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Welcome to Hippotizer Version 4!

Hippotizer Version 4 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 enough for the largest events, V4’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
Note: This manual is continually being updated. For the most up to date information use the web based version: http://www.green-hippo.com/manual/hippotizer-v4?v=4.2
Code Examples

Dressed to the left

Anchor

Photo Credit

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
Whats New In Version 4.2

Hippotizer Version 4.2 builds on the success of V4 by adding a series of improvements throughout the Hippotizer system.

Overview

Version 4.2 focuses on improving performance and workflow while introducing Hippotizer PLAY. A free to use demonstration version of Hippotizer, PLAY required significant changes to the way that application is saved and managed. 4.2 also brings the ability to save and load whole shows to aid in moving data from PLAY to a Hippotizer system.

All changes from the previous version of Hippotizer are listed in the Release Notes

Major changes

- **Show Management**
- **Direct HAP encode**
- **Sync Bus Link**
- **Improved Performance with more than 4 viewports with Virtualised Viewports**
- **Proxy Media**
- **Posi Stage Net support in Multicontroller**
- **Windowed outputs in Output Manager**
- **Improved Startup behavior of Output Manager**
- **Advanced Zookeeper Startup Options**
- **Improved Hippo Launch**
- **Ability to start a clean show**
- **Ability to add previews to custom layouts**
- **Improved Performance with High Performance Mode**
- **Video Mapper DMX Colour Blocks**
- **New Colour Spaces in Pixelmapper**
**4.2 Release Notes**

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

**Version 4.2:**

**Current Codec Support**

Encoding Media into V4 requires the use of one of the supported Codecs. This list changes with each release as Green Hippo extends support for more codecs. As of 4.2 Release the following have been tested.

**Note:** There are restrictions on the resolution that must be observed such as a maximum resolution for use with Mpeg-2 (1920 × 1152), and the resolution (X and Y) must be divisible by 4 in order to work in FlexRes Performance and Quality. FlexRes Lossless has no restriction on height, while the width must be divisible by 4.

All media has a minimum size of 64 × 64 pixels

<table>
<thead>
<tr>
<th>Codec</th>
<th>Extension</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mpeg2</td>
<td>.mpg</td>
<td>Does Not Work</td>
</tr>
<tr>
<td>Mpeg2</td>
<td>.m2v</td>
<td>Does Not Work</td>
</tr>
<tr>
<td>Mpeg4</td>
<td>.mp4</td>
<td>Works</td>
</tr>
<tr>
<td>Mpeg4</td>
<td>.m4v</td>
<td>Does Not Work</td>
</tr>
<tr>
<td>ProRes422</td>
<td>.mov</td>
<td>Works</td>
</tr>
<tr>
<td>ProRes420</td>
<td>.mov</td>
<td>Works</td>
</tr>
<tr>
<td>ProRes444</td>
<td>.mov</td>
<td>Works*</td>
</tr>
<tr>
<td>ProRes4444</td>
<td>.mov</td>
<td>Works*</td>
</tr>
<tr>
<td>FlexRes</td>
<td>.fxr</td>
<td>Works</td>
</tr>
<tr>
<td>AVI</td>
<td>.avi</td>
<td>Works</td>
</tr>
<tr>
<td>Animation RGB</td>
<td>.mov</td>
<td>Works</td>
</tr>
<tr>
<td>Animation RGB + Alpha</td>
<td>.mov</td>
<td>Works</td>
</tr>
<tr>
<td>h.264</td>
<td>varies</td>
<td>Works</td>
</tr>
</tbody>
</table>
### Image File Types

<table>
<thead>
<tr>
<th>Codec</th>
<th>Extension</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiff</td>
<td>.tiff</td>
<td>Works</td>
</tr>
<tr>
<td>PNG</td>
<td>.png</td>
<td>Works</td>
</tr>
<tr>
<td>Jpeg</td>
<td>.jpg</td>
<td>Works</td>
</tr>
<tr>
<td>Targa</td>
<td>.tga</td>
<td>Works</td>
</tr>
</tbody>
</table>

### Image Sequences

<table>
<thead>
<tr>
<th>Codec</th>
<th>Extension</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiff</td>
<td>.tiff</td>
<td>Works</td>
</tr>
<tr>
<td>PNG</td>
<td>.png</td>
<td>Works</td>
</tr>
<tr>
<td>Jpeg</td>
<td>.jpg</td>
<td>Works</td>
</tr>
<tr>
<td>Targa</td>
<td>.tga</td>
<td>Works</td>
</tr>
</tbody>
</table>

### Audio Encoding

<table>
<thead>
<tr>
<th>Codec</th>
<th>Channels</th>
<th>bit depth</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wav</td>
<td>1</td>
<td>16b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>2</td>
<td>16b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>4</td>
<td>16b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>6</td>
<td>16b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>8</td>
<td>16b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>2</td>
<td>24b</td>
<td>Works</td>
</tr>
<tr>
<td>Wav</td>
<td>2</td>
<td>32b</td>
<td>Works</td>
</tr>
<tr>
<td>MP3</td>
<td>2</td>
<td></td>
<td>Works</td>
</tr>
</tbody>
</table>

### Notes
- *Content encoded from ProRes 444 may show a slight colour shift compared to the original due to an issue in the 3rd party media encoder. The ProRes 444 family also has limited support in Windows so it is best to test the specific codec and resolution when establishing a content workflow.
- **As of Version 4.2, HAP content can be ingested without transcode.

**Note:** 4.2 will be the last V4 version to support playback of Mpeg-2 encoded content. It is strongly advised to avoid Mpeg-2 as it will not playback in future versions.
Current CITP Support

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.

<table>
<thead>
<tr>
<th>Desk or Software</th>
<th>Version Tested</th>
<th>Thumbnail Exchange</th>
<th>Streaming Previews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand MA2</td>
<td>3.1.2.5</td>
<td>Works</td>
<td>Works</td>
</tr>
<tr>
<td>Grand MA2</td>
<td>3.2.2.3</td>
<td>Works</td>
<td>Works</td>
</tr>
<tr>
<td>MA-3D</td>
<td>3.2.2.3</td>
<td>N/A</td>
<td>Works</td>
</tr>
<tr>
<td>MSD</td>
<td>3.2.2.3</td>
<td>N/A</td>
<td>Works – Inverted about Y Axis</td>
</tr>
<tr>
<td>Martin M-PC</td>
<td>3.50.645.641</td>
<td>Works</td>
<td>N/A</td>
</tr>
<tr>
<td>Capture Argo</td>
<td>21.1.30</td>
<td>N/A</td>
<td>Works</td>
</tr>
<tr>
<td>Hog 4</td>
<td>3.2.5 (Beta)</td>
<td>Works</td>
<td>N/A</td>
</tr>
<tr>
<td>Avolites</td>
<td>Titan (9/10)</td>
<td>Works</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Current Datapath Drivers

The latest tested version of Datapath capture drivers is 7.14.1. These drivers extend support to Quad SDI capture in 3G and should be downloaded from the Datapath Website.

https://www.datapath.co.uk/datapath-current-downloads

Installation Notes

- Previous versions of Hippotizer must be removed before 4.2 is installed. Export all component data and uninstall older Hippotizer installations before running the 4.2 installer.
- A restart of Windows is required to complete the installation when first upgrading to 4.2.
- 4.2 is supported on all Hippotizer V4 systems, including Portamus and Play.
- 4.2 introduces a new way to manage show data. When installing onto an existing 4.1 version all component settings will be lost. (Media is not affected). Save your data before upgrading by exporting all relevant components.
- From version 4.2 Onwards the Hippotizer data is stored in new locations to comply with 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_2
- The Media folder by default on Portamus and Play is: C:\ProgramData\GreenHippo\MediaV4
• From Version 4.2 Hippo Launch should be used to start Zookeeper and the Engine. For this reason, shortcuts to the engine and zookeeper will no longer be deployed on the desktop as part of the install. If a link to the engine or Zookeeper is required they should point at the Hippotizer Binaries directory listed above.

**Major Changes In Behavior**

• With the addition of anti-aliasing in Videomapper (better rendering of diagonal tiles), there is now an 8192 × 8192-pixel limit to the size of video maps.
• In Zookeeper, the outpoint of each clip is now shown as the out-frame when set to maximum to correctly reflect the length of the clip (previously it was set to 23:59:59). To avoid undesirable behavior, if the outpoint is set to max, and the clip is changed, the new outpoint will automatically reset to the end of the new clip. Controlling media changes from other means such as Timelines and DMX may need to consider this behavior when programming. This behavior can be changed if desired please see the manual for details.
• The Watchfolder Queue has been moved from the media encode Queue to a new Pin Item in media manager. Each Watchfolder queue pertains to the local media manager only, and not all on the entire as network as before.

**DMX Personalities**

**Current Layer Personality: 4.2 Layer**

Changes from 4.1 Layer

• Added Pause on Dark
• Added Rewind on Dark
• Set Volume Control to update only
• Added Keystone on Layer

**Current Mix Personality: 4.2 Mix**

Changes from 4.1 Mix:

*Set Timecode Offset to be a 16bit Channel
*Set Pixelmapper mix controls to be update only

**Current Viewport Personality 4.2 Viewport**

Changes from 4.1 Viewport

*Added 2 Channel space for Preset Select in 4.2 Viewport
*Added 16bit Preset select to 4.2 Viewport Presets
Features Added

- Added Hippotizer Play
- Added Proxy Media rev 23037
- Added indication in output manager of windows primary display 10906
- Added ability to window outputs 10647
- Added PosiStageNet support to MultiController 23152
- Added support for Portamus
- Added new generators: 030 – Westliner, 031 – OneShot 23194
- Added Group selection to Pixelmapper
- Added Watchfolder Queue. 23325
- Added User pins to MacroManager 23256
- Added ability to export Watchfolder database to CSV. 10212
- Added Media Player performance pin 23325
- Added ability to change the output framerate of Pixelmapper 23338
- Added antialiasing in Videomapper. 10986
- Added Art-net3 support to DMX Component. 23378
- Added ability to bypass media player when the level is down 10859
- Added RGBW subtractive colour mode to Pixelmapper 23403
- Added media merging progress bar in Media Manager 23462
- Added indication of sync type to media player sync gui. 11297
- Added colour space option to FlexRes lossless. 11522
- Added HAP import without transcode
- Added progress bar to media import 23800
- Added Mix and Viewport links to quick launch bar in Zookeeper 11516
- Added ability to drag and drop between mixes and viewports
- Added status indication in host selectors. 11536
- Added Mirrored tiling effect (120)
- Added High Performance Mode to Zookeeper 11985
- Added ability to scale the Timecode readout UI element 8598
- Many new features to Hippo Launch:
  - Added ability to start clean show
  - Added ability to load/save Shows
  - Added ability to automatically start the engine and zookeeper
  - Added support for MSEX1.2 in CITP 24247
  - Added support for installation onto non-admin user accounts
  - Added indication of mapping type to MultiController
  - Added ability to import CSV into Videomapper
  - Added integration with SMODE — Ask for a Alpha
  - Added Integration with Notch — Ask for a Beta
  - Added 4:2:2 and 4:4:4 colour spaces to FlexRes Lossless.
  - Added ETC Selador Vivid-R Colour space to Pixelmapper
• Added new DMX Component User Interface
• Improved monitor
• Improved patch / re-patching of universes
• Faster interface with large patches
• Added Virtual Viewports
• Added Keystone on Layer
• Added ability for master/slave timecode in Sync Manager
• Added ability to set countdown in media player
• Added indication of Date added to media player
• Added ability to drag Watchfolder queue onto pinboard
• Added scroll bars to Pinboards when too small for the display
• Added ability to launch Zookeeper into specific pages
• Added ability to launch Zookeeper without page navigation
• Added auto start to Hippo Launch for zookeeper and the engine
• Added Colour Blocks to Videomapper
• Added ability to add DMX monitor as a pin item
• Reduced font size on slider text
• Added Date to media player information; re-styled media player UI.
• Added ability to import and export show data from Hippo Launch
• Added ability to export PNG of Pixelmap
• Changed Timecode Offset to Shift for Alpermann Velte and Audio timecode sources in Sync Manager.
• Added Timecode readout to layer
• Added GRB Colour space to Pixelmapper

Fixes (Since 4.1 Release)

• Fixed issue where 4.1 Personalities for Mix and Viewport with Preset were not visible in DMX – 10923
• Fixed issue where media would not encode when disk space is below 10% – 10684
• Fixed issue where Timecode over HippoNet could fail. – 10829
• Fixed issue where Media Manager could fail to encode images reporting “out of memory” – 10935
• Fixed issue where a blank IP address in ArtNet settings of Pixelmapper or DMX could cause a ZK crash. – Rev 23093
• Fix for issue with CITP streams failing with MA-3D – Rev 23096
• Fixed issue where sorting of clips in media manager by slot would not be correct – 8387
• Fixed TCP Disconnect issue in CITP – 10223
• Fixed issue where output manager UI could become confusing after deleting mixes. – 10827
• Fixed issue where viewports would not be visible before clicking in zookeeper Rev 23202, 23253, 23316, 23348 FB: 11257, 10909
• Fixed intermittent zookeeper crash when immediately navigating to mixes page – 11098
• Fixed possible crash in output manager failing to write to storage – Rev 23262
• Improved DPI handling of Output manager – Revs: 23274, 23276, 23279
• Fixed issue with 30NDF Timecode rev; 23434, 23438, 23440
• Fixed issue where fixture width in Pixelmapper is not calculated correctly. Rev 23438
• Fixed issue where case LEDs would not change to blue on media upload. 11177
• Fixed issue where output manager would crash of vertical displays. 11508
• Fixed issue where windows task bar could overlay higher numbered viewports 11731
• Fixed issue where the Timeline UI could crash if long timelines were zoomed too far 10921
• Fixed issue where DMX Pin selector could not see some components 11190
• Fixed issue where the Mute state of a Timeline was not saved. 11518
• Fixed issue where you could not set a timeline 0. 11549, 11545, 11519
• Fixed issue where editing presets created by drag and drop would crash zookeeper. 11556
• Fixed issue where midi ports could become locked, this could stop the engine from shutting down and potentially cause additional midi devices to not appear. 11377
• Fixed issue where sub-folders would not appear in Media manager in certain situations 11722
• Fixed issue where colour picker would not remember selection. Rev 23654
• Fixed issue where Hippo Launch would try to register already registered machines 11432
• Fixed issue where random play mode did not respect speed Rev 23671
• Fixed issue where DEAP and PRG automation would not set axis. 11568
• Improved performance of CITP thumbnail delivery 24248, 24249
• Fixed Zookeeper crash from entering incorrectly formatted timecode value to timeline’s timecode offset. 11619, 23992
• Fixed issue where timeline sorting by number or name was not working. 24879
• Fixed issue where output limits were not being enforced. 10911
• Fixed issue where it was difficult to patch lots of pinbridges to DMX. 23698
• Fixed issues where viewport changes in Output manager configuration did not occur in real time. 8924
• Fixed but where integer number boxes could become unresponsive. 10986
• Fixed issue where engine would crash where non-Latin characters were in the name of media files encoded by Watchfolders. 5472
• Fixed issue where output would cover single display or Portamus with only one screen. 11400
• Fixed issue where hosts did not disappear in media manager after engine shut down 11459
• Fixed issue where the first frame of a clip could flash with changes to sync state.
• Fixed issue where Videomapper would copy outputs if enabled with no map selected.
• Fixed issue where Watchfolders queue would indicate entire network.
• Fixed issue with zookeeper slowness switching between hosts with large media libraries.
• Fixed issue where STRATA re-map would not always work correctly.
• Fixed issue where Output manager would not show connected monitors correctly with specific EDIDs
• Fixed issues where mixes may not be patched in order in DMX with auto patch
• Fixed lots of issues where Zookeeper licenses could become corrupt on non-Hippo hardware
• Fixed issue where Amba would allow more than one output.
• Fixed issue where track media select would not scroll to correct clip
• Fixed issue where Hippotizer would default to a wireless network adaptor.
• Improved encoding of audio files (see list of codecs supported)
• Fixed issue where multiple mjpegs files encoded at once could create corrupt content.
• Fixed issue where names to media files in media manager would not update immediately when changed.
• Fixed engine crash when the in-point was made greater than the outpoint in clips containing audio.
• Fixed issue in Pixelmapper where changes to which NIC to use would not apply without an engine reset.
• Fixed issue where Sync to clock would fail at midnight
• Fixed issue where timecode readouts would create UI elements of Integer boxes
• Fixed issue where the clip and bank offset on layer could not be made negative
• Fixed issue where arrow keys did not move screen warp nodes.
• Fixed issue where Mix presets could not be applied to mixes with a different layer mode.
• Fixed issue where Geometry control on layer would show the aspect ration of the next mix.

Known Limitations

• Presets are always saved with a playback position of 00.00.00:00. If it is desired to play a clip back from a different position than the beginning use the in-point instead of play-head position.
• Deleting profiles from the Pixelmapper profile library does not work.
• Resetting the Pixelmapper component from within Component settings does not work. To create a new pixelmapper component it is necessary to start a clean show.
• If patching mix controls from DMX, Pixelmapper’s map select must be set to update only.
• After using High Performance Mode all sources may not be available. To fix this, restart Zookeeper.
Using This Manual

This manual covers a broad range of topics from basic Hippotizer operation to advanced video concepts. To make this more readable, the manual uses some standard formats.

Critical information, or areas that could interfere with video output are noted as important.

![Warning] Unplugging the power to your Hippotizer system will stop video output.

Information that can save time or is known to cause users problems will be flagged with a Note box.

Note: Windows firewall can block Zookeeper communicating over the network if not configured correctly.

Code examples will be separated into a code box.

[Identifier],?

Feedback

Each page has the option to leave feedback. If you find a section unclear or see an error please note this in the feedback.
What is Hippotizer?

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

Hippotizer is a software toolbox to display media for the live events industry. Borne from visual jockey software first developed 15 years ago; Hippotizer V4 combines an easy to use structure with powerful 2D and 3D functionality.

In general, we separate 2D and 3D workflows. Hippotizer is considered 2D, while the SHAPE application adds the third dimension. SHAPE is developed by Green Hippo and is supplied free for use with Hippotizer.

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

SHAPE is a software application to assist with projector setups and 3D mapping of video onto complex objects in real time. 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 and is able to assist with aligning,
blending, masking and warping the projector(s).
SHAPE is comprised of two parts: the SHAPE application that is free to download from Green Hippo, and the Hippotizer V4 system running on a Green Hippo media server. SHAPE communicates via the network to Hippotizer V4 machines to allow real time manipulation. Once the model is configured, all settings are saved to the Hippotizer which then handles all content playback; the SHAPE application is then no longer required.

SHAPE’s manual can be found here: SHAPE Manual
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, 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

UK Main Office:

Green Hippo Ltd.
Unit 307 Parma House
Clarendon Road, Wood Green
London, United Kingdom.
N22 6UL

The UK offices handle sales and support for Europe, the Middle East and Asia as well as most of our research and development.

US Sales Office:

US Office Address:
425 E Colorado St
Suite 610
Glendale, CA 91205

The US offices handle sales and support for the Americas.
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 directly that can be reached by email:

**In Europe, the Middle East, Africa or Asia email:**

Support@Green-Hippo.com

**In the Americas email:**

US.Support@Green-Hippo.com

This email is 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.

Alternatively, a support request can be created from the Green Hippo support website:

http://support.green-hippo.com/support/
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; 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](#)
Software Assurance Policy

Every Hippotizer V4 system features a three (3) year software assurance policy period. While software assurance is active, the Hippotizer V4 system is entitled to install and run the latest version of Hippotizer V4 software released by Green Hippo. When the assurance policy has expired, the Hippotizer system will not be able to install Version 4 software released after the expiry date. An early adopter extension was in effect for systems purchased in the first year of the product, all systems purchase on or before February 2016 will end software assurance February 2019. Systems purchased after this date have three (3) years of free software upgrades. The system will continue to work as normal after assurance has ended. Please discuss extensions to the software assurance period with Green Hippo or your local distributor.
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 can 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.
Hardware Information

Hippotizer hardware is a purpose-built computer designed for use in a live events environment. Below is some important information about the hardware and good practice for mounting and maintenance.

- FCC Declaration
- Rack Mounting
- Ventilation
- Power
- Hardware Changes
- F12 Restore Utility and Acronis
- Hardware Warranty
- SSD Refresh Tool
- Capture Cards
- System Specific Information
- Audio
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.

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.

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

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.

! 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.
F12 Restore Utility and Acronis

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.
Hardware Warranty

Hippotizer 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 (at our discretion) of any defective part or product and shall not include incidental damages of any kind.
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
- 1 x Capture Card or Accessory Card

Karst
- 1 x Capture Card or Accessory Card

Boreal
- 2 x Capture Cards
  and
  - 1 x Accessory Card

Taiga
- 2 x Capture Cards
  or
  - 1 x Capture Card and 1 x Accessory 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
• **Data Path VisionRGB-E1S** — Single DVI Single Link Capture

## Capture Drivers

Using the correct software driver for Hippotizer is critical to ensure proper functioning 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.
System Specific Information

Each Hippotizer has different output configurations with associated resolution limits.

- Amba
- Karst
- Boreal
- Taiga
Amba

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.

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

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: \(3840 \times 2160 \, @ \, 60\text{Hz}\)
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: \(1920 \times 1200 \, @ \, 60\text{Hz}\)
Supports Splitters: No
Supports Conversion to Analogue (VGA): No

HDMI:

Max Resolution: \(1920 \times 1080 \, @ \, 60\text{Hz}\)
Supports Splitters: No
Supports Conversion to Analogue (VGA): No

Display Port:

Max Resolution: \(3840 \times 2160 \, @ \, 60\text{Hz}\)
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: \(2048 \times 1080 \, @ \, 60p \, (Supports \, SD/HD/3G \, SDI)\)
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

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

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*
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 referred 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
- 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.

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

- \(720 \times 480i\)
• 1280 × 720P

• 1920 × 1080i

• 1920 × 1080p

• 2048 × 1080p

## 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.

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

## 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:

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.
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:

Connection Properties:

<table>
<thead>
<tr>
<th>Emulation</th>
<th>Emulate always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>DisplayPort</td>
</tr>
<tr>
<td>Lanes</td>
<td>4</td>
</tr>
<tr>
<td>Bit Rate</td>
<td>5.4 GHz</td>
</tr>
</tbody>
</table>

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

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 Minimum Specs

- Windows 8 or 10, 64bit
- 4GB RAM
- 8GB Drive space on system drive
- English Windows (UK or US)
- English Keyboard (UK or US)
- OpenGL 4.3
- 1920 × 1080 Display
- Disable Screen Scaling
Hippotizer Play Recommended Specs

- Intel 4th Gen 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 4.3
- 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 issues.
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 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.

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

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

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 its 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%.
Customise your display

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:

1. **Engine** - The core of the system. The Engine renders video and receives external control (such as DMX). The engine must be running on every Hippotizer system that is outputting video. The Engine has no user interface.

2. **Zookeeper** - The user interface for Hippotizer; it controls all engines on the local network.

3. **HippoLauncher** - A management application for the Engine and Zookeeper, helping to start and stop the programs as well as provide some useful features.

Note: By Default, only HippoLaunch is placed on the desktop.
HippoLauncher

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

To start Hippotizer there are three options: Start the current show, Start a new show and import or export a show.

Current Show

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

- Start the Hippotizer Engine Application only; allows rendering, receiving DMX and control over the network.
- Starts both the Hippotizer Engine and Zookeeper
Starts Zookeeper for remote control from computers that are not outputting video.

New Show

Starts Hippotizer and Zookeeper with default settings.

Start the Hippotizer Engine Application only with default settings for all components.

Resetting the engine will delete all component settings, Presets, Timelines and any other component data will be lost.

Starts both the Hippotizer Engine and Zookeeper with clean defaults.

Starts Zookeeper with default settings. This deletes user created layouts and custom pinboards.

Resetting Zookeeper will delete all custom Pinboards and layouts.
Advanced Options

HippoLauncher has some features to make deploying and maintaining Hippotizer systems easier.

- Remote Update
- Software Download
- Licensing
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.
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.
Zookeeper

Zookeeper is the interface to Hippotizer; it allows for real-time control of the engine and all of it’s components.

Zookeeper is a separate application from the engine to enable remote control; Zookeeper can talk to any Hippotizer on the local network.

- Installing Zookeeper
- Start Page
- Customizing the Interface
- Layer Controls
Advanced Startup options

The startup behavior 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`
Launch Zookeeper without the ability to edit pinboards or navigate to new pages

Add `-h` to the launch short cut.
The Zookeeper start page is the hub connecting all the various elements of the system together.

**Home Button**

Returns to the start page from any other page, or navigates to the previous page when in the start page.

**Create Sub-Window**

Opens a new Zookeeper Window. Use this where multiple displays are being used for Zookeeper at once.

**Quick Access Buttons**

The top two buttons lead to the Mixes and Viewports Pages while the following nine are for customization. Simply drag a custom layout onto the quick access button to make it available in every screen.
Upload Queue

Shows all pending and completed media uploads

HippoNet

Shows the Hippotizer Network (HippoNet)

Custom Layouts

User defined layouts to create custom interfaces. Double click an empty layout to open it. Single click an existing layout to open it.

Settings

Access Zookeeper's advanced settings.
Quick Access Buttons

On the left side of Zookeeper are two 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.
Hippo Net

The Hippo Net is the collection of network based controls that make up Hippotizer. Each control is referred to as a Pin and are the way that engine can be communicated with. The Pins collectively are called 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.
Zookeeper has a few settings that may be required to change.
Log Level

Zookeeper’s logs can be set to different levels. This is used mainly for diagnostic purposes; Green Hippo support may ask for this to be changed to help trace an issue.

Restore Default Layouts

Resets the user layouts (custom pinboards) or the Mixes and Viewports page.

Import Zookeeper Settings

Allows saved Pinboards and Layouts to be applied to the local Zookeeper from a file.

Export Zookeeper Settings

Saves the current Pinboards and Layouts to a file.

Zookeeper Network Adapter

Choose which Network adapter Zookeeper uses to communicate with the engine.

The network adapter with green text is currently in use. (Wi-Fi 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:

- Pinboards
- Layouts
- Pin Items
- Selectors
- Special Items
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: ![HippoNet Button](image) 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.
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 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:

- **Delete**: Deletes the pin board item
- **Move**: Click and drag to move the pin board item around the layout
- **Resize**: 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.
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.
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 icon.
- Then expand Hippo net by clicking the Hippo Net Icon

The selectors are part of the list of special Pin Items:

- **L** Layer Selector
- **M** Mix Selector
- **V** Viewport Selector
- **H** 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.
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.
The Source originates video for each layer, whether by playing media, showing a live capture stream or creating content with a generator. Each layer’s source is independent, and multiple layers can play the same media or live capture stream at the same time.

There are six source types to choose from:

- Media Player
- Live Capture
- Generators
- Relays
- Screen Thief
- Spout
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.
Transport Controls

Playback Position and In/Out-Point

Media plays from the In-Point to the Out-Point, which by default are the first and last frames of the clip.

Note: At each clip change the Out-Point is reset to the out frame of the new media. This can interfere with external control such as DMX. For this reason it is advisable to set the In-Point and Out-Points to be Update Only in DMX. This can be changed if required: Changing In/Out Behaviour

The playback position, In-Point and Out-Point can be seen in time or media frames. This is changed by right-clicking on the time box label and selecting ‘show frames’.

The playback position can also show the time from the In-Point or the Out-Point (time remaining) by toggling the countdown button.
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:** When paused the clip will hold at the play-head position. When un-paused it will jump to the current timecode value.

![Play Backward]

**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]

**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]

**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]

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

**Timecode:** Plays random frames while receiving time code.

![Out Frame]

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

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

Each media layer can lock to and send timecode information, this data is more generally known as Synchronization. TimeCode coming into the system from external sources (such as Linear Time Code) carries time only, while a layer generates a full Sync State which includes clip information, In-Point, Out-Point and playback speed.

To configure Timecode input, please see the Sync Manager.

Sync Buses

Each Hippotizer has 16 Synchronization channels for use by media players referred to as a Sync Bus. Sync buses do not rely on any components to operate.

More Information on Sync Buses

Sync In

Sets the layer to use either an external sync source or another layer as an input. Sync Bus 1-16 carry a full Sync State so control media selection and player state as well as playback. External 1 and 2 only carry time. To disable Sync into a layer, set the Sync In to be Off.

Sync Out

Sends the layer’s playback state to one of the 16 Synchronization buses to be use by other layers.
**TimeCode Offset**

Delays the layer’s response to TimeCode. For example, a layer with Offset of one minute would play a clip at time 0 when receiving timecode of one minute.

**Flywheel**

Determines if the layer stops playing when TimeCode stops being received. With FlyWheel enabled, the layer will carry on on loss of TimeCode. When disabled the layer will stop playing over the course of 5 seconds.

**Media Offset**

Used when receiving a Sync Bus from another layer; the clip and bank offset allow each layer to play different clips in time with each other.

**Timecode Format**

Type of timecode being received by the layer. A Sync Bus will show as “Time” while Linear Time Code will show it’s frame rate, for example 30 Drop Frame displays as “30DF”
Audio Controls

Each Media player is capable of playing stereo or multi-channel audio.

The audio controls offer basic volume and pan controls for stereo playback.

Note: For multi-track audio playback it is best to use the volume controls on the playback device to control individual channel levels

Sync To Level

Sets the volume equal to the layer’s 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 to output audio. This is configured from within the Windows audio control panel;
Other Media Player Functions

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.

Rewind on Dark

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

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. See Hardware Information on Capture Cards for more information.

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.
Delay in Live Capture

It is often desired to have as little latency in live capture as possible. Properly configured, Hippotizer will add 2-3 frames of delay.

For best practice guidelines please see the section on reducing live delay.
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 an integer pin which is populated based on how many relay sources are present on the machine.

**The order of the Relay select pin is:**

- 0 – Disabled
- Mixes
- Viewports
- Layers – increasing by mix and layer number. (Mix 1: Layer1 then Mix1: Layer2 etc.)

Relays are located after the media player and effects, but before colour geometry and the layer level in the render chain. Meaning a relay will convey clip information and effects but ignore colour, geometry and layer level.

**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.
Generators
Screen Thief
Geometry
Keystone on Layer

Every layer in Hippotizer features an independent Keystone control accessed from a tab within the Geometry section.

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 unkeystoned 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.
Zookeeper naturally uses some of the resources of a Hippotizer system. The performance impact of Zookeeper can be reduced by disabling previews and using High Performance Mode.

**Disable Previews**

Rendering previews can cause occasional ‘hicks’ on the output of a system, especially when they are under significant load. Setting the **media preview quality** to off will improve this.

Previews must be disabled on each host to be effective.

Note: If there are no Zookeeper instances on a network, previews are disabled automatically.

**High Performance Mode**

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.
Show Management

All Hippotizer Components can be exported or imported from a single interface in HippoLaunch.

To access this, go to the Import/Export tab in HippoLaunch.

Note: The engine and Zookeeper must be started in a special way for the Import or Export to function. It is best to start with only Hippo Launcher running and choose the desired option before starting the Engine or Zookeeper.
Components

Hippotizer is based around a series of plugins called components each adding functionality.

Each component can be started or stopped from the configuration page of Zookeeper.

Staring and Stopping Components

Components in Hippotizer:

CITP

Enables the transfer of thumbnails and previews between Hippotizer and 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 Component

Runs by default: operates the LED indicator lights on the front of Hippotizer systems.

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**

**SHAPE**

SHAPE is the 3rd dimension of Hippotizer to enable projection mapping, object tracking and advanced projection tools.

**Sync Manager**

Manages time synchronisation between systems

**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.
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 running or stopped. A stopped component retains it's settings by 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.
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.

What works with CITP in 4.2?

Please see the release notes
Setting CITP up can be a challenge, each combination of manufacture can have a unique trick. 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 and then turn the CITP component on Hippo off and on again to allow the desk to see layers.
DMX

The DMX Component receives DMX in Hippotizer to control layers, mixes and viewports from common network control protocols such as ArtNet, Ma-Net and sACN.

**Note:** The DMX component is most commonly used to patch whole layers, mixes and viewports to a lighting desk. To patch a single attribute it is faster to use Multicontroller.
System Setup

The DMX component relies on the network to carry data to the Hippotizer software; the first step then is to configure the network for Hippotizer.

For a detailed explanation of how to setup the network, please visit the networking section of this manual.
Basic Layout

The DMX component is made of several pieces:

- Patch Window
- Personality Editor
- DMX Monitor

The default view of the DMX Component is the Patch Window. To begin, start the DMX component and add it to a Pinboard. Starting a new component.
Add the component to a Pinboard

The patch window is comprised of four parts:
- Universes
- Universes Detail
- Patched Fixtures
- Fixture Detail
Universes

DMX component receives data over the network on one of three protocols:

- Art-net (1, 2 or 3)
- Ma-Net 2.9
- Streaming ACN (sACN)

Each universe of data the Hippo is receiving is represented by an object in the protocols list. The DMX component is capable of receiving many universes at once from multiple protocols.

Each protocol has specific settings that is accessed from the settings cog.
GrandMA V2.9

- Session ID

The Session for Hippotizer to listen too. An MA network can have many sessions; select the session based on which is used on the lighting desks.

- Use Host Address

If enabled, the DMX component will expect data to come in on the same network port as the host (engine) is using.
If disabled, specify which adapter to use based on IP address.

- Network Adapter

If not using the host address, select which adapter to use based on it’s IP address.
ArtNet

- **Select Art-net Interface**

Determines which network card DMX will use to receive Art-net data. The default **automatic** will use Art-net data regardless of which network card it arrives on. Alternatively, choose the IP address for the interface as desired.

* The hardware loop-back adapter (127.0.0.1) should be used where the Art-net source is on the same computer as Hippotizer

- **Receive data from**

In situations where there is a lot of Art-net traffic on the network going to multiple destinations, the data source IP can be specified. If present, the DMX component will only react to Art-net data from the listed sources.
Universes Detail

Each device in the protocol list corresponds to a single universe of received data. One device is required for each universe to be used.

What settings are required depends on the type of Universe.

Art-net

Net

Art-net 3 functionality allowing for additional universes to be addressed, each Net can carry 16 SubNets (0-15)

SubNet

A group of 16 universes (0-15).

Universe

Corresponds to an individual DMX universe.

Hippotizer addresses Art-net universes starting from 0 (as defined in the specification), which can lead to confusion as universe 0 is the first universe and will frequently be numbered one in lighting controllers. The same logic applies to Subnets and Nets.

In order to calculate the universe number, multiply the subnet by 16 and add the universe number, taking into account the fact that universe zero is actually one.

For example, universe 43 works out to the 2nd subnet (16 × 2 = 32) and the 11th universe (43 – 32 = 11). Which would be subnet 1, universe 10.

Streaming ACN

sACN only requires a Universe number which will be combined with the IP address of the interface

GrandMA V2.9

A universe number for each MA-Net universe is required. The Session number and IP will be taken from the protocol of Ma-Net.
Patched Fixtures
Fixture Detail
General Settings

*On/Off DMX of Startup

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 Smoothness

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 and is seldom required for modern lighting control systems.

*Monitor Refresh Rate

Determines how often numbers are re-drawn the DMX monitor window.
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.

Note: Live Masks are saved in the Engine component export.

Shows the Engine is running this is called the Host.

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 Log.

Shutdown Host Saves and shuts down the Engine.

Shutting down the Engine will stop video rendering.

Indicates a layer is running. An icon is loaded for each layer.

Note: There is no functions associated with layer icons, they are present only to show how many layers are loaded.
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.
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

The LED component runs by default and controls the coloured Hippo-head on the front of Hippotizer V4 hardware.

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.

- Example Macros
- Hippotizer API

For more information about Lua please see their website:

www.lua.org/
Example Macros

The easiest way to learn Macro Manager is to use examples:

- Fading Layer Level
Fading Layer Level

A simple Macro Fades the layer 1 level of the local host:

Set the local mix to be a variable mix

```lua
local mix = HippoNet.LocalHost.Engine:FindMix(1)
```

Find layer 1 on mix and set to layer 1

```lua
local layer1 = mix.Layers[1]
```

Find level on layer 1 and set to level1

```lua
local level1 = Layer1:FindPin("Mixer/Level")
```

Now fade the level 1 variable depending on the what value it currently has

```lua
if level1.Value == 0 then
    level1:FadeValue(1,1)
else level1:FadeValue(0,1)
end
```
--- Fades Local Mix 1 Layer 1 to 0 if full, or to 1 if at 0.
--- Set local variable to Mix 1 on the local host
local mix = HippoMete.LocalHost.Engine:FindMix(1)
local layer1 = mix.Layers[1]
local level1 = layer1:FindPin("Mixer/Level")

--- Fade the value of the mix variable to 0 over 1 second. Waiting until the fade finishing before continuing.
if level1.Value == 0 then
  level1:FadeValue(1,1)
else
  level1:FadeValue(0,1)
end
Fade All Levels

__FADE AWAY__

— Fades all the layers on the local host out simultaneously

local FADE_TIME = 2

— First, get the local engine

local engine = HippoNet.LocalHost.Engine

assert(engine)

— Create an empty table which we will store our layers in as we find them

local layers = {}

— Now get the number of mixes on the engine and store it

local mixCount = engine.MixCount

— We’ll now use a ‘for’ loop, to run the following code once for each mix

— There are three parameters here.

— ‘i=1’ – This declares a variable which we will use the hold a number

— ‘mixCount’ – This specifies that the loop should run until the ‘i’ variable equals the value of the mixCount variable
— ‘1’ – This specifies that we should increase the value of ‘i’ by 1 each time we run the loop.

for i=1, mixCount, 1 do

— Get the mix with an index equal to ‘i’
local mix = engine:FindMix(i)
assert(mix)

— This is a different kind of ‘for’ loop, which will run once for each item in the ‘mix.Layers’ table
— ‘index’ is the variable used to store the table key for each loop
— ‘layer’ is the variable used to store the table value for each loop
— ‘in’ specifies that we want to loop through a table
— ‘pairs(mix.Layers)’ specifies that we want to get the value pairs out of the mix.Layers table.
for index, layer in pairs(mix.Layers) do

— Here we use the ‘table.insert’ lua function to add the ‘layer’ variable to end of the ‘layers’ table
  table.insert(layers, layer)
end

end

— Now we’ve completed our ‘for’ loops, all the layers should be contained in the ‘layers’ table. Let’s print the result.
print("Found", #layers, "layers")
print(layers)

— Now we perform another ‘for’ loop to run the FadeLevel API function on each layer.
for index, layer in pairs(layers) do
  layer:FadeLevel(1, 0, FADE_TIME)
end
Hippotizer API

The interface with Hippotizer’s Engine and Components involves some specific parameters and functions.

- Component API
- DMX Component API
- Engine API
Component API

Generic Component API

Properties

Name

Gets a string that is the name of the component

TypeName

Gets a string that is the name of the component's type (Engine, MediaManager, MultiController, etc.)

OwnerHost

Gets the host object

OwnerHostName

Gets a string that is the name of the host the component is running on

AllPinPaths

Gets a table containing all pin paths in this component

RootPin

Gets an object of the component root pin

Functions

FindPin(string)

Finds a pin on a component with a path matching the specified text

If the pin is found returns a path, if not found returns nil.

SearchAllPinPaths(string)

Searches all pins on the host for a pin with a path containing the search pattern.
Returns a table of all pins matching the search pattern.

Stop

Stops the component

Returns True if component was stopped, false if the function failed or the component was already inactive
DMX Component API

The DMX component has a set of properties and commands specific to it.

DMX Component Properties

Enabled

Gets state of DMX component's enabled pin

Universes

Gets a table of universes in the component

Universe Properties

Protocol

Gets the name of the protocol by this device

Fixtures

Gets a table of fixtures patched in this device

Fixture Properties

Name

Gets name of fixtures

StartChannel

Gets start channel this fixture is patched to

TargetPinPath

Gets pin path the fixture is controlling
Engine API

Parameters

MixCount

Gets number of mixes in engine

ViewportCount

Number of viewports on engine

FindMix(number)

Finds the mix with specified index on the engine

returns the mix or nil if the mix is not found

Mix Parameters

Index

The index of the mix

Path

gets the pin path to the root pin of the mix

LayerCount

Number of layers in the mix

Layers

A Lua table containing all the layers in this mix, indexed by their layer number

Level

The master opacity of this mix
Mix Functions

**FadeLevel(number,number,number)**

Performs a smooth fade between two specified mix level values whilst continuing script execution. To run a fade and pause the script until it completes, use FadeValueWait.

**Parameters:** The value to fade from, The value to fade to, duration in seconds.

**FadeLevel(number,number)**

Performs a smooth fade from the current mix level to a specified mix level whilst continuing script execution. To run a fade and pause the script until it completes, use FadeValueWait.

**Parameters:** The value to fade to, the duration in seconds.

**FadeLevelWait(number,number,number)**

Performs a smooth fade between two specified mix level value, and continues the script after it completes. To run a fade and continue script execution, use FadeValue.

**Parameters:** The value to fade from, The value to fade to, duration in seconds.

**FadeLevelWait(number,number)**

Performs a smooth fade from the current mix level to a specified mix level, and continues the script after it completes. To run a fade and continue script execution, use FadeValue.

**Parameters:** The value to fade to, the duration in seconds.
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.
Basic Layout

Media Manager stores and encodes all movies, images and sound files in the Hippotizer system. Clips in Hippotizer are stored in the **Media Library**, and can be assigned to the **Media Map** for playback.

The Media Manager can control all Hippotizers on the network from one interface.

There are different sections to the interface:

[Encode New Media](#)
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.

The selection dialogue box also contains an option for **media expiry**.
If this is enabled, the media will not play after the expiration date.
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**
- **STRATA**
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

For legacy support, Hippotizer V4 supports Mpeg2 playback. This codec has significant resolution, playback and visual limitations so should be avoided if possible.

**Note:** As Hippotizer software is developed, future releases will not support Mpeg2 playback.

- Mpeg-2

Each codec offers strengths and weaknesses; it is best to consider the specific requirements of the production when choosing which codec to use.

**Hippotizer Play:** Mpeg-2 will not appear for users of Hippotizer Play as it requires a separately licensed decoder.

Media Encoding also has some general settings that are shared by all codecs:

[General Settings]
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 Media Manager’s settings.

![Encoding settings](image)

**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 three 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-Alph. Does not support alpha transparency.

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 merge 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)

Weaknesses

- Higher Quality and colour spaces can dramatically increase playback load.
- Relies partially on the computer’s CPU for decoding

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 $2 \times 2$ 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.
- Max Resolution: 16,384 × 16,384
- Minimum Resolution: 64 × 64

**Frame Rates Supported**
- Up to 60 FPS
Alpha Support

- Yes
Mpeg-2

**Mpeg-2** is present in Hippotizer V4 to allow Hippotizer Version 3 media libraries to play back. Due to severe limits in the decoder around resolution and memory allocation, we do not recommend encoding new media to Mpeg-2.

**Strengths**

- Plays back legacy Media Libraries

**Weaknesses**

- Poor slow speed and reverse playback
- Decoder can fail when loaded many times on the same machine

**Resolution Limits**

- Height and Width must be divisible by 16.
- 1920 × 1152

**Frame Rates Supported**

- Up to 30 FPS
Alpha Support

- No

**Note:** Hippotizer Version 4.2 will be the last revision to support Mpeg playback.
General 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:

**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 desired 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.

Auto Re-size media to valid codec size

If enabled, content that is not within the resolution limits of the selected codec will be automatically resized to work. Otherwise the content will fail to encode.

Please Note: Content will be cropped 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.
Sync

Media Manager can send its media and media map to other Hippotizers on the network.

**Note:** In V4 there has been a major change from Version 3 Hippotizer with media identification. V3 Hippotizer created a identification number for each piece of media based on certain attributes of the media file. This means that the same media encoded on two Hippotizer V3 systems created the same ID. Due to cases where the identification could fail to be unique, V4 uses a random ID for each media file. This changes the behaviour of media sync as the same clip encoded to two different Hippo V4s now appears as a different clip. For this reason, the first media sync in V4 will likely send all media. Subsequent syncs will only send new media.

**Media is Synced from the source system and sent to Target system(s)**

In order to determine what media to send, some settings are applied on the source system:

**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 media manager’s 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 Media Manager if the engine is restarted with Continuous Sync is 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 to 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.

More info on different folder methods can be found here.

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 number must be at least 4 digits. For files of number less than 1000, use preceding zeros. `Filename_0001`
- Images files must be contained within a folder with the same name.
- 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 subfolders 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.
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. Amba and Karst use Solid State Drives rated for 400MB/s of continuous read, while Boreal and Taiga use PCI based storage with 1200 MB/s and 2500MB/s read speeds respectively. 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.
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 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:

<table>
<thead>
<tr>
<th>Controller</th>
<th>Text</th>
<th>MIDI</th>
<th>DMX</th>
<th>Automation</th>
<th>GPIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArtNet Input</td>
<td></td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>BlackTrax</td>
<td></td>
<td>X</td>
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</tr>
<tr>
<td>MIDI</td>
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<td>POSI Stage Net</td>
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<tr>
<td>PRG Automation</td>
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<td>X</td>
<td></td>
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<tr>
<td>TCP</td>
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<td>X</td>
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<tr>
<td>UDP</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mapping for each controller and target is indicated in Multicontroller as a letter in a green circle.

*Text Mapping*

Each Controller has a unique configuration.

- [ArtNet Input](#)
- [BlackTrax](#)
- [DEAP / GHAP](#)
- [Labjack / Pokeys](#)
- [Midi](#)
- [OSC](#)
- [Posi Stage Net](#)
- [PRG Automation](#)
• **TCP Listener**
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).
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.
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.
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, 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. Applications like Ableton

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.
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.
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:

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],?

E.g.
Fps,?

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.
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, UDP and OSC.

Midi Mapping

The unique data format used by Midi controllers. Can carry different types of midi information such as midi notes and midi show control.

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
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
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 its details in the menu below the Mixes list.

Each Mix has three attributes:

- **Enable**
  Mixes are on by default. Disabled mixes will not start their media layers.

- **Mode**
  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.
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.

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.

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 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 Re-patching outputs.

* 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.

* 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.
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”.

![EngineHost screenshot](image)
Advanced Options

Some setup options in output manager are in the advanced menu:

- Graphics Card Restriction
- Martin P3 Integration
- Virtualised Viewports
- Render Buffering
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 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.
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 and 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 turns DMX controlled lights into part of the video screen by using video to control the colour or intensity of fixtures.

Pixelmapper is comprised of three parts:

- **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.
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](#)
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 background 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.
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 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

**Receive Live Position Data**

Allows the fixture to be controlled from live position data provided by the Coordinator component.

Note: As of 4.2 release, live tracking by Pixelmapper is available on request. Please contact Green Hippo for more details.

**Groups**

Any group(s) that the fixture has been assigned to.
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”.

---

ArtNet Output

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Art-Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Net</td>
<td>0 Universe</td>
</tr>
<tr>
<td>0 Sub-net</td>
<td>0 Unicast Mode</td>
</tr>
</tbody>
</table>

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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 a several key advantages over Art-Net including support for multi-casting, controller priority and low processing overhead.

![Protocol Universe](Protocol_Uiverse.png)

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.
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.

![Pixel Map Interface](image)

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 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.
Preset Manager

Presets are collections of pin values that are saved on each Layer, Mix and Viewport. Presets are a quick way to save a state for quick recall.

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
Saving and Editing Presets

To save a preset click the record button and select a slot in to which save.

**Note:** If the slot already contains a preset the option will be presented to either overwrite or merge the information.
Presets and Timelines
Presets and DMX
ScreenWarp Manager
Sync Manager

Sync Manager handles timecode in Hippotizer V4; it receives time signals from external devices and sends it to local or network based Hippotizer systems.

Sync Manager has two basic functions: reading timecode and sending it to Hippotizer components locally and on the network.

An external source such as Linear Time Code (LTC) or the clock generates timecode, this must be converted to a Time signal by Sync Manager for use by Hippotizer.

Time vs. Media Control

Synchronization information inside Hippotizer is distributed as two pins which together are referred to as HippoSync. The two pins called “Time” and “Sync State” together carry time and Media control.

When dealing with synchronization and timecode it is important to understand the terminology:

Timecode

Timing sent to Hippotizer by an external source such as LTC or the Generator.

HippoSync

HippoSync is how timing information is carried in Hippotizer, and is comprised of two parts: Time and Media Control. A sync bus carries one channel of HippoSync around the Hippotizer network. HippoSync can be created by the Sync Manager or by a media player.

Time

Carried by Hippo Sync: sets the play-head position of a clip.
Media Control

Carried by HippoSync: sets clip selection, in-point, out-point and play mode.

External Inputs:

Each Sync Manager can receive Timecode from two sources using the External Inputs:

- Audio Input
- Generator Input
- HippoNet
- MIDI
- Alpermann Velte

Sync Buses

Sync Buses allow a HippoSync Channel to be sent between media players.

More information on Sync Buses
Audio Input

Linear Time Code (often called SMPTE timecode) 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 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.
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
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
Sync Buses

Sync Buses send channels of HippoSync between media players.

A Hippotizer has 16 Sync Buses that each can send HippoSync from a source media player to one or many target media players.

Sync Buses are visible on each Media Player by clicking the TC button:

Above the layer’s sync information is being sent to Sync Bus 4.

Any layer that chooses its Sync Bus in as Bus 4 will follow the source layer.
Media Offset

As the Sync Bus carries a full HippoSync channel containing time and media control information, all target layers will show the same clip as the source layer. The target layer can show a different clip as the source by using the Media Offset control. For example, if the offset is set to Bank: 1, Clip: 1 and the source is set to Bank 2, Clip 1, the target will play Bank 3, Clip 2.

Sync Buses can be sent between systems using Sync Bus Link
Sync Bus Link

Normally Sync Buses are local to each machine; in order to share them across the network the Sync Bus Link function in Sync Manager must be used.

Sink Bus Link connects machines together in a Master / Slave arrangement, where the Slaves listen to the Sink Buses of the Master.

Each master can send to multiple slaves.

To configure Sink Bus Link

1. On the Master and the slave machines start the Sync Manager Component
2. On the slave machine(s) enable the Sink Bus Link toggle in Sink Manager
3. In the drop down, select the master machine

The sink buses on the slave machines will now use the HippoSync from the master machine.
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.

- **Layer1** Groups that have had all child pins selected are shown ticked.
- **Mix1** 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 Spine 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 time between the two.
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 based.

Set command types and edit them by right clicking on them:

![Edit Command](image)

A jump command that has been named ‘Jump’ and given the cue number 1.

**Cue Number**

Cue numbers allow Timelines to be started from points within the timeline as required. Cue numbers must unique within the timeline. The Cue number is used by DMX component and Multicontroller to start timelines.
Video Mapper

Video Mapper converts an input texture to an output texture pixel accurately. Frequently used to map LED tiles, Video Mapper is one of the most commonly used components in Hippotizer.

- Creating a Video Map
- Properties of a Video Map
- Adding Tiles
- Properties of a Tile
- Viewport Controls
- CSV Import
- Colour Blocks
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:

**Note:** Tile numbering has an affect on Colour Blocks; as it used to address each tile. No two tiles may have the same number and they cannot be changed after creation. If very specific numbering is required, it may be faster to use CSV Import.

Left to Right

Number starting at the top left corner and works to the right increasing. At the end of a row, the numbering jumps to the next row down.

Top to Bottom

Number starts in the top left corner and increases as it moves down the column. At the end of the column it jumps over to the left one column.

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.
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.
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 part 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), Output X Position (Pixels from top Left), Output Y Position (Pixels from top Left), Rotation of Input Tile (Degrees), Tile Flipped X (True/False), Tile Flipped Y (True/False), X Size of Tile (Pixels), Y Size of Tile (Pixels), Red Level (0-255 255=Default), Green Level (0-255 255=Default), Blue Level (0-255 255=Default)

Example Row

0,0,100,100,90,False,False,100,100,255,255,255

Creates a single tile at 0,0 on input and 100,100 on output with 90 degree rotation.
Colour Blocks

Allowing direct control 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: Intensity (alpha), Red, Green, Blue
- 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.
Compatibility Mode

Included with Hippotizer V4 systems is the ability to run a purpose built version of V3 software. This is called compatibility mode. Compatibility mode will operate with other V3 Hippotizer machines running 3.2.4 or 3.2.5 only.

Compatibility mode software has been modified to run on the Windows 8.1 Hippotizer V4 systems and will not install on any other hardware.

Compatibility Mode can be accessed from the Hippo Launcher application which appears automatically after start-up.

Compatibility mode is limited in outputs and features to that of Hippotizer V3 and cannot make use of all the outputs of the larger V4 systems.

Compatibility mode is fully inter-operable with other V3 machines running on Windows XP: the systems are able to share media, networking and component exports.

Hippotizer V4 systems running compatibility mode will be assigned a legacy machine type based on system size:

- Amba is equivalent to a Grasshopper and can have 1 Output.
- Karst, Boreal and Taiga are equivalent to an HD using up to 2 Outputs.

Using compatibility mode is identical to V3, so please consult the V3 manual for information about the Hippotizer software.
Pan Mode

With the change to Windows 8.1, the Pan Output mode in compatibility modes must be configured in a different way. In order to configure Pan Mode, the two panned outputs must be configured as an eyefinity group in the ATI catalyst control centre.

Details of this procedure can be found in the knowledge base section of support website at: www.Green-hippo.com/support

Once eyefinity is configured then start the Hippotizer V3 engine and set it to single mode, with the resolution of the group of displays. (3840 × 1080 for example for 2 – 1920 × 1080 outputs).

This will then function in pan mode.

On Boreal or Taiga, more outputs can be used as part of a Pan or Dual mode by adding more displays to the Eyefinity group.
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 its 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”
“Waiting for Engine Component to Start”
“Waiting for Engine Component to Reconfigure” -> yes, there is a spelling mistake!
“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.
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 80ms to 40ms.

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.
Appendixes
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 and 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**
DMX Charts

DMX profiles are built in to Hippotizer software and can be viewed from within DMX component.

Default Personalities

- 4.2 Layer
- 4.2 Mix
- 4.2 Viewport
- Timeline
## 4.2 Layer

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Timeline

Timeline Control allows you to trigger and control any Timeline from within DMX.

So it allows to merge using the timeline, but triggering when what timeline is playing conveniently from a lighting console.

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).

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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:

![Parameter Configuration Table]

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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.
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