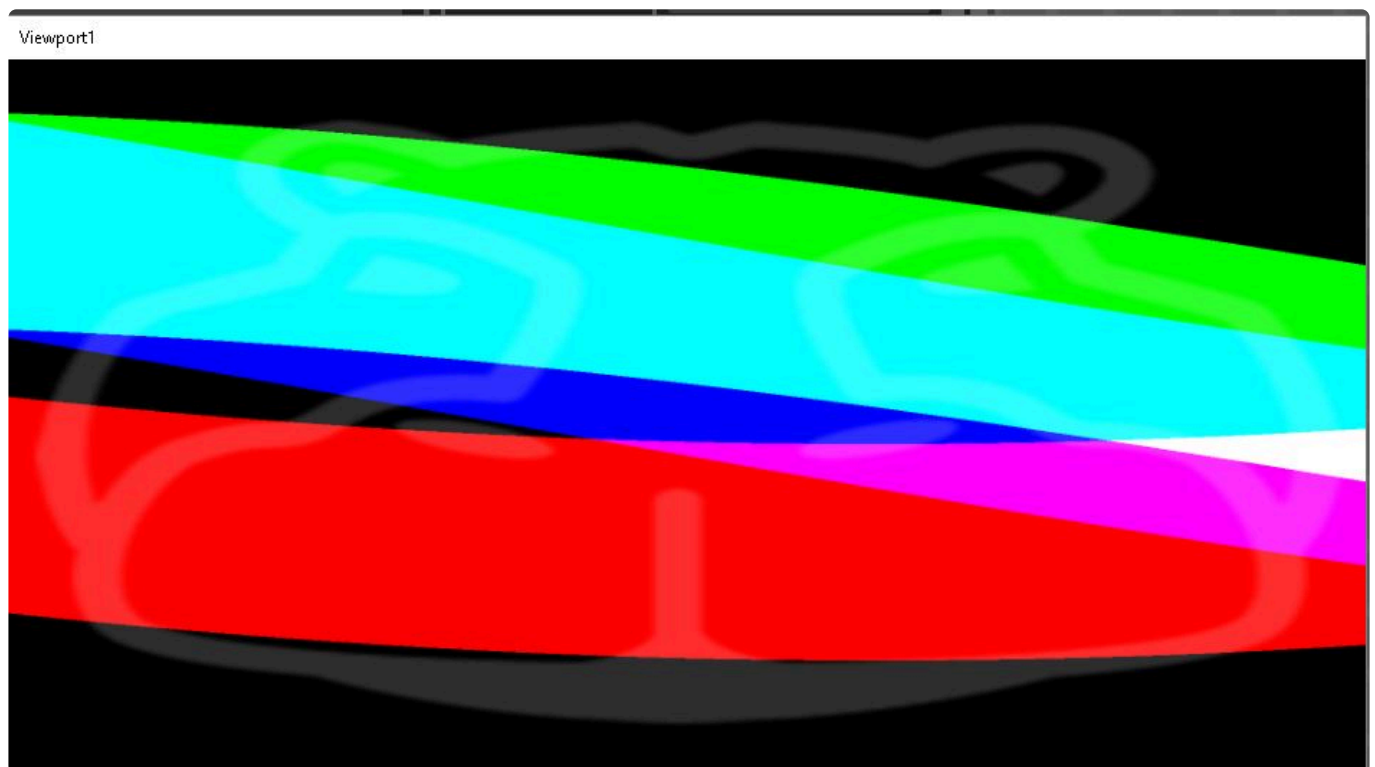
[A complete list of all generators is here.](#)

NDI

The Network Device Interface (NDI) is a method of transferring video over the network.

Developed by NewTek, NDI is a commonly used method to send video around a local network. NDI has a variety of tools freely available for download to send video from popular 3rd party applications such as Adobe Creative Cloud or the Unreal Engine.

Newtek offers many applications for download here:

https://www.newtek.com/ndi/tools/

Below is information on receiving NDI. For more information about sending NDI please see here.

NDI on each layer
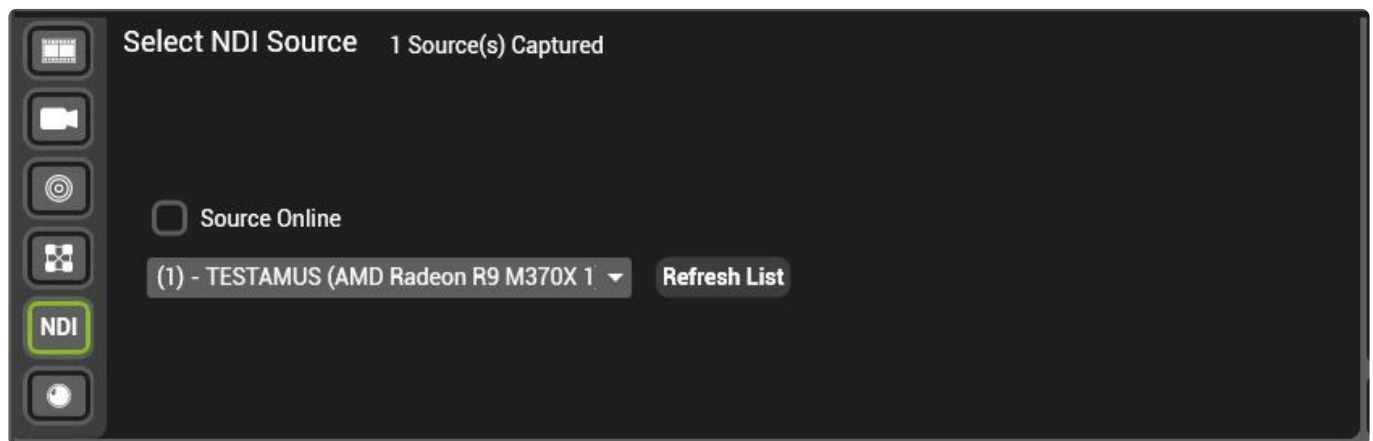
Receiving NDI has several settings:

Refresh List

When pressed, the list of NDI sources detected on the network will be updated. The list is only updated when Refresh list is pressed.

In order to ensure consistent indexing, sources that are no longer online are not deleted on a list refresh. To reset the source list use the clean show option in Hippo Launch.

NDI Source Dropdown
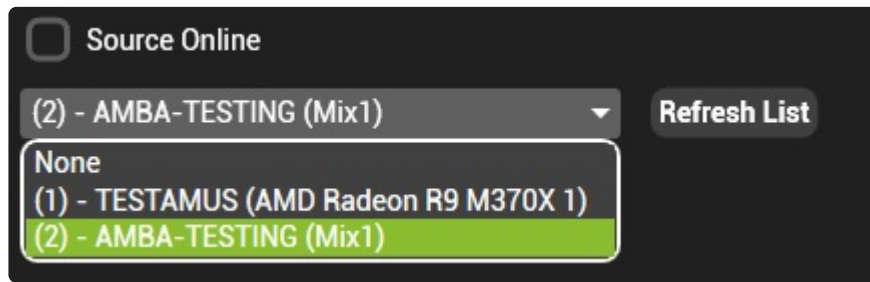
Displays an indexed list of the NDI Sources on the local network. Choosing a source on the list will begin capturing it.

Source Online

When green, the selected source is sending video. If grey, the selected source is not sending.

Replacing Screen Thief.

NDI offers superior performance and a wider variety of supporting platforms then screen thief did. Though there are many NDI sender applications available that offer similar functionality to screen thief. Green Hippo has tested, and recommends **NDI Scan Converter** available for free download as part of Newtek's NDI Tools.

https://www.newtek.com/ndi/tools/

Audio

Audio over NDI is not currently supported.

Spout

Spout is a realtime video sharing framework for Windows, enabling a media layer to receive video from a supporting application running on the same machine.

Commonly used for integrating sound-reactive visuals with a Hippotizer, Spout offers enormous creative potential by combining innovative visual software with Hippotizer seamlessly.

To use Spout:

- Install the supporting 3rd party application onto the Hippotizer machine
- Start the Hippotizer and 3rd party application
- Enable Spout sharing in the application
- In Hippotizer, select Spout as a layer source and choose the stream.

Note: Running untested 3rd party software on your Hippotizer system is intrinsically risky; always test planned setups completely before using in a live environment.

Spout is a widely adopted application; for a full list of supporting software visit their website:
http://spout.zeal.co/

Geometry

Each layer has independent Geometry controls
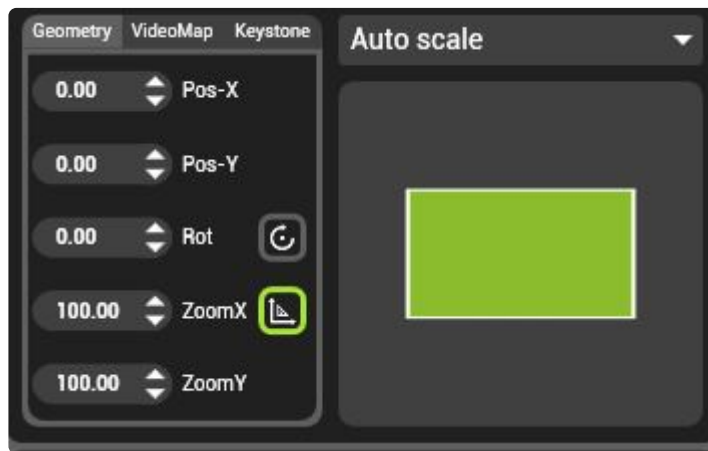
The basic Geometry controls place media onto the layer:

Pos-X

The 'X' or right to left position of the media.

The position is a float pin taking a value from 0-1 while the displacement is measured as a percentage of the layer size:

0.0 = Left -250% of the layer
0.5 = Centre The default
1.0 = Right 250% of the layer

Pos-Y

The 'Y' or up to down position of the media.

The position is a float pin taking a value from 0-1 while the displacement is measured as a percentage of the layer size:

0.0 = Up -250% of the layer
0.5 = Centre The Default
1.0 = Down 250% of the layer

Continuous

 Switches the rotation control from **Position** to **Speed**. With Continuous disabled, rotation is similar to indexing a Gobo in a moving light.

- **Disabled** The default. Indexes rotation – the layer will rotate to the position and stop.

- **Enabled** The layer will rotate continuously.

Position / Speed

The position (or Index) or speed of rotation of a clip. This control is affected by the Continuous switch above.

Position / Speed is actually two float pins that are switched in Zookeeper so only one is visible at a time. For external controllers such as DMX, both pins may be set simultaneously, and only the one chosen by the Continuous pin will be active. The default DMX personalities of Hippotizer control both pins on one channel to mimic the behaviour of Gobo rotate / index common in moving lights.

Position values:

0.0 = -180 Degrees Rotation
0.5 = No Rotation The Default
1.0 = 180 Degrees Rotation

Speed values:

0.0 = Rotate CCW 60 RPM
0.5 = Rotate Stop The Default
1.0 = Rotate CW 60 RPM

Zoom

There are two Zoom controls: Combined Zoom and Zoom X/Y. Either control can be active, but not both at the same time.

ZoomEnable X/Y

Determines which Zoom control is uses.

- **Enabled**. Zoom X and Zoom Y are active. Zoom and Aspect are de-activated.
- **Disabled** The Default. combined Zoom and Aspect is active. Zoom X/Y is de-activated.

For both Zoom and Zoom X/Y The zoom range travels from 0-400% of the layer resolution.

Zoom is a float control with possible values of 0-1:

0.0 = Zoom at 0%
0.5 = Zoom at 100% The Default
1.0 = Zoom at 400%

> Note: The Zoom control in Zookeeper automatically converts to percentage for ease of use. The raw floating point values of the pin are important however for external controls such as DMX.

Aspect

The aspect changes the aspect ratio of the media in a single dimension, X or Y:

0.0 = Aspect X Stretched 300%
0.5 = No Aspect Change The Default
1.0 = Aspect Y Stretched 300%

The Aspect control is active when Zoom X/Y is disabled.

Additional Geometry controls

- [Keystone on Layer](#)
- [Aspect Mode](#)
- [Videomapper on Layer](#)

Keystone on Layer

Every layer in Hippotizer features an independent Keystone control
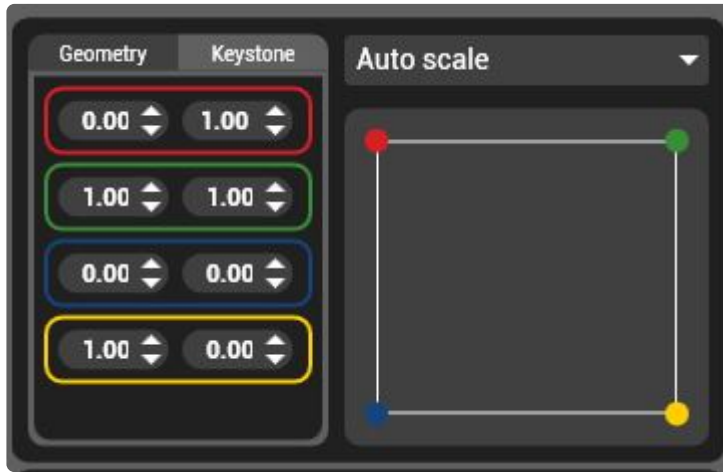
The Keystone is defined by four points, one for each corner.

Note: Keystone does not support concave shapes. In the event a concave keystone is created an un-keystoned image will be shown

The Keystone occurs after geometry controls in the signal chain so it is best to avoid using geometry on layers with keystone.

Aspect Mode

The Aspect Mode determines how media of different resolutions fit to the mix resolution.

Auto Scale

Stretches or shrinks the content to fit to the layer without changing the aspect ratio. The content will be stretched or shrunk until one dimension of the media resolution aligns with the layer resolution. If the media has a different aspect ratio to the layer this will result in black bars on either the top and bottom or the sides of the media.

- Preserves Aspect Ratio
- Will not crop
- Will result in black borders if media aspect ratio is different then the mix.

Pixel 1:1

Content is played without any size change.

Pixel 1:1 is recommended where pixel accuracy is important, such as with UV mapped content.

- Preserves Aspect Ratio
- Will result in cropping if media resolution is larger than the mix
- Will result in black borders if media resolution is smaller than the mix.

Fill

Stretches or shrinks the content to fit to the layer on both axis; can change the aspect ratio.

- Will change Aspect Ratio to match the media to the mix.
- Will not crop
- Will not result in black borders

4:3

Sets the content to a 4:3 aspect ratio and stretches or shrinks it to fit completely on the layer.

- Will force the Aspect Ratio of the media to 4:3.
- Will not crop
- Will result in black borders if the mix resolution is not 4:3

16:9

Sets the content to a 16:9 aspect ratio and stretches or shrinks it to fit completely on the layer.

- Will force the Aspect Ratio of the media to 16:9.

- Will not crop
- Will result in black borders if the mix resolution is not 16:9

16:10

Sets the content to a 16:10 aspect ratio and stretches or shrinks it to fit completely on the layer.

- Will force the Aspect Ratio of the media to 16:10.
- Will not crop
- Will result in black borders if the mix resolution is not 16:10

1:1

Sets the content to a 1:1 aspect ratio and stretches or shrinks it to fit completely on the layer.

- Will force the Aspect Ratio of the media to 1:1.
- Will not crop
- Will result in black borders if the mix resolution is not 1:1

Auto Fill

Preserves aspect ratio and stretches or shrinks the media to fit the layer resolution such that there is no borders.

- Preserves Aspect Ratio
- Will crop to fill the entire mix if media has different aspect ratio to the mix
- Will not result in black borders

Fit to Width

Clamps the media to the width of the mix changing the height to preserve aspect ratio

- Will not change Aspect Ratio
- Can lead to cropping
- Can lead to black borders

Fit to Height

Clamps the height of the media to the mix changing the width to preserve aspect ratio.

- Will not change Aspect Ratio
- Can lead to cropping
- Can lead to black borders

Note: Aspect mode affects all other geometry controls. It is prudent to set aspect mode first, then modify geometry.

Videomapper on Layer

Videomapper on Layer adds the functionality of video maps and colour blocks to each layer.

Videomapper forms part of the Geometry section of the layer controls:

Render Order

Videomapper on layer is rendered after effects but before layer geometry.

To move content around within the video map use an effect such as scroller.

To move the video map around within the mix use layer geometry.

Resolution

As with conventional videomapper, a video map does not have it's own resolution.

The output resolution of Videomapper on Layer is always set to the mix it belongs to.

The input resolution can either be the layer or mix, as determined by the drop down resolution menu.

When the Resolution field is set to Layer, the video map assumes the resolution of the source which depends on the source type:

- **Media Player** Uses media resolution
- **Live Capture** Uses capture resolution.
- **Generator** Uses the mix resolution
- **Relay** Uses the relay source layer resolution
- **NDI** Uses the NDI sender resolution
- **Spout** Uses the Spout sender resolution

When the Resolution is set to Mix, the video map will use the resolution of the mix.

Notch

Notch is 3rd party realtime, generative content creation and rendering software. Hippotizer V4 supports Notch playback with the correct software licenses.

Notch is presented on each Hippotizer layer in tabs behind the layer selector.
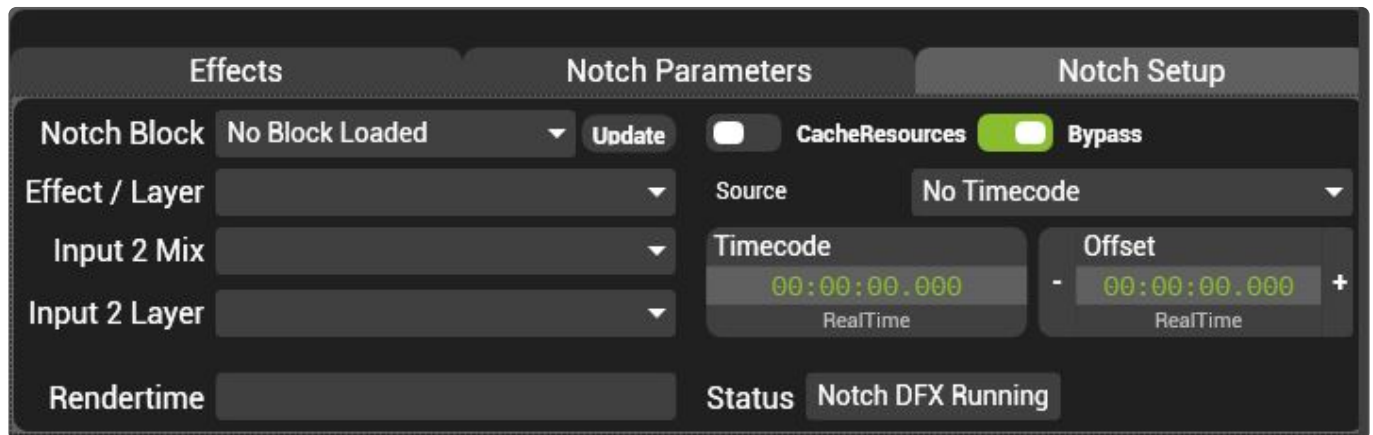
Notch is comprised of two tabs: Notch Setup and Notch Parameters

- Notch Setup
- Notch Parameters

To add or edit the order of Notch blocks, please see below.

- Adding and managing Blocks

The licensing of Notch is described in depth here:

- Notch Licensing

The recommended Notch workflow:

- Notch Workflow

Notch Licensing

Notch is a 3rd party application with a separate licensing system to Hippotizer, there are different levels of licenses to consider.

Hippotizer V4 Systems

- Cannot play Stock V4+ effects
- Requires a Notch dongle to play other blocks

Hippotizer V4+ Systems (excluding Montane+)

- Can play Stock V4+ effects
- Requires a Notch dongle to play other blocks

Hippotizer Montane+ Systems

- Can play Stock V4+ effects
- Includes two-year Notch Playback dongle.

Notch Setup
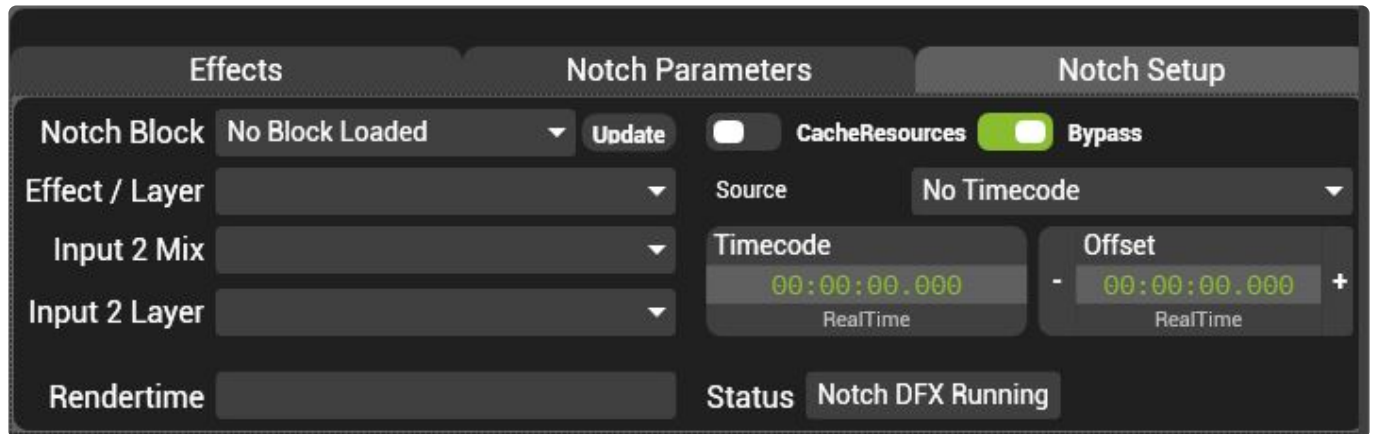
Notch Block

Notch effects are grouped into **Blocks**, this pin chooses which block is loaded.

> **!** Loading a Notch Block is extremely resource intensive and will temporarily stop all rendering. Only load blocks outside of live environments. If changing blocks live is required consider using multiple layers and bypass, or cached resources.

The order and naming of Notch blocks on the block select pin is determined by the naming and is described [here](#).

Effect / Layer

Selects which Notch Effect is loaded.

The order and naming of Notch layers is determined inside the Notch application. To edit this a Notch Builder license is required.

Update

Updates the Block select pin by scanning the Notch folder for new blocks; press update to add newly added blocks to the list.

> **!** Update unloads and reloads all blocks. Only use update when video output disruption can be tolerated.

Video Input

A Notch effect can have up to two video inputs. Input one is always the layer source (normally the media player or live capture). Input 2 can be any other layer, mix or viewport on the local system using a relay.

Resolution

The resolution of the block is set by the mix resolution it is loaded onto. Any inputs into the block should match the mix resolution .

Input 2 Mix

Selects the mix/viewport source for the 2nd input of Notch

Input 2 Layer

Selects the layer source for the 2nd input of Notch

Resource management

Notch can use a lot of processing resources. There are several tools to assist with using Notch in Hippotizer.

Cached Resources

Leaves all Notch blocks stored in memory even after they are de-selected in order to make switching to them again much faster.

- **Enable** Resources are cached. Once a block is loaded it will be saved so subsequent navigation to that block is nearly instant.

- **Disable** The default. Blocks are deleted from memory once they are de-selected. Navigating back to a previously loaded block will be slower and may interrupt the output.

Bypass

Bypasses the active Notch block without unloading it from memory. Use bypass to quickly turn Notch on or off on a layer.

- **Enable** The default. The block is loaded but not rendering.

- **Disable** The block is rendering normally.

Rendertime

The real time measure of how long each frame is taking to render through Notch. At 60FPS, a render time of above 15ms will slow the engine down.

Status

An indication of the Notch status.

- **No Notch Block Loaded** No Block selected
- **Effect loaded OK** Normal run state when Notch is loaded and operating
- **Loading Notch Block** A new block is loading. The whole system output will stop while this is happening.

Notch Parameters

Notch controls are exposed as pins for control by Hippotizer
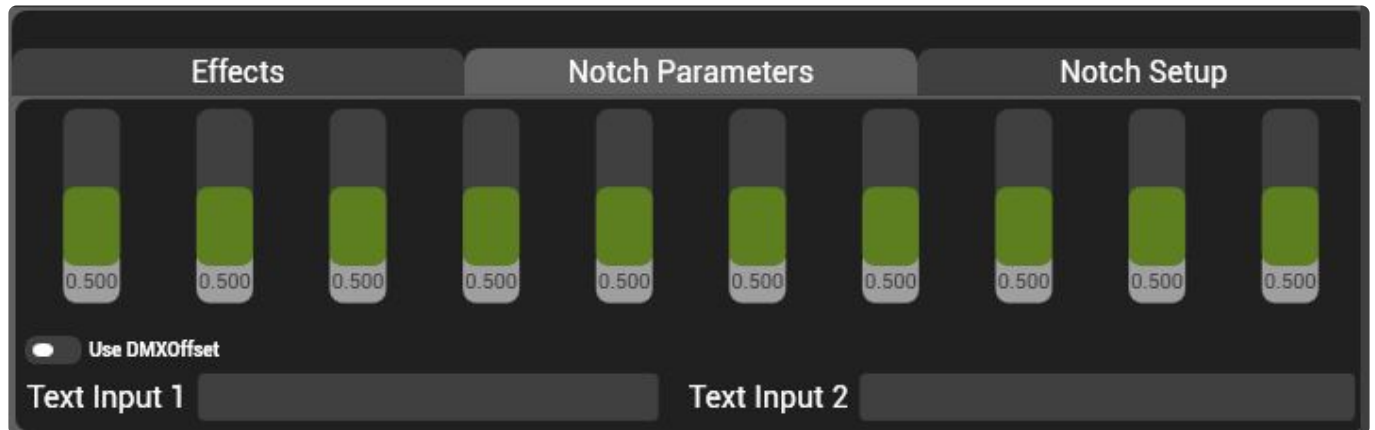
10 float and 2 string pins for the loaded Notch effect.

> Note: Additional Parameters are supported in the **Notch Mix**

Each float control is 16bit internally, but may be controlled as 8 or 16bit by DMX as required.

The name and ordering of parameters are defined by the Notch Block.

Use DMX Offset

- **Enable**, The DMX channel of parameters will respect the DMX table within the Notch Block
- **Disable** The default. The DMX channel of parameters will follow parameter ordering as shown in the interface.

Adding and managing Blocks

Notch blocks are stored as files with the extension .dfxdll
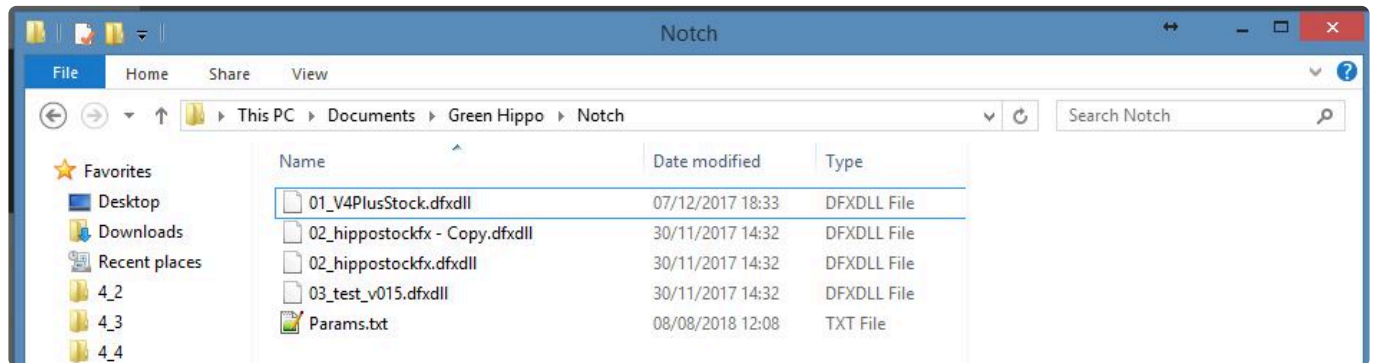
Adding Blocks

To add blocks to Hippotizer, save them to the path:

C:\Users\Hippo\Documents\Green Hippo\Notch

Each block name must be preceded with a unique number, followed by an underscore. The number will determine the order blocks are chosen.

For example `01_V4PlusStock.dfxdll` will appear first in the list as V4PlusStock

In the image example above, only one of the two `hippostockdfx` blocks will be visible in Hippo as they have the same index number.

Updating the Block select pin

When blocks are added or removed the **Update** button must be pressed once on a layer of that system to refresh the block list.

The blocks select pin is also updated on engine restart.

Using Notch

To avoid output disruption, Green Hippo strongly recommends the following workflow.

- Always use cached resources.
- load and test all Notch blocks before every show
- Notch blocks that are not used should remain loaded on the layer. Use the bypass switch to disable Notch.
- Plan the layers that will use Notch. **Use as few layers with Notch as possible**.
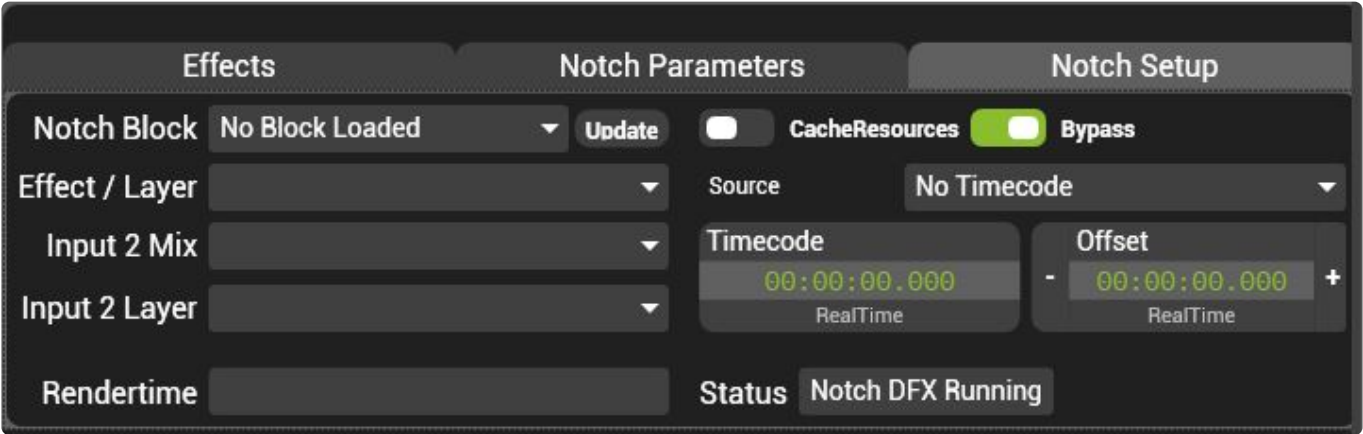
Managing Resolution

The resolution of a Notch effect is determined by the resolution of the mix it is loaded onto. Reducing the resolution will improve performance. Always use the lowest resolution possible for best performance.

V4+ Stock Effects

V4+ Systems include free Stock Notch effects.

Note: V4 Systems do not support stock Notch effects as they do not have the correct license and generally lack the performance to run them well. Should you wish to license a V4 system to run V4+ stock effects please discuss this with Green Hippo.

Touch Engine

The addition of TouchDesigner / TouchEngine support in Hippotizer opens a whole world of interactive and Generative visual and data possibilities for Hippotizer.

TouchEngine is Derivative's embedded version of TouchPlayer which allows the user to run projects or components that were created in TouchDesigner directly inside the Hippotizer engine. Interacting with the Hippotizer frameworks pins, layers, mixes, and control interfaces to produce a cohesive and powerful interactive video system.

> ❗ Not supported on Windows 8 machines due to lack of required Vulcan drivers for this version of Windows

Touch Engine Prerequisites

! TouchDesigner or Touch Player must be installed in order to run the Touch Engine on Hippotizer.

To be able to use the TouchEngine functionality in Hippotizer either TouchDesigner, or TouchPlayer needs to be installed on your system. You can go to www.derivative.ca to download the required files.

A valid TouchDesigner or TouchPlayer commercial, pro or educational licence, or dongle, is required on your machine – TouchEngine will not work with the free non-commercial licences.

Touch Engine Setup

Currently TouchEngine has been implemented in two places, as a special type of mix and as an effect on every Layer in Hippotizer.

Create a TouchEngine mix in the OutputManager by selecting the MixMode as Special and then Layers as TouchEngine. The TouchEngine mix will display like a normal mix in the Mixes page with a unique set of control parameters.

[See here for TouchEngine on layer](#)

Touch Engine Parameters

TouchEngine Mix

Number	Section Name	Description
1	Component Name	Shows the file name of the current loaded component
2	Frame Rate	Output frame rate from Touch Engine component
3	Update	Updates the componenet directory for any changes
4	Timecode Input	Define the timecode input from the sync manager component
5	Parameters list	List of component parameters
6	Performance	Performance metrics readout

TouchEngine Layer

Every layer in Hippotizer will already have a TouchEngine, you will find it in the FX section of the mixes page where there will be 2 new tabs, one for the general settings and one for the parameters.
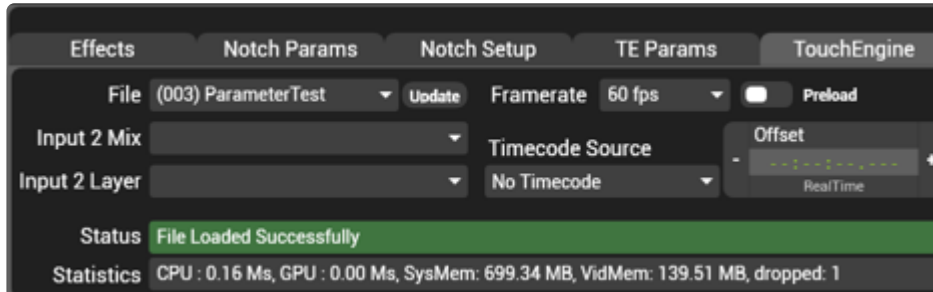
On a Layer, the source of that layer is automatically patched to Input 1 of the TouchEngine. There is a second input available which will automatically activate if your component has 2 or more video input TOPs in it, however this is the maximum that you can use on a layer – while there are 8 inputs on a mix. There are also a fixed number of parameters on a layer, 10 float, 10 integer, 10 bool (toggle or pulse) and 2 Text parameters , and this cannot be changed, while on the Mix you can Customize to have as many as you need (see Customizing Parameter Numbers).

Framerate

The framerate selector determines the rate at which the TouuchDesigner component will be processed internally, seperate from the Hippotizer output renders to screen. This should be set to the same refresh rate value as the Hippotizer output.

If you are using a file that is resource intensive it is possible to set the framerate of the file to lower than the Hippotizer framerate. This will give the server more time per frame to render the content.

> ✳ Keep the frame rate of the component as a factor of the Hippotizer output refresh rate.
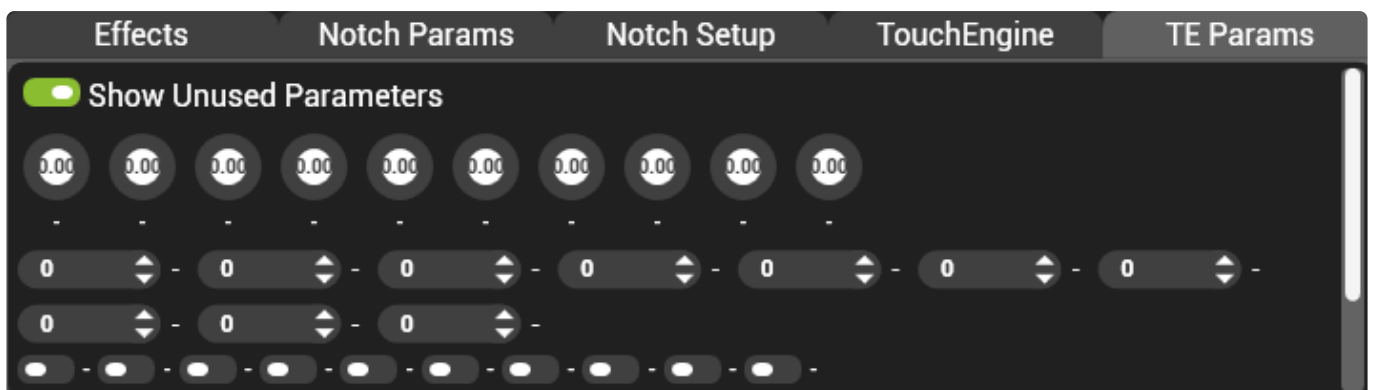
Timecode

By default, the timecode setting in the top right-hand corner is set to "None", in this mode your loaded file will play using an internal clock / timeline and will play looped continuously until you unload the file.

Sometimes it is necessary for a file to be synchronised with an external timecode from an audio source or other timecode generator. In this case you can select a timecode source from the dropdown list (You need to have Sync Manager running for anything to appear here).

For more information on the Sync Manager

If a timecode source is selected, you can set an offset time. This is the time at which your file will start playing and will be locked to the timecode.

Video Inputs

The Touch Engine implementation allows you to route up to 8 video inputs (2 on a layer) to the Touch Designer component and use that video in the component. The system will only process these inputs if the loaded component requests them saving system resources. To enable these inputs in your component please see the later section entitled **Creating Components for Hippotizer**

There are 2 selectors for each video input, the first selects which mix or viewport contains your source video, and the second selector allows you to select which layer or mix master you want to get the video from.

> ✳ The video source will be provided before any geometry or colour correction.

Customising Parameters

By default, we have 8 video inputs, 10 Float, 10 Integer, 10 Boolean and 2 String parameters for TouchEngine Mix, but you can change this by changing the parameters file.

To create a parameters file open any text editor and save the file with the name "Params.txt" and save it into the same folder as the component files are located

("documents/Green Hippo/TouchEngine")

Here is an example of the contents that you can add in this file, you don't have to add all the lines you can just add the ones that you want to change, if a line is missing it will use the default value for that option:

numinputs=5
numfloatparams=20
numintparams=5
numboolparams=20
numstringparams=6

numinputs sets the number of video inputs that are used – this must be between 1 and 8. There is no real reason to change this from its default as we automatically disable the inputs that are not in use by a file.

Other parameters can be set to any number between 1 and 32000 however the system creates pins and reserves resources for parameters even if they are not actually used

❗ Only create the number of parameters required to limit allocated system resources

Adding and managing components

Preparing component files for use in Hippotizer

TouchDesigner components that can be run inside Hippotizer are called tox components and are files with a *.tox extension, they are produced by TouchDesigner by selecting any container in a project and selecting "Save component .tox"

To be recognised by Hippotizer, all component .tox files must be placed into the same folder, the folder should have the following path:

< UserDocumentFolder >/Green Hippo/Touch Engine

< UserDocumentFolder > = path to the current user's My Documents

This folder will be automatically created by Hippotizer after the engine is run at least once, but you can create it yourself if it is not there.

Component Management

To ensure that the files remain in a specified order in the system and to be able to know what DMX value will load a certain file, the files must be prepended with a number, like these:

01_MyFirstComponent.tox
02_MySecondComponent.tox
03_YetAnotherComponent.tox

By doing this, a dmx value of 2 will always select the second file.

Using Folders

In addition to just placing files in the TouchEngine folder, you can also place folders in there. In this case the folder name must have a number at the start just like the files, and in this case the system will use the name of the folder (excluding the number) as the name that appears in the list in Hippotizer.

When using a folder as an entry, the system will look for the first file inside the folder that ends in ".tox" and use this as the component that should be loaded for this entry. The name of the ".tox" file does not have to match the folder name at all.

A folder entry can contain any assets needed by your component such as images, movies etc.. It also means that you can include a custom version of the TouchEngine for your component to use if required .

Creating Components for Hippotizer

To create a component in TouchDesigner that can be used in Hippotizer requires at least a basic knowledge of TouchDesigner concepts before you start, we would recommend viewing some of the many TouchDesigner tutorials on YouTube or via the Derivative website at www.derivative.ca/learn where you can find a host of videos and printed training materials.

Mapping Parameters

For those with a basic knowledge of TouchDesigner, the important thing to know when creating a component for Hippotizer is that Hippotizer matches its parameters to the parameters in TouchDesigner by matching the names of the parameters.

All Float parameters in Hippotizer are named "FloatXX" where XX is a number or index of the float parameter so for example "Float1" or "Float12" are valid names, similarly for integer parameters we use the name "IntXX" for Boolean (on/off) parameters we use "BoolXX" and "StringXX" for text / string parameters.

It is important that the first character is a capital letter and all remaining characters are lowercase, and you must not add any leading zeros to the index, so for example "Float01" would be invalid but "Float1" would be OK.

Your Hippotizer parameters need to be created as Custom Input/Output parameters on the component / container that you are exporting from TouchDesigner, Hippotizer doesn't care what page or group your parameters are in, it will just try to match the parameter names.
For each parameter you can set a label which will be used inside Hippotizers user interface to label the parameter.
Other parameters such as minimum, maximum and default value will also be read by Hippotizer to display the correct information and to reset values correctly.

Special Parameter

MixRes

In addition to the user parameters for controlling your scene, you can also create a special double parameter called "Mixres", this should be of type WH in TouchDesigner (width, height) and have 2 channels. If Hippotizer finds this parameter it will populate it with the resolution of the Mix that you created in Hippotizer (or the resolution of your layer if it is on a layer), this can be useful inside your network for deciding what resolution to render at, this is a one-way parameter that is set by Hippotizer and changing its value inside your component will have no effect in Hippotizer.

ForceRes

You can also create another optional parameter named Forceres which should be a bool (toggle) parameter. If Hippotizer finds a parameter with this name it will read the value to decide what to do on

it's output, if the value is true (or if it can't find this parameter) then it will try to force the output of the mix or the layer to the resolution that you send out of out1 TOP, if the parameter is there but the value is false, then Hippotizer will scale your output from out1 TOP into it's existing canvas.

Parameters in Hippotizer

Hippotizer will attempt to connect its parameters to matching ones in your file, if you have more parameters than the Hippotizer is set up with then the rest will be ignored.

Video Output

If you are outputting video from your component, then your exported container must include an Out TOP called out1 – this is what Hippotizer looks for to get its video output from TouchEngine.

If you want to use video from Hippotizer, your exported container / component must include between 1 and 8 In TOPs named in1, in2….in8 – the names of these TOPs must be exactly as described otherwise Hippotizer will not be able to find them and connect to them.

Touch Engine Component Template

To make things easy we have created a project called HippotizerContainer.toe that can be downloaded from the support section of our website here: https://support.green-hippo.com , this project contains an example container with all the above parameters already created and named correctly, you can use this as a starting point for your own projects and delete the custom parameters that you don't need, set the labels and the default values / ranges on the ones that you do.

V4+ Stock Effects

Hippotizer comes with some stock Touch Designer components for use in the Hippotizer Touch Engine implementation. These stock components will be located in C:< UserDocumentFolder >/Green Hippo/TouchEngine.
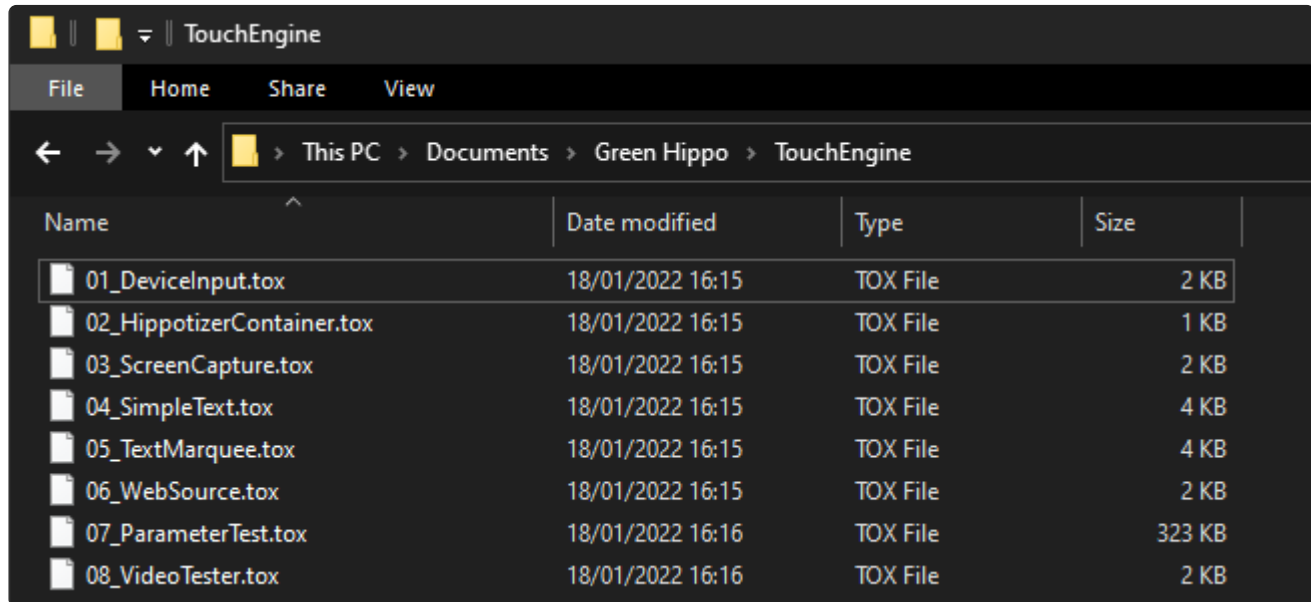
Below details the individual components functions:

Component Name	Description
HippotizerContainer.tox	A default empty project that implements all the Hippotizer TouchEngine parameters for use as a starting point in components
SimpleText.tox	A Text engine that allows placement of text in any font/size/colour/position
TextMarquee.tox	A text engine for creating scrolling Marquee style text in any font/size/colour/position
DeviceInput.tox	Live input from almost any capture card, camera or webcam
ScreenCapture.tox	A desktop or area of a desktop captured in real time and used as a video source
WebSource.tox	Load, display and interact with web pages in real time including support for video playback, audio and transparent pages. Supports local or remote web pages.

In addition we have 2 test components:

Component Name	Description
ParameterTest.tox	Displays the live values of the Hippotizer parameters in a clear to read screen
VideoTester.tox	Shows all 8 video inputs at the same.

Mixer

The Mixer controls how layers interact with each other.

There are two controls for the mixer:

- Mix Mode
- Layer Level

Mix Mode

Mix modes are used to determine how layers are blended with one another. The default mix mode is 'Sprite'.

There are 15 mix modes in Hippotizer:

Add Mode
Subtract Mode
Darken Mode
Lighten Mode
Softlight Mode
Softlight Inverse Mode
Hardlight Mode
Overlay Mode
Difference Mode
Multiply Mode
Screen Mode
Opaque Mode
Sprite Mode
LumaKey Mode
Alpha Mode

Add Mode

Add Mix Mode sums the current layer with all those below it.
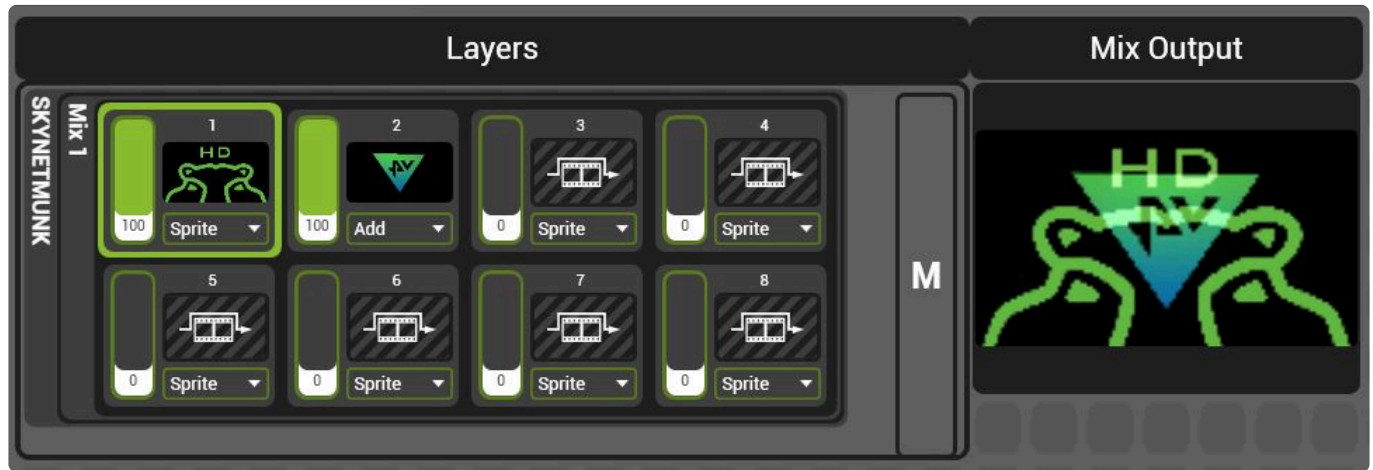
Considerations with Add Mode

- Pixel Colour values are simply added together
- The Alpha Channel is not considered, though full alpha is rendered as black so adds nothing to the composition and appears transparent
- The Area outside the layer's raster is rendered as black and is also transparent
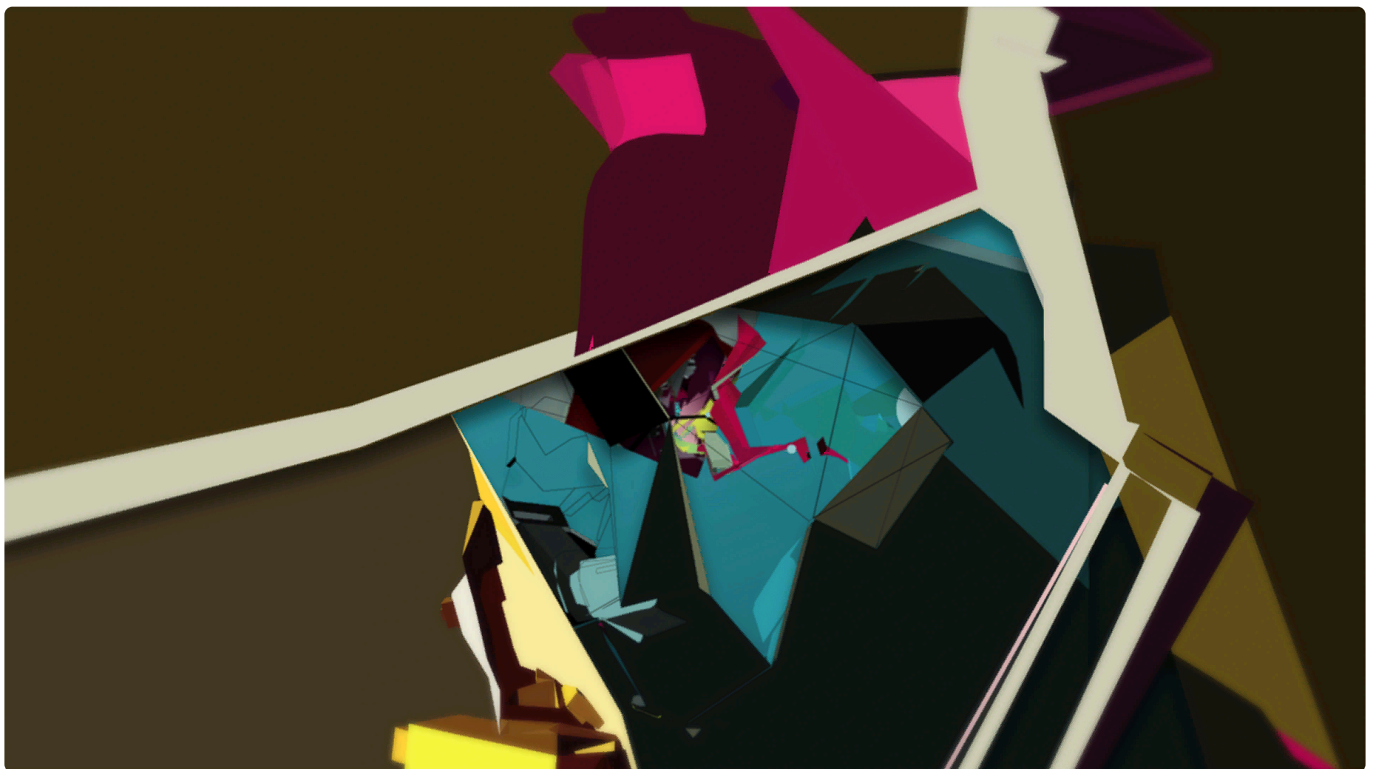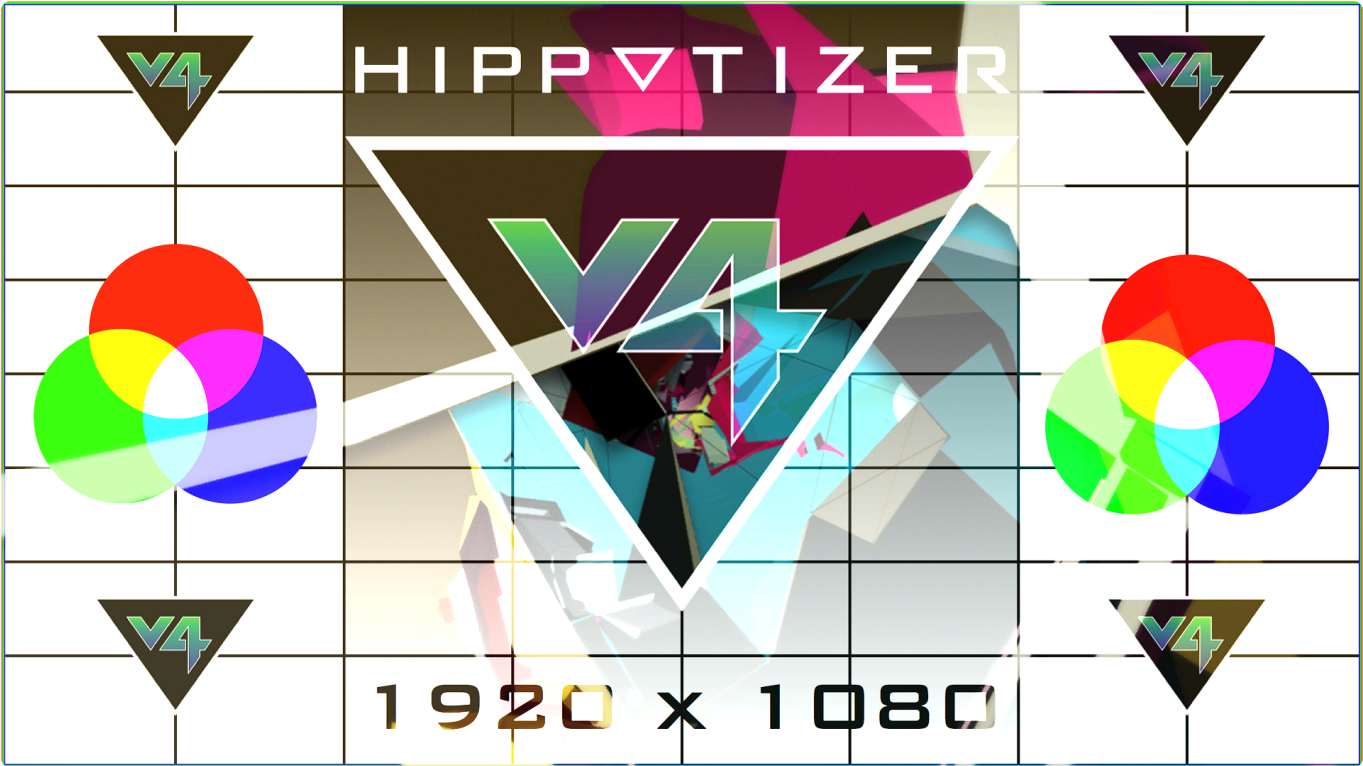
Subtract Mode

Subtract Mix mode deducts the colour of the layer from all those below it.
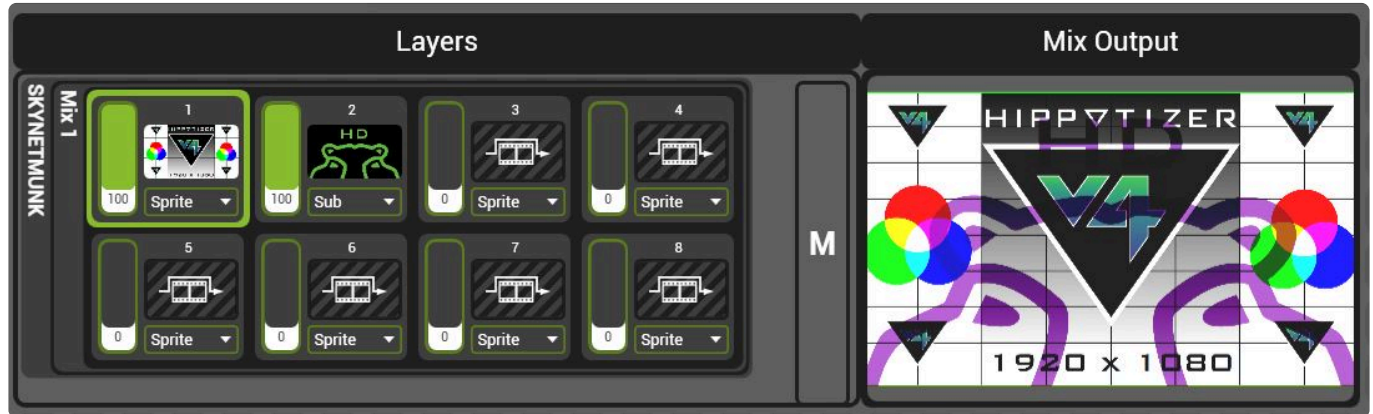
Subtract Mix Mode Considerations

- The Alpha Channel is not considered, though full alpha is rendered black so has no effect
- Areas outside the layer raster are black so do not change the colour values
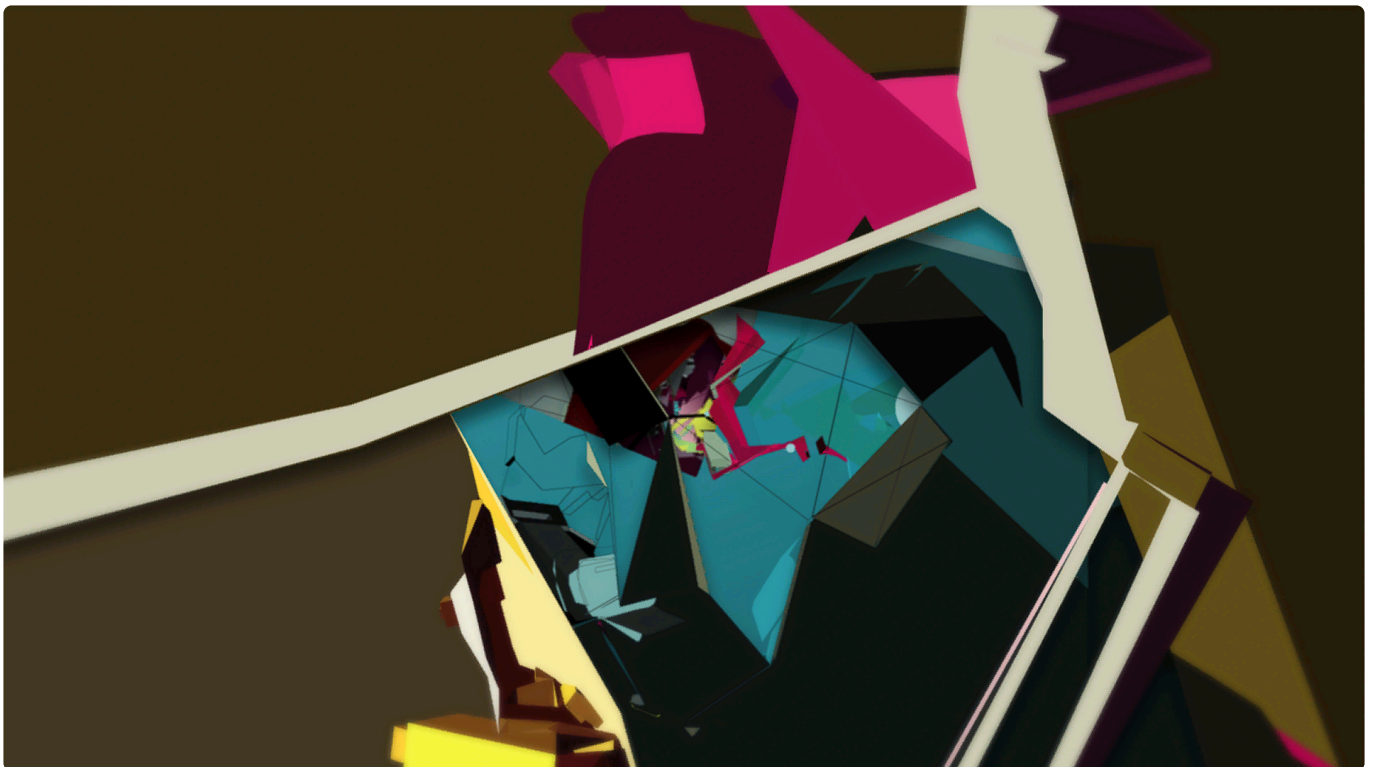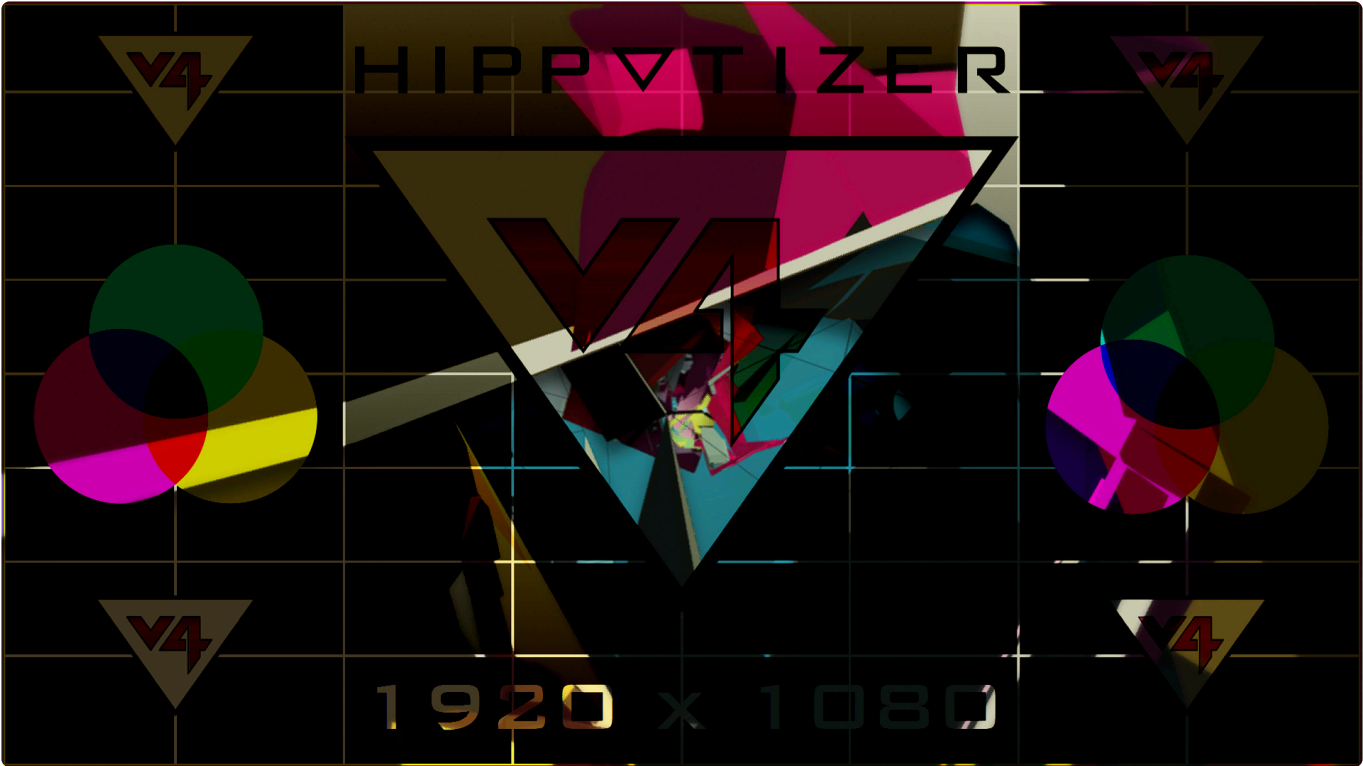
Darken Mode

Darken mode analyses the luminance value of each pixels RGB channels, selecting the darker of the blend layers pixels and displaying those. If the two layers have the same pixel colours then the result will show no change. Anything that is white in the blend layer will be transparent and anything darker than white will darken the base layer.

Lighten Mode

This mode analyses the luminance value of each pixels RGB channels, selecting the lighter of the two blended layers pixels and displaying those. If the two layers have the same pixel colours then the result will show no change. Anything that is black in the blend layer will be transparent and anything lighter than white will lighten the base layer.
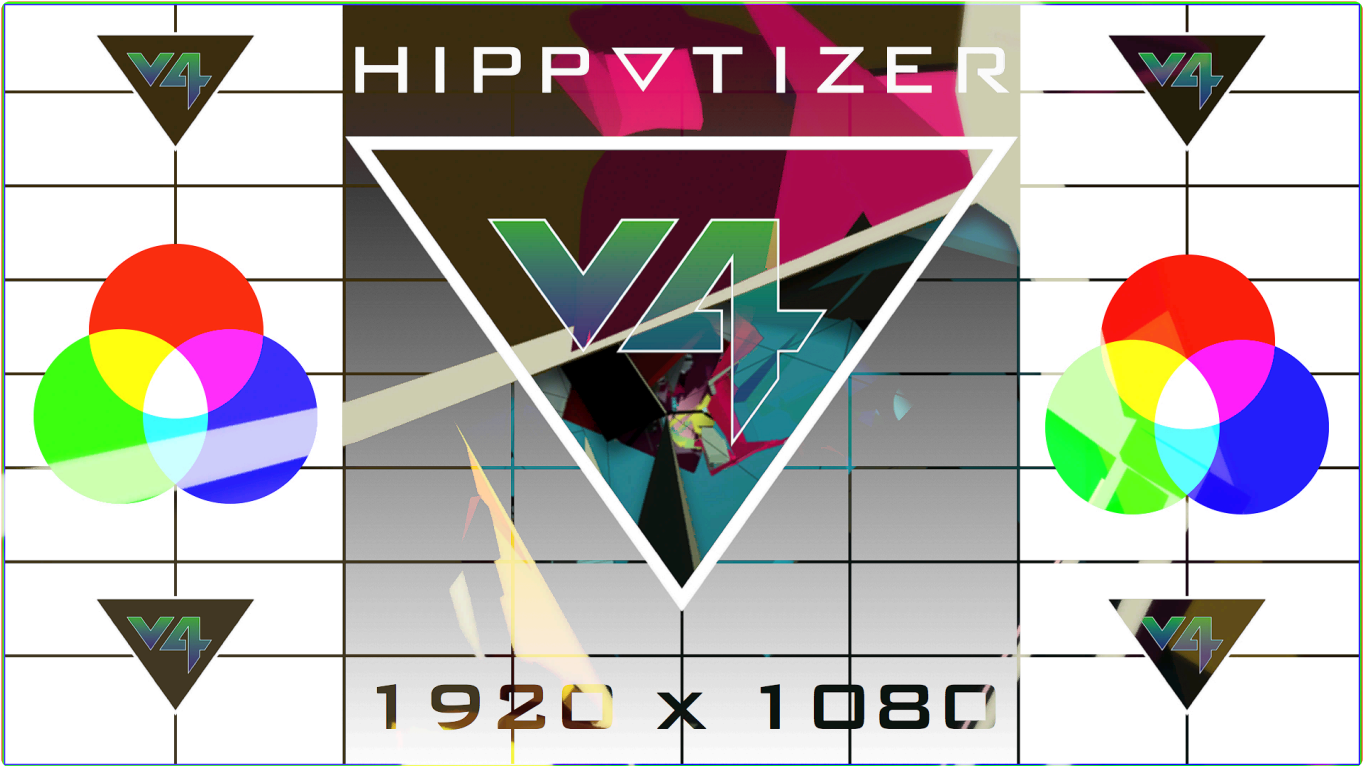
Softlight Mode

If the blend colour values less than 50% gray colour then it will darken the base and Lighten to those with greater luminance than 50% gray. The result is similar to a diffused light source.
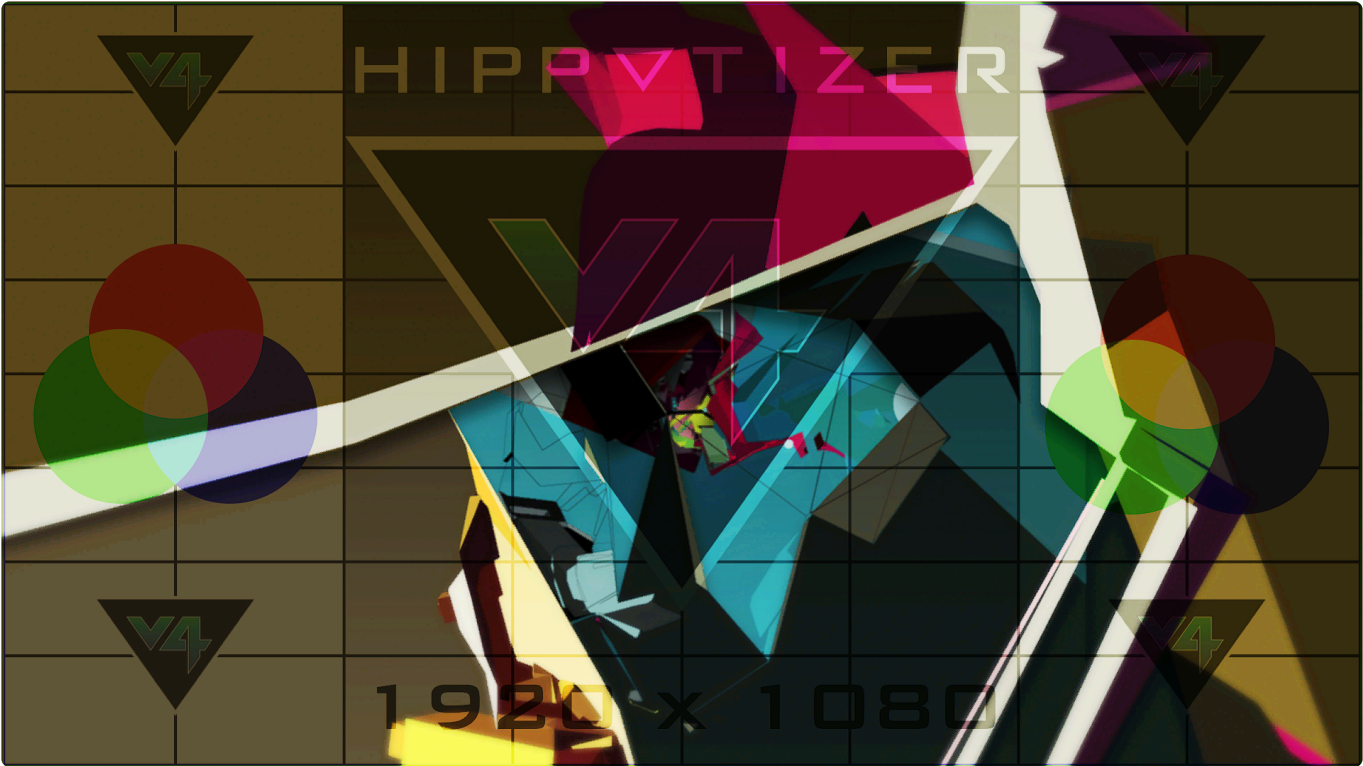
Softlight Inverse Mode

This is the inverse of the softlight blend mode. If the blend colour values less than 50% gray colour then it will Lighten the base and Darken to those with luminance greater than 50% gray.
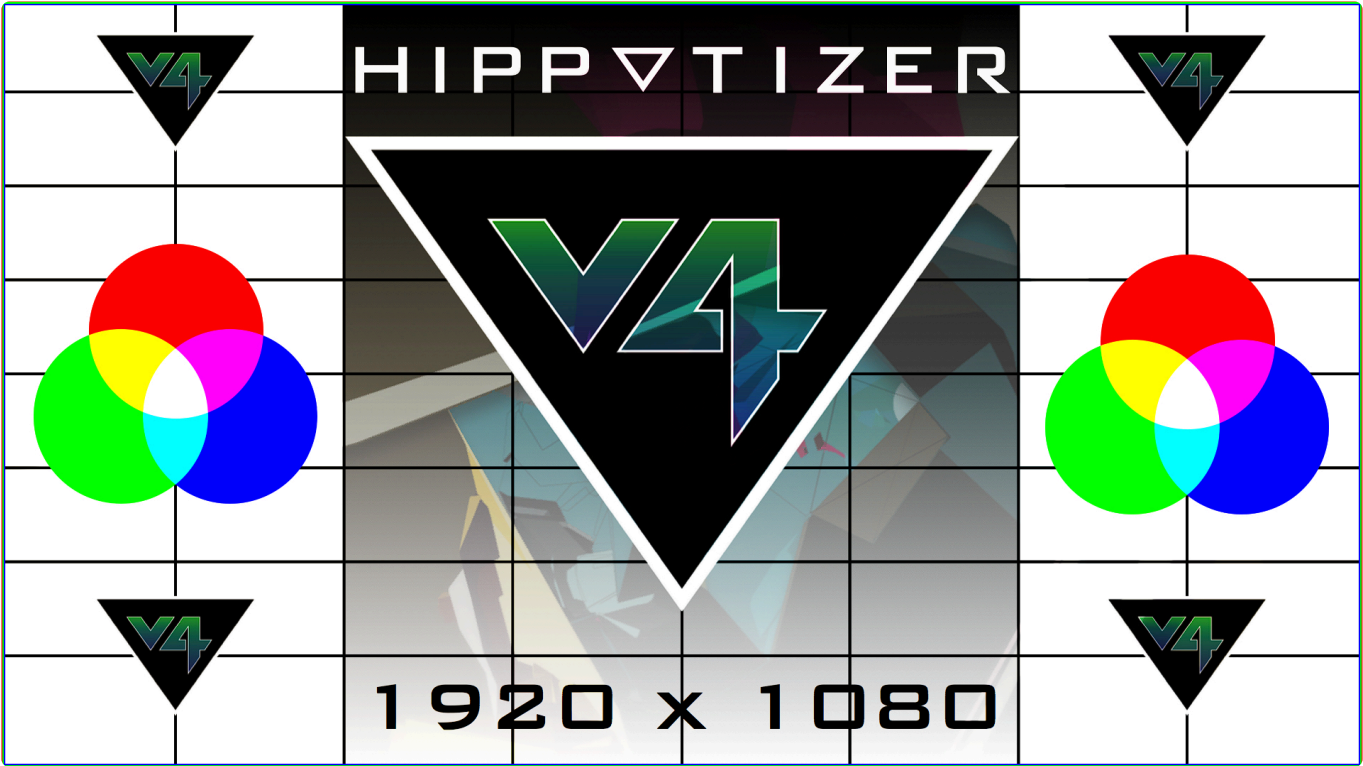
Hardlight Mode

Hard Light applies Multiply to colour values less than 50% grey colour and Screen to the upper 50% of pixels using the blend layer. The result is a high contrasting, intense luminance blend of colour. Pure white and black will result in pure black or white.
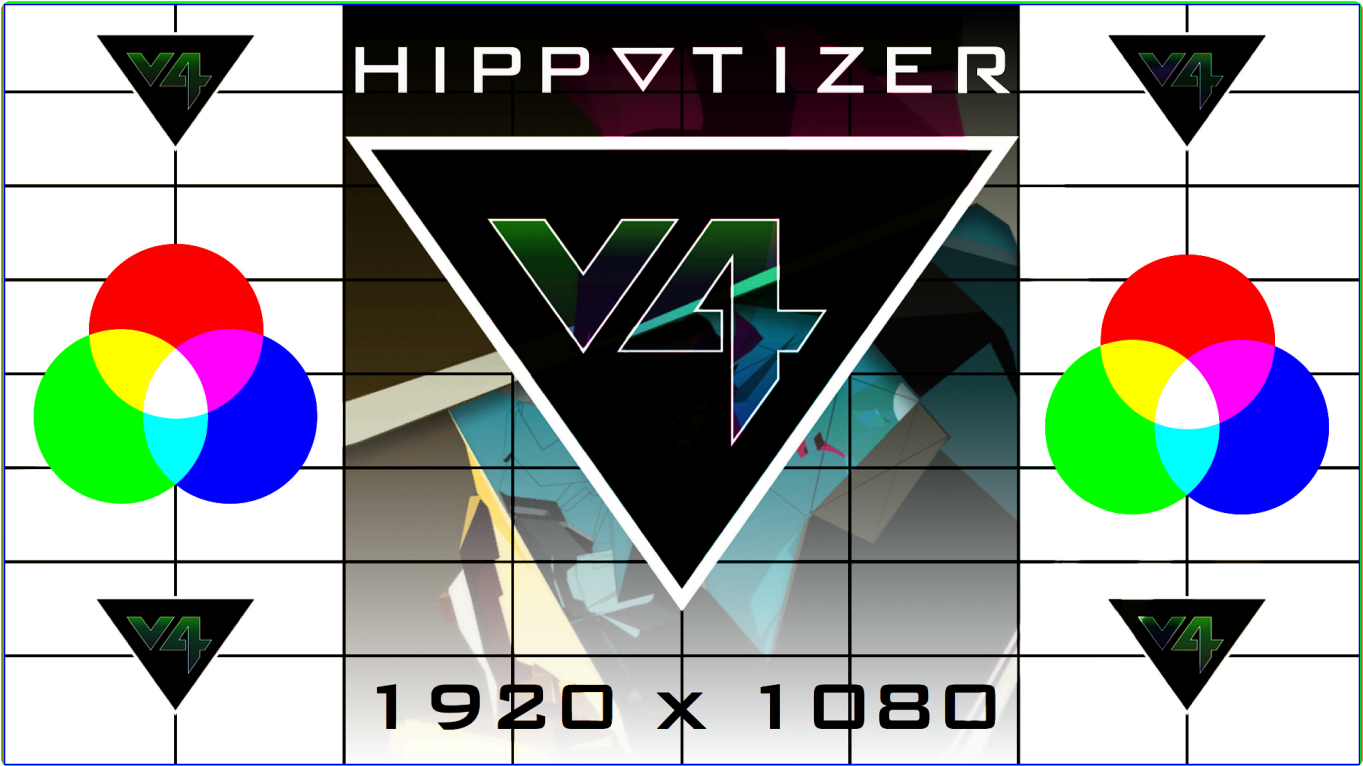
Overlay Mode

Multiplies or Screens the blend colour depending on colour luminance. Screen blending is applied to colours at half strength with luminance above 50% grey and Multiply is applied at half strenbgth to those below 50% grey.
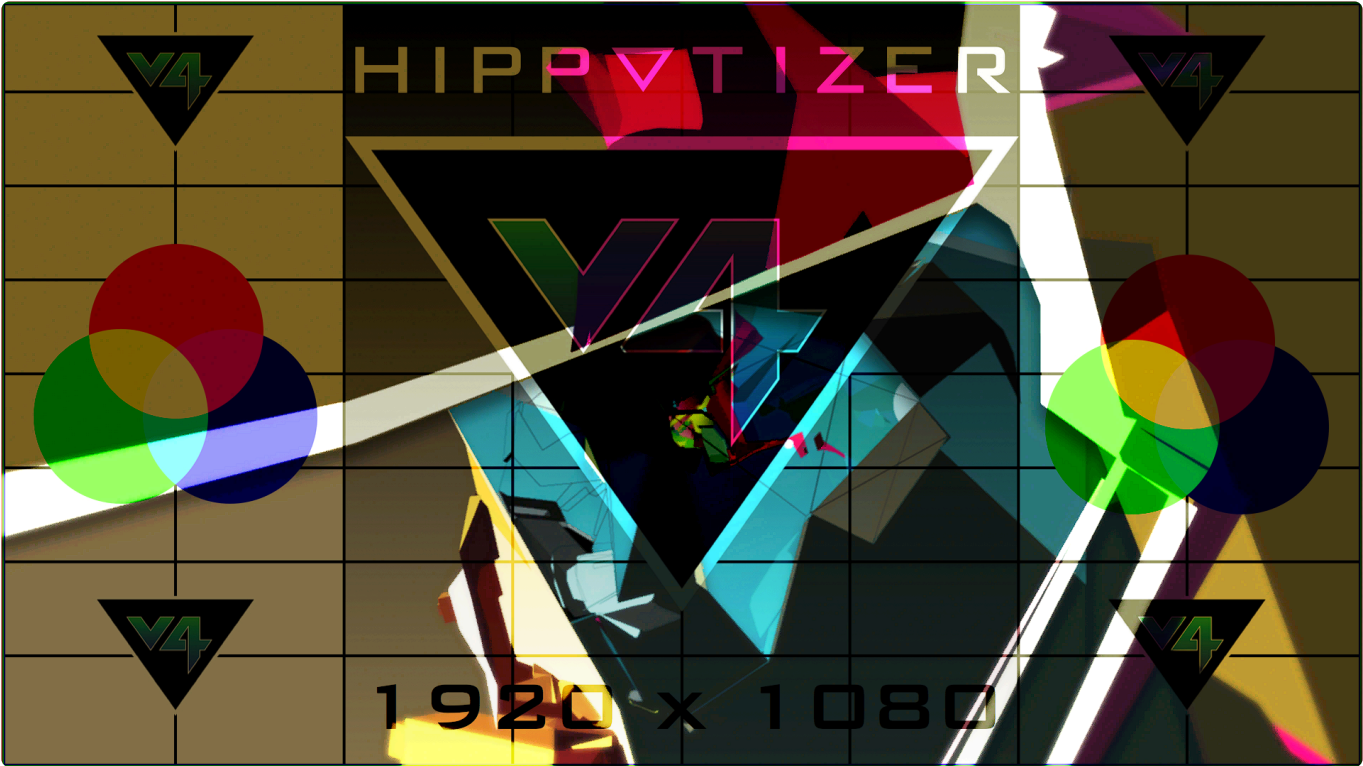
Difference Mode

The result of a difference blend is the difference between the base and blend colour values. White would invert the colours and black would have no change from base layer colours.
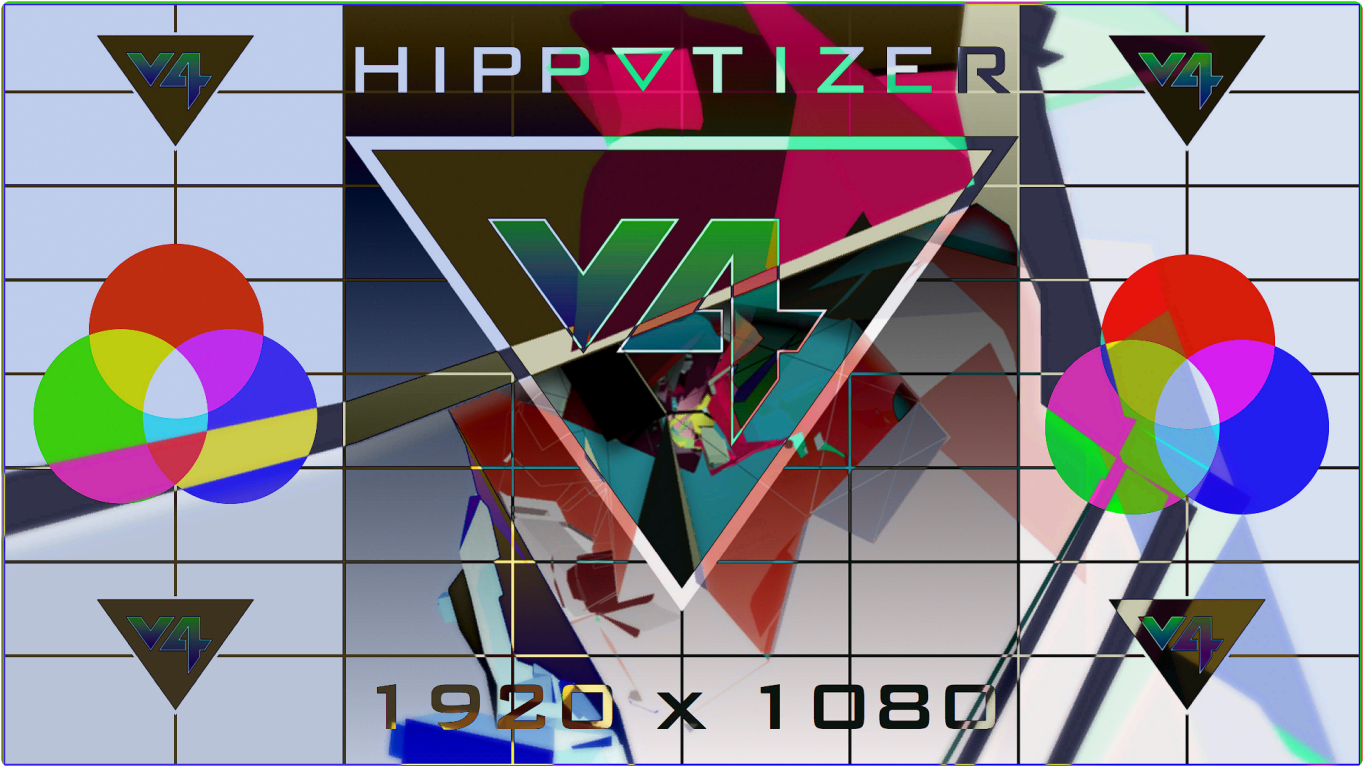
Multiply Mode

Multiplies the colour values of each channel in the base by the values in the blend layer. This Mix Mode always produces darker resulting colours, with exception being pure white where the resulting colour is unchanged from the base. Black in the blend layer always results in black.
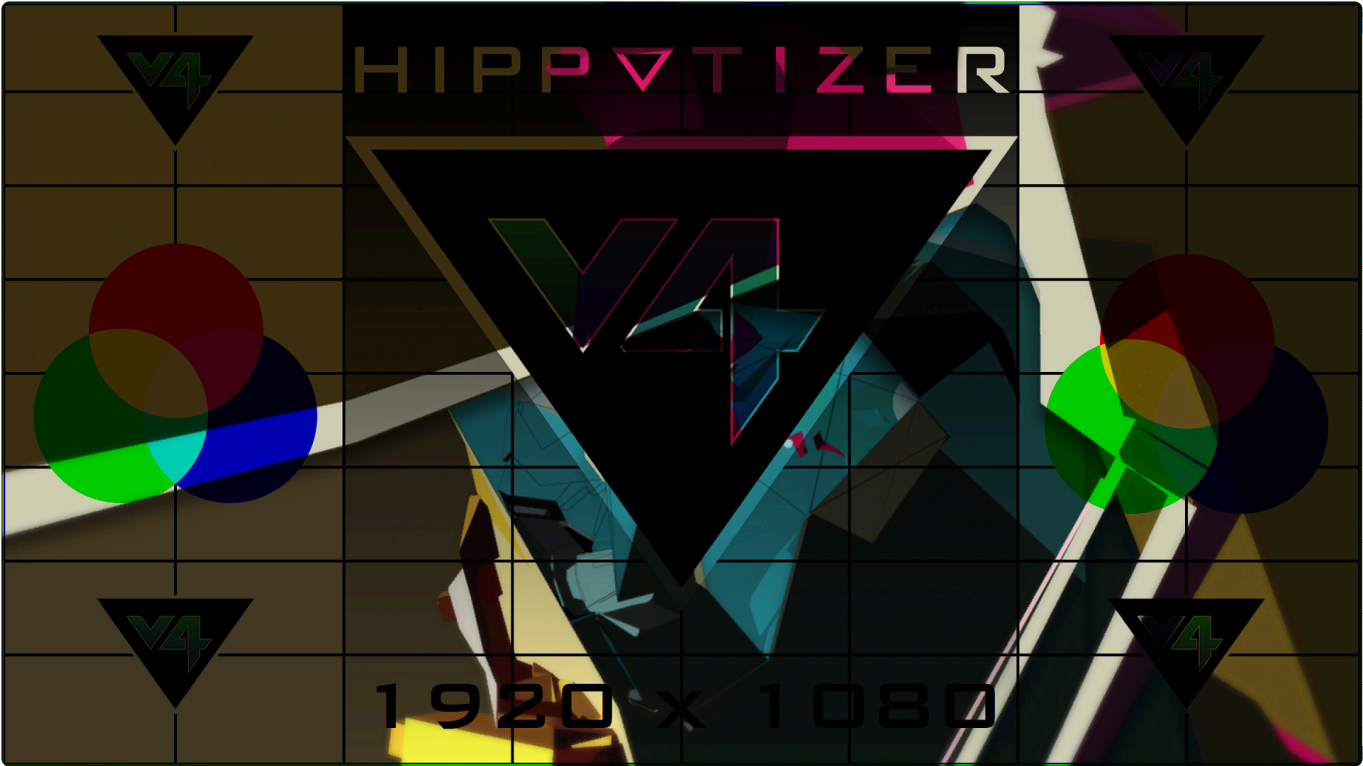
Screen Mode

Multiplies the inverted colour values of each channel in the base layer by the inverted values in the blend layer. This Mix Mode always produces lighter resulting colours, with exception being pure black where the resulting colour is unchanged from the base. Screening white in the blend layer always results in white.
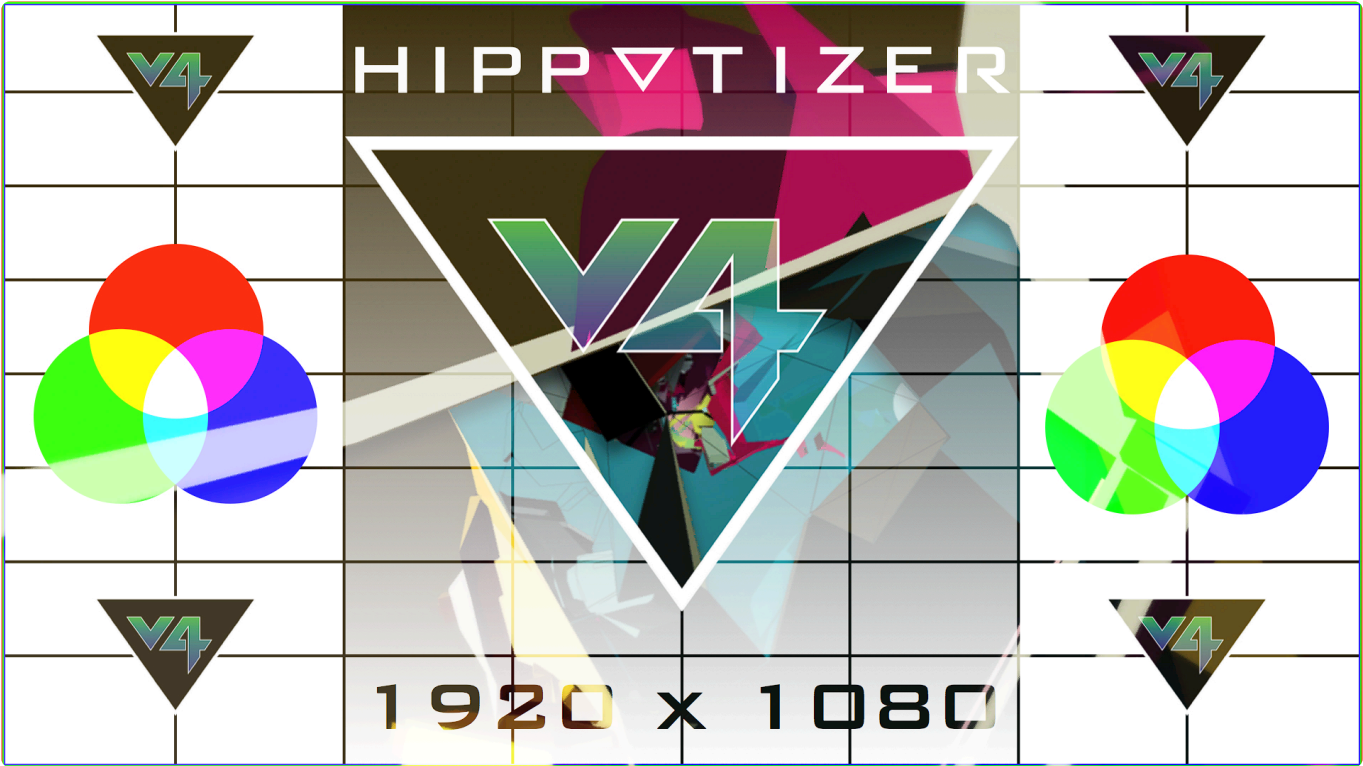
Opaque Mode

Opaque mix mode creates a standard blend with no RGB processing applied to either base or blend layers. The entire layer including space around the outside of the video clip edges will be opaque black.
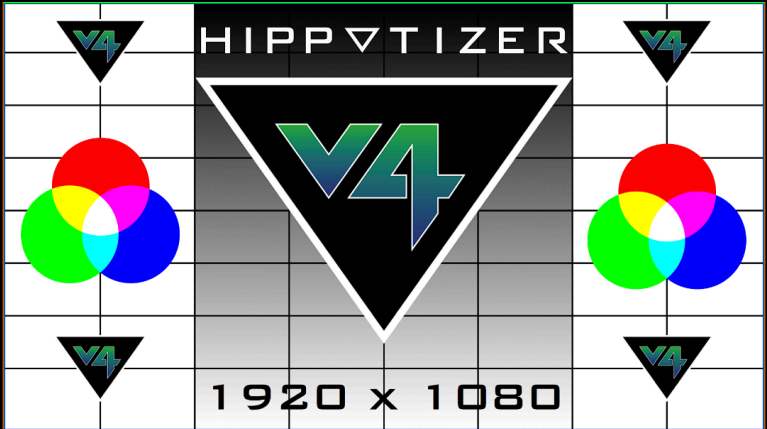
Sprite Mode

Sprite Mode is another standard playback mode similar to Opaque. The diffence is that any area outside the edge of the video content is transparant. An example use for this mode would be Picture In Picture applications.
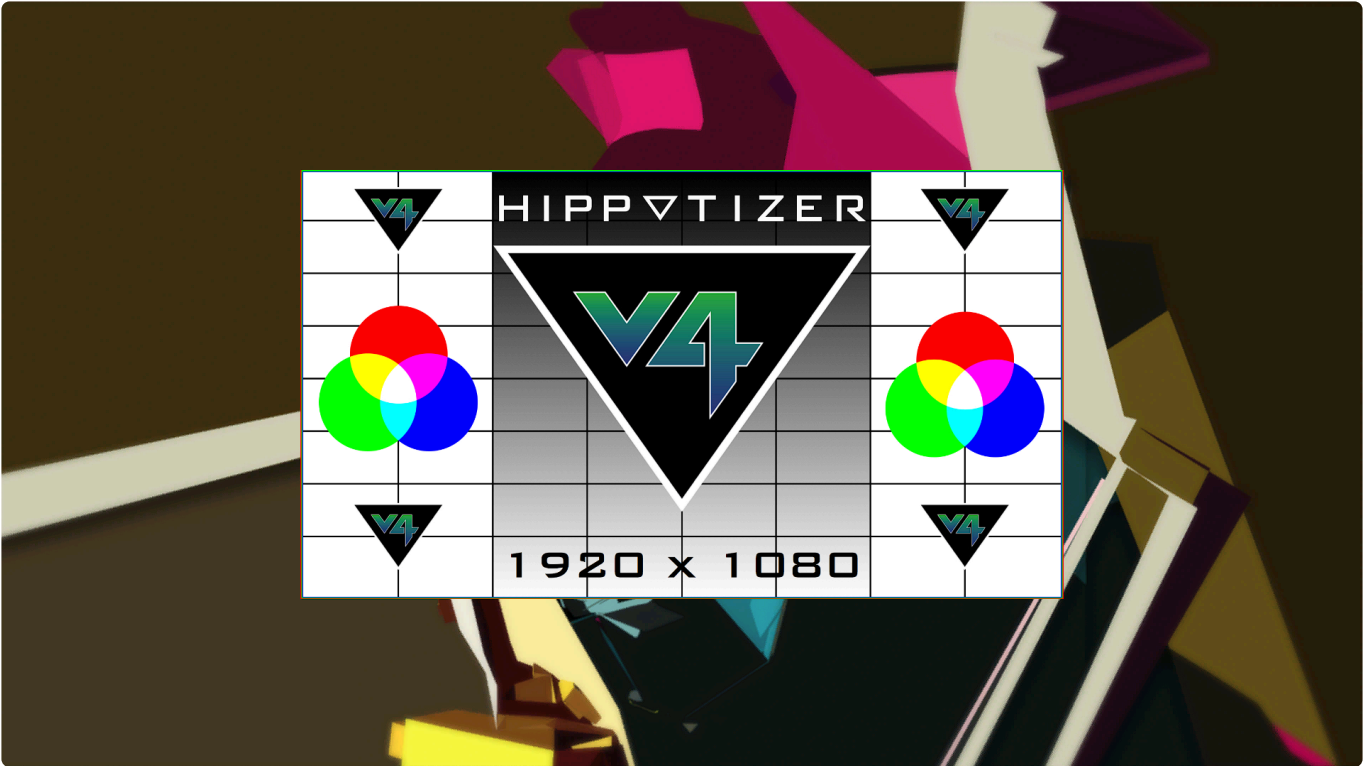
LumaKey Mode

LumaKey mode allows a composite of the blend layer over the base layer using the luma levels of a clip. Low luma levels (e.g. Black) will become transparant and allow the base layer to show through. The level has to be below 100% for the transparancy to take effect.
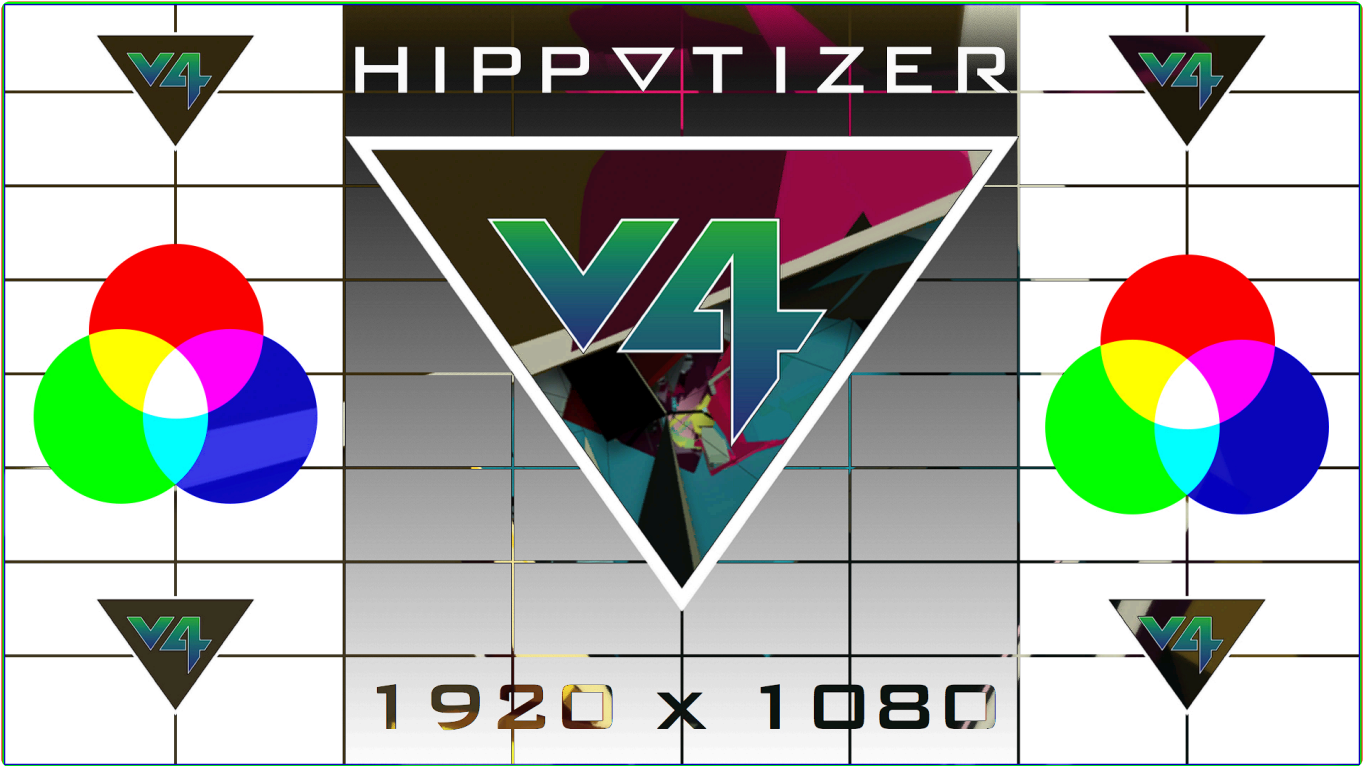
Alpha Mode

Uses the alpha channel of a content clip in the renderer.

Layer Level

Each layer has an intensity control

Effects

Each layer contains two effect engines
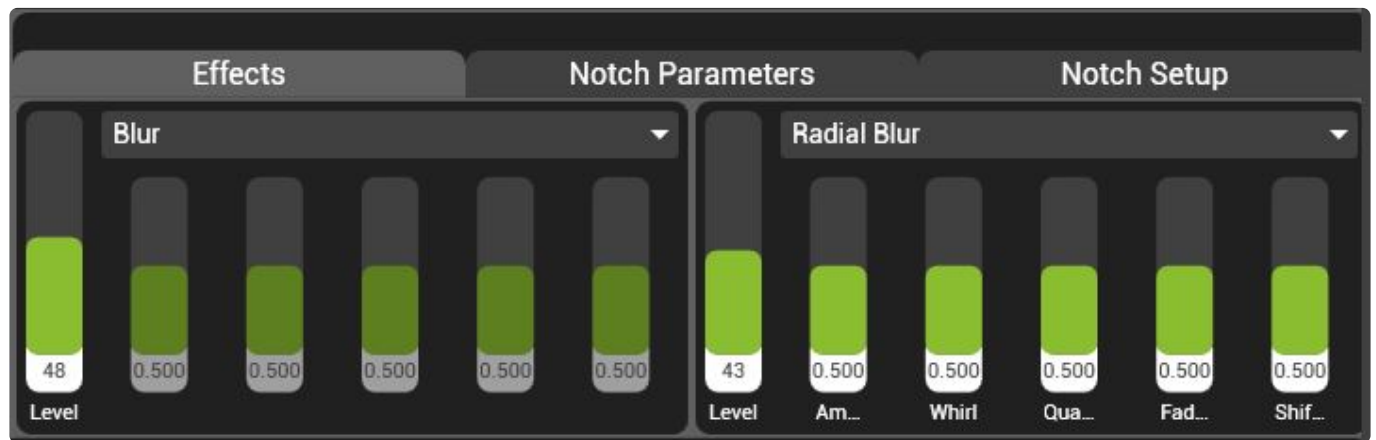
An effect engine contains a collection of video effects useful for a variety of applications.

As an effect selection is made, the five parameter faders will change to reflect the specific effect. Some effects such as **Blur** require only a level fader, while others such as **Radial Blur** use all five faders.

Livemask

Livemask allows masks to be created and edited on each layer.

Creating Live Masks

Press the **Edit** button to open the mask editor
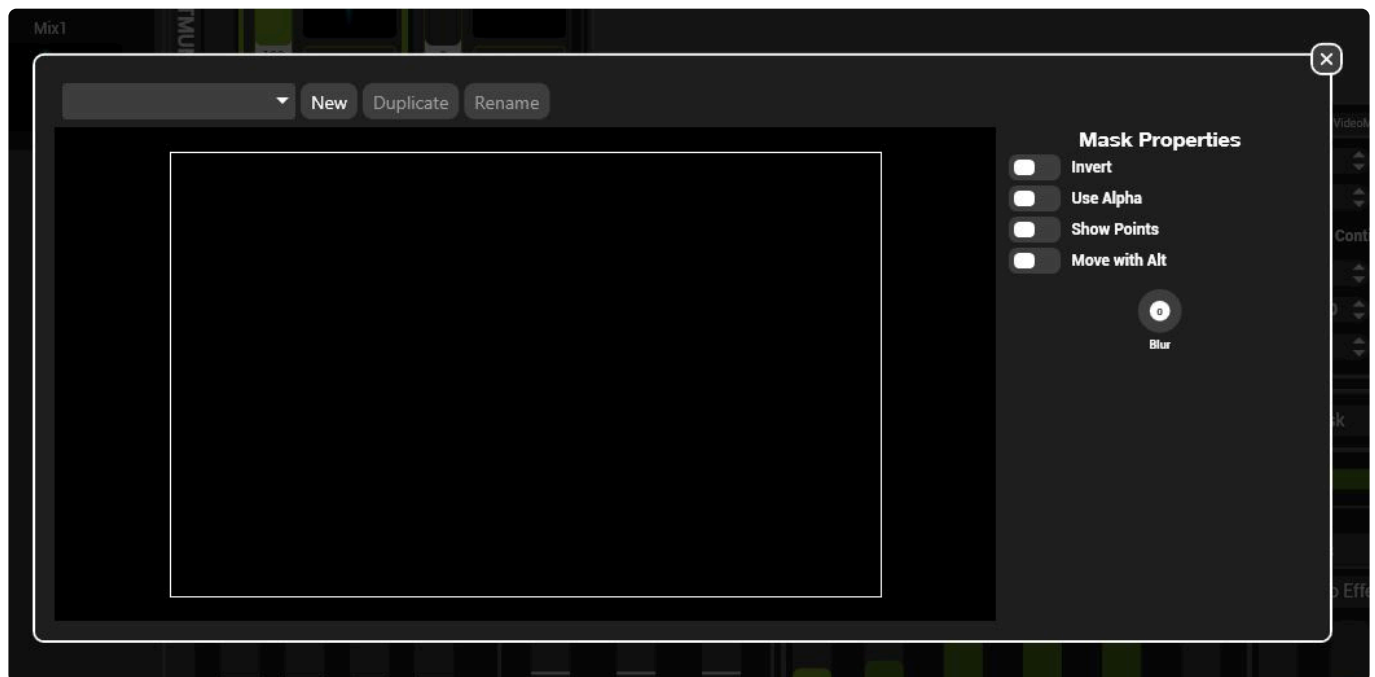
Press the **New** button to create a new, blank mask.

Mask Properties

Invert

Toggles the mask from being clear shapes to clear background with opaque shapes

- **Enable** The background is transparent and shapes mask

- **Disable** The Default. The background is a mask and shapes are transparent.

Use Alpha

Toggles the mask being alpha transparent or black

- **Enable** The mask is rendered as alpha. Layers beneath it will show through in alpha mix modes.

- **Disable** The Default. The mask is rendered as black

Generic Properties

Show Points

Toggles nodes and mouse position being drawn on the output

- **Enable** The position of the mouse and nodes is shown on the output

- **Disable** The Default. Only the mask is show on the output

Move with Alt

Disables mouse dragging of shapes.

- **Enable** Shapes can only be moved with mouse dragging when ALT is held down.

- **Disable** Mouse dragging is enabled.

Creating shapes

Right click inside the central area to create a new mask shape.
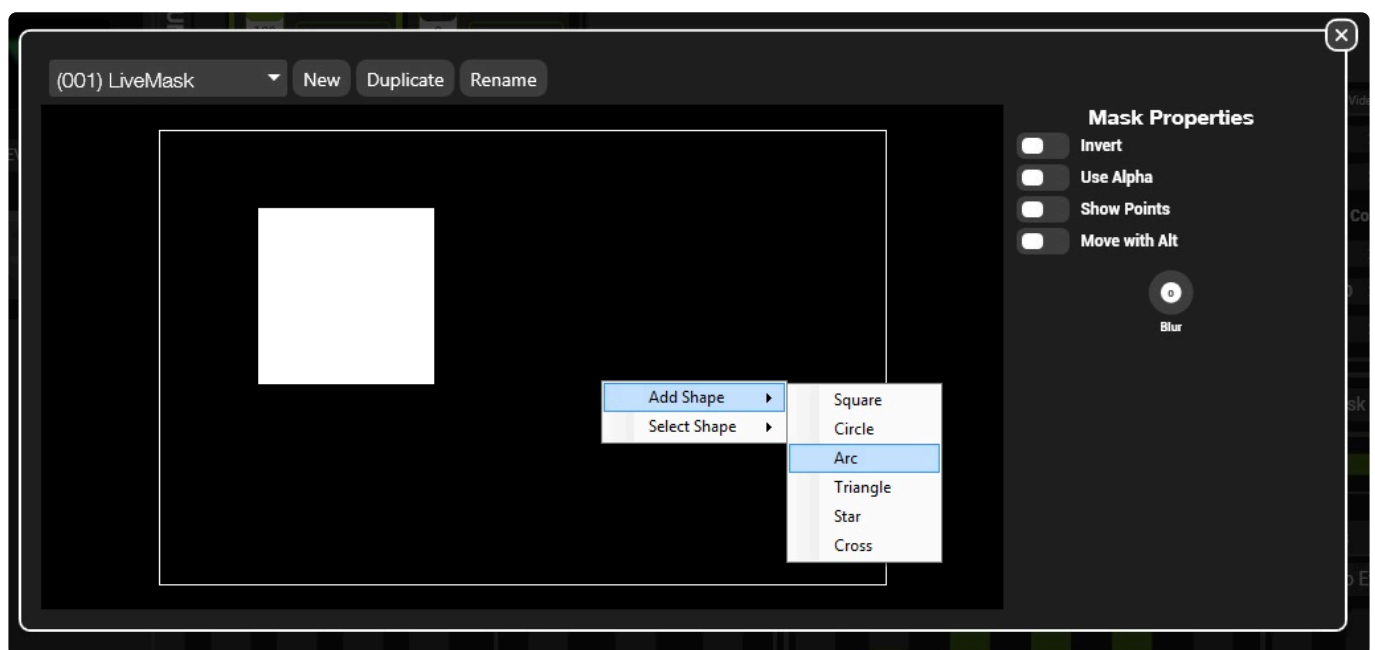
Many basic shapes can be added including:

- Square
- Circle
- Arc
- Triangle
- Star
- Cross

Editing shapes

To edit a shape, left click into it.
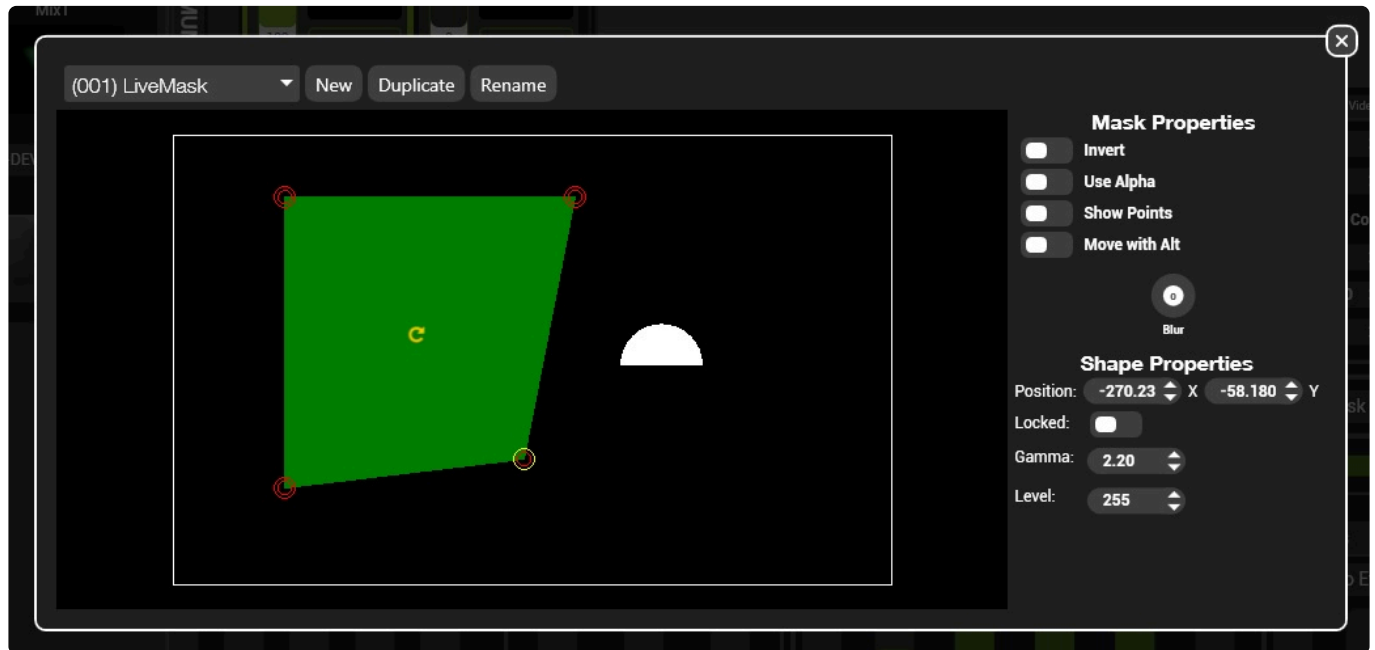
Moving the Shape

There are several ways to move shapes

- Left click and hold over the shape and drag (holding SHIFT while dragging switches to fine control)
- Select the shape and edit the position in the Shape properties panel on the right side.
- Select the shape and use the arrow keys to move the shape. (Holding SHIFT while pressing the arrow keys will move the shape 1/10 as fast).

Editing a Shape

 To rotate the shape left click the rotate symbol and drag the mouse

 The corners (or node) of shapes can be moved by selecting the shape and dragging the desired node

- Right click over the shape for additional options.
- The mouse wheel zooms the selected shape in and out
- Hold CTRL while moving the mouse wheel to feather the edges of the shape.

Colour

Brightness

Affect all RGB channels to adjust the percieved brightness of an image where max is full white and min is black.
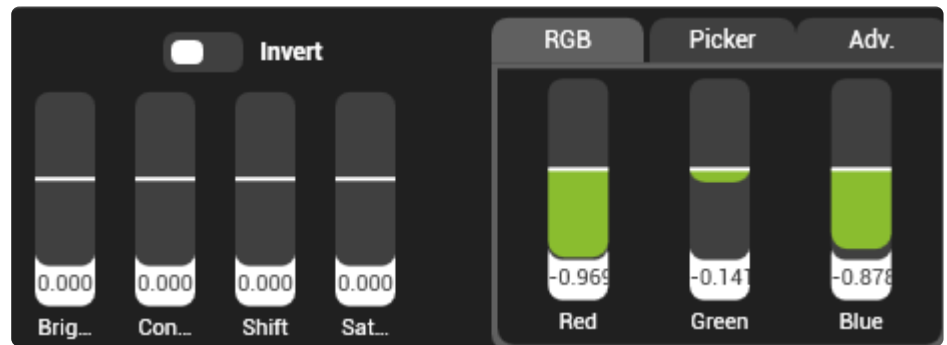
Contrast

Using a contrast factor of X, where X is the pin value, alter RGB channel value relative to their intial value. Results either increase the difference in colour luminance or reduce the difference until each pixel is the same grey hue.

Shift

Hue shift affects the RGB channels by rotating through the colour wheel. Use this parameter to change the overall colours of pixels within a clip.

Saturation

Affects the visual intensity of RGB colour as saturation increases the richness of colour is intensified. At 0 saturation the image will appear greyscale.

Red

Increase of decrease the Red channel of each pixel of a layer by a factor of X, where X is the value of the channel parameter.

Green

Increase of decrease the Green channel of each pixel of a layer by a factor of X, where X is the value of the channel parameter.

Blue

Increase of decrease the Blue channel of each pixel of a layer by a factor of X, where X is the value of the channel parameter.
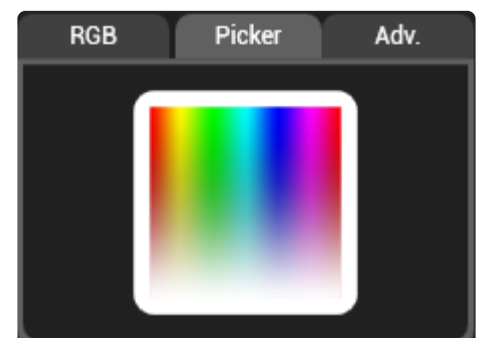
Colour Picker

The picker can evaluate the colour of a clip and alter the RGB channels for the layer to match the selected colour.

Advanced Colour

Affect the individual colour channels based upon the luminance of the pixels. High, mid and low are the three luminance bands and the values entered into each of these fields only affects the colour channels of pixels within the luminance band.

	RGB	Picker	Adv.
	High	Mid	Low
R	0.00	0.00	0.00
G	0.00	0.00	0.00
B	0.00	0.00	0.00

Media Select

Xfade

Cross Fade on layer automatically transitions between looks on a layer

Cross Fade on Layer is present on every layer of a Xfade mix. Non-XFade and special mixes do not have the crossfade function.

Basic function

Crossfade on layer is designed to be easy to use. Simply choose a new clip, or look, and the layer will fade to it automatically. If crossfading is not desired, set the mode to bypass and the layer will operate as normal.

Crossfade on layer operates by pairing each media layer with an invisible, hidden layer. To create a fade, the hidden layer is set to the new values and the intensities of the visible and hidden layers are faded as set by the fade mode.

Since Hippotizer version 4.6.0, the mix type defines whether the layers have crossfade included. Make sure that the mix is a XFade mix in order to use crossfade on layer.

Concepts

Visible and Hidden Layer

Every Hippotizer layer is actually comprised of two media layers; a hidden and a visible.

The visible and hidden layers switch automatically with each crossfade so the output is always either only the visible layer, or during a fade, a combination of both.

A cross fade is comprised of a sequence of events:

- The visible layer renders to the output
- When crossfade is enabled, new values are applied to the hidden layer (depending on Autofade mode)
- The layers fade by reducing the intensity of the visible layer while increasing the intensity of the hidden layer
- Once the fade is complete, the hidden and visible layers synchronise and the hidden layer is ready for new values.

Fade Type

The Crossfade mode enables and disables crossfade and sets the style of fade.

Bypass

By default, Cross fade is set to bypass for every layer. When bypassed, the crossfade engine is disabled to save resources.

Crossfade

Fades the visible layer down as the back layer is fading up.

Fade through Black

Fades the visible layer down to zero then fades the hidden layer up.

Fade up first

Fades the hidden layer up before fading the visible layer out completely.

Fade Time

The time a fade will take to complete. The default setting is 1 second.

Autofade

Autofade determines when a crossfade is started.

- Autofade

Autofade

Autofade determines when a crossfade begins

Autofade Enabled (default)
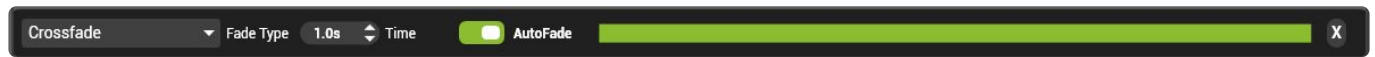
With autofade enabled, a fade will start whenever a change to the source has been made.

Any changes to settings outside of the source will not trigger a fade. So, changing the Geometry or colour of a layer will not trigger a fade while changing the clip will.

> ✳ Autofade mode is designed primarily for operation from a DMX lighting desk where fading values such as geometry is easier to control from the desk, while media fades are best handled from the Hippotizer.

Autofade Disabled.
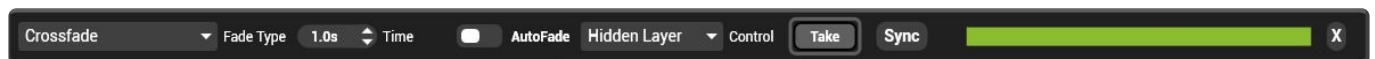
Disabling autofade sets crossfade to a fully manual mode — a crossfade is started by pressing the take button.

Use this mode to set a complete state before applying it.

Disabling autofade creates a series of new controls:

Control

In manual mode, the layer controls will affect either the hidden layer, the visible layer or both depending on the control setting.

Take

Take starts a fade. Once started, a fade cannot be reversed.

Sync

Synchronises the visible layer to the hidden layer.

Key on Layer

Key on Layer replaces Matte Mix mode to use any other layer as key source

Keying is commonly used in broadcast applications to composite a live feed onto a background.

Often times, the key source is presented as two live feeds a Key Cut and a Key Fill which is mixed onto a Background.

Example Media:

Key Fill

Key Cut

Background
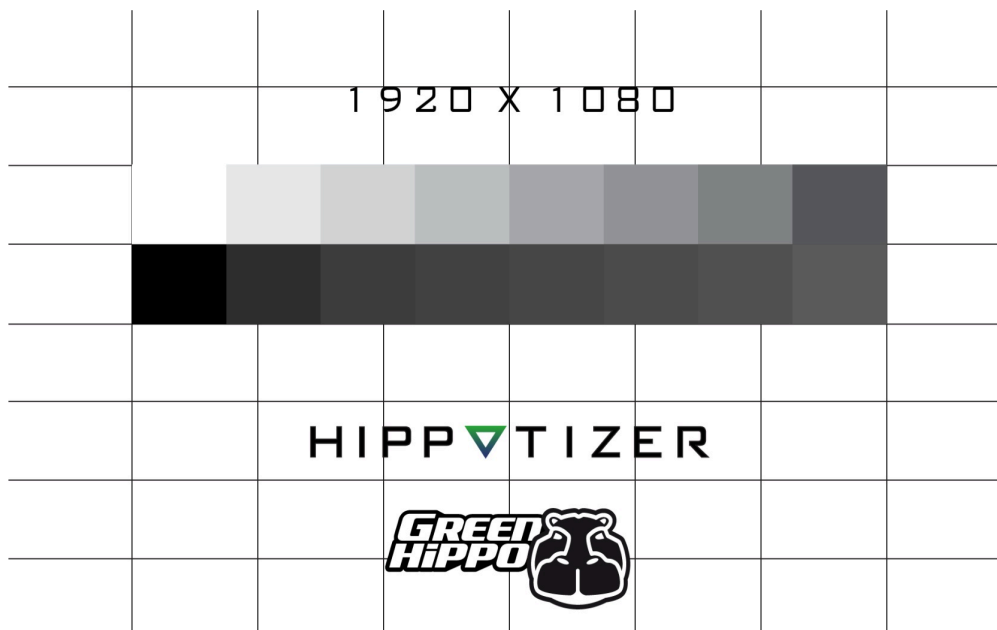
Using Key on Layer

Compositing these three feeds, Key, Fill and background can be done following these steps:

1) Have your key and fill on the lower z-order layers and the background above.

2) Level of the fill needs to be above 0, whereas cut can be set to 0.

3) On the background layer set layer mode to Alpha.

4) Apply key on the background layer and select the key cut Mix/layer.

The background now has the key cut filled with the key fill and overlayed.

The result will be that layer 1 of the output mix will be visible through the cutout of the key on layer 2.

✱ If you are using Key & Fill content with different aspect ratio than the mix then you will be required to create a second mix which you can then select the Mix Master as the key cut Mix/layer

Mix Controls

The mix controls or mix master page contains controls common to all layers on that mix

There are several section to mix controls

- Mix Media Settings
- Pixelmapper
- NDI Send
- Mix Presets
- Mix Volume

Media Mix Controls

Media Controls are global settings for all media players within that mix.
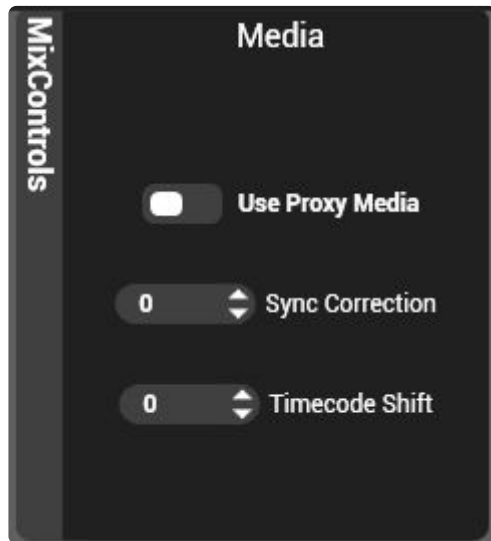
Use Proxy Media

When enabled, if proxy media has been encoded, all media players in that mix will use proxy media.

Sync Correction

A correction factor for the delay (in milliseconds) in passing synchronisation data between media players. The default of zero works in most cases.

Timecode Shift

A global shift (in milliseconds) applied to all timecode being sent into the media players on that mix. Use this setting to compensate for distance delay between mixes.

NDI Send

Each Mix can send an NDI feed over the network.

Enable

Turns NDI Send on and off

- **Enable** NDI is sent from the selected mix

- **Disable** The Default. NDI is not sent from the selected mix.

> Note: Sending NDI does incur computational load, especially at greater than HD resolution. Always test the performance of a system before using in a live situation.

Resolution

Sets the resolution of the NDI send. When set to auto, the NDI send resolution will match that of the mix.

Alpha

Toggles sending an alpha channel. Sending alpha incurs additional load on the network; it is best to only enable when required.

- **Enable** Alpha is sent

- **Disable** The Default. Alpha is not sent.

Rate

Sets the desired refresh rate of the NDI sender.

Receiving a slower framerate then is set by the sender can indicate an overloaded network, sender or receiver.

Mix Master Volume

Each Mix has an independent volume and Audio output device

Mix Volume

Audio output intensity of the mix. This control is independent of layer volumes.

Audio Device

Determines which Windows audio device the mix audio is sent to. Each mix can route audio to a different output device.

Viewports

Viewports are the link between a Mix and a physical output and are created in Output Manager
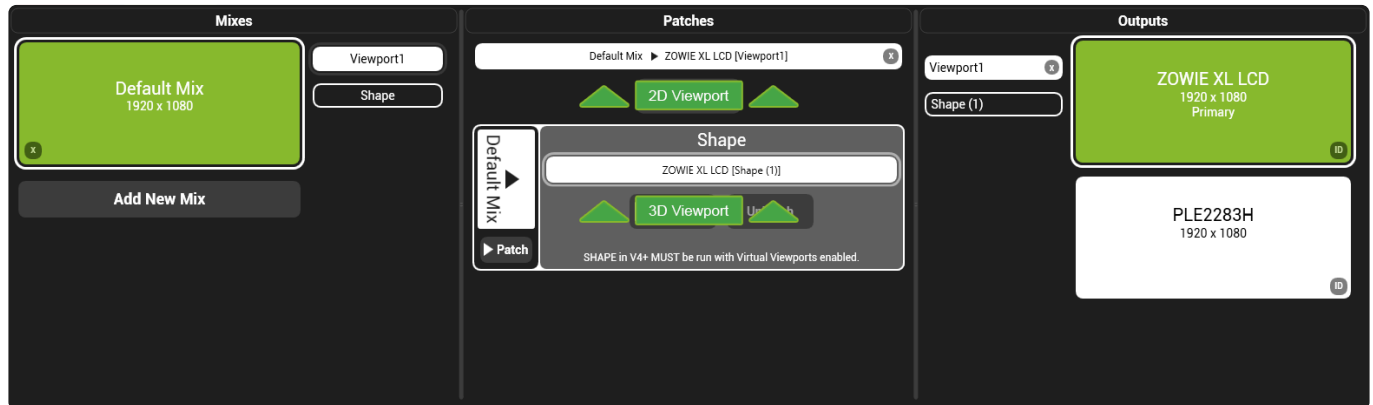
There are two types of Viewports in Hippotizer: 2D and 3D.

2D Viewport

The 2D Viewport is used where a two-dimensional Workflow is preferred. This does not require a 3D model and is commonly used for:

- Led Walls
- Projection onto a flat or curved surface
- Projection mapping where no 3D model is available.
- Flat Displays (such as TVs)
- Pixelmapping

SHAPE 3D Viewport

The SHAPE 3D Viewport utilises a three-dimensional representation of the environment to manage the outputs. The 3D environment must be configured in the SHAPE application and requires a 3D model to be either imported into or drawn inside SHAPE. A 3D workflow frequently is used for:

- Projection Mapping with a 3D model
- Perspective mapping complex display setups (such as LED walls)
- Tracking Dynamic displays

Viewports and System Load

Each Viewport adds significant load to the Hippotizer system; minimising the number of viewports is a good way to increase system performance.

For more information about getting the most out of the Hippotizer system see the best practices section

of this manual.

2D Viewport

The 2D Viewports contains controls unique to the viewport commonly used in non-3D applications.

2D Viewports are normally associated with a specific Projector, Screen or LED processor. As a result, controls such as Videomapper, Screen Warp and Keystone are contained on the viewport.

The Viewports Page is a **default layout** that can be reset from within Zookeeper Settings

The Viewports Page is comprised of two main sections:

Viewport Selector

All Viewports (SHAPE and 2D Viewports) on the local network are displayed in the selector.

The high lighted viewport's controls will appear in the viewport controls panel to the right of the selector.

[For more information about Selectors please see here.](#)

Viewport Controls

The viewport controls are a collection of effects and components are commonly needed to correctly display video on a wide range of projection and display technologies.

Effects Engines

[For More information about Effects see here](#)

Colour Controls

[For more information about Colour Controls see here](#)

Geometry / Keystone / Videomapper

[For more information about Geometry See here](#)

Warping and Blending

[For More information about Warping (or Screenwarp Manager Component) please see here.](#)

Pixelmapper

Pixelmapper is present on each Mix and each Viewport. Use Pixelmapper on the Mix where no physical output is patched.

[For more information about Pixelmapper see here.](#)

NDI Send

NDI outputs are present on each Mix and each Viewport. Use the Mix NDI output where no physical output is patched.

[For more information about NDI Send see here.](#)

MPCDI Engine

MPCDI files can be loaded onto a mix to supply data for warping, colour and blend.

[For more information about the MPCDI engine see here](#)

Live Mask

[For more information about live mask see here.](#)

Freeze & Delay

Enabling this parameter will freeze the output on a single frame.

Delay the viewport output by a number of frames. Max viewport delay is 30 Frames. Each HD frame of delay uses about 8MB of video memory. 4K frames are approximately 25MB of video memory.

Viewport Presets

[For More information about Presets see here](#)

SHAPE 3D Viewport

The 3D Viewport controls outputs from Hippotizer's 3D world; SHAPE
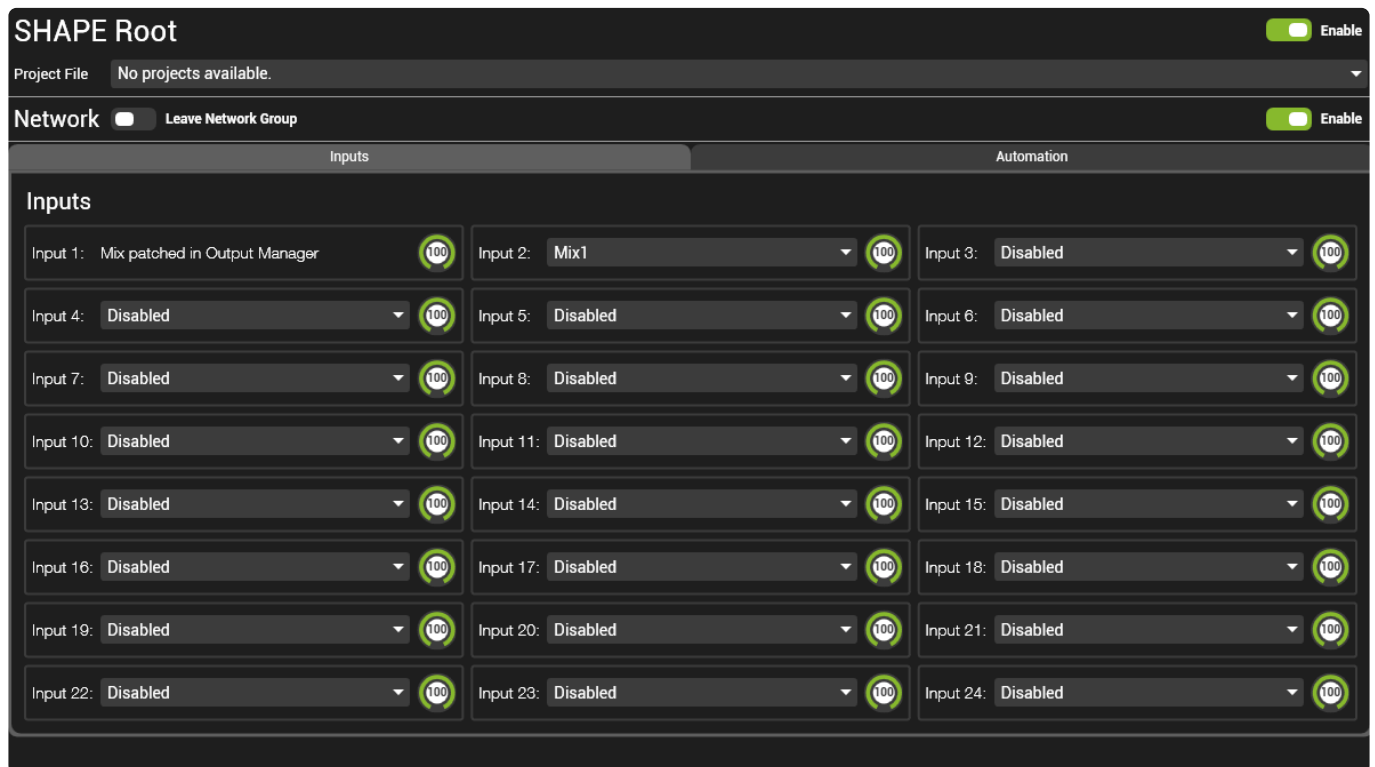
Enable SHAPE

Turns the 3D plugin on and off

- **Enable** The default. The 3D plugin is rendered

- **Disable** The 3D plugin does not render. Video is passed through as a simple 2D texture.

Project File

Displays the local project file.

The SHAPE plugin saves a local copy of the project file when the project is saved in the SHAPE editor. Until the project has been saved **No Projects available** will appear in the Project File list.

Enable Network

Turns network control on.

- **Enable** The default. SHAPE Applications can connect to and control the 3D plugin over the network.

- **Disable** SHAPE applications cannot connect to the 3D plugin. The 3D plugin will continue to

render a chosen project file without network control.

Leave network Group

Disconnects the local system from the SHAPE network session.

Inputs

Sets the source for the video inputs of SHAPE. By default, Input 1 is set to the Mix patched to SHAPE in Output Manager.

Inputs 2-24 can take any local relay source as an input.

Output Settings

Controls the output properties for the selected SHAPE Viewport

Output Look

Determines how the 3D model is displayed.

- **Textured** The default. Hides the model and shows only video applied to the model
- **Textured and Wireframe** Adds the model's outlines to the video applied.
- **Wireframe** Shows the outline of the model only
- **Solid** Displays the faces of the model.
- **Solid and Wireframe** Displays the faces of the model and the outlines
- **Alignment** Displays the only the outlines of the model that are visible to the selected camera.

Source

Sets the source, by index, of the projector feeding the selected viewport.

The source index is set in the SHAPE editor.

Automation Controls

There are 12 banks of controls assigned to 12 controllers in the engine SHAPE file.

Enabled

Toggle on the control for SHAPE controller.

Visible

Toggle visibility of SHAPE controller in the engine.

A B Select

Switch which is the active slider.

A B Sliders

Controller value sliders.

Forward Data

The forward data pin can be used to send the controller value changes through to the SHAPE software to visualise the controller value changes in realtime.

Pin Path: Engine/SHAPE/Automation/ForwardData

MPCDI Viewport Integration
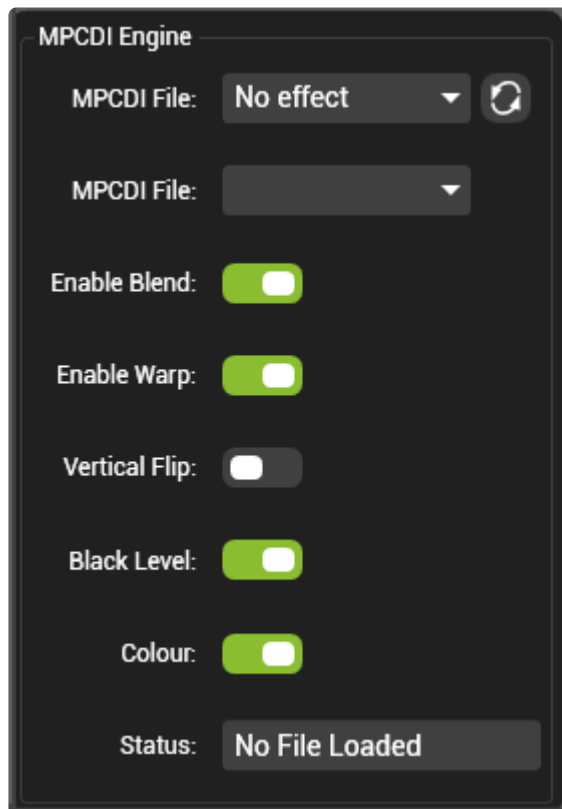
MPCDI Intergration allows the use of MPCDI files to supply settings such as warping, colour, blend to the Hippotizer Viewport

- **MPCDI File**: Allows the user to select from a list of MPCDI files in the system. To add new ones, they need to be placed into the folder found on Hippotizer units at: C:\Users\Hippo\Documents\Green Hippo\MPCDI
They need to be named with a non clashing 3 digit number at the end for DMX mapping purposes. This can all be done whilst the engine is active. Just use the refresh button to update the list.

- **MPCDI File**: A drop down so the user can assign the named sets of data to the corresponding viewport in the Hippotizer software.

- **Enable Blend**: A toggle to allow for blend data to be respected/not respected.

- **Enable Warp**: A toggle to allow for warp data to be respected/not respected.

- **Vertical Flip**: A toggle to flip the entire viewport

- **Black Level**: A toggle to allow for black level data to be respected/not respected.

- **Colour**: A toggle to allow for colour data to be respected/not respected.

- **Status**: A Status readout to help the user diagnose issues with the MPCDI file chosen.

Configuration Page

The Configuration Page contains general controls of Hippotizer.
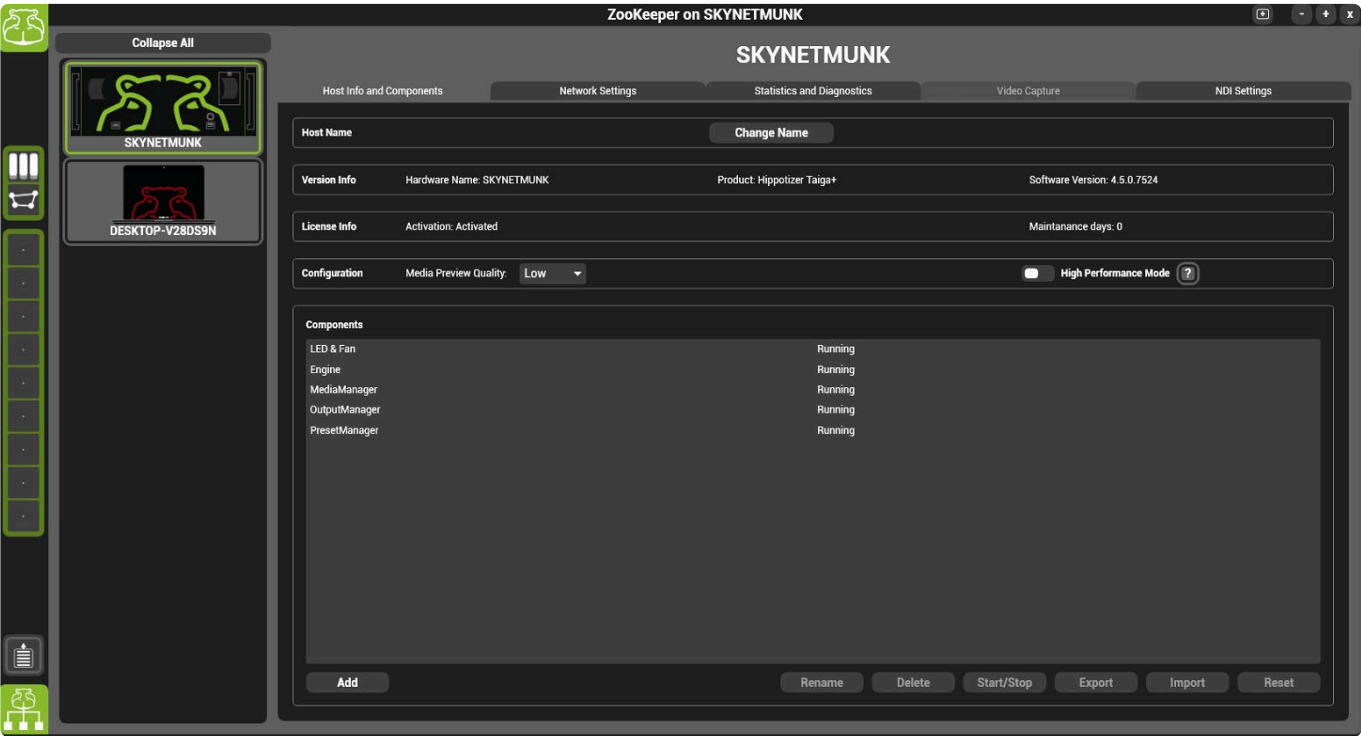
The Configuration Page has six main sections:
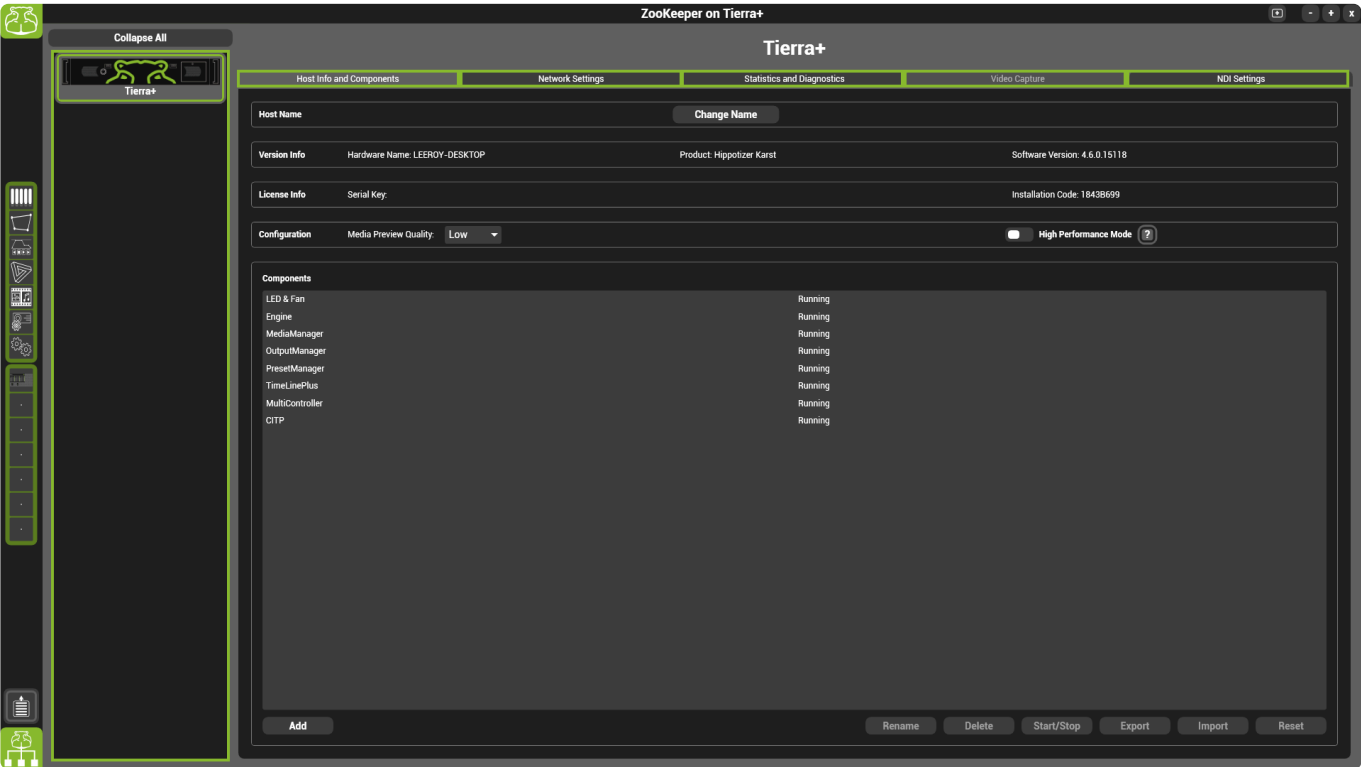
Host Selector

Displays all hosts on the local network. The highlighted host's settings are displayed to the right of the selector.

Configuration Tabs:

- [Host Info And Components](#)
- [Network Settings Tab](#)
- [Statistics And Diagnostics](#)
- [Video Capture Tab](#)
- [NDI Settings](#)

Host Info And Components

Host Info and Components contains basic Zookeeper settings
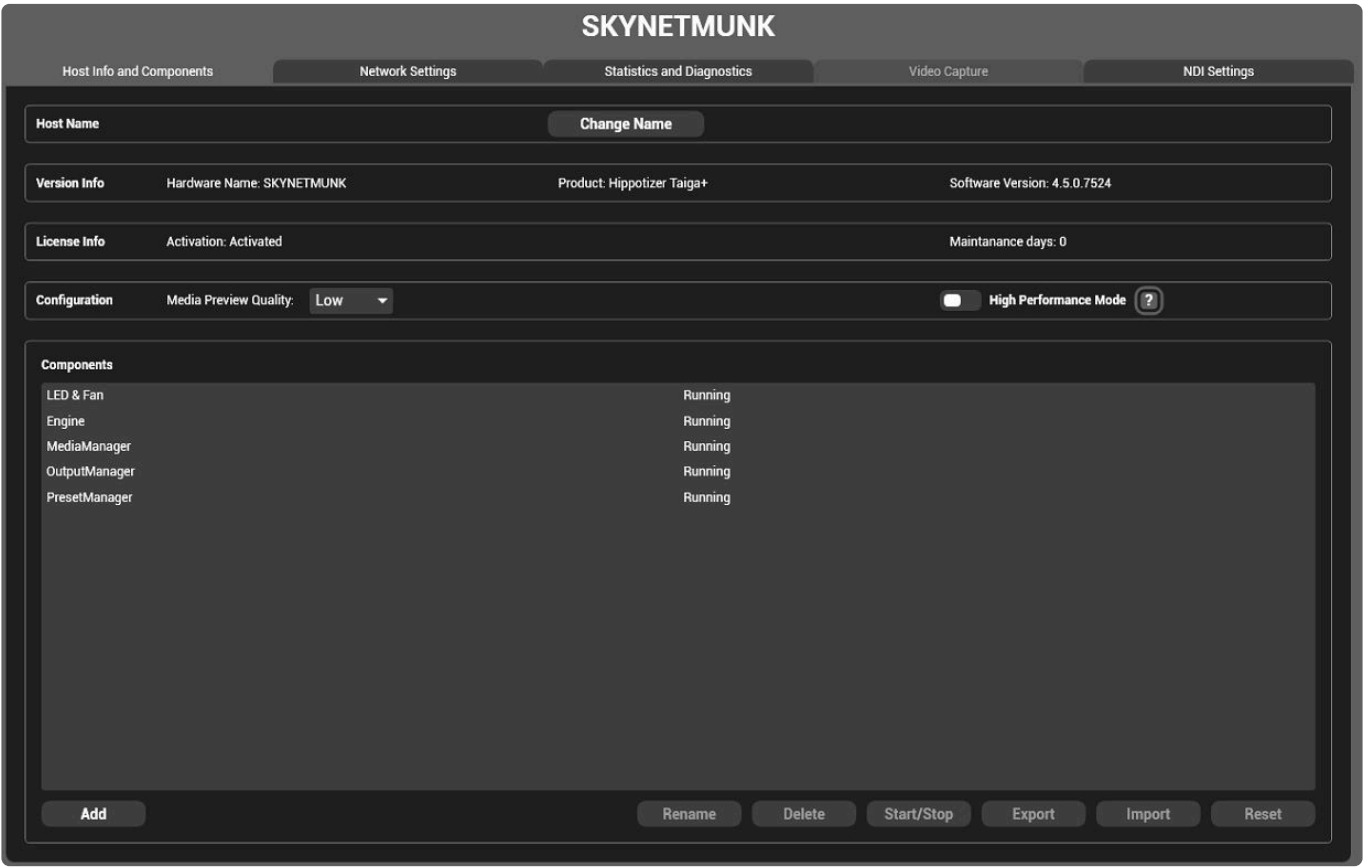
Host Name

The name of a system as it appears in HippoNet. By default, the Host Name is the computer's name. For a change to be displayed the engine must be restarted.

High Performance Mode

High performance mode disables previews and the visualiser to save resources. Using High Performance Mode is especially effective on systems with multiple mixes and/or 4K and above resolutions.

- **Enable** Previews and the visualiser are shut down.

- **Disable** The default. Previews and visualiser are enabled.

For situations with higher workloads and larger texture sizes (4K and above) it will also improve playback to enable High Performance Mode. This disables previews and also shuts down a texture sharing sub-system. When high performance mode is enabled, the Visualizer will not work.

Network Settings Tab

Network Settings shows the IP information of the selected Host.
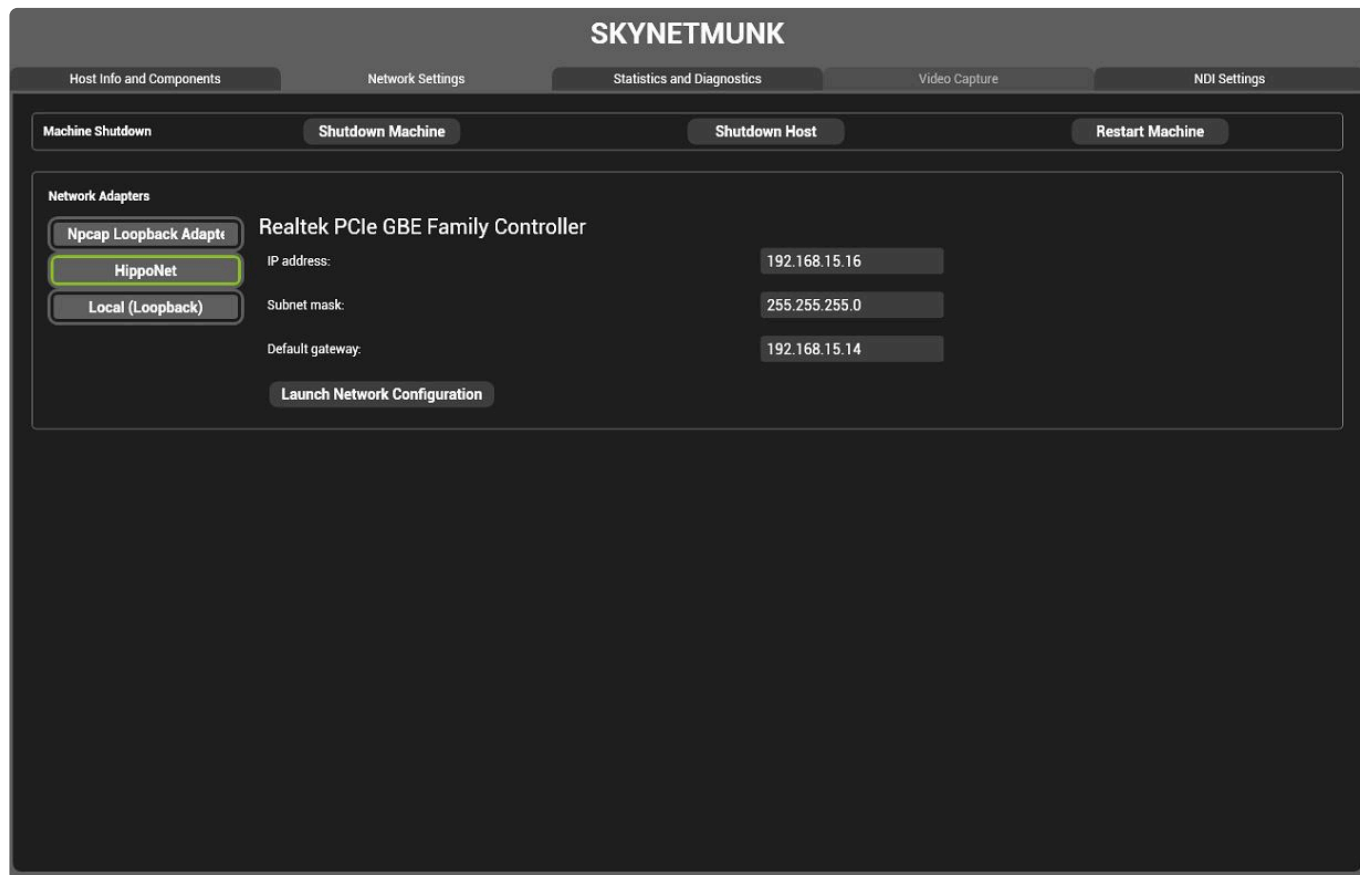
Machine Shut down

- **Shutdown Machine** Shuts down the selected machine completely. Hippotizer will save all settings as part of the shut down sequence.

- **Shutdown Host** Stops the Engine Host on the selected machine.

- **Restart Machine** Restarts the selected machine.

Network Settings

Displays the network information for the selected network connection.

The **Launch Network Config** function only controls the local host – it is not possible to change the IP address of a remote host from within Hippotizer.

Statistics And Diagnostics

Contains readouts of network traffic and real-time logging.

Statistics

Shows a snap-shot of network traffic.

Diagnostics

Shows a real-time view of logging filtered by component and log level.

Video Capture Tab

Displays detected capture cards.
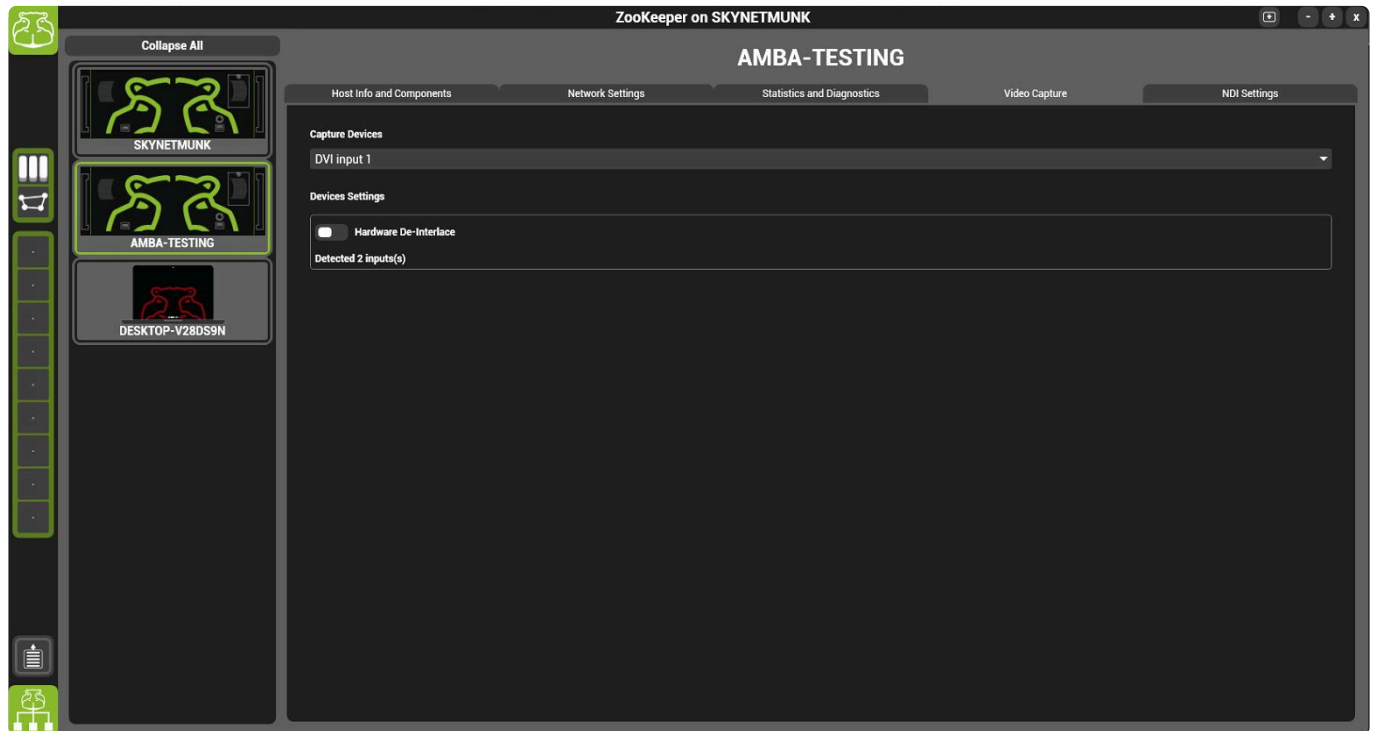
Hardware De-interlace

- **Disable** The default. Interlaced signals are presented to Hippotizer as interlaced.

- **Enable** Interlaced signals are de-interlaced by the capture card by combining two frames. in this way, two frames of 1920 × 1080 60i become one frame of 1920 × 1080 60p. This results in an additional frame of latency.

✱ The engine must be restarted for changes to hardware de-interlace to take effect.

NDI Settings

Maps NDI sources to slot on the NDI select pin used by every layer in Hippotizer
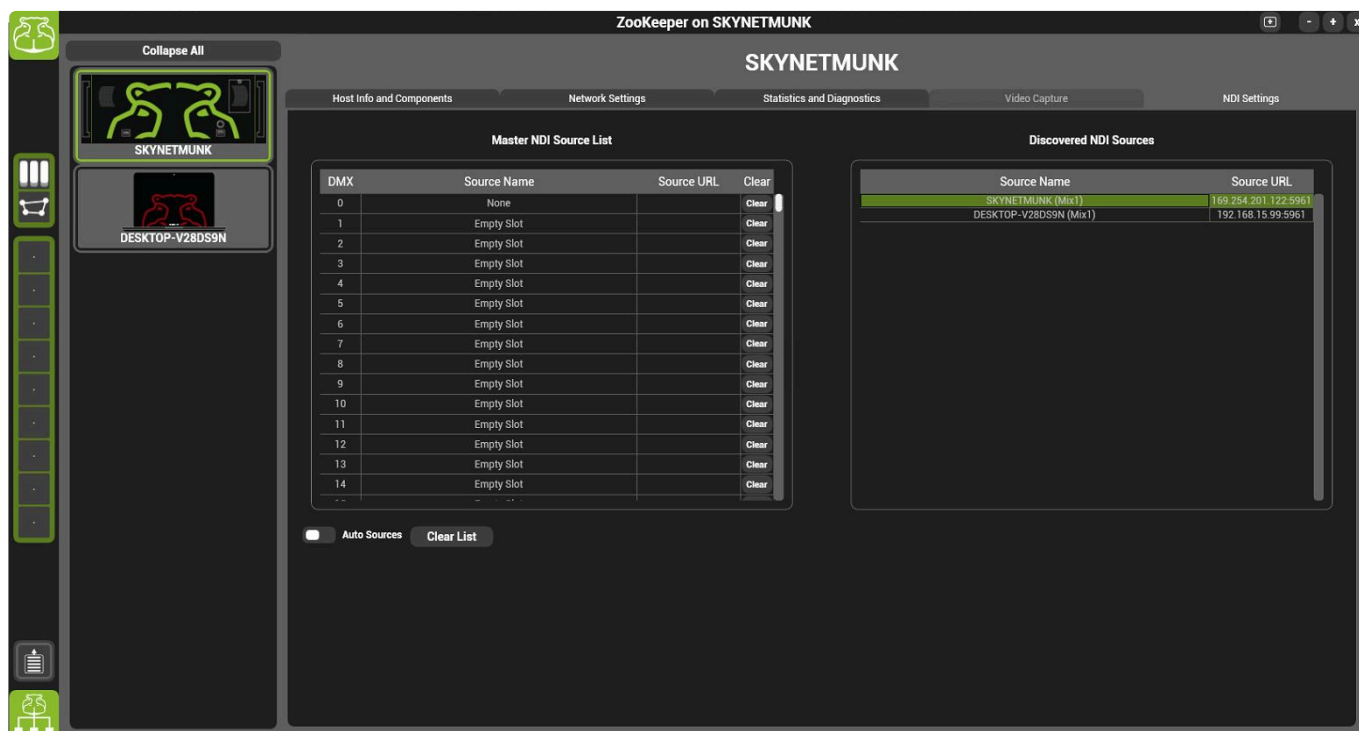
Master NDI Source List

The order of NDI sources as presented to the NDI select pin.

Discovered NDI Sources

NDI Sources currently present on the network.

Adding a Discovered NDI Source to the Master List

To add a discovered NDI Source to the master list:

1. Select a Discovered Source
2. Drag it onto the desired Master List Source

Auto Sources

Adds sources to the list as they appear.

> ✱ Setting the master list manually ensures the order of NDI will remain the same through restarts and network changes.

Zookeeper Settings

The settings of Zookeeper are accessed from the main page.
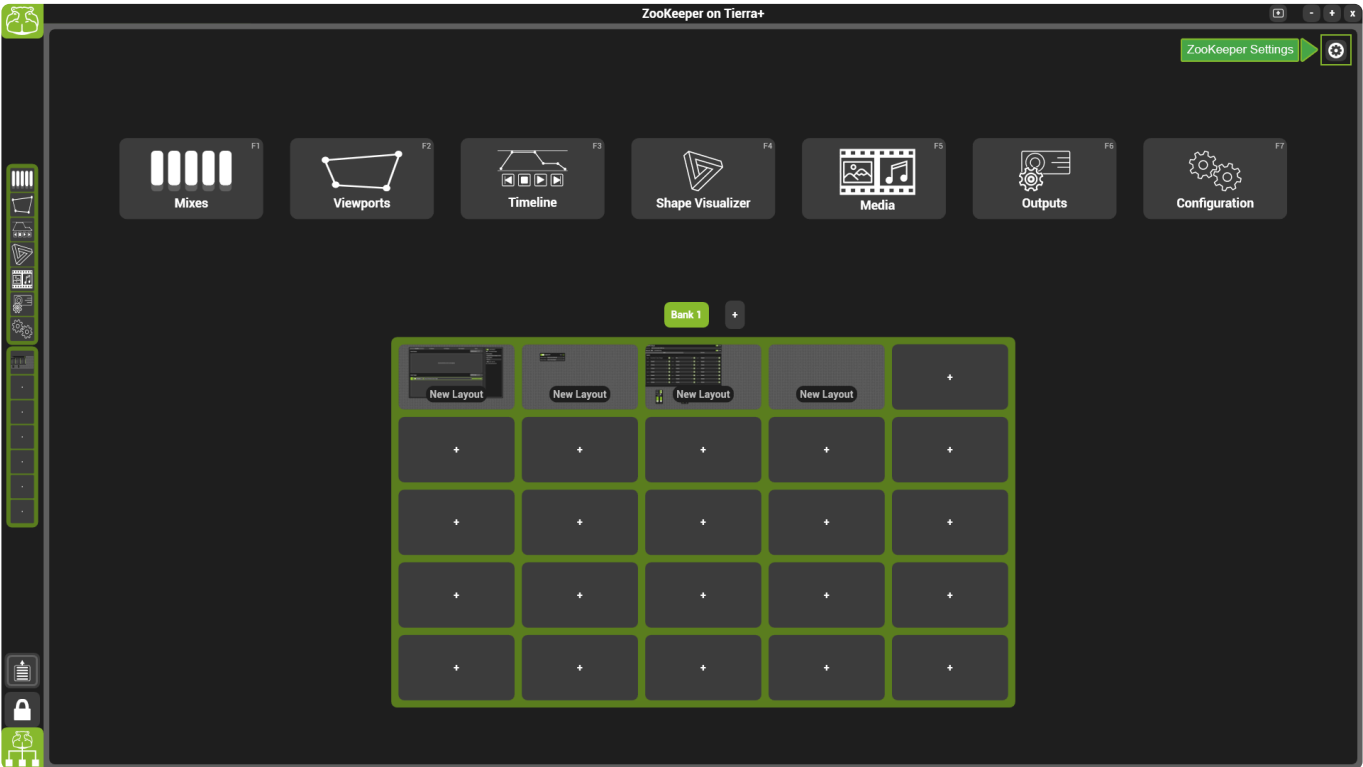
This opens Zookeeper's advanced menu:
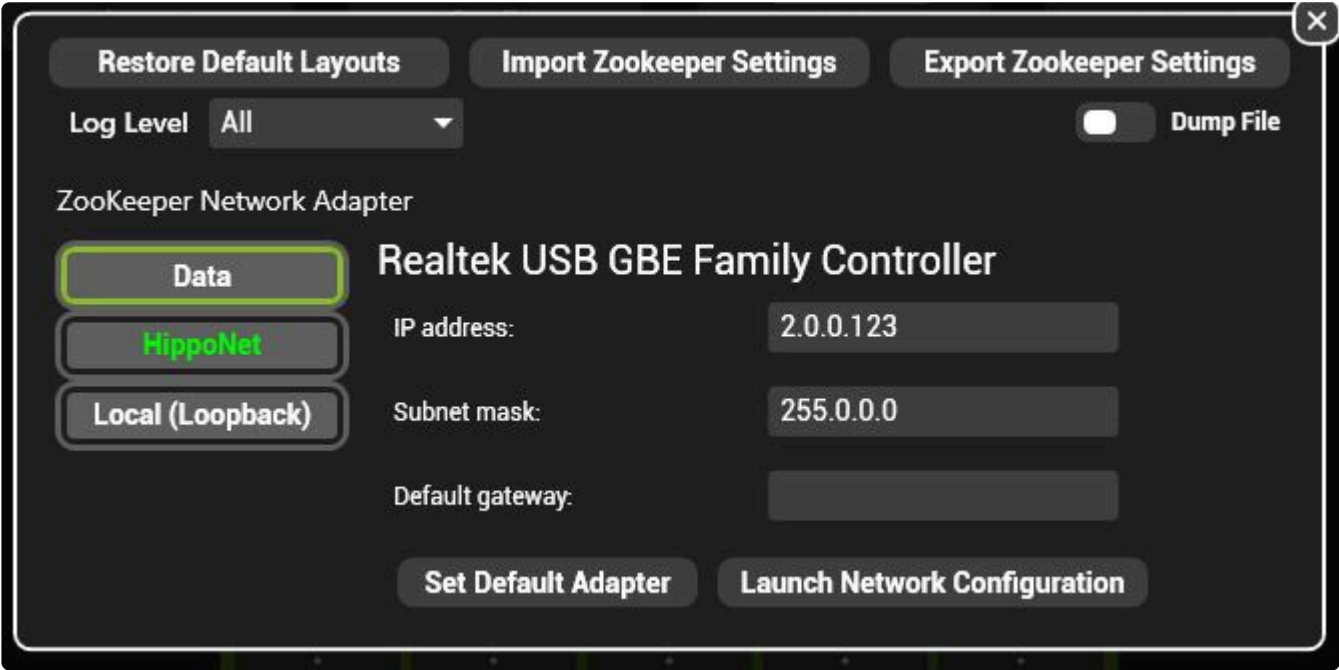
Restore Default Layouts
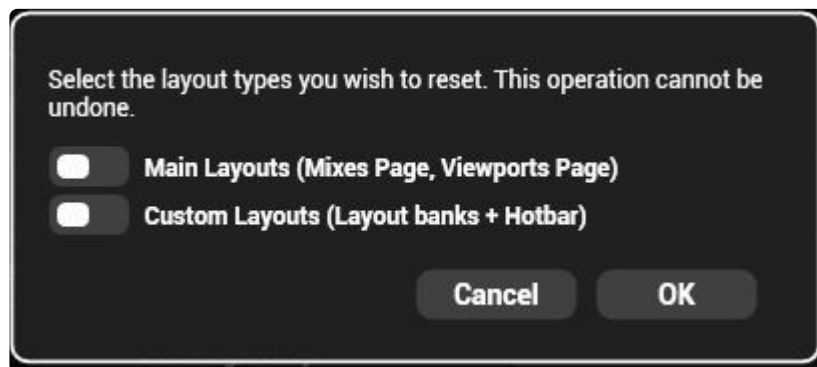
Main Layouts:

Resets the Mixes and Viewports page to the default state

Custom Layouts

Deletes all user created layouts

Import Zookeeper Settings

Loads layouts from a specified file.
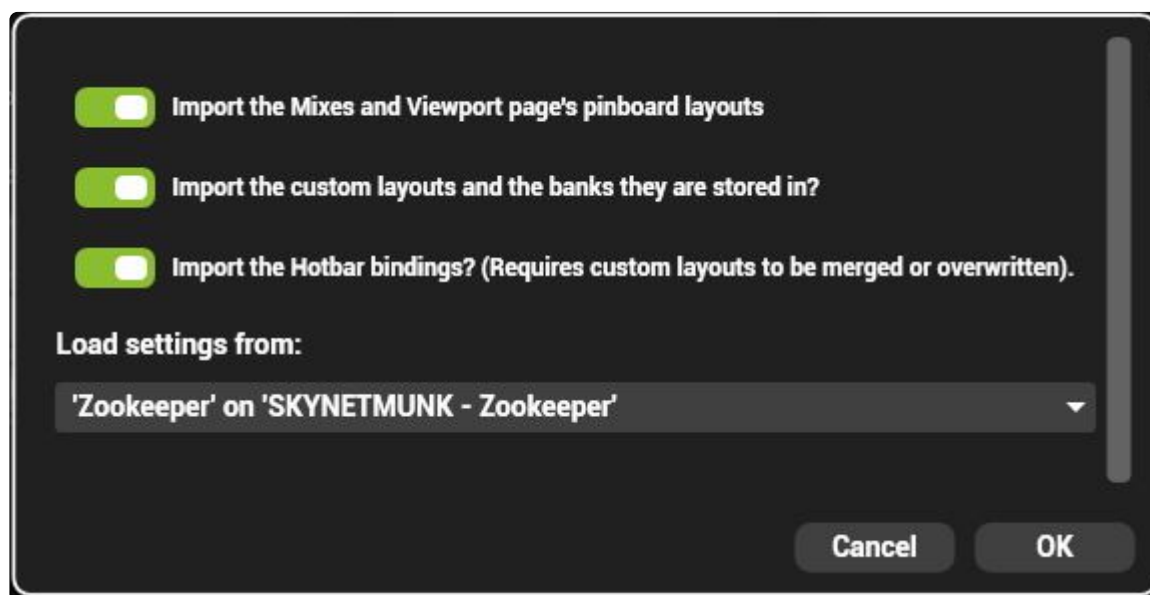
Import the mixes and viewports

Overwrites the mixes and viewports pages

Import custom pinboards

All custom layouts will be imported, overwriting the existing ones.

Import Hotbar bindings

Imports the associations of layouts to the quick access tab

Load Settings from

Choose the zookeeper to load from. Most often there is only one option

Remapping Components

Each component item in zookeeper is associated with a specific host on the network. If that host is not present on import, it must be remapped.
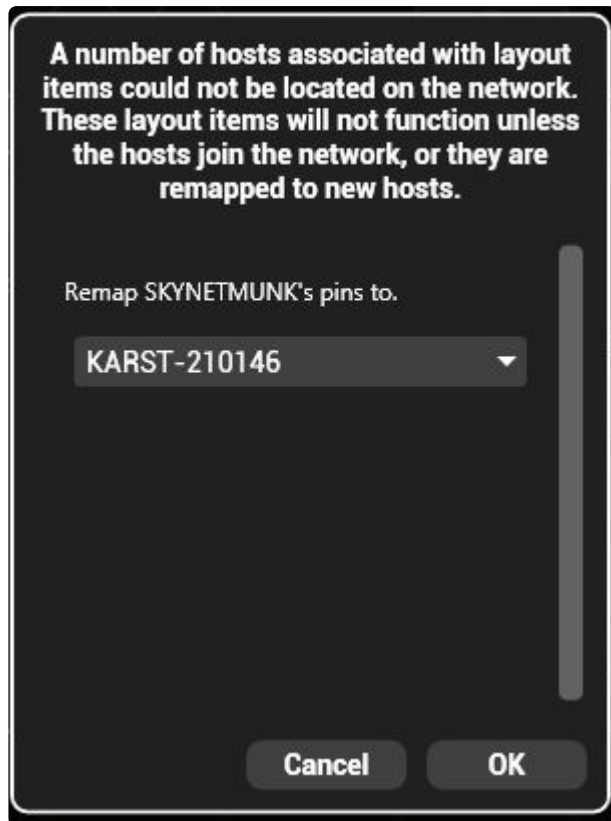
Choose the host that will become associated with the unassigned layout items.

Zookeeper Network Adaptor

Choose which Network adapter Zookeeper uses to communicate with the engine.

The network adapter with green text is currently in use. (Hippo-Net in the above example)

If the Loop-back adapter is used the local system will not be visible to other Hippotizer's on the network.

> ✱ The network adapter of the Engine and Zookeeper must match if controlling a local engine.

A more in depth discussion of Networking in Hippotizer is here.

Customizing the Interface

Creating a custom Zookeeper interface is among the most popular features of Hippotizer V4. The building blocks for the interface are:

- [Pin Boards](#)
- [Adding Elements to a Pin Board](#)
- [Previews](#)
- [Selectors](#)
- [Tabbed Selector](#)
- [Performance Meter](#)

Adding Elements to a Pin Board

Every item in the pin tree with a circle after the name can be added to a pin board.
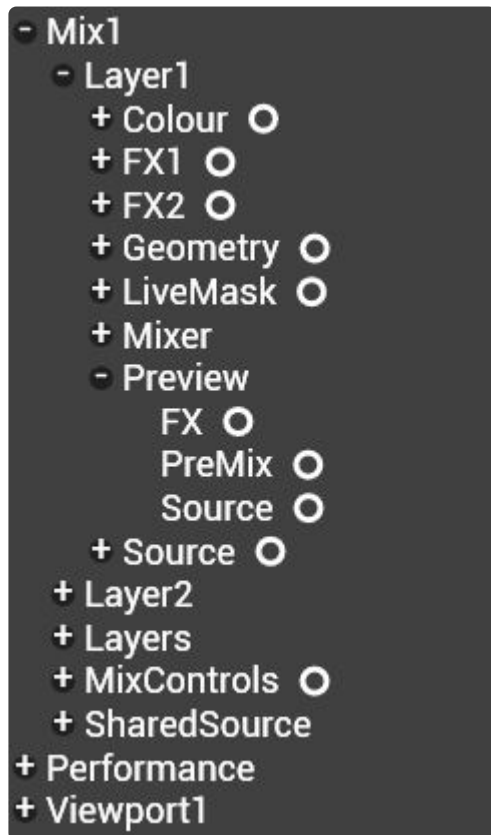
To add it, click into the circle and drag it into the pin board to the desired location.

Elements will draw show red if the position to be dropped collides with existing controls and green if not.
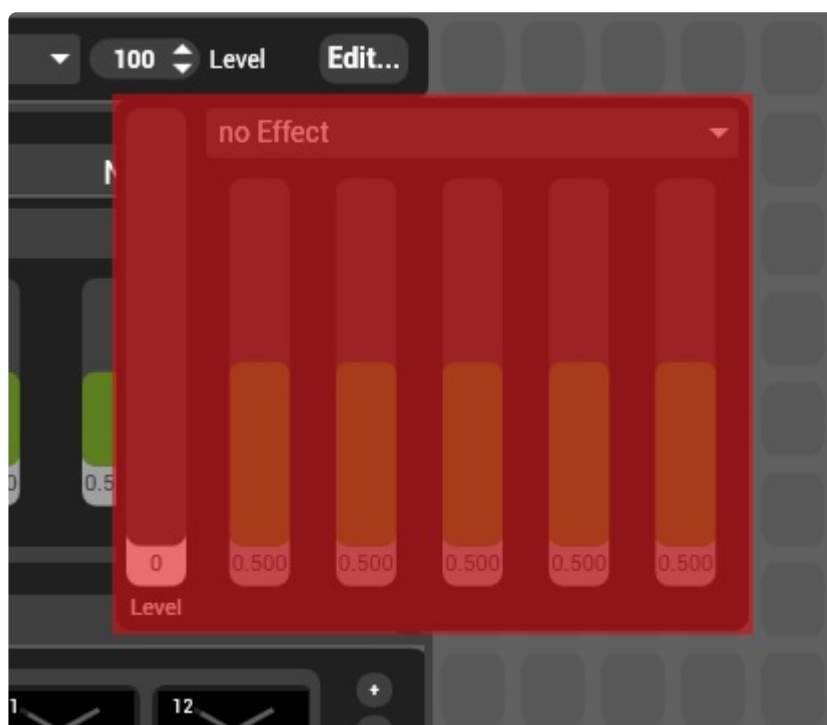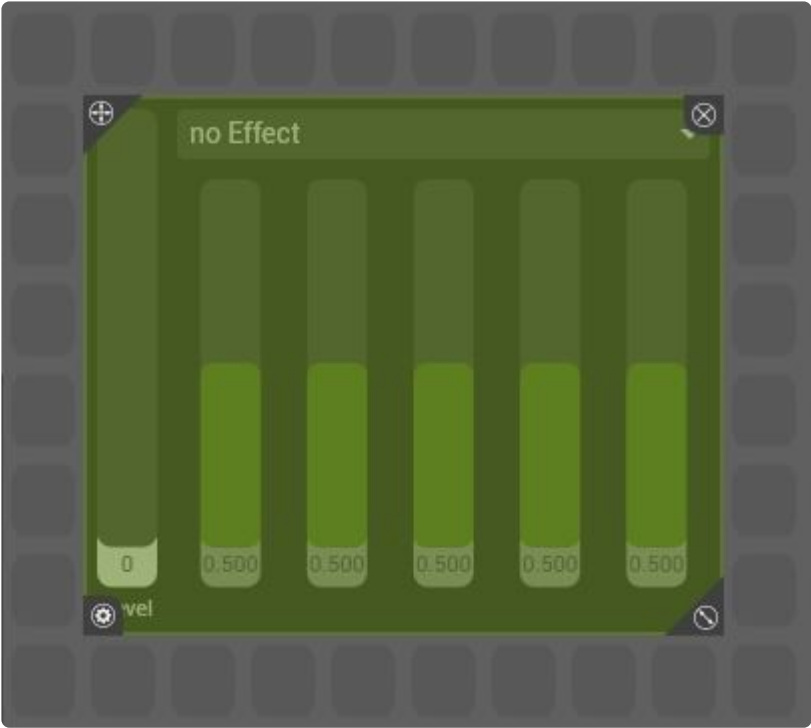
Elements on the pin board can be moved, resized and deleted when the pin board is **unlocked**.

To unlock the pin board, click the lock in the bottom left corner of Zookeeper.

Each pin Item now will show four buttons to modify it:
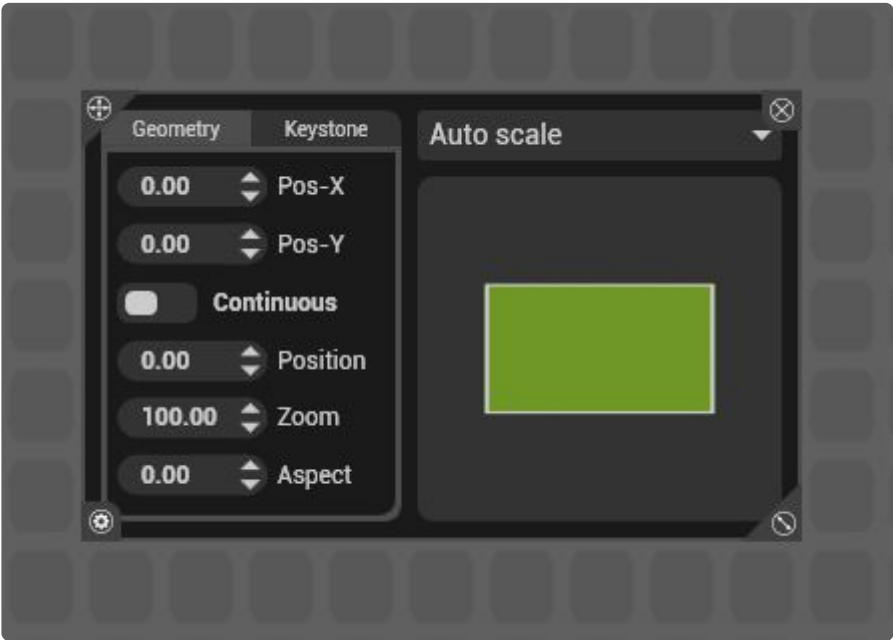
 Deletes the pin board item

 Click and drag to move the pin board item around the layout

Click and drag to make the item larger or smaller. Many controls have a minimum size.

Click to show the item's settings.

Pin Item Settings

Show Label

Displays the pin name of the item.

Item Type

Switches between different options for the pin item based on what the item is. For example Float Pins can be shown as sliders or dials. Some items such as the layer selector has options on how many mixes to show. .

Hippo Net

The **Hippo Net** is the collection of network based controls that make up Hippotizer. Each control is refereed to as a **Pin** and are the way that the engine can be communicated with. The Pins collectively call the Pin Tree in reference to their hierarchical nature.

Each Hippotizer engine appears in the HippoNet window of Zookeeper with the components running on that system listed
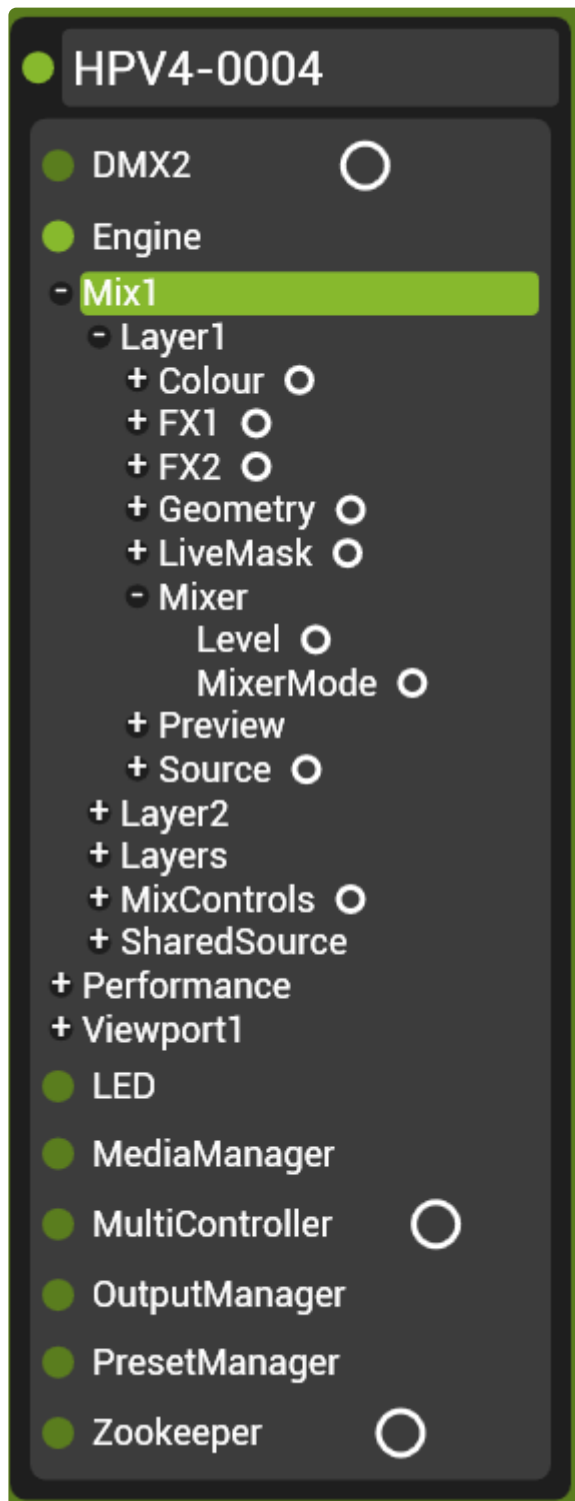
Each component contains Pins based on its function; click on the component to view it's pins.
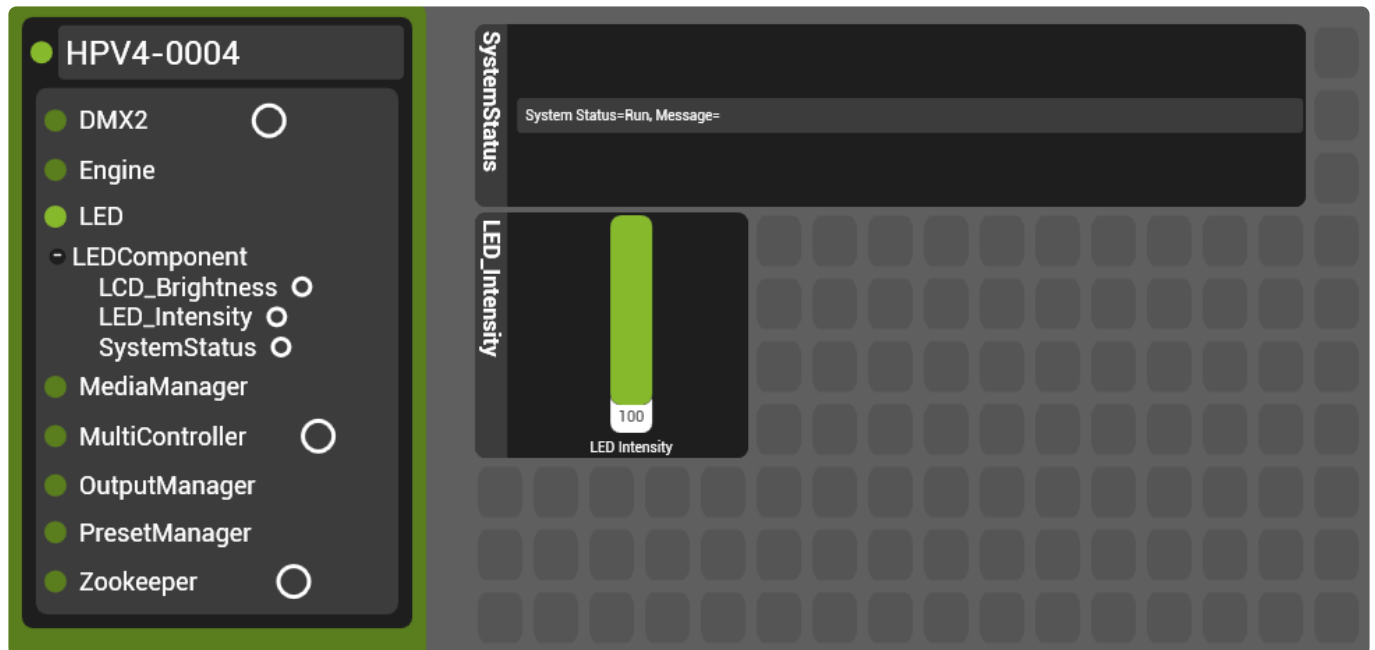
In the above example, the LED Component has been opened to show that it has a Pin controlling the LED and LCD Intensities as well as a status pin. The LED intensity has been dragged out as well as the status.

Some components, such as the Engine, will have a much more complex Pin Tree while others have none at all.

The organisation of the Pin Tree is important when controlling Hippotizer from external protocols such as OSC or TCP. Items that are shown only by unfolding the tree are said to be the children of that item. For example, in the LED Component above, the address or **Pin Path** for SystemStatus is expressed as:

LEDComponent/SystemStatus

Tip: The Pin Path of any item on the pin board can be seen quickly by hovering the mouse over it's name

Tabbed Selector
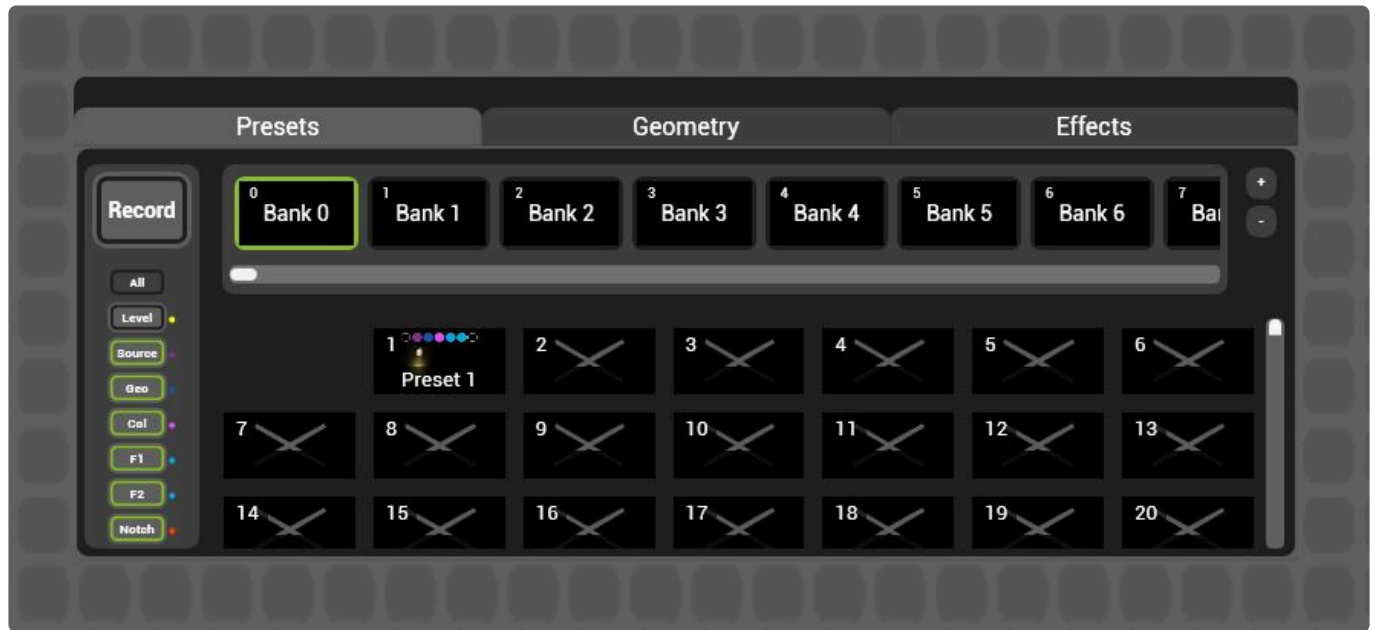
Tabs are a good way to stack controls for rapid access.

Tabs are similar to pinboards; they retain the hierarchy and rules of a standard pinboard.

Creating a Tab

To add a tabbed selector, drag it out from the HippoNet menu with the pinboard unlocked.

The selector can be resized and moved when the pinboard is unlocked.
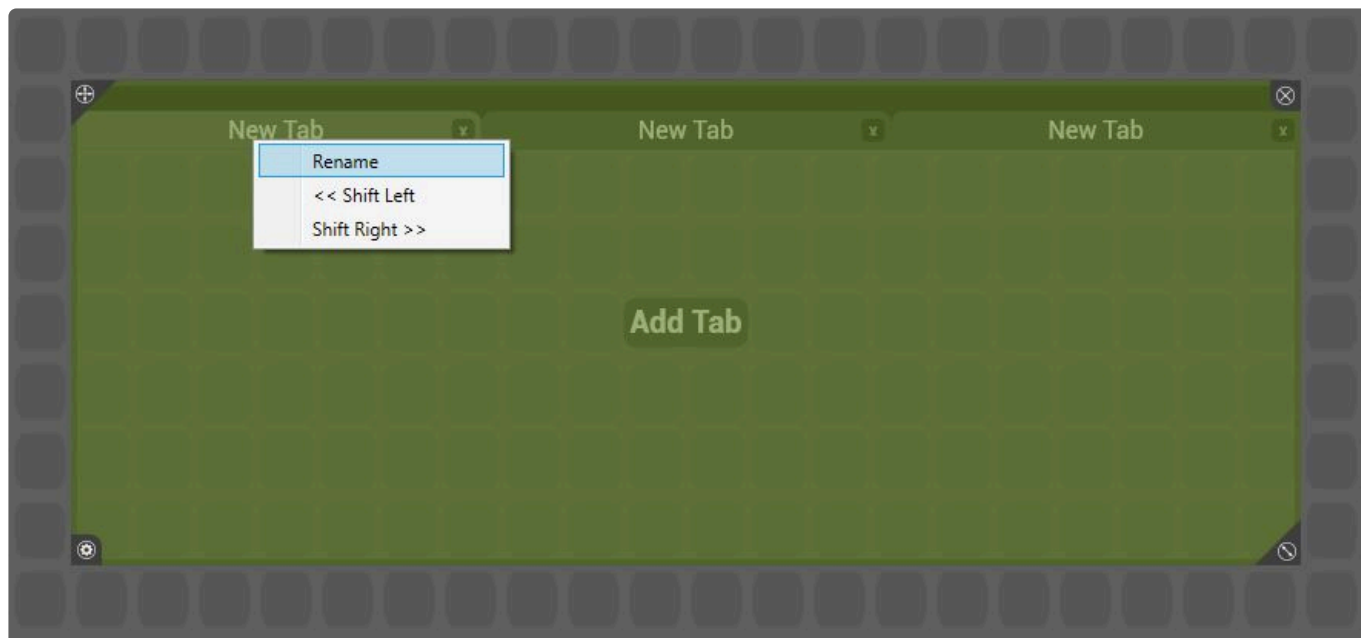
Rename

Names the tab. Tabs can also be renamed with the pinboard locked by right clicking and selecting rename.

Shift

Moves selected tab

Element Tray

The Element Tray is where non-Pin UI items are stored

Some items such has selectors, groups and labels are not pins. To add these to the pin board, open Hippo Net and unlock the board.

Each icon indicates a different UI item that can be dragged on to the pinboard.

Layer Selector

Mix Selector

Viewport Selector

Host Selector

Visualiser Window

Label

Clock

Group

Tabbed Window

Beat Counter

HippoNet Advanced

Beat Counter

The beat counter is a quick way to determine tempo
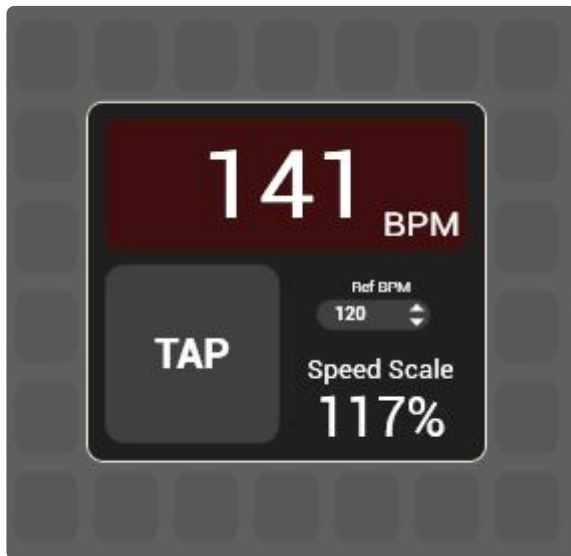
Click the **Tap** button in time with the beat of music and the Beats Per Minute (BPM) will be displayed.

HippoNet Advanced

HippoNet Advanced is a Diagnostic tool for the pin tree

HippoNet Advanced is primarily used as a development tool for Green Hippo.

Unlike other pin tree views, HippoNet Advanced does not filter what is shown; all pins are displayed.

Hosts and Components

Displays all hosts and components on the network. Some hosts (such as Zookeeper) will contain meaningless information.

Details

All pins and pin groups within the selected host or component.

Pin Info

Many pins contain data that is passed along with the pin value throughout HippoNet. This is known as Pin Info. The information is shown for the selected pin if it exists.

Pin info determines what information is shown in the Zookeeper interface, including the pin default.

Hide Flags

Some pins are hidden as they are not useful to the user. There are several different filters that a pin can have to hide it from certain views and components, these are known as Hide Flags. The flags include:

- **ePHFNone** Not hidden
- **ePHFDMX** Hides from the DMX component's pin selector for personality creation
- **ePHFTimeline** Hides from timeline so tracks are not created for these pins
- **ePHFGUI** Hides it from the standard HippoNet view.

Class Tree

Shows how the Pin Class is derived from it's parent group pin.

Hovering over the **GUID** symbol will display the Pinclass Globally Unique ID (GUID).

Selectors

It is often not enough to place static items on the board, usually controls need to switch in context with a selection.

A **Selector** automatically sets all items within it to refer to the selected item.
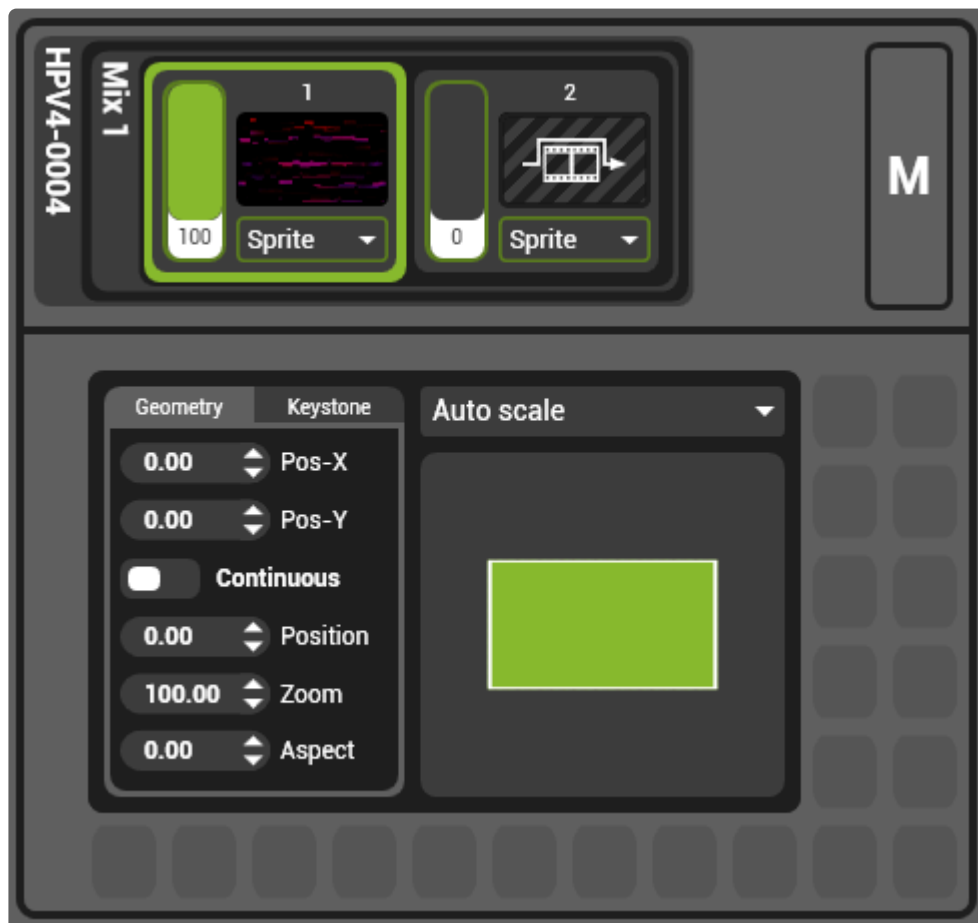
In the above image, the layer geometry has been placed inside a Layer selector. Click on layer two would automatically show layer two's geometry.

There are different types of selectors.

Adding a Selector to the Pinboard

- Unlock the pin board by clicking the lock

- Then expand Hippo net by clicking the Hippo Net Icon

The selectors are part of the the list of special Pin Items:

 Layer Selector

 Mix Selector

 Viewport Selector

 Host Selector

The default mix view has a good example of this.

The mixes page is actually a Mix selector with a layer selector nested inside.

Editing selectors.

From version 4.3, the concept of a selected UI item when editing has been introduced.

With the pinboard unlocked, clicking on a UI item will select it for editing.

Choosing to edit a selector requires specific areas to be clicked.

For the Layer selector click where layers are shown

For the Mix Selector click where mixes are shown

Previews

A video preview item can be added to the Pinboard.
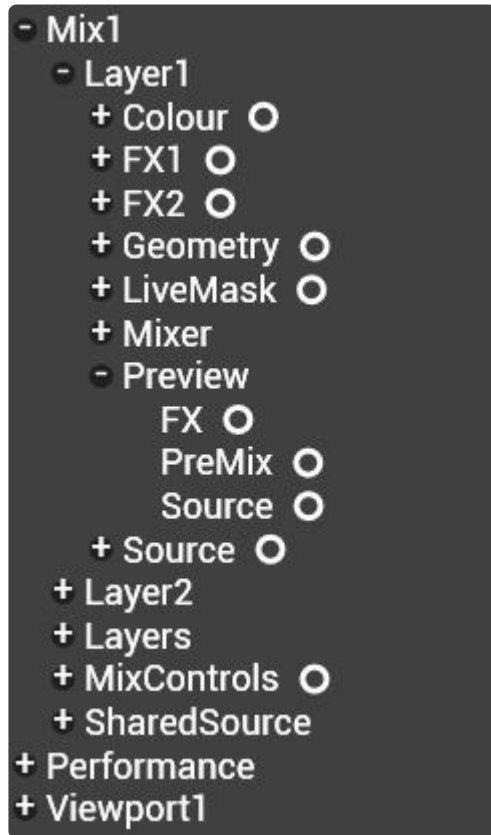
Each layer, mix and viewport has previews that can be used.

In the layer and mix, there are three options of previews:

- **Source:** Shows what is playing in the source only (Media player, Generator etc.)

- **FX:** Previews the post-effects result.

- **PreMix:** Previews post Geometry and colour.

Performance Meter

There are a number of tools in Hippotizer to view and monitor the performance of a system.

The basic Performance Meter provides an overview of system utilisation and temperature and is added by dragging out the **Performance** group from the Pin tree.
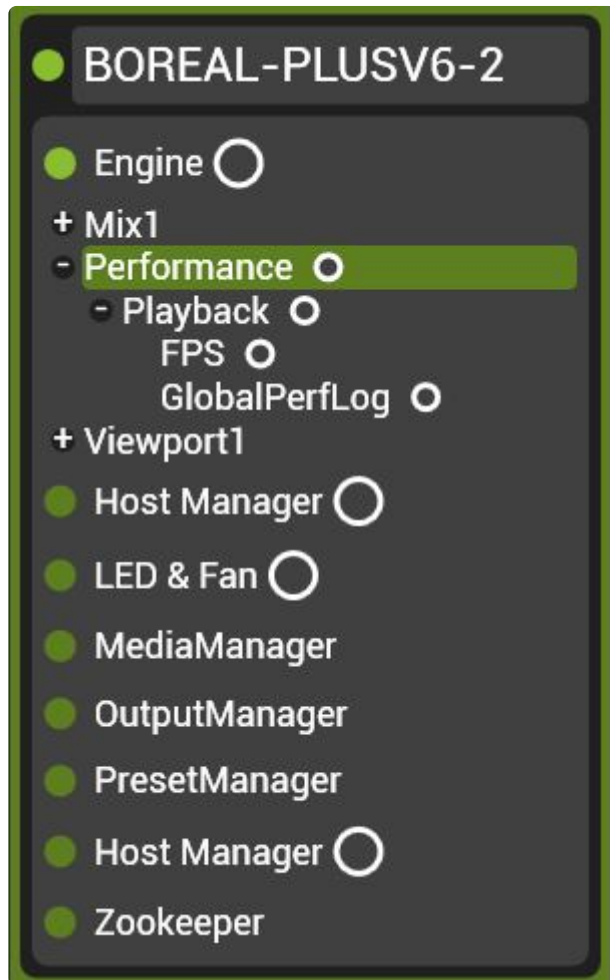
Performance Meter

The Performance Meter is a computationally light-weight way of observing the status of Hippotizer.
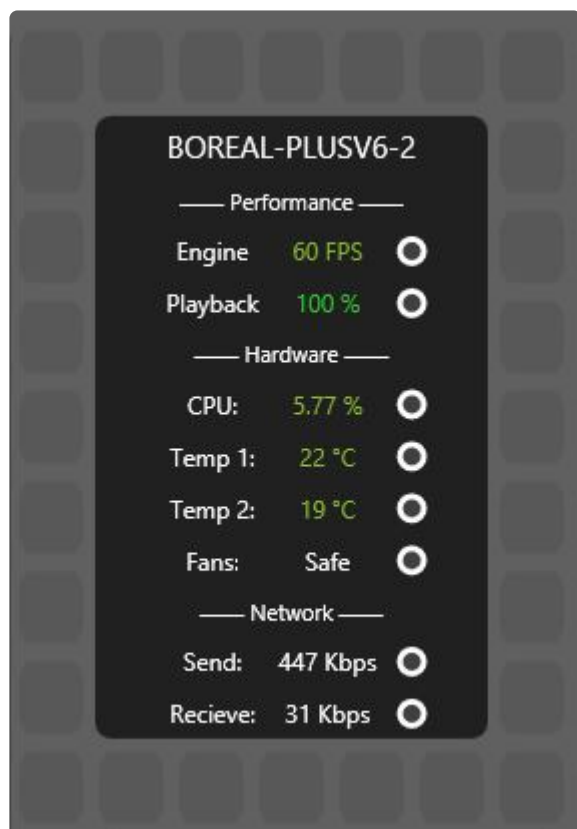
Performance

Engine

Engine Frame Rate is a measure of how fast Hippotizer's engine (The Render Component or RC) can complete a render loop. Each loop processes all layers, mixes, effects and plugins. The engine will render as fast as it can up to the frame-rate of the output (commonly 50 or 60 FPS). If the engine is rendering slightly below 60FPS it does not necessarily mean that output will be un-smooth; all it means is that the render loop is taking longer then the desired frame-rate will allow.

> Note: The time it takes to show captured video (the latency) will become longer as the engine frame-rate decreases. Capture delay is a set number of frames (4 Frames), which at 60 FPS implies a delay of 66ms. A longer render time per frame will increase the latency.

Playback

This is a trailing average indicating what percentage of frames in the last 2 seconds have been rendered. Under normal circumstances, a media player will render 100%.

Hardware

CPU

The percentage utilisation of the computer's Central Processing Unit (CPU). Consistent readings above 70% will likely lead to degraded performance. Much of the processing is done on the Graphics Processing Unit (the Graphics card or GPU) but some work resides on the CPU including:

- Media Encode and Transcode
- Some media decode such as FlexRes Quality
- Windows background programs

Temp 1 and Temp 2:

> Note: Amba and Amba+ have a different temperature control system which does not report back to Zookeeper.

Provides reading from two temperature sensors mounted inside the case. Temperatures of 35 degrees and below are considered normal.
The fan speeds will increase automatically with the system temperature depending on the chosen profile.

Normal *The Default* Fans will always run at a basic level and ramp up with temperature increases.
Quiet Fans will run at a very low speed and ramp up only as the system gets above 30 Degrees.
Safe Fans will run at a higher speed at all times.

Green Hippo recommends Normal fan profiles for most applications. Where noise is an issue, Quiet mode is advised. In permanent installations Safe Mode is suggested.

Network

Send/Receive

Displays the volume of traffic on the HippoNet network connection.

Zookeeper Functions

Pin Boards

A **Pinboard** is the window on which controls are placed to create a layout. Zookeeper has banks of 25 pinboards available from the main page.

To create a new layout, double click on an empty Pinboard to open it.

Elements are added to the Pinboard by dragging items out of the Pin Tree.

Open the Pin tree by pressing the HippoNet button: at the bottom left corner of the window.

Once open, any item that can be added to the Pinboard has a small circle to the right of it. Drag the circle onto the pinboard to create a layout.

The order and layout of the pin tree is explained in depth here.

Quick Access Buttons

On the left side of Zookeeper are seven factory and nine user configurable quick access buttons.

To add a Layout to quick access, drag it from the Zookeeper main page onto the desired button.

SHAPE Visualiser
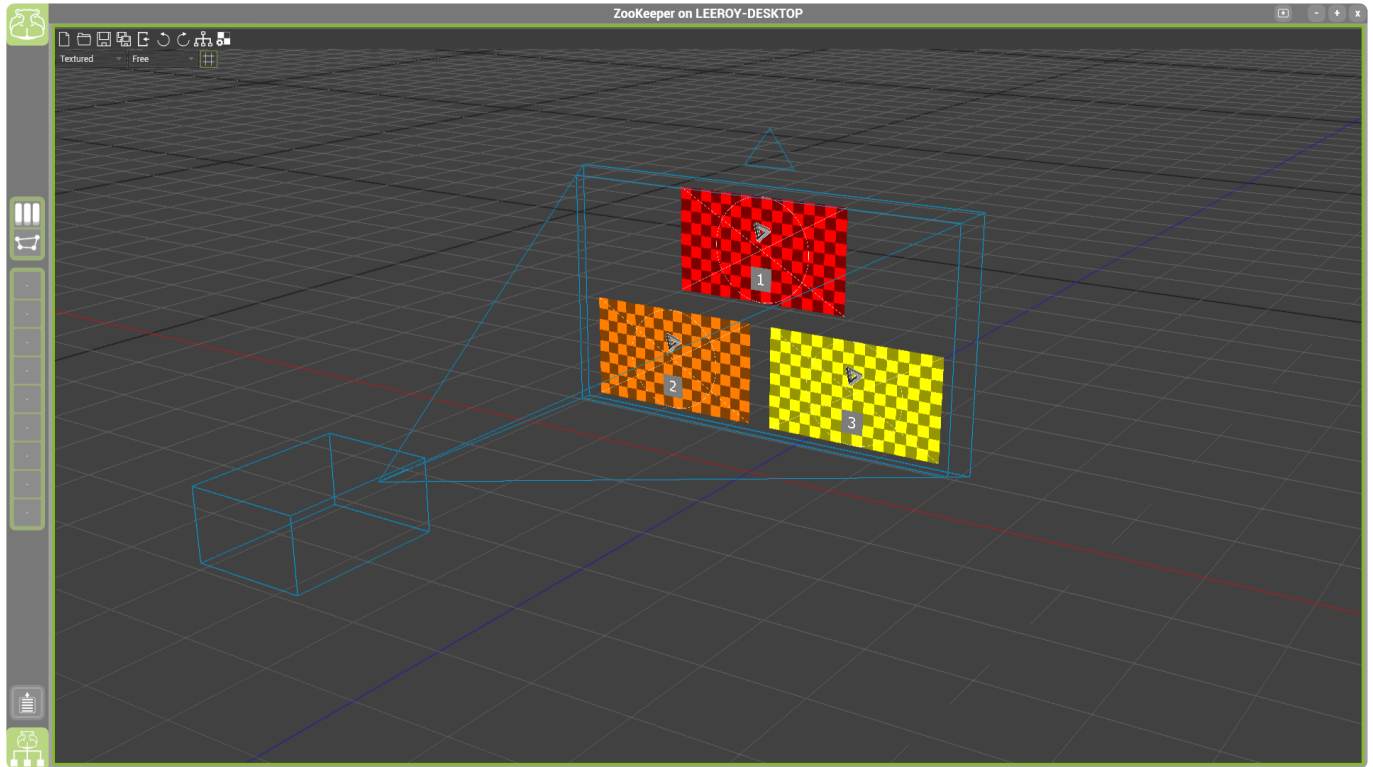
The SHAPE visualaizer is a digital visualiser generated from a previously configured SHAPE project file or factory SHAPE project. This page offers controls for mapping Hippotizer outputs to the visualizer screens, view and display types, as well as network sharing controls for live updates of the view from changes in the SHAPE 3D environment. This view is also embedded in the timeline+ component.

Toolbar Icons

Create a new blank SHAPE visualizer.

Open an existing SHAPE project file.

Save the current SHAPE project.

Specify the name and location to save the current SHAPE project.

Import a 3D model into the SHAPE visualiser.

⟳ Undo previous step.

⟳ Redo last undo.

⊞ Network toggle for live data exchange with SHAPE software.

⊡ Configure the outputs from Hippotizer to SHAPE surface inputs.

Textured ▾ Change the display type of the SHAPE visualiser viewport.

Free ▾ Change the view type of the SHAPE visualiser viewport.

⊞ Toggle the alignment grid On/Off.

Configuring Inputs
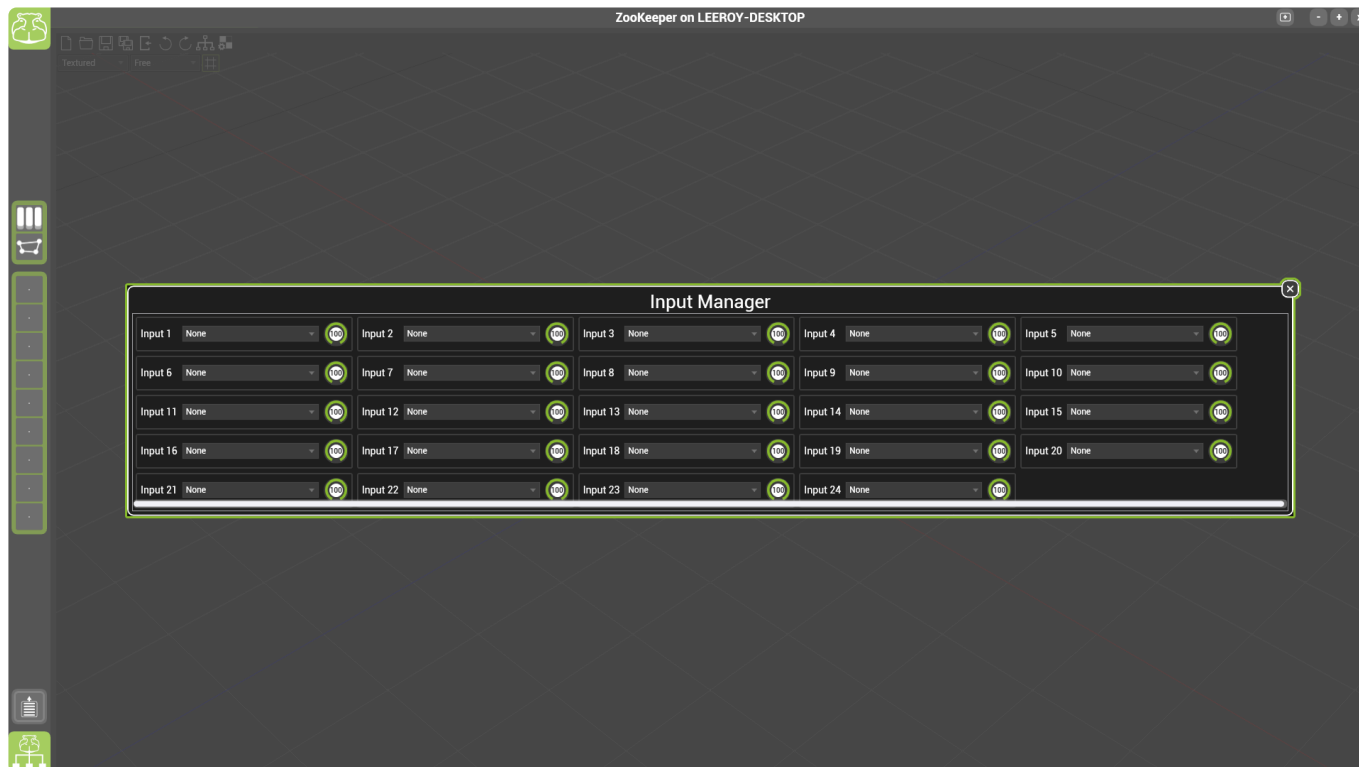
The input manager shows a list of all inputs into the SHAPE software which can each be mapped to a surface, alone they represent the link between Hippotizer and ZooKeeper's SHAPE visualiser only. Therefore, for content to be displayed onto the model in the 3D environment each input must be assigned a Mix from the active Hippotizer show. Clicking the drop down menu next to an input will show all the Mixes currently in the show, after selecting an option the output of that selection will now be assigned to the input. Inputs can then be mapped as a material to object surfaces in SHAPE.

To configure SHAPE inputs for the engine please refer to the **SHAPE viewport**, or **SHAPE manual**.

Components

Hippotizer is based around a series of plugins called **components** each adding functionality.

Managing components is an important part of setting up the Hippotizer system.

Information about the basics of components can be found here.

Components in Hippotizer:

Beatbridge

Triggers parameters of Hippotizer in time with an audio source.

CITP

Enables the transfer of thumbnails and previews between Hippotizer, lighting desks or visualisation software.

DMX2

Enables Hippotizer to be controlled from DMX Lightning desks over ArtNet, MA-Net or sACN.

Engine

Runs by default renders the video output.

HippoSnapper

Allows a still image to be taken of a mix or layer and saved to the media map.

LED & Fan Component

Runs by default: operates the LED indicator lights on the front of Hippotizer systems and cooling fans.

MacroManager

Enables scripts (or Macros) to be written to customise Hippotizer functionality.

MediaManager

Runs by default: organizes and encodes media into Hippotizer.

MultiController

Sends and receives data from external controllers such as MIDI and TCP devices.

Output Manager

Runs by default: configures the number and resolution of mixes and places outputs on displays.

PinBridge

PinBridge allows functions to be grouped together and controlled by a single pin.

PixelMapperV4

Allows Hippotizer to control lights over ArtNet, KiNet or sACN.

Preset Manager

Runs by default saves and recalls sets of pin values for Layers, Mixes and Viewports.

ScreenWarp Manager

Creates warps and blends for use on viewport.

SHAPE

The SHAPE software provides a 3D worflow for Hippotizer to enable projection mapping, object tracking and advanced projection tools.

Sync Manager

Manages time synchronisation between systems including receiving timecode from external devices. (LTC and Midi Timecode)

Timeline

Allows the playback of sequences of values for show recall from video-editor based timelines.

VideoMapper

Transposes pixels from input to output textures for the mapping of complex output configurations. Frequently used for mapping video tiles.

Component Basics

Each component in Hippotizer adds functionality. Some components run by default and should not be stopped, others can be enabled or disabled as required.

> ❗ Starting or stopping a component can be a disruptive action as the pin tree will change, potentially affecting every Hippotizer on the network. Do not start or stop components in a live environment.

- [Starting and Stopping Components](#)
- [Saving or loading a component](#)

The Hippotizer software runs a **host** within which each component operates.

Note: The words host, engine and HFW (Hippotizer FrameWork) are sometimes used interchangeably. In reality, Hippotizer operates on several levels; HFW is the overall container which runs Hosts. Zookeeper and the Engine run their own Hosts. Components run within a Host, however, only the engine host can start components.

Starting and Stopping Components

Hippotizer V4 starts up by default with a few components which are required for basic operation. In order to enable additional functionalities, it is necessary to add the relevant component.

To start a new component:

Go to the Configuration page of Zookeeper
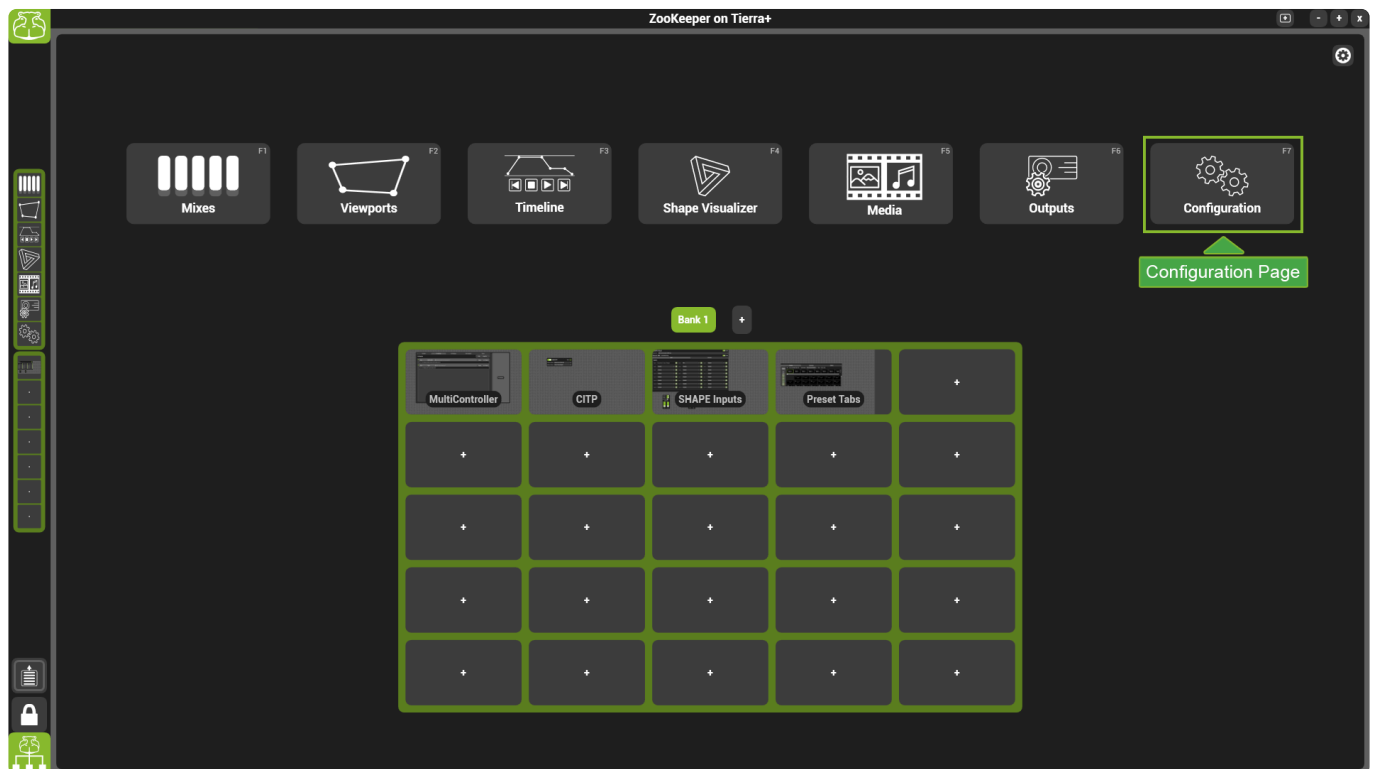
By Default, the configuration window will show a list of all components currently added to the system

> Note: Once components have been added to the system they can be set to run or stop. A stopped component retains it's settings but will not function. Deleting a component will erase all of it's settings.

To add a new component, press the add button and select the desired component from the list.
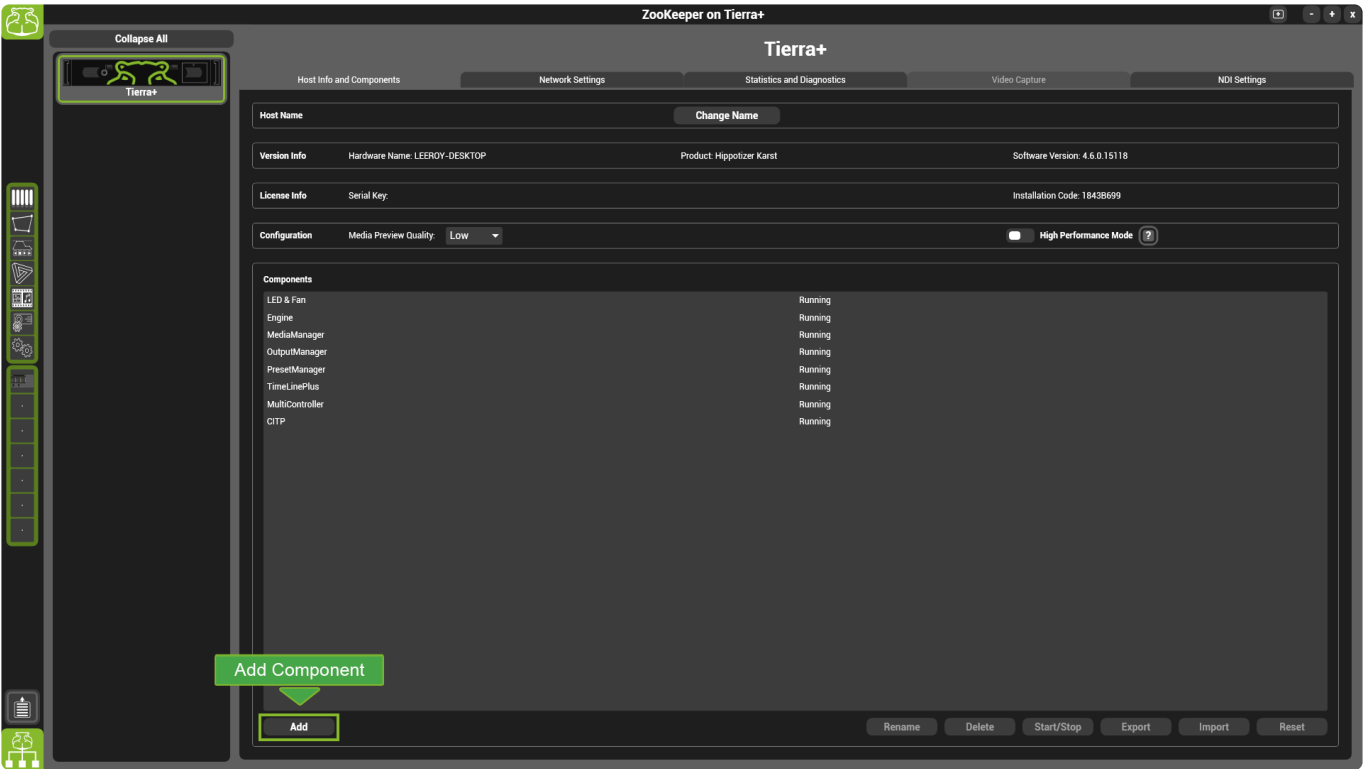
To stop or delete a component, select the component and select the operation from below list.

Saving or loading a component

Many components have information that can saved or imported.

Exporting a component
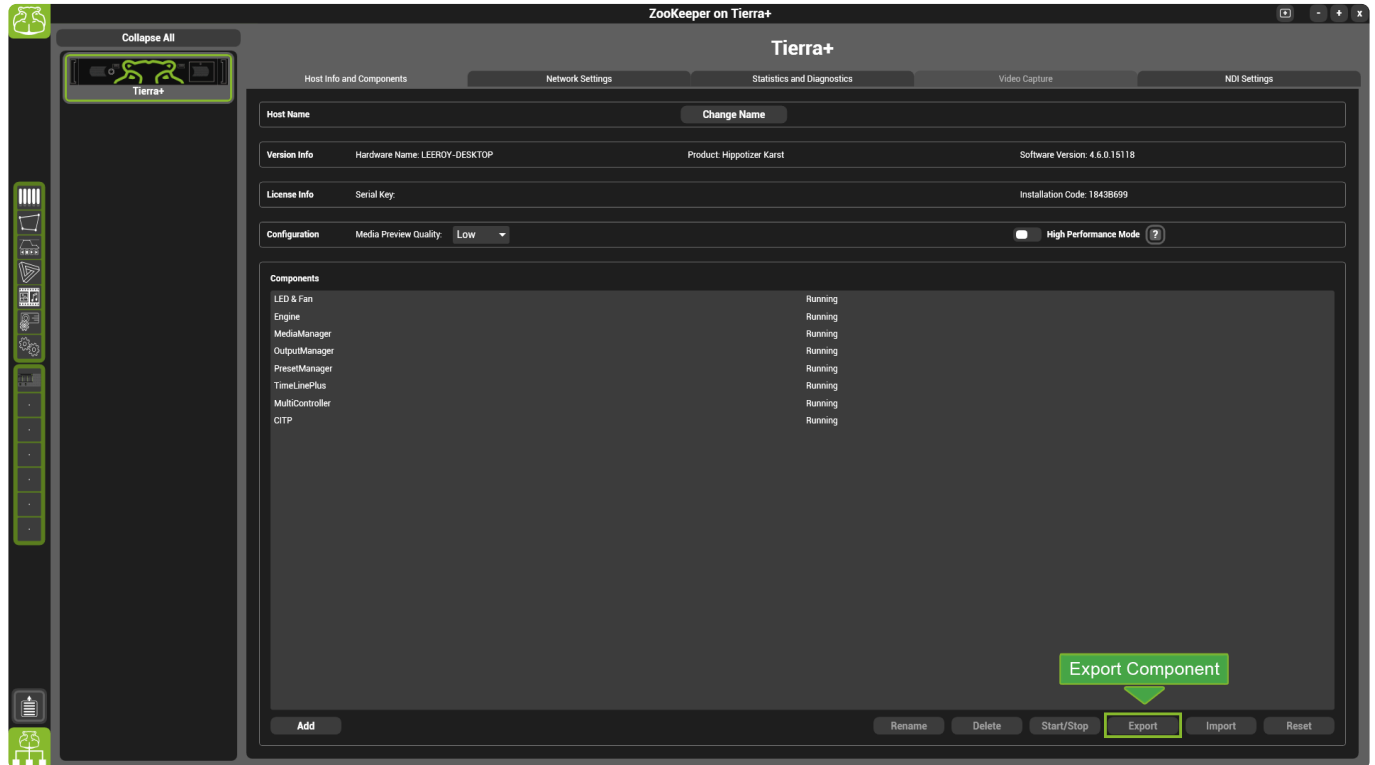
To export data from a component:

- Choose the Component from the list in Zookeeper Configuration
- Select the Component
- Click Export
- Choose a location to save it

Component exports are saved as the component name .ghp. Each export is specific to the type of component, so it is best to leave the type of component clear in the name.

Importing a component
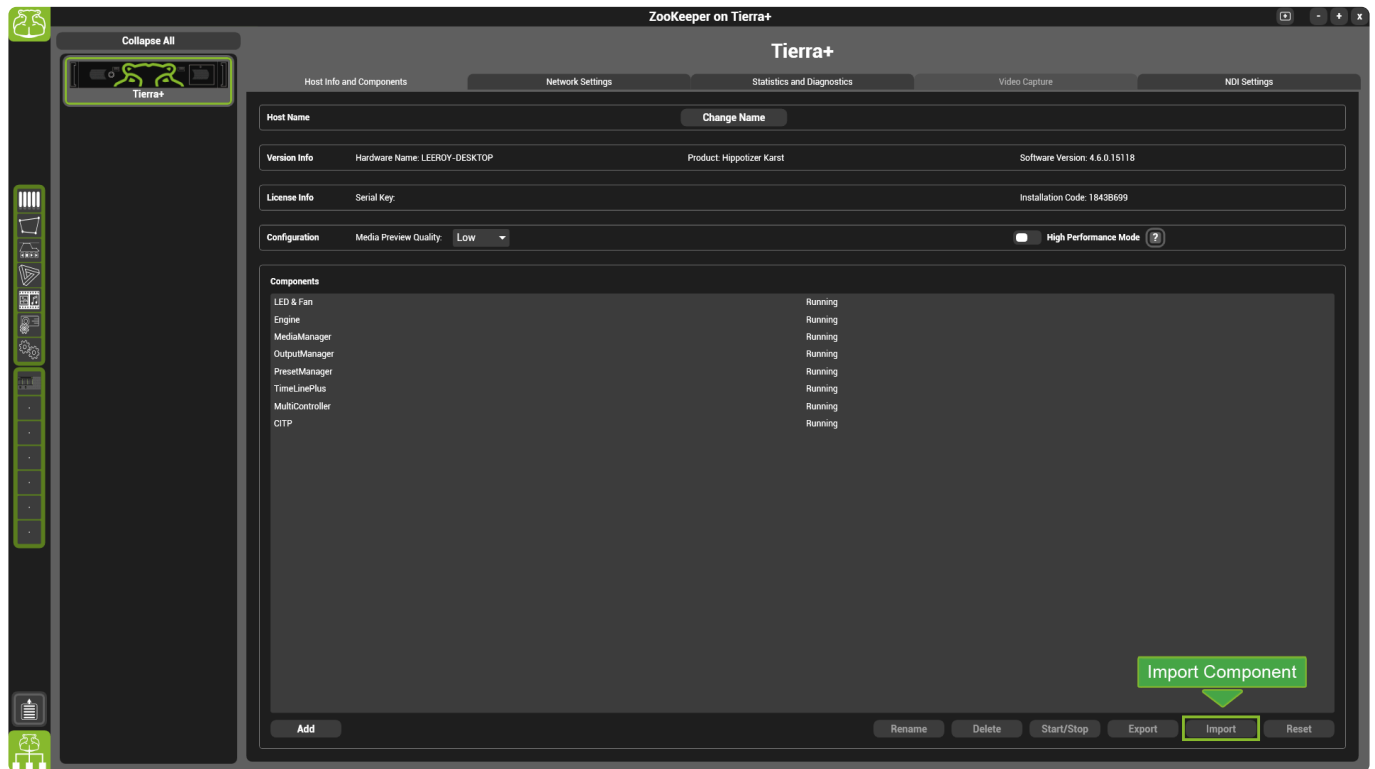
To import data to a component:

- Choose the component from the list in Zookeeper Configuration. If the component is not in the list, add it.
- Click Import
- Locate the file to import from

BeatBridge

The BeatBridge component triggers parameters of Hippotizer in time with an audio source.

Creating Beatbridges

BeatBridge creates links between the component and individual layer controls.
Each link is called a **bridge** and is displayed in the BeatBridge component and can be saved and recalled as a layer or mix preset.

Creating a bridge

Start the BeatBridge component and add it to the Pinboard.

See Starting and Stopping Components for more information.

> ✳ BeatBridge supports Layer and Notch Mix controls only.

Device

This menu will display all recognised audio input devices present in windows.

Mode

There are two modes:

- Analyze
  - This mode analyzes the incoming audio and generates a BPM.
- Generate/Tap
  - This activates the lower buttons **Set BPM** and **TAP** allowing custom BPM configuration defined by the user

Enable Show Speaker Buttons

Click on the **Show Speaker Buttons** switch to toggle the visibility of BeatBridge Icons

Mute

This toggle stops parameters being controlled by BeatBridge, freezing on the last recieved value.

Beat Shift

This rotary control allows the user to offset the Beats while maintaining the BPM.
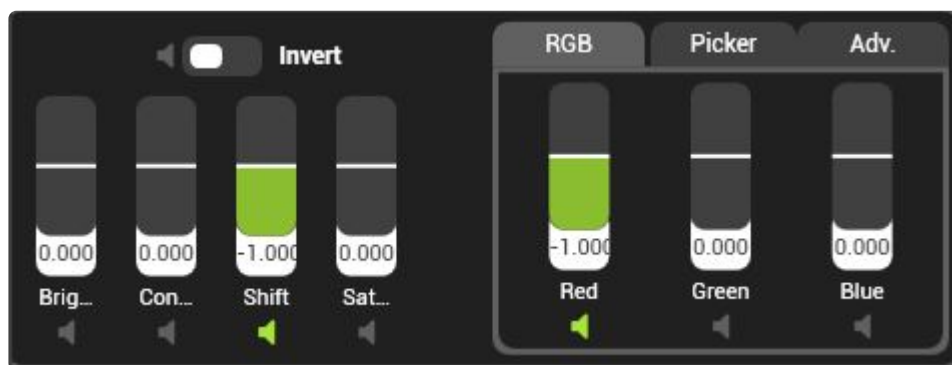
Right Click on the speaker icon of the desired control to edit it's attributes
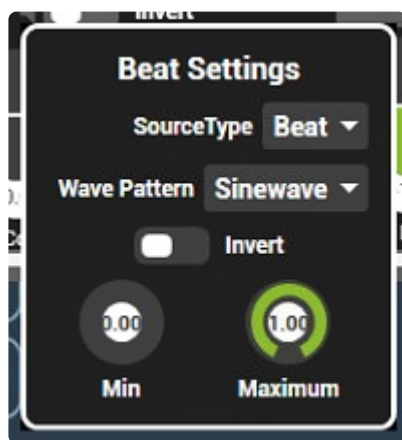
Left Click the speaker icon to bridge that control.

Left clicking the speaker icon will toggle the bridge. Enabled bridges are displayed in the connections tab of the BeatBridge Component

Connections

This tab shows all of the BeatBridge connections currently active. You can remove any connection by **right clicking** a listing and selecting **Delete**

Save the Bridge into a Layer or Mix Preset.

Ensure the BeatBridge Filter is active when saving a layer preset.
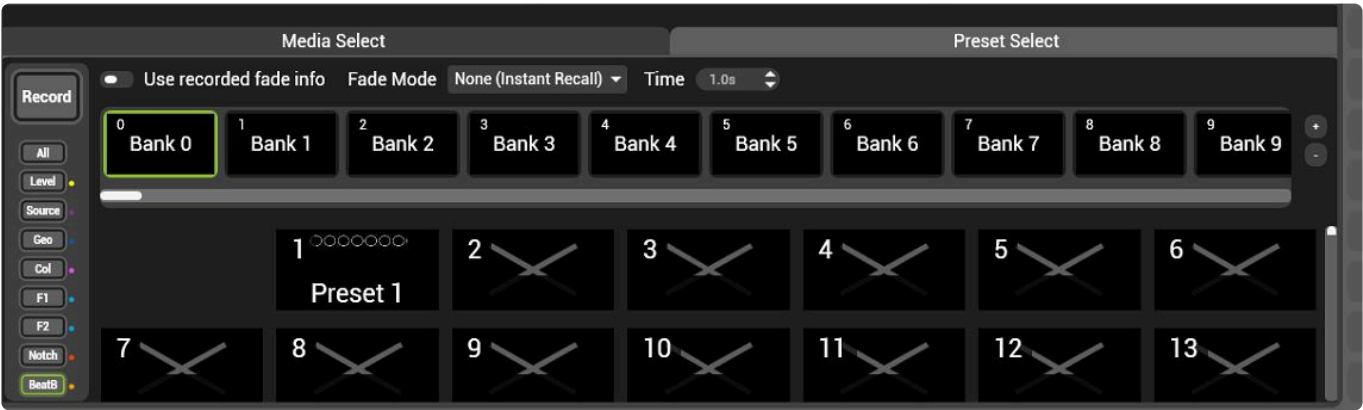
BeatBridge Functions

SourceType

Beat
Slow
Medium
Fast
Static
Bass
Mid
High
Averagevolume
Instantvolume
Eigthbeat
Quarterbeat
Halfbeat
Doublebeat
Quadbeat
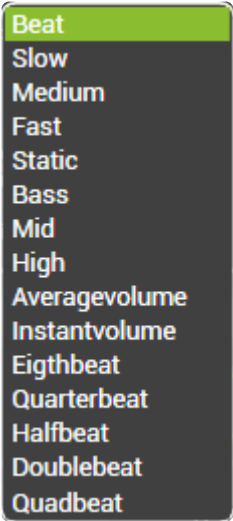
Beat

A complete waveform cycle is completed every beat.

Slow

A complete waveform cycle is completed in 10 seconds.

Medium

A complete wavform cycle is completed in 2.5 seconds.

Fast

A complete wavform cycle is completed in 0.5 seconds.

Static

A fixed value.

Bass

Value has a positive correlation with incoming Bass frequency level. (Does not work with generator)

Mid

Value has a positive correlation with incoming Mid frequency level. (Does not work with generator)

High

Value has a positive correlation with incoming High frequency level. (Does not work with generator)

Averagevolume

Value has a positive correlation with the average level of incoming audio. (Does not work with generator)

Instantvolume

Value has a positive correlation with the level of incoming audio. (Does not work with generator)

Eigthbeat

A complete waveform cycle over 8 beats.

Quarterbeat

A complete waveform cycle over 4 beats.

Halfbeat

A complete waveform cycle over 2 beats.

Doublebeat

A complete waveform cycle over a half beat.

Quadbeat

A complete waveform cycle over a quarter beat.

Wave Pattern

Sinewave
Squarewave
Trianglewave
Sawtooth
Random

Sinewave
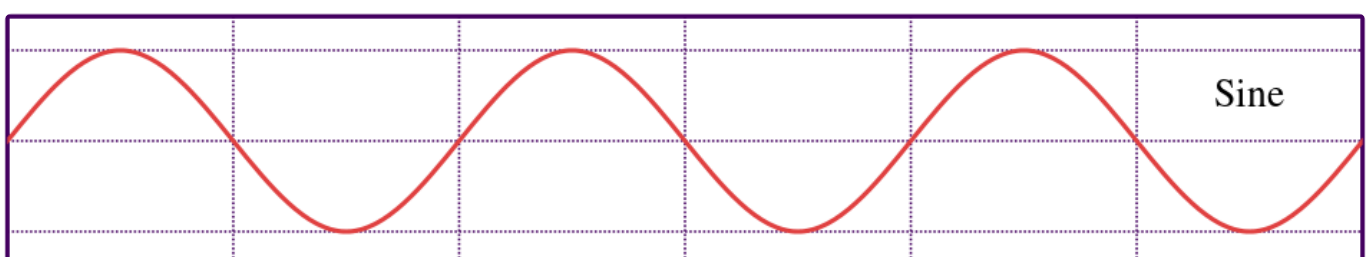
Trianglewave
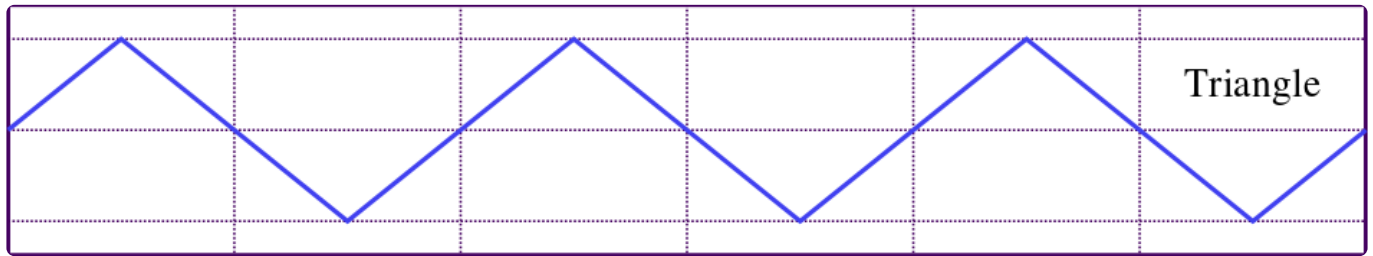
Squarewave
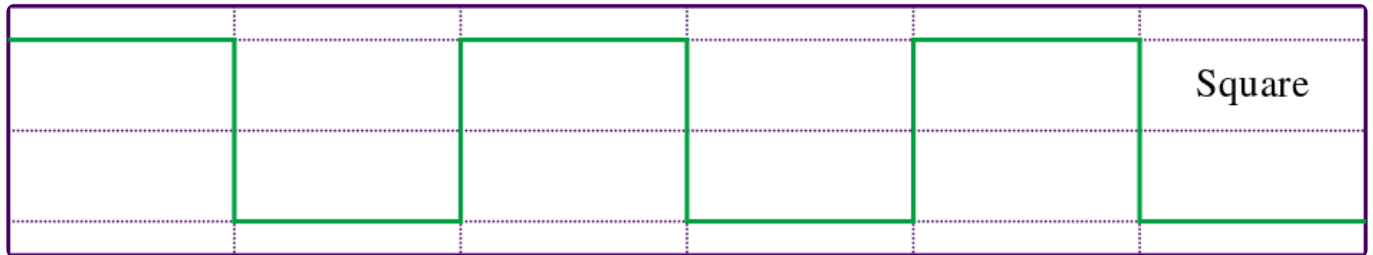
Sawtooth
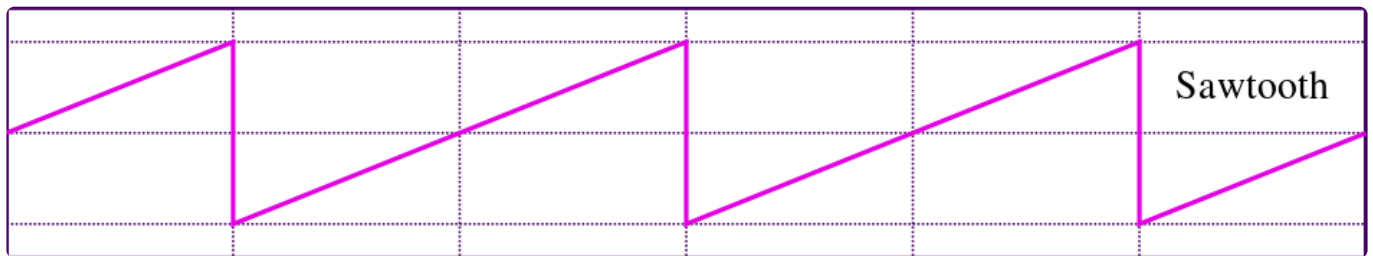
Random

This wave pattern functions differently from the rest of the wave forms and that differs between SourceType:

- Beat
    - Minimum value on the beat and a random value on the half beat.
- Slow
    - Starts at minimum value, after 5 seconds selects a random value and then at 10 seconds returns to minimum value. The process cycles.
- Medium
    - Starts at minimum value, after 1.25 seconds selects a random value and then at 2.5 seconds returns to minimum value. The process cycles.
- Fast
    - Starts at minimum value, after 0.25 seconds selects a random value and then at 0.5 seconds returns to minimum value. The process cycles.

! Random wave pattern does not work with any of the other SourceTypes

Invert

This toggle inverts the waveforms. Regarding the Random Wave Pattern it changes its function to a random value first, then value 0.

Value Range
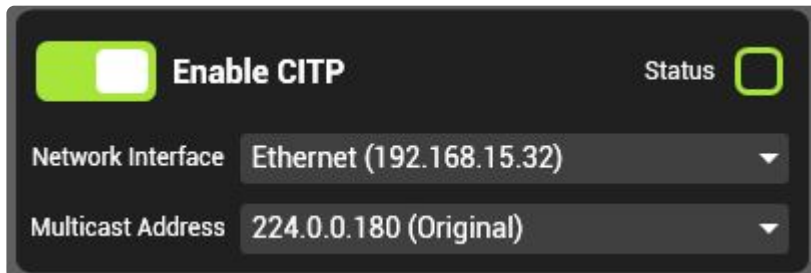
These two rotary controls allow control of the minimum and maximum range of values accesible by BeatBridge on a pin.

CITP

CITP is network based protocol for the transfer of information from a Media Server to a lighting console or Visualizer. CITP can transfer thumbnails and media names, as well as low resolution streaming previews to select lighting consoles and Visualization software.

> **Note:** CITP can add significant load to the network and may negatively affect performance of the Hippotizer or other network systems. We do not advise therefore using CITP during a live show situation. Instead, it should be viewed as a programming aid only.

To use CITP, start the CITP component and add it to a Pinboard.

Enable CITP

Enables / Disables the CITP

Network Interface

Choose which Network port that CITP will use to send data.

> **Note:** It is considered best practice to use the data port to carry CITP to avoid congestion on the HippoNet Network

Multicast Address

Choose which multicast grouping address CITP uses. Most of the time this does not make a difference as many applications support both the old and new standard.

> ✳ CITP Component now will only run when DMX Component is running.

What works with CITP in 4.8.1?

Please see the release notes

Setting CITP up can be a challenge, each manufacturers products may have different steps to configure. The following specific combinations are known to

have a 'trick':

Avolites

The Avolites desk must see the CITP component start up on Hippotizer to work. The easiest way to do this is set everything up, turn the CITP component on, then restart Hippotizer again to allow the desk to see layers.

DMX

The DMX Component receives network data to control Hippotizer.

The DMX Component uses ArtNet, MA-Net or sACN to enable Hippotizer to be controlled from a lighting desk.

Getting started

[Please see the Quick start guide to get up and running fast.](#)

DMX Component sections

1: DMX Component On/Off

When enabled, DMX component will take control of all mapped pins.

DMX Component can be edited, imported and exported while it is enabled or disabled.

[2: Auto Patch](#)

A rapid patching utility that will quickly patch layers, mixes and viewports.

3. Universes

Manual tools to add or edit universes.

4: Universe patch

A listing of all patched universes.

5: Personality Editor

A tool to create and edit personalities.

6: DMX Settings

Component defaults and network card assignments

7: Patch Tab

Lists the fixtures patched to the selected universe

8: Fixture / Universe Properties

Lists the settings of the selected Fixture or Universe

9: Monitor Settings

Options for how the Monitor displays

10: Monitor Tab

Shows the raw DMX data coming into the selected Universe.

11: Fixture Toolbar

Options to add or re-patch fixtures

12: Fixture Patch

Lists the fixtures patched to the selected universe.

Quick Start – DMX

1. Configure the network
2. Set up the mixes and layers
3. Autopatch

Auto Patch

The Auto Patch utility quickly creates a default patch.
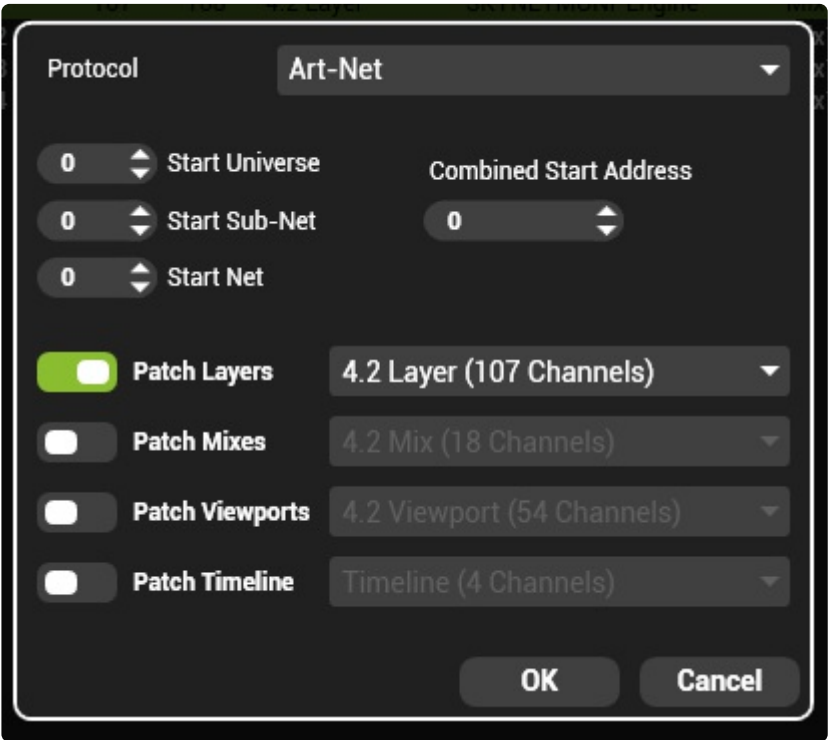
Auto Patch has two sections:
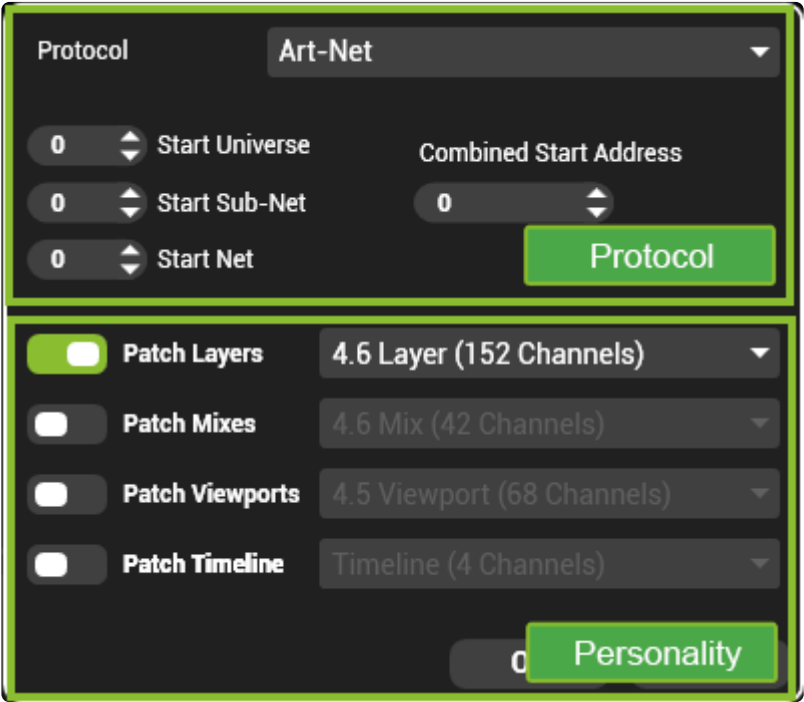
Protocol

Choose which protocol to Auto patch to.

- **Art-Net:** The starting universe, Sub-Net and net. The combined starting address calculates the resulting universe number.
- **Ma-Net** The starting universe number. The session number is set in [DMX settings](#)
- **sACN** The starting streaming Architectural Control network universe number.

Personalities

Choose which personality is used for layers, mixes and viewports.

By default, the patch order will be:

- Mix 1, Layer 1-16
- Mix 1 Controls
- Mix 2, Layer 1-16
- Mix 2 Controls
- …
- Viewport 1
- Viewport 2
- …

Note: Auto patch will delete the existing patch.

Fixture Patch

###. Created from V4.4.

The fixture tab displays everything patched to the selected universe

Each fixture has key attributes:

- **Chn.** The starting channel.
- **Name** The name of where the fixture is targeting. This can be edited in the fixture properties

panel.

- **# Chn** The number of DMX channels used by the selected personality
- **Next** The next free address after the fixture.
- **Personality** The personality patched in the fixture
- **Host** The target system of the patch.
- **Component** Which component within the system is patched. For layers, mixes and viewports the component will be the engine.
- **Pin** The path to the pin targeted by the patch.

Universe and Fixture Selection

The fixture patch displayed is that of the selected universe in the universes list.

If a fixture is selected [highlighted green], then it's properties are displayed in the right-side panel under **Fixture Properties** where the name, start address and personality used may be edited.

If no fixture is selected, then the right side panel will display **Universe Properties** where the name, protocol and starting address may be edited.

DMX Settings

Automatically Enable DMX on Component Start

When **On**, the DMX component will receive DMX immediately on Engine startup.

When **Off** the DMX component will not receive DMX on Engine startup.

Enable Smoothing

When **On** Float pins (pins that go from 0-1 eg Layer Level) will fade based on the smoothness time. (0-500 milliseconds). This function is used to compensate for uneven control signals or slow Art-Net refresh rates.

Monitor Frequency

Determines how often numbers are re-drawn the DMX monitor window.

Art-Net (sACN)

Contains settings for receiving Art-Net and sACN.

Use Host Network Adaptor

When **on** Art-Net will be read from the same network interface as the host [Engine].

When **off** a network adaptor must be specified.

> Note: Art-Net requires a 2.xxx.xxx.xxx or 10.xxx.xxx.xxx IP address to function.

Accept Data from any IP Address

When **on** data from any source IP address will be used.

When **off** only data from specified sources will be used.

The default of receiving data from all IP addresses is the most common case; specifying sources is usually used on only the most complex networks.

MA-Net

Hippotizer will listen to MA-Net data as a passive node. It will consume parameters as a normal fixture. Hippotizer supports Grand MA 2 version 2.9 software and above.

Use Host Network Adaptor

When **on** MA-Net will be read from the same network interface as the host [Engine].

When **off** a network adaptor must be specified.

> Note: MA-Net frequently uses very similar IP addresses to Hippotizer, take care to always separate MA and Hippo Networks physically and in addressing.

Session ID

Specify which MA Session to listen to.

Terminology

The DMX component uses a lot of specific terms which often overlap with lighting desks.

Art-Net

A network based protocol to carry DMX information, Art-Net is widely adopted by lighting controllers. Hippotizer V4 supports Art-Net versions 1, 2 and 3. Each new version extends the maximum number of universes by adding address space (Net, Sub-Net and Universe).

Auto Patch

Frequently the fastest way to set up the system; this automatically patches each layer, mix and viewport with the desired personality.

Channel

Each universe is comprised of 512 Channels. Fixtures then patch a personality to a channel and universe.

Group Pin

Pins are organised in a hierarchy, (the pin tree) where similar pins are children of the same **Group Pin**.
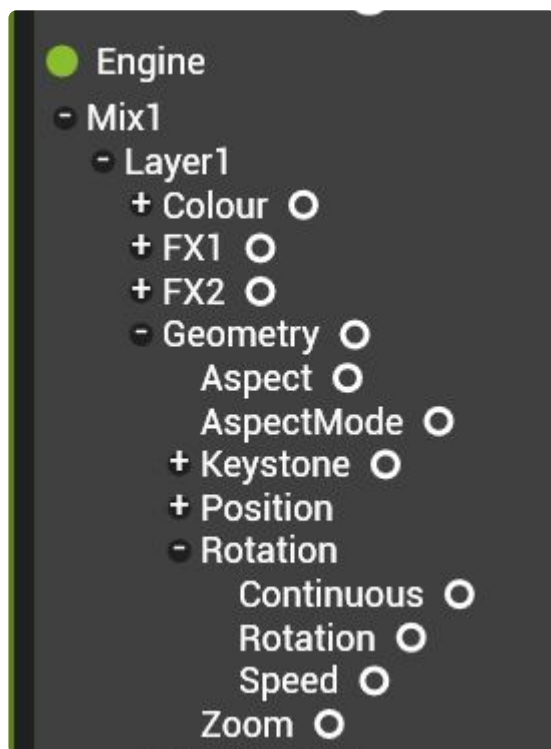
In the above example, Rotation is a group pin with Continuous, Rotation and Speed as it's children.

A DMX personality can only associate to a group pin; it cannot be made to a terminal pin such as speed.

The reason for this restriction is due to an invisible piece of information carried by each pin called the **pin class**. The pin class tells every aspect of Hippotizer how to handle a given pin. For example, the pin class of the Geometry group pin tells the interface to create a geometry control and not just a collection of float pins when the Geometry pin is added to the user interface. DMX relies on the same information to know which personalities can be patched to a given pin. The pin class of a terminal pin such as geometry/aspect is of it's type (in this case an Integer) which is too generic to be helpful for patching a personality. In order to create a DMX personality for a single terminal pin (such as rotation/speed) the parent group pin must be chosen.

Fixture

A fixture is the assignment (or patch) of a Personality to a channel and universe within the DMX component. Each fixture represents a unique patch.

MA-Net

A proprietary network protocol to MA Lighting enabling Grand MA Version 2 lighting consoles to communicate directly with Hippotizer V4.

Monitor

Shows a real-time view of received DMX values on the selected universe.

Patch

The assignment of a personality to a group pin and fixture.

Pin

Every attribute to be controlled by DMX in Hippotizer is a pin. There are three types of pins controllable from DMX:

- **floats** (0-1) such as level faders,
- **integers** (1,2,3,4…) most commonly seen in selectors such as FX select
- **Boolean** (on or off) used to enable functions such as colour invert.

Note: There are controls in Zookeeper that are not pins and cannot therefore be controlled by DMX, Preset filters are an example of this.

Personality

This is the assignment of a channel, or channels, to different control parameters within a fixture. A fixture can span multiple universes and some fixtures can have different personalities depending on the number of features you need to control. Some elements of a channel can be configured, such as bit-rate, default intensity values and label.

sACN

Streaming Architectural Control Network (sACN) is a protocol for sending DMX data across the Architectural Control Network (ACN) family of protocols. sACN has been developed by a group of lighting industry professionals (ESTA) to improve upon other methods of sending DMX on a network such as Art-Net. sACN has several key advantages over Art-Net including support for multi-casting, controller priority and low processing overhead.

Smoothing

Smoothing applies a algorithm to input data to slowly fade from the starting data point to the end data point. This feature results in a smooth change in intensity even if a snap change was made.

Universe

A Universe is a unit of measurement that includes 512 channels of dmx. This is using the DMX512 electric signal data protocol.

Update Only

Allows a fixture feature to only listen for changes in channel intensity, therefore disregarding any repeated commands through a channel. This can improve network performance in Hippotizer.

DMX Monitor

A live indication of DMX values being received can be seen in the **DMX Monitor**

Each universe has it's own monitor and can be quickly accessed by clicking the monitor tab.

Each channel in the monitor is represented by a green or red box.

Red indicates that the channel is set to 0, green indicates that a non-zero value has been received.

Monitor Options

Raw Data

Toggles whether the value on each channel (0-255) is displayed

Ramp Data

Toggles the visual indication of relative layer intensity.

Fixture Toolbar

The Fixture Toolbar contains the status of the patch

Patch	DMX Monitor
◯ Patch OK	Patch Consecutively + Fixture
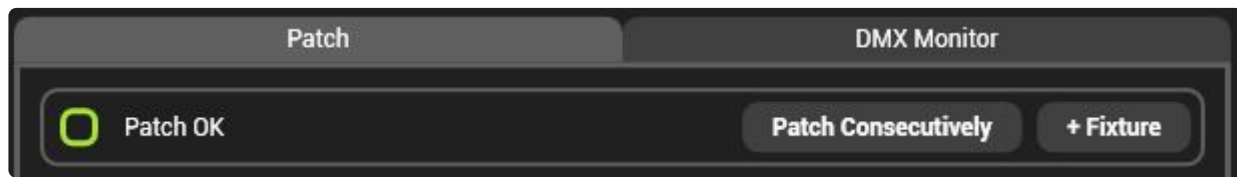
Patch Status

- Green Indicates no fixtures overlap
- Red Indicates fixtures overlap.

Patch Consecutively

Automatically re-patches the fixtures on the selected universe to eliminate gaps and overlaps.

+ Fixture

Opens the add fixture dialogue. Use this to add single fixtures to a patch.

Note: Patching an entire systems is faster with auto patch.
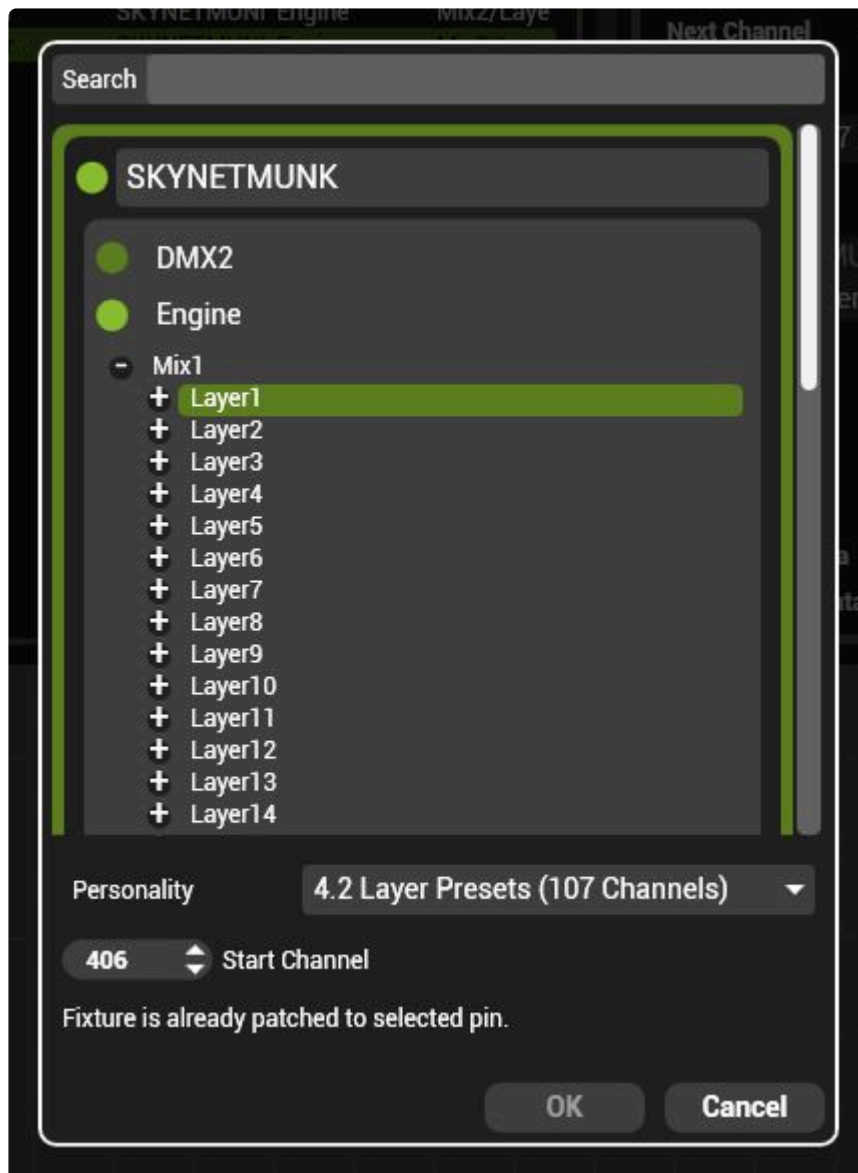
The first step to adding a fixture is to select a target pin. What pin is selected defines which personalities may be patched to it.

[See the manual discussion of the Pin Tree for more information on Pin Classes](#).

By default, only Layers, Mixes, Viewports and the timeline will have personalities defined for them. Other personalities may be imported or created with the personality editor.

To add a fixture:

- Select the target pin (Mix1/Layer1 for example)
- Choose the correct personality to use from the drop down list
- Choose the start channel
- Press OK to patch.

Personality Editor

The personality editor is where DMX profiles can be created or modified
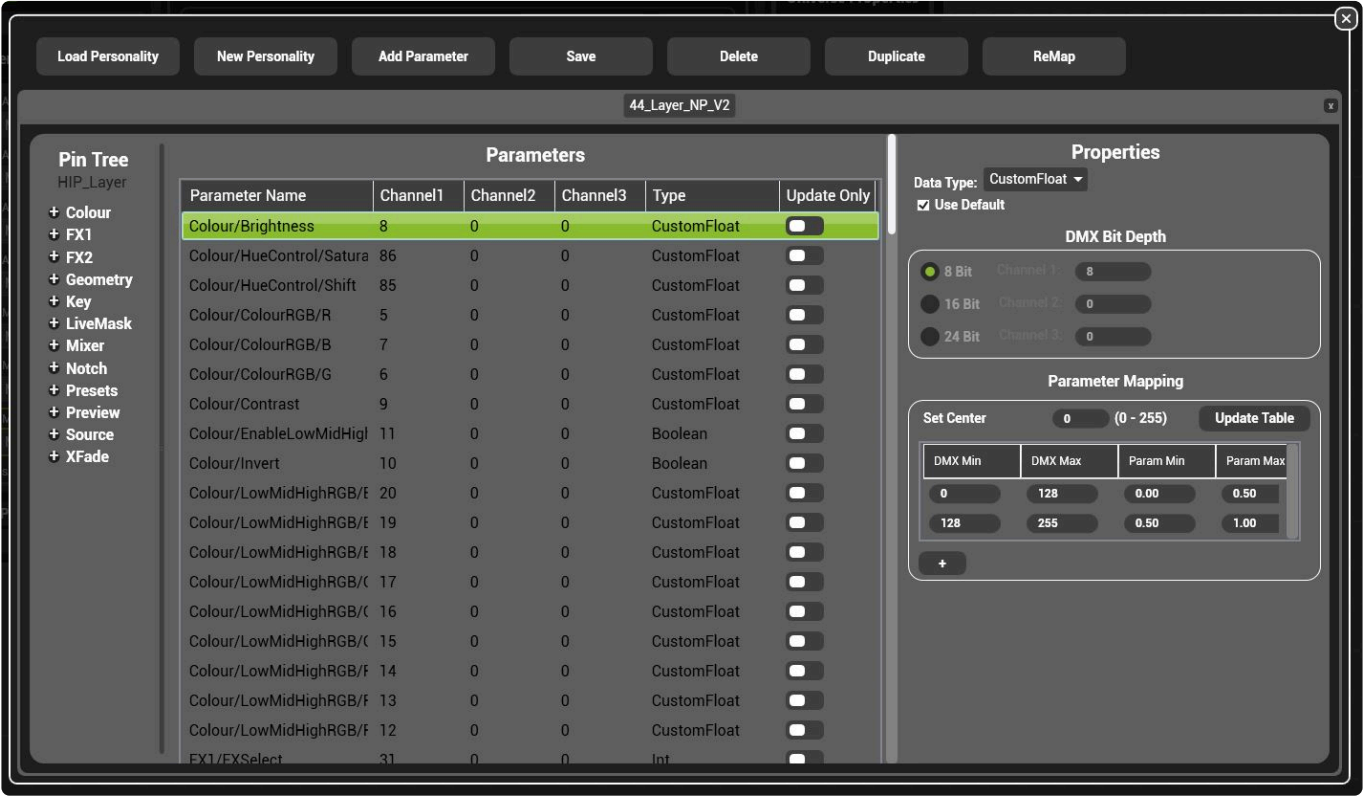
Basic operations are:

- Viewing or editing an existing personality
- Creating a new Personality
- Duplicating or deleting existing personalities.

Personality editor structure.
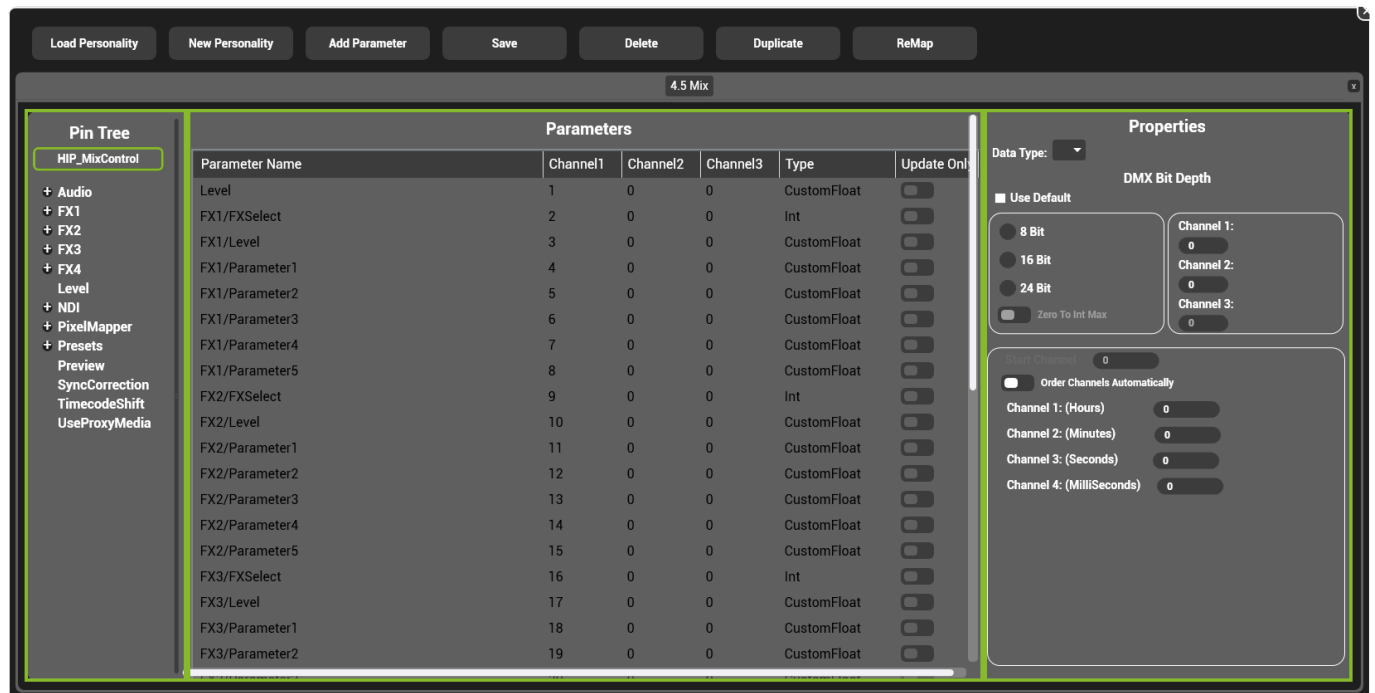
Pin Tree

The pin tree filters the parameter view without modifying the personality. To see all parameters again click the top level (Hip_Layer in this example).

Parameters

Lists all parameters in the personality.

- **Parameter Name** The pin path of the parameter.
- **Channel1** The first channel used by the parameter.
- **Channel2** The second channel used by the parameter, only for 16 or 24 bit parameters.
- **Channel3** The third channel used by the parameter. Only used for 24 bit parameters.
- **Type** The data type of the parameter.

Update Only.

- When enabled, the parameter will only assert control on changes of DMX.
- When disabled, the parameter will constantly assert control of the pin

Properties.

The settings of the selected Parameter.

- **Data Type** Sets the default mapping of the parameter
- **Use Default** Locks editing of the parameter mapping and DMX bit depth.
- **Channel 1/2/3** Sets the DMX address for each parameter.
- **Parameter Mapping** Defines how incoming DMX is mapped to a parameter.

Types of Mappings

Depending on the pin type, there are different mappings available.

- [Integer Pins](#)
- [Boolean Pins](#)
- [Float Pins](#)

Integer Pins

Integer Pins are those that count whole numbers.

Integer Pins (or Int Pins) are most commonly used to select between items in a list:
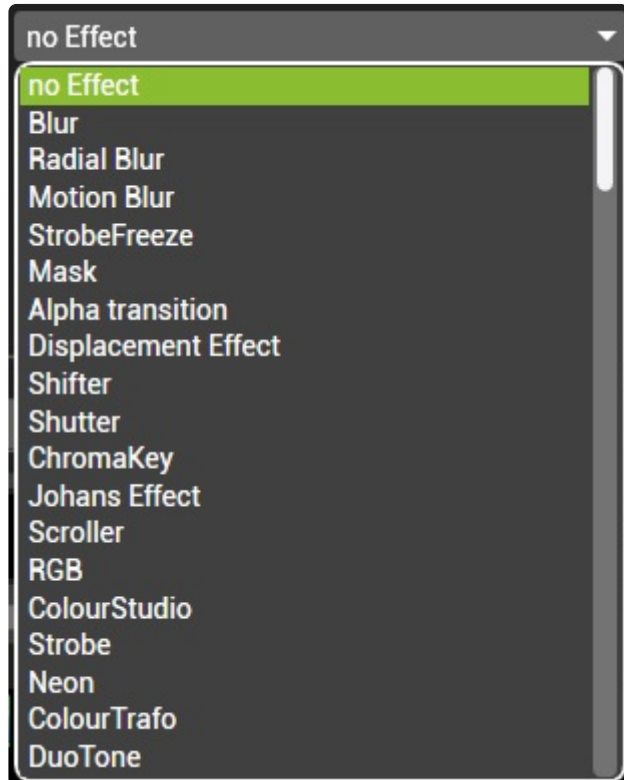
Alternatively, integers can also be represented by lists of buttons such as the transport controls for the media player:

In both cases, the lists represent different integer values for a single pin.

There are five different types of mappings in use in Hippotizer:

Mapping types for Integer Pins with an example:

- **8 Bit, 255 Step**: Effect select
- **16 Bit, 65,535 Step**: Media Select
- **8 Bit. 25 Step**: Source Type Select
- **16 or 24 Bit frame count**. Media Outpoint
- **8 Bit Custom** X-Fade Fade Time

8 Bit, 255 Step

Once set to 8bit, a channel with the Data type of Int, will create this mapping by default.

Uses a single DMX channel to yield 255 possible options.
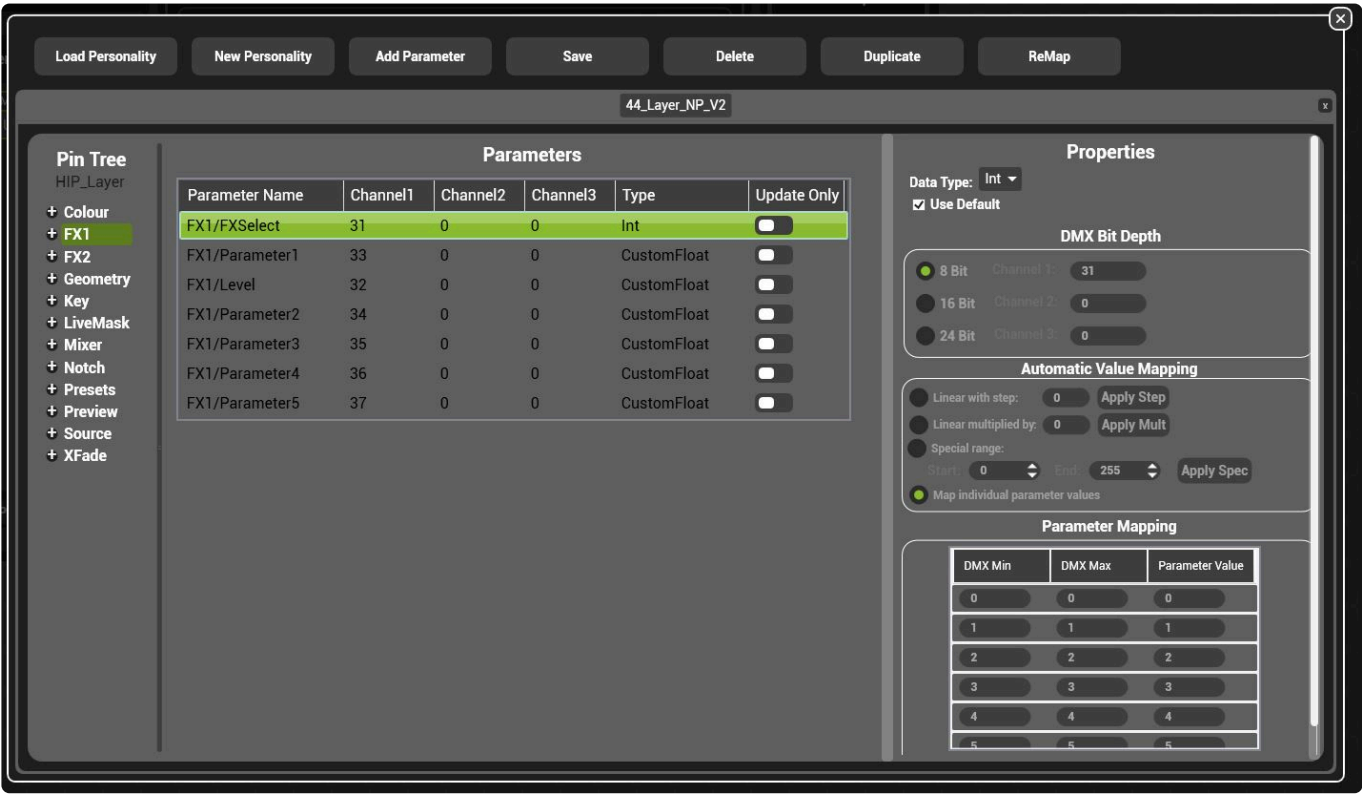
Suggested usage:

- Lists of maps (such as live mask or video map select) where the number of maps could exceed 25.
- Effects select
- Relay (Mix and Layer) Select
- Timecode Offset (4 channels: Hours, Minutes, Seconds and Frames)

16 Bit, 65,535 Step

Uses two DMX channels to choose between 65,535 steps.

Once set to 16bit, a channel with the Data type of Int, will create this mapping by default.

Despite being a single parameter in Hippotizer, the 16 bit integer mapping is frequently addressed as two different channels by lighting desks. The first channel works out to a bank select, while the 2nd channel is the clip select.

Suggested usage:

- Media select. (Bank and Clip)
- Preset (Bank and Clip)
- Media offset (Bank and Clip)

8 bit, 25 Step. Data Type:

Uses a single DMX channel to control smaller lists of up to 25 items. From Hippotizer Version 4.4 on wards, the mapping has been standardised; all 25 step parameters have the same assignments.

Once set to 8bit, a channel with the Data type of Step25, will create this mapping by default.

Suggested usage:

- Lists with less then 25 items such as Source Type

16/24bit Frame count

Uses two or three channels to set the in and outpoints of the media player in frames.
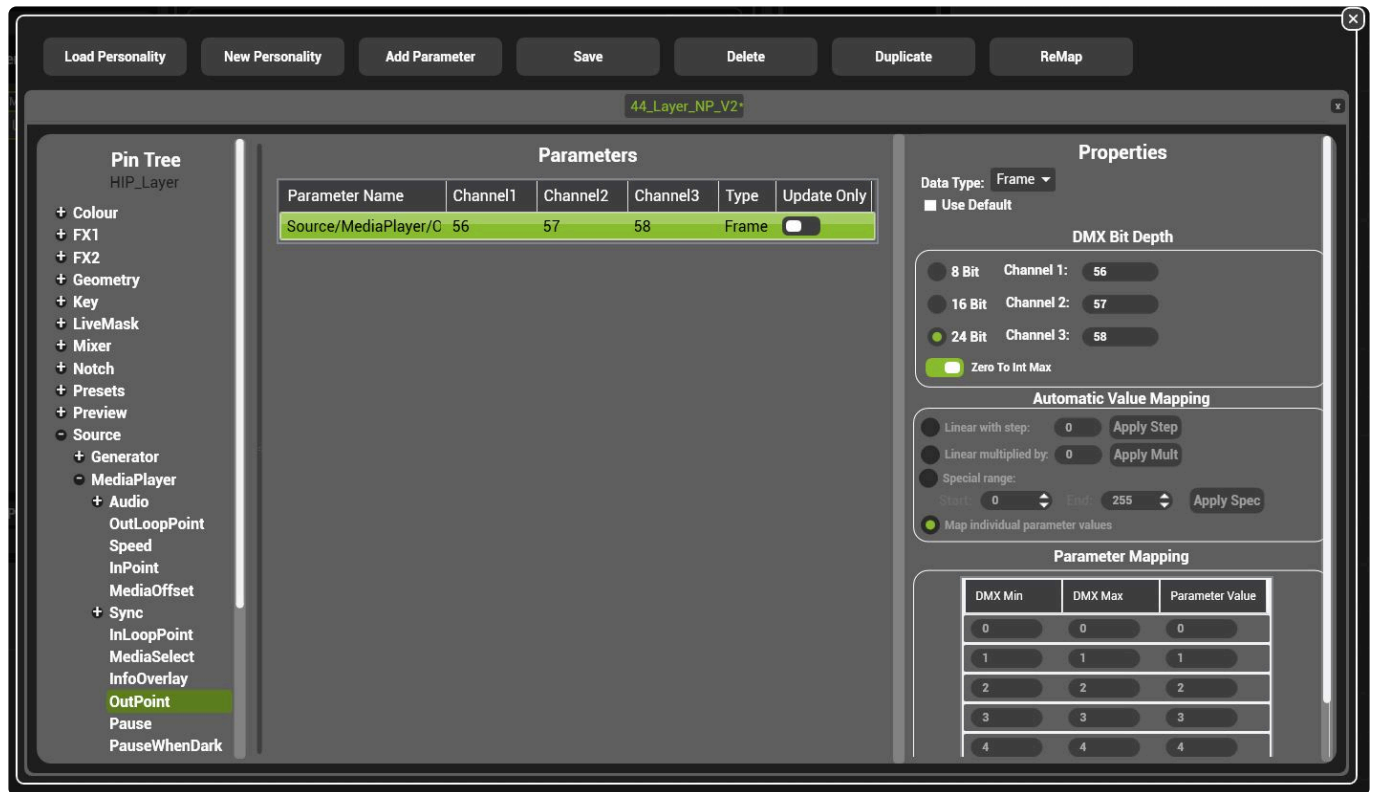
An additional option exists for the Outpoint and Loop Outpoint: **Zero to Int Max**.

When enabled, a value of zero will set the outpoint to 'end of clip': It will play to the end regardless of length.

> Note: At 16 bit, there is a maximum outpoint of 65,535 frames, which equates to 36 minutes on a 30FPS clip. For longer clips, use 24bit.

Suggested Usage:

- Media In and Outpoints
- Inner Loop in and outpoints.

8-Bit Custom

Used in limited cases to map large spreads of integer settings to a single channel.

Use the **Linear with step** to create the mapping. In the example below, setting 100 and pressing apply step will create the mapping.

Suggested Usage:

- X-Fade Fade Time.

Boolean Pins

Boolean Pins are on/off and toggle controls

 Boolean Pins (or bool pins) are represented by single buttons.

Boolean DMX mappings simply set a midpoint, commonly 128:

The **Set Center** function will create the mapping based on the set centre value.

Float Pins

Float Pins are controls that go from 0 to 1.

Float Pins are represented in Hippotizer most commonly as faders.

In both cases, the underlying pin is from 0 – 1 and the User Interface is converting the value into a more readable format.

As the DMX component connects directly to the pin, it must always map from 0-1 regardless of how the pin is displayed in the user interface.

Bit Depth

Unlike Integers, Floats do not have a set bit depth (or number of DMX channels per parameter). Any float can be controlled with 1 DMX Channel (8-bit), 2 Channels (16-bit) or 3 Channels (24-bit). As the parameter will only ever go from 0 – 1, additional bit depth equates to more DMX steps so greater precision and smoother fades.

> Note: Internally, Hippotizer uses greater than 24-bit precision for all Floats regardless of how they are controlled.

The decision of which bit depth to use for each parameter depends on what is being controlled. For the factory personalities, Green Hippo followed these rules:

- Intensities and colour (Layer, Effects etc.) are set at 8-bit as this matches the bit depth of underlying video colour channels. Any additional precision would not make a noticeable difference.
- Effect and Notch parameters are set to 8-bit. The primary reason was balancing benefit with the

significant increase in channel count per layer.
- Geometry and Keystone controls are set to 16-bit to ensure high precision and smooth fades.
- No Floats presently are set to 24-bit by default.

These values can be modified in custom personalities as required.

Center Point

For many controls the center point of the float is very important. For example, in Geometry/Position a float value of 0.5 is the default layer state.

In order to ensure the value of exactly 0.5 corresponds correctly to DMX, Green Hippo sets manual centre points in the personality.

This is important as there are 256 steps in a single DMX channel, therefore 0.5 would fall between two steps if it is not defined.

In the above example, the centre value of 0.5 has been exaggerated allowing for input values of 32767 – 32769.

Floats with specific mappings.

In addition to setting a center point, some floats require additional special consideration.

Note: The default personalities include all specific mappings, Green Hippo strongly encourages copying an existing personality and editing it instead of starting from scratch.

- All colour / effects / Notch parameters have centers set.
- Geometry/Rotation combines rotation speed and the continuous bool pin into a single 16-bit DMX channel.
- Media speed is set with 0.25, 0.5 and 0.75 defined in the mapping.
- 16-bit floats in Geometry have exaggerated centre points.

Engine

The Engine Component handles the rendering of video.

As the engine is frequently run without a Zookeeper interface, it is represented by icons in the system tray of Windows.

Shows the Engine is running this is called the **Engine Host**.

Indicates a **Mix** is running and denotes the layer mode of that mix.

Right Clicking on the Engine Icon brings up options:
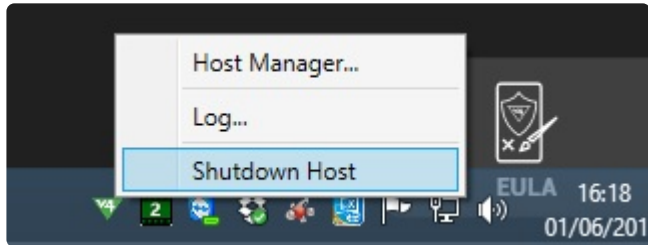
Host Manager is the basic local control of the engine component without using Zookeeper.

Log… Displays a live output of the Engine Host Log.

Shutdown Host Saves and shuts down the Engine Host.

There are no functions associated with clicking the mix icons.

> **Additional Information:** The words **Engine** and **Host** are used interchangeably within the interface and documentation, though they are very different. The Engine Host is actually an umbrella application that runs all components, of which the Engine is one referred to as the Engine or Render Component. The Engine component itself carries only livemask information. Other components such as DMX or Media Manager also run within the Engine Host. Shutting down the Host automatically saves and shuts down all components contained within it. In most cases, shutting down the engine actually refers to shutting down the host. Zookeeper also runs it's own host, called the Zookeeper host.

Host Manager

The Host Manager is the basic local control of the engine component without using Zookeeper.

There are three sections of the Host Manager shown as tabs:

Components
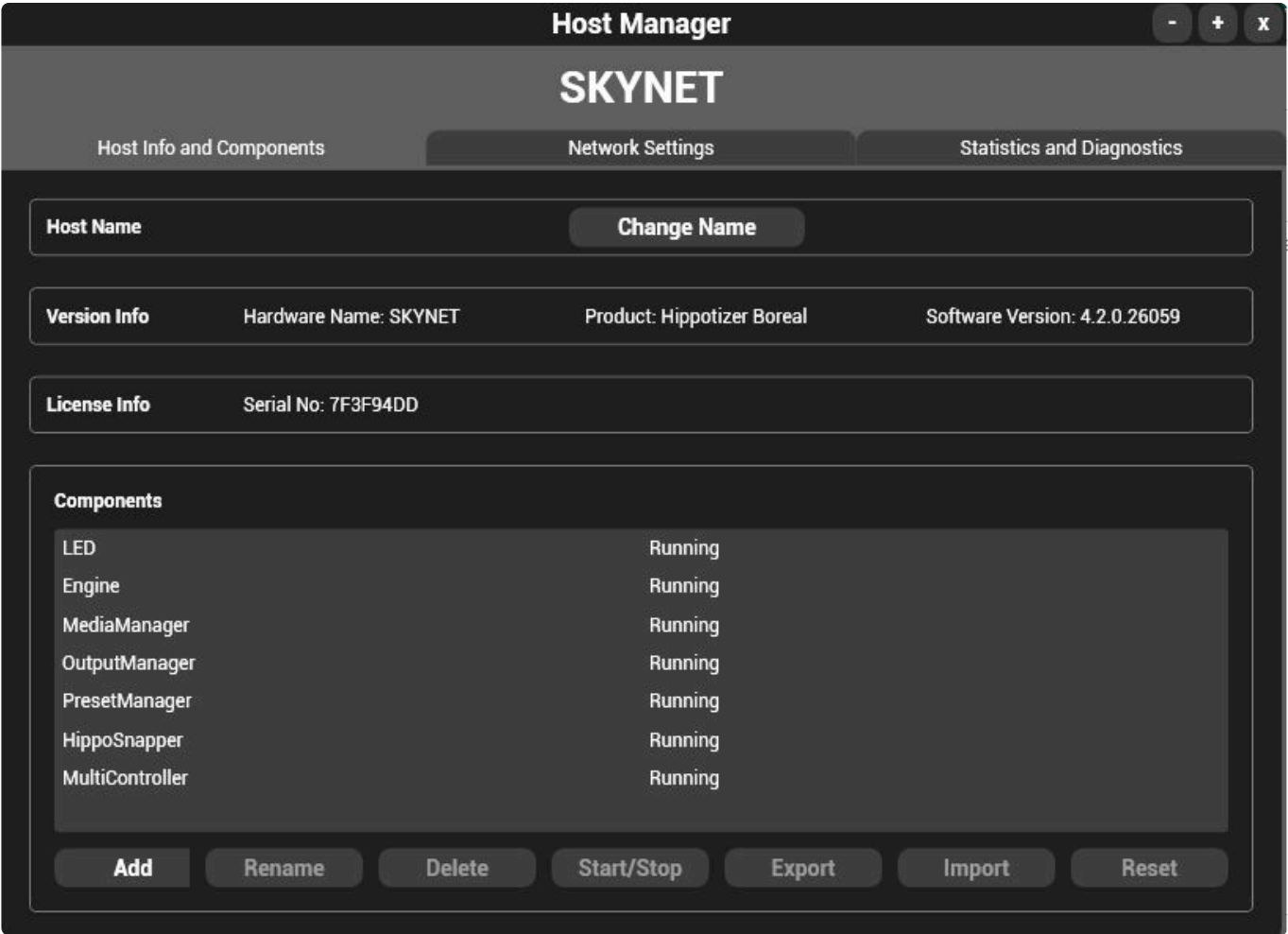
Components can be added, removed and stopped. The Host name can also be changed from this prompt.

> Note: When adding or removing components from Zookeeper, this is accessing the same list so it is not necessary to use the Host Manager when Zookeeper is running.

Network

Selects which network adapter the Engine uses to communicate. This must match the network adapter used by Zookeeper.

Diagnostics

Sets log levels and shows network diagnostics.

Hippo Snapper

Hippo Snapper takes a still image of a selected layer and saves it to the media map. This is commonly used to save a logo.

Image Name

The name of the picture that will appear in the media map.

Image Source

The Mix and Layer that the image will be taken from

Resolution

The resolution of the image that will be created. For best results, this should be set to be the same as the source's resolution.

Image Destination

The position in the media map where the image will be placed

HippoSnap

Saves the image each time the button is pressed.

✳ Saving an image with Hippo Snapper can cause the output to freeze momentarily.

All the controls of Hippo Snapper are pins so they can be accessed from DMX or a Timeline for automating tasks.

LED & Fan

The LED component controls the coloured Hippo head on Hippotizer V4 and V4+ hardware.

The Hippo head colour reflects the state of the worst component on that system. So if any component is showing an error, it will be red. If all components are normal it will be green.

Colour meanings and common causes

Green

- Hippotizer is running normally

Blue

- Media Manager is encoding or syncing content

Yellow

- Output Manager is configuring outputs
- The Media drive has <10% free space

Red

- The engine has stopped rendering due to an error
- Output Manager cannot start all viewports or outputs due to a conflict
- There is less <3% free space on the media drive.

Purple

- The computer is running, but the Hippotizer applications have not been started.

The LED component has a Pin: "LED_Brightness" that can be used to dim the front panel LED's if desired.

Macro Manager

Macro Manager uses the Lua scripting language to automate functions within Hippotizer.

In addition to normal Lua scripting commands and syntax there is also Hippo specific functions and parameters; these are documented here.

- Hippotizer API
- Example Macros
- Memory Management

For more information about Lua please see their website:

www.lua.org/

Hippotizer API

The interface with Hippotizer's Engine and Components involves some specific parameters and functions.

Globals			
Properties			
Property Name	**Return Data Type**	**Description**	**Example Syntax**
TriggerPinName	String	Returns the name of the UserPin that triggered this macro, or empty string if it was triggered by another method	`TriggerP inName`
TriggerPinMonitorName	String	Returns the name of the PinMonitor that triggered this macro, or empty string if it was triggered by another method	`TriggerP inMonito rName`
HippoNet	HippoNet Object	Returns The Global HippoNet object	`HippoNet`
PinMonitors	Lua Table [String,Object]	Returns a table of PinMonitor pin values indexed by the name of the PinMonitor value can be String,Bool or Number	`PinMonit ors`
UserPins	Lua Table [String,Object]	Returns a table of UserPin values indexed by the name of the UserPin, value can be String,Bool or Number	`UserPins`

There are a number of more specific APIs.

- [HippoNet API](#)
- [Host API](#)
- [Component API](#)
- [DMX Component API](#)
- [Pin API](#)
- [Engine API](#)
- [Mix API](#)
- [Layer API](#)
- [Media Manager API](#)
- [Media API](#)
- [Pin Bridge API](#)
- [Helper Functions](#)
- [Viewport API](#)

HippoNet API

HippoNet contains all the pins and components of Hippotizer. Use this API to find components, host names and pin paths.

HippoNet				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
LocalHost		Host Object	Returns the host object that this Macro Manager is running on	`HippoNet.LocalHost`
HostNames		Lua Table [Number,String]	Returns a table of all the HippoNet hosts found on the network, indexed by an increasing integer	`HippoNet.HostNames`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FindHost	(String HostName)	Host Object or Nil	Returns the host object called or Nil if it cannot find it	`HippoNet:FindHost('AMBA-240041')`
SearchHostNames	(String Pattern)	Lua Table [String,Host Object]	Returns a table of all the Host objects that have a name containing indexed by their Host Name	`HippoNet:SearchHostNames('AMBA')`
FindComponent	(String HostName, String ComponentName)	Component Object or Nil	Returns the Component object called running on Host called or Nil if it cannot be found	`HippoNet:FindComponent('AMBA-240041', 'Engine')`
FindPin	(String HostName, String ComponentName, String PathFromRootPin)	Pin Object or Nil	Returns the Pin object at path on component running on Host or Nil if it is not found	`HippoNet:FindPin('AMBA-240041', 'Engine', 'Mix1\Layer1\Colour\Brightness')`

Host API

The Host contains references to local components and Engine commands.

Host				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Name		String	Returns the name of this Host	`HippoNet.LocalHost.Name`
ProductName		String	Returns the string name of the product that the host is running on eg.	`HippoNet.LocalHost.ProductName`
IpAddress		String	Returns a string representation of the IP address of this Host in the form of xxx.xxx.xxx.xxx	`HippoNet.LocalHost.IpAddress`
ComponentNames		Lua Table [Number,String]	Returns a table of the names of all the components running on this Host indexed by increasing integer	`HippoNet.LocalHost.ComponentNames`
StoppedComponentNames		Lua Table [Number,String]	Returns a table of the names of all the components on this host that are not currently running indexed by increasing integer	`HippoNet.LocalHost.StoppedComponentNames`
Engine		Engine Component Object or Nil	Returns the Engine Component Object running on this host if it exists or Nil if it does not or is stopped	`HippoNet.LocalHost.Engine`
DMX		DMX Component Object or Nil	Returns the DMX2 Component Object running on this host if it exists or nil if it does not or is stopped	`HippoNet.LocalHost.DMX`

Host				
MediaManager		MediaManager Component Object or Nil	Returns the MediaManager Component Object running on this host if it exists or nil if it does not or is stopped	`HippoNet.LocalHost.MediaManager`
MacroManager		MacroManager Component Object or Nil	Returns the MacroManager Component Object running on this host if it exists or nil if it does not or is stopped	`HippoNet.LocalHost.MacroManager`
PresetManager		PresetManager Component Object or Nil	Returns the PresetManager Component Object running on this host if it exists or nil if it does not or is stopped	`HippoNet.LocalHost.PresetManager`
Timeline		Timeline Object	Returns the Timeline Component Object running on this host if it exists or nil if it does not or is stopped	`HippoNet.LocalHost.Timeline`
AvailableComponents		Lua Table	This returns an indexed lua table of names of components available to be added to the host	`HippoNet.LocalHost.AvailableComponents`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FindComponent	(String Name)	Component Object or Nuil	Returns the Component Object called running on this host or Nil if it cannot be found	`HippoNet.LocalHost:FindComponent('CITP')`
SearchComponentNames	(String Pattern)	Lua Table [Number, Component Object]	Returns a table of all the Components running on this host whose name includes indexed by increasing integer	`HippoNet.LocalHost:SearchComponentN`

Host				
				`ames('M anage r')`
ShutdownHostSoftware		Nothing	Attempts to shutdown Hippotizer software on this machine, returns nothing	`HippoNe t.Local Host:Sh utdownH ostSoft ware()`
ShutdownHostMachine		Nothing	Attempts to shutdown this machine and all the software running on it, returns nothing	`HippoNe t.Local Host:Sh utdownH ostMach ine()`
RestartHostMachine		Nothing	Attempts to restart this machine , returns nothing	`HippoNe t.Local Host:Re startHo stMachi ne()`
StartComponent	(String ComponentName)	Boolean	Attempts to start Component with name if it is stopped, returns True if successful or False if it failed	`HippoNe t.Local Host:St artComp onen t('PinB ridge')`
StopComponent	(String ComponentName)	Boolean	Attempts to stop Component with name if it is running, returns True if successful or False if it failed	`HippoNe t.Local Host:St opCompo nent('H ippoSna pper')`
AddComponent	(String ComponentName)	String	This adds a new component to the host of type "XXX' with name of "XXX", respects component install limits.	`HippoNe t.Local Host:Ad dCompon ent('Sc`

Host				
				`reenWar p Manag er')`
DeleteComponent	(String ComponentName)	String	This stops and deletes the first component that it finds on the host with the name "XXX", respects Component rules so you cannot delete reserved components such as Engine.	`HippoNe t.Local Host:De leteCom ponen t('Pixe lMapper V4')`
ResetComponent	(String ComponentName)	String	This resets the first component that it find on the host with the name "XXX".	`HippoNe t.Local Host:Re setComp onen t('Mult iContro ller')`

Component API

The component API works across all components. Some components contain additional commands that are detailed separately.

Component (All Component Types)				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Name		String	Returns the name of this component	`HippoNet.Loca lHost.Engin e.Name`
TypeName		String	Returns the Type of this component eg.	`HippoNet.Loca lHost.Engin e.TypeName`
OwnerHost		Host Object	Returns the Host Object that this component is running on	`HippoNet.Loca lHost.Engin e.OwnerHost`
OwnerHostName		String	Returns the name of the Host Object that this component is running on	`HippoNet.Loca lHost.Engin e.OwnerHostNa me`
AllPinPaths		Lua Table [Number,String]	Returns a table of the paths to all the pins in the pin tree of this component from the root pin indexed by increasing integer	`HippoNet.Loca lHost.Engin e.AllPinPaths`
RootPin		Pin Object (GroupPin)	Returns the topmost Pin Object in this components pin tree which is parent to all other pin objects	`HippoNet.Loca lHost.Engin e.RootPin`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FindPin	(String PathFromRoot)	Pin Object or Nil	Returns the Pin Object with a path of from the component Root Pin or Nil if it cannot be found	`HippoNet.Loca lHost.Engin e:FindPin(Mix 1/Layer1/Colo`

Component (All Component Types)				
				`ur/Brightnes s')`
SearchAllPinPaths	(String Pattern)	Lua Table [Number,Pin Object]	Returns a table of all the Pin Objects with a path from Root that contains indexed by increasing integer	`HippoNet.Loca lHost.Engin e:SearchAllPi nPaths('Leve l')`
Stop	()	Nothing	Attempts to stop this component	`HippoNet.Loca lHost:FindCom ponent('CIT P'):Stop()`
Import	(String FilePath)	Boolean	Attempts to import a component settings file at location from disk, returns True is successful or False if it failed for any reason	`HippoNet.Loca lHost:FindCom ponent('Multi Controlle r'):Impor t('C:\\MC.v4 s')`
Export	(String FilePath)	Boolean	Attempts to export this components settings to location on disk, returns True is successful or False if it failed for any reason (files should contain the .v4s file extension)	`HippoNet.Loca lHost:FindCom ponent('Multi Controlle r'):Expor t('C:\\MC.v4 s')`

DMX Component API

DMX Component			
Properties			
Property Name	**Return Data Type**	**Description**	**Example Syntax**
Enabled	Boolean	Returns True if DMX is active or False if it is disabled, value can be read or set	`HippoNet.LocalHost.DMX.Enabled | | Universes | Lua Table [Strin g,DMX Universe Object] | Returns a table of all the DMX Universes used on this DMX component indexe d by Universe Name |` HippoNet.LocalHost.DMX.Universes@
NetworkAdapters	Lua Table [Number,String]	Returns a table of all the IP addresses of the network adapters on the machine that DMX is running on indexed by increasing integer	`HippoNet.LocalHost.DMX.NetworkAda pters`
LocalIp	String	Returns the IP address of the Network adapter being used to receive DMX and MANet data, this value can be read or set	`HippoNet.LocalHost.DMX.LocalIp`
MANetSessionId	Number	Returns the current MANet Session ID, this value can be read or set	`HippoNet.LocalHost.DMX.MANetSessi onId`
DMX Universe			
Properties			
Property Name	**Return Data Type**	**Description**	**Example Syntax**
Name	String	Returns the name of this Universe Object, this value can be read or set	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Name`
Protocol	String	Returns the description of the protocol used on	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Protocol`

DMX Component			
		this Universe Object eg.	
Fixtures	Lua Table [String,DMX Fixture Object]	Returns a table containing all the Fixture Objects patched in this Univers Object indexed by Fixture Object Name	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Fixtures`
Address	Number	Returns the universe number of this DMX Universe Object in the range 1 – 65535, this value can be read or set	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Address`

DMX Fixture			
Properties			
Property Name	**Return Data Type**	**Description**	**Example Syntax**
Name	String	Returns the name of this DMX Fixture Object, this value can be read or set	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Fixtures['Mix 1 : Controls'].Name`
StartChannel	Number	Returns the start channel address of this DMX Fixture Object, this value can be read or set	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Fixtures['Mix 1 : Controls'].StartChannel`
TargetPinPath	String	Returns the full path to the target pin of this DMX Fixture Object	`HippoNet.LocalHost.DMX.Universes ['Universe A'].Fixtures['Mix 1 : Controls'].TargetPinPath`

Pin API

The Pin API is used to access and set Pin values.

Pin (All Types)				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Name		String	Returns the name of this Pin Object	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').Name`
Path		String	Returns the full path of this object from the Root Pin	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').Path`
ParentName		String	Returns the name of this Pin Objects parent or an empty string if this is the Root Pin	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').ParentName`
IsRootPin		Boolean	True if this is the Root Pin or False if not	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').IsRootPin`
OwnerComponent		Component Object	The Component Object that hosts this Pin Objects pin tree	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').OwnerCompo nent`
ChildPinNames		Lua Table [Number,String]	Returns a table containing all the names of the direct children of this Pin Object indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').ChildPinNa mes`

Pin (All Types)				
ChildPinPaths		Lua Table [Number,String]	Returns a table of all the paths of the direct children of this Pin Object indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').ChildPinPa ths`
DescendentPinPaths		Lua Table [Number,String]	Returns a table of all the paths of all the children and descendents of this Pin Object indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r').Descendent PinPaths`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
SearchChildNames	(String Pattern)	Lua Table [Number,String]	Returns a table of all the pin names of all the direct children of this Pin Object that contain in their name indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r'):SearchChil dNames('Bright ness')`
SearchChildPinPaths	(String Pattern)	Lua Table [Number,String]	Returns a table of all the pin paths of all the direct children of this Pin Object that contain in their path indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r'):SearchChil dPinPaths('RG B')`
SearchDescendentPinPaths	(String Pattern)	Lua Table [Number,String]	Returns a table of all the pin paths of all the children of this Pin Object and their descendents that contain in their path indexed by increasing integer	`HippoNet.Local Host.Engine:Fi ndPin('Mix1/La yer1/Colou r'):SearchDesc endentPinPath s('Low')`

Pin (Value Pins – Boolean,String,Float and Integer)				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
PinType		String	Returns the type description of this PinObject eg.	`HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness').PinType`
Value		Object (String,Number,Boolean)	Returns the current value of this Pin Object, this value can be set which will in turn set the pin to that value	`HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness').Value`
DefaultValue		Object(String,Number,Boolean)	The default value of this Pin Object	`HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness').DefaultValue`
Info		Lua Table [String,Object]	Returns a table of info parameters for this Pin object indexed by parameter name:\n"DefaultValue" – (Object)The default Value of this Pin Object	`HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness').I`

Pin (Value Pins – Boolean,String,Float and Integer)				
			"Label" – (String) The Label of this Pin Object "QuickInfo" – (String) Basic description of this pin "ValueLabels" – (Lua Table [Number,String]) table of labels and values (Integer Pin Only) "TrueLabel" – (String) Display value for a true value (Boolean Pin Only) "FalseLabel" – (String) Display value for a false value (Boolean Pin Only) "DisplayMin" – (Number)Minimum display value (Float Pin Only) "DisplayMax" – (Number)Maximum display value (Float Pin Only)	nfo
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
Reset	()	Nothing	Attempts to set this pin to it's default value	`HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness')`

Pin (Floats)				
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FadeLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the value of a float pin in the background from a value (either given or current) to the value given, over FadeTime Seconds, does not halt script execution	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:FindPin('FX1/Level'):FadeValue(0, 1, 8)`
FadeLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the value of a float pin from a value (either given or current) to the value given, over FadeTime Seconds, does halt script execution while in progress	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:FindPin('FX1/Level'):FadeLevelWait(1, 0, 15)`
SnapEndLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the float pin from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:FindPin('FX1/Level'):SnapEndLevel(0, 1, 10)`
SnapEndLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the float pin from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:FindPin('FX1/Level'):SnapEndLevelWait(1, 0, 15)`
EasingCubicLevel	(Number From(Optional),Number	Nothing	Fades float pin from a value (either given or	`HippoNet.LocalHost.Engin`

Pin (Floats)				
	To,Number FadeTime)		current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does not halt the script	`e:FindMi x(1).Layer s[1]:FindPi n('FX1/Leve l'):EasingCub icLevel(0, 1, 10)`
EasingCubicLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades float pin from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does halt the script	`HippoNet.Loca lHost.Engin e:FindMi x(1).Layer s[1]:FindPi n('FX1/Leve l'):EasingCub icLevelWai t(1, 0, 15)`
EasingSineLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades float pin from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does not halt the script	`HippoNet.Loca lHost.Engin e:FindMi x(1).Layer s[1]:FindPi n('FX1/Leve l'):EasingSin eLevel(0, 1, 10)`
EasingSineLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades float pin from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does halt the script	`HippoNet.Loca lHost.Engin e:FindMi x(1).Layer s[1]:FindPi n('FX1/Leve l'):EasingSin eLevelWai t(1, 0, 15)`
EasingQuadraticLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades float pin from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does not	`HippoNet.Loca lHost.Engin e:FindMi x(1).Layer s[1]:FindPi n('FX1/Leve l'):EasingQua`

Pin (Floats)				
			halt the script	`draticLevel(0, 1, 10)`
EasingQuadraticLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades float pin from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:FindPin('FX1/Level'):EasingQuadraticLevelWait(1, 0, 15)`

Engine API

Used to query mixes and viewports on the specific Engine.

Engine Component				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
MixCount		Number	Returns the number of Mixes running on this engine	`HippoNet.LocalHost.Engine.MixCount`
ViewportCount		Number	Returns the number of Viewports running on this engine	`HippoNet.LocalHost.Engine.ViewportCount`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FindMix	(Number MixIndex)	Mix Object or Nil	Returns the Mix Object with index of or nil if is out of range	`HippoNet.LocalHost.Engine:FindMix(1)`
FindViewport	(Number ViewportIndex)	Viewport Object or Nil	Returns the Viewport Object with index of or nil if is out of range	`HippoNet.LocalHost.Engine:FindViewport(2)`

Mix API

Mix				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Index		Number	Returns the numerical index of this Mix	`HippoNet.LocalHost.Engine:FindMix(1).Index`
Path		String	Returns the full path of the Root Pin of this mix from the Engine Root Pin	`HippoNet.LocalHost.Engine:FindMix(1).Path`
LayerCount		Number	Returns the number of layers in this Mix Object	`HippoNet.LocalHost.Engine:FindMix(1).LayerCount`
Layers		Lua Table [Number,Layer Object]	Returns a table of all the Layer Objects on this mix indexed by their layer index	`HippoNet.LocalHost.Engine:FindMix(1).Layers`
Level		Number	Value between 0.0 and 1.0 that represents the level of the mix master on this mix, this value can be read or set	`HippoNet.LocalHost.Engine:FindMix(1).Level`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FadeLevel	(Number	Nothing	Fades the level of this	`HippoNe`

Mix				
	From(Optional),Number To,Number FadeTime)		mix master in the background from a value (either given or current) to the value given, over FadeTime Seconds, does not halt script execution	`t.LocalHost.Engine:FindMix(1):FadeLevel(0, 1, 10)`
FadeLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the level of this mix master from a value (either given or current) to the value given, over FadeTime Seconds, does halt script execution while in progress	`HippoNet.LocalHost.Engine:FindMix(1):FadeLevelWait(1, 0, 15)`
SnapEndLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1):SnapEndLevel(0, 1, 10)`
SnapEndLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1):SnapEndLevelWait(1, 0, 15)`
EasingCubicLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1):EasingCubicLevel(0, 1, 10)`
EasingCubicLevelWait	(Number From(Optional),Number	Nothing	Fades level from a value (either given or	`HippoNe`

Mix				
	To,Number FadeTime)		current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does halt the script	`t.LocalHost.Engine:FindMix(1):EasingCubicLevelWait(1, 0, 15)`
EasingSineLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1):EasingSineLevel(0, 1, 10)`
EasingSineLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1):EasingSineLevelWait(1, 0, 15)`
EasingQuadraticLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1):EasingQuadraticLevel(0, 1, 10)`
EasingQuadraticLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic	`HippoNet.LocalHost.Engine:FindMix(1):EasingQuadraticLevelWa`

Mix				
			curve. This does halt the script	`it(1, 0, 15)`
SetPreset	(Number PresetIndex)	Nothing	Attempts to load a Mix Preset with index onto this Mix Object if the preset exists. , will set a fade time	`HippoNet.LocalHost.Engine:FindMix(1):SetPreset(10)`
Reset	()	Nothing	Resets the Mix and all it's Layers back to their default state	`HippoNet.LocalHost.Engine:FindMix(1):Reset()`

Layer API

Layer				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Index		Number	Returns the numerical index of this Layer Object	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1].Index`
Path		String	Returns the full path of the Root Pin of this Layer from the Engine Root Pin	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1].Path`
Level		Number	A value between 0.0 and 1.0 that represents the level of this Layer Object, this value can be read or set	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1].Level`
Pause		Boolean	Returns True if the media player on this Layer Object is paused, False if it is not, this value can be read or set	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1].Pause`
Position		Number	Returns the position of the mediaplayer playhead in milliseconds from the start of the media clip, this value can be read or set. If no media return is 1	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1].Position`
InPoint		Number	Returns the position of the InpoInt flag in	`HippoNet.LocalHost.E`

Layer				
			milliseconds from the start of the media, this value can be read or set. If no media return is 1	`ngine:Find Mix(1).Lay ers[1].InP oint`
OutPoint		Number	Returns the position of the OutPoint flag in milliseconds from the start of the media, this value can be read or set. If no media return is 2147483647	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1].Out Point`
PlayMode		String	Returns a string that represents the playmode of the mediaplayer from one of these values: forward forwardLoop backward backwardLoop pingPong random in out This value can be read or set	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1].Pla yMode`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FadeLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the level of this layer level in the background from a value (either given or current) to the value given, over FadeTime Seconds, does not halt script execution	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Fad eLevel(0, 1, 8)`
FadeLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the level of this layer level from a value (either given or	`HippoNet.L ocalHost.E ngine:Find`

Layer				
			current) to the value given, over FadeTime Seconds, does halt script execution while in progress	`Mix(1).Lay ers[1]:Fad eLevelWai t(1, 0, 1 5)`
SnapEndLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does not halt the script	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Sna pEndLeve l(0, 1, 1 0)`
SnapEndLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does halt the script	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Sna pEndLevelW ait(1, 0, 15)`
EasingCubicLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does not halt the script	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Eas ingCubicLe vel(0, 1, 10)`
EasingCubicLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does halt the script	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Eas ingCubicLe velWai t(1, 0, 1 5)`
EasingSineLevel	(Number From(Optional),Number	Nothing	Fades level from a value (either given or	`HippoNet.L ocalHost.E`

Layer				
	To,Number FadeTime)		current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does not halt the script	`ngine:FindMix(1).Layers[1]:EasingSineLevel(0, 1, 10)`
EasingSineLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:EasingSineLevelWait(1, 0, 15)`
EasingQuadraticLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:EasingQuadraticLevel(0, 1, 10)`
EasingQuadraticLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does halt the script	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:EasingQuadraticLevelWait(1, 0, 15)`
SetMedia	(Number MediaIndex,String PlayMode(optional),Number Position(optional),Number InPoint(optional),Number OutPoint(optional),Number MediaWait(optional))	Nothing	Attempts to load the media with an index of into the mediaplayer and set the playmode to , InPoint to Ms, OutPoint to Ms, Playhead to Ms and then wait for Seconds	`HippoNet.LocalHost.Engine:FindMix(1).Layers[1]:SetMedia(20, 'backward', 100, 1`

Layer				
			before proceeding with script	`0, 200, 30 0)`
SetPreset	(Number PresetIndex)	Nothing	Attempts to load a Layer Preset with index onto this Layer Object if the preset exists	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Set Preset(11 2)`
FindPin	(String PathFromRoot)	Pin Object or Nil	Returns the Pin Object with a path of from the Root Pin of this Layer Object	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Fin dPin('Colo ur/Brightn ess')`
Reset	()	Nothing	Resets the Layer Object to it's default values	`HippoNet.L ocalHost.E ngine:Find Mix(1).Lay ers[1]:Res et()`

Media Manager API

MediaManager Component				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
MediaLibrary		Lua Table [Number,Media Object]	Returns a table of all the Media Objects contained in the mediaManager in no particular order indexed by increasing integer	`HippoNet.LocalHost.MediaManager.MediaLibrary`
MediaMap		Lua Table [Number,Media Object]	Returns a table of all the Media Objects in the MediaMap indexed by their MediaMap slot index, this value can be read or set	`HippoNet.LocalHost.MediaManager.MediaMap`
Path		String	Returns the Media Manager path for the selected media	`HippoNet.LocalHost.MediaManager.MediaMap[116].Path`
Name		String	Returns the name of the selected media	`HippoNet.LocalHost.MediaManager.MediaMap[116].Name`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
SetMediaMap	(Lua Table [Number,Media Object] MediaMap,Boolean ClearExisting(optional))	Boolean	Attempts to place the medias in into the mediamap indexes contained in . If is set to True it clears the existing MediaMap first. Returns True if the action succeeded or False if it failed	`HippoNet.LocalHost.MediaManager:SetMediaMap(HippoNet.LocalHost.MediaManager.MediaLibrary, true)`

MediaManager Component				
SetMediaMapIndex	(Number MapIndex,Media Object(or Nil) Media)	Boolean	Attempts to place MediaObject into the mediamap at position . If is Nil then the slot at position is cleared. Returns True on success or False on failiure	`HippoNet.LocalHost.MediaManager:SetMediaMapIndex(50, HippoNet.LocalHost.MediaManager.MediaLibrary[10])`
SetMediaMapIndex	(Number MapBank,Number MapClip,Media Object(or Nil) Media)	Boolean	Attempts to place MediaObject into the mediamap at bank Clip . If is Nil then bank Clip is cleared. Returns True on success or False on failure	`HippoNet.LocalHost.MediaManager:SetMediaMapIndex(5, 10, HippoNet.LocalHost.MediaManager.MediaLibrary[20])`
UploadSingleFile	(FilePathSource String, FilePathDestination String)	Boolean	The FilePathSource will be the original piece of media and the FilePathDestination is the folder structure MediaManager will use to store the encoded media.	`HippoNet.LocalHost.MediaManager:UploadSingleFile('C:\\Media.Mov', 'MacroManagerUploadedMedia/SingleFile/')`
UploadFolder	(FilePathSource String, FilePathDesitnation String	Boolean	The FilePathSource will be the path to the parent folder and the FilePathDestination is the folder structure MediaManager will use to store the encoded media	`HippoNet.LocalHost.MediaManager:UploadFolder('C:\\MediaFolders\\Folder', 'MacroManagerUploadedFolders')`
GetAllStrataFolders		Lua Table [Number, Folder Name]	Returns all mapped potential Strata paths	`print(HippoNet.LocalHost.MediaManager:GetAllStrataFolders))`
AddNewStrataFolder	FilePathSource String		Creates a new Strata	`HippoNet.Loca`

MediaManager Component				
			mapping to the input String path	`lHost.MediaManager:AddNewStrataFolder("D:/MediaManager2/test")`
GetMainStrataFolder		Lua Table [Number, Folder Name]	Returns the currently used strata path	`print(HippoNet.LocalHost.MediaManager:GetMainStrataFolder())`
RemapMediaPath			Sets the currently active Strata Path	`HippoNet.LocalHost.MediaManager:RemapMediaPath(mm:GetAllStrataFolders()[2].ID)`
SetMediaPath	FolderPathSource String		Remap the current Strata path to specified folder path	`HippoNet.LocalHost.MediaManager:SetMediaPath('C:/ProgramData/GreenHippo/MediaV4')`

Media API

Media				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Name		String	Returns the name of this Media Object, this value can be read or set	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].Name`
Path		String	Returns the full folder path and Name of this MediaObject, this value can be read or set	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].Path`
FileType		String	Returns the description of the filetype of this MediaObject eg.	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].FileType`
Duration		Number	Returns the duration in milliseconds of this Media Object	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].Duration`
FileSize		Number	Returns the filesize in bytes of this Media Object	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].FileSize`
Width		Number	Returns the width in pixels of this Media Object	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].Width`
Height		Number	Returns the height in pixels of this Media Object	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].Height`
~~FPS~~		~~Number~~	~~Returns the Frames Per second of the clip~~	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].FPS`
DurationFrames		Number	Returns the number of frames of the clip	`HippoNet.LocalHost.MediaManager.MediaLibrary[20].DurationFrames`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**

Media				
Delete	()	Boolean	Attempts to delete this Media Object , returns true is succeeded or false if the file is in use or locked	`HippoNet.LocalHost.MediaManager.MediaLibrary[20]:Delete()`
Equals	(MediaObject Media)	Boolean	Returns True if this Media Object is the same as or False if it is different	`HippoNet.LocalHost.MediaManager.MediaLibrary[20]:Equals(HippoNet.LocalHost.MediaManager.MediaLibrary[30])`

Pin Bridge API

PinBridge Component				
Functions				
Function Name	Parameters	Return Data Type	Description	Example Syntax
AddFloatBridge	(String BridgeName, [Pin Object] Targets)	Nothing	Attempts to create a Float PinBridge with name and adds the Pins to that bridge	`HippoNet.LocalHost:FindComponent('PinBridge'):AddFloatBridge('FloatBridge', HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness'), HippoNet.LocalHost.Engine:FindPin('Mix1/Layer2/Colour/Brightness'))`
AddBoolBridge	(String BridgeName, [Pin Object] Targets)	Nothing	Attempts to create a Boolean PinBridge with name and adds the Pins to that bridge	`HippoNet.LocalHost:FindComponent('PinBridge'):AddBoolBridge('BoolBridge', HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness'), HippoNet.LocalHost.Engine:FindPin('Mix1/Layer2/Colour/Brightness'))`
AddIntBridge	(String BridgeName, Pin Object] Targets)	Nothing	Attempts to create an Integer PinBridge with name and adds the Pins to that bridge	`HippoNet.LocalHost:FindComponent('PinBridge'):AddIntBridge('IntBridge', HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness'), HippoNet.LocalHost.Engine:FindPin('Mix1/Layer2/Colour/Brightness'))`
AddStringBridge	(String BridgeName, [Pin Object] Targets)	Nothing	Attempts to create a String PinBridge with name and adds the Pins to that bridge	`HippoNet.LocalHost:FindComponent('PinBridge'):AddStringBridge('StringBridge', HippoNet.LocalHost.Engine:FindPin('Mix1/Layer1/Colour/Brightness'), HippoNet.LocalHost.Engine:FindPin('Mix1/Layer2/Colour/Brightness'))`

Helper Functions

Helper Functions				
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
scale	(Number Input,Number InputMin,Number InputMax,Number OutputMin,Number OutputMax,Boolean ClipToOutputRange(optional))	Number	Scales the value Input according to the ratio between InputMin – InputMax and OutputMin – OutputMax. Restricts the output to the stated output range if ClipToOutputRange is True	`scale(100, 1 0, 200, 100, 500, True)`
mediaIndex	(Number Bank,Number Clip)	Number	Converts a Bank and Clip to a media index	`mediaIndex(1 0, 50)`
mediaClip	(Number MediaIndex)	Number	Returns the Clip portion of a media index	`mediaClip(50 0)`
mediaBank	(Number MediaIndex)	Number	Returns the Bank portion of a media index	`mediaBank(50 0)`
time	(Number Hours,Number Minutes,Number Seconds,Number Milliseconds(optional))	Number	Returns Hours, Minutes, Seconds, and Milliseconds as total milliseconds	`time(0, 58, 2 0, 0)`
timecode24	(Number Hours,Number Minutes,Number Seconds,Number Frames)	Number	Returns a value that represents the entered timecode as total milliseconds based on a timecode format of 23.98 fps	`timecode2 4(1, 30, 20, 5)`
timecode25	(Number Hours,Number Minutes,Number Seconds,Number Frames)	Number	Returns a value that represents the entered timecode as total milliseconds based on a timecode format of 25 fps	`timecode2 5(1, 30, 20, 5)`
timecode30NonDrop	(Number Hours,Number	Number	Returns a value that	`timecode30Non`

Helper Functions				
	~~Minutes,Number Seconds,Number Frames)~~		~~represents the entered timecode as total milliseconds based on a timecode format of 30.00 fps Non Drop~~	`Drop(1, 30, 20, 5)`
~~timecode30Drop~~	~~(Number Hours,Number Minutes,Number Seconds,Number Frames)~~	~~Number~~	~~Returns a value that represents the entered timecode as total milliseconds based on a timecode format of 29.97 fps Drop Frame~~	`timecode30Drop(1, 30, 20, 5)`
sleep	(Number Milliseconds)	Nothing	Forces the script execution to pause for X Milliseconds	`sleep(1000)`
regexMatch	(String Input,String Pattern)	Boolean	Returns True if the string Input matches the regex Pattern, false if it does not match	`regexMatch('Me', 'Me')`
regexReplace	(String Input,String Replacement,String Pattern)	String	Returns a new String where the string Input is modified with string Replacement according to the regex string Pattern	`regexReplace('Hello World Its Me', 'You', 'Me')`
ping	(String IP,Number TimeOut)	Boolean	Returns true if a response is received to a network ping to address Ip before the timeout of X Milliseconds	`ping('8.8.8.8', 20)`
udpSend	(String Data,String IP,Number Port,String LocalIP(optional))	Boolean	Attempts to send the String Data using UDP to target IP on port X using the local network adapter with IP Address X. Returns true if data was sent to target, false if there was an error	`udpSend('Data String', '192.168.20.20', 3005, '192.168.20.22'`
tcpSend	(String Data,String IP,Number Port,String LocalIP(optional),Number		Attempts to send the String Data using TCP to target IP on port X	`tcpSend('StringData', '192.168.20.2`

Helper Functions				
	TimeOut(optional))		using the local network adapter with IP X. Returns true if data was sent to target within TimeOut> Milliseconds, false if there was an error or it took too long	`0', 3005, '192.168.20.22, 100)`
httpGet	(String Address)	String	Performs an Http Get request to address and returns the message received back as a string	`httpGet('http://192.168.20.20'`
httpPost	(String Address,String Data	String	Performs an Http Post request to address including the added data and returns the message received back as a string	`httpPost('http:\\192.168.20.20', 'DataString')`

Viewport API

Viewport				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Index		Number	Returns the numerical index of this Viewport	`HippoNet.LocalHost.Engine:FindViewport(1).Index`
Path		String	Returns the full path of the Root Pin of this viewport from the Engine Root Pin	`HippoNet.LocalHost.Engine:FindViewport(1).Path`
Level		Number	Value between 0.0 and 1.0 that represents the level of the viewport master on this viewport this value can be read or set	`HippoNet.LocalHost.Engine:FindViewport(1).Level`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
FadeLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the level of this viewport in the background from a value (either given or current) to the value given, over FadeTime Seconds, does not halt script execution	`HippoNet.LocalHost.Engine:FindViewport(1):FadeLevel(0, 1, 10)`
FadeLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades the level of this viewport from a value (either given or current) to the value given, over FadeTime Seconds, does halt script execution while in progress	`HippoNet.LocalHost.Engine:FindViewport(1):FadeLevelWait(1, 0, 15)`

SnapEndLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does not halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):SnapEndLevel(0, 1, 10)`
SnapEndLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Snaps the level from a value (either given or current) to the value give after the FadeTime Seconds has passed. This does halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):SnapEndLevelWait(1, 0, 15)`
EasingCubicLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):EasingCubicLevel(0, 1, 10)`
EasingCubicLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value give after the FadeTime Seconds has passed using a Easing Cubic curve. This does halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):EasingCubicLevelWait(1, 0, 15)`
EasingSineLevel	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does not halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):EasingSineLevel(0, 1, 10)`
EasingSineLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Sine curve. This does halt the script	`HippoNet.LocalHost.Engine:FindViewport(1):EasingSineLevelWait(1, 0, 15)`
EasingQuadraticLevel	(Number	Nothing	Fades level from a value	`HippoNet.Lo`

	From(Optional),Number To,Number FadeTime)		(either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does not halt the script	`calHost.Eng ine:FindVie wport(1):Ea singQuadrat icLevel(0, 1, 10)`
EasingQuadraticLevelWait	(Number From(Optional),Number To,Number FadeTime)	Nothing	Fades level from a value (either given or current) to the value given after the FadeTime Seconds has passed using a Easing Quadratic curve. This does halt the script	`HippoNet.Lo calHost.Eng ine:FindVie wport(1):Ea singQuadrat icLevelWai t(1, 0, 15)`
SetPreset	(Number PresetIndex)	Nothing	Attempts to load a Mix Preset with index PresetIndex onto this Viewport Object if the preset exists	`HippoNet.Lo calHost.Eng ine:FindVie wport(1):Se tPreset(10)`
Reset	()	Nothing	Resets the Viewport and all it's Layers back to their default state	`HippoNet.Lo calHost.Eng ine:FindVie wport(1):Re set()`

Timeline API

The Timeline API contains specific commands for the Timeline Component and Timelines it contains.

Timeline				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Timelines		Lua Table [Number,String]	This returns a table of Timeline objects indexed by timeline name, individual timelines can be accesed by the format Timelines["My Timeline"]	`HippoNet.Local Host.Timelin e.Timlines`
TimelinesByID		Lua Table [Number, String	This returns a lua table of Timeline objects indexed by their ID, only timelines with a valid ID will be included, timelines can be accesed using the format TimelinesByID[5]	`HippoNet.Local Host.Timelin e.TimelinesBy ID`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
StopAll	()	Returns Nothing	stops all timelines playing	`HippoNet.Loca lHost.Timelin e:StopAll()`
PlayAll	()	Returns Nothing	Starts all timelines playing	`HippoNet.Loca lHost.Timelin e:PlayAll()`
RewindAll	()	Returns Nothing	rewinds all timelines without changing the play mode (so if timelines were playing they will continue playing but from start)	`HippoNet.Loca lHost.Timelin e:RewindAll()`
MuteAll	()	Returns Nothing	Mutes all timelines, returns nothing	`HippoNet.Loca lHost.Timelin e:MuteAll()`
UnMuteAll	()	Returns Nothing	UnMutes all timelines, returns nothing	`HippoNet.Loca lHost.Timelin e:UnMuteAll()`
Play	()	Returns Nothing	Plays the Timeline	`HippoNet.Loca lHost.Timelin`

Timeline				
				`e.Timeline s['Colour']:P lay()`
Stop	()	Returns Nothing	Stops the Timeline	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:S top()`
Pause	()	Returns Nothing	Pauses the Timeline	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:P ause()`
Rewind	()	Returns Nothing	Rewinds the Timeline	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:R ewind()`
Mute	()	Returns Nothing	Mutes the Timeline	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:M ute()`
UnMute	()	Returns Nothing	UnMutes the Timeline	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:U nMute()`
GotoCue	(cuenumber)	Returns Nothing	jumps playhead to specific cue with cuenumber (cuenumber can be decimal ie. 4.5)	`HippoNet.Loca lHost.Timelin e.Timeline s['Colour']:G otoCue(2)`

Timeline object

The Timeline objects referenced in the above tables have the following parameters:

- **Name** name of timeline – can be read or set
- **ID** unique ID of timeline as integer – can be read or set
- **Start** time of first event in timeline in milliseconds – read only

- **End** time of last event in timeline in milliseconds – read only
- **Position** position of playhead in milliseconds – can be read or set
- **TimecodeEnabled** state of timecode enabled, can be read or set

Timeline+ API

The Timeline+ API contains specific commands for the Timeline+ Component and Timelines it contains.

Timeline+				
Properties				
Property Name		**Return Data Type**	**Description**	**Example Syntax**
Timelines		Lua Table [Number,String]	This returns a table of Timeline objects indexed by timeline name, individual timelines can be accesed by the format Timelines["My Timeline"]	`HippoNet.Local Host.TimelineP lus.Timelines`
TimelinesByID		Lua Table [Number, String	This returns a lua table of Timeline objects indexed by their ID, only timelines with a valid ID will be included, timelines can be accesed using the format TimelinesByID[5]	`HippoNet.Local Host.TimelineP lus.TimelinesB yID`
Functions				
Function Name	**Parameters**	**Return Data Type**	**Description**	**Example Syntax**
StopAll	()	Returns Nothing	stops all timelines playing	`HippoNet.Local Host.TimelineP lus:StopAll()`
PlayAll	()	Returns Nothing	Starts all timelines playing	`HippoNet.Local Host.TimelineP lus:PlayAll()`
RewindAll	()	Returns Nothing	rewinds all timelines without changing the play mode (so if timelines were playing they will continue playing but from start)	`HippoNet.Local Host.TimelineP lus:RewindAl l()`
MuteAll	()	Returns Nothing	Mutes all timelines, returns nothing	`HippoNet.Local Host.TimelineP lus:MuteAll()`
UnMuteAll	()	Returns Nothing	UnMutes all timelines, returns nothing	`HippoNet.Local Host.TimelineP lus:UnMuteAl l()`

Timeline+				
Play	()	Returns Nothing	Plays the Timeline	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Pl ay()`
Stop	()	Returns Nothing	Stops the Timeline	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:St op()`
Pause	()	Returns Nothing	Pauses the Timeline	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Pa use()`
Mute	()	Returns Nothing	Mutes the Timeline	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Mu te()`
UnMute	()	Returns Nothing	UnMutes the Timeline	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Un Mute()`
GoCue	(cuenumber, "Action")	Returns Nothing	jumps playhead to specific cue with cuenumber (cuenumber can be decimal ie. 4.5) and starts action play	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Go Cue(2,"Play")`
GoNextCue	()	Returns Nothing	Advances the Playhead to the next cue	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Go NextCue()`
GoPreviousCue	()	Returns Nothing	Advances the Playhead to the previous cue	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Go PreviousCue()`

Timeline+				
ForceUpdate	()	Returns Nothing	Updates live values to where the playhead is currently at	`HippoNet.Local Host.TimelineP lus.Timeline s['Colour']:Fo rceUpdate()`

Timeline object

The Timeline objects referenced in the above tables have the following parameters:

- **Name** name of timeline – can be read or set
- **ID** unique ID of timeline as integer – can be read or set
- **Start** time of first event in timeline in milliseconds – read only
- **End** time of last event in timeline in milliseconds – read only
- **Position** position of playhead in milliseconds – can be read or set

Example Macros

The easiest way to learn Macro Manager is to use examples:

- Fading Layer Level

Additional Examples are available for download as a Macro Manager export

Fading Layer Level

A two layer cross fade
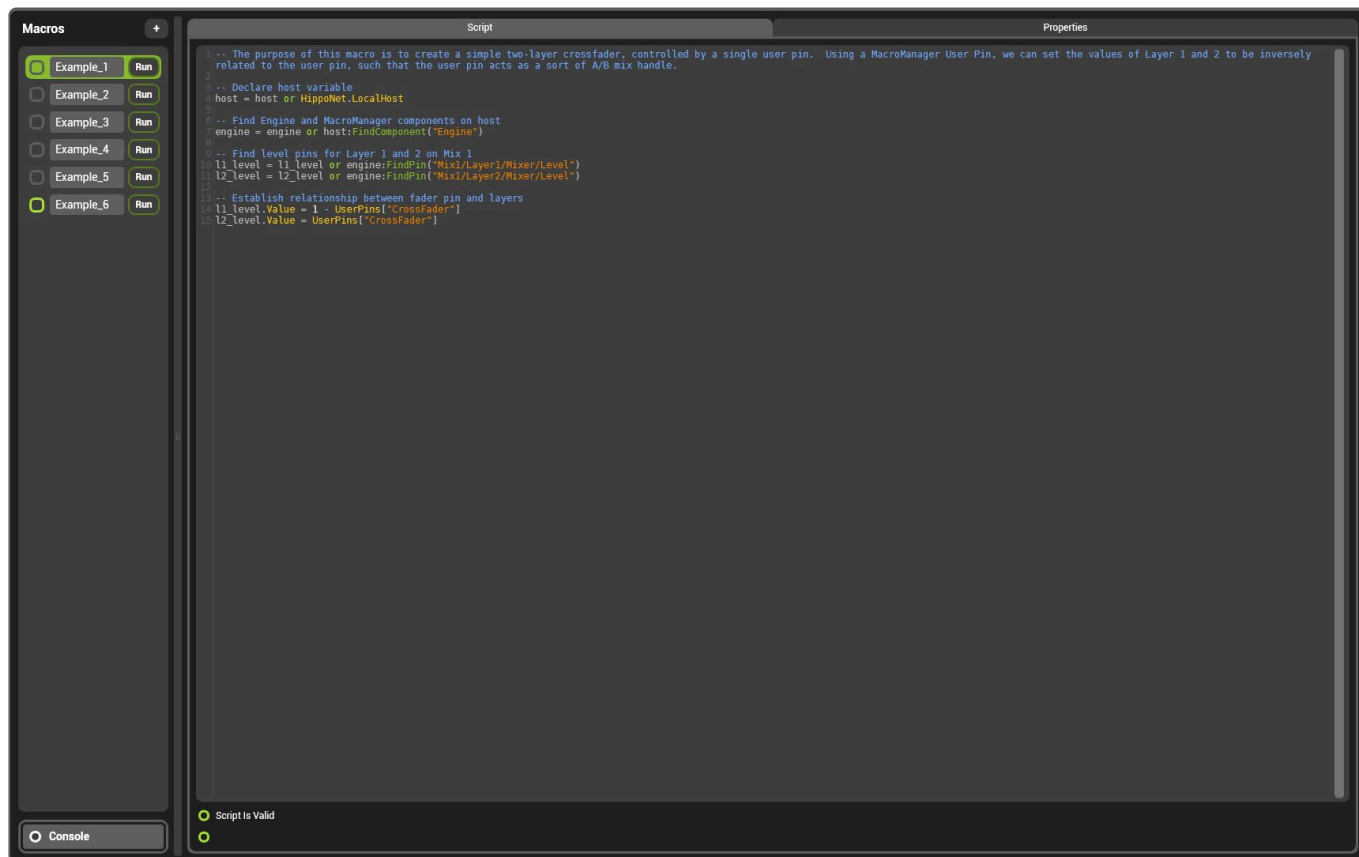
A user pin must also be created

The code for this macro is below

```
-- The purpose of this macro is to create a simple two-layer crossfader, contr
olled by a single user pin.  Using a MacroManager User Pin, we can set the val
ues of Layer 1 and 2 to be inversely related to the user pin, such that the us
er pin acts as a sort of A/B mix handle.

-- Declare host variable
host = host or HippoNet.LocalHost
```

```
-- Find Engine and MacroManager components on host
engine = engine or host:FindComponent("Engine")

-- Find level pins for Layer 1 and 2 on Mix 1
l1_level = l1_level or engine:FindPin("Mix1/Layer1/Mixer/Level")
l2_level = l2_level or engine:FindPin("Mix1/Layer2/Mixer/Level")

-- Establish relationship between fader pin and layers
l1_level.Value = 1 - UserPins["CrossFader"]
l2_level.Value = UserPins["CrossFader"]
```

Memory Management

Memory in Macromanager must be managed to avoid possible leaks and instability.

The following is the best practice when creating macros.

Use local as opposed to global variables

Global variables are not cleaned up by LUA's automatic memory management.

Use the local scope where possible. For example, to declare a variable 'Test' to nil locally use; `local Test = nil`

Variables that are created without a scope are global.

When global Variables are used, set them to nil at the end of the script

Global variables that are set to nil are cleaned by LUA automatically after the script runs.

Run automatic clean up at the end of a script

The Properties of each macro contain a setting to automatically purge the memory of the macro:
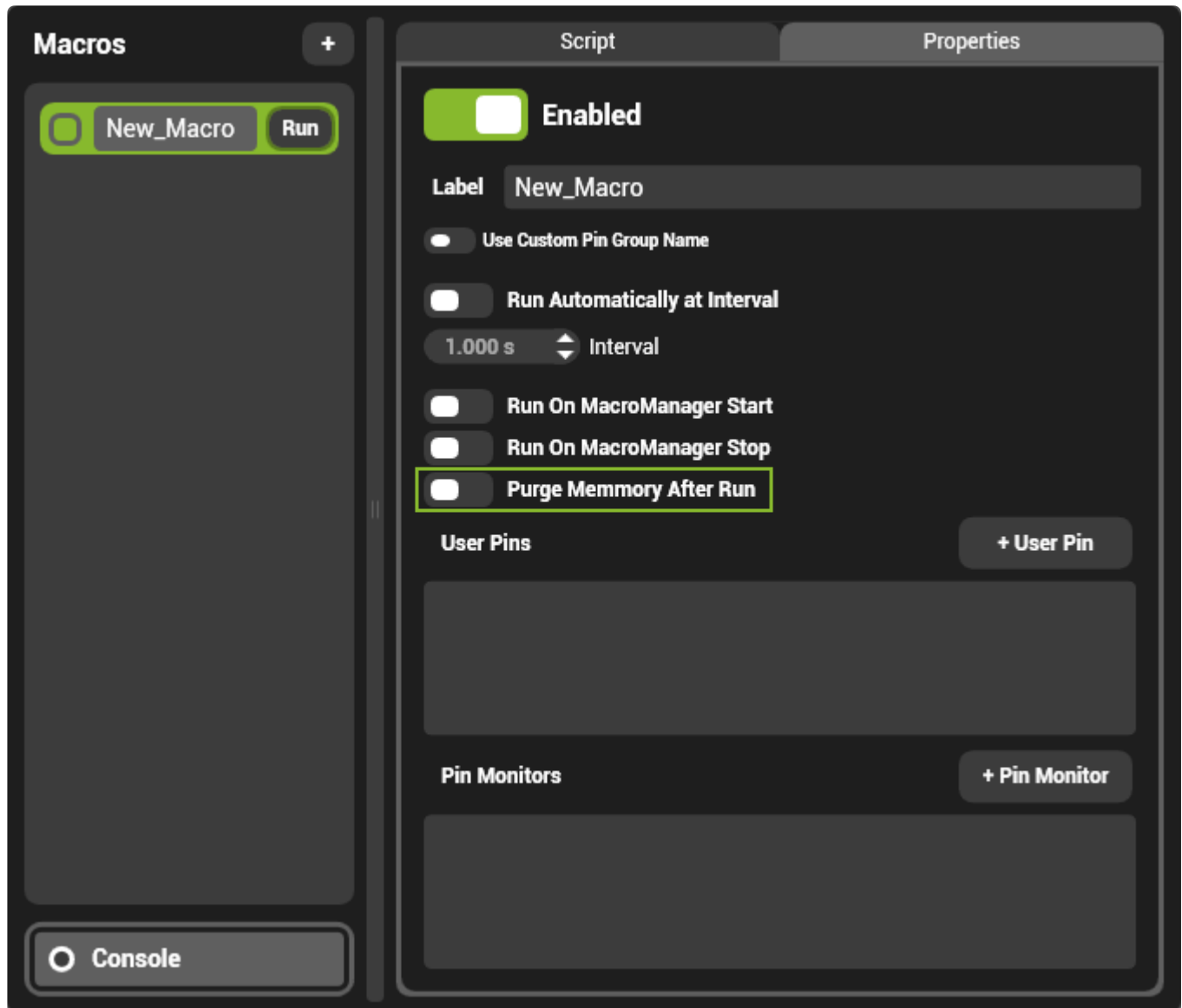
When enabled, Purging Memory will automatically destroy all variables created in that script.

Note: Purging Memory may prove too computationally heavy on scripts that run at a high frequency. (many times per second).

Media Manager

Media Manager is a complete content organisation system built into Hippotizer V4. Handling the encode, storage and playback of all video and audio files, Media Manager is an integral part of the Hippotizer.

To open Media Manager, click the media tab in Zookeeper's home screen.
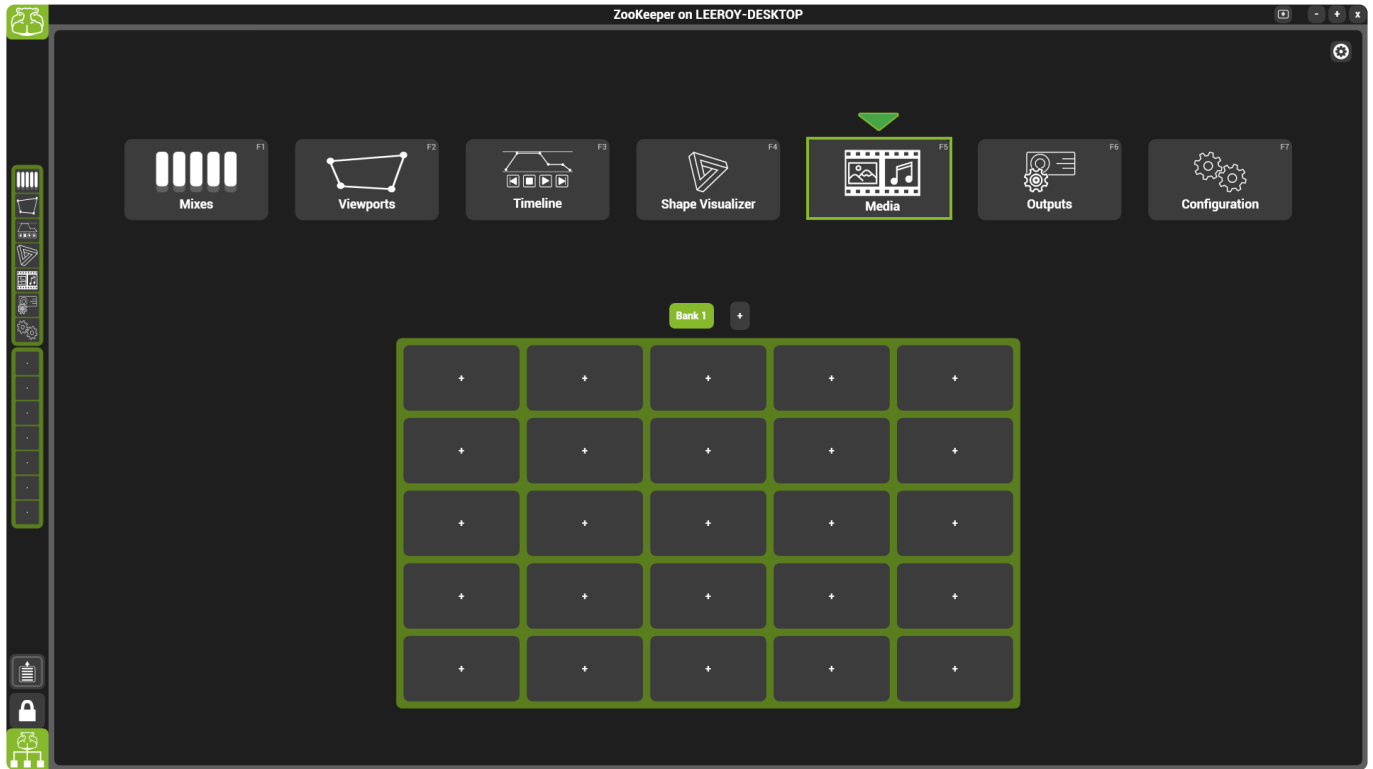
> ⚠ Media Manager is critical for the normal operation of Hippotizer. The component should not be stopped or deleted.

Sections of Media Manager

- [Basic Layout](#)
- [Encoding Media](#)
- [Media Manager Settings](#)
- [Tags and Notes](#)

Initialisation

On ZooKeeper start-up, the MediaManager component from every unit on the network will begin to share its MediaManager information. This is locally cached on the unit to allow for quicker changes and use when programming/ operating the Hippotizer software.

On the main MediaManager page on the ZooKeeper, each seperate engine will now display a progress bar to indicate the progress of the system as seen below.*
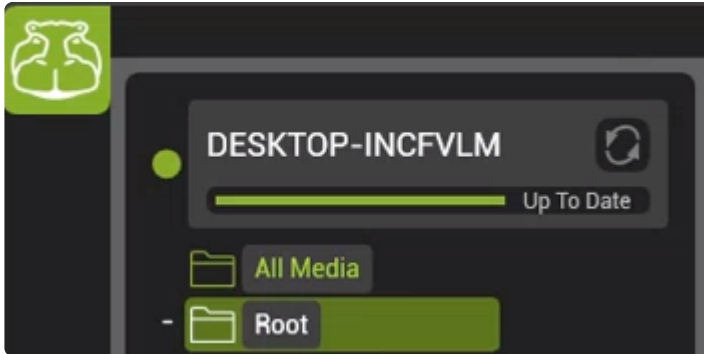
*Performance may be decreased until this process is completed.

Basic Layout

Media Manager stores and encodes all movies, images and sound files in the Hippotizer system.

Media Manager has different sections

Media Manager follows the convention that a Host Selector on the left of the screen chooses which media manager is shown on the right.

Host selector

Displays each system on the network.

Clicking the circle to the left of the host will show or hide the folder tree of that host.
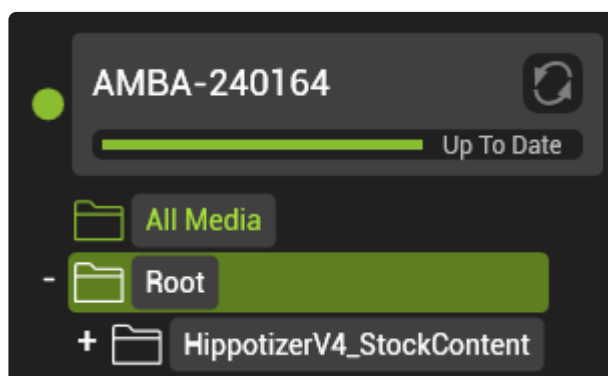
The circle's colour indicates the status of the media manager on that host.

- **Green:** Normal operation.

- **Blue:** Media manager on that host is busy either uploading or encoding content.
- **Yellow** Caution: Free Space on the media drive is at 10% or less.
- **Red** Error: Media Manager has an error or drive space is below 3%.

Hovering the mouse over the circle will show the details of the status.
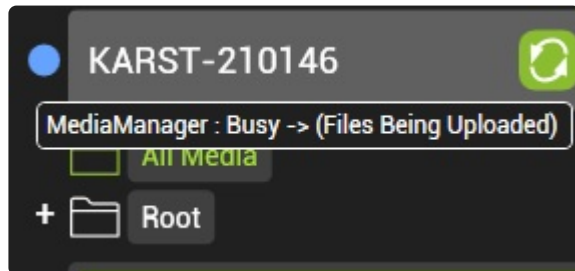
The arrow icon to the right of the host name indicates if the system is configured for sync.

 If the host has never had sync configured the icon will be grey

 If the host has been configured for sync then the icon will be green.

Clicking the green icon will sync the host to the previously configured targets.

This bar will show if the media cache is up to date, across all systems.

The media cache will be used when a page containing a media map is loaded. The media cache will make the loading of these pages much quicker.

Folder Tree

Media is organised into virtual folders in each Media Manager.
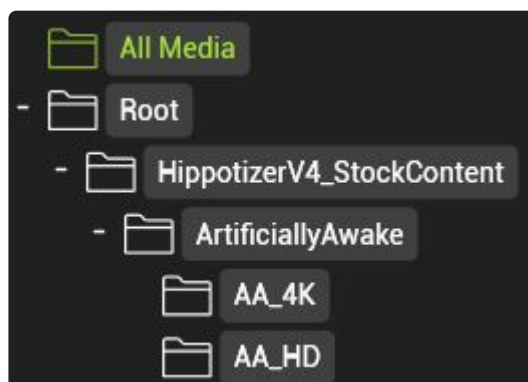
The **All Media** and **Root** folders are created by default and cannot be deleted.

- The root is the folder at the base of the folder tree.
- The All Media folder displays all the media in the Media Manager regardless of what folder they

are in.

Selected Folder's Media

Once a folder is selected, its media will display in the main pane of the interface.

 Displays each clip as it's thumbnail.

 Displays media as a list with details.

Media in either thumbnail or detailed view can be selected to add it to the media map.

- Left mouse click will toggle selection for each clip
- Holding CTRL while clicking will add to the current selection
- Holding SHIFT while clicking will toggle all clips between the selection
- A number will appear as clips are selected to indicate the order that they will be added to the media map.
- To add a selection to the media map, drag and drop it on a bank to add it from slot 0, or drop it directly onto a clip.

 Shows Media Manager Settings. Please see encoding media for more information.

Disk Usage

Disk Usage indicates how much space is used on the drive containing the strata folder.
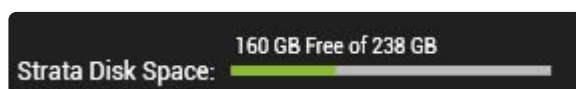
- At 10% free space the Media Manager component will be set to a yellow caution state.
- At 3% free space the Media Manager component will be set to a red error state and will refuse to encode additional media.

Media Upload

Uploading media allows external movie and audio files to be encoded into Hippotizer.

- Upload Files allows for single files to be choosen
- Upload Folders allows for whole folders to be encoded.
- When uploading image sequences and using the upload file option, choose a single image from the sequence to encode the entire sequence.

Please see the section on Encoding media for more information.

Media Map

The media map is the reference that Hippotizer uses to play media.
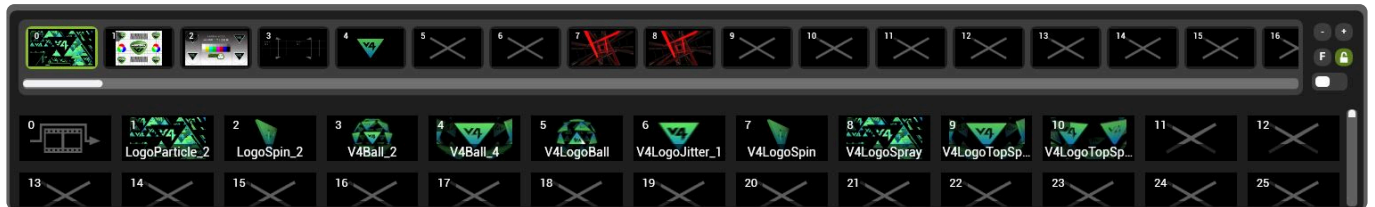
- In order to play a piece of media it must first be encoded and then added to the media map
- A single piece of media can be in multiple locations in the media map
- Any changes to the media map take effect immediately

Media Map Options

Display options for the media map are shown to the right of it.
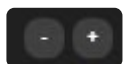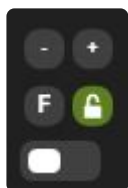
 Increases and decreases the number of clips shown per line.

 When green, the media map can be edited. Click to lock, which shows red, and blocks editing the map until unlocked.

 Enable to show Tags instead of media. See the Notes and Tags section for more information.

Encoding Media

Media Manager automatically converts external video files into the selected internal codec.

To Encode media, choose either the option to upload a file or folder from the Media Manager's main window.

Use **Upload Files…** to choose individual clips within a folder and use **Upload Folders…** to select an entire folder for encoding.

Media Manager Settings
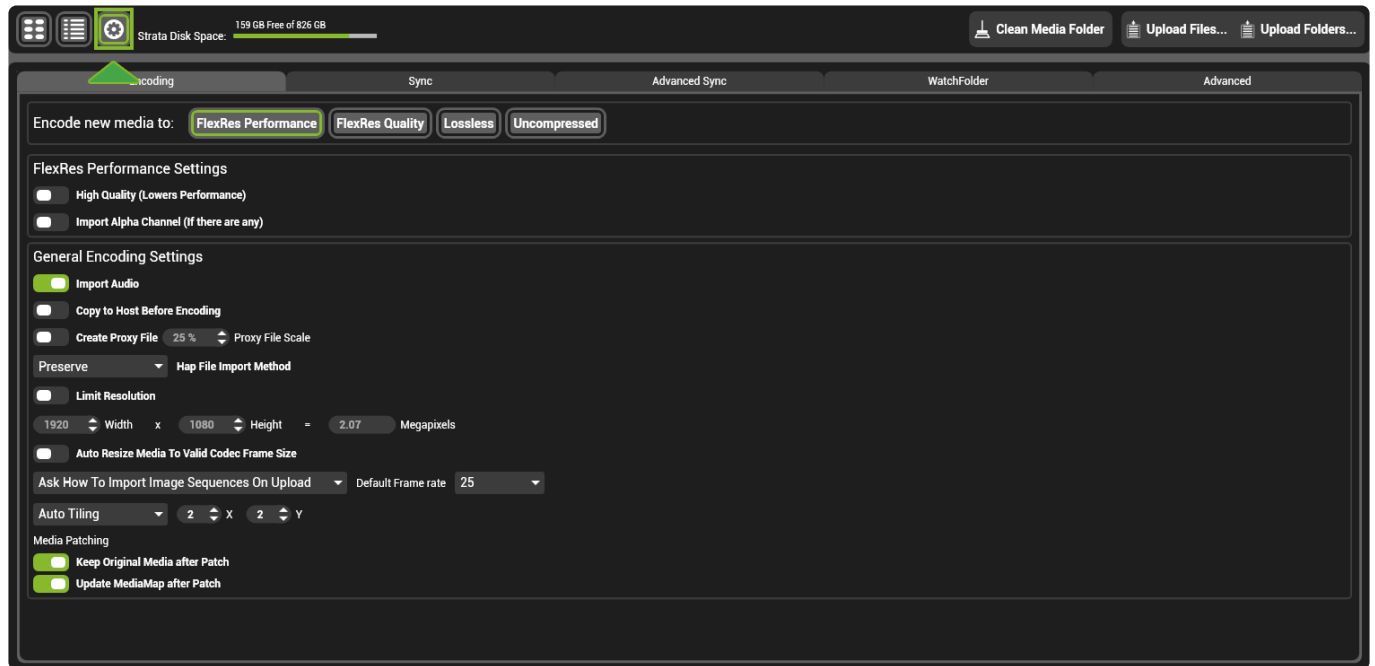
Media Manager's Settings control how media is encoded, where it is stored as well as other important functions.

In the settings menu, there are four main areas:

- [Encoding](#)
- [Sync](#)
- [Watchfolders](#)
- [Advanced](#)

Encoding

All movie files are converted automatically to a format that Hippotizer can play back. This process, called **Transcoding** is handled by media manager. Clips are converted to one of four internal Codecs:

- FlexRes Performance
- FlexRes Quality
- Lossless
- Uncompressed

Each codec offers strengths and weaknesses; it is best to consider the specific requirements of the production when choosing which codec to use.

> ❗ Content to be ingested must fit length and width restrictions in order to encode. Please see the Release Notes for the most up to date encoding restrictions.

General Encode Settings

Many settings in Media Manager apply to all content regardless of which Codec is selected:
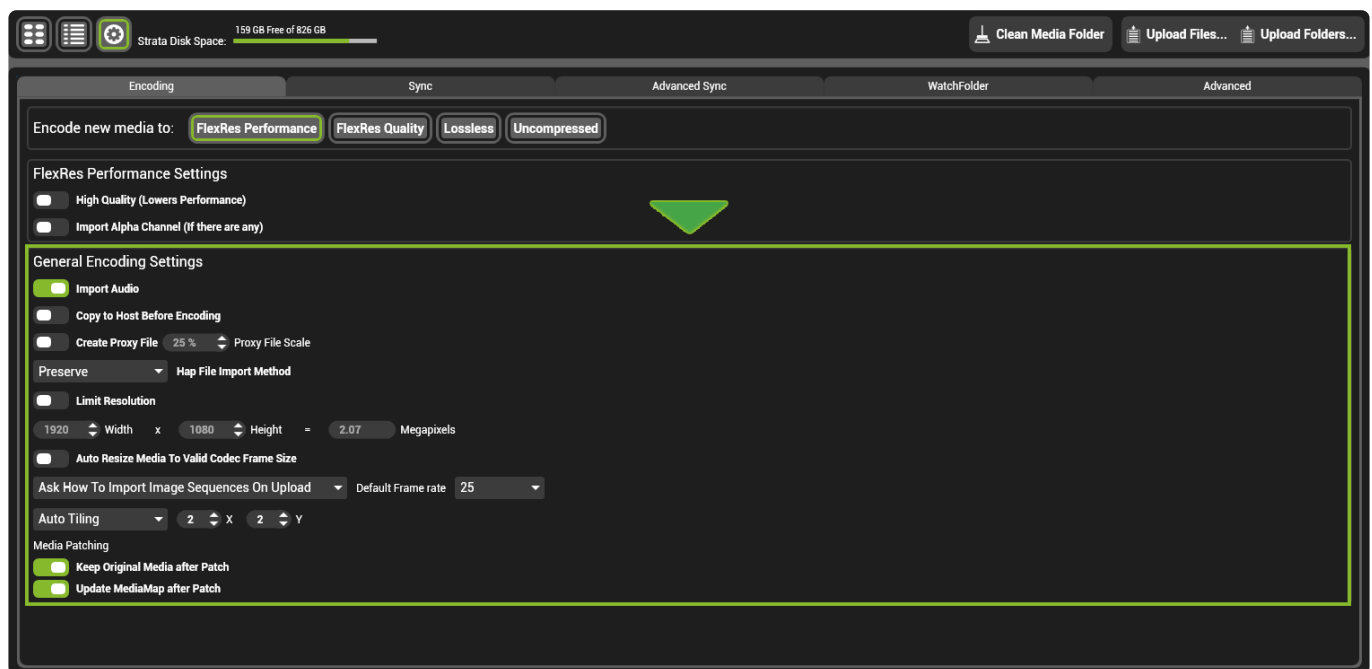
Import Audio:

If enabled, audio attached to clips will be encoded as well. If the source is an image sequence and an audio file is present in the folder with the same name as the sequence, then the audio file will be attached to the encoded clip.

> **Please Note:** Separate audio clips can be associated with image sequences to do this, place the audio file in the same folder as the target image sequence when it is encoded.Take care to ensure the resulting video

clip is the same length as the audio file.

Copy to host before Encoding:

If enabled media is copied to the local machine before encode. This is not recommended as it will create an extra copy operation and consume drive space.

Create Proxy

If enabled a smaller version (a proxy) of each media file will be created and saved in addition to the full resolution media. Proxy media is useful when using a visualiser to simulate larger multi-Hippotizer systems. Each mix can be set to use proxy or full resolution content with the pin UseProxyMedia under mix controls.
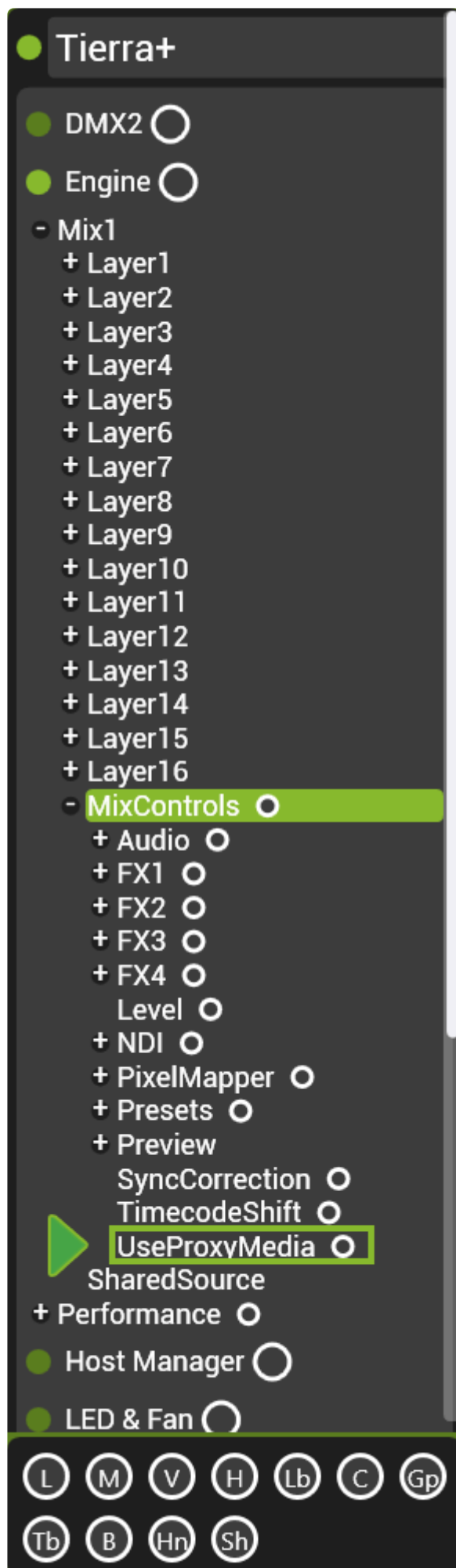
HAP File Import method

Files encoded directly to HAP can be encoded to Hippotizer with little or no transcode saving significant time in media ingest. To do this, files must be rendered directly to HAP.

> **Please Note:** Rendering to HAP can itself be a slow process, especially in QuickTime. If you are using PC based AfterEffects or Nuke it will be faster to use FlexRes plugins to render directly to FlexRes.

Any HAP files that are then encoded will follow the chosen transcode method:

> ❗ HAP, HAP-Alpha, HAP-Quality and HAP-Quality Alpha is supported.

Preserve: The fastest method: files are copied straight to the media library.

Repack: Files are re-wrapped but not transcoded. This is still fast, but may improve playback compared to normal HAP files.

Transcode: Files are re-encoded with the FlexRes wrapper applied.

Limit Resolution

If enabled will downscale all encoded media to the nearest legal resolution. The limit resolution values must respect the limits of the target codec; so for FlexRes Performance it must be divisible by four in height and width. Original aspect ratio is always maintained resulting in some output media including black edges to maintain aspect continuity.

Auto Re-size media to valid codec size

If enabled, content that is not within the resolution requirements of the selected codec will be automatically resized to work. The x and y pixel counts are adjusted independently with disregard for original aspect ratio.

> **Please Note:** Content will be scaled to fit. So a clip that was originally 1922 × 1080 would encode to 1920 × 1080. This slightly changes the aspect ratio so may not be desirable.

Ask how to Encode Image sequences

When files in the same folder to be encoded are detected as a series of images with sequential numbers in the name, Media Manager will assume they are image sequences and act accordingly. By default, it will ask the user to confirm that it is an image sequence instead of a series of discrete images to be encoded.

Default Frame Rate

The frame rate of the resulting clip when an image sequence is encoded.

FlexRes Performance

Building on the widely used HAP family of codecs, **FlexRes Performance** offers very low playback load with reasonable visual quality. The HAP codec uses GPU based decoding (the graphics card) to playback video which generally results in better overall system performance. HAP typically has a lower compression ratio than FlexRes Quality so encoded media can take up more space on disk and requires greater disk read performance.

To encode to FlexRes Performance, select it in the Media Manager settings.
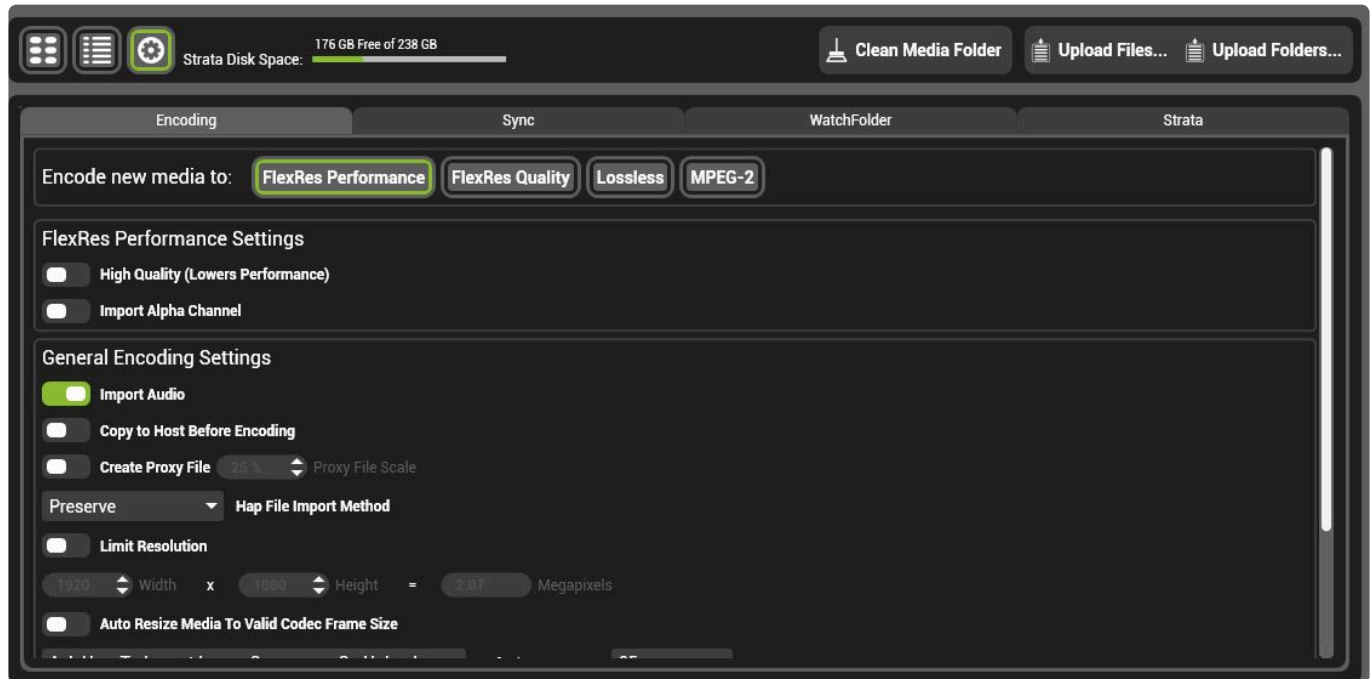
Strengths

- Very low playback overhead

Weaknesses

- Reduced colour space can result in banding especially with colour gradients.
- Colour sub-sampling carried out in 4×4 pixel blocks can make diagonal lines appear 'steppy'.
- Low compression ratio results in large files on disk

Tip: Applying noise to generated content with colour gradients can help to reduce the visibility of banding.

Resolution Limits

- Height and Width must be divisible by four.
- Max Resolution: 16,384 × 16,384
- Minimum Resolution: 64 × 64

Frame Rates Supported

- Up to 60 FPS

Alpha Support

- Yes, in FlexRes Performance Alpha only

FlexRes Performance offers four encoding options:
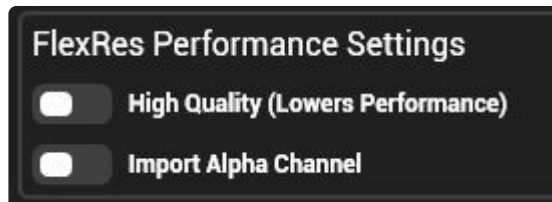
Performance Uses basic HAP; Offers the lowest data rate with the most compression. Visual artifacts are most noticeable on high contrast diagonal lines (where it will appear as steps) and in colour gradients: especially in warm colours.
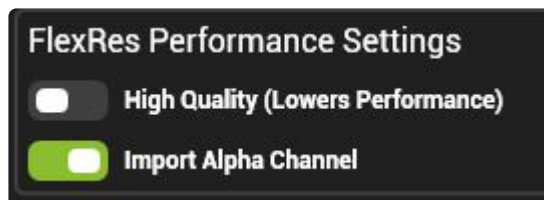
Performance Alpha Uses HAP-Alpha; adds alpha transparency support to HAP. Due to the extra data of the alpha channel, media file size and playback load is higher than that of normal HAP.
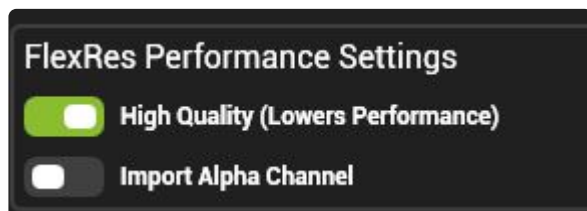
Performance High Quality Uses HAP-Q: offers improved image quality with a similar data rate and load as HAP-Alpha. Does not support alpha transparency.
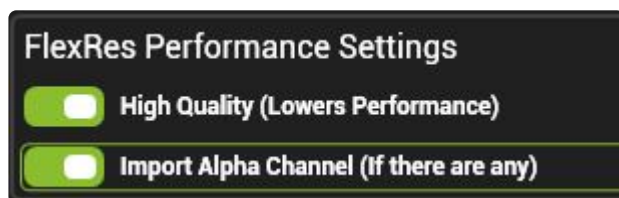
Performance High Quality Alpha Uses HAP-QA: offers improved image quality and Alpha with a slightly higher load to that of HAP-QA.

Tiling

- Tiling is an internal method that Hippotizer uses to optimise playback of greater than HD clips. It is best to leave this set to automatic.

FlexRes Quality

FlexRes Quality uses a codec developed by Green Hippo to combine low playback overhead with better visual quality.
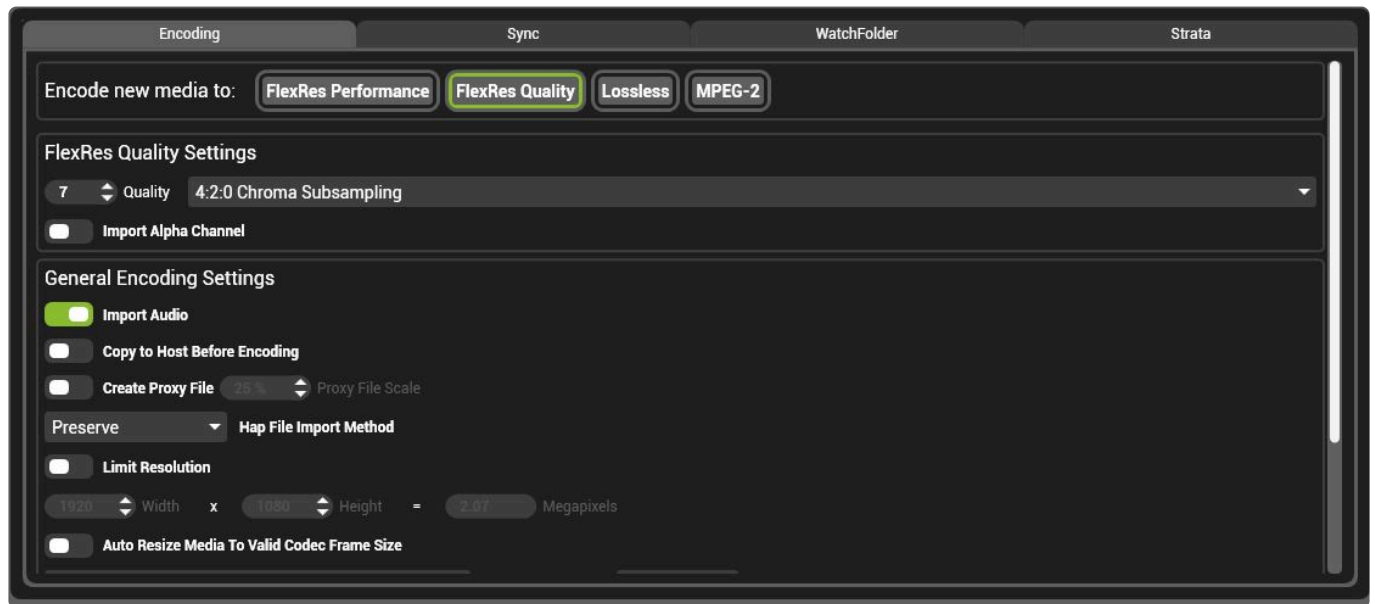
Strengths

- Choose what quality and colour sub-sampling is required
- 4:2:0 Quality 7 has comparable quality as FlexRes Performance with a smaller size on disk in most circumstances. (better compression)
- Good at encoding live (not rendered) content

Weaknesses

- Higher Quality and colour spaces can dramatically increase playback load.
- Relies partially on the computer's CPU for decoding
- Computer generated content with gradients and uniform colours do not compress well

Resolution Limits

- Height and Width must be divisible by four.
- Max Resolution: 16,384 × 16,384
- Minimum Resolution: 64 × 64

Frame Rates Supported

- Up to 60 FPS

Alpha Support

- Yes

FlexRes Quality has three encoding settings:

- **Chroma Sub-sampling** One method of image compression reduces the colour space of the video by only encoding certain colour channels for each 2 × 2 pixel block of video. The specifics of this process extend beyond the scope of this manual. In brief, 4:2:0 is encoding only half as much colour information as 4:4:4 which does not compress the colour data at all. The most visible artifact from colour compression is banding in colour gradients (as similar colours are rounded together forming a band) and steppy diagonal lines in areas of high contrast.

- **Quality** In addition to colour, FlexRes Quality also carries data out compression per frame. The degree of this compression is user configurable with 10 being visually lossless and 1 being very highly compressed.

- **Tiling** Tiling is an internal method that Hippotizer uses to optimise playback of greater than HD clips. It is best to leave this set to automatic.

Lossless

FlexRes **Lossless** uses a compression method that allows the source data to be perfectly reconstructed. FlexRes Lossless is designed for scenarios where perfect video reproduction is vital. Lossless has the potential to create relatively large files and can be very heavy to playback so is best used with caution.
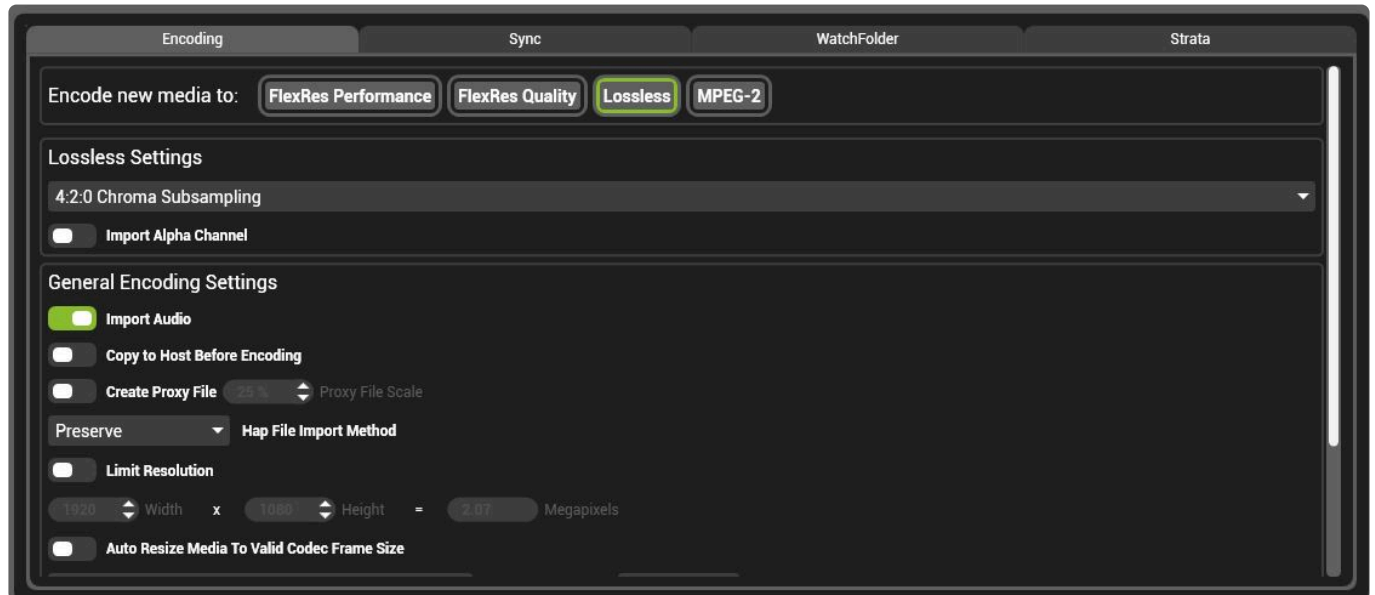
Strengths

- Perfect video reproduction when set to 4:4:4 colour.

Weaknesses

- Very High Playback load
- Large file size on disk

> **Note:** Due to the potentially huge file size of Lossless media, it is very important to consider drive space carefully for each application.

Resolution Limits

- Width must be divisible by four when using 4:2:0 or 4:2:2 chromatic sub-sampling
- Max Resolution: 16,384 × 16,384
- Minimum Resolution: 64 × 64

Frame Rates Supported

- Up to 60 FPS

Alpha Support

- Yes

Uncompressed

FlexRes **Uncompressed** uses no compression when storing video files. Without data compression a single frame of 1920 × 1080 alpha containing video stores at 8MB.
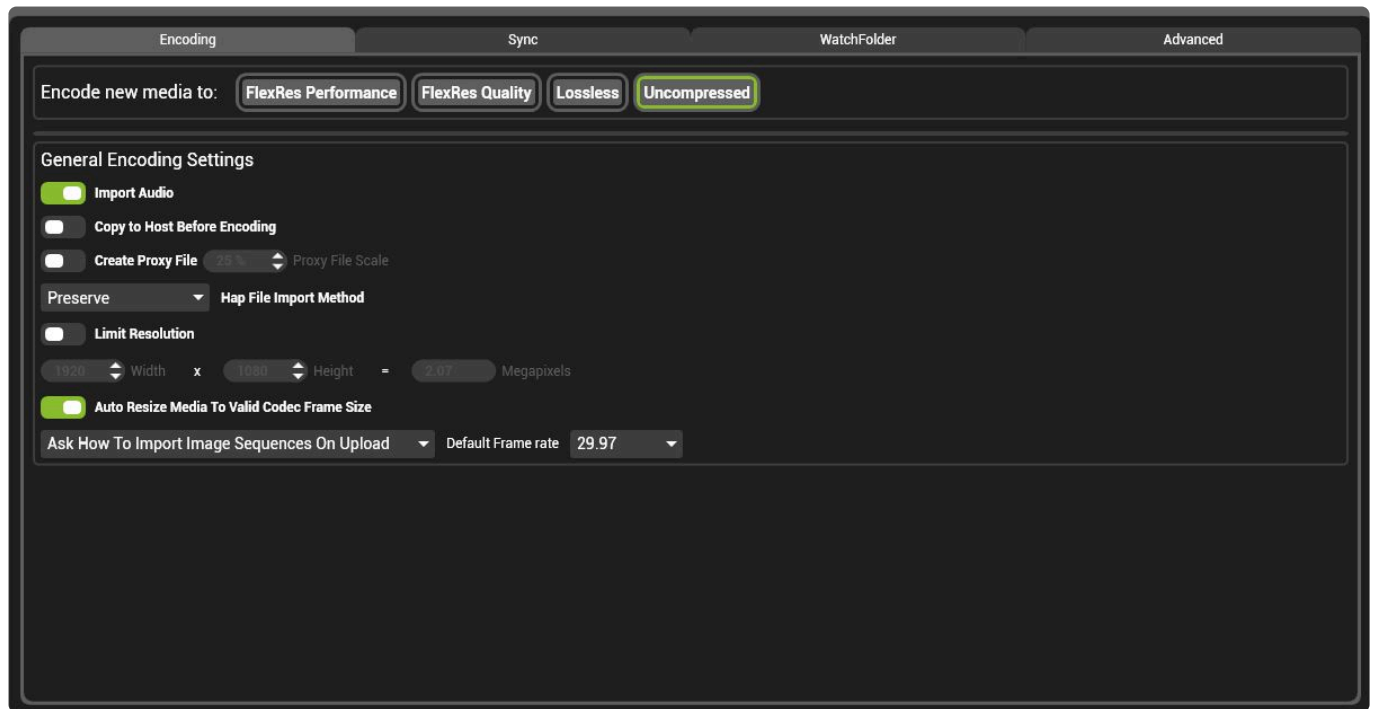
Strengths

- Perfect video reproduction
- No CPU usage to decompress.

Weaknesses

- Very High Playback load
- Huge file size on disk

Note: Due to the potentially huge file size of Lossless media, it is very important to consider drive space carefully for each application.

Resolution Limits

- Max Resolution: 16,384 × 16,384
- Minimum Resolution: 64 × 64

Frame Rates Supported

- Up to 60 FPS

Alpha Support

- Yes

Media Sync

Sync sends media to other systems on the network
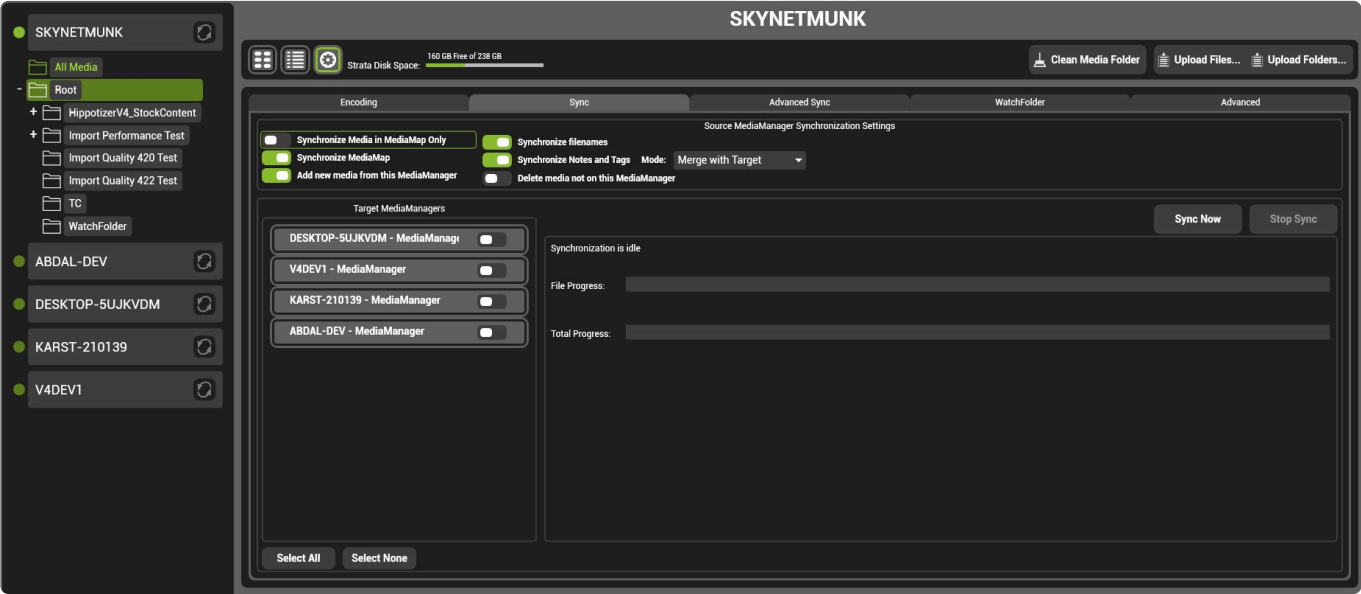
Media is sent from the selected system to the selected targets:
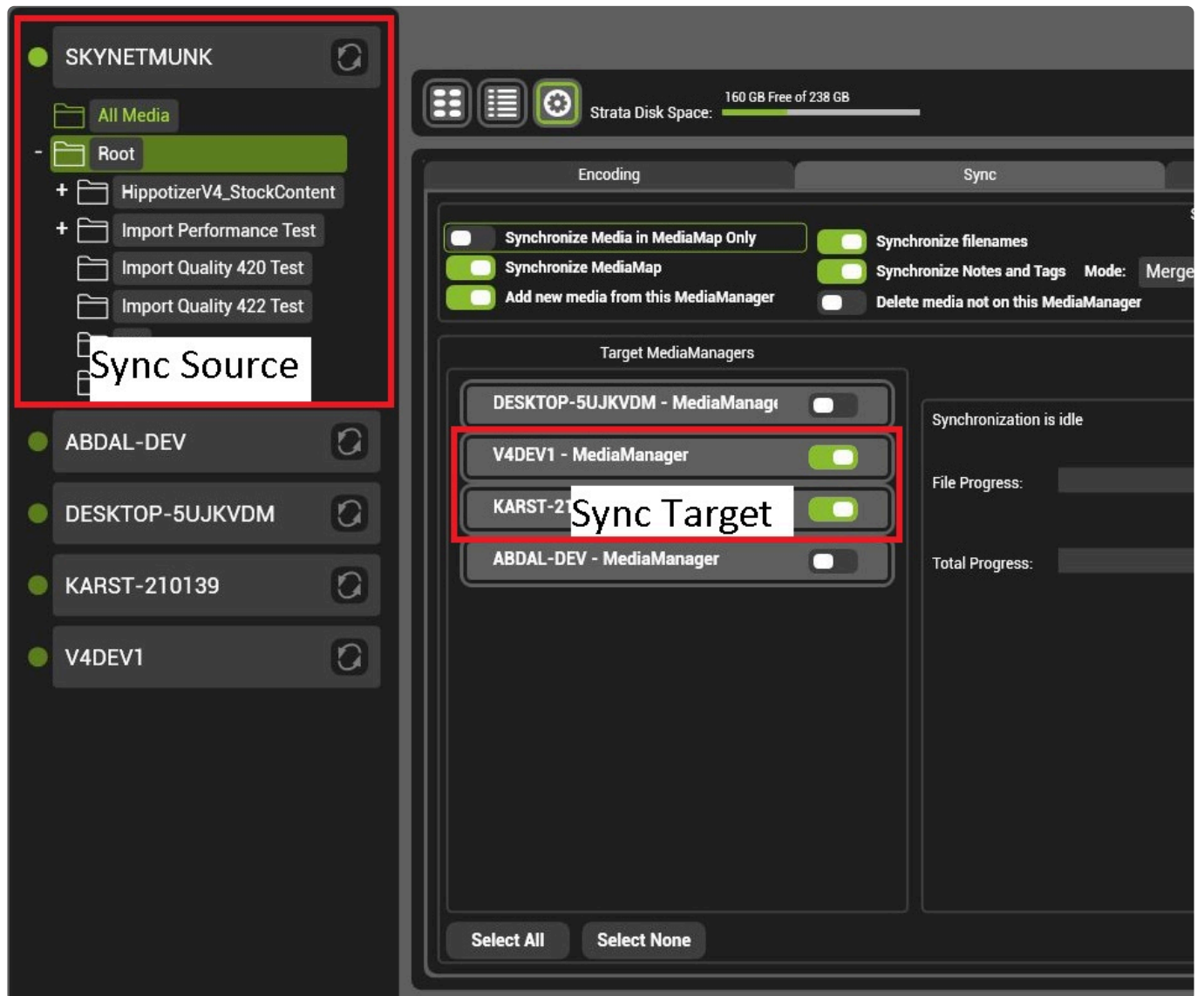
Sync Settings:

Synchronise Media in Media Map only

Only media that is used in the media map will be sent.

Synchronise Media Map

Sends the media map as well as media.

Add new Media from this media Manager

If disabled, only deletions are synchronised. If Enabled all additional media will be sent.

Synchronise file names

If enabled and a file on the destination system has the same ID as the source but a different name, the name will be changed on the destination.

Delete Media not on this media manager

Deletes any media that are not present on the source machine.

Target Media managers

Choose which media managers to sync to.

Watchfolders

Watchfolders automatically encodes media files in a selected folder. The media will be placed in Hippotizer's media library where it can be added to the media map and sent to other systems across the network.

Watchfolders is used in many ways to save time and improve the media workflow to:

- Instantly encode content as it is created by watching a shared network folder
- Synchronize media on primary and backup systems by watching the same folder with two (or more) systems.
- Automatically download new content from web based folders such as Dropbox
- Remotely update the media map of an installation

> **!** Watchfolders is a powerful tool to automate the media ingest and distribution workflow. It can automate media changes and deletions so should be used with great caution; disable it in show critical situations.

Watchfolders is configured from within the media manager settings.
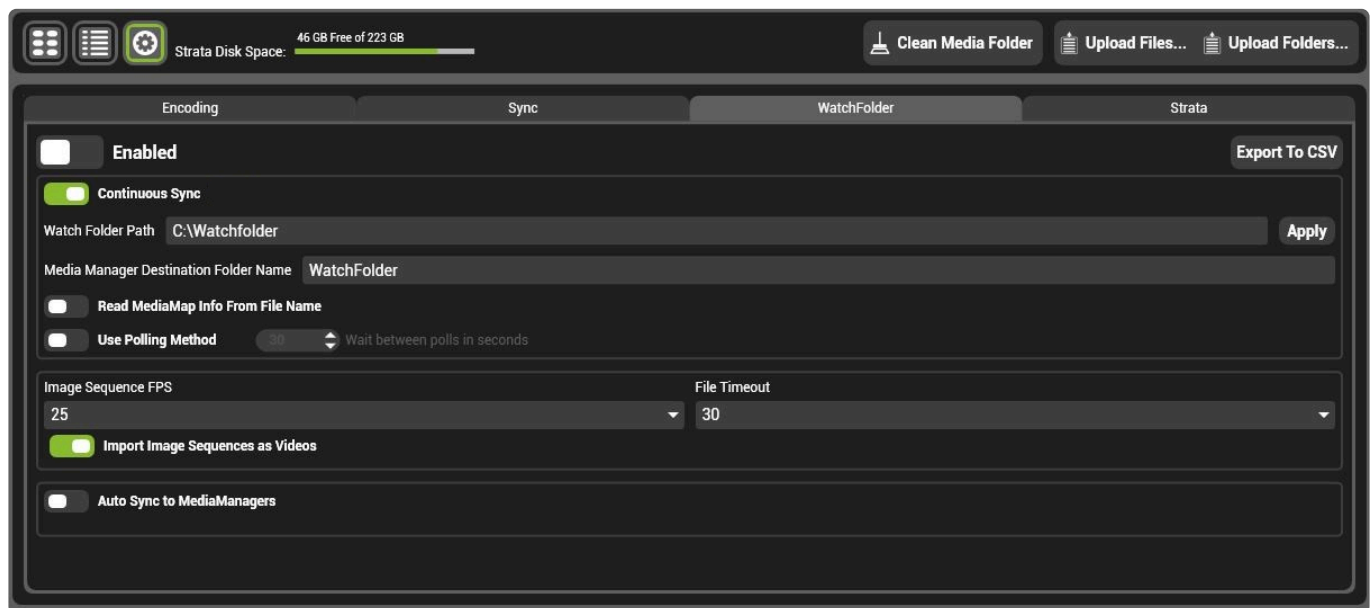
Enabled

If enabled, Watchfolders will automatically encode any media placed in the designated watch folder path.

With the above settings:

Media Placed in `C:\Watchfolder` will automatically encode using the codec chosen in media manager's settings and be placed in the `Watchfolder` folder in media manager. Files deleted from the watchfolder will not be changed in media manager.

> **Note:** When Watchfolders is enabled it will check to see if the folder on the watchfolder path exists, if it doesn't the folder will be created. Watchfolders will also place a small hidden file on the designated folder, this is integral for normal function of Watchfolders: do not delete or modify it.

Continuous Sync

If enabled, Watchfolders will synchronise file deletes from the Watchfolder to the Media Manager.

Continuous Sync only deletes media that is deleted while it is enabled; it does not synchronise the folder when it is enabled

Media deleted while Continuous Sync is disabled will be deleted from the Media Manager if the engine is restarted with Continuous Sync enabled.

> **Note:** Media deletes are synchronised across media manager no matter what folder the clip is placed in. **This setting will result in media being deleted automatically from media manager and the media map; use with caution.**

Watch Folder Path

The source folder where Watchfolders reads from. Networking and Watchfolders can be complex. [More info is here.](#)

Media Manager Destination

The folder in media manager where content is encoded to. Folder trees in the Media Manager Path will be replicated in the destination.

Read Media Map Info from File Name

If enabled, any clips that contain `[bank number, clip number]` in the name will automatically be placed in the media map.

For example:

`Layout[10,10].mov` will be placed in bank 10, clip 10 of the media map.

> **Note:** This will overwrite any media already present in this media location.

Use Polling Method

An alternate way to detect media changes other than using Windows. By default, Watchfolders uses a Microsoft Windows subsystem to detect when files are added to the Watchfolder. On some Network Attached Storage (NAS) devices this is not supported. Polling will manually check the designated folder for changes at every poll interval. Polling is a more intensive system than using Windows notifications so should be used only where required.

Image Sequences and Watchfolders

Watchfolders will encode any numbered sequence of images as an image sequence providing they are named correctly:

- All images in the sequence share the same name preceding the file number `Filename_####`. The name must be more than 3 characters.
- The number must be at least 4 digits. For frame numbers less than 1000, use preceding zeros. `Filename_0001`. The frame number must have a preceeding hash, space, underscore or dash.
- When using bank and clip information, it should be between the file name and the frame number. `FileName_[##,##]_0001`

Frame Rate

Image sequences are encoded at the set frame rate. The setting for Media Manager's image sequence frame rate and that of Watchfolders are separate. All other encode settings are shared.

File Timeout

Watchfolders can import image sequences however it is a little more complicated than in a normal file encode. This is due to the fact that as an image sequence is added to the watchfolder path Hippotizer will detect the image files being added one at time but not know when to start encoding them. (There is no way to know the copy has been completed). To fix this, Watchfolders has a **File Timeout** which is the time in seconds that it will wait before attempting to encode an image sequence from the time the last image was added. After each image is added Watchfolders waits for the File Timeout period, if the time elapses and no additional frames of that sequence are added it will be encoded. As a new frame is added the file timeout is reset. The default setting of 30 seconds is appropriate for most applications.

Auto Sync to Media Managers

Will synchronise media encoded with Watchfolders to selected media managers on the network as they are uploaded.

Setting up Networked Watchfolders

Hints for setting up various networking scenarios:

Choosing a NAS to use.

Networked Attached Storage (NAS) is a very good way to store data on the network and share it to Watchfolders. Multiple content creators can add media to a single NAS and watchfolders can encode it automatically creating a seamless content ingest path. When choosing the NAS, it is best to ensure that it supports Windows Files Notifications. In general, only a NAS running a Windows operating system (such as Microsoft Storage Server). Other operating systems may work in one folder, but not in sub folders for example.

Where a NAS does not support Windows File Notifications, use Polling.

Sharing a Mac folder with Windows

1. Create a folder on the Mac to share
2. Use SMB sharing (Samba)
3. The username and password will need to be entered after a restart

Sharing with Dropbox or similar cloud storage

1. Use the cloud storage's client to create a folder that synchronises with the online content on a networked machine (we do not advise directly connecting a Hippo to the internet)
2. Share the folder with the Hippotizer
3. Point watchfolders to this folder.

Advanced
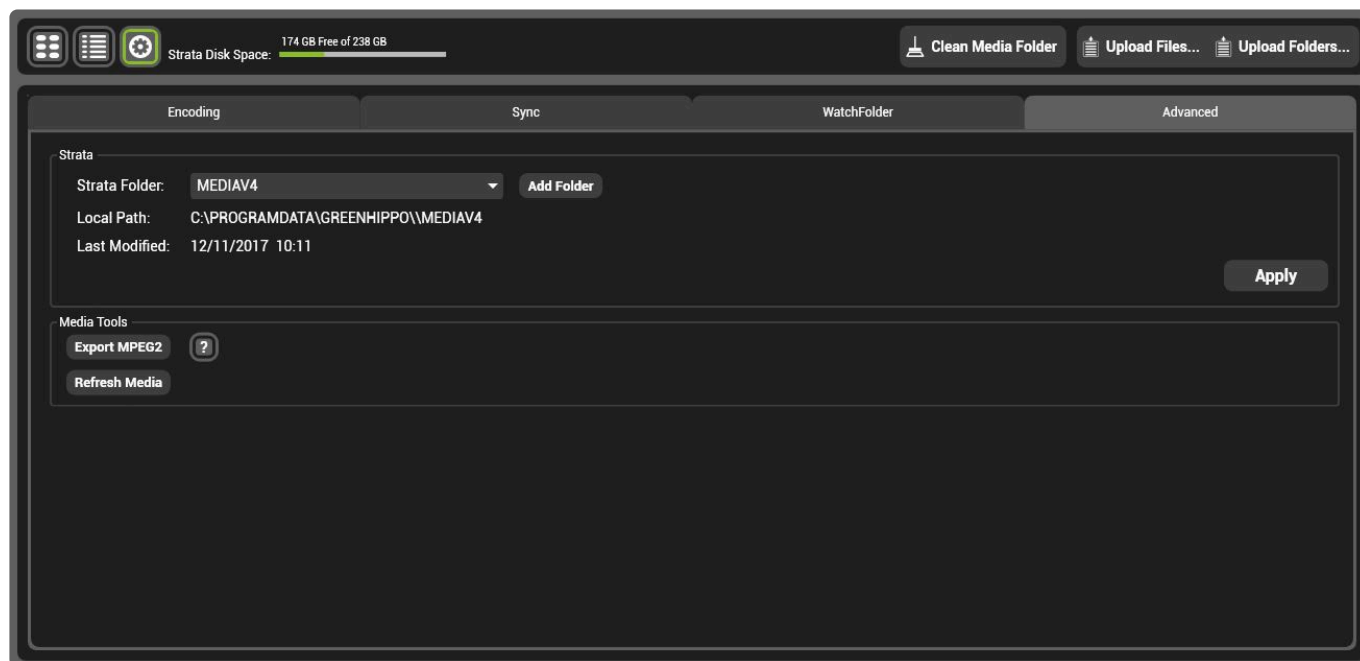
STRATA Folders

STRATA folder re-maps the path to media storage. By default the internal D: Drive is set as the media path. Other paths and drives may be used.

- [STRATA](#)

Export Mpeg2

Exports all mpeg2 based media.

- [Export Mpeg2](#)

Refresh Media

Re-writes all media files on the drive to combat read degradation seen on some SSDs.

- [Refresh media](#)

STRATA

The folder that Media Manager uses to store and retrieve media is called the STRATA path.
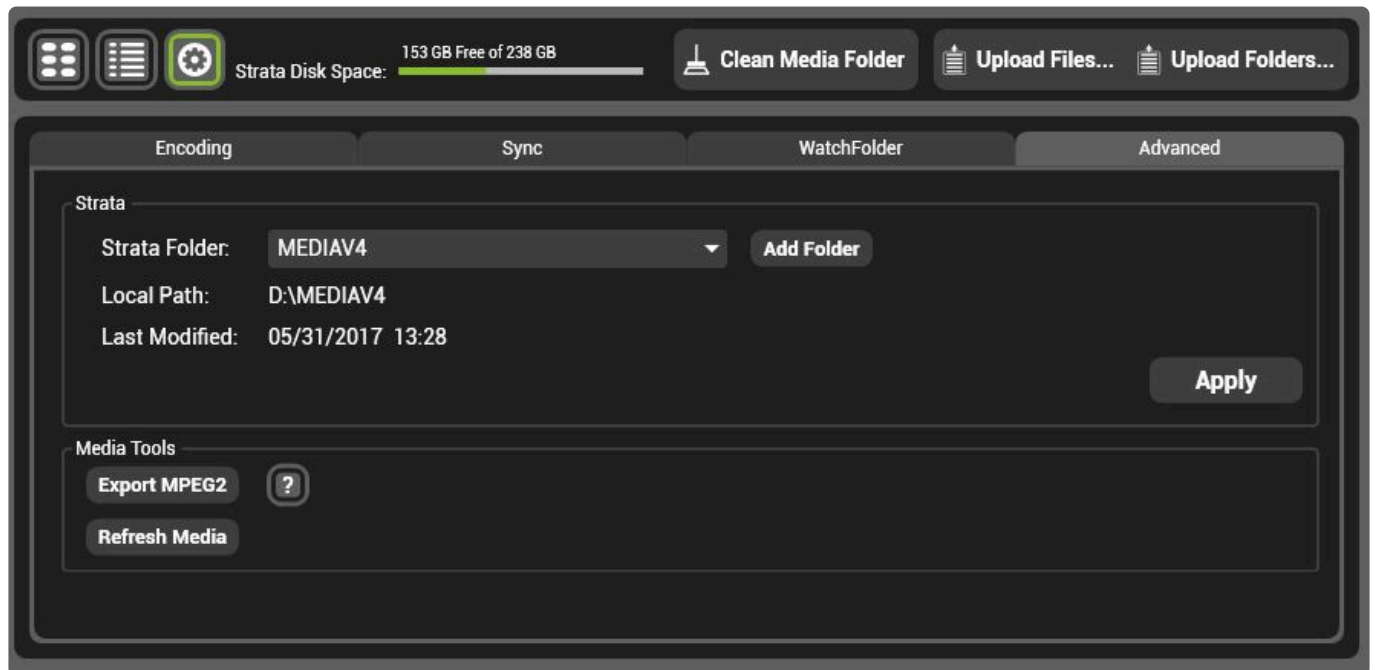
By Default on a production Hippotizer (except Portamus) the media is stored on `D:\MediaV4`

On Play and Portamus the media is stored on `C:\ProgramData\GreenHippo\MediaV4`

This path can be changed to a new drive or folder as required.

> **Note:** Hippotizer's performance is heavily dependant on the read speed and latency of the media drive. For best results use the removable drive bay and Sata 6G SSDs to hold media. Never use USB Drives, network locations or conventional hard drives. Where possible on Boreal and Taiga copy media to the D: Drive for playback.

Multiple STRATA Locations

The STRATA folder can be used to seperate your content into a new directory of the same hard drive. In the advanced tab of media manager select 'Add Folder' and 'Make New Folder' to create a new STRATA location. Media can not be transferred between these folders directly unless you synchronise media from another Hippotizer. Using this method new media clips can be seperated from the stock library retaining the integrity of the default media STRATA folder.

Recommended drives to use for STRATA

Given the fast changing nature of computer hardware it is impossible to maintain an up to date list of recommended STRATA drives. Green Hippo has extensive experience with some makes and product lines however that we have found to be reliable:

- Samsung Pro series. (850 and 860 have been tested)
- Crucial MX 500 Series

When choosing the drive we recommend targeting the fastest possible sequential read speeds. (500MB/s is common for SATA drives). The read-centric nature of media drives means that other measures such as IOPS or drive writes per day (DWPD) are not as important.

Advanced Sync

Advanced Sync transfers specific media between Hippotizers across the network

Setting up Advanced Sync involves setting a source, choosing media and destination.
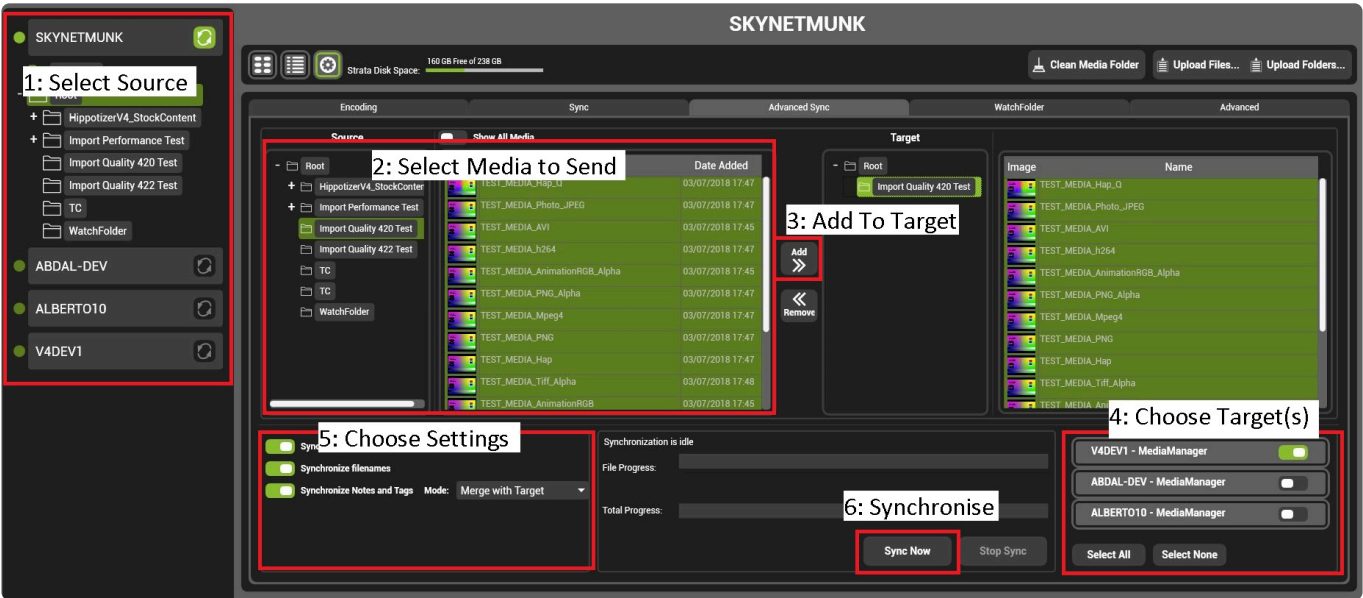
1: Select Source

Choose the media manager that will send media.

2: Select Media to Send

Choose a folder to send all the media contained within it, or choose individual clips within the folder.

Holding **CTRL** will toggle clip selection.

Holding **SHIFT** will toggle all clips between the selection.

3: Add to Target

Press the Add to target button to add the selected media to the send list. Media will not be sent yet.

When sending multiple folders it is best to select each one individually, then add it, and select the next one.

4: Choose Targets

Choose which media manager(s) will receive the media

5: Choose settings.

Synchronise Media Map

Determines if the media map is sent.

- **Enable** The default. The media map will be sent with the synchronisation

- **Disable** The media map is not sent.

Synchronise File Names

- **Enable** The default. Media name changes will be reflected in the destinations

- **Disable** Synchronised media will appear with it's original name (if it had been changed)

Synchronise Notes and Tags

- **Enable** The default. All notes and tags are sent with the media

- **Disable** The notes and tags are not sent.

6: Synchronise

Press **Sync Now** to begin sending files.

> Note: Zookeeper must be running throughout the media sync process.

Tags and Notes

In order to assist with Media Management and versioning, Notes and Tags can be applied to media in media manager.

This is accessed from the list view in Media Manager:
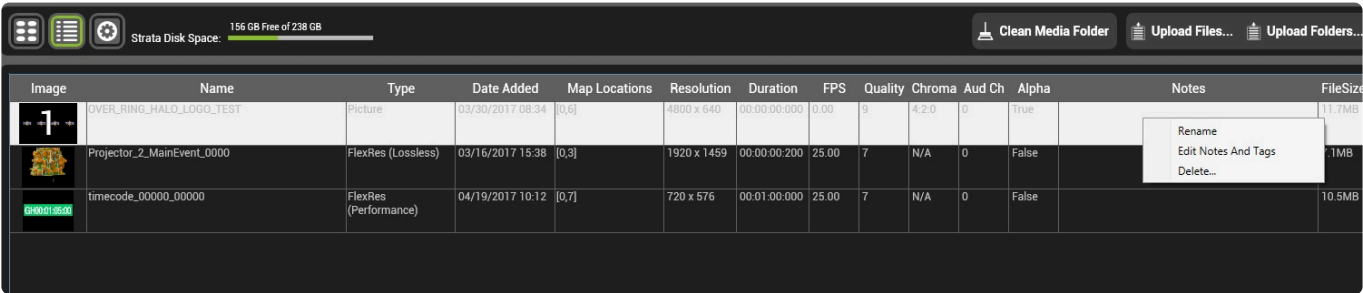
Right click in the Notes Field to open the editor:

Tags

A tag is a short, generic descriptor of a media file such as "blue" or "120BPM" to enable rapid searching of content.

Hippotizer Version 4.3 will introduce a Tag searching feature.

Notes

Text can be added to each clip that is visible in Media Manager. This can be useful to include extra information for later reference.

Entering a new Tag

To create a tag, type the desired name in and press **Add Tag**

Removing a Tag

Select the Tag and press **Remove**

Adding or editing notes

Click into the notes field and type or edit the note.

Converting Mpeg2 to FlexRes

From Version 4.2.1 Hippotizer does not support Mpeg2 playback.

If Mpeg encoded content is present in your media library it must be converted to FlexRes to play in Version 4.2.1 onwards.

Converting a library should follow these steps:

1. Back up the Media Library
2. Mpeg Export Tool
3. MPEG Conversion

> **!** The Mpeg conversion process can be very time consuming (depending on size) and could lead to corrupt media. **It is critical to create a back-up copy before attempting to convert**

Back up the Media Library

Before beginning the process of transcoding media from Mpeg2 to FlexRes it is vital to back up the media library.

To create a back-up, follow these steps.

Note: In most cases, an external hard drive or large USB stick will be required.

Locate the media folder:

The STRATA Path is listed in the advanced tab of Media Manage:
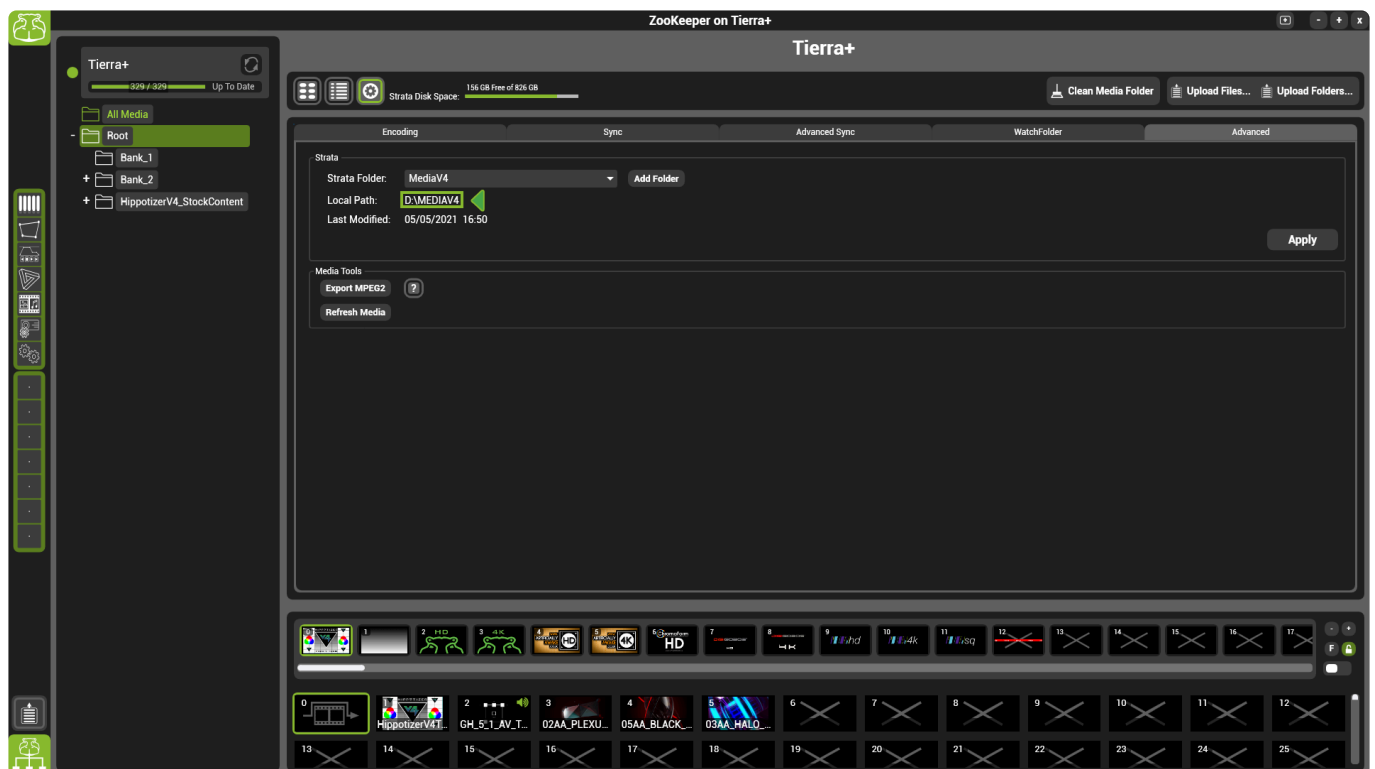
Note: The STRATA path is local to the engine; a remote Zookeeper will not be able to see the media folder.

Locate this folder on your Hippotizer system from the STRATA Folder and copy it. If there is enough space, making a copy to the same drive is ok, otherwise the copy must be made to an external drive or USB stick.

❗ The size of the media folder will increase when it is converted from Mpeg2 to FlexRes. Be sure to leave at least **6 Times** the media folder space free on the media drive. For example, if the media folder is 5GB, be sure there is 30GB free on the media drive before proceeding.

Mpeg Export Tool

The Mpeg Export tool copies all Mpeg based media out of the media folder and saves it to a new directory. The media's original name is restored in this process.

> ❗ This tool simply copies media out and renames it; media containing alpha will not play normally in a media player.

The media export tool is accessible from the advanced tab of media manager:
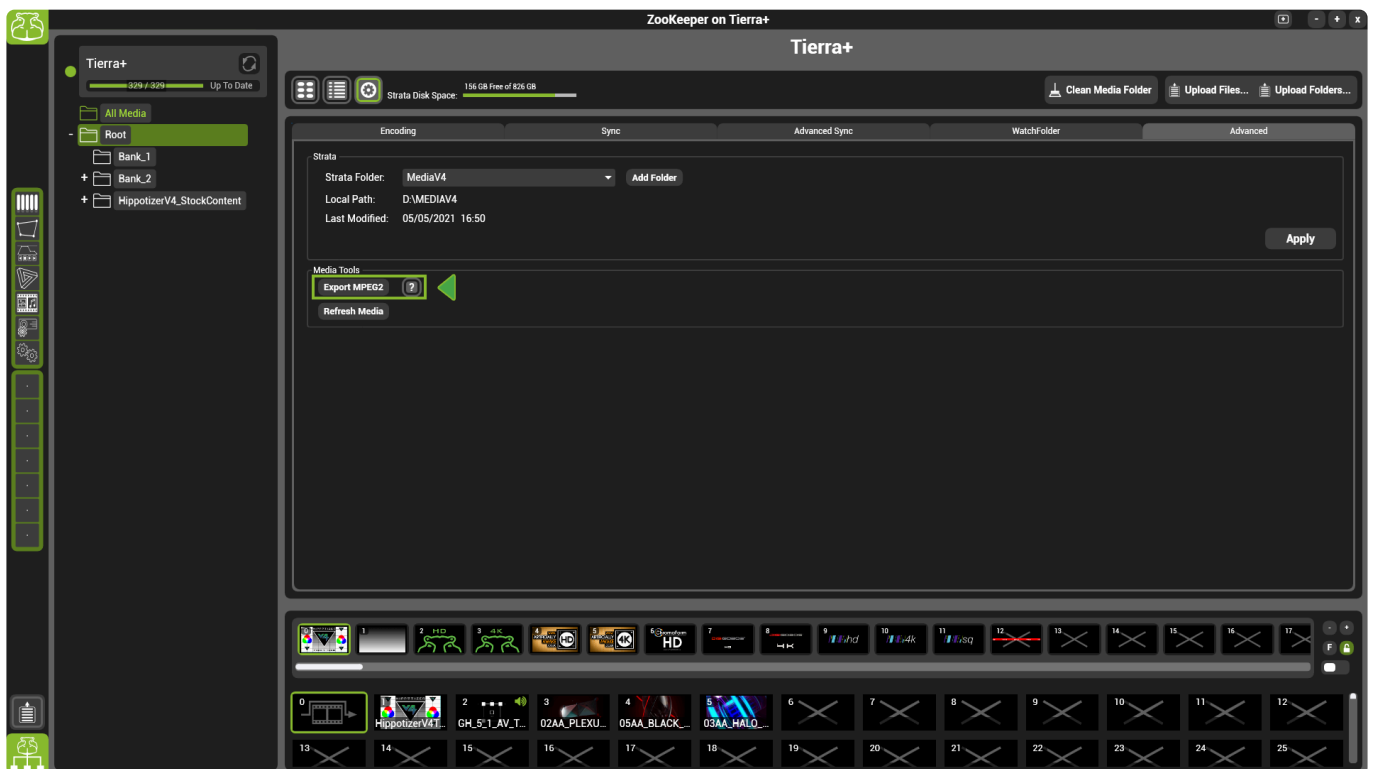
Note: Media is not deleted as it is exported, only copied.

MPEG Conversion

The final step to transcode Mpeg content to FlexRes is to run the Mpeg Conversion tool.

The Mpeg Conversion Tool can be found in the media toolbox in Hippo Launch.

Note: The engine and Zookeeper must not be running to use media tool box.
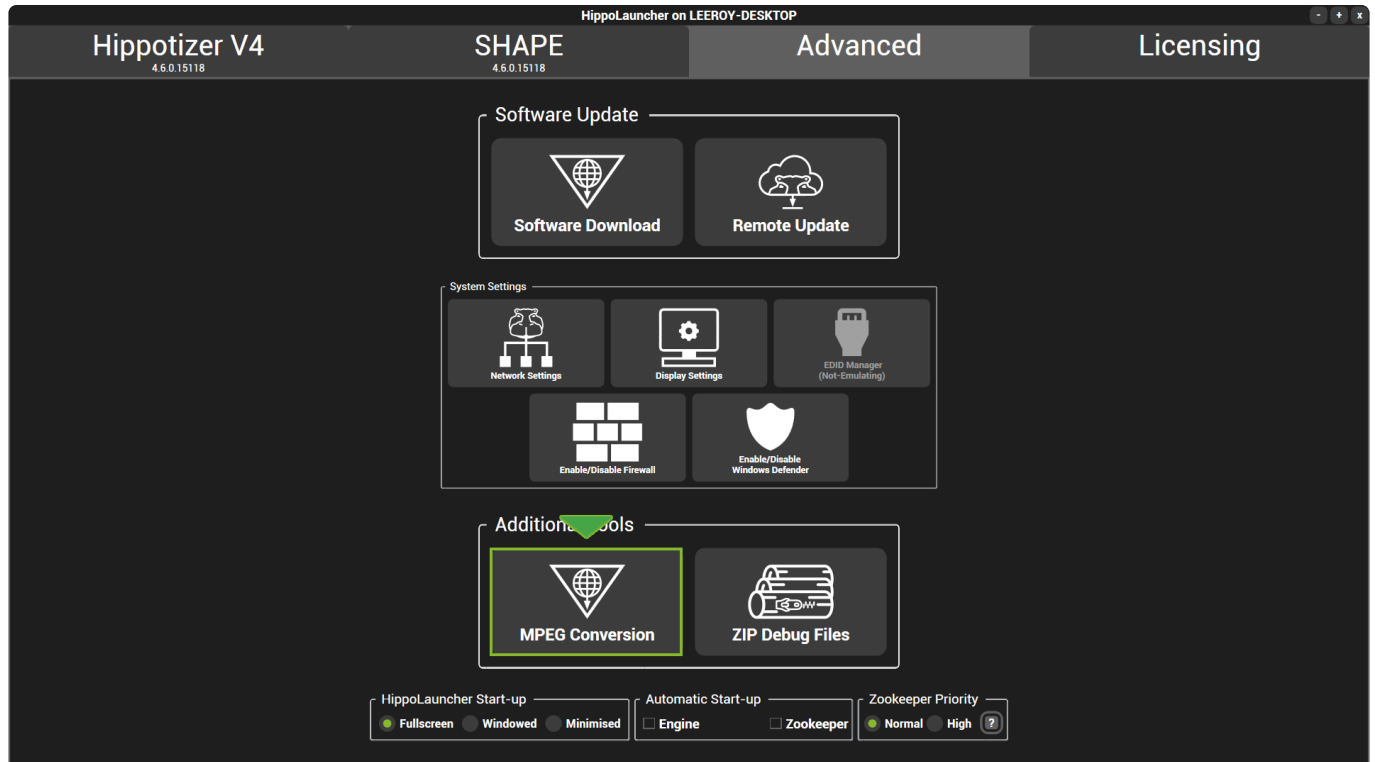
This opens the Media toolbox:
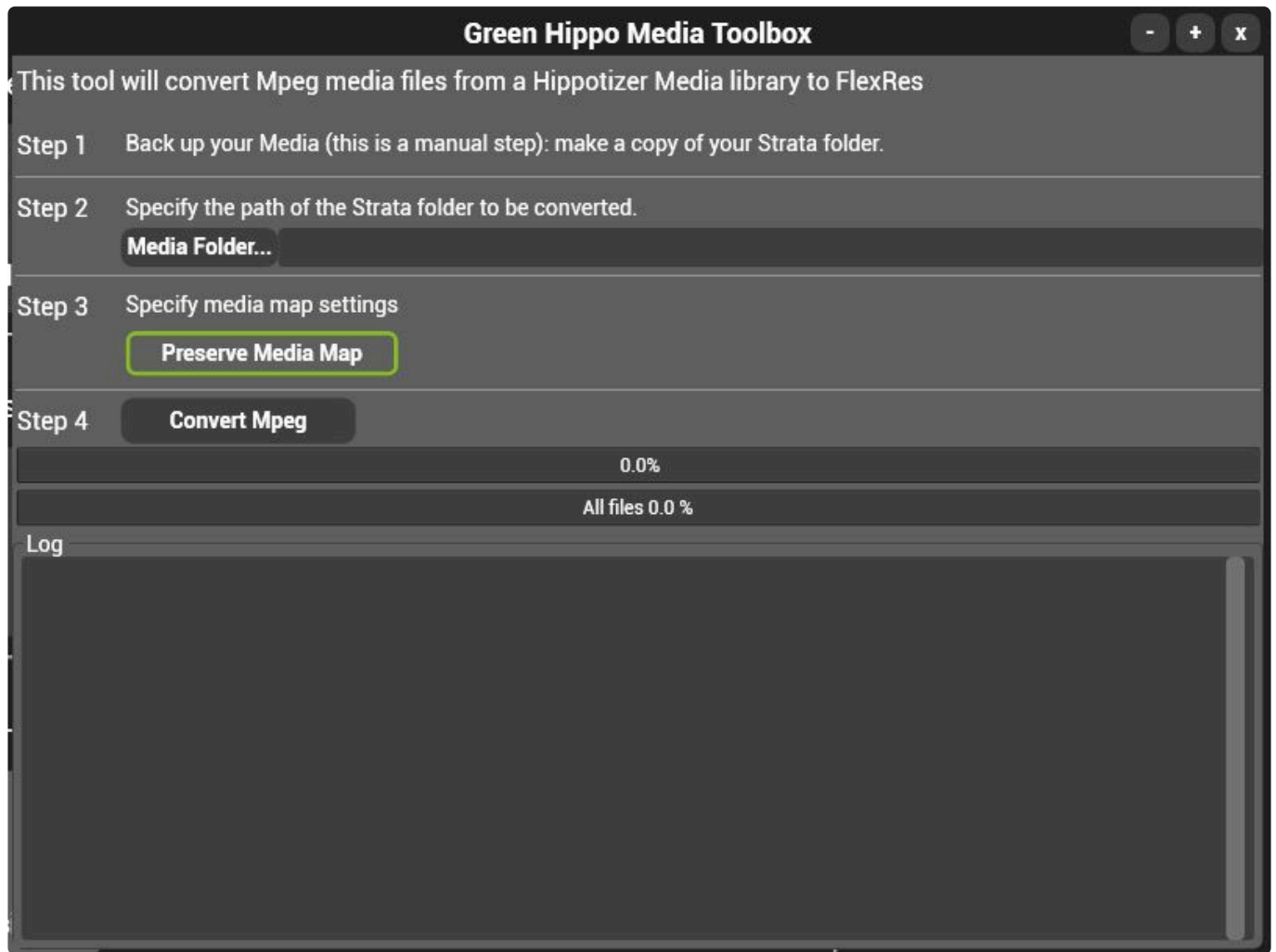
Step 1: [Back up the media library before converting.](#)

A separate back up folder is the only way to ensure there is no data loss should a failure occur during transcode.

Step 2: Choose the media folder to convert.

Note: The transcode process will increase file size by four to five times. A media library that was 2GB will inflate to 8-10GB. Ensure sufficient disk space is available before proceeding.

When a folder is selected, Media Toolbox will scan it for Mpeg media and display the results in the log.
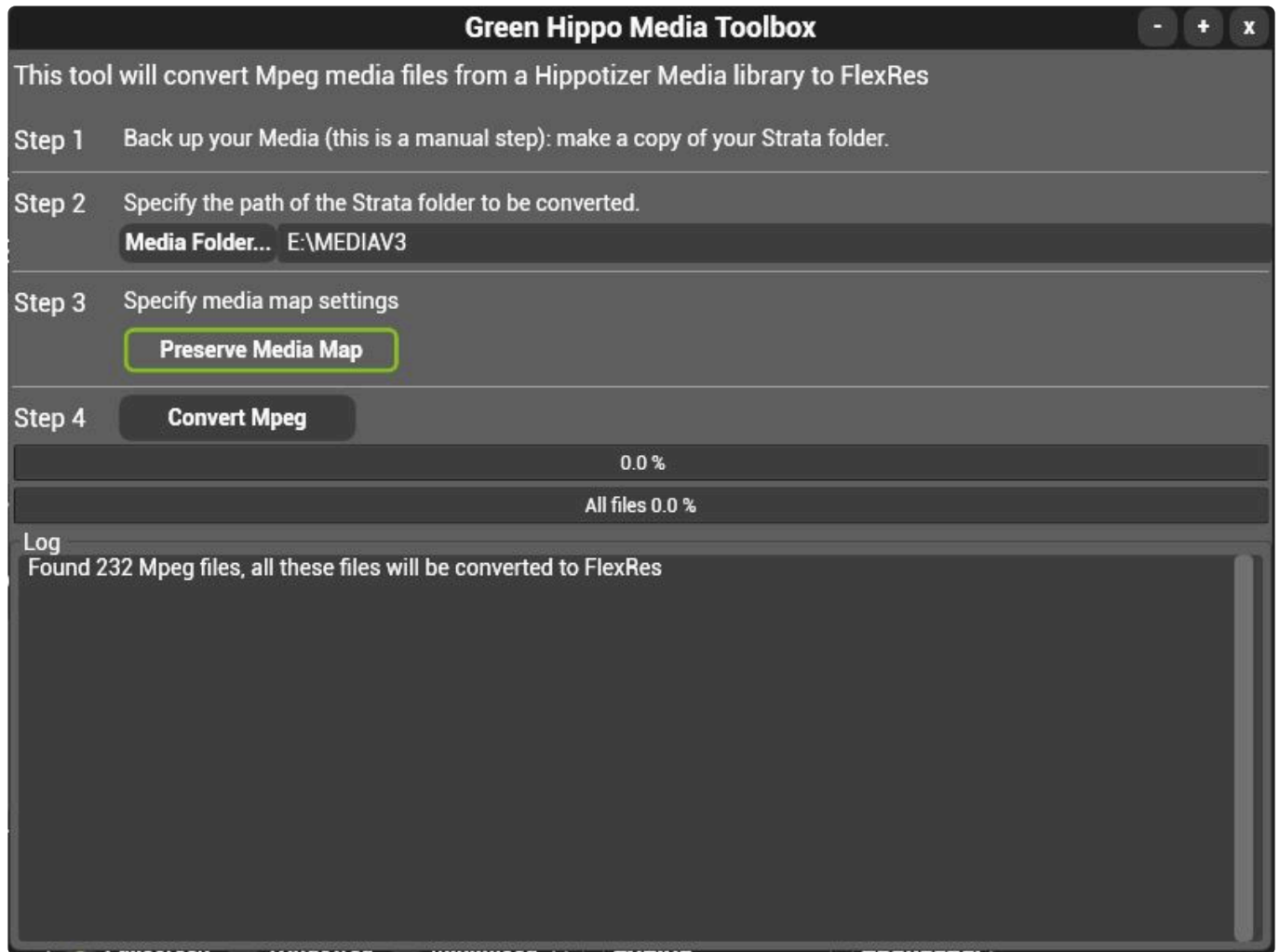
Step 3: Choose to preserve the media map or not

If **enabled**, the media map will be updated with the FlexRes encoded clips.

If **disabled**, the media map will not be changed.

Step 4: Convert Mpeg

The conversion process will proceed automatically once **Convert Mpeg** is chosen. Any files that fail conversion will be noted in the log.

Step 5: Test the content

We strongly recommend testing the converted content to ensure it is visually correct before using in a live environment.

Step 6: Delete Mpeg content

Once everything has been tested the mpeg content can be deleted from inside media manager.

Additional considerations

Mpeg clips with an alpha channel

Hippotizer V3 allowed alpha to be encoded in to media files. Due to the fact that mpeg-2 does not support alpha, the clip was divided in half horizontally with one half encoding the RGB values and the other half the alpha channel. The media player combines the two halves on playback. This method results in the halving of vertical resolution; so the maximum resolution of alpha containing clips is 1920 × 540.

Preserve Media Map

Before making changes to the media map a back-up is made and stored into the media folder. The active media map is `DMXMediaMap.v3.xml` while the back up is `DMXMediaMap.v3.xml.backup`. Should it ever be necessary to revert to the original media map simply replace the active media map with the backup.

Media Quality

Mpeg clips are converted to FlexRes Performance by default by the media tool box as this offers a good balance of visual quality and playback performance. Some clips may noticeably degrade in FlexRes Performance however, especially those with colour gradients or high contrast edges. If better visual quality is required, clips can be encoded in Media Manager into a lower compression format such as FlexRes Quality.

Multicontroller

Multicontroller combines many of the ways that Hippotizer interfaces with the world around it into one component.

Multicontroller supports Midi, OSC, TCP, and ArtNet as well as myriad Automation protocols.

The component can also directly control select devices such as BlackMagic Videohubs or Lightware Matrix's.

> Note: Multicontroller can receive DMX input over ArtNet, however to control Hippotizer from a lighting desk it is best to use the [DMX component.](#)
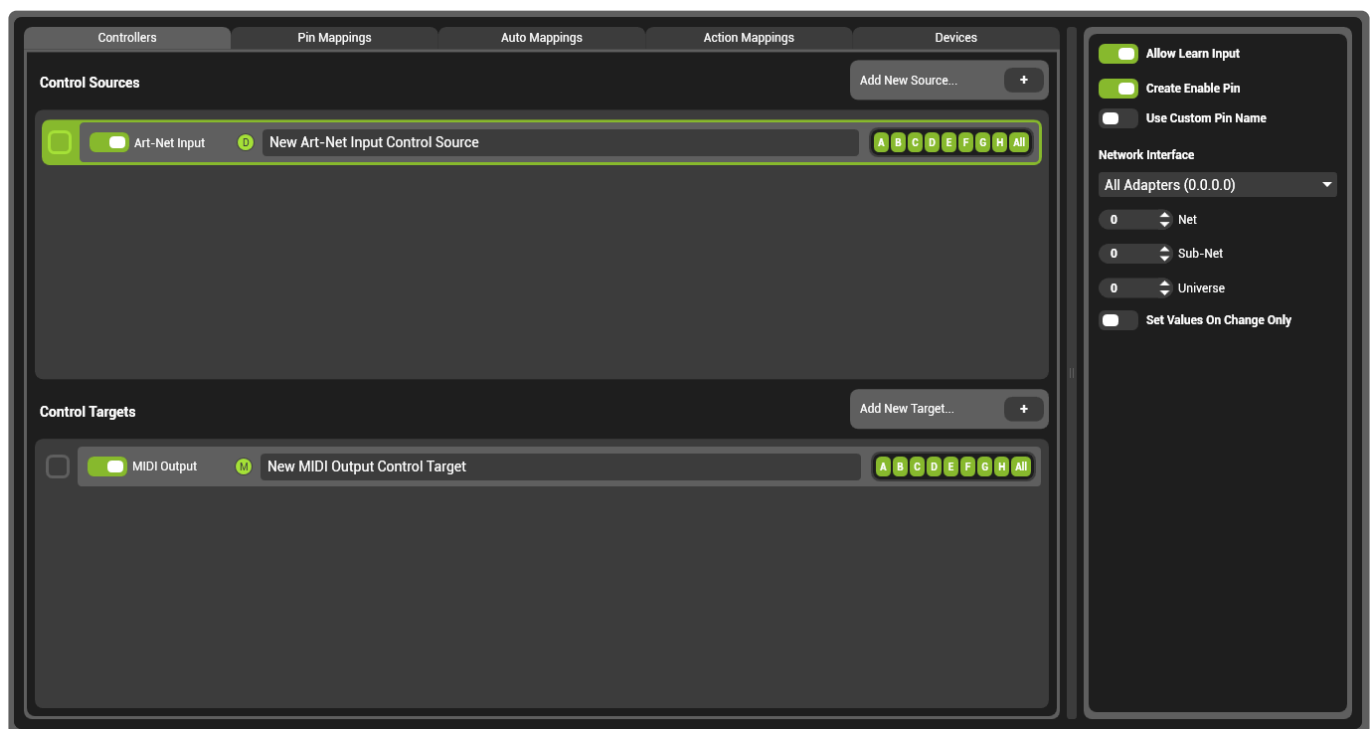
Multicontroller is made up of five sections represented as tabs in the interface:

[Controllers](#):

Define the inputs and outputs of Multicontroller. Whether a TCP port or a MIDI device, each controller is added as a separate item in this menu.

Mappings

The most important concept to understand in Multicontroller is **Mappings**: the connection between a controller (such as a Midi controller or TCP listener) to a pin in Hippotizer (such as the level of a layer). There are three types of mappings in Multicontroller

[Pin Mappings](#)

Specify individual pins in Hippotizer to send or receive data.

For example: Set layer 1's level fader to respond to a MIDI controller with a Midi Mapping.

Auto Mappings

Specify whole groups of pins to send or receive data.

For example: Set Mix 1, Layers 1 thru 8 to listen to OSC information with a Text Mapping.

Action Mappings

Some pins are not easily mapped such as preset select or Timeline controls. Action Mappings allow for these functions to be controlled simply. Frequently, Action Mappings are used to create a trigger that is then controlled from a Timeline, DMX or within a the Zookeeper interface directly.

For example: Create a trigger pin to play Timeline 2, Cue 10.

Devices

Similar to a personality, Devices are pre-built profiles to communicate with specific third party equipment. Devices must be created by Green Hippo. To request a new device to be added please contact us.

Adding a device creates a series of pins to control the functions of that device. These pins can then be controlled from DMX, a Timeline or within Multicontroller.

For example: Create a Black Magic video hub to create pins controlling the input and output patch of the video hub.

Controllers

Multicontroller is able to handle external devices controlling Hippotizer as well as trigger actions in connected equipment. In both cases, the protocol used, and specifically the format of data, determines how information is handled by Multicontroller. For example, TCP commands are actually strings of text transmitted over the network, so they use a text mapping in Multicontroller.

Controllers and their mappings:

	Text	MIDI	DMX	Automation	GPIO
ArtNet Input			X		
BlackTrax				X	
DEAP				X	
GHAP				X	
LabJack					X
MIDI		X			
OSC	X				
PoKeys					X
Posi Stage Net				X	
PRG Automation				X	
TCP	X				
UDP	X				
Automation				X	

The mapping for each controller and target is indicated in Multicontroller as a letter in a green circle.

T Text Mapping
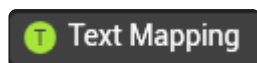
Each Controller has a unique configuration.

- ArtNet Input
- BlackTrax
- DEAP / GHAP
- Labjack / Pokeys
- Midi
- OSC
- Posi Stage Net
- PRG Automation
- TCP Listener

ArtNet Input
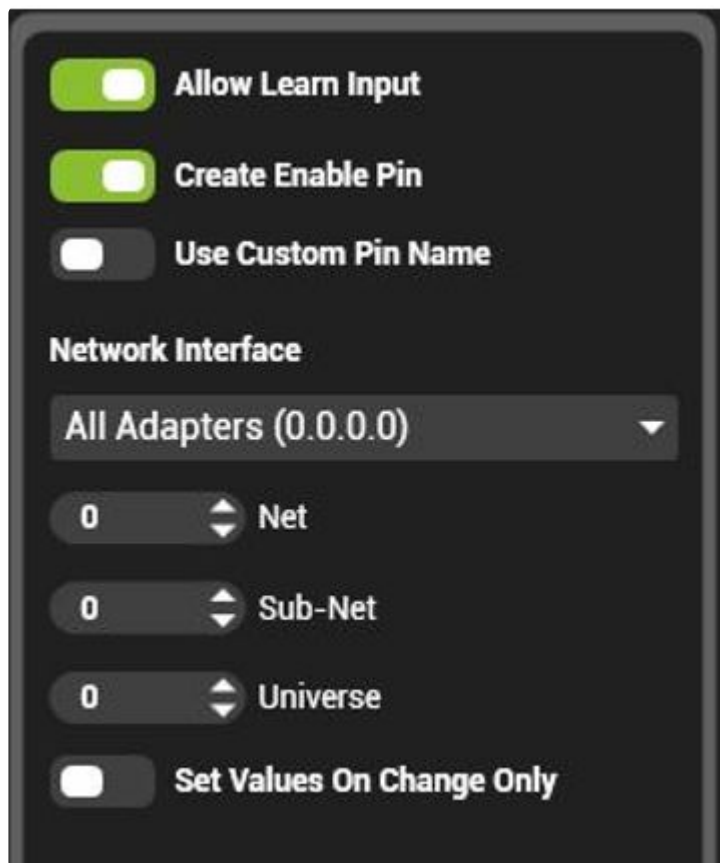
The ArtNet input allows for easy mapping of single ArtNet based DMX channels to specific functions in Hippotizer. The DMX component is still the best way to patch a DMX lighting desk to an entire layer where Multicontroller is useful for setting a show controller to recall presets for example. ArtNet uses a DMX mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.

- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.

- **Use Custom Pin Name**: Allows user to name enable Pin.

- **Network Interface**: Choose which network interface connection to receive data from.

- **Net**: ArtNet 3 Only, defines which net to receive data from. Devices that are not ArtNet 3 compliant normally default the net number to 0.

- **Sub-Net**: defines which ArtNet sub-net to receive data from

- **Universe**: defines which ArtNet universe to receive data from

- **Set Values on Change Only**: Similar to update only in DMX2, pin values are only changed when
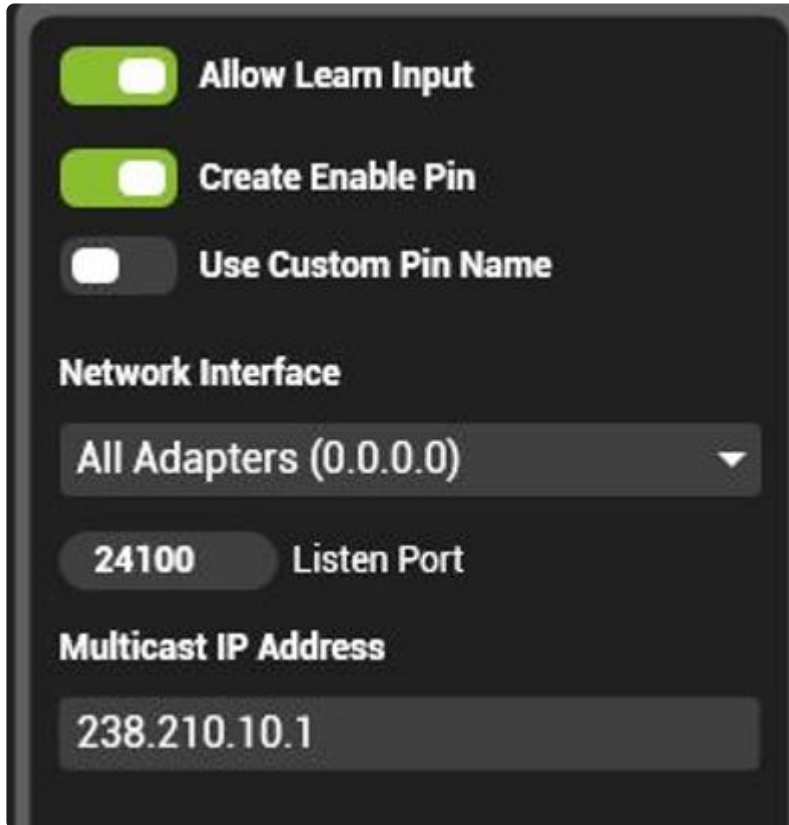
the incoming

ArtNet changes. Often known as Last Takes Precedence (LTP).

✳ New projects should use the Automation Reader instead of the individual protocol controllers.

BlackTrax

BlackTrax is Cast Software's proprietary object tracking system based on infra-red beacons and calibrated cameras. The BlackTrax system is able to communicate to Hippotizer the location in 3D space of the beacons. BlackTrax integration is most commonly used with SHAPE to move 3D objects around in a scene, for that application in order to reduce latency, we suggest receiving the automation directly in SHAPE and not through Multicontroller. For other applications, such as using BlackTrax together with the Visualiser, use Multicontroller.

BlackTrax uses an Automation Mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which network interface connection to receive data from.
- **Listen Port**: Defines which network port data is received. Must match the port set by the BlackTrax sender.
- **Multicast IP Address**: Defines which multicast group to subscribe to, set by the multicast IP address. This must match the settings of the BlackTrax sender.

It can be confusing to configure IP settings when receiving multicast data. In general, the Network interface on the sender and the receiver should be set as a normal static local network: (192.168.0.xxx with a subnet mask of 255.255.255.0). The multicast IP address is only an identification of the multicast group used by network equipment, and should not be set as an address. The most common error in setup of BlackTrax (or any automation protocol) is with IP configuration.

✳ New projects should use the Automation Reader instead of the individual protocol controllers.

DEAP / GHAP
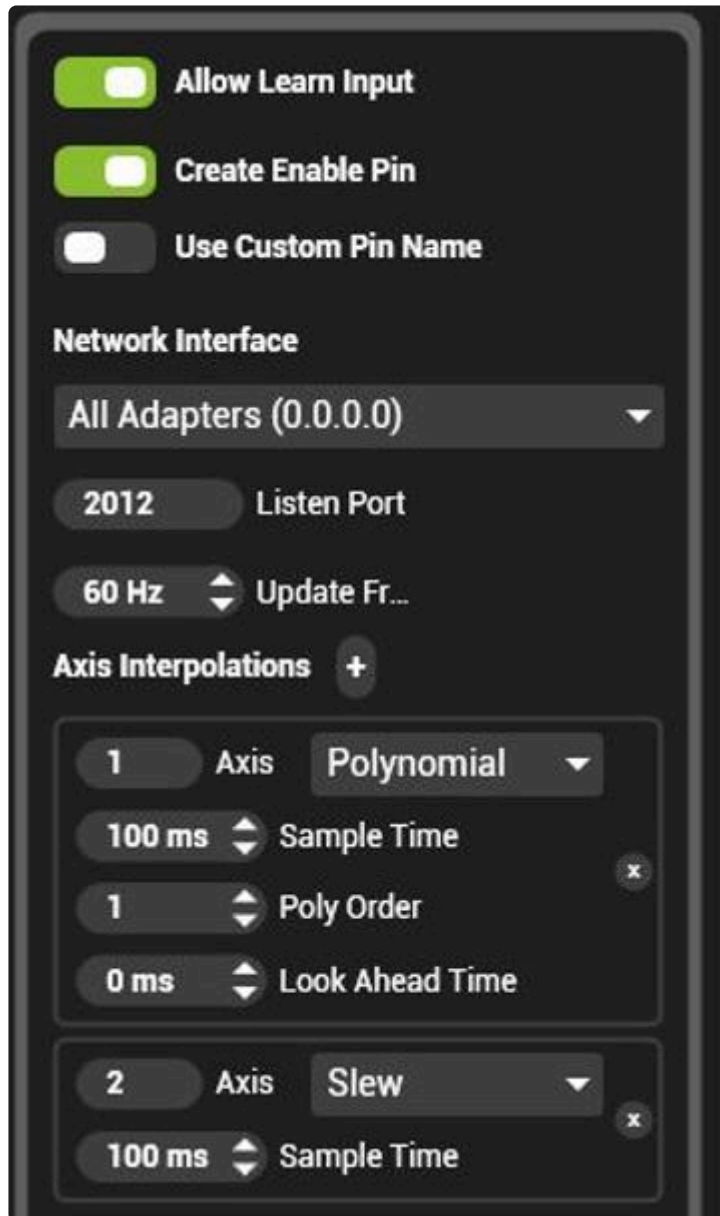
DEAP (Disney Automation Protocol) and GHAP (Green Hippo Automation Protocol) are network based methods for transferring movement information from encoders. Commonly used for tracking moving set pieces, each encoder reports the position of a specific axis.

Both DEAP and GHAP use an Automation mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which network interface connection to receive data from.
- **Listen Port**: Defines which network port data is received. Must match the port set by the automation sender.
- **Update Frequency**: Sets how often data is sent from Multicontroller. This essentially sets the

frequency of interpolation. It is recommended to set this to the output video frequency. (50 or 60Hz usually).

- **Axis Interpolations**: As the data refresh rate from most encoders is much slower than the output frame rate, it is often desirable to 'smooth' the movement. There are two methods for smoothing automation data in Hippotizer: Polynomial and Slew.

- **Polynomial** looks at a set of received values defined by the sample time, and attempts to find an equation to approximate them. Using this equation, it then tries to predict what values will come in next based on the look ahead time setting. The complexity of the equation is its Poly Order; an order of 1 would be a static number, 2 a straight line and 3 a curved line for example. In general, lower Poly Order produces better results.

- **Slew** is a simple interpolation: it takes data across it's sample time and creates data points in-between.
  Both interpolation methods must introduce delay in order to function and may cause objects in Hippotizer to disagree with the real world, especially when changing speed.

✱ New projects should use the Automation Reader instead of the individual protocol controllers.

Labjack / Pokeys
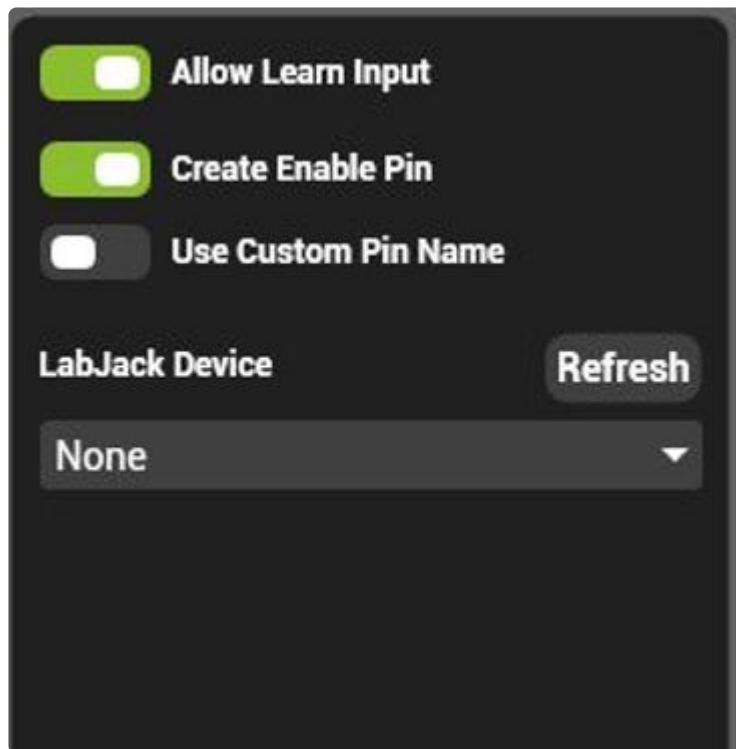
LabJack https://labjack.com/ make a series of USB and Ethernet based analogue and digital input and output devices. These devices offer a reliable way to integrate sensors and buttons with Hippotizer.

Pokeys https://www.poscope.com/PoKeys57U are a lower cost USB based input device.

LabJack and Pokeys uses a GPIO mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **LabJack Device**: Select from connected lab jacks.

Midi
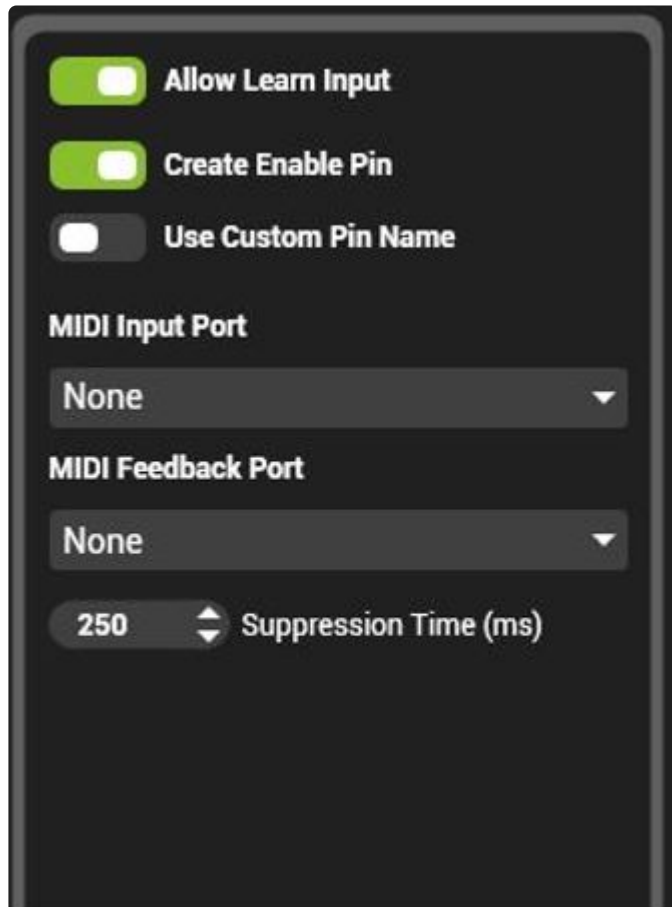
Midi used by many popular controllers such as a BCF2000 or Launch Pad. Midi devices rely on Windows USB drivers to function properly; install the device and confirm it is working in Windows before using it in Hippotizer.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Midi Input Port**: Select which midi device to use for input. In order to appear in this list, the device must be plugged in with drivers installed.
- **Midi Feedback Port**: Select which midi device to send feedback to (if desired). This is frequently used for midi controllers with motorised faders.
- **Suppression Time**: When a device is using feedback, the data sent to Hippo must be delayed before being sent back to the device in order to avoid feedback loops. This is most commonly noticed as motorized faders 'snapping back' after they have been moved. The default setting of 250ms has been found to be correct for many Midi controllers.

OSC
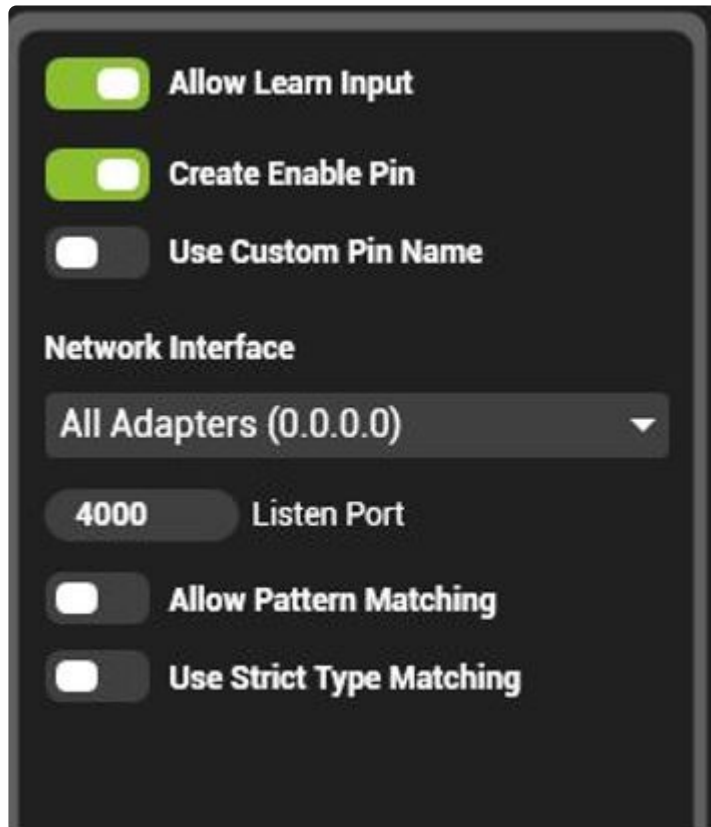
OSC, or Open Sound Control is an open-ended network protocol designed to connect musical instruments such as synthesizers together. http://opensoundcontrol.org/introduction-osc Due to its flexibility, OSC is an easy way to send commands from 3rd party devices such as an iPad application to Hippotizer. (TouchOSC is popular for this). OSC sends strings of data, (words basically) across the network which Multicontroller can listen to.

OSC input uses a Text Mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which adaptor to use for receiving OSC data
- **Port**: Choose which port to use for receiving OSC data, this must match the sender's settings.
- **Allow Pattern Matching**: Enables OSC Pattern Matching as defined in the OSC spec:
- '?' in the OSC Address Pattern matches any single character
- '*' in the OSC Address Pattern matches any sequence of zero or more characters
- A string of characters in square brackets (e.g., "[string]") in the OSC Address Pattern matches any character in the string. Inside square brackets, the minus sign (-) and exclamation point (!) have special meanings:
- two characters separated by a minus sign indicate the range of characters between the given two in ASCII collating sequence. (A minus sign at the end of the string has no special meaning.)
- An exclamation point at the beginning of a bracketed string negates the sense of the list, meaning

that the list matches any character not in the list. (An exclamation point anywhere besides the first character after the open bracket has no special meaning.)

- A comma-separated list of strings enclosed in curly braces (e.g., "{foo,bar}") in the OSC Address Pattern matches any of the strings in the list.
- Any other character in an OSC Address Pattern can match only the same character.
  Source: http://opensoundcontrol.org/spec-1_0
- **Use Strict Type Matching**: If strict type matching is on, data types from OSC must match exactly the data type of the pin to be set. For example, float messages will only apply to float pins even if the address matches. This is off by default as it can lead to undesired behaviour. TouchOSC for example only sends float messages, so enabling strict type matching would make it impossible to control Int pins.

Posi Stage Net
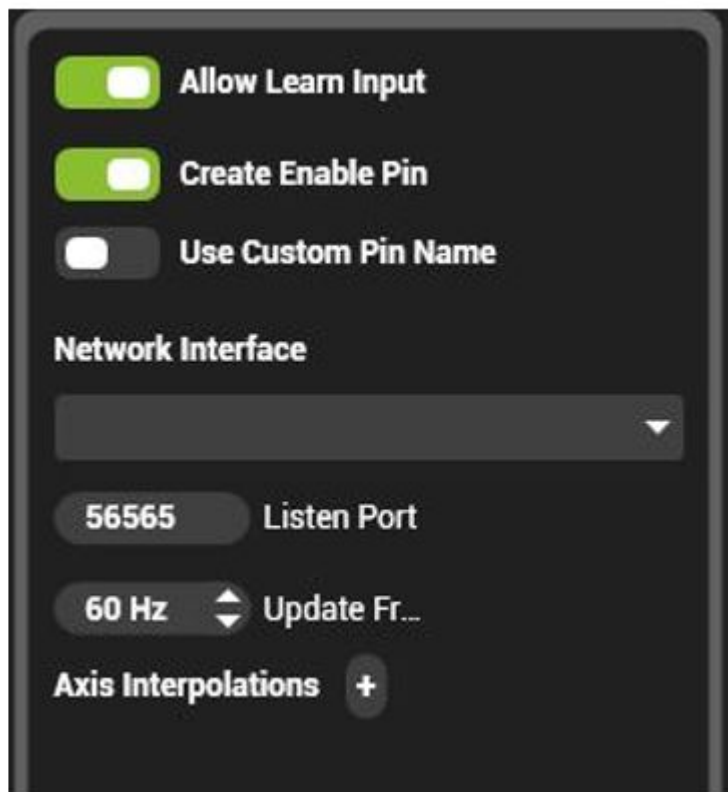
PosiStageNet (PSN) is an open protocol for streaming 3D positioning of objects on stage developed by VYV and Ma Lighting. http://www.posistage.net/ PSN is a network based protocol that reports the position, velocity and acceleration of multiple objects.

PSN uses an Automation mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which adaptor to use for receiving PSN data
- **Listen Port**: Choose which network port to receive on, must match the settings of the sender.
- **Update Frequency**: Sets how often data is sent from Multicontroller. This essentially sets the frequency of interpolation. It is recommended to set this to the output video frequency. (50 or 60Hz usually).
- **Axis Interpolations**: As the data refresh rate from most encoders is much slower than the output frame rate, it is often desirable to 'smooth' the movement. There are two methods for smoothing automation data in Hippotizer: **Polynomial and Slew.**
- **Polynomial** looks at a set of received values defined by the sample time, and attempts to find an equation to approximate them. Using this equation, it then tries to predict what values will come in next based on the look ahead time setting. The complexity of the equation is its Poly Order; an order of 1 would be a static number, 2 a straight line and 3 a curved line for example. In general, lower Poly Order produces better results.
- **Slew** is a simple interpolation: it takes data across it's sample time and creates data points in-

between.

Both interpolation methods must introduce delay in order to function and may cause objects in Hippotizer to disagree with the real world, especially when changing speed.

✳ New projects should use the Automation Reader instead of the individual protocol controllers.

PRG Automation
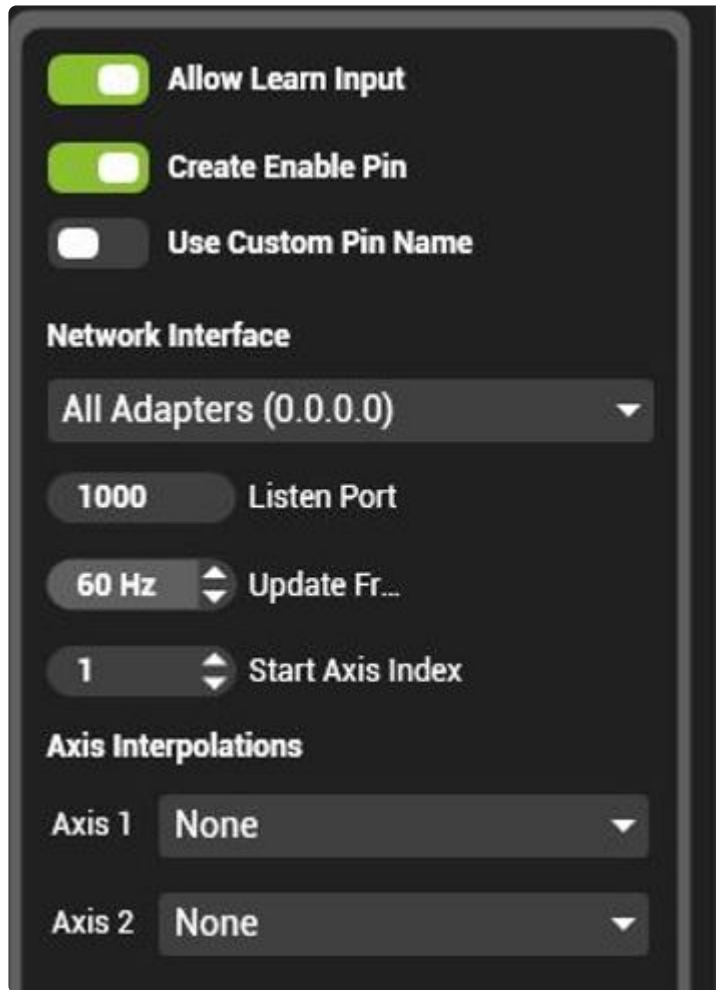
PRG Automation Reader brings data into Hippotizer from the proprietary PRG Automation system.

PRG uses an Automation mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which adaptor to use for receiving PSN data
- **Listen Port**: Choose which network port to receive on, must match the settings of the sender.
- **Update Frequency**: Sets how often data is sent from Multicontroller. This essentially sets the frequency of interpolation. It is recommended to set this to the output video frequency. (50 or 60Hz usually).
- **Axis Interpolations**: As the data refresh rate from most encoders is much slower than the output frame rate, it is often desirable to 'smooth' the movement. There are two methods for smoothing automation data in Hippotizer: **Polynomial and Slew.**
- **Polynomial** looks at a set of received values defined by the sample time, and attempts to find an equation to approximate them. Using this equation, it then tries to predict what values will come in next based on the look ahead time setting. The complexity of the equation is its Poly Order; an

order of 1 would be a static number, 2 a straight line and 3 a curved line for example. In general, lower Poly Order produces better results.

- **Slew** is a simple interpolation: it takes data across it's sample time and creates data points in-between.

Both interpolation methods must introduce delay in order to function and may cause objects in Hippotizer to disagree with the real world, especially when changing speed.

✱ New projects should use the Automation Reader instead of the individual protocol controllers.

TCP Listener
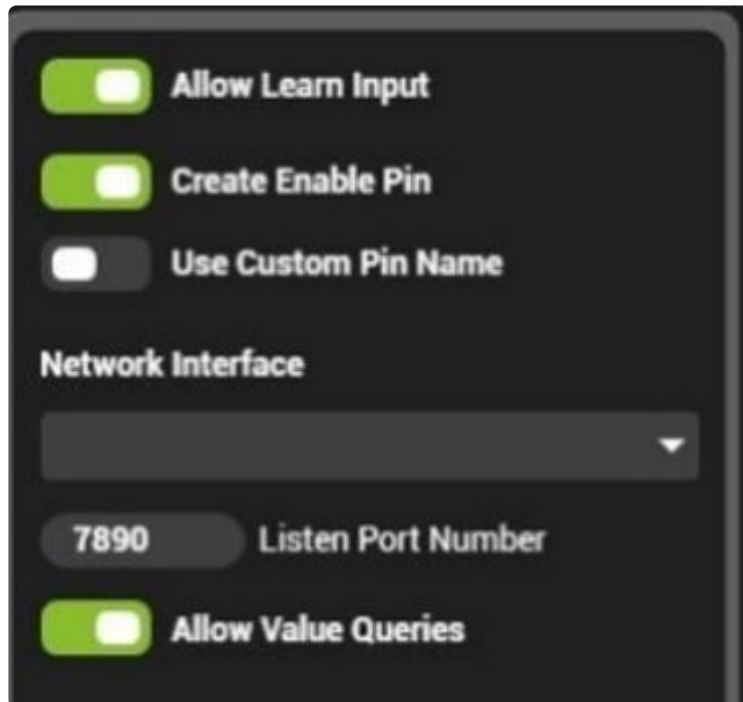
TCP Listener allows Hippo to interface with network based TCP commands. Frequently used by controllers such as Crestron or AMX systems, TCP can be used to trigger events in Hippo or to query the status of a system.

TCP uses a Text mapping.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.
- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.
- **Use Custom Pin Name**: Allows user to name enable Pin.
- **Network Interface**: Choose which adaptor to use for receiving TCP data
- **Listen Port**: Choose network port number to receive data on: must match sender's settings.
- **Allow Value Queries**: TCP can be used to get the values of pins to determine the status of a system. For example, getting the value of the performance/FPS pin can be a good way to see how the engine is running. When this is enabled queries are allowed.

Commands for the TCP listener are formatted as the **Identifier** followed by the command. The Identifier is set in the pin mapping:

For single pins, the identifier is in the text mapping:
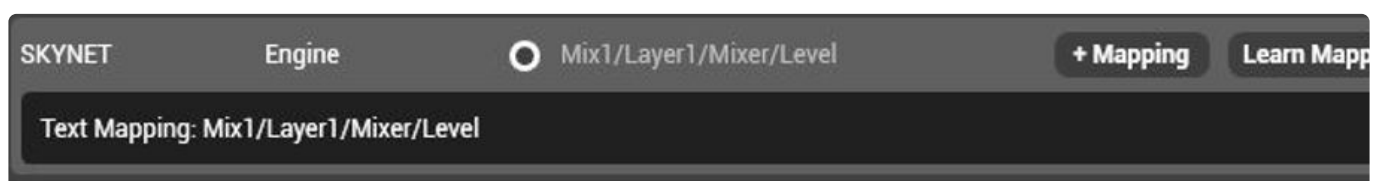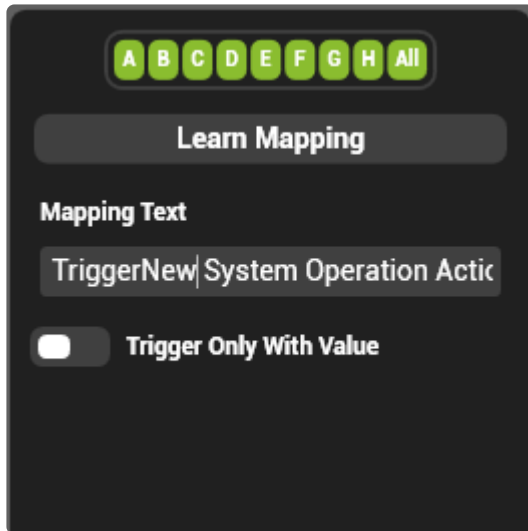
The identifier can be customised by changed the mapping text.

For auto mappings the identifier looks different:
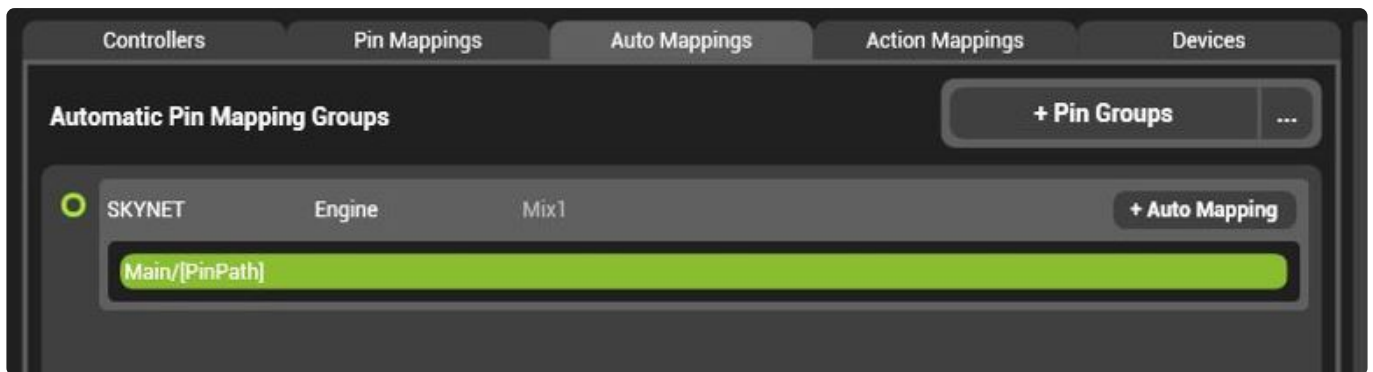
TCP command syntax

Commands take the basic form as the identifier followed by a comma, the value and then a carriage return.

To set a value:

```
[Identifier],[Value]\r
```
E.g.
```
DmxEnable,1\r
```
Returns (if successful):
```
[Identifier],[Value]:OK\r
```
E.g.
```
DmxEnable,1:OK\r
```

To Trigger a Command:

```
[Identifier]\r
```
E.g.

```
TestPattern\r
```
Returns (if successful):
```
[Identifier]:OK\r
```
E.g.
```
TestPattern:OK\r
```

To Query a Value:

```
[Identifier],?\r
```
E.g.
```
Fps,?\r
```
Returns (if successful):
```
[Identifier]_[ValueType]=[Value]\r
```
E.g.
```
Fps_(float)=60.\r
```

ValueType can be:

- bool (on/off values),
- int (whole numbers),
- float (fractional numbers)
- string (text).

Errors

One of the following may be returned if there is an error:

`[Identifier]:NOK_SYN\r` – Command syntax is incorrect

`[Identifier]:NOK_VAL\r` – Failed to set value (can happen when sending the wrong value type, e.g. text to a number value)

`[Identifier]:NOK_STR\r` – Identifier was not found.

Stream Deck

The Stream Deck is an inexpensive, configurable USB controller made by Elgato.

Elgato Website

Multicontroller supports the Stream Deck and Stream Deck Mini
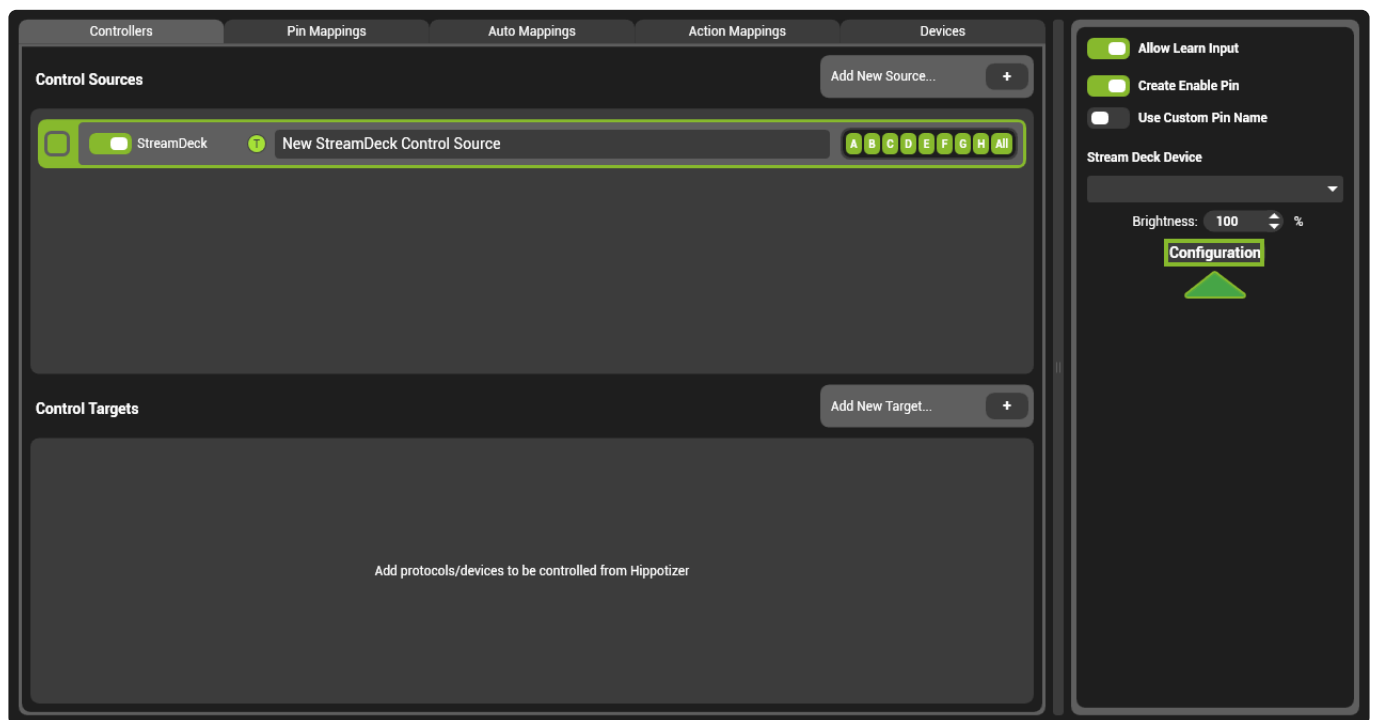
To set the function of Stream Deck buttons, press the Configuration button in the settings of the Stream Deck control source.

Stream Deck has been added to Hippotizer as a source of String commands. These commands can be mapped to action mappings for easy control of Presets and Timelines.
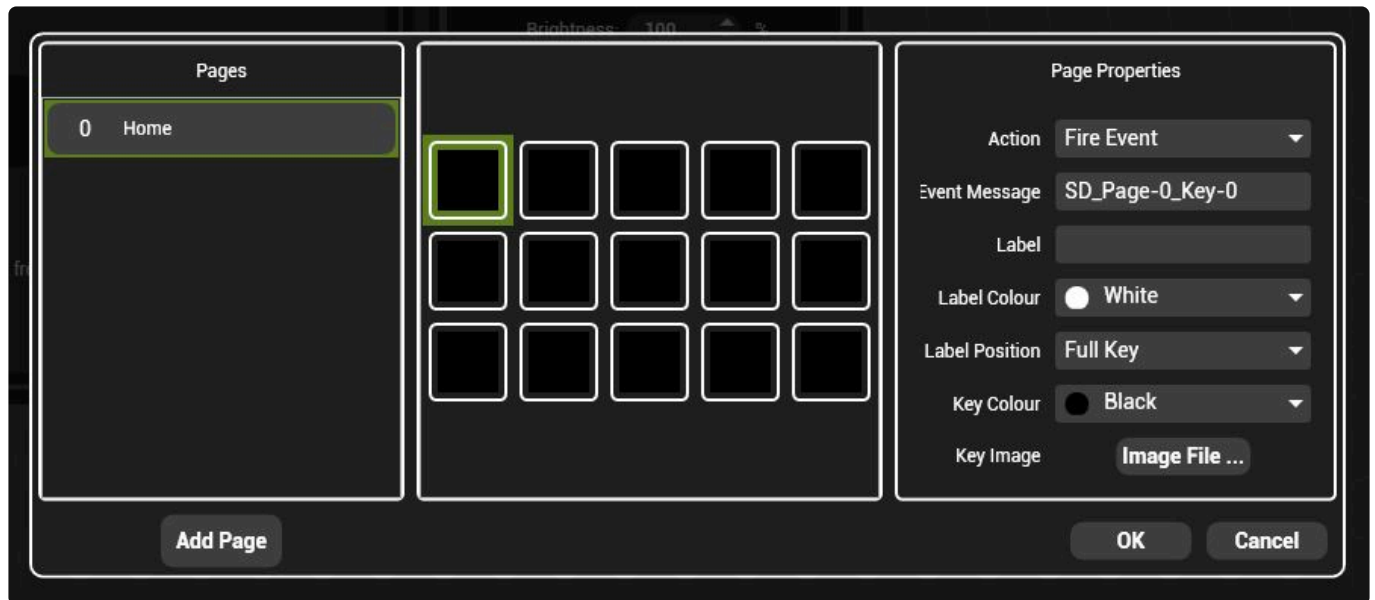
The Stream Deck configuration has three basic sections:
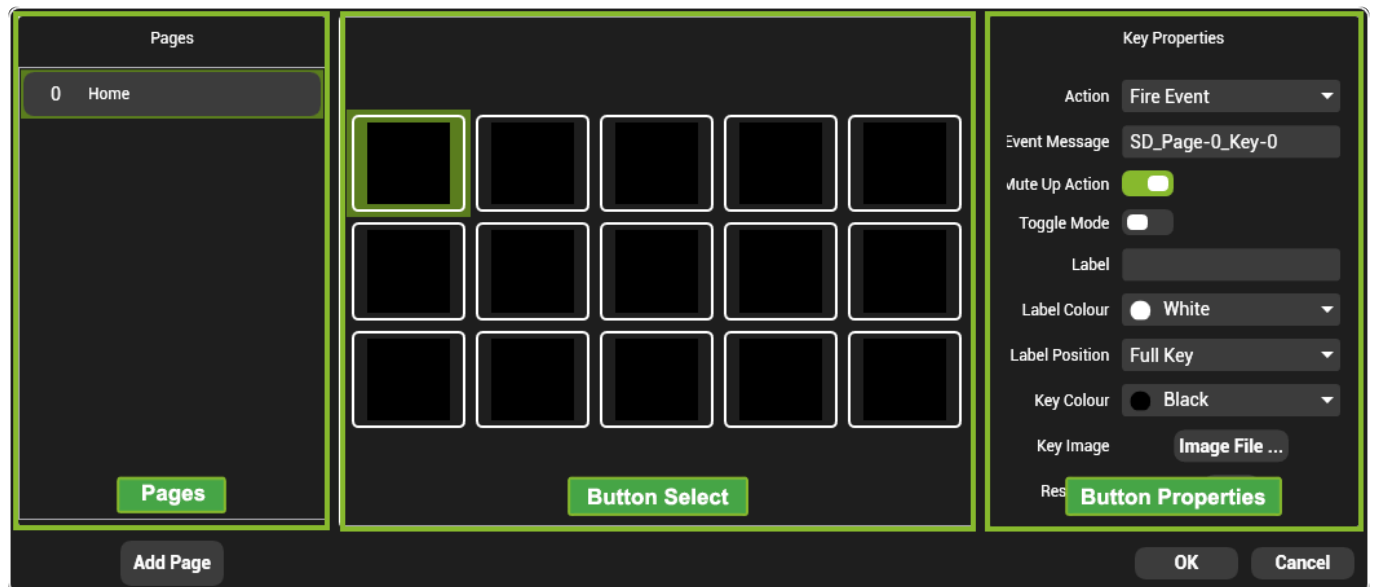
Pages

Each panel of buttons is called a page.

Button Select

Determines which button is being edited in the properties panel

Button Properties

Displays the settings for the selected button.

Action

Sets what pressing the selected button does.

Fire Event

Sends the command string displayed in the **Event Message** panel below. The default for each button is unique so under normal circumstances no editing is required.

Navigate to Page

Changes the page to the page number selected. Pages can only be selected after they have been created.

Navigate to Previous Page

Changes the page to the one numbered below it.

Navigate to Next Page

Changes the page to the one numbered after it.

Navigate to Homepage

Changes to page 0.

Label

Adds a text label to the button. The **Label Colour** and **Label Position** is set a well.

Key Colour

Sets the background colour of the button.

Image File.

Select and image file to use for the button. Images are automatically scaled down on import.

Assigning a button to an action

The fastest way to map a button to an action is to use the **learn** function of the action.

1. Create the button on Stream Deck
2. Create the action
3. Add a string mapping
4. press learn on the string mapping and then press the button on Stream Deck

Automation Reader
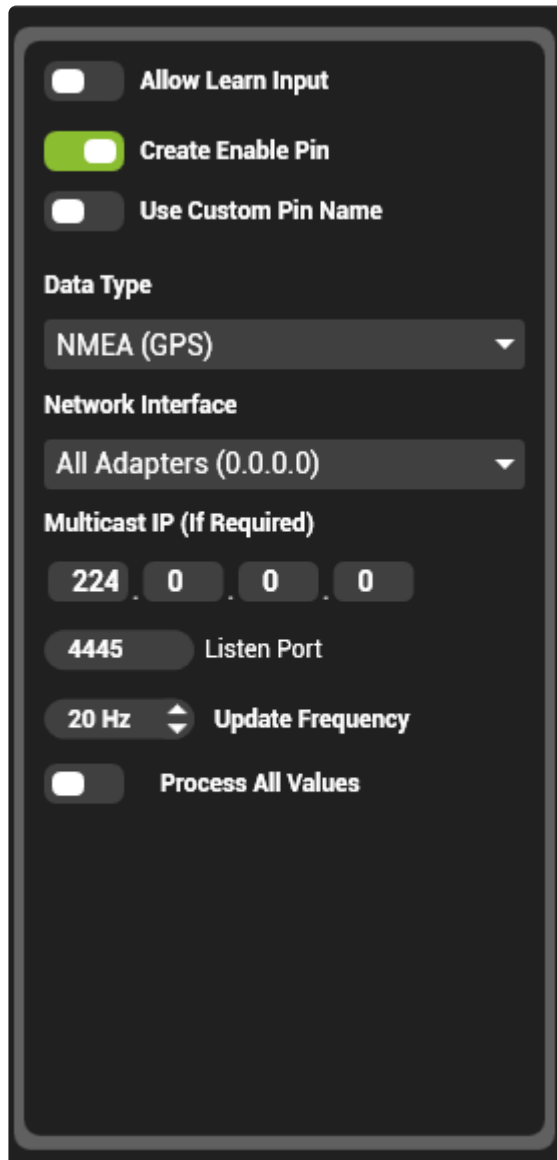
The Automation Reader is a general controller replacing individual protocol controllers
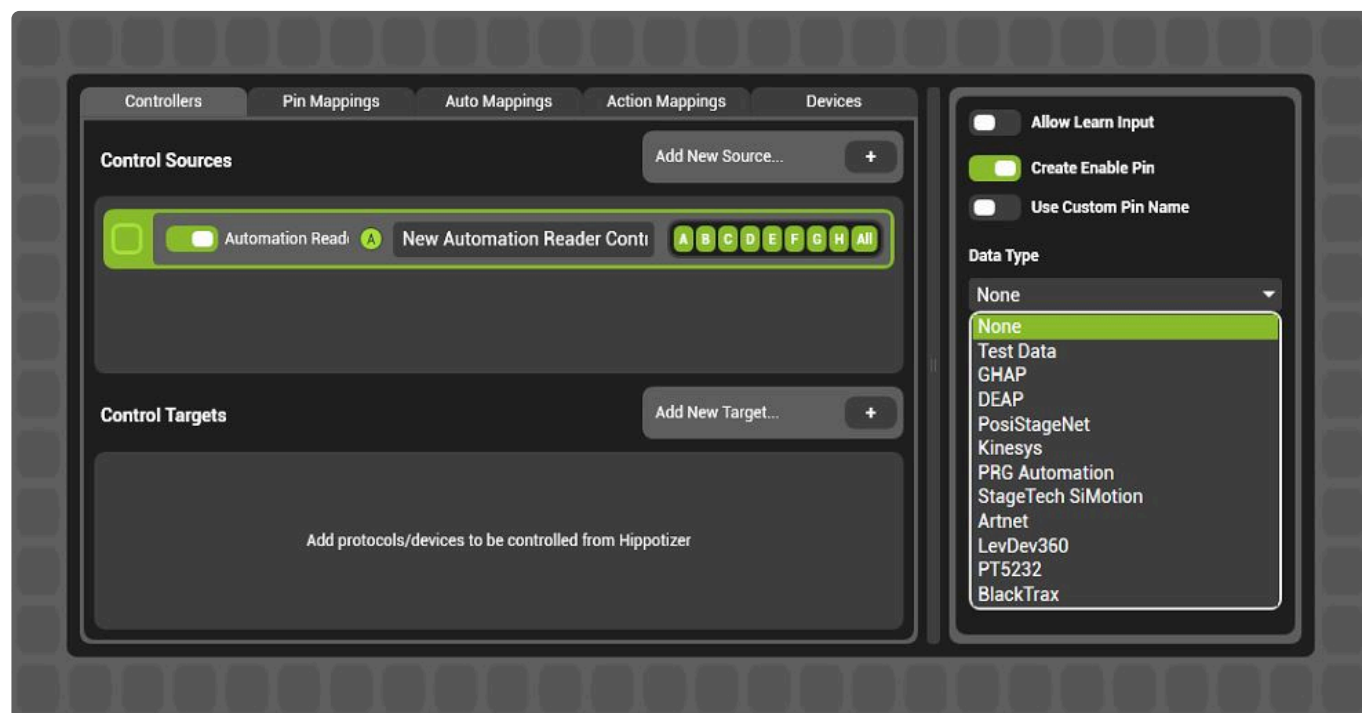
The Automation Reader combines all automation sources into a single controller and adds advanced smoothing.

New projects should use the Automation Reader instead of single protocol controllers.
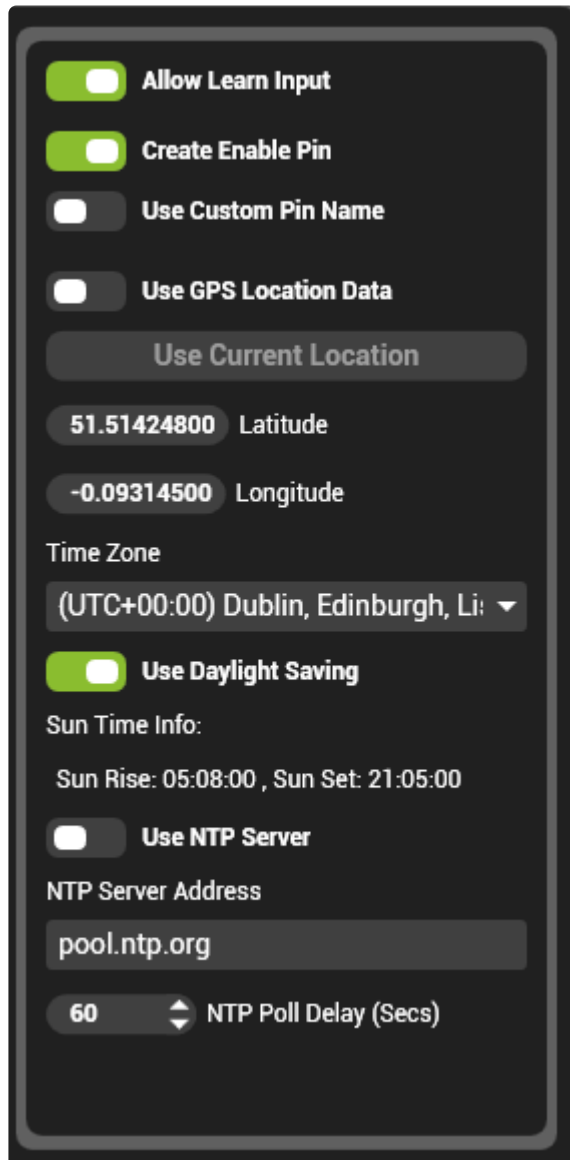
NMEA (GPS)

The Clock Source allows either the local clock or another clock source to schedule Multi Controller mappings.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.

- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.

- **Use Custom Pin Name**: Allows user to name the enable Pin.

- **Data Type**: A drop down for the user to select the data type.

- **Network Interface**: Select which adaptor to listen to, alternatively all adapters can be selected.

- **Multicast IP**: If using multicast the user can set the IP address here.

- **Listen Port**: Which port the Reader needs to listen to.

- **Update Frequency**: A user defined frequency of which data will be checked for updates.

- **Process All Values**: Forces all values to be updated even if they haven't changed

Clock Source

The Clock Source allows either the local clock or another clock source to schedule Multi Controller mappings with.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.

- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.

- **Use Custom Pin Name**: Allows user to name enable Pin.

- **Use GPS Location Data**: Allows the use of a GPS source, both manual or automated, as a locale for accurate time.

- **Time Zone**: Allows user to select from a list of Time Zones.

- **Use Daylight Saving**: Toggle for the use of Daylight saving time

- **Use NTP Server**: Define an address and poll rate for an NTP server to return a clock time.

RFID Reader
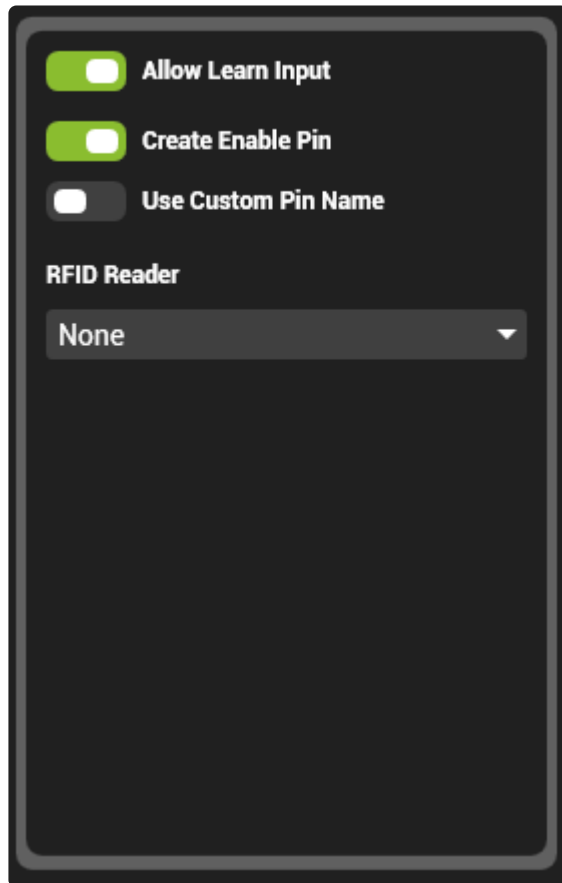
The RFID Reader source is the platform a user can use to interact with RFID readers plugged into the unit.

- **Allow Learn Input**: If enabled, the input can be used to automatically assign to a mapping with the learn button. It is advisable to disable allow learn input on sources that are constantly sending data as it will interfere with other sources associating.

- **Create Enable Pin**: Creates a new pin (Bool) to allow the controller to be turned on or off.

- **Use Custom Pin Name**: Allows user to name enable Pin.

- **RFID Reader**: Will populate a list of any RFID reader plugged into the machine.

Pin Mappings

Each Mapping corresponds to a certain format of data. Each mapping is represented by a green dot in Multicontroller.

Text Mapping

Strings of plain text. Used by network based protocols to send data such as TCP and OSC.

Midi Mapping

The unique data format used by Midi controllers. For example a Midi Mapping could use a particular Midi Note to trigger the mapping.

DMX Mapping

An Array of number values associated with a single universe of ArtNet.

Automation Mapping

Used by automation systems to send information about the location of items. This is normally an axis number and a displacement, though some protocols such as Posi Stage Net carry additional information such as acceleration.

GPIO Mapping

General Purpose Input Output mapping, the GPIO is used to interface with devices that read analogue or digital inputs.

A controller's mapping type is determined by how that controller sends data. Pins in Hippotizer are assigned mappings as required.

Multicontroller does not require the user to specifically patch a controller to a target; by default any sources or targets with the same mapping will automatically be connected.

Action Mappings

(Video online only)

Actions mappings are a selection of preset commands that Hippotizer includes to control some of the components features. This includes:

- System operation (Shutdown, Restart)
- Preset operation (Recalling Presets)
- Media Manager operation (Enable/Disable Watch Folders)
- Timeline operation (Pause, Play, Go to cue)
- TimelinePlus operation (Play, Pause, Stop, Go to Cue, Mute, Un-Mute)
- Send TCP (Send 'string' TCP commands).

Output Manager

Output Manager is the component which starts and manages layers, mixes and viewports. Output Manager is used to configure many important aspects of Hippotizer V4 including:

- [Basic Layout](#)
- [Basic Configuration](#)
- [Patching SHAPE](#)
- [Viewports and mix resolution](#)
- [Windowed Outputs](#)
- [Startup behaviour](#)
- [Re-patching Outputs](#)

Access the output manager by clicking the 'Outputs' tab in Zookeeper's Home screen.

> ✳ Output Manager is critical for the normal operation of Hippotizer. The component should not be stopped or deleted.

Video Tutorial of Output Manager

https://www.youtube.com/embed/020gJw2yd70?rel=0

Basic Layout

Output Manager has a few basic parts

1. The Host Selector
2. Mixes
3. Viewports (Patches)
4. Outputs
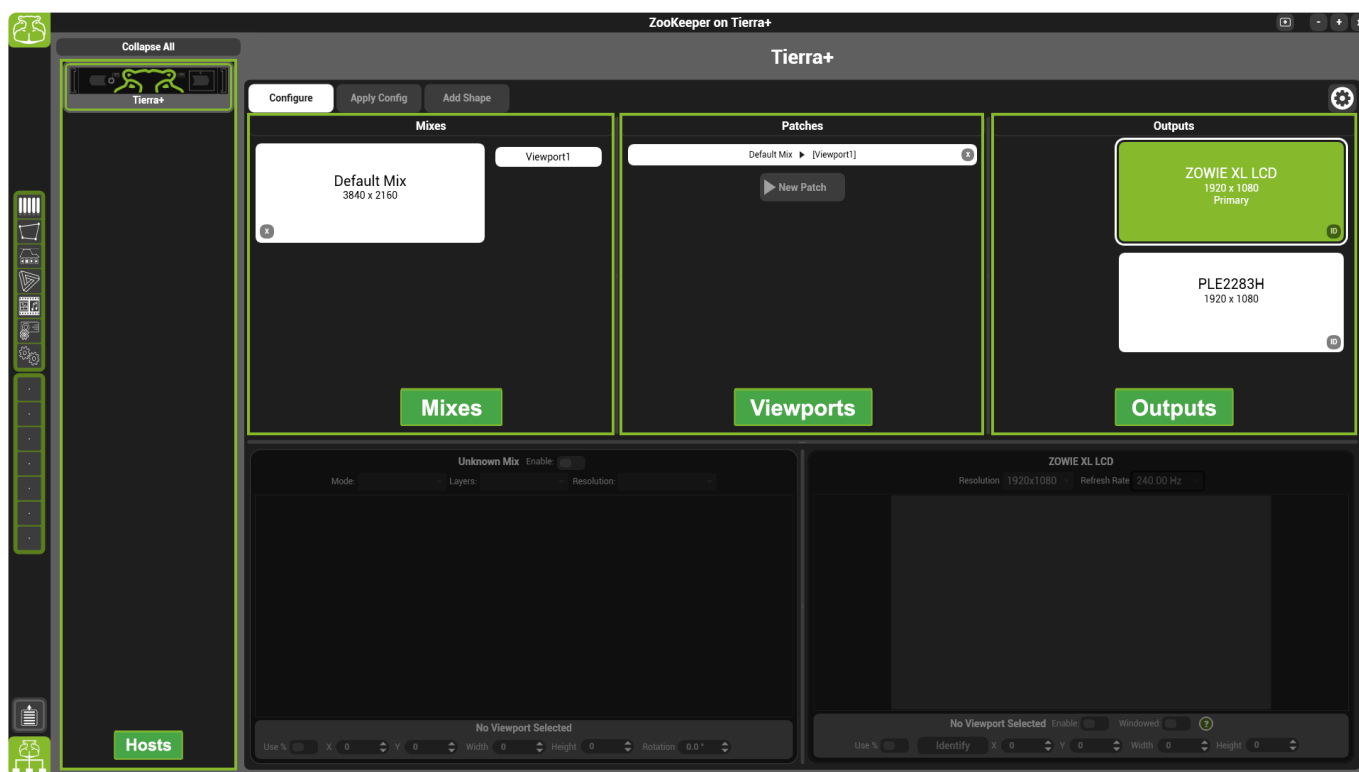
Host Selector:

Shows all systems running in HippoNet. Simply click on the host to select it and view it's settings.

Mixes:

A mix is a collection of media layers that are composited based on mix modes. Each mix can run up to 16 layers, which are capable of playing clips, still images or live camera feeds.

The number of mixes that a system can run is based on what type of Hippotizer it is:

- Amba / Portamus: 4 Mixes
- Karst: 8 Mixes
- Boreal: 12 Mixes
- Taiga: No Limit

Clicking on a mix selects and will show it's details in the menu below the Mixes list.
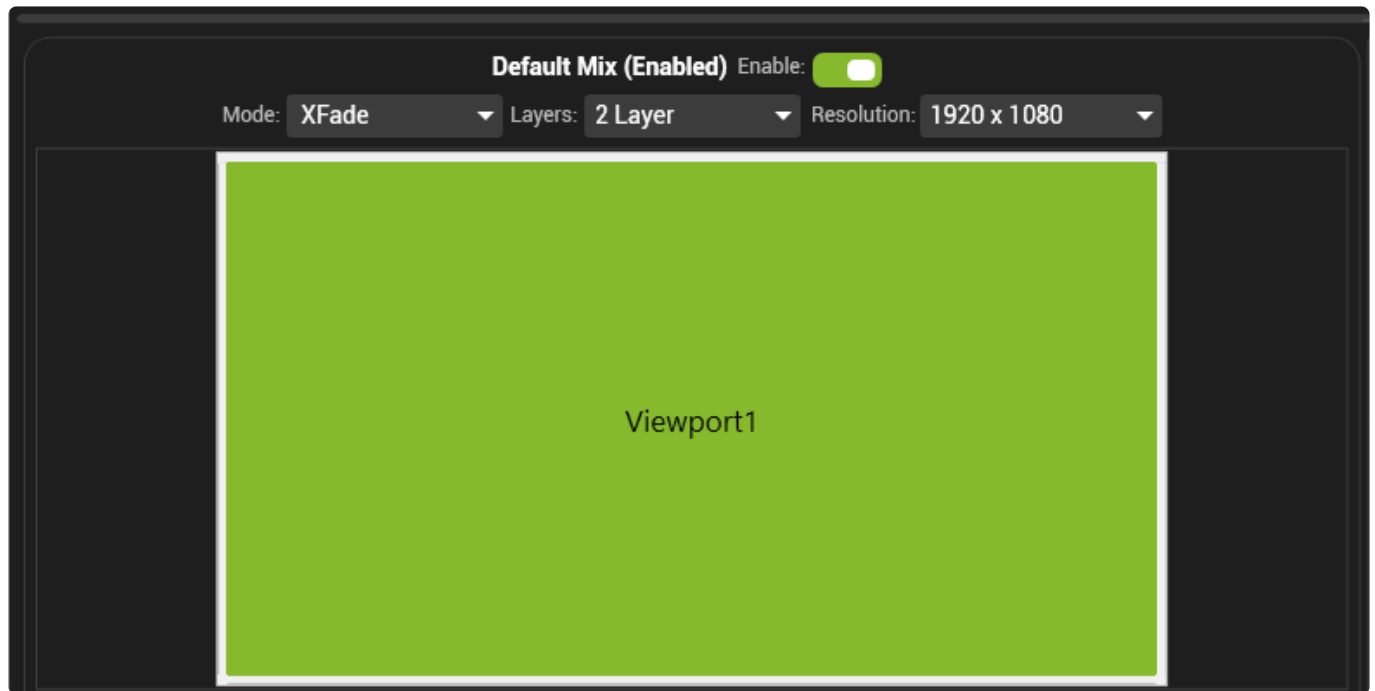
Each Mix has four attributes:

- Enable
  Mixes are on by default. Disabled mixes will not start their media layers.

- Mode
  XFade- Up to 16 layers, all with crossfade on layer enabled
  Normal- Up to 24 layers, all with crossfade on layer disabled
  Special- Notch Mix

- Layers
  The number of layers that the mix will start.

> ✱ Media layers use resources to run even if they are not doing anything. To maximize performance only start as many layers as required.

- Resolution
  The size in pixels of all layers in that mix. The Mix resolution is usually best set to be as high as the highest content resolution. Media of different resolutions can be played on the same mix however playing content of a higher resolution than the mix will result in down scaling.

> ✱ The resolution of a mix can have a large impact on performance. It is best to set the resolution only as high as required.

Viewports

Viewports patch mixes to outputs. A Viewport contains controls for blending, warping and video mapping

usually a viewport is associated with a single display device (such as projector or LED processor). The viewport is represented as bars in the patches section of Output Manager. Click on them to show their settings in the details windows below.

A viewport is comprised of an input window and an output window. The input window is where in the Mix the viewport samples, while the output determines where on the output the viewport is placed.

Basic Configuration

When the system is running and playing video, the Output manager's settings can be viewed but not edited. In order to make changes in Output Manager, press the configure button.
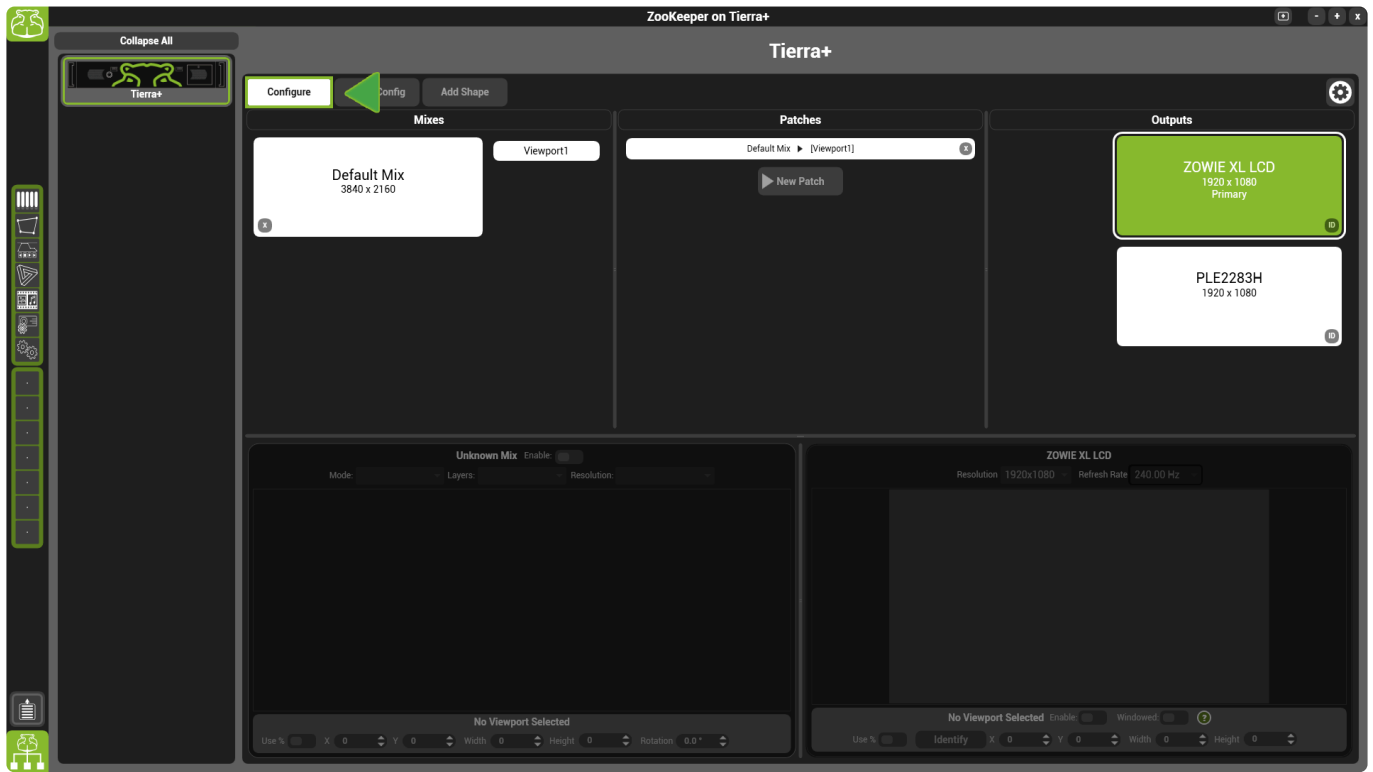
> **!** When the Output Manager is being configured media is not rendered and test grids are displayed on all outputs.

All detected outputs will display a purple test grid while viewports will appear as black test grids.
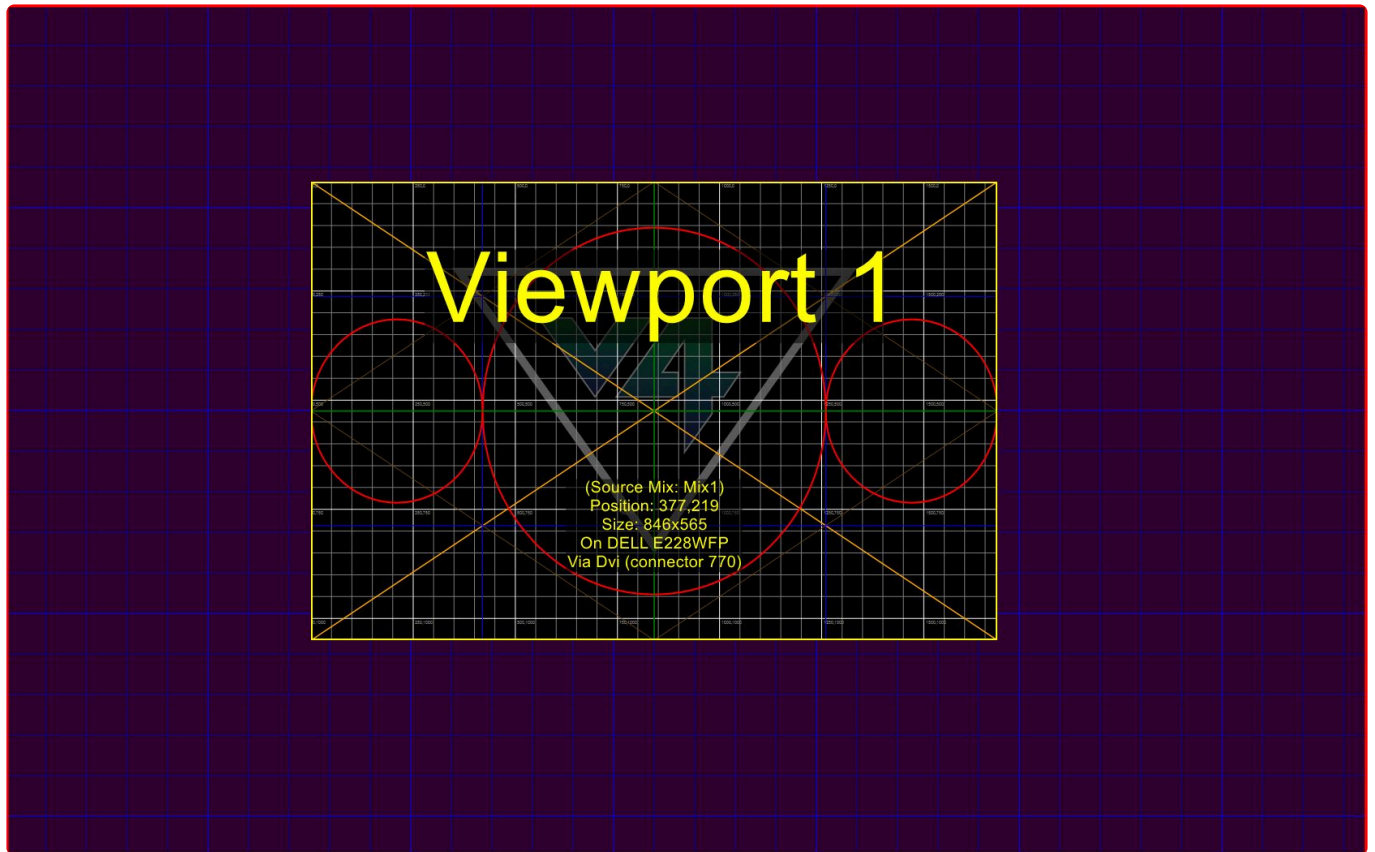
To send a mix to an output; add a mix, select it, then click the target output and press New Patch.
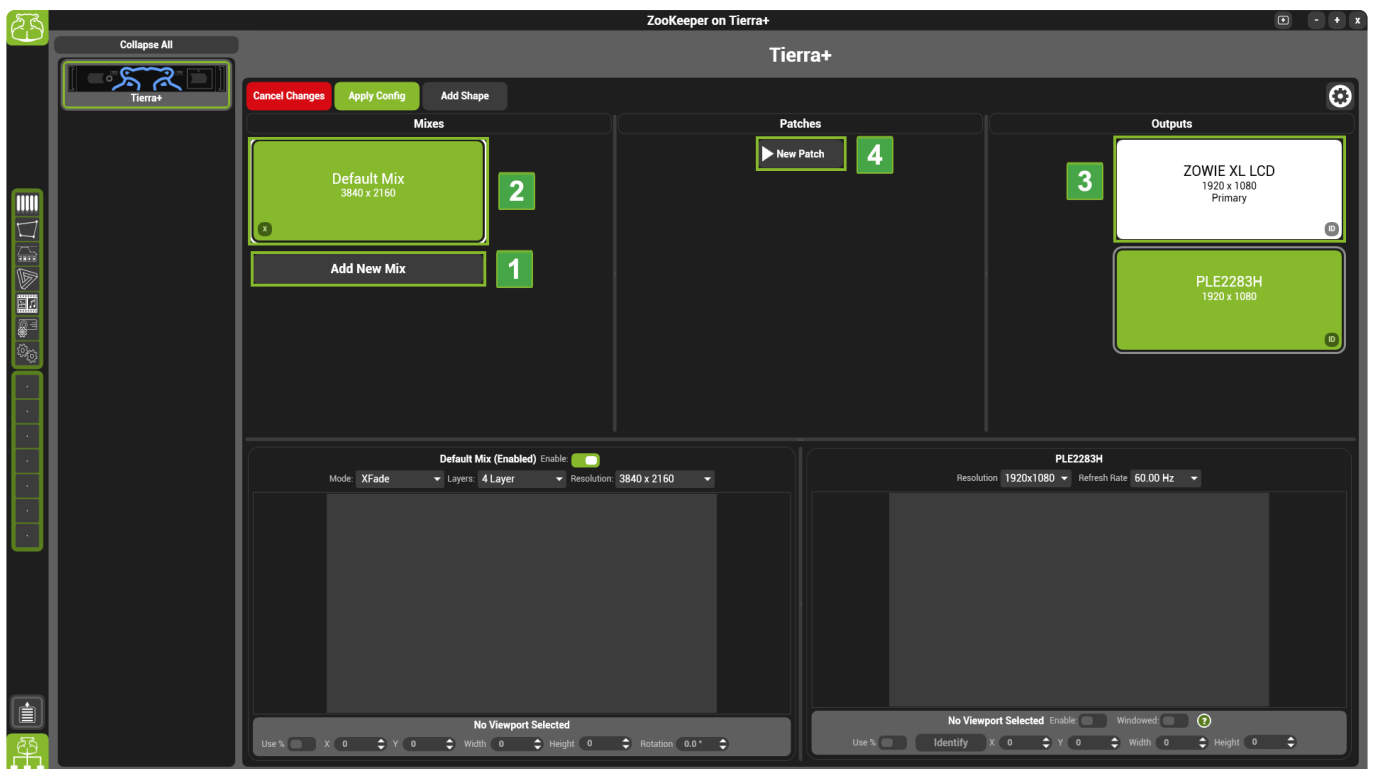
By Default, a new mix will be created with the resolution of the output and the viewport will send the whole mix to the whole output.

Pressing the apply config button now will save these changes and start the rendering engine.

✱ Starting the engine can take some time depending on how many media layers are being started. Each media layer will appear as a green film strip in the system tray.

Patching SHAPE

SHAPE is the third dimension of Hippotizer V4 allowing for real time rendering of video on a 3D model. SHAPE is comprised of two parts: a plug-in in Hippotizer and an editor. The SHAPE plugin is started from Output Manager while the editor is a separate application. To add the SHAPE plugin, enter configuration mode and press the Add SHAPE button.
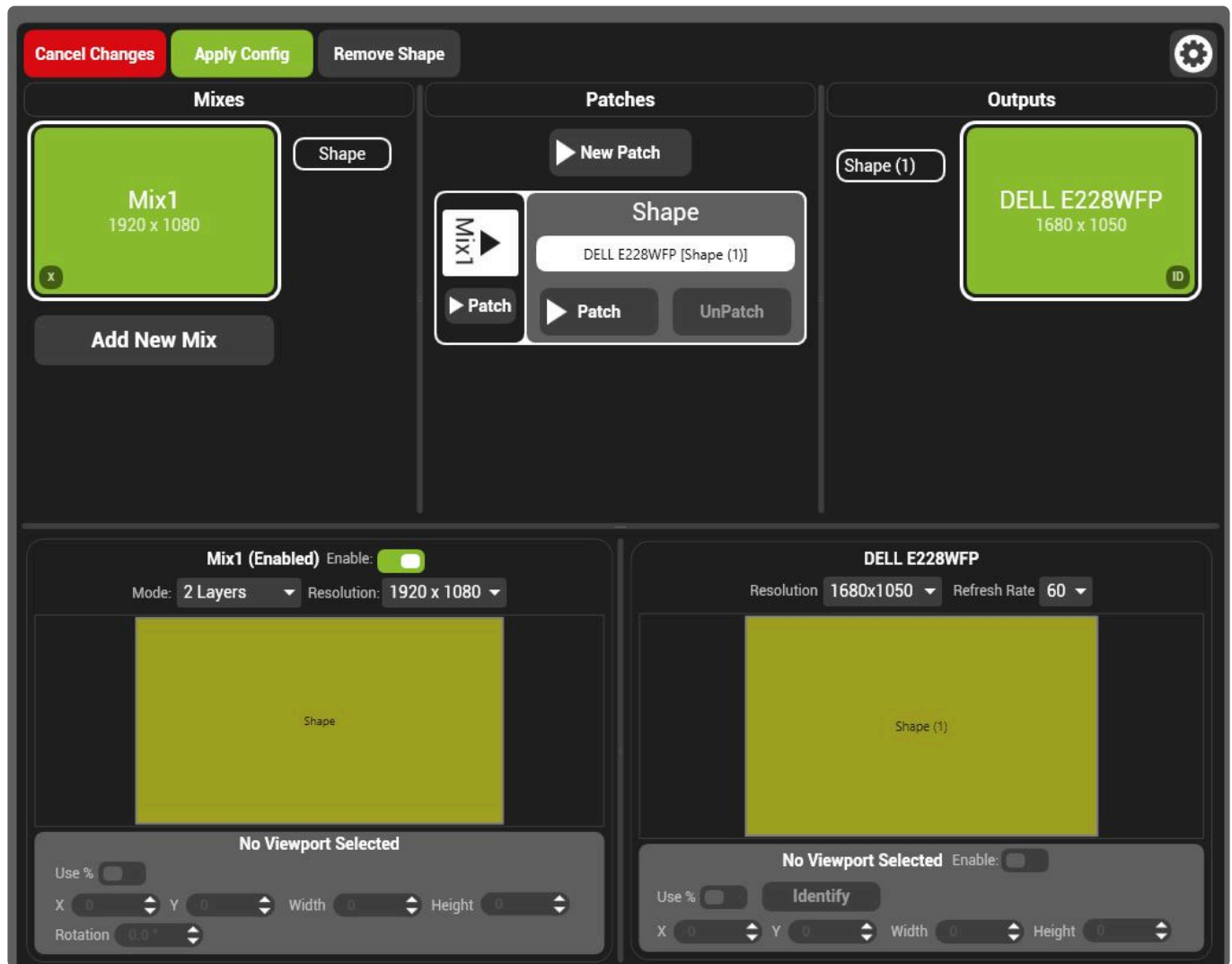
SHAPE is patched in a similar way to a viewport: it has an input mix and is patched to one or more outputs.

> ✱ The input mix of SHAPE feeds the 1st of eight input textures. The other seven inputs are controlled from the SHAPE viewport.
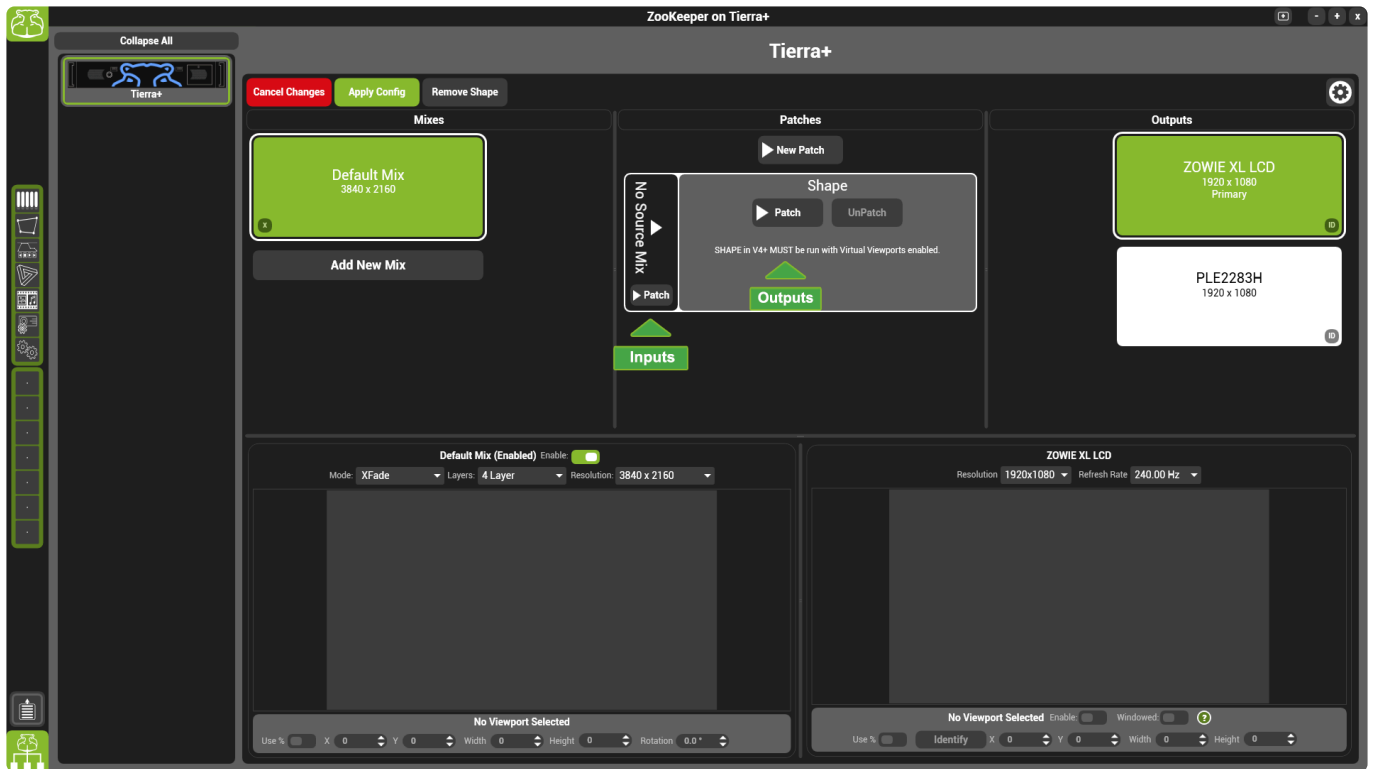
SHAPE should be patched to a physical output for each projector in the SHAPE model. The assignment of projectors to outputs is handled from within the SHAPE project in the SHAPE application.

https://www.youtube.com/embed/YPl2fArWG0A?rel=0

Viewports and mix resolution

When setting up the Output Manager there are several different resolutions to consider:

- Mix Resolution
- Input Viewport Resolution
- Output Viewport Resolution
- Output Resolution
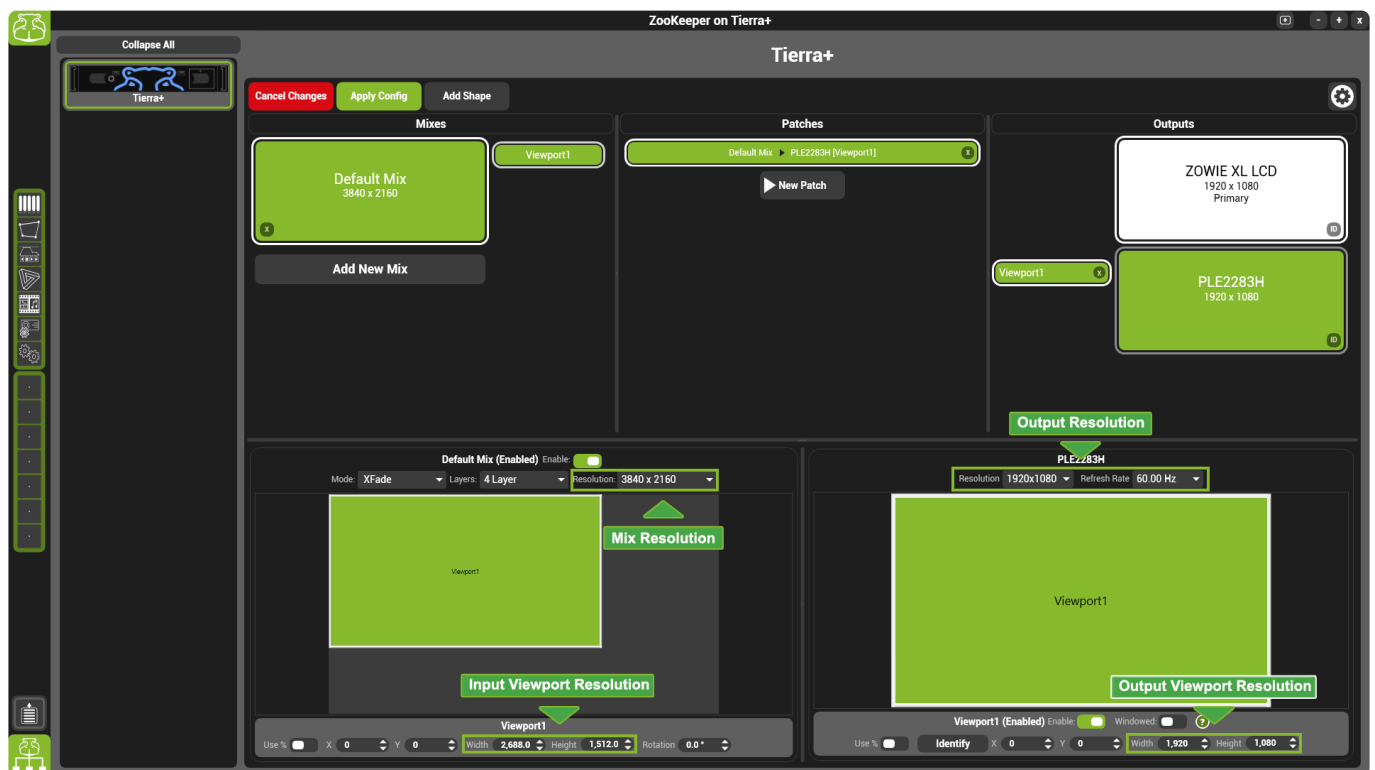
Mix Resolution

The Mix resolution is the pixel size of the layer mixer; where media layers are composited. Every mix has an independent layer mixer and can have different resolutions.. Each media layer will automatically take the resolution of the clip it is playing, however that will then be scaled by the layer mixer according to the mix resolution.

Input Viewport Resolution

The input viewport is the window through which the viewport samples the mix. The input viewport is usually set to match the resolution of the output it is associated with. A common exception would be where an output splitter (such as Datapath FX-4) is used.

> ✻ The input viewport resolution is also the input resolution for any videomaps on that viewport.

Output Viewport Resolution

The output viewport dictates where on a physical output the viewport is displayed. On a simple display, the viewport may fill the entire output. Where a splitter is used, several viewports would be placed on an output.

> ✱ Output viewports may not overlap each other. Any overlapping viewports will be disabled by default.

The resolution of an output viewport is dictated by the physical output itself; normally it is set to the whole output, or a portion of the output based on a video splitter.

> ✱ The output viewport resolution is also the output resolution of any videomaps on that viewport.

Windowed Outputs

In normal operation, the Hippotizer renders video to entire outputs. However there are times where it is better to see only a small windows of the video output; for pre-programming for example. This can be achieved in Output Manager by setting the viewport to be Windowed.

In order to set a viewport to be windowed, Enter Configuration mode, select the viewport and enable Windowed mode.

> ✳ Placing windowed outputs on Zookeeper displays (driven from the Zookeeper graphics card) can result in poor performance. Always ensure windowed outputs are on displays driven from the more powerful graphics card.

Startup behaviour

The first time your Hippotizer starts up, or after a clean show is started, Output Manager will create a default setup based on the output configuration at startup.

> ✳ It is always best to ensure all displays are attached and are visible in Windows before starting the Hippotizer software. The windows primary display should be set to the Zookeeper (control) output.

Output Manager's defaults are based around the number of displays and where the Windows primary display is assigned.

If only one display is present, a single output viewport will be created in Windowed mode on that output.

If two or more displays are present a single full screen output will be created on the non-primary display

> ✳ Holding CTRL + ESCAPE for four seconds will put Output Manager into configuration mode. This is a good way to break out of situations of where you can not see the desktop because it is covered with an output.

After the first run, Output Manager saves the previous settings and will attempt to place the system back into the same state it was at shut down. This is based on the display name as give to Hippotizer by EDID. If the same displays are not detected, Viewports will appear un-patched and can be re-patched from within Output Manager.

See <u>Re-patching outputs.</u>

Re-patching Outputs

On every startup of Output Manager, viewports will attempt to re-attach to the output they were previously patched to. This is based on the name of the display and what physical output port it is on. If that changes, the Output Manager will not know which viewport should be patched to which output. To avoid confusion, it will create the viewport "unpatched"
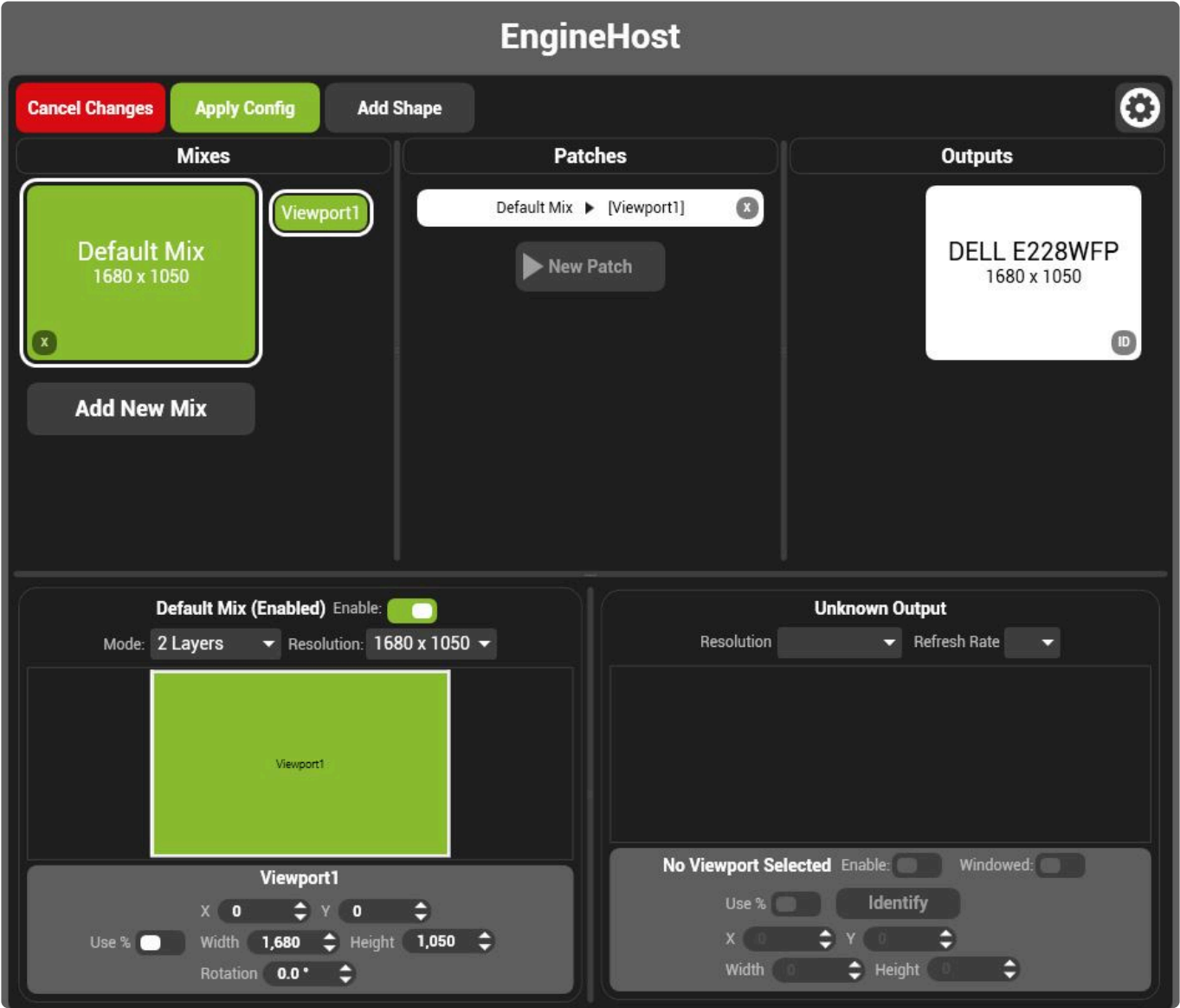
To Repatch the viewport, in configuration mode, select the viewport to re-patch, select the output to patch it to and press "Repatch".

ZooKeeper on Tierra+

Tierra+

Cancel Changes | Apply Config | Add Shape

Mixes	Patches	Outputs

Mixes

Viewport1

Default Mix
3840 x 2160

x

Add New Mix

Patches

Default Mix ▶ [Viewport1] x

▶ RePatch

▲

Outputs

ZOWIE XL LCD
1920 x 1080
Primary

ID

PLE2283H
1920 x 1080

ID

Default Mix (Enabled) Enable: ⬤

Mode: XFade   Layers: 4 Layer   Resolution: 3840 x 2160

Viewport1

Viewport1

Use % ⬤   X 0   Y 0   Width 3,840   Height 2,160   Rotation 0.0 °

PLE2283H

Resolution 1920x1080   Refresh Rate 60.00 Hz

No Viewport Selected Enable: ⬤   Windowed: ⬤   ?

Use % ⬤   Identify   X 0   Y 0   Width 0   Height 0

Advanced Options

Some setup options in output manager are in the advanced menu:

- [Graphics Card Restriction](#)
- [Martin P3 Integration](#)
- [Virtualised Viewports](#)
- [Render Buffering](#)

Graphics Card Restriction
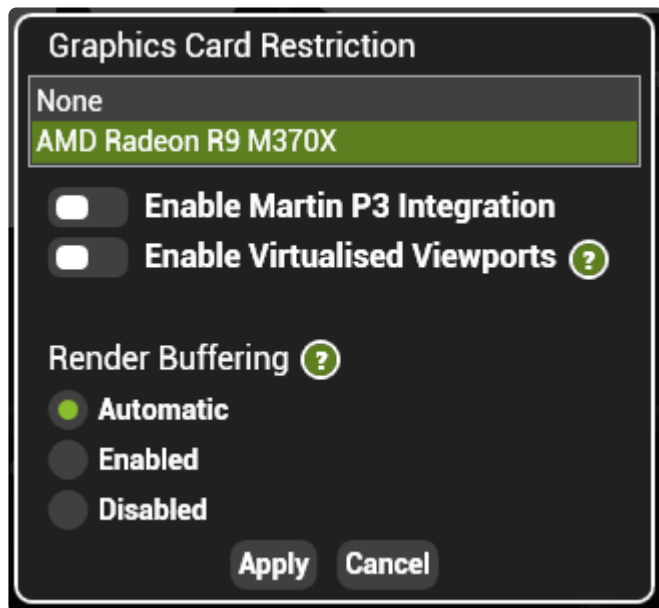
Output manager will only show the displays of the output graphics card as available for patching. If attached displays are not shown in output manager or creating an output on the Zookeeper monitor is desired, then this restriction can be changed.

Select the graphics card from the list or choose none to see all outputs.

✱ Although outputs can be placed onto the Zookeeper graphics card, the performance will be will be significantly reduced. Where a single output is required (such as for visualisation) it is best to use the more powerful graphics card by plugging into a production output.

Martin P3 Integration

Working in conjunction with Martin Professional's P3 controller software, Hippotizer can send video directly to P3 running on the same machine. Use this to control a limited amount of Martin P3 fixtures directly from the Hippotizer.

> ✳ A Martin USB Dongle is required to run P3 software, purchased from your local Martin distributor.

P3 integration allows the Martin software to detect and automatically capture local mixes and viewports running in Hippotizer.

To set up P3 integration:

1. Install P3 software onto the Hippotizer machine
2. Start Hippotizer and start a mix
3. Start the P3 software on the same machine
4. Enable P3 integration in Hippotizer
5. The mixes and viewports of Hippotizer should now be visible to the P3 software as sources

Virtualised Viewports

Virtualised viewports change the way that the output windows are created and can dramatically improve Hippotizer performance when using more than four viewports.

Normally, each viewport is created inside a discrete window which is placed on the output. This works well where there are four or less viewports. However, for more than four viewports it is more efficient to use one large window. Virtual viewports creates a single window around all the viewports and renders each viewport inside that window. There is no difference to the user; viewports are created and patched the same way in both modes.

> ✱ Virtual Viewports will create a window that surrounds all viewports; this requires that the zookeeper output is not placed between two production outputs as it would be covered by a black window. Be sure that the Zookeeper monitor is placed to one side of the output displays in the Windows Display management control.

It is usually best to disable render buffering when using virtualised viewports.

Render Buffering

In order to ensure output smoothness in all cases, by default Hippotizer stores several frames for each output before displaying them in a buffer. This buffer will increase the delay of live capture so may need to be disabled in certain situations.

There are three settings:

Automatic

Enables render buffering where there are four or less viewports.

Enabled

Buffers the output by up to three frames. Capture latency with buffering enabled will be roughly five frames. Using render buffering with more than four viewports will likely result in un-smooth output.

Disabled

Removes the buffer. Capture latency with buffering disabled will be between two and three frames.

> ✳ With buffering disabled output smoothness will be dependent on the timing of each display. It is advised to genlock the outputs together and ensure that Zookeeper outputs have the same frame rate as production outputs to ensure smooth playback.

Notch Mix

The Notch Mix is a mix type dedicated to Notch playback
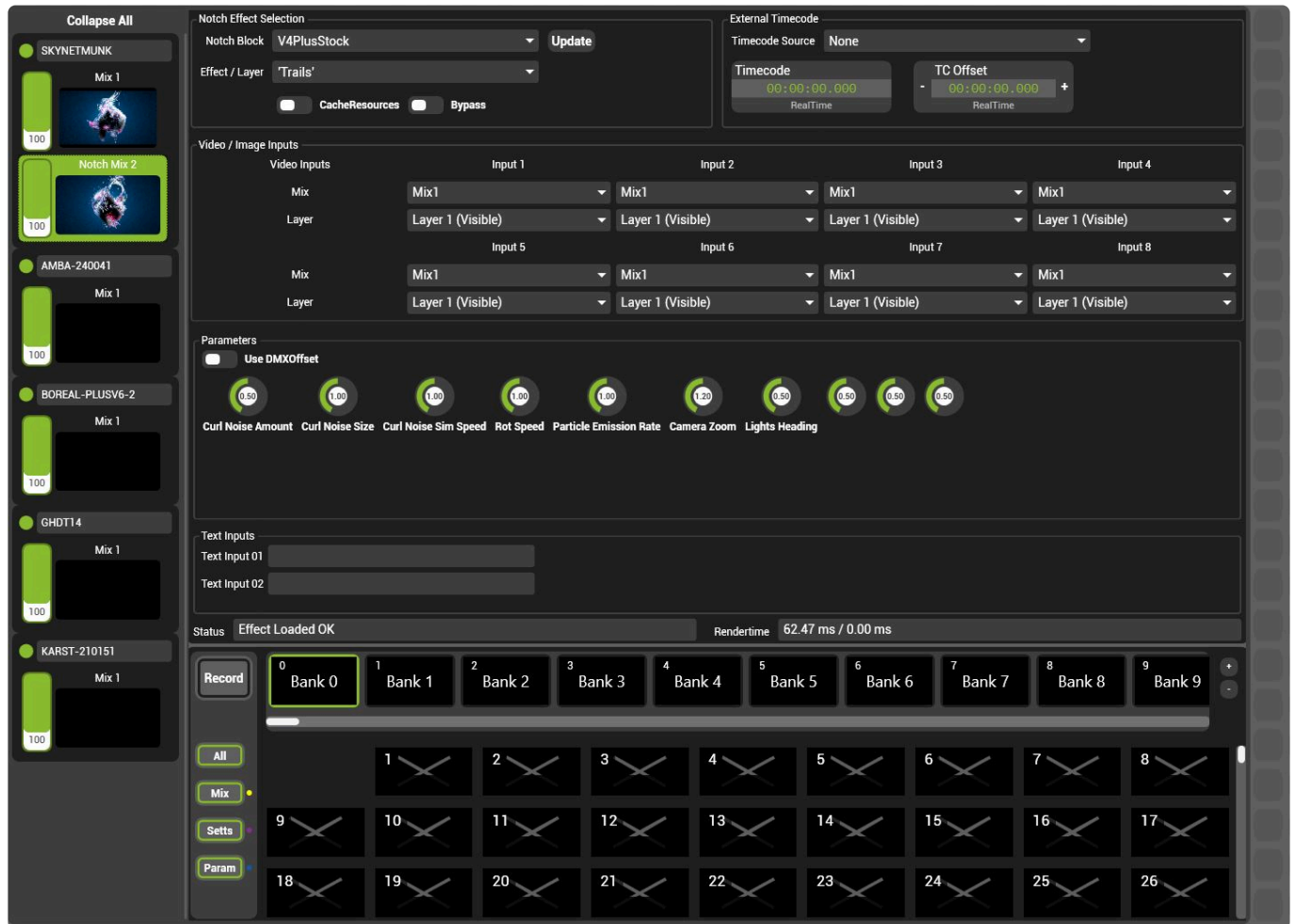
A Notch Mix offers several benefits over the Notch implementation present on every layer:

8 Video inputs instead of 2 on layer

Notch on layer is limited to 2 texture inputs; the first is the layer itself while the second is set from a relay.

Notch Mix has up to 8 texture inputs, each set from a relay so any mix or layer can be a source.

User definable parameter counts.

The number of parameters (text and value) are set from a text file and can be modified for the Notch Mix.

Notch on layer is limited to 10 value and 2 text parameters.

[See here for how to add more parameters.](#)

Lower playback overhead

The Notch mix does not have the computational overhead of media playback, effects engines and the cross fade system making Notch Mixes a more efficient way to playback Notch effects.

Creating a Notch Mix

Notch Mixes are created in Output Manager.

A Notch mix is a mix type so must be set as part of Output Manager's configuration.

Creating a Notch Mix
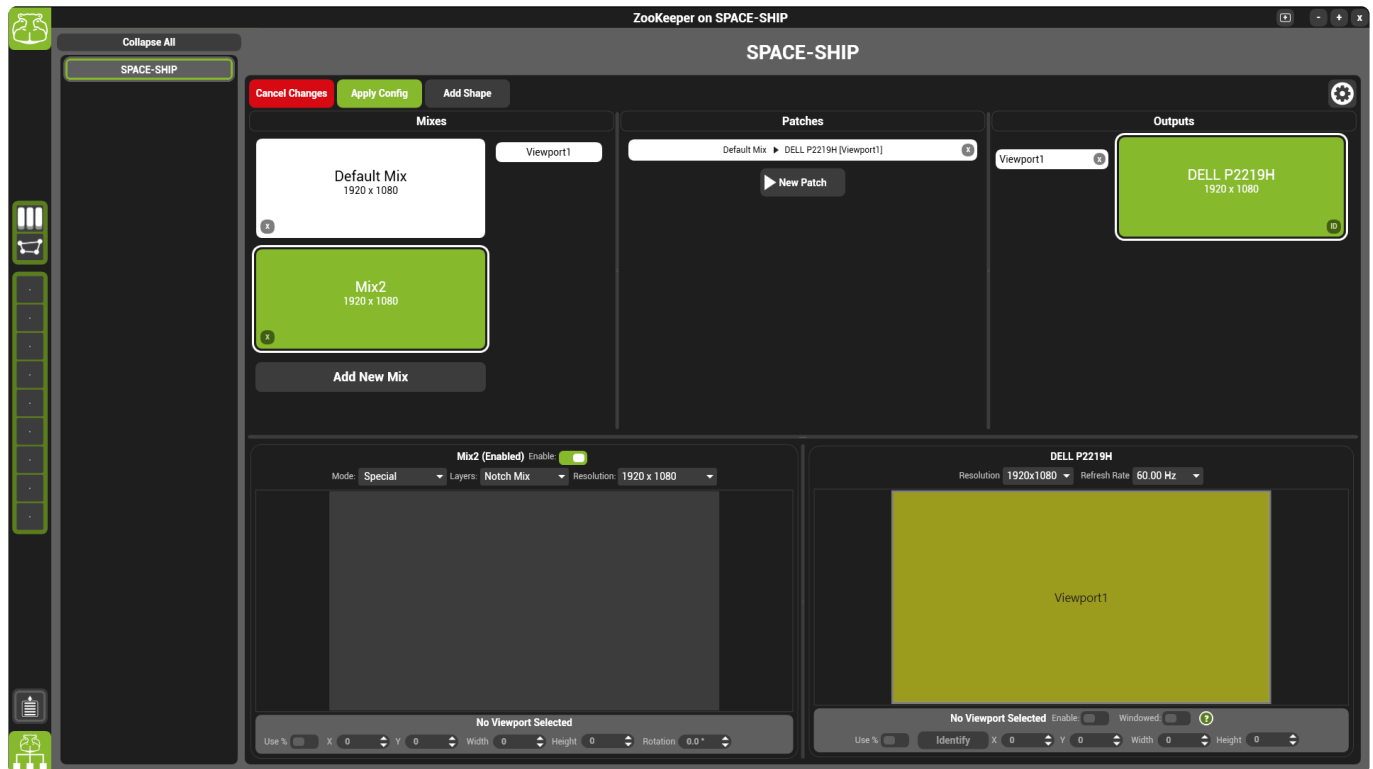
In setting up a Notch mix there are a few decision to make:

Notch Mix Resolution

The resolution of a Notch block has a significant effect on it's performance impact.

Often the fastest way to reduce the load of a Notch block is to lower its resolution.

Mix order

Most commonly the Notch mix should be the first or second mix to reduce delay

Mixes in Hippotizer are rendered in order: Mix 1, then Mix 2 etc. Meaning that relays between mixes will add a frame latency if moving from a higher mix to a lower mix.

If the Notch Mix is receiving live capture, then the best is to capture onto Mix 1, use Mix 2 for Notch and higher mixes for content playback.

If the Notch Mix is not receiving live capture then it is best to place the Notch Mix as mix 1, and content playback in higher mixes.

Output Patching

If the Notch effect is going to be played out directly then the Notch mix can be patched directly to an output.

If the Notch effect is to be composited with layer playback then the Notch mix can be created without an output patch and relayed onto another mix.

Adding Parameters

**If more parameters are required, the number of channels can be changed by adding a text file to the Notch Block folder:

- Shut down the Engine and Zookeeper
- On the Hippotizer, navigate to Documents/Green Hippo/Notch
- Create a text document and name it **Params.txt**
- Open the text document and add two lines:

```
numtextparams=5
numfaderparams=20
firstparamiszero=true
```

- Save the text file and close it
- Restart the engine

The variables to consider when editing the number of parameters of Notch:

Text Parameters

- 2 by default
- No Limit to how many can be created

Fader Parameters (Floats)

- 10 by default
- No limit to how many can be created

First Parameter is Zero

Notch's DMX offset table adds an offset to each DMX address. If first parameter is zero is set to true, any offset will be overridden forcing DMX to start from 1.

Notch Mix Functions

Notch Block

Notch effects are grouped into **Blocks**, this pin chooses which block is loaded.

> **!** Loading a Notch Block is extremely resource intensive and will temporarily stop all rendering. Only load blocks outside of live environments. If changing blocks live is required consider using multiple layers and bypass, or cached resources.

The order and naming of Notch blocks on the block select pin is determined by the naming and is described here.

Cached Resources

Leaves all Notch blocks stored in memory even after they are de-selected in order to make switching to them again much faster.

- **Enable** Resources are cached. Once a block is loaded it will be saved so subsequent navigation to that block is nearly instant.

- **Disable** The default. Blocks are deleted from memory once they are de-selected. Navigating back to a previously loaded block will be slower and may interrupt the output.

Bypass

Bypasses the active Notch block without unloading it from memory. Use bypass to quickly turn Notch on or off on a layer.

- **Enable** The default. The block is loaded but not rendering.

- **Disable** The block is rendering normally.

Rendertime

The real time measure of how long each frame is taking to render through Notch. At 60FPS, a render time of above 15ms will slow the engine down.

Effect / Layer

Selects which Notch Effect is loaded.

The order and naming of Notch layers is determined inside the Notch application.

Update

Updates the Block select pin by scanning the Notch folder for new blocks; press update to add newly added blocks to the list.

> **!** Update unloads and reloads all blocks temporarily stopping video render. Only use update when video output disruption can be tolerated.

External Timecode

Timecode Source

Sets the timecode source for the block's internal timeline. If none is set the block will flywheel, creating it's own time counting up from when it is initialised.

Timecode

Displays timecode received

TC Offset

Sets the offset applied to timecode as it is sent to the Notch block. An offset of 1 hour (01:00:00.00) will set the internal timecode of the block to 00:00:00.00 when 1 hour is received.

Video / Image Inputs

A Notch effect can have up to eight video inputs. Each input is a relay allowing any local layer, mix or viewport to function as an input.

Parameters

All external parameters exposed by the Notch block are shown in the parameters section. The ordering of Parameters is determined by the Notch block. The number of parameters is defined by the parameters text file. See here for more info.

Use DMXOffset

Determines whether the DMX offset table in the Notch block is used as opposed to the parameter ordering

- **Enable** Uses the DMX Offset table.
- **Disable** The Default. Ignores the DMX Offset Table and uses the parameter ordering instead.

Status

An indication of the Notch status.

- **No Notch Block Loaded** No Block selected
- **Effect loaded OK** Normal run state when Notch is loaded and operating
- **Loading Notch Block** A new block is loading. The whole system output will stop while this is happening.

Rendertime

The time (in milliseconds) it takes to render a frame of the selected effect.

Mode and Layers

Each Mix will offer the user the ability to set both the mode of the mix as well as the layer count.

Modes:
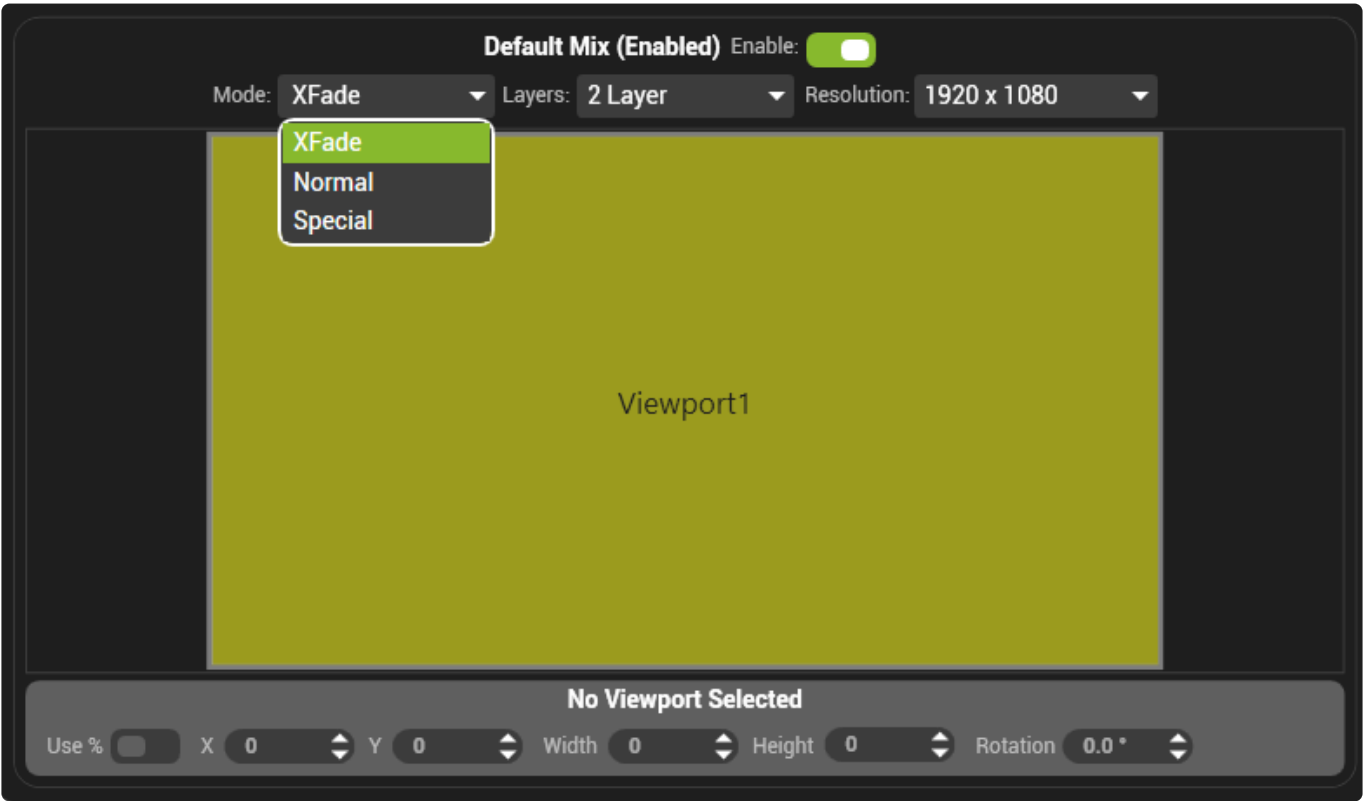
XFade: XFade is the mode that allows the full cross-fade on layer engine to be in operation. However as this incurs some amount of overhead it is possible to turn this off also.

Normal: No crossfade engine is running

Special: For non-standard layer based mixes e.g. Notch

Layers:

Between XFade and Normal, the only difference is that Normal mixes also have a 24 layer mode.
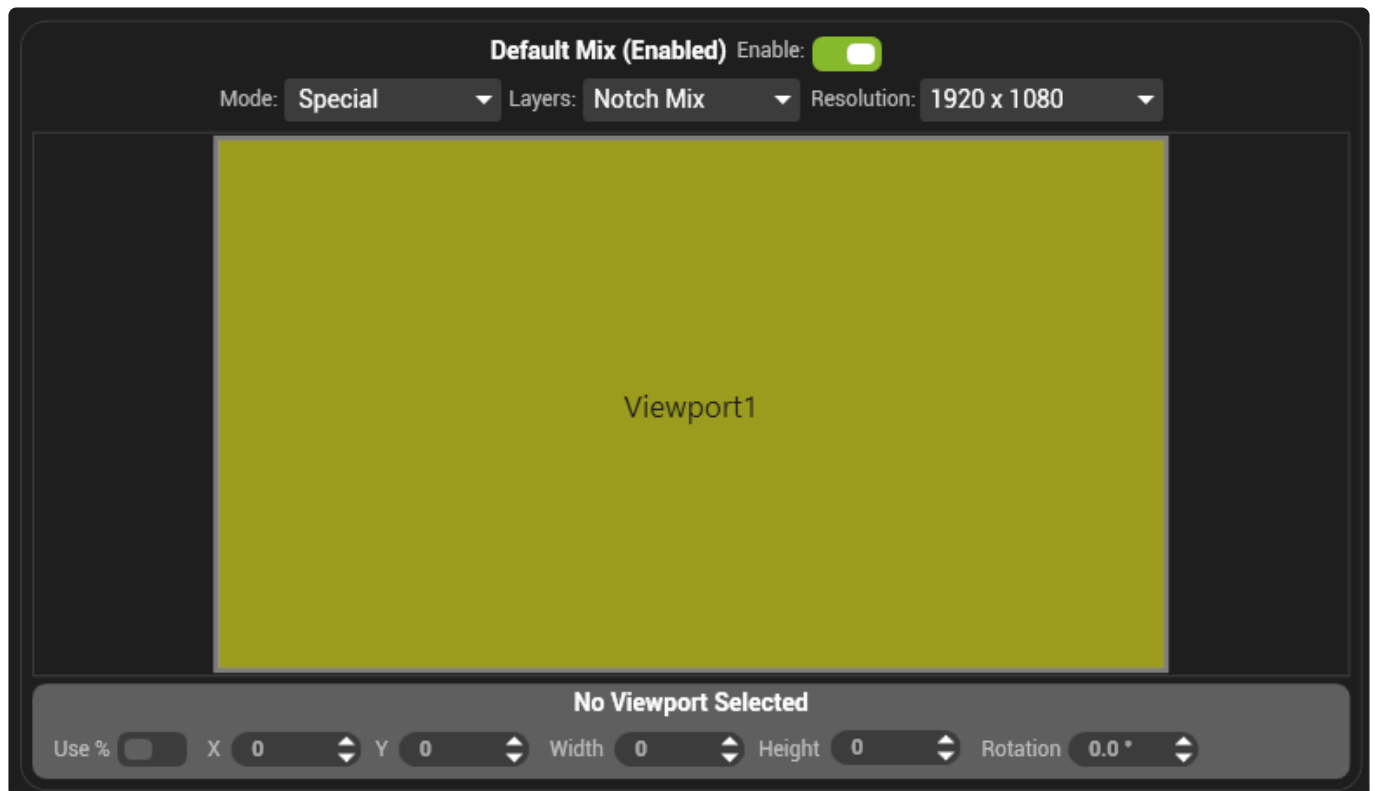
For Special Mixes, the Layers selector is the type selector e.g. Notch Mix

> ✳ Even with Normal Mixes, the crossfade pin still exist so DMX will use the same charts and require no reprogramming from this change.

PinBridge

PinBridge allows functions to be grouped together and controlled by a single pin.
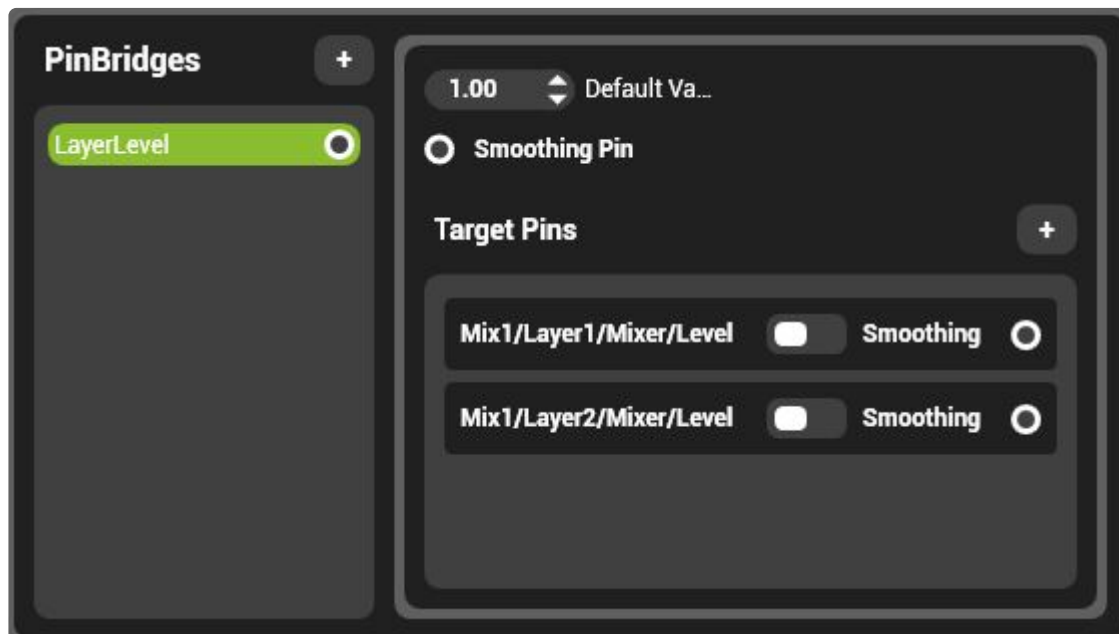
Creating Pin Bridges

To create a new PinBridge:

Press the new bridge button (the + symbol)
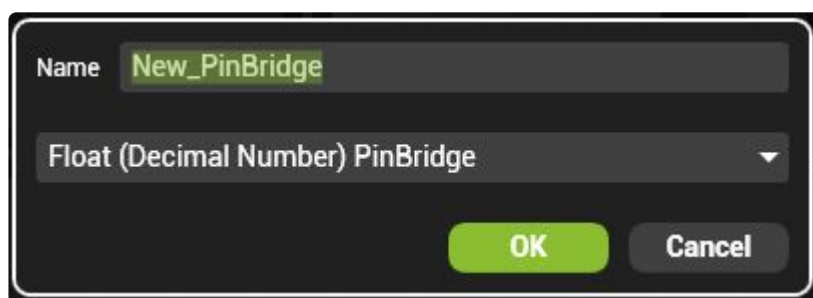
Name the PinBridge

Note: As creating a PinBridge will create a new Pin in HippoNet, they cannot be renamed once created.

Select the type of Bridge to use.

Boolean Pin: Can be on or off, represented by a switch in Zookeeper.

Float Pin: Can be a number value from 0 to 1 ad are most commonly shown as faders in Zookeeper.

Integer Pin: Can be a whole number (1,2,3…) used to pick options from a list such as Mix modes.

String Pin: Carries text — Very rare to use this in a PinBridge.

Select the pins to control
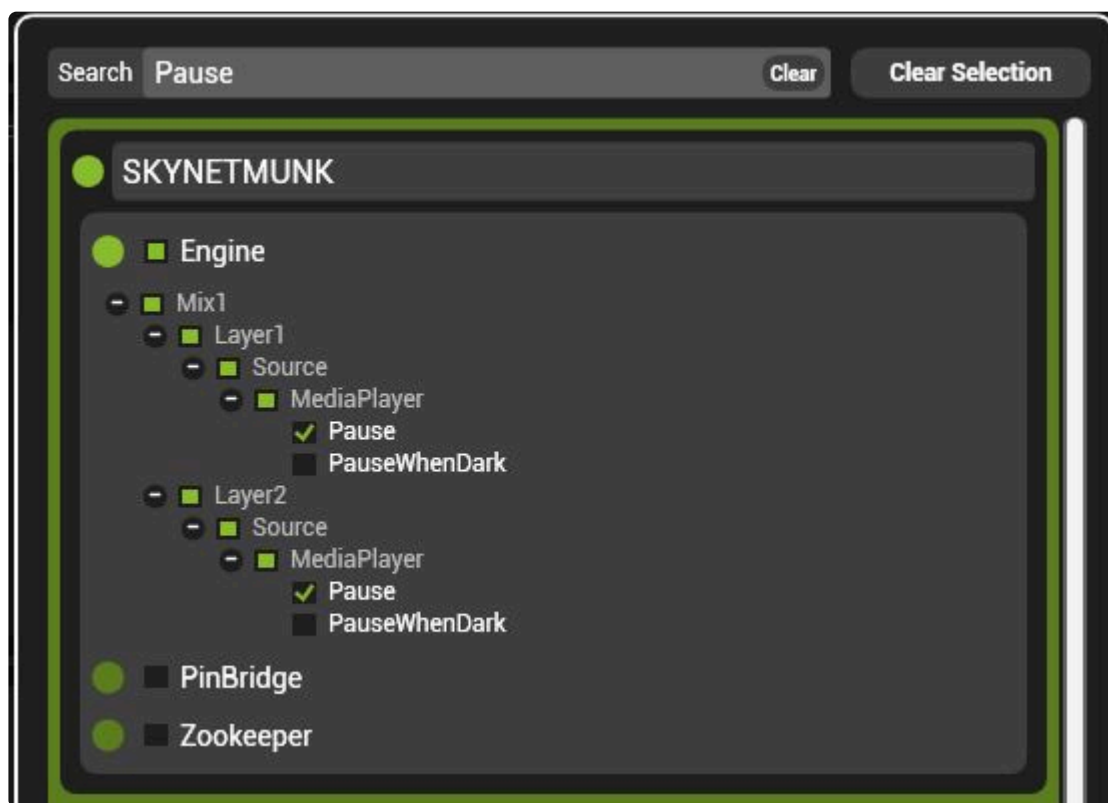
Adding Bridges to the Pin Board

To add a PinBridge control to the pin board simply drag the bridge out from the component:
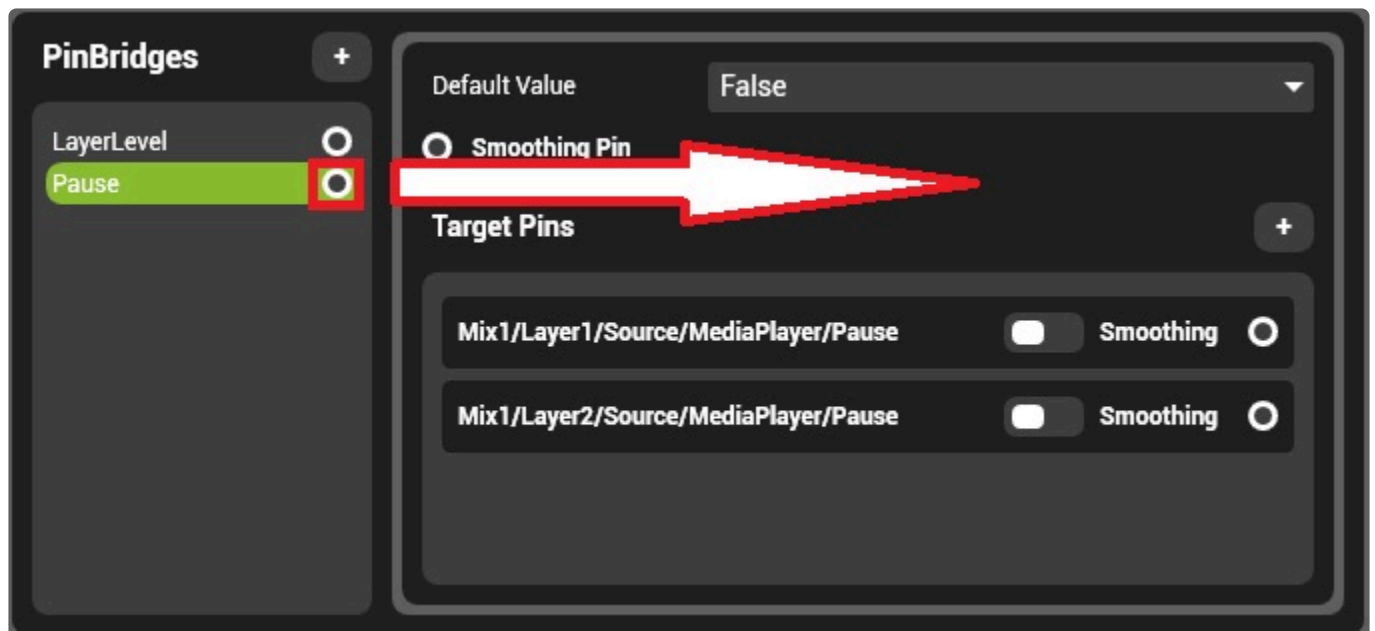
Or, drag the Pin out from the pin tree:
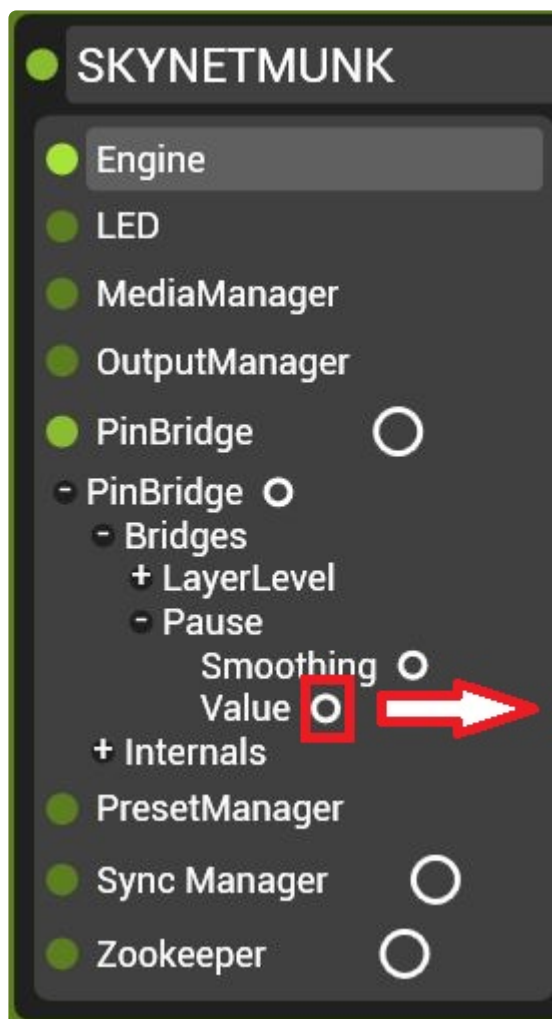
Pixelmapper

Pixelmapper sends video to DMX controlled lights

Pixelmapper is comprised of three parts:

Pixelmapper is a component, to create or edit maps the component must be started.

For more information about starting and stopping components see here.

- **Pixel Maps** The two dimensional representation of the fixture layout.

- **Settings** Controls how to send data out of Pixelmapper over the network. Choose output protocols and IP addresses.

- **Mix Controls** Assign pixelmaps to a mix to choose the video source for pixelmapper.

Intro to Pixelmapper Video (Online Only)

Pixel Maps

A **Pixel Map** is the representation of where lighting fixtures are located to determine how video is applied to them.

Pixelmapper can have many different maps. Each map has a name and Index number and are opened from the Pixelmapper component.

To Create a new pixel map:

- Start the Pixelmapper Component
- Add the component to a pin board.
- Click + New Map
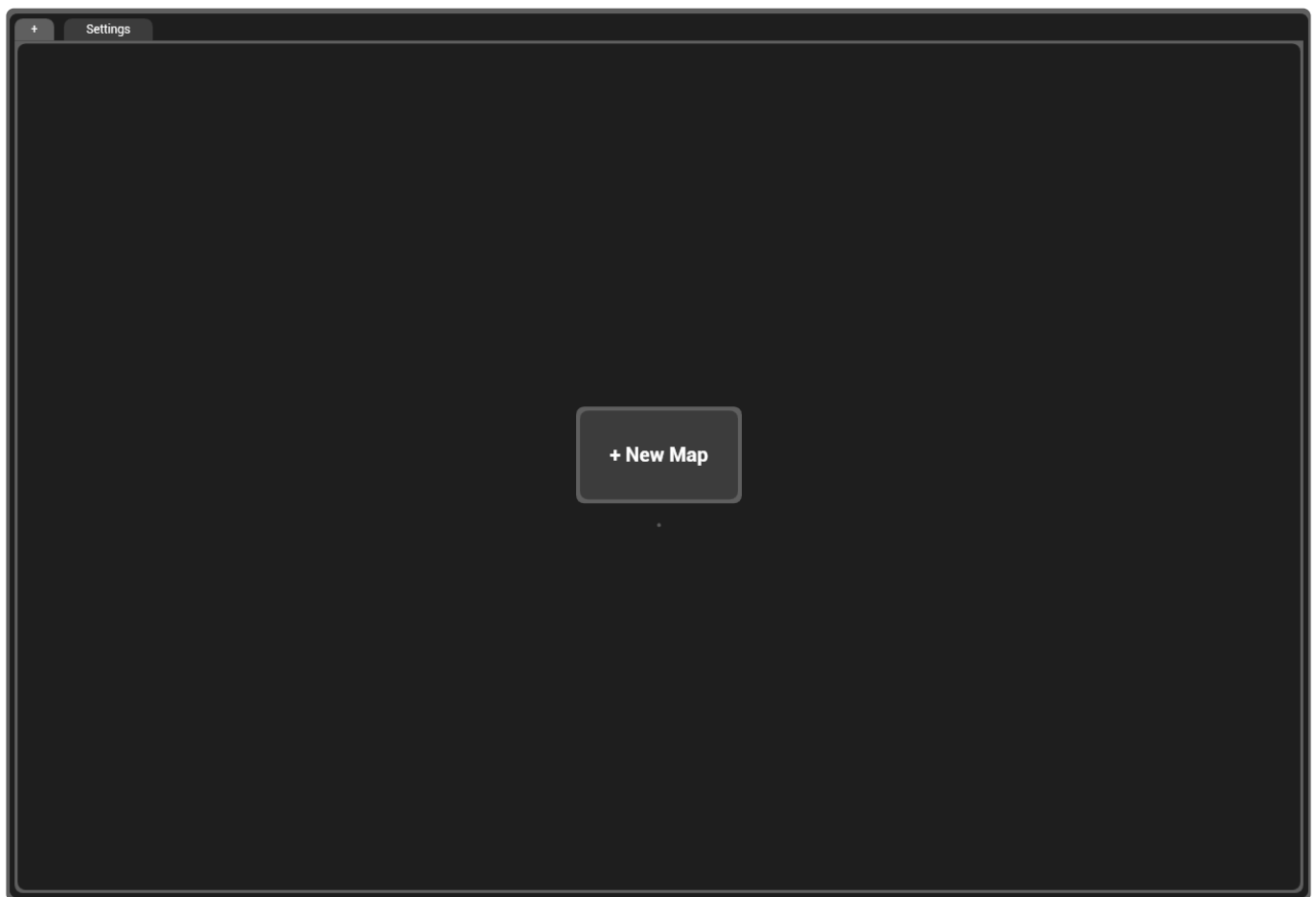
This will open a new Pixel map where fixtures can be created, added and patched to universes.

There are three basic modes used when working with pixel maps:

- Pixel Map Properties
- Fixture Profile Properties
- Fixture Properties

The active mode is shown in the right side context menu.
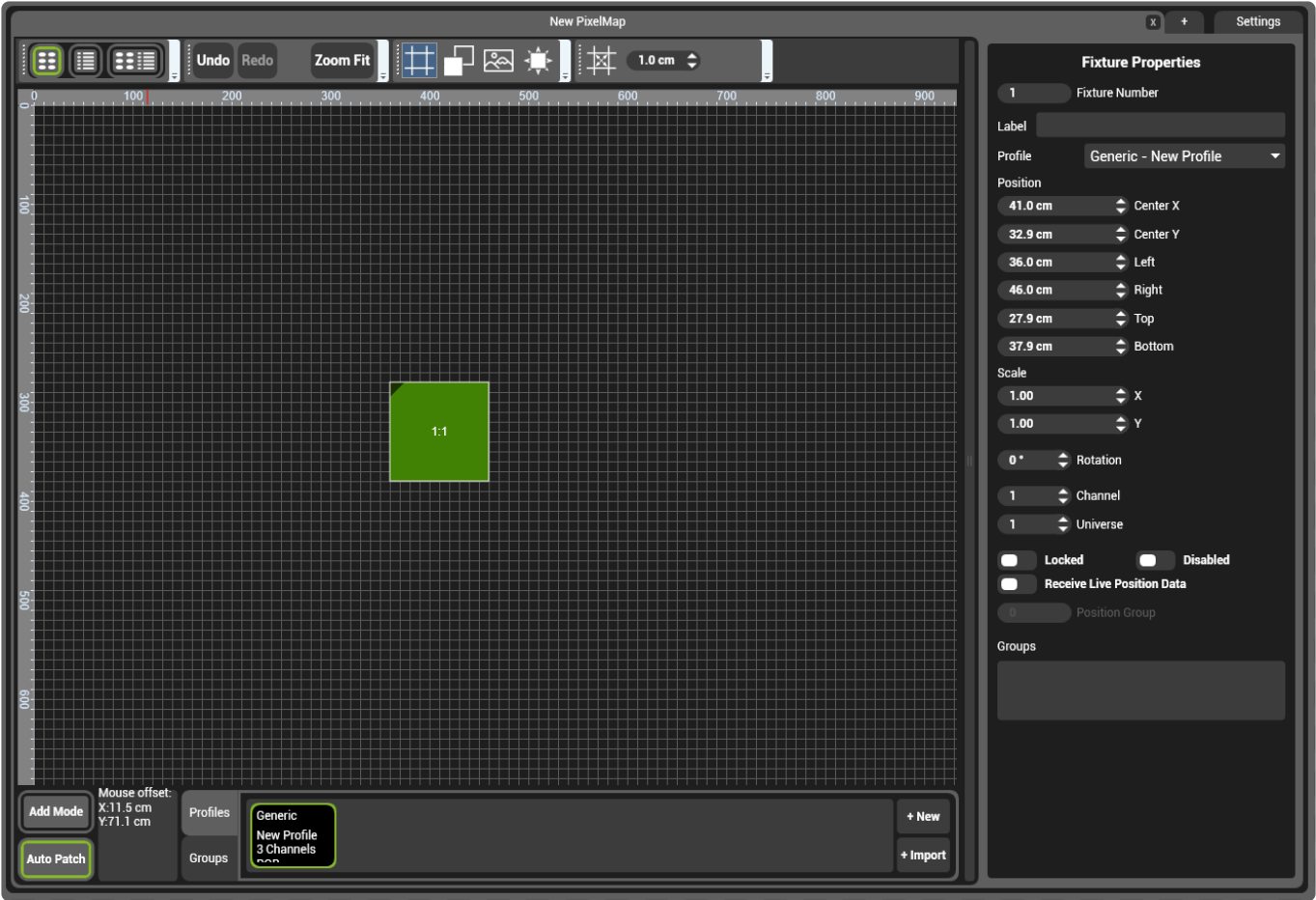
Clicking the map, a fixture or a profile will switch the properties to that object.

Around the pixelmap are a series of controls.
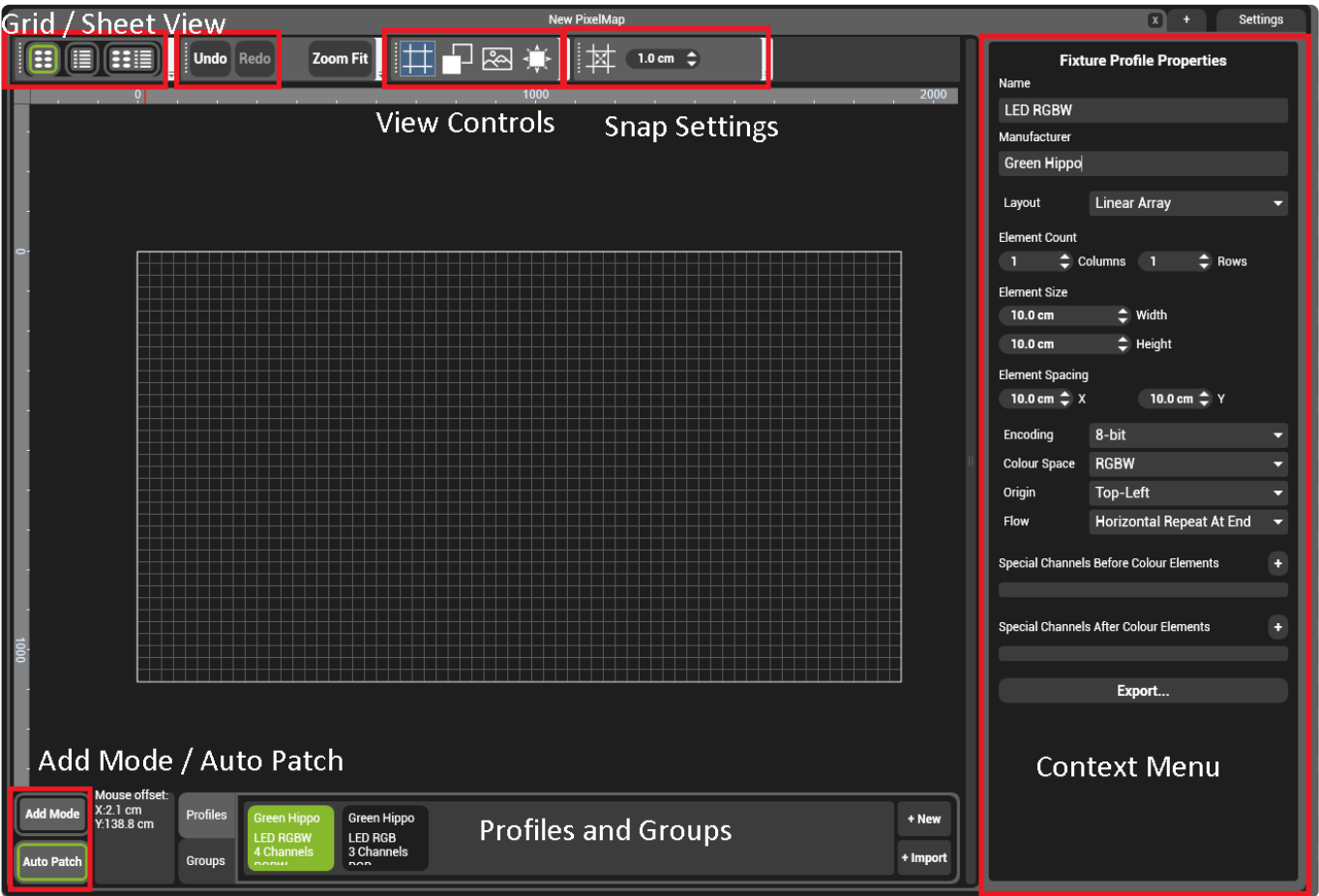
Grid / Sheet View

Changes the map view to be either full map, half data grid or full data grid.
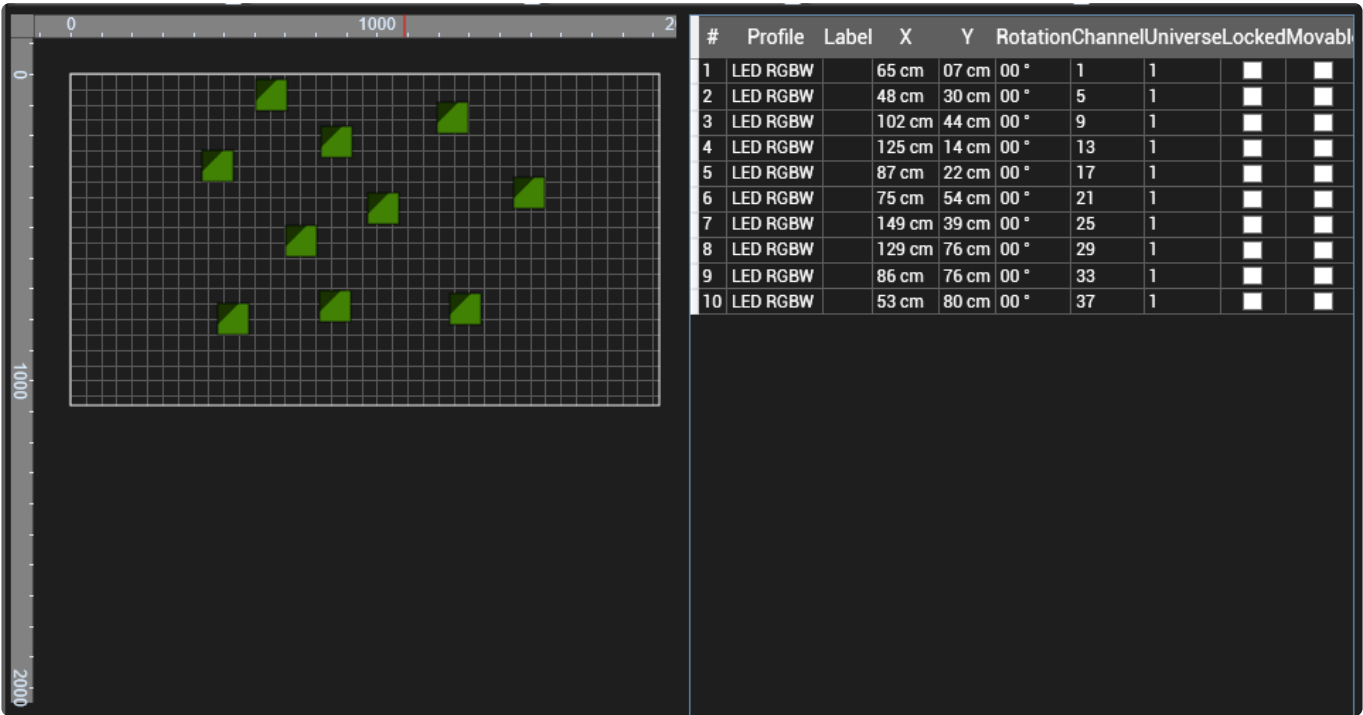
View Controls

Shows or hide the back ground grid

Show fixtures as wire-frame or as solid

Show or hide background image, also click to edit background image settings.

Flashes selected fixture sending 0 and full DMX values to all channels of that fixture.

Snap Settings

When enabled, fixtures will be placed in multiples of the snap distance. So if set to 5, fixtures would only be placed at 0, 5, 10 etc.

Context Menu

Shows the properties of the selected item.

Profiles and Groups

Fixture Profiles define how a fixture is laid out similar to a personality in a lighting desk. Every fixture on the pixel map references a profile and if the profile is changed, the fixtures using that profile will also change.

Fixture Groups allows fixtures to be grouped together for easier editing.

Add mode / Auto Patch

Add Mode When enabled, left clicks in the pixel map will add the selected fixture.

Auto Patch All new fixtures added to the pixel map are placed in the next available DMX Address.

Pixel Map Properties

Each Pixel Map has configuration and settings to determine the resolution and size of the map.

PixelMap Properties

Name

New PixelMap

1 ⬍ Index

Size

192.0 cm ⬍ Width

108.0 cm ⬍ Height

Resolution

1920 px ⬍ Width   1080 px ⬍ Height

AutoPatch Start Address

1 ⬍ Start Channel

1 ⬍ Start Universe

Import Fixtures...   **Export Fixtures...**

Import Fixture Profile XML...

Background Image Properties

Image Path

[   ] **Open...**

Size

0.0 cm ⬍ Width

0.0 cm ⬍ Height

0 px ⬍ Width   0 px ⬍ Height

PixelMap Size   Image Size

Offset

0.0 cm ⬍ X   0.0 cm ⬍ Y

0 px ⬍ X   0 px ⬍ Y

1.00 ⬍ Opacity

Click in the pixel map grid to show map properties in the context menu.

Name

The name of the pixel map as it appears in map select menus. This does not need to be unique.

Index

The order the pixel map will be shown in lists and selected by DMX. Zero is reserved for bypassed.

Size

The physical size of the pixel mapped area.

The combination of the size and the resolution of a pixelmap determine the physical size of each pixel. For example, the default is set to 192cm x 108cm with a resolution of 1920×1080. This equates to 10 pixels per centimeter.

Resolution

The resolution of the pixel mapped area.

> Note: Pixelmapper will not scale the input into it. In order to maintain Pixel 1-to-1 behavior therefore, it is important to set the pixel map's resolution to match that of the mix.

Auto Patch Start Address

Sets the address that auto patch will start patching fixtures. Once a fixture is placed auto patch will increment to the next free address.

Import / Export Fixtures

Saves or loads a comma delimited file (csv) of the fixture patch.

> Note: The csv export uses the globally unique identification (GUID) to reference the fixture profiles, so it is important to save the fixture profile with the csv export.

Import Fixture Profile XML

Import a Fixture patch from a Grand MA 2 lighting desk. To do this, use the option in Grand MA to export the patch as XML.

Background Image Properties

A Background image can be placed in the pixelmap to aid with fixture placement.

Image Path

location of the image

Size

Size of the image

Pixelmap / Image Size

Set the image to be the full size of the pixel map or the native size of the image (in pixels)

Offset

Location of the top left corner of the image.

Opacity

Determines the transparency of the image.

Fixture Profile Properties

The fixture profile defines the channel layout and attributes of each fixture type used in the pixel map.

A fixture profile is required for each type of light being used.

Fixture profiles can be saved and shared between maps and systems. so they only need to be created once.

Saving Fixture Profiles

Fixture profiles are saved as part of each pixelmap. To use fixture profiles in other maps, right click on them and select copy to profile library. A copy of the profile is now stored in the profile library. Any map

can copy from that profile using the profile import button.
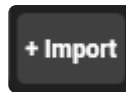
The Fixture Profile Properties pane

Name

The Name of the fixture. This does not need to be unique.

Manufacturer

Further identification for the fixture

Layout

The pattern of emitters of the light. **Linear Array** is the most common type of fixture comprising rectangular rows and columns of lights.

Note: As of Version 4.2, Free-form fixtures have not been implemented. To work around this create a linear array fixture that is 1×1.

Element Count

The number of individually controllable lights in the fixture.

Element Size

The size (Diameter) of each emitter element.

Element Spacing

The amount of space between each emitter measured from the centre of one light to the centre of the other.

Encoding

Sets the DMX information to the fixture to be either 8 or 16 bit.

Colour Space

Sets what colour mixing system the fixture uses.

Origin

When addressing the emitters within the fixture, sets where to start counting.

Flow

Sets how to count up in address from the origin.

Special Channels

Special Channels are spacers in the channel layout of the fixture. In the above example, the personality would leave 4 channels empty (2 × 16bit channels) before the colour information and 1 channel empty after the colour information. This is frequently used to patch moving lights or LED fixtures that have macro or strobe channels.

Note: The default value of each special channel is output from Pixelmapper at all times as DMX does not allow channels to be skipped.

Export

Saves the personality file as an XML to allow it to be loaded onto other systems.

Fixture Properties

Each Fixture has a set of properties such as it's patch, location and scaling.

To view the properties of a fixture, select it and the context menu will change to show that fixture's information.

Fixture Number

A user assignable number for each fixture. Two fixtures can have the same number.

Label

An optional text field for each fixture

Profile

Select which profile the fixture references.

Position

The location in the map. As the center of the fixture can be confusing when arraying fixtures, the location of the corners are also given.

Note: The position of a fixture is measured from the bounding box containing the un-rotated fixture.

Scale

Allows the fixture to be made smaller or larger. The scale is a factor, so scale of 10 will make the fixtures 10 times larger in that axis.

Rotation

Rotation of the fixture in degrees.

Channel

The starting DMX channel of the fixture.

Universe

The pixelmapper universe that the fixture will transmit on.

Note: Pixelmapper universes are patched to outputs in the settings of Pixelmapper.

Locked

Locks the fixture so it can not be moved on the map by accident

Disabled

Stops output to the fixture

Groups

Any group(s) that the fixture has been assigned to.

Repatching Tool

Any selected fixtures can be repatched to different channels or universes based upon the different filters.

Rearrange Options
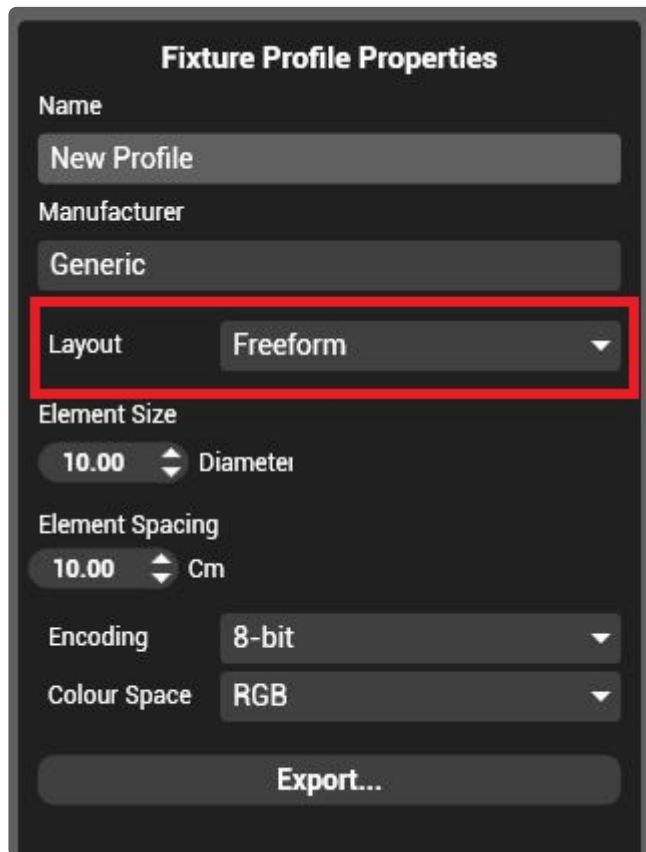
Any selected fixtures can be automatically transformed into arc/circular shapes defined by user.

Free Form Fixtures

Free Form Fixtures allow for LED tape and other non-linear fixtures to be Pixel mapped.
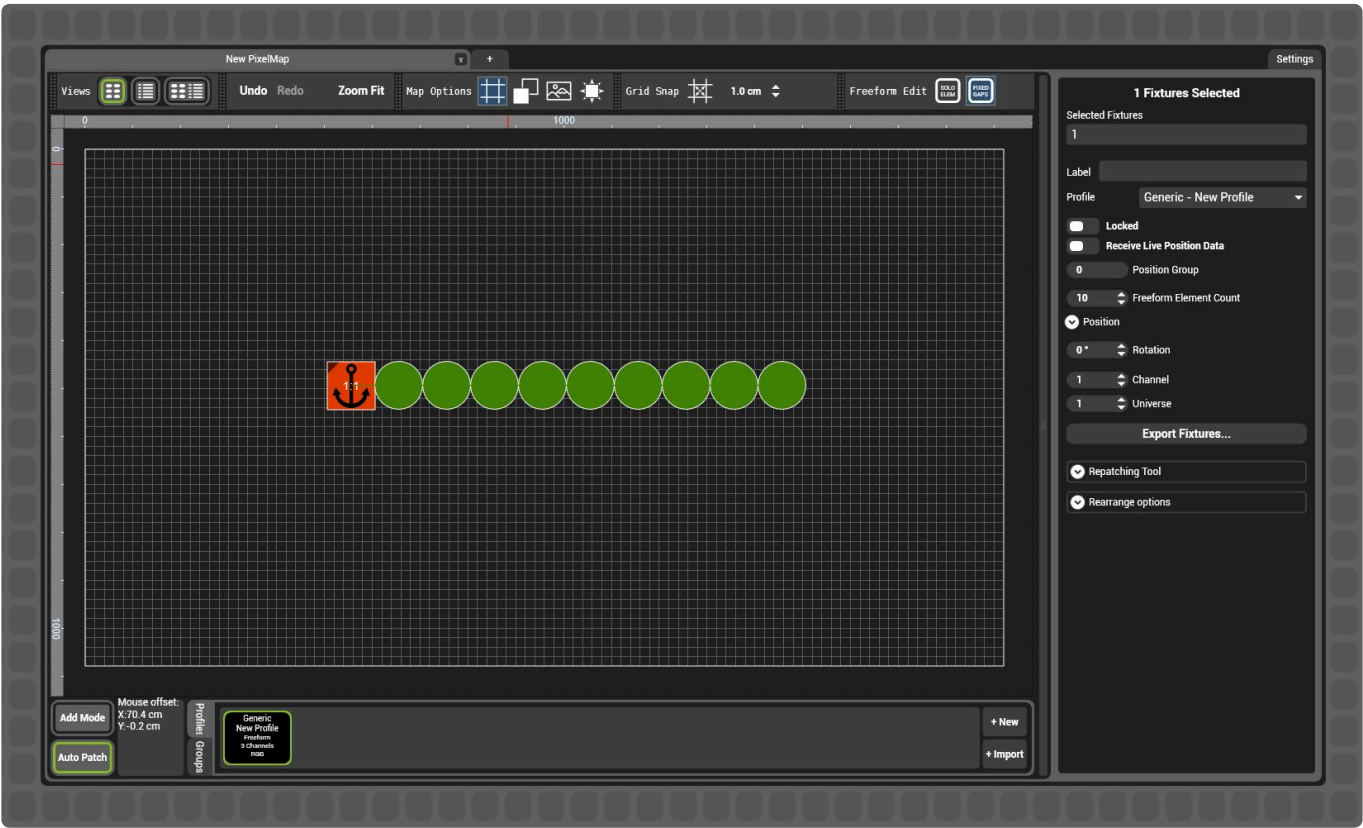
Freeform Fixture Properties

Free Form Fixtures are set through the **layout** of a fixture profile.

A Freeform Fixture profile has only four parameters:

Element Size

Sets the size of an emitting element. Size is a reference to the diameter of the circular element.

Element Spacing

The distance between elements. Distance is measured from the centre of one element to the centre of the next.

Encoding

Sets the number of DMX channels for each element (the bit depth). An **8-bit** element is controlled from a single DMX channel, 16-bit elements use two DMX channels.

The most common **16-bit** control method is big-endian, where the 1st channel is fine control and the 2nd is course control.

The alternative method of **16-bit little-endian** is also available. This sets the 1st channel as course control and the 2nd channel as fine control.

Colour Space

Sets the colour scheme used for the fixture. The Colour Space must match that of the fixture.

Number of Cells

The number of cells of a Free Form fixture is not set by the profile. Instead, each fixture can have a different number of cells as is common with LED tape.

To set the number of cells of a Free Form fixture add it to the map and select it.

> Note: Free Form fixtures can not exceed 512 control channels

Free Form Fixture Properties

Selecting a Free Form fixture in the pixel map will show it's properties in the right side pane.

Selected Fixture

The fixture number of selected fixture(s)

Label

A note that appears in list view and .csv export of the fixture

Profile

Sets which fixture profile is used for that fixture.

Freeform element count

Sets the number elements in the freeform fixture.

Settings

The patch of pixelmapper is configured within the Settings tab of the component.
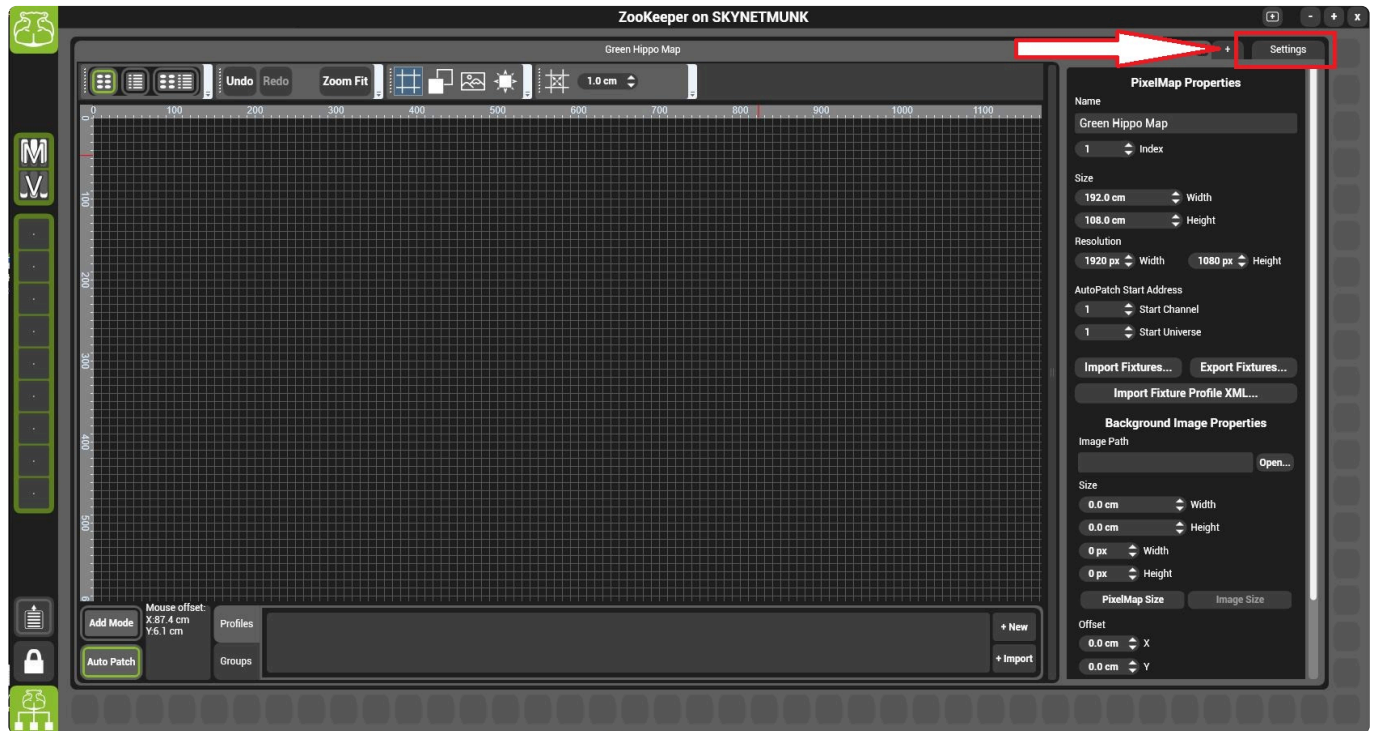
The Pixelmapper settings page is comprised of several parts.
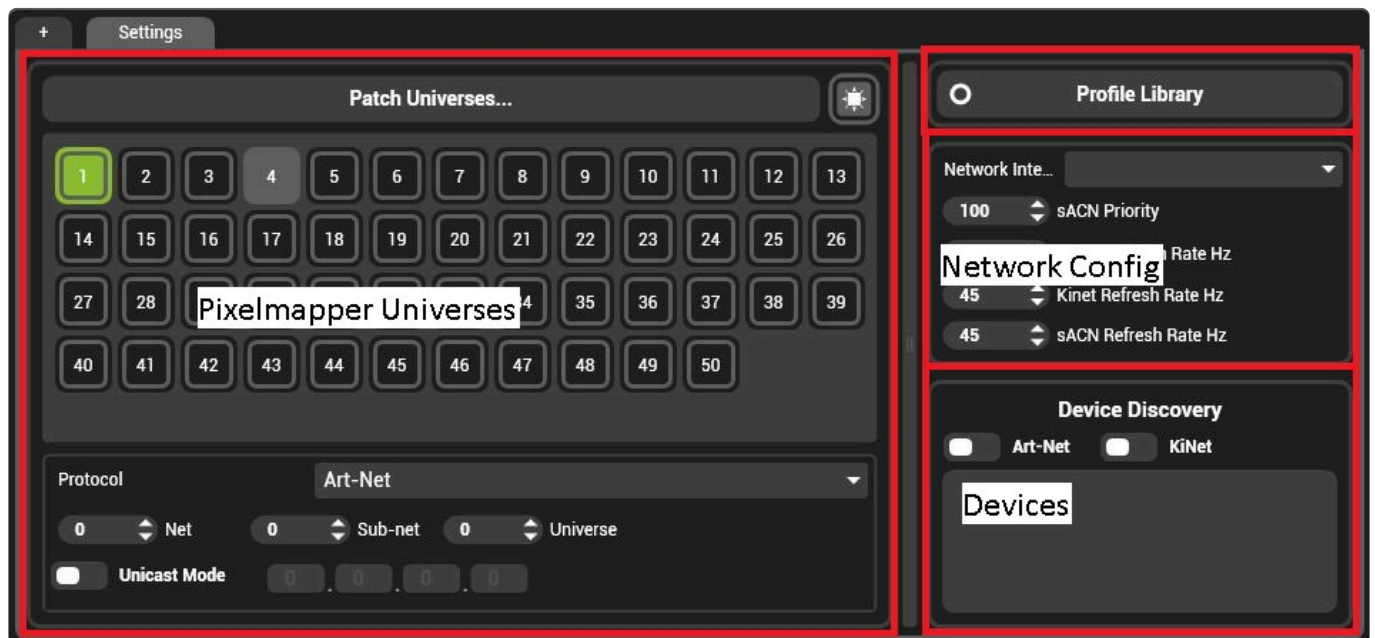
- **Pixelmapper Universes**
- **Network Config**
- **Devices**
- **Profile Library**

Pixelmapper Universes

In order to know where to send data to, each **Pixelmapper Universe** must be patched to an output device.

Pixelmapper Universes

Pixelmapper combines all data universes used by all active pixelmaps into a single pool represented in the settings menu as Pixelmapper universes. This allows pixelmaps to be created without regard for how each universe will be transmitted (e.g. by Art-Net and to what IP).
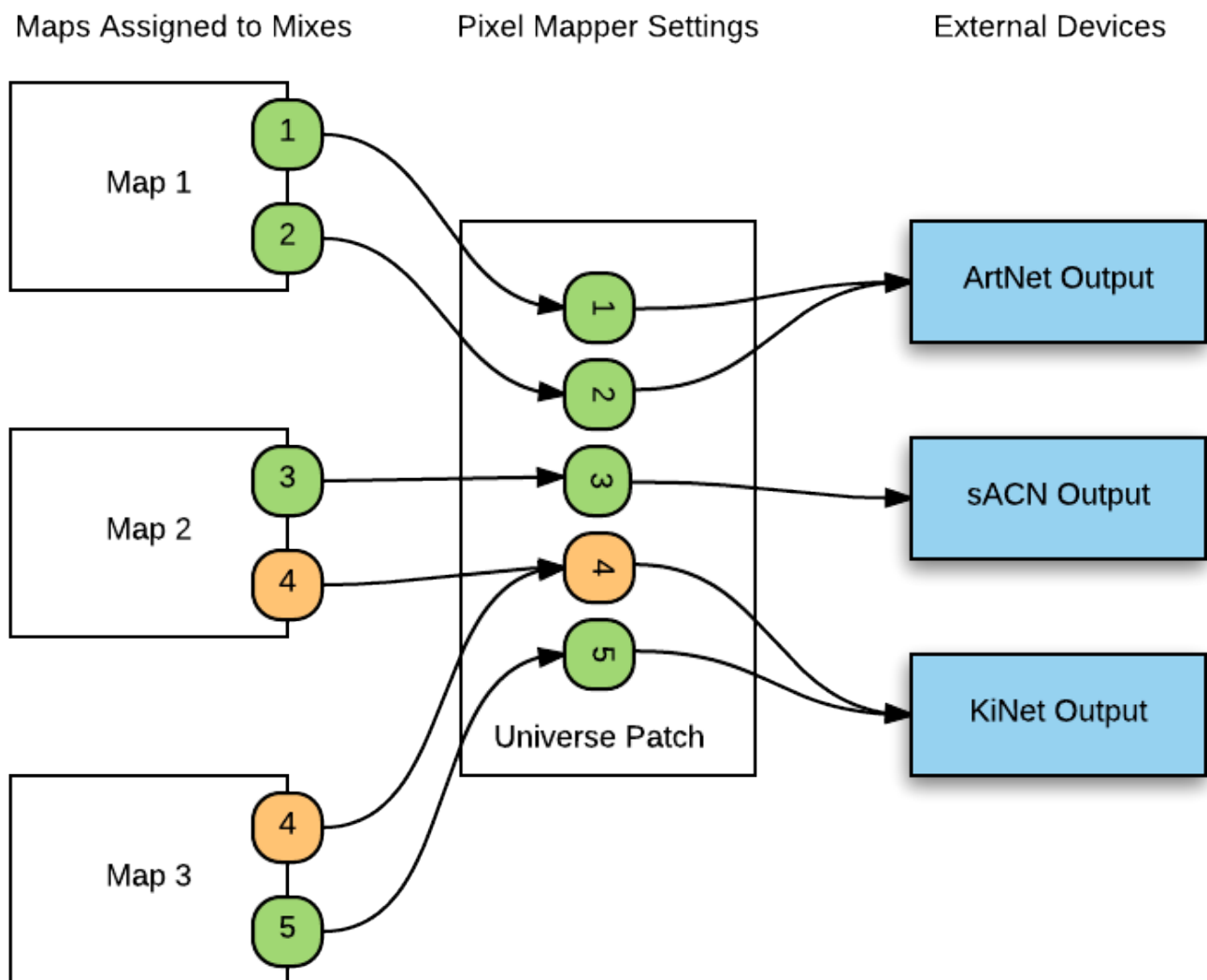
In the above example, there are three pixelmaps loaded onto three different mixes. Each pixelmap uses two universes.

> **Note:** Universe four above is used by two maps simultaneously. This is allowed; any values that are in both maps will be taken on a Last Take Precedence basis.

Each Pixelmapper universe outputs to the network using one of three protocols: Artnet, Kinet or sACN.

A pixelmapper universe must be assigned a protocol and applicable settings. These settings are accessible in the pane below and apply to the highlighted universe.
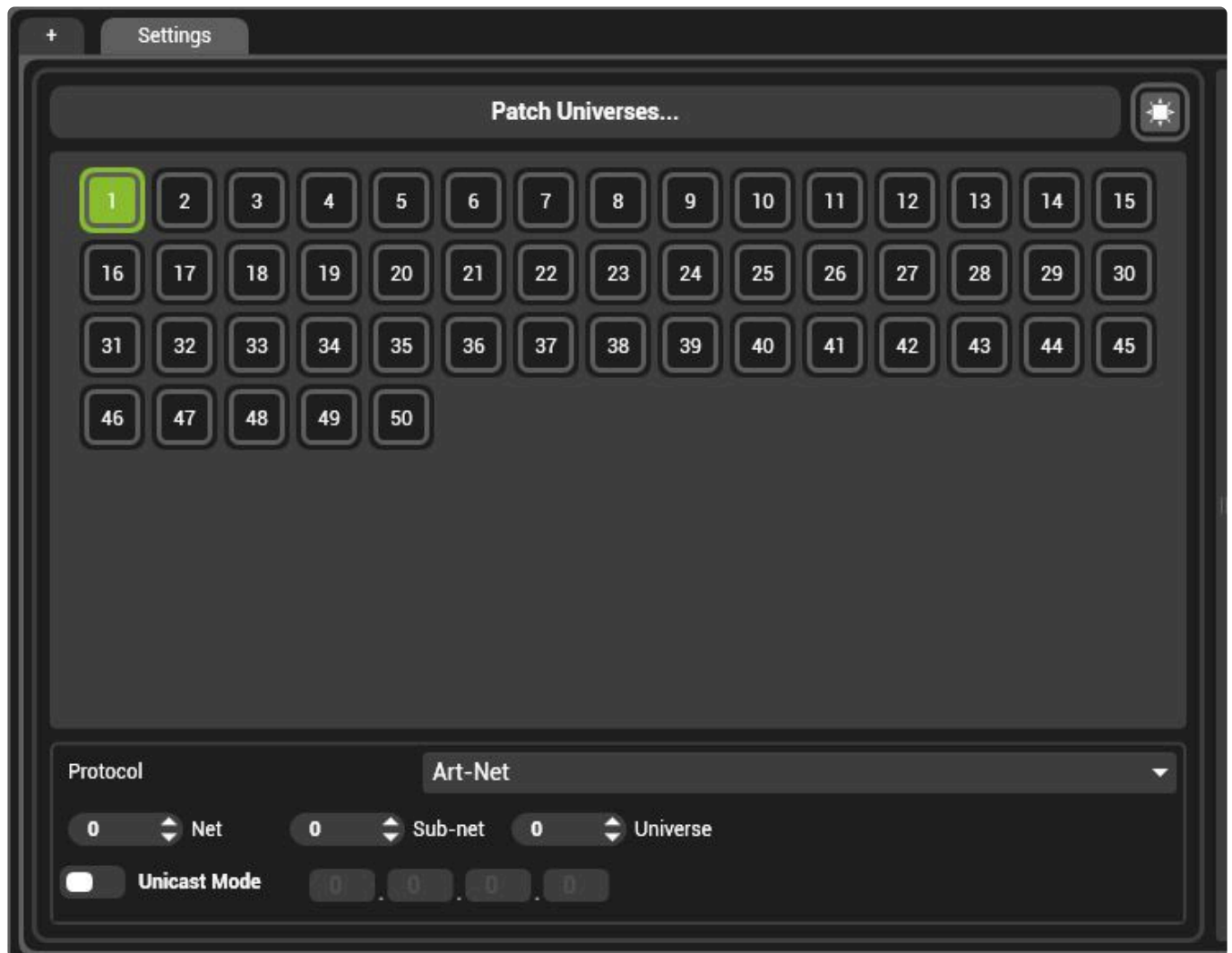
- **Art-Net Output**
- **Kinet Output**
- **sACN Output**

ArtNet Output

Art-Net is a very common DMX over network protocol; Pixelmapper supports Art-Net Versions 1, 2 and 3 as well as discovery and Artsync.

Net:

Used for Art-Net 3, Net increases the number of universes that can be carried in Art-Net's address space.

For devices that do not support Art-Net 3 this setting should normally be left at 0.

> **Note:** Art-Net 3 has a larger capacity to address universes however it does not have any better data handling than previous iterations, as such do not expect any higher capacity than Art-Net 1 or 2.

Universe and Sub-Net:

Output Universe assignment used for Art-Net 1 and 2.

Unicast Mode:

Unicast sends data to a specific IP address instead of using broadcast. To use unicast, a destination IP address for each node must be set.

Many Art-Net Nodes support discovery, this is accessed from the devices section of Pixelmapper. and can simplify the process of setting unicast addresses.

> **Note:** Using unicast as opposed to broadcast dramatically reduces network load and will increase the amount of channels.

How many universes can be sent?
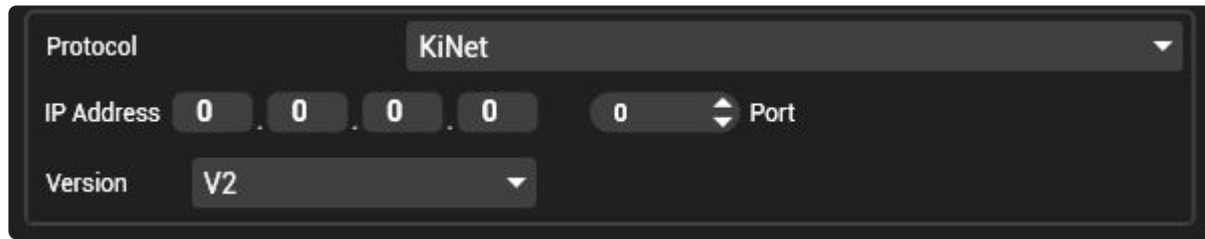
The question of how many universes can be sent from a particular system type is not easily answered; the natural response is always (and unhelpfully) "it depends".

There is no software limit in Hippotizer on how many universes can be created or sent. Most commonly the limit is dictated by the network or the receivers.

Best practices to maximise Art-Net data carrying capacity

- Use unicast addressing for all universes
- Reduce the Art-Net refresh rate if receivers start to flicker or fail
- Use a gigabit switched network that have non-blocking switches (are capable of switching at full wire speed). Most modern models from reputable brands have this.

KiNET Output

KiNET is a proprietary network based protocol used by many Color Kinetics brand LED control nodes.

Similar to other network based control systems, KiNET addresses each output node by IP address. Each port of the node is then given a number.

IP Address

The IP address of the output node. Usually in the 10.xxx.xxx.xxx range, nodes can be discovered on the network using [discovery.](#)

Port

The port number of the string of devices to be controlled.

Version

KiNET control version, this is defined by the receiving hardware.

Getting the most from KiNET

- KiNET networks can quickly become clogged when a node drops offline. It is important to un-patch nodes that are not present.
- Older output nodes (Such as PDS-60) can saturate on busy networks. This can be helped by reducing sending frame-rate and reducing the network speed to the node. (10base is frequently best).

sACN Output

Streaming Architectural Control Network (sACN) is a protocol for sending DMX data across the Architectural Control Network (ACN) family of protocols. sACN has been developed by a group of lighting industry professionals (ESTA) to improve upon other methods of sending DMX on a network such as Art-Net. sACN has several key advantages over Art-Net including support for multi-casting, controller priority and low processing overhead.
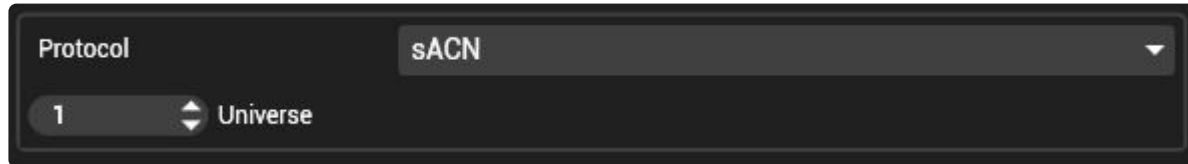
sACN uses the IP address and priority set in Pixelmapper's network configuration

Universe Number

sACN receivers are addressed based on what Universe they respond to. Set this for each Pixelmapper universe.

> **Please Note:** sACN relies on multi-cast grouping so disabling network functions such as IGMP snooping can seriously degrade the efficiency of sACN. Careful network planning and management is critical to maximise the amount of data that can be carried.

Network Config
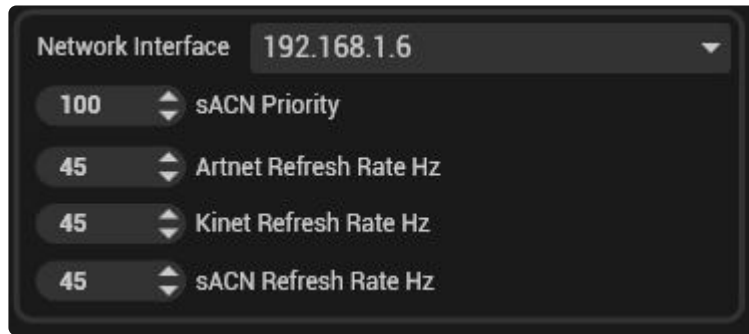
Network Interface

Specifies which network port Pixelmapper will use to output data. This is defined by the IP address of available network cards.

Only IP Addresses from enabled and connected Network Cards will appear in this list.

> **Note:** The configuration of IP addresses should be carried out before starting Pixelmapper. A guide to setting IP addresses can be found here.

sACN Priority

Sets the behaviour of receivers where multiple sACN senders are present on the network. This can be used to define what happens in the event a controller stops transmitting. The higher priority station on a network takes control. If a higher priority station stops transmitting, the next highest priority sender will take control after a short delay.

Two senders with the same priority will normally merge their values on each receiver.

> **Note:** The exact priority behaviour depends on the make and model of receiver.

Artnet Refresh Rate

How often a new frame of Art-Net is sent over the network. Older Art-Net receivers or very congested networks may benefit from a lower refresh rate.

KiNET Refresh Rate

How often a new frame of KiNET is sent over the network. Older KiNET receivers or very congested networks may benefit from a lower refresh rate.

sACN Refresh Rate

How often a new frame of sACN is sent over the network.

Devices
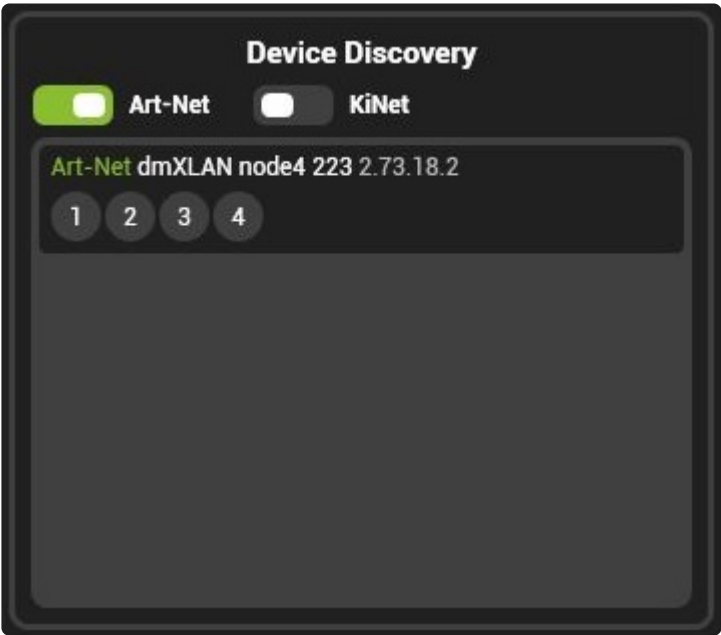
Pixelmapper can discover attached Art-Net and KiNET nodes; enable the relevant discovery to populate the list.

All discovered nodes appear with the number of reported ports. Depending on the device, the reported number of ports may not correlate with physical ports on the node. (KiNET nodes for example usually report two ports despite only having one).

The IP address and name of any discovered devices can also be seen.

To quickly patch a Pixelmapper universe to a device port, simply drag the port onto the pixelmapper universe.
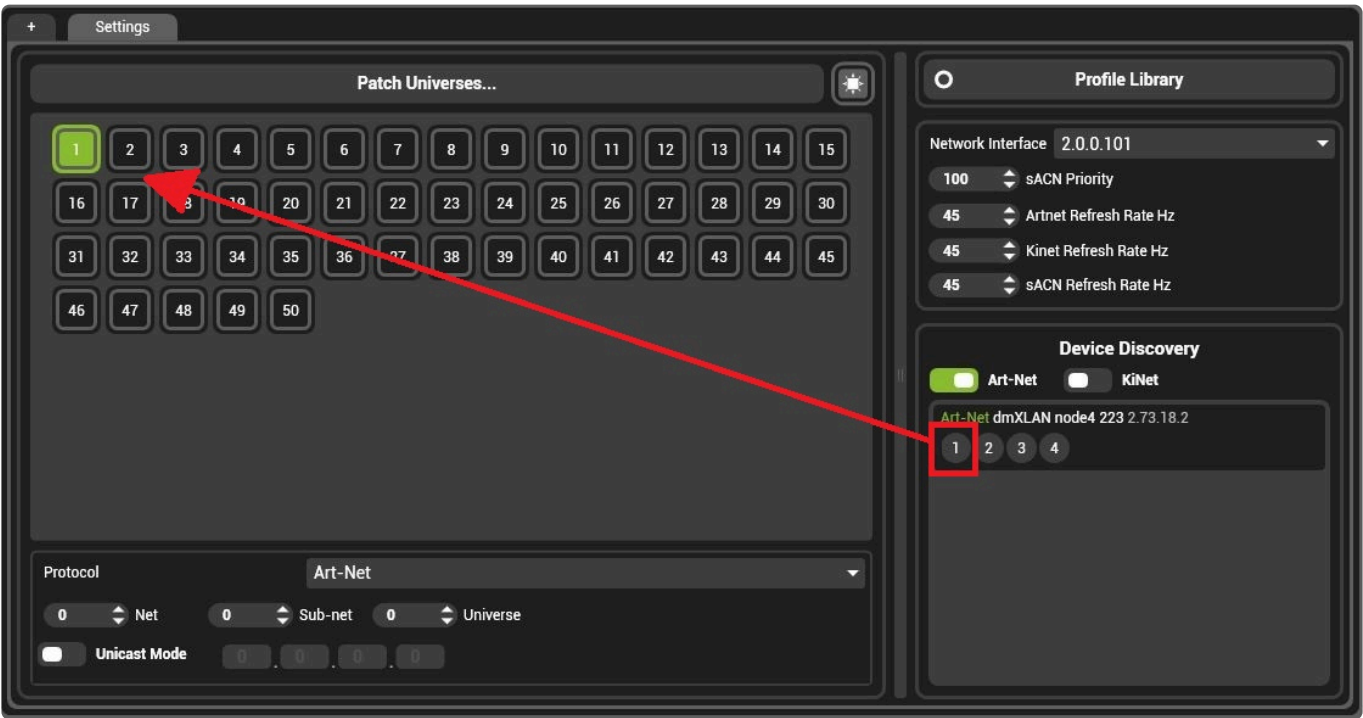
Dragging the port onto the Pixelmapper universe will apply the correct network and port settings to the universe. The network settings will be retained in the event discovery is turned off or connection is lost.

Profile Library

The Profile Library allows fixtures to be shared between Pixel maps; a profile created in one map is saved to the library so that it can be used in other maps.

The Profile Library exists in the settings tab of Pixelmapper.

The library can be viewed by either clicking on it or adding it to a pinboard.

To add fixtures from a map to the library right click on them and select "Copy to Profile Library"

To add fixtures to a pixel map from the library click the **Import** button in the pixelmap.
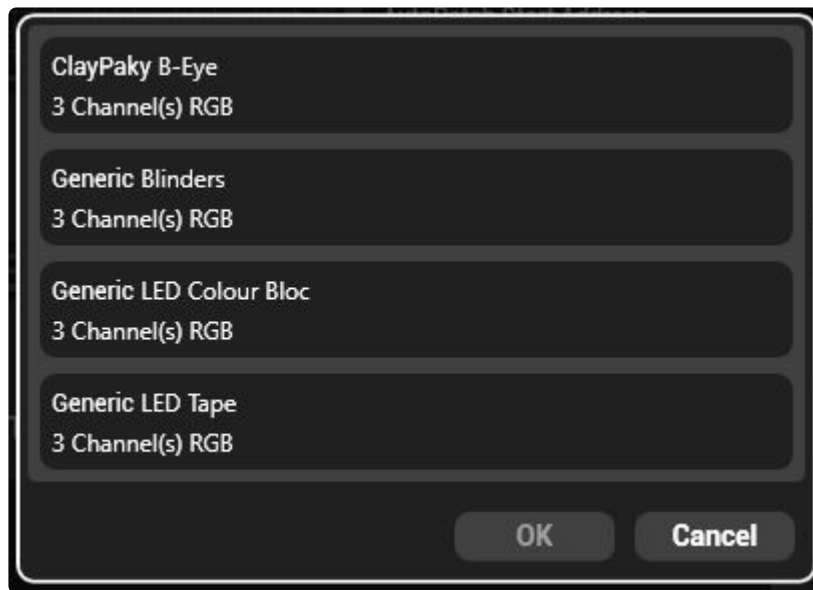
Once a profile has been added to the pixelmap it can be edited without affecting the library copy of the profile.

Mix Controls

Pixel maps are assigned to a mix using the mix controls. Enter the mix controls by pressing the 'M' button in a layer selector.

Each mix has a pixelmapper control panel:
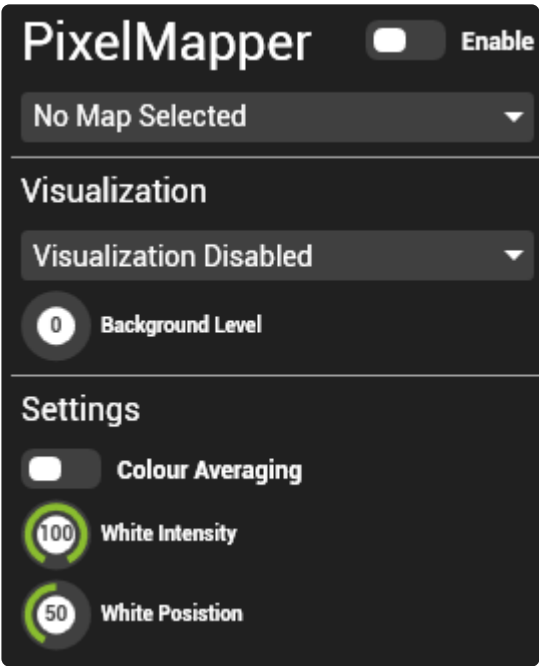
Enable

When disabled, Pixel mapper is shut off for that mix.

Visualisation

By default, there is no video output to the mix from pixelmapper; it only samples pixels and sends the data out over the network. The mapping can be seen live on the mix output by selecting an option in the visualisation menu.

Colour Averaging

Colour averaging calculates the average colour for each cell based on all pixels it intersects.

With Colour Averaging disabled, cells that span across multiple pixels will take the colour of the pixel that hits the centre of the cell. When enabled, all pixels that are overlapped by a cell are averaged together and used to determine the colour for that cell.

Colour averaging can have a dramatic impact specifically with very large or very small cells.

Where cells span across multiple pixels, colour averaging will have the effect of smoothing out colour changes that otherwise would appear too fast. **In the case of larger cells, colour averaging is frequently desirable.**

Where cells are only one pixel, colour averaging makes it very difficult to place fixtures perfectly as they not overlap any adjoining pixels. **In the case of small, or single pixel cells colour averaging is likely better disabled.**

Visualisation Background Image

Sets the level of the background video when using pixelmapper visualisation on the mix. When visualisation is on, an area of the output not covered by a pixelmapper fixture is black by default. Visualisation Background Image allows the video to be show as well as the mapped fixtures.

Pixelmapper and Engine performance

Pixelmapper can add significant load to a system, especially with large and complex maps. This results in a slowing of the video output frame-rate.

White Intensity

Controls the overall brightness of the white value. When using a advanced colour space with extra white channels these will impact the output channel values.

White Position

Changes the colour temperature of the white values of the output PixelMapper data.

Preset Manager

Presets are a quick way to save and quickly recall layers, a whole mix or a viewport.

Presets can be saved for Layers, Mixes or Viewports.

Layer Presets
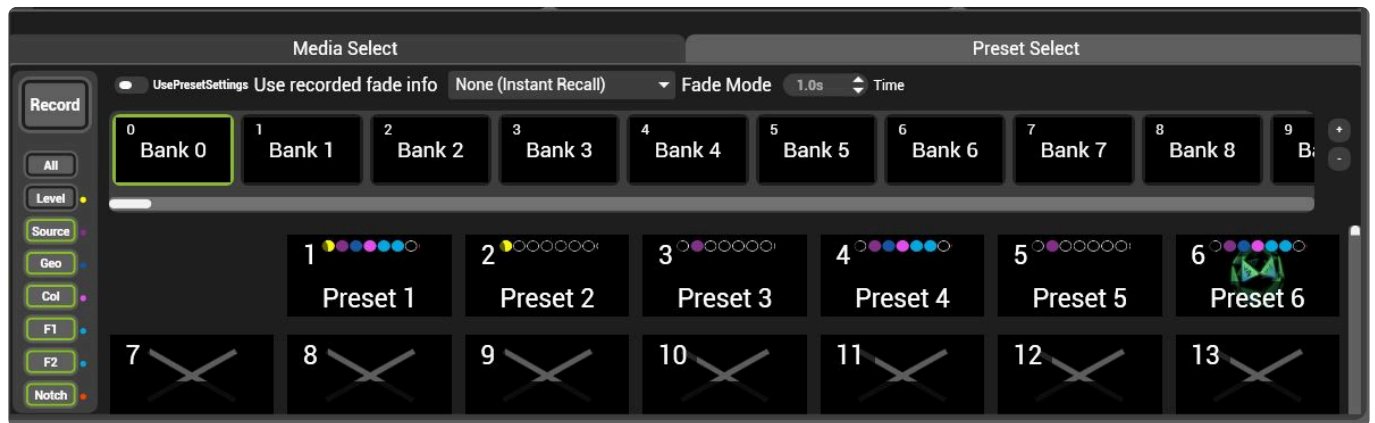
Layer Presets save information from each layer such as level, media playing, colour, effects and geometry.

Mix Presets

Mix Presets save the mix effects and pixelmapper information and can save some or all layers in that mix.

Viewport Presets

Viewport Presets save information such as warp, keystone and video mapper assignments.

Saving Presets

Layer Presets

Layer Presets save all aspects of a media layer
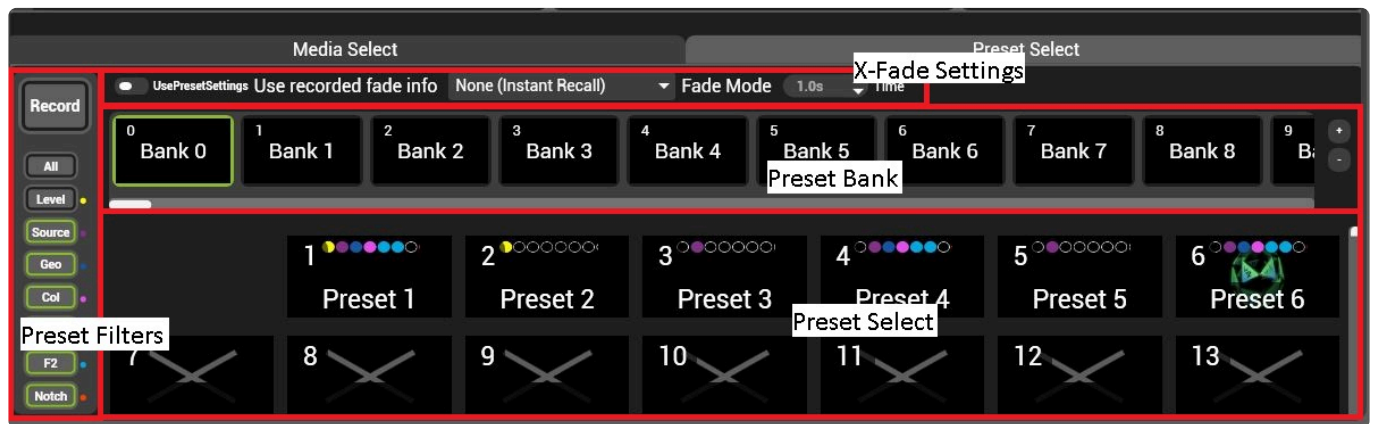
Presets have four main sections:

Preset bank and select

Each Preset bank contains 255 preset select slots.

A single Integer pin (0-65535) selects each preset sequentially, so Bank 1, Preset 1 is a value of 257.

In order to toggle a preset the value of the pin must change. From a DMX desk, it is often easiest to toggle the value from 0 (Bank 0, Preset 0 cannot be recorded to) then set the pin to the desired preset value before returning it to 0. When toggling from Midi, use action mappings in Multicontroller to automate this process.

X-Fade Settings

All layer presets save the x-fade state of the layer as they are recorded. The X-fade settings override this setting to quickly allow the fade time to be set on the fly.

Preset Filters

The preset filters determine what attributes are saved or recalled from a selected preset.

All **Selects or deselects all filters**

Level **Filters the layer level**

Contains:

- Mixer/Level

Source **Filters the layer source and mix mode**

Contains:

- Source / MediaPlayer
- Source / Generator
- Source / Liveinput
- Source / Relays
- Source / NDI
- Source / Spout
- Mixer / Mixmode
- Key

Geo **Filters the layer Geometry, Videomap, Aspect and keystone**

Contains:

- Geometry
- Keystone
- Videomapper on layer
- Live Mask

Col **Filters colour**

Contains:

- Colour

F1 **Filters Effects 1**
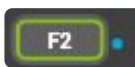
F2 **Filters Effects 2**

Notch **Filters Notch parameters and setup**

Contains:

- Notch/Parameters
- All Notch Settings

Using Filters

- Filters work both in saving **and** applying presets. It is usually best to either filter while saving or filter while playing back.
- Double clicking a filter will solo it.

Mix Presets

Mix Presets save and recall the whole mix and it's layers

Mix Presets have four main sections:

Bank and Preset select

Each Preset bank contains 255 preset select slots.

A single Integer pin (0-65535) selects each preset sequentially, so Bank 1, Preset 1 is a value of 257.

In order to toggle a preset the value of the pin must change. From a DMX desk, it is often easiest to toggle the value from 0 (Bank 0, Preset 0 cannot be recorded to) then set the pin to the desired preset value before returning it to 0. When toggling from Midi, use action mappings in Multicontroller to automate this process.

X-Fade Settings

All mix presets save the x-fade state of each of layers as they are recorded. The X-fade settings override this setting to quickly allow the fade time to be set on the fly.

Filters

Filters control what data is saved or recalled from a preset. Mix presets have several types of filters:

Contains all information from the Mix Master

Contains:

- Mix / Audio
- Timecode Shift
- FX
- Mix / Level
- NDI
- Pixelmapper

Toggles the selection of all layer filters

Selects which whole layers are included in the preset

Saving and Editing Presets

Presets record the current state of the selected Layer, Mix or Viewport.

Recording a preset follows a simple 3-step process:

1. Press Record

- Single clicking the record button will highlight it with green indicating the window is primed for saving a single preset. After a preset is saved the record function will disable.
- Double clicking the record button will highlight it with orange indicating the windoes is primed for saving multiple presets. This will remain active until you click the button again to deactivate.

2. Select the desired record filters

- On **Layer**, filters allow for only certain attributes such as level, geometry or effects to be saved.
- On **Mix** filters allow for certain layers or the mix controls to be saved.
- There are no filters for **Viewports**.

3. Choose the bank and slot to save the preset in.
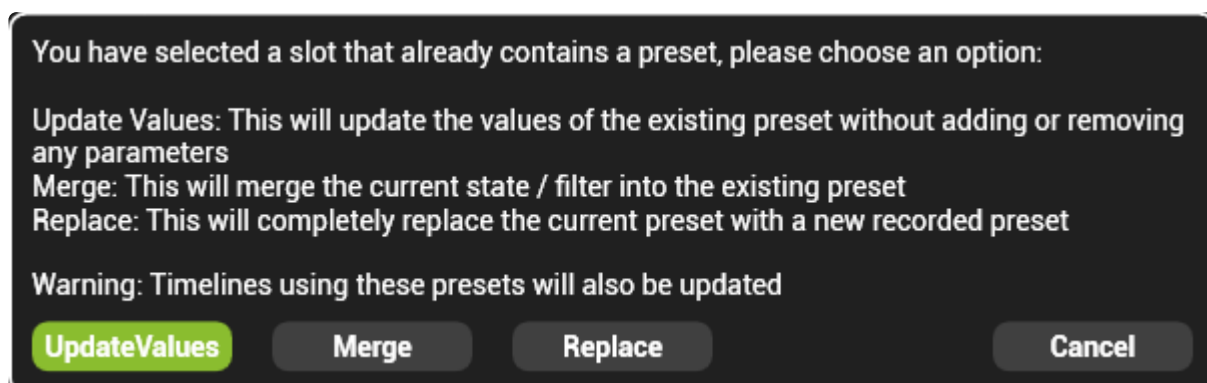
4. If saving into an occupied preset slot you are giving a choice of 3 actions.

Updatevalues

Only changes the pin values already included in the preset with the current values.

Merge

Change any values that are saved in the preset with the current values, as well as, add any additional values that were not included in the preset.

Replace

Completely overwrite a preset with the current values.

> ✱ If you wish to retroactively change settings in a preset for use in a timeline then you must choose either UpdateValues or Merge depending on your requirements.

> ❗ If you have a preset currently in a timeline DO NOT replace the preset. Doing so will remove the preset from the Timeline.

Presets and Timelines

This is a typical layout for programming a timeline using both layer and mix presets. You can find the 'Presets' pin for both layers and mixs as a subordinate of the 'Layer' and 'Mix' pins.

A preset is denoted by a triangle on the timeline. Hovering over the triangle will show you the label assigned to that preset. You can also right-click on a preset marker in a particular track to detach this from the preset meaning it is no longer affected by changes to the original preset.
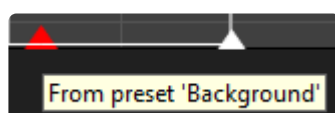
Benefits of using this method:

- Quick programming once presets have been created, simply drag and drop the presets into the corresponding layer or mix.
- Changes made to presets also update in the timeline.

- Preset information can be applied to either a single track or a parent track and follows the hierarchical structure.
    - Drag a preset onto a level track to only recall the level data, drag a preset onto the layer track and include all the data for any subordinate tracks within that layer track

More information regarding preset manager can be found here

Tips:

- Take time to decide which tracks you wish to include. Opening all tracks within an entire layer and only using a few of them makes the timeline both cluttered and inefficient.
- Name your presets to help identify the preset you have stored in the timeline.
- If you like the look of a preset but need to change a particular parameter within it. Detach the track information for that preset by right-clicking the preset marker and selecting 'Detach from preset' this only applies to that parameter.

Presets and DMX

This feature has been added as per user request but carries some limitations in use that need to be carfully considered. Under normal circumstances it is best practise to use the lighting desk for the creation and recalling of presets, or the ZooKeeper, both as standalone methods.

When using DMX to program and create presets in hippotizer considerations must be made to how these two system work. Conflicts can happen when broadcasting DMX data when recalling a preset, therefore, personalities have been created with all paramaters set to update only to neutralise any conflicting commands recieved by Hippotizer.

More information regarding DMX can be found here

DMX charts can be found here

ScreenWarp Manager

Screen Warp Manager is Hippotizer's blending and warping system

> Note: SHAPE has a warping and blending system for use with SHAPE Viewports.

Screen Warp is a component that does not run by default; it must be started before use.

More information on starting a component can be found here.

Basic Layout

Screen Warp is made up of two parts: the warp editor and viewport controls.

Warp Editor
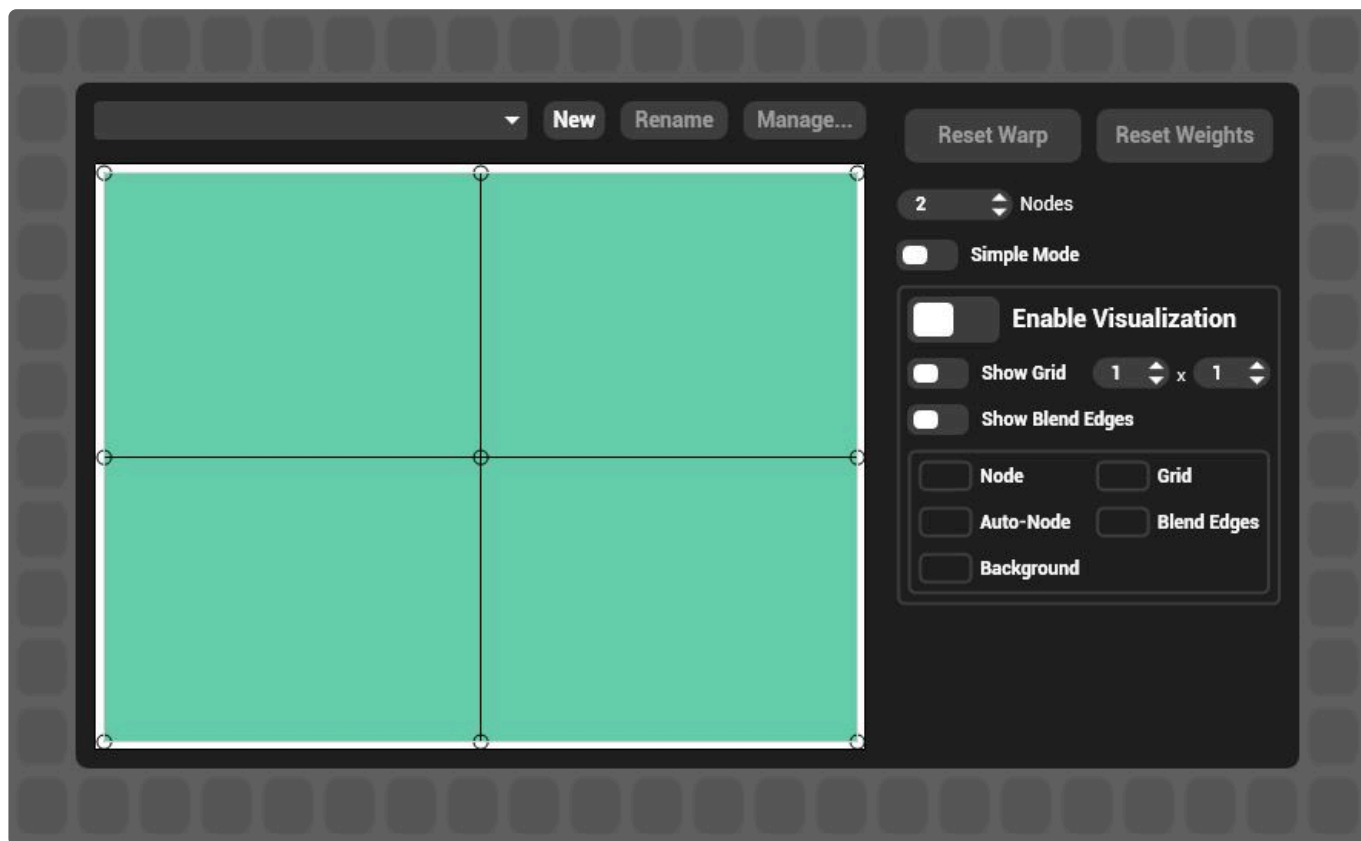
The warp editor is where warps are created and edited.

Viewport Controls

[Each warp can be assigned to one or more Viewports. The viewport controls also contain blending controls enabling square and radial blending.](#)

Screen Warp Viewport Controls

Each Viewport selects whether to use Screen Warp and sets blending.

The viewport controls are made of two sections:

Enable

Turns the screen warp rendering on that selected viewport on or off.

Warp Mix

Two screen warps can be loaded to each viewport and faded between with the warp mix fader.

Blending

On each viewport all four edges can be blended individually or a radial (circular) blend can be applied.

Each blend has two attributes:

Gamma

Measured from 1 – 3, a gamma of 1 is a steeper curve while a gamma of three is flatter.

Overlap

Sets the starting point for the blend as a proportion of the overall width of the viewport.

Overlap

Sets the starting point for the blend as a proportion of the overall width of the viewport.

Screen Warp Editor

The Screen Warp editor is where warps are created and modified.
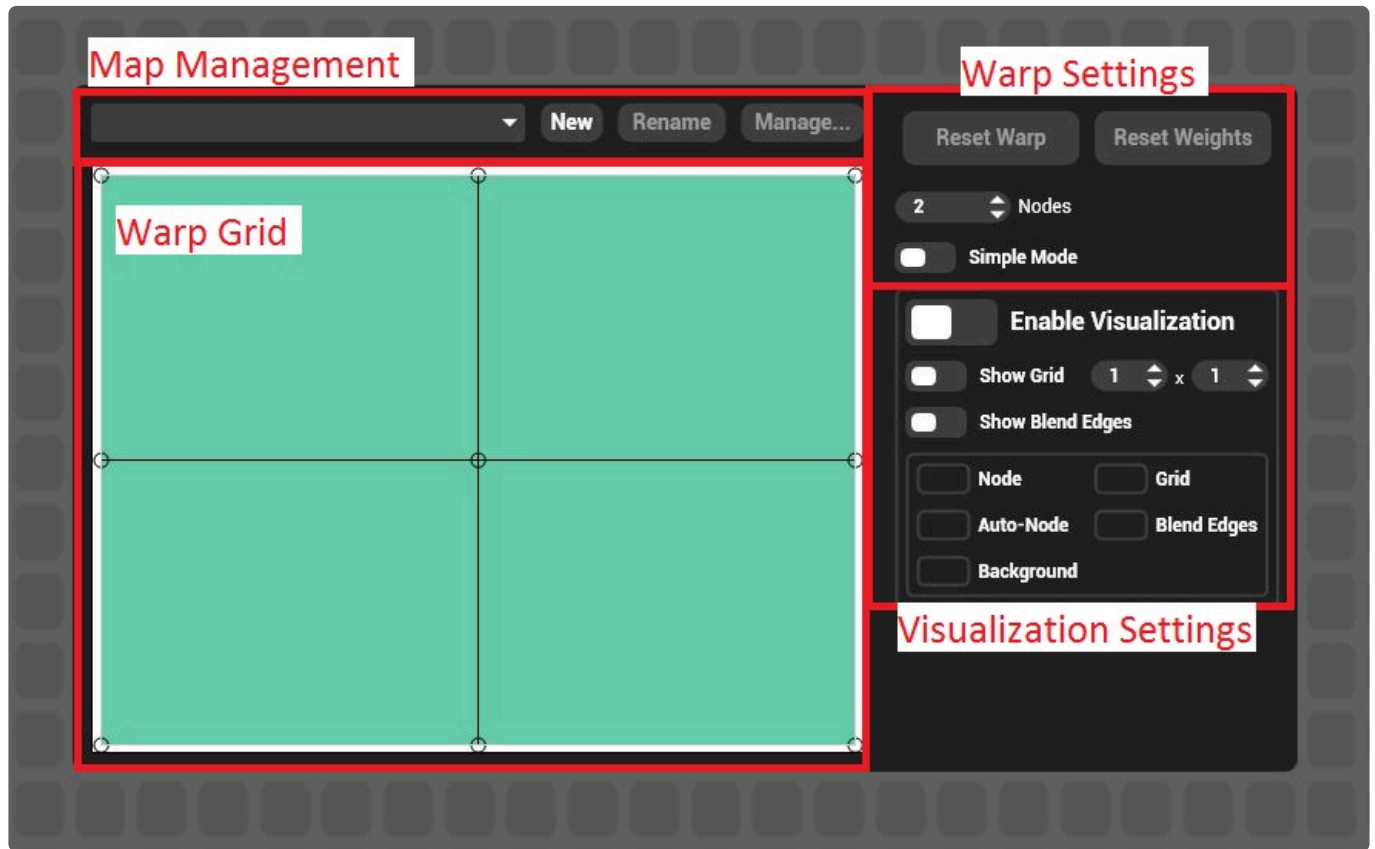
The Editor is comprise of four sections:

Map Management

Screen warps are saved as part of a list of warps accessible by each viewport.

Warp select drop down list

Selects which warp is visible in the screen warp editor.

New

Creates a new screen warp and adds it to the end of the screen warp list.

Rename

Renames the selected warp

Manage…
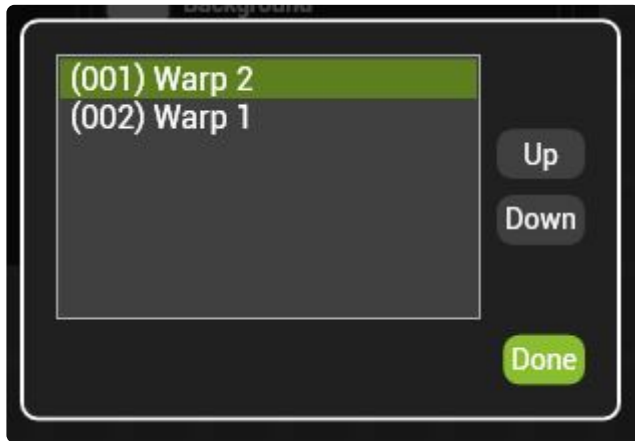
Each warp has an index to determine how they are recalled from the warp select pin. The manage dialogue allows the list to be re-ordered by moving warps up and down in the list.

Note; DMX, Timeline and Preset recall of warps is by index number; changing the index may affect existing programming.

Warp Grid

The warp grid represents the distortion of the selected screen warp.

Controls

Editing a warp begins by selecting the desired node to modify. Multiple node can be selected by clicking and dragging over them with the mouse or holding CTRL while selecting the nodes.

Selected nodes appear red.
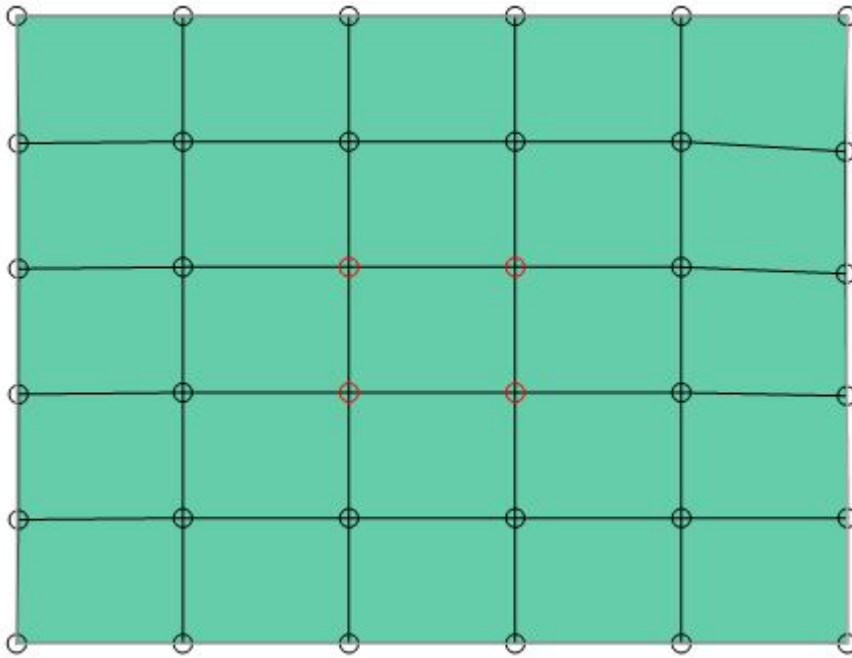
Once selected, there are different ways to edit a warp depending on the situation.

Left Click and drag on the desired node to move it with the mouse. To edit multiple nodes select them first then click on one node in the selection to move the entire selection. Holding SHIFT while dragging with the mouse is a fine adjustment.

Arrow Keys Select the desired node and use the arrow keys to move it. Holding SHIFT + Arrow keys is a fine adjustment.

Right Click and drag changes the selected node's **weight**. This is best thought of pushing the node into or pulling it out of the screen.

Warp Settings

Reset Warp

Sets the position and weight of all nodes to default.

Reset Weight

Sets the weight of all nodes to default.

Number of nodes

Sets the number of nodes (in the and X and Y dimensions)

Hint: The warp grid does not move when you add points, so it is faster to use as few nodes as possible and add them as needed.

Simple Mode

In simple mode, only the corner points are editable to facilitate quick basic warps.

Visualisation settings

Warps can be shown on the output as they are edited.

Show Grid

Draws a lineup grid on the output with the selected number of lines

Show blend edges

Displays where the beginning of the gamma curve is applied to the edge of the viewport

Colours

The colour of each aspect of screen warp visualisation can be edited by left clicking on the colour tags.

Sync Manager

Sync Manager receives and distributes timecode
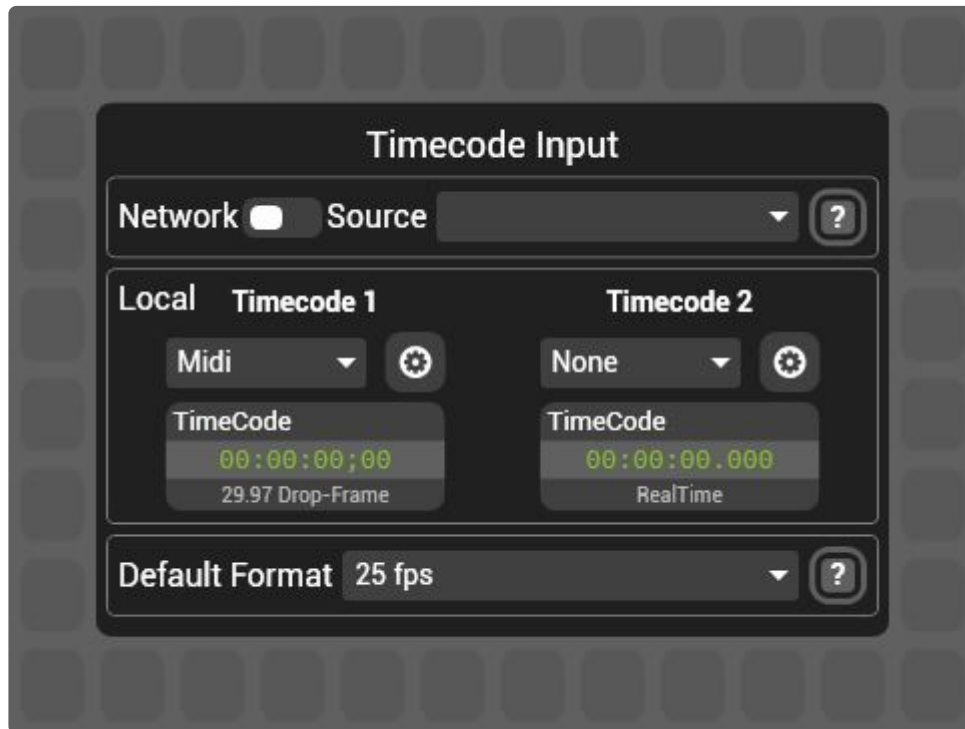
The Sync Manager is a component that does not run by default. For more information on starting components see here.

Sync Manager has three basic parts:
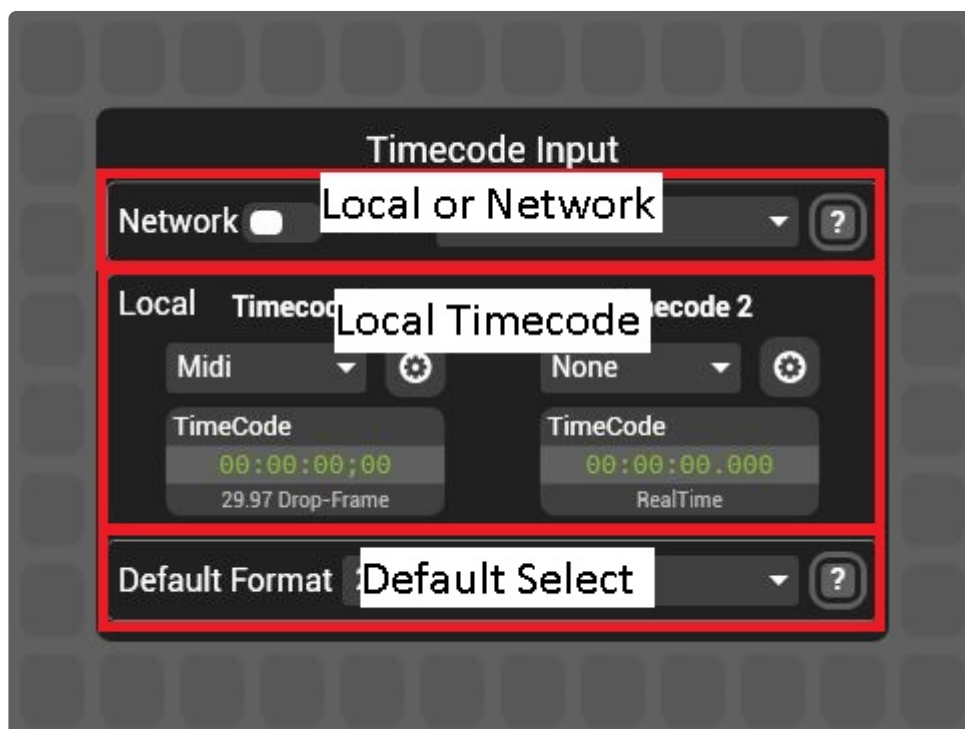
Local or Network

Selects the source of timecode; whether it is local to the system or another system on the network

Local Timecode

Where all local timecode input and generation is handled.

Default Select

Instructs the media players what timecode to expect before timecode is first received.

Timecode, Time and Sync busses

Hippotizer synchronises media playback in several ways depending on the timing source.

Timecode

Timecode is an externally received time signal expressed in [Hours:Minutes:Seconds; Frame Number].

Timecode is applied to the media player with respect to time. That means if two media players are locked to the same timecode signal and they are playing dissimilar frame-rate media, their play heads will be at the same time.

In the case that media frame-rate does not match the timecode frame-rate, playback will be smooth, however it will be impossible to seek to specific media frames accurately from timecode. For this reason it is recommended to always match media and timecode frame-rates.

Timecode has been standardised into formats, of which Hippotizer supports **Linear timecode** (LTC) and **Midi timecode**.

Linear Timecode (LTC)

Linear timecode follows a SMPTE defined standard (SMPTE 12M) encoding timecode into an audio signal. LTC is widely used in broadcast and live events and is frequently distributed over standard audio cables.

Linear timecode can be received in Hippotizer with the following devices:

- Factory fitted Alpermann Velte internal card
- Rosendahl Mif4 USB timecode interface
- CB Electronics TC-5
- Adrienne Electronics USB-LTC
- The left channel of the audio input can also receive LTC

Midi Timecode (MTC)

Midi timecode is a standard for transmitting timecode using midi messages.

Midi timecode is supported in Hippotizer from the following devices:

- Rosendahl Mif4 USB timecode interface.
- CB Electronics TC-5
  If you are used to Mif4's but are now using the TC-5, please refer the linked blog explaining how the workflows transfer from Mif4 to TC-5 TC5/Mif4 Compabability

Time

Differing from timecode, time signals are used internally by Hippotizer to synchronise media playback by defining the play head position in time and the playback speed, regardless of clip frame rate. Time signals are created when using the Generator or a media player as a source.

Sync buses

A sync bus carries time and a **sync state** between media players. The sync state is the media selection, playmode, in and outpoints and the inner-loop points. A layer listening to a sync will follow the source's media selection as well as synchronising playback.

Timecode In

The timecode in panel controls the two input channels
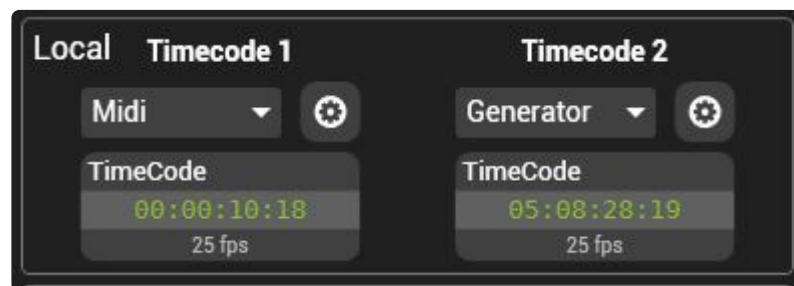
Each sync component has two input channels: **Timecode 1 and Timecode 2**

> ✳ Supported timecode is between 00:00:00:00 and 23:59:59:999.

An input channel can use a variety of sources:

- Audio Input
- Generator Input
- MIDI
- Alpermann Velte

Non Real-Time Timecode

Audio Input

Linear Timecode can be received using the audio input.
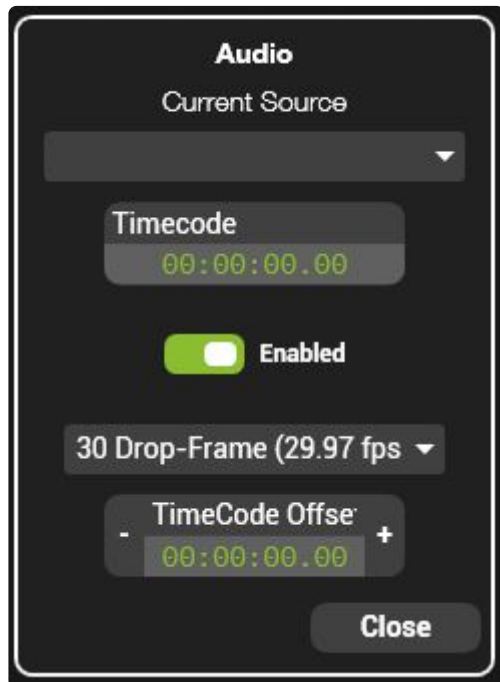
Linear Time Code (often called SMPTE timecode or LTC) encodes a time signal into audio, Hippotizer can read this signal from any audio input.

Current Source

Lists all active audio input sources on that machine. This list is managed by Windows and determined by which devices are discovered, so if a device does not appear here it is likely down to a driver issue.

Timecode

The time received from the selected source

Enabled

On/Off control for the source.

Frame Rate Drop Down

Select the type of timecode received. (This is determined by the timecode source)

Timecode Offset

Add a set amount of time to the incoming timecode in order to compensate for delays.

To Configure

1. Plug the audio input into your Hippotizer system (Audio must be going into the system running the

Sync Manager Component)

2. Goto Sync Manager in Zookeeper and select Audio as an External Input
3. Click the settings cog
4. Select the Audio input device as the Current Source; this will depend on what is used to bring audio into the system.
5. When Set correctly, the time readout will reflect the timecode being received

Note: As timecode is being carried by a normal audio line, the gain (volume) must be set correctly to function. It is frequently necessary to experiment with various combinations of the output device volume and the input gain to find a correct setting.

Generator Input

The Timecode Generator creates timecode from the computer's clock or from a user specified time.
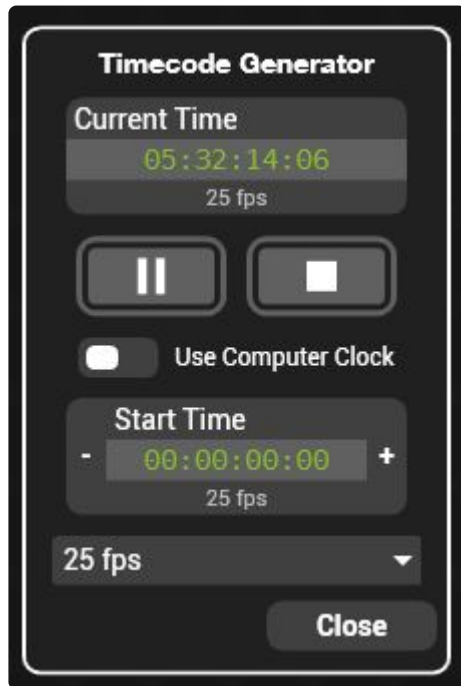
Using the computer clock

1. Set the external input in Sync Manager to be Generator
2. Open the settings by clicking the settings cog
3. Ensure the switch "Use Computer Clock" is enabled.

When using the computer clock, the stop jog control is disabled, while play and pause can be used to hold and restart timecode.

Note: Automatic changes to the computer clock (such as for daylight savings time) will be reflected in this time.

Using an arbitrary time

1. Set the external input in Sync Manager to be Generator
2. Open the settings by clicking the settings cog
3. Ensure the switch "Use Computer Clock" is disabled
4. Set the desired start time in the "Start Time" readout

When using an arbitrary time the stop jog control resets the timecode to the Start Time. Pausing and restarting will not reset to the start time.

Frame rate drop down

Sets the frame rate of generated timecode.

MIDI

Hippotizer can use Timecode over MIDI via a USB interface to receive Timecode.

Supported Devices:

Rosendahl Mif 4

[Mif 4 Website](#)

Adrienne Electronics USB LTC/RDR

[USB-TC Website](#)

CB Electronics TC-5

[TC-5 Website](#)

To Configure:

1. Stop the Hippotizer Engine and Zookeeper
2. Plug in the USB Time Code device and allow Windows to discover it and install drivers. (Follow manufacturer instructions)
3. Start the Engine and Zookeeper and select the Midi source as an external source in Sync Manager
4. Click the settings cog and select the desired midi device
5. Enable the source. If timecode is being received the time counter should reflect it.

Alpermann Velte

Hippotizer supports an internal timecode card using the Alpermann Velte PCIe TC card.

If fitted, the Alpermann will appear as a timecode source option in Sync Manager's External inputs.

To Configure:

1. Ensure the Alpermann Card is fitted and drivers are correctly installed.
2. In Sync Manager, set the External Input source as Alpermann
3. Click the settings cog to view and edit the Alpermann card's options

Non Real-Time Timecode

Hippotizer V4 supports many Timecode standards, including 29.97 FPS Non Drop-Frame (NDF) a "Non real-time" time code format.

29.97 Non Drop Frame is a somewhat archaic standard that for legacy reasons differs from the time it is meant to represent. Unless there is a specific reason to use this format, we strongly advise using another more common standard of timecode.

> **Note**: The logic and mathematics behind 29.97 NDF extends beyond the scope of this manual, however there is a very good explanation of how and why this format exists here:
> http://www.connect.ecuad.ca/~mrose/pdf_documents/timecode.pdf

In 29.97 NDF, the **time** and the **timecode** differ by 1.8 frames of video per minute, which equates to a drift of 3.6 seconds per hour. This means that timecode of `01:00:00:00` equals a time of `01:00:03:18`.

Hippotizer's media player uses time to know which frame of video to play, this requires all timecode to be converted to time. Under normal circumstances, these two values are identical, meaning it does not matter which value is displayed or controlled. 29.97 NDF however breaks this convention, making it very important to know where time and timecode is used in Hippotizer.
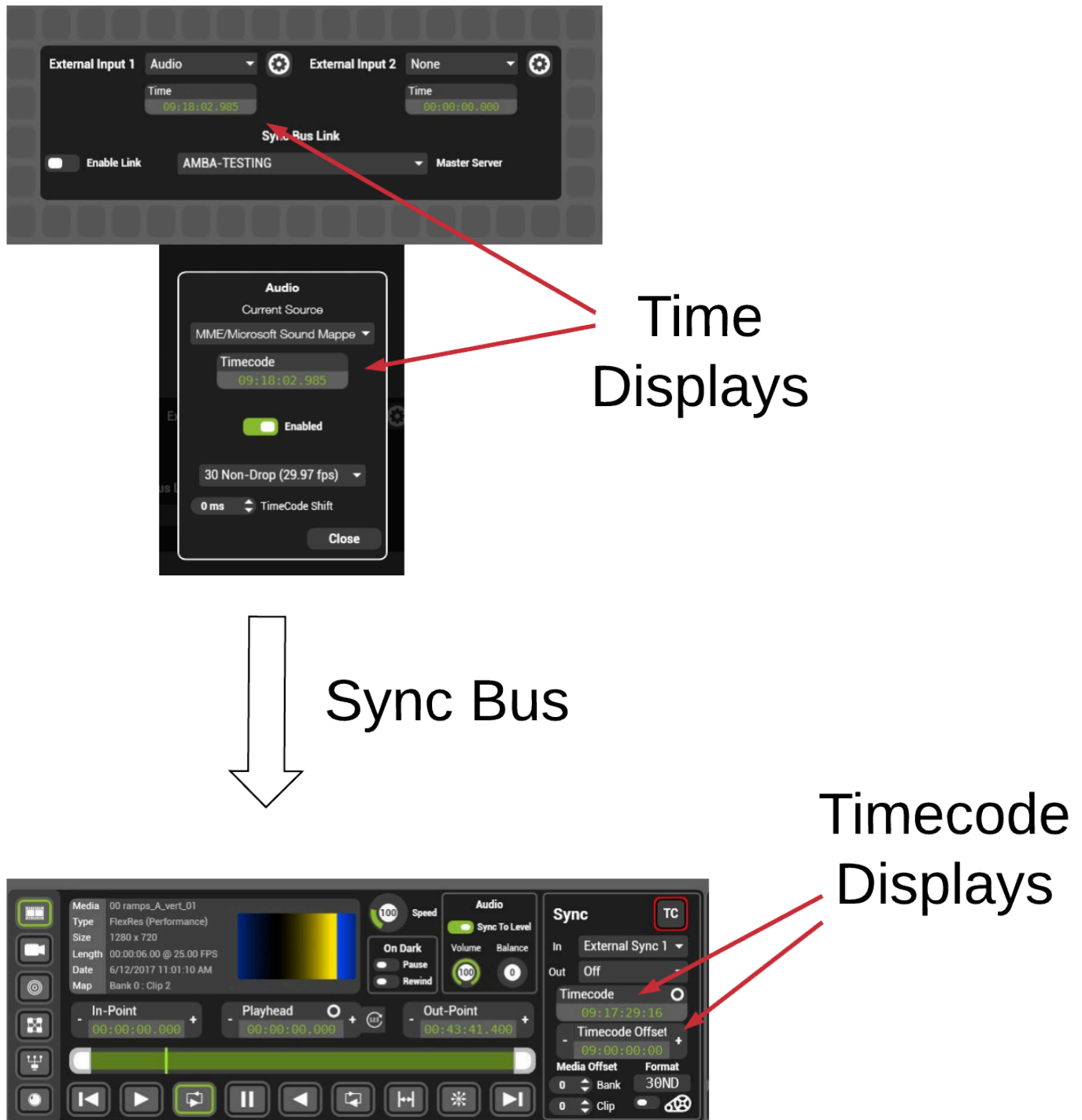
Sync manager receives the timecode signal and will convert it to **time**, displaying it as **time** in the Sync manager interface and detailed views.

The time signal then travels to media player(s) over a sync bus, which also displays in **time**.

The Media Player then converts it back into **timecode** so it can be correctly edited and viewed. The timecode offset control also displays **timecode**.

The timecode offset pins work in **timecode**.

This mixture of time and timecode means that for 29.97 NDF it is normal to see slightly different numbers in each interface depend on where in the signal flow you are.

Default Timecode Format

Default format sets the frame-rate used by media player controls when nothing else is setting the frame-rate.
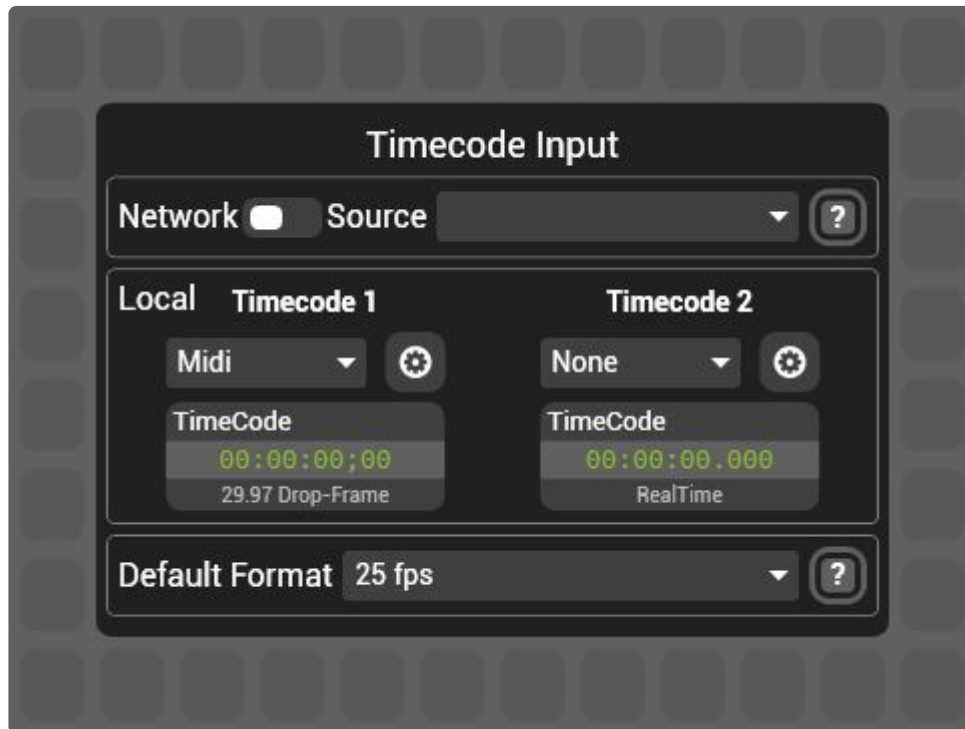
The default format sets timecode controls to the desired frame-rate. As the default setting is overridden by the media or timecode frame-rate, it's primary purpose is to assist programming before media is played.

The default format is indicated in timecode controls:
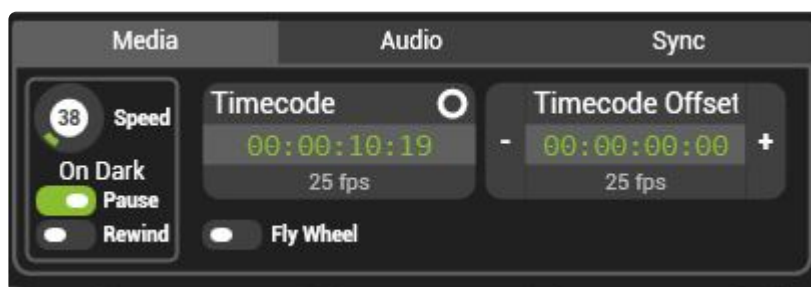
Default format disagreeing with timecode

If the default format is set to a different frame-rate to timecode being received by the media player then it will appear red in the interface.
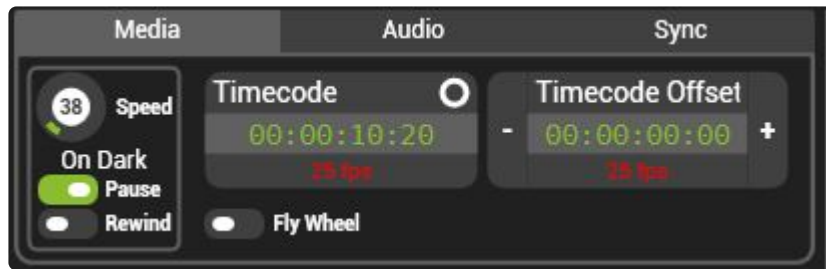
In cases where the default format is a different frame-rate to the media player (if it is receiving different frame-rate timecode) the media player will take priority.

Default format and timelines

One important use for default format is when programming with timelines. Without a default, setting the media player's in or outpoint before loading media or assigning timecode can yield unpredictable results as it does not know what frame-rate to use.

To avoid this, it is best to always set the default format to the show's timecode format.

Local or Network Timecode

Timecode can either be received on the local machine or on a remote one via HippoNet
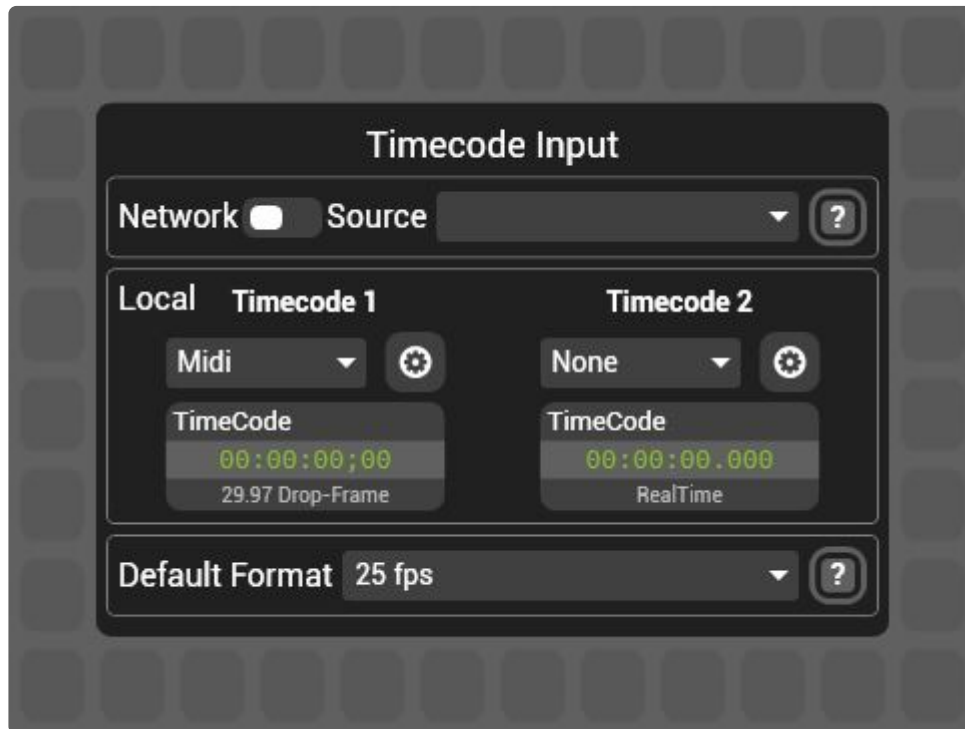
Time and timecode are distributed by Hippotizer within a single system or between systems over the network.

Network

Sets the timecode and synchronisation sources.

- **Disabled** The default. *The system is the master*. Timecode is received on the local system. Sync busses are generated and received on the local system only.

- **Enabled** *The system is a slave to another system*. Local timecode controls are disabled. Both Timecode channels and all 16 Sync Bus channels are received from the selected remote source.

There are two common methods for handling timecode in Hippotizer systems:

Receive timecode on every system.
- Send timecode to each system
- Disable network timecode in sync manager

Advantages to this method:

- Offers a robust topology; a single failure will not stop multiple systems from playing back

- Any signal delay will be same for all systems ensuring frame synchronisation

Disadvantages to this method

- Requires more equipment as each system must have identical timecode hardware.

Distribute timecode from a master system.
- Send timecode to one system only — the master.
- Enable network sync on all other systems (the slaves) and set their source to be the master

Advantages to this method:

- Simplifies setup and uses less equipment; only one timecode receiver is required.

Disadvantages to this method

- If a the master system, or it's timecode hardware were to fail the whole system would stop working
- The delay may not be the same between master and slaves as they have dis-similar signal chains.

TimelinePlus

Timeline is a sequential programming environment and visualizer, from which cues can be recalled at the users discretion; with support for manual cue triggering, time of day control, timecode syncronisation and custom control protocols. The component toolset and features will be explained within this section. For additional information or assistance with complex workflows please contact Green Hippo for further training resources.

Starting Timeline+

Timeline+ is a default component in a New Show, a button to access Timeline+ is available from the Hippotizer home page.

TimelinePlus UI
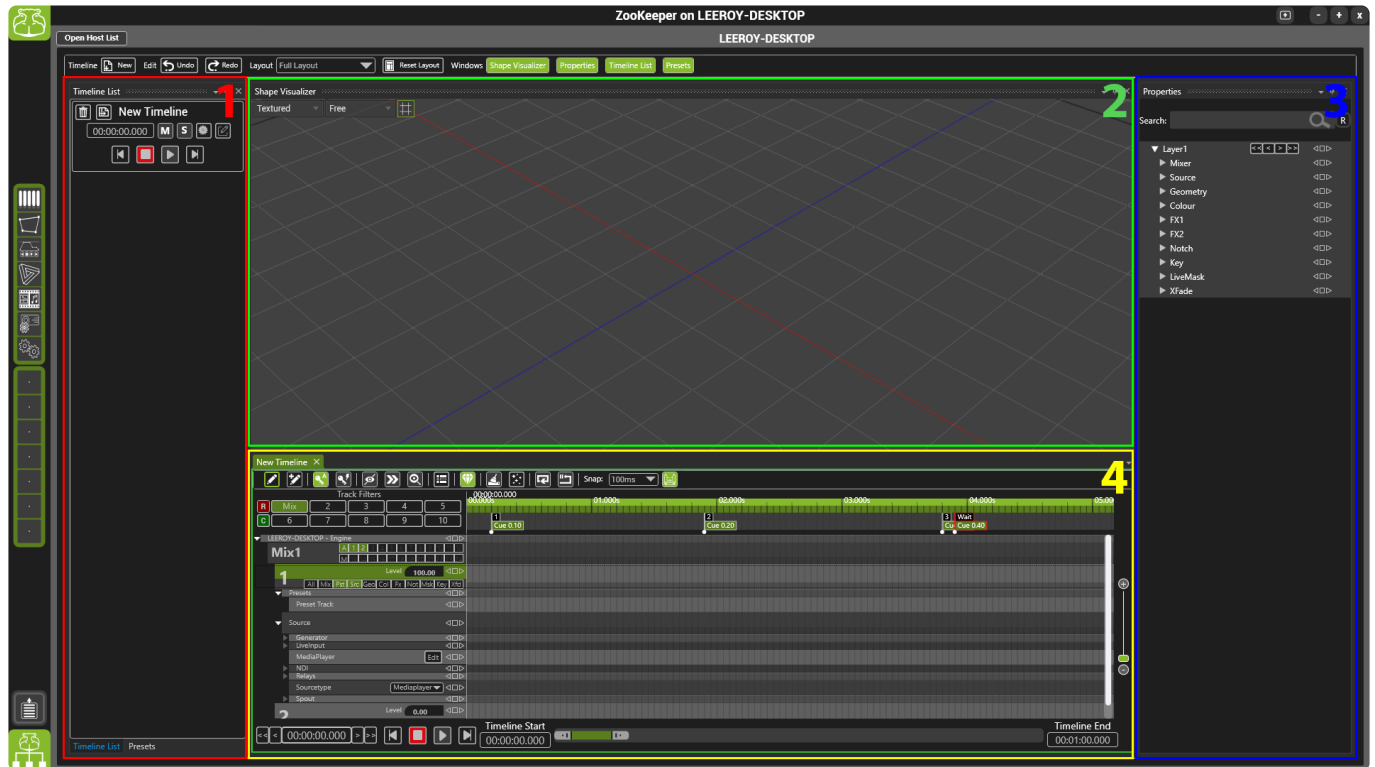
1. Timeline List & Presets

All timelines on the system are shown in the Timeline List tab and any presets in the preset manager shown in the Presets tab.

2. SHAPE Visualizer

This view shows an imported SHAPE project in a 3D view with all visible assets. This will update live when surfaces are patched to an active mix.

3. Properties

A context sensitive panel for editing selection properties values.

4. Timeline Editor

Shows selected timeline in a sequential view ready for editing.

Timeline List
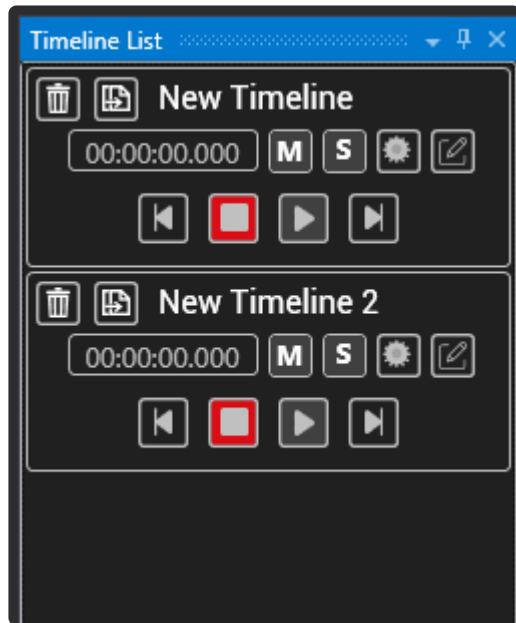
The timeline list includes all the timelines on a system. The window has timeline specific controls which are independent of other timelines.

🗑 Use to completely delete the timeline from the system

📄 Duplicating will copy a timelines programming and ID into another timeline. This does not include timeline settings for timecode.

00:00:00.000 Shows the current timecode value of the timeline.

M Use to disable timeline programming.

S Use to isolate a solo timeline's programming **only**

⚙ Timeline specific settings including ID, timecode options and naming.
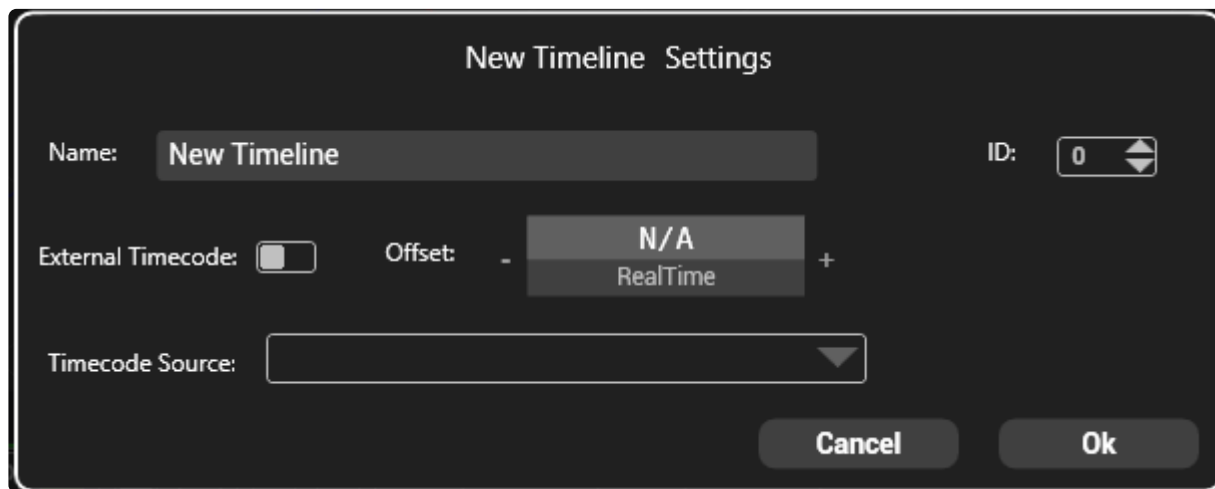
✏ Opens the timeline in the editor.

⏮⏹▶⏭ Playback controls.

Settings

Name

This is a user defined name for recognition.

External Timecode

A toggle for external timecode synchronisation on selected timeline.

Offset

Timecode offset controls for selected timeline.

Timecode Source

Select from a timecode source available on the server.

[Use sync manager to configure timecode sources](#)

Presets

Preset Manager

Timeline+ can be programmed using presets from the PresetManager system in Hippotizer. Presets can be created in the Mixes page which then can be dragged into the timeline+ editor window. The preset manager in the Timeline+ page shows all the presets that have been stored in the manager ready for use in a Timeline.
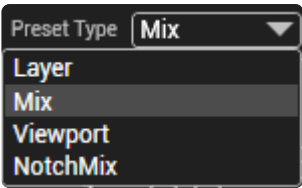
Preset Type

The preset type selector is how you can select the different preset types.

For more information on using the presets in a timeline please refer here

Editor

The editor is a list of all tracks included in the selected timeline with programming information stored horizontally along a timecoded measure. Programming is stored in keyframes denoted by circles in an editable track and diamonds in a parent track. Controls are located along the toolbar at the top including creation, selection and cleaning of keyframes, capture of keyframes for recording live changes, view options for the editor and adding tracks and embedded timelines.

The editor window shows a **green** highlight around this space when it is selected, and **red** when deselected. Key commands will only work in the editor when the workspace is selected.

Toolbar Icons

Edit Mode Edit

 Enables cursor selection.

Edit Mode Add

 Enables keyframe on left click.

Auto Create Keyframe

 When a parameter value is changed, in the properties panel, while the timeline is paused a new keyframe will be created at the playhead.

Auto Create Keyframes When Live Source Changes

Whenever a value changes at the playhead location, create a new keyframe.

Enable Blind Editing

Timeline programming can be edited while playing.

Enable Timeline Scrubbing

Enables playhead scrubbing when the timeline is paused.

Preview Edits Live

Changes made to a keyframe will preview in the visualiser.

Add Tracks

Add more tracks to selected timeline.

Show Keyframe Diamonds

Show or hide the keyframe diamonds on parent tracks.

Auto Clean Redundant Keyframes

Automatically removes consecutive keyframes with the same pin value upon creation of a new keyframe in a track.

Clean Keyframes Now

Removes consecutive keyframes with the same pin values.

Loop Timeline

Loop timelines between start and end points.

Pause On Rewind

While the timeline is playing, pressing rewind will rewind and pause at the start of the timeline.

Snap

The increments, in milliseconds, keyframes will snap to.

Scroll

Auto scroll options which include scroll, jump and none. Scroll will move with the playhead, jump moves to a new section as the playhead reaches the end of the viewable editor and none disables scrolling.

Shift Time

Shift Time will move keyframes before or after the playhead forward or backwards in time. There is also an option to shift keyframes only on selected tracks, when this is not enabled all keyframes will be shifted. The shortcut for this is CTRL+o , hitting enter once will confirm the time value, hitting enter a second time will apply the time shift with the current settings.

Vertical Scale

This slider controls the vertical scale of tracks

Transport Bar

⁑ Horizontal scaling is controlled via the handles on the transport bar scroller located either side of the green bar. The width of the green bar shows the current viewable area of the timeline in the editor.

Transport Timecode
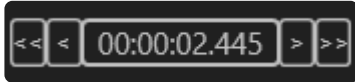
 On the left is the current timecode of the playhead and controls for moving the playhead in increments of snaps (Defined in the snaps drop down in the toolbar).

Playback Controls

 The playback controls for the timeline.

Timeline Start and End Point

 The start and end point scale the size of the timeline and are used to denote the start and end for the timeline loop tool.

Tracks

The Timeline track list uses a hierachical structure comprised from parent Pin groups and their children. When creating a new timeline the user must select the required Pin groups to include from the HippoNet PinTree. After expanding a parent group and a single pin has been exposed as its own track, keyframes can be added and edited to store data values for recall during playback.
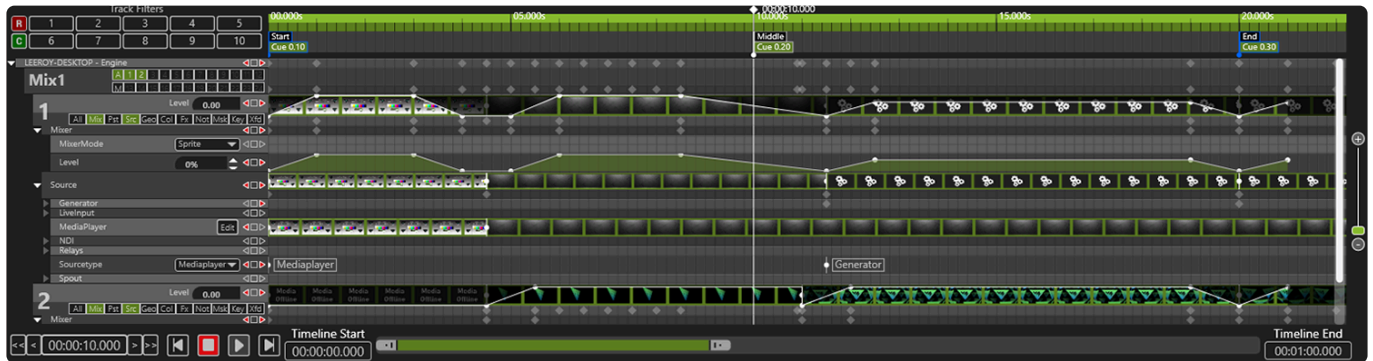
Track Controls

Mixes

The Mix track represents one of the mixes created in the OutputManager. The block of numbers to the right are the visbility buttons for layers within the Mix. The 'A' button represents 'All Mixes' and can be selected to expand all included tracks of the mix, and 'M' are the Mix controls.

Layers

The Layer track has three seperate controls within the track header, pin group visbility buttons, a level readout of the mixes/level pin and the keyframe controls. Selecting the visibility group exposes the pins within it, multiple layers can be selected using Shift+ Left Mouse Button and then by selecting one of the pin groups all selected layers will expand at once.

The keyframe control can be used to navigate and create keyframes in a track. The left and right arrows jump to the previous or next keyframe and the center square creates a keyframe at the playhead location. These controls will either be red or clear; red represents a keyframe is active either before (left), after (right) or at the playheads position (square); clear controls represent no keyframes to be

active.

Track Filters
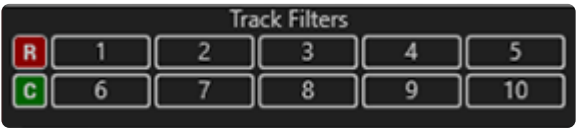
This bank of 10 custom track filters are programmable by the user. Use these to store the current expanded categories of tracks for easy recall. To use this feature create the hierarchy you wish to store, select the record button and then select the bank number. This filter is now stored and can be recalled by selecting the filter bank.

Renaming Tracks

Right-clicking on a track and selecting rename will open a entry form for users to apply custom names to a track. This feature can be used on every track.

> ! Careful renaming tracks without reference to their original name to avoid later confusion.

Command Track

Located at the top of any timeline. The command track is where command, labels and cues can be created using the Edit Mode Add tool.

Labels

Labels are user defined for easy recognition of parts within a timeline.

Commands

There are three different command types:

None	When the command is being used as a label or cue without an action.
Stop	Stops playback of the timeline upon reaching this command keyframe

Jump	Upon reaching the command keyframe skip to another command keyframe, start, or end of the timeline.

Cues

This ID is referenced by the multicontroller and external protocols for recall.

Reassignable Tracks

Any track within Timeline+ can be resassigned to control one or more new targets, these can be any other pin groups or pins of the same data type. Tracks can have multiple control targets at once meaning a single layers timeline+ programming can be applied to multiple layers, both on the local machine and to other networked Hippotizers.

To assign control targets right click on the track in the Timeline+ editor and select 'Edit Control Targets', this will open up a new control targets window. In order to activate custom control targets you must toggle the notice to disable class inheritance.
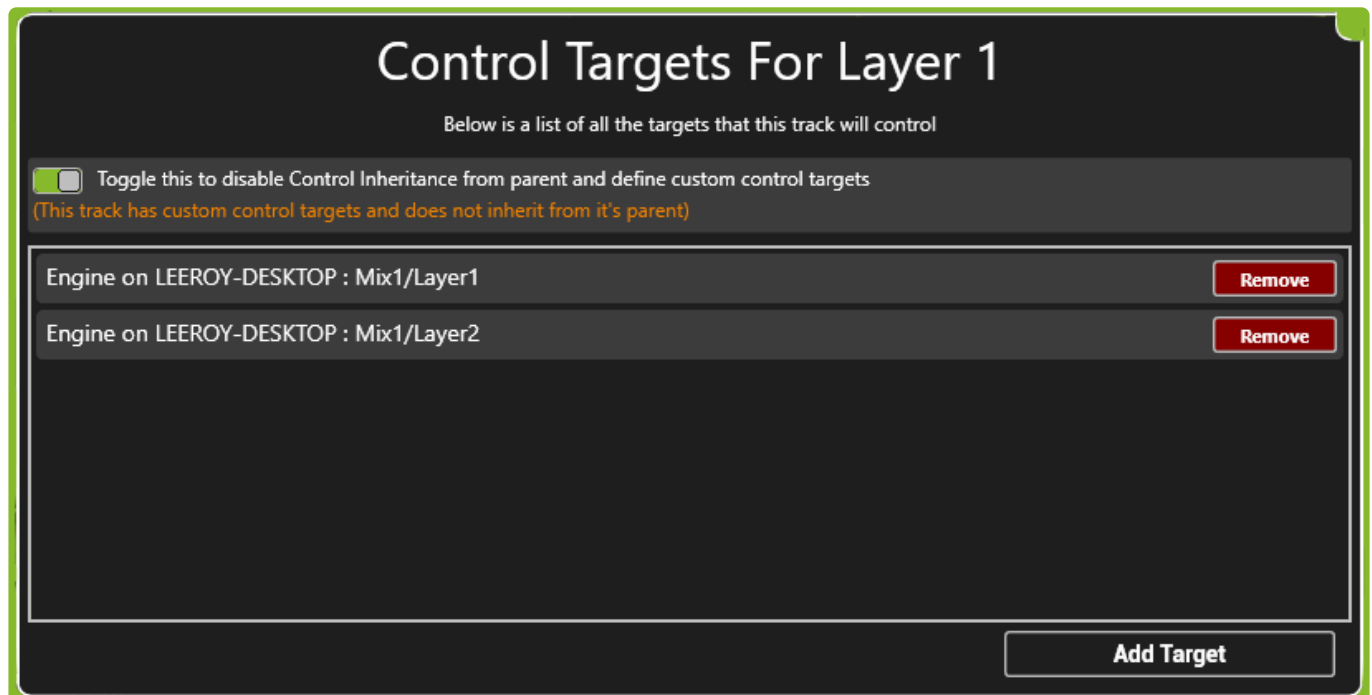
! When a track has a custom control target it no longer inherits pin control from its parent

Child Tracks With Custom Control Targets

The child tracks below already have custom targets set, currently these tracks will not inherit any changes that you make to the control targets of this track. To proceed please choose one of the following:

'Cancel' - do nothing and cancel operation completely
'Continue' - Continue with the changes to this track and understand that the child tracks will remain the same
'Reset + Continue' - Reset the child tracks to inherit from parents and then proceed with changes to this track

Engine on LEEROY-DESKTOP : Mix1/Layer1/Mixer/Level

[Cancel]   [Continue]   [Reset + Continue]

Inheritance

If a track has a custom control target it no longer uses it parents control target information, therefore if I set a custom control target for the layer1/Geometry pin group and then reassign Layer1 to control Layer2, the Layer1/Geometry control target will still only control its custom target and will not inherit its target information from the parent Layer.

Upon reassigning a parent control target with children which already have a custom target, a warning window will appear explaining this. You maye continue while maintaing all control targets, cancel the current action or reset all the children control targets and continue with the new parent target.

Off-site Programming and Backup Systems

Reassigning tracks can be used to prep a show on a PREP or other machine, imported onto the show machine and each mix can then be re-assigned to the correct local mixes or networked mixes. Sharing control targets across machines on the same network opens up the opportunity for live backup machines which each share the same programming.

Custom Control Target Symbol

✱ Tracks which have a custom control target will be shown with a green circle on the left-hand side of the track header.

Properties Panel

The properties panel is a context sensitive interface changing to display information dependent on the selection. There are two types of selection which affect the properties panel, tracks or keyframes. At the top of the panel is a search field for filtering via Pin names.

Track Properties

Track selection will show all of the including Pins in that track, whether that be a Pin group or an individual Pin(See image). The image shows the Source track properties which includes all of the Source Pin groups Pins. Some pins also have graphical displays for easier navigation, an example of this is the Media Player pin which shows the thumbnails of media in the selected bank.

Keyframing in the Properties Panel

The keyframe controls can be seen next to applicable Pins in the panel and can be used to navigate or create keyframes.

More information on keyframes.

Keyframe Properties
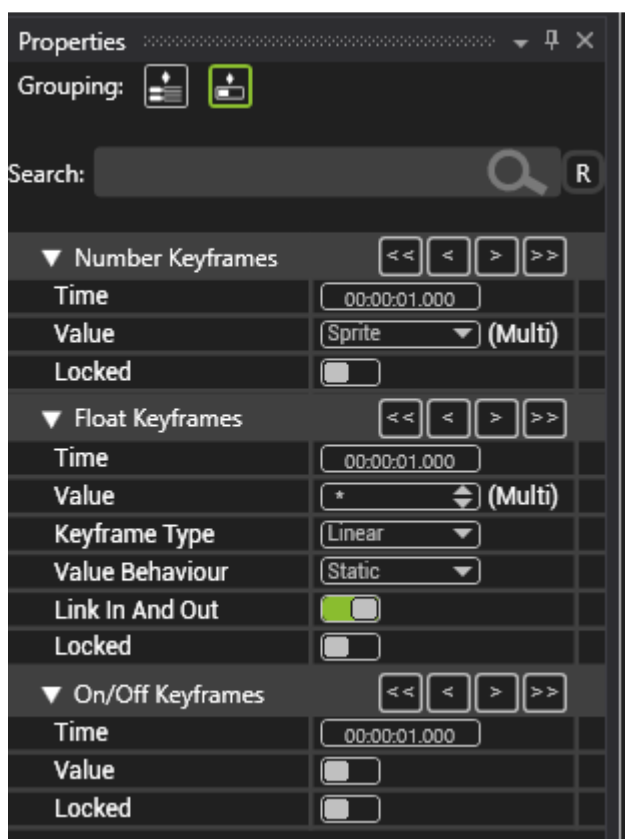
The keyframe properties panel includes a nudge in steps, timecode of the keyframe, pin value, keyframe type (If data pin data type is a float) and a lock. Keyframes can also be grouped by either Data Type or by Track Type by using the buttons at the top of the properties panel.

More information on keyframe properties.

SHAPE Visualizer

The SHAPE visualizer is an embedded 3D environment which uses a SHAPE project to displaying content on a 3D model. This tool can be used to simulate the realworld environment of a show or as a display for your content as you work in the Timeline.
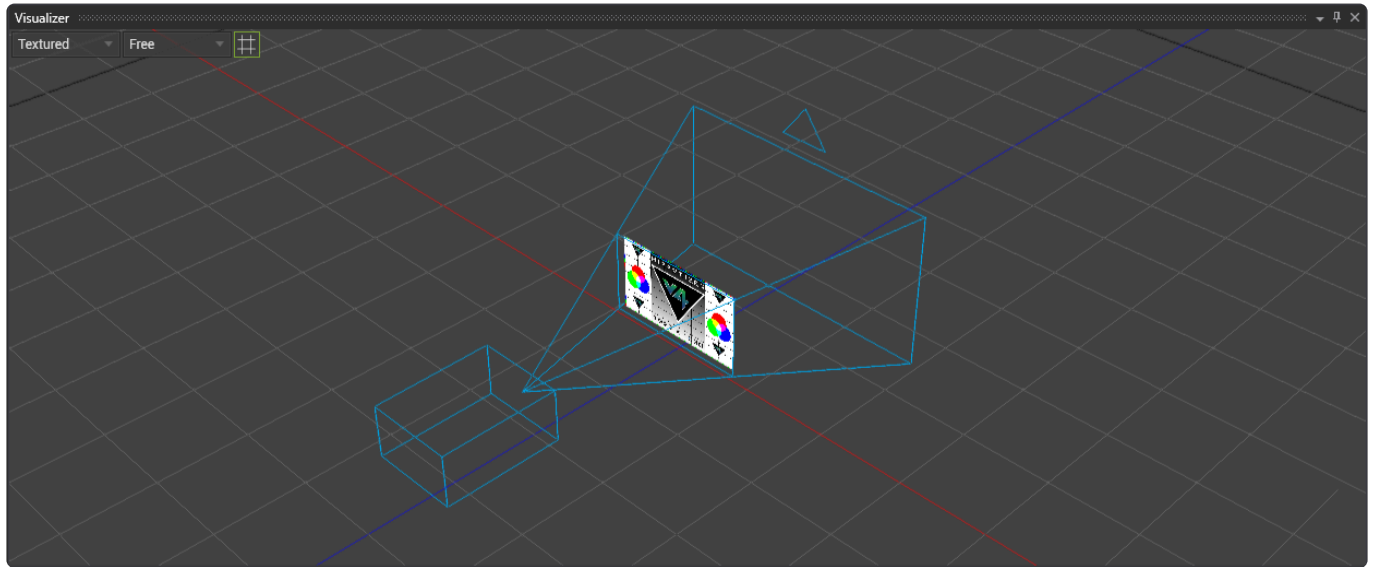
Configuring your SHAPE project

Display Types

Solid

Solid Wireframe
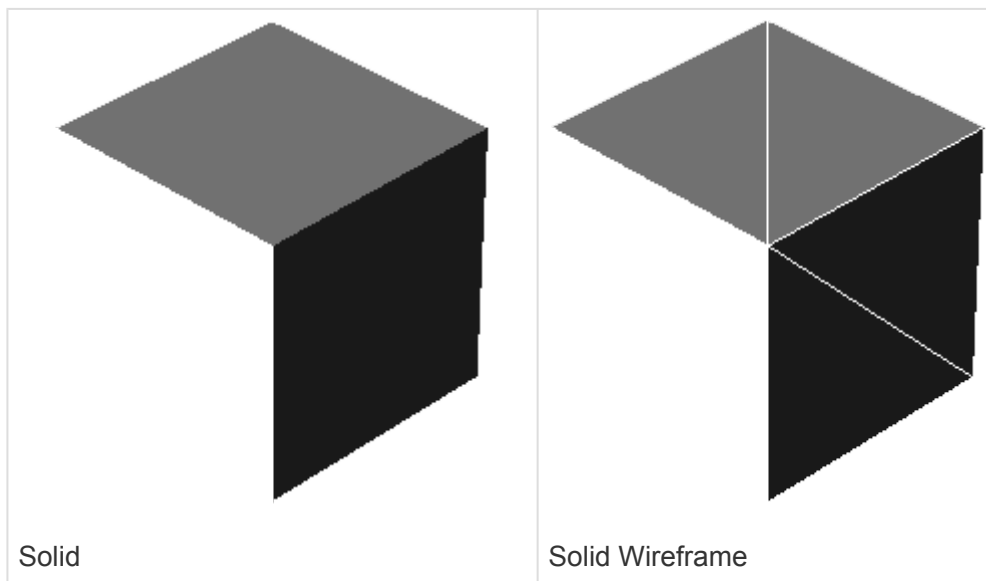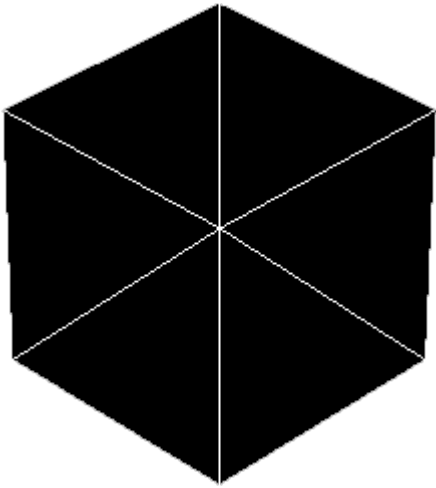
Alignment
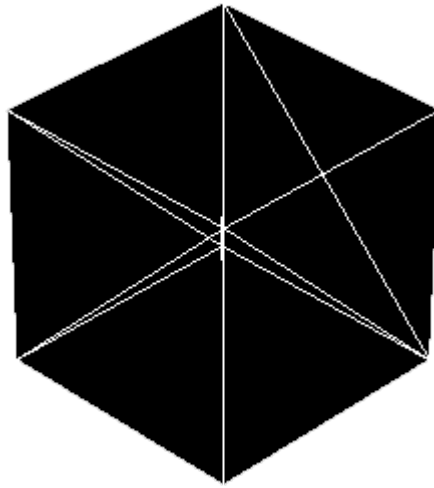
Wireframe
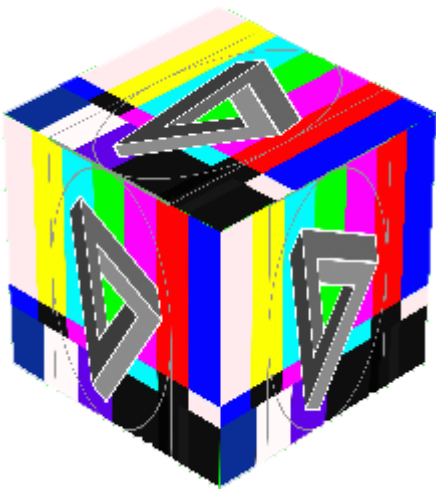
Texture
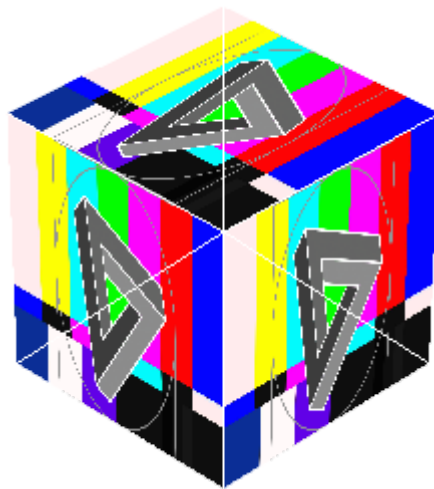
Texture Wireframe
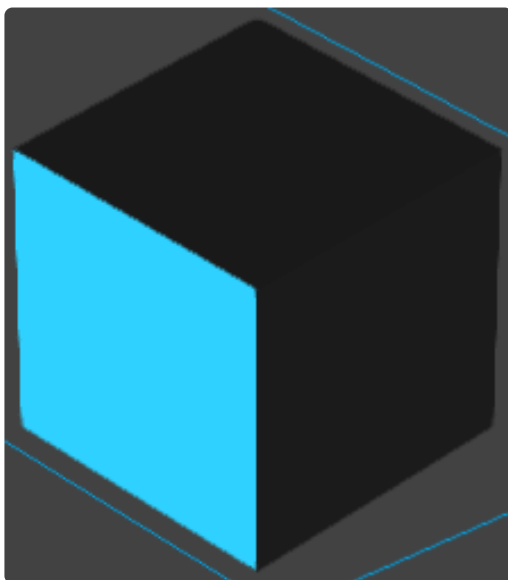
Case Study

Camera Types

• Free Camera
• Right Orthographic View
• Left Orthographic View
• Front Orthographic View
• Back Orthographic View
• Top Orthographic View
• Bottom Orthographic View

Grid Toggle

On/Off toggle for the grid to be displayed in the visualizer.

Scrubbing TimelinePlus

TimelinePlus playback behaviour:

TimelinePlus triggers values (keyframes) on it's tracks when the play head passes over them: in normal playback this is easily seen and understood. Whether or not to trigger keyframes becomes a little more complex when commands, jumps and stopping the timeline is introduced. This will try to explain what TimelinePlus will do in these cases.

Playback at Key Frames:

TimelinePlus is an event-based keyframe timeline; meaning it only makes changes to the elements (called Pins in Hippotizer) under it's control when the Playhead crosses the keyframe.

If there is no keyframe (or fade between keyframes) on the track at the playhead then TimelinePlus will not change the corresponding pin value. This is similar to the way that a tracking lighting console works.

> ✱ Pins in Hippotizer operate on a Last Takes Precedence (LTP) basis. If two methods try to set the same pin whichever is last will set the value. Some methods (such as DMX) continuously set the pin value so a change made through Zookeeper will quickly be overridden by DMX resulting in the pin 'snapping back'.

A Timeline generally only sets a pin once as the playhead passes over the keyframe, the exception to this is fades between two values of float key frames: during the fade the timeline will continuously set the pin value in order to execute the fade.

Playback Between Key Frames:

When the playhead is playing between key frames the timeline normally will not set pin values. (Except for fades as described above)

There are cases however where it becomes necessary to re-evaluate pin values at the play head even if there is not a key frame. This is called scrubbing the timeline.

In TimelinePlus there are two ways to scrub:

- While the timeline is playing, use a jump command to send the playhead to a new location in the timeline. Upon landing from the jump, the timeline will re-evaluate all tracks and set pin values even if its between key frames.
- While Playing, If a timeline has been stopped with the space bar or by pressing play, manually moving the playhead will re-evaluate all tracks if the scrub setting is enabled.

In all other cases (such as starting a timeline from a Stop Command) the timeline will not re-evaluate track values unless it's a key frame. This is a key design aspect of the system as it allows for seamless loops to be programmed.

Layouts

In the timeline toolbar is a Layout drop down menu, there are three default layouts:

- **Full**
- **Programming**
- **Show Playback**

Also two user layouts. These layouts can all be personalised to improve workflow depending on the task. To edit the position of a window within Timeline click and hold on the stippled header of the window. Once you have activated the layout edit, directional widgets will show for locations this window can be docked (See Image, Below). Any changes that are made to a latyout are automatically stored in the selected layout.
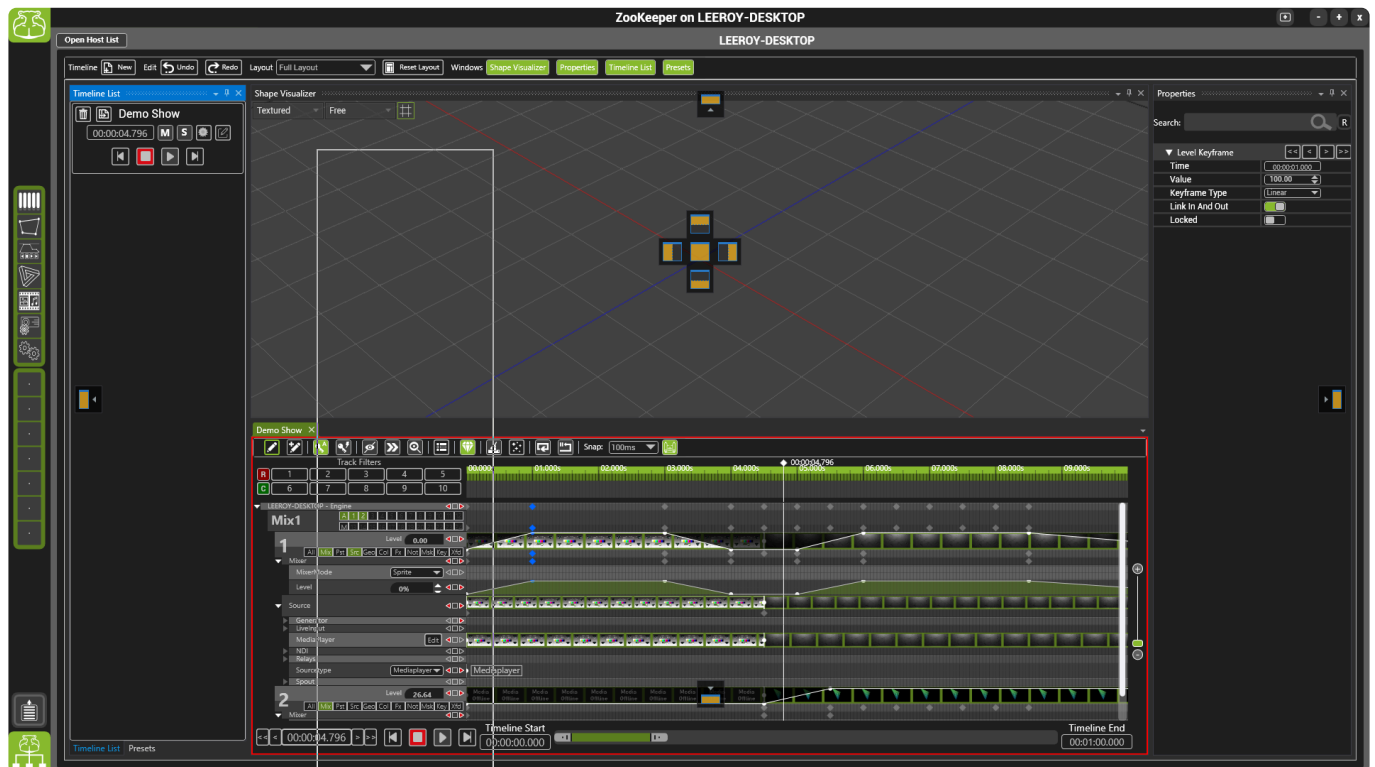
> ✳ Layouts can be reset to their default by clicking the reset layout button next to the layout selection drop down. This will reset the selected layout to default.

Below is the layout widget. These icons will display on the screen when you are in layout edit mode:
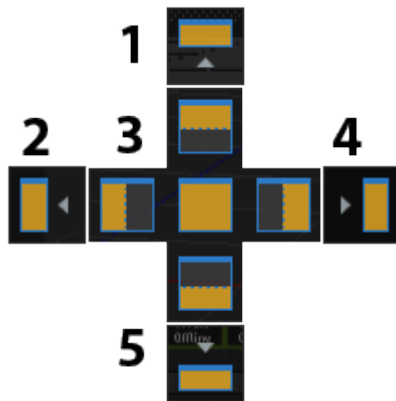
1. Dock top of screen
2. Dock left of screen
3. Split current window and dock (left, right, up, down)
4. Dock right of screen
5. Dock bottom of screen

Creating New Timelines

1. Open the Timeline window from the start page by pressing the button.

2. Click the 'New' button, the first in the top toolbar, to create a new timeline in the Timeline List.

3. Using the HippoNet PinTree expand Engine, then Mix 1 and finally select the layers you would like to include in this timeline. If there are more mixes required then select those as well to include them in the timeline. In the next window give the timeline a name.

4. In the Timeline List click the edit timeline button to open the editor. [Using the Timeline List](#)
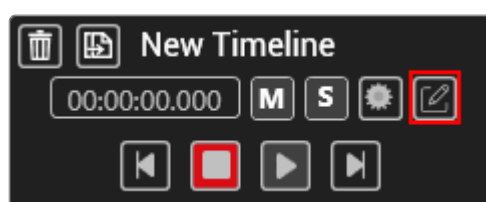
4. The timeline is now created and open in the editor. <u>Using the Editor</u>

Keyframing

Keyframes are the storing of data at a point within a track, as the playhead passes this position the data is recalled from the keyframe. Transitions, which dictate how the data value changes, are the connections between two keyframes. In Hippotizer if no keyframes are present in a track then whatever value is currently set for a Pin will stay the same, therefore it is important to set a default state at the beginning of a show or use keyframes to reset to a state at the start of a timeline.

Keyframes are shown in a child track with a circle and within a parent group track as a diamond. The diamond will show when a track within a group has a keyframe at this position.

Creating Keyframes

The two ways to create a keyframe in a track are:

- Using Edit Mode Add in the editor window to click a location within a track.
- Using the keyframe widget to create a keyframe at the playhead location.

Edit Mode Add

This tool is located in the editor toolbar and turns the cursor into a drawing tool for keyframe creation. Clicking anywhere within a track, in a timeline, will create a keyframe at that location. Using Edit Mode Add is a quick way to create multiple keyframes in quick succession and then editing the properties for these keyframes in the properties panel.

Keyframe Controller

The keyframe controller can be found on selected tracks or in the properties panel next to pin values. These controls allows selection of the previous or next keyframe, from current playhead location, using the left and right arrow keys. Alternatively, clicking the central square will create a keyframe at the playhead location. When a keyframe is present either before, after or at the current playhead location the corresponding control of the widget will be red. Using this tool to quickly navigate around keyframes in a single track quick and easy.

Keyframe Properties

Selecting a keyframe will open the keyframe properties in the properties panel. This panel is context sensitive to the type of keyframe selected. There are four types of data stored in keyframes, each will have a different properties panel display:

- Integer
- Float
- Boolean
- Mixed

These are determined by the pin data type stored in the keyframe. If the track represents a single Pin data type then either Integer, Float or Boolean properties controls will be displayed. There are some instances where a single keyframe contains multiple data types within it. An example of this would be the Media Player keyframe.

The properties available to the Integer, Float and Boolean keyframes include nudge in steps, time, pin value(Data can be a boolean, float or integer value) and a lock.
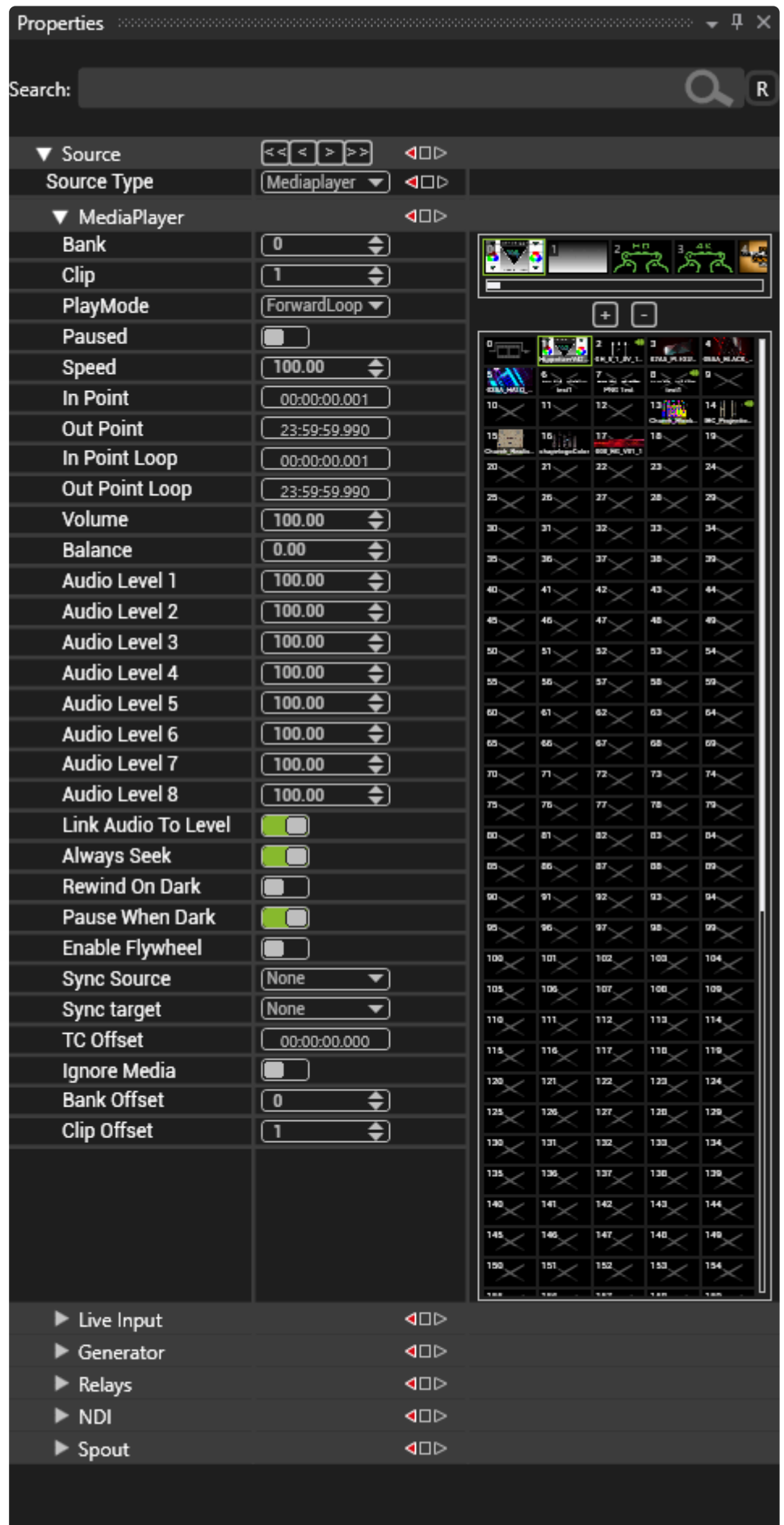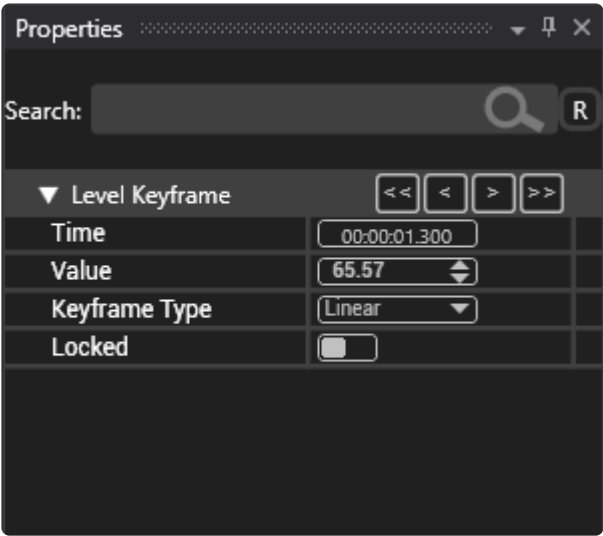
Nudge in steps

Using the steps measurement (Changeable in the editor toolbar) to nudge at increments of x1 or x5.

Timecode

The time that the keyframe is located in the timeline.

Pin Value
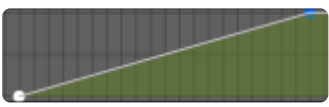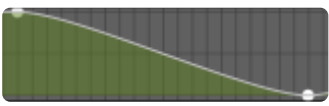
The value can be displayed as a number value, a list or a toggle.

Lock

Lock restricts editing of this keyframe until unlocked.

Transition Type

The type field is available to keyframe with solely float type pin data stored. The transition is a change in data values between two keyframes expressed as a line. To alter a transition type you must change the value in the end keyframe, for example if a transition is between keyframe A and keyframe B and you wish to change to a snap transition then you must change the value in keyframe B's properties panel. The three types of transition are linear, snap and curve.

Linear	A straight line between two points	
Curve	A slow attack and release line between to points	
Snap	A instant change from previous to next value	

Floating Keyframes
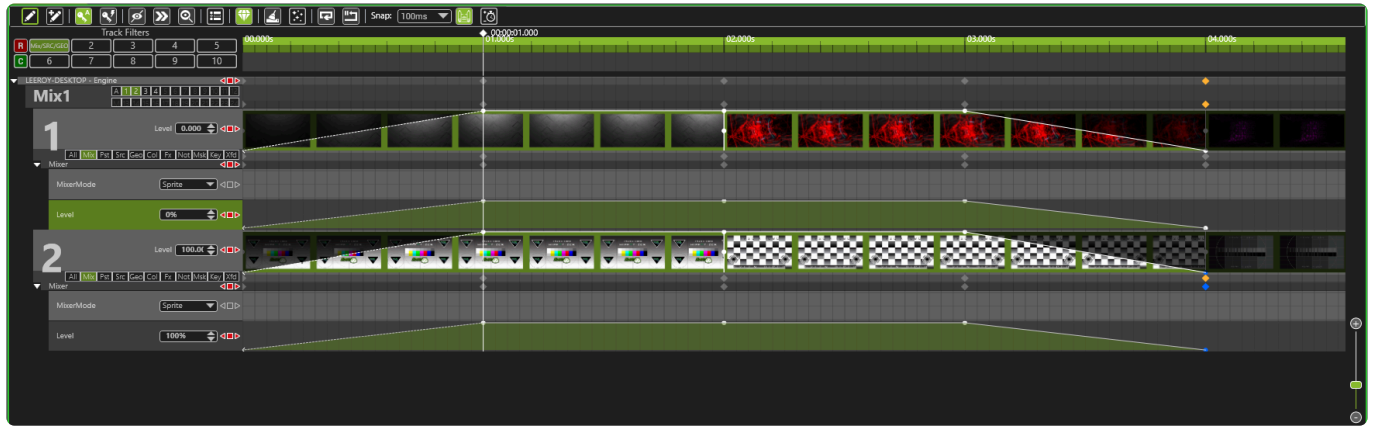
A unique keyframe type that transitions from the current pin value to the upcoming value over a period of time, calculated from the position of the playhead until the next keyframe. This type of keyframe can only be applied to tracks which control float pins. Consecutive floating keyframes still function normally, it is only when the user has skipped to a floating keyframe that the transition will be applied. These keyframes offer flexibility for switching between multiple timelines.

Floating keyframes icon is different from a standard keyframe. It is instead shown as a cross followed by a dashed transient.

Including a floating keyframe at the start of a new timeline is a great way to ensure that when swapping between timeline there is not a snap from current to new values

Using Presets in a Timeline
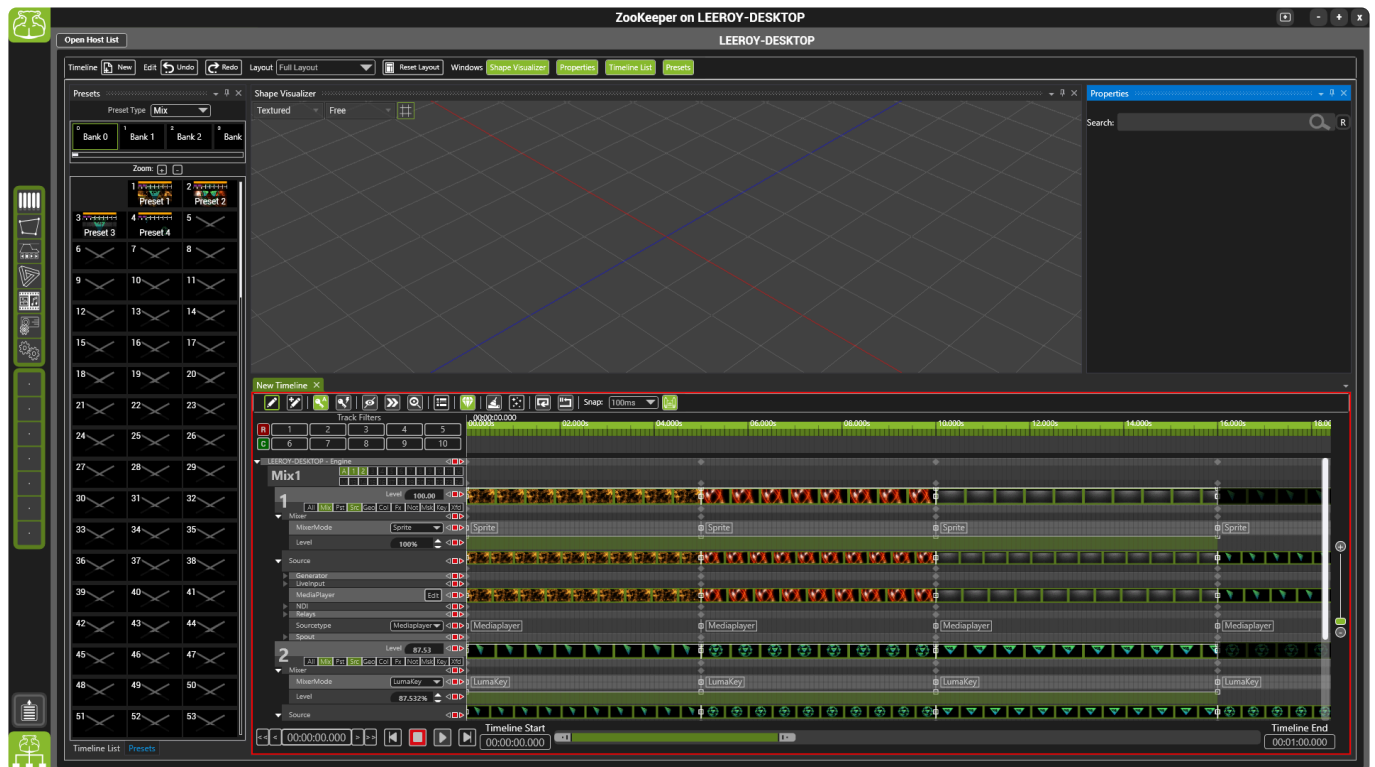
Preset Timelines

The Preset timeline functions by allowing the user to drag a preset on a track to automatically create keyframes that are locked to the pin data stored in the preset. The benefit of this system is being able to retroactively edit presets which will automatically update the preset keyframes in a timeline.

Drag and Drop Editing

To add a preset to a timeline drag from the preset manager into the editor. Dragging onto a track will include the pins for the parent and all child tracks. To drag a preset for an entire mix into the editor you must drop the preset onto the mix track. This will add all of the preset keyframes stored into the parent mix and child layers.

Preset Keyframes

Preset keyframes are shown as a a hollow square rather than a normal keyframe icon (See Image above). These types of keyframes can not be edited unless detached from the preset. If a keyframe is detached from a preset it will not be updated by any changes to the preset. To detach a keyframe from a preset right click and select 'Detach From Preset'.

[For steps on creating and editing existing presets please look here](#)

Controlling Timeline+

MultiController action mappings for TimelinePlus control are available, these include:

- Play – Starts playing the timeline from the playhead position.
- Pause – Stops the timeline at playhead location can be resume with a play command.
- Stop – Stops the timeline and returns playhead to the start.
- Go to cue – Jumps a timeline to a cue position and starts playing.
- Mute – The timeline is no longer active and will not affect and pin data
- Un-Mute – If muted the timeline will now resume active control of pins.

[For more information on multicontroller please refer here](#)

The macromanager syntax for recalling a cue in a timeline is as follows:

HippoNet.LocalHost.TimelinePlus.Timelines['New Timeline']:GoCue(2,"Play")

'New Timeline' can be substituted with the name of any timeline and acts as the timeline selector.

The 'GoCue(2,"Play")' command will set the playhead to the position of the chosen cue, in this case cue 2 and then run the playmode.

> ✻ For further assistance using the Macromanager please contact customer support.

Controlling Timeline from DMX

DMX control is used to select and control individual timelines either through the recall of Cues in a timeline or through playmode actions of a timeline.

Timelines can be triggered from DMX using a built in personality. For charts and channel explanations please refer [here](#)

Timeline+ Syntax

Master Timelines

A timeline can be created to call upon other timelines using the 'RemoteControlCommand' pin in the PinTree. This pin is located at 'TimelinePlus/TimelinePlus/RemoteControlCommand'. A keyframe in this track will store a string which can be used to recall commands relative to timeline IDs.

```
TIERRA+ MK2
  ● ■ Engine
  ● ■ LED & Fan
  ● ■ OutputManager
  ● ■ PresetManager
  ● ■ TimeLinePlus
  ─ □ TimelinePlus
       ■ ActiveTimeline
  + ■ Data
       ✓ RemoteControlCommand
  ● ■ Zookeeper
```
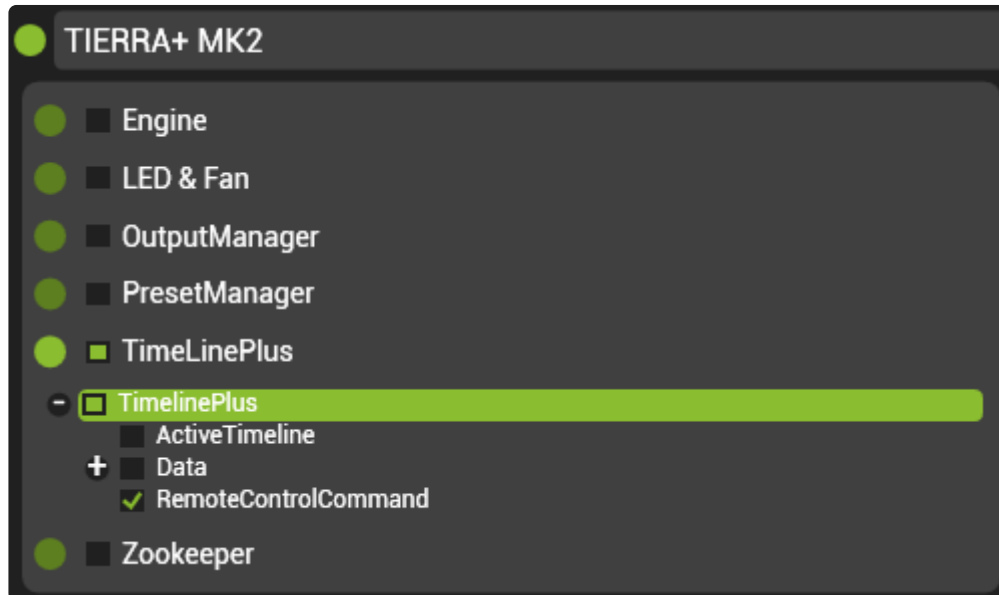
The following is a list of commands and their syntax:

Command	String (# = Timeline ID)	Description	Example
Play	#->Play	Plays timeline with ID #	1->Play
Pause	#->Pause	Pause timeline with ID #	1->Pause
Stop	#->Stop	Stops timeline with ID #	1->Stop
Mute	#->Mute	Mute timeline with ID #	1-> Mute
Unmute	#->Unmute	Unmute timeline with ID #	1->Unmute
Go Cue	#->GoCue([Cue#*1000])	Go to cue number in timeline with ID #	1->GoCue(1500)
Reset	#->Reset	Rewind timeline with ID # to the start	1->Reset
Go To Next Cue	#->GoNextCue	Skip timeline with ID # to the next cue after the playhead position	1->GoNextCue
Go To Previous Cue	#->GoPreviousCue	Skip timeline with ID # to the previous cue before the playhead position	1->GoPreviousCue

Force Update	#->ForceUpdate	Force current pin values to those stored in playhead position within a specific timeline	1->ForceUpdate

Global Timeline Identifiers

'All' Keyword

The 'All' keyword can be used to replace the timeline ID #, this keyword applies to all timelines within the Timline+ component. The All keyword can be used with any of the commands stated in the table above.

Example:

Command	String	Description	Example
Play	All->Play	Plays all timelines	All->Play

Exclusion Syntax

An exclusionary statement can be entered in place of the timeline ID #, the syntax for this is the ID within parentheses (#).

Example:

Command	String (# = Timeline ID)	Description	Example
Play	(#)->Play	Plays all timelines excluding timeline ID 1	(1)->Play

Preset Timelines

Preset timelines offer a simplified interface for sequencing the playback of presets configured in the mixes page. Presets in a timeline remain updated by the preset manager and therefore retroactively change to any preset updates. Create a preset timeline by selecting the 'Create PTL' button in the Timeline+ component.
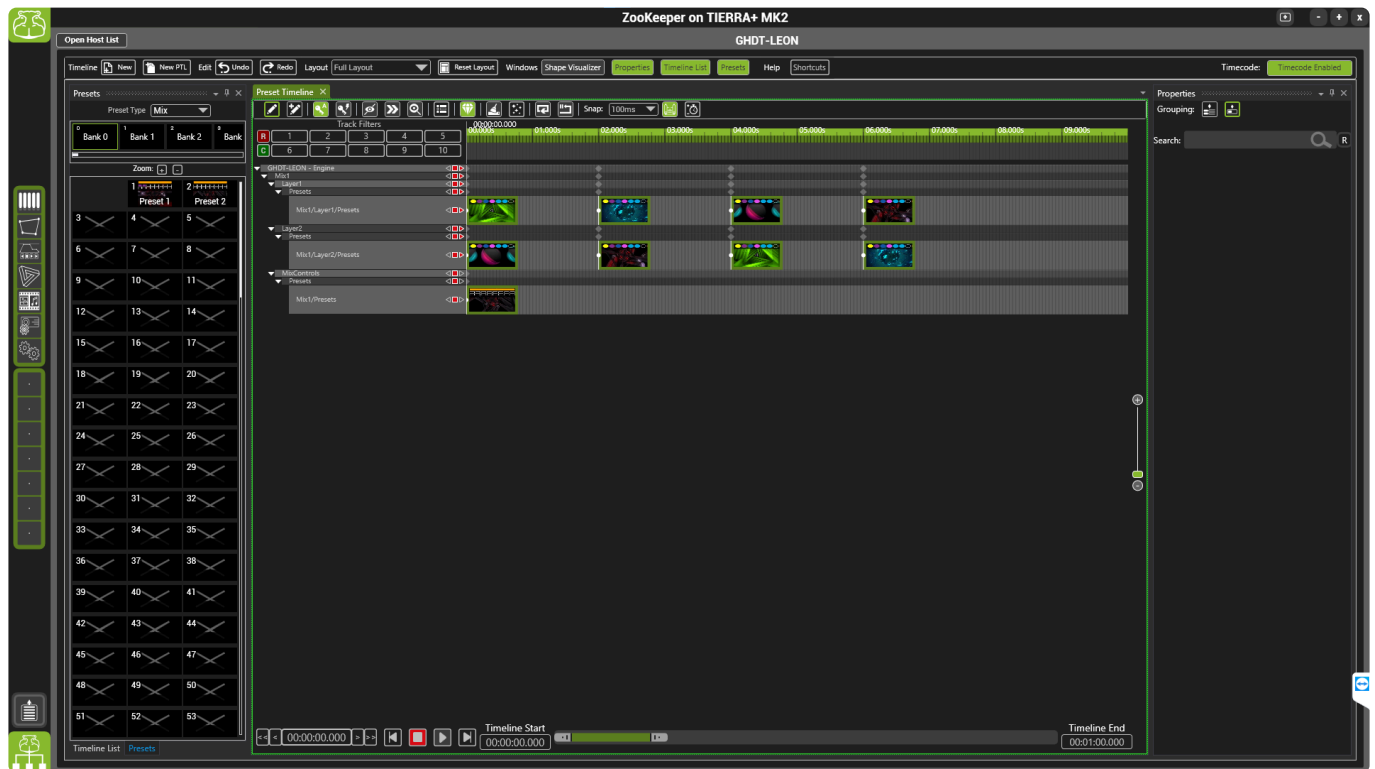
Adding Presets

You can either drag and drop presets from the Presets window of Timeline+ into the timeline editor, or create a keyframe and select the bank and slot in keyframe properties.

All instances of presets can be applied to the timeline on the corresponding track. Each of the thumbnails for a preset show the categories that are stored in the preset.

Fade can be applied when loading a preset by selecting the type of fade and length of time in the key frame properties panel.

Timeline

Timeline allows a Hippotizer V4 to save and playback complex shows across the Hippotizer network. Timeline programming is a skill and the best method depends on how it will be used. The basics of timelines and their use are covered here while the nuances of advanced timeline programming are beyond the scope of this manual; for additional information please contact Green Hippo for training.

Starting Timeline

Timeline is a component, to use it start the component.

Basic Component Layout
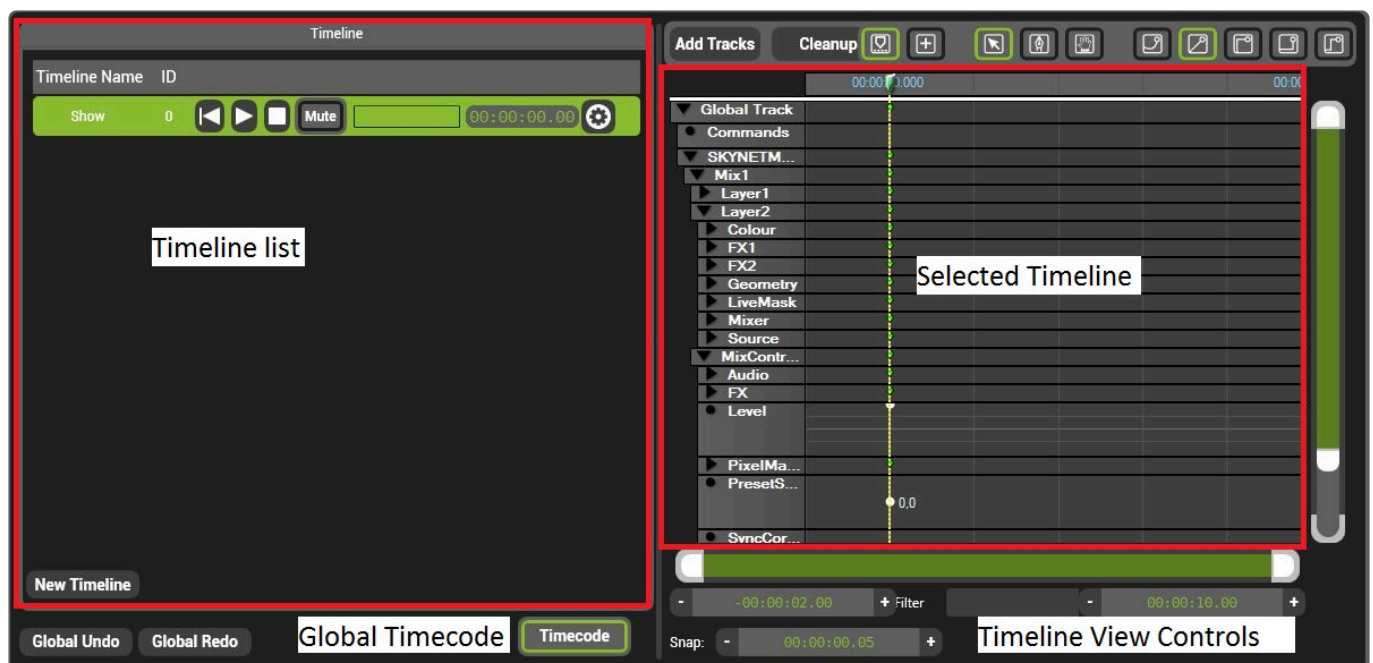
Timeline List

All timelines on the system are shown here. They can be ordered by index or name.

Selected Timeline

Shows the detail of the timeline selected in the timeline list.

Global Timecode

Enables / Disables timecode going to all timelines

Timeline View Controls

View Bar
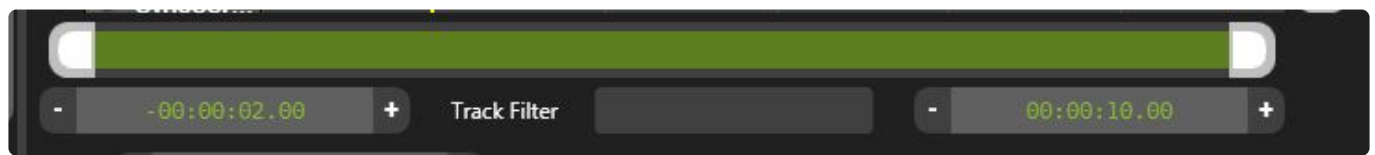
The view in the selected timeline window extends from the two times shown.

Track Filter

Will only show the tracks matching words in the filter. To see **mixer/level** type `level` and the timeline will show only tracks with level in the name.

Creating a new Timeline

Timelines control pins: the first step in making a Timeline is to choose which pins to control.
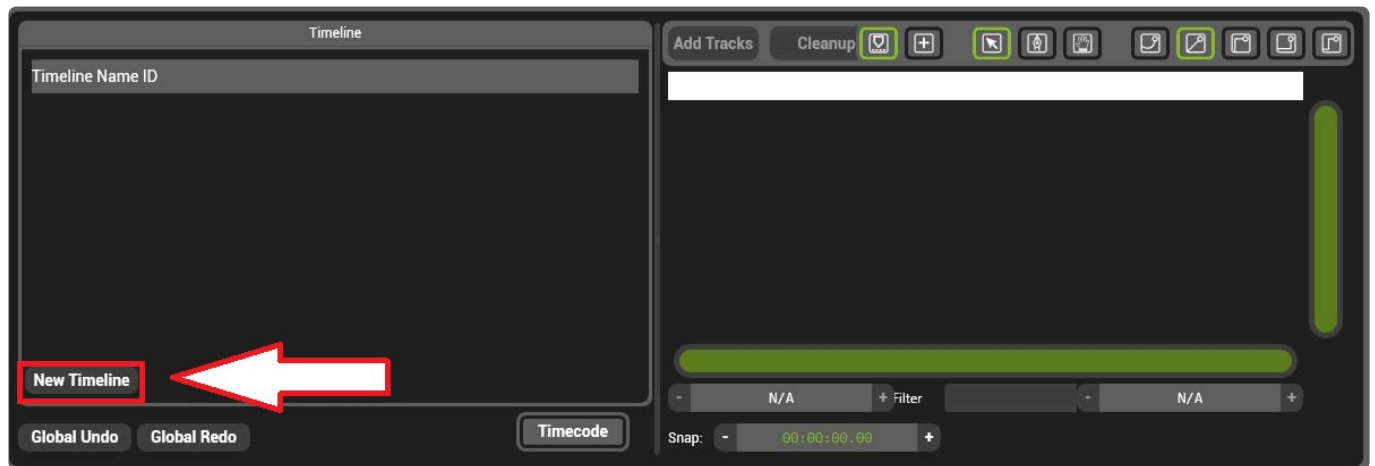
Click **New Timeline** to create a Timeline.

A Pin Selector Window will open

The pin tree will show all local and networked Hippotizer systems, expand the groups to select desired pins.

 Groups that have had all child pins selected are shown ticked.

 Groups that have some but not all child pins are show with a square.

Once all desired pins have been selected click OK to create the timeline and name it.

Timeline Structure
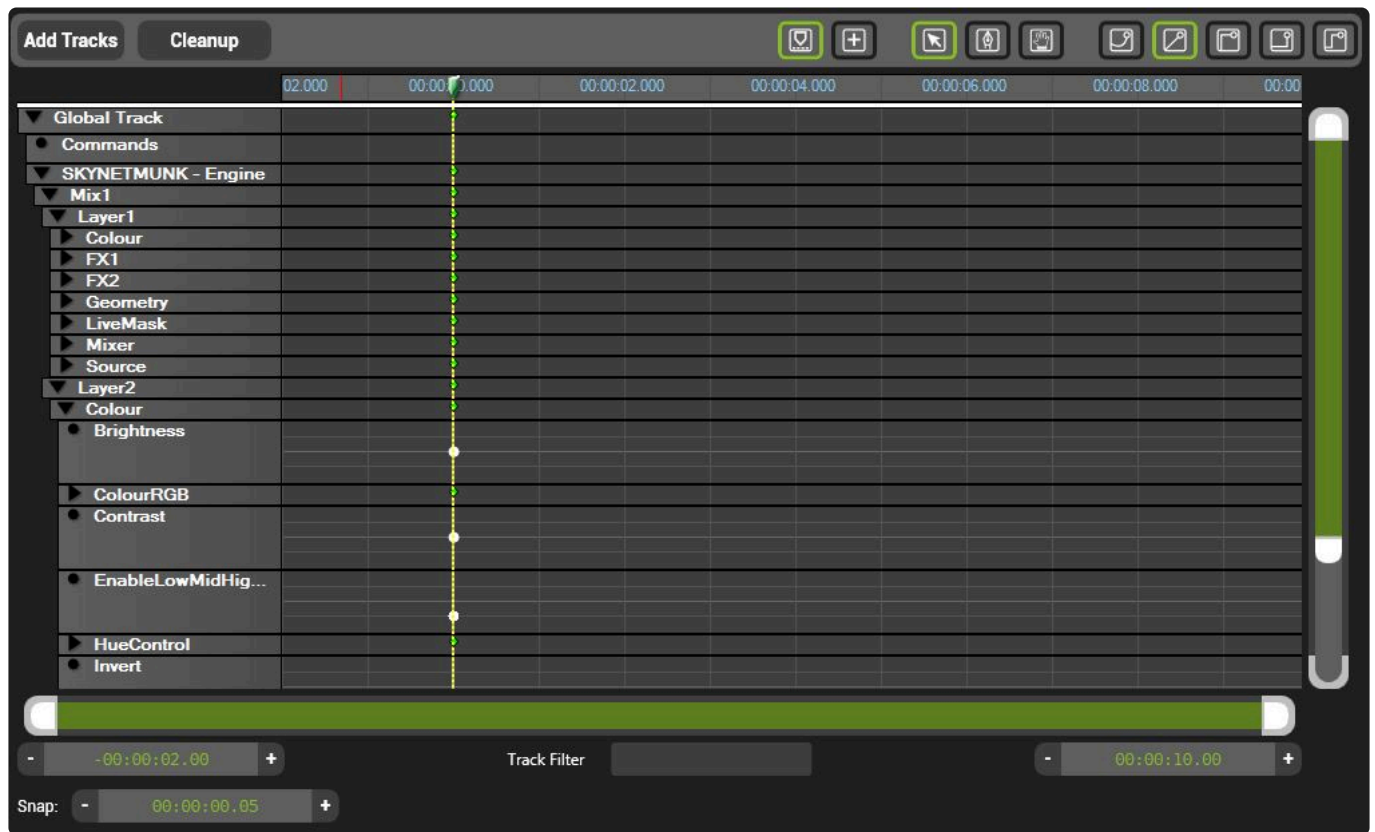
The Timeline window is comprised of a series of controls around the tracks window.

Basic Timeline Controls

Scrolls the timeline view to keep the play head in view

Opens the insert timeline dialogue to embed one timeline into another. Timelines can also be dragged from the timeline list into the Global Track to embed them.

Sets the mouse to allow selecting of nodes or groups of nodes.

Sets the mouse to add values to a track with a single click. Pressing **ALT** will temporarily set insert mode.

Sets the mouse to scroll the view by left clicking and dragging.

Transition controls

The transition between two points on a float pin's track can be set in different ways.

> **Note:** Only float pins (those going from 0-1) can be faded, other pin types such as integers do not fade.

 Creates a curve between two points in a track. The Spline's curve is controlled by modifying the red Spline bar.
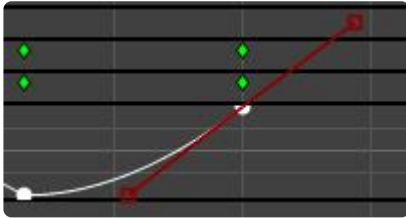
 Linearly fades between the two points.

 Snaps from the first value to the second value immediately
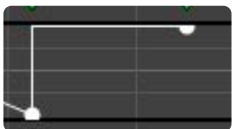
 Snaps from the first value to the second value at the second value.
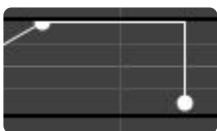
 Snaps from the first value to the second value at the centre point between the two values.

Track Filter

The timeline will show all tracks inside of it by default. For larger timelines this can prove daunting. To temporarily hide tracks, type a filter into the **Track Filter** box. The filter will hide all pins that do not match the filter text.
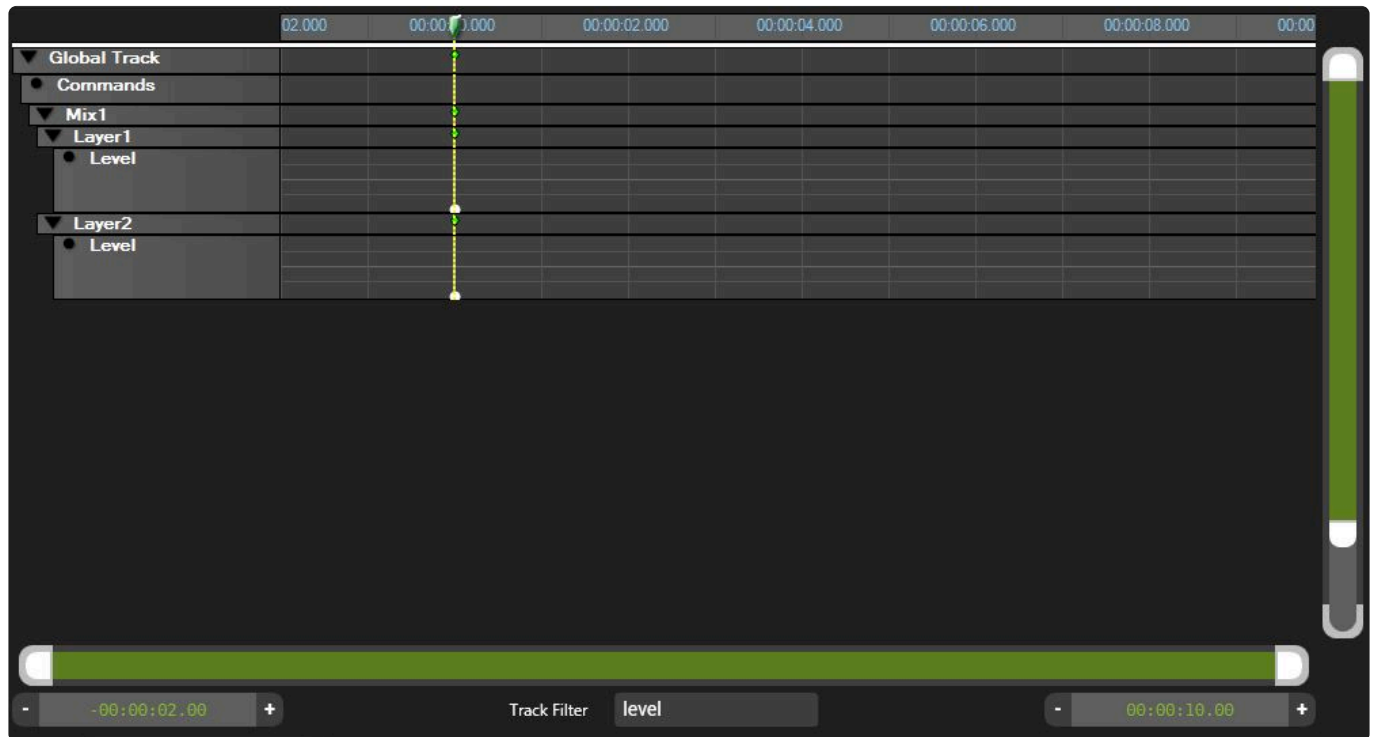
Global Track

The Global contains any timelines that are embedded into the current timeline.

To embed timelines either drag the timeline to be nested into the global track of the current timeline or

select the Insert Timeline button.

Command Track

The command track controls how the timeline is played.

To create a command, select insert mode (or press the ALT key) and click in the command track where the desired command should be placed.

New commands will be created matching the command before them, or as blank commands if no commands are before them.

Event takes no action

Stops the play head at the action. Pressing Play again resumes the timeline.

The Play head will jump from the command to either the beginning of the timeline or another event command cue.

Set command types and edit them by right clicking on them:
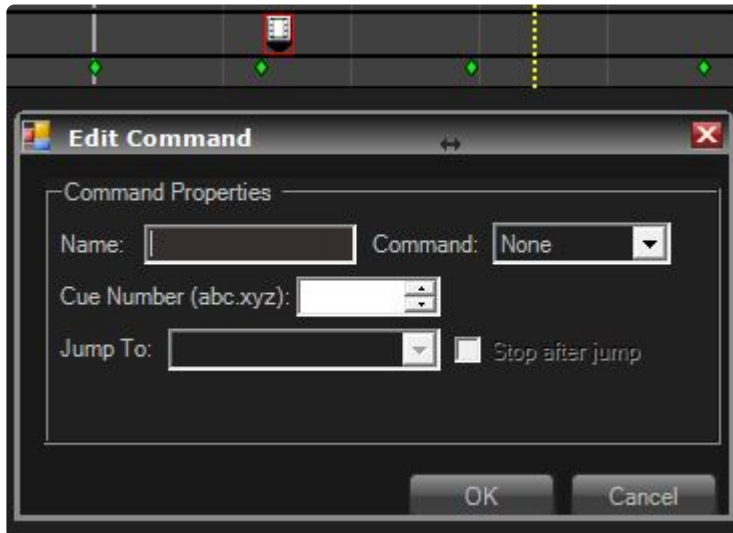
Jump (1) A jump command that has been named 'Jump' and given the cue number 1.

Cue Number

Cue numbers are a way to segment a timeline for recall and transport control. Cue numbers must use unique numbers within a single timeline. The Cue number is used by DMX component and Multicontroller for recalling specific segments ready for playback.

Control of Timelines

Timeline can be controlled from several sources.

- [Triggering from another timeline](#)
- [Controlling from Zookeeper](#)

Triggering from another timeline

Timelines can be triggered in different ways from either a remote device such as a DMX lighting desk or locally from Zookeeper. Timelines can also trigger other timelines.

Triggering a timeline from another timeline.

The timeline component contains a String Pin: **RemoteControlCommand** this pin receives commands for all timelines on it's timeline component.

Add this pin to a timeline to trigger other timelines.

To add a command:

- Add a point on the remote control track at the desired position. (ALT + Left Mouse Click is a quick way).
- Right click on the point and choose the blank field:
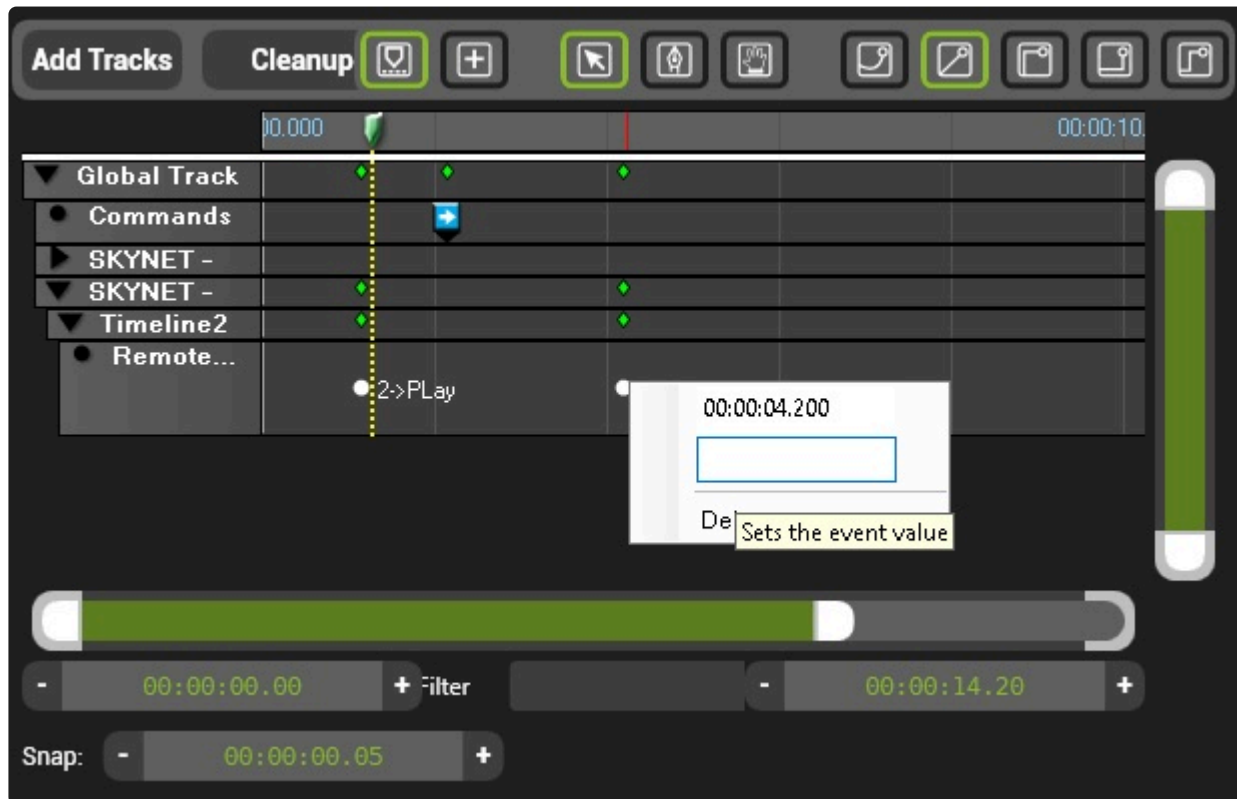
- Type in the command.

Remote control pin Syntax:

Play Timeline

Plays a timeline referenced by the timeline ID.

```
2->Play
```

Stop Timeline

Stops a timeline referenced by the timeline ID.

```
2->Stop
```

Pause Timeline

Pauses a timeline referenced by the timeline ID

```
2->Pause
```

Go to a Cue

Moves timeline playhead to the designated cue number. Cue numbers are referenced with three trailing zeros. So cue 1 is shown as cue 1000. Cue 1.001 would be 1001.

```
2->GoCue(1000)
```

Muting a timeline

Mutes the target timeline (1 in the example)

```
1->Mute
```

UnMutes the target timeline (3 in the example)

```
3->UnMute
```

Controlling from Zookeeper

Timelines can be triggered and controlled from inside the Timeline window in one of three ways.

- Playback Controls
- Timeline Button View
- Inline controls

Playback controls

The basic playback controls are shown in the timeline component interface.

Resets the timeline. The play head is sent to 00:00:00.000

Plays the timeline from the current play head position

Pauses the timeline leaving the play head at the current position. If the play head is scrubbed when the timeline is paused, all changes the play head encounters while moving will be applied.

Stops the timeline leaving the play head at the current position. If the play head is scrubbed when the timeline is stopped, changes the play head encounters are not applied.

Mutes the timeline the timeline will not affect any pins while muted.

Shows the progress of the timeline as a proportion of the overall length and also the play head location.

Timeline Attributes

Each timeline also has a Name, and ID number. The name is a non-unique identification that is used only for the user interface. While the ID is used by multicontroller and DMX to remotely trigger the timeline.

> ! Changing the timeline ID number will render existing multicontroller actions referencing that timeline inoperable. It is best to set the ID of a timeline then create actions

referencing it.

Controlling a timeline from within the editor

The timeline play head can be started and stopped from within the editor by pressing space bar when the window is selected.

To select the timeline window left click into it.

Controlling Timelines from DMX

Timelines can be triggered from DMX

The DMX personality for timeline is included in the DMX component. The profile uses four channels to trigger timelines and cues.

Function	DMX	DMX (16bit)	Default	Range	Notes
Timeline Select	1		0	0 – 255	
				0	No Timeline Selected
				255	Timeline 255 Seclected
Playback Command	2		0	0-9	Nothing
				10-19	Play
				20-29	Pause
				30-39	Stop
				40-49	GoCue and Play
				50-59	Go Cue and Pause
Recall Cues Command	3	4	0	0-65535	Recall Cues
				0	Recall Cue 0.00
				100	Recall Cue 1.00
				65535	Recall Cue 655.35

Video Mapper

Video Mapper converts an input texture to an output texture pixel accurately, often used to map LED walls.

- [Creating a Video Map](#)
- [Properties of a Video Map](#)
- [Adding Tiles](#)
- [Properties of a Tile](#)
- [Viewport Controls](#)
- [CSV Import](#)
- [Colour Blocks](#)
- [Video Map Configuration](#)
- [Video Map Settings](#)
- [Videomapper on Layer](#)

Creating a Video Map
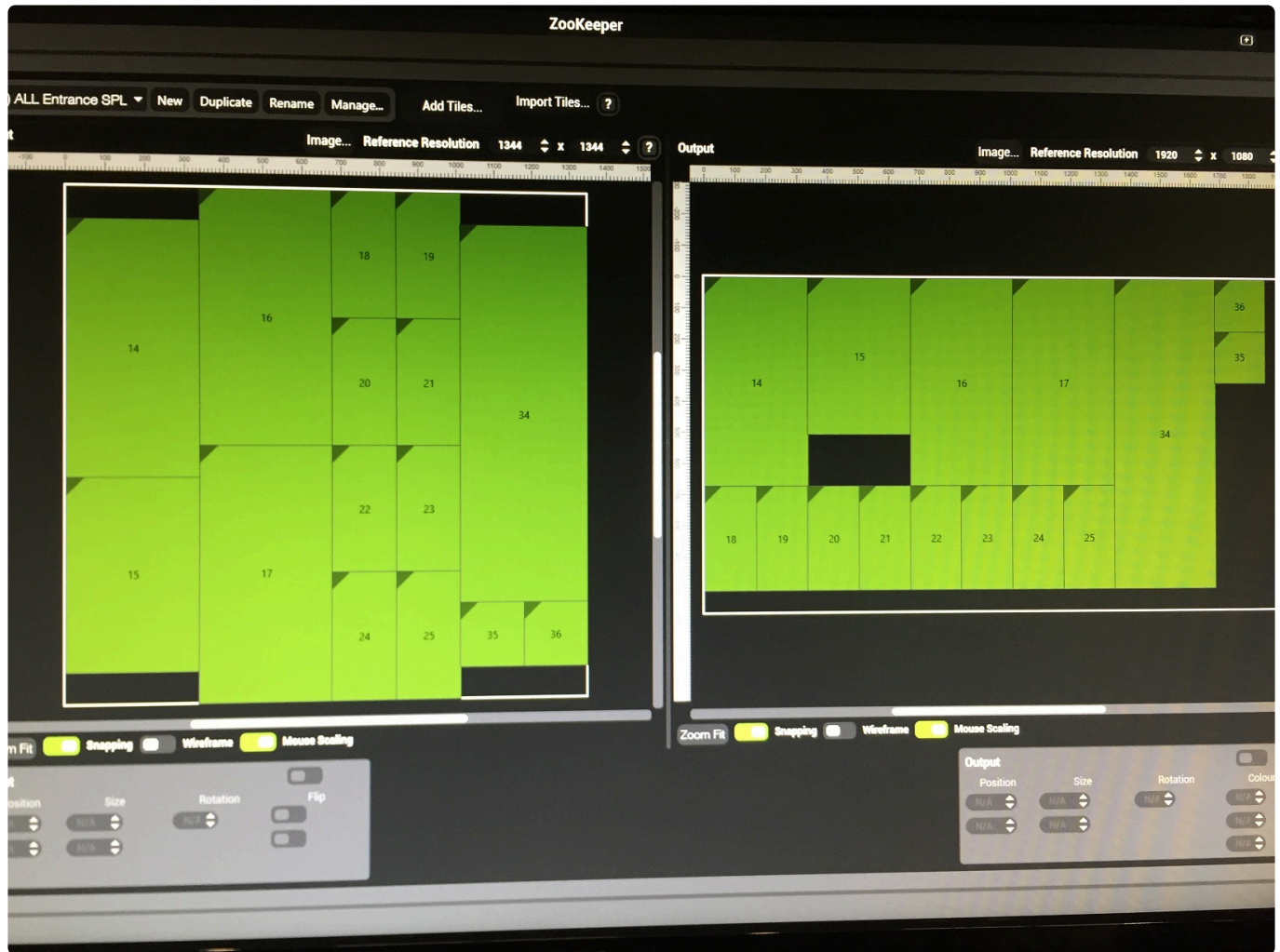
Starting Video Mapper

Video Mapper is a component and must be started in order to function:

Starting a Component

Basic Structure

Video Mapper is comprised of two parts; the interface and viewport controls.

- The interface is used to create and edit video maps. The interface must be added to a pin board.

- Viewport controls are used to assign videomaps to viewport(s) and are part of the viewport controls by default.

Adding the interface to a Pin Board.

Once the component has been started, it will appear in the Pin Tree.

Drag the Video Mapper component onto a blank Pin Board 'grabbing' it by the circle next to the name.
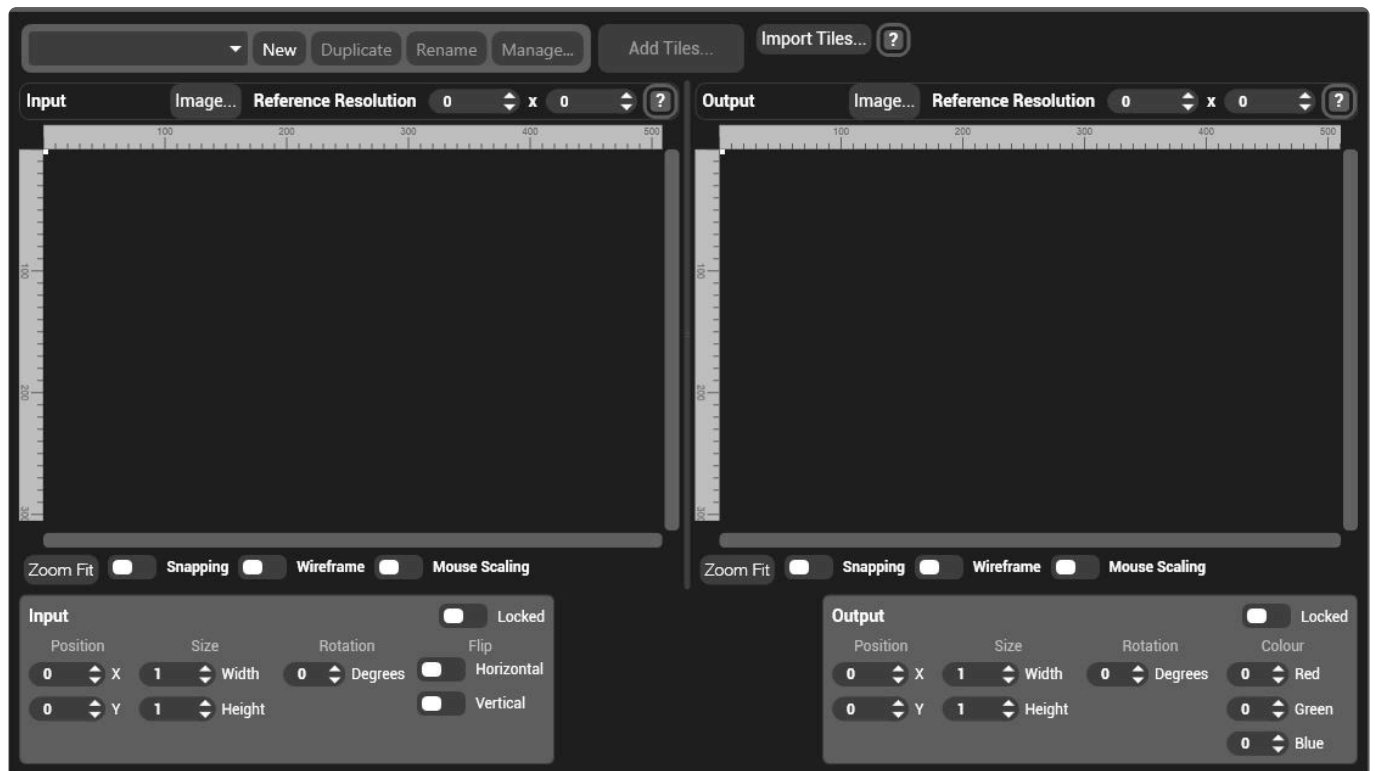
Select **New** in the top bar of the Video Mapper interface to create a map and name it.
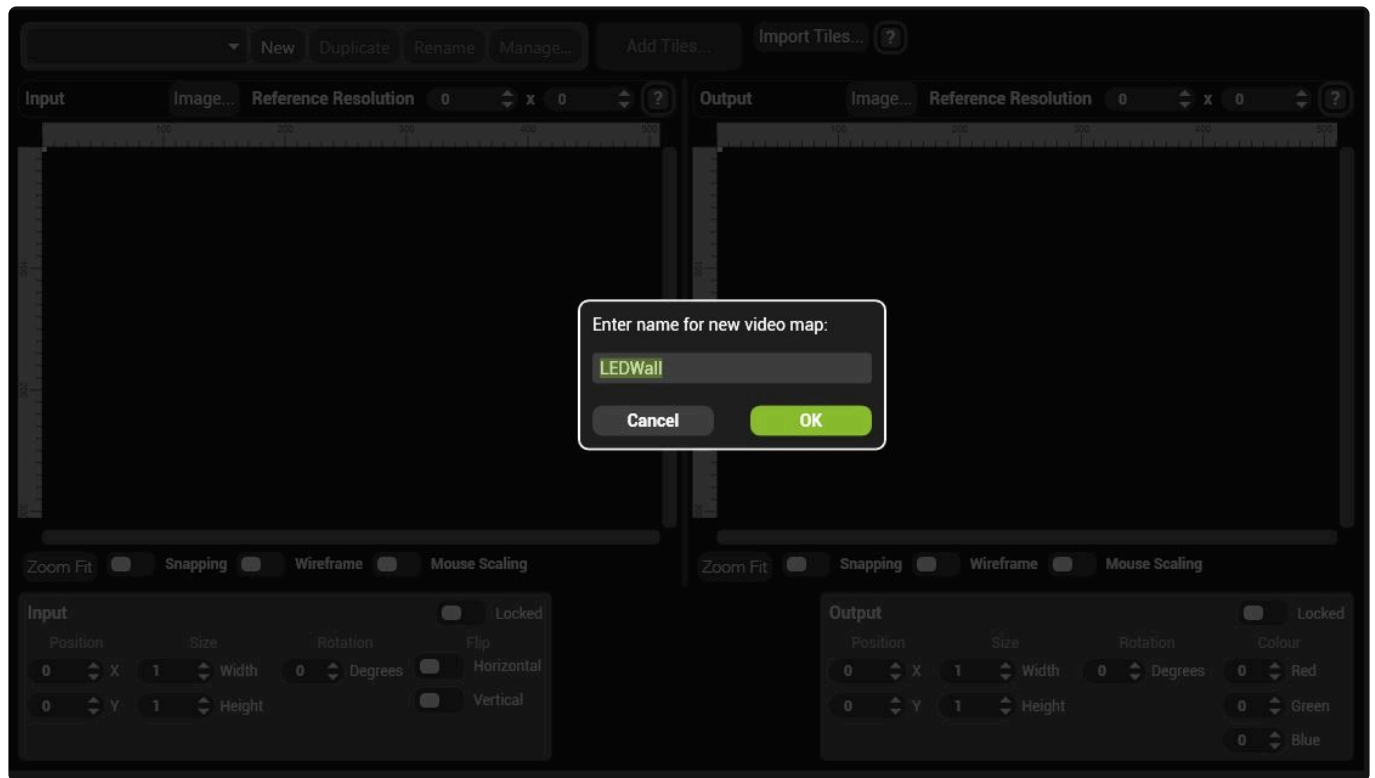
Note: The name of a Video Map does not need to be unique and can be changed later.

Once created, editing a video map has several steps:

- Adding Tiles
- Properties of a Video Map
- CSV Import

Properties of a Video Map

A video map has a set of properties that are to aid drawing and manipulating the map
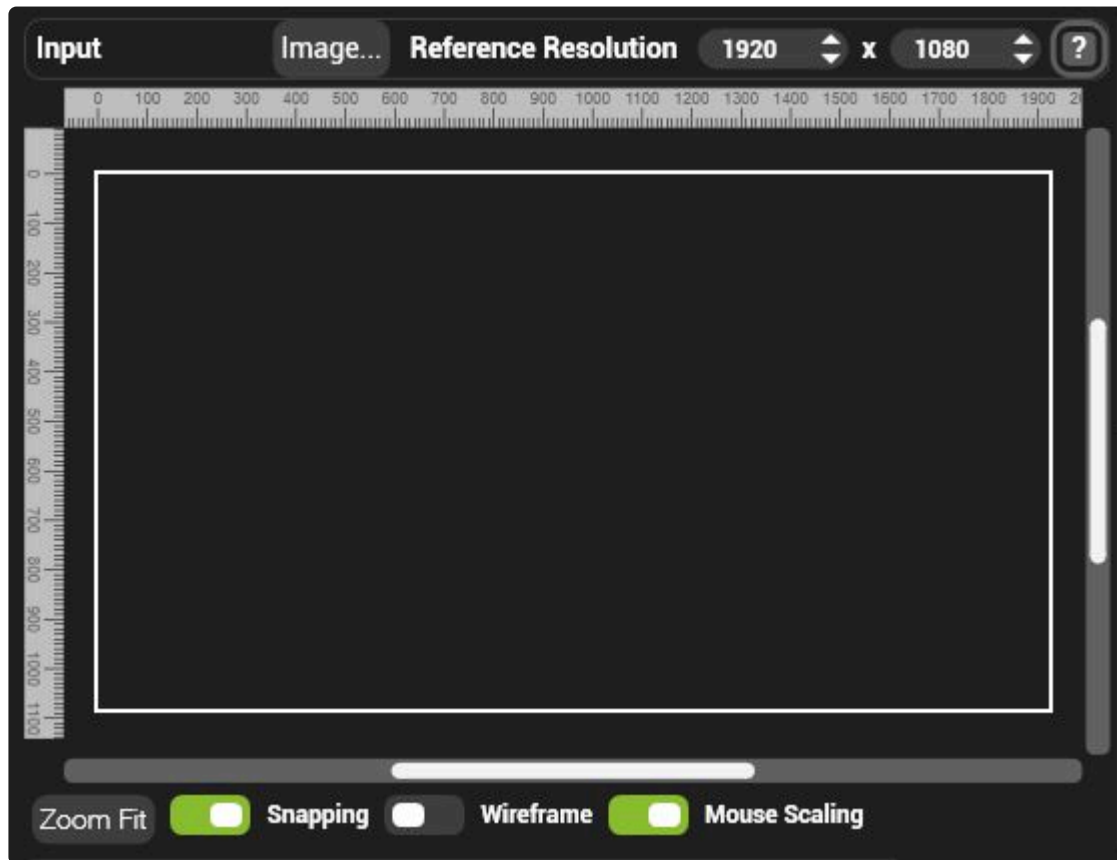
Image…

Allows a background image to be placed on the video map

Reference Resolution

Video maps do not have an intrinsic resolution; they use the resolution of the Mix and Viewport to which they are assigned. The **Reference Resolution** simply provides guide lines to aid with placing tiles.

> **Note:** As of version 4.2 Each video map is limited to 8192 × 8192 Pixels to allow for improved anti-aliasing.

Zoom Fit

Shows the entire video map

Snapping

When enabled, tiles will automatically move to abut one another when placed close together.

> **Note:** Snapping can cause undesired behavior if small gaps are required between tiles. In this case it is

best to disable snapping.

Wireframe

Tiles are rendered as a clear box (better if a background image is present).

Mouse Scaling

When enabled, tiles can be dragged larger or smaller with the mouse.

Adding Tiles

A Video Map is comprised of tiles. A tile normally corresponds to the resolution of a video wall panel.

To create tiles, use the Add Tiles Dialogue.
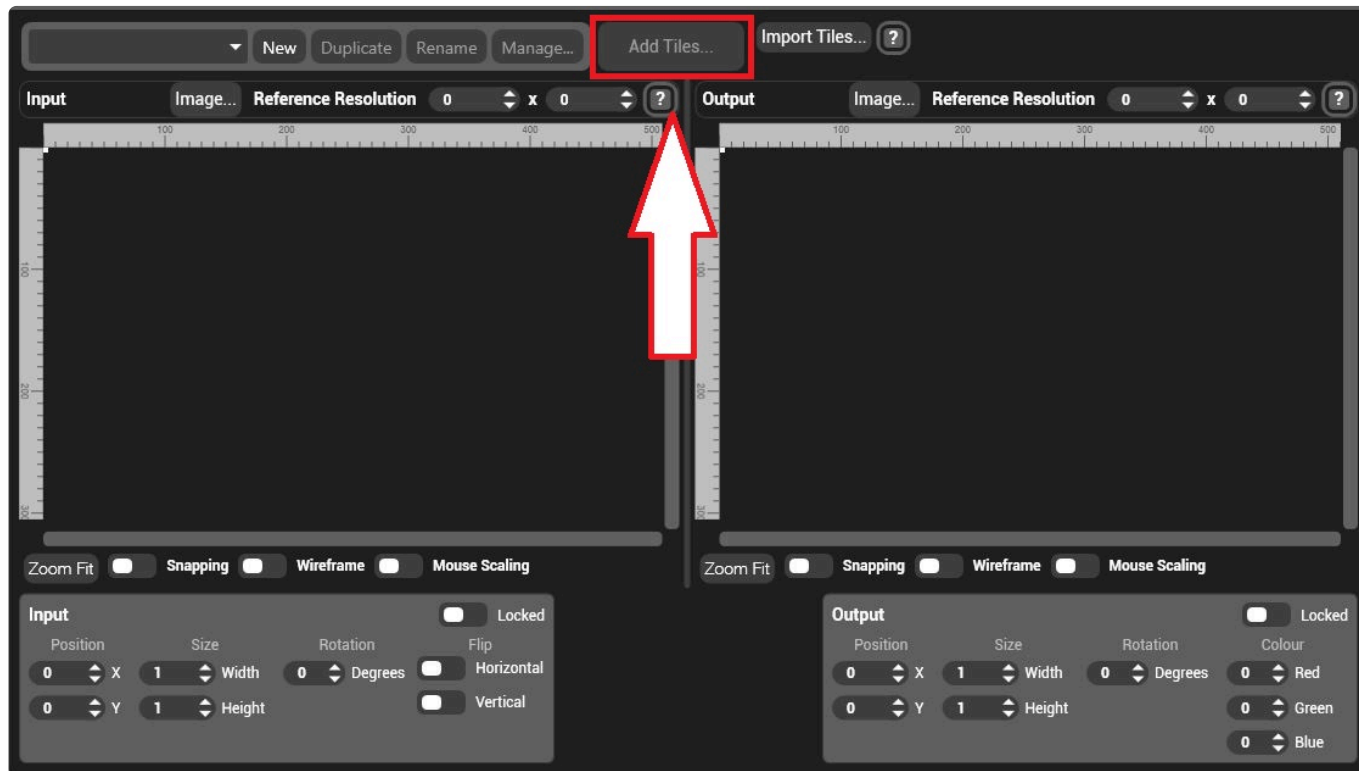
Tile Width and Height

The size in pixels of the tiles to be created

Layout

The number of tiles to be created. By default, new tiles are created in a grid with a number of rows and columns. Tiles can be re-arranged after they are created.

Position

The location of the top left corner of the array of tiles

Numbering

The starting number of the tiles. By default this is the next available number.
The numbering can be set **Left To Right** or **Top to Bottom**:

Left to Right

Number starting at the top left corner and works to the right increasing along the row. At the end of a row, the numbering jumps to the next row down.

Top to Bottom

Numbering starts at the top left and travels down each column before shifting one row right and moving down again.

Allow Overlaps

When enabled, two tiles may have the same Colour blocks index.

Once added, tiles can be arranged by dragging them or by setting the position in the tile properties.
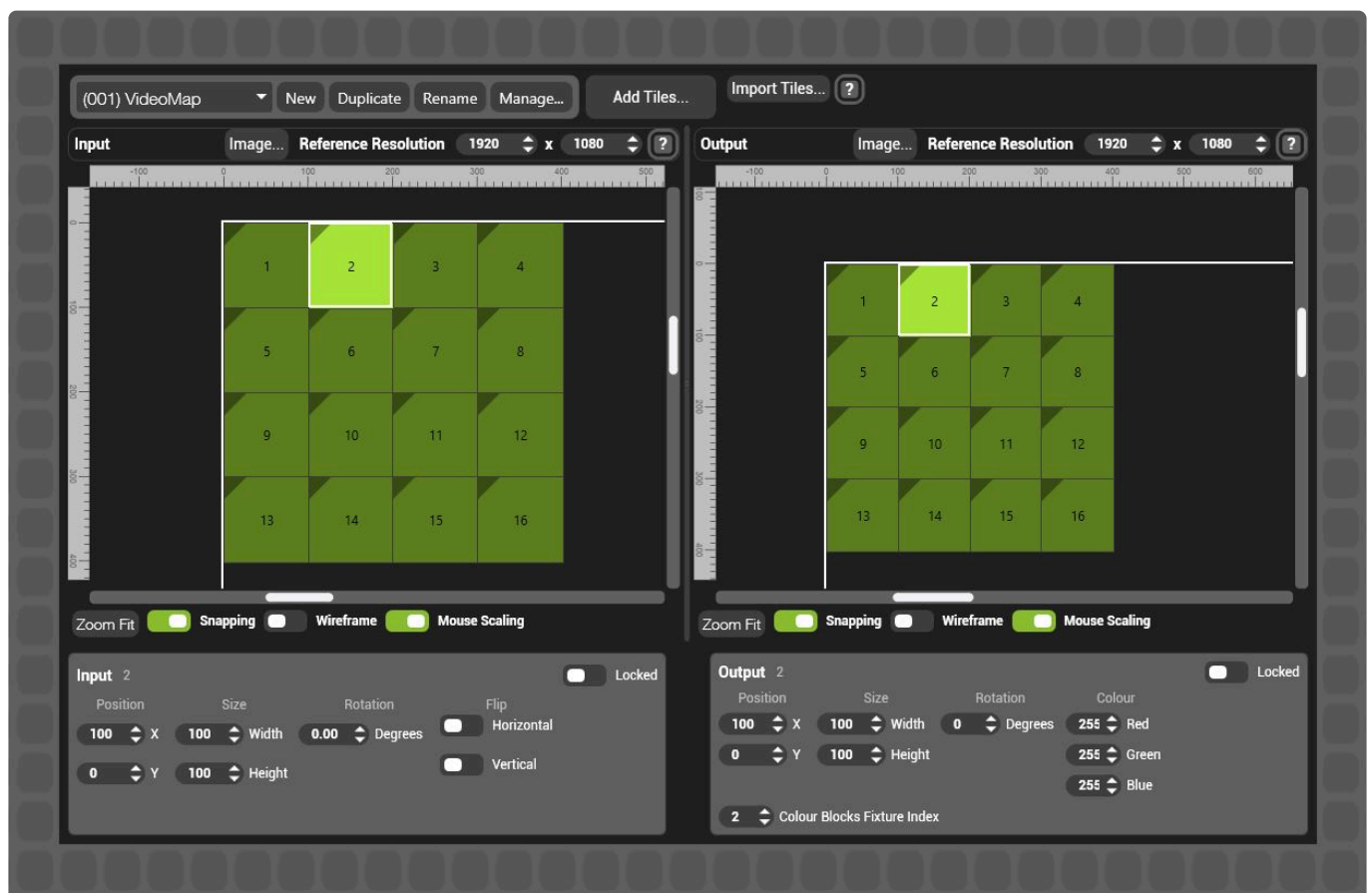
Properties of a Tile

Each video map tile represents a section of pixels that are transposed from input to output.
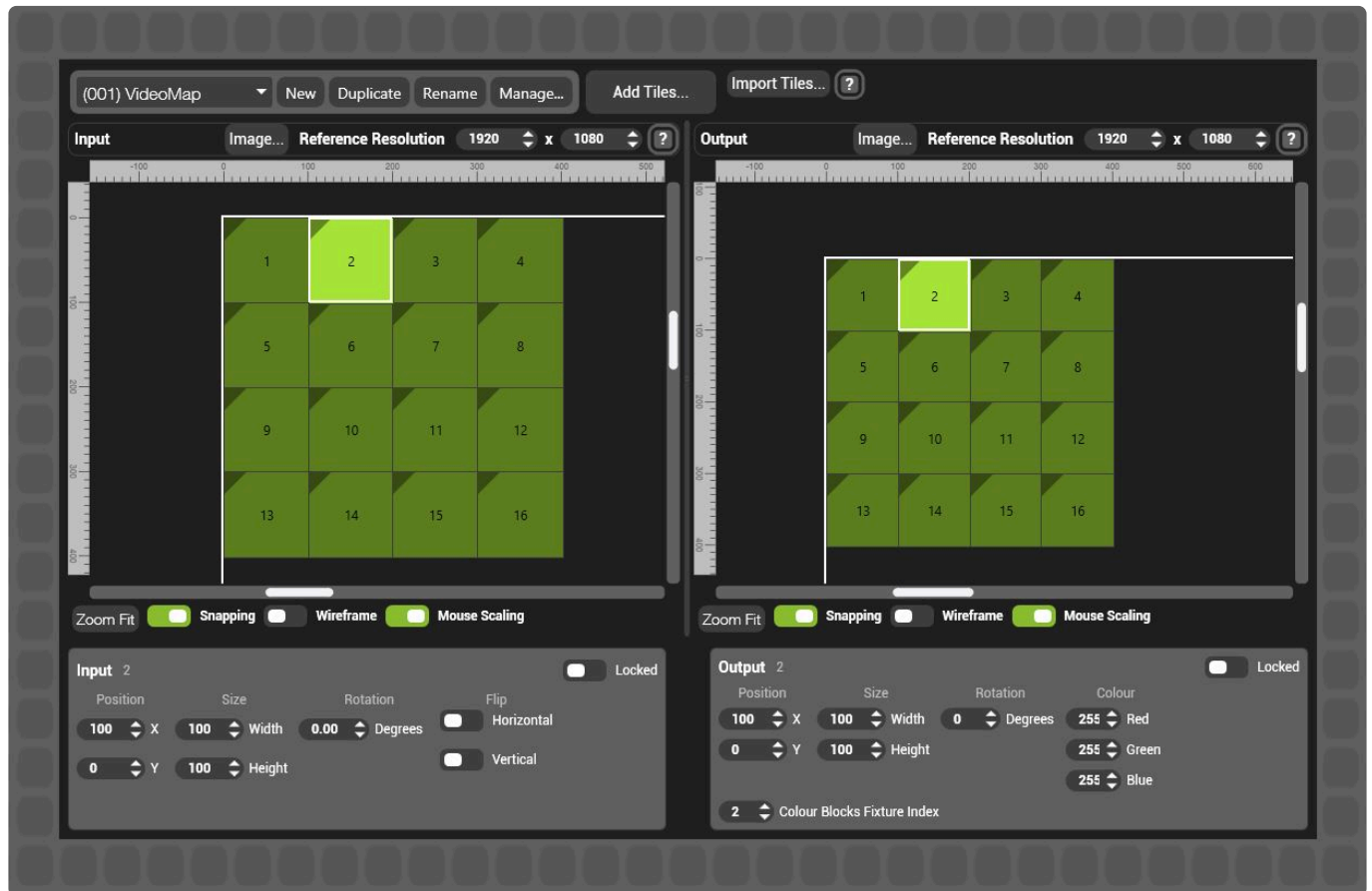
Each tile exists on the input and on the output of a video map.

Input Tile Properties

The input video map is often drawn to match the physical setup of LED tiles or displays.

Position

The location in pixel space of the top left corner of the tile.

Size

The size in pixels of the input tile

Rotation

The rotation in degrees of the tile.

> **Note:** The position of a rotated tile can be confusing. The position of a tile is always referenced to the location of the top left corner of that tile if it was not rotated.

Locked

Protects the tile from being edited.

Flip

Mirrors the image on the tile about the Horizontal or Vertical axis.

Output Tile Properties

The output video map is frequently drawn to match the content's layout

Position

The location in pixel space of the top left corner of the tile.

Size

The size in pixels of the output tile.

The output tile can be a different size than the input, Videomapper will scale in this instance. If a pixel-accurate pipeline is desired then the input and output tiles must be the same size.

Rotation

The rotation in degrees of the tile.

> **Note:** Input tiles can be rotated to any angle. Output Tiles can only be rotated in increments of 90 degrees.

Locked

Protects the tile from being edited.

Colour

Sets the maximum colour values (RGB) that can be sent to each tile. This can be used to colour balance panels or displays.

Colour Blocks Fixture Index

The value that Colour Blocks will use to address that tile. By default, the index matches the tile number. Unlike the tile number, Index can be changed at any time.

Viewport Controls

Video maps are assigned on a per viewport basis in the viewport controls window.

Each Viewport can load two different video maps, or multiple viewports can use the same maps.
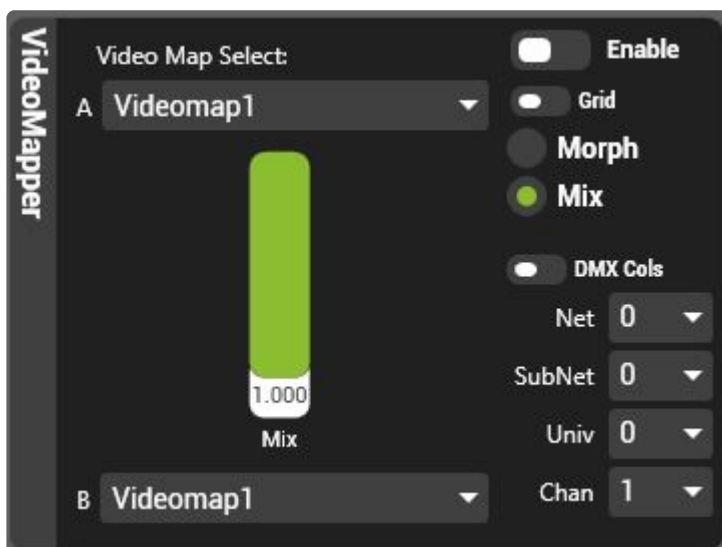
Viewport controls

Video Map Select

Each viewport can load two maps to allow for fading between maps. Select which maps to load from the drop down and use the Mix control to fade between them. The fade between maps can be a **Mix** or a **Morph**.

Mix

Cross-fades between the two video maps; fading the intensity of map 1 out as it fades map 2 up.

Morph

Content is stretched between the two maps as it transitions.

Grid

Displays each tile as a solid green numbered box with a 2 pixel white outline.
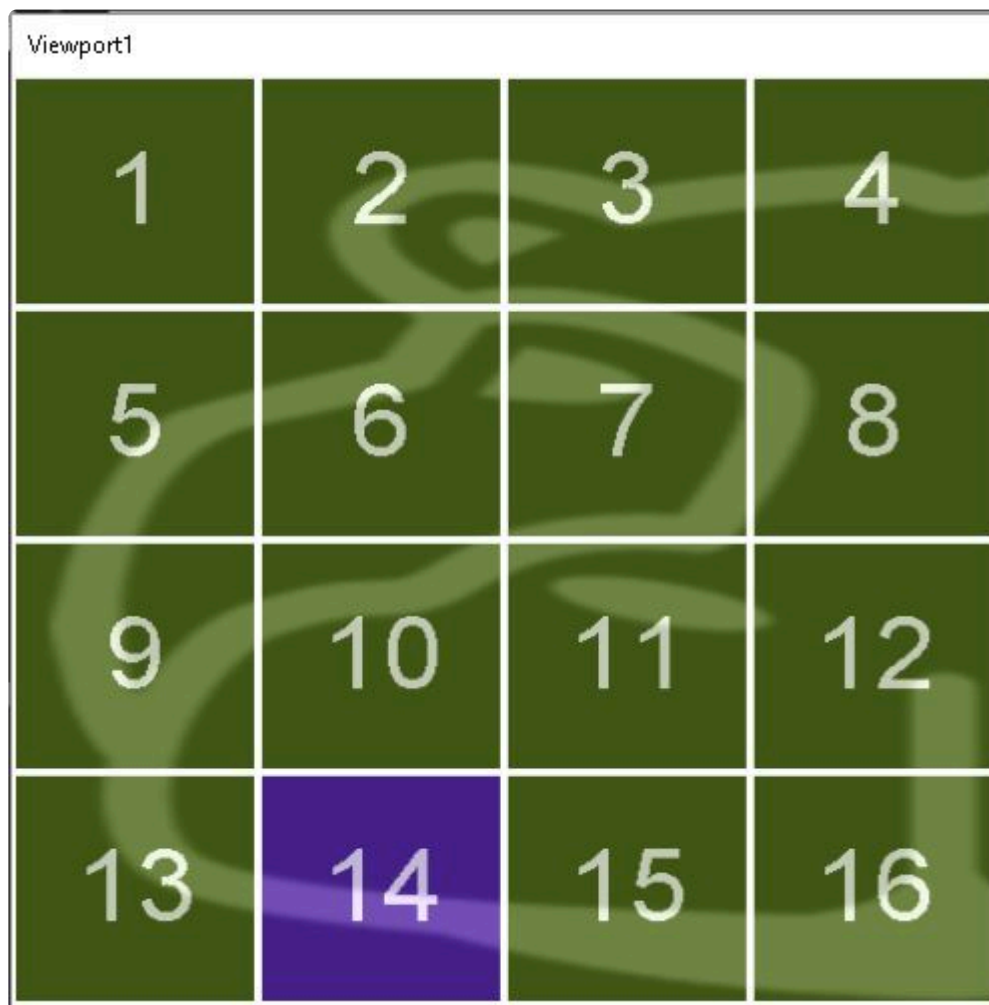
> **Note:** Mix and Morph do not work when grid is enabled.
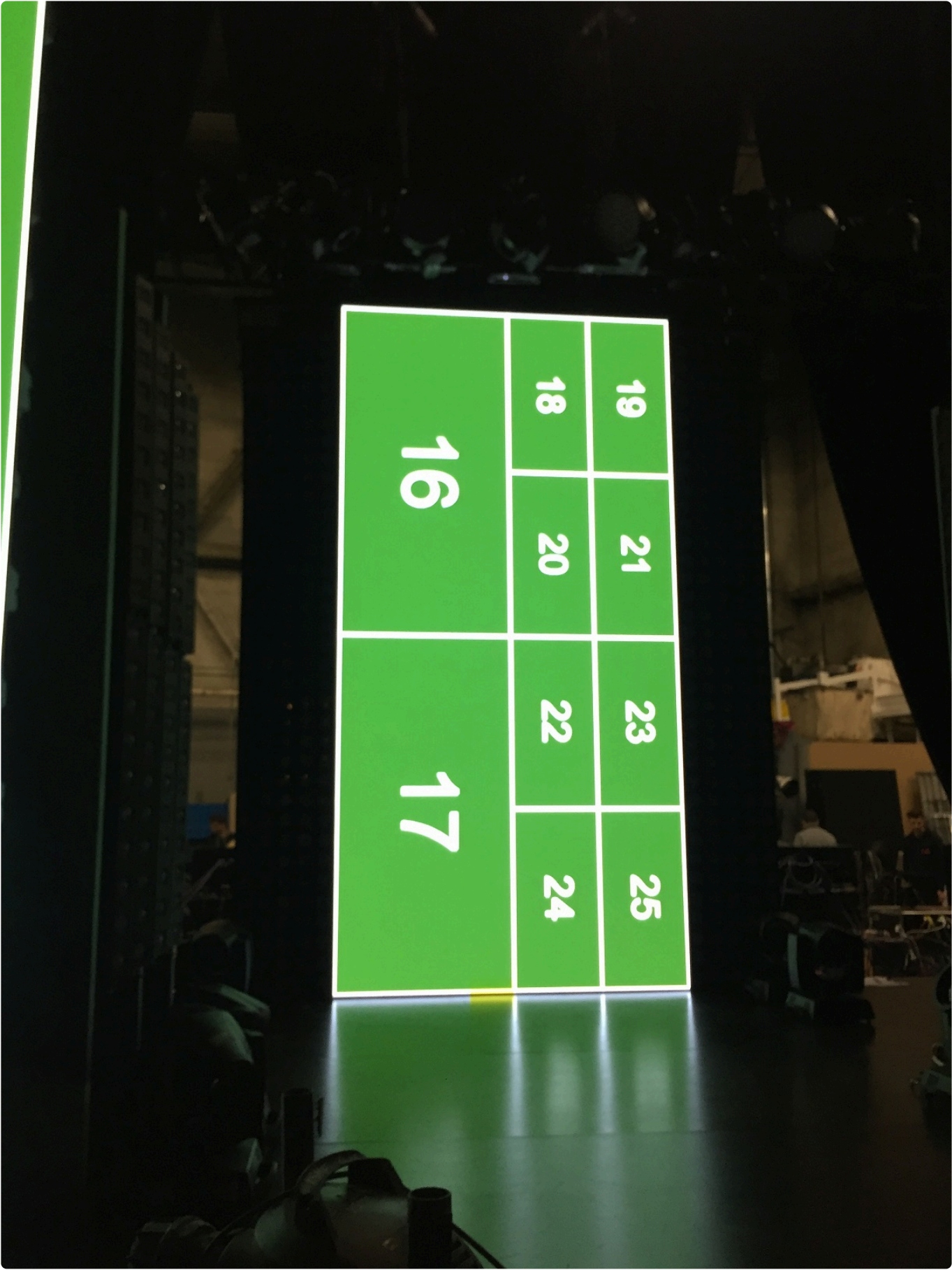
Boston Major 2016
Video Design: Starladder
Supertech: Cory Froke

DMX Colour

Direct control of tile colour from DMX.

CSV Import

For complex video maps, it can be faster to create the map in a 3rd party application such as Cinema 4D and then import the data to Hippotizer. Video Mapper supports importing data from Comma Separated Values (CSV) files.

CSV files should have the data separated by a comma with a carriage return at the end of each line. A row represents a single input/output tile in Video Mapper.

Data Format:

- Input X Position (Pixels from top Left),
- Input Y Position (Pixels from top Left),
- Input X Size of Tile (Pixels),
- Input Y Size of Tile (Pixels),
- Input Rotation of Tile (Degrees),
- Input Tile Flipped X (True/False),
- Input Tile Flipped Y (True/False),
- Output X Position (Pixels from top Left),
- Output Y Position (Pixels from top Left),
- Output X Size of Tile (Pixels),
- Output Y Size of Tile (Pixels),
- Output Rotation of Tile (Degrees),
- Red Level (0-255 255=Default),
- Green Level (0-255 255=Default),
- Blue Level (0-255 255=Default)
- Colour Block Index (Number)

Example Row

0,0,100,100,90,False,False,100,100,100,100,0,255,255,255

Creates a single tile at 0,0 on input and 100,100 on output with 90 degree rotation on the input.

Colour Blocks

Allows direct control of the colour of each video map tile, Colour Blocks can be used to 'bit map' video mapped tiles from a lighting desk.
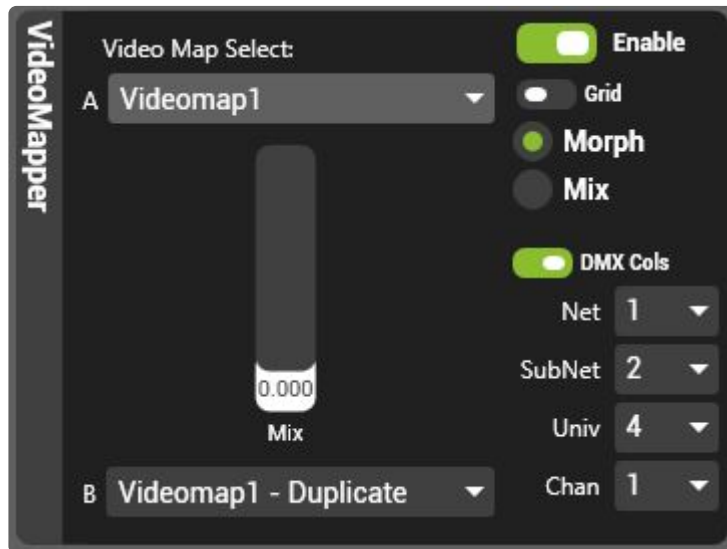
Configuring colour blocks

- The start address for colour blocks is set in the Viewport controls. Set this to the desired Art-net address.
- Colour Blocks uses Art-Net received from any sender irrespective of which NIC it is received on.
- Each tile is addressed based on the tile number.
- Each tile uses four DMX channels: Red, Green, Blue and Intensity (alpha),
- The intensity value acts as a mixer between the video and the colour; Intensity at full is all colour and at zero is all Video.

> **Note:** Colour Blocks must be set to a different address than other Art Net receiving components in Hippotizer such as DMX or Multicontroller to avoid conflict.

Colour block tile index can be edited in the video map. Select the tile(s) and choose the desired colour block index.

Video Map Configuration

Each Video map has its own settings
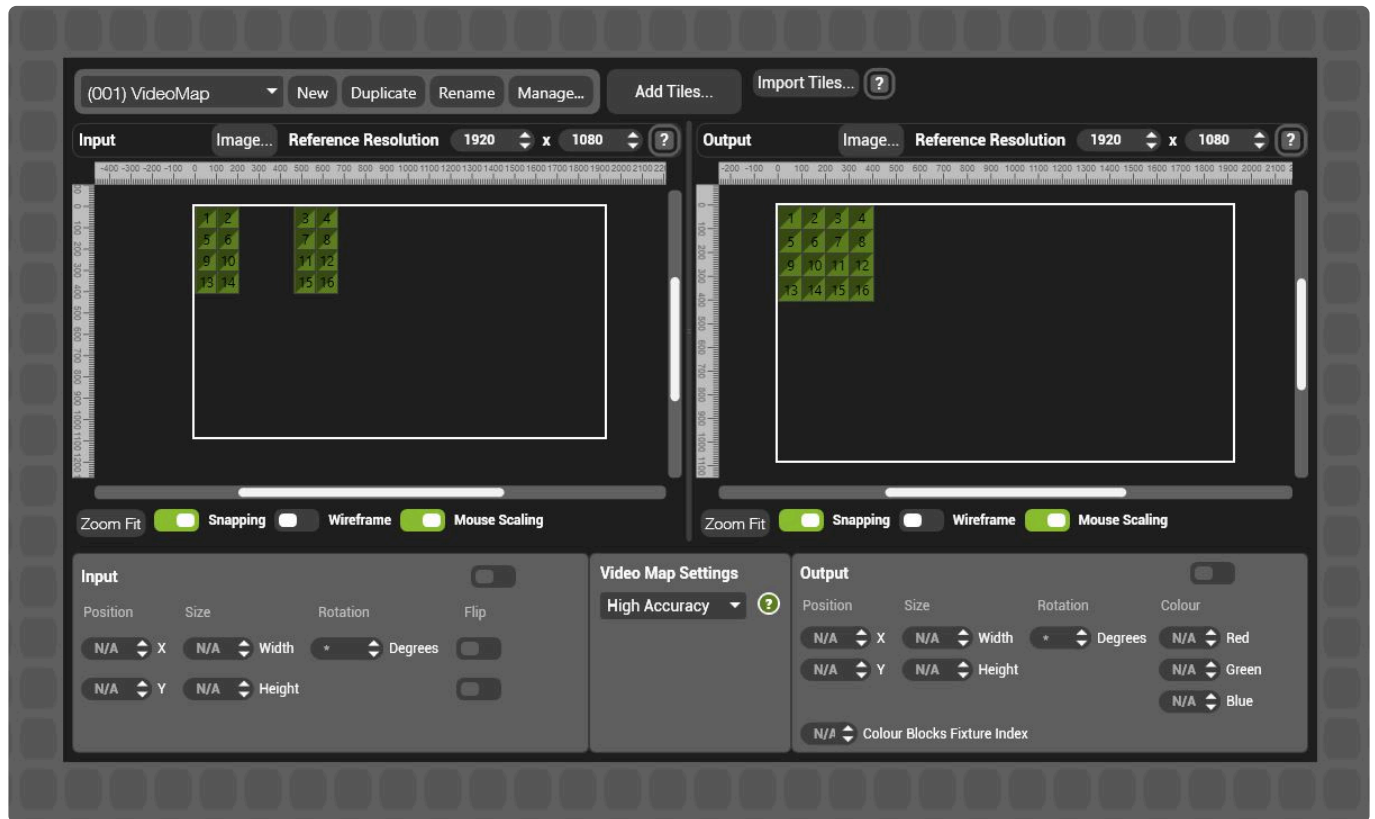
Rendering Mode

A video map is transposing pixels from input to output. In most cases, a simple pixel-to-pixel reference works well. However, when tiles are rotated to non-square angles or are scaled, super sampling becomes important. Super sampling itself also can introduce artefacts and it reduces the maximum resolution of the Video map so the decision of which mode to use depends on the application.

The main cause of problems is when pixels do not line up exactly with each other. Pixels are arranged in a perfect grid, however a rotated tile's pixels will not always fall within that grid. Some pixels of a rotated tile will land between two other pixels — leading to the question of what is the correct behaviour. With super sampling, videomapper samples each underlying pixel many times allowing it to take an accurate average. Without super sampling it will use the nearest neighbour approach; using all the colour from the closest pixel.

To assist with this, there are three rendering modes to choose from:

- **High Accuracy** The default. Videomapper uses interpolation. The maximum resolution of the map is 8192 × 8192. Diagonal tiles will appear more smooth. May introduce artefacts when scaling small tiles to larger ones.

- **High Resolution** Videomapper uses less interpolation then in High Accuracy. The maximum resolution of the map is 16384 × 16384. Diagonal lines will be smoothed as compared to 'nearest neighbour'. May introduce artefacts when scaling small tiles to larger ones.

- **No Interpolation** Videomapper uses no super sampling and instead uses the 'nearest neighbour' approach. The maximum resolution of the map is 16384 × 16384. Diagonal lines may appear steppy. Will note introduce scaling artefacts. **This mode is completely pixel accurate and is best used when single pixel wide content or fixtures are being used**

Video Map Settings

Each Video Map's sampling mode can be set.
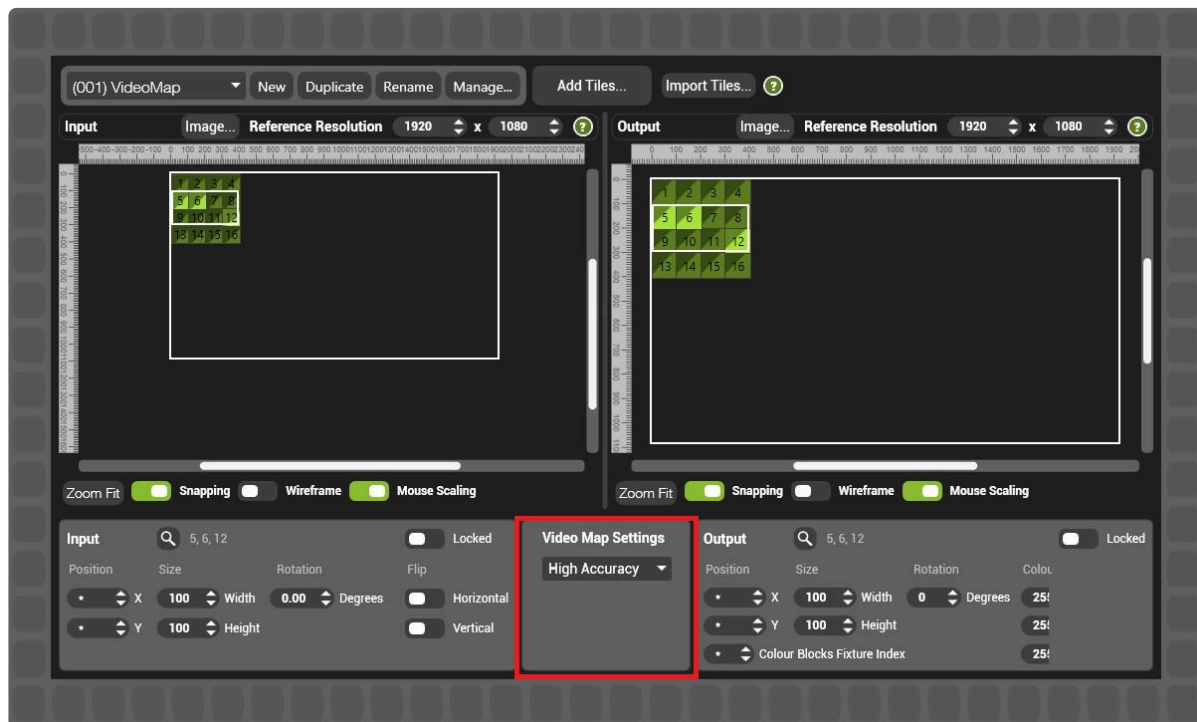
Interpolation in Videomapper

Videomapper transposes pixels from input to output — a pixel however is not a point, it has a length and width. When tiles are rotated or scaled, a tile's pixel can correspond to multiple input pixels. How videomapper handles this is determined by the Interpolation Mode.
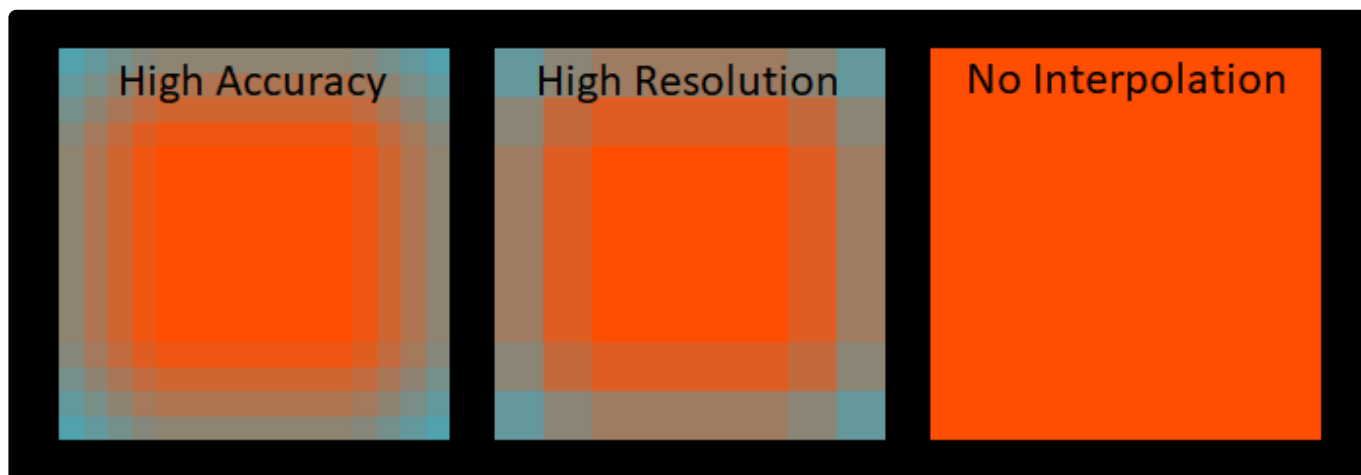
in the above example, a single red pixel is placed onto a blue background. The red pixel is rotated and scaled up to exaggerate the effect.

High Accuracy

The Default Groups of pixels are super-sampled to smooth edges.

- Diagonal lines will be smoothed.
- Single Pixel diagonal lines may lose brightness
- **Max Map Resolution** 8192 × 8192

High Resolution

Smaller groups of pixels are super-sampled resulting in less smooth edges.

- Diagonal lines will be smoothed slightly.
- Single pixel diagonal lines may lose brightness.
- **Max Map Resolution** 16,384 × 16,384

No Interpolation

Pixels are transposed 1 for 1.

- Diagonal lines will appear steppy.
- Single pixel diagonal lines will be correctly rendered.
- **Max Map Resolution** 16,384 × 16,384

REST API

The complete RestAPI documentation can be found here

HippoAPI is a RESTFUL API for the Hippotizer software. Using a web browser, HTTP commands can be sent to a webpage to control parameters in Hippotizer. The Web GUI can be found at http://localhost:40512 which includes a list of commands, syntax and features try it now triggers for a selection of command types.

Alternatively, the stated IP address within the ZooKeeper component UI can be used to access the REST API.

Look here to see how to add a component

When dragging out the Hippo API pin onto a pinboard the user is presented with instructions for accessing the RESTFUL API webpage.

The Hippo API component has no user adjustable settings so has no GUI, point your browser to the URL
http://192.168.0.38:40512
to get a full guide and specification to the API commands
(NOTE: Windows firewall must be disabled for requests for external machines)

Web Callbacks

We have also now added the ability for the HippoAPI to generate "Callbacks" to users webpages to inform them of certain actions such as New Media has been added, media has been changed, timeline has been added, preset added etc…We do this by using WebSockets which can be accessed in javascript code from the users webpage.

Creating callbacks

To use websockets, the user has to first connect to the websocket server by using the following URL syntax:

URL Syntax

```
ws://<serverhost>:40513    // <serverhost> is replaced with the servers acces
s url or ip address.
```

Example

```
ws://192.168.0.50:40513
```

Once the connection is established, the user must then subscribe to the event categories that they want to receive notifications about, currently the categories are:

- **MEDIA** : events related to media such as mediamap changed, media added, media changed, media deleted
- **PRESETS**: events related to add, delete and modification of presets
- **SYSTEM**: events related to system status or configuration

An example piece of code for subscribing to these events is given here:

```
const apiBaseURL = window.location.hostname;
const prefix = 'ws://';
const websocketURL = prefix.concat(apiBaseURL,':40513');
const ws = new WebSocket(websocketURL);
ws.addEventListener('open', (event) => {
const subscription = [
    {"subscribe" : {
        "category" : "MEDIA"
        }},
    {"subscribe" : {
        "category" : "SYSTEM"
        }},
    {"subscribe" : {
        "category" : "PRESETS"
```

```
    }}
    ]
    const message = JSON.stringify(subscription);
    ws.send(message);
    });
ws.addEventListener('message', (event) => {
    // process the event data here
    // the actual event is inside event.data
    })
```

Responses

MEDIA Subscription

Event

```
MEDIAMAP_CHANGED
```

Description

Event is raised when the mediamap is changed in any way, file added, file removed or file moved

Response

```
event.data =
{
    "category" : "MEDIA",
    "event" : "MEDIAMAP_CHANGED"
}
```

Event

```
MEDIAFILES_ADDED
```

Description

Event is raised when the and new media is added to the database by any means, data contains the mediaID of the added media

Response

```
event.data =
{
    "category" : "MEDIA",
    "event" : "MEDIAFILES_ADDED",
    "data" : [
        {
            "mediaID":" 00c82c53-156d-4601-
        aed8e97c175e0479_00B50D458F9E755CC817B142F80B1FB2_2e823641-da0d-602e-b
7e2-
        446f47b0c0a0"
        },
        {
            "mediaID":" 1a76a123-2dbe-4a6f-be58-
        d2a843e47724_5748CF198C351138C8C0B3EE40106E34_dbc0cfe2-caad-e1b9-c
71c-
        7844bb1b1155"
        },
        {
            "mediaID":" 9ed8aaf0-ec7c-433c-8ef0-
        cc81da621f09_69C2DAEB3952F75A990AC3947B934D27_c9250c48-db07-88be-8
460-
        96aa5524c775"
        }
    ]
        }
```

Event

```
MEDIAFILE_DELETED
```

Description

Event is raised when a media file is deleted from the database, data contains the mediaID of the file that was deleted

Response

```
event.data =
{
    "category" : "MEDIA",
    "event" : "MEDIAFILE_DELETED",
    "data" : "00c82c53-156d-4601-
```

```
    aed8e97c175e0479_00B50D458F9E755CC817B142F80B1FB2_2e823641-da0d-602e-b7e
2-
    446f47b0c0a0"
}
```

Event

```
MEDIAFILE_CHANGED
```

Description

Event is raised when a media file is changed data contains the mediaID of the file that was changed

Response

```
event.data =
{
    "category" : "MEDIA",
    "event" : "MEDIAFILE_CHANGED",
    "data" : "00c82c53-156d-4601-
    aed8e97c175e0479_00B50D458F9E755CC817B142F80B1FB2_2e823641-da0d-602e-b7e
2-
    446f47b0c0a0"
}
```

PRESETS Subscription

Event

```
PRESET_ADDED
```

Description

Event is raised when a new preset has been added, data contains the bank and slot of the preset and the type of the preset added.

Response

event.data =
{ "category" : "PRESETS", "event" : "PRESET_ADDED", "data" : { "presetid":"
00c82c53-156d-4601-aed8e97c175e0479", "bank":"5", "slot":"16", "type":"layer" }
}

Event

```
PRESET_DELETED
```

Description

Event is raised when a preset is deleted, data contains the preset ID of the preset that was deleted

Response

```
event.data =
{
    "category" : "PRESETS",
    "event" : "PRESET_DELETED",
    "data" : "00c82c53-156d-4601-aed8e97c175e0479"
}
```

Event

```
PRESET_CHANGED
```

Description

Event is raised when a preset has been modified or moved, data contains the bank and slot of the preset and the type of the preset changed.

Response

```
event.data =
{
    "category" : "PRESETS",
    "event" : "PRESET_CHANGED",
    "data" : {
        "presetid":" 00c82c53-156d-4601-aed8e97c175e0479",
        "bank":"5",
        "slot":"16",
        "type":"layer"
        }
}
```

Event

```
PRESETS_RESET
```

Description

Event is raised when the preset manager is reset and all presets are deleted

Response

```
event.data =
{
    "category" : "PRESETS",
    "event" : "PRESES_RESET",
}
```

SYSTEM Subscription

Event

```
CONFIG_CHANGED
```

Description

Event is raised when the system config has been changed, outputs added, mixes changed etc..

Response

```
event.data =
{
    "category" : "SYSTEM",
    "event" : "CONFIG_CHANGED",
}
```

Event

```
SYSTEM_STATUS_CHANGED
```

Description

Event is raised when the output system status has changed ie. If the system is rendering or not.

Response

```
event.data =
{
    "category" : "SYSTEM",
    "event" : "SYSTEM_STATUS_CHANGED",
    "data" : "Configuring"
}
```

Best Practices

Optimising the performance of Hippotizer requires several changes. The below should help answer common questions.

- [Maximising Performance](#)
- [Minimizing Capture Delay](#)

Maximising Performance

Many factors drive the capabilities of a Hippotizer. Here are some best practice tips to get the most out of the server.

Use the least number of viewports possible.

Rendering a viewport is computationally heavy; aim to use as few as possible.
While there is no set limit, using more than two viewports per output will noticeably impact performance.

Tips to reduce viewports:

- Use Videomapper instead of viewports to transpose from a single mix to a single output.
- Use sub-mixes and relays when compositing lots of mixes onto a single output. (eg. Run several mixes, patching only one 'main mix' to the output and use relays to composite onto the main mix).
- Use the overlapping viewport function in Output Manger to create 'frames' and other complex shapes thus requiring viewports.
- Make sure to use Virtual Viewports when there are five or more viewports.

Use High Performance Mode

High Performance Mode disables previews and the visualiser offering a significant boost to performance and smoothness.
Systems with lots of mixes and layers and/or very high resolution mixes will benefit the most from using High Performance Mode.

Run Zookeeper on a Remote Machine.

Zookeeper, like any program, uses some of the computer's resources; running it on a separate machine will improve performance.

Minimizing Capture Delay

Reducing the delay (or latency) of a video system is a huge topic that extends beyond the scope of this manual. Here we can offer some best practice guidelines specifically to do with Hippotizer to reduce delay.

Disable Render Buffering

In output manager, there is the option to buffer the outputs. Render Buffering adds up to three frames of delay. To reduce delay, disable render buffering.

Use as high frame rate signals as possible

Delay occurs per frame; an operation that takes one frame will take 16 milliseconds (ms) at 60 frames per second (FPS), or 33ms at 30fps. Changing to 60FPS capture signal from 30 for example will reduce the delay from 200ms to 100ms.

Ensure the engine is running at full frame rate

Similar to the capture signal's frame rate, the engine frame rate also can have a large effect on delay. Ensure systems are running at full frame rate when latency is critical.

Genlock the whole signal chain

Genlocking the Hippotizer to the capture source will slightly improve delay (less than a frame) and will improve smoothness.

How much delay to expect

Due to the nature of media servers some delay is inevitable. A fully optimised system as described here should result in 4-5 frames of delay. (80-100ms at 60FPS).

Advanced Topics

Hippotizer V4 is a tool box that is used in may different ways depending on requirements.

Querying Component Status with TCP

Each Component in Hippotizer has a string pin to report it's status in real time. These can be found in the pin tree under each component.

The status pin carries the state of the component and an info tag.

The state can be:

- Config
- Run
- Limited
- Problem

Each component has specific responses

DMX2

If no Devices have been created it will return an empty string, if one or more devices are enabled it will return a comma separated list of the status of each Device:

Example:

"Artnet0:OK,Artnet1:OK,Artnet2:No Data,sACN_1:OK"

It will give an OK if and DMX data has been received at a rate of 1 Hz or more. On each device universe.

Sync Component

Will return: Running or No Data for each of the two External Timecode sources separated by a comma:

Example:

"EXT1:Running,EXT2:No Data"

Output Manager

Will be one of the following:

"Just Started"
"Waiting for Engine Component"
"WaitingForEngineToStart"
"WaitingForEngineReconfig"
"Running"
"Configuring"
"Error – Waiting for Reset"

"Unknown"

LED Component

Returns one of the following statuses

"run" -> normal operation, no problems
"config" -> one or more components are being reconfigured
"limited" -> there is an issue that is not stopping system from working but needs attention
"problem" -> A major issue is stopping normal operation of the system

For all of the above except "run" there is also a component name and a description of the issue or operation, far too many to list here.

Example:

"System Status=run, Message="

Or

"System Status=config, Message=Media Manager : Media Files Syncing"

Or

"System Status=problem,Message=Engine : Viewports Overlapping On Output"

Changing In/Outpoint Behavior on Media Change

By default, when media is changed the in and out-points are reset to the in and out-frames of the new media. Though this is often expected, it may not be desirable in certain circumstances. To change it, the Engine XML must be edited.

- Stop the Engine and Zookeeper
- Find the Engine XML, it is located in: C:\Users*User*\Hippo\Appdata\Local\GreenHippo\4_2\ HFWStorage
- The Engine XML is a Unique ID prefaced with "Engine".
- Open the XML with note pad
- Locate the line containing **bMediaSelectModifiesInOut**

By Default this reads:

```
<StorageEntry Name="bMediaSelectModifiesInOut" Class="bool" Value = "true"/>
```

Change this to:

```
<StorageEntry Name="bMediaSelectModifiesInOut" Class="bool" Value = "false"/>
```

- Save the file and close it
- Restart the engine and Zookeeper

Note: New Show will reset these changes.

Advanced Startup options

The startup behaviour of Zookeeper can be edited to open into a default window or to disable editing of Pinboards.

Starting up into a specific layout

Zookeeper can be set to go to a specific layout on startup with arguments that are added to the launch shortcut.
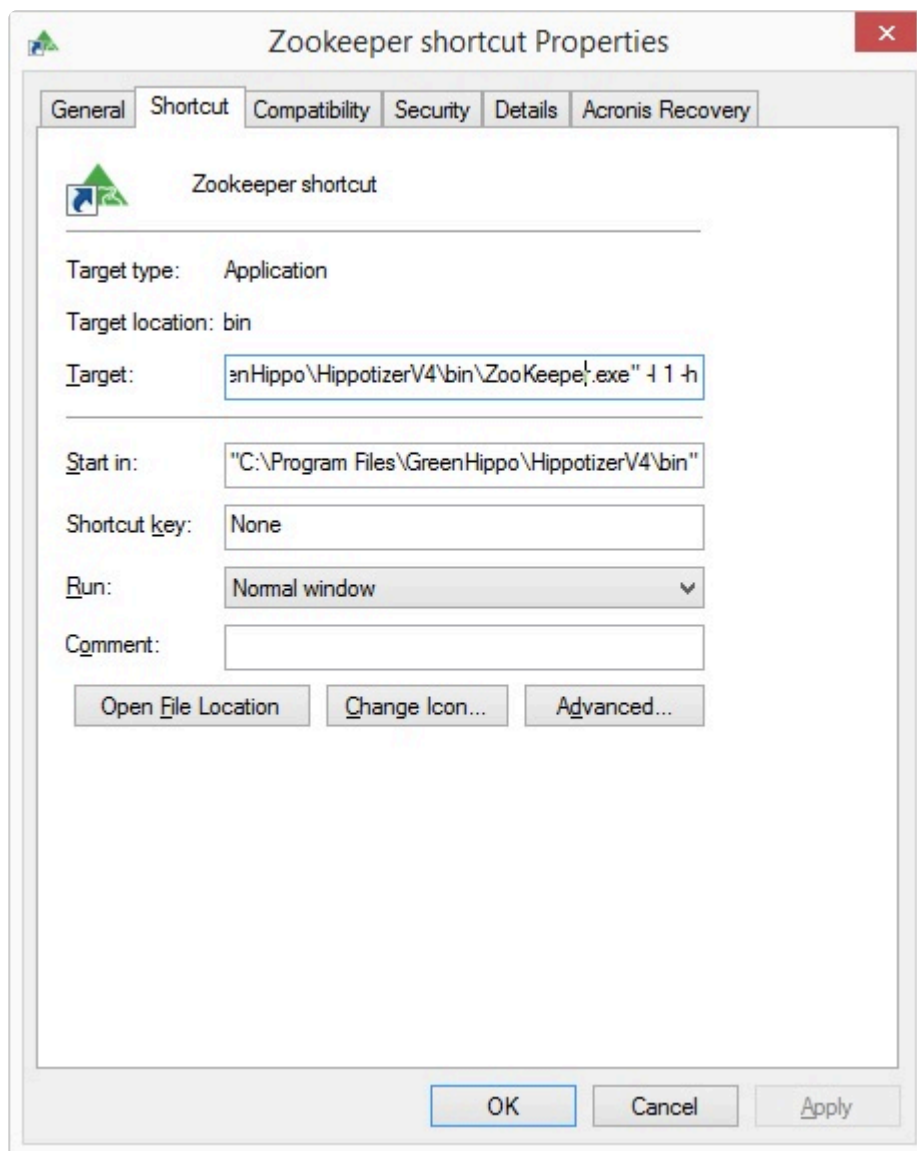
Launch Zookeeper into a specific Pinboard

Add `-l 1` to launch into the 1st layout of the 1st bank. Each bank has 25 layouts so to launch into layout 1 of bank 2, use: `-l 26`

> **Note:** The precise syntax is a hyphen and then lowercase letter "L"

Launch Zookeeper without the ability to edit pinboards or navigate to new pages

Add `-h` to the launch short cut to hide the navigation bar of Zookeeper. Navigation Keyboard shortcuts will also be disabled.

The Pin Tree

Time and Timecode

Time and Timecode are used throughout Hippotizer though they are often confused.

Timecode

To quote the [Wikipedia](#):

> A timecode (alternatively, time code) is a sequence of numeric codes generated at regular intervals by a timing synchronization system.

There are several types of timecode commonly used in video, including LTC, MIDI and VITC. In every case, the timecode is received by a hardware or software decoder for translation into Hippotizer's framework.

[Additional information about receiving timecode can be found here.](#)

The most common type of Timecode is Linear Time Code (LTC), which is embedded within an audio signal. As such LTC is often carried on standard audio connectors such as XLR cables. LTC can be received into Hippotizer over audio input, an internal card, or an external device such as a Mif4 or TC-5. In each case the Timecode signal is received by the local Sync Manager for distribution to local and networked Hippotizers.

Timecode in Hippotizer is comprised of two pieces; time and format. Time is simply a clock from 00:00:00;00 to 23:59:59;59 while format indicates the frame rate used such as 25FPS or 29.97.

Whenever timecode is displayed within Hippotizer it will show the time and format.
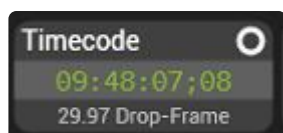
> **Note:** A red flashing timecode format indicates a miss-match between the format and where it is applied. For example, 25FPS format run into a 30FPS clip will flash red. The clip will playback however the time will be extrapolated between the frame rates resulting in potentially confusing readouts.

Starting from 0 or 1

A long standing point of confusion is the seemingly simply question: what number is the first frame of a clip? Is it frame 0 or frame 1?

If the first frame of a clip is frame 1 then the total number of frames in a sequence is simply the last frame number; making counts easier. It also simplifies the setting of an out-frame: if the desired last frame is the 30th frame then set the outpoint to frame 30. This is the convention used by most of Hippotizer.

The exception is timecode, which starts at time 0.

The result is that timecode time 1 second of a 30FPS clip correctly returns the 31st frame.

Shape Visualizer- getting started

Using the included simple screen setups

If all that is neede dis a view of 16×9 screens there are a few basic visualizer files to quickly get up and running.
Simply click the Shape tab from the Zookeeper home Screen
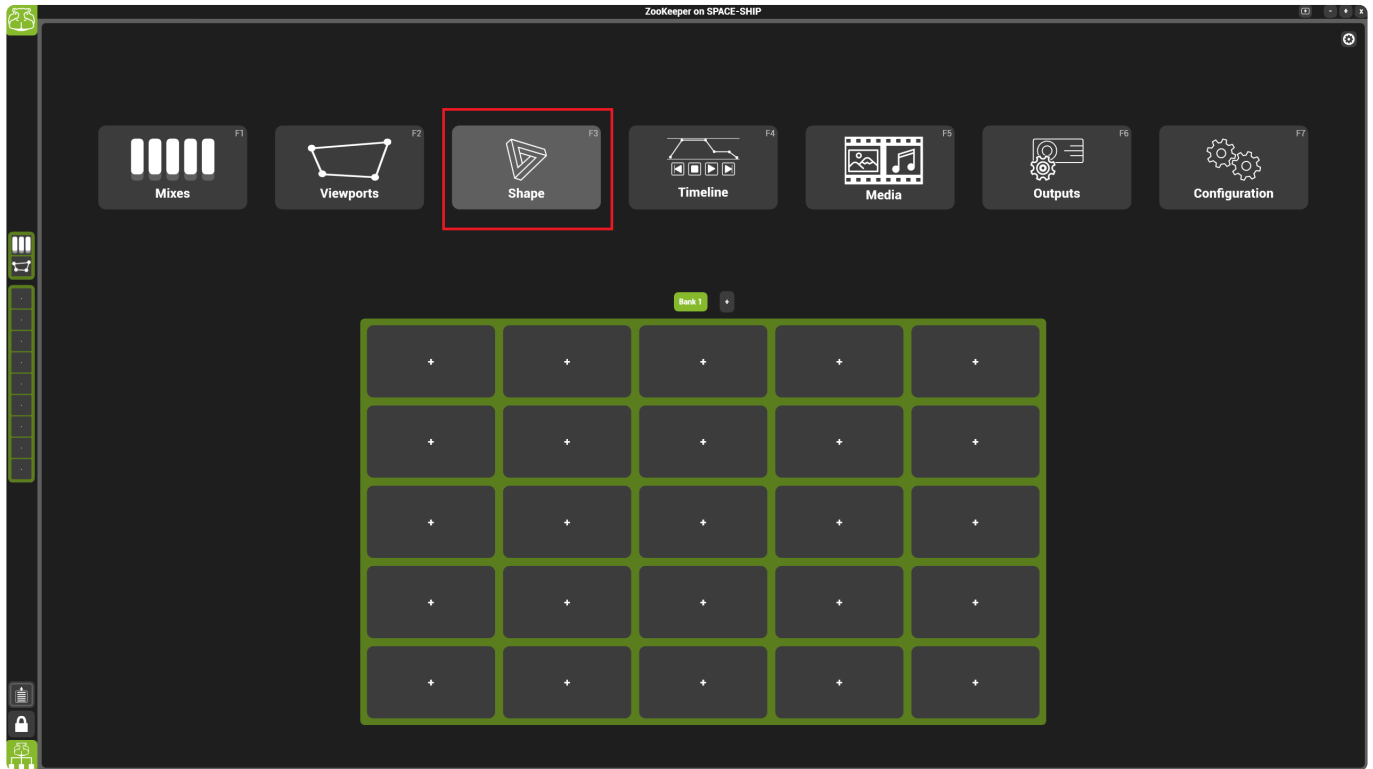
Click the Open Project button and choose the desired amount of screens and select open.
Included are 1-6 screen configurations by default. These projects can be located in the Documents\ GreenHippo\Shape\Default Projects folder if it is not opened by default.
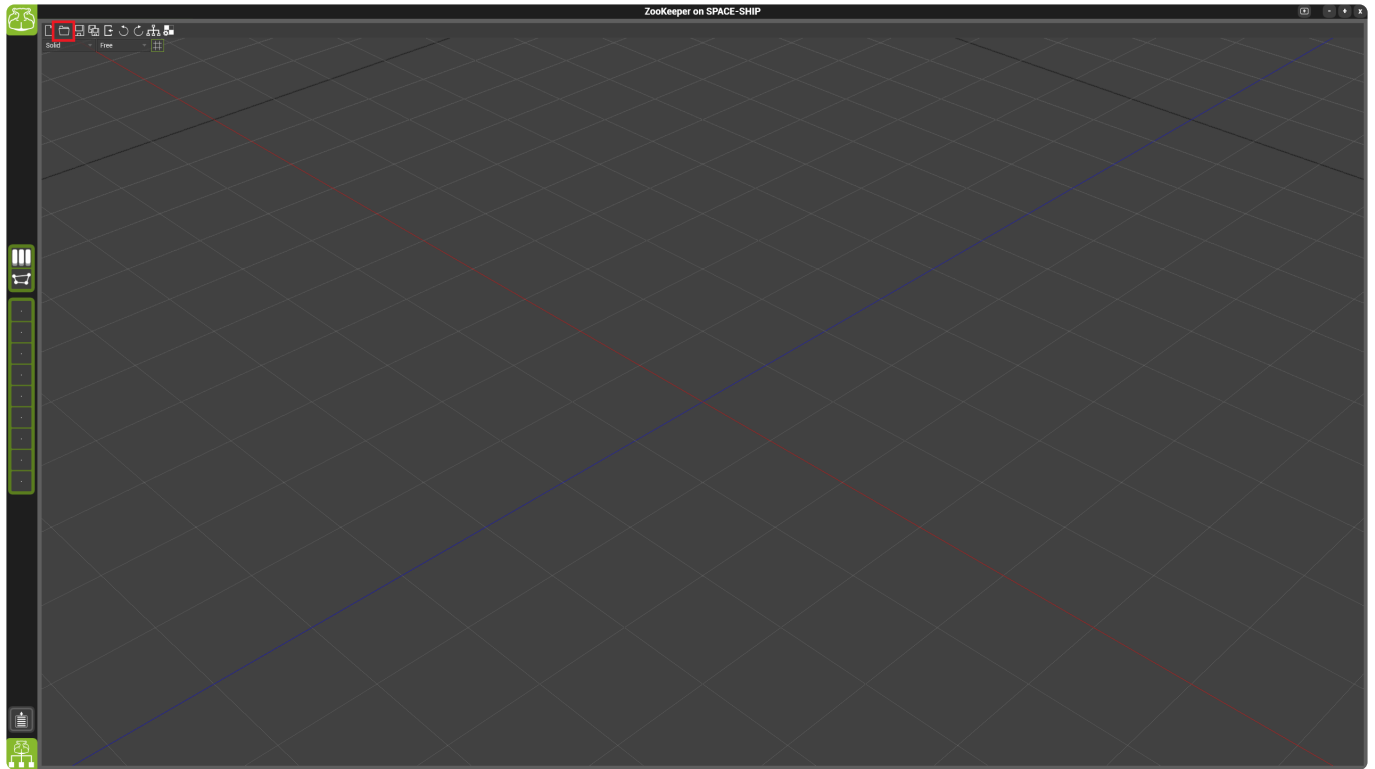
Next assign the inputs for each screen by going to the Input Manager and selecting the desired source for each Hippotizer Input.
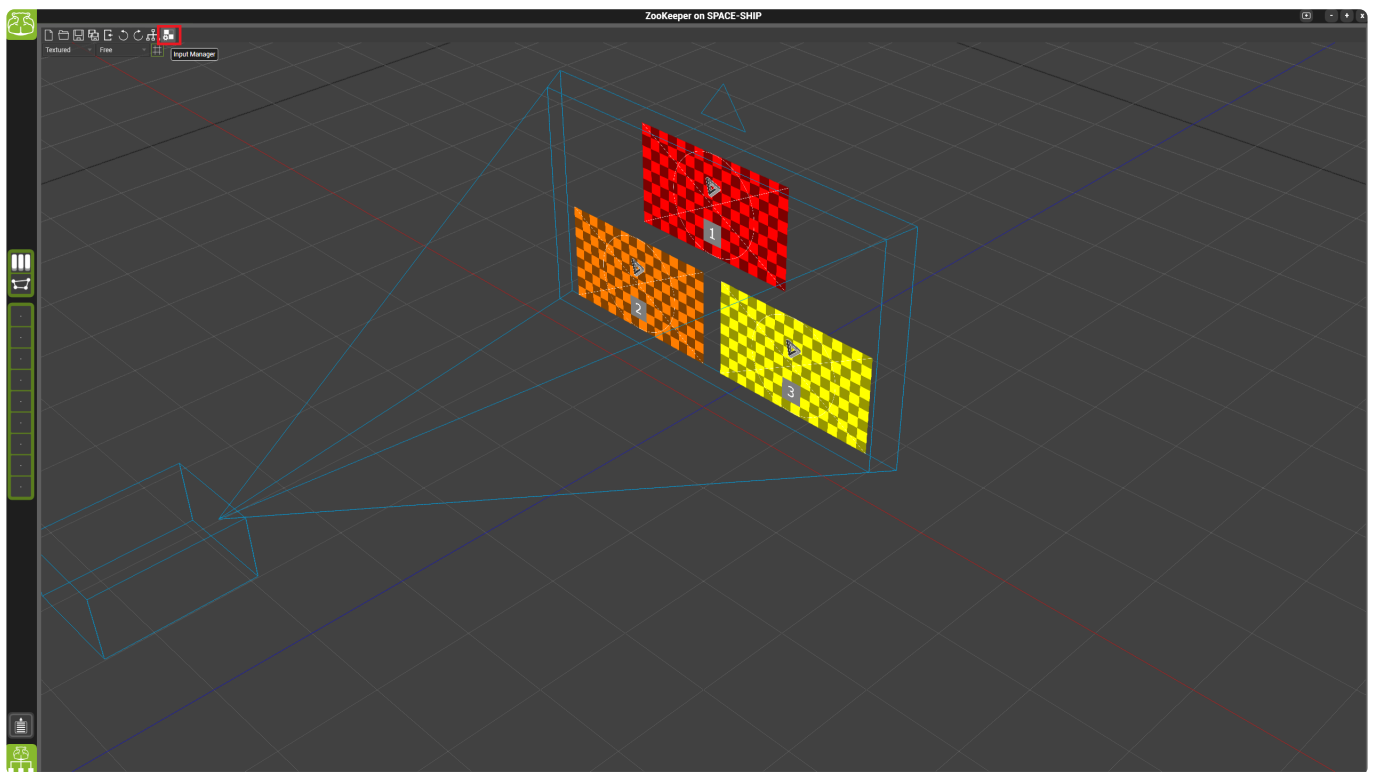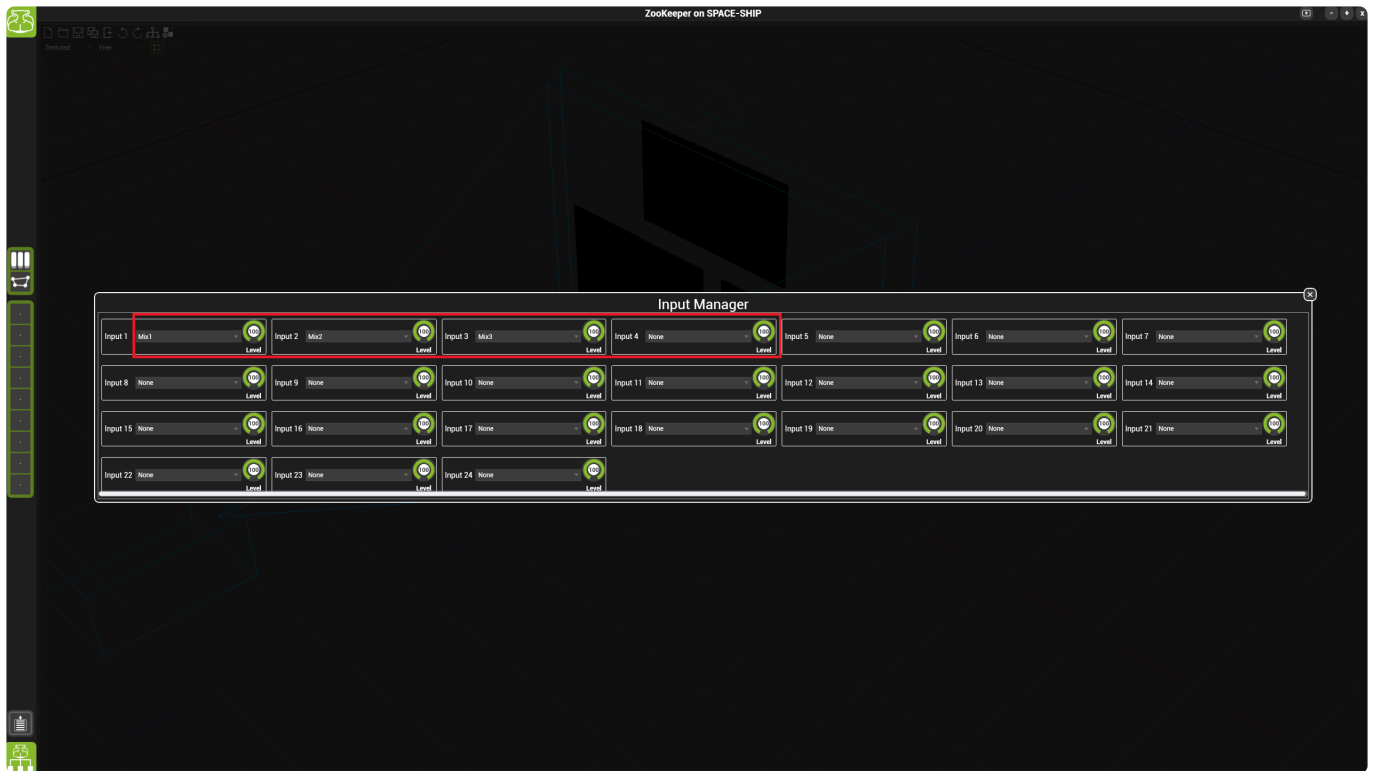
Now all of the assigned Mixes/Viewports should be seen on the correct screens.

To freely navigate around the Visualizer use the 1, 2, or 3 key while clicking and moving the mouse.
Holding 1 will pan the camera, 2 will zoom, and 3 will orbit the camera.
There are also othrographic views or projector views located in the View field. There is a projector in
each default project for easy selection which is labeled "Screen View".
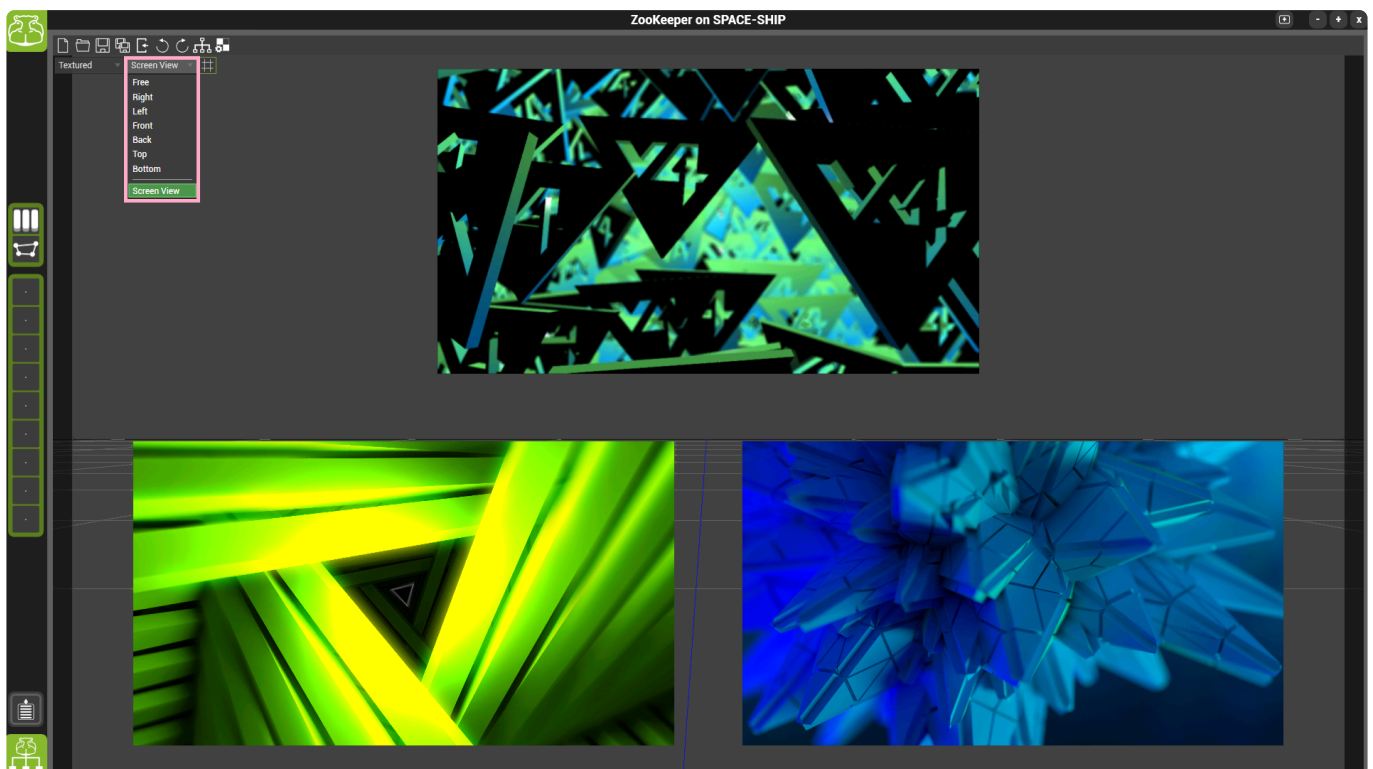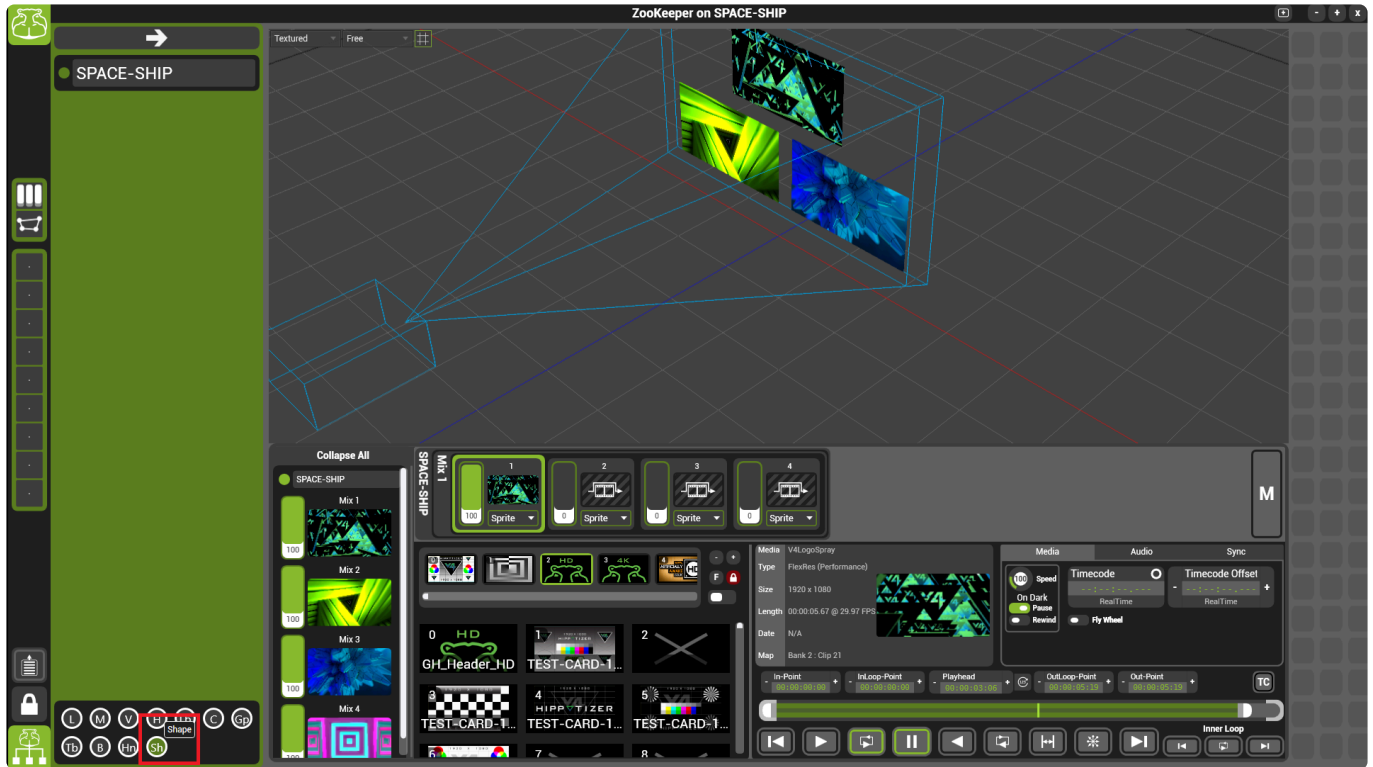
Using other model files

If other models are required for visualizing, some extra setup is required in the SHAPE standalone app. There are some default models included with the installer that can be found in Documents\Green Hippo\ Shape\Default Models.
Start Shape from the Shape tab in HippoLauncher
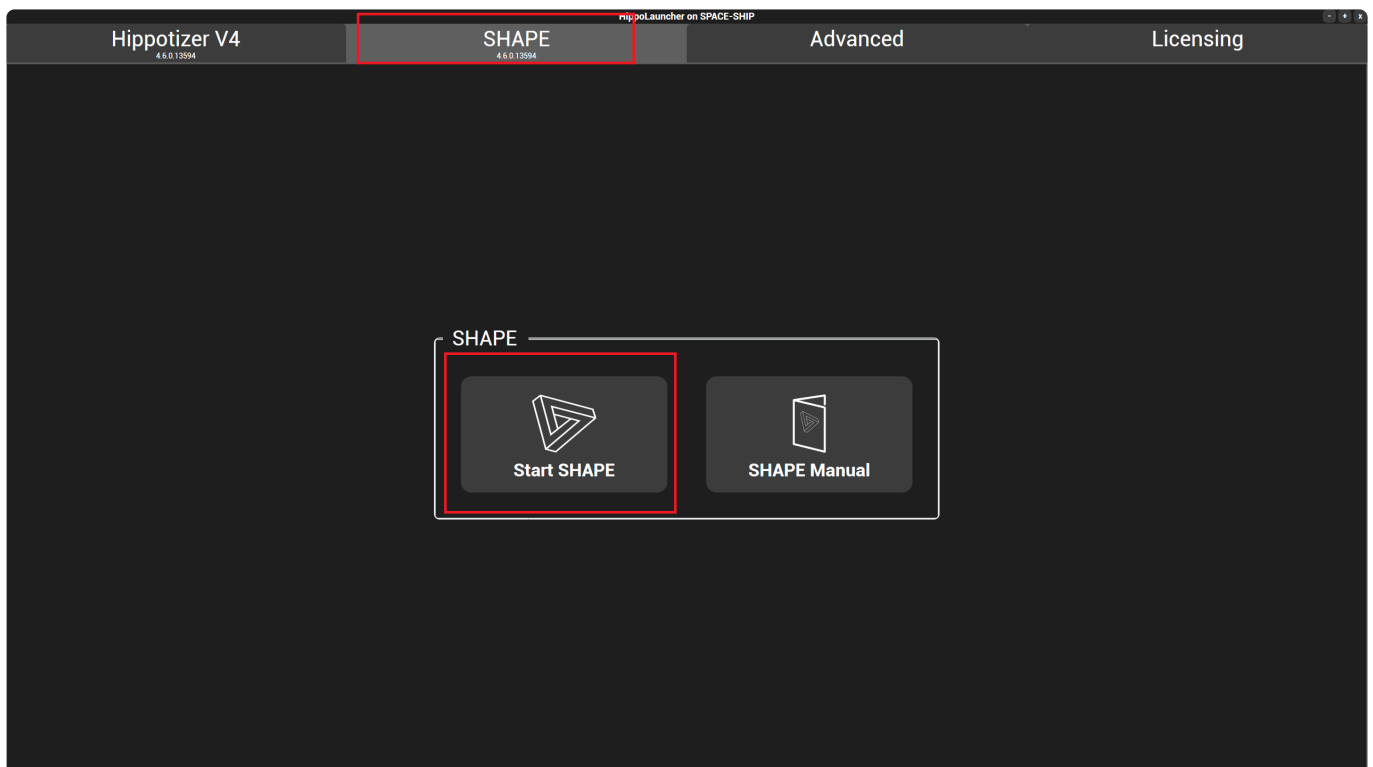
Import the model by going to File->Import, navigate to where the file is located on the machine and select open.
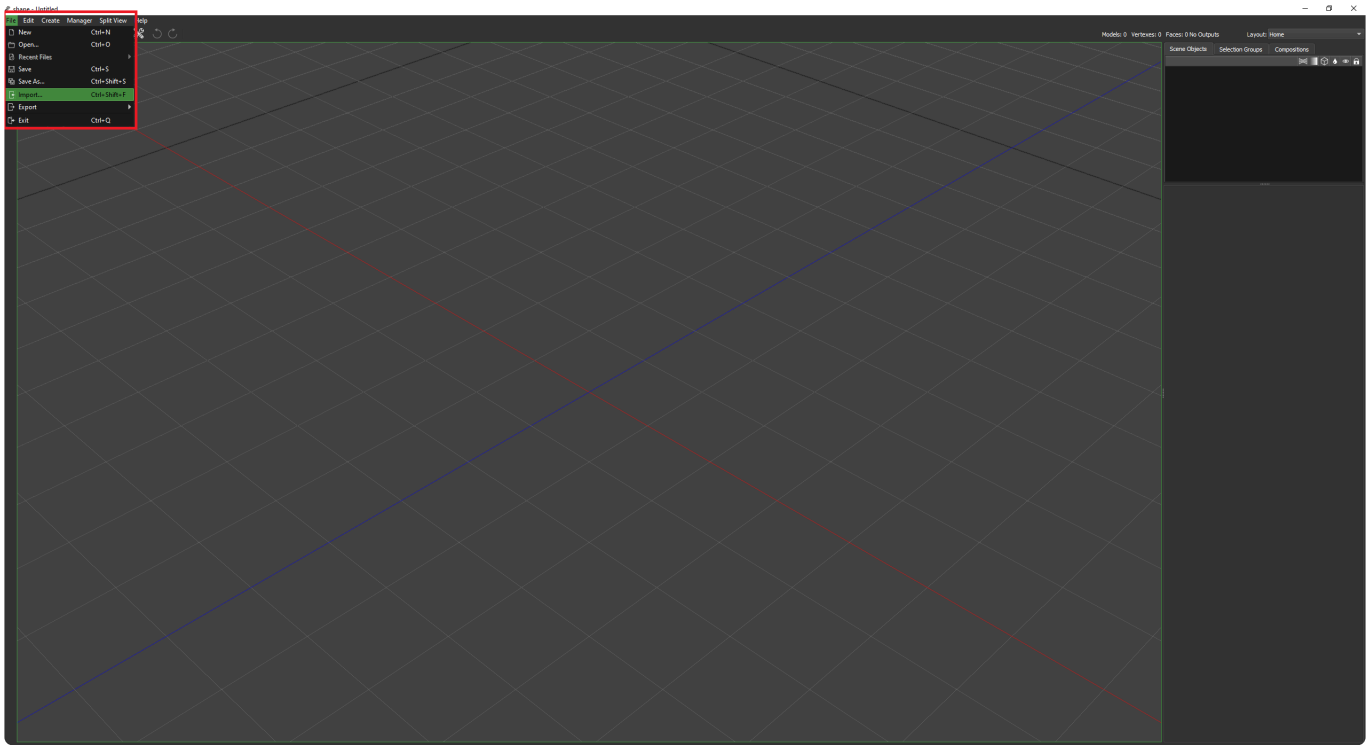
When importing a model be sure to double check that the correct scale and units are selected, as well as double checking the objects which should be imported are selected from the list.

There is also an option for importing materials which is useful for automatically assigning textures to objects which will not be a Hippotizer Input.
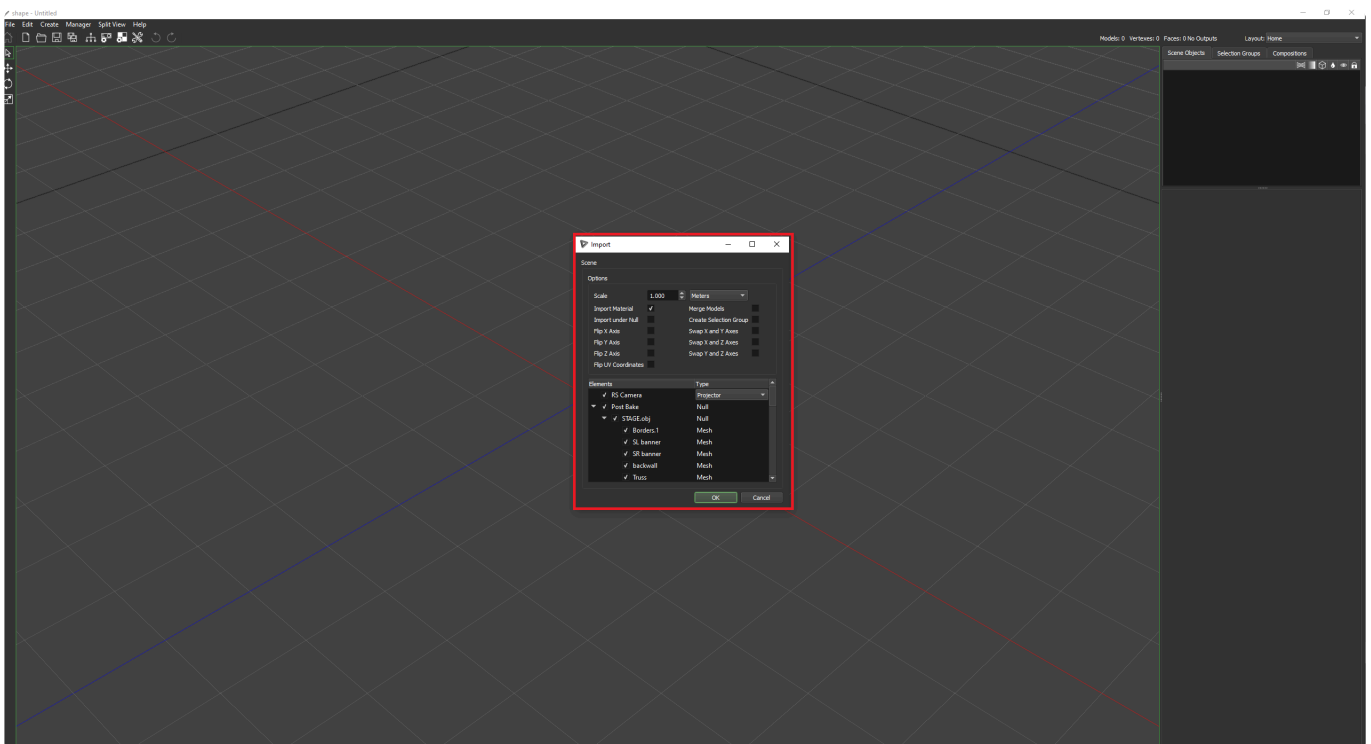
Next set up the Hippotizer inputs by going to the Input Manager.
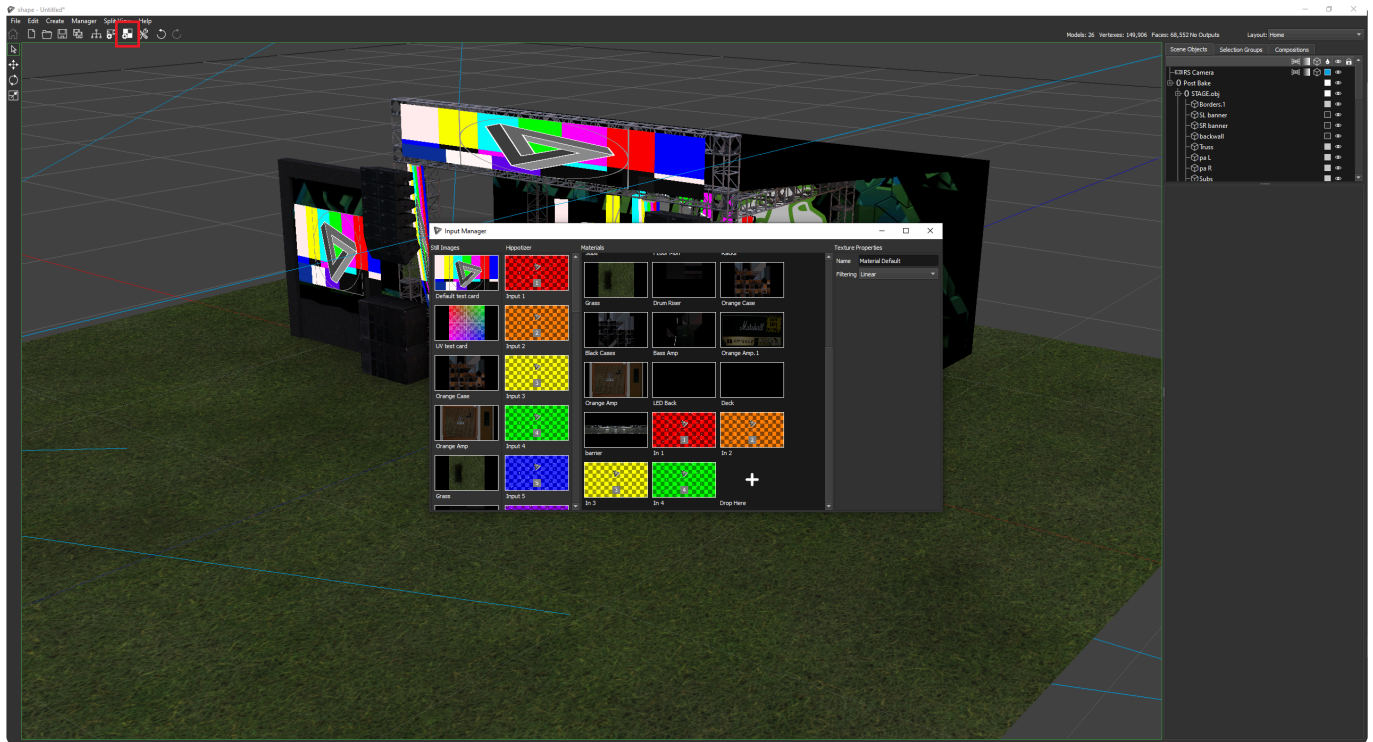
To add the Hippotizer Inputs select them from the list on the left (outlined in red) and drag them into an empty slot in the Materials list (outlined in blue).
Materials can also be renamed using the Texture properties panel on the right (outlined in green).
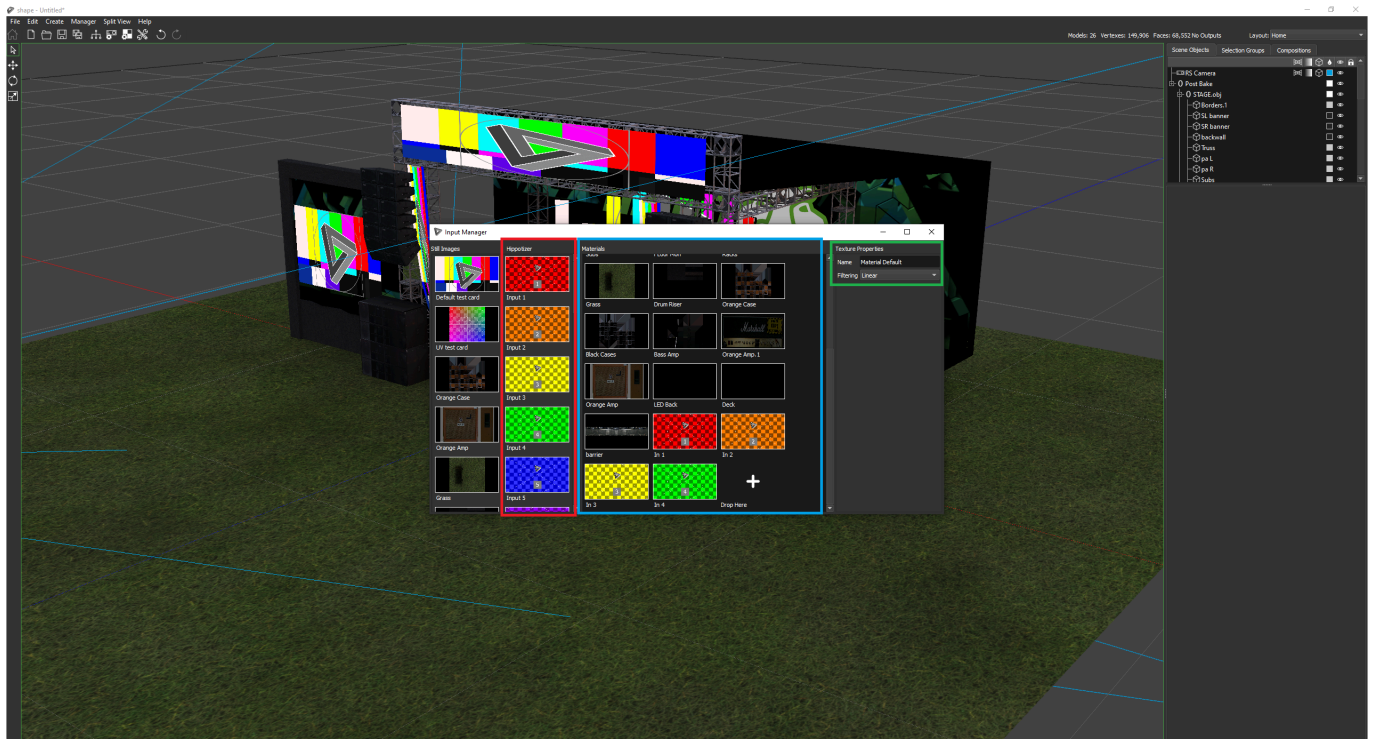
close the Input Manager and select one of the screens which will be fed from Hippo. At the bottom of the Properties Panel for this object there is a material selection. Chose the correct material which is assigned a Hippo input for this screen. Repeat for all desired screens/surfaces.
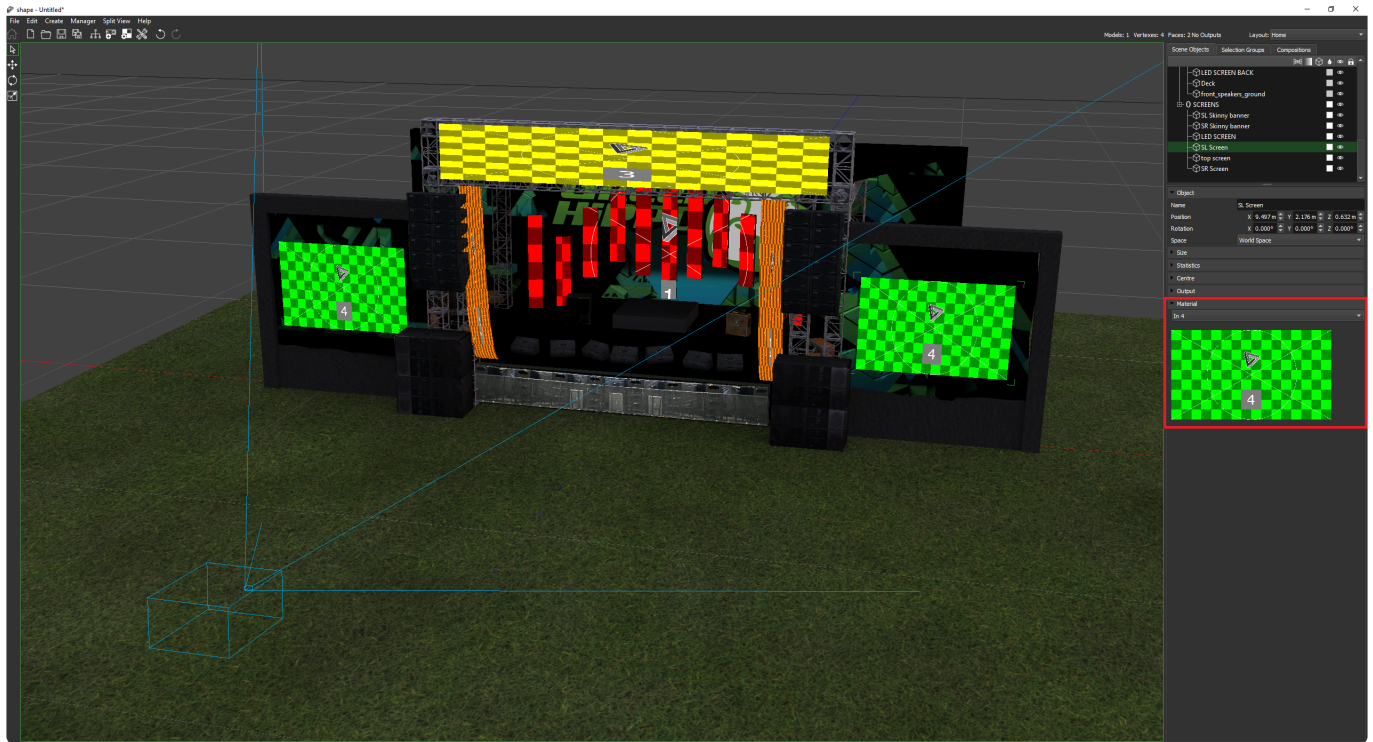
If there are any specific viewing positions desired it is a good idea to also add in a projector now. Place it at the desired location and give it a name for easy reference in Visualizer.

The project is now set up for use in Visualizer. Save the file and refer to the steps for using the included projects to load into Visualizer. Projects can also be patched to the visualizer by enabling networking in the visualizer and adding it to the group from the SHAPE app Network Manager.

Appendixes

- [DMX Charts](#)
- [Creating DMX Personalities](#)
- [Effects List](#)
- [Generator List](#)
- [Key Board Shortcuts](#)
- [Glossary](#)

DMX Charts

DMX profiles are built in to Hippotizer software and can be viewed from within DMX component.

Factory Personalities for 4.8.1

- [4.8 Layer](#)
- [4.8 Layer Presets](#)
- [4.8 Mix](#)
- [4.8 Mix Presets](#)
- [4.8 Viewport](#)
- [4.8 Shape Viewport](#)
- [TimelinePlus](#)

4.8 Layer

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	7		128	0-127	Subtract Blue	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Advance Colour	11		0	0-128	Disable Advance Colour	
				129-255	Enable Advance Colour	
Advance Red Low	12		128	0-127	Subtract Red Low	
				128	No Change	
				129-255	Add Red Low	
Advance Red Mid	13		128	0-127	Subtract Red Mid	
				128	No Change	
				129-255	Add Red Mid	
Advance Red High	14		128	0-127	Subtract Red High	
				128	No Change	
				129-255	Add Red High	
Advance Green Low	15		128	0-127	Subtract Green Low	
				128	No Change	
				129-255	Add Green Low	
Advance Green Mid	16		128	0-127	Subtract Green Mid	
				128	No Change	
				129-255	Add Green Mid	
Advance Green High	17		128	0-127	Subtract Green High	
				128	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Add Green High	
Advance Blue Low	18		128	0-127	Subtract Blue Low	
				128	No Change	
				129-255	Add Blue Low	
Advance Blue Mid	19		128	0-127	Subtract Blue Mid	
				128	No Change	
				129-255	Add Blue Mid	
Advance Blue High	20		128	0-127	Subtract Blue High	
				128	No Change	
				129-255	Add Blue High	
Layer Rotation	21	22	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	23	24	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	25	26	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	27		128	0-127	Distort Aspect Ratio	
				0	No Change	
				129-255	Distort Aspect Ratio	
Zoom	28	29	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	30		0	0-9	Auto Scale (Fits image to nearest axis)	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	31		0	0-255	See Effects List	
Effects 1 Level	32		0	0-255		
Effects 1 Parameter 1	33		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	34		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	35		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	36		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	37		128	0-255	Determined by Selected Effect	
Effects 2 Select	38		0	0-255	See Effects List	
Effects 2 Level	39		0	0-255		
Effects 2 Parameter 1	40		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	41		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	42		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	43		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	44		128	0-255	Determined by Selected	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
					Effect	
Source Type	45		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	46		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	47		0	0-255		
Media Player Play Mode	48		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	49		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	50		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	51		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	52	53 and 54	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	55		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	56	57 and 58	0	0	End of Clip	
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	59		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	60		0	0-128	De-interlace Off	
				129-255	De-interlace On	
Generator Select	61		0	0-255	See List of Generators	
Generator Parameter 1	62		128	0-255	Determined by Selected Generator	
Generator Parameter 2	63		128	0-255	Determined by Selected Generator	
Generator Parameter 3	64		128	0-255	Determined by Selected Generator	
Generator Parameter 4	65		128	0-255	Determined by Selected Generator	
Generator Parameter 5	66		128	0-255	Determined by Selected Generator	
Generator Parameter 6	67		128	0-255	Determined by Selected Generator	
Generator Parameter 7	68		128	0-255	Determined by Selected Generator	
Generator Parameter 8	69		128	0-255	Determined by Selected Generator	
Generator Parameter 9	70		128	0-255	Determined by Selected Generator	
NDI Source Select	72		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	73		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	74		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	75		0	0-255		
Audio Pan	76		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	77		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	78		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	79	80 and 81	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	82	83 and 84	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	85		128	0-255	Shifts colour gamut of layer	
Colour Saturation	86		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	87		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	88		0	0-255	TC on Layer Offset Minutes	
Time Code Offset: Seconds	89		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	90		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	91		0	0-127	Disable Fly Wheel	
				128-255	Enable Fly Wheel	
Keystone 1X	92	93	0	0-65535		
Keystone 1Y	94	95	0	0-65535		
Keystone 2X	96	97	65535	0-65535		
Keystone 2Y	98	99	0	0-65535		
Keystone 3X	100	101	65535	0-65535		
Keystone 3Y	102	103	65535	0-65535		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Keystone 4X	104	105	0	0-65535		
Keystone 4Y	106	107	65535	0-65535		
X-fade Type	108		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	109	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	110		0	0-128	Manual	
				129-255	Auto	
Take	111		0	0-127	Take On	
				128-255	Take Off	
Spout Source	112		0	0-9	None	
				10-19	Source 1	
				20-29	Source 2	
				30-39	Source 3	
				40-49	Source 4	
				50-59	Source 5	
				60-69	Source 6	
				70-79	Source 7	
Media Bank Offset	113		127	0-255	-127 to 127	
Media Clip Offset	114		0	0-255	-127 to 127	
Ignore Media	115		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	116		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
Key Mode	117		0	0-9	Bypass	
				10-19	Key	
				20-29	inverse Key	
Key Source Mix Select	118		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Key Source Layer	119		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Videomapper Enable	120		0	0-128	Disabled	
				129-255	Enabled	
VideoMap A Select	121		0	Map 1-255		
VideoMap B Select	122		0	Map 1-255		
Colourblocks Enable	123		0	0-128	Disabled	
				129-255	Enabled	
VideoMap Mix	124		255	Mix A to B		
VideoMap Mix / Morph	125		0	0-127	Mix	
				128-255	Morph	
Notch Bypass	126		255	0-127	Disabled	
				128-255	Enable	
Cached Resources	127		0	0-127	Cache	
				128-255	Enable	
Notch File Select	128		0	File 1-255		
Notch Effect Select	129		0	Effect 1-255		
Input 2 Source Mix Select	130		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Input 2 Source Layer	131		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Notch Timecode Source	132		0	0-9	Disable	
				10-19	Ext 1	
				20-29	Ext 2	
Notch Time Code Offset: Hours	133		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	134		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	135		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	136		0	0-255	TC on Layer Offset Frames	
Notch Parameter 1	137		0	0-255	Parameter 1	
Notch Parameter 2	138		0	0-255	Parameter 2	
Notch Parameter 3	139		0	0-255	Parameter 3	
Notch Parameter 4	140		0	0-255	Parameter 4	
Notch Parameter 5	141		0	0-255	Parameter 5	
Notch Parameter 6	142		0	0-255	Parameter 6	
Notch Parameter 7	143		0	0-255	Parameter 7	
Notch Parameter 8	144		0	0-255	Parameter 8	
Notch Parameter 9	145		0	0-255	Parameter 9	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Notch Parameter 10	146		0	0-255	Parameter 10	
ZoomEnableXY	147		0	0-128	Disabled	
Zoom X	148	149	32768	0-32767	Zoom X In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	150	151	32768	0-32767	Zoom Y In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	
UseMixRes	152		0	0-9	Layer	
				10-19	Mix	Added in 4.5.2
TouchEngine File	153		0	0-255	File Select	
TouchEngine Framerate	154		11	0	1 FPS	
				1	5 FPS	
				2	10 FPS	
				3	15 FPS	
				4	23.97 FPS	
				5	24 FPS	
				6	25 FPS	
				7	29.97 FPS	
				8	30 FPS	
				9	50 FPS	
				10	59.94 FPS	
				11	60 FPS	
				12	90 FPS	
				13	100 FPS	
				14	120 FPS	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Input 2 Mix	155		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 2 Layer	156		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Float 1	157		0	0-255		
TouchEngine Float 2	158		0	0-255		
TouchEngine Float 3	159		0	0-255		
TouchEngine Float 4	160		0	0-255		
TouchEngine Float 5	161		0	0-255		
TouchEngine Float 6	162		0	0-255		
TouchEngine Float 7	163		0	0-255		
TouchEngine Float 8	164		0	0-255		
TouchEngine Float 9	165		0	0-255		
TouchEngine Float 10	166		0	0-255		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Integer 1	167		0	0-255		
TouchEngine Integer 2	168		0	0-255		
TouchEngine Integer 3	169		0	0-255		
TouchEngine Integer 4	170		0	0-255		
TouchEngine Integer 5	171		0	0-255		
TouchEngine Integer 6	172		0	0-255		
TouchEngine Integer 7	173		0	0-255		
TouchEngine Integer 8	174		0	0-255		
TouchEngine Integer 9	175		0	0-255		
TouchEngine Integer 10	176		0	0-255		
TouchEngine Bool 1	177		0	0-255		
TouchEngine Bool 2	178		0	0-255		
TouchEngine Bool 3	179		0	0-255		
TouchEngine Bool 4	180		0	0-255		
TouchEngine Bool 5	181		0	0-255		
TouchEngine Bool 6	182		0	0-255		
TouchEngine Bool 7	183		0	0-255		
TouchEngine Bool 8	184		0	0-255		
TouchEngine Bool 9	185		0	0-255		
TouchEngine Bool 10	186		0	0-255		
TouchEngine Timecode Source	187		0	0	Disable	
				1	Ext 1	
				2	Ext 2	
TouchEngine Time Code Offset: Hours	188		0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	189		0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	190		0	0-255	TC on Layer Offset Seconds	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Time Code Offset: Frames	191		0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	192		0	0-128	Disable	
				129-255	Enable	

4.8 Layer Presets

The Layer Preset personality is the same as 4.8 Layer, with the following changes:

- Add Preset Select Pin
- Add Preset Crossfade settings
- Set all channels to update only

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	7		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Advance Colour	11		0	0-128	Disable Advance Colour	
				129-255	Enable Advance Colour	
Advance Red Low	12		128	0-127	Subtract Red Low	
				128	No Change	
				129-255	Add Red Low	
Advance Red Mid	13		128	0-127	Subtract Red Mid	
				128	No Change	
				129-255	Add Red Mid	
Advance Red High	14		128	0-127	Subtract Red High	
				128	No Change	
				129-255	Add Red High	
Advance Green Low	15		128	0-127	Subtract Green Low	
				128	No Change	
				129-255	Add Green Low	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Advance Green Mid	16		128	0-127	Subtract Green Mid	
				128	No Change	
				129-255	Add Green Mid	
Advance Green High	17		128	0-127	Subtract Green High	
				128	No Change	
				129-255	Add Green High	
Advance Blue Low	18		128	0-127	Subtract Blue Low	
				128	No Change	
				129-255	Add Blue Low	
Advance Blue Mid	19		128	0-127	Subtract Blue Mid	
				128	No Change	
				129-255	Add Blue Mid	
Advance Blue High	20		128	0-127	Subtract Blue High	
				128	No Change	
				129-255	Add Blue High	
Layer Rotation	21	22	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	23	24	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	25	26	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	27		128	0-127	Distort Aspect Ratio	
				0	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Distort Aspect Ratio	
Zoom	28	29	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	30		0	0-9	Auto Scale (Fits image to nearest axis)	
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	31		0	0-255	See Effects List	
Effects 1 Level	32		0	0-255		
Effects 1 Parameter 1	33		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	34		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	35		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	36		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	37		128	0-255	Determined by Selected Effect	
Effects 2 Select	38		0	0-255	See Effects List	
Effects 2 Level	39		0	0-255		
Effects 2 Parameter 1	40		128	0-255	Determined by Selected Effect	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Effects 2 Parameter 2	41		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	42		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	43		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	44		128	0-255	Determined by Selected Effect	
Source Type	45		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	46		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	47		0	0-255		
Media Player Play Mode	48		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	49		0	0	Disabled	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	50		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	51		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	52	53 and 54	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	55		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	56	57 and 58	0	0	End of Clip	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	59		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	60		0	0-128	De-interlace Off	
				129-255	De-interlace On	
Generator Select	61		0	0-255	See List of Generators	
Generator Parameter 1	62		128	0-255	Determined by Selected Generator	
Generator Parameter 2	63		128	0-255	Determined by Selected Generator	
Generator Parameter 3	64		128	0-255	Determined by Selected Generator	
Generator Parameter 4	65		128	0-255	Determined by Selected Generator	
Generator Parameter 5	66		128	0-255	Determined by Selected Generator	
Generator Parameter 6	67		128	0-255	Determined by Selected Generator	
Generator Parameter 7	68		128	0-255	Determined by Selected Generator	
Generator Parameter 8	69		128	0-255	Determined by Selected Generator	
Generator Parameter 9	70		128	0-255	Determined by Selected Generator	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
NDI Source Select	72		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	73		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	74		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	75		0	0-255		
Audio Pan	76		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	77		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	78		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	79	80 and 81	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	82	83 and 84	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	85		128	0-255	Shifts colour gamut of layer	
Colour Saturation	86		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	87		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	88		0	0-255	TC on Layer Offset Minutes	
Time Code Offset: Seconds	89		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	90		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	91		0	0-127	Disable Fly Wheel	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128-255	Enable Fly Wheel	
Keystone 1X	92	93	0	0-65535		
Keystone 1Y	94	95	0	0-65535		
Keystone 2X	96	97	65535	0-65535		
Keystone 2Y	98	99	0	0-65535		
Keystone 3X	100	101	65535	0-65535		
Keystone 3Y	102	103	65535	0-65535		
Keystone 4X	104	105	0	0-65535		
Keystone 4Y	106	107	65535	0-65535		
X-fade Type	108		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	109	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	110		0	0-128	Manual	
				129-255	Auto	
Take	111		0	0-127	Take On	
				128-255	Take Off	
Spout Source	112		0	0-9	None	
				10-19	Source 1	
				20-29	Source 2	
				30-39	Source 3	
				40-49	Source 4	
				50-59	Source 5	
				60-69	Source 6	
				70-79	Source 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Media Bank Offset	113		127	0-255	-127 to 127	
Media Clip Offset	114		0	0-255	-127 to 127	
Ignore Media	115		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	116		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
Key Mode	117		0	0-9	Bypass	
				10-19	Key	
				20-29	inverse Key	
Key Source Mix Select	118		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Key Source Layer	119		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Videomapper Enable	120		0	0-128	Disabled	
				129-255	Enabled	
VideoMap A Select	121		0	Map 1-255		
VideoMap B Select	122		0	Map 1-255		
Colourblocks Enable	123		0	0-128	Disabled	
				129-255	Enabled	
VideoMap Mix	124		255	Mix A to B		
VideoMap Mix / Morph	125		0	0-127	Mix	
				128-255	Morph	
Notch Bypass	126		255	0-127	Disabled	
				128-255	Enable	
Cached Resources	127		0	0-127	Cache	
				128-255	Enable	
Notch File Select	128		0	File 1-255		
Notch Effect Select	129		0	Effect 1-255		
Input 2 Source Mix Select	130		0	0	Disabled	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Input 2 Source Layer	131		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Notch Timecode Source	132		0	0-9	Disable	
				10-19	Ext 1	
				20-29	Ext 2	
Notch Time Code Offset: Hours	133		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	134		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	135		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	136		0	0-255	TC on Layer Offset Frames	
Notch Parameter 1	137		0	0-255	Parameter 1	
Notch Parameter 2	138		0	0-255	Parameter 2	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Notch Parameter 3	139		0	0-255	Parameter 3	
Notch Parameter 4	140		0	0-255	Parameter 4	
Notch Parameter 5	141		0	0-255	Parameter 5	
Notch Parameter 6	142		0	0-255	Parameter 6	
Notch Parameter 7	143		0	0-255	Parameter 7	
Notch Parameter 8	144		0	0-255	Parameter 8	
Notch Parameter 9	145		0	0-255	Parameter 9	
Notch Parameter 10	146		0	0-255	Parameter 10	
ZoomEnableXY	147		0	0-128	Disabled	
Zoom X	148	149	32768	0-32767	Zoom X In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	150	151	32768	0-32767	Zoom Y In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	
UseMixRes	152		0	0-9	Layer	
				10-19	Mix	Added in 4.5.2
TouchEngine File	153		0	0-255	File Select	
TouchEngine Framerate	154		11	0	1 FPS	
				1	5 FPS	
				2	10 FPS	
				3	15 FPS	
				4	23.97 FPS	
				5	24 FPS	
				6	25 FPS	
				7	29.97 FPS	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				8	30 FPS	
				9	50 FPS	
				10	59.94 FPS	
				11	60 FPS	
				12	90 FPS	
				13	100 FPS	
				14	120 FPS	
TouchEngine Input 2 Mix	155		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 2 Layer	156		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Float 1	157		0	0-255		
TouchEngine Float 2	158		0	0-255		
TouchEngine Float 3	159		0	0-255		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Float 4	160		0	0-255		
TouchEngine Float 5	161		0	0-255		
TouchEngine Float 6	162		0	0-255		
TouchEngine Float 7	163		0	0-255		
TouchEngine Float 8	164		0	0-255		
TouchEngine Float 9	165		0	0-255		
TouchEngine Float 10	166		0	0-255		
TouchEngine Integer 1	167		0	0-255		
TouchEngine Integer 2	168		0	0-255		
TouchEngine Integer 3	169		0	0-255		
TouchEngine Integer 4	170		0	0-255		
TouchEngine Integer 5	171		0	0-255		
TouchEngine Integer 6	172		0	0-255		
TouchEngine Integer 7	173		0	0-255		
TouchEngine Integer 8	174		0	0-255		
TouchEngine Integer 9	175		0	0-255		
TouchEngine Integer 10	176		0	0-255		
TouchEngine Bool 1	177		0	0-255		
TouchEngine Bool 2	178		0	0-255		
TouchEngine Bool 3	179		0	0-255		
TouchEngine Bool 4	180		0	0-255		
TouchEngine Bool 5	181		0	0-255		
TouchEngine Bool 6	182		0	0-255		
TouchEngine Bool 7	183		0	0-255		
TouchEngine Bool 8	184		0	0-255		
TouchEngine Bool 9	185		0	0-255		
TouchEngine Bool 10	186		0	0-255		
TouchEngine Timecode Source	187		0	0	Disable	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Ext 1	
				2	Ext 2	
TouchEngine Time Code Offset: Hours	188		0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	189		0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	190		0	0-255	TC on Layer Offset Seconds	
TouchEngine Time Code Offset: Frames	191		0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	192		0	0-128	Disable	
				129-255	Enable	
Preset Bank Select	193		0	0-255	Preset Bank	
Preset Index Select	194		0	0-255	Preset Index	
Use Recorded Fade	195		0	0-128	Disabled	
Preset Fade Type	196		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	197		0	0-255	Cross Fade Time in 0.1 Seconds	

4.8 Layer Lite

4.8 Layer Lite

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Blue	7		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Layer Rotation	11	12	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	13	14	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	15	16	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	17		128	0-127	Distort Aspect Ratio	
				0	No Change	
				129-255	Distort Aspect Ratio	
Zoom	18	19	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	20		0	0-9	Auto Scale (Fits image to	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
					nearest axis)	
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	21		0	0-255	See Effects List	
Effects 1 Level	22		0	0-255		
Effects 1 Parameter 1	23		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	24		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	25		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	26		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	27		128	0-255	Determined by Selected Effect	
Effects 2 Select	28		0	0-255	See Effects List	
Effects 2 Level	29		0	0-255		
Effects 2 Parameter 1	30		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	31		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	32		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	33		128	0-255	Determined by Selected Effect	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Effects 2 Parameter 5	34		128	0-255	Determined by Selected Effect	
Source Type	35		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	36		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	37		0	0-255		
Media Player Play Mode	38		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	39		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	40		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	41		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	42	43 and 44	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	45		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	46	47 and 48	0	0	End of Clip	
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	49		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	50		0	0-128	De-interlace Off	
				129-255	De-interlace On	
NDI Source Select	51		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	52		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	53		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	54		0	0-255		
Audio Pan	55		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	56		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	67		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	58	59 and 60	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	61	62 and 63	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	64		128	0-255	Shifts colour gamut of layer	
Colour Saturation	65		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	66		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	67		0	0-255	TC on Layer Offset Minutes	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Time Code Offset: Seconds	68		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	69		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	70		0	0-127	Disable Fly Wheel	
				128-255	Enable Fly Wheel	
X-fade Type	71		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	72	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	73		0	0-128	Manual	
				129-255	Auto	
Take	74		0	0-127	Take On	
				128-255	Take Off	
Media Bank Offset	75		127	0-255	-127 to 127	
Media Clip Offset	76		0	0-255	-127 to 127	
Ignore Media	77		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	78		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
ZoomEnableXY	79		0	0-128	Disabled	Added in 4.5.2
Zoom X	80	81	32768	0-32767	Zoom X In	Added in 4.5.2
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	82	83	32768	0-32767	Zoom Y In	Added in 4.5.2
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	Added in 4.5.2

4.8 Mix

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Mix Level	1		255	0-255		
Effects 1 Select	2		0	0-255	See Effects List	
Effects 1 Level	3		0	0-255		
Effects 1 Parameter 1	4		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	5		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	6		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	7		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	8		128	0-255	Determined by Selected Effect	
Effects 2 Select	9		0	0-255	See Effects List	
Effects 2 Level	10		0	0-255		
Effects 2 Parameter 1	11		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	12		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	13		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	14		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	15		128	0-255	Determined by Selected Effect	
Effects 3 Select	16		0	0-255	See Effects List	
Effects 3 Level	17		0	0-255		
Effects 3 Parameter 1	18		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 2	19		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 3	20		128	0-255	Determined by Selected	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
					Effect	
Effects 3 Parameter 4	21		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 5	22		128	0-255	Determined by Selected Effect	
Effects 4 Select	23		0	0-255	See Effects List	
Effects 4 Level	24		0	0-255		
Effects 4 Parameter 1	25		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 2	26		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 3	27		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 4	28		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 5	29		128	0-255	Determined by Selected Effect	
Pixelmapper Enable	30		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	31		0	0-255		
Visulisation mode	32		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	33		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	34		0	0-255		
Audio Level	35		255	0-255		
AudioDevice	36		0	0-9	Windows Default Device	
				10-19	Device 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				20-29	Device 3	
				30-39	Device 4	
				40-49	Device 5	
Timecode shift	37	38	32767	0-65535		
NDI Enable	39		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	40		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	41		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	42		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	
Pixelmapper White Intesity	43		255	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Pixelmapper White Balance	44		128	0-255		
Preset Bank Select	45		0	0-255	Preset Bank	
Preset Index Select	46		0	0-255	Preset Index	
Use Recorded Fade	47		0	0-128	Disabled	
Preset Fade Type	48		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	49		0	0-255	Cross Fade Time in 0.1 Seconds	

4.8 Mix Presets

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Mix Level	1		255	0-255		
Effects 1 Select	2		0	0-255	See Effects List	
Effects 1 Level	3		0	0-255		
Effects 1 Parameter 1	4		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	5		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	6		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	7		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	8		128	0-255	Determined by Selected Effect	
Effects 2 Select	9		0	0-255	See Effects List	
Effects 2 Level	10		0	0-255		
Effects 2 Parameter 1	11		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	12		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	13		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	14		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	15		128	0-255	Determined by Selected Effect	
Effects 3 Select	16		0	0-255	See Effects List	
Effects 3 Level	17		0	0-255		
Effects 3 Parameter 1	18		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 2	19		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 3	20		128	0-255	Determined by Selected	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
					Effect	
Effects 3 Parameter 4	21		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 5	22		128	0-255	Determined by Selected Effect	
Effects 4 Select	23		0	0-255	See Effects List	
Effects 4 Level	24		0	0-255		
Effects 4 Parameter 1	25		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 2	26		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 3	27		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 4	28		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 5	29		128	0-255	Determined by Selected Effect	
Pixelmapper Enable	30		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	31		0	0-255		
Visulisation mode	32		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	33		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	34		0	0-255		
Audio Level	35		255	0-255		
AudioDevice	36		0	0-9	Windows Default Device	
				10-19	Device 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				20-29	Device 3	
				30-39	Device 4	
				40-49	Device 5	
Timecode shift	37	38	32767	0-65535		
NDI Enable	39		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	40		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	41		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	42		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	
Pixelmapper White Intesity	43		255	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Pixelmapper White Balance	44		128	0-255		
Preset Bank Select	45		0	0-255	Preset Bank	
Preset Index Select	46		0	0-255	Preset Index	
Use Recorded Fade	47		0	0-128	Disabled	
Preset Fade Type	48		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	49		0	0-255	Cross Fade Time in 0.1 Seconds	

4.8 TouchEngine Mix

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Mix Level	1		0-255			
TouchEngine File	2		0	0-255	File Select	
TouchEngine Framerate	3		11	0	1 FPS	
				1	5 FPS	
				2	10 FPS	
				3	15 FPS	
				4	23.97 FPS	
				5	24 FPS	
				6	25 FPS	
				7	29.97 FPS	
				8	30 FPS	
				9	50 FPS	
				10	59.94 FPS	
				11	60 FPS	
				12	90 FPS	
				13	100 FPS	
				14	120 FPS	
TouchEngine Input 1 Mix	4		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 1 Layer	5		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 2 Mix	6		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 2 Layer	7		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 3 Mix	8		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 3 Layer	9		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 4 Mix	10		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 4 Layer	11		0	0	Master	
				1	Layer 1 Visible	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 5 Mix	12		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 5 Layer	13		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 6 Mix	14		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 6 Layer	15		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Input 7 Mix	16		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 7 Layer	17		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
TouchEngine Input 8 Mix	18		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 8 Layer	19		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Float 1	20		0	0-255		
TouchEngine Float 2	21		0	0-255		
TouchEngine Float 3	22		0	0-255		
TouchEngine Float 4	23		0	0-255		
TouchEngine Float 5	24		0	0-255		
TouchEngine Float 6	25		0	0-255		
TouchEngine Float 7	26		0	0-255		
TouchEngine Float 8	27		0	0-255		
TouchEngine Float 9	28		0	0-255		
TouchEngine Float 10	29		0	0-255		
TouchEngine Integer 1	30		0	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
TouchEngine Integer 2	31		0	0-255		
TouchEngine Integer 3	32		0	0-255		
TouchEngine Integer 4	33		0	0-255		
TouchEngine Integer 5	34		0	0-255		
TouchEngine Integer 6	35		0	0-255		
TouchEngine Integer 7	36		0	0-255		
TouchEngine Integer 8	37		0	0-255		
TouchEngine Integer 9	38		0	0-255		
TouchEngine Integer 10	39		0	0-255		
TouchEngine Bool 1	40		0	0-255		
TouchEngine Bool 2	41		0	0-255		
TouchEngine Bool 3	42		0	0-255		
TouchEngine Bool 4	43		0	0-255		
TouchEngine Bool 5	44		0	0-255		
TouchEngine Bool 6	45		0	0-255		
TouchEngine Bool 7	46		0	0-255		
TouchEngine Bool 8	47		0	0-255		
TouchEngine Bool 9	48		0	0-255		
TouchEngine Bool 10	49		0	0-255		
TouchEngine Timecode Source	50		0	0	Disable	
				1	Ext 1	
				2	Ext 2	
TouchEngine Time Code Offset: Hours	51		0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	52		0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	53		0	0-255	TC on Layer Offset Seconds	
TouchEngine Time Code Offset: Frames	54		0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	55		0	0-128	Disable	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				129-255	Enable	

4.8 Notch Mix

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Notch Bypass	1		0	0-128	Disabled	
				129-255	Enabled	
Cache Resources	2		0	0-128	Disabled	
				129-255	Enabled	
Notch Block Select	3		0	0	Disabled	
				1	Block 1	
				2	Block 2	
				…	to Block 255	
Notch Layer Select	4		0	0	Disabled	
				1	Layer 1	
				2	Layer 2	
				…	to Layer 255	
Input_1 Mix/Viewport	5		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_1 Layer	6		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_2 Mix/Viewport	7		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_2 Layer	8		0	0	Master	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_3 Mix/Viewport	9		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_3 Layer	10		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_4 Mix/Viewport	11		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_4 Layer	12		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_5 Mix/Viewport	13		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Input_5 Layer	14		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_6 Mix/Viewport	15		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_6 Layer	16		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_7 Mix/Viewport	17		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_7 Layer	18		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_8 Mix/Viewport	19		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				…	to Mix 255	
Input_8 Layer	20		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Notch Parameter 1	21		0	0-255		
Notch Parameter 2	22		0	0-255		
Notch Parameter 3	23		0	0-255		
Notch Parameter 4	24		0	0-255		
Notch Parameter 5	25		0	0-255		
Notch Parameter 6	26		0	0-255		
Notch Parameter 7	27		0	0-255		
Notch Parameter 8	28		0	0-255		
Notch Parameter 9	29		0	0-255		
Notch Parameter 10	30		0	0-255		
Use DMX Offset	31		0	0-128	Disabled	
				129-255	Enabled	
Notch Timecode Source	32		0	0	Disable	
				1	Ext 1	
				2	Ext 2	
Notch Time Code Offset: Hours	33		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	34		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	35		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	36		0	0-255	TC on Layer Offset Frames	

4.8 Viewport

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Viewport Level	1		255	0-255		
Red	2		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	3		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	4		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	5		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	6		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Colour Saturation	7		128	0-255	Saturates / Desaturates colours	
Colour Shift	8		128	0-255	Shifts colour gamut of layer	
Invert Colour	9		0	0-127	Invert Off	
				128-255	Invert On	
Effects 1 Select	10		0	0-255	See Effects List	
Effects 1 Level	11		0	0-255		
Effects 1 Parameter 1	12		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	13		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	14		128	0-255	Determined by Selected Effect	
Effects 1 Parameter	15		128	0-255	Determined by Selected Effect	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
4						
Effects 1 Parameter 5	16		128	0-255	Determined by Selected Effect	
Effects 2 Select	17		0	0-255	See Effects List	
Effects 2 Level	18		0	0-255		
Effects 2 Parameter 1	19		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	20		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	21		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	22		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	23		128	0-255	Determined by Selected Effect	
Rotation Positon (Index)	24	25	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	26	27	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	28	29	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Viewport Zoom	30	31	32768	0-32767	Zoom –	
				32768	No Change	
				32769-65535	Zoom +	
Keystone Point 1X	33	34	0	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Keystone Point 1Y	35	36	0	0-255		
Keystone Point 2X	37	38	65535	0-255		
Keystone Point 2Y	39	40	0	0-255		
Keystone Point 3X	41	42	65535	0-255		
Keystone Point 3Y	43	44	65535	0-255		
Keystone Point 4X	45	46	0	0-255		
Keystone Point 4Y	47	48	65535	0-255		
Livemask Select	49		0	0-255	Live Mask Select	
Livemask Level	50		100	0-255		
Videomapper Enable	51		0	0-127	Disable	
				128-255	Enable	
Videomapper Mix	52		255	0-255		
Videomapper Mix/ Morph	53		0	0-127	Mix	
				128-255	Morph	
Videomap A Select	54		0	0-255		
Videomap B Select	55		0	0-255		
Screen Warp Enable	56		0	0-127	Disabled	
				128-255	Enabled	
Screen Warp Select A	57		0	0-255	Screen Warp A Select	
Screen Warp Select B	58		0	0-255	Screen Warp B Select	
Screen Warp Mix	59		0	0-255		
Pixelmapper Enable	60		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	61		0	0-255		
Visulisation mode	62		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	63		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	64		0	0-255		
NDI Enable	65		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	66		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	67		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	68		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
MPCDI File	69		0	0-255	File Select	
MPCDI Output	70		0	0-255	Output Select	
MPCDI Blend	71		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Warp	72		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Vertical Flip	73		0	0-128	Disabled	
				129-255	Enabled	
MPCDI Black Level	74		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Colour	75		255	0-128	Disabled	
				129-255	Enabled	
Frame Delay	76		0	0	Disabled	
				1	1 Frame	
				2	2 Frames	
				…	To 30 Frames	
Freeze Output	77		0	0-128	Disabled	
				129-255	Enabled	
Pixelmapper White Intesity	78		255	0-255		
Pixelmapper White Balance	79		128	0-255		

4.8 SHAPE Viewport

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Viewport Level	1		255	0-255		
Red	2		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	3		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	4		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	5		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	6		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Colour Saturation	7		128	0-255	Saturates / Desaturates colours	
Colour Shift	8		128	0-255	Shifts colour gamut of layer	
Invert Colour	9		0	0-127	Invert Off	
				128-255	Invert On	
Effects 1 Select	10		0	0-255	See Effects List	
Effects 1 Level	11		0	0-255		
Effects 1 Parameter 1	12		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	13		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	14		128	0-255	Determined by Selected Effect	
Effects 1 Parameter	15		128	0-255	Determined by Selected Effect	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
4						
Effects 1 Parameter 5	16		128	0-255	Determined by Selected Effect	
Effects 2 Select	17		0	0-255	See Effects List	
Effects 2 Level	18		0	0-255		
Effects 2 Parameter 1	19		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	20		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	21		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	22		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	23		128	0-255	Determined by Selected Effect	
Rotation Positon (Index)	24	25	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	26	27	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	28	29	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Viewport Zoom	30	31	32768	0-32767	Zoom –	
				32768	No Change	
				32769-65535	Zoom +	
Keystone Point 1X	33	34	0	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Keystone Point 1Y	35	36	0	0-255		
Keystone Point 2X	37	38	65535	0-255		
Keystone Point 2Y	39	40	0	0-255		
Keystone Point 3X	41	42	65535	0-255		
Keystone Point 3Y	43	44	65535	0-255		
Keystone Point 4X	45	46	0	0-255		
Keystone Point 4Y	47	48	65535	0-255		
Livemask Select	49		0	0-255	Live Mask Select	
Livemask Level	50		100	0-255		
Videomapper Enable	51		0	0-127	Disable	
				128-255	Enable	
Videomapper Mix	52		255	0-255		
Videomapper Mix/ Morph	53		0	0-127	Mix	
				128-255	Morph	
Videomap A Select	54		0	0-255		
Videomap B Select	55		0	0-255		
Screen Warp Enable	56		0	0-127	Disabled	
				128-255	Enabled	
Screen Warp Select A	57		0	0-255	Screen Warp A Select	
Screen Warp Select B	58		0	0-255	Screen Warp B Select	
Screen Warp Mix	59		0	0-255		
Pixelmapper Enable	60		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	61		0	0-255		
Visulisation mode	62		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	63		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	64		0	0-255		
NDI Enable	65		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	66		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	67		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	68		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
MPCDI File	69		0	0-255	File Select	
MPCDI Output	70		0	0-255	Output Select	
MPCDI Blend	71		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Warp	72		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Vertical Flip	73		0	0-128	Disabled	
				129-255	Enabled	
MPCDI Black Level	74		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Colour	75		255	0-128	Disabled	
				129-255	Enabled	
Frame Delay	76		0	0	Disabled	
				1	1 Frame	
				2	2 Frames	
				…	To 30 Frames	
Freeze Output	77		0	0-128	Disabled	
				129-255	Enabled	
Pixelmapper White Intesity	78		255	0-255		
Pixelmapper White Balance	79		128	0-255		
Shape Output Look	80		0	0-9	Textured	
				10-19	Textured+Wireframe	
				20-29	Wireframe	
				30-39	Solid	
				40-49	Solid+Wireframe	
				50-59	Alignment	
Shape Source	81		0	0-255	File Select	

4.8 SHAPE

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Enable	1		255	0-128	Disabled	
				129-255	Enabled	
Project File	2		0	0	Default Project	
				1	Project 1	
				2	Project 2	
				…	to Project 255	
Network Enable	3		255	0-128	Disabled	
				129-255	Enabled	
Leave Network	4		0	0-128	Disabled	
				129-255	Enabled	
Input_1 Level	5		255	0-255		
Input_2 Level	6		255	0-255		
Input_2 Mix/Viewport	7		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_3 Level	8		255	0-255		
Input_3 Mix/Viewport	9		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_4 Level	10		255	0-255		
Input_4 Mix/Viewport	11		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_5 Level	12		255	0-255		
Input_5 Mix/Viewport	13		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_6 Level	14		255	0-255		
Input_6 Mix/Viewport	15		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_7 Level	16		255	0-255		
Input_7 Mix/Viewport	17		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_8 Level	18		255	0-255		
Input_8 Mix/Viewport	19		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_9 Level	20		255	0-255		
Input_9 Mix/Viewport	21		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_10 Level	22		255	0-255		
Input_10 Mix/Viewport	23		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_11 Level	24		255	0-255		
Input_11 Mix/Viewport	25		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_12 Level	26		255	0-255		
Input_12 Mix/Viewport	27		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_13 Level	28		255	0-255		
Input_13 Mix/Viewport	29		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_14 Level	30		255	0-255		
Input_14 Mix/Viewport	31		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_15 Level	32		255	0-255		
Input_15 Mix/Viewport	33		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_16 Level	34		255	0-255		
Input_16 Mix/Viewport	35		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_17 Level	36		255	0-255		
Input_17 Mix/Viewport	37		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_18 Level	38		255	0-255		
Input_18 Mix/Viewport	39		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_19 Level	40		255	0-255		
Input_19 Mix/Viewport	41		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_20 Level	42		255	0-255		
Input_20 Mix/Viewport	43		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_21 Level	44		255	0-255		
Input_21 Mix/Viewport	45		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_22 Level	46		255	0-255		
Input_22 Mix/Viewport	47		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_23 Level	48		255	0-255		
Input_23 Mix/Viewport	49		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_24 Level	50		255	0-255		
Input_24 Mix/Viewport	51		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	

TimelinePlus

Timelines can be triggered from DMX using a built in personality

In the timeline list in the User Interface you need to set the ID for each timeline as this will be referenced by the first DMX channel. Channel 2 triggers the action on this particular timeline.

Please note that a command will only be triggered if a DMX value changes.

For example timeline 1->Play (DMX values 1, 10) will trigger a play command the first time this is issued.

If the timeline runs into a stop command and you wish to play again simple sending 1->Play won't do anything as the values have not changed.

you need to insert a "nothing" cue in between (values 1, 0) before issued 1_Play again (1,10).

Function	DMX	DMX (16bit)	Default	Range	Notes
Timeline Select	1	2	0	0 – 65535	
				0	No Timeline Selected
				255	Timeline 255 Seclected
Playback Command	3		0	0-9	Nothing
				10-19	Play
				20-29	Pause
				30-39	Stop
				40-49	GoCue and Play
				50-59	Go Cue and Stop
				60-69	Go Cue
				70-79	Mute
				80-89	UnMute
Cue Major	4	5	0	0-65535	Cue # Major
				0	Recall Cue 0.xx
				1	Recall Cue 1.xx
				999	Recall Cue 999.xx
Cue Minor	6	7	0	0-65535	Cue # Minor
				0	Recall Cue x.000
				1	Recall Cue x.001

Function	DMX	DMX (16bit)	Default	Range	Notes
				999	Recall Cue x.999

Old Charts

4.7 Layer

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	7		128	0-127	Subtract Blue	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Advance Colour	11		0	0-128	Disable Advance Colour	
				129-255	Enable Advance Colour	
Advance Red Low	12		128	0-127	Subtract Red Low	
				128	No Change	
				129-255	Add Red Low	
Advance Red Mid	13		128	0-127	Subtract Red Mid	
				128	No Change	
				129-255	Add Red Mid	
Advance Red High	14		128	0-127	Subtract Red High	
				128	No Change	
				129-255	Add Red High	
Advance Green Low	15		128	0-127	Subtract Green Low	
				128	No Change	
				129-255	Add Green Low	
Advance Green Mid	16		128	0-127	Subtract Green Mid	
				128	No Change	
				129-255	Add Green Mid	
Advance Green High	17		128	0-127	Subtract Green High	
				128	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Add Green High	
Advance Blue Low	18		128	0-127	Subtract Blue Low	
				128	No Change	
				129-255	Add Blue Low	
Advance Blue Mid	19		128	0-127	Subtract Blue Mid	
				128	No Change	
				129-255	Add Blue Mid	
Advance Blue High	20		128	0-127	Subtract Blue High	
				128	No Change	
				129-255	Add Blue High	
Layer Rotation	21	22	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	23	24	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	25	26	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	27		128	0-127	Distort Aspect Ratio	
				0	No Change	
				129-255	Distort Aspect Ratio	
Zoom	28	29	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	30		0	0-9	Auto Scale (Fits image to nearest axis)	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	31		0	0-255	See Effects List	
Effects 1 Level	32		0	0-255		
Effects 1 Parameter 1	33		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	34		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	35		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	36		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	37		128	0-255	Determined by Selected Effect	
Effects 2 Select	38		0	0-255	See Effects List	
Effects 2 Level	39		0	0-255		
Effects 2 Parameter 1	40		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	41		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	42		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	43		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	44		128	0-255	Determined by Selected	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
					Effect	
Source Type	45		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	46		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	47		0	0-255		
Media Player Play Mode	48		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	49		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	50		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	51		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	52	53 and 54	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	55		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	56	57 and 58	0	0	End of Clip	
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	59		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	60		0	0-128	De-interlace Off	
				129-255	De-interlace On	
Generator Select	61		0	0-255	See List of Generators	
Generator Parameter 1	62		128	0-255	Determined by Selected Generator	
Generator Parameter 2	63		128	0-255	Determined by Selected Generator	
Generator Parameter 3	64		128	0-255	Determined by Selected Generator	
Generator Parameter 4	65		128	0-255	Determined by Selected Generator	
Generator Parameter 5	66		128	0-255	Determined by Selected Generator	
Generator Parameter 6	67		128	0-255	Determined by Selected Generator	
Generator Parameter 7	68		128	0-255	Determined by Selected Generator	
Generator Parameter 8	69		128	0-255	Determined by Selected Generator	
Generator Parameter 9	70		128	0-255	Determined by Selected Generator	
NDI Source Select	72		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	73		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	74		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	75		0	0-255		
Audio Pan	76		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	77		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	78		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	79	80 and 81	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	82	83 and 84	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	85		128	0-255	Shifts colour gamut of layer	
Colour Saturation	86		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	87		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	88		0	0-255	TC on Layer Offset Minutes	
Time Code Offset: Seconds	89		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	90		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	91		0	0-127	Disable Fly Wheel	
				128-255	Enable Fly Wheel	
Keystone 1X	92	93	0	0-65535		
Keystone 1Y	94	95	0	0-65535		
Keystone 2X	96	97	65535	0-65535		
Keystone 2Y	98	99	0	0-65535		
Keystone 3X	100	101	65535	0-65535		
Keystone 3Y	102	103	65535	0-65535		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Keystone 4X	104	105	0	0-65535		
Keystone 4Y	106	107	65535	0-65535		
X-fade Type	108		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	109	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	110		0	0-128	Manual	
				129-255	Auto	
Take	111		0	0-127	Take On	
				128-255	Take Off	
Spout Source	112		0	0-9	None	
				10-19	Source 1	
				20-29	Source 2	
				30-39	Source 3	
				40-49	Source 4	
				50-59	Source 5	
				60-69	Source 6	
				70-79	Source 7	
Media Bank Offset	113		127	0-255	-127 to 127	
Media Clip Offset	114		0	0-255	-127 to 127	
Ignore Media	115		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	116		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
Key Mode	117		0	0-9	Bypass	
				10-19	Key	
				20-29	inverse Key	
Key Source Mix Select	118		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Key Source Layer	119		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Videomapper Enable	120		0	0-128	Disabled	
				129-255	Enabled	
VideoMap A Select	121		0	Map 1-255		
VideoMap B Select	122		0	Map 1-255		
Colourblocks Enable	123		0	0-128	Disabled	
				129-255	Enabled	
VideoMap Mix	124		255	Mix A to B		
VideoMap Mix / Morph	125		0	0-127	Mix	
				128-255	Morph	
Notch Bypass	126		255	0-127	Disabled	
				128-255	Enable	
Cached Resources	127		0	0-127	Cache	
				128-255	Enable	
Notch File Select	128		0	File 1-255		
Notch Effect Select	129		0	Effect 1-255		
Input 2 Source Mix Select	130		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Input 2 Source Layer	131		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Notch Timecode Source	132		0	0-9	Disable	
				10-19	Ext 1	
				20-29	Ext 2	
Notch Time Code Offset: Hours	133		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	134		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	135		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	136		0	0-255	TC on Layer Offset Frames	
Notch Parameter 1	137		0	0-255	Parameter 1	
Notch Parameter 2	138		0	0-255	Parameter 2	
Notch Parameter 3	139		0	0-255	Parameter 3	
Notch Parameter 4	140		0	0-255	Parameter 4	
Notch Parameter 5	141		0	0-255	Parameter 5	
Notch Parameter 6	142		0	0-255	Parameter 6	
Notch Parameter 7	143		0	0-255	Parameter 7	
Notch Parameter 8	144		0	0-255	Parameter 8	
Notch Parameter 9	145		0	0-255	Parameter 9	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Notch Parameter 10	146		0	0-255	Parameter 10	
ZoomEnableXY	147		0	0-128	Disabled	
Zoom X	148	149	32768	0-32767	Zoom X In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	150	151	32768	0-32767	Zoom Y In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	
UseMixRes	152		0	0-9	Layer	
				10-19	Mix	Added in 4.5.2
TouchEngine File	153		0	0-255	File Select	
TouchEngine Framerate	154		11	0	1 FPS	
				1	5 FPS	
				2	10 FPS	
				3	15 FPS	
				4	23.97 FPS	
				5	24 FPS	
				6	25 FPS	
				7	29.97 FPS	
				8	30 FPS	
				9	50 FPS	
				10	59.94 FPS	
				11	60 FPS	
				12	90 FPS	
				13	100 FPS	
				14	120 FPS	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Input 2 Mix	155		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 2 Layer	156		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Float 1	157		0	0-255		
TouchEngine Float 2	158		0	0-255		
TouchEngine Float 3	159		0	0-255		
TouchEngine Float 4	160		0	0-255		
TouchEngine Float 5	161		0	0-255		
TouchEngine Float 6	162		0	0-255		
TouchEngine Float 7	163		0	0-255		
TouchEngine Float 8	164		0	0-255		
TouchEngine Float 9	165		0	0-255		
TouchEngine Float 10	166		0	0-255		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Integer 1	167		0	0-255		
TouchEngine Integer 2	168		0	0-255		
TouchEngine Integer 3	169		0	0-255		
TouchEngine Integer 4	170		0	0-255		
TouchEngine Integer 5	171		0	0-255		
TouchEngine Integer 6	172		0	0-255		
TouchEngine Integer 7	173		0	0-255		
TouchEngine Integer 8	174		0	0-255		
TouchEngine Integer 9	175		0	0-255		
TouchEngine Integer 10	176		0	0-255		
TouchEngine Bool 1	177		0	0-255		
TouchEngine Bool 2	178		0	0-255		
TouchEngine Bool 3	179		0	0-255		
TouchEngine Bool 4	180		0	0-255		
TouchEngine Bool 5	181		0	0-255		
TouchEngine Bool 6	182		0	0-255		
TouchEngine Bool 7	183		0	0-255		
TouchEngine Bool 8	184		0	0-255		
TouchEngine Bool 9	185		0	0-255		
TouchEngine Bool 10	186		0	0-255		
TouchEngine Timecode Source	187		0	0	Disable	
				1	Ext 1	
				2	Ext 2	
TouchEngine Time Code Offset: Hours	188		0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	189		0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	190		0	0-255	TC on Layer Offset Seconds	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Time Code Offset: Frames	191		0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	192		0	0-128	Disable	
				129-255	Enable	

4.7 Layer Presets

The Layer Preset personality is the same as 4.7 Layer, with the following changes:

- Add Preset Select Pin
- Add Preset Crossfade settings
- Set all channels to update only

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	7		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Advance Colour	11		0	0-128	Disable Advance Colour	
				129-255	Enable Advance Colour	
Advance Red Low	12		128	0-127	Subtract Red Low	
				128	No Change	
				129-255	Add Red Low	
Advance Red Mid	13		128	0-127	Subtract Red Mid	
				128	No Change	
				129-255	Add Red Mid	
Advance Red High	14		128	0-127	Subtract Red High	
				128	No Change	
				129-255	Add Red High	
Advance Green Low	15		128	0-127	Subtract Green Low	
				128	No Change	
				129-255	Add Green Low	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Advance Green Mid	16		128	0-127	Subtract Green Mid	
				128	No Change	
				129-255	Add Green Mid	
Advance Green High	17		128	0-127	Subtract Green High	
				128	No Change	
				129-255	Add Green High	
Advance Blue Low	18		128	0-127	Subtract Blue Low	
				128	No Change	
				129-255	Add Blue Low	
Advance Blue Mid	19		128	0-127	Subtract Blue Mid	
				128	No Change	
				129-255	Add Blue Mid	
Advance Blue High	20		128	0-127	Subtract Blue High	
				128	No Change	
				129-255	Add Blue High	
Layer Rotation	21	22	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	23	24	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	25	26	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	27		128	0-127	Distort Aspect Ratio	
				0	No Change	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				129-255	Distort Aspect Ratio	
Zoom	28	29	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	30		0	0-9	Auto Scale (Fits image to nearest axis)	
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	31		0	0-255	See Effects List	
Effects 1 Level	32		0	0-255		
Effects 1 Parameter 1	33		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	34		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	35		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	36		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	37		128	0-255	Determined by Selected Effect	
Effects 2 Select	38		0	0-255	See Effects List	
Effects 2 Level	39		0	0-255		
Effects 2 Parameter 1	40		128	0-255	Determined by Selected Effect	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Effects 2 Parameter 2	41		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	42		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	43		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	44		128	0-255	Determined by Selected Effect	
Source Type	45		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	46		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	47		0	0-255		
Media Player Play Mode	48		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	49		0	0	Disabled	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	50		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	51		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	52	53 and 54	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	55		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	56	57 and 58	0	0	End of Clip	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	59		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	60		0	0-128	De-interlace Off	
				129-255	De-interlace On	
Generator Select	61		0	0-255	See List of Generators	
Generator Parameter 1	62		128	0-255	Determined by Selected Generator	
Generator Parameter 2	63		128	0-255	Determined by Selected Generator	
Generator Parameter 3	64		128	0-255	Determined by Selected Generator	
Generator Parameter 4	65		128	0-255	Determined by Selected Generator	
Generator Parameter 5	66		128	0-255	Determined by Selected Generator	
Generator Parameter 6	67		128	0-255	Determined by Selected Generator	
Generator Parameter 7	68		128	0-255	Determined by Selected Generator	
Generator Parameter 8	69		128	0-255	Determined by Selected Generator	
Generator Parameter 9	70		128	0-255	Determined by Selected Generator	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
NDI Source Select	72		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	73		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	74		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	75		0	0-255		
Audio Pan	76		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	77		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	78		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	79	80 and 81	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	82	83 and 84	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	85		128	0-255	Shifts colour gamut of layer	
Colour Saturation	86		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	87		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	88		0	0-255	TC on Layer Offset Minutes	
Time Code Offset: Seconds	89		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	90		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	91		0	0-127	Disable Fly Wheel	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128-255	Enable Fly Wheel	
Keystone 1X	92	93	0	0-65535		
Keystone 1Y	94	95	0	0-65535		
Keystone 2X	96	97	65535	0-65535		
Keystone 2Y	98	99	0	0-65535		
Keystone 3X	100	101	65535	0-65535		
Keystone 3Y	102	103	65535	0-65535		
Keystone 4X	104	105	0	0-65535		
Keystone 4Y	106	107	65535	0-65535		
X-fade Type	108		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	109	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	110		0	0-128	Manual	
				129-255	Auto	
Take	111		0	0-127	Take On	
				128-255	Take Off	
Spout Source	112		0	0-9	None	
				10-19	Source 1	
				20-29	Source 2	
				30-39	Source 3	
				40-49	Source 4	
				50-59	Source 5	
				60-69	Source 6	
				70-79	Source 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Media Bank Offset	113		127	0-255	-127 to 127	
Media Clip Offset	114		0	0-255	-127 to 127	
Ignore Media	115		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	116		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
Key Mode	117		0	0-9	Bypass	
				10-19	Key	
				20-29	inverse Key	
Key Source Mix Select	118		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Key Source Layer	119		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Videomapper Enable	120		0	0-128	Disabled	
				129-255	Enabled	
VideoMap A Select	121		0	Map 1-255		
VideoMap B Select	122		0	Map 1-255		
Colourblocks Enable	123		0	0-128	Disabled	
				129-255	Enabled	
VideoMap Mix	124		255	Mix A to B		
VideoMap Mix / Morph	125		0	0-127	Mix	
				128-255	Morph	
Notch Bypass	126		255	0-127	Disabled	
				128-255	Enable	
Cached Resources	127		0	0-127	Cache	
				128-255	Enable	
Notch File Select	128		0	File 1-255		
Notch Effect Select	129		0	Effect 1-255		
Input 2 Source Mix Select	130		0	0	Disabled	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Input 2 Source Layer	131		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Notch Timecode Source	132		0	0-9	Disable	
				10-19	Ext 1	
				20-29	Ext 2	
Notch Time Code Offset: Hours	133		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	134		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	135		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	136		0	0-255	TC on Layer Offset Frames	
Notch Parameter 1	137		0	0-255	Parameter 1	
Notch Parameter 2	138		0	0-255	Parameter 2	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Notch Parameter 3	139		0	0-255	Parameter 3	
Notch Parameter 4	140		0	0-255	Parameter 4	
Notch Parameter 5	141		0	0-255	Parameter 5	
Notch Parameter 6	142		0	0-255	Parameter 6	
Notch Parameter 7	143		0	0-255	Parameter 7	
Notch Parameter 8	144		0	0-255	Parameter 8	
Notch Parameter 9	145		0	0-255	Parameter 9	
Notch Parameter 10	146		0	0-255	Parameter 10	
ZoomEnableXY	147		0	0-128	Disabled	
Zoom X	148	149	32768	0-32767	Zoom X In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	150	151	32768	0-32767	Zoom Y In	
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	
UseMixRes	152		0	0-9	Layer	
				10-19	Mix	Added in 4.5.2
TouchEngine File	153		0	0-255	File Select	
TouchEngine Framerate	154		11	0	1 FPS	
				1	5 FPS	
				2	10 FPS	
				3	15 FPS	
				4	23.97 FPS	
				5	24 FPS	
				6	25 FPS	
				7	29.97 FPS	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				8	30 FPS	
				9	50 FPS	
				10	59.94 FPS	
				11	60 FPS	
				12	90 FPS	
				13	100 FPS	
				14	120 FPS	
TouchEngine Input 2 Mix	155		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
TouchEngine Input 2 Layer	156		0	0	Master	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
TouchEngine Float 1	157		0	0-255		
TouchEngine Float 2	158		0	0-255		
TouchEngine Float 3	159		0	0-255		

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
TouchEngine Float 4	160		0	0-255		
TouchEngine Float 5	161		0	0-255		
TouchEngine Float 6	162		0	0-255		
TouchEngine Float 7	163		0	0-255		
TouchEngine Float 8	164		0	0-255		
TouchEngine Float 9	165		0	0-255		
TouchEngine Float 10	166		0	0-255		
TouchEngine Integer 1	167		0	0-255		
TouchEngine Integer 2	168		0	0-255		
TouchEngine Integer 3	169		0	0-255		
TouchEngine Integer 4	170		0	0-255		
TouchEngine Integer 5	171		0	0-255		
TouchEngine Integer 6	172		0	0-255		
TouchEngine Integer 7	173		0	0-255		
TouchEngine Integer 8	174		0	0-255		
TouchEngine Integer 9	175		0	0-255		
TouchEngine Integer 10	176		0	0-255		
TouchEngine Bool 1	177		0	0-255		
TouchEngine Bool 2	178		0	0-255		
TouchEngine Bool 3	179		0	0-255		
TouchEngine Bool 4	180		0	0-255		
TouchEngine Bool 5	181		0	0-255		
TouchEngine Bool 6	182		0	0-255		
TouchEngine Bool 7	183		0	0-255		
TouchEngine Bool 8	184		0	0-255		
TouchEngine Bool 9	185		0	0-255		
TouchEngine Bool 10	186		0	0-255		
TouchEngine Timecode Source	187		0	0	Disable	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				1	Ext 1	
				2	Ext 2	
TouchEngine Time Code Offset: Hours	188		0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	189		0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	190		0	0-255	TC on Layer Offset Seconds	
TouchEngine Time Code Offset: Frames	191		0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	192		0	0-128	Disable	
				129-255	Enable	
Preset Bank Select	193		0	0-255	Preset Bank	
Preset Index Select	194		0	0-255	Preset Index	
Use Recorded Fade	195		0	0-128	Disabled	
Preset Fade Type	196		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	197		0	0-255	Cross Fade Time in 0.1 Seconds	

4.7 Layer Lite

4.7 Layer Lite

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Layer Level	1		0	0-255		
Mixer Mode	2		128	0-9	Additive Dissolve	
				10-19	Subtractive Dissolve	
				20-29	Darken	
				30-39	Lighten	
				40-49	Softlight	
				50-59	Softlight Inverse	
				60-69	Hardlight	
				70-79	Overlay	
				80-89	Difference	
				90-99	Multiply	
				100-109	Screen	
				110-119	Opaque	
				120-129	Sprite	
				130-139	Luminance Key	
				140-149	**Empty**	
				150-159	Alpha	
				160-169		
Live Mask	3		0	0-255	Live Mask Select	
Live Mask Level	4		0	0-255		
Red	5		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	6		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Blue	7		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	8		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	9		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Invert Colour	10		0	0-128	Invert Off	
				129-255	Invert On	
Layer Rotation	11	12	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	13	14	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	15	16	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Aspect Ratio	17		128	0-127	Distort Aspect Ratio	
				0	No Change	
				129-255	Distort Aspect Ratio	
Zoom	18	19	32768	0-32767	Zoom Layer –	
				32768	No Change	
				32769-65535	Zoom Layer +	
Aspect Mode	20		0	0-9	Auto Scale (Fits image to	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
					nearest axis)	
				10-19	Pixel 1:1	
				20-19	Fill	
				30-39	4:3	
				40-49	16:9	
				50-59	16:10	
				60-69	1:1	
				70-79	Auto Fill	
				80-89	Fit to Width	
				90-99	Fit to Height	
Effects 1 Select	21		0	0-255	See Effects List	
Effects 1 Level	22		0	0-255		
Effects 1 Parameter 1	23		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	24		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	25		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	26		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	27		128	0-255	Determined by Selected Effect	
Effects 2 Select	28		0	0-255	See Effects List	
Effects 2 Level	29		0	0-255		
Effects 2 Parameter 1	30		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	31		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	32		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	33		128	0-255	Determined by Selected Effect	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Effects 2 Parameter 5	34		128	0-255	Determined by Selected Effect	
Source Type	35		0	0-9	Media Player	
				10-19	Live Input (Capture)	
				20-29	Generator	
				30-39	Relays	
				40-49	NDI	
				50-59	SPOUT	
Media Bank Select	36		0	0-255	Bank 0, Clip 0 Bypasses the Media player	
Media Clip Select	37		0	0-255		
Media Player Play Mode	38		15	0-9	Play Forward Once	
				10-19	Play Forward and Loop	
				20-29	Play Backwards Once	
				30-39	Play Backwards and Loop	
				40-49	Play Forwards then Backward, looping	
				50-59	Random Frame	
				60-69	In Frame	
				70-79	Out Frame	
				80-89	Inner Loop Play	
				90-99	Loop In Frame	
				100-109	Loop Out Frame	
Relay Mix Select	39		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				3	Mix 3	
				4	Mix 4	
				5	Mix 5	
				…	To Mix 127	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				128	Viewport 1	
				129	Viewport 2	
				130	Viewport 3	
				131	Viewport 4	
				…	To Viewport 128	
Relay Layer Select	40		0	0	Use Mix / Viewport	
				1	Layer 1 Visible	
				2	Layer 1 Hidden	
				3	Layer 2 Visible	
				4	Layer 2 Hidden	
				…	To layer 16 Hidden	
Playback Speed	41		64	0-63	Slows Media Playback: 0-99%	
				64	Playback Normal Speed	
				65-255	Faster Playback Speed: 101-400%	
Media In-Point	42	43 and 44	0	0	First Frame	
				1-16,777,216	Moves Inpoint into clip by frame	
Media Pause	45		0	0-128	Pause Off	
				129-255	Pause On	
Media Out-Point	46	47 and 48	0	0	End of Clip	
				1-16,777,216	Moves Outpoint into clip by frame	
Live Input Select	49		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Live input De-Interlace	50		0	0-128	De-interlace Off	
				129-255	De-interlace On	
NDI Source Select	51		0	0-9	Disabled	
				10-19	Input 1	
				20-29	Input 2	
				30-39	Input 3	
				40-49	Input 4	
				50-59	Input 5	
				60-69	Input 6	
				70-79	Input 7	
				80-89	Input 8	
Pause on Dark	52		255	0-128	Disabled	
				129-255	Enabled	
Rewind on Dark	53		0	0-128	Disabled	
				129-255	Enabled	
Layer Audio Volume	54		0	0-255		
Audio Pan	55		128	0-127	Pan Left	
				128	Centre	
				129-255	Pan Right	
Sync Audio to Layer Level	56		255	0-128	Do Not Sync to Layer Level	
				129-255	Sync to Layer Level	
Timecode On Layer (Sync In)	67		0	0-9	Sync In – Off	
				10-19	Sync In – Sync Bus 1	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
				170-179	Sync In – External Sync 1	
				180-255	Sync In – External Sync 2	
Media In Loop Point	58	59 and 60	0	0	First Frame	
				1-16,777,216	Moves In Loop Point into clip by frame	
Media Out Loop Point	61	62 and 63	0	0	End of Clip	
				1-16,777,216	Moves Out Loop Point into clip by frame	
Colour Shift	64		128	0-255	Shifts colour gamut of layer	
Colour Saturation	65		128	0-255	Saturates / De-saturates colours	
Time Code Offset: Hours	66		0	0-255	TC on Layer Offset Hours	
Time Code Offset: Minutes	67		0	0-255	TC on Layer Offset Minutes	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
Time Code Offset: Seconds	68		0	0-255	TC on Layer Offset Seconds	
Time Code Offset: Frames	69		0	0-255	TC on Layer Offset Frames	
Timecode on layer Fly Wheel	70		0	0-127	Disable Fly Wheel	
				128-255	Enable Fly Wheel	
X-fade Type	71		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Fade Time	72	0	0	0-255	Cross Fade Time in 0.1 Seconds	
Auto Fade	73		0	0-128	Manual	
				129-255	Auto	
Take	74		0	0-127	Take On	
				128-255	Take Off	
Media Bank Offset	75		127	0-255	-127 to 127	
Media Clip Offset	76		0	0-255	-127 to 127	
Ignore Media	77		0	0-128	Media and Time	
				129-255	Time only	
Sync Out	78		0	0-9	Sync Out – Off	
				10-19	Sync In – Sync Bus 1	
				20-29	Sync In – Sync Bus 2	
				30-39	Sync In – Sync Bus 3	
				40-49	Sync In – Sync Bus 4	
				50-59	Sync In – Sync Bus 5	
				60-69	Sync In – Sync Bus 6	
				70-79	Sync In – Sync Bus 7	

CHANNEL FUNCTION	DMX	DMX (16BIT)	DEFAULT	DMX RANGE (0-255)		NOTES
				80-89	Sync In – Sync Bus 8	
				90-99	Sync In – Sync Bus 9	
				100-109	Sync In – Sync Bus 10	
				110-119	Sync In – Sync Bus 11	
				120-129	Sync In – Sync Bus 12	
				130-139	Sync In – Sync Bus 13	
				140-149	Sync In – Sync Bus 14	
				150-159	Sync In – Sync Bus 15	
				160-169	Sync In – Sync Bus 16	
ZoomEnableXY	79		0	0-128	Disabled	Added in 4.5.2
Zoom X	80	81	32768	0-32767	Zoom X In	Added in 4.5.2
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom X Out	Added in 4.5.2
Zoom Y	82	83	32768	0-32767	Zoom Y In	Added in 4.5.2
				32768	No Change	Added in 4.5.2
				32769-65535	Zoom Y Out	Added in 4.5.2

4.7 Mix

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Mix Level	1		255	0-255		
Effects 1 Select	2		0	0-255	See Effects List	
Effects 1 Level	3		0	0-255		
Effects 1 Parameter 1	4		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	5		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	6		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	7		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	8		128	0-255	Determined by Selected Effect	
Effects 2 Select	9		0	0-255	See Effects List	
Effects 2 Level	10		0	0-255		
Effects 2 Parameter 1	11		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	12		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	13		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	14		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	15		128	0-255	Determined by Selected Effect	
Effects 3 Select	16		0	0-255	See Effects List	
Effects 3 Level	17		0	0-255		
Effects 3 Parameter 1	18		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 2	19		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 3	20		128	0-255	Determined by Selected	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
					Effect	
Effects 3 Parameter 4	21		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 5	22		128	0-255	Determined by Selected Effect	
Effects 4 Select	23		0	0-255	See Effects List	
Effects 4 Level	24		0	0-255		
Effects 4 Parameter 1	25		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 2	26		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 3	27		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 4	28		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 5	29		128	0-255	Determined by Selected Effect	
Pixelmapper Enable	30		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	31		0	0-255		
Visulisation mode	32		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	33		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	34		0	0-255		
Audio Level	35		255	0-255		
AudioDevice	36		0	0-9	Windows Default Device	
				10-19	Device 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				20-29	Device 3	
				30-39	Device 4	
				40-49	Device 5	
Timecode shift	37	38	32767	0-65535		
NDI Enable	39		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	40		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	41		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	42		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	
Pixelmapper White Intesity	43		255	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Pixelmapper White Balance	44		128	0-255		
Preset Bank Select	45		0	0-255	Preset Bank	
Preset Index Select	46		0	0-255	Preset Index	
Use Recorded Fade	47		0	0-128	Disabled	
Preset Fade Type	48		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	49		0	0-255	Cross Fade Time in 0.1 Seconds	

4.7 Mix Presets

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Mix Level	1		255	0-255		
Effects 1 Select	2		0	0-255	See Effects List	
Effects 1 Level	3		0	0-255		
Effects 1 Parameter 1	4		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	5		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	6		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 4	7		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 5	8		128	0-255	Determined by Selected Effect	
Effects 2 Select	9		0	0-255	See Effects List	
Effects 2 Level	10		0	0-255		
Effects 2 Parameter 1	11		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	12		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	13		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	14		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	15		128	0-255	Determined by Selected Effect	
Effects 3 Select	16		0	0-255	See Effects List	
Effects 3 Level	17		0	0-255		
Effects 3 Parameter 1	18		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 2	19		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 3	20		128	0-255	Determined by Selected	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
					Effect	
Effects 3 Parameter 4	21		128	0-255	Determined by Selected Effect	
Effects 3 Parameter 5	22		128	0-255	Determined by Selected Effect	
Effects 4 Select	23		0	0-255	See Effects List	
Effects 4 Level	24		0	0-255		
Effects 4 Parameter 1	25		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 2	26		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 3	27		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 4	28		128	0-255	Determined by Selected Effect	
Effects 4 Parameter 5	29		128	0-255	Determined by Selected Effect	
Pixelmapper Enable	30		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	31		0	0-255		
Visulisation mode	32		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	33		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	34		0	0-255		
Audio Level	35		255	0-255		
AudioDevice	36		0	0-9	Windows Default Device	
				10-19	Device 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				20-29	Device 3	
				30-39	Device 4	
				40-49	Device 5	
Timecode shift	37	38	32767	0-65535		
NDI Enable	39		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	40		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	41		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	42		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	
Pixelmapper White Intesity	43		255	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Pixelmapper White Balance	44		128	0-255		
Preset Bank Select	45		0	0-255	Preset Bank	
Preset Index Select	46		0	0-255	Preset Index	
Use Recorded Fade	47		0	0-128	Disabled	
Preset Fade Type	48		0	0-9	Bypass	
				10-19	Cross Fade	
				20-29	Fade Through Black	
				30-39	Fade Up First	
				40-49	Snap Start	
				50-59	Snap End	
Preset Fade Time	49		0	0-255	Cross Fade Time in 0.1 Seconds	

4.7 TouchEngine Mix

Mix Level	1	0-255		
TouchEngine File	2	0	0-255	File Select
TouchEngine Framerate	3	11	0	1 FPS
			1	5 FPS
			2	10 FPS
			3	15 FPS
			4	23.97 FPS
			5	24 FPS
			6	25 FPS
			7	29.97 FPS
			8	30 FPS
			9	50 FPS
			10	59.94 FPS
			11	60 FPS
			12	90 FPS
			13	100 FPS
			14	120 FPS
TouchEngine Input 1 Mix	4	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127
			128	Viewport 1
			129	Viewport 2
			130	Viewport 3
			131	Viewport 4
			…	To Viewport 128

TouchEngine Input 1 Layer	5	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 2 Mix	6	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127
			128	Viewport 1
			129	Viewport 2
			130	Viewport 3
			131	Viewport 4
			…	To Viewport 128
TouchEngine Input 2 Layer	7	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 3 Mix	8	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127

			128	Viewport 1
			129	Viewport 2
			130	Viewport 3
			131	Viewport 4
			…	To Viewport 128
TouchEngine Input 3 Layer	9	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 4 Mix	10	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127
			128	Viewport 1
			129	Viewport 2
			130	Viewport 3
			131	Viewport 4
			…	To Viewport 128
TouchEngine Input 4 Layer	11	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 5 Mix	12	0	0	Disabled
			1	Mix 1

			2	Mix 2	
			3	Mix 3	
			4	Mix 4	
			5	Mix 5	
			…	To Mix 127	
			128	Viewport 1	
			129	Viewport 2	
			130	Viewport 3	
			131	Viewport 4	
			…	To Viewport 128	
TouchEngine Input 5 Layer	13	0	0	Master	
			1	Layer 1 Visible	
			2	Layer 1 Hidden	
			3	Layer 2 Visible	
			4	Layer 2 Hidden	
			…	To layer 16 Hidden	
TouchEngine Input 6 Mix	14	0	0	Disabled	
			1	Mix 1	
			2	Mix 2	
			3	Mix 3	
			4	Mix 4	
			5	Mix 5	
			…	To Mix 127	
			128	Viewport 1	
			129	Viewport 2	
			130	Viewport 3	
			131	Viewport 4	
			…	To Viewport 128	
TouchEngine Input 6 Layer	15	0	0	Master	
			1	Layer 1 Visible	
			2	Layer 1 Hidden	

			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 7 Mix	16	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127
			128	Viewport 1
			129	Viewport 2
			130	Viewport 3
			131	Viewport 4
			…	To Viewport 128
TouchEngine Input 7 Layer	17	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Input 8 Mix	18	0	0	Disabled
			1	Mix 1
			2	Mix 2
			3	Mix 3
			4	Mix 4
			5	Mix 5
			…	To Mix 127
			128	Viewport 1
			129	Viewport 2
			130	Viewport 3

			131	Viewport 4
			…	To Viewport 128
TouchEngine Input 8 Layer	19	0	0	Master
			1	Layer 1 Visible
			2	Layer 1 Hidden
			3	Layer 2 Visible
			4	Layer 2 Hidden
			…	To layer 16 Hidden
TouchEngine Float 1	20	0	0-255	
TouchEngine Float 2	21	0	0-255	
TouchEngine Float 3	22	0	0-255	
TouchEngine Float 4	23	0	0-255	
TouchEngine Float 5	24	0	0-255	
TouchEngine Float 6	25	0	0-255	
TouchEngine Float 7	26	0	0-255	
TouchEngine Float 8	27	0	0-255	
TouchEngine Float 9	28	0	0-255	
TouchEngine Float 10	29	0	0-255	
TouchEngine Integer 1	30	0	0-255	
TouchEngine Integer 2	31	0	0-255	
TouchEngine Integer 3	32	0	0-255	
TouchEngine Integer 4	33	0	0-255	
TouchEngine Integer 5	34	0	0-255	
TouchEngine Integer 6	35	0	0-255	
TouchEngine Integer 7	36	0	0-255	
TouchEngine Integer 8	37	0	0-255	
TouchEngine Integer 9	38	0	0-255	
TouchEngine Integer 10	39	0	0-255	
TouchEngine Bool 1	40	0	0-255	
TouchEngine Bool 2	41	0	0-255	
TouchEngine Bool 3	42	0	0-255	

TouchEngine Bool 4	43	0	0-255		
TouchEngine Bool 5	44	0	0-255		
TouchEngine Bool 6	45	0	0-255		
TouchEngine Bool 7	46	0	0-255		
TouchEngine Bool 8	47	0	0-255		
TouchEngine Bool 9	48	0	0-255		
TouchEngine Bool 10	49	0	0-255		
TouchEngine Timecode Source	50	0	0	Disable	
			1	Ext 1	
			2	Ext 2	
TouchEngine Time Code Offset: Hours	51	0	0-255	TC on Layer Offset Hours	
TouchEngine Time Code Offset: Minutes	52	0	0-255	TC on Layer Offset Minutes	
TouchEngine Time Code Offset: Seconds	53	0	0-255	TC on Layer Offset Seconds	
TouchEngine Time Code Offset: Frames	54	0	0-255	TC on Layer Offset Frames	
TouchEngine Preload	55	0	0-128	Disable	
			129-255	Enable	

4.7 Viewport

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Viewport Level	1		255	0-255		
Red	2		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	3		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	4		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	5		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	6		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Colour Saturation	7		128	0-255	Saturates / Desaturates colours	
Colour Shift	8		128	0-255	Shifts colour gamut of layer	
Invert Colour	9		0	0-127	Invert Off	
				128-255	Invert On	
Effects 1 Select	10		0	0-255	See Effects List	
Effects 1 Level	11		0	0-255		
Effects 1 Parameter 1	12		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	13		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 3	14		128	0-255	Determined by Selected Effect	
Effects 1 Parameter	15		128	0-255	Determined by Selected Effect	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
4						
Effects 1 Parameter 5	16		128	0-255	Determined by Selected Effect	
Effects 2 Select	17		0	0-255	See Effects List	
Effects 2 Level	18		0	0-255		
Effects 2 Parameter 1	19		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	20		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	21		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	22		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	23		128	0-255	Determined by Selected Effect	
Rotation Positon (Index)	24	25	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	26	27	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	28	29	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Viewport Zoom	30	31	32768	0-32767	Zoom –	
				32768	No Change	
				32769-65535	Zoom +	
Keystone Point 1X	33	34	0	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Keystone Point 1Y	35	36	0	0-255		
Keystone Point 2X	37	38	65535	0-255		
Keystone Point 2Y	39	40	0	0-255		
Keystone Point 3X	41	42	65535	0-255		
Keystone Point 3Y	43	44	65535	0-255		
Keystone Point 4X	45	46	0	0-255		
Keystone Point 4Y	47	48	65535	0-255		
Livemask Select	49		0	0-255	Live Mask Select	
Livemask Level	50		100	0-255		
Videomapper Enable	51		0	0-127	Disable	
				128-255	Enable	
Videomapper Mix	52		255	0-255		
Videomapper Mix/ Morph	53		0	0-127	Mix	
				128-255	Morph	
Videomap A Select	54		0	0-255		
Videomap B Select	55		0	0-255		
Screen Warp Enable	56		0	0-127	Disabled	
				128-255	Enabled	
Screen Warp Select A	57		0	0-255	Screen Warp A Select	
Screen Warp Select B	58		0	0-255	Screen Warp B Select	
Screen Warp Mix	59		0	0-255		
Pixelmapper Enable	60		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	61		0	0-255		
Visulisation mode	62		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	63		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	64		0	0-255		
NDI Enable	65		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	66		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	67		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	68		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
MPCDI File	69		0	0-255	File Select	
MPCDI Output	70		0	0-255	Output Select	
MPCDI Blend	71		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Warp	72		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Vertical Flip	73		0	0-128	Disabled	
				129-255	Enabled	
MPCDI Black Level	74		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Colour	75		255	0-128	Disabled	
				129-255	Enabled	
Frame Delay	76		0	0	Disabled	
				1	1 Frame	
				2	2 Frames	
				…	To 30 Frames	
Freeze Output	77		0	0-128	Disabled	
				129-255	Enabled	
Pixelmapper White Intesity	78		255	0-255		
Pixelmapper White Balance	79		128	0-255		

4.7 Shape Viewport

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Viewport Level	1		255	0-255		
Red	2		128	0-127	Subtract Red	
				128	No Change	
				129-255	Add Red	
Green	3		128	0-127	Subtract Green	
				128	No Change	
				129-255	Add Green	
Blue	4		128	0-127	Subtract Blue	
				128	No Change	
				129-255	Add Blue	
Brightness	5		128	0-127	Darken layer	
				128	No Change	
				129-255	Brighten Layer	
Contrast	6		128	0-127	Reduce Contrast	
				128	No Change	
				129-255	Increase Contrast	
Colour Saturation	7		128	0-255	Saturates / Desaturates colours	
Colour Shift	8		128	0-255	Shifts colour gamut of layer	
Invert Colour	9		0	0-127	Invert Off	
				128-255	Invert On	
Effects 1 Select	10		0	0-255	See Effects List	
Effects 1 Level	11		0	0-255		
Effects 1 Parameter 1	12		128	0-255	Determined by Selected Effect	
Effects 1 Parameter 2	13		128	0-255	Determined by Selected Effect	
Effects 1 Paramater 3	14		128	0-255	Determined by Selected Effect	
Effects 1 Parameter	15		128	0-255	Determined by Selected Effect	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
4						
Effects 1 Parameter 5	16		128	0-255	Determined by Selected Effect	
Effects 2 Select	17		0	0-255	See Effects List	
Effects 2 Level	18		0	0-255		
Effects 2 Parameter 1	19		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 2	20		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 3	21		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 4	22		128	0-255	Determined by Selected Effect	
Effects 2 Parameter 5	23		128	0-255	Determined by Selected Effect	
Rotation Positon (Index)	24	25	16384	0-32768	Index Position	
				32769-49151	Continuous Counter Clock-Wise Rotation	
				49152	Stop	
				49153-65535	Continuous Clock-Wise Rotation	
Position X	26	27	32768	0-32767	Move Left	
				32768	No Change	
				32769-65535	Move Right	
Position Y	28	29	32768	0-32767	Move Up	
				32768	No Change	
				32769-65535	Move Down	
Viewport Zoom	30	31	32768	0-32767	Zoom –	
				32768	No Change	
				32769-65535	Zoom +	
Keystone Point 1X	33	34	0	0-255		

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Keystone Point 1Y	35	36	0	0-255		
Keystone Point 2X	37	38	65535	0-255		
Keystone Point 2Y	39	40	0	0-255		
Keystone Point 3X	41	42	65535	0-255		
Keystone Point 3Y	43	44	65535	0-255		
Keystone Point 4X	45	46	0	0-255		
Keystone Point 4Y	47	48	65535	0-255		
Livemask Select	49		0	0-255	Live Mask Select	
Livemask Level	50		100	0-255		
Videomapper Enable	51		0	0-127	Disable	
				128-255	Enable	
Videomapper Mix	52		255	0-255		
Videomapper Mix/ Morph	53		0	0-127	Mix	
				128-255	Morph	
Videomap A Select	54		0	0-255		
Videomap B Select	55		0	0-255		
Screen Warp Enable	56		0	0-127	Disabled	
				128-255	Enabled	
Screen Warp Select A	57		0	0-255	Screen Warp A Select	
Screen Warp Select B	58		0	0-255	Screen Warp B Select	
Screen Warp Mix	59		0	0-255		
Pixelmapper Enable	60		0	0-128	Disabled	
				129-255	Enabled	
Pixel mapper map select	61		0	0-255		
Visulisation mode	62		0	0-9	Visulization Disabled	
				10-19	Output Buffer	
				20-29	Buffer View Overlay	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				30-39	Element Locations	
				40-49	Element Colours	
Colour Averaging	63		0	0-128	Disabled	
				129-255	Enabled	
Vis background level	64		0	0-255		
NDI Enable	65		0	0-128	Disabled	
				129-255	Enabled	
NDI Frame Rate	66		0	0-9	15FPS	
				10-19	25 FPS	
				20-29	29.97 FPS	
				30-39	30 FPS	
				40-49	50 FPS	
				50-59	59.94 FPS	
				60-69	60 FPS	
				70-79	Free Run	
NDI SendAlpha	67		0	0-128	Disabled	
				129-255	Enabled	
NDI Resolution	68		0	0-9	Auto (Mix Res)	
				10-19	160 × 90	
				20-29	320 × 180	
				30-39	640 × 360	
				40-49	640 × 480	
				50-59	1024 × 576	
				60-69	1024 × 768	
				70-79	1280 × 720	
				80-89	1280 × 1024	
				90-99	1920 × 1080	
				100-109	3840 × 2160	
				110-119	4096 × 2160	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
MPCDI File	69		0	0-255	File Select	
MPCDI Output	70		0	0-255	Output Select	
MPCDI Blend	71		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Warp	72		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Vertical Flip	73		0	0-128	Disabled	
				129-255	Enabled	
MPCDI Black Level	74		255	0-128	Disabled	
				129-255	Enabled	
MPCDI Colour	75		255	0-128	Disabled	
				129-255	Enabled	
Frame Delay	76		0	0	Disabled	
				1	1 Frame	
				2	2 Frames	
				…	To 30 Frames	
Freeze Output	77		0	0-128	Disabled	
				129-255	Enabled	
Pixelmapper White Intesity	78		255	0-255		
Pixelmapper White Balance	79		128	0-255		
Shape Output Look	80		0	0-9	Textured	
				10-19	Textured+Wireframe	
				20-29	Wireframe	
				30-39	Solid	
				40-49	Solid+Wireframe	
				50-59	Alignment	
Shape Source	81		0	0-255	File Select	

4.7 SHAPE

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Enable	1		255	0-128	Disabled	
				129-255	Enabled	
Project File	2		0	0	Default Project	
				1	Project 1	
				2	Project 2	
				…	to Project 255	
Network Enable	3		255	0-128	Disabled	
				129-255	Enabled	
Leave Network	4		0	0-128	Disabled	
				129-255	Enabled	
Input_1 Level	5		255	0-255		
Input_2 Level	6		255	0-255		
Input_2 Mix/Viewport	7		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_3 Level	8		255	0-255		
Input_3 Mix/Viewport	9		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_4 Level	10		255	0-255		
Input_4 Mix/Viewport	11		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_5 Level	12		255	0-255		
Input_5 Mix/Viewport	13		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_6 Level	14		255	0-255		
Input_6 Mix/Viewport	15		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_7 Level	16		255	0-255		
Input_7 Mix/Viewport	17		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_8 Level	18		255	0-255		
Input_8 Mix/Viewport	19		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_9 Level	20		255	0-255		
Input_9 Mix/Viewport	21		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_10 Level	22		255	0-255		
Input_10 Mix/Viewport	23		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_11 Level	24		255	0-255		
Input_11 Mix/Viewport	25		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_12 Level	26		255	0-255		
Input_12 Mix/Viewport	27		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_13 Level	28		255	0-255		
Input_13 Mix/Viewport	29		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_14 Level	30		255	0-255		
Input_14 Mix/Viewport	31		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_15 Level	32		255	0-255		
Input_15 Mix/Viewport	33		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_16 Level	34		255	0-255		
Input_16 Mix/Viewport	35		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_17 Level	36		255	0-255		
Input_17 Mix/Viewport	37		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_18 Level	38		255	0-255		
Input_18 Mix/Viewport	39		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_19 Level	40		255	0-255		
Input_19 Mix/Viewport	41		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_20 Level	42		255	0-255		
Input_20 Mix/Viewport	43		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_21 Level	44		255	0-255		
Input_21 Mix/Viewport	45		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_22 Level	46		255	0-255		
Input_22 Mix/Viewport	47		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_23 Level	48		255	0-255		
Input_23 Mix/Viewport	49		0	0	Disabled	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_24 Level	50		255	0-255		
Input_24 Mix/Viewport	51		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	

4.7 Notch Mix

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Notch Bypass	1		0	0-128	Disabled	
				129-255	Enabled	
Cache Resources	2		0	0-128	Disabled	
				129-255	Enabled	
Notch Block Select	3		0	0	Disabled	
				1	Block 1	
				2	Block 2	
				…	to Block 255	
Notch Layer Select	4		0	0	Disabled	
				1	Layer 1	
				2	Layer 2	
				…	to Layer 255	
Input_1 Mix/Viewport	5		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_1 Layer	6		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_2 Mix/Viewport	7		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_2 Layer	8		0	0	Master	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_3 Mix/Viewport	9		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_3 Layer	10		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_4 Mix/Viewport	11		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_4 Layer	12		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_5 Mix/Viewport	13		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
Input_5 Layer	14		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_6 Mix/Viewport	15		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_6 Layer	16		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_7 Mix/Viewport	17		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	
				…	to Mix 255	
Input_7 Layer	18		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Input_8 Mix/Viewport	19		0	0	Disabled	
				1	Mix 1	
				2	Mix 2	

Channel Function	DMX	DMX (16bit)	Default	DMX Range (0-255)		Notes
				…	to Mix 255	
Input_8 Layer	20		0	0	Master	
				1	Layer 1(visible)	
				2	Layer 1(hidden)	
				3	Layer 2(visible)	
				4	Layer 2(hidden)	
				…	to Layer "X"	
Notch Parameter 1	21		0	0-255		
Notch Parameter 2	22		0	0-255		
Notch Parameter 3	23		0	0-255		
Notch Parameter 4	24		0	0-255		
Notch Parameter 5	25		0	0-255		
Notch Parameter 6	26		0	0-255		
Notch Parameter 7	27		0	0-255		
Notch Parameter 8	28		0	0-255		
Notch Parameter 9	29		0	0-255		
Notch Parameter 10	30		0	0-255		
Use DMX Offset	31		0	0-128	Disabled	
				129-255	Enabled	
Notch Timecode Source	32		0	0	Disable	
				1	Ext 1	
				2	Ext 2	
Notch Time Code Offset: Hours	33		0	0-255	TC on Layer Offset Hours	
Notch Time Code Offset: Minutes	34		0	0-255	TC on Layer Offset Minutes	
Notch Time Code Offset: Seconds	35		0	0-255	TC on Layer Offset Seconds	
Notch Time Code Offset: Frames	36		0	0-255	TC on Layer Offset Frames	

Creating DMX Personalities

Controlling a Hippotizer from a DMX lighting desk is easy and the software come complete with stock personalities.

However, it is can be necessary to create custom personalities. This requires some specific decisions and mappings. These are detailed here.

Layer Playback Speed

The speed of a layer should be set to 25% exactly by default. This requires mapping the value of 25% to a DMX value of 64:

Pixelmapper Map select update only

To avoid a serious impact on performance, ensure the Map Select pin in mix controls is set to update only.

Effects List

DMX #	FX Name	Level	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
1	Blur	Level					
2	Radial Blur	Level	Amount	Whirl	Quality	Fade Out	Shift X
3	Motion Blur	Level					
4	StrobeFreeze	Level					
5	Mask	Level	Mask	Blur	Zoom	Rotate	
6	Alpha Transition	Level	Mask	Blur	Smooth		
7	Displacement effect	Level	Input		Smooth		
8	XY-Shifter	Level	X	Y	Speed X	Speed Y	
9	Shutter	Level	Left	Right	Top	Bottom	Feather
10	ChromaKey	Level	Hue	Tolerance	Transparency		
11	Johans Effect	Level	Squash X	Squash Y			
12	Scroller	Level	X	Y	Speed X	Speed Y	
13	RGB Tint	Level	Red	Green	Blue		
14	Colour Studio	Level	Shift A	Shift B	Bright		
15	Strobe	Level	Frequency	Symmetry	Colour		
16	Neon	Level	Width				
17	ColourTrafo	Level	Saturation	Hue	Brightness	Speed	Contrast
18	DuoTone	Level	Col 1	Col 2	Contrast		
19	RGB Pallette	Level	Red	Green	Blue	Speed	
20	Bloom	Level	Bloom				
21	Interlace	Level	Stripes	Sat			
22	Colourizer (random)	Level	Mymul	Shifter	Randomizer	Speed	
23	Karls Eye	Level	K1	Shift X	Shift Y	Zoom	
24	Mega Zoom	Level	Zoom	Rotate	Shift X	Shift Y	Aspect
25	Noise	Level	Colouredness	Frequency	Grain Size		
26	Leave Colour	Level	Hue	Tolerance	Transparency		

DMX #	FX Name	Level	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
27	Rings	Level	Rings				
28	Cube Style	Level	Size	Patern A	Pattern B	Speed A	Speed B
29	Bump	Level	Bump	Light X	Light Y	Zoom	
30	LED	Level	Density	Softness	Brightness		
31	Pixelate	Level	Pixels				
32	Film	Level	Flicker	Flickrate	Dirt		
33	Halftone	Level	Size	Angle			
34	Inv LumaKey	Level	Threshold	Softness	Invert		
35	Colour Change	Level	Blue2Red	Blue2Green	Green2Red	Green2Blue	Red2Green
36	Colour Enhancer	Level	Red	Green	Blue		
37	Plasma	Level	D1	D2	Light	Anim	
38	Flower	Level	Flora				
39	Flip	Level	Flip X	Flip Y			
40	Kaleidoscope	Level	Leaves	Angle	Shift	Speed A	Speed B
41	Roto Zoom	Level	Rot	ZoomOut			
42	Glass	Level	Glass				
43	Aqua	Level	Wave A	Wave B	Speed A	Speed B	
44	Tunnel	Level	Cam	ZoomOut	Speed X	Speed Y	
45	Planes	Level	Anim Rot	Anim Shift	Wip	Dist shift	Distplanes
46	FluidDistortion	Level	X	Y	Z	Speed A	Speed B
47	Polarwave	Level	Flower	Caleido	Leaves	Speed	
48	Twisted	Level	Twist	Flower	Leaves	Speed	Twisty
49	Rectangles	Level	Width	Height	Num X	Num Y	Speed
50	Ripple	Level	Numwaves	Speed			
51	Wave	Level	Wave				
52	Jitter	Level	Speed	Rotation	X	Y	Zoom
53	Stripes	Level	Frequency	Scale			
54	Infinite zoom	Level	Speed				

DMX #	FX Name	Level	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
55	Sven's digits	Level	Zoom	Height	Width	digits	
56	Pixel Dunst	Level	Direction	Frequency	GrainSize		
57	Bounce	Level	Speed	X move	Y move	Zoom	
58	Infinity	Level	Speed				
59	RB MultiMirror	Level	Vert	Horiz	X-Flip	Y-Flip	
60	Zoom Area	Level	Left	Right	Top	Bottom	
61	SE-Left	Level	Gamma	Factor	Offset		
62	SE-Right	Level	Gamma	Factor	Offset		
63	SE-Left Right	Level	Gamma	Factor	Offset		
64	SE-Top	Level	Gamma	Factor	Offset		
65	SE-Bottom	Level	Gamma	Factor	Offset		
66	SE-Top Bottom	Level	Gamma	Factor	Offset		
67	SE-Pan	Level	Gamma	Width	Pos		
68	SE-Frame	Level	Range	Gamma			
69	DropShadow	Level	Distance	Size	Alpha	Softness	
70	Radar Screen	Level	Speed	Glow Curve Radar	Number of Rings	Glow Curve Content	Color
71	Crop_De-Interlace	Level	Crop Left	Crop Right	Crop Top	Crop Bottom	
72	SEDualPan	OverlapLeft	Pos Left	Gamma Left	Overlap Right	Pos Right	Gamma Right
73	SEPanV	Level	gamma	width	position		
74	Displace Mixer	Level	X	Y			
75	Magnifier	Level	Size	X	Y	Manual	Speed
76	Curtain Down	Level	Rotation				
77	Burn Out	Level	Gamma				
78	Moving Blurb	Level	Gamma				
79	DeGapper	Level	X Reps	X Gap	Y Reps	Y Gap	
80	Tilt Shift	Level	Shift X	Shift Y	Angle	DOF	

DMX #	FX Name	Level	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
81	Tilt Shift Radial	Level	Shift X	Shift Y	DOF		
82	Cady Colour	Level	Speed	Colours	Saturation		
83	Idiot Strobe	Level	Freq	Symmetry	colour	Wash	Random
84	Neils Gamma	Level	Gamma	Black	White		
85	Neon 2	Level	Width				
86	Super 8	Level	Speed	Rot	X	Y	Zoom
87	JR Fade	Level	Hue	Saturation	Offset	Width	Rotate
88	Reflection	Level	Gamma	Factor	Angle	Zoom	
89	Katie Mirror	Level	Speed	Splits	Direction		
90	Mirror Max	Level	Source	Orient			
91	Blinder	Level					
92	Fader	Level	Fader				
93	Line Displacement	Level	Lines	Y-Shift	Width		
94	RGB Key	Level	Red Key	Green Key	Blue Key		
95	RGB Split	Level	Red X	Red Y	Blue X	Blue Y	Green Z
96	Contour Drop	Level	X	Y	R	G	B
97	Ken Burns Effect	Level	Speed	Zoom			
98	RB Jitter Mask	Level	Size	Speed	Pattern	Edges	
99	Lens Flare	Level	Shift X	Shift Y	Darken	Size	Spikes
100	Bad TV	Level	Noise	Wobble	Frequency	scroll	Interlace
101	UV Tile	Level	U Tile	V Tile	U Offset	V offset	
102	TV Wall	Level	SizeX	SizeY	Curve	Mode	Dodginess
103	Console Daze	Level	Invert	Pixels	Constrast	Pallette	
104	Colour Crush	Level	BitDepth	CrushR	CrushG	CrushB	
105	Recursion Window	Level	Shift X	Shift Y	Zoom		
106	MulitiImage	Level	Size	Aspect			

DMX #	FX Name	Level	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
107							
108							
109	Pufferizer	Level	BaseHeight	Repeat	Rotate X	Rotate Y	Mode
110	CTBO	Level	Filter	Bright			
111	Pre Multiply Alpha	Level					
112	Negative Space	Level	X Offset	X Skip	Y Offset	Y Skip	
125	Jitter Zoom	Level	Speed	Trigger	Size	Variation	
126	Alpha Fader To Solid	Level	Fader				
127	Alpha Fader	Level	Fader				
128	Channel Swap	Level	Red	Green	Blue	Alpha	
140	Iris Inside	Level	Iris	Feather	Aspect	X position	Y position
141	Iris Outside	Level	Iris	Feather	Aspect	X Position	Y Position
142	Iris Alpha	Level	Iris	Feather	Aspect	X Position	Y Position

Generator List

Generator number	Description	Par 1	Par 2	Par 3	Par 4	Par 5	Par 6	Par 7	Par 8	P 9
0	RGB colour Generator	Red	Green	Blue						
1	HSV Colour Generator	Hue	Saturation	Bright						
2										
3	Rings Generator	X	Y	Z	Size	Smooth	Animmation			
4	Chess Generator	X	Y	Edge X	Edge Y	XY	Zoom	Anim		
5	Interference CC	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
6	Interference CC Retro	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
7	Interference RC	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
8	Interference RCretro2	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
9	Interference RC Retro	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
10	Interference RR	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
11	Interference RR Retro2	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
12	Interference RR Retro	Speed	Red 1	Green 1	Blue 1	Red 2	Green 2	Blue 2		
13	Clouds	Lightness	Speed	Softness	Scale					
14	Flowerz	Rotspeed	Zoom	Fade	Colour	Colour Speed				
15	Fog	Lightness	Speed							
16	Rain	Density	Length	Angle	Speed					
17	Starfield	Speed								
18	Gradient	Hue 1	Sat 1	Hue 2	Sat 2	Angle	Speed 1	Speed	Rot	

Generator number	Description	Par 1	Par 2	Par 3	Par 4	Par 5	Par 6	Par 7	Par 8	P 9
								2	Speed	
19	Colourgames	Speed	Size	Offset	Boost	Cutoff				
20	Globulars 1	Speed	Size	Offset	Boost	Cutoff				
21	Globulars 2	Speed	Size	Offset	Boost	Cutoff				
22	Globulars 3	Speed	Size	Offset	Boost	Cutoff				
23	Colour bands	Speed	Wave 1	Wave 2						
24	Smoke	Lightness	Speed							
25										
26	Radar	Speed	Glow curve radar	Number of rings	Glow Curve Content	Speed 1	Speed 2	Speed 3		
27	Countdown	TSec	Tmin	Thour	Tday	Tmonth	Tyear			
28	Digital Clock	Blink	Height	Contrast						
29	Moire Generator	Translation X	Translation Y	Rotation Speed	Texture	Rotation	Zoom			
30	WestLiner	Rotation	Count	Smooth	Animation	Colour				
31	OneShot	Rotation	Count	Smooth	Animation	Colour				
80	Pong (bouncer)	Block 1	Block 2	Speed						
100	Sound Spectrum	Bar Width	Bar Pattern	Peak Falls Off	X	Y	Offset	Zoom		
101	WaveForm	Scale	Red	Green	Blue	Width				
121										

Key Board Shortcuts

General control methodology

In designing the controls for Hippotizer, we have made some assumptions:

- Users will always have at least two-button mouse with scroll wheel
- A screen resolution of 1280 × 720 minimum, 1920 × 1080 or greater is ideal.
- A keyboard is present for naming and keyboard shortcuts though not critical.

Engine Short-cuts

- Holding CTRL + ESCAPE for 5 seconds will put output manager into configuration mode.This shortcut works only local to the engine and does not require Zookeeper to be running.

General Zookeeper Shortcuts

- **F1** Navigate to Mixes Page
- **F2** Navigate to Viewports Page
- **F3** Navigate to Visualiser
- **F4** Navigate to Media Manager
- **F5** Navigate to Output Manager
- **F6** Navigate to Configuration Page
- **Escape** Toggle Home screen; returns to home screen if in a pinboard or navigates to previous page if in the home screen.
- **CTRL + 1-9** Navigates to quick launch screen 1-9.
- **SHIFT** holding shift while moving faders with the mouse makes changes 10x more fine.
- **CTRL + E** Toggles lock of the pinboard.

Moving values between layers, mixes and viewports

- **Drag** Applies the values of the source to the destination
- **CTRL + Drag** Switches the values between the source and destination

Mixes Page

The geometry controls have specific set of shortcuts in addition to **SHIFT:**

- **X + Click and drag** Locks geometry movement in the X-Axis
- **Y + Click and drag** Locks geometry movement in the Y-Axis
- **CTRL + Click and drag** Locks geometry movement to position (Indexed rotation)
- **ALT + Click and drag** Locks geometry movement to Zoom

Timeline

- **Spacebar** Starts or stops selected timeline
- **ALT** enters insert mode to quickly add nodes or commands
- **Scroll Wheel** Navigate up and down the timeline

TimelinePlus

- **A** Edit mode add/ insert
- **Insert** Toggle Add Mode
- **Ctl + K** Next Keyframe for selected track – advance playhead
- **Ctl + J** Previous Keyframe for selected track – avance playhead
- **Ctl + I** Advance playhead to next command
- **Ctl + U** Advance Playhead to previous command
- **Ctl + M** Jump Forwards
- **Ctl + N** Jump Backwards
- **Escape** Clear Selection (first press clears groups/keyframes, second press clears tracks)
- **Left/Right** Nudge Keyframe Time
- **Up/Down** Nudge Keyframe Value
- **Space** Start/Stop Timeline
- **Delete** Delete Keyframe / Group
- **Home** Jump to start of timeline
- **Ctrl + D** Deselect
- **Ctrl + H** Open Shortcut Menu
- **Ctrl + O** Open Timeshift Menu

Screen Warp

- **Scroll Wheel** Zoom in and out on the warp

Live Mask

- **Scroll Wheel** Zoom the selected shape
- **CTRL + Click** Move blur point
- **CTRL + Scroll Wheel** Zoom all blur points

Glossary

Hippotizer uses some technical terminology. Here is a list of frequently used terms.

Last Takes Precedence (LTP)

As with lighting desks, Hippotizer is frequently mixing control inputs from different sources. To do this, all pin values will always take the latest input they have been given. There are common cases where LTP becomes important to understand.

DMX Control + Zookeeper

Zookeeper may be controlling a system that is also being triggered from DMX. A value that is controlled from DMX will always 'snap' to the DMX value if moved in Zookeeper. This is normal, DMX is constantly refreshing so sets the pin values many times per second. In affect, DMX is always last.

> **Note:** Setting a DMX channel to update only changes this behaviour. With Update only enabled the pin value is only applied when the DMX value coming in changes.

Multiple Zookeepers controlling one system

More than one Zookeeper interface can be used to control a Hippotizer system. In this case the last change made will take priority.
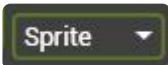
Timeline and Zookeeper

Timeline applies changes to it's target pins only when there values or fades at the Timeline play-head and it is playing. Values are set once by timeline so other interface methods can be used in parallel with timeline with predictable results.

Pins

Pins are the 'handles' used to control attributes within the Hippotizer Engine. Each Pin is available to all systems on the network over HippoNet. There are different types of Pins depending on what information they convey.

- **Boolean Pin:** Can be on or off, represented by a switch in Zookeeper.

- **Float Pin:** Can be a number value from 0 to 1 ad are most commonly shown as faders in Zookeeper.

- **Integer Pin:** Can be a whole number (1,2,3…) used to pick options from a list such

as Mix modes.

- **String Pin:** Sends text which can be letters and numbers. Used to report the status of Components and for other tasks where complex data needs to be transferred. For example, Timeline remote control uses String Pins to select and start timelines.

Pin Path

Each pin has a unique address that is derived from the Pins's address. This is expressed as a hierarchy, for example, the level of a layer is show as: **Mix1/Layer1/Mixer/Level**