7th Sense

DELTA®
Media Server

User's Guide

Trademark Information

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Welcome to the **7thSense® Delta®**, an advanced Media Server for playback and composition of multiple media types. Unlike standard playback systems, Delta allows the user to create complex shows near to Showtime from a variety of pre-rendered content types such as movies, static imagery, audio, text titling and live video. Combined with the built-in transition effects, multiple composition layers and interactive editing, you can easily create fluid shows.

Table of Contents

DELTA SYSTEM ARCHITECTURE

Delta is designed as two halves, the **Delta Server** and the **Delta GUI** (Graphical User Interface).
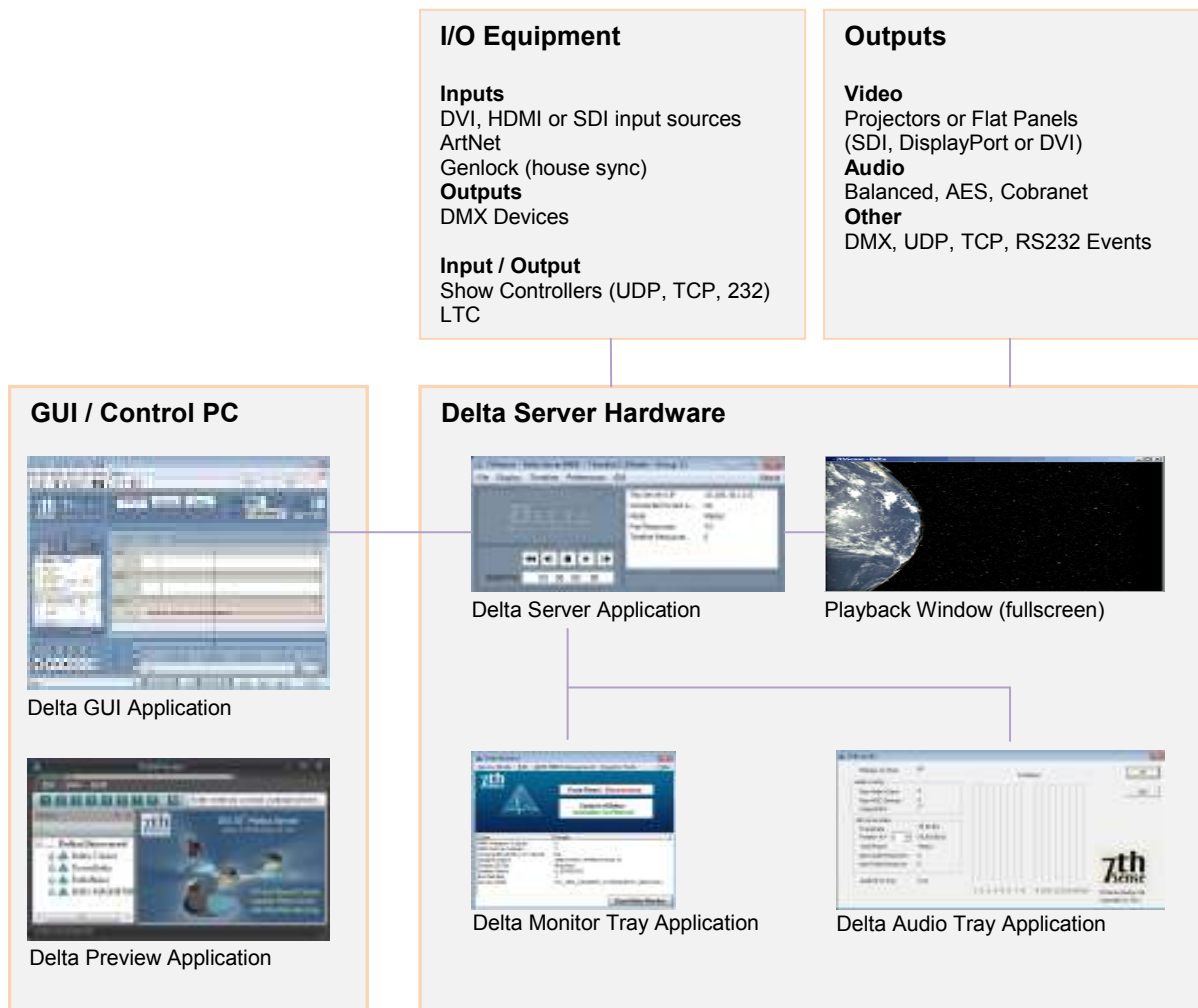
The **Delta Server** is the playback server software with user interaction limited to loading, saving, and timeline controls such as Play, Stop etc. Delta Server plays your show, but has no editing capabilities and does not require the Delta GUI to be running in order to play shows. Delta Server serves its shows into the *Playback Window*, which is usually shown full screen during playback.

The **Delta GUI** is a comprehensive user interface to all Delta Servers found on the network. Through the Delta GUI, users can create complex shows and save them to disk for later playback. Delta GUI communicates through Ethernet, finding the server(s) automatically, and presenting the resources available for interactive editing. Delta GUI is not essential for playback, only for show creation.

Delta Audio is a (tray application) sub-component of Delta Server, which runs automatically when Delta server launches to provide a common interface to audio devices. This application is essential for audio playback.

Delta Monitor is a tray application which provides communication to the front panel readout, EDID spoofing and some backup functionality. This application is essential for front panel updates.

Delta Preview is an optional application which can run standalone on the network & connect to any server to preview the output(s).

I/O Equipment

Inputs
DVI, HDMI or SDI input sources
ArtNet
Genlock (house sync)
Outputs
DMX Devices

Input / Output
Show Controllers (UDP, TCP, 232)
LTC

Outputs

Video
Projectors or Flat Panels
(SDI, DisplayPort or DVI)
Audio
Balanced, AES, Cobranet
Other
DMX, UDP, TCP, RS232 Events

GUI / Control PC

Delta GUI Application

Delta Preview Application

Delta Server Hardware

Delta Server Application

Playback Window (fullscreen)

Delta Monitor Tray Application

Delta Audio Tray Application

MULTI RACK ARCHITECTURE

Delta is multi-rack capable, with the ability for the GUI to be run from anywhere on the local network, on one of the servers, or a separate machine. The servers can be grouped together, with one as Master rack, the others as slaves. The master rack then controls all timing, so that all machines in the same group are locked in time.

Delta GUI and servers communicate via Ethernet on a Gigabit local network.
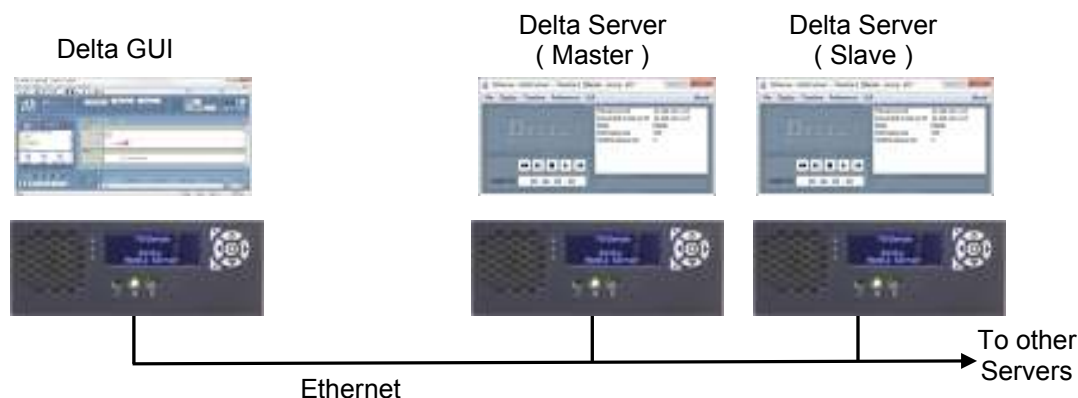
Choosing a particular server to view its resources, timeline or preferences is simply a matter of choosing the Group it lives in and then selecting the individual server by the server name. This name is the PC's machine name, which can be seen by right-clicking My Computer, choose Properties, and the Network Identification tab. The text in the Full Computer Name box is the name reported to Delta GUI.

When interacting with multiple servers, you are presented with some multi-rack choices at certain times. For example, when choosing File New, you are asked whether you wish to perform this on the selected server, on all servers in this group, or on all servers.

When altering the Preferences, those shown are for the selected server.

N o t e s
- Delta uses various ports and protocols, including servers scanning for an available GUI, so the Delta network should not be connected to an IT network, for security reasons as well as interruption of timing between racks.

- External Control is available to each Server through RS232 or Ethernet.

DELTA SERVER SOFTWARE

The Delta Server software comprises the Server user interface and the playback window. In normal operation, the Delta PC runs the Delta server on boot and starts the Playback Window in full screen mode, then plays the default show chosen by the user.

To access the Delta Server user interface o the server, press the **F** key if looking at the Playback Window to toggle full screen mode off.
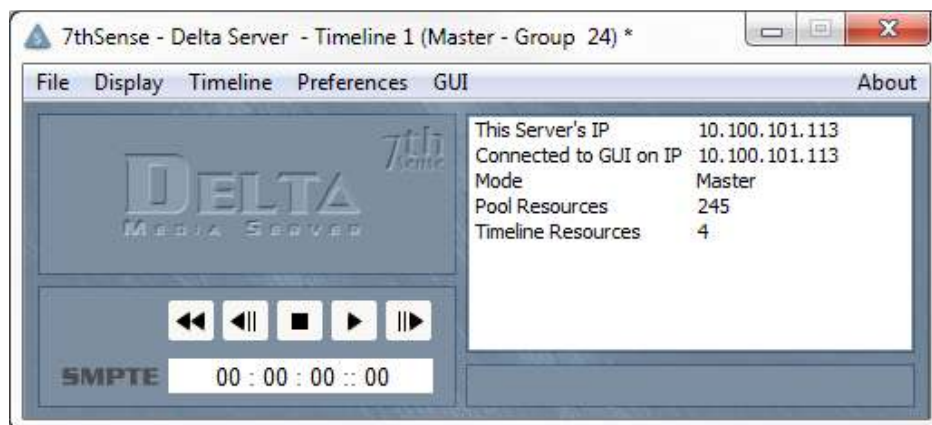
Delta Server Menu
From this menu, you can Load or Save a Delta file, clear the timeline (File New), exit the application (File Exit), change the Playback Window from full screen to windowed using the View menu and jump to a particular frame using the Timeline – Jump to Frame menu.
You can close the GUI from this server by choosing GUI – Close.

You can also access the About Box from this menu. This dialog shows the current licence details and software version.

Status
- This server's IP : Shows the current IP Address, set in the Windows Local Area Network dialog (Internet Protocol settings)
- Connected to IP: Shows the GUI IP address when connected
- Mode   : Master or Slave.
- Pool Resources : Shows the total count of resources found on the media disk(s)
- Timeline Resources   : Shows the total count of resources on the timeline for this show.
- Telnet IP   : Shows the telnet address when connected.

Note that this display does not update when the server is playing

Timeline Controls
The SMPTE time code is shown on the left, then playback controls; Rewind, Step Back, Stop, Play, Advance. Note these only appear on a Master server.

Preferences
This simple dialog allows you to set basic server parameters such as:

Server Group   : Which group this server belongs to (1-20)
Server Type   : Master / Slave.

Framerate   : The required frames per second

Default File   : A full path to the default Delta show.

Permanent Resource File   : A full path to the a Delta show which will be merged after
                                                loading the main show (for masks etc)

Permanent Display File   : Set an XDL file to be loaded after any file load (see display
                                                configuration files -xdl files)

Permanent Resource File   : Set an XML file to be merged after any file load, for example to
                                                load common mask files to all shows.

Play On Start   : If Yes, the Default file will be played when Delta starts.
Timeline   : Which timeline to play on start.
Start Delay   : The seconds to wait before loading the default show.

Startup Sequence   : This sequence will be run on boot.

Communication   : Set the ports for the GUI / Server comms.
                                  : Choose which Ethernet adapter to use & what ports
                                  : Set optional GUI & Telnet timeout in seconds – use this if there is a
                                  possibility of the network being removed so that the GUI can reconnect.

Startup Sequence   : Specify which if any sequence to run when the server starts

NOTE : Start Delay
Since Delta can play a show immediately after the PC boots, having a delay before Delta loads and
plays the default show allows the various Windows boot procedures to finish using CPU and disk
resources which could interfere with Delta's playback.

It is recommended to set Slave Delta servers to a delay of at around 20 seconds, and a Master
Delta server to 30 seconds to ensure the slave servers are ready to play as a group.

Video Capture
This page lists any capture devices found and their assigned IDs which map physical input
connectors to the resource on the timeline.

Normally, this list is populated automatically and needs no interaction, but if, for example, you
would like to swap the IDs around on a multiple input card, you can edit the Assigned ID for each
card here – this will be remembered in the registry next time the server application starts.

Note – do not allow two devices to have the same Assigned ID.

Delete Stored Capture Devices – press this button to remove all capture devices and enumerate
them again. Note this loses any previously edited Assigned IDs and is usually only used if a
capture device has been removed physically from the server, but the driver has not been removed
properly – this process attempts to find only real hardware.

SUPPORTED MEDIA

Delta can use many different types of media to create a show. The supported types and their locations are listed below.

M o v i e s — A sequence of images (e.g. stars_0001.jpg, stars_0002.jpg) played back at the specified framerate. TGA or 7TH format files are preferred for performance.

I m a g e s — Single bitmap images in a variety of formats, up to 8192 x 8192 pixels, including full 8-bit alpha plane in TGA, TIF and PNG images.

A u d i o — Audio files in a variety of formats.

C a p t u r e — Using an optional capture card or USB Web camera, multiple live video sources can be placed on the timeline in exactly the same way as images. The Web control also appears as a capture resource.

E f f e c t s

Fade : Fade the image to black or up from black over specified time. When placed on an audio layer, also fades audio volume.

Transparency : Fade the image transparency to the lower layers over time.

Dynamic Transparency : You can set the opacity of these from external control by layer or resource name using the LAYERFADE command

G e o m e t r y — Static distortion correction to match projectors to screens (flat, curved or full dome).

Morphed distortion to provide fly-in or transition effects.
Background layer affects all, or place on a layer for effects

**T i m e l i n e
C o n t r o l s**

Loop : Restart playing at the start of the timeline.
Stop : Stop playing at this point on the timeline.
Goto : Jump to a specific frame.
Comment : Add user notes to the layer.
Marker : Named marker, allowing interactive or external control to go to that point.
Placeholder : A placeholder reserves a space on the timeline.
GUI Beep : A audible beep on the GUI PC only.

Load Show : Load a different show at this point on the timeline
Sequence : Call a sequence at a point on the timeline

Section : Show a part of the timeline in a user set colour.

C o l o u r — Static colour correction to match adjacent projectors to each other.

B l e n d i n g — Edge blending to allow overlapped projected images to be blended into one seamless, continuous display surface.

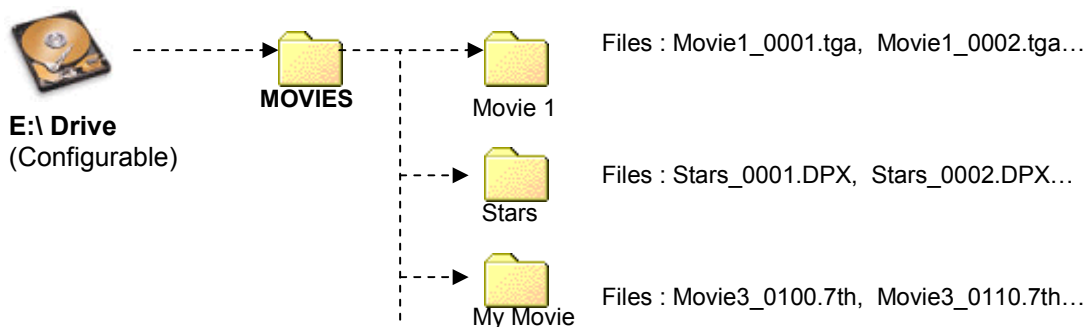|		
	S e r i a l E v e n t s	External devices can be serially controlled on a frame accurate basis by placing serial events on the timeline, such as Start Projector or Select Source.
	T e x t	The text resource is a simple way of placing custom titling onto a show. The standard text resource can be placed multiple times on the timeline, and the font, size, colour, animation and location specified independently for each.
		The *Ticker* text resource can be placed once on the timeline, and changed live from external control.
	S p l i n e s	The Spline resource is a user-drawn path over which visual resources on that layer will follow. You can draw the shape of the spline in the Spline editing page

Movies

These are sequential image frames stored on a fast hard disk. Supported playback file types include; 7TH, TGA, YUV, A7S, DPX, CIN, SGI.

Supported file types for recording (carving / slicing) are JPG, JPEG2000, BMP, TIF, PNG.

Individual movies are stored in separate folders under the **MOVIES** folder like this:

E:\ Drive
(Configurable)

MOVIES

Movie 1 — Files : Movie1_0001.tga, Movie1_0002.tga…

Stars — Files : Stars_0001.DPX, Stars_0002.DPX…

My Movie — Files : Movie3_0100.7th, Movie3_0110.7th…

Note that the movie name presented in the Delta GUI is the name of the First file found, minus the frame count (e.g. Movie1_0001, Movie1_0002.tga, Movie1_0003 will be shown as Movie1 in the resources area.

Notes

- The movie filenames require a fixed number of digits for the framecount, so Movie_0998, Movie_0999, Movie_1000 is acceptable,

  Movie_998, Movie_999, Movie_1000 is not suitable.

- **For best playback performance, use TGA, DPX sequences or convert image sequences to one of the 7TH file format using the Distributed File Manager (DFM) utility.**

- Best performance is achieved when the Movies are served from one drive or RAID set, and all other content is served from a separate drive. Configure this in Preferences – Disk Drives in the Delta GUI.

- TGA, SGI, CINeon, DPX or YUV single file per frame format require Solid State drives (SSD) to play these movies in realtime.

- TGA single file per frame movies can also have an alpha plane – this will require fast disks. Uncompressed or RLE compressed TGA files only

Encrypted Movies
Movies can be Encrypted with a valid date range and venue code which is locked to a single or multiple USB keys to protect content from being used elsewhere. This is discussed in the *Encrypted Content user guide*.

Movie Formats

Format	Image Quality	Hardware Requirement
7TH	Medium	6:1 Compression, lowest hardware requirements
7TH 420	Good	This is 2:1 compression, and can be the best compromise between quality and performance High performance disks required
7TH 420 Z	Good	2:1 compression with lossless compression. High performance CPU and disks required
7TH 422	Excellent	This is 1.5:1 compression, and improves on the 420 format for quality. High performance disks required
7TH 422 Z	Excellent	1.5:1 compression with lossless compression. High performance CPU and disks required
7TH RGB Z	Perfect	Lossless compression. High performance CPU and disks required
7TH 444	Perfect	No Compression High performance disks required
7TH 444A	Perfect	No Compression High performance disks required Alpha Layer
YUV 422	Excellent	Raw, single 422 frames in 2VUY 8 Bit format. SSD disks required
DPX	Perfect	No Compression, can be 8 or 10Bit SSD disks required
CIN	Perfect	No Compression, can be 8 or 10Bit SSD disks required
A7S	Perfect	No Compression (can be losslessly compressed), can be 8 or 10Bit, RGB or 422 colour space SSD disks required
TGA	Perfect	Uncompressed or RLE Compression, 24 Bit (can have 8 bit alpha plane) or 16 Bit (optional 1 bit alpha plane). Single file per frame TGA files are supported (will require SSD disks)
SGI	Perfect	No Compression, 8 Bit SSD disks required

Note that TGA, A7S, CIN, DPX and SGI sequences can be used as movies with a system using SSD disks.

BMP, TGA, TIF and JPG are not optimised for real-time playback, but can be used as a source movie for recording out to another format.

Images

Images are single bitmap image files of JPG, JPEG2000, BMP, PSD, TIF, TGA, PNG, GIF or A7S type. These are stored in the **IMAGES** folder, and can be grouped into subfolders as required.

C:\ Drive
(configurable)

IMAGES

Show 1 — Files : any image files

Show 2 — Files : any image files
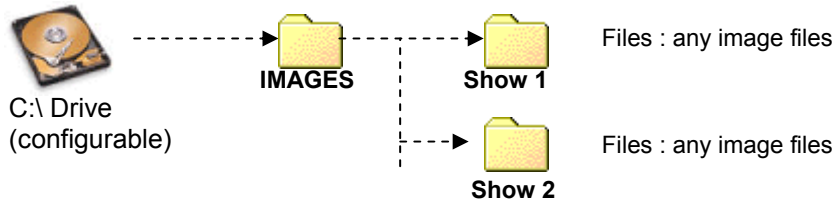
Images can be up to 8192x8192 pixels in size. Images larger than this will be scaled down to 8192x8192 pixels.

The alpha channel is available in TGA, TIF (LZW and normal) and PNG file types.

Audio

Audio files are single sound files of WAV, MP3, MP2, AIFF type. These are stored in the **AUDIO** folder, and can be grouped into subfolders as required.

C:\ Drive
(configurable)

AUDIO

Show 1 — Files : any audio files

Show 2 — Files : any audio files
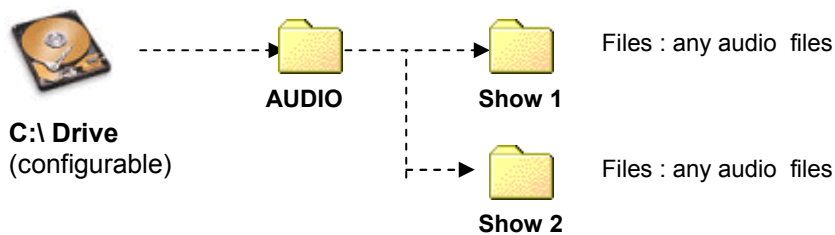
Surround sound audio can be created using multi- channel WAV or individual mono WAVs (preferred), which can be directed to the appropriate output within Delta.

Geometry Correction

Preset geometry files have the extension **7GM.** These are created and stored using the Delta GUI. These are stored in the **GEOMETRY** folder, and can be grouped into subfolders as required.

C:\ Drive
(configurable)

GEOMETRY

Show 1 — Files : .7GM geometry files

Show 2 — Files : .7GM geometry files
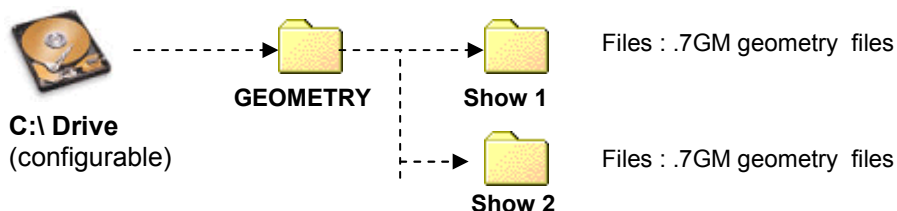
■ Edge Blending

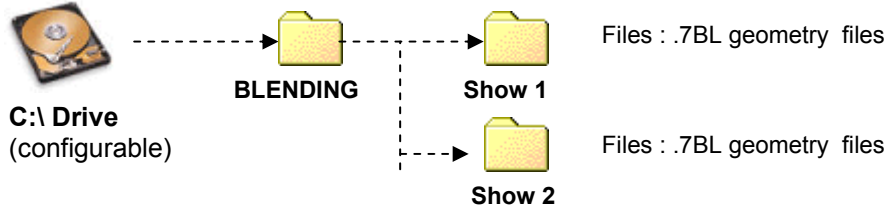Preset blending files have the extension **7BL.** These are created and stored using the Delta GUI. These are stored in the **BLENDING** folder, and can be grouped into subfolders as required.

C:\ Drive
(configurable)

BLENDING   **Show 1**   Files : .7BL geometry files

Show 2   Files : .7BL geometry files

◑ Colour Correction

Preset colour files have the extension **7CO.** These are created and stored using the Delta GUI. These are stored in the **COLOUR** folder, and can be grouped into subfolders as required.
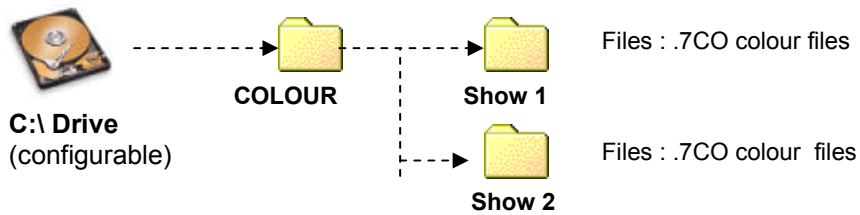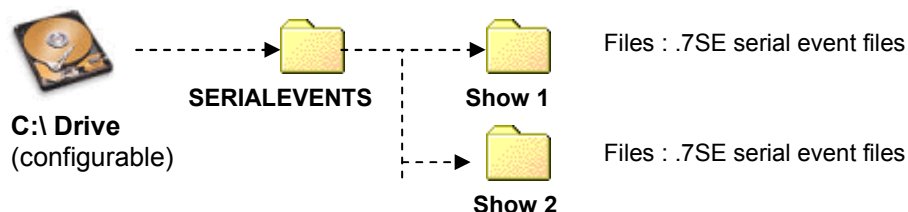

C:\ Drive
(configurable)

COLOUR   **Show 1**   Files : .7CO colour files

Show 2   Files : .7CO colour files

Serial Events

Serial Event files have the extension **7SE.** These are shown using the Delta GUI. These are stored in the **SERIALEVENTS** folder, and can be grouped into subfolders as required, although these groups do not show up in the Delta GUI.

Com ports are configured in the Preferences dialog, see that section below:

Notes

External Control is a built-in serial event device. You can output any string on the external control com port or telnet, for instance to notify the controller that a specific point on the timeline has been reached.

If you create a file named "External Control.7SE" in the SERIALEVENTS folder, the contents of this will be available when adding an external control event to the timeline. This allows standard external control commands to be available. The format of this file is the same as other serial event 7SE files.

Serial Events can be set to repeat for a number of counts and at a set frame interval.

RS232 or Telnet Serial Events

A Serial Event can be output to a specific IP Address and port. See the Serial Event section below.

Serial Events can be set to repeat at certain frame intervals and for a number of counts, edit these values on each resource.

Splines

A Motion path for visual resources to follow can be created in the Splines menu. This path can be saved to disk for use in other shows.

DELTA GUI SOFTWARE

USER INTERFACE INTRODUCTION

The user primarily interacts with the Delta Server using the Delta GUI software. From the GUI, you can add resources to the timeline, move them, change their properties, delete them and assign them to layers, later saving the show to a Delta XML file.

When you interact with the GUI, you are in fact changing the media live on the server and you can see the changes immediately in the Playback Window, also when you save a Delta show, it defaults to saving to the server PC, not the GUI PC.

In the example below, **Timeline** editing is selected from the Controls area.
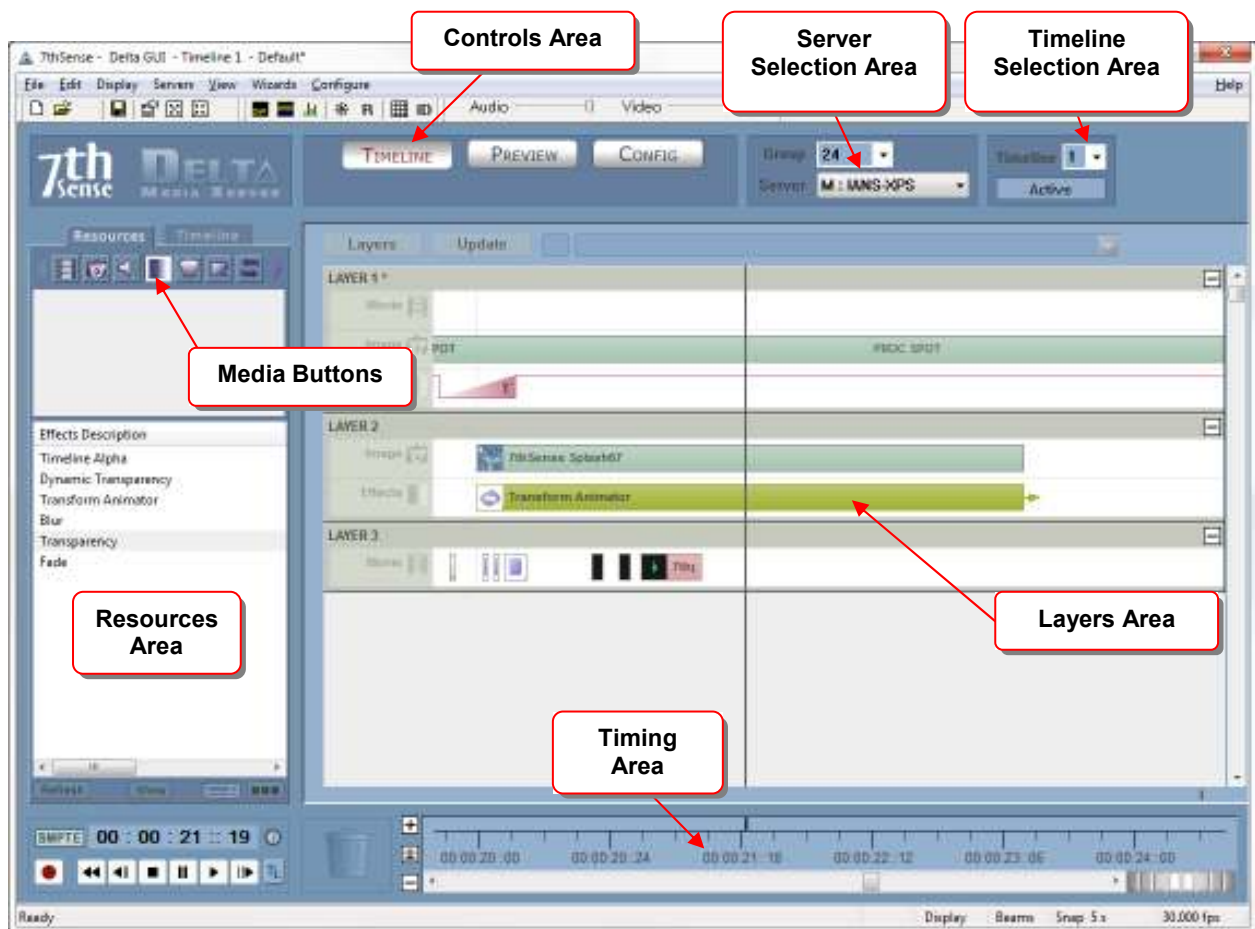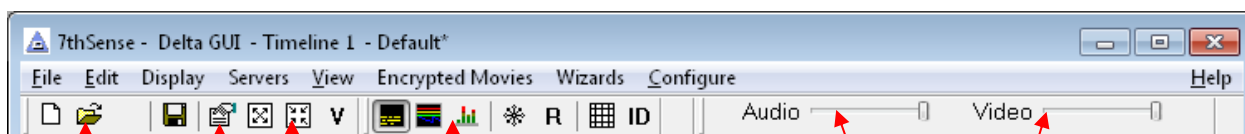
Menu and Toolbars

File New	Toggle Statistics (group)
File Open	Toggle Graph (group)
File Save	Toggle Freezing Video Capture (group)
Configure Preferences	Toggle Reserve Layer (group)
Display Windowed (group)	Overall Audio Level (group)
Display Fullscreen (group)	Overall Video Fade (group)
Toggle VU Meter	Show Pixel Grid
Toggle display channel numbers	Launch VNC Viewer (configure password in Config – Preferences - System)
Launch Webservice (on Local GUI PC) using default browser	

N o t e s

- Display buttons, on-screen graph and statistics buttons, Reserve Mode and the Interactive sliders affect all servers in the same group.

Display - Apply Show Mode

Using the menu item Display- Apply Show Mode, you can in one operation configure the server to be ready for an audience. Selecting this option applies the following immediately;

- Server goes full screen
- The Graph, Statistics and Grid are turned off
- Test patterns are turned off
- Geometry, Edge Blending and all Beams are turned on
- Channel mode is selected if in Frustum mode

Controls Area

This selects between Timeline, Preview or Config view, Warp, Blending, Colour, Splines, and Display Configuration.

Server Selection

Each server is identified uniquely by its Ethernet IP Address. The machine name is presented here under Servers, and either M: or S: to indicate whether this machine is configured as a Master or Slave machine within the group.
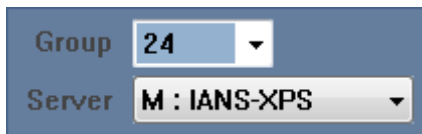
You can configure each server in Configure – Preferences.

Timeline Selection

Servers can have 1, 2 or up to 8 independent timelines depending on model, you can select between these timelines using this dropdown.

Resources Area
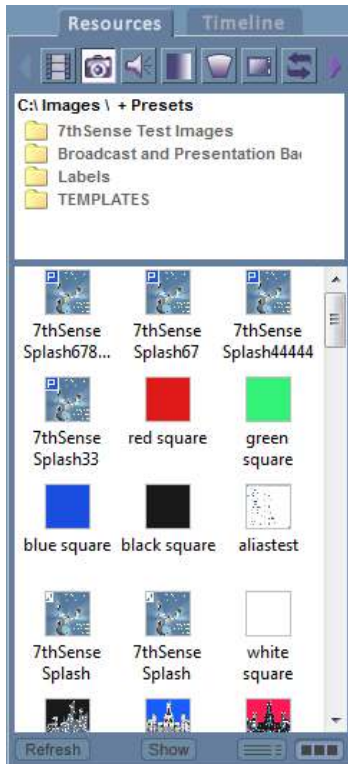
This is where the various Media types for that server are shown.

Clicking the **Resources / Timeline tab** switches from viewing all the available media on the disk (Resources) to viewing the resources present on the timeline (Timeline).

Pressing the various **Media buttons** on the Resources area selects different types of media to be listed – in the example above, Movies are selected.

You can drag media from here to a layer when viewing Resources, and edit the resource on the timeline when viewing Timeline by double- clicking.

Hover the mouse over an icon to view further information about that media.

If new content is on disk, press **Refresh** to get a fresh list.

To show only Presets, Resources or Presets and Resources, press the **Show** button.

To swap between icon & detailed view, press the two buttons on the lower right.

Resource Folders

In the image above, the Resource Folders are shown (Menu : View – Resource Folders.

With this active, only the resources contained in the folder on the server at the top are shown, allowing you to see only those you are interested in by grouping the various resources within subfolders.

Timeline Controls

Enable SMPTE Chase (requires Genlock Licence)

SMPTE 00 : 00 : 21 :: 19

Choose between viewing time in Frames, Seconds or SMPTE.

Rewind

Stop

Play

Show Timelines

Record

Back

Cue

Forward
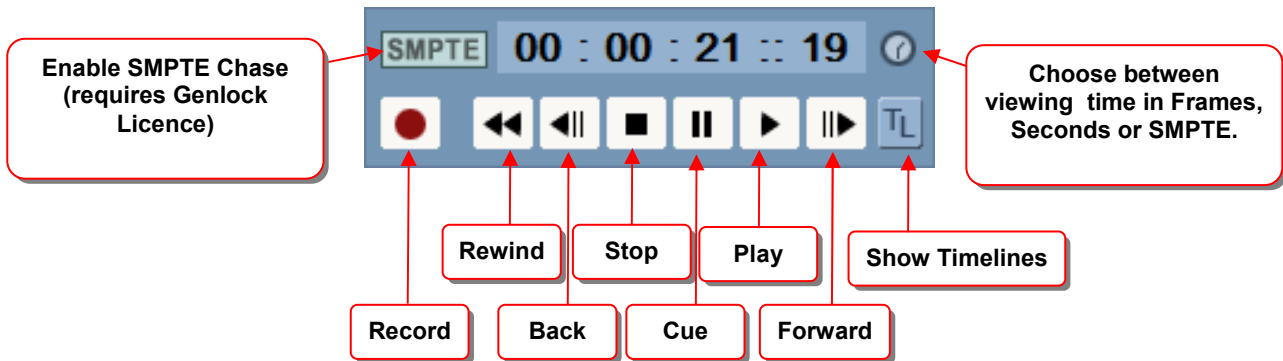
Layers Area

This shows the various user-created layers containing the media. Note that layers higher up the screen hide those below them (Layer 1 in this example would hide Layer 2 where there is active content on Layer 2).
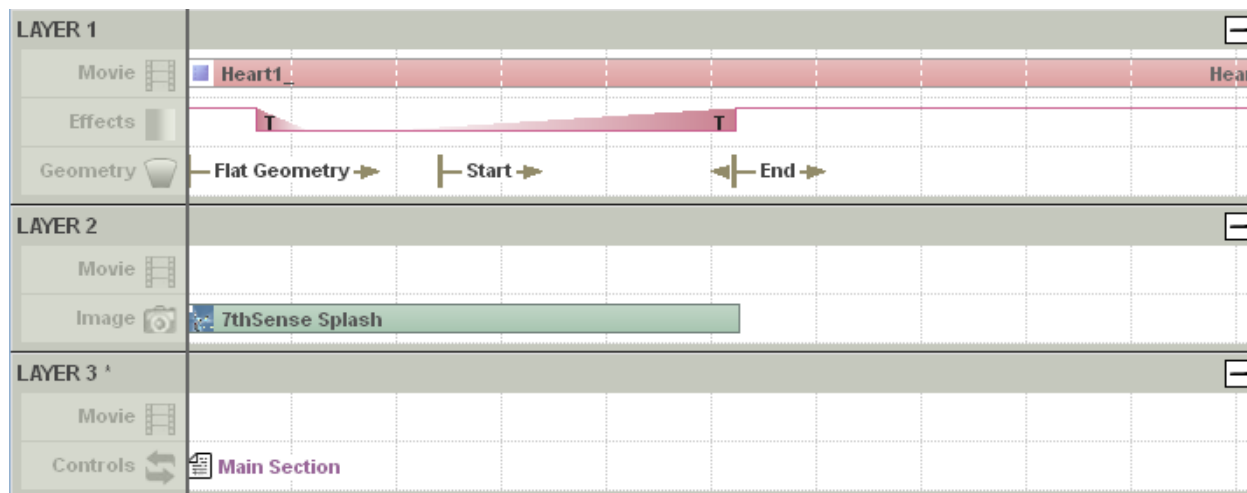
You can edit properties on a resource by double clicking it, or right click and select Properties from the menu.

Hovering the mouse over the resource will give further information on it;
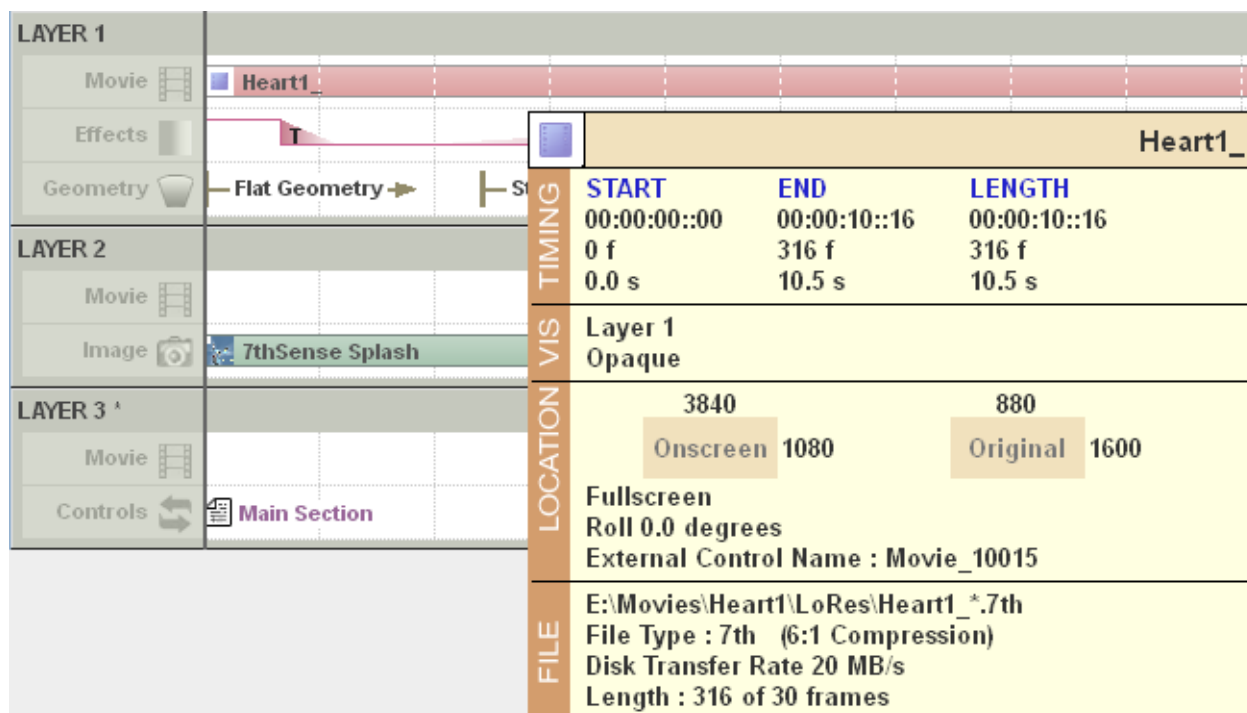
A resource position and length on the timeline can be altered by dragging it in the middle or on each end.

Timing Area

This allows the user to interact with the current frame, moving back and forth along the timeline, and zooming in or out to show different parts of the timeline.

Use Mouse Scroll Wheel to move visible portion

Scroll Point (moveable)

CTRL F1   SHIFT F4

00:00:19::06   00:00:20::00   00:00:20::24   00:00:21::18   00:00:22::12

Click +/- to zoom in / out

Drag to alter current frame

Left Click to set frame, drag to move active area

Right Click and drag to alter the active area without changing the frame

Drag to Shuttle
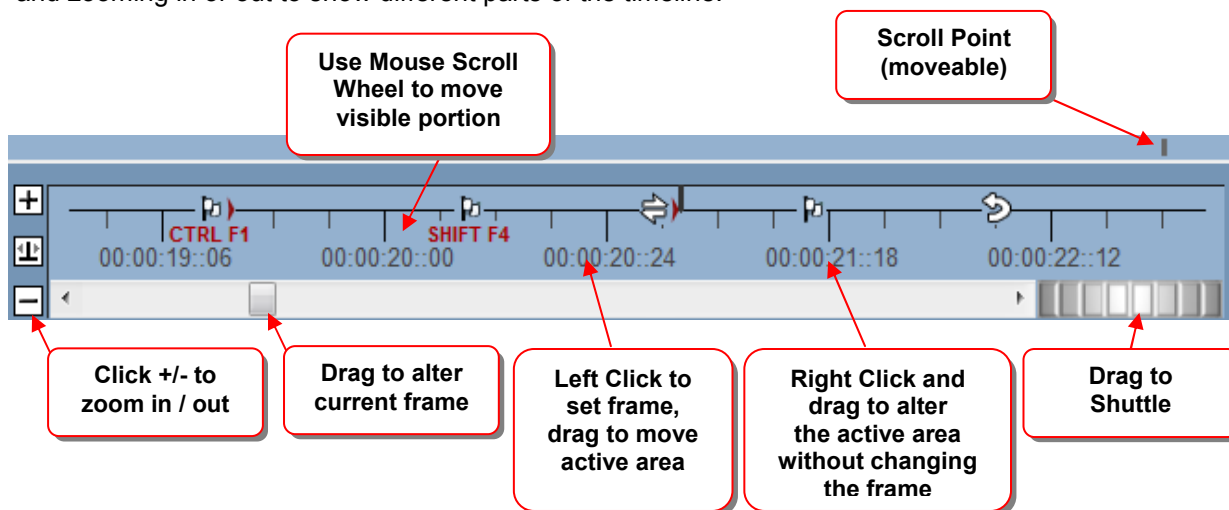
Timing resources are shown here, such as Loop, Stop, Markers etc. You can edit by dragging them, right click to delete, or double click to edit the properties.

The **Scroll Point ca**n be dragged from the right edge into the middle so that the timeline advances there, showing what's coming on the timeline more easily.

The Shuttle controller can move forwards & backwards through the timeline at different speeds, drag more to the left or right to speed up, release to stop again.

LAYERS

In the Delta "Layer" concept, movies, images, audio etc can be placed on up to 250 separate layers. Where images and movies occupy the same part of the canvas at the same time, the higher layer will be shown.

You can alter each image or movie's transparency, so that layers below are only partially obscured, and even perform crossfade-type transitions between layers to provide smooth effects.
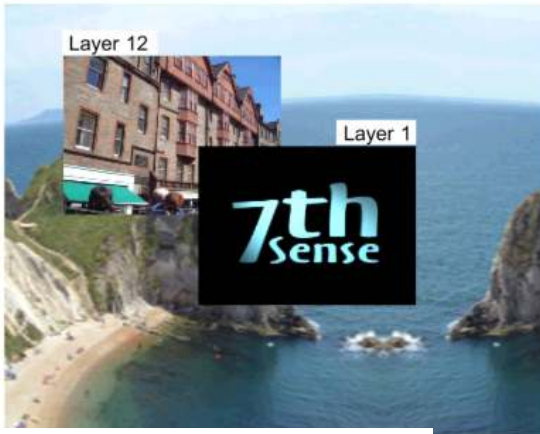
Background Layer

How layers appear
(note layer 1 obscures layer 12

How layers are actually arranged inside Delta – Layer 1 is higher than layer 12, which is higher than the background layer.

CONFIGURE THE SERVER

Start the Delta Server and the Delta GUI. Choose Configure – Preferences from the menu. If the server requires licensing, see that section in this manual.

System Configuration

On the System Configuration page, the current server name and its Ethernet IP Address is shown.

You can configure which group this server belongs to using the **Server Group** drop down list. This is only applicable in multi-rack configurations.

The **Server Type** is either Master or Slave for multi-rack configurations, set this to Master for single rack systems.

Avoid having two masters in the same group; this leads to some conflicts in timing.

Note that Edit Station licences can only be a master and will not control Slave nodes.

If **Control Slaves** is on, timing information is broadcast to all slaves in this group.

VNC password is used with the V toolbar button to automatically login to the Delta server, the default password is 7th

Startup & File Load Configuration

On the Startup & File Configuration page, you can configure how the server behaves at start up and on any file load.
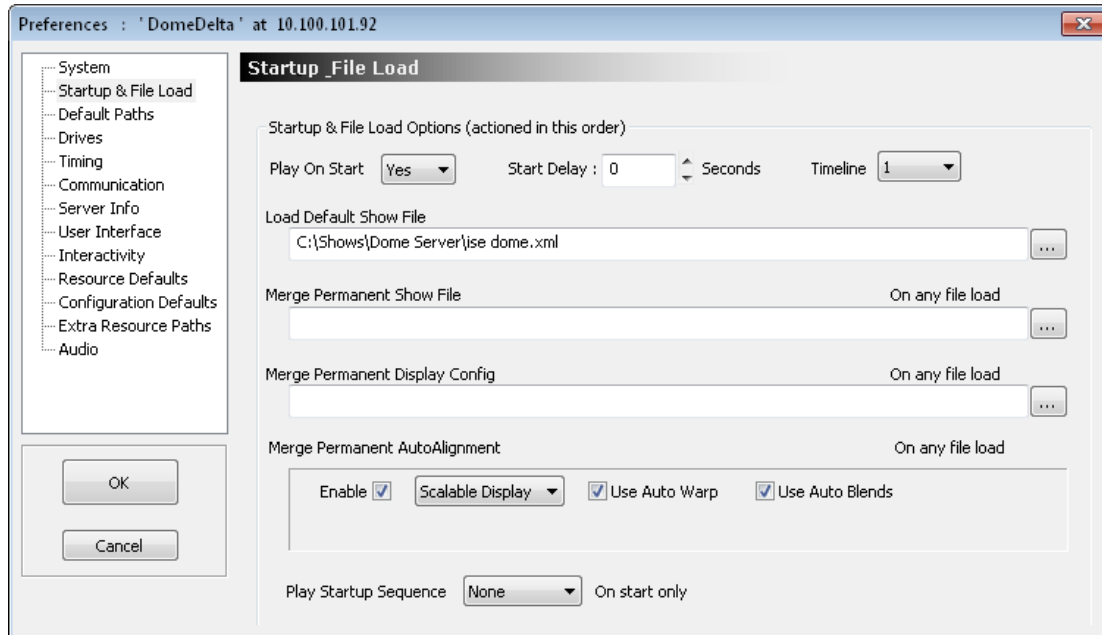
Play Startup Sequence : this runs a selected sequence when the server starts up, for example to select a standard test pattern.

Load Default Show File is the file loaded when the server starts.

Merge Permanent Show File specifies an XML file (saved from Delta, contains resources only) which is loaded after any file load to allow you to have a separate XML containing any resources which are common across all files.

This can be used for example to load a Masks.XML which contains image masks common to all show files used to mask out particular areas of the display.

Merge Permanent Display Config specifies an XDL file (saved from Delta, contains background geometry, blending & display config only) which is loaded after any file load to force the display config into any show. See the Display Config section below.

Merge Permanent Autoalignment (Licenced Option)
Enable this if the optional auto alignment software is installed to apply the output of that software to the display channels. Warp & Blend can be optionally enabled

Set **Play on Start** to Yes to immediately play the default file when the server runs. This is the default for a standalone server. This will make the Playback Window full-screen when the server is started.

Start Delay is the number of seconds after loading that Delta will wait before loading and playing the default show. On a master rack, set this to 10 seconds longer than the slave rack delay to give the slave racks time to get ready.

Timeline is which timeline you would like to play on start from a multi-timeline setup.

Notes
- When permanent files are entered above, any File Load will also merge these files.
- Files are loaded in this sequence;
    - Default Show file (or any show file manually opened)

> ○ Permanent Show File is merged
> ○ Permanent Display Config file is merged (background resources in first 10 frames deleted first so the warp & blends are replaced each time).
- If a Permanent Show File is loaded, then saved, it contains the contents of both files, so if then merged again, you would create duplicates.
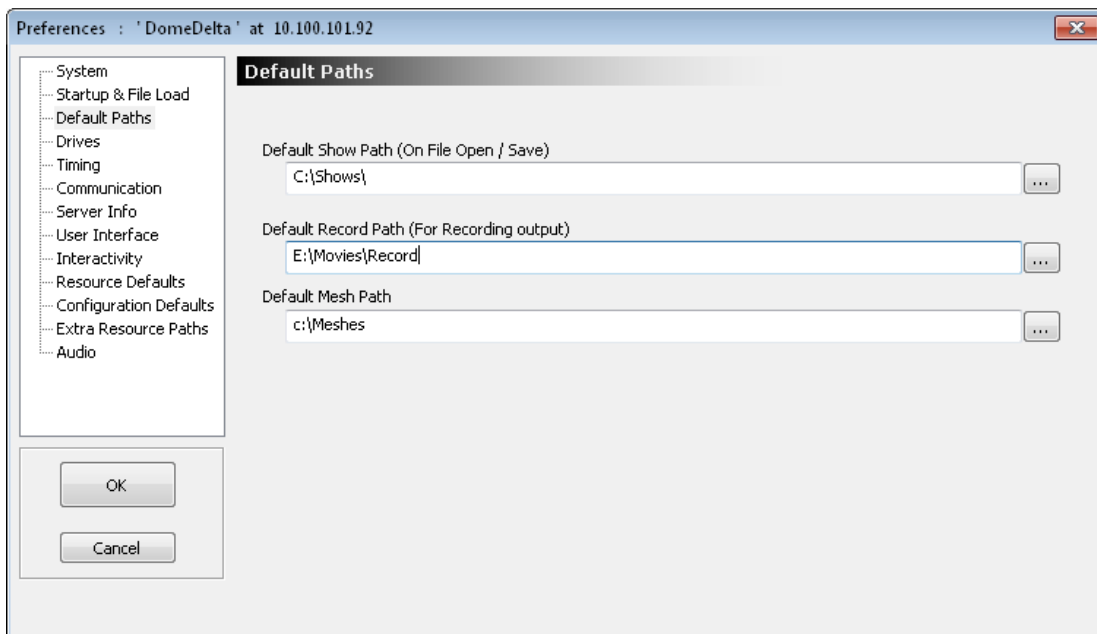
Default Paths Configuration

Enter default paths into this dialog;

Default Show Path   : Used in File Open / File Save dialog

Default Record Path   : Used for recording back out of Delta

Default Mesh Path   : Used for Mesh Mode OBJ file location

Disk Drive Configuration

This dialog is used to configure where the server looks for Media. In the example above, the server looks for Movies on drive C: and M: and all other media on drive C:.
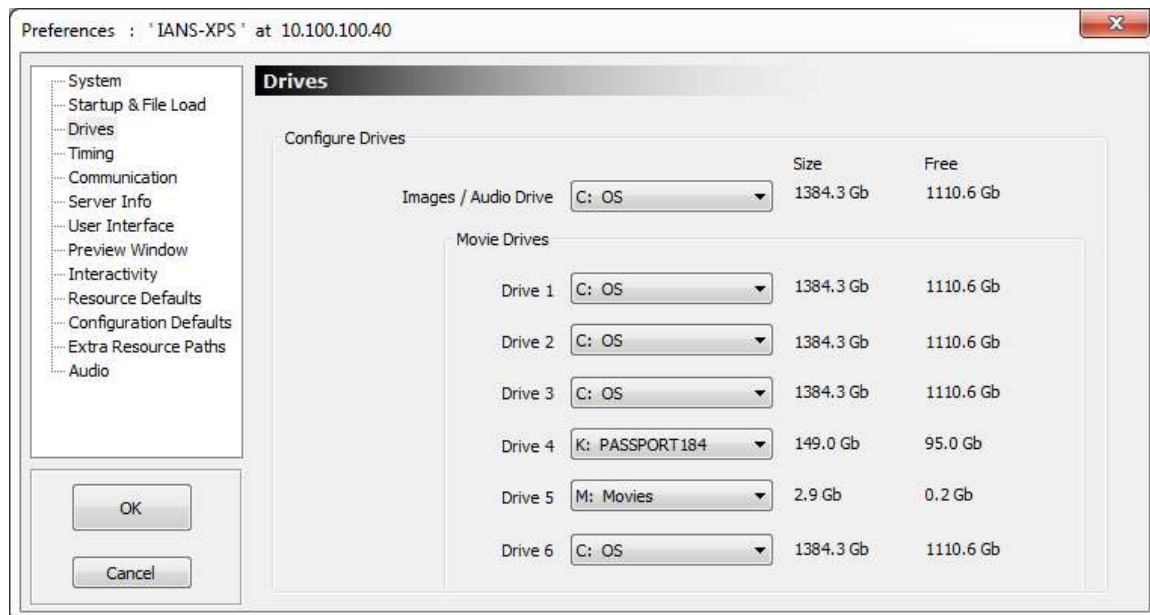
If you have more than one drive locations where movies are held, set the other Movie Drives to point at the other locations.

N o t e s

- Movies are very disk intensive, so Delta servers are configured with fast disk drives for movies. Other content is usually stored on a separate drive to maintain the fast disk solely for movies.

- If Server & GUI are running and there are no resources found: check where the disks are set to look in this dialog.

- When you change the disk drives, the Delta Server automatically searches the drive for media, and presents this in the Resources Area.

  If you had a resource on the timeline which is now not on the right drive, it will be shown in black (bad resource). Either edit to correct the naming problem, delete this resource, or move the file(s) to the correct path & drive and refresh the resources again.

Timing Configuration

Configure the timing for the frame rate you require. A faster framerate gives smoother playback, but depending on the file size of the movie you are loading, you may run out of horsepower in the PC, and the framerate will not be maintained. Note also that some movies are designed for a particular framerate – playing them faster or slower may not give the intended effect.
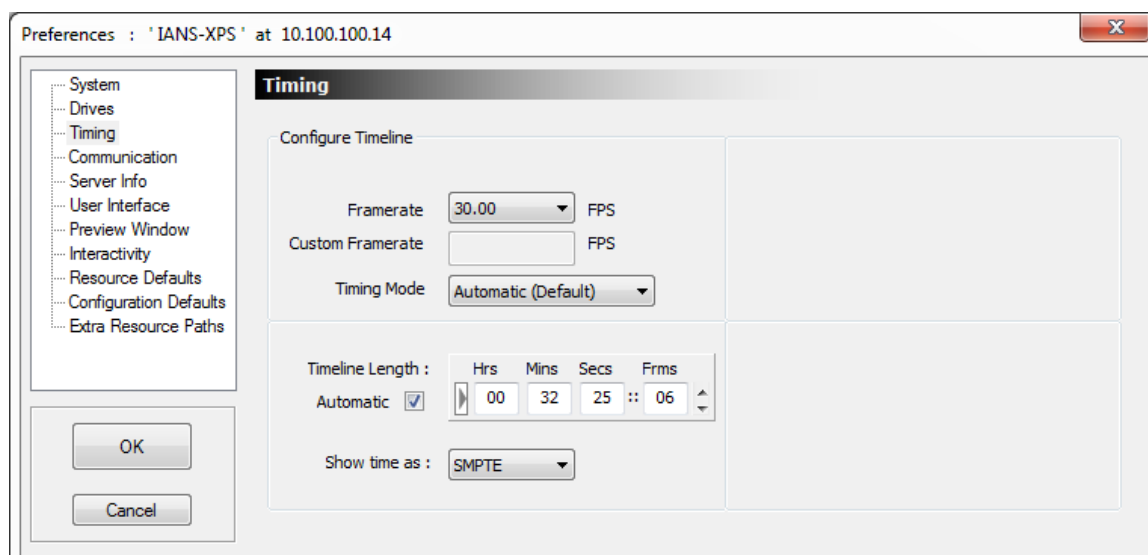
It is always better to choose a framerate which is steady, than one which jumps between one framerate and another, so if your movie can not play steadily at 60 frames per second, drop it to the next lowest framerate.

Optimal framerates are displayed in the listbox which are integer divisions of the graphics card framerate, so if set to 60Hz, optimal rates are 60, 30, 20, 15, 7.5 etc.

You may want an optimal framerate of 50FPS, to achieve this, set the graphics card monitor refresh rate to 50Hz (using the normal Windows Display configuration dialog), and restart the server.

The Timeline Length determines how many frames are shown in the Timing Area. Simply set this slightly larger than the show length.

Time can be shown as SMPTE (e.g. Hours, minutes, seconds and frames - 00:01:20:12) or Frames (e.g. 1200 frames). This is simply how the time is viewed on the Timing Area, and does not affect how the show is played.

Set the timeline length to **Automatic** – when you OK this dialog, the length is set to the last active frame.

Timing Mode : this should normally be in **Automatic**. Other timing Modes;

Use Hardware   : Time from the internal hardware timer
Use Software   : Time from a software timer
Windowed   : Use this mode if timing is not constant when the playback window is non-
                          fullscreen

Timing Configuration –Genlocked / SMPTE

In a Genlocked system, SMPTE slaving via suitable hardware is available. This allows an external SMPTE audio track to directly control the playback.
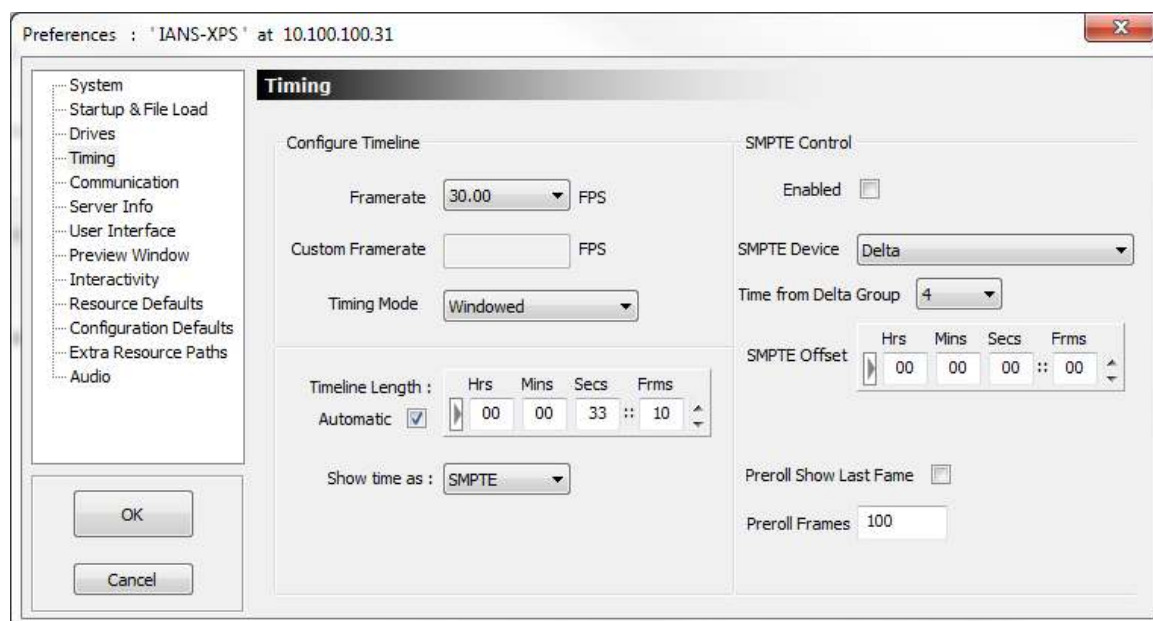
Enabled : This switch is replicated on the GUI in the timing area, when enabled, timeline controls such as stop, play, rewind are hidden, and external control of the playback position is enabled.

SMPTE Input Device : When available, the list of SMPTE input devices available is presented: select the one which will be the SMPTE input master.

Note that you can set this master server to SMPTE chase a different Delta master server in a different group as if it was a SMPTE source – choose the Delta Group to listen to using the "Time from Delta Group" dropdown.

SMPTE Offset : Since there is no negative time in the SMPTE timecode, many SMPTE tracks start at 59mins, 50 secs, which allows a 10s preroll, and the show starts at 1 hour. The SMPTE Offset allows you to type in 59 min, 50s, which will be subtracted from the incoming timecode which means the Delta content can start at 0 time on the timeline.

Incoming Rate : This is the SMPTE timecode rate read from the SMPTE Input Device.

Note that for perfect timing when chasing LTC, the LTC / SMPTE timecode should be synchronous with the genlock video sync.

Communication Configuration

Serial Ports

Up to 32 serial com ports can be configured, even if there are less than that installed in the machine, allowing you to configure and save com port details to a file for a different server.

A Com port will show up in the Baud/Parity/Data & Stop columns if it is present on that server. If a different application to Delta has grabbed that com port, it will be listed as *Taken*.
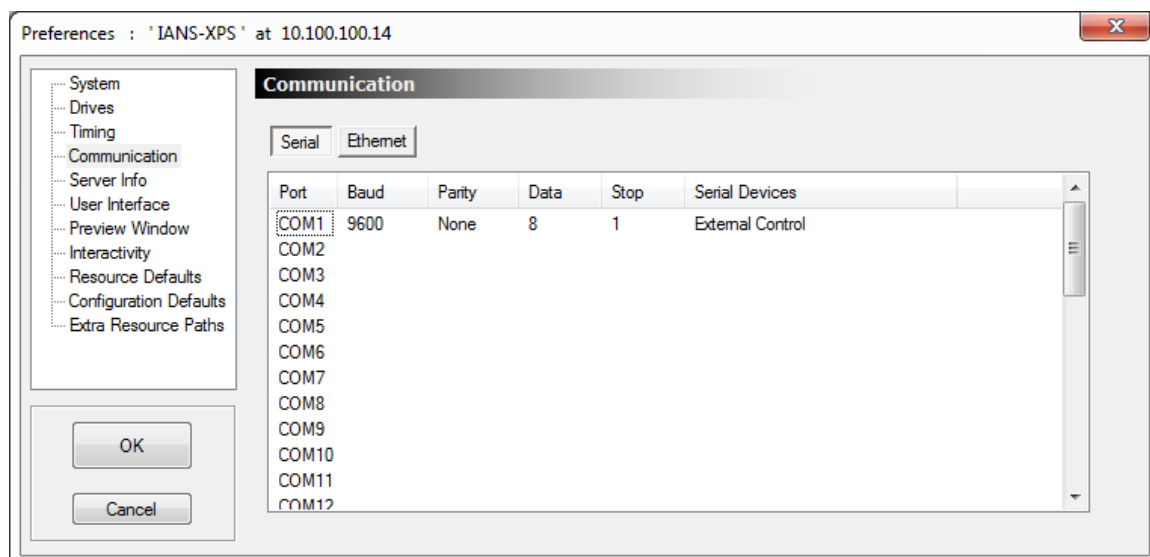
Choose the COM port parameters to match the external device, and then the device from the Serial Devices list. This list contains those devices found in the *SerialEvents* folder as well as external and transport controls

External Control and Transport Control are saved in the PC (in the registry), all other comport devices are held in XML files. If a file contains serial devices which conflict with existing external or transport control com ports, the file devices are ignored.

This means External or Transport controls, once configured, are available from startup with no additional interaction. This allows external controllers to immediately load a show.

Communication Timeout

In some networks, the comms can be unreliable, leading to the situation where the network dies, leaving the server still thinking it's connected to the GUI – A server application restart is required to fix this. The same can be true of communication from external control systems over telnet.

To fix this, enable the GUI Comms timeout or Telnet timeout in the **server's** communication dialog:
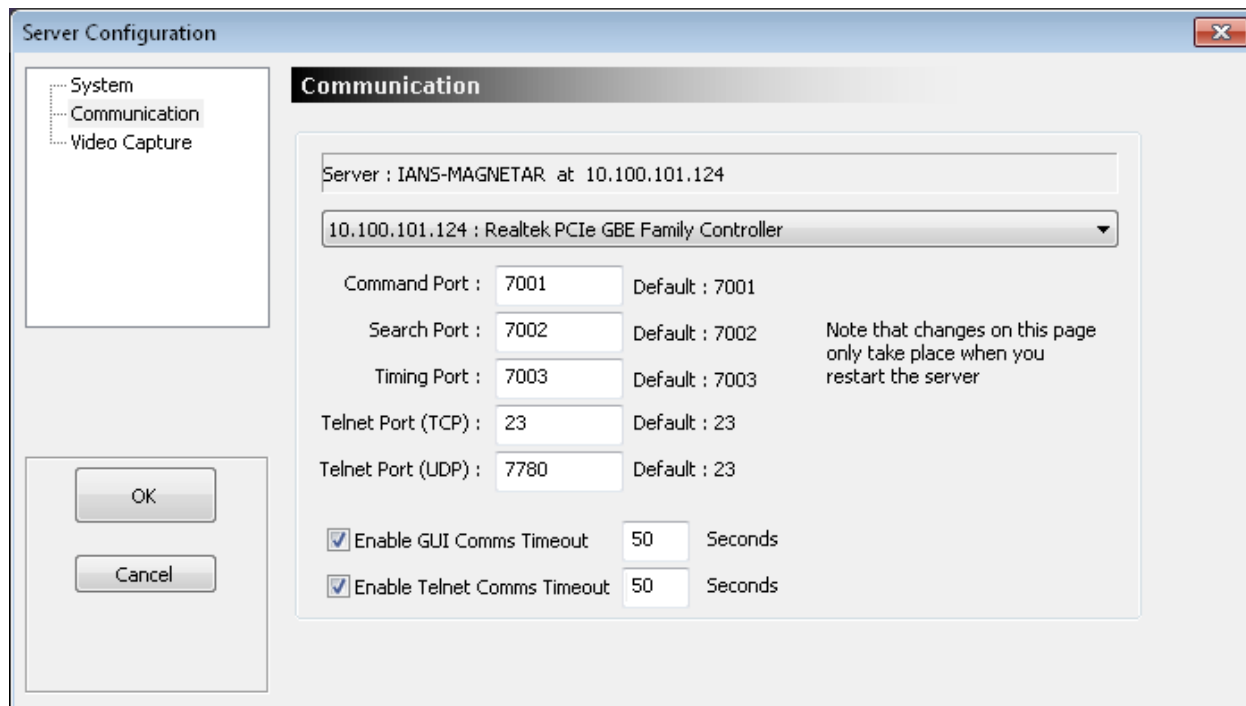
Communication Preferences (Server Application Dialog)

Set the timeout value in seconds, and if the Telnet is inactive (no characters received from the control system) in 30s in the example above, the telnet connection is dropped, allowing the control system to reconnect.

The GUI operates on a heartbeat system, so if the Server detects the heartbeat from the GUI missing for 60s in the example above, the connection is reset, allowing the GUI to reconnect if the network has come back.

Ethernet Configuration (from GUI Config-Preferences)
In this dialog, you can configure which ports the GUI talks to the server over, and the external control port for telnet.

The defaults for Delta are:
Command Port   : 7001
Search Port   : 7002
Timing Port   : 7003
TCP External Control : 23
UDP External Control : 7780 (response from Delta on 7781)

These can be changed to any normal port as long as the GUI is configured to have the same ports as the server.
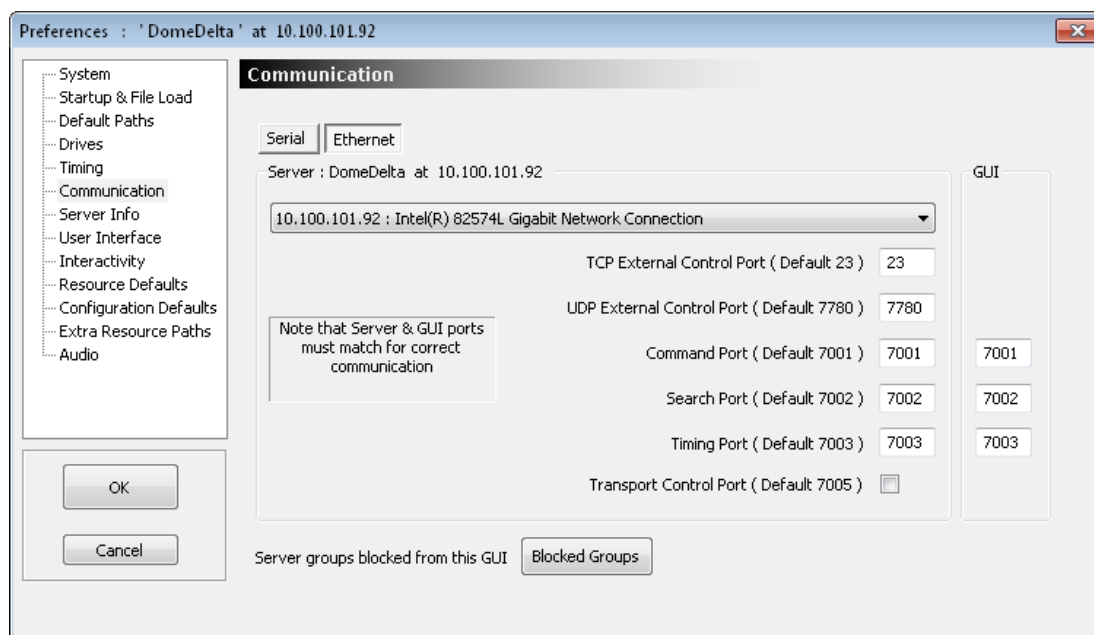
In systems with multiple active Ethernet ports, you can choose which one the server will use with the drop down box. Note that disabled Ethernet ports do not show up in this dialog, and that the IP address shown for each port is that configured at the time; with DHCP enabled, this may change in the future, though the server will use whatever the IP Address is at the time the server starts.

The Ethernet external control port defaults to 23 (TCP / Telnet) and 7780 (UDP), although this can be any port. A standard telnet client can connect to the server, even if playing, and be controlled through the external control protocol.

Blocked Groups.

If dialog is cleared, this GUI will accept connections from all servers found on the network. In some cases, you may want 2 or more GUI's controlling different groups of servers.

You can also choose between showing the standard 20 or the maximum 64 groups in the server drop-down here.
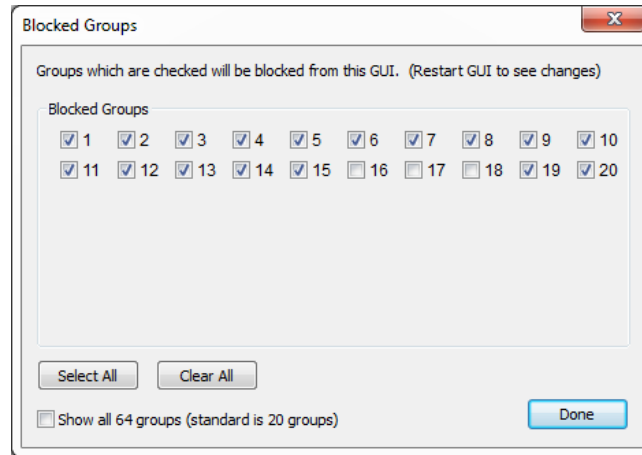
Server Information

The server information tab shows hardware configuration information gathered from the current server.
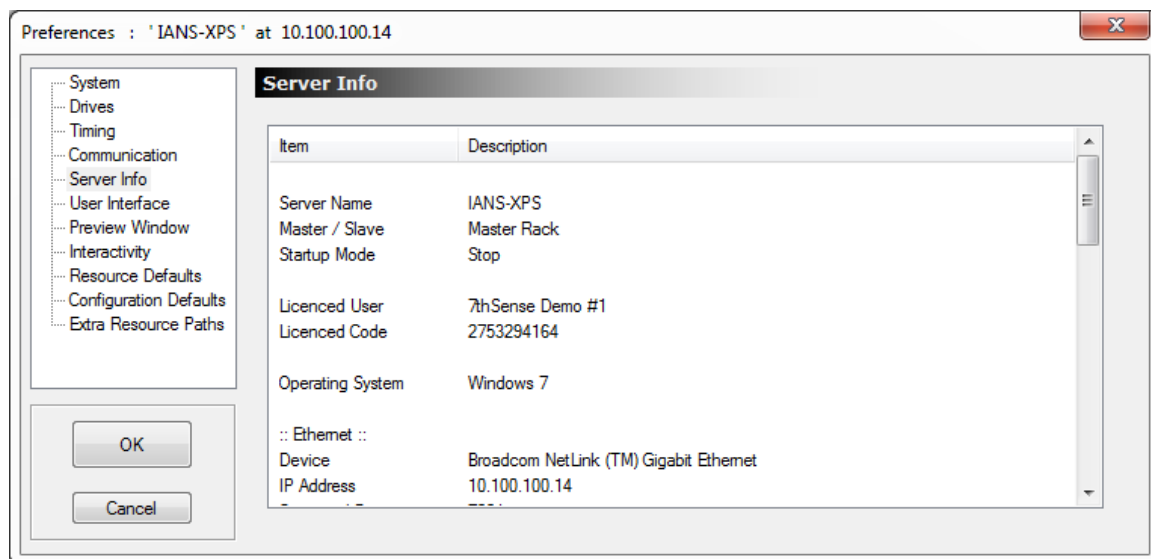
User Interface

This dialog allows you to tune the GUI preferences.
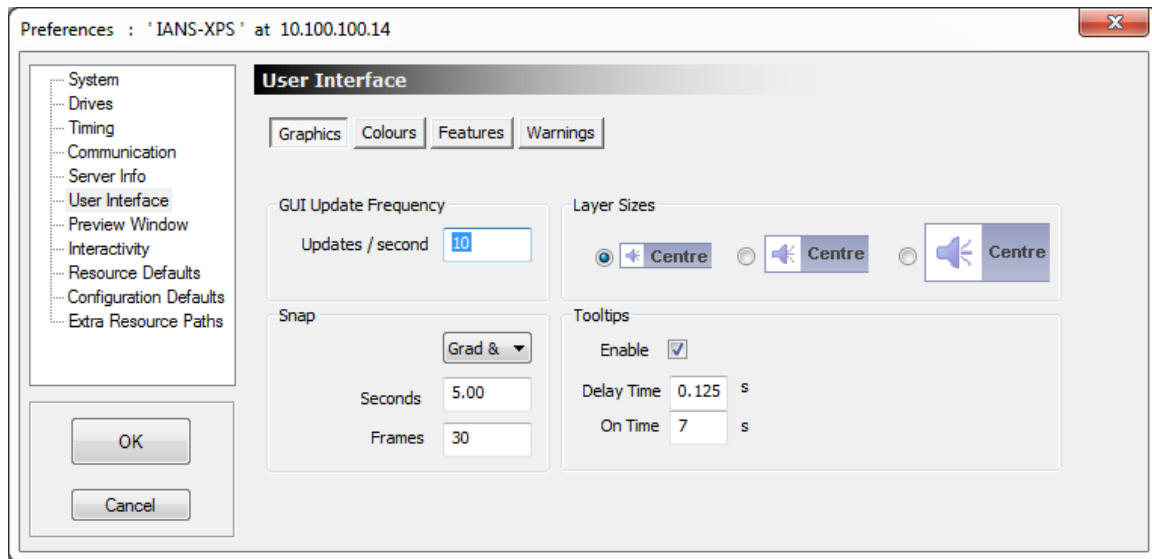
GUI Update Frequency: In updates per second, the frequency with which the layers are redrawn. For a low performance machine, you may need to lower this to 10 updates /second, for higher performance machines, 20 or 30 is preferable.

Snap   : This enables and configures the layer snap grid. When showing Frames, the snap is set to 30 frames in the example above, when viewing SMPTE, the snap is set to 1 second in the example above. You can also snap to the end or start point of other resources on the same layer by turning on Snap – Grid & Resources.

Layer Sizes   : Choose from small, medium or large layer heights in the Timeline

These items are remembered locally wherever the GUI runs.

Colours   : These are the default colours for layer items when selected, disabled or when they have errors. These can be tuned to your preferences; they are stored in the registry.
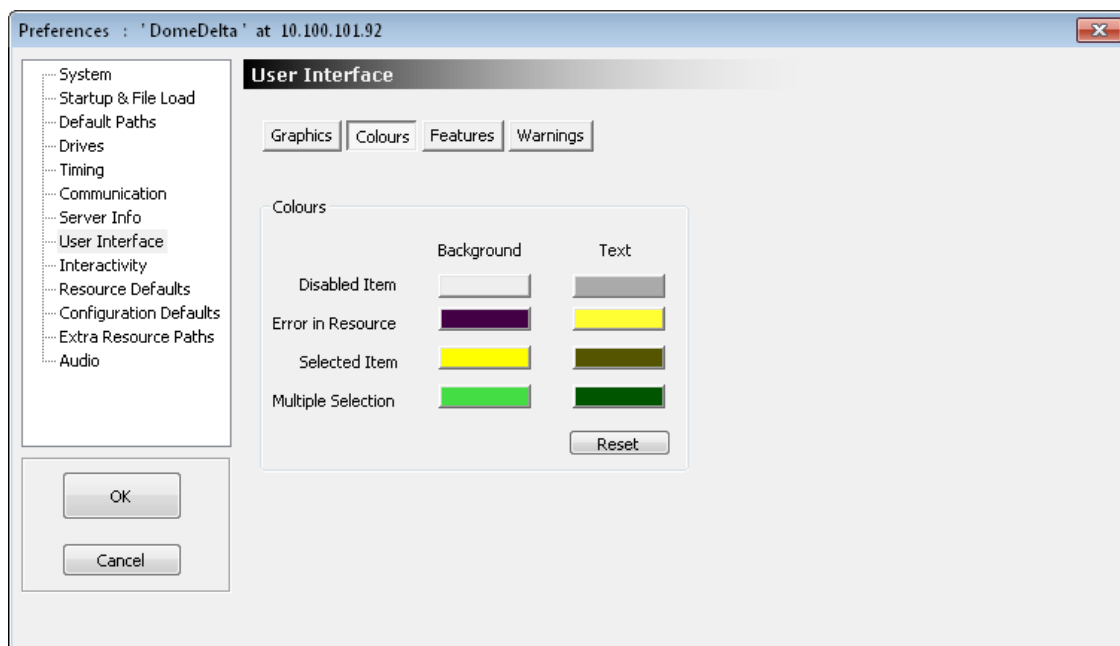
Features

This dialog page allows the user interface to be customised;
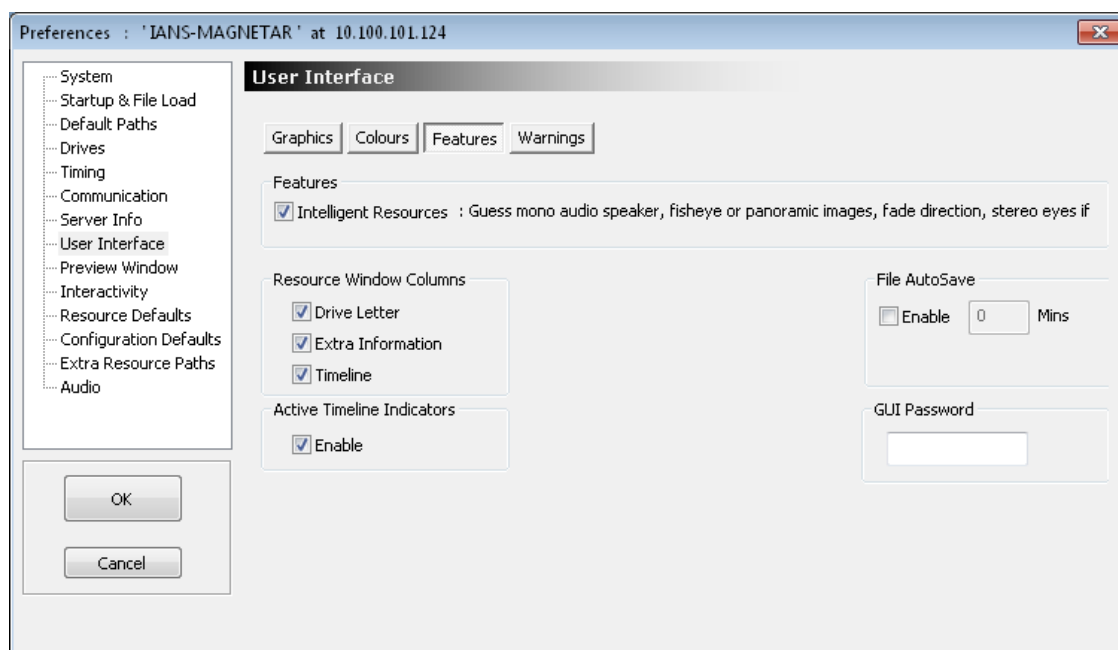
Resource Window Columns   : In the resource window (left side of the GUI), you can have optional columns showing the drive letter, extra information such as image size or audio format or which timeline a resource is on for timeline resources.

Active timeline Indicators   : The timeline play & autoplay indicators in the bottom status bar default to being simply LED indicators – if you enabled this checkbox, those LEDs become toggle switches to play/stop each timeline or autoplay state.
AutoSave
Saves this server's current file at the specified interval (if not playing a show).

GUI Startup password
Type in a password which will be requested anytime the GUI is started. Note that this password is stored in plaintext in the registry

Intelligent resources : If enabled, a set of behaviours is added which help minimise time to create a show: These are only used when you add a new resource to the timeline, they do not affect existing resources on the timeline.

Media	Media Format (Mono Audio Files)	Display Mode	Automatic Parameter
Image or Movie	Square and 1500 x1500 or larger or Square and has "fisheye" in filename	Frustum	Fisheye mapping
Image or Movie	Aspect ratio > 2.5 and width >=1500 or Aspect ratio > 2.5 and has "panoramic" in filename	Frustum	Panoramic
Back Surface Projection	If the projectors are on the outside of the dome & the software is set to draw on the back surface, in Frustum mode, visual resources will be placed on Mirrored horizontally	Frustum	Mirror

Image or Movie	Filename has _L or _left on the end	Stereo	Left eye
	Filename has _R or _right on the end		Right eye
Audio	Mono audio and filename is or ends in;	Any	Speaker;
	L or left or 1 or ch1		Left
	R or Right or 2 or ch2		Right
	C or Centre or Center or 3 or ch3		Centre
	Ls or leftsurround or 4 or ch4		Left Surround
	Rs or rightsurround or 5 or ch5		Right Surround
	LFE or Sub or 6 or ch6		Sub
	Lside or rearleft or rl or leftback or 7 or ch7		Left Side
	Rside or rearright or rr or rightback or8 or ch8		Right Side
	9 or ch9		Output 9
	10 or ch10		Output 10
	11 or ch11		Output 11
	12 or ch12		Output 12
	13 or ch13		Output 13
	14 or ch14		Output 14
	15 or ch15		Output 15
	16 or ch16		Output 16
Fade	Choose up or down to be opposite from previous up or down fade / transparency	Any	Direction

Warnings

File Modified : If the file has changed by editing the timeline, and you attempt to load a file or do File New, a warning dialog will pop up.
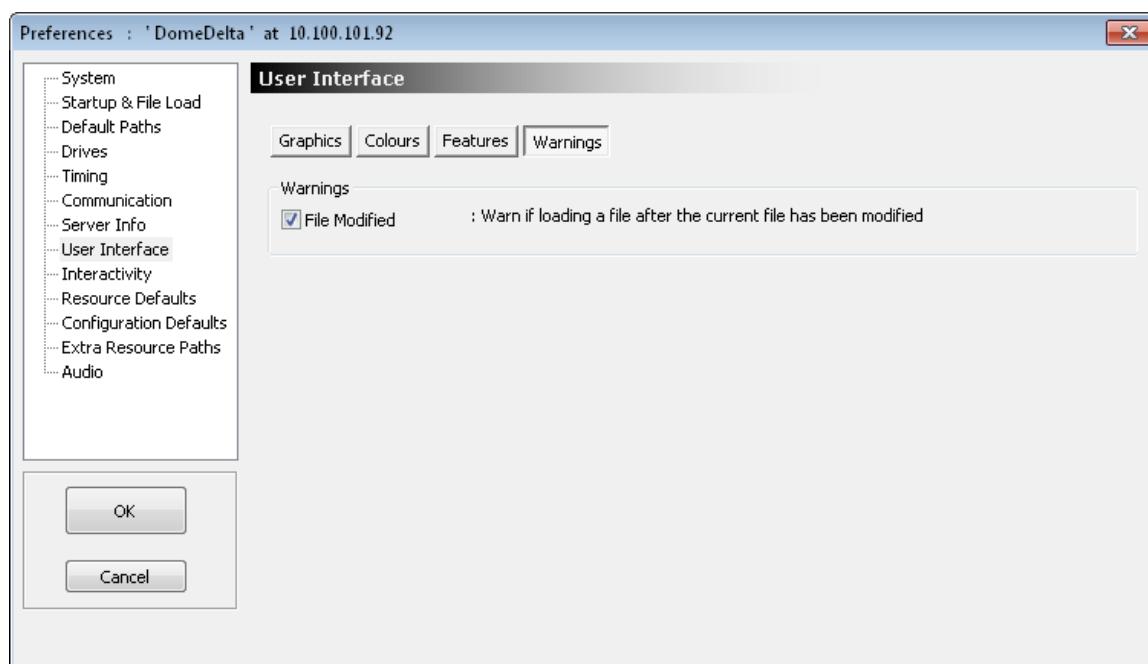
Interactivity

This dialog allows configuration of some interactive features;
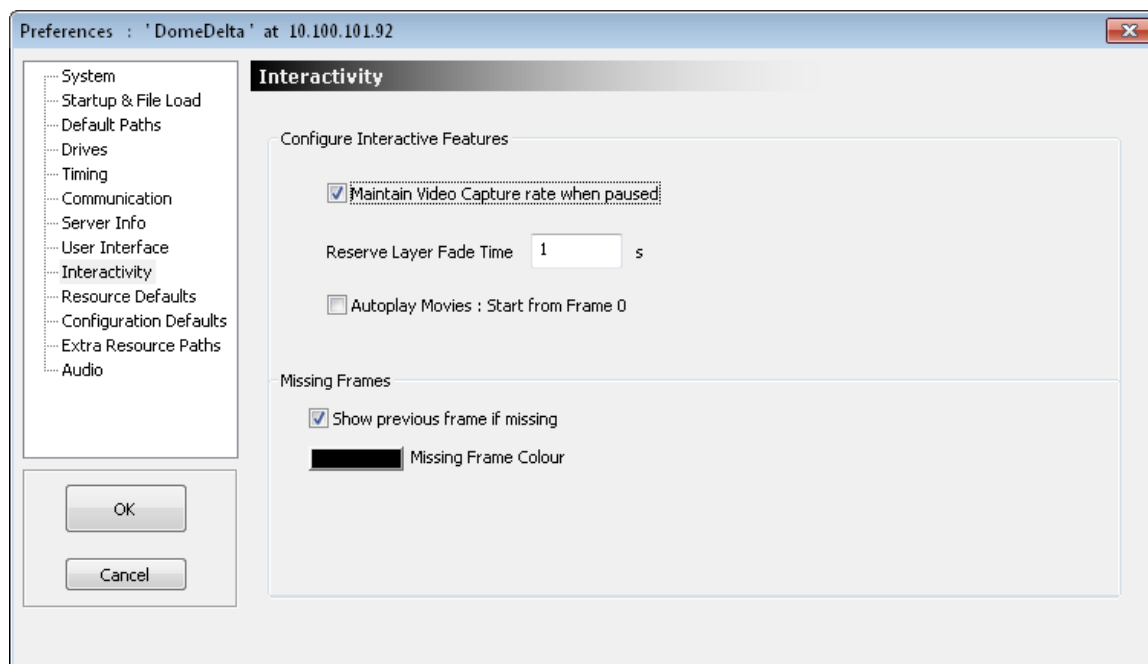
Maintain Video Capture rate when paused

If cleared, the any video capture windows shown on the timeline when not playing will drop to 1 frame per second to free up CPU.

To keep the video capture at full rate when not playing, tick this box.

Reserve Layer Fade Time

Sets the time in seconds to fade from Reserve to normal operation.

Missing Frames

If Checked, is a missing frame or bad frame is detected when loading from disk, the default behaviour is to show the previous frame.

For debugging bad movies, un-check this box, and select the colour to show whenever there is a missing frame so that it is obvious which are missing. This setting is not stored and will revert to showing the previous frame when the Delta server is next run.

Resource Defaults

This dialog allows configuration of the defaults applied to a resource when you add a new one to the timeline;
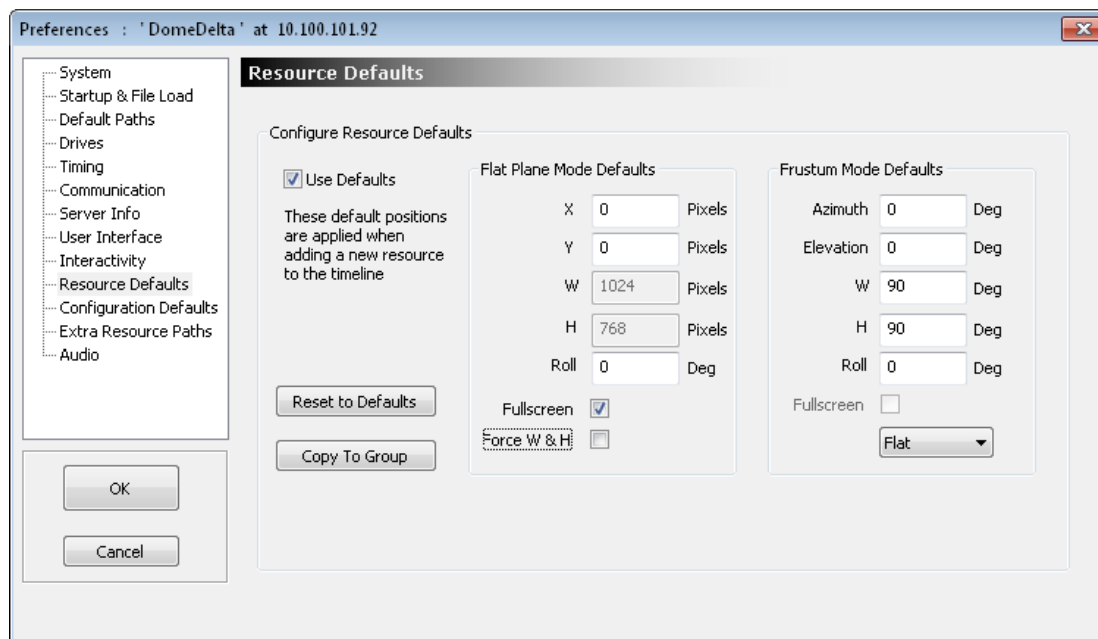
In Flat plane or Stereo, the left hand column defines the position and size of the new resource, in Frustum mode, the right hand column defines the position, size and mapping mode of the new resource.

If Force W&H is checked, the width & height of the new resource is forced to the values in the W & H edit boxes. If not checked, the width & height are left as the resource defaults from the image or movie.

You can turn off these defaults by un-checking the Use Defaults checkbox.

You can also copy these defaults to the group by clicking Copy To Group

Configuration Defaults

This dialog allows the server to be set in Show Mode (or partially in Show Mode) where certain parameters from a show XML are ignored.
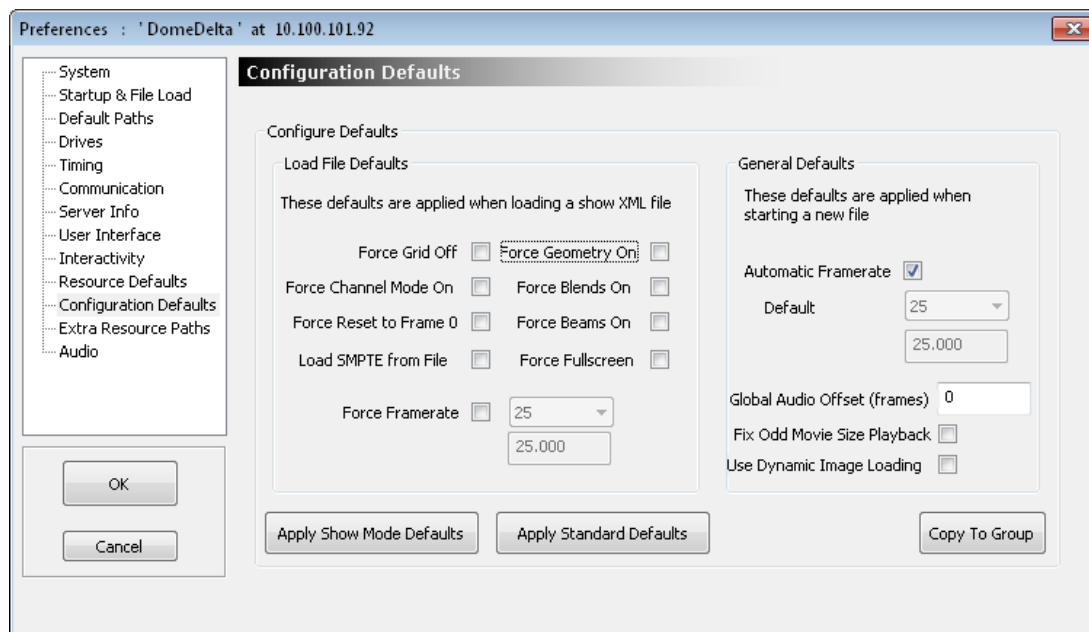
This allows, for example, a server to always override the XML settings for grid, beams, geometry to ensure that these are always turned to the most suitable setting for a show, so that the audience never sees the grid and the beams are always forced on.

Pressing the **Apply Show Mode** defaults turns on all of the options, **Standard Defaults** turns them off.

In addition, if the Automatic Framerate is Not checked, you can force the default framerate when File New is chosen instead of having the server guess the framerate from the refresh rate.

Load SMPTE from File – the state of SMPTE slaving when the file is saved is ignored unless this box is checked.

Extra Resource Paths

The standard resource paths (e.g. E:\Movies for movies, C:\Images for images) can be extended to your own paths, so that you could add a path for each resource type, for example in these path trees;

C: \ MyProjects \ Projects2009 \ Movies
                                                       \ Images
                                                       \ Audio

C: \ MyProjects \ Projects2010 \ Movies
                                                       \ Images
                                                       \ Audio
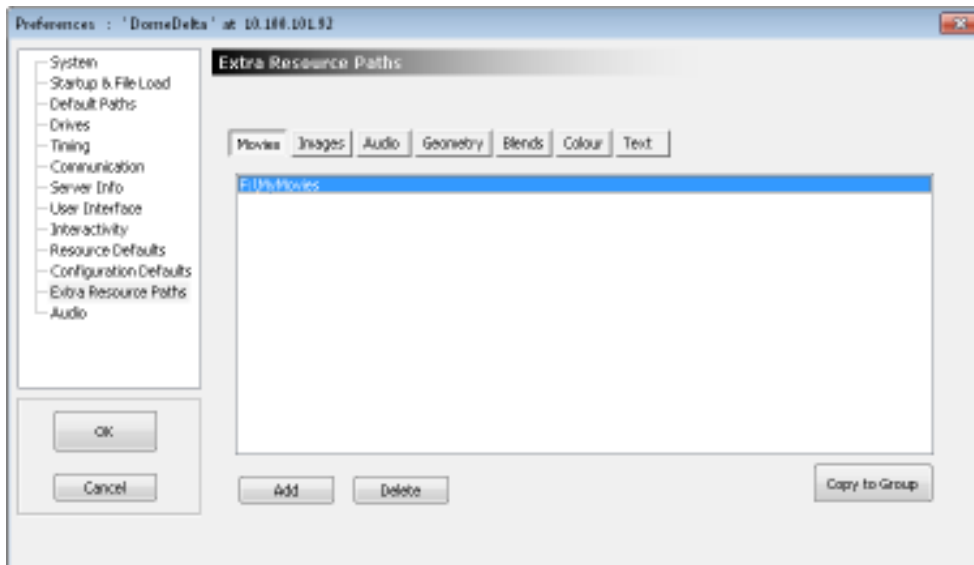
Note that movies are usually held on a different, faster disk.

You can cycle between the standard paths
and extra resource paths by pressing this button;
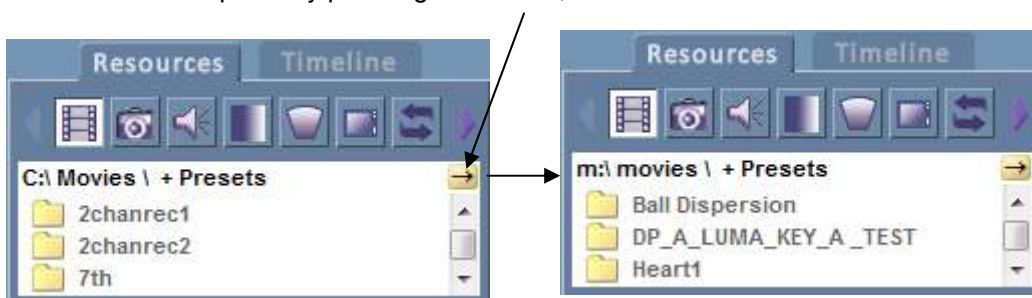
After clicking on one of the paths in the resource folder area, you see only those resources in the main resource window below.

Audio Type

You can choose to use a Windows (DirectShow) based audio device or ASIO device in this page. If there are any ASIO devices present, you can select ASIO and then the particular ASIO device if there are multiple present.

You can also choose to autodetect the number of audio channels or force the number (some audio devices need this, as they do not report the correct number of channels). Note that if you force a number of channels that the device does not support, it will fail, so the number reported in the Stats will be 0 & there will be no audio.

Note : After changing any settings in this page, you will need to restart the server application.
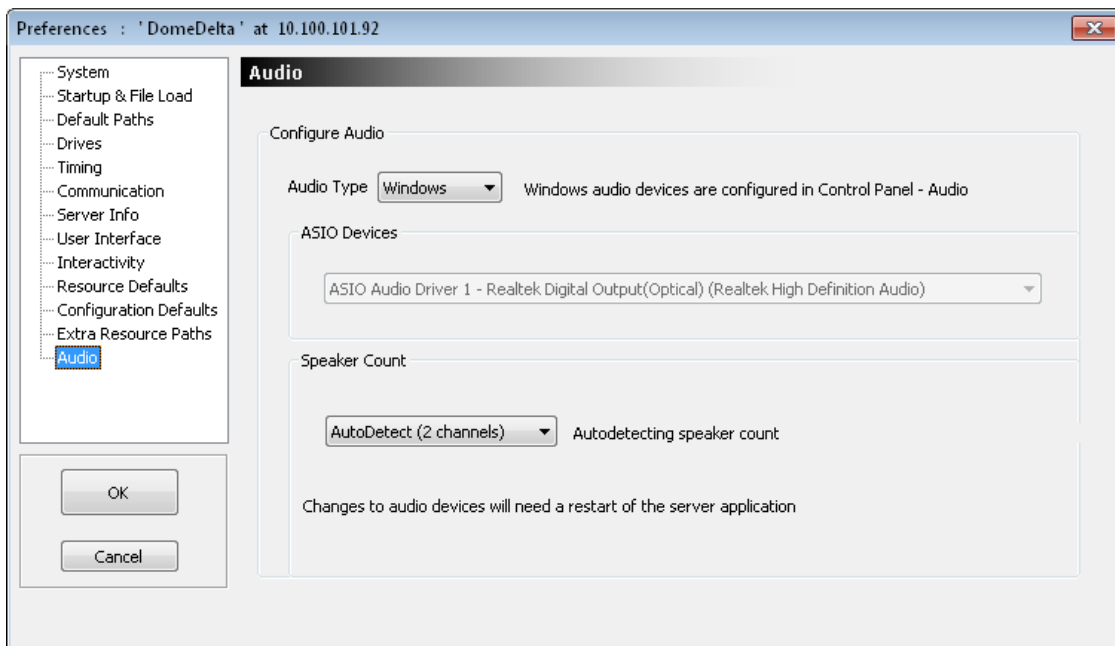
Artnet & DMX Config

Delta has the ability to send out an ArtNet stream from the timeline and listen to ArtNet in order to activate any command from the external control command set. ArtNet can be converted to DMX using inexpensive Ethernet (RJ45 - ArtNet) to DMX (5 Pin DIN) devices.
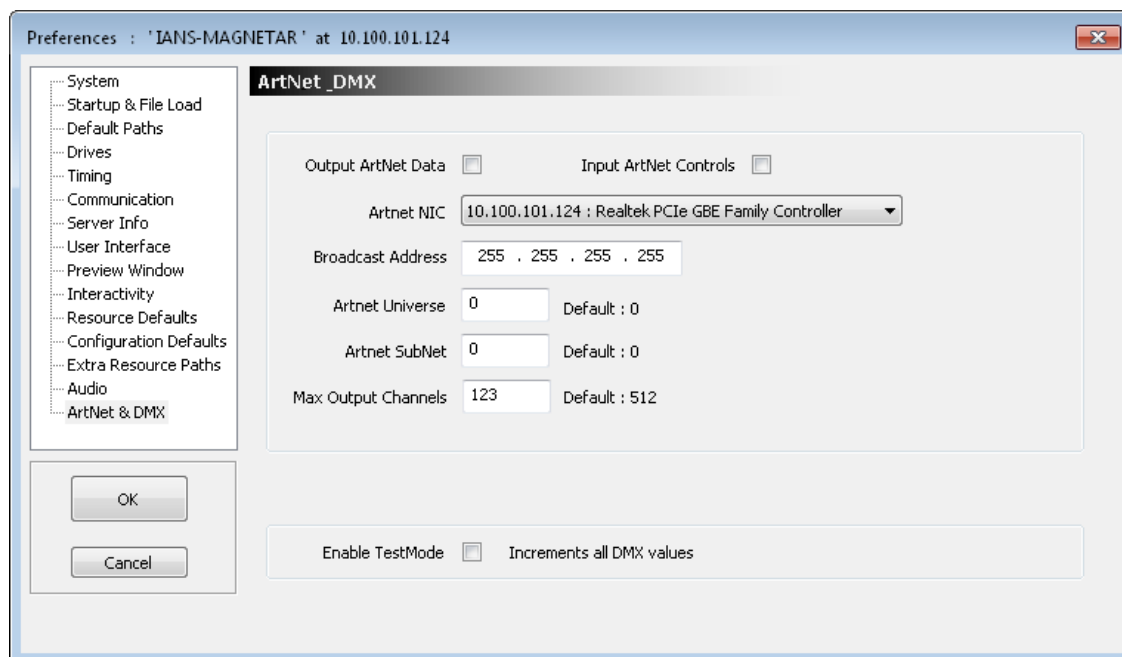
The configuration page sets up the output parameters for ArtNet and whether this is enabled for input & output separately;

Output ArtNet Data   : Select this to enable the continuous ArtNet data stream output
Input ArtNet Controls   : Select this to enable ArtNet listeners (see ArtNet resource section).

ArtNet NIC   : Choose which network adapter to broadcast ArtNet data from
Broadcast Address   : Choose 255.255.255.255 for the whole network or a more limited address as required.

ArtNet Universe   : Value 0 – 15, these behave as separate sets of data on the network
ArtNet SubNet   : Value 0 – 15, these behave as separate sets of data on the network

Max Output Channels : ArtNet has 512 maximum channels, but you can select to output only a subset of this if required. Note that some DMX devices do not work properly unless they receive all 512 channels.

Enable TestMode   : Selecting this increments all output channels continuously in a ramp for testing.

Note that only one server should be set to broadcast out to a specific Universe / SubNet, as multiple servers broadcasting on the same settings will conflict

ADD MEDIA TO THE TIMELINE

Start the Server and GUI. At this point there are no resources on the timeline (assuming there was no default file set to load), and any resources found in the relevant folders are presented in the Resources Area on the left.

Select the media type (in the example below, Images), and double click the image you want to add to the timeline. The Add Resource dialog is displayed, so choose a name for this resource, which layer and where along the timeline you want it to be placed.
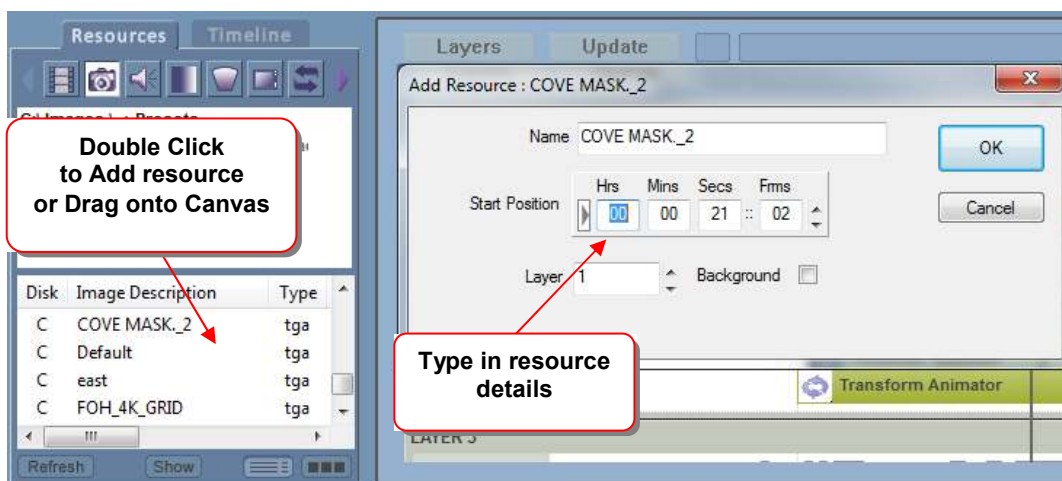
After pressing OK on the Add Resource dialog, Layer 1 is shown, and the Resource Area shows you the newly created resource on the Timeline.

We have created Layer 1 with one image resource starting at 0 on the current timeline. The resource is given a default length, but you can change this interactively.
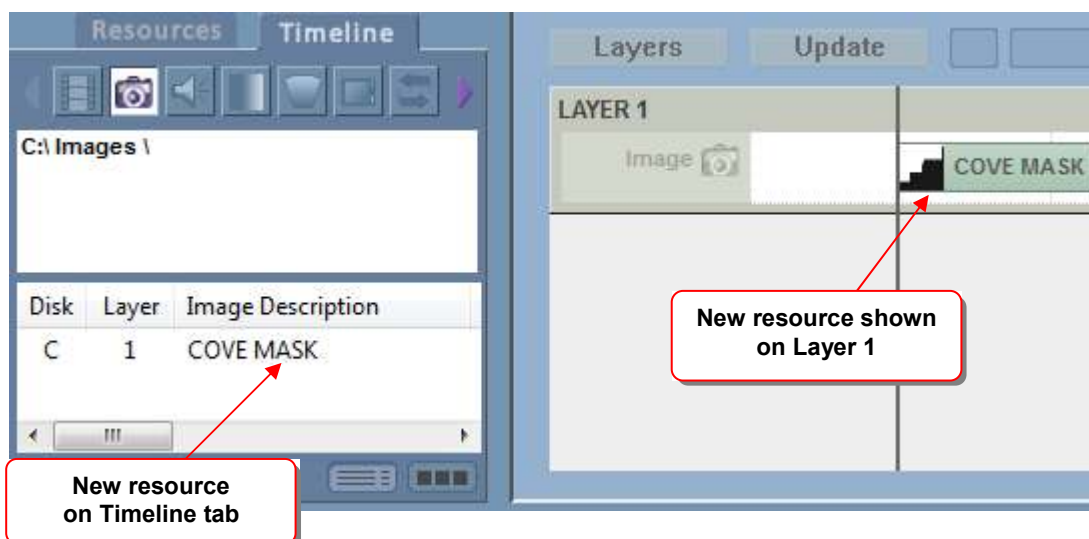
INTERACT WITH MEDIA

Media on the timeline can be **moved** along the timeline simply by left-clicking on it and dragging it while the left mouse button is down. When moving you mouse over the media resource on the timeline, the pointer changes to ✛ to indicate that the resource can be moved left or right.

While moving, the resource is shown in yellow, and the start / stop positions on the timeline are shown as you move.
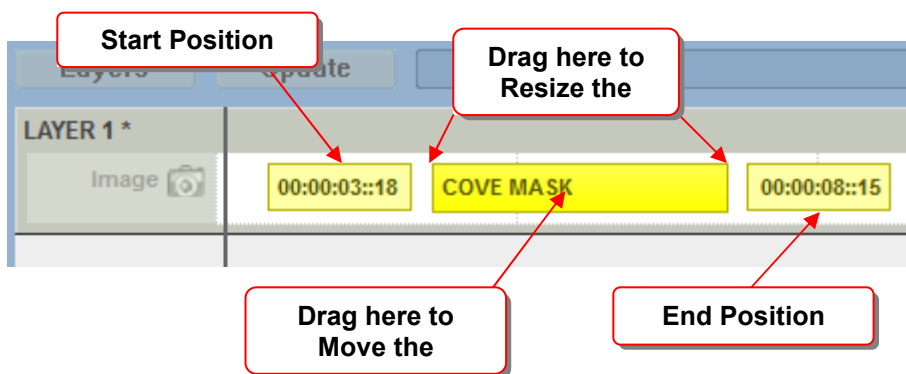
To **change the length** of the resource on the timeline, simply move the cursor over either end of the resource on the timeline; the cursor changes to ↔ to indicate that you can pull that end of the resource. If the resource is very short on the timeline, you may not get the sizing cursor – simply zoom in until the resource is large enough.

To change which part of the timeline you are viewing, use the controls below;
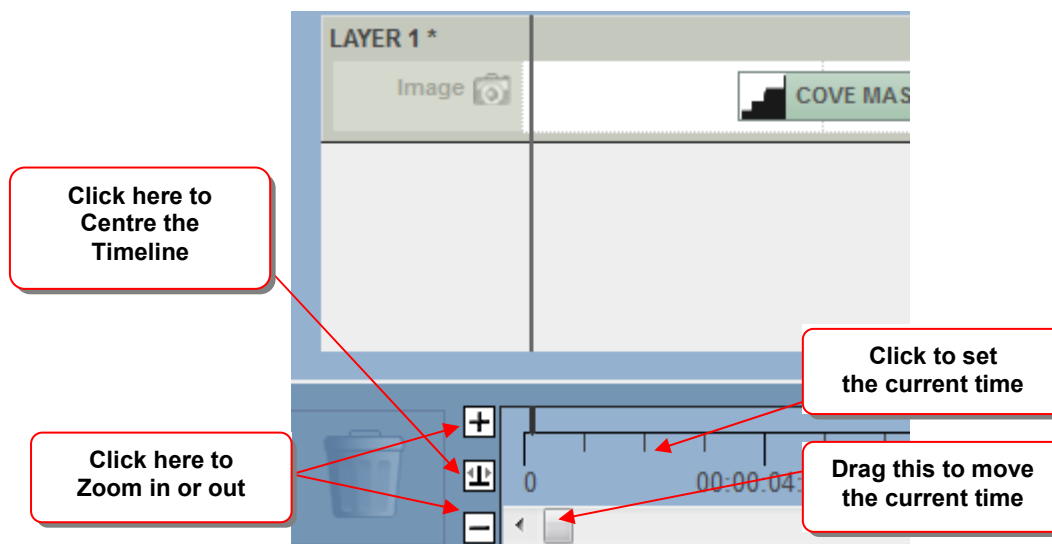
If you can't see enough of the resource, use the timeline controls to zoom in or out, and centre the resource in the visible part of the timeline.

DRAG & DROP

You can drag media from the resources area directly onto a layer, or drag it onto the blank canvas to create a new layer.
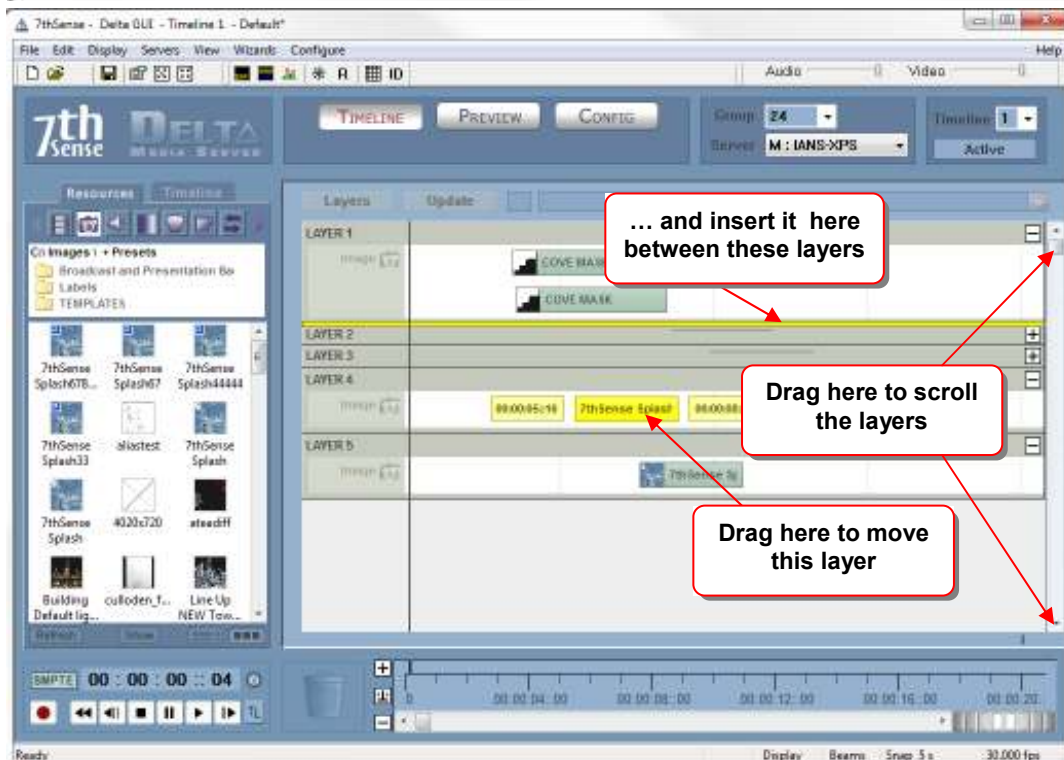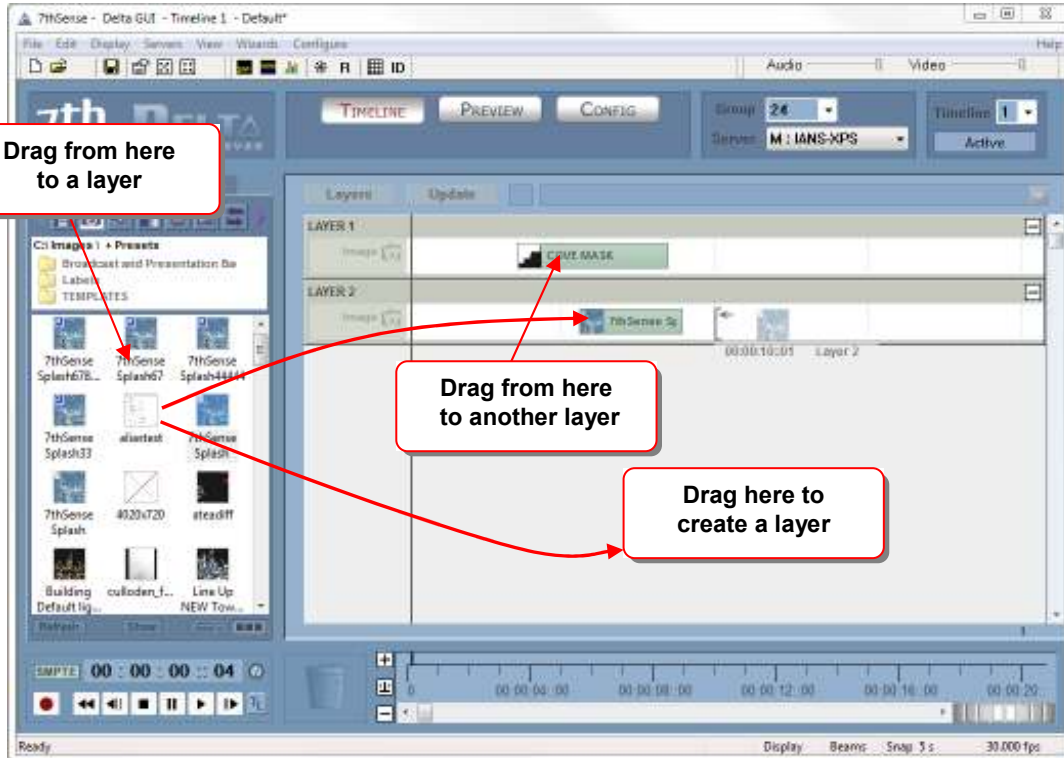
COPY MEDIA

In addition to dragging resources from the resource area to a layer, you can select multiple resources with a rubber band. Also see Copy Timeline.

Rubber banding

If you wish to move a number of resources along the timeline, left click somewhere away from a resource in the white area the rubber band to cover the resources (they turn green to indicate selected). Then drag this group left or right along the timeline.
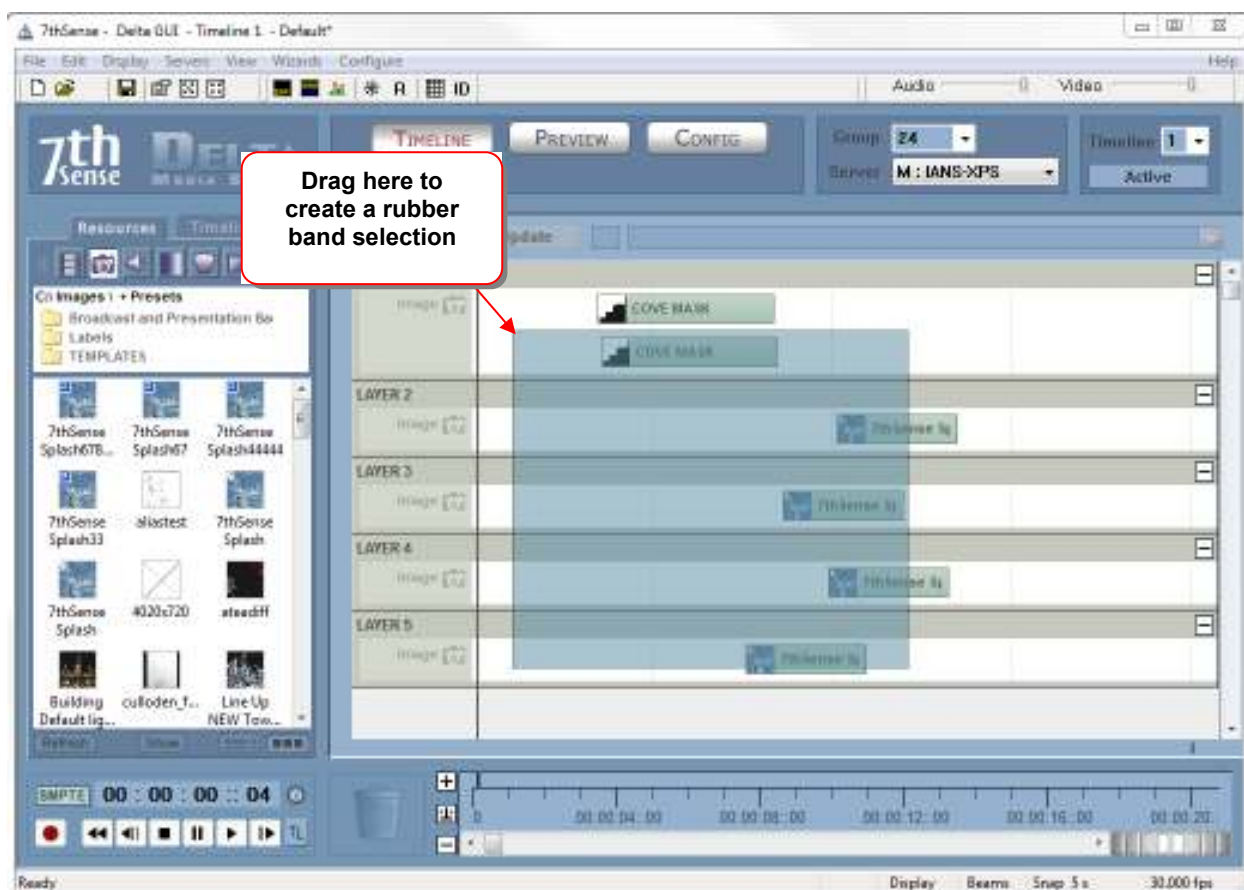
N o t e s

- Hold Shift down while rubber banding to add to or remove from the current selection group.
- You can rubber-band over the timeline controls area as well
- You can rubber-band over closed layers (selects all within the closed layer)

Once two or more resources are selected, you can use cut, copy, paste or delete on them;

Cut	: CTRL X	: Cuts the selected resources from timeline, and stores in the Clipboard
Copy	: CTRL C	: Copies the selected resources from timeline, and stores in the Clipboard
Paste	: CTRL V	: Pastes the clipboard resources (if any) to the current cursor location on the timeline. Note that resources are only ever pasted back onto the layer they were copied from.
Paste At	: CTRL B	: Pastes the clipboard resources (if any) to a frame or time that you specify.
Delete	: Del	: Delete the selected resources (or drag them to the wastebasket).

Select All   : CTRL A   : Select All resources in this timeline

Deselect All   : CTRL C   : Deselect any selected resources

These items are also available on the menu under Edit.

In addition to dragging a resource from one layer to another, if your press **CTRL while dragging**, you will when copy that resource to the same or other layer.

While interacting with the media, bear in mind that the different media types have their own limitations, as detailed below:
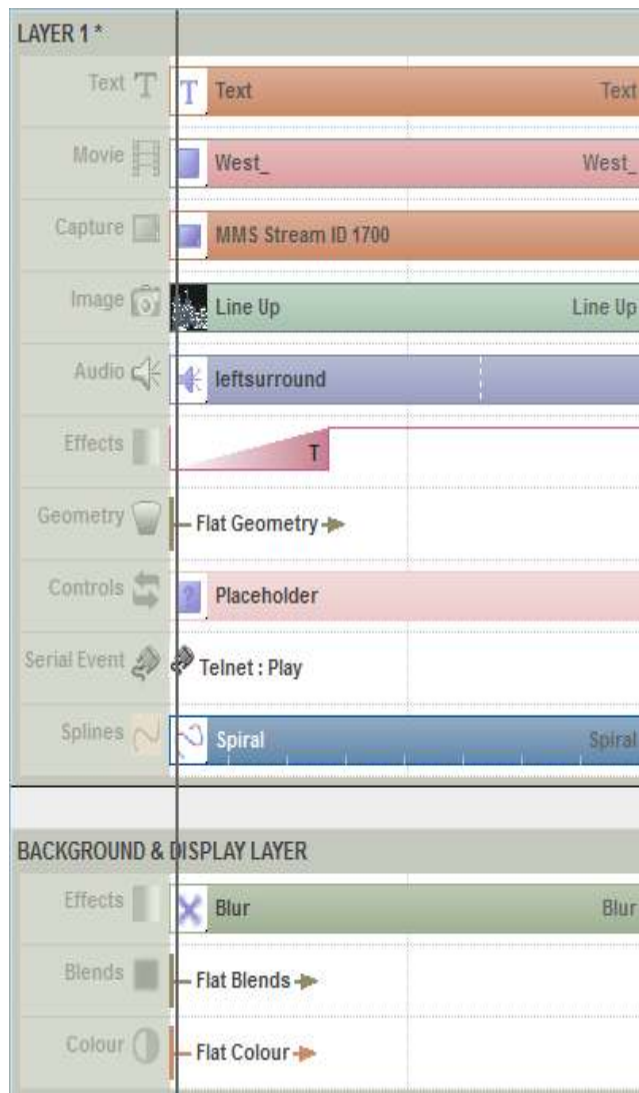
Ticker text : Can only exist on the timeline once. Normal Text can be used multiple times.

Movies : Turn on looping to drag longer than the native length

Audio : Turn on looping to drag longer than the native length

Geometry: the geometry applies from the start point onwards it only stops when another geometry resource occurs.

Serial Events: Are single frame events.

Blur : Can only exist on the Background layer.

Blending & Colour : As per Geometry, plus, blends and colour can only exist on the Background layer.

CONFIGURE MEDIA

Resources have configurable items. You can access these by double-clicking on the resource in the Layers Area, double-click on the resource name in the Resources Area (timeline selected), or right-click the resource and select Properties.
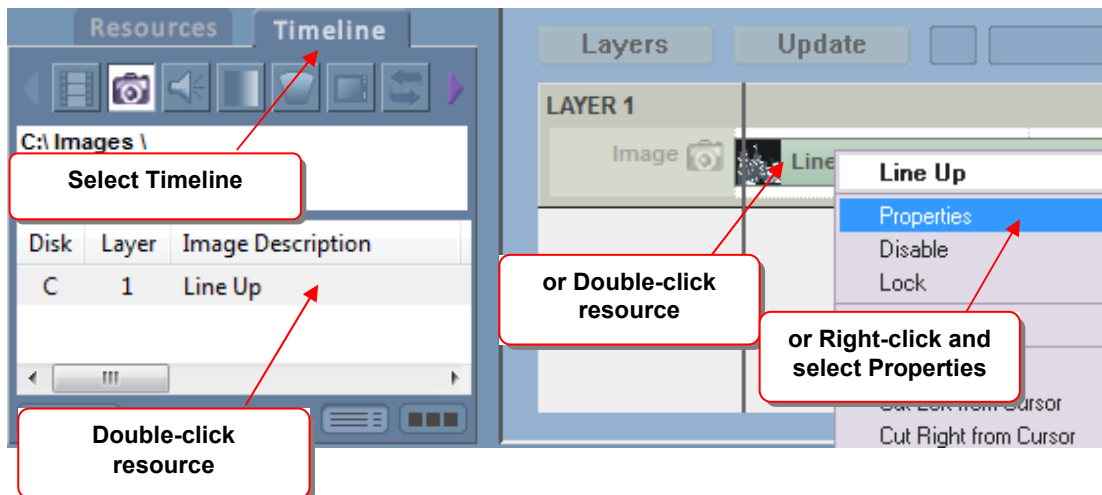
General Configuration

After selecting properties, the Resource Editor is displayed:
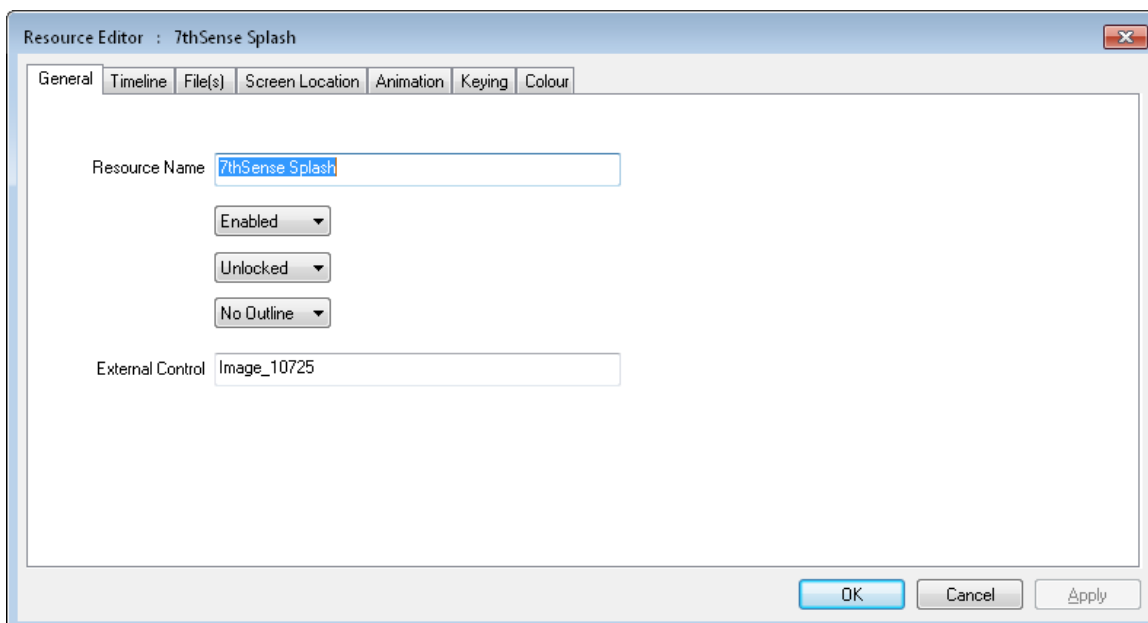
On this tab, you can change the name of the resource, and whether it is enabled or disabled.

Disabled resources will not be visible in the show, and are drawn in light grey on the timeline to indicate this.

Outlined resources will show a moving edge to highlight that resource

External Control name – use the default or edit this to a more memorable name for use by external control commads.

Timeline Configuration

The timeline configuration page is the most used resource-editing page, where you can set important parameters such as Layer, Position on the timeline etc.
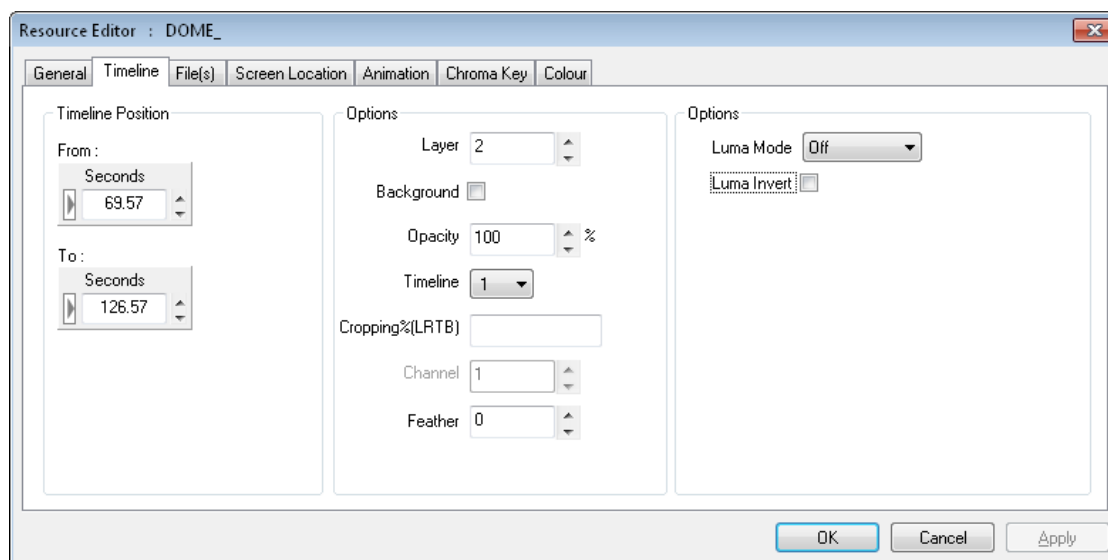
Available options:

Timeline Position : The timeline **Position / To** values can be set using the dragging technique mentioned above, or entered manually here.

Layer : You can change the **layer** of this resource, from 1-250, or place it on the background layer, which is below all other layers.

Opacity : The static **Opacity** can be changed from 100% to 0%, for example, if Layer 1 has an image with 75% opacity, a layer below it will show through by 25%.

Background : Checking this box puts the resource on the background layer, behind all others. Other options (e.g. Channel) then become available.

Feather : Images only, a percentage amount of softening around the edge of the image to remove any jaggy edge.

Channel : Background layer only, which channel the effect (e.g. geometry, colour or blend) will affect. Note that if the channel is disabled, nothing will be seen in the playback window for this resource.

Morph : Geometry only, whether to morph from the previous geometry or simply switch in this geometry at the start position.

Direction : Fade / Transparency resource can be Up or Down.

Panning : Audio resources, pan the audio from -100 (full left), through 0 (equal left and right) to +100 (full right).

Go to Frame : Goto timeline control only, which frame to go to, also the Mode of Stop or Play is shown here for this resource.

Key : Markers only; which function key, if any, is assigned to that marker for quick positioning on the timeline.

Keypress Action   : Markers only : choose to play or stop after moving to the marker
                              when the chosen function key is pressed

Playing Action   : Markers only : Choose to do nothing (default) or Stop as the playhead
                              reaches the marker. This option means you don't need a Stop control at
                              the same location as well as a marker to just play between markers.

Freeze Group   : Yes / No. Selecting Yes for this video capture device will allow it to be
frozen from the toolbar freeze button. Note that all instances of this video capture device on the
timeline are frozen together.

IP Address & Port   : Only for Serial Event files which have had the Telnet section added. Set
any valid IP Address and port here, the serial event string is sent out as normal in a UDP packet,
instead of to a COM Port.

Cropping (LRTB)   **:** For Images, Video Capture and Movies, you can specify a percentage
amount of cropping on each edge. You can select to enter the values as Percent (of resource
width) or in Pixels directly. Note that swapping between modes will reset values to 0.

Video Mode   : For Video Capture devices, choose the video resolution, refresh rate and
compression from this list.

Pitch Correction   : For Audio Files, if you use Play Speed compensation to match an audio
file at a different frame rate to the timeline's frame rate, the pitch will shift up or down accordingly.
Enable Pitch Correction to stop this change in pitch, but still change the length of the audio file.
NOTE : this requires some CPU processing, so check that frame drops are not caused by
overloading the CPU.

Repeat Frames: For Serial Events, turn on Repeat and this value sets the frame interval between
repeated instances of this serial event.

Repeat Count   : For Serial Events or Splines, turn on Repeat and this value sets the
number of times this event will be repeated (1 = repeat once more on timeline).

Eye   : For stereo content, select the eye (left or right) or even left-right and
top-bottom configured content.

Ping-Pong   : For Splines with a repeat count greater than 1, either restart from the
start of the spline, or change direction on each repeat.

Luma Mode   : For Movies, Images or Video Capture, these resources can be set
to be a luminance modifier instead of a normally drawn resource. This allows movies (or images
etc) to be used as a transition effect between clips.

In this case, any resource on that layer will be multiplied with the resource set to luma-key in
one of these modes;
Off   : Standard resource, no luma key
Luminance   : Use this resource as a luminance modifier
Red   : Use this resource's red channel as a luminance modifier
Green   : Use this resource's green channel as a luminance modifier
Blue   : Use this resource's blue channel as a luminance modifier
Alpha   : Use this resource's alpha channel as a luminance modifier
Luma Invert   : invert the sense of the luminance modification.

Timeline   : For multi-timeline configurations, which timeline this resource is on.

Forced W & Forced H : For capture cards, force the Input resolution to these values (where the
capture hardware supports this feature)

Fixed (Yes/No)   : For geometry or blends on the background, if Fixed, will auto-reset to frame 0, if not Fixed, you can set the start frame as normal

H Resolution   : For Web Controls, the rendered width of the page
V Resolution   : For Web Controls, the rendered height of the page

File(s) Configuration (Movies)

The Files configuration tab for Images simply shows the full path to the file.
For Movies resources, there are configurable items as below;
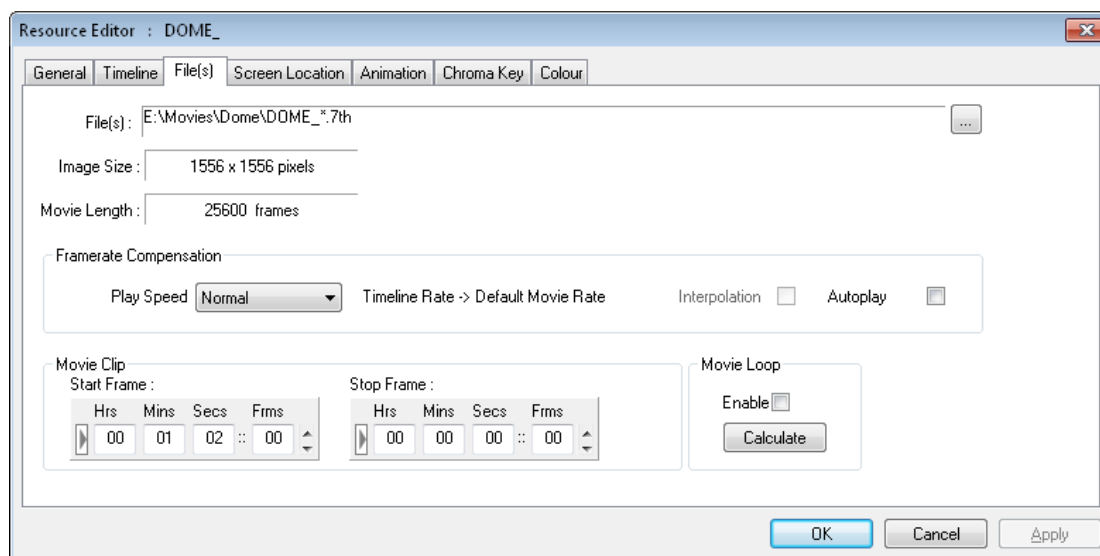
The **Start Frame** is that frame number on disk that you want to start using, so for instance, if set to the above example of 100, the first frame shown will be frame 100, wherever on the timeline you placed this resource.

The **Stop Frame** is that frame number on disk to stop at. Setting this allows you to loop the movie from a start frame to a stop frame.

Example : The Start Frame on this dialog is separate from the Timeline Position value on the Timeline tab, so for example:

- 300 frames found on disk for sphere.jpg (sphere _0001.jpg, sphere _0002.jpg etc)
- Position the movie at frame 5000 (Timeline Position = 5000 to 5299)
- Set the start frame to 100 (Timeline Position is now 5000 to 5199), starting at sphere_0100.jpg onwards
- Press Play

The timeline advances until it reaches frame 5000, then the 100th frame (sphere_0100.jpg) is shown at 5000, 101st frame at 5001 and so on for 200 frames.

Movie Loop :
Enable this so that the movie can be dragged past it's normal length, looping seamlessly. Use the calculator if you want to work out the length for a set number of loops.

AutoPlay :
Enable this to make the movie autoplay – as long as the playhead is in scope with the movie, the movie is playing, even if the timeline is stopped.

Video Framerate Conversion

The **Play Speed** allows you to perform video framerate conversion, for example, playing a 24fps movie at 25fps, but maintaining the right movie length in time.

Since Delta gets its timing from the graphics card refresh, ideally, this should always be set to a multiple of the movie framerate, so for example a 24fps movie would have the graphics refresh set to 48Hz or 72Hz (the lower value is preferred).

If this is not possible, you could set the graphics refresh to 50Hz, so now, playing a 24 fps movie at 25fps makes it 25 / 24 too fast. To correct this, choose the Play Speed of 24->25fps.

To perform this conversion, frames must be dropped or shown twice in order to maintain the correct rate. This may lead to disturbing jumps in the movie, but this is dependent on the movie content and the difference between movie actual and desired rates.

To minimise the size of frame drops, set the timeline rate to a higher rate, so in the example above, choose a 50fps timeline rate, and enter the custom conversion rate in the box provided;

Actual Movie rate   = 24 fps
Graphics Refresh   = 50 Hz
Timeline rate   = 50 fps
Movie Custom Ratio   = 24 / 50 = 0.48

Movie Interpolation
If you have to use video framerate conversion, for example a 24fps movie on a 30fps timeline, you can turn on Interpolation, where extra inter-frame information is created in realtime based on the time error at that point to improve the smoothness of motion.

The ⬚ button allows manual editing of the file details.

The **Loop** checkbox allows you to drag the movie out on the timeline longer than the number of frames – the movie will seamlessly repeat.

The **Audio** checkbox allows you to specify if audio contained in a movie file should be played.

Files Configuration (Audio)

For Audio, Play Speed has a dropdown of various audio conversion rates such as 30fps ->29.97, 25fps ->30fps etc as well as a custom setting which allows you to type in a speedup factor.
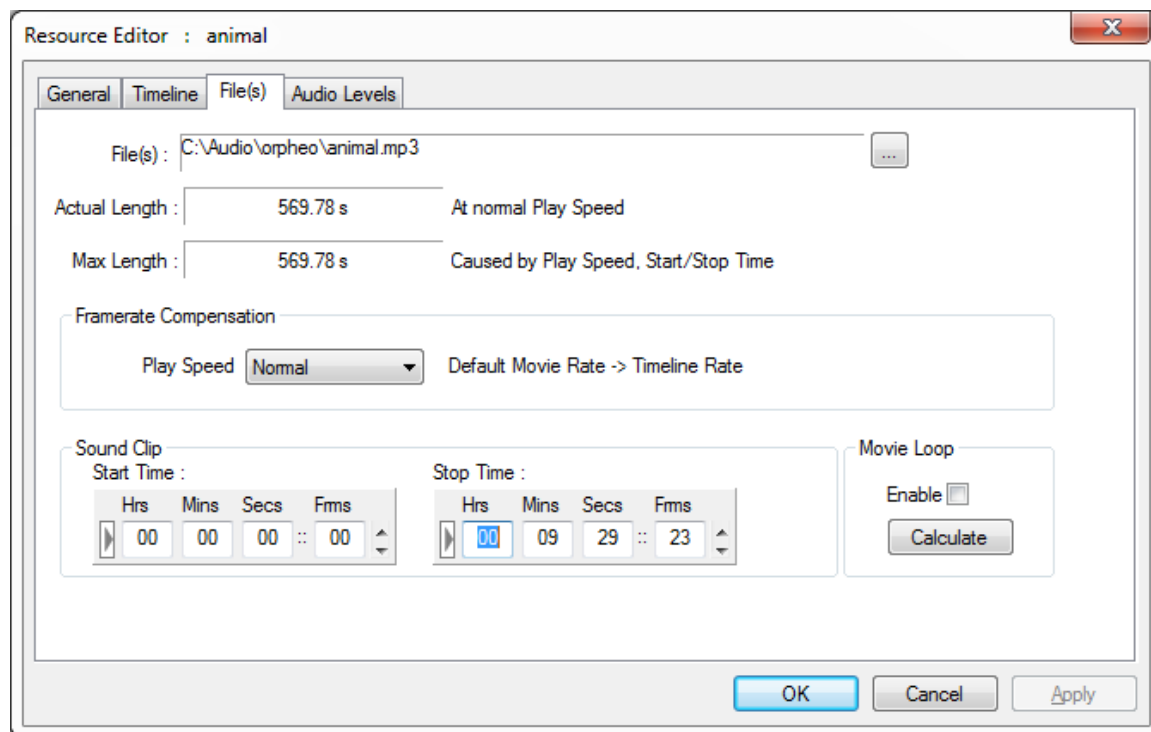
These conversion rates can be used to compensate, for example, a 24fps audio track playing on a 25fps timeline. Without compensating, the audio will run ahead of the video in the example below;

Using the conversion below, the movie will play 25 / 24 too fast, but the audio will stay in sync with the movie;

Actual Movie rate   = 24 fps
Movie Rate   = 24 fps
Graphics Refresh   = 50 Hz
Timeline rate   = 25 fps
Audio Play Speed   = 24 -> 25

Note that the pitch of the audio will be increased by this amount.

Start and Stop Time can be used to crop the start or end of the audio file.

The **Loop** checkbox allows you to drag the audio file out on the timeline longer than the number of frames – the audio will seamlessly repeat.

Audio Mixing : 8 Channels

For mono files, you can choose which physical connector on the PC the sound comes out on. The right hand group of checkboxes becomes live, and you can choose to send this mono file out one or more of the connectors. Panning is only for stereo files.
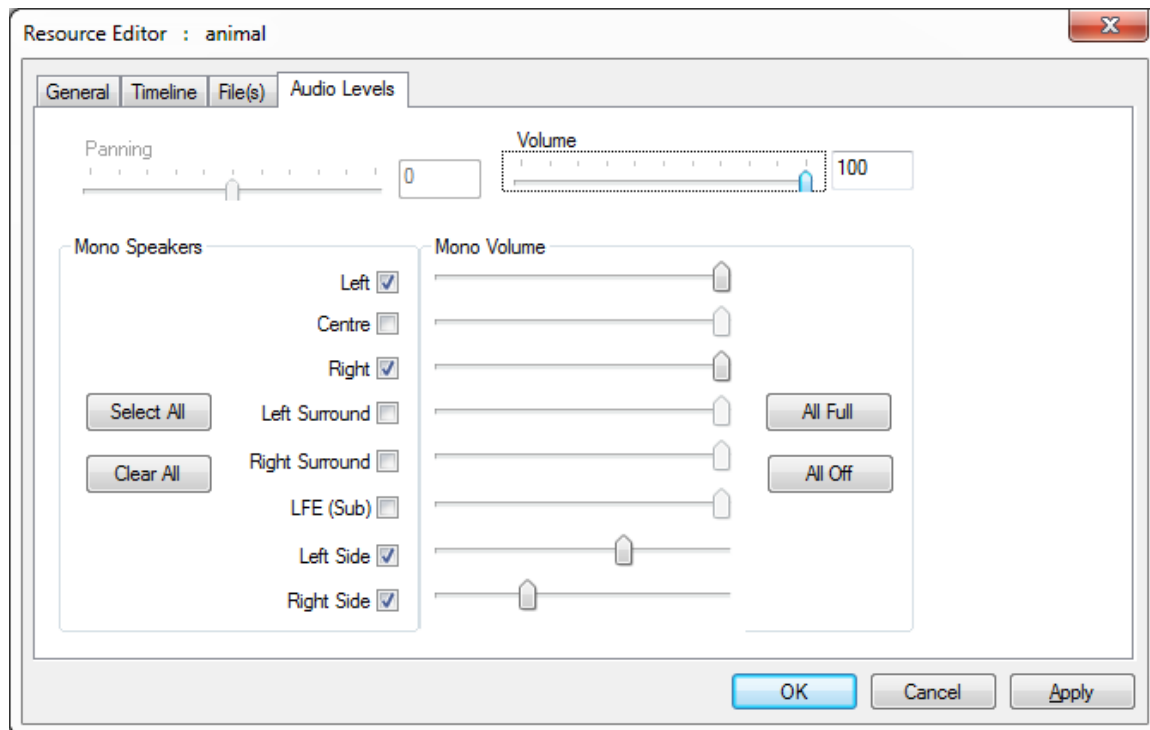
Audio levels for each speaker (mono files only) can be set using the 8 sliders on the right side, Overall volume of this track affects these individual speaker volume levels as well.

Audio Mixing : 16 Channels

Some sound cards have up to 16 channels, in this case, the following choices are available – note that Panning is not available on these sound cards.
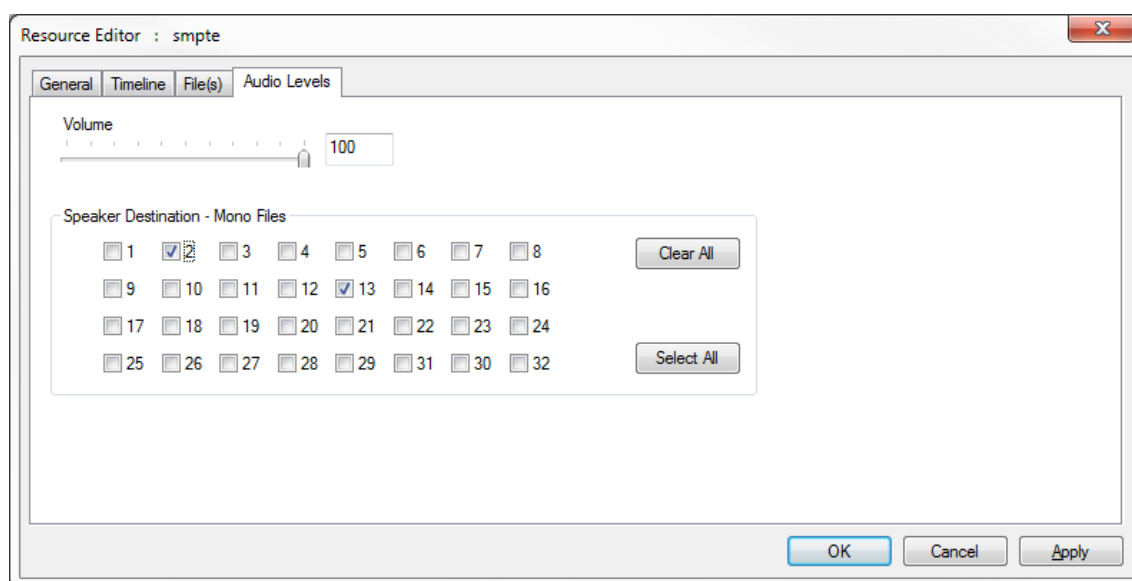
Screen Location : Flat or Stereo mode

This tab allows you to specify that the Image, Movie or Video Capture occupies a section of screen less than the full screen, and additionally, you can roll the image through 360 degrees.
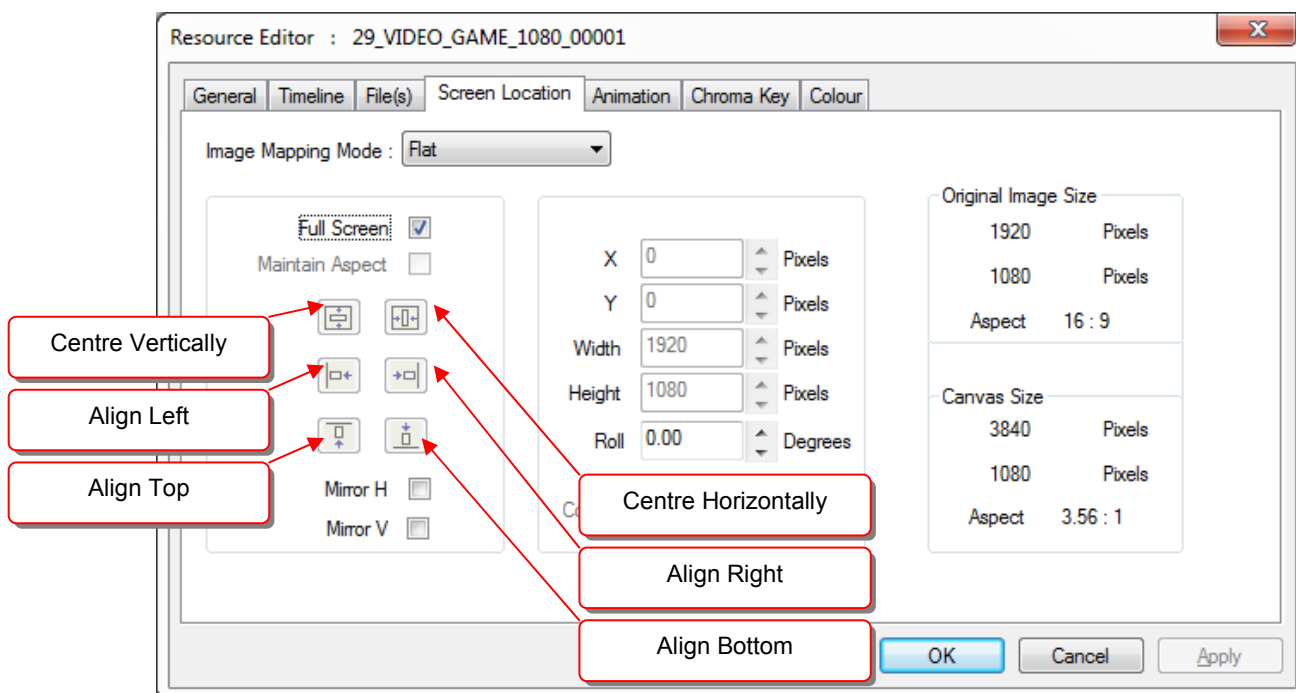
This allows you to perform scaling on the image, so you can zoom up on a part of an image and position it in the centre of the canvas.

Image Mapping Mode can be **Flat** (manually set values in the dialog) or **Channel Mapped** (resource fills the channel you select in this dialog).Channels are setup in Config – Display.

With **Maintain Aspect** checked, the height is auto-calculated based on the original Image Size aspect.

Mirror H & Mirror V can invert the visual resource at any time.

Pressing alignment buttons will align the image with respect to the canvas.

The Canvas is discussed in the *Display Configuration* section, but briefly, this is how a display could look with an image set to:

```
X        : 900
Y        : 400
Width   : 1000
Height  : 200
```

Canvas of 1920 wide x 1080 high.

> **Canvas : 1920 x 1080**
>
> **Image :**
> **1000 x 200**
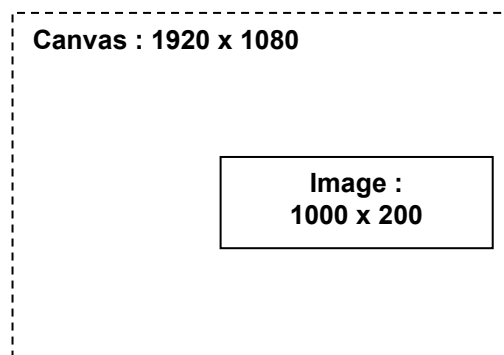
Coordinates relate to Centre : This defaults to off, where the X & Y values describe where the top left of the visual resource. If checked, X & Y describe where the centre of the resource is located.

Screen Location : Frustum mode

Frustum mode is a special geometric mode in which resources are now rendered onto a 3D world, so they are now placed and sized in terms of angles instead of pixels.
This is discussed in the separate Frustum Mode User Guide supplied to customers purchasing this option.

Animation

Animation is available for Movies, video capture, text and Images, and sets the rate and angle at which the image moves and rotates.
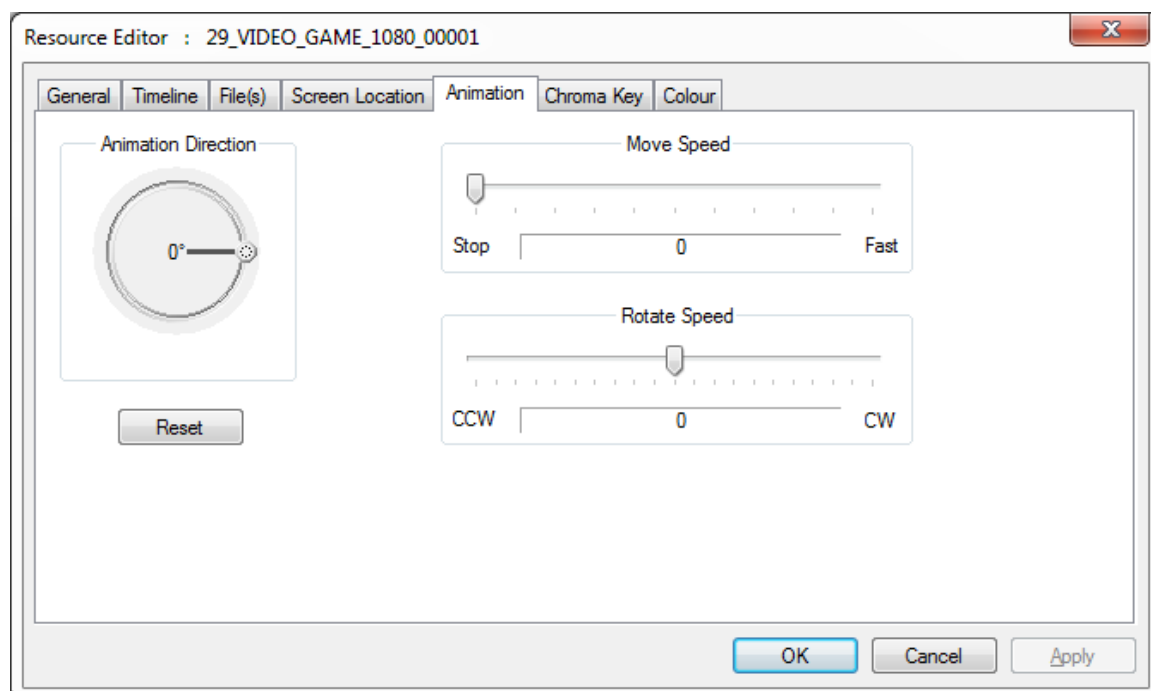
Note that the animation is frame-based, so the timeline has to be playing in order to see the animation. This also means that the animation is dependent on the actual frame number, so that on multiple racks, the look of the image is consistent at a particular frame.

Movies and Video Capture only have rotational animation.

Keying (Chroma & Luma)

Chroma & Luma keying is available on visual resources (Images, Video Capture and Movies) and is typically used for masking out areas or green screen applications.

Chroma Key is available for, and sets which colour will become transparent to layers below, and is most usable on multi-coloured media (not monochrome), since you pick a colour and tolerance / range around that colour.
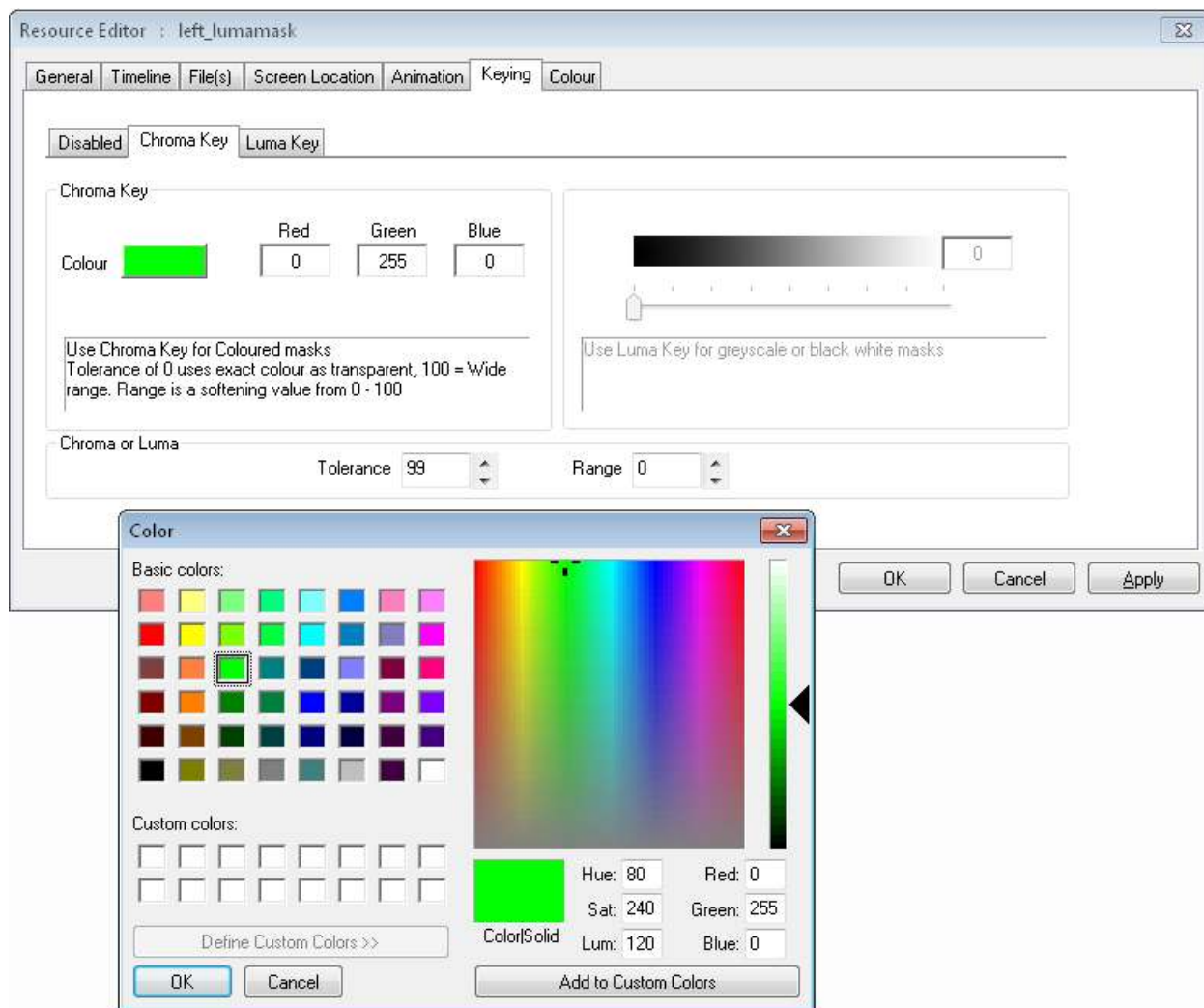
Colour : Choose which colour will be transparent.

Tolerance : 0 means the exact colour only will be transparent, higher numbers will allow similar colours to be transparent.

Range : Range is a softening value about the tolerance

Note that due to compression artefacts, for example in jpg images, what may look like a single colour will be surrounded by similar colours which interfere with this process. Increasing the tolerance can help this problem.

Uncompressed images such as bmp preserve exact colour perfectly.

Luma Key is available for, and sets which monochrome luminance value will become transparent to layers below, and is most usable on monochrome (not multi-coloured), since you pick a greyscale value and tolerance / range around that value.
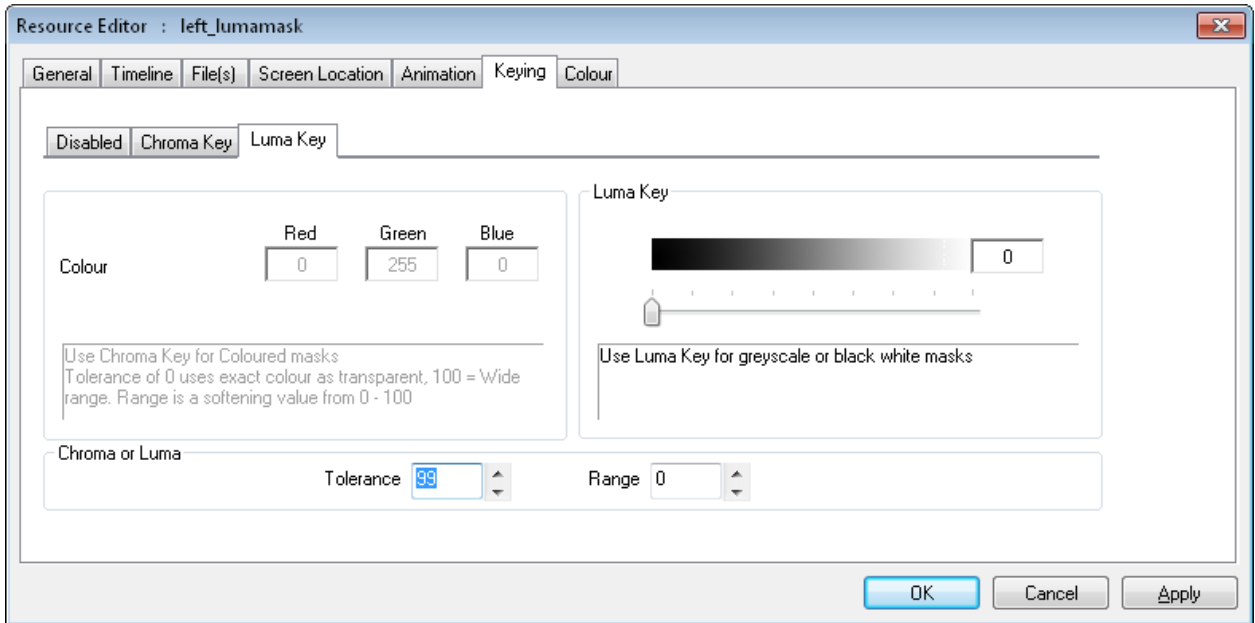
Luma Value   : Choose the value to make transparent.

Tolerance   : 0 means the exact colour only will be transparent, higher numbers will allow similar colours to be transparent.

Range   : Range is a softening value about the tolerance

Colour Controls

All visual resources (Movies, Images, Video Capture and Text) can have the contrast, brightness and gamma set on individual resources by choosing the colour tab;
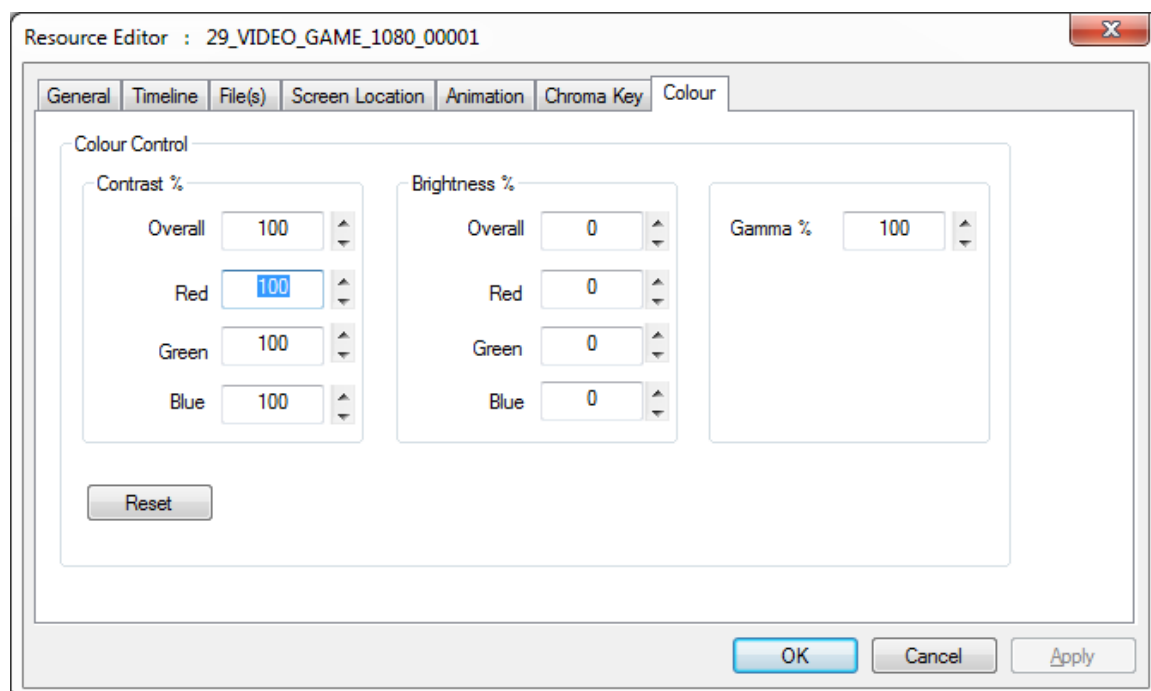
Serial Events

Serial event devices are XML-based files which hold a human readable name linked with command bytes for the particular serial device.

An example of this file's contents is:

```
<COMMAND0>
<NAME>  Play  </NAME>
<DATA>  PL\x0D  </DATA>
</COMMAND0>

<COMMAND1>
<NAME>  Power Off  </NAME>
<DATA>  \xBE\xEF\x00\x00\x00\x00\x00  </DATA>
</COMMAND1>
```

The human readable control list is shown in a drop-down list for that serial event device, and the control codes shown below.

From this drop-down list of controls, select the control that this resource should play.
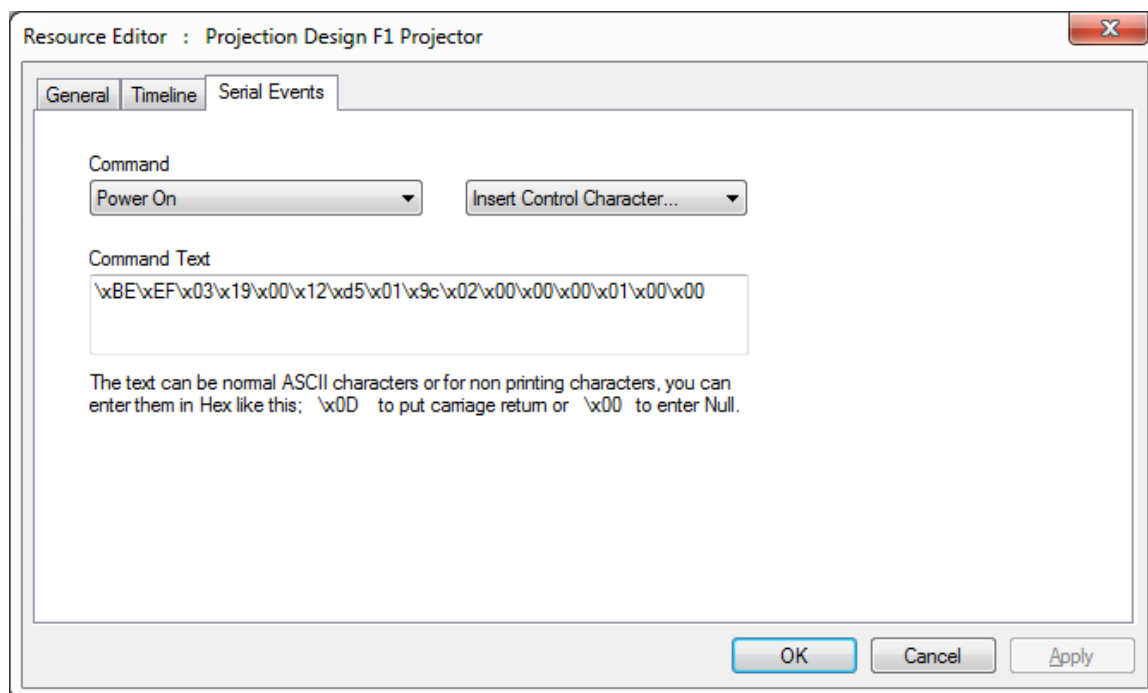
The text in the Command Text box is what is sent out the serial port. You can enter ASCII characters directly, or for non-printing characters for example, use the hex notation of \xEB to send character 235. You can edit this string directly and the new string will be saved with the file, but the Resource Pool version of this serial Event device is not altered.

If you create a file named "External Control.7SE" in the SERIALEVENTS folder, the contents of this will be available when adding an external control event to the timeline. This allows standard external control commands to be available. The format of this file is the same as other serial event 7SE files.

RS232 or Telnet Serial Events

A serial event can be output to any IP address and port instead of an RS232 COM port by including the following XML snippet (shown in red, note, this is case sensitive) in the serial event file:

<RESOURCENAME>Telnet</RESOURCENAME>
<TELNET>
 <Active>1</Active>
 <IPAddress>192.168.2.8</IPAddress>
 <Port>25</Port>
</TELNET>
<SERIALEVENTS>

You can type in any default IP Address and port.

When the Telnet section is found in a serial event file, it is no longer available in the COM port list (Configure – Preferences – Communications), and when you edit the properties, the IP Address and port are shown on the Timeline tab. The serial event is sent out as a UDP packet to the specified address.

Repeat Frames:
Enable Repeat and this value sets the frame interval between repeated instances of this serial event.

Repeat Count :
Enable Repeat and this value sets the number of times this event will be repeated (1 = repeat once more on timeline).

Add Frame
Enable this to append the current frame to any string output by this serial event

Text

The text resource allows you to place simple titling onto the show. You can adjust the font used, size and colour of the text, as well as previously mentioned items such as animation, screen location, opacity etc.
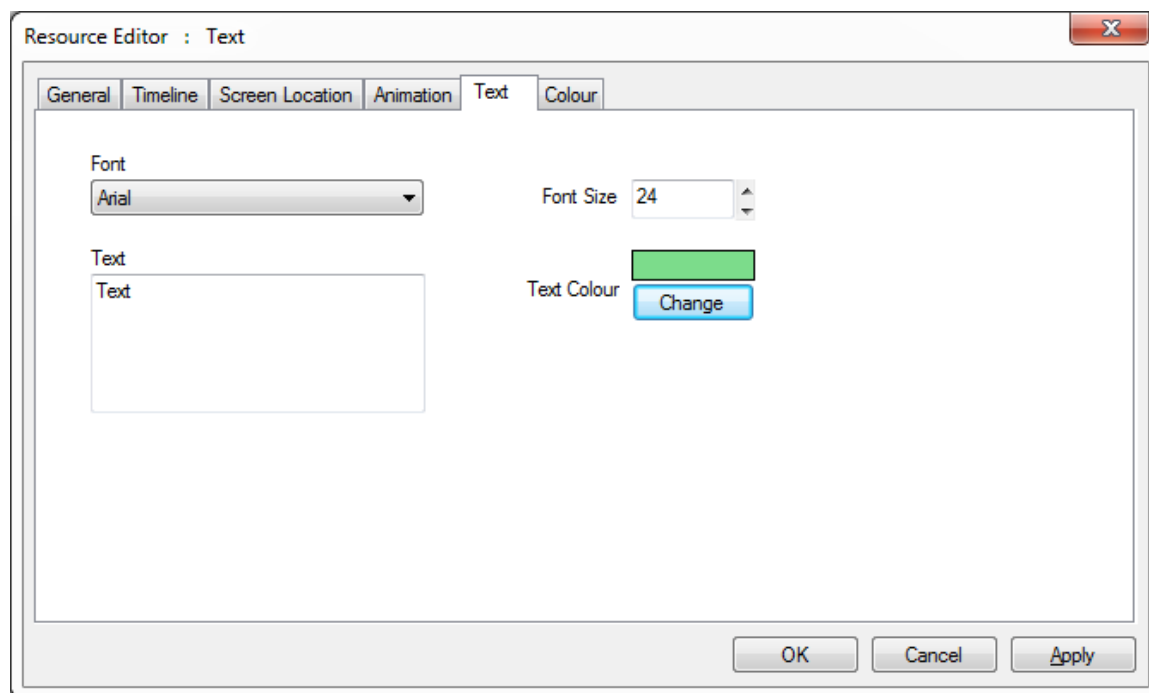
A special instance of a text resource is the Ticker text resource. Only one of these can be placed in the timeline, and can be directly controlled from external control in terms of colour, size and text.

Transform Animator

This resource effect provides Flat Plane transformation of X, Y, Width, Height or Roll so that users can quickly create motion effects for a whole layer without creating complex geometry resources.
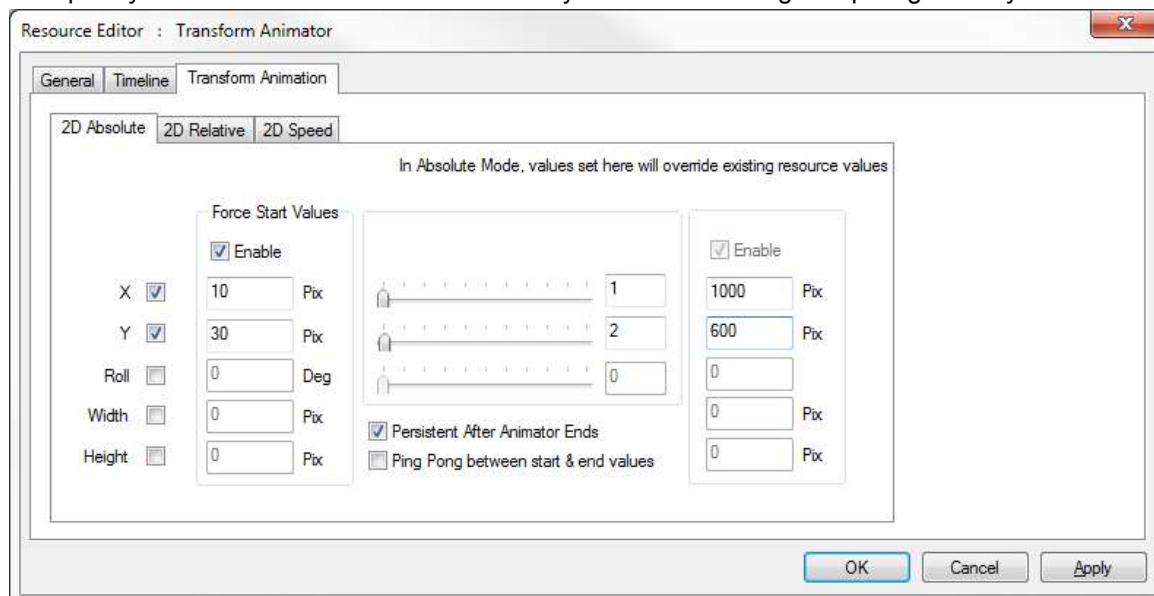
When you add a Transform Animator (TA) to a layer, it affects the resources on that layer when it is scope.

If the Force Start Values are enabled, resources will "ping" to the start values before moving to the end position if the Force End Values are enabled.

If the Force End Values are enabled, type in X,Y, W,H, Roll where you would like the resources to move to at the end of the TA resource. Resources will stay at the end values after the TA has finished only if "Persistent after animator Ends" is checked.

Speed values
0 ; Do Nothing
1 : Move from the resource current position in one move
2 : Move from the resource current position, once around the screen, then to the end position
3+ : Move more times around the dome before ending up at the end position.

-1 : Move in the opposite direction to +1
-2 : Move in the opposite direction to +1, once around the screen
-3+ : Move in the opposite direction more times around the dome before ending up at the end position.

Start / End Enable
Force Start on – Force End on
Move from known position to known position n times around the screen

Force Start off – Force End on
Move from resource current position to known position n times around the screen

Force Start on – Force End off
Move from known position n times around the screen

Relative Mode

In absolute mode, the values entered will alter all resources directly, so for example, a forced X & Y value of 100, 200 in absolute mode will move all resources top left corner to that value as the transform animator comes into scope on the timeline.

In Relative mode shown below, values entered here will be added to any resources on that layer.
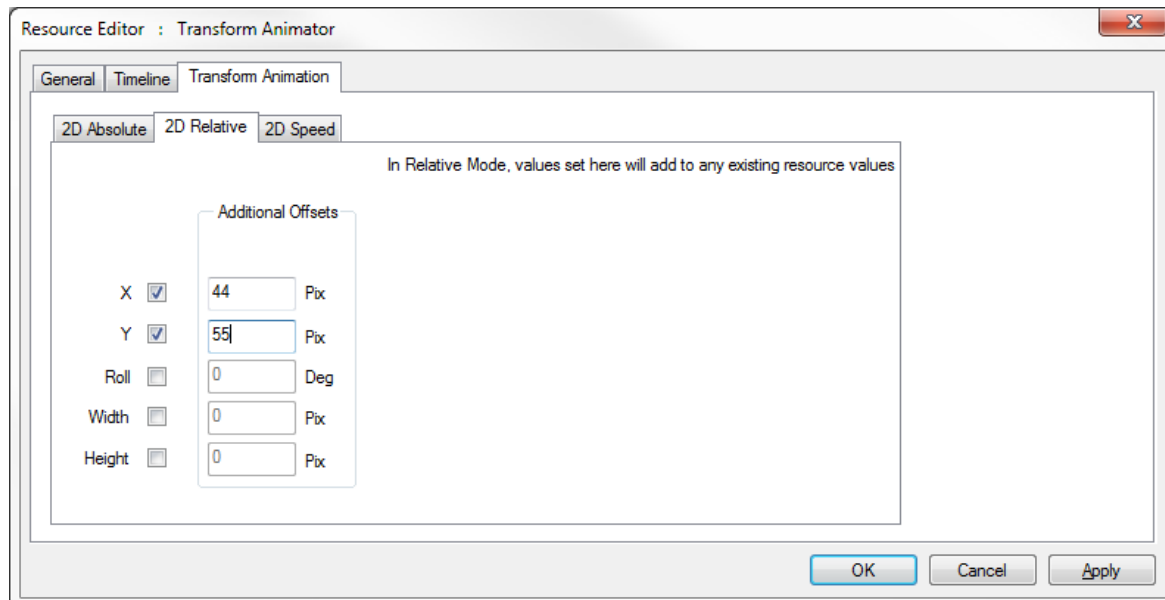
The transform animator's values can be altered from external control, simply call the TRANSFORMPARAMS transformer_name X Y W H R control to set the values.

Speed Mode

In Speed Mode, you can set the speed of motion in both X&Y over the length of the transform animator. This allows you to animate resources onscreen at a known speed and "Ease" in and out of a set speed from another speed or to/from stopped.
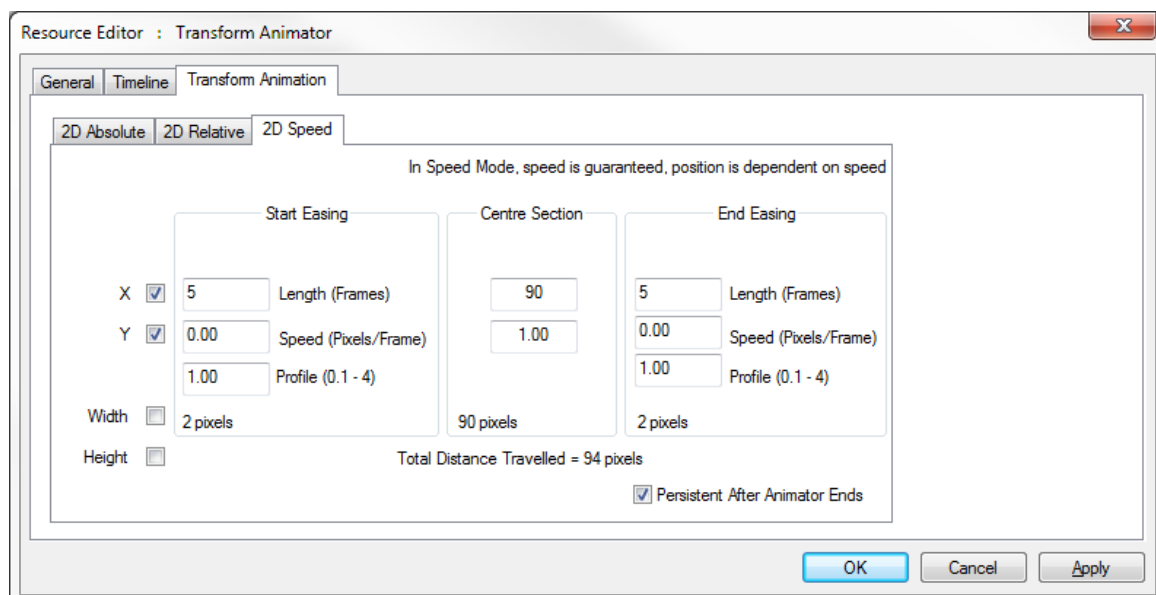
In the example above, the start speed is 0, the speed will increase to 1 pixel/frame (set in the centre section) over 5 frames, maintain that speed for 90 frames, then slow down to 0 over 5 frames. The profile sets the contour of acceleration and deceleration.

ArtNet & DMX resources

This resource can be an Input or Output, and you can edit a subset of the parameters compared to the main Artnet & DMX editor.

Output Device
Set the channel values, base address, fade time & tweening for this one resource.
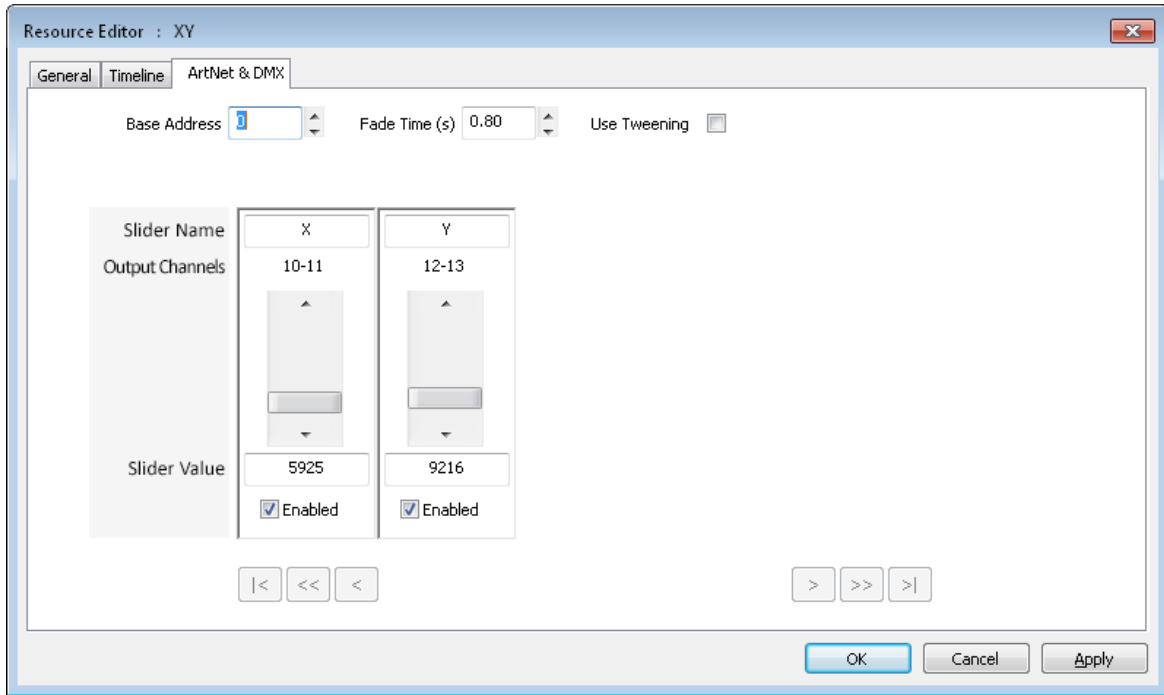
Input Device
Set the Control Message, SubNet, Universe.

Note that setting Slider Values is only here for testing, since the incoming ArtNet data will set these values & trigger the message on any change in value.
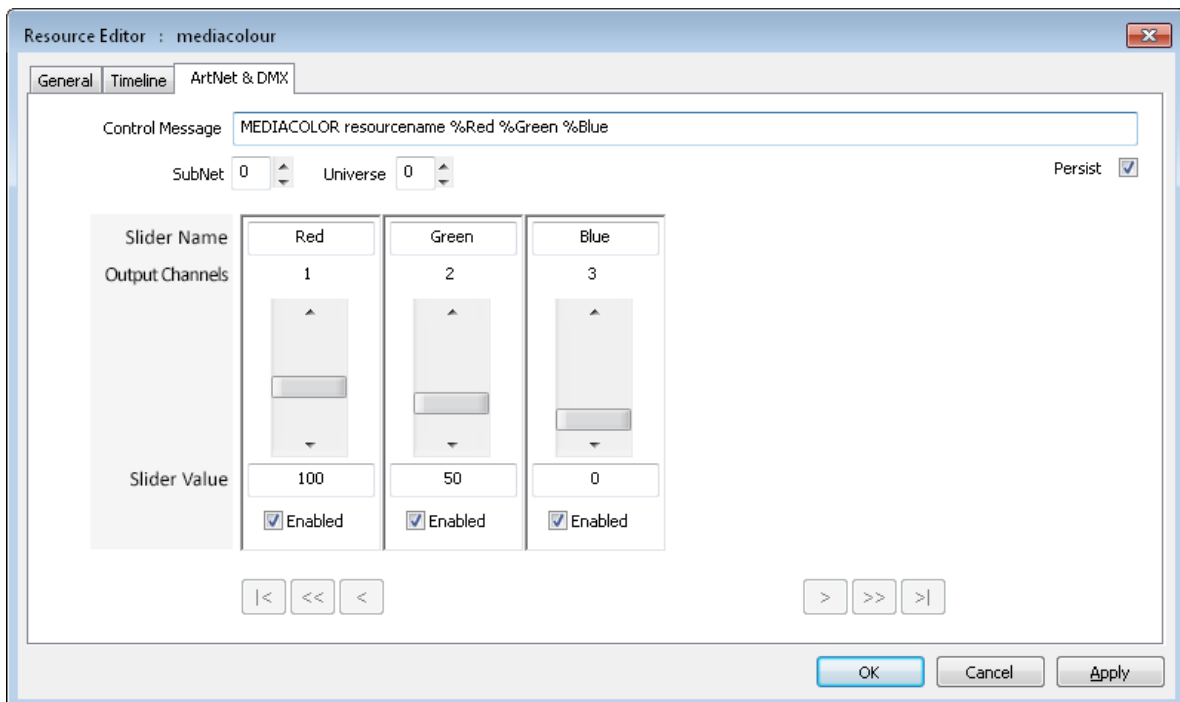
DISABLE, LOCK OR DELETE MEDIA

To **Disable a resource** on the timeline, simply Right-click on the resource and select Disable (or Enable if it is disabled).

You can also select its properties and choose Disable from the General tab.

Right-click here to edit this resource

Right-click here to disable or lock a layer

Right-click here to disable all resources of this type on Layer 1
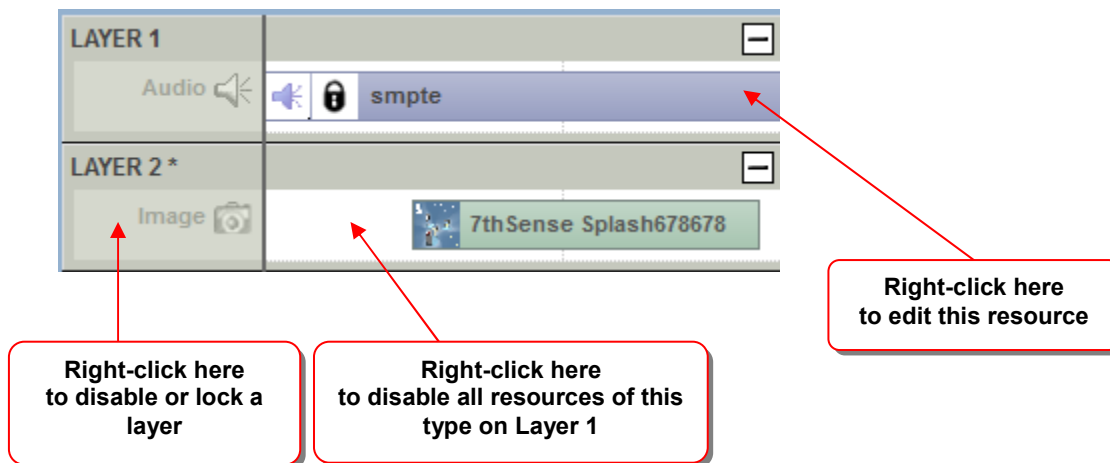
Disabled resources act as if they are not present on the timeline, and are drawn in light grey.

To **Disable an entire Layer**, right-click on the Layer area outside a resource, and select Enable or Disable;

From this menu, you can also **Delete an entire layer**, collapse or expand a layer, or insert padding space or cut space at the current cursor position.

To **delete a resource**, Right-click on the resource and select either Delete this Resource or Delete all Resources of this type on the layer. You can also drag the resource to the trashcan.

Locked resources behave as normal, except you can not select them or move them in the GUI until unlocked. A lock icon 🔒 shows up when this is active.

To Lock a resource or layer, right click and choose lock / unlock.

To **Split** a Movie, Video Capture, Text resource or Audio file, right click and press Split. This will create two resources where the timeline cursor is located which are contiguous in time, so until you move the second movie / audio file, it will still play with no gap. This function can be used to align separate parts of movies or audio files to help in synchronising content.

To Cut a visual resource, choose **Cut Left from Cursor** to remove all parts of the resource to the left of the cursor, or **Cut Right from Cursor** to remove parts to the right.

To **Align** resources, rubberband around multiple resources, then right click & choose align left or right.

To **Concatenate** resources, rubberband around multiple resources, then right click & choose Concatenate left or right.

OUTLINE MEDIA

Outlining is a temporary moving edge around a resource which can be used to locate a resource onscreen in a complex show, or simply show the edge of (for example) an image used as a mask

To **Outline a resource** on the timeline, simply Right-click on the resource and select Outlined or No Outline.

You can also use the right click context menu on a single or multiple selected resources to Outline or Clear Outlining

PRESETS

You can save a resource from the timeline as a preset, with all its configuration saved so that later, you can drag that preset back onto the timeline.
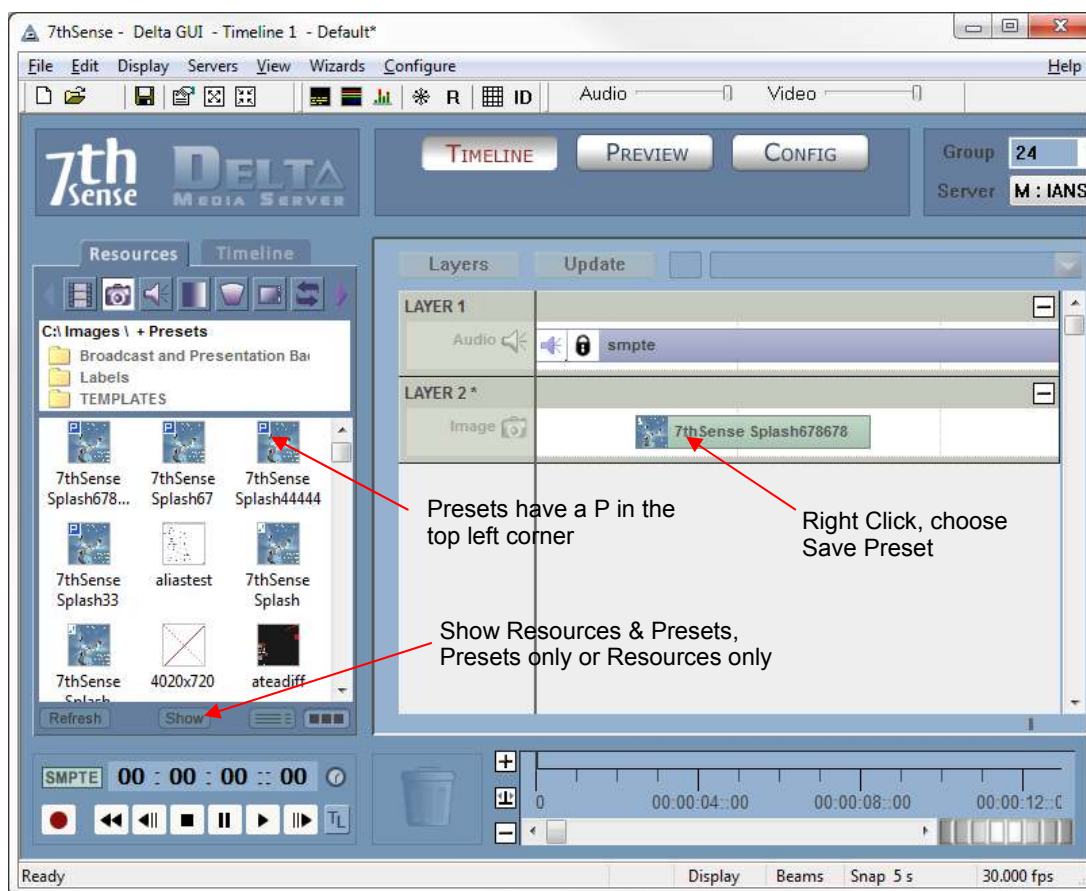
Presets are available for Movies, Images, Audio, Serial Events, Text, Video Capture and are stored in the C:\Presets folder as CLP files. These are shown in the resource pool with a small blue P in the top left corner.

You can delete a preset from the resource pool by right clicking in the resource pool and selecting Delete.

You can filter the resource pool to only show presets, only non-preset resources or all presets and resources by pressing the Show button in the resource window and choosing that option.

Geometry, Blends, Colour, Splines all still save their presets (in the relevant Config page) to the relevant folder on the C: drive as before.

SPLINES

On the Splines editing page, you can select any of the pre-defined shapes from the Resource Pool and add them to the timeline as with any other resource.
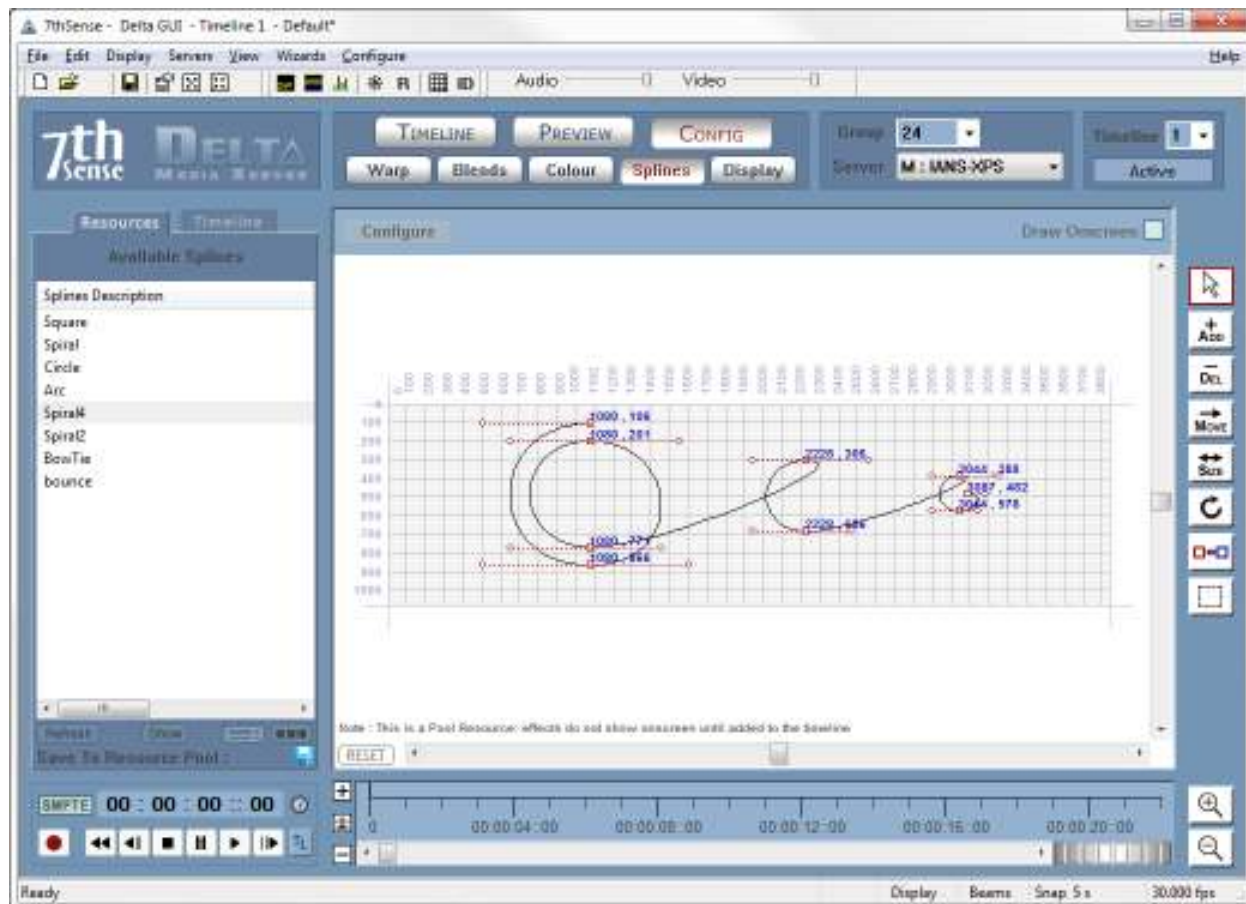
You can select the spline in the Timeline tab of the resource window, then using the controls in the right panel, add nodes, remove them, move nodes and control nodes around until the shape is as required.

Controls

Move a node or control node (Press the Control key to restrict movement in X or Y)
+ ADD	Add a node to the end or insert a node in the middle of a spline
− DEL	Delete a node
→ MOVE	Move the entire spline
↔ SIZE	Resize the entire spline
C	Rotate the entire spline
□↔□	Toggle a node from symmetric control nodes to separated control nodes
⬚	Rubber band selection of a number of nodes (Press the shift key to add to the selection)

Note you can also zoom in & out using the mouse wheel.

Zoom Into the canvas

Zoom Out from the canvas

In certain modes (Move, Delete, Toggle Node Type), dragging on an empty part of the canvas allows you to drag the canvas around to navigate more easily.

Draw Onscreen
With this checkbox selected, the spline path will be shown in the playback window if the spline resource is in scope on the timeline. In addition, the selected spline will be drawn brighter than any other spline also in scope at the time.

Configure Menu
Reset Spline Location : This will move the spline so that the first node is at 0,0 in order to put it back on the canvas – it does not change the shape of the spline

Limit Bezier to Canvas : This will move any node which is off the canvas onto the canvas – note that this will change the spline shape.

Show Node Coordinates : enables the drawing of the pixel coordinates of all nodes

Show Node Order   : enables the drawing of the node order

Mirror Spline   : mirror the spline horizontally or vertically

Rotate Spline   : Rotate 90 Clockwise, 90 Counter Clockwise or 180 degrees.

Show VCR Controls   : Show the VCR controls to enable moving the play head.

Snap   : Enable or disable snapping points to the grid.

Reset Button
Resets the view so that the canvas is shown fullscreen

Copy to Resource Pool
This button in the resource window allows you to alter a spline, then save it to the \Splines folder as a template for future use.

Undo / Redo
Pressing Ctrl-Z will Undo and Ctrl-Y will Redo up to the last 20 changes to each spline

Note that Splines only work in Flat canvas mode (not Frustum Mode)

Spline Timing
By default, the spline is set to Equal-Timed mode, where the total time of the spline is split equally among the number of nodes in the spline, which means the speed between nodes is dependent on the distance onscreen between the nodes.

In Node Timed mode, you can edit each node and change it's time along the node, giving fine control over speed.

The two modes are shown differently on the timeline, with Node Timed spline showing the time of each node as a tick mark descending from the spline box, and Equal Timed spline showing the tick mark within the spline body;
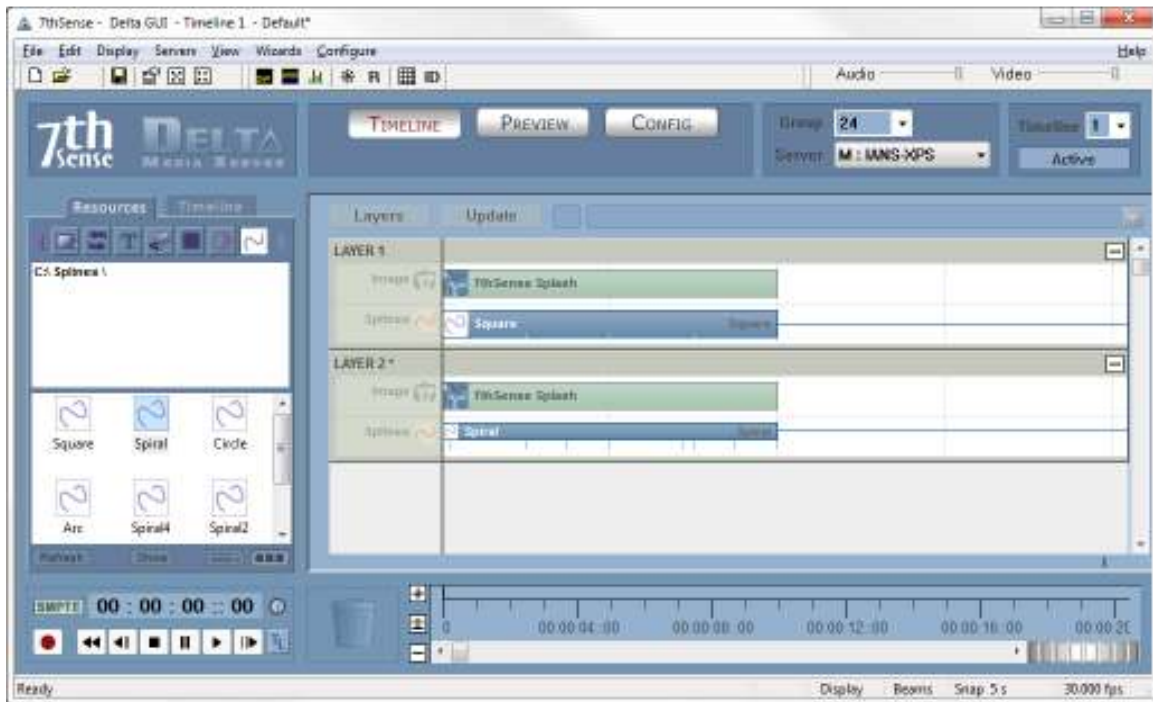
To change modes and edit the node time, right click, select Properties and then Spline Properties;

To edit the node times, select Node Timed from the drop down, then double click one of the nodes to edit the node location onscreen or the time of that node. Note that a node cannot be set later than the next node or earlier than the previous node and that the first & last nodes are fixed at 0% & 100%.
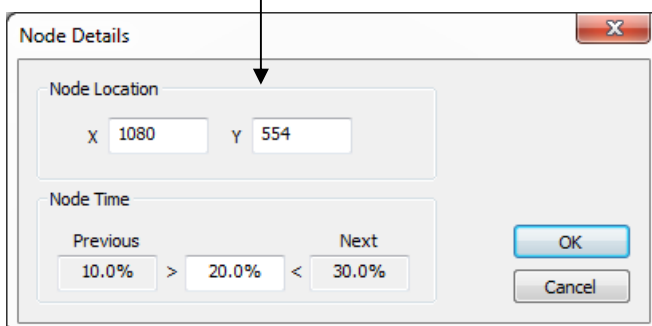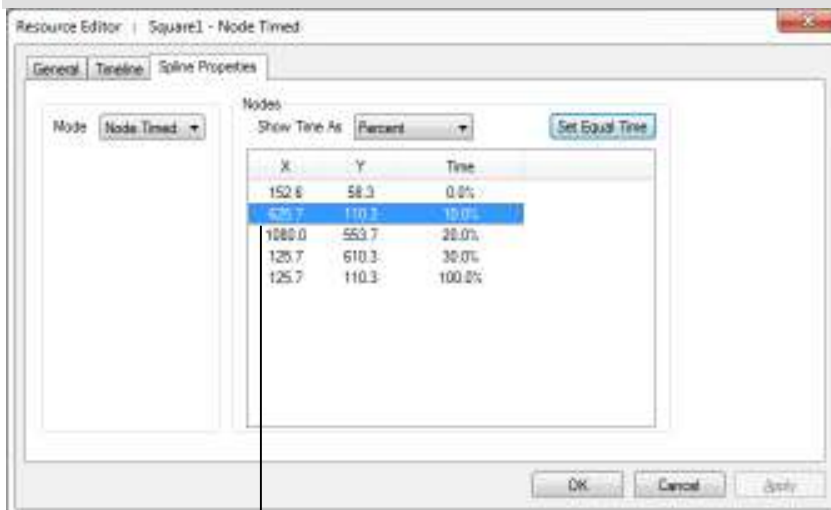
MULTIPLE TIMELINES

Delta can have multiple timelines which are independent of each other within the same server. This allows you to create and present timeline 1 to the audience while editing timeline 2 in the background, then smoothly crossfade between the 2 timelines. You can also use other timelines for purely audio or as control timelines for Serial Events.

Access the timelines dialog with **Ctrl T**, or from the TL button in the bottom left of the GUI or View Timelines from the menu.

This brings up the timelines dialog from where you can change the opacity of all the timelines, configure how many live timelines you have and play/stop/cue individual or all timelines.
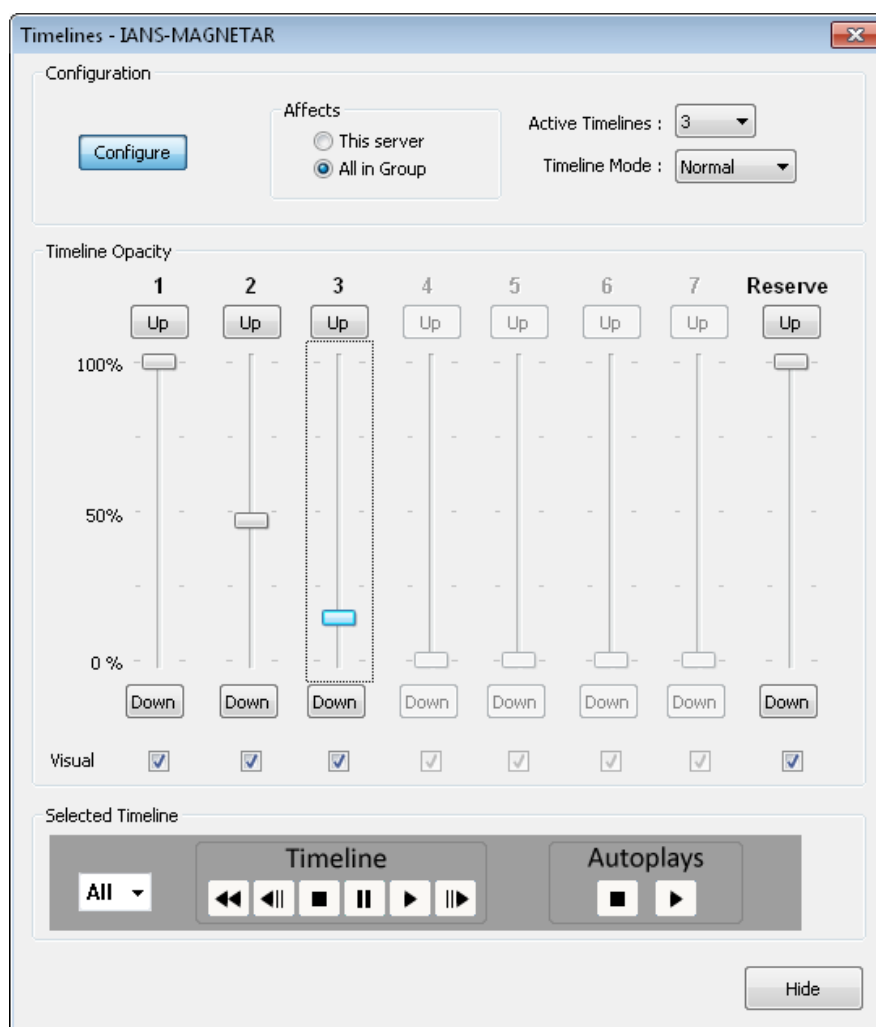
Pressing **Configure** activates the controls at the right of the dialog. You can now choose how many active timelines you need (Not Delta Nano). Timeline Mode can also be set here from these choices;

Normal   : Higher timelines (1 is the highest) obscure lower timelines and the opacity values set the opacity of the entire timeline.

GlobalZ   : Layers across all timelines are Z Order, so layer 1 on any timeline is higher than layer 66 on any other timeline.

Composite   : Same as Normal, but with a transparent background between timelines

Affects   : Choose This Server for one server only, or All In Group where opacity sliders will affect all servers in the group.

You can also set a timeline to be Visual or not with the checkboxes below each timeline – Visual timelines increase rendering load, so you may have a non-visual timeline for audio only for example which does not add to the load.

VCR Controls
You can select All, 1-7 or R for the play/stop/cue controls etc
You can also Stop or Play all movies set to Autoplay in the selected server or all servers.

Timeline Up/Down buttons   : Pressing these triggers a 1s up or down timeline opacity fade.

RESOURCE LAYOUT

Choose View - Resource Layout from the menu to access this window which shows a 2D basic representation of the Flat canvas and resources, enabling you to move and resize visual resources (Movies, Images, Text and Video capture) directly on the canvas.

Note that this only works in Flat modes (including Mesh Mode), not Frustum mode.
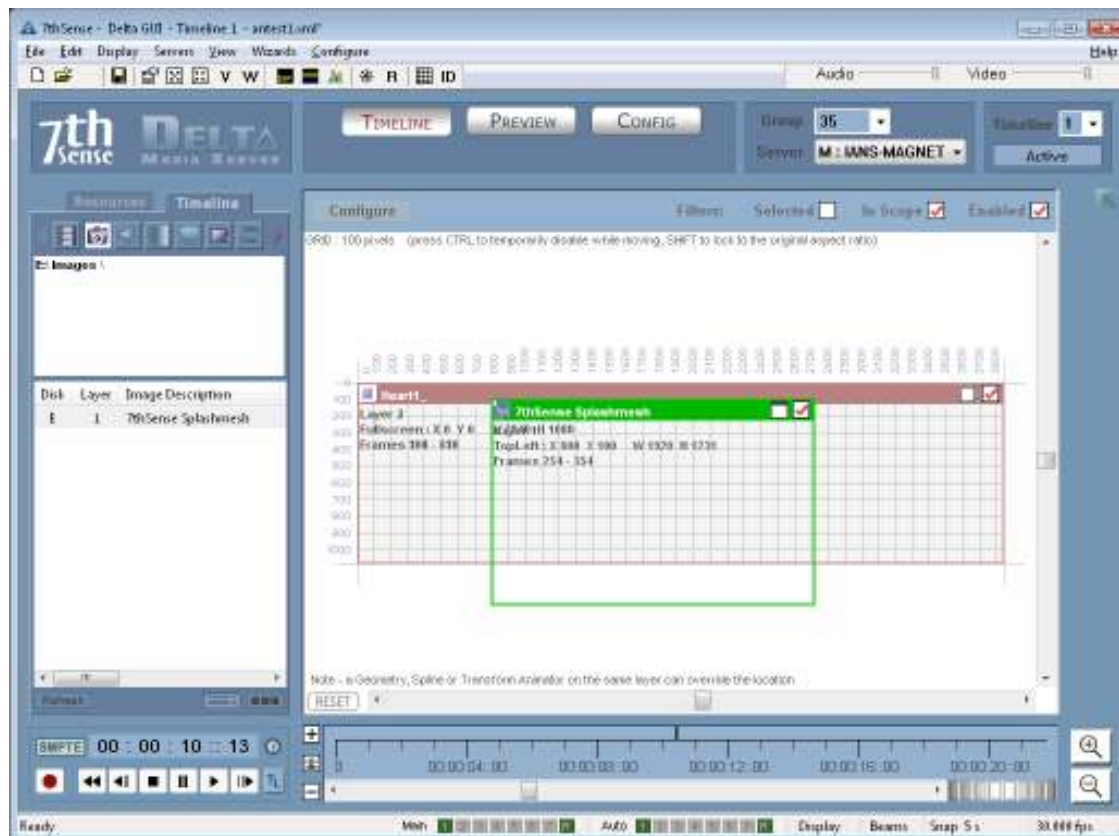
Drag resources from the resource pool on the left onto the canvas. Resources are initially fullscreen by default, so click the maximize / windowed button to allow resizing & moving.

Click the Enable tick-mark in each window's top right corner to enable or disable that resource.

Filters
Choose *Enabled* to only show enabled resources

Choose *In Scope* to only show those resources which are visible at the current timeline time.

Choose *Selected* to only show one resource at a time in the layout window so that you can work with overlapping resources – simply choose the resource from the left resource window, then you can move that single resource. The resource will also be Outlined automatically once selected, and all others deselected for outlining.

Configure Menu
Draw resources as Solid : If disabled, the resource windows become see-through, allowing you to move a resource which is on a lower layer.

Draw resource details   : Show the resource layer, coordinates within the resource window

Draw resource controls : Show the enable / maximize control in each resource window.

Show VCR Controls   : Show the VCR controls to enable moving the play head.

Snap   : Enable or disable snapping points to the grid.

Reset Button
Resets the view so that the canvas is shown fullscreen

Other controls
When resizing, hold the Shift key down to lock the resource to its original aspect ratio.

When moving or resizing with the grid on, press the Ctrl key to temporarily ignore the snap function.

The mouse wheel will zoom in / out about the cursor within the layout window.

Notes
- Enabling a movie while playing may not work depending on the disk system

- The position the canvas as shown may not represent the true position as seen in the server playback window, since other resources (geometry, spline, transform animator) can override the position set within the resource.

- Once a resource is selected, also move it with the arrow keys, and press Control while using the arrow keys to move by 10 pixels a time.

SEQUENCES

Sequences are user-editable macros which can be called at any time from the GUI or via external control. They are useful to assemble a list of commonly used playback controls, for example;

Sequence Test1
Stop
Rewind
Reserve On
AudioLevel 0
Play
Delay 1s
Reserve Off
Delay 10s
GlobalAudioFade up 5s

This sequence stops playback, puts reserve mode on, so the background only image is shown, then plays, waits 1s before fading up to the content. 10s after that, the audio level is faded up.

The Sequence Editor is found in the GUI on the menu, under View – Sequence Editor

Edit Sequences
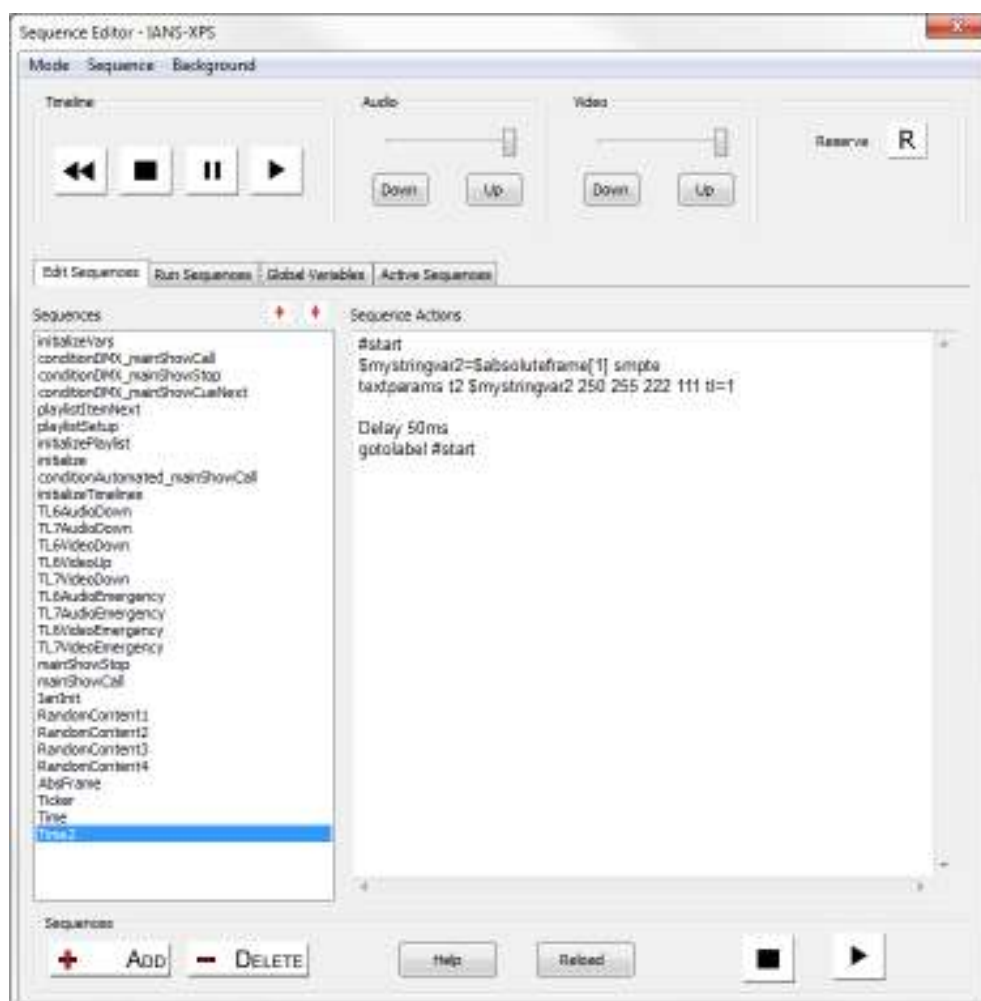
From here, you can control the timeline, the video & audio levels, whether to go into reserve mode, add or delete sequences, and edit the content of each sequence. By default, sequences are held in the Sequences \ Sequence.xml file.

A full list of sequence actions is in the **Help dialog** of the **sequence editor,** but in general, the list is the same as the external control command set with a few additions;

EYEGOTOXYZ x y z	Move the interactive mode eyepoint to X Y Z (in mm)
EYEGOTOXYZAZEL x y z h p r	Move the interactive mode eyepoint to X Y Z (in mm) Azimuth and Elevation (in degrees)
DELAY time	: Delay the sequence for the amount of time specified. This can be written as 1000ms, 1.2s or 100f for 100 frames.
SENDASCII text telnetport	: Send this text out of the telnet port.
SENDASCIIUDP ipaddress port ascii	: Send the ascii string to the ipaddress and UDP port
SENDASCIISERIAL Comport baudrate parity databits stopbits ascii	: Send the ascii string to the Comport.

Version 2 Format
SENDASCII2 data="any text" port=telnetport
: Send this text out of the telnet port, note that it is 1001 for the first connected device on a multi telnet port, 1002 for the second etc.

SENDASCIIUDP2 data=text ipaddress=ip port=theport
: Send the ascii string to the ipaddress and UDP port

SENDASCIISERIAL2 data="any text" port=theport baudrate=thebaudrate parity=p databits=n stopbits=s
: Send the ascii string to the Comport with the parameters specified

Examples
SENDASCII2 data="some text \x0d" port=1002
SENDASCIIUDP2 data="some text \x0d" port=1002 ipaddress=10.100.101.102
SENDASCIIUDP2 data="some text \x0d" port=$myport ipaddress=$myipaddress
SENDASCIISERIAL2 data="some text \x0d" port=COM2 baudrate=38400 parity=n databits=7 stopbits=1

TESTPATTERN name	: Chequerboard, greyscale, white, grid or normal
BEAMS [r g b rg rb gb rgb]	: Set the overall beams
GEOMETRY [on/ off]	: Set the overall geometry on or off
BLENDS [on/ off]	: Set the overall blending on or off

Sequences can be called from external control via the Sequence or SequenceAll command, you can also list the available sequences using ListSequences, and reload them using ReloadSequences.

Run Sequences

By choosing Run Sequences from the Sequence Editor, a set of 100 buttons are presented in 5 pages.

You can set each one to any of the available sequences for immediate use. In addition, using the Background – Load menu, the background can show a different bitmap (.BMP only) file behind the buttons, allowing you to customise the look of each page. This bitmap only shows when the Lock checkbox is selected.
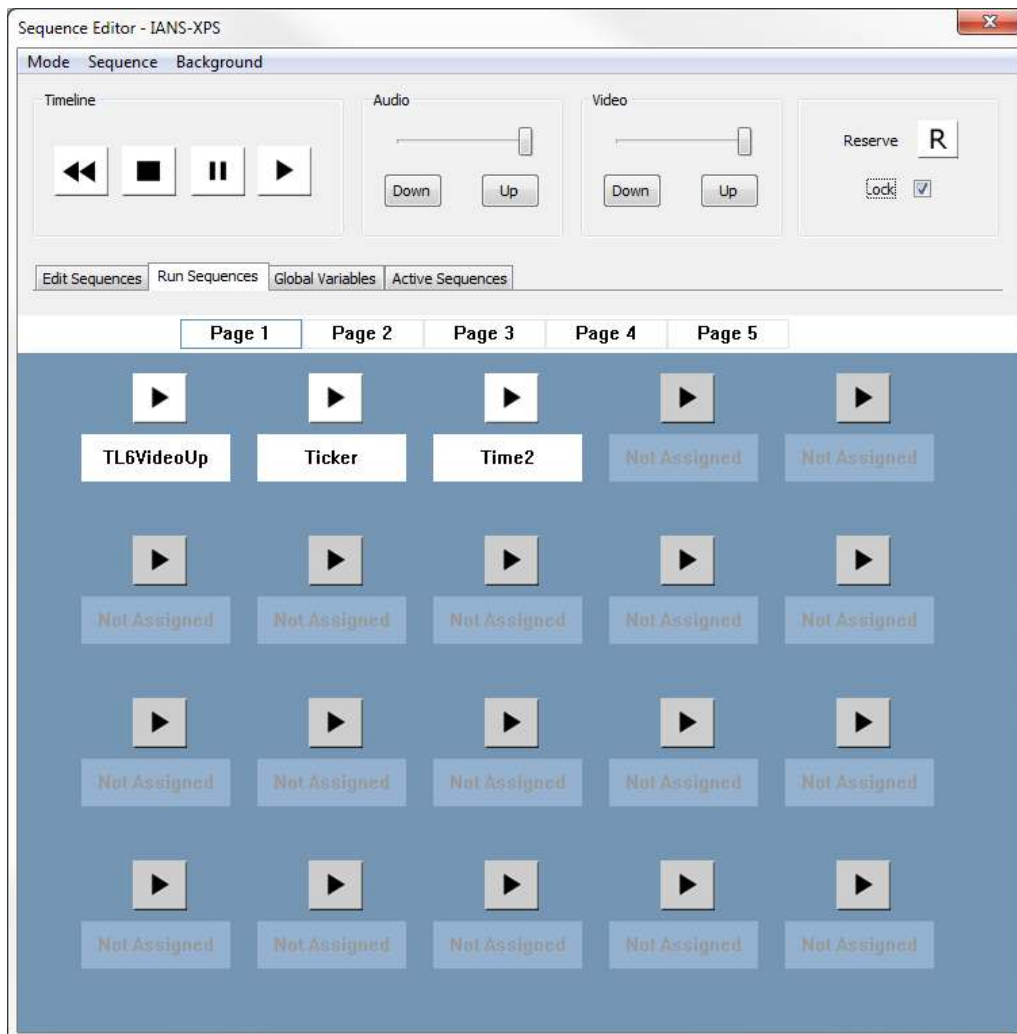
Global Variables
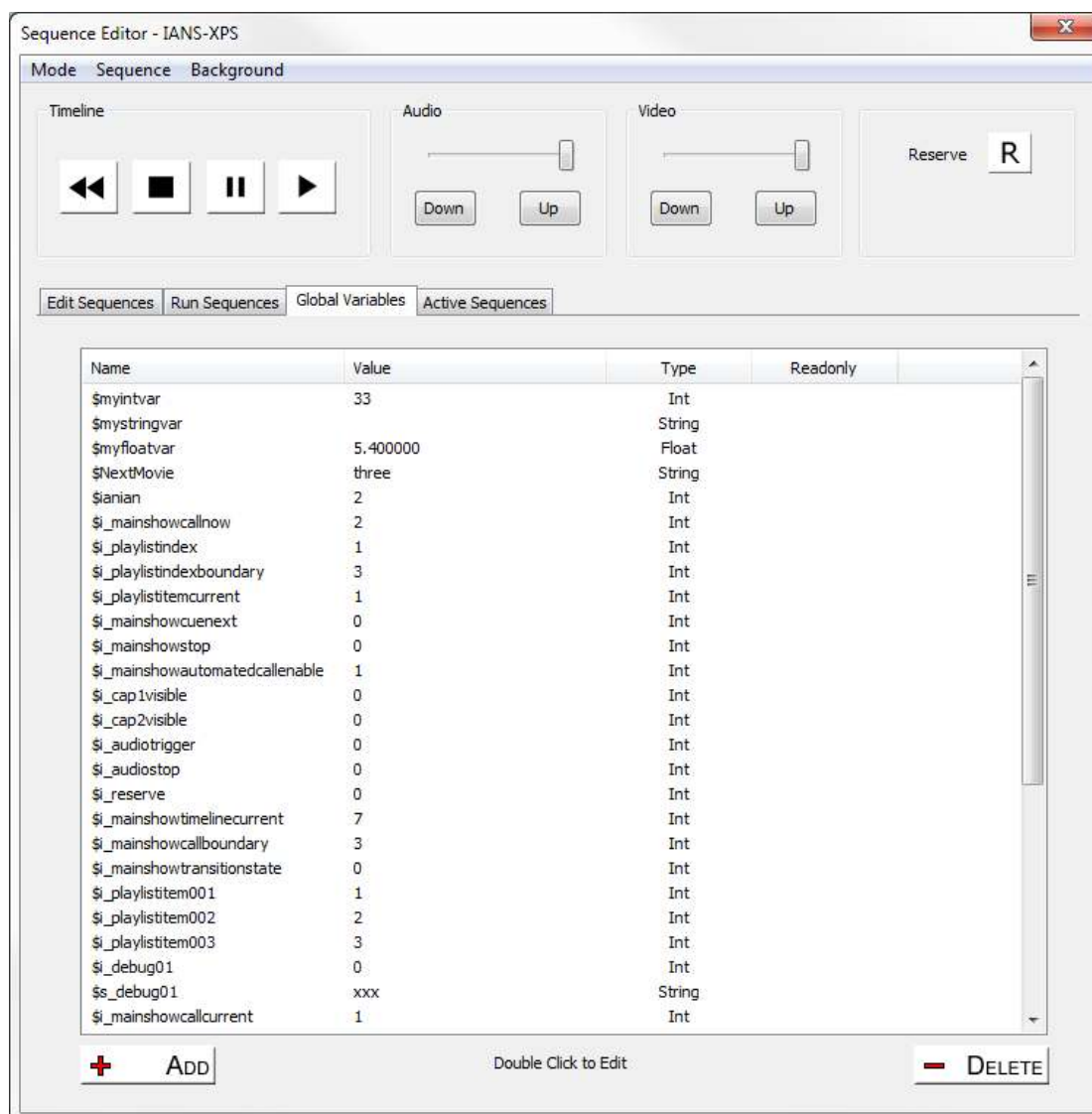
The sequence editor has a built-in language interpreter allowing you to write complex sequences using variables and conditions.

From this page, you can add, edit or delete global variables, which are created in the server and are persistent after the server quits. You can choose any name for the global variable, and it can be one of the following styles;

Int   : whole number, value in the range -2147483648 to +2147483647
Float   : floating point , 1.17×10^{-38} to 3.4×10^{38}
String   : Character array, up to 128 characters in length.

Variables can be used in sequences to control playback or media, for example this sequence creates & initialises a global variable (similar to adding via the dialog above) to keep track of which timeline is active;

Sequence **InitialiseVars**:
      globalvar $i_ WhichTimeline = 0

This sequence then uses these variables to control show playback when the sequence is triggered (from external control, from the timeline or from the buttons in the sequence editor).

Sequence **ShowControl**:

```
if ($i_ WhichTimeline =1)
  {
  play tl=2
  sequence TL1AudioDown
  sequence TL1VideoDown
  delay 1000
  stop tl=1
  $i_ WhichTimeline =2
  }
else
  {
  play tl=1
  sequence TL2AudioDown
  sequence TL2VideoDown
  delay 1000
  stop tl=2
  $i_ WhichTimeline =1
  }
```

This sequence interrogates the $i_ WhichTimeline variable and if it is 1, plays timeline 2, triggers off other sequences which fade down timeline 1, then stops timeline 1 after a delay. It then sets the $i_ WhichTimeline to 2 so that the next time the same sequence is called, the Else part is called to reverse the actions and start timeline 1 while stopping timeline 2.

A further example is a realtime clock, where a text resource is placed on the timeline and this sequence is triggered (once only, since it keeps running) to update the text resource contents with a string representing the current local time;

Sequence **RTC**:

```
#start
$mystringvar2=$currenttime
textparams MyRTC $mystringvar2 150 255 255 0 tl=1

Delay 500ms
gotolabel #start
```

In this sequence, the $mystringvar2 is a String type variable (previously created in a sequence or the editor), and it is set to the reserved variable "$currenttime" which fills it with for example 10:20:41. The Textparams command then sets the resource named "MyRTC" to this value and the text size is 150, the colour is 255,255,0 (yellow) and the timeline is 1.

Code Syntax
```
// --- Comments -------------------
        // Can have full line comments like this or
        $myvar = 2    // after the code comment

// ---- Comparison -------
        valid tests  =   !=   and    or   <   >
        if ($myvar = $myvar2)
        if ($myvar = 2)
        if (2 = $myvar)
```

```
if ($myvar > $myvar2)
if ($myvar and 2)
if ($myvar!=2)
and,or only work on Int type variables
Greater to or less than work on int or float type variables
```

// ---- Addition, Subtraction, Multiplication, Division -------
```
$myvar = $myvar2 + $myvar3
$myvar = $myvar2 + 2
$myvar = 2 + $myvar2
Above lines can use + - * /
```

// ---- Create Global Variables -------
```
Global Variables can be int, float or string
globalvar $myintvar = 1
globalvar $myfloatvar = 6.54
globalvar $mystringvar = "movie"
globalvar $myintvar = 1   readonly
Adding readonly will create a variable at that value, which will
not be written to the registry thereafter
Creating a global var which already exists will do nothing
```

// ---- Set Global Var -------
```
$myintvar = 12
$myfloatvar = 16.54
$mystringvar = "movie2"
$myvar = $myothervar
```

// ---- Special Variables -------

$myvar = $seqrandom[4,40]   Sets $myvar to a random value between 4 & 40

$myvar = $absoluteframe[2]   Sets $myvar to the current absolute frame of timeline 2

$mystringvar = $absoluteframe[1] smpte   Sets $mystringvar to the current absolute frame in smpte mode of timeline 1

$mystringvar = $absoluteframe[1] digits=5   Sets $mystringvar to the current absolute frame formatted to 5 digits where possible

$mystringvar = $currenttime   Sets $mystringvar to the current time of timeline 2

$mystringvar = $currentdate   Sets $mystringvar to the current date in dd/mm/yyyy

$mystringvar = $currentdate usa   Sets $mystringvar to the current date in mm/dd/yyyy

$replacevarmode = [0/1]   0 is the default search replace mode, 1 is a simple string replace mode

// ---- Special Keywords-------

$persistsequence   Adding this keyword to your sequence will call this sequence to persist through filenew/open.

// ---- Increment / Decrement -------
```
$myval++
$myval--
```

// ---- Conditional Branching -------
```
if (condition)
// Do something
else
// Do something else
```

Multiple if or if-else blocks are allowed, no nesting is allowed

```
// ---- Jump to lines ----
#start     // label is designated by #
$myintvar = 12
if ($myintvar>0)

$myintvar--
// do something 12 times
gotolabel #start
```

Active Sequences

Sequences that are running are shown in this dialog. When you run a sequence, it is given a unique name of SequenceName_X where X is an internal counter. To cancel a specific sequence, for example call CANCELSEQUENCE Time_0 from the list below. To cancel all sequences, call CANCELALLSEQUENCES.

Note that this list is updated every 1s.
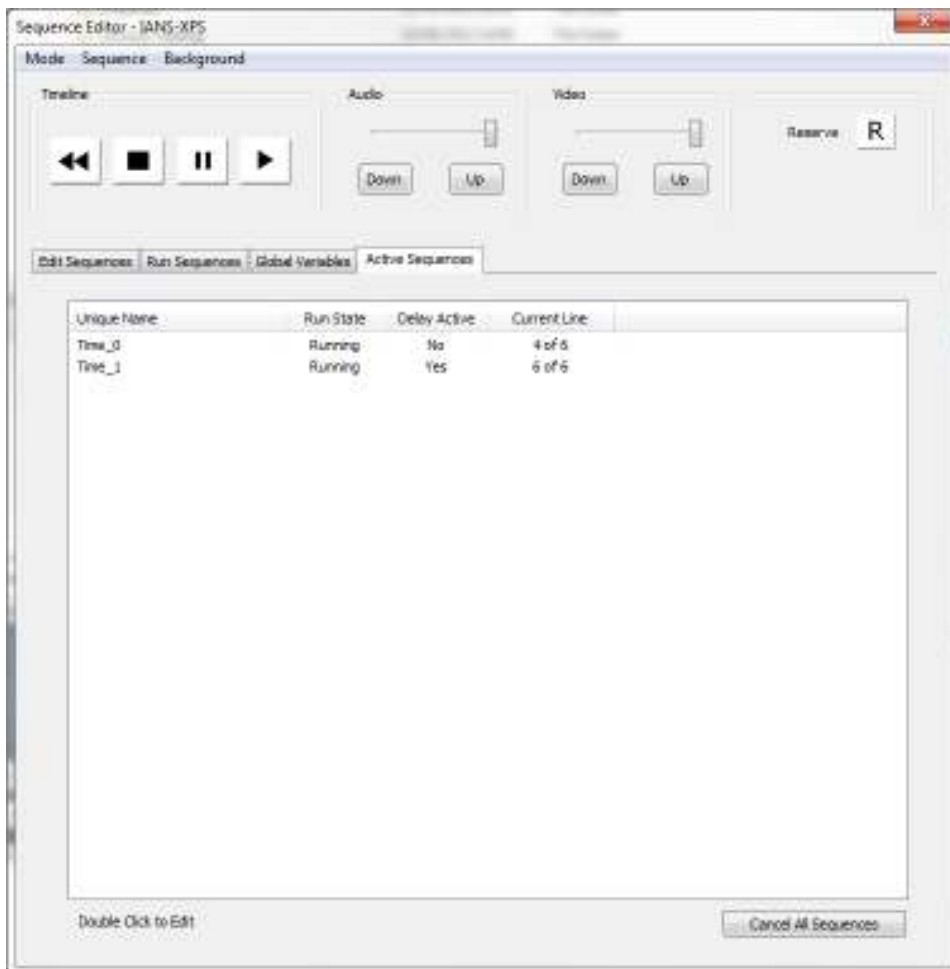
VIDEO CAPTURE

Video Capture is an option within Delta, which can use a variety of video capture hardware, from single-channel high-update rate cards, dual channel medium update cards and inexpensive web cams. Any video capture device, which implements a proper DirectShow filter, will work with Delta.

Video Capture windows shown in the resource pool can be placed anywhere on the timeline, and shown multiple times simultaneously, allowing video-wall type effects to be created.

A Capture window can be manipulated in exactly the same way as other image-based resources, so for example, geometry, morphing geometry and transparency can be applied or changed at any time.

Notes
- Video capture can be an intensive task, so if you are playing a high-resolution movie at the same time as showing a capture window, the movie may drop frames.

- Some video capture cards require a separate process to create a video definition file. This file is then selected when you edit this resource.

- Direct Show compliant capture cards can be tuned using their own control applications, so to choose PAL / NTSC, deinterlacing or setup colour etc, this must be done in the manufacturer supplied application. Alternatively, use the **Video Capture Tuner** program to launch the devices setup pages.

- Most video capture devices will choose a best fit format to match the incoming video. Some do not, so you can select the video format from the resource's drop down list when editing.

- MMS Video capture will show content from a Microsoft Media Stream. Add this device to the timeline, then configure the IP Address of the source.

The capture device can be set to always play at full update, even when the timeline is paused. Configure this in the Configure – Preferences – Timing page.

Video Capture Freeze Group
Capture devices can be assigned to a Freeze Group. For each capture device type, edit the resource properties, and choose Yes or No to the Freeze Group item. When the Freeze Video Capture button in the toolbar is pressed, only those devices, which are set to be part of the freeze group, are frozen.
This allows certain video capture inputs to be frozen while content is changed in the background, before un-freezing.

Note that all instances of a particular video capture device freeze at the same time.

Note : Video Capture device IDs
Some capture devices such as USB webcams can dynamically change the Identifier number assigned by Windows. In this case, fix the capture device Identifiers in the Server Dialog - Preferences – Video Capture.

Deinterlace
For certain capture cards (such as Datapath), you can enable deinterlacing for interlaced inputs, the options are Off, Weave, Bob, Field0, Field1.

WEB RESOURCE

This is a special capture resource which is a built-in web control, where you can set the URL (http://www.mydomain.com) to be rendered in the web control and you can also set the rendering size of the web page using the H Resolution & V Resolution parameters.

Web controls behave like all other visual media in that you can scale, position, chromakey, crop, feather etc.

You can also set the web URL from external control using the WEBSETURL res="External Control Name" url="http://mynewdomain.com" or make the web control navigate using the WEBNAVIGATE res=\"ExternalControlName\" navigate=[back/forward/reload/stop] command.

GEOMETRY

Selecting Warp from the Controls Area brings up the geometry configuration menu.
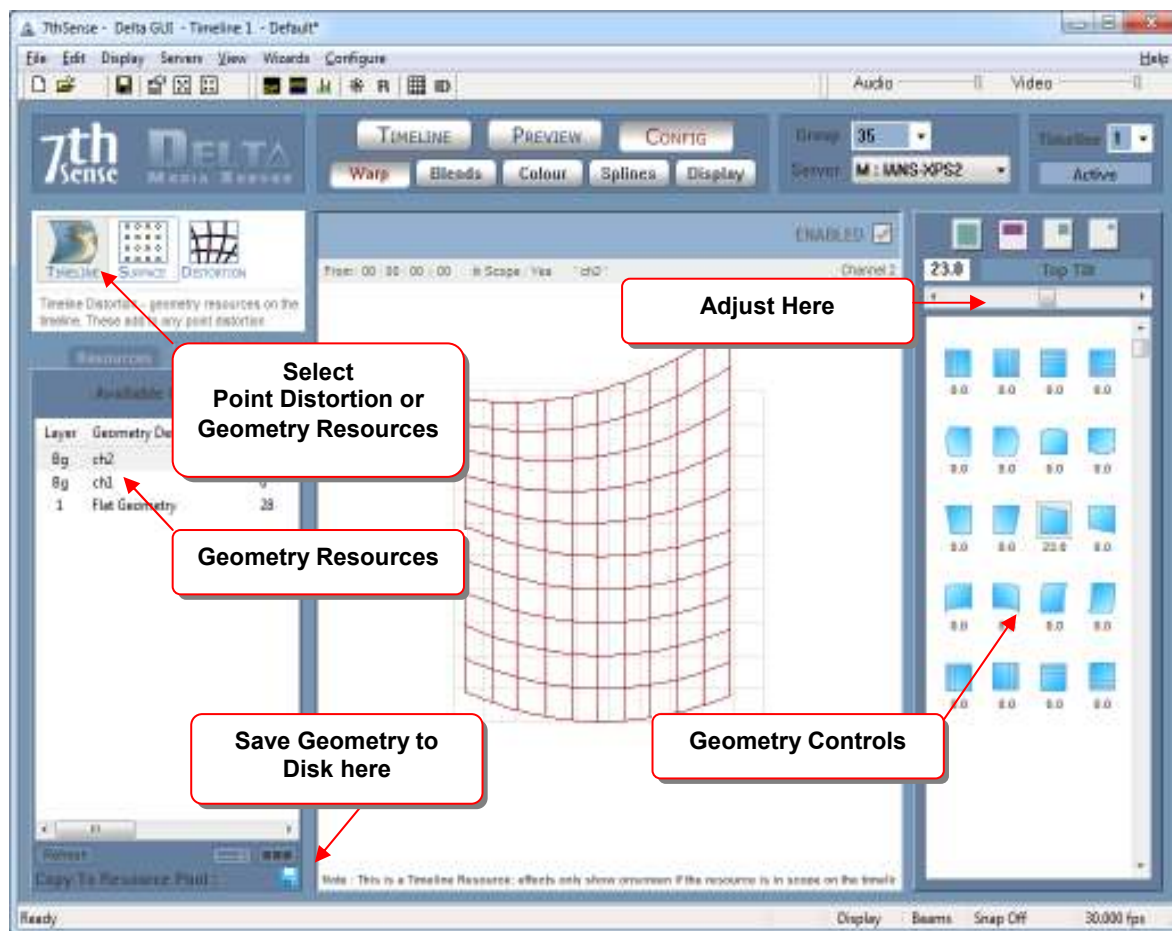
This window allows you to tune both geometric resources, which have been placed on the timeline or point distortion which is assigned to each channel. The mode is selected by clicking on the Timeline / Distortion tab control in the top left corner.

To add a timeline geometry resource to the timeline, select Resources and double-click a geometry resource in the Resources Tab, add it to the timeline where you want, then select it in the Timeline tab, and configure the geometry using the blue controls on the right hand side.

The various icons on the right provide basic geometry tuning of the shape. This shape is changed for the single resource on the timeline if you selected the Timeline tab.

You can have multiple geometry resources on the timeline, which come into scope when the current time passes the start position. If you select that resource to be Morphed, the geometry of that layer (or all layers if it is on the background) will smoothly change shape from whatever is there before to be completely changed to the new shape by the start position.

Using Morphing, you can create nice fly-in / out effects, or shrink content down to size once something more interesting has appeared.

N o t e s
- Editing one of the Resources geometry (not on the timeline): if you change one here, you are temporarily changing the resource pool geometry, but unless you save it using the Copy To Resource Pool button, the changes will be lost when you quit the server.
- The Enabled checkbox is used to temporarily disable geometry so you can see the undistorted image.

Background Geometry

Geometry on the background is typically used to align the Delta image onto the display system, perhaps to correct slight errors in the display, or to make the image geometry correct for a curved screen display system.

Background geometry can also have Fixed enabled – this will auto-reset the start frame of this geometry to frame 0. If Fixed is disabled, you can set the start frame as normal.

Geometric Controls (Global)
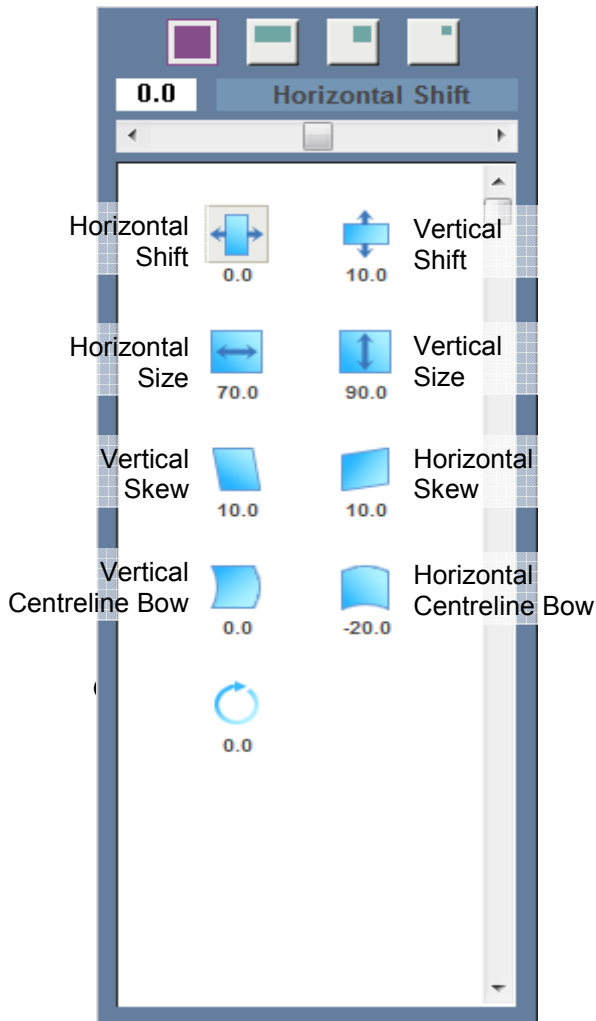
Geometric Controls (Halves)

Cubic Bows

0.0		TL H Bow	

H Top Left Bow — 0.0

H Top Right Bow — 0.0

H Bottom Left Bow — 0.0

H Bottom Right Bow — 0.0

V Top Left Bow — 0.0

V Top Right Bow — 0.0

V Bottom Left Bow — 0.0

V Bottom Right Bow — 0.0

Quadratic Bows

0.0		TL H Corner	

H Top Left Corner — 0.0

H Top Right Corner — 0.0

H Bottom Left Corner — 0.0

H Bottom Right Corner — 0.0

V Top Left Corner — 0.0

V Top Right Corner — 0.0

V Bottom Left Corner — 0.0

V Bottom Right Corner — 0.0
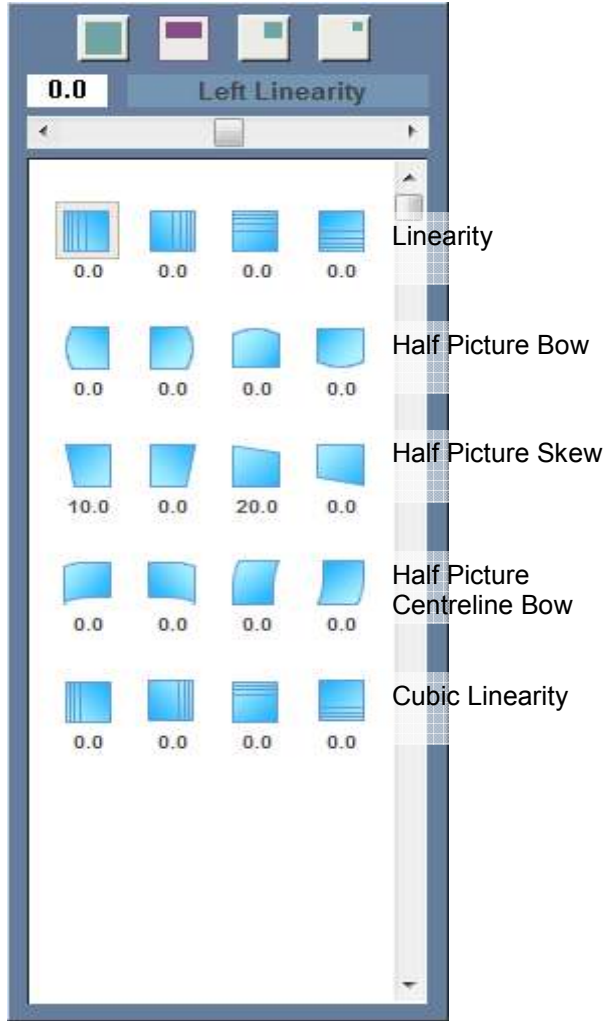
GEOMETRY: SURFACES

Surface distortion is an additional geometric distortion which is built-in to a geometry resource –
you can have normal projector type warps or this mode or both and this geometric resource can be
placed on any layer as well as the background layer, where it becomes Channel based. Point
Distortion is still available on each channel and can be used together with any resource based
mode.

Surface mode is useful for quickly pulling the shape around with a mouse – you can choose the
number of nodes, from only 4 in total, up to a 13 x 13 grid of points by pressing the + / - buttons
followed by the Apply button. Note that the new grid density will follow approximately the shape of
the original node count.
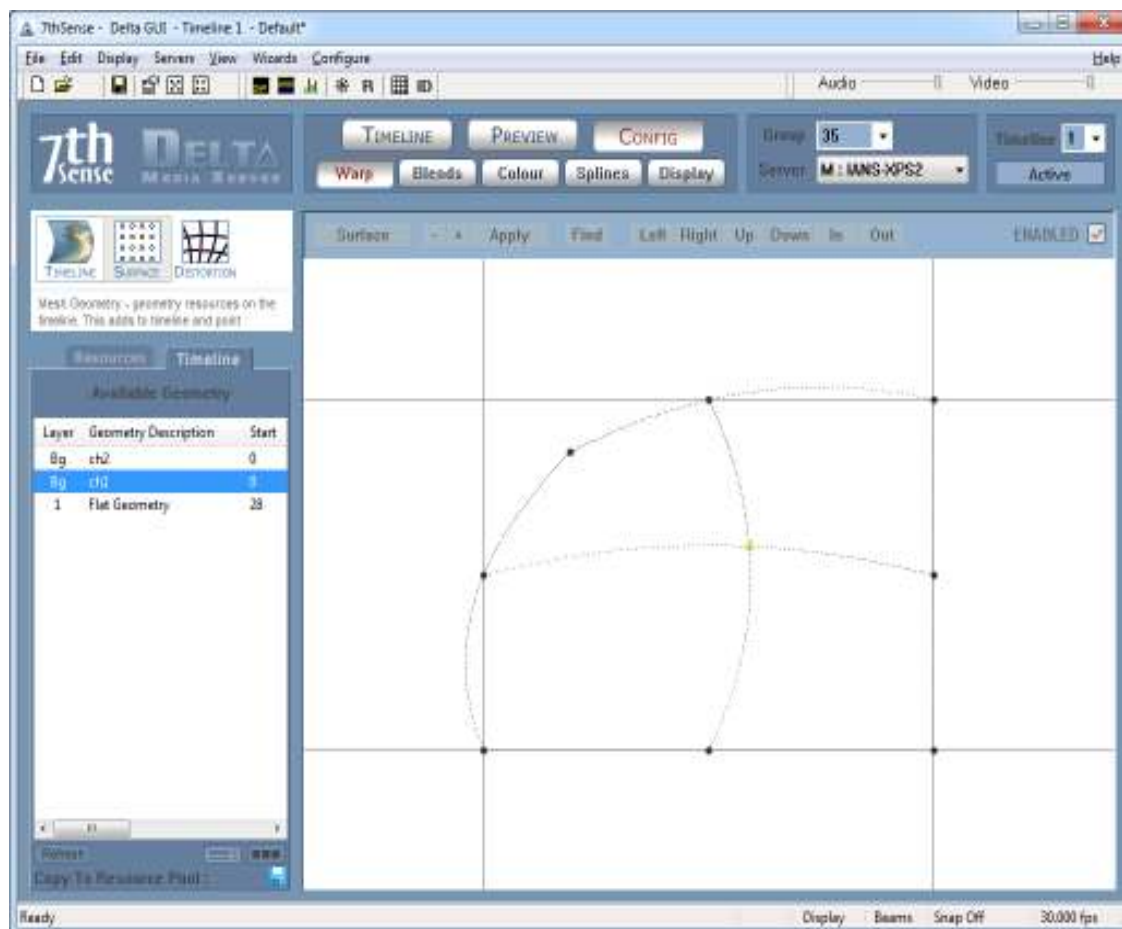
Pressing the Left / Right / Up / Down / In / Out buttons moves your view of the grid – you can zoom
in for very fine control or zoom out to see the whole grid. You can select the node & move it with
the mouse, or use the arrow keys to select a node, then press **CTRL** with the arrow keys to move
the distortion at that node.

With the mouse, you can select one or more points to move – hold control down while clicking on a
new node, then keep control down and move them with the mouse.

Under the Surface button, you can reset a selected point or points, or the whole grid, and also
change from Linear Interpolation (Straight lines between nodes), or Spline Interpolation (smooth
curves). You can also change the dot size onscreen.

To find the active dot's location, even if off screen, press the **Find** button – this highlights the X & Y
lines leading to the selected node. This will disappear automatically after 10s.

GEOMETRY: POINT DISTORTION

Point distortion is an additional Channel based geometric distortion which is typically used in curved screen displays to finely tune geometry.
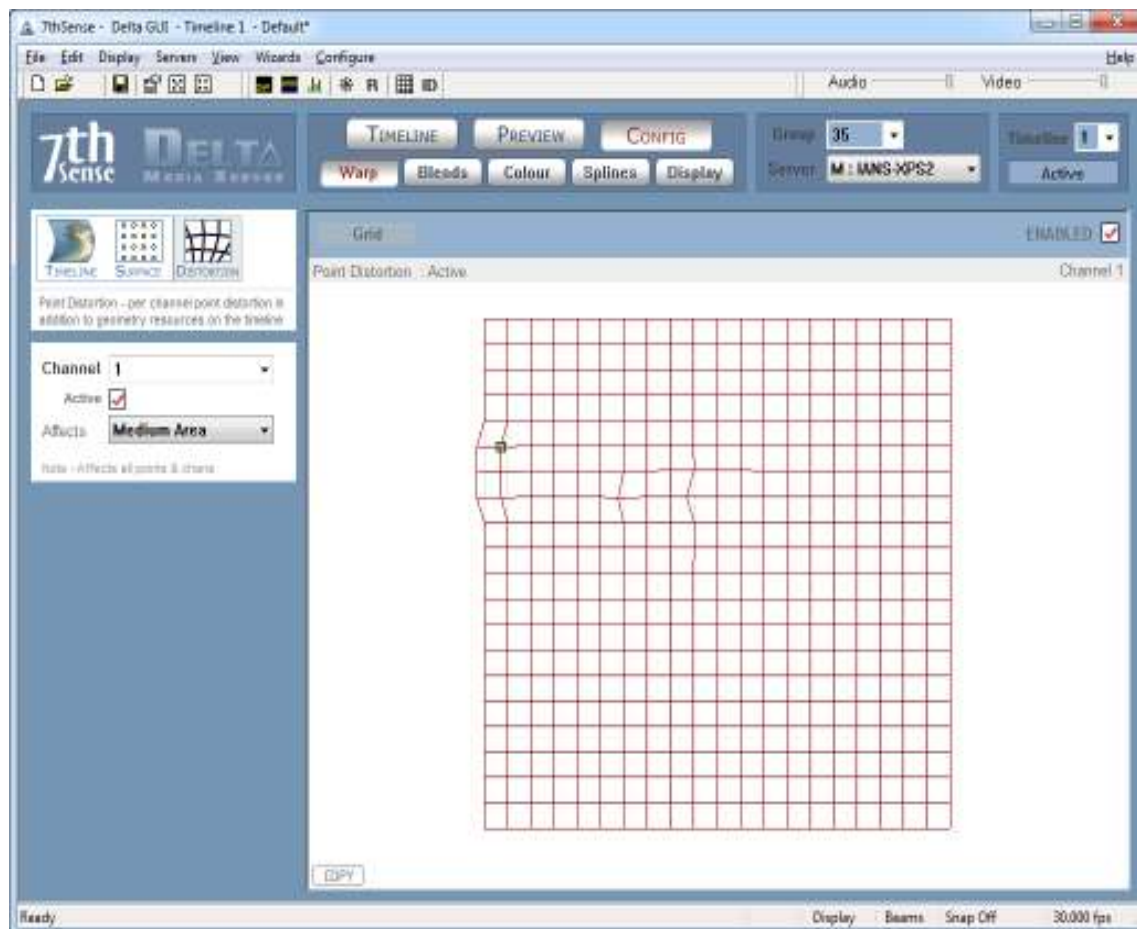
On the Geometry page, select Distortion from the Timeline / Distortion tab control. The GUI now shows a 21 x 21 or 10 x 10 grid of boxes (configurable in the Grid menu)

In the example above, some points in the top left have been adjusted:
- Use the mouse to select the point & drag it to the new location
- Use the arrow keys to select the point, then press CTRL and use the arrow keys to move the distortion of that point.

Note that keyboard control is a more precise way of adjustment.

Onscreen, point distortion is shown as a grid of white boxes, and the selected point is shown in yellow.

Multiple Selection
You can rubberband over a number of points and move them as a group. Also, press SHIFT and rubberband over points to add to the group. While some points are selected (shown as green points in the GUI), pressing Reset sets those points only back to default.

Reset Distortion
To reset a group of points, rubber band over them to select them, then choose Reset – Selected Points from the Reset menu.

To reset the current channel, click anywhere to deselect any selected points and choose Reset – This channels points from the Reset menu

To reset all channels, choose Reset – All channels points.

Copy Distortion
To copy the current channel's distortion to another channel, press the Copy button in the lower left corner and type in the destination channel

From the diagram below, you can see the distorted part of the image in the top left;

Moving a single point smoothly affects those around it to a certain degree so that sharp changes in direction are minimised.

You can adjust the range of influence using the Affects; Small, Medium and Large drop down box. Note that this range affects all points, so choose this value before starting alignment.

Once finished aligning the geometry, return to the Timeline image source using the dropdown control.

Grid Density
You can swap from the default 21x21 grid to an 11x11 grid using the Reset menu – Grid Density item. Note that this will reset all point distortion on all channels on this server to flat

Dot Size
You can choose larger than the standard dot size if the dots are hard to see - Reset menu – Dot Size

N o t e s
- Each channel has an independent distortion map and these are stored in the XML file.
- Medium is recommended for the range of influence for 11x11, small for 21x21.

BLENDING

Delta implements simple edge blending to allow overlapped display systems to be inexpensively blended together to form a single continuous display surface.
Combining edge blending with Geometry, Delta can be aligned to any display system with no additional external hardware.
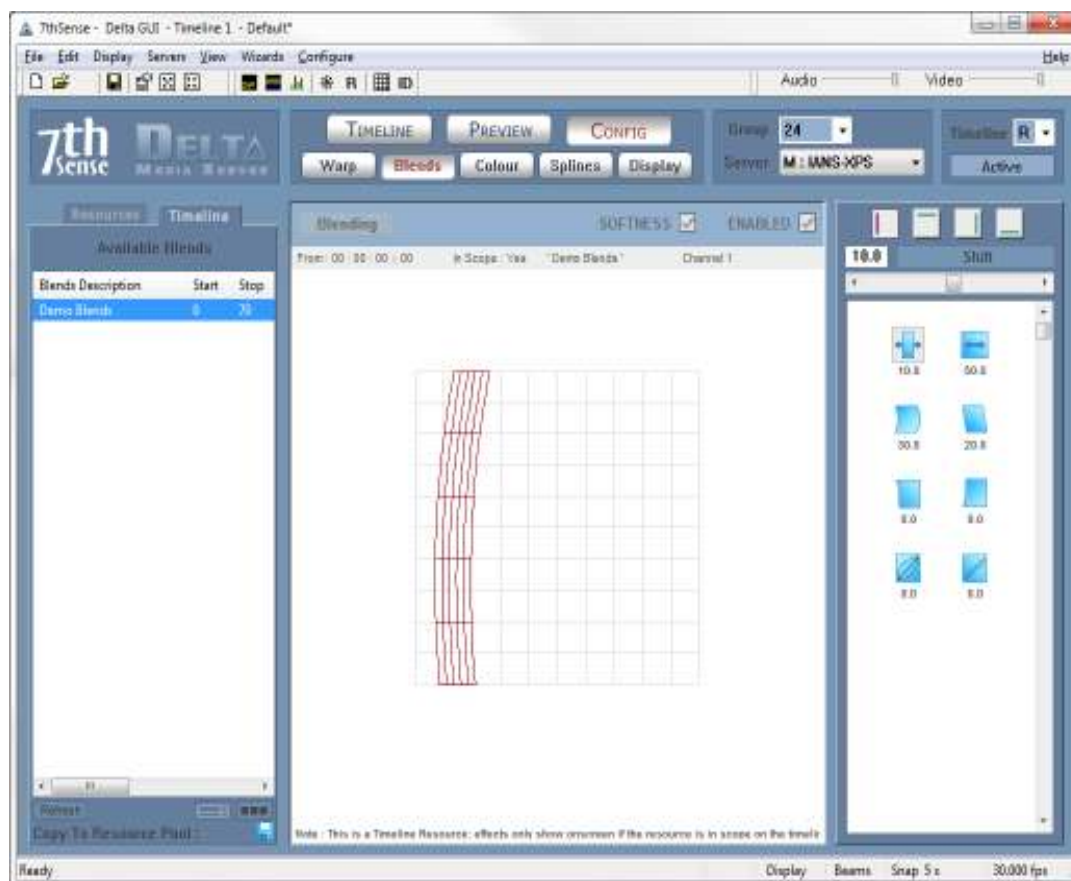
The Edge Blending page allows you to tune each blend (Left, Right, Top and Bottom) for position, softness, bow and keystone, as well as gamma and smoothness (s-correction).

To edge blend a system, ensure softness on overlapping blends is the same, make the edges parallel, then tune the position and gamma to make a seamless blend.

A good blend is highly dependent on the fundamental display matching, so ensure the luminance and colour match between the adjacent display channels is as good as it can be.

A blend resource can be rotated (edit the resource on the timeline, type in the rotation angle) so that you can align the direction of controls with the apparent direction onscreen caused by geometry & channel parameters (typically dome screens).

N o t e s
- The Enabled button allows you to temporarily disable this group's blending
- The Softness button toggles between a hard edge or correct softness for this group so you can match up the two adjacent blends with a hard edge, then enable the softness to see the result. This is a temporary condition which is not saved to the file.
- If you put two blends (same channel) on the same frame, they will multiply together, so you can create complex blends using multiple blends
- Blend resources can also have Fixed enabled – this will auto-reset the start frame of this geometry to frame 0. If Fixed is disabled, you can set the start frame as normal.
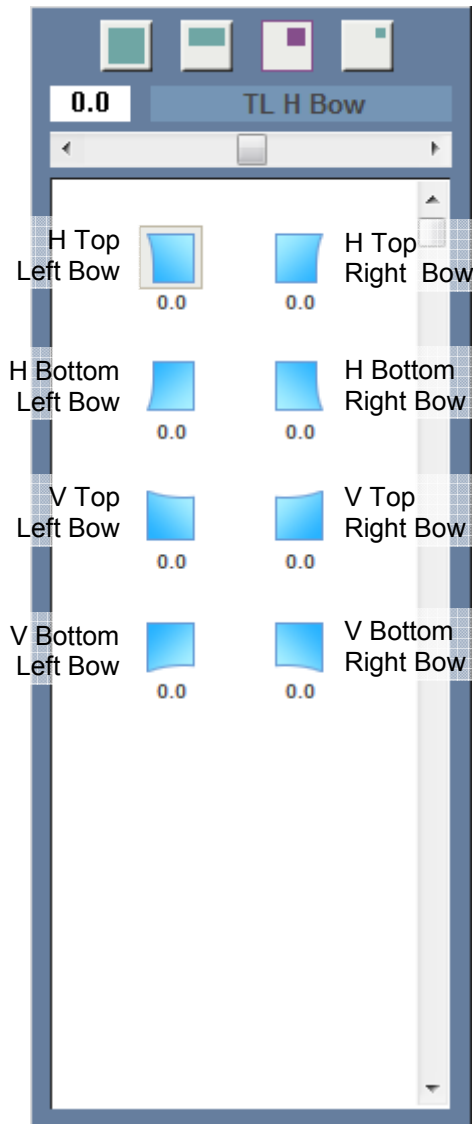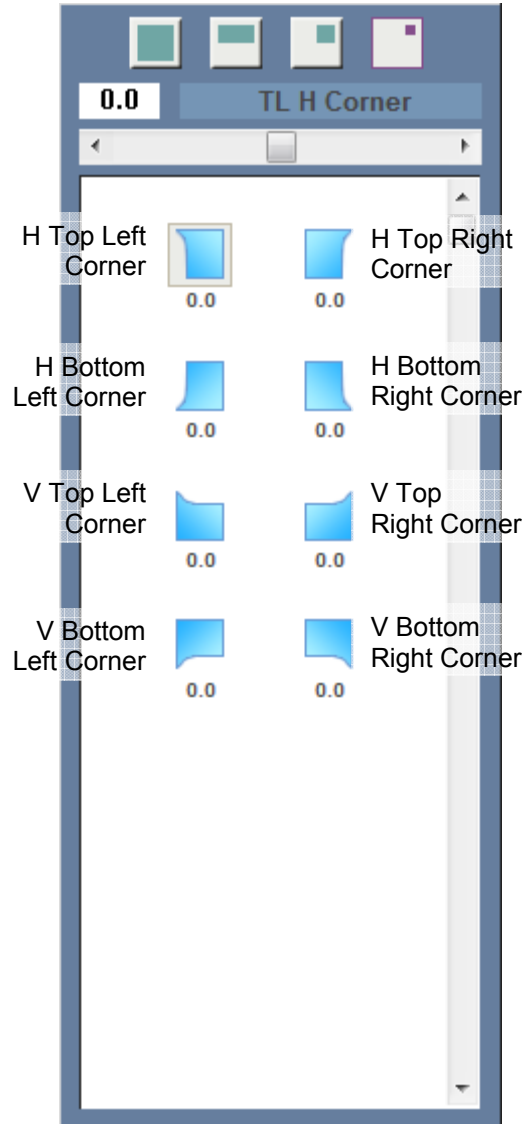
COLOUR BALANCING

In this configuration menu, you can tune the overall colour of the image (press the White button) or even the colour shading of the overall image (Red, Green and Blue).
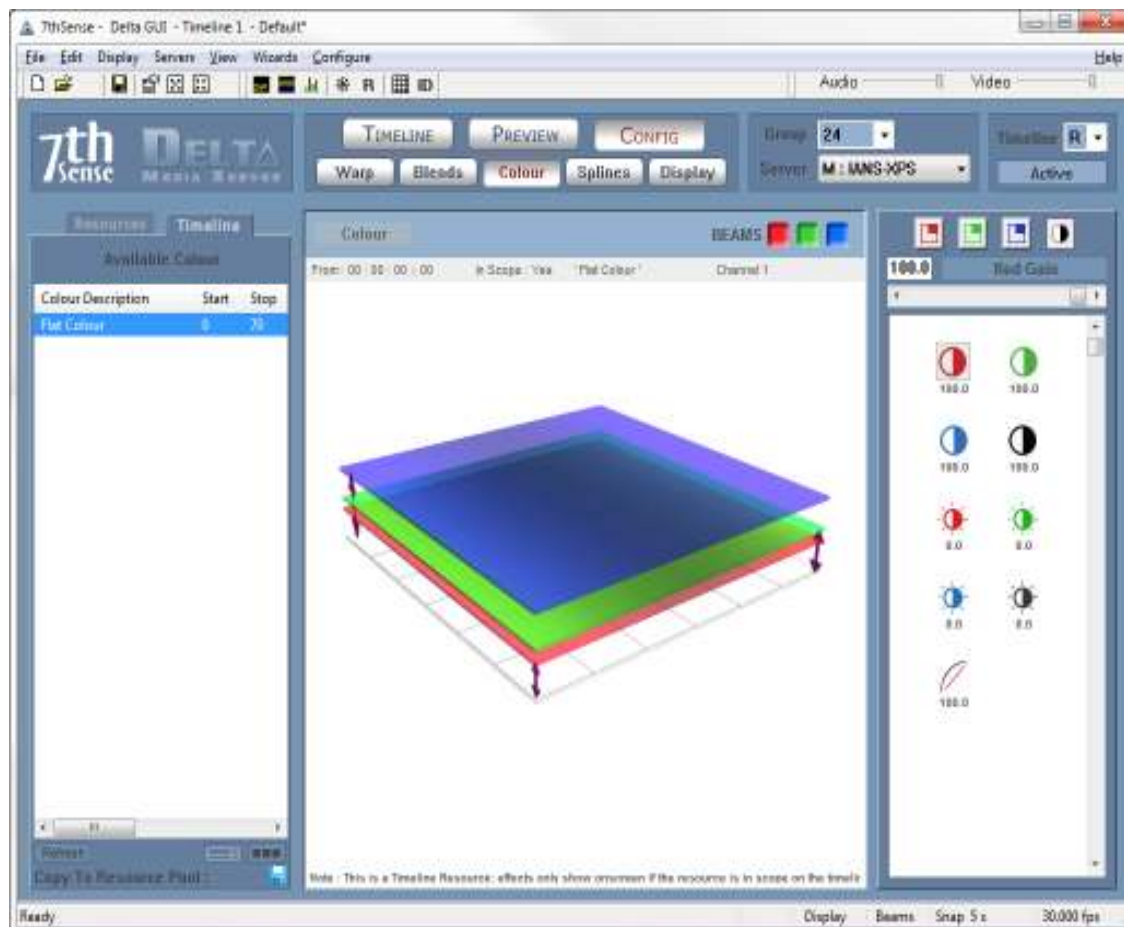
Choose the colour from the Red, Green or Blue buttons.
You now have the option of increasing the left, right, top or bottom of the image for that colour.
The normal sequence of operation in matching a multi-channel display system is:
- Choose a rich, full-screen image with all colours present.
- Observe the centre of each channel, and use the White colour controls to match the centre luminance and colour.
- Observe the edge between channels, and use the relevant edge colour shading control to match the colour and luminance at that point.

This is typically used to match colour & luminance across multi-channel display systems.

N o t e s
- Colour shading can be placed only on the background layer, but you can place as many on the timeline as you want to change colour as the show plays.
- The Beams buttons allow you to match colour on red alone, then green, then blue, then finally, all 3 colours on.
- Colour resources can also have Fixed enabled – this will auto-reset the start frame of this geometry to frame 0. If Fixed is disabled, you can set the start frame as normal

ARTNET & DMX

Delta can output an ArtNet data stream (which can then be converted to DMX using Ethernet-DMX convertors) and also take ArtNet inputs which can carry out any of the external control commands within Delta.

Shown below is a timeline with various input & output ArtNet resources:
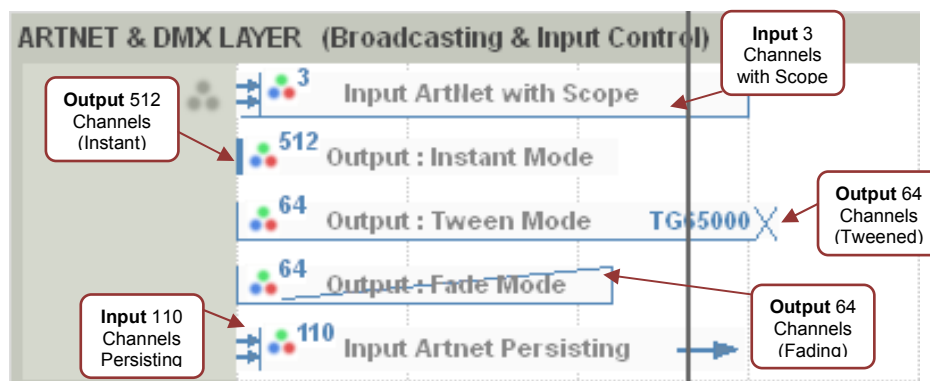
Output ArtNet

Once output is enabled (see Config – Preferences – ArtNet & DMX), Delta is broadcasting an ArtNet datastream to the network address(es) specified. With no ArtNet resources on the timeline, all output channels will be set to 0.

Output ArtNet resources can be created using the Editor (GUI Menu – View - ArtNet & DMX Editor), which is shown below with a typical 5-channel DMX controlled Floodlight device

Base Address : This is the first active channel this device will have, so if set to 15 & choose the first output channel as DMX Channel 1, this will actually be 15.

Mode – Fade : In Fade Mode, the output values will change from the previous value to the preset values over this fade time, so by the end of the fade time, the values in that resource are active. You can set the Fade Time in seconds in this mode.

Mode – Instant : In Instant Mode, the output values will change instantly from the previous value to the preset values, so at the start of the resource, the values in that resource are active.

Mode – Tween : In Tween Mode, the output values will change to the values in the resource by the start of the resource, so the values smoothly change from the previous resource to this resource's values by the start of the resource.

In Instant or Tween Mode, the Tween Group is active (TG 0 – TG 65535). To separate different instant or tween resources, you can put them in different Tween Groups, so that a resource with TG12 will only tween from a previous resource also in TG12. A special case is TG0 which till tween from any previous tweening resource, regardless of its tween group and also any tweening resource ahead of the TG0 resource will tween from its values.

Mixing different ArtNet output resources
For the same ArtNet channels, you cannot mix Tween mode resources and Fade types (this will lead to indeterminate values), but Tween and Instant can be mixed. This means that fade type output resources should be kept on separate channels to tween or instant resources.

Notes
- All ArtNet output resources persist from the start of the resource, there is no end frame.

ArtNet & DMX Editor showing Output resource
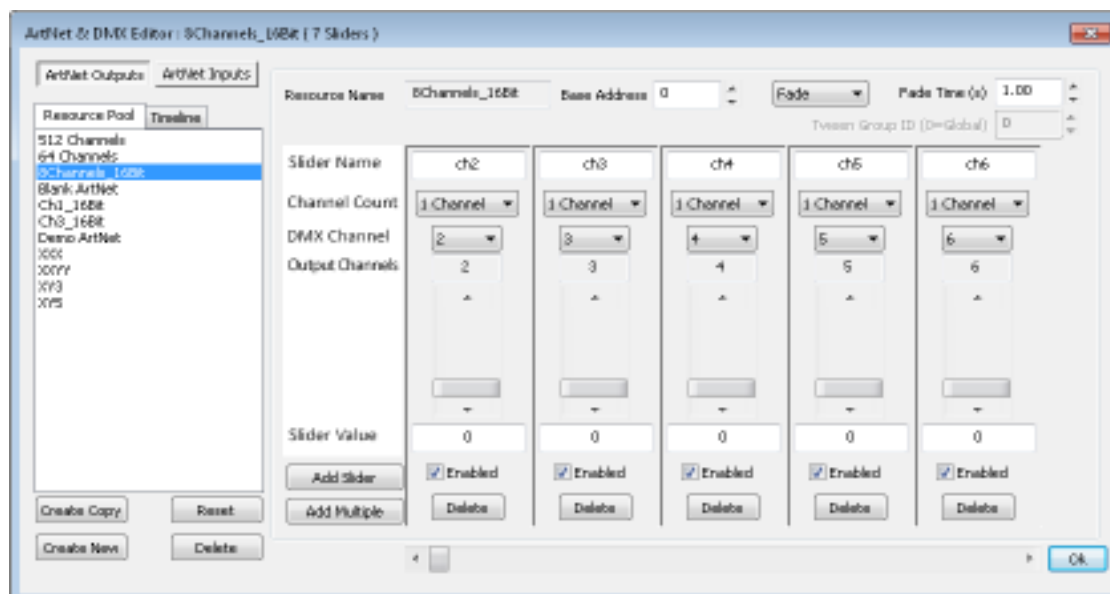
The device shown above has 5 "Sliders", where each one is assigned parameters;

Slider Name   : Memorable name for this channel

Channel Count   : You can choose 1, 2 or 4 channels for this slider.
For 1 channel used, the range is 0 - 255
For 2 channels, 2 adjacent channels are ganged for a range of 0 - 65535
For 4 channels, 4 adjacent channels are ganged for a range of 0 - 4294967295

Note that if you choose higher channel count, adjacent DMX channels are used, so for example if Slider 1 is Channels 1&2, Slider 2 should start at Channel 3 minimum, otherwise you have overlapping channels with unpredictable results.

DMX Channel   : The only (channel count of 1) or base (channel counts of 2 or 4) channel
for this slider

Output Channels   : This is an addition of Base Address & the base DMX Channel

Slider / Slider Value : You can use the slider to set the output value, or for more accuracy, type
in the value

Enabled   : Check this box to use this slider

Delete (Slider)   : Press this to delete the slider

Fade/Instant/Tween   : Choose the mode of this resource (see descriptions above);

Fade   : Select the Fade time in seconds
Instant   : Select the Tween Group
Tween   : Select the Tween Group

Input ArtNet

This can be enabled separately from ArtNet output in the Config – Preferences – ArtNet & DMX page. To show Input resources in the ArtNet & DMX Editor, press the Show Inputs button, then you can select the pool or timeline input ArtNet resource from the list.

Shown below is an example "mediacolour" input device where the device listens to channels 1,2 & 3, and if any changes are detected, sends an internal MEDIACOLOR command constructed from the Control Message and Slider Names as below.
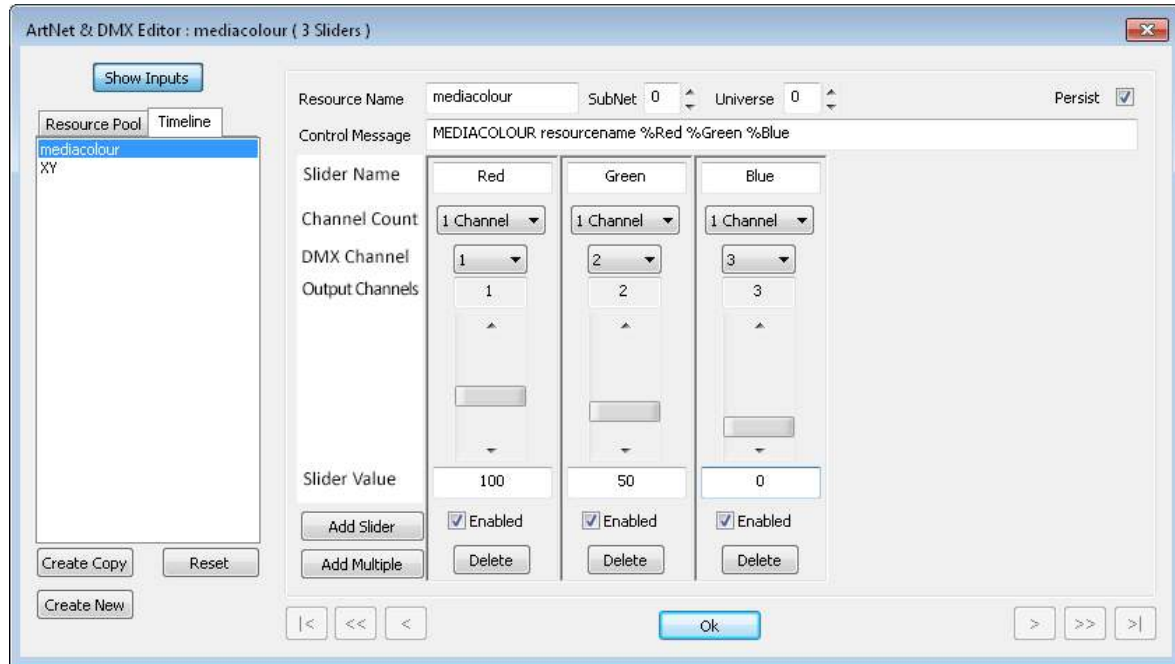
In the above example, the Slider Names are Red, Green & Blue, and the Control Message is   MEDIACOLOR resourcename %Red %Green %Blue, so in this case the %Red string in the message is replaced with the value of the Red Slider, %Green with the value of the Green Slider and so on, so that that actual message sent internally is :

MEDIACOLOR resourcename 100 50 0

Which will change any visual resource with a name of "resourcename" to 100% red, 50% green and 0% blue intensity.

Note that if the Control Message does not find the %Variable name in the Sliders, it will send that string directly, which may cause the command to fail.

SubNet   : 0 – 15, these are separate ArtNet SubNets which can be listened to

Universe   : 0 – 15, these are separate ArtNet Universes which can be listened to

Persist   : If enabled, this Input device will listen from the first frame on the timeline onwards (no end), if disabled, it will only listen if the timeline current frame is within the scope of this resource.

More Examples: Marker Selection
An input ArtNet resource is required to goto a marker depending on the value of ArtNet channel 1, so you add an Input Artnet resource to the timeline at frame 0, set it to Persist, then have one slider with a name of "Name", set to channel 1 and the control message is;

GOTOMARKER %Name

Now create markers on the timeline with Marker Name of "1" and "2" and place them on the timeline where you need, then when channel 1's value changes from 0 to 1 to 2, gotomarker commands will be issued of GOTOMARKER 0, GOTOMARKER 1, GOTOMARKER 2 and since the marker exists for 1 & 2, these commands will succeed, where the value of 0 will do nothing, since there is no marker named "0"

More Examples: Setting Global Variables
An Input ArtNet resource is required to set 3 global variables for use by a sequence, so you add an Input Artnet resource to the timeline at frame 0, set it to Persist, then have three sliders with names of "Ch1", "Ch2" and "Ch3", set to channels 1,2,3 and the control message is;

globalvarset cmd=realtime $ch1=%Ch1 $ch2=%Ch2 $ch3=%Ch3

When any the artnet values in channels 1,2,3 change, the command is issued like this for values of 3, 45 & 88;

globalvarset cmd=realtime $ch1=3 $ch2=45 $ch3=88

This in turn sets (or creates & sets) $ch1, $ch2 and $ch3 variables to the values shown, which can be used within any sequence, for example to control media colour, position etc. The benefit of this is that the values can be manipulated in the sequence, for example offsetting or scaling them as required based on other inputs or variables.

The cmd=realtime is used to speed up this command, disabling logging so that for fast movement of channel values, the command is actioned as fast as possible.

Pool & Timeline Resources

There are 2 built-in Output Artnet resources ("Blank" has no channels, and "Demo ArtNet" has 5 active channels) and 1 built-in Input Artnet resource ("Demo Input ArtNet" has 3 input channels connected to a Mediacolor external control command).

When you edit a Built-in Pool resource, changes are discarded on server exit, but if you create a new Output or Input Pool resource, this is saved into the c:\ArtNet folder as a small XML device file and any changes you make are reflected to that device on disk immediately.

When you edit a Timeline resource, changes are instant & will be saved into the normal show XML.

Common Controls to Input & Output

Create Copy   : Press to copy the current selected resource to a new one

Reset   : Press to remove all sliders from the selected resource

Create New   : Press to create a new blank device

Add Slider   : Press to add one slider (will be added after the last active channel)

Add Multiple   : Press to add multiple sliders at a set base channel

Arrow Buttons   : Press to navigate to the next, previous, first or last slider.

Delete (Resource)   : Press to delete the selected resource on the timeline or resource pool. Note that you cannot delete the built-in pool resources (Demo ArtNet or Blank ArtNet) and that deleting the others permanently removes them from the server (from the c:\ArtNet folder).

Note that editing an Output ArtNet resource from the timeline (using the normal resource editor) gives a cut down version of this dialog where you can change most parameters apart from Channel, Channel Count and you cannot add or remove sliders from this dialog.

Pool & Timeline Resources

PREVIEW

In the GUI, it is possible to see a live preview of what's on the timeline. This is useful in those situations where the control of the server is not in sight of the screen.

Mini Preview : Accessible from the main menu (View – Mini Preview), this is a small preview window above the resource area.
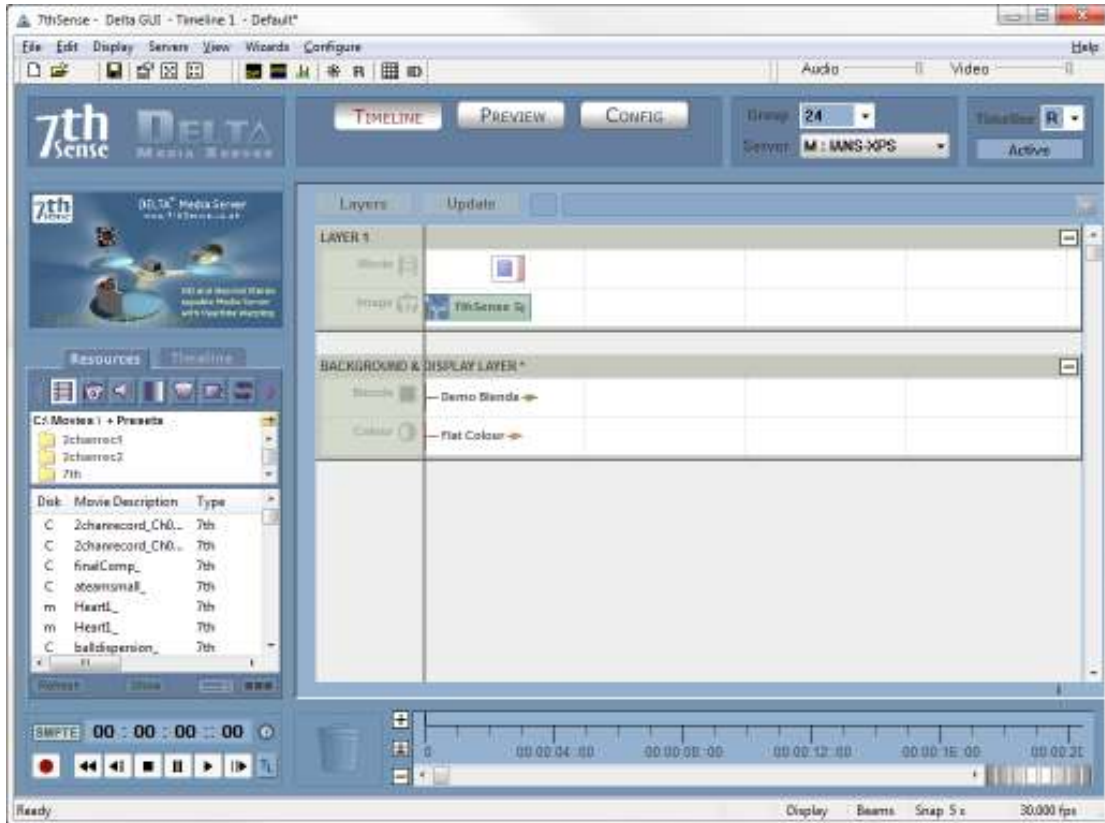
If you move your mouse over the mini preview window, a menu bar is available to swap between the two preview modes described below.

Main Preview: Accessible from the main Preview button on the GUI, this area provides a large size preview with better fidelity imagery than the mini preview.

Note that you can steer the preview around the canvas using the mouse & mouse buttons;

Drag + Left Mouse Button   : Move preview area
Drag + Middle Mouse Button   : Zoom preview area

Reset Button   : reset to full canvas

RESERVE TIMELINE

This is an interactive mode such that when active, only those resources on the reserve timeline (Not Delta Nano) are shown, and pressing the R button on the toolbar (or CTRL-R or through external control) fades between normal operation (current timelines shown) and Reserve Mode (Reserve timeline only shown).

This enables customers with live events happening at unknown times to play a movie, then gracefully fade to a background image, move the timeline head to a new position (the audience still see the background image while this is happening), then start playing a new movie and gracefully fade up.

RECORDING

A show can be recorded to disk, in effect compositing all the layers into one for playback on another machine.

Pressing the Record button on the timeline shows this dialog;
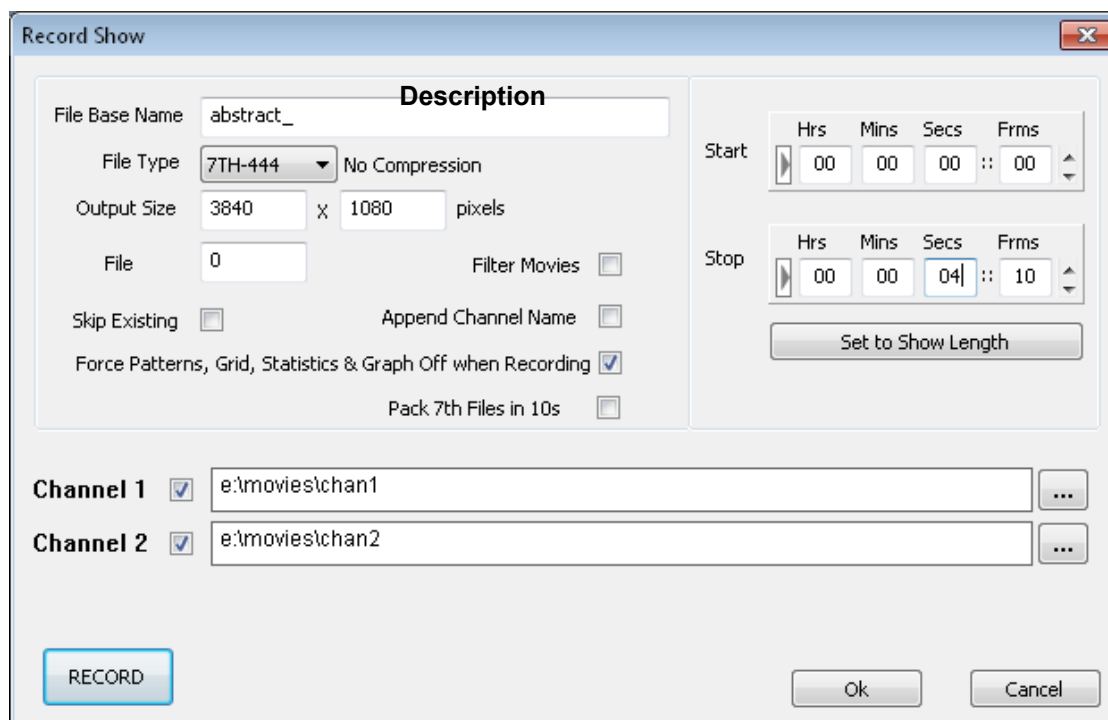
Control

File Base Name	Name of the recorded movie
File Type	Choose 6:1 (7TH), 1.5:1 (7TH - 422), 2:1 (7TH - 420), Uncompressed (7TH–444) or JPG / TGA single frames. Z formats (lossless compressed) are also available.
Output Size	Output movie resolution (any size)
Start / Stop	Set which frames to record
File Offset	Add a specified offset to the output numbering
Skip Existing	Skip any movie files already in that folder
Channel	(1 in the above example) – check this to record this channel
File Button […]	Select the output path and folder to contain the movie files
Append Channel Name	will add _CHx to the base name where x is the channel.
Set to Show Length	Press this button to set the record length to the show length (which comprises all non-disabled resources, but not timeline controls)
Force Patterns, Grid, Statistics & Graph	Check this o ensure these diagnostic and alignment aids are turned off before recording.
Pack 7TH Files in 10	This should be left blank for an SSD based server, but for standard HDD based servers, this should be checked.

Example:
File Base Name   : Birds
Start / Stop frames   : 200 / 400, File Offset 1000.
Channel 1 ticked, output path e:\Movies\Birds422
File Type   : 422
This will record **Birds_0001010.7TH**, **Birds_001020. 7TH** to e:\Movies\Birds422

Note that for multiple channels, the frame is advanced, then all channels are saved to disk for that frame, before moving onto the next frame.

AUDIO EQUALISATION

Access the global audio equalisation from the View menu – Global EQ Levels. This dialog shows controls which can shape the frequency response of the audio output.
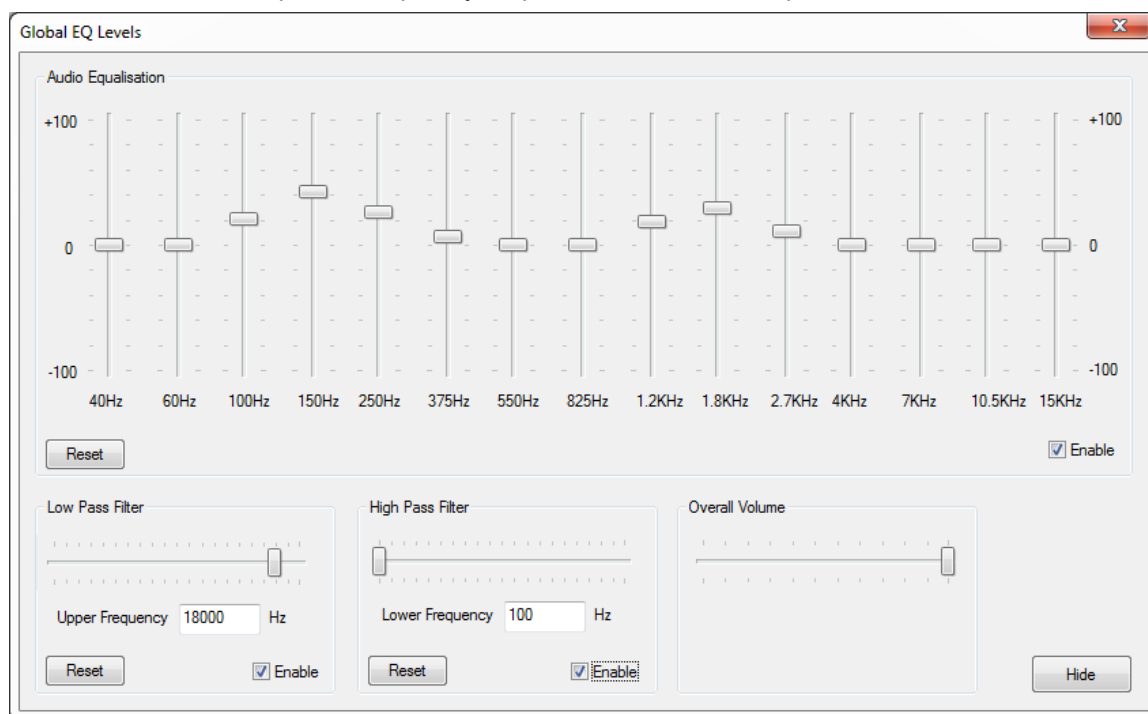
Equalisation
Vertical sliders affect the 15 frequency bands shown above, from this area you can change the mix of bass or high frequencies affecting the overall sound of the audio.

Press Reset to set back to a flat equalisation (no affect on audio).

Low Pass Filter
A low pass filter, if enabled, allows all frequencies up to the Upper Frequency set using the slider. After this value, the volume smoothly reduces. Use this slider to remove unwanted high frequency sound,

Press Reset to allow all frequencies (no affect on audio).

High Pass Filter
A high pass filter, if enabled, allows all frequencies from the Lower Frequency set using the slider. Before this value, the volume smoothly reduces. Use this slider to remove unwanted low frequency sound,

Press Reset to allow all frequencies (no affect on audio).

Overall Volume
This is the same overall volume slider as in the main frame toolbar or Sequence Editor.

Spectrum Output Visualisation.
To see a visualisation of the spectral content of the audio on the playback window, turn on the VU meter (Main Toolbar) while the audio is playing and enable one of the above areas.

Audio equalisation is stored in the show XML file.

SERVER CONNECTIONS

The GUI tries to connect automatically to all servers in the network. This can be altered in the Config - Preferences - Communications dialog to Block Groups so that the GUI will refuse connections from certain groups.

You can view what servers are attempting to connect to this GUI by choosing the About - Server Connections option from the GUI menu.

Server Connections to this GUI - Version 1.5 Build 20 (ID 1)

IP Address	Group	ID	Software Version	GUI Connection	Note
10.100.100.109	9	0	< 1.5 Build 20	Old - Refused	
10.100.100.42	8	1	1.5 Build 20	Blocked	
10.100.100.40	19	1	1.5 Build 20	Accepted	

Cancel   Clear   OK
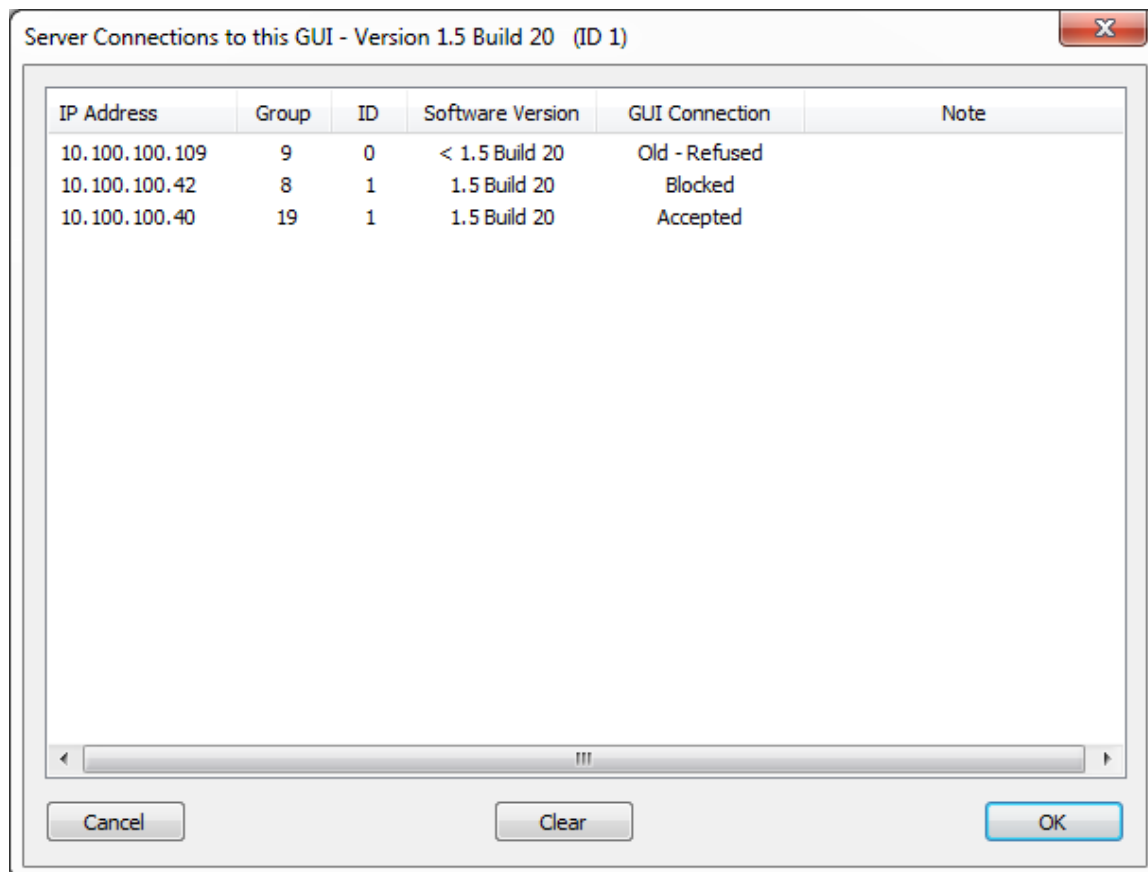
This example dialog shows 3 servers;

One from 10.100.100.109 which is a previous server version and the GUI refuses to connect, since communication will not work.

The server at 10.100.100.42 is the correct server version, but has been blocked in the Blocked Groups dialog mentioned above.

The server at 10.100.100.40 has been accepted as not blocked and is the correct version.

You can clear this list by pressing the Clear button - note that the list will now only show servers which attempt to connect from then on - previously connected servers will not show up.

SLIDESHOW WIZARD

This wizard can help setup a quick slideshow of audio, images or movies (GUI Menu – Wizards – Create Slideshow).

From the initial dialog, choose one or more audio files, images or movies (optionally filter the type using the check boxes in the top right), then click the + button to add them to the list. If you hold Control down while clicking, you can select multiple resources before adding, hold Shift down to select multiple from the first selected resource.

Once in the lower Timeline Resources area, you can select them & remove (again with Control or Shift) by clicking the – button. If you want to re arrange the order, select one resource, then click the up or down arrows in the right side to move.
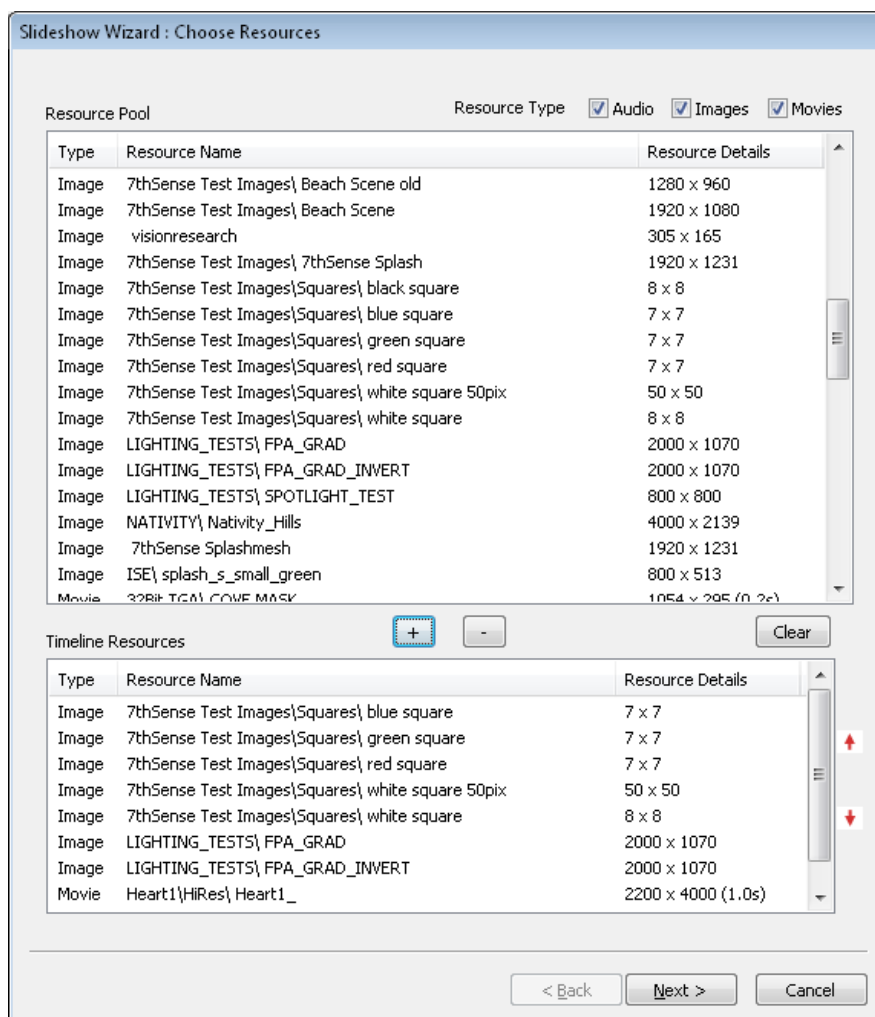
Once the list is complete, press the Next button to move onto the options page.

On this page, select the various options as described below & press Create.

| Time per Resource | : Defaults to 6s, choose this for the amount of time a resource is visible |

Time per Resource : Defaults to 6s, choose this for the amount of time a resource is visible

Transition Time : Defaults to 1s, choose this for the amount of time crossfading.

Movie Auto Play : Movies will autoplay if checked (Also look at Config – Preferences – Interactivity for how autoplay movies behave). Movies that are shorter than the Time per Resource will be looped to fill that time.

Use Movie Natural Length : For movies, use the actual length of the movie instead of the transition time (movies less than 3 x the transition time will be extended so that the fades has sufficient time to work.

Add Timeline Loop to End : If checked, add a loop at the end

Add Marker at Each Resource : If checked, add a named marker at the start of each resource.

Marker Stops Timeline on Play : If checked, created markers will have Stop set, so that playing to the marker will stop at that point, no need to add a Stop control as well.

Keep Existing Timeline Resources: By default un-checked, will perform a File New before creating the slidhow. If checked, will insert the resources from the current timeline cursor position.

Keep Existing Warp & Blends : If checked, will not delete background warp & blends.

Layer   : Select the top layer for the slideshow.

Notes

- Movie / Image files are inserted on the selected layer & next lower layer to allow crossfades, Audio files will be placed on selected layer+2 & selected layer +3 to allow audio fading

- Audio files are matched to the movie file based on the first 25 characters of the video file name (since audio & movie usually have slightly different filenames) – if there is a match, the start frame of the audio is matched to the movie, if it is not found, the audio is placed on a separate layer, at frame 0 & disabled so that you can place them by hand.

DISPLAY CONFIGURATION

FLAT PLANE MODE

In this mode, the display screen(s) are co-planar, that is, they are flat and on the same flat screen surface. For multi-channel curved screens and advanced display systems, use Frustum Mode if available.

In Flat plane mode, you can have up to 32 Channels, which show any part of the **Canvas** (the full display area including all Delta output channels), up to the full canvas, and down to 155 x 80 pixels (extreme zoom in).

You can think of the Channel as the window onto the entire canvas, for instance a small channel will only view a small part of the entire canvas.
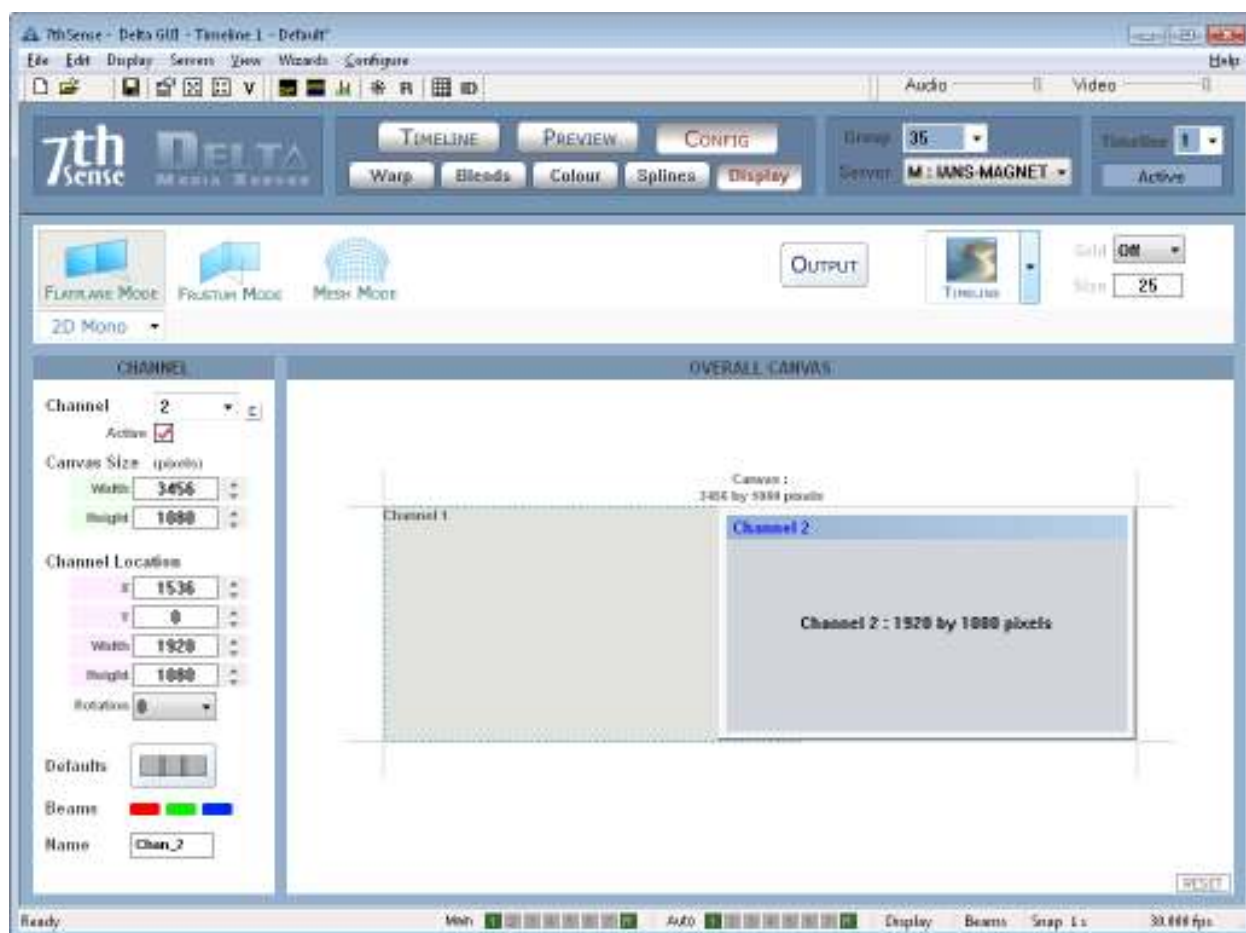
In the example above, the canvas is set to a nominal 3456 x 1080 pixels (it can be any units you want), and two channels are defined : Channel 1 is shown as a purple rectangle covering half the canvas, Channel 2 covers the other half.

These channels can be independently sized, or rotated by any angle to match the display orientation.

N o t e s

Use the Display Gamma to tune the display channels to the content, for instance to boost dark content in a brightly lit hall, increase the gamma. This value is stored in the file when you save it.

The canvas colour can be changed to anything, the default is black when no content is showing.

Flat Plane Defaults

Press the Defaults button to view the configuration dialog;
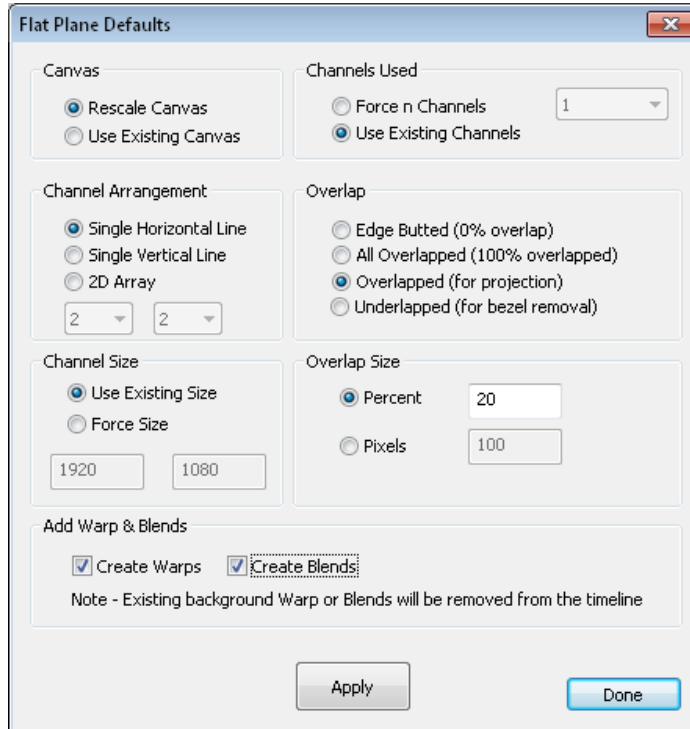
From this dialog, you can arrange channels in a horizontal line, vertical line or X by Y grid of channels. You can also choose to edge butt the channels (no overlap) or set the overlap in pixels or percentage of channel width.

- **Edge Butted** is typically used for projection which has no overlap.

- **All Overlapped** creates multiple channels which all look at the same canvas, but can have different distortion / blending – ideal for stacked projection.

- **Overlapped** is used for overlapped projection.

- **Underlapped** is used to remove the gap between fixed matrix panels.

Rescale Canvas will resize the canvas when overlap is introduced, for example reducing from 2560x1024 to 2432 x1024 for 2 channels 10% overlapped. You can choose to leave the canvas size fixed instead – in this case, channels will be resized to fit.

Channel Size can be Forced to a user value or in "Use existing size", will be taken from the graphic card's information,

Note that for Overlapped, you can choose **Create Warp** & **Create Blends** options. Create Warp will add a flat (non distorted) warp resource for each channel and Create Blends will insert nominal blends in the right place for a startpoint.

Output Modes
Press the Output button to show the output mode dialog;
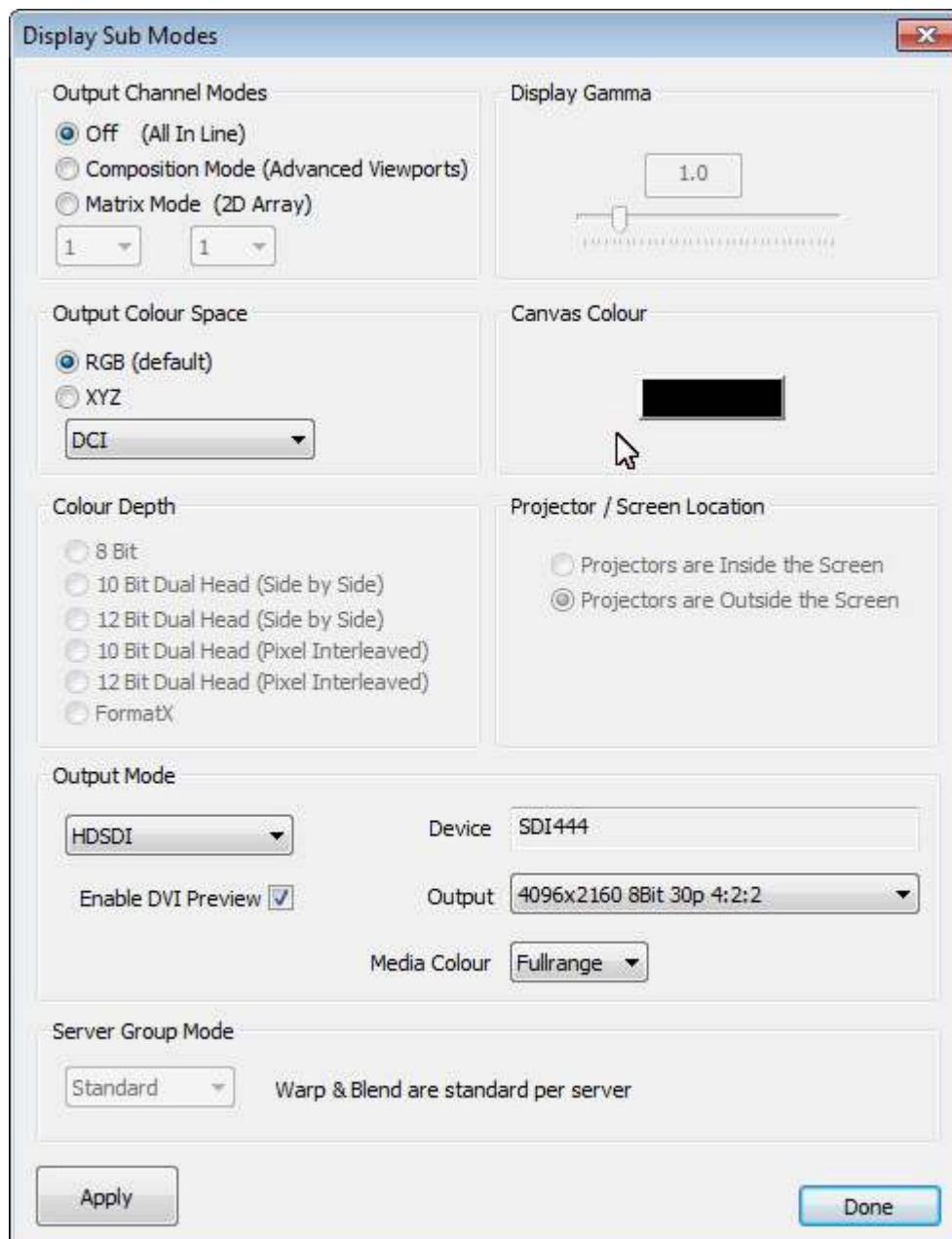
Output Channel Modes (Optional Licence)
If **off**, channels are arranged in a horizontal line on the desktop
If **Composition Mode**, output channels are directly editable in XYWH on the output framebuffer
If **Matrix Mode** channels can be arranged in a X by Y grid on the playback window.

Output Colour Space
RGB is the normal colour space, but some projectors, typically in Digital Cinema, take an XYZ colour space. The dropdown list contains various RGB – XYZ mappings:
- DCI and CIE are fixed, internal mappings.
- Same is a 1:1 RGB-XYZ (no change) mapping for testing.
- DCI_File is stored in System / ColourSpaceConvert.xml file and can be changed.

Colour Depth (Optional Licence)

- **8 Bit colour** is the standard single head graphics output.

- **10 bit Dual head and 12 Bit Dual head (side by side)** uses 2 graphics outputs to contain higher bit depth video output. The Leftmost output contains the lower 8 bits and the rightmost output contains the higher 2 or 4 bits scaled to use the full 0 - 255 range. This mode is suitable only for projectors that can support this mode.

- **10 bit Dual head and 12 Bit Dual head (pixel interleaved)** use 2 graphics outputs to contain higher bit depth video. The upper 8 bits are on even pixels and lower n bits are on odd pixels.
  This mode is suitable only for projectors that can support this mode.

Projector / Screen Location (Frustum Mode required)
For Frustum and Mesh Modes, the standard configuration is to have projectors inside a dome screen.

For those systems where the projectors are projecting onto the outside of the dome screen, choose the "Projectors are Outside the Screen" option. You must then place the channels (virtual projectors) outside & pointing at the screen. Intelligent resources in this mode will also automatically horizontally mirror visual resources so that text still reads correctly.

Display Gamma
This slider controls the overall display gamma on the server PC – this value is saved in the file

Canvas Colour
This is the background colour which shows when there are no visual resources on the timeline.

Output Mode (Optional Licence)
See Appendix C for details.

Server Group Mode (Optional Licence)
This mode is for when multiple servers drive a single 4k projector (if required) and allows the user to designate which half or quadrant this server is responsible for – when adjusting warp & blending, the same information is used in all servers to maintain coherent geometry across all servers. Since a single Delta server can drive a 4k projector, this option is for high end testing only.

Edge Butted Display
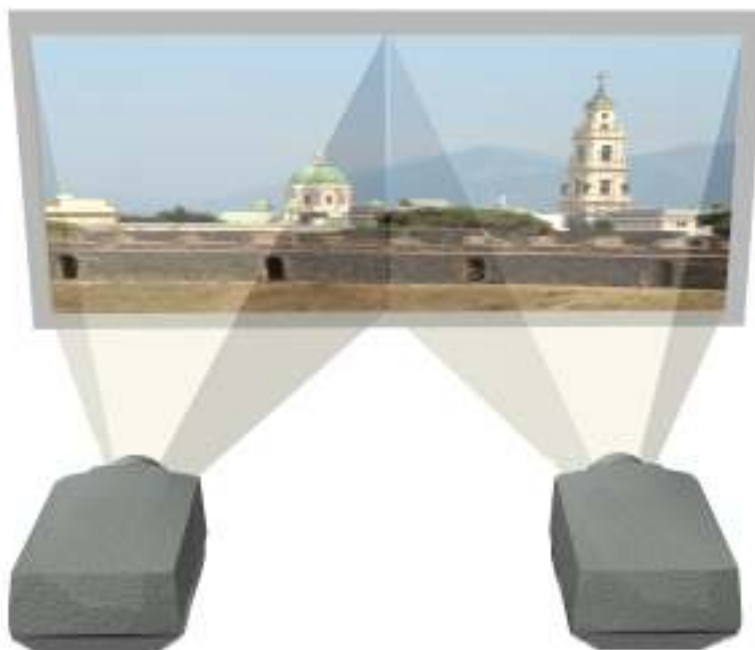
In this configuration, each picture is lined up to its neighbour exactly along a common edge. In Delta, Set Channel 1 & 2 to exactly half of the canvas size, and set Channel 2 to have an X Offset of half the canvas size. No blending is required for this system.

You can either type in the figures manually, or use the Defaults drop-down list and choose Horizontally Edge Butted to automatically calculate the figures.

In the example below, Channel 2 is shown with an X offset of half the canvas width.
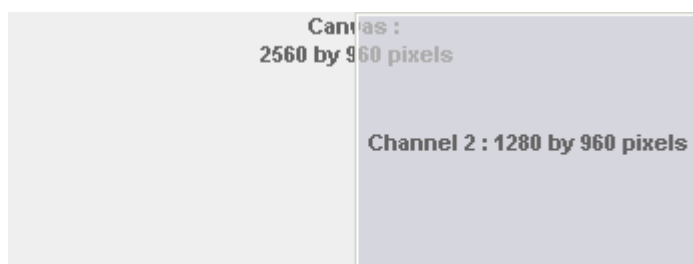
Overlapped Display

In this display, the projected images are physically overlapped (usually by 10%), then a blend is applied to the left & right edges to provide a seamless display.

You can either type in the figures manually, or use the Defaults drop-down list and choose Horizontal 10% Overlap to automatically calculate the figures.

In the example below, the canvas is set to 2304 pixels wide, with Channel 2 shown with an X offset of 1024, leaving a 256 pixel overlap between Channels 1 & 2.
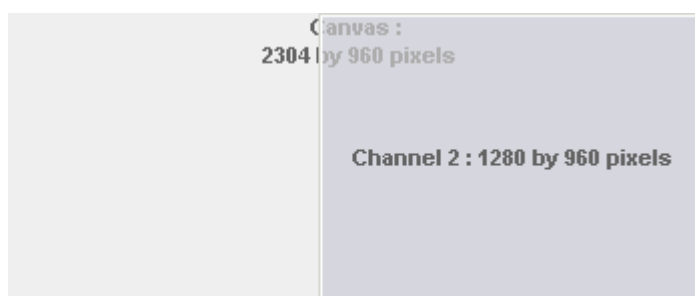
Underlapped Display
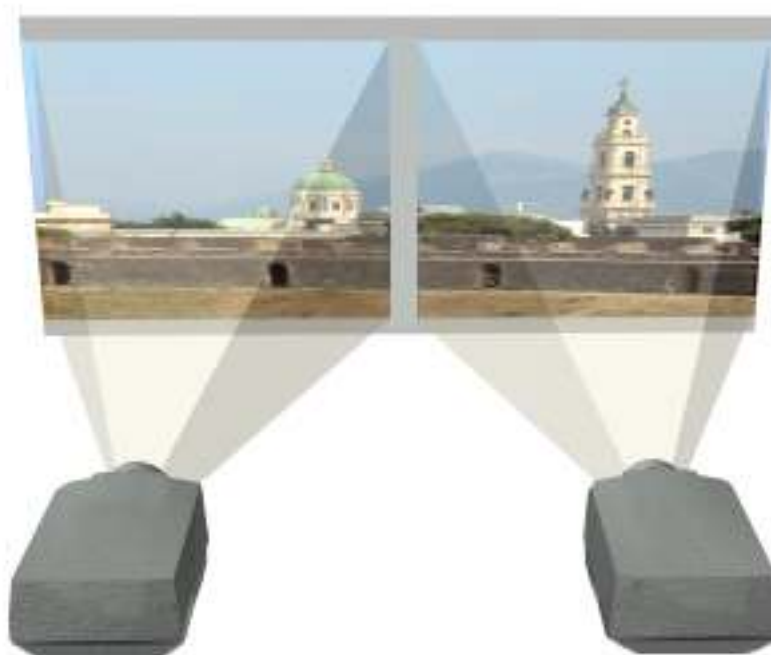
In this display, the projected images have a physical gap, so the Delta imagery must also have a gap otherwise things will not "disappear" properly in the gap.

A typical example of this arrangement is two or more Plasma Display panels butted together. Due to the bezel around the panel edge, there is always a significant gap between adjacent channels, so the underlapped configuration can be tuned to provide the correct imagery.
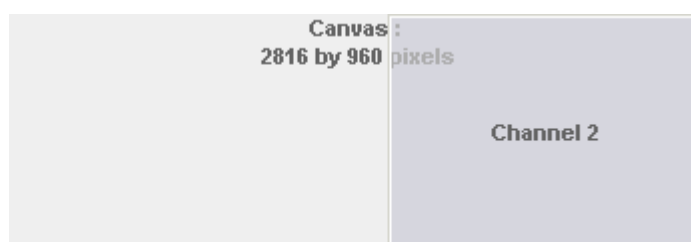
PASSIVE STEREO MODE

As an option, Delta can enable Stereo mode, which can be Passive or Active.
In this mode, Delta's layers are treated as stereo depth which, when viewed on a passive or active stereo display system, create the illusion of distance which can bring another dimension to presentations.

Layer 1 is treated as the nearest layer; the Background layer is farthest away. All layers between 1 and background are scaled in distance according to the layer number. Using this system, you can have layered objects float in front or behind other media according to the show requirements.

Passive Stereo Configuration
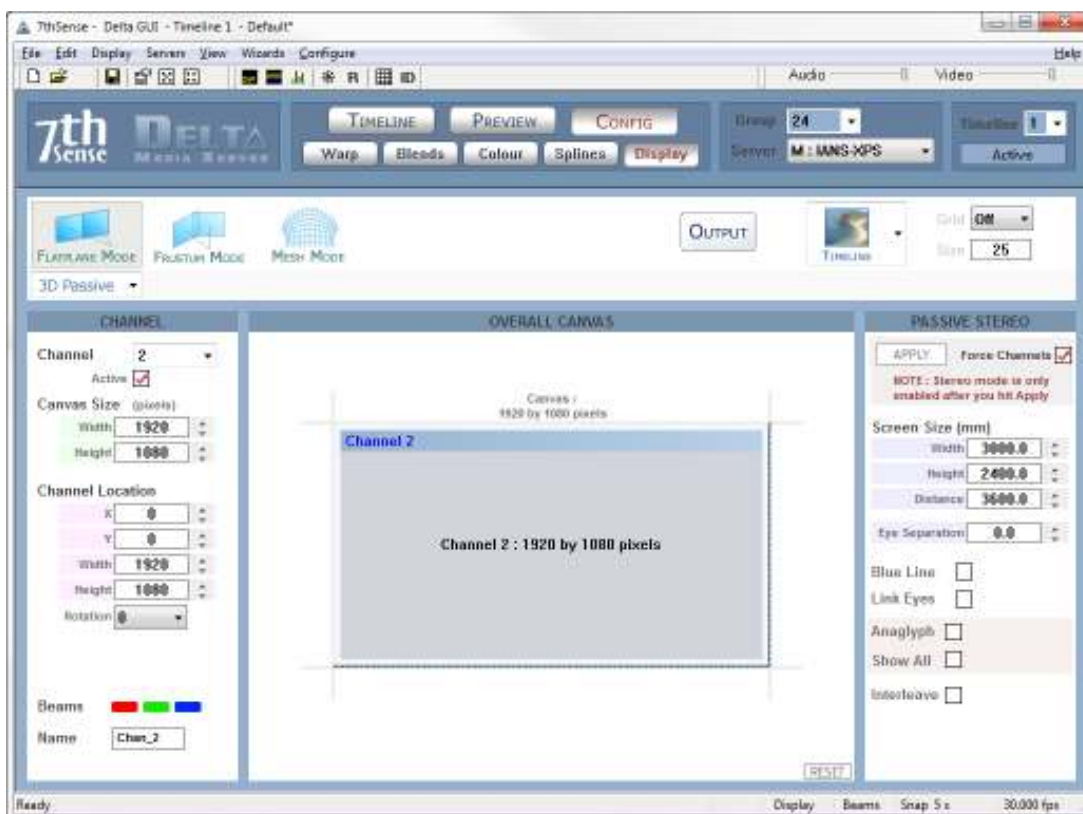
In this mode, the canvas is divided into 2 channels, one for left eye and one for right eye. Each channel is output through a separate video output to a projector, which are exactly overlaid on the screen, each projector having a different polarisation. Using inexpensive passive stereo glasses, each eye receives only the polarised image for the relevant eye, and in this way, each eye sees a slightly different view, creating the stereo depth.

Requirements:
- 2 projectors overlaid, each one polarised with a non depolarising screen
- Two channels output from Delta using standard video card
- Inexpensive polarised or Infitec glasses

N o t e s

- You must press **apply** in order for active stereo to be active

- **Blue Line** mode places a ¼ channel width blue line on the last line of video for the left eye & ¾ width line for the right channel. Some projectors support this mode instead of a separate sync signal from the PC.

- **Link Eyes** links the geometry, colour and blending from channel 1 onto channel 2, channel 3 to 4 and so on. In this way, if the two projected images are already aligned, only add warp & blend to odd numbered channels and adjust as normal – even numbered channel warp will be identical to its odd numbered partner.

- **Anaglyph** mode creates a realtime anaglyph (red/blue stereo) from non anaglyph content. Suitable red/blue glasses are required.

- **Show All** for anaglyph shows the composite Red/Blue channel in addition to the 2 channels which create this mode. This is useful to have anaglyph and passive stereo of the same source

- **Interleave** mode interleaves the left & right eye images in a 1 pixel chequerboard pattern, suitable for certain 3D LED walls.

- **Force Channels** – if this is checked, for passive stereo, two channels are made active and the second channel is copied over the first so they are overlapped. If the checkbox is not checked, your existing channels are left untouched, so you can configure passive stereo with overlap on more than 2 channels.

ACTIVE STEREO MODE

In this mode, 2 channels mentioned in Passive Stereo are alternated in time, and this single image is sent to a single projector. Since we want to maintain sufficient update rate for each eye, this single output from Delta has to run twice as fast as the passive stereo solution, as does the projector. Shutter glasses, synced to the stereo output of Delta, are synchronised to only show each eye the relevant image, creating the stereo depth.

The inter-eye distance or IOD is set within the display configuration for Stereo mode which affects the level of depth perceived.

Active Stereo Configuration
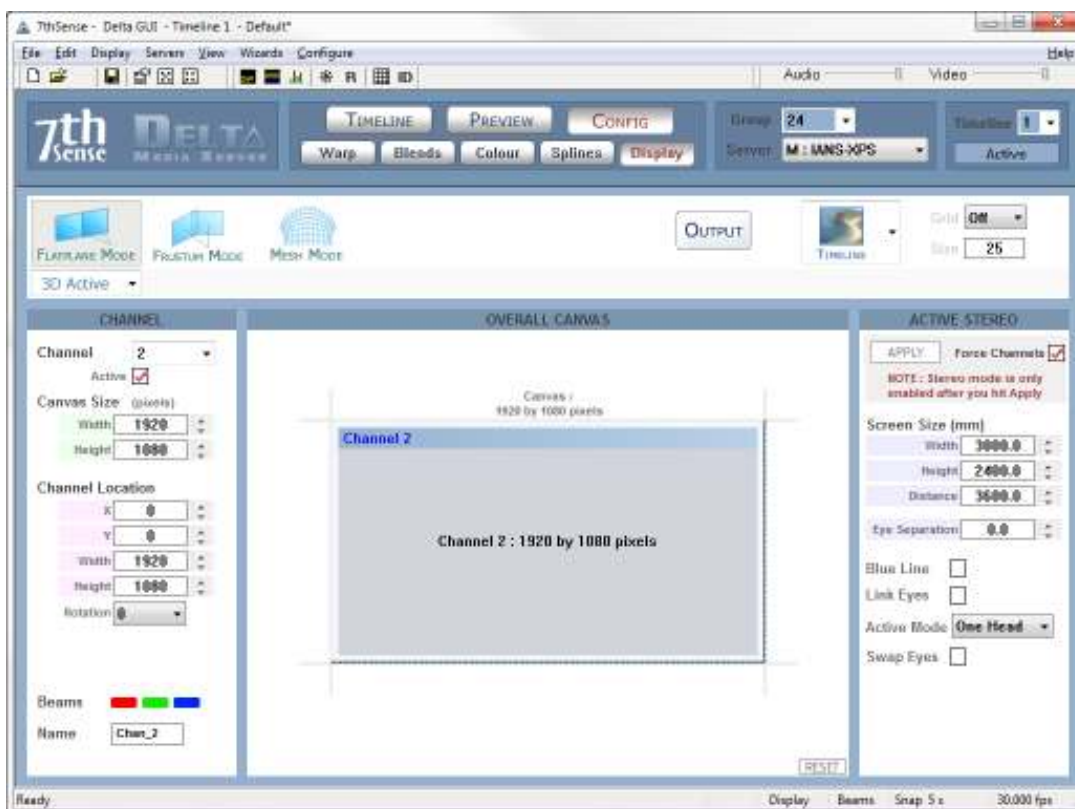
Typical Requirements:
- 1 projector, fast enough for the higher video rate
- One channel output from Delta using stereo-capable graphics card.
- Shutter glasses or Z Screen

N o t e s
- You must press **apply** in order for stereo to be active

- In Active Stereo, choose **One Head** or **Two Head** if the graphics card supports this mode
  In One Head, channel 1 is left eye, channel 2 is right eye
  In Two Head, channel 1 is left eye, channel 2 is right eye on the first output, channel 3 is left eye and channel 4 is right eye on the second output.

- **Blue Line** mode places a ¼ channel width blue line on the last line of video for the left eye & ¾ width line for the right channel. Some active stereo projectors support this mode in addition to the traditional stereo sync input.

- **Link Eyes** links the geometry, colour and blending from channel 1 onto channel 2 and from channel 3 onto channel 4. In this way, both channels fed to a single active stereo projector

are adjusted at the same time if the control is placed on channel 1 (On head mode) or
channel 1 and 3 (Two head mode)

- **Force Channels** – if this is checked, for active stereo, two channels are made active and
  the second channel is copied over the first so they are overlapped. If the checkbox is not
  checked, your existing channels are left untouched, so you can configure active stereo with
  overlap.

For both Passive and Active Stereo, simply enter the screen and Eyepoint locations and size, and
choose the Eye Separation to match your system – these values affect only the additional stereo
separation activated per layer (layer 1 has most separation, background layer has 0 separation)

A typical Eye Separation is 65mm, though this value can be experimented with to achieve the right
amount of stereo. *Beware of using too much separation, as this can make objects appear behind
the observer's head, causing discomfort.*

The Canvas & Screen location can be entered so that one PC can play the left half of a stereo
screen, another the right half – enter appropriate Channel values to cover the left & right half of the
canvas in this case.

Pre-Rendered Stereo Content
If a movie has been rendered into left eye / right eye already, then you can simply play this out as
normal from Delta without the stereo option enabled, since this is normal playback.

Alternatively, place this on the background layer, which has no additional eye-offset applied by
Delta.

Left Eye or Right eye Separate Movies
After placing a stereo movie on the timeline, you can edit the resource to move it to the left
eye or right only (pre-rendered for that eye).

Left/Right or Top/Bottom Configuration
Some movies come with both eyes as left/right side by side, or top/bottom, this can be
selected in the resource dialog.

Stereo Wizard.
Choose the GUI menu Wizards – Create Stereo Show.
- On the first page, select the Left & Right eye movies
- On the second page, choose which audio files to include & the FPS of the audio files
- On the last page, choose Passive or Active, whether to add a loop, and if there is any time
  offset between audio files & movies.

Press Create, and the timeline is populated, ready to play.

DISPLAY CONFIGURATION FILES (XDL FILES)

When choosing File Save As, you have the option of saving a Display Configuration file (choose this in the Files of Type dropdown box). This file contains a subset of the current server's settings, which relate to the display configuration.

You can load an XDL file at any time onto an existing show. This merges the display configuration in the XDL file with the current timeline contents, which allows you to keep display configuration separate from the show.

An XDL file contains:

Display Settings: Canvas size, active channels, channel sizes, timeline length and framerate, geometric mode, display gamma, beams, geometry and softness enable flags.

Background Geometry : Only those geometries on the background layer are saved in an XDL file.

Blends   : If present, any blends are saved to the XDL file.

Colour   : If present, any colour corrections are saved to the XDL file.

N o t e s
- An XDL file is *merged* with the current file, so if there are background geometry, blends or colour corrections on the timeline, they will not be replaced, but added to.

Permanent Geometry

You can specify an XDL file which is loaded after any file load so that the display config, point distortion & background geometry, blending and colour is maintained across show files even though this is not saved in each show file.

In the GUI - Config - Preferences - System, browse to the XDL file which is to be loaded each time. This is stored in the registry.

With a permanent XDL file defines, the behaviour of this process is on any file load;
- Load the Show XML file as normal
- Delete any geometry, blends and colour found in frames 0-9 on the background layer
- Merge the XDL file

You can also set the XDL file from external control if you want to swap between different permanent geometry setups;

SETDISPLAYCONFIG "c:\program files\7thsense\delta\setup1.xdl"
or
SETDISPLAYCONFIGALL "c:\program files\7thsense\delta\setup1.xdl"
to set all in that group to the same XDL file.

MULTI RACK CONTROL

The Delta GUI is inherently multi-rack aware, and will find all Delta servers on the network if they are not currently playing.

You can choose to place servers into a Group (1-20), and then set one server to Master, the others to Slaves. The master server will then broadcast timing information to the slaves over Ethernet.

You view a specific server by choosing its group, then the server by name.
The GUI therefore shows one server's timeline at a time.

Server List Dialog
To view all servers, choose Servers – View Server List from the main menu. This dialog offers a summary of all server's and all timeline's current status.

Group	Type	Timeline	Server Name	Server IP	State	Frame	File
24	Master	1	IANS-XPS	10.100.101.113	Stopped	0	Default
24	Master	2	IANS-XPS	10.100.101.113	Playing	349	Default
24	Master	3	IANS-XPS	10.100.101.113	Stopped	0	Default
24	Master	R	IANS-XPS	10.100.101.113	Stopped	0	Default
2	Master	1	XPS 1	10.100.101.111	Stopped	0	Default

Show Time As : Frames
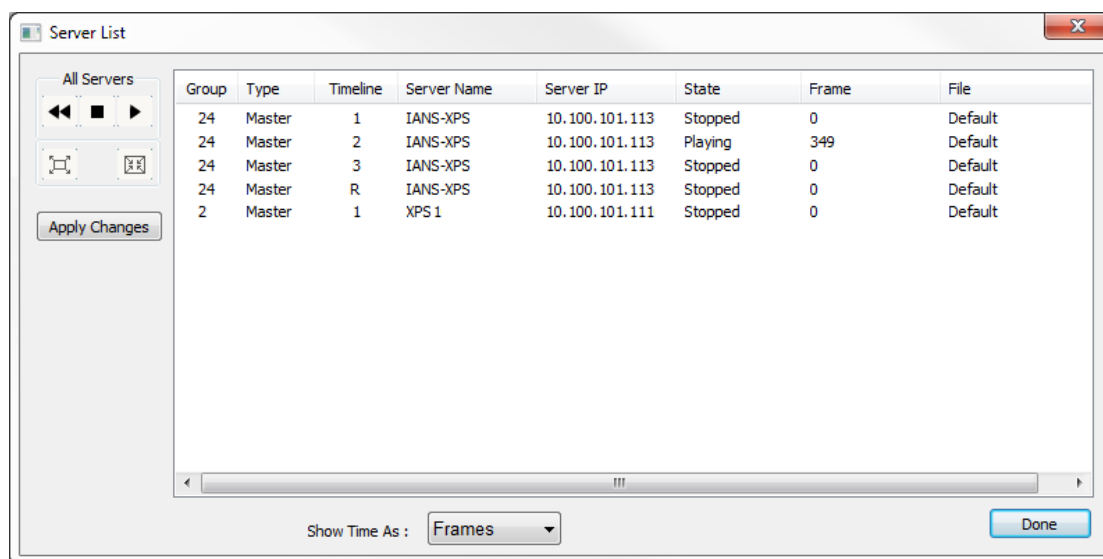
You can change group and master / slave setting by clicking on a server's details; also start, rewind or stop all servers and set them all to fullscreen or windowed.
The master / slave and group settings are changed when you press Apply Changes.

Copy Timeline
A convenient shortcut, this menu item allows you to propagate the show or configuration from the currently selected server to either the current group or all servers.

Note that the exact resources from one server are sent to the others, so if resources are kept in different paths, or are missing, the show will not be constructed properly.
The current show is overwritten with the new show.

For all modes below, you can choose to copy the following;
Timeline   : Copy the non-background timeline resources only.
Background Layer   : Copy the background layer resources as well.
Display Mode & Canvas: Copy the canvas dimensions, display mode (Flat / Stereo etc)
Channel Configuration : Copy all channel configuration as well.
Mesh   : For Mesh Mode, copy mesh configuration

Include Background
For multi server systems, display alignment geometry & blending may be placed on the background and Copy timeline would normally overwrite these with the current server's timeline. Un-Check the Include Background box to copy all layers except the background, preserving server-specific background resources.

Single
Copy from the chosen server to a single server selected in the drop down list.

Multiple
Copy from the chosen server to a single server selected in the drop down list.
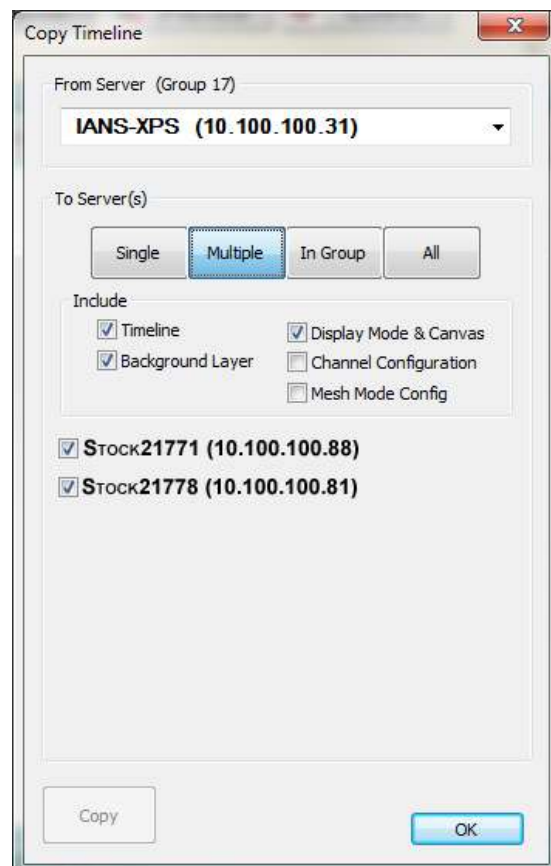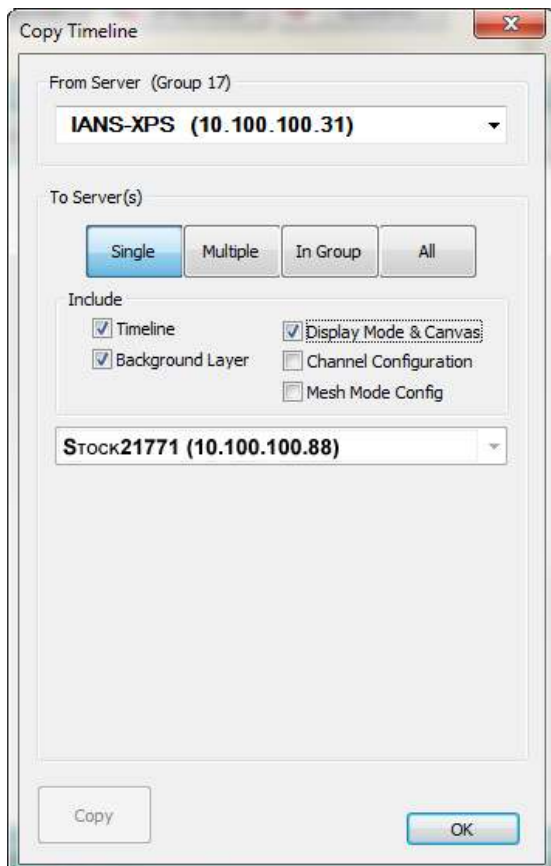
Group
Copy from the chosen server all servers in the selected group
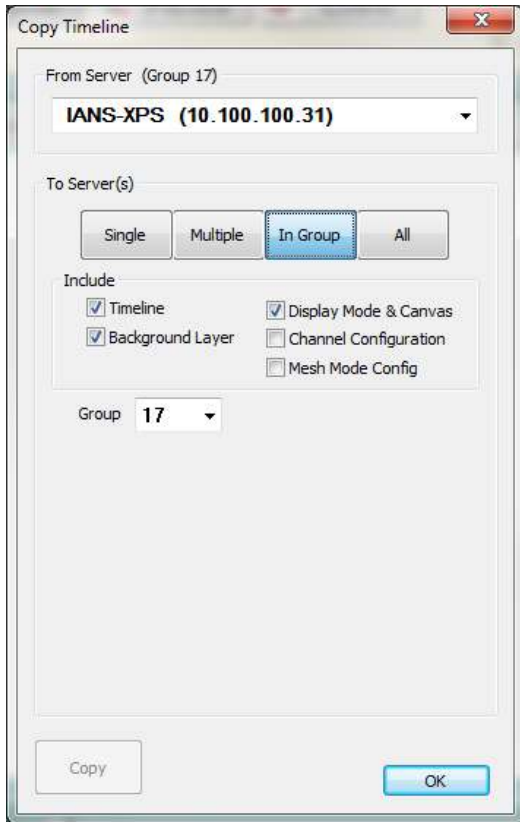
All
Copy from the chosen server all servers in all groups.
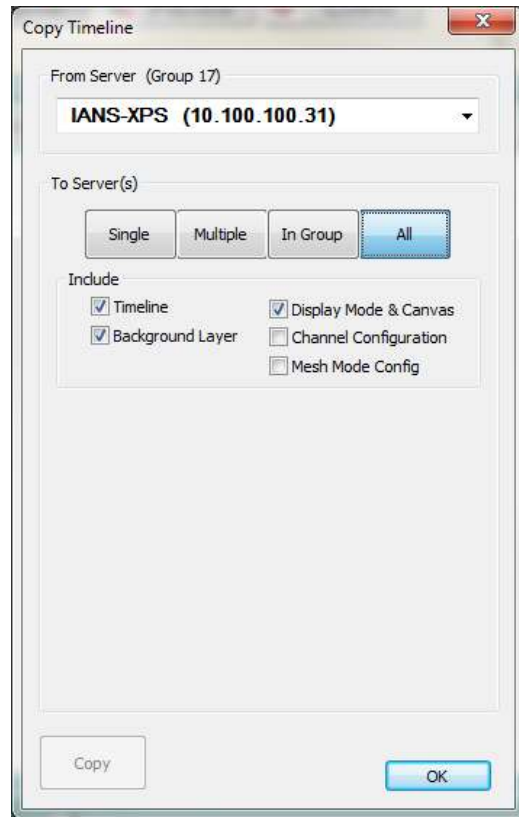
Ingest Resources

From the GUI PC, you can ingest files (save on remote servers) by using the Ingest Wizard, from the GUI - Wizards menu.

Choose Files
Press the Add File button to choose OBJ, XML, Audio and Images files to the list.
Press the Clear button to remove all files from the list.
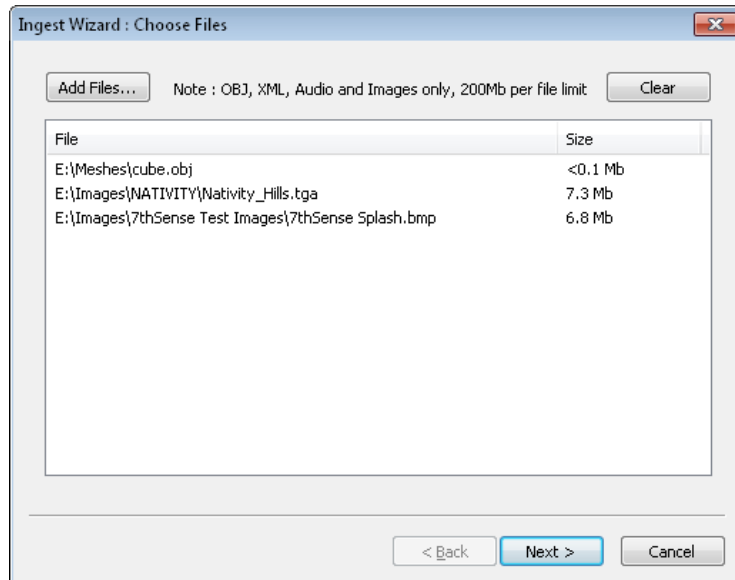
Choose Destination
In a similar set of choices to the Copy Timeline dialog above, choose a single server, multiple servers, a group or all servers to receive the files.
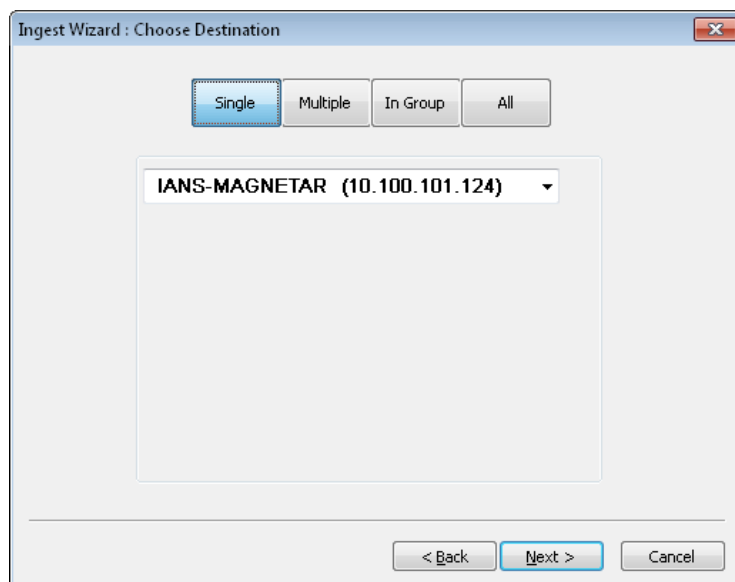
Process Files

Press the Go button, which will send the selected files to the selected servers, showing "Sent" when complete
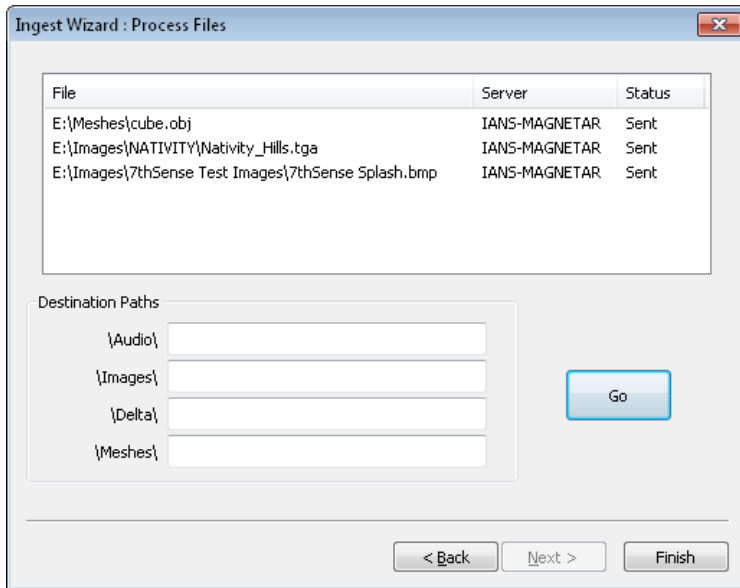
Note that in this dialog, you can enter a subfolder for each resource type. Leaving these boxes blank will for example place an image resource in the default c:\Images folder.

There is a size limit of 200Mb per single file, and currently only images, audio files, OBJ mesh files and XML / XDL files are supported.

VIEW DISPLAY SUMMARY

This dialog provides an overall summary of all the server's display configurations and allows control over beams, geometry and blending for all channels in all servers.

RESOURCE SEARCH

This dialog can be used to find resources on the timeline by typing in the full or partial resource name, then pressing Go..
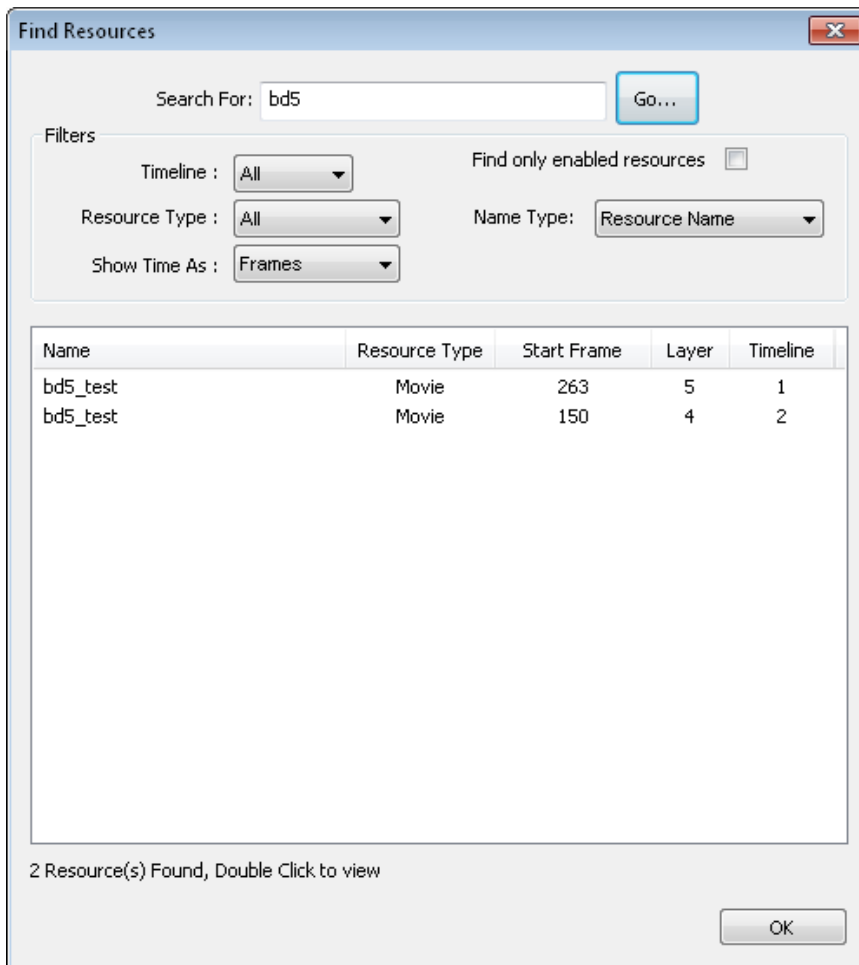
Resources will be listed - double clicking any of them will set the timeline cursor to that resource and layer in the GUI.

You can optionally search one or any timeline, for only enabled resources, by resource name or external control name or by resource type.

TIMELINE SUMMARY

Choosing Timeline Summary from the View menu shows a dialog which has a text summary of all the resources on the timeline. This can be sorted by start position or layer.

The summary can be copied to the clipboard for offline review using the Clipboard Copy button.
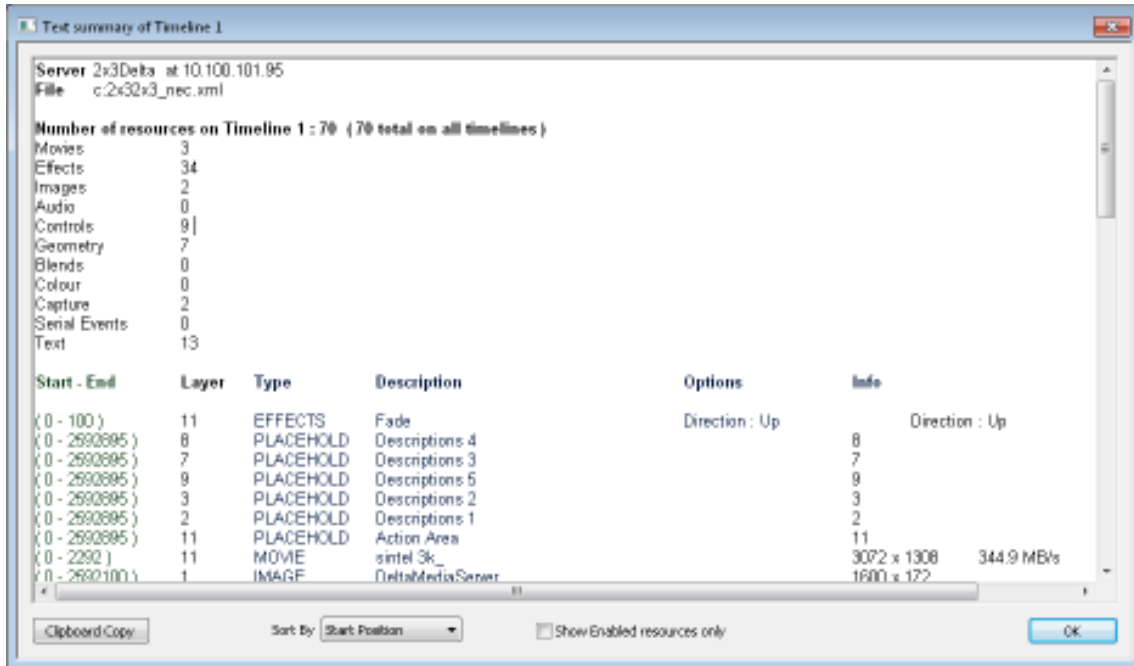
Any problems with an individual resource will be highlighted beside the name and a list of resources with errors will appear at the bottom of the page

APPENDICES

A : EXTERNAL CONTROL

This is a built-in serial event allowing an external serial or telnet controller to control the timeline. You can also add custom events to the timeline which output strings on the external control com port.

To specify a timeline for a command, add TL=X where X is the timeline in the range 1-7 or use R to specify the Reserve timeline. You can also use TL=ALL to specify all timelines.

Commands – Master Rack

Command	Description
PLAY	: Play the show (instant start if cue already done)
CUE	: Cue the show ready for the Play command
STOP	: Stop the show
ADVANCE n	: Step forward **n** frames
STEPBACK n	: Step back **n** frames
REWIND	: Rewind the show to frame zero
RATE n	: Set the framerate to n frames per second
RATESCALE factor	: Change the rate of the timeline by a multiple (1.3, 0.75 etc)
LOADALL "file name"	: Load the filename on all servers
MERGEALL "file name"	: Merge the filename on all servers
SEQUENCEALL sequencename	: Run the sequence on all servers
LAYERFADEALL [layer /name] opacity	: Set the transparency of this layer/resource
DISPLAYALL [fullscreen/windowed/minimized]	: Set all server's playback windows
GOTOMARKER "marker name" [play]	: Move to a named marker on timeline and optionally start playing from there.
GOTOFRAME framenumber	: Move to the framenumber specified and optionally start playing from there

GOTOTIME timecode framerate [play]   : Move to a timecode at a specific framerate, optionally play. So "Gototime 0:1:0:15   30.00" will move to 1hour and 15 frames for a framerate of 30fps, if your timeline is set to 24fps, the same command will move to 1 hour and 12 frames (12 frames is 50% of 24fps).

Commands – Master or Slave Rack.

Command	Description
LOAD "file name"	: Load the filename specified
MERGE "file name"	: Merge the filename specified with the current show
CLEAR	: Clear the timeline (same as File New)
STATUS	: Return a status message
SHORTSTATUS [seconds / smpte / file]	: Returns status information (frame/play mode) in a variety of formats
STATUSEX	: Return a list of tagged status information.
TIMELINESTATUS	: Return a list of status strings for the specified timeline including current timecode, timeline visibility, enabled, fade, autoplay status
FILESTATUS	: Returns the current show, permanent XML & XDL filenames
RECORD	: Start recording, details set in GUI
DISPLAY fullscreen	: Make the playback window fullscreen
DISPLAY windowed	: Make the playback window windowed
DISPLAY minimized	: Make the playback window minimized

DISPLAYALL [minimized, fullscreen, windowed] : As above, master will send to slaves

DIALOG windowed   : Make the server dialog visible
DIALOG minimized   : Make the server dialog minimized

LISTSHOWS "path"   : List the Media Player XML files in "path"
LISTMARKERS   : List any markers on the timeline.

TICKER "newtext" size R G B   : Change the ticker text to "newtext" at font size "size" and
colours R G B each off (0) to full (255).

Note that this is not a real-time command, so will interrupt playback for a few frames.

TICKERPOS   Y   : Change the ticker Y location in pixels

GLOBALFADE   [up / down] n   : Fade the video up or down over n seconds
                                             If sent to a master server, this will do the group

GLOBALAUDIOFADE   [up / down] n   : Fade the video up or down over n
                                             Seconds If sent to a master server, this will do the group

VIDEOLEVEL percent   : Set the overall video level to the percentage

AUDIOLEVEL percent   : Set the overall audio level to the percentage

LAYERFADE [layer / name] opacity   : Set Dynamic Transparency controls to the
                                             percentage opacity. This is set by layer (1 – 250 +
                                             background) or by resource name.

Version 2
LAYERFADE2 [layer=layer_num] / [resname=name] [percent=val] / [byte=val] [allingroup=yes]
Set Dynamic Transparency controls to the percentage opacity.
This is set by layer (1 – 250 + background) or by resource name.
Optionally use percent or byte (0-255) values and optionally send to all in that group

Examples
LAYERFADE2 layer=2 percent=90 allingroup=yes
Fade dynamic transparency on layer 2 to 90% on all servers in that group

LAYERFADE2 resname=MyFade byte=255
Fade dynamic transparency named MyFade to 100% (value of 255)

LAYERFADETIMED [name / layer] [up / down] n
                                             : Fade the dynamic transparency on the layer or by control
                                             name up or down (in 1000ms or 1.5s or 100f)
LAYERFADETIMEDALL [name / layer] [up / down] n : Do this on all servers.

LAYERFADETIMEDTO layer=Layernum time=Fadetime value=[0-100] all=[y/n] startvalue=[0-100]
                                             :Fade to a specific opacity value over time, optionally set
                                             the start value as well & optionally all servers or this one.

LAYERENABLE   layer [on/ off]   : Set a specific layer on or off
LAYERENABLEALL   layer [on/ off]   : Set all servers layer on or off

MOVIEPARAMS resourcename basefilename : Dynamically change a movies path in
Realtime for advanced movie switching

APPLYSHOWMODE   : Turn on geometry, blending & beams, turn off
grid, stats & graph, set fullscreen & channel
mode.

RESERVE [on / off]   : Go into / out of Reserve Mode.
If sent to a master server, this will do the group

MOVIEDRIVES [C-Z] [C-Z] [C-Z] [C-Z] [C-Z] [C-Z]: Set the primary movie drive, or set all 6
movie drive letters

OTHERDRIVE   [C-Z]   : Set the other resource drive letter (for images /
audio etc)

FORCEGRAPHICS W H refresh [single/dual/dualv]: Change the server's graphics mode to W x H
at the refresh, single , dual head horizontal span or dualhead vertical span.

Note that the display device must support the mode & the mode must be already created in the
driver before this will work. Dual head will only succeed if both display devices are present.

SMPTE [on / off]   : If SMPTE chasing is available on this PC, turn
it on or off for a master
SEQUENCE name   : Run the named sequence on this server
SEQUENCEALL name   : Run the named sequence on all servers in the group
CANCELSEQUENCE uniquename   : Cancel the named sequence
CANCELALLSEQUENCES   : Cancel all sequences on this server
LOADSEQUENCES filename   : Load the named sequences xml file
RELOADSEQUENCES   : Reload the current sequences xml file.
LISTSEQUENCES   : List the available sequences
LISTSEQUENCEACTIONS   : List the available actions for a sequence
PAUSESEQUENCE uniquename [y/n]   : Pause or continue the named sequence
GLOBALVARGET $variablename   : Return the value of this global variable
GLOBALVARSET $variablename=value : Set the value of this global variable (or create the
variable if does not exist)
GLOBALVARLIST   : List all variables and values
GLOBALVARDELETE $variablename   : Delete this variable

MEDIAMOVE controlname x [y] [w] [h] [r] [fullscreen / flat / channel]
: Move the media with external control name in 2D
: Examples MEDIAMOVE image1 channel 2 or MEDIAMOVE image2 100 100 1024 768

MEDIAMOVE controlname Az [El] [w] [h] [r] [fullscreen / flat / channel / fisheye / panoramic]
: Move the media with external control name in 3D
: Examples MEDIAMOVE image1 fisheye or MEDIAMOVE image2 –20 30 60 40 90

MEDIAMOVE [controlname / ctrlname=name] [x=X] [y=Y] [w=W] [h=H] [r=R] [fullscreen / flat /
channel] [feather=percent] [crop=\"L% R% T% B%\"]
: Alternative syntax : Move this media in 2D, all parameters are optional and tagged, e.g X=11

MEDIALAYER controlname layer
: Changed layer of media with this external control name

MEDIACOLOR controlname red green blue [contrast] [alpha] [reset]
: Set a resource rgb colour, optionally set the overall gain of the resource or alpha (all in %)
: Examples MEDIACOLOR Image_233 10 255 10 100 50 or MEDIA Image_233 reset

MEDIALUMA controlname mode [invert]   : Set the visual media's lumamode

Modes : [off,luma,red,green,blue,alpha], optionally invert.

MEDIAENABLE   controlname [y/n]
: Enable or disable a timeline resource by its external control name.
Note that enabling movies while playing will not work without first stopping.

Version 1 (Obsolete, but works);
MEDIAINSERT type resourcename [frame / +frame / -frame] [layer] [x y] [w h] [crop "L R T B"]
[feather %] [controlname / ctrlname=newname] [crop=\"L% R% T% B%\"] [length=framecount]
autodelete

Version 2
MEDIAINSERT [type=image/movie/audio/capture/geometry/blend/effect/control]
[resourcename=myresourcename] [newname=mynewname]
[frame= newframe / +frame / -frame] [layer=newlayer / background] [x=X] [y=Y] [w=W] [h=H]
[autodelete] [ctrlname=myctrlname] [length=framecount] [feather=percent] [crop=\"L% R% T%
B%\"] [channel=ChannelNumber] [mapping=channel/flat] [fullscreen] [audiochans=XX]:
[direction=up/dn]

Add a resource to the timeline, optionally set other parameters.

: Insert a movie or image at a specific layer, frame or position onscreen, optionally autodelete it
once the resource has been played through.

Examples (Version 1)
: MEDIAINSERT image white.jpg
: MEDIAINSERT image white.jpg 123 12
: MEDIAINSERT image white.jpg 123 12 100 200
: MEDIAINSERT image white.jpg 123 12 100 200 333 444
: MEDIAINSERT movie "mymovie channel 1" 123 12 autodelete
: MEDIAINSERT movie "mymovie channel 1" 123 12 ctrlname=whitemovie
: MEDIAINSERT image white.jpg +100
: MEDIAINSERT movie "mymovie channel 1" 123 12 crop="10 0 0 0" feather=20

Examples (Version 2, Tag Style)

: MEDIAINSERT type=effect resourcename=transparency frame=100 direction=up
: MEDIAINSERT type=effect resourcename=fade   frame=100 direction=dn

: MEDIAINSERT type=control resourcename=loop frame=100
: MEDIAINSERT type=control resourcename=marker frame=100

: MEDIAINSERT type=blend resourcename="Flat Blends" newname="Ch2" channel=2

: MEDIAINSERT type=image resourcename="my white.jpg" layer=2

: MEDIAINSERT type=audio resourcename=ls audiochans=f
Audiochans is bitwise, so FF equates to 1111 1111 which is the first 8 channels enabled.
Note this works only for mono files, stereo and multichannel audio always contain speaker
mappings.

AudioChans are hex values in the order RSide, LSide, RS, LS, Sub, C, R, L, so to enable RSide
Rsurround R & L, the binary is 1001 0101 which is A3 in Hex

: MEDIAINSERT type=movie frame=+200 resourcename=mymovie mapping=channel channel=4
x=100 y=100 w=1000 h = 800 TL=3
This will insert the movie 200 frames ahead of the current timecode on timeline 3, channel mapped
to channel 4, but with offsets of 100,100 from the top left corner of channel 4, sized at 1000x800.

Note that when adding a movie to the timeline, it should be placed ahead of the current frame to allow the movie to cache.

MEDIAREMOVE controlname
: Remove all resources with this control name from the timeline

MEDIACLEARAUTODELETES
: Remove all resources which have been inserted with autodelete, but not yet played through.

Version 1:
TRANSFORMPARAMS transformer_name X Y W H R   : alter the transform animator values
TRANSFORMPARAMS transformer_name Az El W H R: alter the transform animator values in frustum mode

Version 2:
TRANSFORMPARAMS [controlname / ctrlname=name] [mode=absolute/relative/speed] [startx=0] [starty=0] [startw=0] [starth=0] [startr=0] [endx=0] [endy=0] [endw=0] [endh=0] [endr=0] [enablex=0/1] [enabley=0/1] [enablew=0/1] [enableh=0/1] [enabler=0/1] [persistent=0/1] [pingpong=0/1] [start_easelength=0] [start_easespeed=0] [start_easeprofile=0.0] [center_easelength=0] [center_easespeed=0] [end_easelength=0] [end_easespeed=0] [end_easeprofile=0.0] [enablestart=0/1] [enableend=0/1] [xcount=0] [ycount=0] [rollcount=0] [startframe=X] [endframe=X]:
Set the Transform Animator parameters (all parameters are optional except control name)

Examples (Version 2)

TRANSFORMPARAMS controlname=myTA mode=speed start_easespeed=5 start_easelength=60 center_easespeed=20 center_easelength=200   end_easelength=5 end_easespeed=0
This example sets the myTA transform animator and sets start, centre & end speeds & lengths.

TEXTPARAMS resource_name "new text" Size R G B X Y : Change any text resource's text, colour, size or position. The parameters after the new text are all optional.

SETSPEAKERMIX audioname L R C Sub LS RS LSide RSide
: Set a mono audio file's 8 speaker volumes (in percent). You do not have to send all volume levels. External software can use these values to provide spatial audio based on a speaker location and volume level.

RELOADIMAGES [name=controlname] [1]: Reload all images on the timeline. Note that this is a non-realtime control and may stall playback while the images are loaded. This command allows you to replace images in a folder, while the show is loaded & reload them prior to playing the show.

Adding the "1" parameter will delete the thumbnails held for the images, these will be recreated on the next Refresh Resources or restart of the server application

GEOMETRY [on / off]   : Enable or disable all geometry on this server

BLENDING [on / off]   : Enable or disable all blending on this server

SETDISPLAYCONFIG   "XDL File path and name" : Set the permanent XDL file

SETDISPLAYCONFIGALL "XDL File path and name": Set the permanent XDL file for the
                              group

SETPERMANENTSHOWFILE "XDL File path and name" : Set the permanent XML file

SETPERMANENTSHOWFILEALL "XDL File path and name" : Set the permanent XML file on all servers

GROUP group [master/slave]   : Set the group of this server, optionally change it to master
or slave.

GRAPH [on/off]   : Turn the diagnostic graph onscreen on or off
STATS [on/off]   : Turn the diagnostic text onscreen on or off

RESTART_PC   : Immediately restarts the server (Note - will not prompt to
save any un-saved work)

SHUTDOWN_PC   : Immediately shuts the server down (Note - will not prompt
to save any un-saved work)

TIMELINEOPACITY value=XX Time=Ys TL=Z   : Set the timeline opacity, with optional fade
over time in seconds

TIMELINEOPACITYALL value=XX Time=Ys TL=Z   : Set the timeline opacity, with
optional fade over time in seconds for all servers in this
group.

SETTIMELINEVISIBILITY visible= 'y' or 'n'   : Make a timeline visual or non visual

SETNUMTIMELINES value=X   reserve=[0/1]   : Set number of active timelines (1-8)
and optionally set if Reserve is enabled or not.

AUTOPLAY controlname [on/off]   : Set a movie to be autoplay or not

PLAYAUTOPLAYMOVIES controlname [on/off]   : Play or stop autoplay movies

STARTAUTOPLAYFROMBEGINNING controlname [yes/no] : Start from the beginning or from the
last frame when starting to play an autoplay movie.

GETAUTOPLAYSTATUS   Gets autoplaying status of timelines.

CHANNELMOVE [name=channame or num=X] [x=X] [y=Y] [w=W] [h=H]

CHANNELCOMPVP [name=channame or num=X] [x=X] [y=Y] [w=W] [h=H]
These commands are part of the optional Composition Mode which allows the setting of channels
or the input viewports from ArtNet.

SETMESHDATA meshid=meshidval [x=xval] [y=yval] [z=zval] [h=hval] [p=pval] [r=rval]
[xscale=xscaleval] [yscale=yscaleval] [zscale=zscaleval] : Set one of the 16 Mesh objects location
and size.

TESTPATTERN name   : Set the test pattern to normal (no testpattern), chequer, black,
white, greyscale, crosshatch, sphericaldots, dipslaygrid (yes/no)

PREVIEWTIMELINE [1-8 / 255] : Select which timeline to preview, 1-8]. 255 means all timelines.

REGISTERPREVIEWLISTENER [ip address]   : Register to listen to Preview.
UNREGISTERPREVIEWLISTENER [ip address   : Unregister to listen to Preview.

SELECTSDIFORMAT name="formatname" OR index=X :Select the current SDI format by name or
Index

INITAUDIO forceuseasio=[y/n] forceasiointerface=[Zero based audio interfaceindex (as listed in the
GUI)] forcenumchannels=0-16. Note - if no forced options are used, audio will be reinitialised with
existing options

WEBSETURL res="External Control Name" url="http://mynewdomain.com" hres=H vres=V:
change a web control's domain & optionally the rendered resolution.

WEBNAVIGATE res=\"ExternalControlName\" navigate=[back/forward/reload/stop] : make the web
control navigate as if the browser buttons are used.

ARTNET inputenable=[y/n] outputenable=[y/n]   : Enable or Disable broadcasting output & input
listening independently.

SETARTNETCHANNEL channel=cvalue value=vvalue [stride=sval]. : Set a channel to a value
and optionally set the stride to 1, 2 or 4. Note that any ArtNet timeline resource on the same
channel will overwrite these values when in scope.

HELP   : This help information

N o t e : File names or marker names must be enclosed in double quotes if there is a space in the name.

Return Codes

When first connected to Delta, it returns a statement such as ;

       ApplicationName Deltaserver.exe ↵

       Welcome to the 7thSense Delta Telnet interface, Help[CR] for commands ↵
       SERVER : ServerNode1 ↵
       READY ↵

Where ↵ is the 0x0d 0x0a Carriage Return / Linefeed Pair
Note the **SERVER** name is taken from the PC.

If a command is not recognised by Delta, it will return :
       BAD ↵

If a command is correctly formatted, it will return :
       OK ↵

Certain commands return more information:

STATUS will return a string such as this;

       SERVER   : ServerNode1 (Master) ↵
       FILE   : stratosphere show1.xml ↵
       MODE   : Stopped ↵
       CURRENTFRAME: 2646 ↵
       FRAMERATE : 30.0 ↵
       LICENCE   : Permanent ↵
       MOVIEDRIVES : C E ↵
       OTHERDRIVE : C ↵
       GRAPHICS : 1920 X 1080 60 HZ ↵
       SMPTE   : OFF ↵
       AUDIOLEVEL : 100 ↵
       VIDEOLEVEL : 100 ↵
       ↵
       OK ↵

In this return information,
The SERVER is taken from the PC, and will be (Master) or (Slave)
The FILE is the current loaded filename
The MODE can be Stopped, Preparing to Play or Playing
The CURRENTFRAME is the current frame number
The FRAMERATE is the current framerate
The LICENCE can be Permanent or will show a date for time expired licences

LOAD "file" will return the STATUS information after the load

LISTSHOWS [path] will return a list of XML files in the path specified such as;

       Show List ↵
       08newsting.xml ↵
       08newsting.xml.xml ↵
       showcase 2006 novidcap.xml ↵

HD Test 1.xml ↵
tile 2006 hd3.xml ↵
OK ↵

LISTMARKERS

Marker List ↵
Start : 5 ↵
Images : 420 ↵
Movies : 780 ↵
Audio : 1382 ↵
Video Capture : 1980 ↵
Text : 1680 ↵
Crossfades : 2280 ↵
OK ↵

Example Dialog

ApplicationName Deltaserver.exe

Welcome to the 7thSense Delta Telnet interface, Help [CR] for commands
SERVER : athlon2600
READY

status ↵
SERVER   : Server1 (Master)
FILE   : ball bounce.xml
MODE   : Stopped
CURRENTFRAME: 311
FRAMERATE : 25.0
LICENCE   : Permanent
MOVIEDRIVES : C C C C
OTHERDRIVE : C
GRAPHICS : 1920 X 1080 60 HZ
SMPTE   : OFF
AUDIOLEVEL : 100
VIDEOLEVEL : 100

OK

listshows ↵
Show List
08newsting.xml
test.xml
test2.xml
TILE.xml
OK
load " TILE.xml " ↵
SERVER   : athlon2600 (Master)
FILE   : TILE.xml
MODE   : Stopped
CURRENTFRAME: 0
FRAMERATE : 25.0
LICENCE   : 30.12.2006
MOVIEDRIVES : C E V W
OTHERDRIVES : C
OK

play ↵
OK

status ↵
SERVER   : athlon2600 (Master)
FILE   : test.xml
MODE   : Playing
CURRENTFRAME: 22
FRAMERATE : 37.5
LICENCE   : 30.12.2006
MOVIEDRIVES : C E V W
OTHERDRIVES : C

OK
stop ↵
OK

Troubleshooting External Control

To see what communication is taking place from your control system to the server, on the server dialog, do Help - External Control Traffic;

External Control Traffic				
Time	From/To	Data		OK
13:28:56	Out: Both			
13:28:56	Out: Both	ApplicationName Deltaserver.exe		
13:28:56	Out: Both			
13:28:56	Out: Both	Welcome to the 7thSense Delta Telnet interface, Help [CR] for commands		
13:28:56	Out: Both	SERVER : IANS-XPS		
13:28:56	Out: Both	READY		
13:29:03	IN: telnet 0	STATUS		
13:29:03	Out: Both	SERVER : IANS-XPS (Master)		
13:29:03	Out: Both	FILE : fff.xml		
13:29:03	Out: Both	MODE : Stopped		
13:29:03	Out: Both	CURRENTFRAME: 0		
13:29:03	Out: Both	FRAMERATE : 30.0		
13:29:03	Out: Both	LICENCE : Permanent		
13:29:03	Out: Both	MOVIEDRIVES : C C C C		
13:29:03	Out: Both	OTHERDRIVE : C		
13:29:03	Out: Both	GRAPHICS : 1920 X 1080 60 HZ		
13:29:03	Out: Both	SMPTE : OFF		
13:29:03	Out: Both			
13:29:03	Out: Both	OK		Clear

This dialog shows the last 2000 input & output strings

B : LICENSING THE SERVER

Delta is licensed software, using a physical Key (USB or Parallel port), which is locked to the physical hardware of the Delta PC. This Key is supplied by 7thSense.

To license a Delta PC (if not already done by 7thSense):

- Install Delta using the setup.exe supplied
- Insert the USB Delta Key into USB port.

Windows 7:
- Run the setupdrv.exe supplied for Blue dongles, Green dongles need no driver.
- Install the dongle in a USB port – the driver should be found automatically.
- *Note that you have to do this for each USB port you want to plug the Key into.*

An unlicensed Delta system will continue to run, but certain features are disabled, and you won't be able to save a Delta file.

Note that the GUI does not require a license, only the server, so you can run the GUI from any PC.

Changing the Licence
An update code can be obtained from 7thSense to add features remotely through email.
To update the USB licence, from the Delta Server dialog menu, choose About – Enter Licence Code:
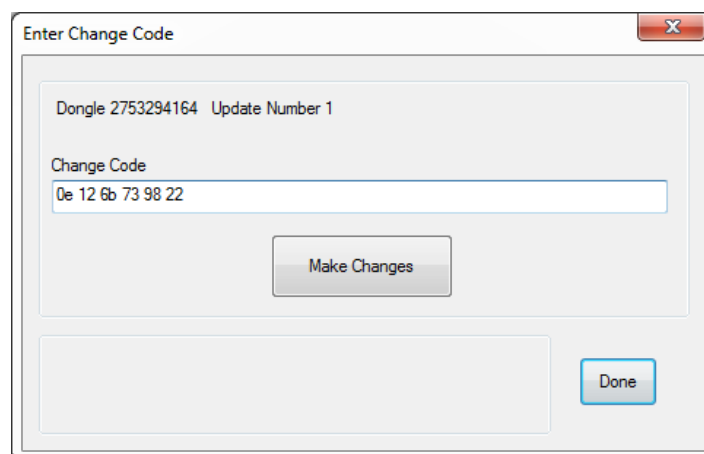
The emailed code should be copied into the Change Code edit box & then press Make changes – any errors will be shown below.

Note that to obtain an update code, you will need to send the **Dongle Number** & **Update Number** to 7thSense – these are shown above or in the Help – About dialog.

C : HDSDI OUTPUT OPTION

Delta can be configured as having HDSDI outputs instead of DVI, which is useful in certain AV installations having long video cable runs.

The HDSDI option has to be licenced & a compatible HDSDI output card installed.

You can configure the output mode in Config - Display, Output button. In this dialog you can choose DVI or HDSDI outputs. In HDSDI mode, you can select the various HD video formats which are stored in c:\ program files \ 7thSense \ Delta \ System \ SDI_BF.XML. You can edit this XML file to add other video formats, which will work as long as the mode is supported by that specific HDSDI card.

Enable DVI Preview   : Enable this to also show all channels on the DVI outputs. Note that these are preview only, and could show video tearing on the DVI outputs in this mode.

Media Colour
Rec709   : This is the HD standard in which certain colours are reserved and the media uses a restricted range of values (8Bit is 16 to 235, 10Bit is 64 to 940). Choose this if the media you have conforms to the Rec709 standard.

Full Range   : Select this option if the media uses the full range of colours (0-255 in 8Bit, 0-1023 in 10Bit.

Audio
Note that audio can be optionally made to stream via HDSDI (up to 8 channels). This is a manually installed option, by running the Drivers \ HDSDI \ InstallHDSDIAudio.Bat file.
Once installed, in HDSDI mode, audio will always be streamed via HDSDI and not output on any other sound device.

HDSDI Timing

When in HDSDI mode, the timing is taken from the HDSDI card, so in the GUI - Config - Preferences, choose;

- Timing page :
- Check or Uncheck the SMPTE Control - Enabled checkbox according to the LTC / SMPTE chase mode you need.
- Timing Mode is "Use hardware."
- Framerate is Custom & type in the actual framerate you need (e.g. 23.976)

- Configuration Defaults
- Set Automatic Framerate to unchecked and select Custom, type in 23.976
- Set Force Framerate to unchecked

D : SMPTE / TRANSPORT CONTROL SETUP

Delta can listen to SMPTE LTC timecode, and play, stop, jog and shuttle accordingly. To do this:
- A Genlock licence must be purchased with Delta
- A Midi (MTC)– USB input device or Adrielec card is required
- An LTC timecode device which can output Midi Time Code (MTC)

Configure the SMPTE device in Delta (Configure – Preferences – Timing) to point at the Midi – USB input device, and Enable the SMPTE tracking in this menu.

At this point, when pressing the SMPTE button in the lower left area of the GUI, the VCR transport controls will disappear, since we are purely tracking the incoming SMPTE timecode.

RS422 Transport Controls

In order for Delta to have some control over the external LTC device, in Configure – Preferences – Communication section, configure a comport to have the following parameters:
COMn : 38400, Odd Parity, 8 Data bits, 1 Stop bit, set to Transport Control

Connect this com port to the external LTC device input via an RS422 converter like this;
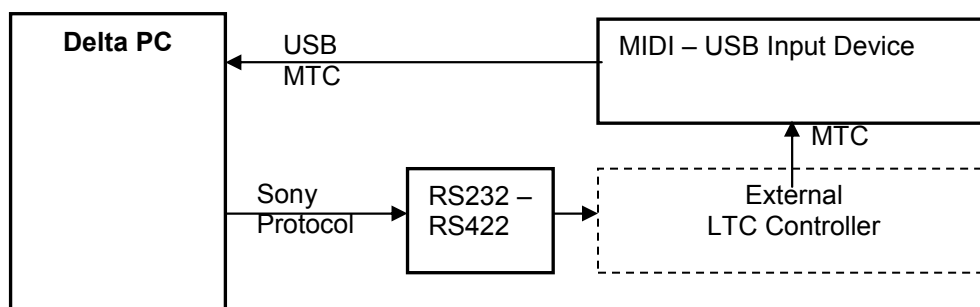
Now, when you enable SMPTE tracking by pressing the GUI SMPTE button, the transport controls remain, and when you play, stop / drag the slider, you are communicating to the external LTC controller via Sony Protocol commands.

Example Devices
RS232 – RS422	: Moxa™ Transio TCC-100
MTC Input	: M-Audio™ MidiMan
External LTC Device	: CB Electronics™ P2MMC
Adrielec	: PCIe-TC LTC Reader card

E : SHORTCUT KEYS

Common to both GUI and Server :

H   : Halt the playback
P   : Play
R   : Stop and rewind the timeline to frame 0.

F1 – F12,	**Control F1 – F12 ,**
Shift F1 – F12,	**Control-Shift F1 – F12:**
0 –9	**Control 0 – 9**
Shift 0 –9	**Control-Shift 0 - 9**

A marker on the timeline can be set to one of the function keys or numeric keys for quick access to a timeline position. Using the Control or Shift keys, up to 88 markers can be accessed by a key

Home	: Rewind to frame 0
Left Arrow	: Step back one frame
Right Arrow	: Step forward one frame
Control Left Arrow	: Search previous marker
Control Right Arrow	: Search next marker

Alt F1 : Help file

Server :

F   : Toggle the playback window fullscreen or windowed
S   : Show statistics on the playback window
G   : Show the graph on the playback window
A   : Show the Audio levels on the playback window

GUI :

Space : Toggle playing
Ctrl G : Goto Dialog
Ctrl C : Copy
Ctrl X : Cut
Ctrl P : Paste
Ctrl B : Paste At
Ctrl A : Select all
Ctrl D : De select all
Del : Delete all selected
Ctrl R : Reserve Mode toggle
Ctrl M : Add Marker at current frame
Ctrl F : Find a resource
Ctrl T : Show the Timelines dialog

+ / - : Zoom in or out on the timeline
Shift Z : Zoom to the extents of all media on the timeline

Ctrl when dragging a resource or selected resources: Copy.
Ctrl when incrementing or decrementing a value : 10 x speed
Shift when incrementing or decrementing a value : 1/10 x speed

---

F : COMMAND LINE SWITCHES

These switches can be sent to the server application to modify its startup behaviour. Enter them in the Target box of a shortcut.

SERVER

Affects this run only

-minimized : Show the server dialog and playback window minimized.

-minimizedialog : Show the server dialog minimized.

-fullscreen : Show the playback window fullscreen.

-delay n : Delay the server startup for n seconds

-smpte_on : Enable tracking SMPTE

-smpte_off : Disable tracking SMPTE

- nopool : Do not look for pool resources on disk on startup

Changes are also stored for the next run

-master : Change the current mode to master

-slave : Change the current mode to slave

-group n : Change the current group to n

GUI

- group N : Force the GUI to accept only connections from group N

- selectgroup : Force the GUI to show a dialog on start to select the single group to allow connections from.

Note that when starting the GUI with no command line parameters, any other GUI will be terminated on that PC. However, if you run with Group N or selectgroup command line parameters, this will not happen, so on the same PC you can have one GUI on Group 3 and another on Group 6 and so on.

G : HARDWARE SPECIFICATION

Physical Characteristics*

Delta can be supplied in a 1U or 3U high 19" Rackmount chassis, or optionally in a small form factor VESA mount.

	Format	Width (mm)	Height (mm)	Depth (mm)	Weight (kg)
Delta Nano R	1U Rackmount	437	46	240	4
Delta Nano V	VESA Mount	220	95	200	2
Delta DuoII	1U Rackmount	437	46	240	4
Delta Trio	3U Rackmount	437	132	450	*20
Delta Nucleus	3U Rackmount	437	132	450	*24
Delta InfinityII	3U Rackmount	437	132	610	*28

*Approximate, depending on options.

N o t e s
- When installing any of the Delta family, ensure that the device is not positioned such that it can be used as a foothold or step to stand on. Always unplug all cables when handling the device.

Environmental Characteristics*

	All Delta Versions
Operating Temperature	15 to +30°C
Non Operating Temperature	-10 to +50 ^{o}C
Humidity Range	10 - 90% non condensing
Non Operating Humidity Range	5 – 95% non condensing
Max Operating Altitude	<2000m
Max Shipping Altitude	<10000m
Vibration	+/- 0.25g (normal operating)

N o t e s
- This equipment is intended for benign environments while operating; that is, not subject to corrosive or explosive atmospheres, excessive dust or moisture, flammable gases or extremes of temperature.

- This equipment is non-protected against ingress of liquid (IPx0).

Electrical Characteristics

	Max Power (W)	AC Voltage (V)	Max Input Current (A)	Power Inlet
Delta Nano R	100	100 – 240V, 50 / 60Hz	1.3 (230V) 3 (100V)	IEC320 Plug
Delta Nano V	100	100 – 240V, 50 / 60Hz	1.3 (230V) 3 (100V)	IEC320 Plug
Delta DuoII	100	100 – 240V, 50 / 60Hz	1.3 (230V) 3 (100V)	IEC320 Plug
Delta Trio	500	100 – 240V, 50 / 60Hz	4.5 (230V) 9 (100V)	IEC320 Plug
Delta Nucleus	750	100 – 240V, 50 / 60Hz	5 (230V) 10 (100V)	IEC320 Plug
Delta InfinityII / III	1050	100 – 240V, 50 / 60Hz	6.5 (230V) 13 (100V)	IEC320 Plug

N o t e s
- All members of the Delta family are not suitable for connection to an IT power system ("a power system having no direct connection to earth, the exposed conductive parts of the electrical installation being earthed").

- The equipment must be earthed.

- For a server with a redundant power input, the power supply has 2 power leads. These must be connected to the same phase of the electricity supply.

IT Characteristics

	All Delta Versions
Operating System	Windows 7
Network Connection	Gigabit Ethernet
Com Ports	(options for 1 - 16)
Graphics Outputs	1, 2, 4, 6, 8 or 12 (DVI or DisplayPort) or 1, 2, 4, 8 or 12 SDI

N o t e s
- This equipment is not intended for connection to a corporate network. The machine has full administrator rights and is therefore not secure against misuse of a network.

- This equipment is not intended to have other applications loaded onto the machine, which may interfere with playback performance, communications or other operation of the Delta software.

Delta GUI will not connect to the server

The GUI automatically looks for all servers on the same network. If it cannot find the server, it could be one of the following;

Server does not have an IP Address
For the GUI to find the server, the server must have a valid IP address. This happens when the Ethernet interface of the PC is connected to another Ethernet device such as a Hub or Switch. If the server IP address is 0.0.0.0, this indicates it does not have a valid IP Address.

Corrective Action – Connect the server to an ethernet Hub or switch and attach the GUI PC to the same hub or switch. Check if a DHCP server is available or set the server to a static IP Address in the same range as the GUI PC.

Server has a different IP range to the GUI
If the server has an IP Address of 10.100.100.200 and a Netmask of 255.255.255.0, it could never be found from a GUI PC which is on 192.168.2.100, since they are on completely different IP ranges.

Corrective Action – Change the GUI or the server's IP Address to the same range – e.g. GUI on 10.100.100.88, server on 10.100.100.200

GUI has blocked this group
You can type a list of groups into the GUI which it will not connect to. This list is held in the Preferences dialog, at Configure – Preferences – Communication – Ethernet, Server Groups Blocked List.

Corrective Action – Check the server's group is not listed in this edit box, if it is, remove it from this list and press OK.

Another GUI is connected
Only one GUI can connect to a server at a time, if you have multiple groups, use the -SelectGroup command line switch on the GUI to force it only to look at this one group – in that way you can have multiple GUIs on a single PC connected to multiple servers (in different groups).

To understand which GUI is connected, find the server dialog (through VNC) and Stop playback, then the status indication will highlight the IP address of the GUI machine. You can also choose GUI – Kill GUI from this server dialog. Alternatively, send in the KILLGUI external control command to kill the currently attached GUI. Note that this is safe to do as the contents of the server, even if not saved, are not altered by the GUI terminating.

Delta will not play smoothly

When playing movies, the playback is jerky or random, this could be one of the following;

Server is playing movies from a disk that is not fast enough
Normally, Delta has a RAID or SSD drive for movie playback, if playing from the C: operating system disk, this may not be fast enough.

Corrective Action – Check the server is configured to use a fast enough movie disk (Configure – Preferences – Drives, check the Movie drive is RAID or SSD).

Corrective Action – Check the movie transfer disk rate by hovering over the movie on the GUI timeline, this shows it in MegaBytes/second. For example, a 8Mb/s movie may be ok

on the C: drive, a 50Mb/s movie will need 2 disks in RAID0, a 180Mb/s movie will need SSDs or 8 disks in RAID5.

Disks are ok, but the movie still does not play ok in Dual-Head.
The graphics mode for dual-head mode must be Horizontal or Vertical Span, Dual-View is not supported and can cause problems. You will see a warning in the GUI and on the blue server dialog if it is DualView.

Corrective Action – Check the nVidia control panel under the "setup multiple displays section), it should be "one large horizontal desktop" or "one large vertical desktop". After changing mode, restart the Delta Server.

Disks and graphics appear ok, but movie playback is not smooth.
Check the playback window Graph and Stats (press the S and G keys);
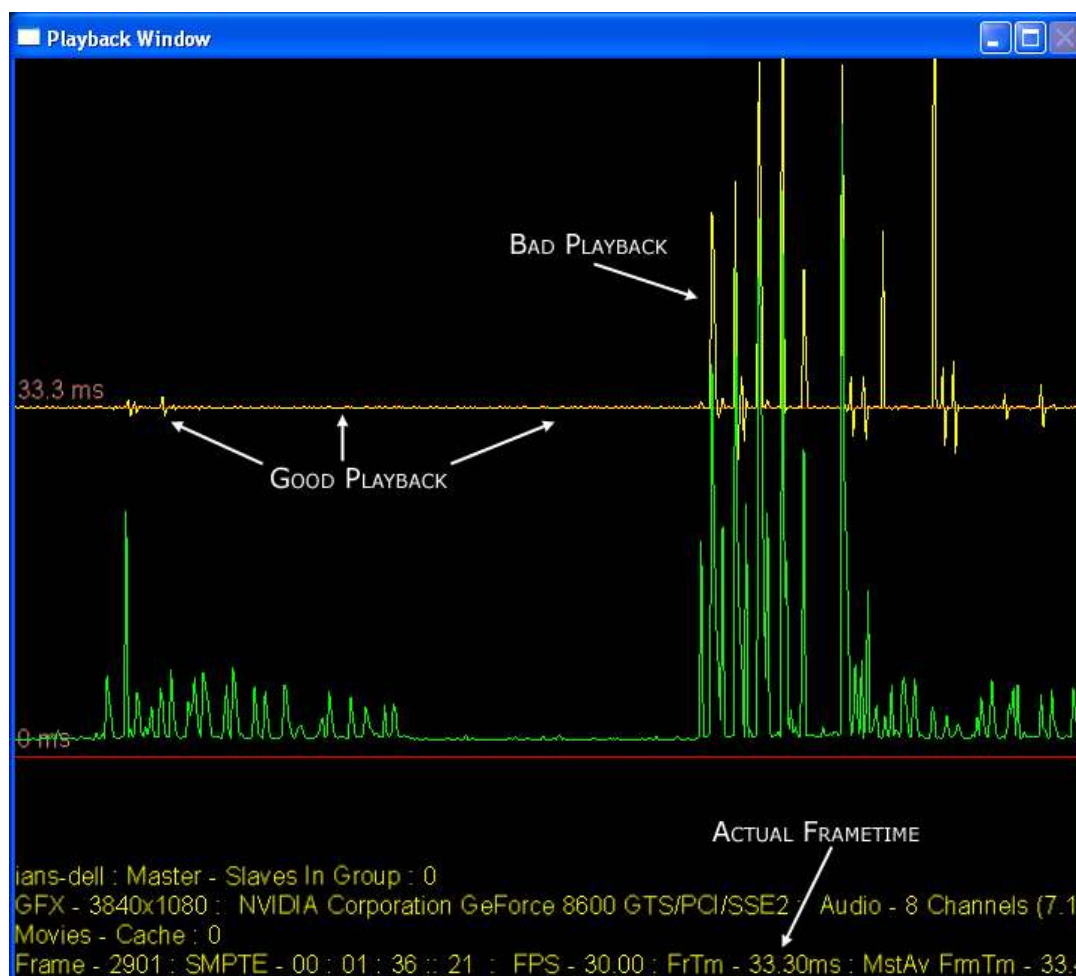
If the yellow line is on the top red line as in the left part, playback will be smooth, if there are yellow spikes in the graph well above the top red line, something is causing bad playback.

Corrective Action

– Check there is not another application running which is taking high CPU time.

– Check the FrTm value (shown above) matches the expected frame time, e.g. 33.3ms for 30fps, 40ms for 25fps and 41.7ms for 24fps. If this is not the case, check the EDID to projector or monitor matches the expected video format.

System Log

You can create a system log to send back to us using the server dialog's Save System Log option, found in the server dialog menu – About – Save System Log.

This creates a folder with the current date in the **c:\ program files (x86) \ 7thsense \ Delta \ Logs** (32bit version) or **c:\ program files \ 7thsense \ Delta \ Logs** (64bit version) folder which contains show xml files, snapshot of the registry, debug log if it is turned on – Zip this folder up & send back if requested.