

**VCube**  
HD VIDEO SYSTEM

**User Manual**

**VI**

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## Thank you!

Congratulations on your purchase of the **VCube Video System**. More than just a powerful video solution, VCube is part of a comprehensive range of Audio, Video and Show Control products, software and hardware. Welcome to the worldwide community of users who have already discovered the Merging Technologies advantage.

**Note: IMPORTANT!** - The first thing you need to do is register your software to acquire your VCube key(s) and to be included in our user support list.

Please also subscribe to the User Forum at:

<http://www.merging.com/forum/>

## Overview

### What is VCube?

**VCube** is a hard-disk based video player / recorder system with real-time editing and resizing functions. It is designed to be an easy to use, flexible, high quality, and reliable video file play out and capture device synchronizable with any time reference standard. For example:

**In Sound for Picture Post-Production, ADR etc.**

**Theatres**

**Theme Parks**

**Museums**

**Trade Shows**

**AV Presentations**

**Film Festivals**

are just a few of the possible applications for **VCube**.

**VCube** can operate as a standalone unit, or as part of a multi-system network, fully integrated with **Pyramix** or **Ovation**, over standard Ethernet networks.

Like Pyramix it offers sync to PAL, NTSC, 24fps Film and all the HDTV frame rates.

The Turnkey versions of VCube are also able to sync to a different TimeCode and reference than the internal frame rate. This enables, for example, playing in 24 fps while syncing to a 25 fps TimeCode.

Pro versions of VCube can also be controlled via the 9-pin Sony (P2) protocol by any third-party DAW system, as well as controlling any device equipped with 9-pin remote control for capture. VCube fully supports the Merging Technologies Virtual Transport 2 technology.

The integrated video editor with multi-track, multi-layer features enables the VCube user to remove, add or trim Media Files imported from a Composition (VCube native Composition or OMF, AAF, and Apple XML are optional).

VCube is able to mix different video file formats at different resolutions and frame rates in the same Timeline. It is only necessary to specify the output format. All video Clips are resized and the frame rate compensated as necessary to this format in real time. Therefore it is possible to play out any video file at any frame rate in combination with any other without rendering.

VCube is an open solution that can import OMF, AAF, Apple XML Compositions. VCube is also able to convert, and render Media. A password protected watermark feature enables the administrator to tag both video and graphic outputs. The administrator can also protect VCube settings and editing with a second password.

**VCube will be your Swiss Army Knife for video !**

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**For all documentation inquiries or suggestions for improvement:**

<http://www.merging.com>

## VCube Keys & Options

Please visit the Merging Technologies VCube pages for the latest options available:

<http://www.merging.com/products/vcube/software-packs>

## Installation

Please see the VCube Installation Guide and the Installation Guides for any hardware you have purchased.

## Early VCube Systems

**Note:** Early VCube systems may include AJA Xena LS, Xena HS or Canopus ADVX-1000 video cards. These are no longer actively supported as of Version 6. If you have one of these cards you may wish to contact your Merging Technologies sales partner to discuss a cross-grade solution.

## VCube Concepts

### *Project*

A **Project** is the top level of organization. Projects are saved with the file extension **.VCube**. A **Project** controls and keeps track of all the various elements you are assembling at a given time. A **Project** always contains a **Composition**, viewed on the **Timeline**.

### *Composition*

A **Composition** is any number of **Clips** complete with edits and fades, level settings etc. placed on a **Layer** in a **Track** or tracks in a time relationship to each other and to the **Timeline**.

### *Track*

In the Timeline Video and Audio assets are placed onto Layers within Tracks.

### *Video Track Layer*

Video Track Layers behave in the same manner as layers in a non-linear video editor. I.e. video on the topmost layer of the topmost track will hide concurrent video below it unless there is a compositing blend mode or picture-in-picture mode in force.

### *Audio Track Layer*

Audio Track Layers display the waveform for each channel in the audio media file. Thus a stereo audio track will have two layers and a 5.1 will have six.

## *Video and Audio Outputs*

### **Video**

Video may be viewed via the computer graphics card or via a dedicated video card. **Please see: Video I/O on page 112.**

### **Audio**

Audio may be monitored via an ASIO device or a RAVENNA device such as a HORUS or HAPI. MassCore is NOT supported in ASIO mode.

The Audio output device is selected and set in the VS3 Control Panel.

## About This Manual

### Assumptions

This User Manual and the other documentation assume you are thoroughly familiar with PCs and Windows terms and concepts. If the PC is new, please ensure the machine is working correctly before attempting to install VCube.

**Note:** VCube does not support the “Aero” style transparency display features present in Windows Windows 7. This will be turned off automatically for the duration of the VCube session.

### Conventions

#### Conventions used in this document:

Names found on screens and in menus are shown in bold. E.g. **Information & Settings**

Menu and sub-menu selections are shown like this:

**User-Interface > Output > Show Buffer Tab**

Which means:

Go to the **User-Interface** pull-down menu, mouse down to the **Output** sub-menu, mouse down to the **Show Buffer Tab** entry and **Click**.

References to VCube Settings Tabs are shown thus:

**Settings : Formats & Sync : Composition Video Format : Height**

Which means:

In the Settings Page accessed via **Settings > Show All Settings** click on the **Down Arrow** and **Click Format & Sync** to open the Tab. In the **Composition Video Format Section** the **Height** field is the one we are interested in.

**Keyboard Shortcuts** are shown thus: **[Ctrl + Num 9]**.

The VCube User Interface uses a number of buttons. These are dark when unchecked (inactive, not selected) and orange when checked (active, selected) The state of these buttons is referred to as **checked** or **unchecked**.



VCube button states

In the screenshot above the **Transparent Overlay Box** is inactive (unchecked) and **Chase TimeCode** is active (checked).

### Documentation

Automatically installed with VCube and available under the **Help** menu or **[F1]**, this manual is intended to be a comprehensive reference source for all the standard features and functions in VCube.

To ensure the document is visible please uncheck **TopMost** in **Settings > Show User Interface Tab : Display - Manual Resize** or use **[Ctrl + Shift + Alt +P]** to open the page.

All the documentation is in the Adobe Acrobat pdf format. (.pdf file extension)

In order to read the documentation you will need to have **Adobe Acrobat Reader V5** or later installed on your computer.

Other documentation can be found in the Windows **Start** menu in **All Programs > VCube > Docs**. Please check for the most recent versions at:

<http://www.merging.com>

**Note:** All features described in the documentation are available in the **Advanced Mode**. If the user-interface is set to **Simple Mode** some features may remain hidden or unavailable. To change the UI Mode:

**User Interface > WorkSpace > UIMode: Advanced [Alt + F3]**

**User Interface > WorkSpace > UIMode: Simple [Alt + F1]**

## Navigation

In electronic form, all the **Contents** and **Index** entries and **Cross-references** are hyperlinks. I.e. Clicking on them will jump to the relevant item.

## ToolTips

VCube software is equipped with 'ToolTips'. Hovering the mouse cursor over a tool icon pops-up a box with the name of the function and the keyboard shortcut (where applicable).

## Support

If you cannot find an answer to a query in the documentation, please consult the on-line support at:

<http://www.merging.com>

where you will find answers to F.A.Q.s (Frequently Asked Questions) and further support.

## Multiple Monitors

VCube supports 2 screen extended desktop operation. Depending on the Vcube version and the hardware available, analog and digital video outputs are available to feed monitors and or projectors.

## Important Note

VCube is not only a very powerful video player/recorder, it is also a highly configurable one, the User Interface as much as the Video and Audio. Therefore screenshots in this document may differ from what you see on screen.

**PLEASE DO NOT PRINT THIS DOCUMENT UNLESS ABSOLUTELY NECESSARY  
SAVE TREES AND INK BY USING THE HYPERLINKS**

## Overview

VCube is organized with a Tabbed Page interface. Every Tab can be displayed in a broken away window, on top of the Preview, if required, even while Preview is full screen. Classic pull-down menus complement this user interface. In VCube there are usually at least three ways of accessing everything. E.g. Menu, Icon, Tab or Keyboard Shortcut.

To display a Page Tab separately, **Double-click** on its **Title Label**. The floating Tab Page can now be Click-and-dragged anywhere on the screen(s).

To restore the Tab Page to its default position, just **Double-click** again on the **Title Label** or use the close window **X** icon.

To display an individual Tab separately, [**Ctrl + Double-click**] on its **Title Label**.

To restore to the default position, just **Double-click** on its **Title Label** or use the close window icon.

Individual Tabs can also be displayed separately by a **Double-clicking** on their **Title Labels**.

## Color Picker

Several VCube Settings Tabs use a **Color Picker**.



Pick one of the standard colors by simply clicking on it.

Alternatively Click on **Custom** to edit the colors in the first row of the **Color Picker**.



Click in the bottom bar to choose a **Hue** value.

Finally, Click in the Saturation area to define the custom color.





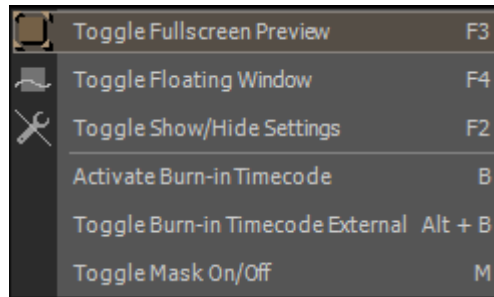
## Context Menus

**Right-click** in the Preview pane or in the Timeline with the Cursor over the tracks to display contextual menus.

**Note:** The Timeline menu contents varies depending on circumstances.

### Preview Context Menu

In Simple, Full Screen or Floating modes, several VCube functions can be accessed with a **Right-Click** on the preview area :



Preview Context Menu

<b>Toggle Fullscreen Preview</b>	<b>[F3]</b>	Toggles Preview Full Screen.
<b>Toggle Floating Window</b>	<b>[F4]</b>	Toggles the Preview window floating and hides the User Interface except for broken away windows
<b>Toggle Show/Hide Settings</b>	<b>[F2]</b>	Toggles Control Settings Pages.
<b>Toggle Burn-in Timecode</b>	<b>[B]</b>	Toggles the Burnt-in TimeCode Counter Show/Hide
<b>Toggle Burn-in External TC</b>	<b>[Alt + B]</b>	Toggles the External TimeCode Input display Show/Hide
<b>Toggle Mask On/Off</b>	<b>[M]</b>	Toggles the horizontal and vertical Masking On/Off

## Navigating the Interface

Whilst it is perfectly possible to operate VCube without recourse to Keyboard Shortcuts we strongly advise learning at least the basics. Changing the layout of the User Interface during operation and opening and closing the most common Pages and Folders is much more efficient this way rather than delving in menus. The following list gives the most commonly used Interface functions, their shortcuts and menu entries :

### Display Control Settings Pages [F2]

### User Interface > Toggle Show/Hide Settings

Displays the Settings and Control Pages on the right-hand side of the Preview pane. The Preview is resized to suit. The width of the Control Settings Pages can be changed by clicking and dragging the separator.

### Toggle Full Screen Preview [F3]

### User Interface > Toggle Full Screen preview

### Toggle Floating Window [F4]

### User Interface > Toggle Floating Window

Makes the Preview window float and hides the User Interface except for broken away windows. You can choose from

### Refresh [F5]

### User Interface > Refresh

### Toggle File Page [F6]

### User Interface > Settings Pages > Show File Page

### Toggle Locator Page [F7]

### User Interface > Settings Pages > Show Locator Page

### Toggle View Page [F8]

### User Interface > Settings Pages > Show View Page

### Toggle Edit Page [F9]

### User Interface > Settings Pages > Show Edit Page

### Open Settings Page [F10]

### User Interface > Settings Pages > Show Settings Page

Opens the **Settings Page** floating

### Previous Settings Page [Home]

### User Interface > Settings Pages > Previous Settings Page

### Next Settings Page [End]

### User Interface > Settings Pages > Next Settings Page

### Show Timeline in lower panel [F11]

### User Interface Show Timeline Page

Show Record Page in lower panel [F12]

Toggle Transport Control Panel [T]

Show Preset Tab [P]

User Interface > Show Record Page

User Interface > Toggle Transport Tool

Settings > Show Preset Tab

## *Zoom in the Timeline*

To change the Zoom level use [Alt + Mouse wheel] or [Alt + Click into the Time Ruler and Drag].

[Alt + Drag in the Timeline] Zooms to the Region selected.

Double-click on the Time Ruler acts as **Zoom All** and deselect selected clip(s).

**Zoom All** [Alt + 1]

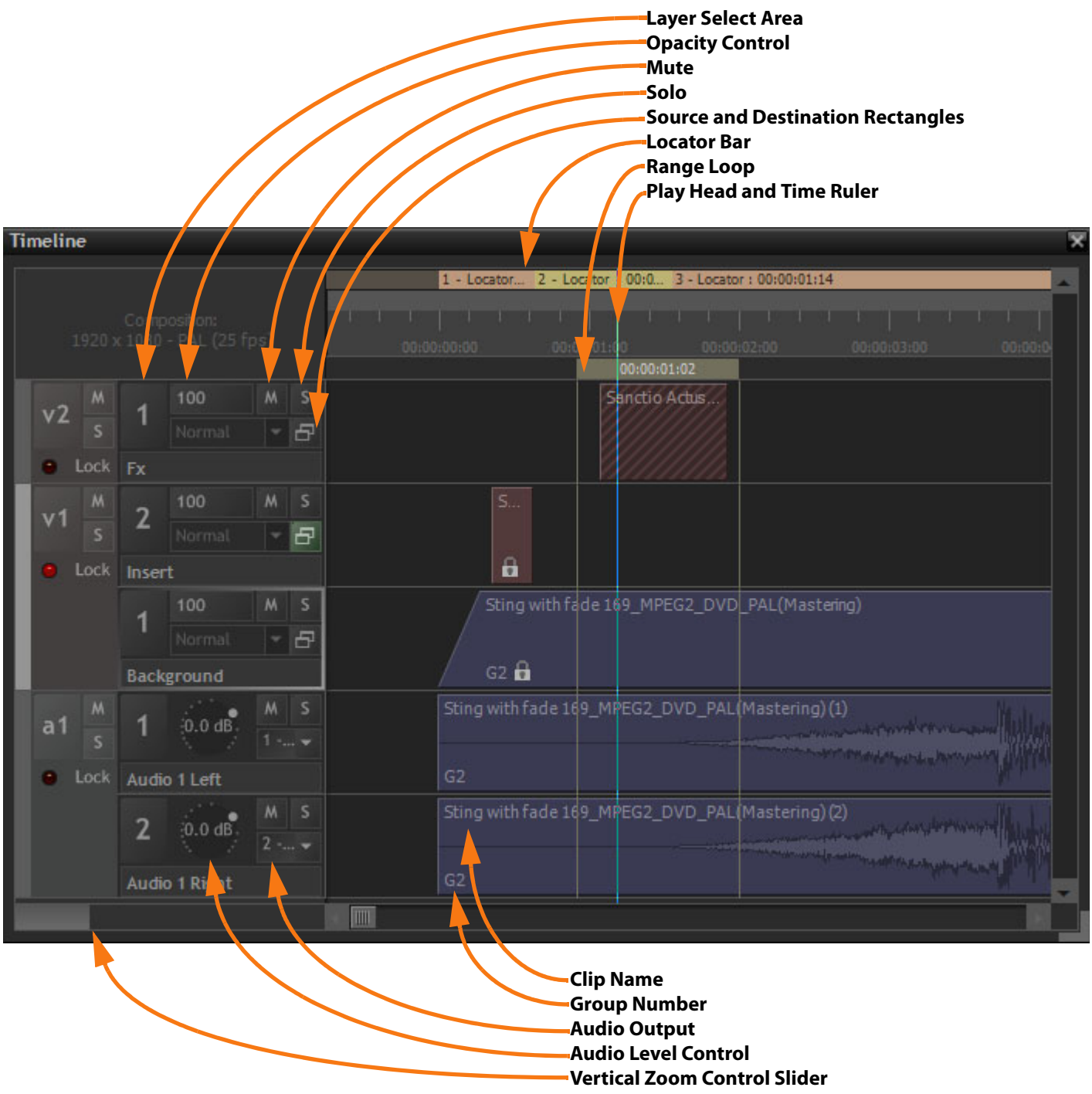
**Undo zoom** [Alt + 2]

**Zoom In** [Alt + 3]

**Zoom Out** [Alt + 4]

# Timeline

**User Interface > Show Timeline Page [F11]** brings the focus to the Timeline Tab below the Preview pane. Double-clicking the **Timeline** Tab breaks it away as a floating window.



Timeline floating Tab

- The **Locator Tray** is above the **Timeline**. Locators can be dragged with the mouse. Double-click in the Locator tray to open the **Locators** page.
- Below is the **TimeCode Scale**. A Double-click in the TimeCode **Scale** acts as Zoom Fit [Alt + 1] and **Deselects All Clips**.
- Underneath is the **Range Tray**. The Range can be dragged and trimmed with the mouse. Double-clicking in the **Range Tray** sets the Range from the **Start** to the **End** of the **Composition**.
- **Video Track 1** has **2** Layers and is locked, **Track 2** has only one Layer.

- Layer 1 is selected in **Video Track 1. Track 1** is also selected. **Sting Clip** is set to Fade In.
- Opacity of every Layer is set to full (**100**). **Layer 2** in **Video Track 1** has been modified in Size or Position
- In **Video Track 2** the Red / Blue Clip (crosshatched or “zebra” striped) means the Media is missing but despite this, the Clip can still be edited.
- Audio Clips and Video **Clip Sting...** belong to the same group, G2.
- Click and drag on the **Vertical Zoom Control** to vary the Track height.
- Click on the **Audio Output** indicator to pop-up a list of all available audio outputs.

**Note:** Right-clicking in a blank area of the Timeline pops-up a context menu. Right-clicking on a Clip pops-up a different context menu.

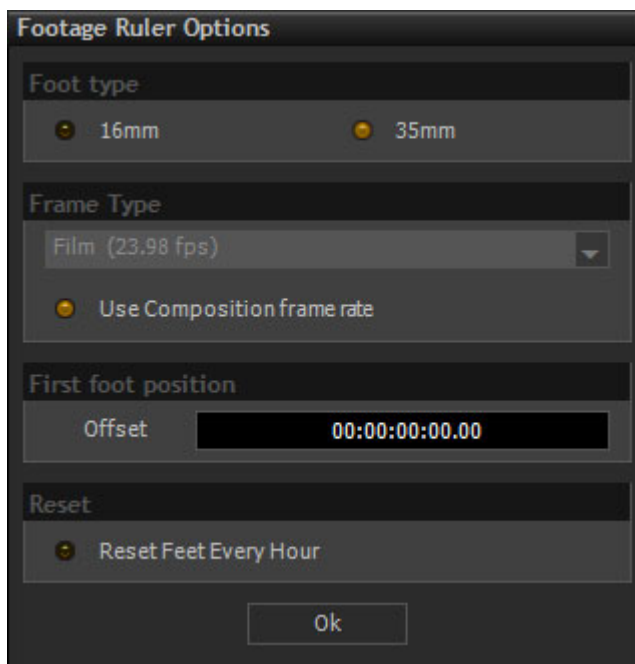
**Note:** In the Video Layer header, the button labeled **Normal** and associated drop-down are for a future feature under development.

## Film Footage Ruler

### Settings > Show Timeline Tab : Feet Ruler

When checked, the **Show Feet Ruler** entry shows the **Film Footage Ruler** above the TimeCode Scale.

The Footage Ruler Settings dialog can be accessed by Right-clicking the **Film Footage Ruler** or via **Settings > Show Footage Ruler Options Dialog**



Footage Ruler Options dialog

### Footage type

**16mm** When checked Film Feet are counted in units of 40 Frames

**35mm** When checked Film Feet are counted in units of 16 Frames

### Frame Type

The Frame Type drop-down menu allows for the cadence and temporal subdivisions of the feet & frames counter to be changed independently of the Composition frame rate or incoming timecode. By far the most popular footage counter temporal rate is 24 fps which corresponds to a standard 35 mm frame rate, but you may also need to compensate for picture that has been accelerated frame-for-frame (24=>25 fps) or pull-down frame rates (23.98 film) so that feet & frame values actually match frames in the Timeline regardless of the Composition's or incoming TimeCode's frame rates. The **Use Composition** frame rate button locks the feet & frames counters to the Composition frame rate.

- Use Composition frame rate** When checked the time-base is the same as the Composition Frame Rate. When unchecked the time-base can be selected from the drop-down list above.
  
- First foot position** The Time field enables an offset to be entered if required. For example when a 15 foot (10 second) leader starting at **01:00:00:00:00** precedes the first frame of action and the first frame of action should show **0.00 Feet & frames** at **01:00:10:00:00** TimeCode then enter an offset of **01:00:10:00:00**
  
- Reset**
- Reset Feet Every Hour** When checked, the footage counter and footage ruler will return to **0.0** after every hour. This is useful if there are several film reels in a composition with first frame of picture of each reel at the beginning of each hour. E.g. reel one starts at **01:00:00:00:00**, reel two at **02:00:00:00:00** and so on. Thus enabling each reel to count from **0.00** feet.

# Synchronization

## Settings

All the relevant synchronization settings can be found in the **Settings > Show Format & Sync Tab**.

## Requirements

In order to be synchronized properly VCube requires the following as a minimum:

- A Chase TimeCode Source (Virtual-Transport: Network, Sony 9-pin (P2) protocol or external : LTC, VITC, MTC)
- A TimeCode Clock Reference (AJA or BlackMagicDesign card with a video reference or USB Sync card Video reference)

## TimeCode Sources

- LTC (XLR connector) Network (RJ45 Ethernet connection)
- Sony 9 pin protocol (RS-422 serial port). RS-232 on COM1 port is also possible.
- MTC (MIDI TimeCode from a suitable hardware MIDI interface or IP MIDI etc.)

**Note:** that an Ethernet connection used as a source of TimeCode is also able to feed VCube with an SD stream from a Video Server simultaneously.

## Virtual Transport 2

TimeCode Chase, whilst effective, is slow. **Virtual Transport 2** enables VCube (and Pyramix) to be locked together. In effect this is a built in **Chase Synchronizer** for VCube.

Configuration is done in Pyramix please see: **Virtual Transport 2** in the **Pyramix User Manual**.

## Important Note

In order to ensure optimum sync; the, **AJA**, **Black Magic Design** and **USB Sync** cards, where present, must all be locked to the same Video Reference.

# Quick Settings

## Overview

In order to ensure that VCube is as versatile as possible there are a very large number of settings. To make it easier to configure VCube for common formats there are two **Quick Settings** options.

These two dedicated Settings panels enable one click setting of the Video Input format, the Composition format, the TimeCode frame rate and the Video Output format. When VCube is configured by using **Quick Settings** it behaves like a VCR for the format selected. Quick Settings can also form a useful basis for more complex configurations.

## Using Quick Settings

### Set Up

To set up VCube using **Quick Settings**:

- Open the relevant **Quick Settings** Page using :

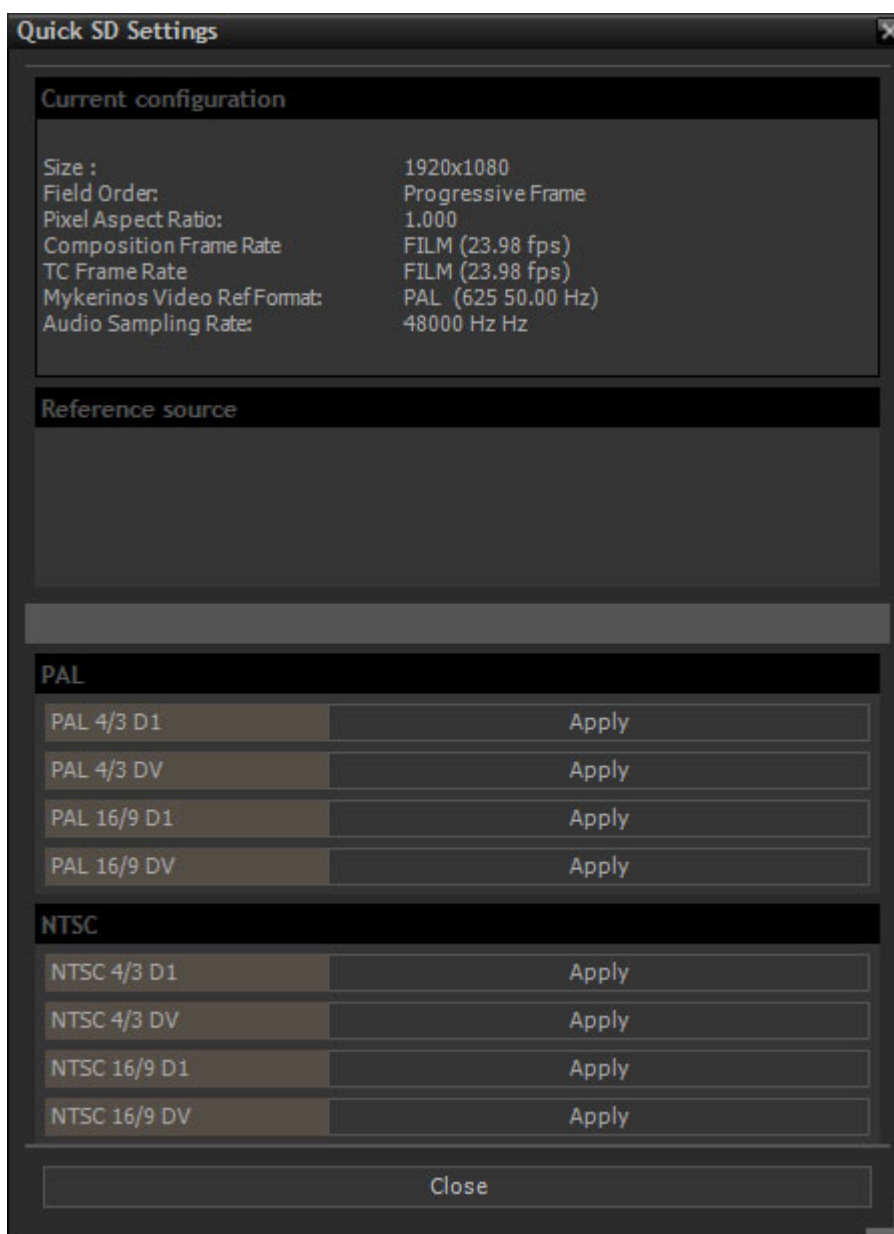
**Quick SD Settings** for Standard Definition formats: **Settings > Quick SD Settings [Alt+F5]**

**Quick HD Settings** for High Definition formats: **Settings > Quick HD Settings [Alt+F6]**

- Ensure that the **Reference Sources** if any are set appropriately.
- Click on the **Apply** button for the appropriate format.
- Verify in the **Current Configuration** section that the settings are as you desire
- Click on **Close** to finish and close the Page

Please see subsequent pages for screenshots and details.

## Quick SD Settings



Quick Standard Definition Settings page

### Current Configuration

The **Current Configuration** section summarizes the current state of VCube in terms of:

<b>Size :</b>	Shows the number of horizontal and vertical pixels.
<b>Field Order:</b>	Shows <b>Progressive Frame</b> for non field based formats or field order and type.
<b>Pixel Aspect Ratio</b>	Shows the shape of pixels as a ratio
<b>Composition frame Rate</b>	E.g. FILM (23.98 fps)
<b>TC Frame Rate</b>	E.g. FILM (23.98 fps)
<b>Audio Sampling Rate</b>	E.g. 48000 Hz

### Reference Source

The **Reference source** Panel is blank when using the graphics card. Drop-down lists of sources appear here when appropriate hardware is present e.g.:

<b>Video Reference Source</b>	Field shows the current Video Reference source. Click on the down arrow to select an alternative. (This field is only populated when a Video card and or USB sync card is fitted.)
-------------------------------	--



**Note:** When a video card is used, it is highly desirable, if not essential, except in exceptional circumstances that all the references are the same and, ideally, sourced from external video syncs.

**PAL**

**PAL 4/3 D1**

**PAL 4/3 DV**

**PAL 16/9 D1**

**PAL 16/9 DV**

**NTSC**

**NTSC 4/3 D1**

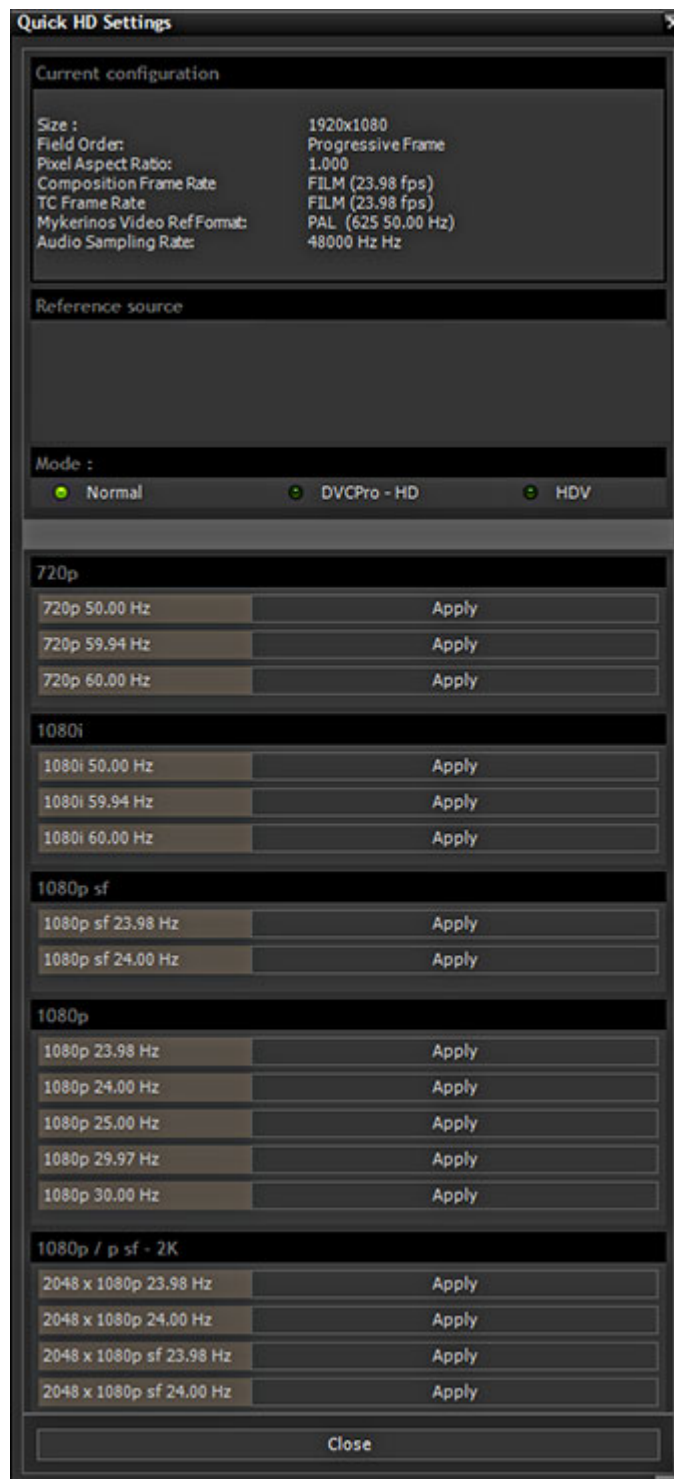
**NTSC 4/3 DV**

**NTSC 16/9 D1**

**NTSC 16/9 DV**

**Note:** The terms **PAL** and **NTSC** are not strictly accurate in the context of Digital Video but are used commonly as a convenient shorthand to differentiate between European and US standards.

## Quick HD Settings



Quick High Definition Settings page

### Current Configuration

The **Current Configuration** section summarizes the current state of VCube in terms of:

- Size :** Shows the number of horizontal and vertical pixels.
- Field Order:** Shows **Progressive Frame** for non field based formats or field order and type.
- Pixel Aspect Ratio** Shows the shape of pixels as a ratio
- Composition frame Rate** E.g. FILM (23.98 fps)
- TC Frame Rate** E.g. FILM (23.98 fps)
- Audio Sampling Rate** E.g. 48000 Hz

## Reference Source

The **Reference source** Panel features two or three drop-down lists:

**Video Reference Source** Field shows the current Video Reference source. Click on the down arrow to select an alternative. (This field is only populated when a Video card and or USB sync card is fitted.)

**Note:** Except in exceptional circumstances it is highly desirable, if not essential, that all the references are the same and, ideally, sourced from external video syncs.

## Mode

The three **Mode** buttons enable video card memory usage to be optimized depending of the type of HD media.

**DVCPRO-HD** and **HDV** require specific settings to achieve maximum performance in **Record** and **Playback**.

## Compositions

The top level of organization in VCube is the **Composition**.

A Composition is a set of instructions to VCube. These include format information, screen layout and an EDL indicating what Media is to be played and when. It also determines fades, levels and other parameters. A Composition does not contain Media Files. Compositions are portable between systems.

**Note:** Only one Composition can be loaded at a time. However it is possible to load elements of other Compositions into the current Composition.

### File Extension

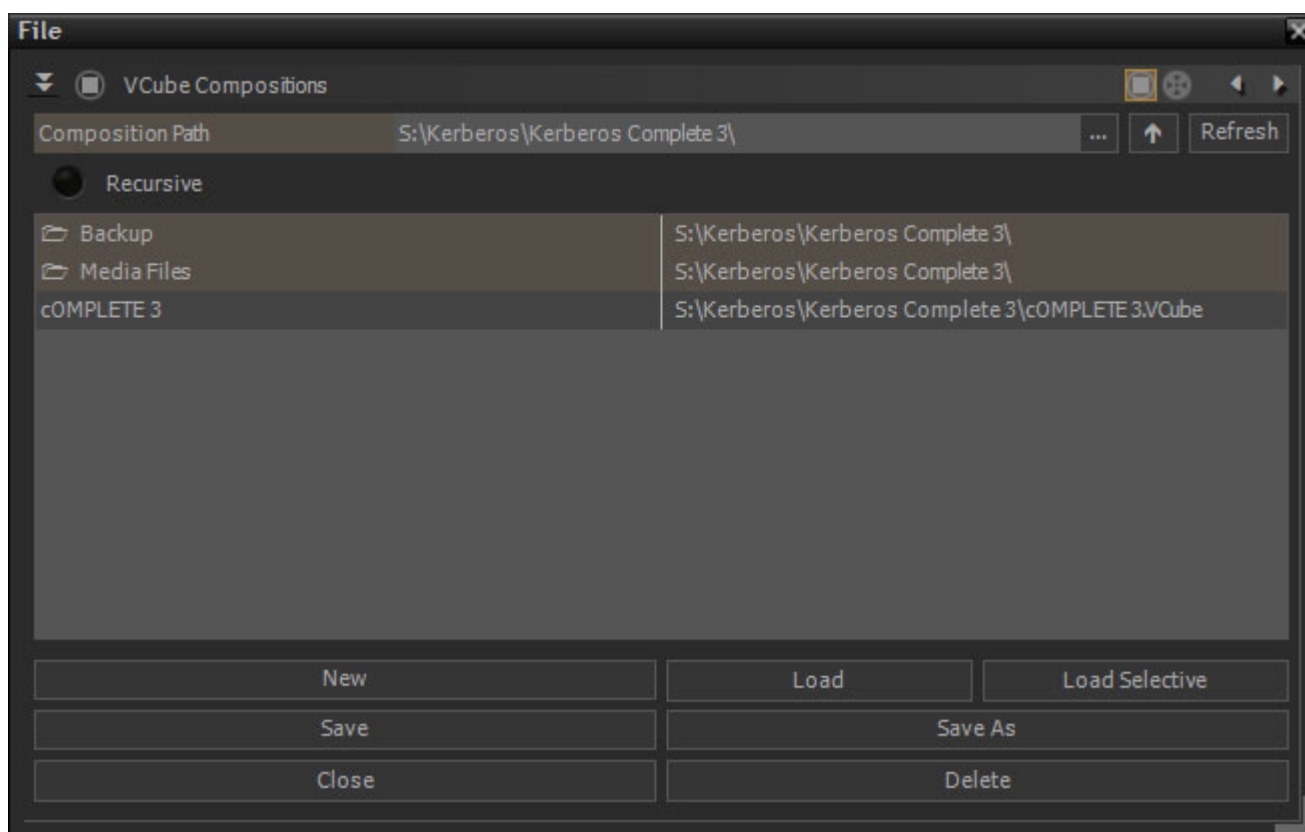
Vcube Compositions are saved with a **.VCube** extension.

Video Files in VCube format are saved with a **.cube** extension.

## Composition File Tab Page

To open the **File** Tab Page in **VCube Compositions** mode:

**File > Open** or **[Ctrl + O]** or the File Open Icon in the Toolbar:



File Page - floating

### Composition Path

Field shows the Path to the current Composition location. The ... button opens a browser which enables VCube Composition files to be selected from local hard disks or via a network. This Composition Path is also used when a Composition is Saved or Saved As.

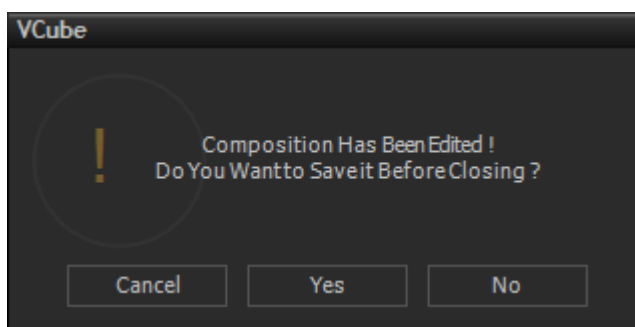
### Up

Arrow moves up one level in the file hierarchy.

### Refresh

Updates the list of Media Files in a specific location. [F5]

- Recursive** When checked all Media Files in the Folder will be shown including those in sub-folders
- New** Opens a new Composition with the current settings. [Ctrl + N]. If a Composition is already open then a warning dialog appears:



**VCube Save Warning dialog**

- Cancel** Aborts the new Composition and returns to the current one
- Yes** Saves the current Composition and opens the new one.
- No** Closes the current Composition without saving it and opens the new one.

- Load** Opens a pre-existing Composition. [Ctrl + L]
- Save** Saves the current Composition using the current Composition name. [Ctrl + S]
- Save As** Opens a Windows browser to enable the Composition to be with a new name or to a new location. This feature is useful since it enables you to save many versions of the same Composition with different names. [Ctrl + Shift + S]
- Close** Aborts the current Composition. Any edit decisions made since the last time the Composition was saved are discarded. [Ctrl + Shift + Q]
- Delete** Deletes the selected Composition from the hard drive. [Shift + DELETE]

**Note:** The associated Media Files remain on the mass storage.

- Load Selective** Enables Composition objects or properties to be imported into the current one. A dialog determines how the selection will be imported into current one. [Ctrl + Shift + L] Please see: Load Selective on page 30

### Open an Existing Composition

**File > Open** or **[Ctrl + O]** or the File Open Icon in the Toolbar opens the VCube Compositions Browser Page:

1. If the **File** page is showing the **Media File Browser** page switch to the **VCube Compositions** page.
2. Browse and select a folder using the **...** button to open a Windows File Browser
3. If **Recursive** is checked then all files in all sub-folders will be displayed.
4. Click on a Composition to select it.
5. Click on **Load** to open the Composition in VCube

Alternatively, simply Double-click on the desired Composition name in the list.

### Drag & Drop

It is also possible to **drag and drop** Compositions and Media Files into the Timeline directly from normal Windows Browser windows. For behaviors **please see: Drag & Drop on page 42**

## New Composition

**File > New** closes the existing Composition (if any is open) and creates a new Composition with the same settings as the last open Composition.

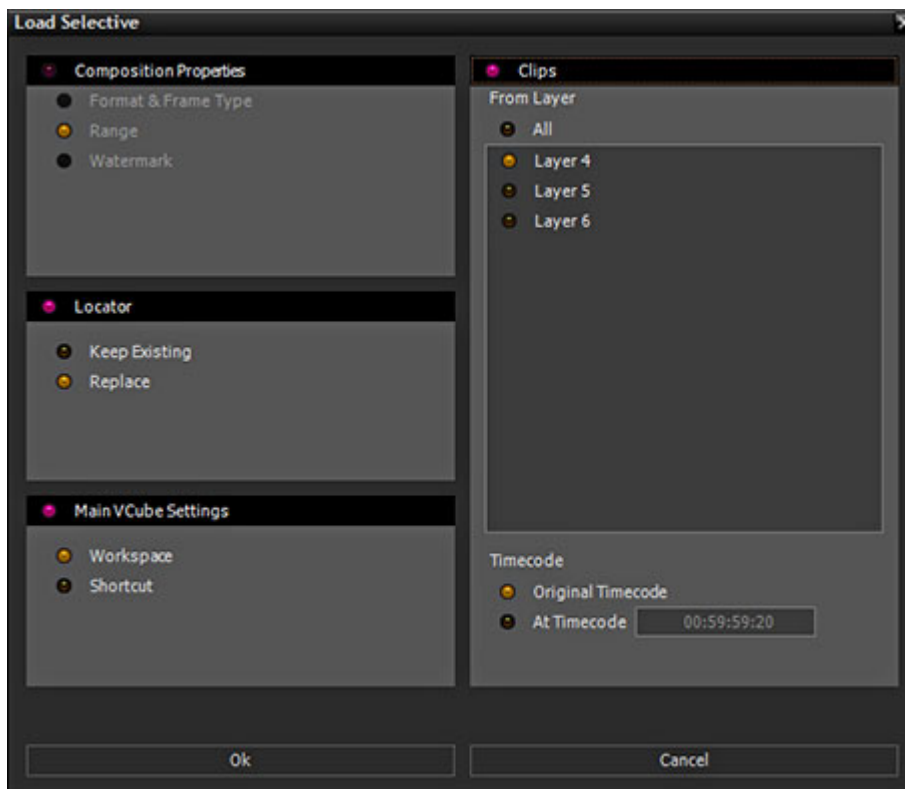
Alternatively open the **VCube Compositions** Browser Page

**User Interface > Settings Tabs > File > Show VCube Files [Ctrl + O]** .

1. Browse and select a destination folder
2. Click on **New**
3. The **New Composition** opens with the same settings as the last Composition opened

## Load Selective

**Load Selective** enables Composition objects or properties to be loaded into the current Composition.



**Load Selective dialog**

Options are grouped into boxes. Each black box header has a button which, when checked, turns on import of the properties or objects selected in the box itself. Selection can only be made when the box title button is checked.

### **Composition Properties**

#### **Format & Frame Type**

When selected Format and Frame rate will be imported when the new Composition is loaded.

#### **Range**

When selected the current Composition range markers will be overwritten by new values when the new Composition is loaded.

#### **Watermark**

When selected the current Composition **Watermark** (If any) will be overwritten by the Watermark the new Composition when it is loaded.

### **Locator**

#### **Keep Existing**

Mutually exclusive with **Replace**. Existing **Locators** can either be retained and merged with the imported ones or replaced by the ones in the Composition to be loaded.

#### **Replace**

**See above**

### **Main VCube Settings**

#### **Workspace**

When selected the **Workspaces** in the current Composition will be overwritten with the ones in the Composition about to be loaded.

#### **Shortcut**

When selected the **Keyboard Shortcuts** in the current Composition will be overwritten with the ones in the Composition about to be loaded.

### **Clips**

#### **From Layer**

- All Layer...** When selected **All Layers** in the current Composition will be imported. All layers present in the Composition to be imported are listed. When the **All** button is not checked you can select any of the Layers listed to be imported by clicking on the buttons.
- Timecode**
- Original Timecode** When checked Clips will be imported at the original TimeCode in the source Composition.
- At Timecode** When checked you can enter a Timecode starting point in the field. If this option is used then Locator positions will also be shifted.

## Settings Imported With Composition

Settings		Saved in Composition
<b>Overlay</b>		
TC Enable		X
Ext TC Enable		X
TC Position & Size		X
TC Color		X
TC Transparency Enable		X
Mask Enable		X
Mask Size		X
<b>Preview</b>		
Deinterleave		X
Video Frame		X
Safe Area		X
<b>Composition</b>		
Lock Editing		X
Watermark Enable		X
Copyright		X
Position		X
Watermark Color		X
Media Path Link to Composition Path		X
Auto Wipe & Auto Countdown		X
<b>Format &amp; Sync</b>		
Audio Sampling Rate		X
Video Size		X
Field Order		X
Pixel Aspect Ratio		X

Composition Saved Settings

If you use the **Load** option all **Settings** in the table above will be changed as required to those saved in the **Composition** being opened. If you use the **Load Selective** option it is possible to import just Composition Settings such as **Workspaces**, **Keyboard Shortcuts** and **Synchronization**.

# Import

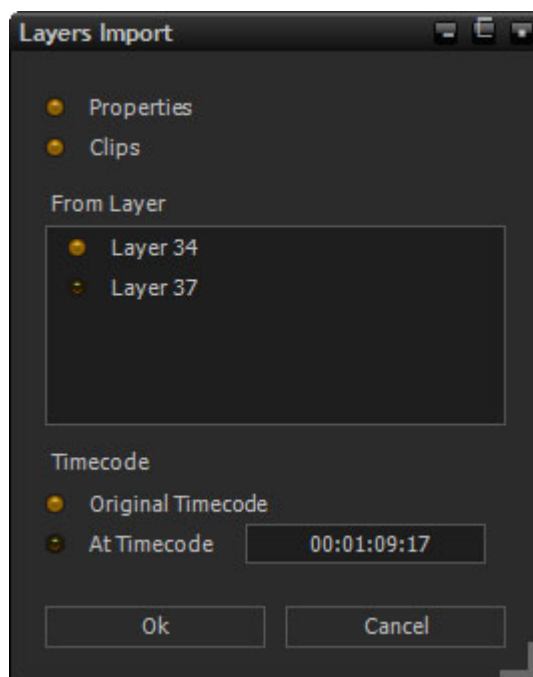
## Import Composition and Export Changes

This feature creates an EDL reflecting the differences between two versions of a project.

An .EDL file is created in the Composition folder. This file can also be opened in a text editor e.g. Notepad.

## Import Layer

A particular layer or a selection of layers can be imported from a VCube Composition into the current one. [Ctrl + Alt + L]



Layers Import dialog

### Properties

When checked, also imports the individual Clips Properties (Locked, Invert Fields, Invert Color...)

### Clips

When checked Clips in the selected Layer(s) will be imported.

### From Layer

All Layers available for import from the source composition are listed. Checked Layers will be imported.

### Original Timecode

When checked Clips will be imported at their Original Timecodes.

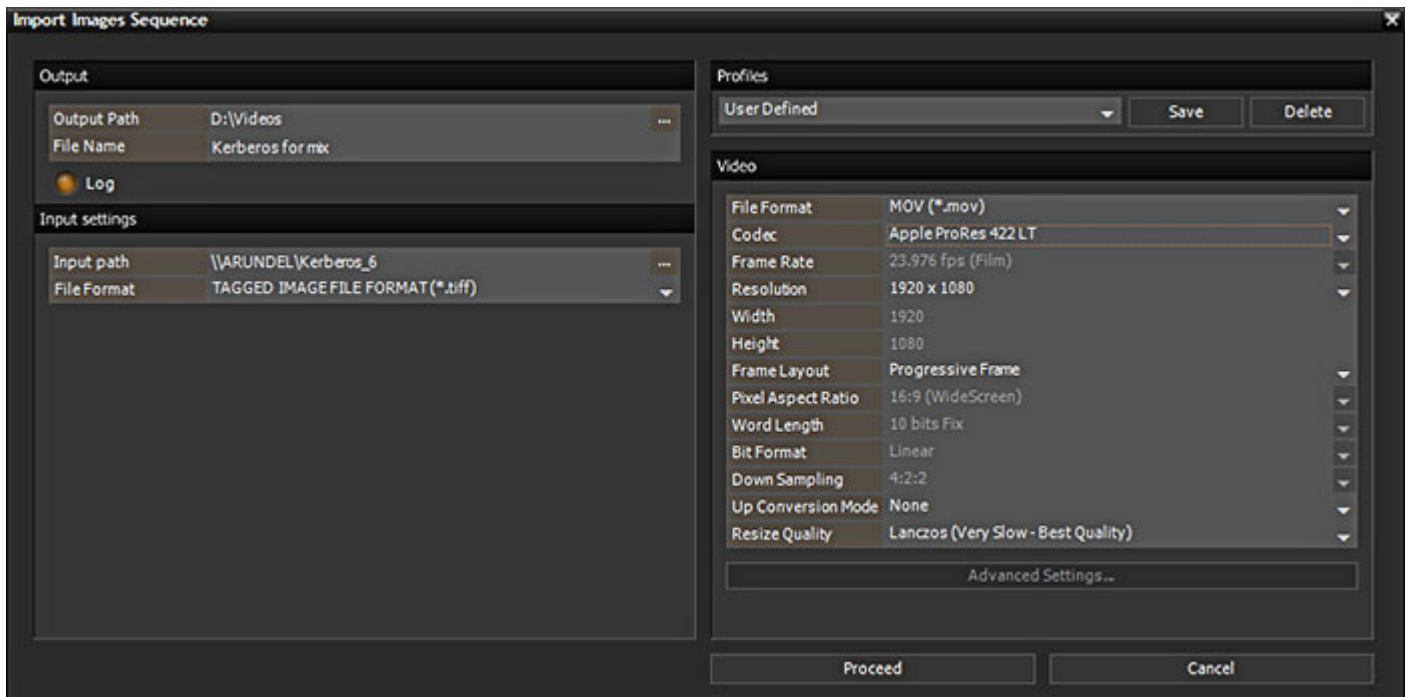
### At Timecode

When checked a Timecode start value can be entered in the field. When unchecked the value shown is the beginning of the first Clip in the selected Layer(s).



## Convert Still Images

**Convert Still Images** [Ctrl + I] creates a Video file from a set of Individual Image Files numbered consecutively. A wide range of Image file formats are supported.



Import Images Sequence dialog

The **Import Images Sequence** Page has two panes, **Output** and **Input Settings** on the left and **Profiles** and **Video** on the right.

### Output

#### Output Path

Field shows the current Path where the new Video File will be written.

...

Click on the ... button to open a Windows browser to select an alternative directory.

#### File Name

Click in the field and type a suitable name for the new Video file.

### Input Settings

#### Import Path

Field shows the directory where the still images are located

...

Click on the ... button to open a Windows browser to select the directory where the source image files are located.

#### File Format

Field shows the image file format to be imported. Click on the down arrow to choose the required format from the list below.

#### Proceed

Click on Proceed to begin the Import and Conversion process

#### Cancel

Click on Cancel to abort the Import

## Still Image File Formats Supported

Supported File Extensions	Description
.dpx	Digital Moving Picture Exchange (DPX)
.yuv	YUV RAW
.yuv8	YUV 8 BIT RAW
.yuv10	YUV 10 BIT RAW
.yuv16	YUV 16 BIT RAW
.bmp	Microsoft Bitmap
.png	Portable Network Graphics
.jpg	Joint Photographic Experts Group
.jpeg	Joint Photographic Experts Group
.j2k	JPEG 2000
.psd	Adobe Photoshop File
.tga	Targa Graphic File
.gif	Graphics Interchange Format
.wmf	Windows Metafile
.tif	Tagged Image File Format
.tiff	Tagged Image File Format
.pcx	PCX
.mng	Multiple Image Network Graphics
.jng	Multiple Image Network Graphics
.ico	Icon File
.wbmp	Wireless Bitmap
.emf	Windows Metafile
.jbg	JBG
.jpc	JPEG 2000 Code Stream
.pgx	PGX
.ras	Sun Raster Images
.pnm	Portable Bitmap
.pgm	Portable Bitmap
.ppm	Portable Bitmap

## Profiles

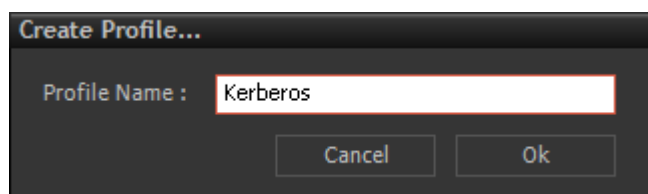
Complete sets of render settings can be saved as Profiles and reloaded for future use.

### User Defined

The drop-down list shows a list of all Profiles available.

### Save

Saves the current Settings to a new Profile. The **Create Profile...** dialog opens:



Create Profile ... dialog

Type a suitable name for the new Profile in the **Profile Name :** field and click on **OK** to save the profile and close the dialog. **Cancel** closes the dialog without saving. If you attempt to overwrite an existing Profile a warning dialog appears.

**Delete** Deletes the Profile currently listed in the Drop-down field. A confirmation dialog appears. Click on **Yes** to delete or **No** to cancel.

## Included Profiles

### User Defined

**AVIDV25 NTSC - Audio 16bits**

**AVIDV25PAL - Audio 16bits**

- MOV DNxHD220 - Audio 24bits
- MOV ProRes422 1920x1080 - Audio 24bits
- MXF AVC1100 1080p - Audio 24bits
- MXF D10-IMX50 NTSC - Audio 16bits
- MXF D10-IMX50 PAL - Audio 16bits
- MXF DNxHD220 - Audio 24bits
- MXF DV50 NTSC - Audio 16bits
- MXF DV50 PAL - Audio 16 bits
- MXF XDCAM HD422 GOP12 - Audio 24bits

## Video

<b>File Format</b>	Field shows the Output File format selected currently. Click on the down arrow to select from:
<b>MOV</b>	*.mov
<b>CUBE</b>	*.Cube
<b>MPEG</b>	*.mpeg
<b>MP4</b>	*.mp4
<b>MPEG</b>	*.m1v
<b>MPEG</b>	*.m2t
<b>MPEG</b>	*.m2v
<b>MPEG</b>	*.mpg
<b>AVI</b>	*.avi
<b>MXF</b>	*.mxf
<b>Frame Rate</b>	The field shows the current Composition Frame Rate selected currently.
<b>Codec</b>	The field shows the type of Compression selected currently. Click on the down arrow to select an alternative. The exact composition of the list will depend on options purchased.
<b>Resolution</b>	The field shows the Resolution selected currently. The drop-down list shows all Resolutions available.
<b>Width</b>	The field shows the Width of the output Video in pixels.
<b>Height</b>	The field shows the Height of the output Video in pixels.
<b>Frame Layout</b>	Field shows the current setting. Click on the down arrow to select an alternative. The alternatives available depend on the Composition format, the File Format and Codec:
	<b>Progressive Frame</b>
	<b>2 Fields (Interleaved - Lower First)</b>
	<b>2 Fields (Interleaved - Upper First)</b>
	<b>2 Fields (Separate - Lower First)</b>
	<b>2 Fields (Separate - Upper First)</b>
	<b>Single Field</b>
<b>Word Length</b>	Fixed at 8 bits currently
<b>Bit Format</b>	
<b>Down Sampling</b>	Field shows the current color sub-sampling scheme. 4.2.2 is the default.
	One of the next two entries is shown as appropriate.
<b>(Up Conversion Mode)</b>	Field shows current conversion mode. Options will vary with the Pixel Aspect Mode setting. E.g. Anamorphic, Letterbox, Pillarbox or None
<b>(Down Conversion Mode)</b>	Field shows current conversion mode. Options will vary with the Pixel Aspect Mode setting. E.g. Anamorphic, Letterbox, Pillarbox or None

<b>Pixel Aspect Ratio</b>	Field shows the current Pixel Aspect Ratio and the format associated with this. Click on the down arrow to select an alternative.
<b>Resize Quality</b>	Field shows the resizing algorithm selected currently. Click on the down arrow to select an alternative.
<b>Nearest neighbour</b>	<b>Fastest but poor quality</b>
<b>Linear (Bi Linear)</b>	<b>Fast and poor quality</b>
<b>Cubic</b>	<b>Slow but very good quality</b>
<b>Lanczos</b>	<b>Very Slow but excellent quality</b>
<b>Advanced Settings...</b>	The button is only available for MXF. A dialog appears with compression settings.
<b>Proceed</b>	Click on Proceed to begin the Import and Conversion process
<b>Cancel</b>	Click on Cancel to abort the Import

### Notes

- **Frame Rate** must be set to match the frame rate of the Composition where the generated Video file is to be used.
- Compression allows the user to select the CODEC used to generate the new Media File(s). Depending on the chosen CODEC, it is possible to adjust the Compression Settings.
- For full details about the **MPEG** Settings, please refer to the dedicated section. We recommend using only regular **Format Types** in the **Basic Settings** dialog for trouble free operation.

## Still Image Import

To import a single still image (not a sequence) into the Timeline, use **Files > Import > Media File Browser**. Use the browser to select the image to Import and use an appropriate option to place it in the Timeline. A 5 seconds Clip will be created from a single frame image. Alpha Channel (transparency) is supported.

## AAF

VCube can import projects in AAF (Advanced Authoring Format).

### About AAF

AAF is a set of specifications for project interchange (.aaf) files. Media files can be embedded or referenced by link. **Note** that VCube only handles Media Files referenced by link currently.

AAF Import follows the **Interchange Import Settings**. These help deal with AAF projects which contain large numbers of files, improving project opening times etc.. Please see: **InterChange Import on page 124**

**[Alt + O]File > Import > Composition (Create New)**

If VCube cannot find a Media File the **VCube: Searching for Media File** Tab pops-up.

Use this to point VCube at the file location(s). **Cancel** opens the Composition with the missing Media shown as zebra Clips.

## MXF

MXF (**M**aterial **eX**change **F**ormat).

The VCube MXF Module has full support (Playback, Render, Record up to 30 fps) for:

- D10 / Sony IMX (MPEG-2 in SD format)
- MPEG-2-HD / Sony XDCAM HD (MPEG-2 in HD 1080i format)
- VC-3 / Avid DNxHD (in HD 1080i format)
- AVCIntra / Panasonic P2 (class 50 and 100)

## MXF Configuration

To record or render an MPEG-2 flavour in MXF:

Select the **Custom (Media Handler Specific)** codec. This will automatically select the D-10 (Sony IMX) MPEG-2 flavour for SD formats, and the MPEG2-HD (Sony XDCam-HD) for HD formats.

To record or render in VC-3 or AVC-Intra simply choose the codec in the codec list.

In **Video Advanced Settings...**, **Aspect Ratio** can be **Transparent**, **Force 4:3** or **Force 16:9**.

A checkbox enables **WSS** (Widescreen Signaling) on the first visible line.

To record audio embedded in the MXF file:

Select **MXF** in the **Audio** tab

16-bit and 24-bit PCM formats are supported.

## OMF

[Alt + O]

**File > Import > Composition (Create New)**



**(Yellow)** The Clip is a rendered effect.



**(Green)** VCube can render the effect in realtime.

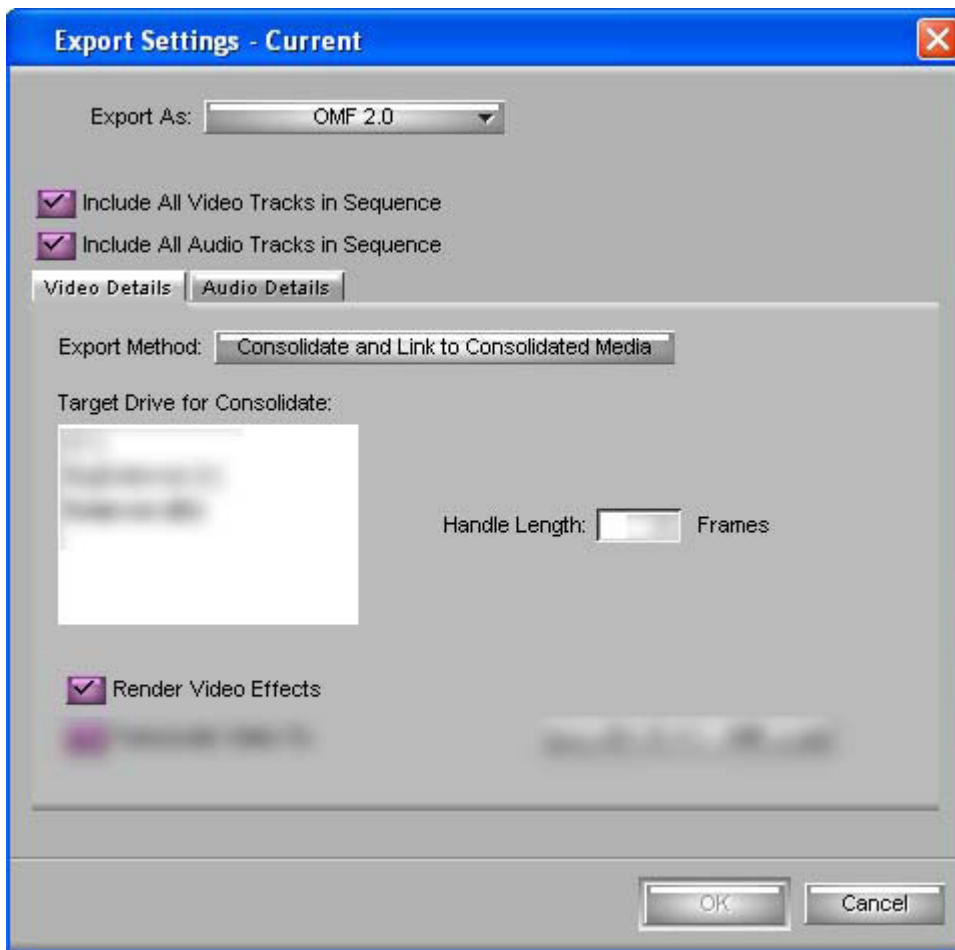


**(Red)** VCube does not support the effect.

**Note:** The **Fx** icon shows when an imported Clip has an effect. The color of the icon denotes VCube treatment of the effect as above.

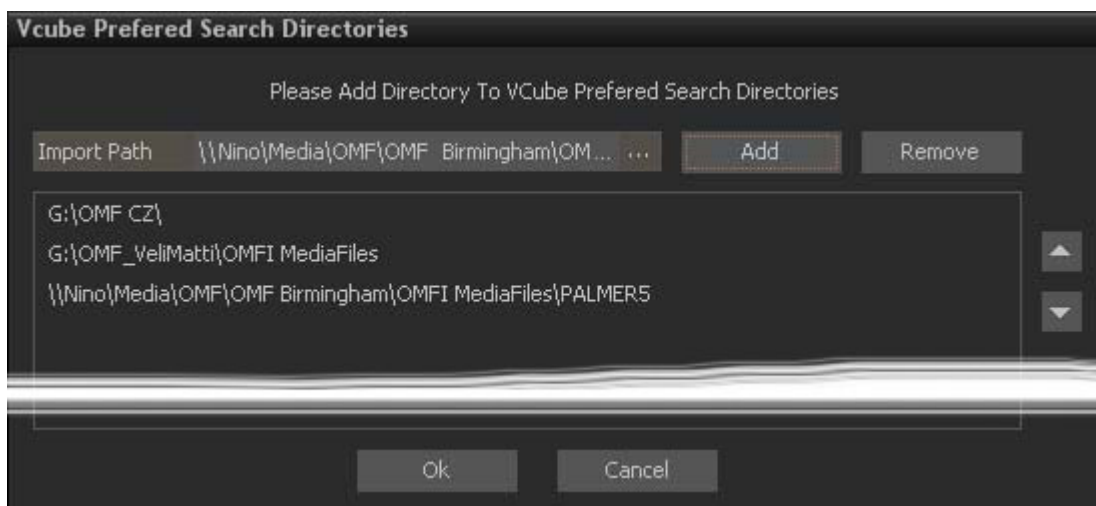
1. If the path to media is included in the Composition, VCube asks the user to specify a network location for those Media Files: Workspace/OMFI Media Files/... or a specific user path. If OMF Media Files are on the local storage, press Cancel when the dialog appears.
2. If the Media Files remain unlocatable, the VCube software looks for Media Files in the sub-folders of the Composition file location on the local storage.

3. Lastly VCube uses the database to re-link Media Files. If the path to Media Files is not available in the OMF Composition, then the Scan function must be used to generate the OMF Media Files data base. The first scan process can take a very long time on a big media server storing thousands of files.



Export Settings - Current dialog

If some media files cannot be found by VCube a dialog is displayed.



VCube Preferred Search Directories dialog

Here, one or many paths to the missing Media Files can be specified to allow VCube to reconnect the needed Media Files.

**Import Path**

Shows the last Import Path added. Clicking on the ... button opens a Windows File browser to enable paths to be selected.

- Add** Clicking on the Add button adds the path displayed in the Import Path field to the list of Paths which will be searched.
- Remove** Clicking on the Remove button deletes the path selected (by clicking on it) in the panel below the Import File field.
- OK** Click on the **OK** button to commence the search and close the dialog.
- Cancel** Click on the **Cancel** button to cancel any changes and close the dialog.

**Note:** The **VCube Preferred Search Directories** dialog can also be reached directly from the **Settings Menu**. It enables VCube to re-link Media Files spread over different workspaces or servers.

# Media Management

## Scope

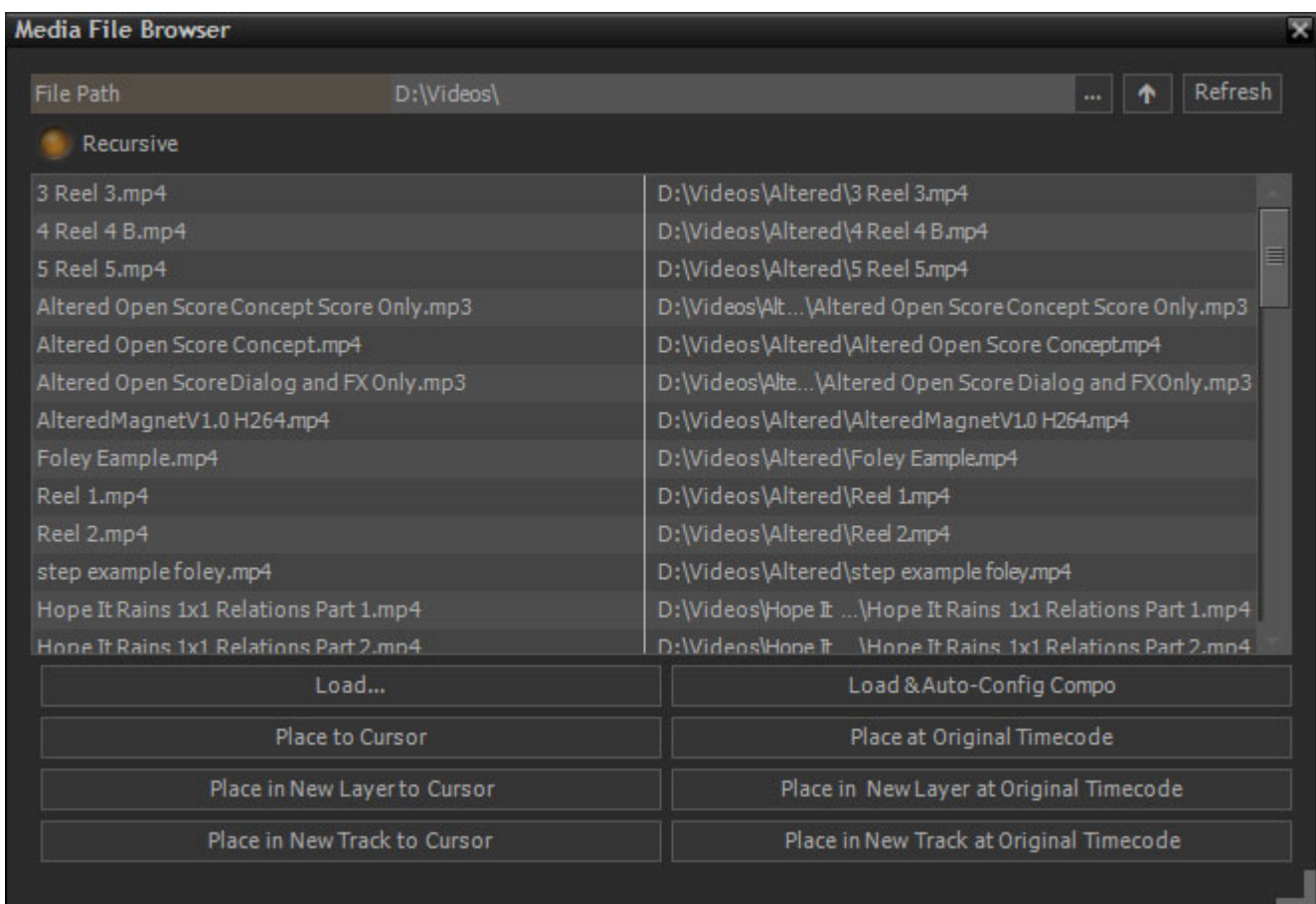
VCube supports Video only, Video + Audio, Audio only, single Still Image and Still Image Sequence Media Files.

VCube has a pair of File management Tabs for managing **Compositions** and **Media Files**.

Media Files can be dragged and dropped into the Preview screen or the Timeline. **Please see: Drag & Drop on page 42**

## Media File Browser

To open the **Media File Browser** select **File > Import > Media File Browser** or **Ctrl + Shift + O** or choose the **Media File Browser** icon in the Toolbar :



Media File Browser

Navigate to the Drive, Folder or Network Drive / Folder containing the Media using the ... button which opens a conventional Windows Browser. Then double-click on any of the Folders displayed in the main area to view the Media Files.

Double-clicking on a Media File will insert it as a Clip into the Composition Timeline at the current Playhead position on the selected Track/Layer. If an Audio Track / Channel is selected currently then a Video Media file Clip will be inserted on the first Video Layer above the Audio Tracks in the Timeline.

- To add a Clip at the end of the last Clip on the selected Layer: **Shift + Double-click**. If no Layer is selected a new one will be created.
- To add a Clip at the current Playhead position in selected Layer: **Double-click**. If no Layer is selected a new one will be created.

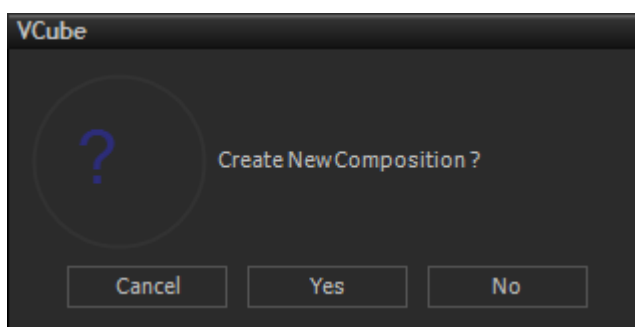


- To add a Clip at the current Playhead Position in a new Layer: **Control + Shift + Double-click**

### Recursive

If the **Recursive** button is checked then all Media Files in the Drive or Folder listed in the **File Path** field will be listed in the main area, including those in Sub-Folders.

<b>File Path</b>	Field shows the current Path
...	Opens a Windows browser to change the Path to a location on local storage or via a network.
^	Up arrow steps up the path tree to the root directory.
<b>Refresh</b>	Updates the list of Media Files in the current location [F5]
<b>Recursive</b>	When checked all Media Files in the folder specified will be shown including those in sub-folders.
<b>Load...</b>	Opens the Create New Composition dialog. [Ctrl + L]



**VCube Create New Composition dialog**

<b>Cancel</b>	Aborts the <b>Load</b>
<b>Yes</b>	Closes the current Composition with a dialog inviting <b>Save</b> it if it has been changed, then opens a new Composition with the same Settings as the previous Composition.
<b>No</b>	Places the selected Media File on the selected Layer at the current Playhead Cursor position.

<b>Load &amp; Auto-Config Compo</b>	Loads the selected Media File in a new Composition and sets Composition settings from the Media File properties. [ <b>Shift + L</b> ]
<b>Place to Cursor</b>	Pastes the selected Media File into the selected Layer at the current Playhead cursor position.
<b>Place at Original Timecode</b>	Pastes the selected Media File into the selected Layer at its original TimeCode location.
<b>Place in New Layer to Cursor</b>	Pastes the selected Media File into a new Layer at the current Playhead cursor position.
<b>Place in New Layer at Original Timecode</b>	Pastes the selected Media File into a new Layer at its original TimeCode location.
<b>Place in New Track to Cursor</b>	Pastes the selected Media File into a new track at the current Playhead cursor position.
<b>Place in New Track at Original Timecode</b>	Pastes the selected Media File into a new Track at its original TimeCode location.

**Note:** Media Files can also be drag-and-dropped into the Timeline.

**Note:** Still images are stored in RAM when dropped in the Timeline. The Alpha channel is preserved. The **Convert Still Image** function [**Ctrl + I**] is the preferred option for numbered still image Sequences. The Alpha channel is not preserved when image sequences are converted into video Clips.

## Drag & Drop

Drag & Drop of Media Files from Windows Explorer browser windows is supported as follows:

### **Drop Into Preview Screen**

When the file is dropped the current Composition will be closed (after a confirmation dialog is accepted). A new Composition is then created to suit the characteristics of the Media File being dropped. (Image Size, Frame Rate, Aspect Ratio, Interlacing...) The Media will be placed at its original TimeCode in the Timeline.

### **Drop Into Timeline**

Drag & Drop into the Timeline adds Media to the current composition.  
If more than one file is dropped they are placed in sequence in the Timeline.

### ***Place to Cursor***

Place to Cursor is the default behavior. The Media will be placed at the current cursor position in the Timeline.

### ***Insert Mode***

If the **Ctrl** key is held down while dropping the file(s) the files are inserted at the Cursor position and all subsequent clips are rippled.

### ***Enqueue Mode***

If the **Shift** key is held down while dropping the file(s) the files are placed after the last Clip in the Composition or at the current TimeCode if the Composition is empty.

## Media Handlers

### MOV (QuickTime)

MOV is a very popular file format (Media Handler) for audio and video media.

VCube features complete support of **MOV** for both **Playback** and **Record/Render/Convert Media Files**.

**Note:** Selecting MOV as the file format for both Video and Audio generates a single MOV file including both video and audio.

### MXF

VCube supports standard definition and high definition MXF formats for playback at NTSC or PAL frame rates.

SD Files must be encoded with **DV**, **DVCPRO 50 (dv50)**, or **D-10** (AKA Sony IMX) codecs.

HD files must be encoded with **DVCPRO 100**, **VC-3** (aka AVID DNxHD), **AVC-Intra** (aka Panasonic P2), or **MPEG2-HD** (aka Sony XDCAM-HD) codecs.

VCube can render or wrap MXF files using all the supported codecs listed above. Due to real-time constraints, **Record** is not available for AVC-Intra.

To render [**Ctrl + R**] an MXF file in VCube:

- Select **MXF** as the File Format for both video and audio.
- Select one of the available codecs for video Compression. For Sony XDCAM or XDCAM-HD, **Advanced Settings** will enable you to select the flavour of MPEG-2 and the bit rate.
- Audio settings are available via the **Advanced Settings** dialog box.

**Note:** VCube can record both video and audio multiplexed in a single MXF file when **MXF** is selected as the **File Format** for both Video and Audio.

### MPEG

VCube uses the **Mainconcept MPEG Encoder**. Please see: **MPEG Settings (MainConcept Encoder)** on **page 191**



Additional Codecs supported in playback only							
Codecs	Codec Profile	Resolution	Licence (V Cube)				
AVID MJPEG A	MJPA	SD - HD	FREE				
AVID DV	AVdv	SD	FREE				
AVID DVCPro 100	AVd1	HD	FREE				
XDCAM EX	MPG2	HD	VSO-IM X-MPG2HD				
HDV	HDV	HD	FREE				
PhotoJPG	JPEG	SD - HD	FREE				
DV Canopus	DVC	SD	FREE				

Still Images support					
Format	File extension	Resolution	Licence (V Cube)	Import and Re	Direct Timeline Playback
Bitmap	BMP	SD - HD	FREE	✓	✓
PNG	PNG	SD - HD	FREE	✓	✓
Jpeg	jpeg, jpg	SD - HD	FREE	✓	✓
Jpeg 2000	j2k, j2p	SD - HD	FREE	✓	✓
Jpeg 2000 Coded Stream	jpc	SD - HD	FREE	✓	✓
Photoshop PSD	psd	SD - HD	FREE	✓	✓
Targa	tga, targa	SD - HD	FREE	✓	✓
TIF	tif, tiff	SD - HD	FREE	✓	✓
DPX	dpx	SD - HD	FREE	✓	X

**Note:** A single Still Image is imported as a 5 seconds Clip. A sequence of numbered Still Images is imported one images per video frame. Imported Still images are loaded in RAM.

# Tracks and Layers

Each Composition includes a number of Video and Audio **Tracks** on which audio and video **Clips** can be placed. Blocks representing placed or recorded **Clips** will appear on the **Track** as soon as a **Clip** has been placed. The Track itself extends horizontally beneath the **Time Scale** bar, and multiple **Tracks** are stacked vertically.

**Video Track Number**

**Track Mute**

**Track Solo**

**Layer Number**

**Opacity**

**Compositing (under development)**

**Layer Mute**

**Layer Solo**

**Motion Rectangles (PiP)**

**Layer Name**

**Audio Layer Solo**

**Audio Layer Mute**

**Audio Output**

**Audio Gain**

**Audio Layer Name**

**Audio Layer Number**

**Audio Track Solo**

**Audio Track Mute**

**Audio Track Number**

**Track Locks**

Track and Layer Headers

On the left side of each **Track** is a **Header** panel with various controls and information displays.

## Video Track Header

<b>Lock</b>	When checked the entire Track is locked for editing.
<b>Track Number</b>	
<b>Track Mute</b>	Mutes (Hides) all Layers in the Track.
<b>Track Solo</b>	Solos the Track
<b>Layer Number</b>	Shows the Layer number
<b>(Normal)</b>	Under Development - may be used for compositing.
<b>Layer Opacity</b>	Field shows the current Opacity value. Click in the field and type to enter a value between 0 and 100%.
<b>Layer Mute</b>	Mutes (Hides) the Layer
<b>Layer Solo</b>	Solos the Layer
<b>Compositing</b>	Under development
<b>Motion Rectangles (PiP)</b>	Switches to Motion Rectangles Set-up mode. Please see: Motion Rectangles (PiP) on page 67
<b>Layer Name</b>	Field shows the current Layer Name. Click in the field and type to change

## Audio Track Header

<b>Lock</b>	When checked the entire Track is locked for editing.
<b>Track Number</b>	
<b>Track Mute</b>	Mutes all Layers (channels) in the Track
<b>Track Solo</b>	Solos the Track
<b>Layer Number</b>	
<b>Layer Gain</b>	Shows the current Layer (Channel) output gain. Click and drag the pointer to vary the playback gain between -60dB and +24dB. Double-click the pointer to restore the 0dB default value. [Ctrl + Click and Drag] constrains to 6 dB increments.
<b>Layer Mute</b>	Mutes the Layer (channel)
<b>Layer Solo</b>	Solos the Layer (channel)
<b>Layer Name</b>	Field shows the current Layer Name. Click in the field and type to change
<b>Layer Physical Output</b>	Field show the physical output the Layer is patched to currently. Click to drop-down a list of all valid outputs available on the system

Some operations only apply to a selected Video Layer track or Audio track channel. A Video Layer or Audio Track channel is selected by Clicking in the Timeline or on the Layer or Channel number in the Header. The Layer/Channel area of the selection is highlighted and the color of the bar at the left of the Track Header changes to light gray.

## Video Tracks and Layers

Video Tracks appear at the top of the Timeline. Each Video Track may contain a number of Layers. The Track Mute and Solo buttons affect all the Layers in the Track. Each Layer also has it's own Mute and Solo buttons which only affect the Layer. Compositing order is from top to bottom. Thus the top Layer takes precedence.

## Track and Layer Order

For those users unfamiliar with NLEs it is important to understand that video on the TOP Layer of the top Video Track in the Timeline takes precedence. I.e. when there is video present on the top Layer in the Timeline any video placed on lower Layers or Tracks will be hidden unless the top Layer is made transparent, partially or completely, using the Layer **opacity** setting available in the Layer Header, or if the video in the top Layer is reduced in size, e.g. for **Picture-in-Picture** purposes. Please see: **Motion Rectangles (PiP) on page 67**

## Audio Tracks and Layers

Audio Tracks appear below the Video Tracks in the Timeline. Each Audio Track can contain a number of Layers (individual Channels) E.g. a 5.1 Audio Track will have six Layers. As with Video Tracks the Track Mute and Solo buttons affect all the Layers in the Track. Each Layer also has its own Mute and Solo buttons which only affect the Layer. Each Channel can be routed to any physical RAVENNA or ASIO output present on the system.

The number of Tracks and Layers is effectively unlimited.

### Audio Bit Depth

VCube plays 8, 16, 20, 24 or 32 bit audio files and captures in 16, 24 or 32 bits. Sampling rate options for capture are 44 KHz and 48 KHz.

## Tracks and Layers Created Automatically

- A new Composition opens with no Tracks in the Timeline.
- Adding a Media File creates a Track or Tracks to contain the resultant Clip(s).
- If the Media File contains video and audio a Video Track and an Audio Track will be created.
- If the Audio is multi-channel then sufficient Layers will be created in the Audio Track to accommodate the number of channels in the Media File.

Certain **Media File Browser** options and **Import** options will also create Tracks and or Layers automatically.

## Adding Tracks and Layers

**Edit > Auto Create > New Video Track** Creates a new Video Track above the topmost Track in the Timeline [Ctrl + Shift + T]

**Edit > Auto Create > New Audio Track** Creates a new Audio Track below the bottom Track in the Timeline [Ctrl + Alt + T]

**Edit > Auto Create > New Layer** Creates a new Layer above the topmost Layer in the selected Video Track [Ctrl + Shift + N]

**Edit > Auto Create > New Layer** Creates a new Layer below the bottom Layer in the selected Audio Track [Ctrl + Shift + N]



# Transport and Navigation

## Navigation

VCube offers a number of ways of navigating around a Composition.

### Time Ruler

In the Timeline panel, under the **Locator Bar**, is a larger horizontal gray area with Timecode numbers and graduation marks. This is the Time Ruler. On the left, above the track headers, the Composition Frame Rate is shown.





The simplest way to move the Playhead Cursor within the Timeline is to position the mouse I-beam cursor anywhere along the Time Ruler and Click. The Playhead will immediately jump to the new position. You can also left-click, hold and drag the Playhead Cursor along this bar to scrub through the cue.

**[Ctrl + Click and Drag]** In the Timeline moves the Timeline without altering the Playhead Cursor position.

**Double-Click** on the Time Ruler Zooms to the full extent of the Composition and deselects any selected clips.

### Zoom

**[Alt + Click and drag]** in the Timeline varies the Zoom level. Drag Left to Zoom In and Right to Zoom Out.

	<b>Zoom In</b>	<b>[Alt + 3]</b>	Zooms In to Timeline with each press.
	<b>Zoom Out</b>	<b>[Alt + 4]</b>	Zooms Out of Timeline with each press.
	<b>Fit Selection Zoom</b>	<b>[Alt + 1]</b>	Adjusts the Zoom level so that the current selection fills the full visible width of the Timeline.
	<b>Zoom Undo</b>	<b>[Alt + 2]</b>	Restores Zoom level to previous value.

These options can also be found in the **Zoom** menu.

### Locators

Locators are an extremely powerful and intuitive method of locating, almost instantaneously, to any position in the current Composition.

#### Setting Locators

**Locator > Set New Locator [NUMPAD 9]** Add a locator at current TimeCode

**[Ctrl + Alt + NUMPAD 9]** Create a Locator for Each and Every Clip

**[Alt + NUMPAD 9]** Create Locators (override) for Every Clip in the Selected Layer(s)

**[Ctrl + NUMPAD 9]** Create Locators (add) for Every Clip in the Selected Layer(s)

**[/] (divide)** Move current Locator Start to Cursor

#### View Locators

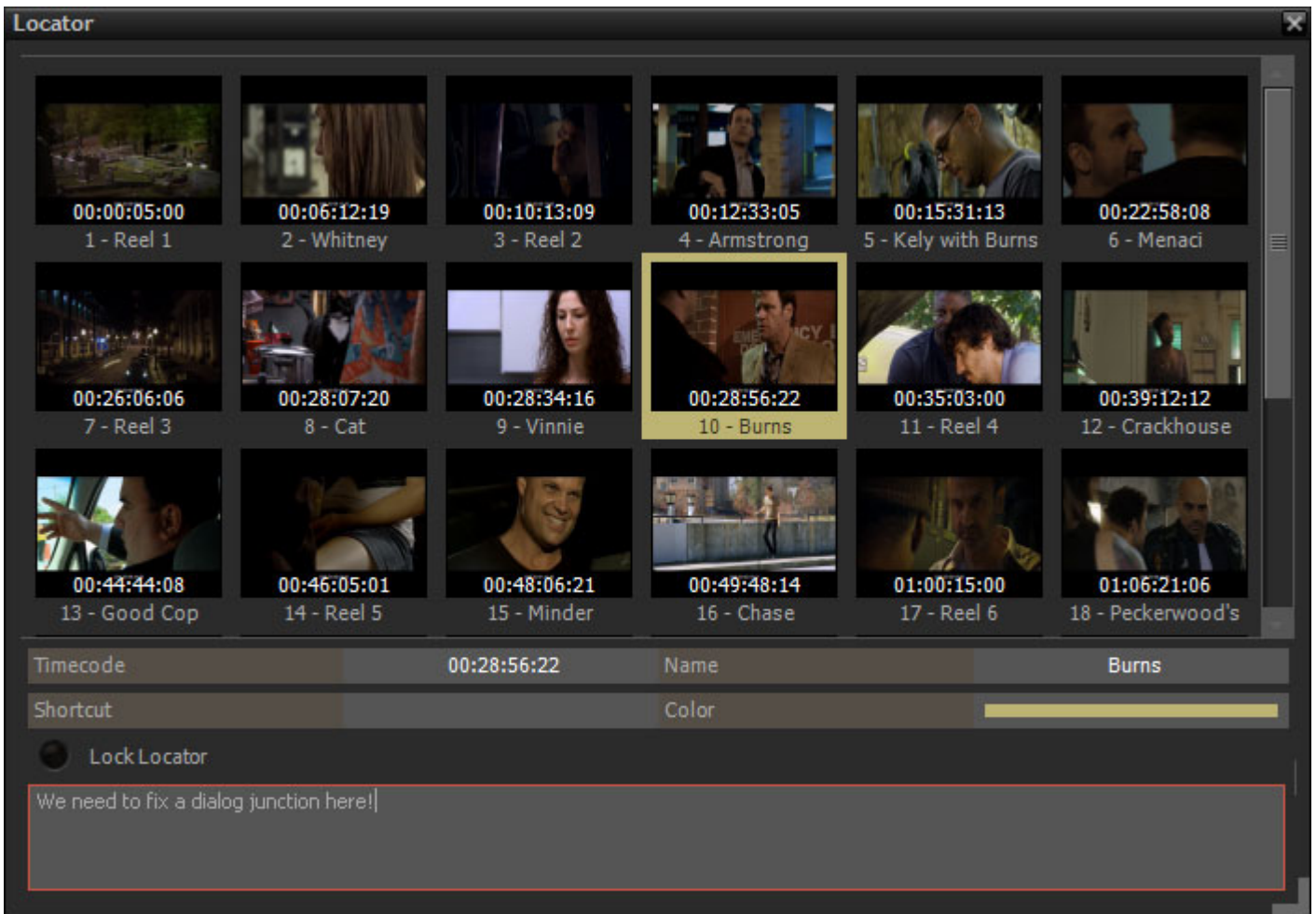
To view the **Locator** panel either click on the **Locator Page** icon in the Toolbar double-click on the **Locator Bar** or choose **User Interface > Settings Pages > Show Locator Page** or **[F7]**

#### Select Next / Previous Locator

**Next** [Numpad +]

**Previous** [Numpad -]

## Locator Tab Page



Locator page

The **Locator** Tab Page displays all the Locators set in the Composition.

In the upper section thumbnails of all set locators are displayed.

Any change in the Timeline edit is reflected in the Locators thumbnails immediately.

The Tab Page can be resized by clicking and dragging on the edges or the bottom right-hand corner.

Double-Clicking on any of the thumbnails locates to that position.

### **Timecode**

The field shows the Timecode of the Locator selected currently. (Highlighted thumbnail) Type in the field to change the Locator Position.

### **Name**

Type in the gray field to the right of **Name** to add a name to the Locator

### **Shortcut**

### Color

Click in the **Color** field to open the **Color Picker**. Please see: **Color Picker** on page 15

### Lock locator

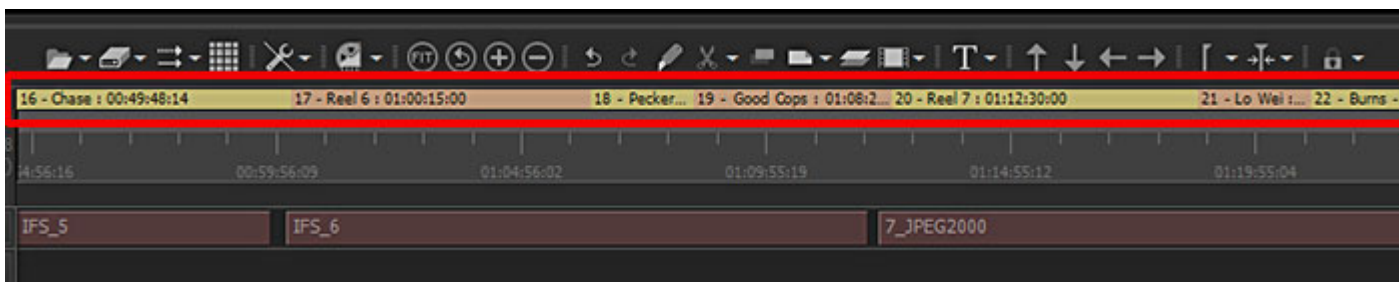
Click on **Lock Locator** to protect the selected Locator from changes. The button is checked when active.

### Notes Field

The *gray panel at the bottom of the page* is a free-text field for notes. Simply Click in the field and type.

### Locator Bar

At the top of the Timeline panel lies the **Locator Bar**.



**Locator Bar**

All set **Locators** are shown. Locators can be moved by clicking and dragging at the junction. (cursor changes to double headed horizontal arrow <->). Press and Hold **Shift** to update the corresponding thumbnail continuously while dragging.



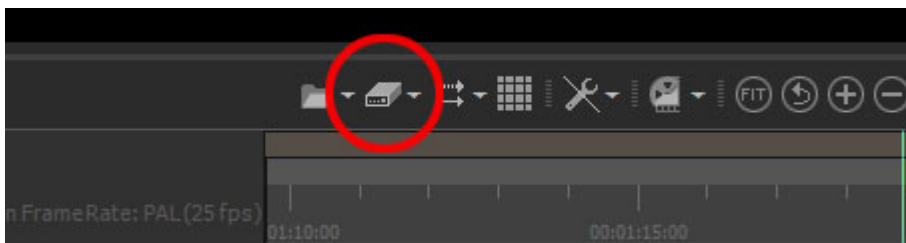
frames for the optional video output. A zero value indicates a correct setting of Disk Cache and Playback Buffers.

2. Current TimeCode position. Can also be used as a locator by double-clicking in the field, editing the existing or typing a new TimeCode value and clicking outside the field or hitting **Enter**.
3. Transport Controls
  - **Rewind** [Num 1]
    - First press 400%
    - Second press 1000%
    - Third press 2000%
    - Fourth press 5000%
  - **Fast Forward** [Num 2]
    - First press 400%
    - Second press 1000%
    - Third press 2000%
    - Fourth press 5000%
  - **Stop** [Num 0]
  - **Play Reverse** [Ctrl + Enter or Ctrl + Space]
  - **Play Forward** [Space (Toggles Play/Stop) or Num Enter (Toggles Play / Pause)]
  - **Pause** [Num 3]
  - **Record** [Decimal]
4. Transport Status and Speed
5. When the button is active the Transport will Loop between **In** and **Out** markers.
6. Current Format and Frame rate

**Note:** Read Drop and Current FPS are useful diagnostic tools when trimming Disk Cache and Playback Buffers.

## Transport Tool

A VCR like Transport Tool is available from the **Toolbar**. It collates all the information and controls relating to Transport, incoming TimeCode and Chasing.

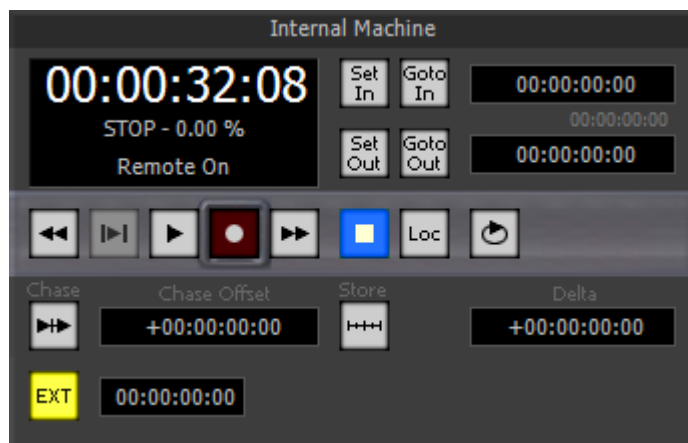


Toolbar Transport Control Panel Icon

Note that the Icon displayed on the Toolbar may differ since the last tool chosen from the drop-down list will be displayed. Alternatively the Transport Tool can be accessed from:

**User Interface > Toggle Transport Tool [T]** or

## Transport > Toggle Transport Tool [T]



Transport Control Panel

If **Sony 9 Pin Remote Control** is enabled in: **Settings > Format & Sync : Sony 9 Pin Remote Control Remote On** is displayed. This means that the **Internal Machine** is controlled by the Sony 9 pin protocol serial data emanating from another device. **Please see: Remote Control on page 137**

If **Sony 9 Pin Machine Control** is enabled in the same Tab then VCube controls the external machine while chasing its TimeCode. A further Transport Control panel appears below the **Internal Machine**. **Please see: Machine Control on page 141**

- **Set In** [Num 7]
- **Set Out** [Num 8]

Are linked to the Timeline Range.

- **Goto In** [Num 4]
- **Goto Out** [Num 5]

Are linked to the Timeline Locator controls.

- **Rewind** [Num 1]
  - First press 400%
  - Second press 1000%
  - Third press 2000%
  - Fourth press 5000%
- |>
- **Play** [Space (Toggles Play/Stop) or Num Enter (Toggles Play / Pause)]
- **Record** [Decimal]
- **Fast Forward** [Num 2]
  - First press 400%
  - Second press 1000%
  - Third press 2000%
  - Fourth press 5000%
- **Stop** [Num 0]
- **Loc** [Num 6] Accesses the **Goto Locator** window.
- **Loop** [L] When checked VCube Plays in a Loop from the **In** point to the **Out** point
- **Chase** [Ctrl + F1]..

- **Chase Offset** Shows the current Chase Offset. Double-click in the field to type or edit the value. Click on the **Store** button to store the offset.
- **Store** Stores the Chase Offset displayed in the **Chase Offset** field.
- **LTC** When checked the Linear TimeCode Input is used as the reference.
- **Delta** The field indicates any discrepancy between the VCube current location and where it should be.
- **EXT** Select to chase serial TimeCode from the Sony 9 pin serial stream. If EXT is not selected, the displayed TimeCode is the current Virtual Transport TimeCode.

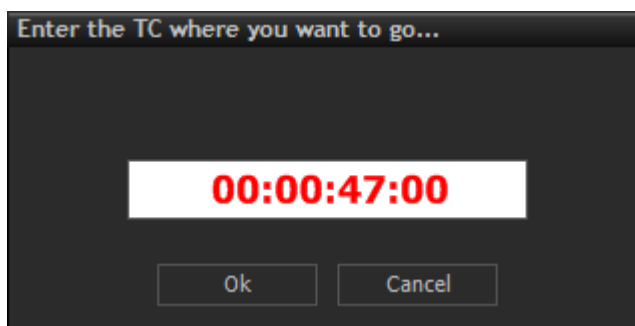
### Control of External Machine

When **Ctrl** is used with the Transport controls the **Internal Machine** is unlinked for the controls. In this way it is possible to control the external Sony 9-pin machine to receive control commands directly from the VCube keyboard.

**Note:** The Internal Machine and Sony 9-pin cannot use the same Serial Port.

### Go To TimeCode

The **Go To TC** function is accessed by **Ctrl + Num 6**.



Locator - Enter the TC where you want to go... dialog

Simply type the required TimeCode in the field and click on **OK** to locate the Playhead cursor there.

# Recording and Acquisition

## Acquisition

In many applications recording will be unnecessary. In these cases Compositions can be created by importing projects in formats such as AAF. **Please see: Import on page 32.**

Alternatively, empty Compositions can be created and Media Files imported using the **Media File Browser**. **Please see: Media Management on page 40.**

## Recording

### Overview

**Note:** When **Record : Enable** is checked **Quick SD Settings** and **Quick HD Settings** are unavailable. Audio recording is only available with Audio or Video I/O card options.

The plug-in corresponding to the video card must be **enabled** and set up in **User Interface > Settings Tabs > Settings > Show Video I/O Tab [Shift + Alt + P]**. **Please see: Video I/O on page 112**

**Note:** Be sure that both reference video input on the synchronization panel of the VCube and the Video Card Reference Input are referenced to the same genlock, black and burst, or video signal. This is the only way to ensure precise timing of the video signal.

The Record Tab Page has two Tabs.

**Record - Settings > Show Record Settings Tab** includes **Enable** and **Record Settings**. [F12]

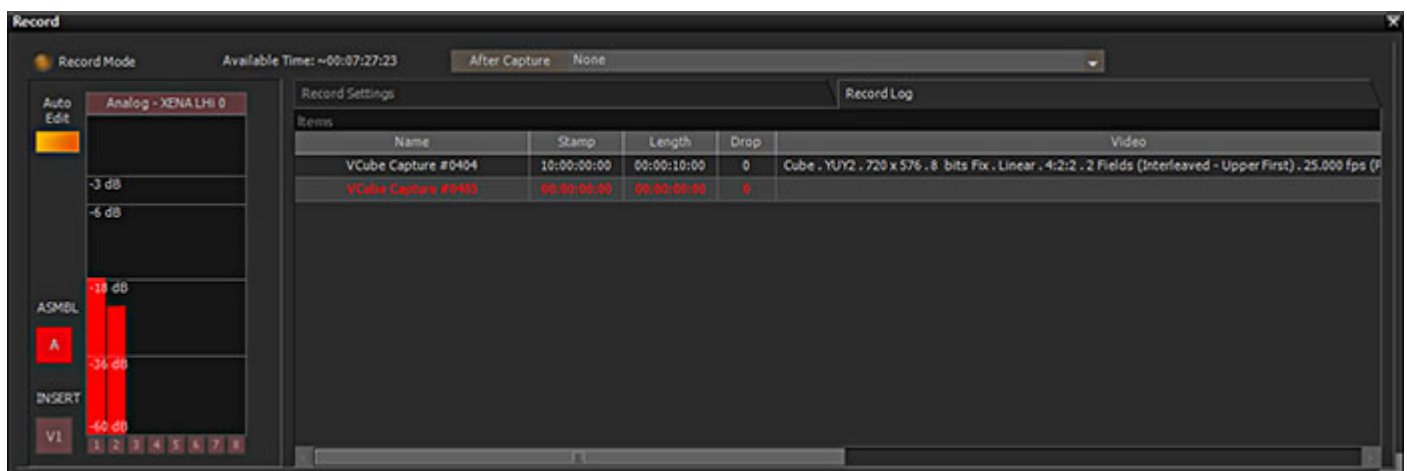
**Record Log - Settings > Show Record Log** shows information about each file recorded. [Ctrl + R]

## Virtual VTR

VCube record functions mirror closely the record functions found on industry standard VTRs. Both **Insert** and **Assemble** modes are provided.

During recording both Video and Audio monitoring go into E to E mode.

### Assemble (ASMBL)



**Record Tab page Assemble Auto Edit in progress**

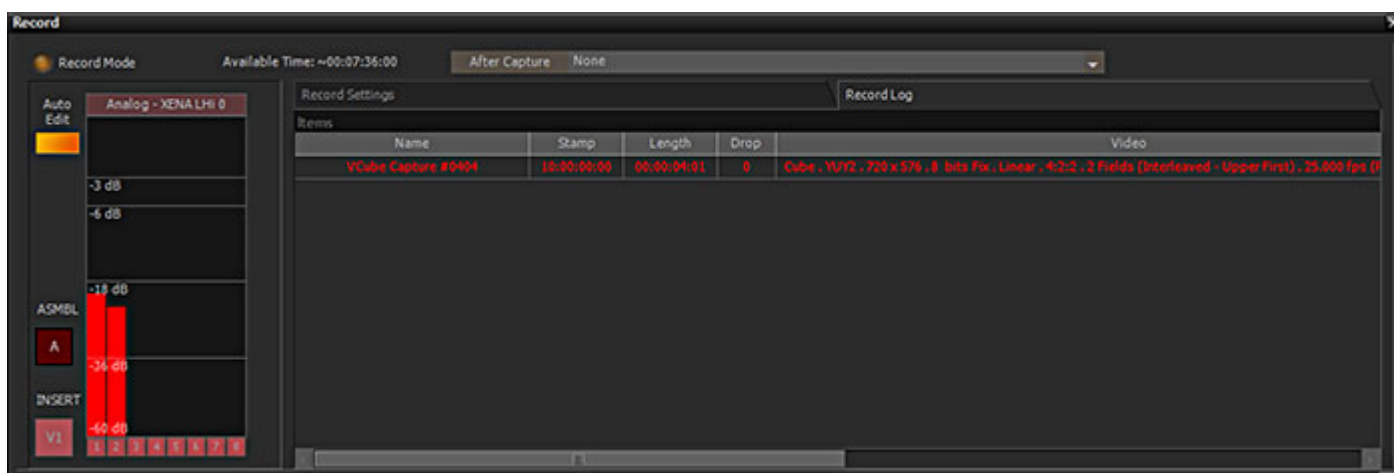
- The VCube Assemble mode operates in almost exactly the same way as a VTR:
- Before attempting an Assemble Auto Edit a valid TimeCode source must be set. (LTC, VITC, Ext. (Sony, MTC))



- When ASMBL is selected any active Track Arming buttons are switched off. Recording takes place on the Video and all available Audio Tracks. If a Track Arming button is switched on while in ASMBL mode ASMBL mode is disabled.
- Chase is set Automatically when the **Auto Edit** is initiated.
- VCube commences recording at the Cursor position as opposed to the In point.
- The Record Length is the external machine In to Out length.
- VCube computes the Chase Offset and the In and Out record points automatically.
- If an Auto Edit in Assemble mode fails (Stopped by user, invalid incoming TimeCode etc.) the VCube and VTR cue up where they were at the beginning of the process.
- If an Auto Edit completes successfully the VTR goes back to the Out point after the Postroll, This allows for assembling video end-to-end.

**Note:** VCube records beyond the Out point (like a VTR) allowing for subsequent Clip trimming.

## Insert (INSERT)



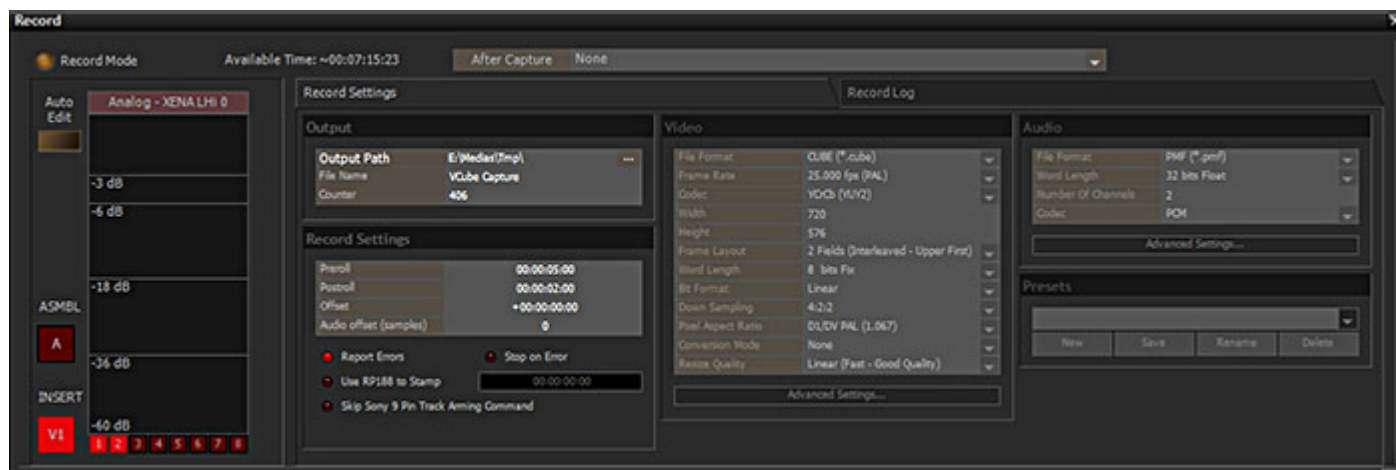
Record Tab page Insert Auto Edit in progress

- VCube Insert mode behaves in a similar manner to a VTR.
- Different In and Out points can be set on the VTR and in VCube.
- When an edit is initiated the Chase offset is set automatically.
- The recorded material duration corresponds (exactly) to the VCube In to Out duration.

## External Controller

- When the last track arming button on an external controller is switched off, Record mode is disabled.
- When Record mode is inactive, arming a track from an external controller switches Record mode on.

## Record Settings Tab



Record Settings Tab page

**Record Mode** When checked recording is possible using the settings in the rest of the Tab.

**Note:** The **Enable** button must be disabled (unchecked) in order to see captured Media in the Timeline.

**Auto Edit** When lit, Auto Edit Mode is active. This enables VCube to automatically control a VCR via the Sony 9 Pin (P2) protocol, and to record a range of the video tape from In point to Out point set in the Transport Tool - **User Interface > Toggle Transport Tool [T]**. **Please see also: Transport Tool on page 53**

**Note:** During this process, VCube needs to be in chase mode. To bypass possible drop outs in the Reference TimeCode source, **Soft Chase Mode** can be selected in **Formats & Sync**. In this case the Video Card **MUST** be referenced to an external reference signal.

**ASMBL** Click on the **ASseMBLe** button to use VCube's Assemble edit mode. **Please see: Assemble (ASMBL) on page 56**

**Analog - Xena LHi 0** This section shows the Audio Hardware currently selected for recording. The number of record channels available will vary accordingly to a maximum of 8.

**Insert V1** Click on the V1 button to arm Video for recording in **Insert** mode. When lit (as above) Video is armed for recording. **Please see: Insert (INSERT) on page 57**

**12345678** Click on the numbered buttons to arm Audio Channels for recording in **Insert** mode. Here, Channels 1 & 2 are armed. The number of Audio Channels available will depend on the hardware. Multiple Audio Channels appear as Layers in a single Audio Track. Level meters are above each arming button.

**After Capture** The field shows what will be done with the recorded material after capture. Options are None and In Current Composition, Place Clips at Original Timecode. If None is selected the recorded fields are simply added to the Output folder. If the in Current Composition ... option is selected and no Track is selected in the Timeline, a new Track or Tracks will be created.

### Output

**Output Path** The field shows the current Output Path. Click on the ... button to open a Windows browser to change the path. The Path defaults to the current Composition Media Files Path.

**File Name** The field shows the Current root File Name Click in the field and type to enter a new File Name.

**Counter** Field shows the start number for the incrementation process. Click in the field and type to enter a different start number.

## Record Settings

**Note:** These settings apply to **Auto Edit** mode. See above.

<b>Preroll</b>	Field shows the current VCR Preroll. Click in the field and type to change the value.
<b>Postroll</b>	Field shows the current VCR Postroll. Click in the field and type to change the value.
<b>Offset</b>	Field shows the current Offset between the incoming and recorded Timecode. This value only affects the Time Stamp of the recorded Media File(s) Click in the field and type to change the value.
<b>Audio Offset (samples)</b>	Field shows the current Audio Offset in samples. Click in the field and type to change the value. Enables sync errors to be corrected at Capture.
<b>Report Errors</b>	When checked a list of errors and their corresponding Timecodes is created.
<b>Stop on Error</b>	When checked Capture is terminated when an error is detected.
<b>Use RP188 to Stamp</b>	When enabled uses the incoming picture Timecode to Timestamp the recorded Media File(s)

### Skip Sony 9-pin Track Arming Command

#### Prefer track for Assemble

##### Video

**File Format** Field shows the Output File format selected currently. Click on the down arrow to select from:

<b>CUBE</b>	<b>*.Cube</b>
<b>AVI</b>	<b>*.avi</b>
<b>MPEG</b>	<b>*.mpg</b>
<b>MPEG</b>	<b>*.mpeg</b>
<b>MPEG</b>	<b>*.m2v</b>
<b>MPEG</b>	<b>*.m2t</b>
<b>MXF</b>	<b>*.mxf</b>
<b>QuickTime</b>	<b>*.mov</b>

**Note:** If **Quicktime**, **MPEG mpg** or **mpeg** are selected then a single audio + video file will be produced.

<b>Frame Rate</b>	The field shows the Frame Rate selected currently. Click on the down arrow to select an alternative.
<b>Codec</b>	The field shows the type of Compression selected currently. Click on the down arrow to select an alternative. The exact composition of the list will depend on options purchased.
<b>Width</b>	The field shows the Width of the output Video in pixels. Click in the field to enter a new value manually.
<b>Height</b>	The field shows the Height of the output Video in pixels. Click in the field to enter a new value manually.
<b>Frame Layout</b>	Field shows the current setting. Click on the down arrow to select an alternative: <ul style="list-style-type: none"> <li><b>Progressive Frame</b></li> <li><b>2 Fields (Interleaved - Lower First)</b></li> <li><b>2 Fields (Interleaved - Upper First)</b></li> <li><b>2 Fields (Separate - Lower First)</b></li> <li><b>2 Fields (Separate - Upper First)</b></li> <li><b>Single Field</b></li> </ul>
<b>Word Length</b>	Set automatically according to the codec selected.
<b>Bit Format</b>	

<b>Down Sampling</b>	Field shows the current color sub-sampling scheme. 4.2.2 is the default.								
<b>Up Conversion Mode</b>	Field shows current conversion mode. Options will vary with the Pixel Aspect Mode setting. E.g. Anamorphic, Letterbox, Pillarbox or None								
<b>Pixel Aspect Ratio</b>	Field shows the current Pixel Aspect Ratio and the format associated with this. Click on the down arrow to select an alternative.								
<b>Resize Quality</b>	Field shows the resizing algorithm selected currently. Click on the down arrow to select an alternative.								
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"><b>Nearest neighbour</b></td> <td style="width: 50%;"><b>Fastest but poor quality</b></td> </tr> <tr> <td><b>Linear (Bi Linear)</b></td> <td><b>Fast and poor quality</b></td> </tr> <tr> <td><b>Cubic</b></td> <td><b>Slow but very good quality</b></td> </tr> <tr> <td><b>Lanczos</b></td> <td><b>Very Slow but excellent quality</b></td> </tr> </table>	<b>Nearest neighbour</b>	<b>Fastest but poor quality</b>	<b>Linear (Bi Linear)</b>	<b>Fast and poor quality</b>	<b>Cubic</b>	<b>Slow but very good quality</b>	<b>Lanczos</b>	<b>Very Slow but excellent quality</b>	
<b>Nearest neighbour</b>	<b>Fastest but poor quality</b>								
<b>Linear (Bi Linear)</b>	<b>Fast and poor quality</b>								
<b>Cubic</b>	<b>Slow but very good quality</b>								
<b>Lanczos</b>	<b>Very Slow but excellent quality</b>								
<b>Advanced Settings</b>	The button is only available when MJPEG or Avid: VC-3/DNxHD are selected as the Compression scheme or when MPEG is selected in File Format. A dialog appears with compression settings.								

### Notes

- When **QuickTime** and an **MJPEG** codec are chosen, **Progressive Frame** must be selected in **Frame Layout** to ensure QuickTime player compatibility.
- **Frame Rate** must be set to match the frame rate of the Composition where the generated Video file is to be used.
- Compression allows the user to select the CODEC used to generate the new Media File(s). Depending on the chosen CODEC, it is possible to adjust the Compression Settings.
- For full details about the **MPEG** Settings, please refer to the dedicated section. We recommend using only regular **Format Types** in the **Basic Settings** dialog for trouble free operation.

### Audio

<b>File Format</b>	The field shows the current File Format. The drop-down list offers a choice of formats from the following depending on the container chosen. If both Video and Audio are of the same type, e.g. AVI or QuickTime they are merged inside a single Media File : The drop-down list offers a choice of formats from the following depending on the container chosen:										
<table border="0" style="width: 100%;"> <tr><td><b>None</b></td></tr> <tr><td><b>AVI (*.avi)</b></td></tr> <tr><td><b>MPEG (*.mpg)</b></td></tr> <tr><td><b>MPEG (*.mpeg)</b></td></tr> <tr><td><b>MPEG (*.mpa)</b></td></tr> <tr><td><b>PMF (*.pmf)</b></td></tr> <tr><td><b>WAV (*.wav)</b></td></tr> <tr><td><b>BWF (*.bwf)</b></td></tr> <tr><td><b>AIF (*.aif)</b></td></tr> <tr><td><b>MOV (*.mov)</b></td></tr> </table>	<b>None</b>	<b>AVI (*.avi)</b>	<b>MPEG (*.mpg)</b>	<b>MPEG (*.mpeg)</b>	<b>MPEG (*.mpa)</b>	<b>PMF (*.pmf)</b>	<b>WAV (*.wav)</b>	<b>BWF (*.bwf)</b>	<b>AIF (*.aif)</b>	<b>MOV (*.mov)</b>	
<b>None</b>											
<b>AVI (*.avi)</b>											
<b>MPEG (*.mpg)</b>											
<b>MPEG (*.mpeg)</b>											
<b>MPEG (*.mpa)</b>											
<b>PMF (*.pmf)</b>											
<b>WAV (*.wav)</b>											
<b>BWF (*.bwf)</b>											
<b>AIF (*.aif)</b>											
<b>MOV (*.mov)</b>											
<b>Number of Channels</b>	Indicates the number of physical outputs fed by Audio layers in the Composition.										
<b>Word Length</b>	Field shows the Word Length selected currently. The drop-down list offers a choice of:										
<table border="0" style="width: 100%;"> <tr><td><b>16 bits Fix</b></td></tr> <tr><td><b>24 bits Fix</b></td></tr> <tr><td><b>32 Bits Float</b></td></tr> </table>	<b>16 bits Fix</b>	<b>24 bits Fix</b>	<b>32 Bits Float</b>								
<b>16 bits Fix</b>											
<b>24 bits Fix</b>											
<b>32 Bits Float</b>											
<b>Compression</b>	Field shows the Compression scheme selected currently. The drop-down list offers a choice of schemes depending on the selected Audio File Format. QuickTime offers various solutions for compressing audio data.										

**Note:** The **AVI** and **QuickTime MPEG2** Media Handlers support multiple audio channels in a single file. When recording more than 2 channels in an AVI2 or QuickTime file, each channel is treated as a separate mono channel. I.e. if you have 4 channels in VCube, they will appear as 4 mono channels in an AVI file.

## Scope

Editing in VCube is not intended to replace an NLE. It is basic and intended to facilitate the editing required when using Video for playback and presentation.

## Editing in the Timeline

The **Timeline** is the place in VCube where Audio and Video **Clips** can be edited, faded up and down and otherwise arranged into an audio visual **Composition**.

### *Clips in a Composition*

**Clips** in a **Composition** are just pointers to the original audio and video **Media File(s)**. Any actions performed on a **clip** in a **Composition** will not affect the original **Media File(s)**. **Clips** can be edited, shortened, split into 2 **clips**, moved, have level or transparency adjusted, be copied, deleted, etc., and all actions will **ONLY** affect the **Composition**.

Once placed in the Composition, each Audio clip by default displays a Waveform of the Media file to which it points. This Waveform display can be enabled or disabled by the user.

### *Selections and Groups*

#### Selection

Selections can be made of individual Clips or of a **Range**

**Click** on a single Clip to select it. If it is a member of a **Group** the entire Group will be selected.

[**Shift + Click**] enables multiple Clips to be selected.

#### Region

**Click and drag** anywhere in the Timeline to create a **Region**. Any Layer dragged over will be included in the Region. The Region will be shown highlighted.

Click on the **Region** to create a **Split** in all Clips at the beginning and end of the Region in all Clips included in it. The resultant Clips are Selected and can be moved as a group regardless of whether they are members of other Groups.

[**Shift + Click and drag**] will select all clips partially or totally included in the Region.

[**Enter**] sets the **Range** to the beginning and End of the Region.

[**Ctrl + ENTER**] selects the Range contents as a **Region**.

**Double-click** on the **Range Tray** will set the Range from the beginning of the Composition to the end.

#### Groups

The most common **Groups** are created automatically when a Video Clip and its associated Audio with the same source Timecodes and lengths is placed in the Timeline.

[**Ctrl + G**] Groups the Clips selected currently

[**Ctrl + U**] Ungroups the Group selected currently

#### **Multi-level Grouping**

VCube supports multi-level grouping. I.e. a Group or Groups may in turn be grouped. Such a multi-level Group will need to be ungrouped as many times as there are levels in the group to be able to select indi-

vidual Clips. A Group number, e.g. **G12** is displayed inside a grouped Clip in the Timeline. The number will be the number of the highest level Group that the Clip is a member of.

**Note:** A Group including a Video clip is constrained to a one-frame grid.

## Nudge

<b>[Ctrl + UP or DOWN]</b>	Moves the Selected Clip(s) Up or Down a Layer. If the destination Layer already has a Clip the Clip moved is laid over the existing Clip for the duration of the moved Clip. If transparency is set appropriately both will be visible.
<b>[Shift + UP or DOWN]</b>	Invokes Nudge Overwrite mode for Selected Clip(s). The Clip moved will overwrite an existing Clip in a layer for the duration of the Clip moved.
<b>[Shift + LEFT or RIGHT]</b>	Nudges the selected Clip Left or Right in the Timeline. Where Clips meet the moving Clip overwrites the stationery Clip.
<b>[Ctrl + LEFT or RIGHT]</b>	Nudges Selected Clips Left or Right in the Timeline. Where Clips meet an overlap is created. The incoming Clip takes precedence.
<b>[Ctrl + UP or DOWN]</b>	Nudges Selected Layer Up or Down.
<b>[Ctrl + Shift + UP or DOWN]</b>	Nudges Selected Track Up or Down.

## Editing Functions

Editing Functions are similar to Pyramix.

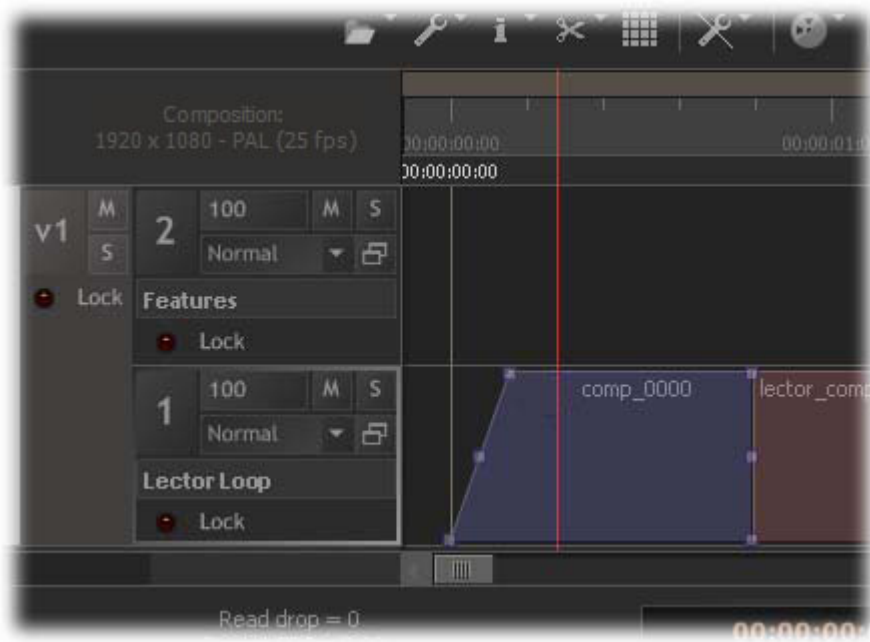
- To split a Clip at the mouse position use **[Ctrl + Right-Click]**. When Clips are Grouped or Selected, every Clip present at the mouse position will be split.
- To slip the Clip content inside fixed in out points in the selected Clip **[Ctrl + Shift + Click and Drag]**. When Clips are grouped, contents of grouped clips are slipped.
- Paste at Playhead Cursor in selected Layer/Track **[Ctrl + V]**
- Paste & Ripple at Playhead Cursor in selected Layer/Track **[Ctrl + Shift + V]**
- To split a Selection at the Playhead Cursor position use **[Ctrl + T]**. When Clips are grouped, every Clip present at the locator position will be split.
- To move a Selection in a Track or Layer just Click on the selected element and drag it wherever you wish, up and down between tracks or layers, or left and right to move it in time.
- Use **[Alt]** to constrain moves within the Layer(s). The selected element(s) will be placed before or after the existing element in the Track or Layer, depending on where you move it. This is also valid when you move a Group. In Audio Layers moves with **[Alt]** are constrained to a one frame grid.

**Note:** that a group with both video and audio can only be moved horizontally in the Timeline. To change the order of video Clips vertically for preview, **Nudge Up / Down Layer** must be used. Select the desired video Layer(s), then use **[Ctrl + Up]** / **[Ctrl + Down]** or **Edit > Nudge > Nudge Up / Nudge Down**.

- A selection in a Track or Layer can be dragged and dropped onto another element already present in a Track or Layer. The default mode when you move a Clip in between two elements is unconstrained within this space anywhere within a one frame grid except in audio Layers where the grid is one sample.
- A moved Clip can overlap a Clip already placed in the Layer. When a Video Clip is placed over another in the same Layer the incoming Clip takes precedence.
- Use **[Ctrl + Click and Drag]** to create an automatic cross-fade between the Clip moved and the adjacent Clip.

## Trim

To trim the **In** or **Out** points of a Clip, just use the six handles on the selected element.



Trim handles

On the left:

The bottom handle controls the **In** point for the selected element. The center one just moves the fade in without shifting the Clip content. The top one enables you to create a real time fade in when moved to the right. If you use **[Ctrl]** the fade can be adjusted symmetrically. If you use **[Ctrl]** while moving a faded Clip, an automatic symmetric cross fade is produced within the adjacent Clips.

On the right

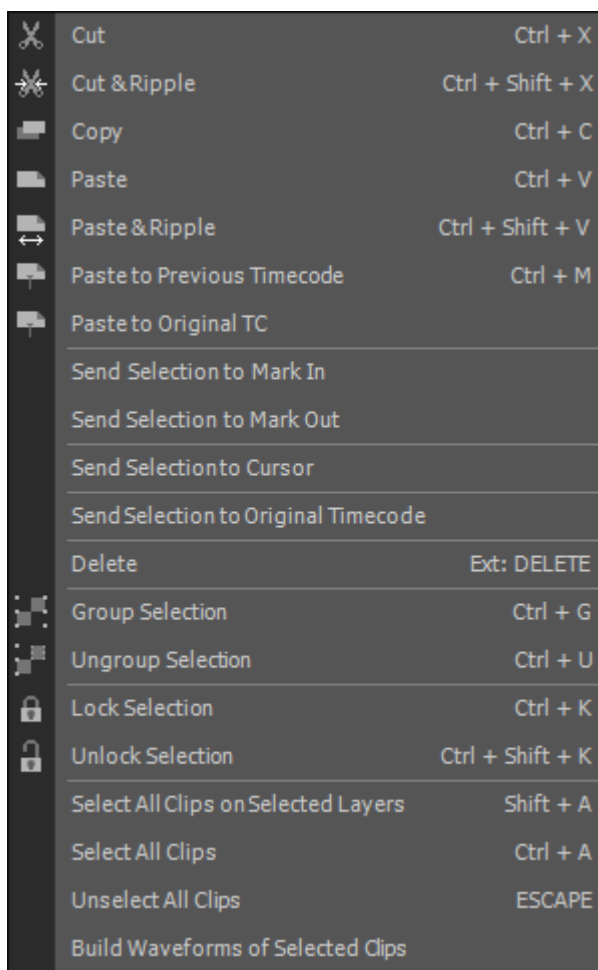
Handles act in the same manner for the **Out** point

- With Grouped Clips having the same Source In TC and the same In Time in the Timeline, actions on handles are applied to all Clips. **[Click + Shift]** on a handle temporarily unlinks the selected Clips and produces a fade action only on the Clip with the handle clicked. After such an operation the handles remain unlinked until all grouped clips fade handles are restored to no fade in at the same Timecode.



## Edit Context Menu

Right-Clicking on the Selection displays a contextual menu with editing functions:



Edit context menu

<b>Cut</b>	[Ctrl + X]
<b>Cut &amp; Ripple</b>	[Ctrl + Shift + X]
<b>Copy</b>	[Ctrl + C]
<b>Paste</b>	[Ctrl + V] (only available if the Clipboard isn't empty)
<b>Paste &amp; Ripple</b>	[Ctrl + Shift + V] (only available if the Clipboard isn't empty)
<b>Paste at Previous TimeCode</b>	[Ctrl + M] (only available if the Clipboard isn't empty)
<b>Paste To original TC</b>	(only available if the Clipboard isn't empty)
<b>Send Selection to Mark In</b>	
<b>Send Selection to Mark Out</b>	
<b>Send Selection to Cursor</b>	
<b>Send Selection to Original Timecode</b>	
<b>Delete</b>	[DELETE]
<b>Group Selection</b>	[Ctrl + G] (only available if more than one Clip is selected)
<b>UnGroup Selection</b>	[Ctrl + U] (only available if more than one Clip is selected)
<b>Lock Selection</b>	[Clip Ctrl + L]
<b>Unlock Selection</b>	[Clip Ctrl + Shift + K]
<b>Select All Clips on Selected Layers</b>	[Shift + A]

**Select All Clips**

**[Ctrl + A]**

**UnSelect All Clips**

**[ESCAPE]**

**Build Waveforms of Selected Clips**

Forces waveform generation for selected Clips whe disables in Settings.

## Motion Rectangles (PiP)

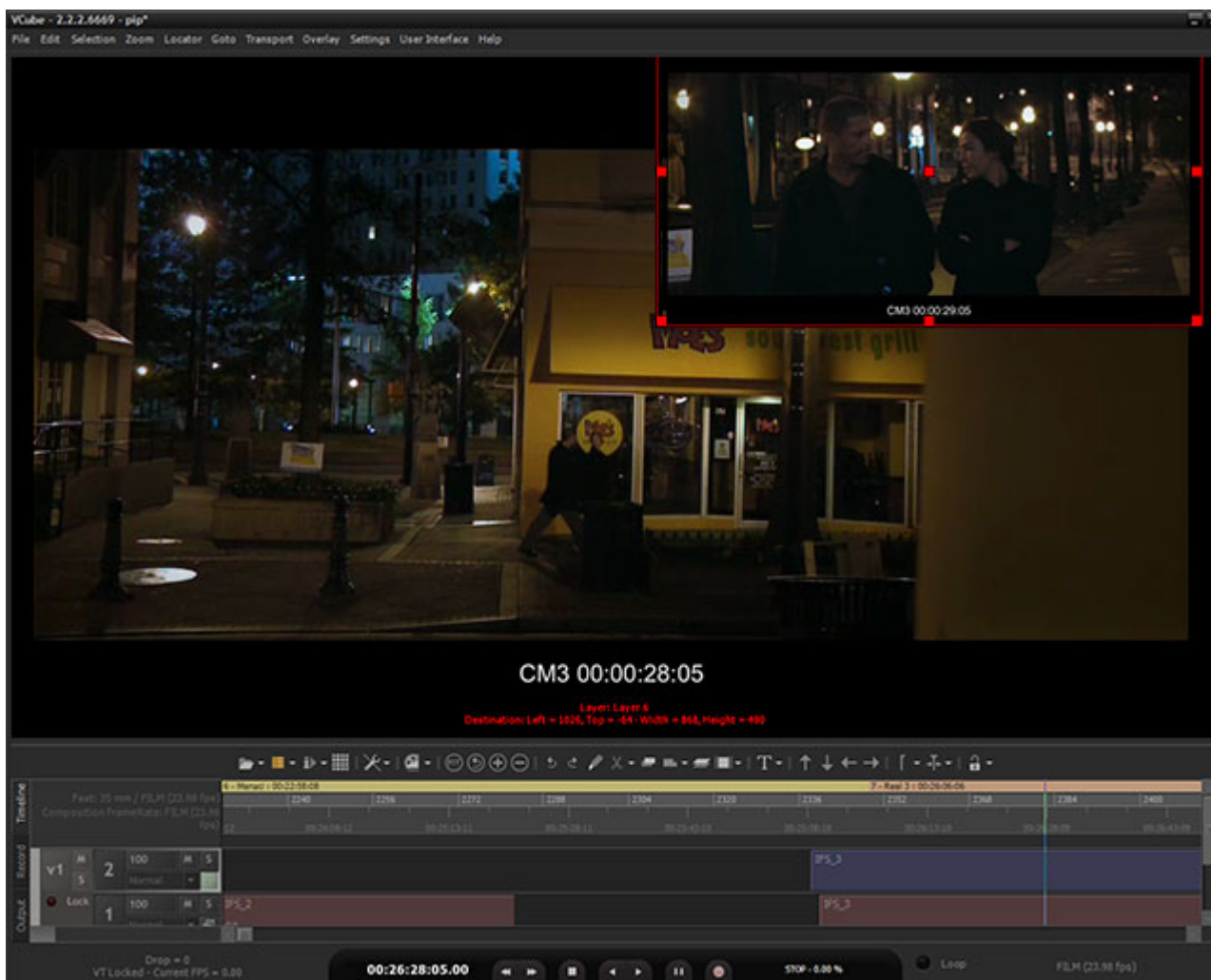
Motion Rectangles enable a Layer's position and size to be altered. The Motion Rectangles interface is only visible on the computer screen. The Video Output only displays the results.

This feature can be useful when different versions of the same video or film project need to be compared. When used in combination with the Import Composition function, 2 versions of the same video or film project can be compared on a single screen without rendering.

It can also be used to crop unwanted picture information, for example a working copy which has several potentially confusing burnt-in Timecodes at the top or bottom.

### Advanced Preview

Picture-in-Picture can also be used to give Re-recording (Dubbing) Mixers an advanced Preview when mixing as below:



Picture-in-Picture Advanced Preview

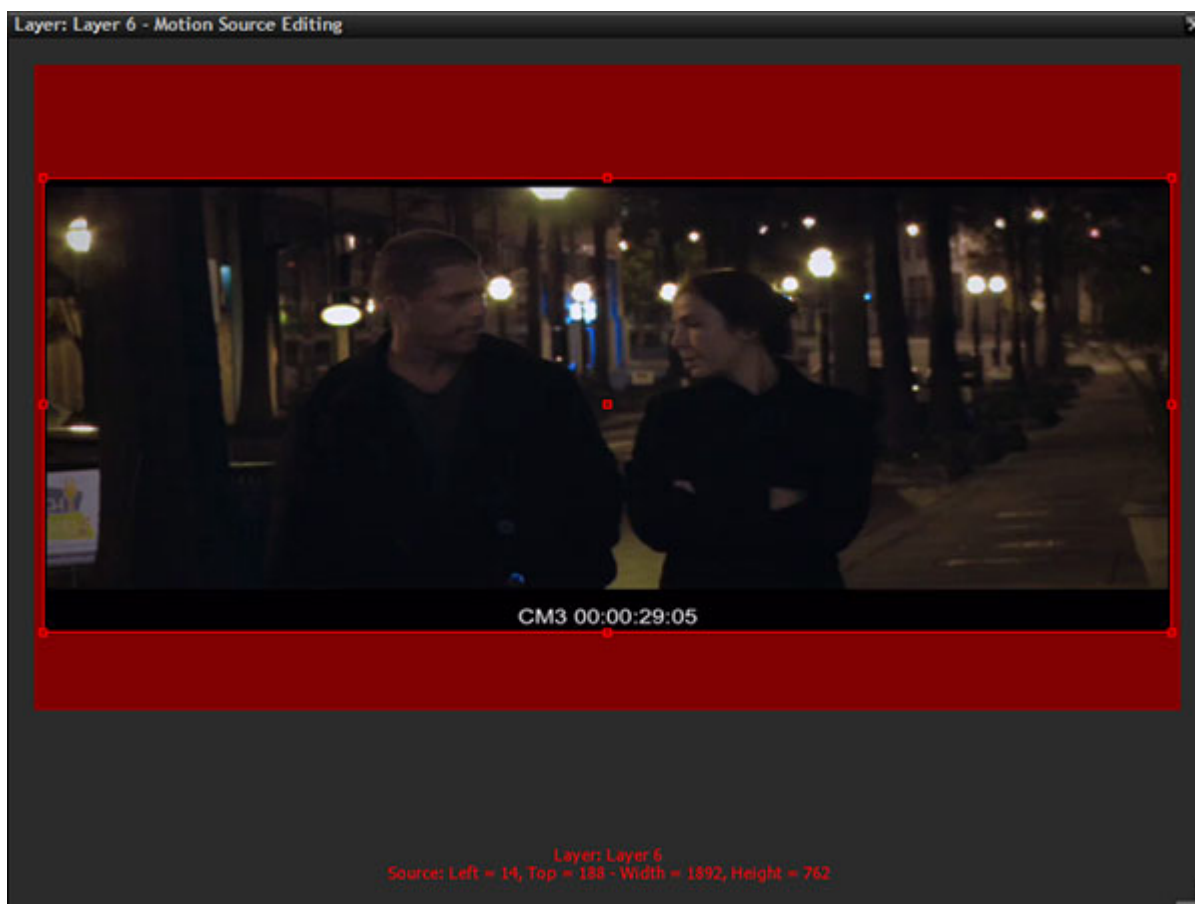
In this screenshot the selected Clip on Video Track 1, Layer 2 is advanced by one second and the Motion Rectangles feature is used to shrink and position it at top right. To achieve a similar result do this :

First copy the **Clip** you wish to see in advance. Paste into a higher Layer (Create a new one if necessary) at the desired position in advance (earlier than the original Clip. (Values of one foot (16 frames) or one second are commonly used.



Click on the Motion Rectangles button in the Layer header

1. Click the **Source** button now visible at top left. The **Motion Source Editing** pane opens:



Motion Source Editing

2. [Alt + Click and Drag] a red handle or handles to crop the image if required.
3. Press **Enter** to accept the **Source Rectangle** changes and close the pane.
4. [Shift + Click and Drag] a red corner handle to reduce the **Destination Rectangle** to the size desired.
5. [Click + Drag] the center red handle to position the **Destination Rectangle** as required
6. Press **Enter** to accept the **Destination Rectangle** changes.



The **Motion Rectangles** icon in the Layer Header turns green to indicate that the layer position and or size has been modified.

### Controls and Shortcuts

The **Source Rectangle** is accessed from the **Destination Rectangle** (**Source** button at top left) and determines the shape and size of the portion of the Clip frame which will be sized and positioned on screen.

The **Destination Rectangle** determines the shape and size of the **Source Rectangle** contents on screen.

Playback is still possible while **Destination** or **Source Rectangles** are being adjusted.

With **Motion Rectangles** active (red sizing box displayed):

[Tab] steps Layer selection from top to bottom.

[Shift + Tab] steps Layer selection from bottom to top.

**Layer** number, **Top** and **Left** corner positions, **Width** and **Height** are displayed in red at bottom center.

### Crop

**[Alt + Click and Drag]**

Both Source and Destination Rectangles can be cropped by using [Alt + Click and Drag] on resize handles. This permits the useful part of the source Layer to be chosen while preserving the geometry and the field order if the selected window is not moved.

### **Resize**

**[Click and Drag]**

the external handles to adjust rectangle size.

**[Shift + Click and Drag]**

the external handles to adjust rectangle size while preserving the aspect ratio.

**[UP], [DOWN] [LEFT] and [RIGHT]**

keys can also be used to move the rectangle.

**[Ctrl + UP], [Ctrl + DOWN], [Ctrl + LEFT] and [Ctrl + RIGHT]** keys resize the rectangle. In this mode the Top Left handle is the fixed reference point.

**[Shift + UP], [Shift + DOWN], [Shift + LEFT] and [Shift + RIGHT]** keys resize the rectangle. In this mode the Bottom Right handle becomes the fixed reference point.

**[ENTER]**

accepts Rectangle settings and removes the red frame etc.

**[Esc]**

accepts Rectangle settings and removes the red frame etc.

### **Move**

**[Click and Drag]**

the central handle to adjust rectangle position.

**[Double-click]**

on the central handle centers the rectangle on the X & Y axes.

**[Ctrl + Double-click]**

on the central handle restores the Layer to its original size.

**[Alt + Double-click]**

on the central handle centers the Layer on the vertical axis.

**[Shift + Double-click]**

on the central handle centers the Layer on the horizontal axis.

# Watermark and Text

Watermark, Copyright and Text Clips can be added to a Composition. These functions are useful for security and other purposes.

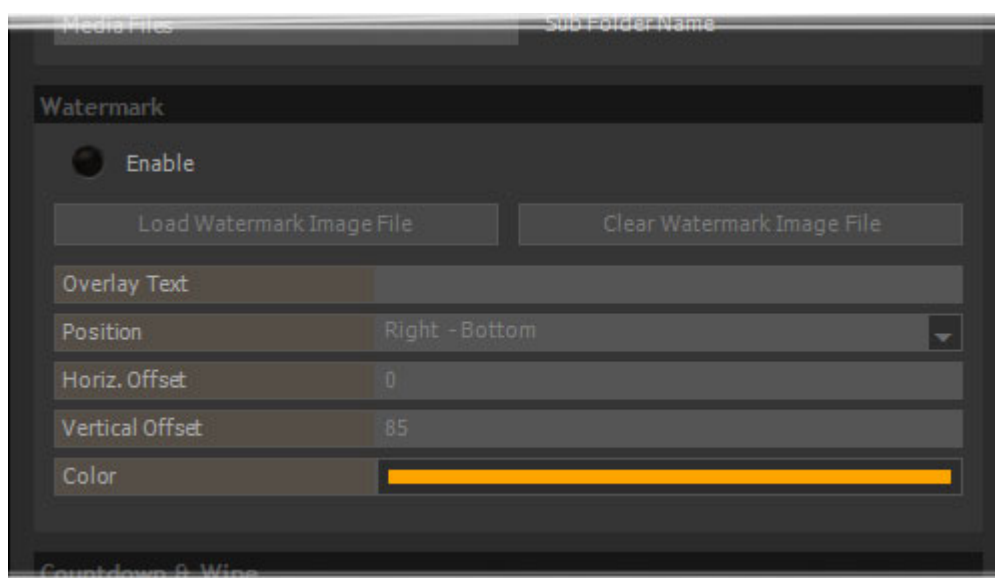
## Watermark

### Overview

The **Watermark** function enables a still image and or Copyright Text to be added to the current Composition. Simply load a still image file (with alpha channel supported) and or enter and position the Copyright Text. A Watermark image file must be of the same dimensions as the desired output video format to avoid real-time stretching.

### Settings

**Watermark** settings can be found in the **Composition** Tab:



**Watermark Settings**

**Enable** When Enable is checked a user selected Watermark image will be added, in real-time, to every video output. Both Text and still image are possible.

**Note: Enable** must be active in order to access the **Watermark** settings.

**Load Watermark Image File** Opens a Windows File Browser to locate and open the desired image file. Image transparency, size and position must be set in the image file in a suitable Image Editor, matching the current video format.

**Clear Watermark Image File** Unloads the current Watermark Image file

**Overlay Text** Type any text required in the field

**Position** The drop-down list offers a wide range of positions on screen for the text.

**Horiz. Offset** Offsets the text by the number of pixels typed in the box to the right or left depending on the anchor position chosen above. When **Center - xx** is chosen no offset is possible.

**Vertical Offset**

Offsets the text by the number of pixels typed in the box downwards or upwards depending on the anchor position chosen above. When **xxx - Center** is chosen no offset is possible.

**Color**

The field shows the color selected currently. Click in the field to pop-up a color picker. **Please see: Color Picker on page 15**

**Note:** Watermark, when activated, is present on all video outputs (both computer screen and video card). No VCube feature, including Mask can hide it.

# Text Clip

There are two types of **Text Clip**

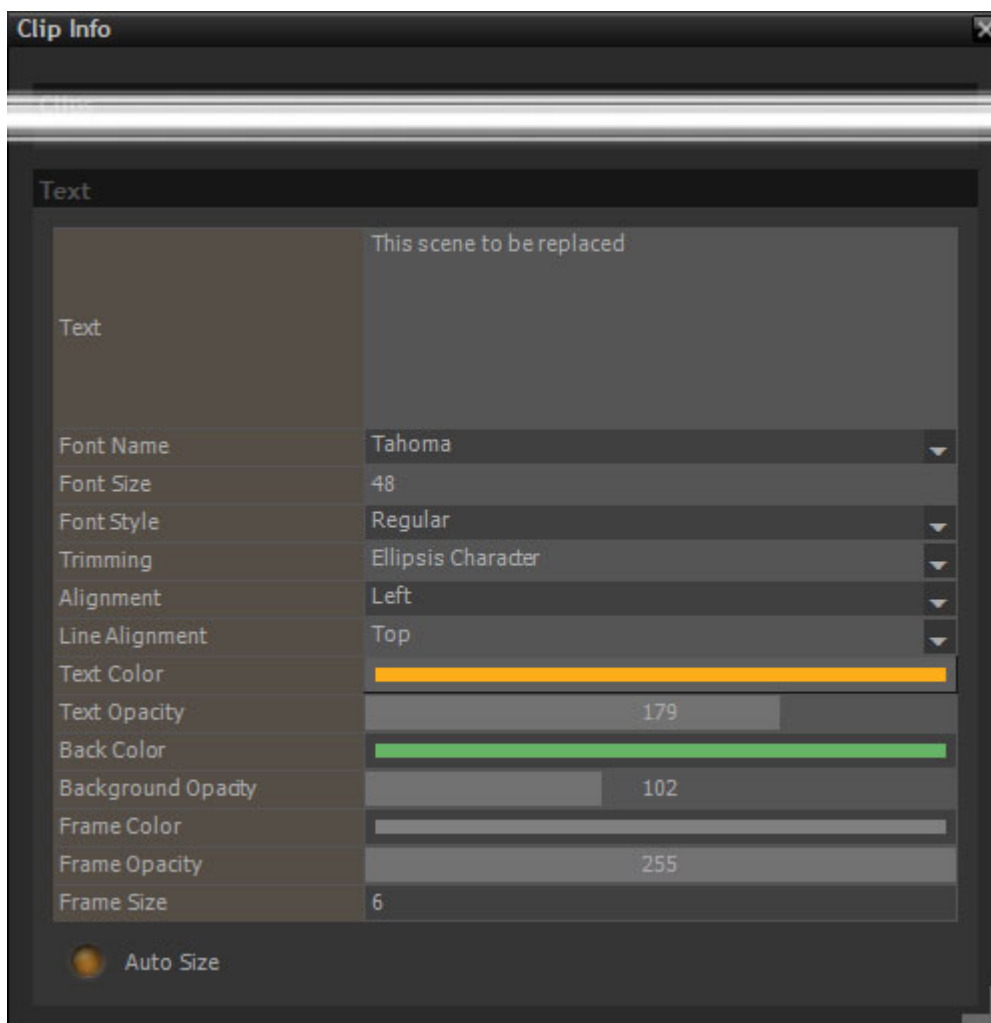
The only differences between the two is the text pre-entered and the Font size etc.

To create a **Text Clip** or a **Sticky Clip**:

**Edit > Auto Create > New Text Clip**, [Shift + T] Creates a new 5 second **Text Clip** in the Layer selected currently.

**Edit > Auto Create New Post-it (Text Clip)**, [Alt + T] Creates a new 5 second **Text Clip** in the Layer selected currently.

Double-Click on the Text Clip created in the Timeline to open the **Clips Info** Tab.



Clip Info add text

## Text

<b>Text</b>	Click in the box to highlight the field and type the Text you wish to see on screen. The result will be visible in the Preview Text box when the field is no longer highlighted.
<b>Font Name</b>	Field shows Font selected currently. Click to drop-down a list of all fonts available on the system.
<b>Font Size</b>	Field shows the font size in current use. Click in the field and type to enter an alternative value.
<b>Font Style</b>	Field shows current style. Click to drop-down a list of alternatives: <b>Regular</b> <b>Bold</b>



	<p><b>Italic</b></p> <p><b>Bold Italic</b></p> <p><b>Underline</b></p> <p><b>Strike out</b></p>
<b>Trimming</b>	Field shows current selection. Determines how excess text which will not fit in the Text Box will be dealt with. Please see: <a href="#">Trimming Setting</a> on page 74
<b>Alignment</b>	Field shows current justification. Click to drop-down list of alternatives:
	<p><b>Left</b></p> <p><b>Center</b></p> <p><b>Right</b></p>
<b>Line Alignment</b>	Field shows current Line Alignment. Click to drop-down list of alternatives:
	<p><b>Top</b></p> <p><b>Center</b></p> <p><b>Bottom</b></p>
<b>Text Color</b>	Field shows current Text Color. Click to open the Color Picker: Please see: <a href="#">Color Picker</a> on page 15
<b>Text Opacity</b>	The field is a slider showing the current opacity between 1 and 255. Click and drag the slider to change the value.
<b>Back Color</b>	Field shows current Text box Background Color. Click to open the Color Picker: Please see: <a href="#">Color Picker</a> on page 15
<b>Background Opacity</b>	The field is a slider showing the current opacity between 1 and 255. Click and drag the slider to change the value.
<b>Frame Color</b>	Field shows current Text box Frame Color. Click to open the Color Picker. Please see: <a href="#">Color Picker</a> on page 15
<b>Frame Opacity</b>	The field is a slider showing the current opacity between 1 and 255. Click and drag the slider to change the value.
<b>Frame Size</b>	Field shows current Frame border width. Click in the field and type to enter an alternative value.
<b>Auto Size</b>	Adjusts the rectangle area automatically to the Text content. In Auto Size mode there are no external handles for the rectangle. But the center positioning handle remains available.

### Timeline Preview

Text Clips behave differently to video and audio Clips in the Timeline. When a text Clip is moved, the Video Preview follows. When the move ends Preview reverts to the Playhead Cursor position. In fades editing, the preview respects the compositing of the Project at the current TimeCode.

In contrast, when moving audio and video Clips, Preview displays the current Playhead Cursor position. In fades editing, the preview displays only the selected video Clip at the current TimeCode without any other mixed Layer or Motion Rectangle applied (no compositing).

Layer motion and opacity are not applied to text Clips.

Any font installed on the system can be used.

Add a text Clip in the Timeline will display a red Destination Rectangle for text. Then, Double-click inside this rectangle. The text can then be edited in the preview screen. Click outside this rectangle to validate the text.

The Text Properties tab is automatically opened when a text Clip is selected. Text can also be edited in this tab with additional options for style.

### Resize

**[Click and Drag]** the external handles to adjust rectangle size.

**[Shift + Click and Drag]** the external handles to adjust rectangle size while preserving the aspect ratio.

[UP], [DOWN] [LEFT] and [RIGHT] keys can also be used to move the rectangle.

[Ctrl + UP], [Ctrl + DOWN], [Ctrl + LEFT] and [Ctrl + RIGHT] keys resize the rectangle. In this mode the Top Left handle is the fixed reference point.

[Shift + UP], [Shift + DOWN], [Shift + LEFT] and [Shift + RIGHT] keys resize the rectangle. In this mode the Bottom Right handle becomes the fixed reference point.

### **Move**

[Click and Drag] the central handle to adjust rectangle position.

[Double-click] on the central handle centers the rectangle on the X & Y axes.

[Ctrl + Double-click] on the central handle restores the Text box to its original size.

[Alt + Double-click] on the central handle centers the Text box on the vertical axis.

[Shift + Double-click] on the central handle centers the Text box on the horizontal axis.

### **Finish**

[Enter] accepts Text box settings and removes the red frame etc.

[Esc] accepts Text box settings and removes the red frame etc.

Clicking elsewhere in the Timeline to deselect the Text Clip accepts Text box settings and removes the red frame etc.

### **Trimming Setting**

The **Trimming** setting determines how excess Text which will not fit in the on-screen box is dealt with.

For example: for the phrase **The Rain In Spain Falls Mainly in The Plain**, and for a given Text Box size, the options will display as follows:

<b>Ellipsis Character</b> (default)	The Rain In Spain F..
<b>None</b>	The Rain In Spain Falls
<b>Character</b>	The Rain In Spain Fall
<b>Word</b>	The Rain In Spain
<b>Ellipsis Word</b>	The Rain In Spain...
<b>Ellipsis Path</b>	The Rain ... The Plain

## Generated Clips

**Countdown** Clips, **Wipe** Clips, **Video Test Pattern** Clips, and **Audio Tone** Clips can be generated by the VCube application from **Edit > Auto Create** : or the Tool Bar.

Pyramix ADR capabilities can create Wipe and Countdown clips automatically in the VCube Timeline. This feature either works internally in a **PyraCube** machine or uses the network connection between separate Pyramix and VCube machines to send the corresponding information.

**Note:** Dedicated shortcuts can be defined in the Shortcuts editor section [**Shift + W**]



Countdown Clock and Wipe

Here **Auto Countdown** and **Auto Wipe** are enabled.

### Countdown Clip

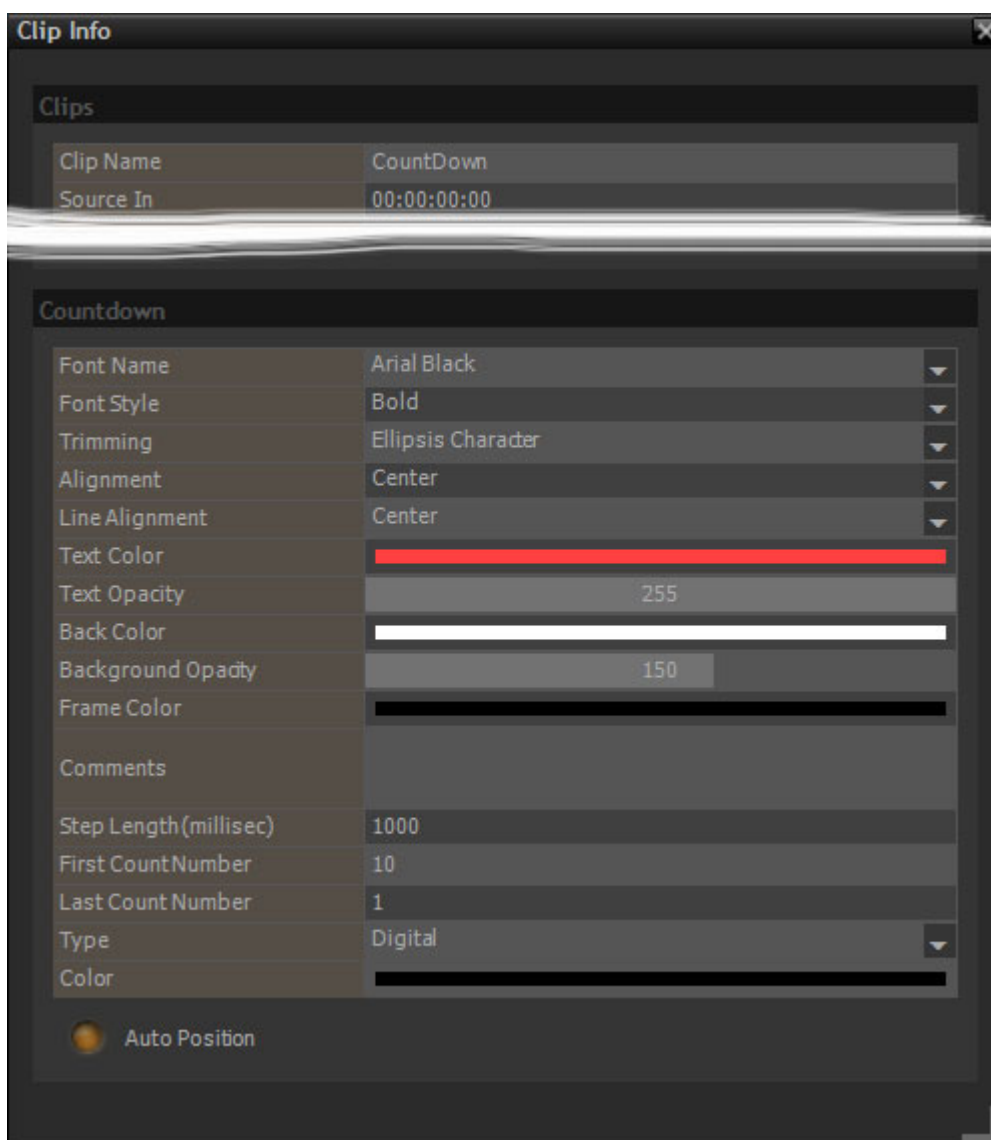
Countdown clips can be generated automatically by VCube:

**Edit > Auto Create : New Countdown Clip** or



In the Toolbar

Once created in the Timeline, Double-click on the Clip to access its settings in Clip Info:



Clip Info - Countdown Settings

### Clips

The fields in this section are the same as for standard Video or Audio Clips. However **Clip Name** appears on the Countdown overlay just below the Count number :

**Clip Name** Field shows the current Clip Name. Click in the field and type to rename.

### Countdown

**Font Name** Field shows Font selected currently. Click to drop-down a list of all fonts available on the system.

**Font Style** Field shows current style. Click to drop-down a list of alternatives:

- Regular**
- Bold**
- Italic**
- Bold Italic**
- Underline**
- Strike out**

**Trimming**

**Alignment** Field shows current justification. Click to drop-down list of alternatives. Default is Center :

**Left**

<b>Line Alignment</b>	<p><b>Center</b> <b>Right</b></p> <p>Field shows current Line Alignment. Click to drop-down list of alternatives. Default is Center.</p>
<b>Text Color</b>	<p><b>Top</b> <b>Center</b> <b>Bottom</b></p> <p>Field shows current Text Color. Click to open the Color Picker. Please see: Color Picker on page 15</p>
<b>Text Opacity</b>	<p>The field is a slider showing the current opacity between 1 and 255. Click and drag the slider to change the value.</p>
<b>Back Color</b>	<p>Field shows current Text box Background Color. Click to open the Color Picker. Please see: Color Picker on page 15</p>
<b>Background Opacity</b>	<p>The field is a slider showing the current opacity between 1 and 255. Click and drag the slider to change the value.</p>
<b>Frame Color</b>	<p>Field shows current Text outline Color. Click to open the Color Picker. Please see: Color Picker on page 15</p>
<b>Comments</b>	<p>Free text field. Click in the field and type.</p>
<b>Step Length (millisec)</b>	<p>Field show the current Step Length between numbers. 1000 = 1 second. NTSC based video standards require 1001 ms per second.</p>
<b>First Count Number</b>	<p>Field shows the First step number for the countdown Click in the field and type to enter an alternative value.</p>
<b>Last Count Number</b>	<p>Field shows the Last step number for the countdown Click in the field and type to enter an alternative value.</p>
<b>Type</b>	<p>Field shows the current Countdown style. Click to drop-down the list of alternatives:</p> <p><b>Digital</b> <b>Watch</b> <b>Left to Right</b> <b>Right to Left</b> <b>Border to Center</b> <b>Center to Border</b></p>
<b>Color</b>	<p>Field shows current Countdown Bar and Clip Color in the Timeline. Click to open the Color Picker:</p>

**Auto Position**

**Note:** Some Clip Properties are not supported by Countdown Clips. Countdown clips are unaffected by the Layer Source/Destination rectangle settings. Countdown Clip duration cannot be edited directly in the Timeline using the Clip handles. Use **Clip Settings** to change Countdown Clip duration.

## Wipe Clip

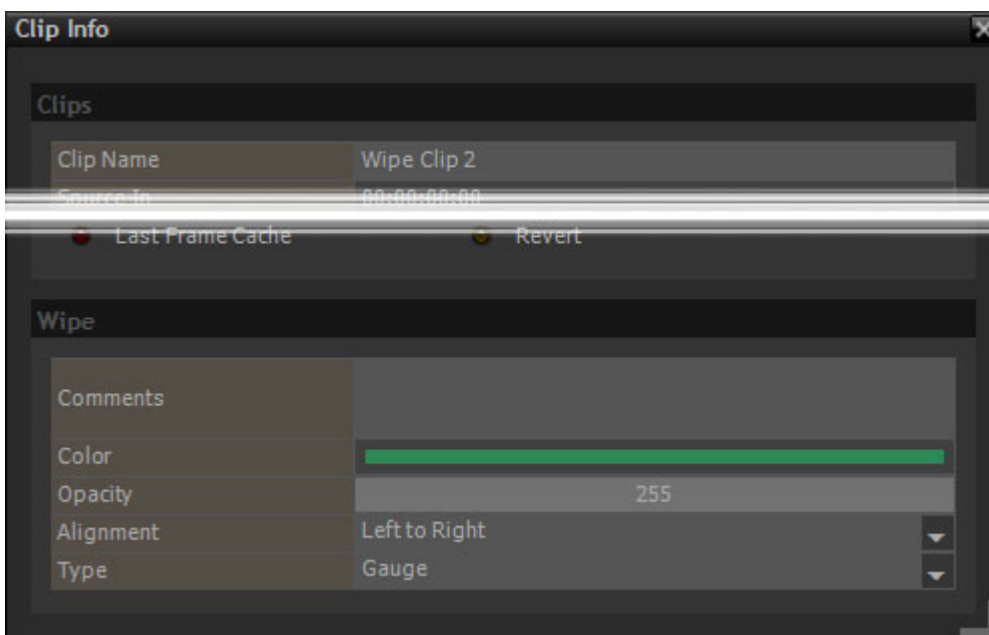
Wipe clips can be generated automatically by VCube.

**Edit > Auto Create : New Wipe Clip** or



In the Toolbar

Once created in the Timeline, Double-click on the Clip to access its settings in Clip Info:



Clip Info - Wipe settings

### Clips

The fields in this section are the same as for standard Video or Audio Clips. However **Clip Name** appears on the Wipe overlay just above the Wipe :

**Clip Name** Field shows the current Clip Name. Click in the field and type to rename.

### Countdown

**Comments** Free text field. Click in the field and type.

**Color** Field shows current Wipe Color. Click to open the Color Picker. Please see: Color Picker on page 15

**Opacity** The field is a slider showing the current Opacity between 1 and 255. Click and drag the slider to change the value.

**Alignment** Field shows current Wipe direction. Click to drop-down list of alternatives. Default is Left to Right

- Left to Right**
- Right to Left**
- Border to Center**
- Center to Border**

**Type** Field shows the current Wipe style. Click to drop-down the list of alternatives:

- Gauge** (Horizontal)
- Vertical**

**Note:** Some Clip Properties are not supported by Wipe Clips.  
Countdown clips are unaffected by the Layer Source/Destination rectangle settings.

## Video Test Pattern Clip

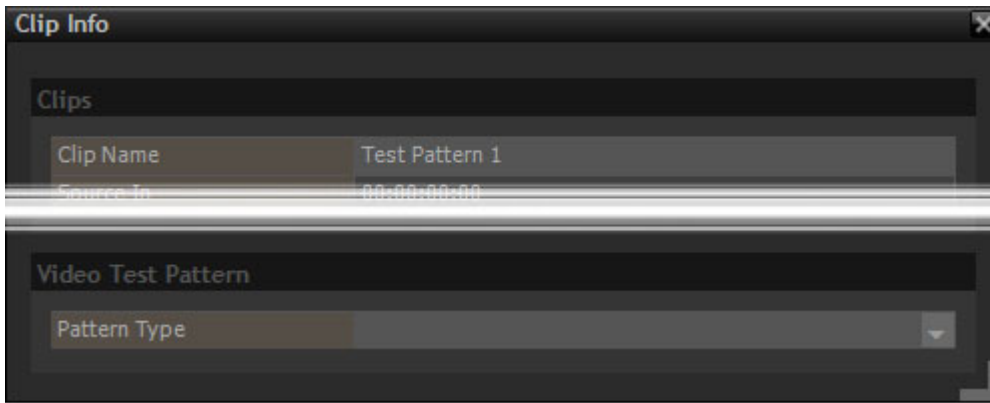
Video Test Pattern clips can be generated automatically by VCube.

**Edit > Auto Create : New Video Test Pattern** or



In the Toolbar

Once created in the Timeline, Double-click on the Clip to access its settings in Clip Info:



Clip Info - Video Test Pattern chooser

### Video test Pattern

**Pattern Type**

Field shows the Test Pattern selected currently. Click to access the list of patterns available.

## Audio Tone clip

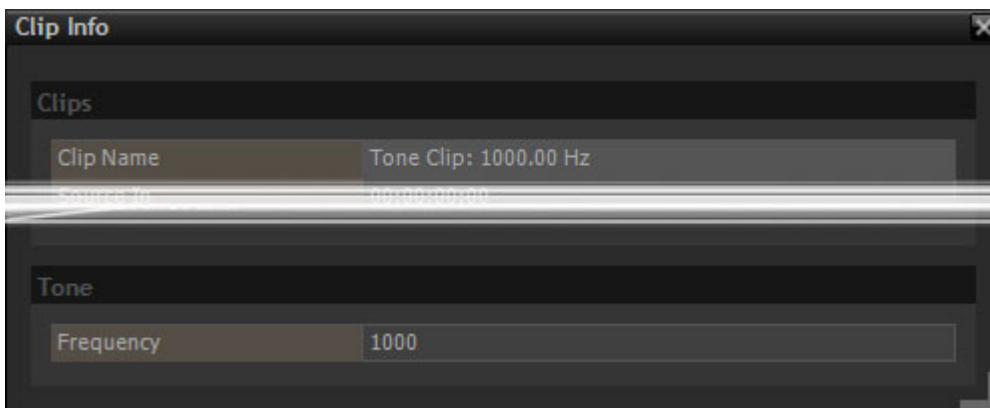
Audio Tone Clips can be generated automatically by VCube.

**Edit > Auto Create :** or



In the Toolbar

Once created in the Timeline, Double-click on the Clip to access its settings in Clip Info:



Clip Info - Tone Clip setting

### Tone

**Frequency**

Field shows the frequency of the sine wave tone.

# Conversion and Rendering

**Note:** When VCube executes Conversion or Rendering processes, the current Composition frame rate is used.

**Note:** All the VCube Export, Conversion and functions are available in the File Menu. E.g. **File > Export > Wrap**.

## Export Composition

### XML

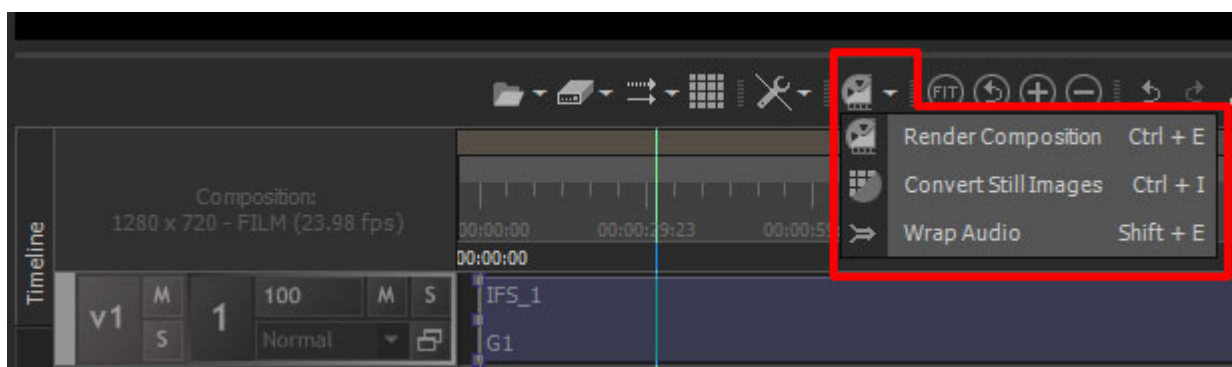
VCube Compositions can be exported as **.xml** files. This feature enables Timelines to be exchanged between the last generation of Merging Technologies software (Pyramix or Ovation).

To export XML choose:

- **File > Export > Composition**
- The **Export Composition** File Browser opens.
- Navigate to the desired destination folder or create a new one.
- The file type is already selected for you. **Interchange file format (\*.xml)**
- Type a suitable name in the **File name:** drop-down list box. (or choose from the list if overwriting a previous export.
- **Click** the **Save** button to begin the export.

## Rendering, Conversion and Wrapping

The **Rendering, Conversion and Wrapping** toolbar icon is a modal Toolpicker. I.e. the icon shown will be for the process last invoked from the adjacent drop-down list. All these options are also available from **File > Export > (function)**



Render, Convert and Wrap toolbar icon/menu



# Render Composition

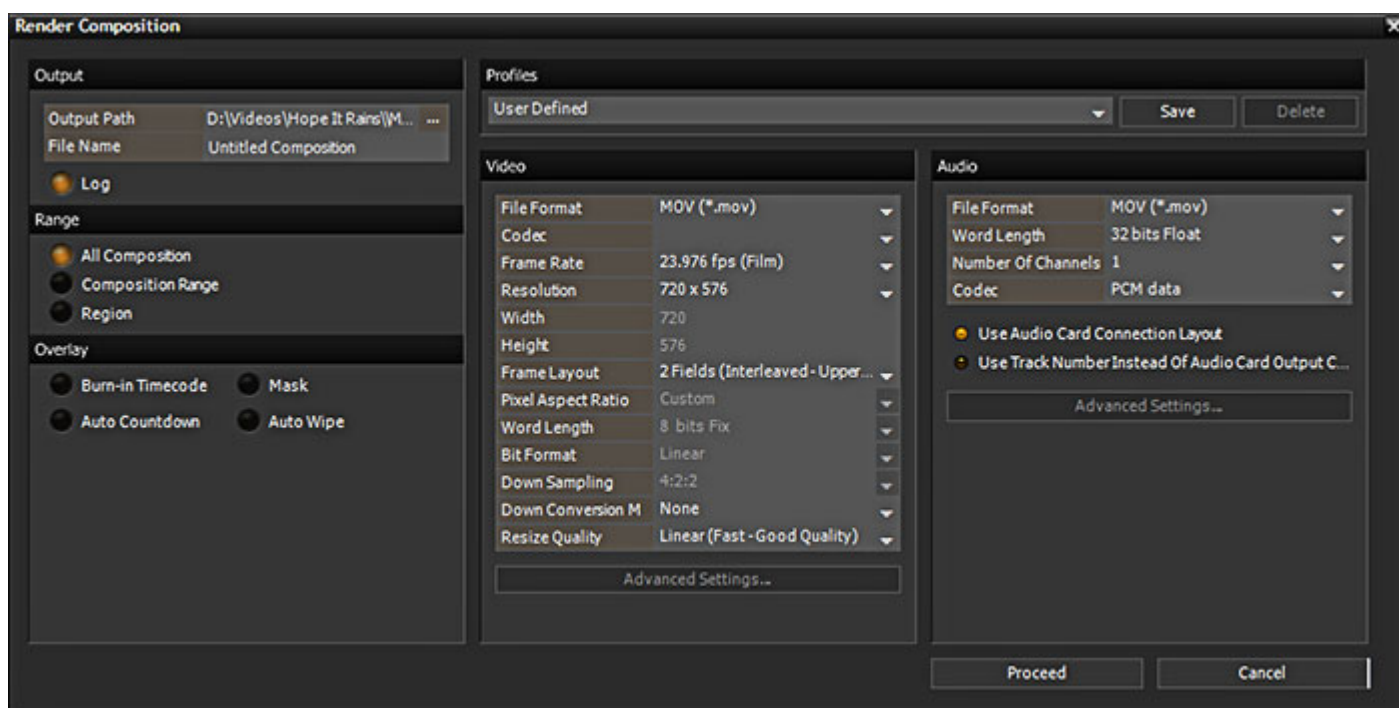
**File > Export > Render Composition**

**Render Composition** enables the entire Composition or a Range or Region of it to be rendered as a single Media File. The render can be in any of a number of file formats including **.cube**, **MOV**, **MPEG2** or **AVI**.

Selecting **Render Composition** opens the **Render Composition** dialog which has six sections **Output**, **Range**, **Overlay**, **Profiles**, **Video** and **Audio**.

When suitable settings have been made, the **Proceed** button starts the rendering process while **Cancel** closes the dialog without rendering.

## Render Composition Dialog



Render Composition dialog

### Output

**Output Path xxxxxx ...**

Shows current path for output file(s). Click on... to open a browser to change the path.

**File Name**

Click in this field to type a suitable name for the output Media.

**Log**

When active a window will appear at the end of the conversion process reporting success and listing any anomalies.

### Range

**All Composition**

When selected, the whole Composition will be rendered.

**Composition Range**

When selected the range selected in the Composition currently will be rendered.

**Region**

When enabled, render will be from **Region In** to **Region Out** (Set by placing a **Mark In** and **Mark Out** and choosing **Selection > Range to Region**)

### Overlay

**Burn-in Timecode**



<b>MPEG</b>	<b>*.m2v</b>
<b>MPEG</b>	<b>*.mpg</b>
<b>AVI</b>	<b>*.avi</b>
<b>MXF</b>	<b>*.mxf</b>

<b>Codec</b>	The field shows the type of Compression selected currently. Click on the down arrow to select an alternative. The exact composition of the list will depend on options purchased.
<b>Frame Rate</b>	The field shows the current Composition Frame Rate selected currently.
<b>Resolution</b>	The field shows the Resolution selected currently. The drop-down list shows all Resolutions available.
<b>Width</b>	The field shows the Width of the output Video in pixels.
<b>Height</b>	The field shows the Height of the output Video in pixels.
<b>Frame Layout</b>	Field shows the current setting. Click on the down arrow to select an alternative. The alternatives available depend on the Composition format, the File Format and Codec:

**Progressive Frame**

**2 Fields (Interleaved - Lower First)**

**2 Fields (Interleaved - Upper First)**

**2 Fields (Separate - Lower First)**

**2 Fields (Separate - Upper First)**

**Single Field**

<b>Word Length</b>	Fixed at 8 bits currently
--------------------	---------------------------

**Bit Format**

<b>Down Sampling</b>	Field shows the current color sub-sampling scheme. 4.2.2 is the default.
----------------------	--

One of the next two entries is shown as appropriate.

<b>(Up Conversion Mode)</b>	Field shows current conversion mode. Options will vary with the Pixel Aspect Mode setting. E.g. Anamorphic, Letterbox, Pillarbox or None
-----------------------------	--

<b>(Down Conversion Mode)</b>	Field shows current conversion mode. Options will vary with the Pixel Aspect Mode setting. E.g. Anamorphic, Letterbox, Pillarbox or None
-------------------------------	--

<b>Pixel Aspect Ratio</b>	Field shows the current Pixel Aspect Ratio and the format associated with this. Click on the down arrow to select an alternative.
---------------------------	---

<b>Resize Quality</b>	Field shows the resizing algorithm selected currently. Click on the down arrow to select an alternative.
-----------------------	--

<b>Nearest neighbour</b>	<b>Fastest but poor quality</b>
<b>Linear (Bi Linear)</b>	<b>Fast and poor quality</b>
<b>Cubic</b>	<b>Slow but very good quality</b>
<b>Lanczos</b>	<b>Very Slow but excellent quality</b>

<b>Advanced Settings...</b>	The button is only available for MXF. A dialog appears with compression settings.
-----------------------------	---

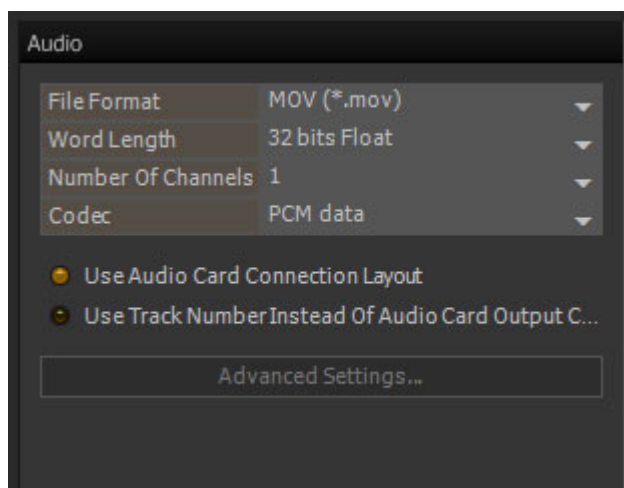
<b>Proceed</b>	Click on Proceed to begin the Export and Conversion process
----------------	---

<b>Cancel</b>	Click on Cancel to abort the Export
---------------	-------------------------------------

**Notes**

- Compression allows the user to select the CODEC used to generate the new Media File(s). Depending on the chosen CODEC, it is possible to adjust the Compression Settings.
- For full details about the **MPEG** Settings, please refer to the dedicated section. We recommend using only regular **Format Types** in the **Basic Settings** dialog for trouble free operation.

## Audio



Render dialog - Audio section

### File Format

The drop-down offers the choice of:

- MOV (\*.mov)
- WAV (\*.wav)
- MPEG (\*.mpeg)
- MP4 (\*.mp4)
- MPEG (\*.mpa)
- MPEG (\*.mpg)
- DWF (\*.bwf)
- AVI (\*.avi)
- PMF (\*.pmf)
- AIF (\*.aif)
- MXF (\*.mxf)

### Word Length

The drop-down offers the choice of:

- 32 bits Float
- 24 bits Fix
- 16 bits Fix
- 8 bits Fix

Options available depend on the **File Format** selected.

### Number of Channels

The drop down offers up to 16 channels, depending on the **File Format** selected.

### Codec

The choice available depends on the **File Format** selected.

**Use Audio Card Connection Layout Toggles with :**

**Use Track Number Instead Of Audio Card Output Connection**

### Advanced Settings

Only available for certain **File Formats**, notably **MPEG** where it opens the **MainConcept MPEG Encoder** dialog **Please see: MPEG Settings (MainConcept Encoder) on page 191**

## Convert Still Images

This is an ingest function and details can be found here: **Convert Still Images on page 33**

## Wrap Audio

### Scope

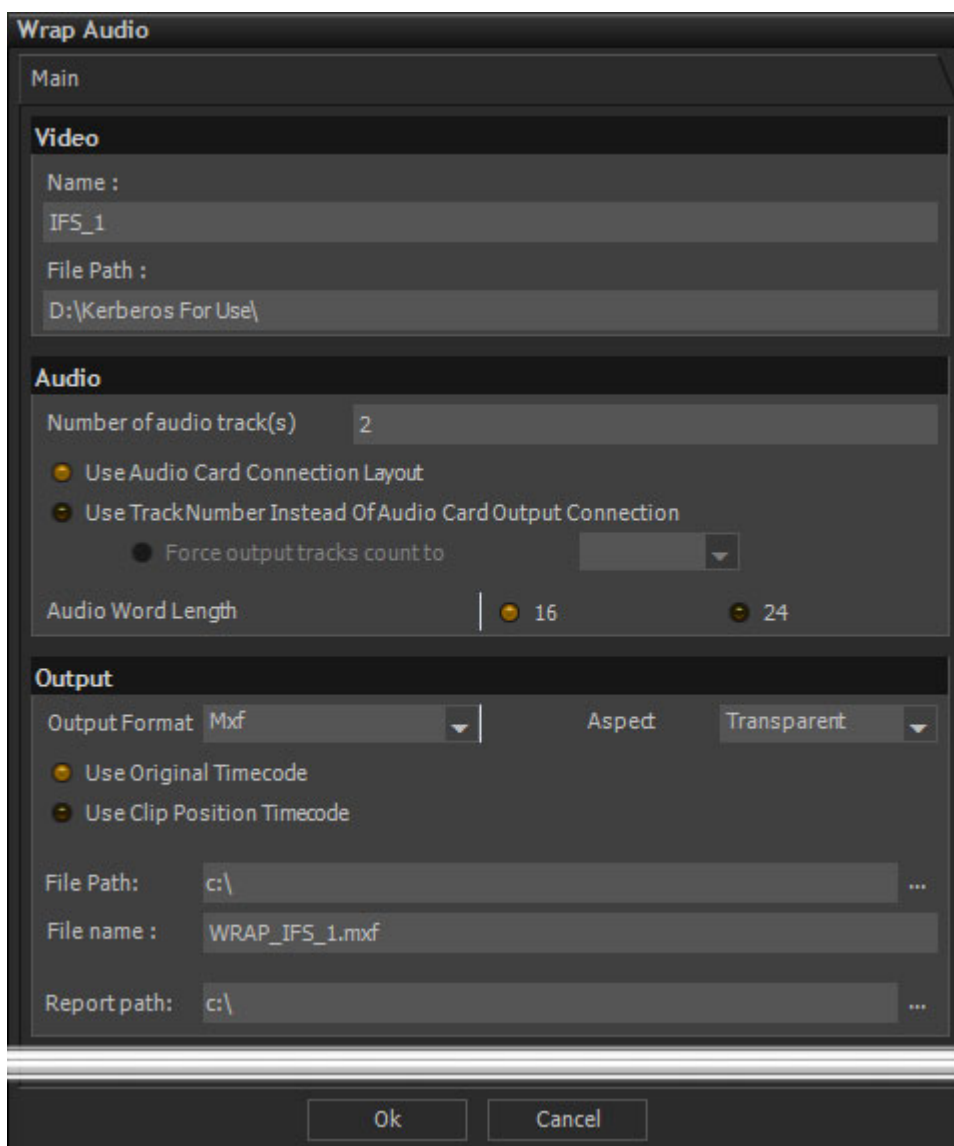
The Media Wrapper feature enables Audio files to be embedded in to a new file without decoding and re-encoding the video of the original file. A new Media File with embedded Audio is created.

The Media Files to be wrapped (one Video, up to eight Audio) correspond with the Clips selected in the Timeline. Any Audio and Video Files which play in the Timeline can be encapsulated in MXF, AVI or QuickTime containers provided the output format supports the original file format(s).

### Wrap Audio Dialog

**File > Export > Wrap Audio** or the:

 icon in the **Convert Media Files** Toolpicker opens the **Wrap Audio** dialog:



Wrap Audio dialog

### Video

- Name:** Field below (Information only) shows the Clip name of the Video to be encapsulated.
- File Path :** Field below (Information only) shows the path to the Media File underlying the Video Clip.

## Audio

**Number of Audio track(s)** Shows the number of Audio Tracks in the selected Clip

**Use Audio Card Connection Layout Toggles with :**

**Use TrackNumber Instead Of Audio Card Output Connection**

**Note:** Note that the audio card connection layout in Wrap Audio is associated with the **Routing of 8 First Channels** drop-down menu in the **Audio Engine** tab. The options available in this drop-down vary in relation to the type of audio hardware present in your VCube system (AJA, Black Magic, ASIO)

**Force output tracks count to** When active the number of Output Tracks will equal the number shown in the field selected from the drop-down list. This may be required for certain hardware. If more tracks are present in the source then the extra tracks will be omitted. If there are less tracks present in the source then extra tracks of silence will be added.

### Audio Word Length

**16** Sets Output Word Length to 16 bits.

**24** Sets Output Word Length to 24 bits.

## Output

**Output Format** Field shows the current Output Format. Click to drop-down the list of alternatives

**MXF**

**Mov**

**Avi**

**WAV audio**

**MP4**

**Aspect** When the **Output Format** is **MXF** the drop-down offers the choice of:

**Transparent**

**Force 4:3**

**Force 16:9**

**Use Original Timecode** When checked, Output file will correspond to original Video file TimeCode stamp.

**Use Clip Position Timecode** When checked, the current TimeCode of the Video Clip in the Timeline will be used in the wrapped file.

**File Path :** Field shows the current Output File Path. Click to type an alternative or:

**... button** Opens a Windows File Browser to enable a different File Path to be selected/created.

**File Name :** Click in the field to type a name for the Output file.

**Report Path** Field shows the current Report File Output Path. click to type an alternative or:

**... button** Opens a Windows File Browser to enable a different File Path to be selected/created.

### OK

Click on **OK** to accept the settings and start the Wrap.

### Cancel

Click on **Cancel** to abort the Wrap and close the dialog.

**Note:** Settings made in the dialog are retained when the Wrap is cancelled.

**Note:** **MOV** files using the following codecs are supported for wrapping:

**H.264** (Supported in **Render** only when **H264 Encoder Key** is present.)

**MPEG-4 M-JPEG**

**HDV IMX**

**XDCAM**

## Frame Rate Management

The VCube application can manage different frame rates for Media Files, Composition, and TimeCode. For Conversion or Rendering Processes, VCube uses the current Composition frame rate.

### Media File Frame Rate Differs From Composition Frame Rate

If the Media File's frame rate is lower than the Composition frame rate, some frames will be duplicated.

If the Media File frame rate is higher than the Composition's frame rate, some frames will be dropped.

The Video Engine will play back the Media File preserving its original duration.

Playback duration can be changed if required by changing the speed of the Clip in the Timeline with a Double-click on the Clip. **[Ctrl + W]**

### NTSC Frame Rates

Composition frame rates of the NTSC family are stretched in time (i.e. one second lasts 1001 ms). This requires that Clips be pulled-down to 99.9 % to preserve their original duration. In this case the Clip in the timeline needs to be manually pulled out (expanded) on its Layer(s) to reflect the new duration.

### Composition Rate Differs From Incoming TimeCode

The Timeline displays the External and the current Composition frame rate in the right bottom corner of the Timeline.

The **Overlay** Tab settings enable external or internal (Composition) to be selected for Burnt In TimeCode.

The Composition will remain in sync. A second lasts a second for both Composition and TimeCode.

**Note:** The video engine must produce enough frames to match the chosen video standard of the video card.

#### E.g:

- Using a 25 fps frame rate for the Composition produces video drops out on an NTSC video output. The Composition frame rate must be set to 29.97 fps and the Clips must be pulled-down and resized into the Timeline (expanded time). While playing, a PAL frame will be duplicated every six NTSC frames to preserve the overall duration.
- Using a 24 fps frame rate for Composition produces video drops out on a PAL video output. The Composition frame rate must be set to 25 fps. A frame will be duplicated every second to preserve the overall duration.

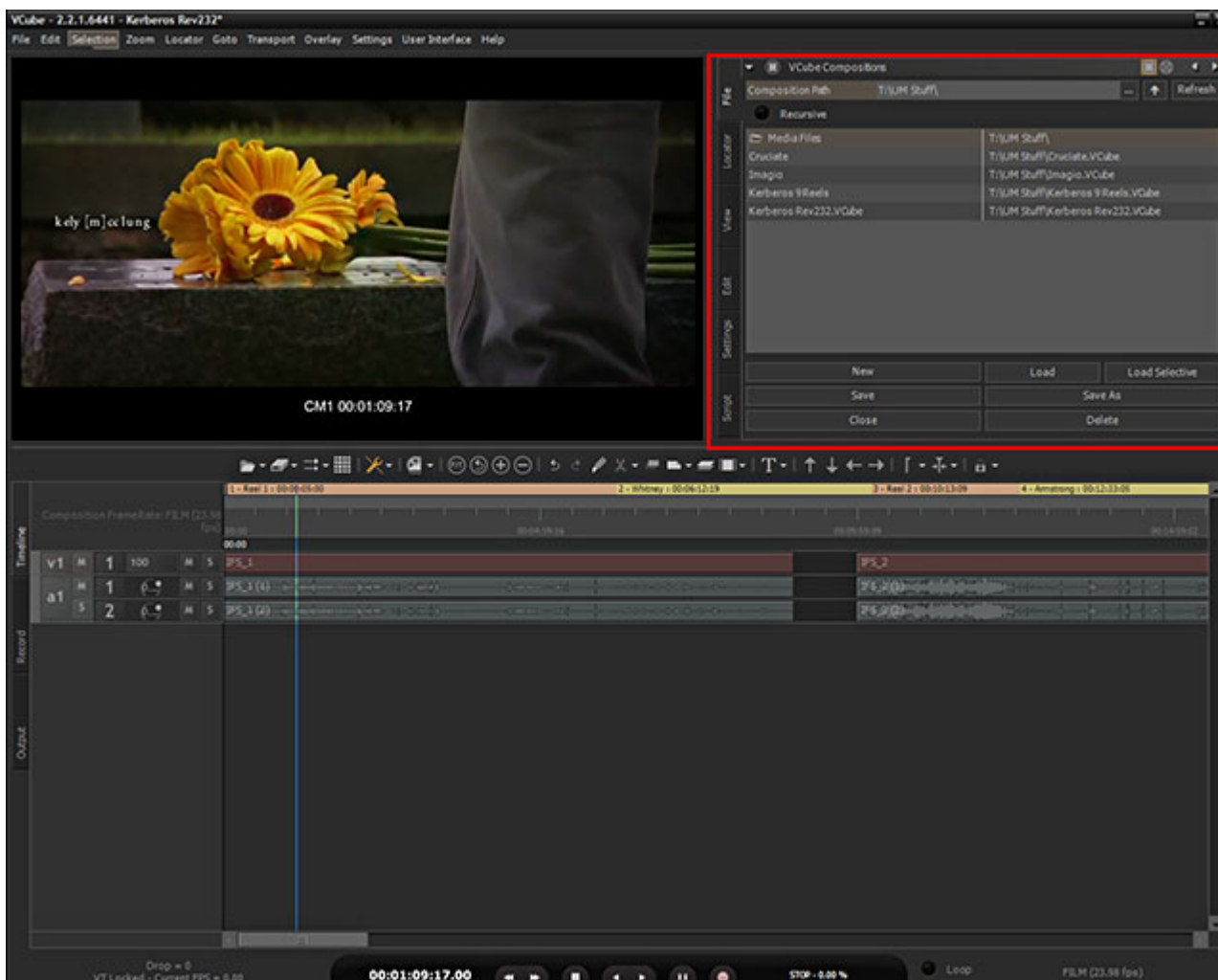
**Note:** If the graphic card output is used, the Composition frame rate need not match any SD video standard. 24 fps can be used as the Composition frame rate.

Only HD video formats allow film frame rates for the Composition on HD video cards.

## Control Settings Page

The **Control Settings Page** gives access to the main settings for the VCube working environment.

**User Interface > Toggle Show/Hide Settings [F2]** Brings up a Pane to the right of **Preview** with all the Control Settings Tabs down the left-hand side. **Preview** is resized to suit and the size of the Pane can be adjusted by hovering over the left and bottom splitters (borders). When the cursor changes to a double-headed arrow Click and drag to resize :



**Control Settings**

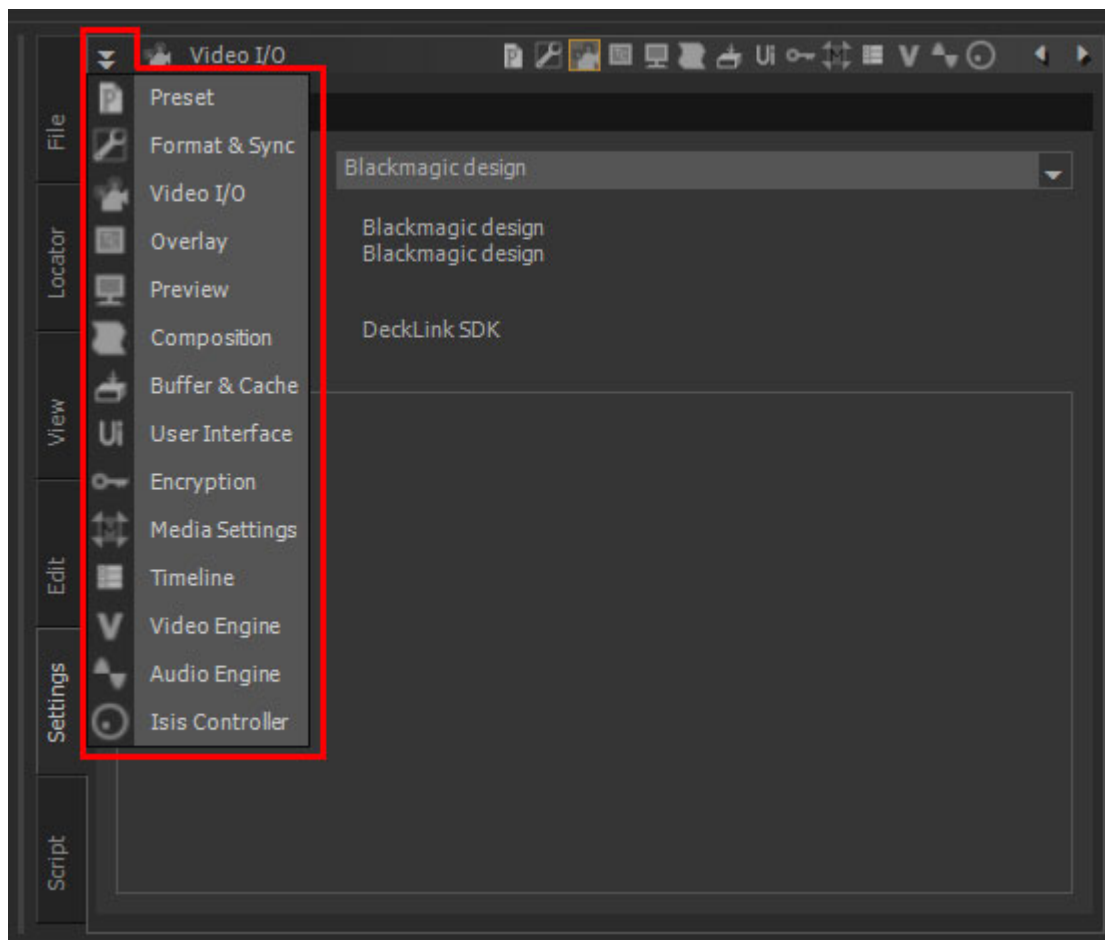
The Tabs on the left access **Tab Pages** each with several **Tabs** or where there is only one Tab, the **Tab** itself. When the **Control Settings** Tabs are in this position and form :

- **Home / End** steps through the different Tabs. (Or: **User Interface > Settings Pages > Previous Settings Page / Next Settings Page**)
- **Page UP / DOWN** steps through the different **Tabs** in each Tab Page.

**or...**



- Click on the double down arrow in the header to see all the Tabs in the Folder, Click on the desired entry to open.



Tab Icons with text labels drop-down list

- or Click directly on one of the Icons to the right of the header
- or Click on the Left Right arrows far right on the header to step forwards and backwards through Tabs.

### Individual Tabs

The **Control Settings** Tabs can also be accessed individually via Menus and shortcuts. When accessed this way they appear as broken away windows.

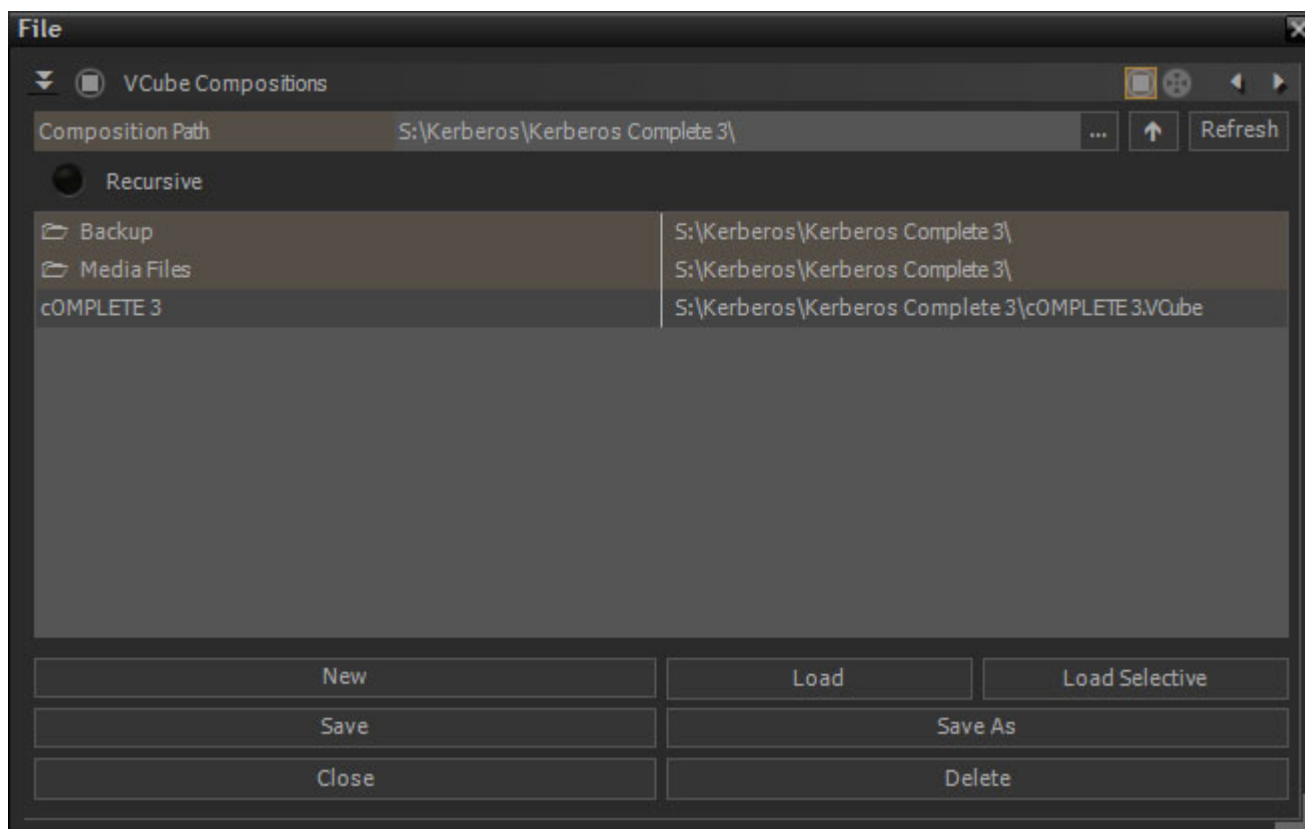
<b>User Interface &gt; Settings Pages &gt; Show File Page</b>	<b>[F6]</b>	Toggle File Tab
<b>User Interface &gt; Settings Pages &gt; Show Locator Page</b>	<b>[F7]</b>	Toggle Locator Tab
<b>User Interface &gt; Settings Pages &gt; Show View Page</b>	<b>[F8]</b>	Toggle View Tab
<b>User Interface &gt; Settings Pages &gt; Show Edit Page</b>	<b>[F9]</b>	Toggle Edit Tab
<b>User Interface &gt; Settings Pages &gt; Show Settings Page</b>	<b>[F10]</b>	Opens the Control Settings Tab with Tabs in the Preview Pane

## File Tab

The **File** Tab Page has two Tabs which enable **Media Files** and **VCube Compositions** to be managed. **[F6]** opens the page as a floating Tab Window.

**VCube Compositions** and **Media Files** can also be dropped directly onto an existing Timeline track from a Windows folder opened in a Windows file Browser.

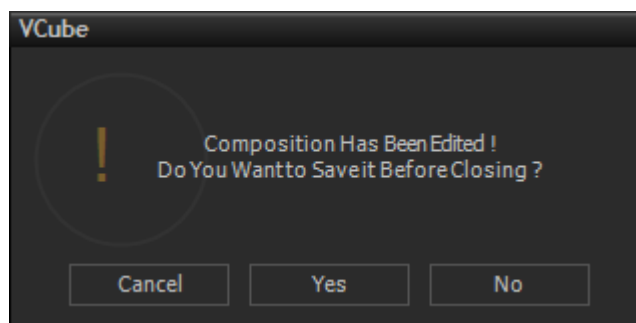
## VCube Compositions



File Tab

The Compositions Tab can also be opened on its own with **File > Open [Ctrl + O]**

<b>Composition Path</b>	Field shows the current Path
...	Opens a Windows browser to change the Path to a location on local storage or via a network.
^	Up arrow steps up the path tree to the root directory.
<b>Refresh</b>	Updates the list of Files in the current location [F5]
<b>Recursive</b>	When checked all Composition Files in the folder specified will be shown including those in sub-folders.
<b>Files</b>	Panel shows all Folders and Composition files in the current Path.
<b>New</b>	Opens a new Composition with the current settings. [Ctrl + N] If a Composition is already open then a warning dialog appears:



VCube Composition Save warning dialog

<b>Cancel</b>	Aborts the new Composition and returns to the current one
<b>Yes</b>	Saves the current Composition and opens the new one.
<b>No</b>	Closes the current Composition without saving it and opens the new one.
<b>Load</b>	Opens a pre-existing Composition. [Ctrl + L]

<b>Save</b>	saves the current Composition using the current Composition name. [Ctrl + S]
<b>Save As</b>	Opens a Windows browser to enable the Composition to be with a new name or to a new location. This feature is useful since it enables you to save many versions of the same Composition with different names. [Ctrl + Shift + S]
<b>Close</b>	Aborts the current Composition. Any edit decisions made since the last time the Composition was saved are discarded. [Ctrl + Shift + Q]
<b>Delete</b>	Deletes the selected Composition from the hard drive. [Shift + DELETE]

**Note:** The associated Media Files remain on the mass storage.

<b>Load Selective</b>	Enables Composition objects or properties to be imported into the current one. A dialog determines how the selection will be imported into current one. [Ctrl + Shift + L] Please see: Load Selective on page 30
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## Media File Browser

For full details of the **Media File Browser** Please see: **Media File Browser on page 40**

## Locator Tab

For details of the **Locator** Panel please see: **Locator Tab Page on page 50**

## View Tab

The **View** Tab Page has three Tabs, **Clip Info**, Keyboard **Shortcuts** and **Workspaces**.

### *Clip Info*

**Note:** The **Clip Info** Tab can also be opened as a floating Tab window by Double-clicking on a Clip in the Timeline. Once opened a single Click on a Clip in the Timeline loads that Clip's information into **Clip Info**.

## Video Clip

### Clip Info

Clips	
Clip Name	IFS_8
Source In	00:00:00:00
Length	00:10:02:16
Fade In	00:00:00:00
Fade Out	00:00:00:00
Dest In	01:27:38:07
Level	100.00
Speed	100.0000 % <span style="float: right;">Nominal ▾</span>
Frame Layout	Progressive Frame ▾
Effect	

- Lock Locator
- Invert Fields
- Invert Color
- Last Frame Cache

- Flip Horizontal
- Flip Vertical
- Shift Fields
- Revert

### Media File Browser

Media Name	IFS_8
Media File	S:\Kerberos\Complete4\IFS_8.mp4
Frame Rate	FILM (23.98 fps)
Original Timecode	00:00:00:00
Length	00:10:02:16
Still Image	false
Compression	H264
Word Length	24 Bits
Size	720 x 480
Source Rect	0 x 0 / 720 x 480
Dest Rect	0 x 0 / 720 x 480
Frame Layout	Progressive Frame
Aspect Ratio	1:1
Down Sampling	4:2:2
Component Word Length	8 bits Fix
Bit Format	Linear
Pixel Aspect Ratio	1.000000
Black Ref Level	16
White Ref Level	235
Color Range	225

Video Clip Info

### Clips

In this section every information field is editable by either Double-clicking in it and typing or selecting from the drop-down where there is a down arrow at the end of the field.

#### Clip Name

Shows the name used in the Timeline. Double-click in field to type an alternative

<b>Source In</b>	is the original TimeCode in point for the Clip in the current Composition. Double-click in field to modify.
<b>Length</b>	is the Clip's duration in the current Composition. Double-click in field to modify.
<b>Fade In</b>	is the length of the Clip's fade in for the current Composition. Double-click in field to modify.
<b>Fade Out</b>	is the length of the Clip's fade out in the current Composition. Double-click in field to modify.
<b>Destination In</b>	shows the TimeCode for the first frame of the Clip used in the current Composition. Double-click in field to modify.
<b>Level</b>	is the opacity ratio in percent of the Clip in the current Composition. Double-click in field to modify.



Level appears on the Clip when the opacity value isn't equal to 100%.

**Speed**

value adjusts the playback speed of the selected Clip. A drop-down list offers preset values. This setting affects only the speed of the Clip in the Timeline. There is no picture interpolation. The Media File is just played with another frame rate. Sped up Clips have their duration shortened in the Timeline. Slowed down ones keep their original duration in the Timeline. I.e. Slowed down Clips are truncated.



Speed appears on the Clip when the Timeline playback speed is different to the original fps of the Media File.

**Frame Layout**

can be set for a particular clip in order to correct improper flag.

**Effect**

indicates a particular effect name attached to an OMF Composition.

**Selector Buttons**



Lock Locator prevents editing actions on the selected Clip. A selection including a locked clip will also be locked.

**Note:** Actions such as **Cut** and **Copy** which affect the entire selection are still allowed.



Invert Fields rearranges the field order on a wrongly defined video file.



Invert Color transforms the Clip to or from a negative.



Last Frame Cache keeps the last read frame in memory to reduce disk or network requirements when playing a low frame rate Media File at a fast frame rate.



Flip Horizontal flips the Clip around the vertical axis.



Flip Vertical flips the Clip around the horizontal axis.



Shift Fields has to be used to playback an upper field first Media File in a lower field first video format or the inverse.



Revert displays the Clip's frames from the end to the beginning.

**Note:** All options for Clips listed above are shown as a small icon inside the Clip in the Timeline when at anything other than the default value.



Clip options icons

### Media File browser

<b>Media Name</b>	Could be different from the Media File name. (In an OMF Composition)
<b>Media File</b>	Shows the path to the Media File.
<b>Frame Rate</b>	is the original Media File frame rate.
<b>Original TimeCode</b>	is the TimeCode stamped in the Media File at its creation.
<b>Length</b>	is the total duration of the Media File.
<b>Still Image</b>	is true when the selected Clip is an unconverted Still Image File otherwise false.

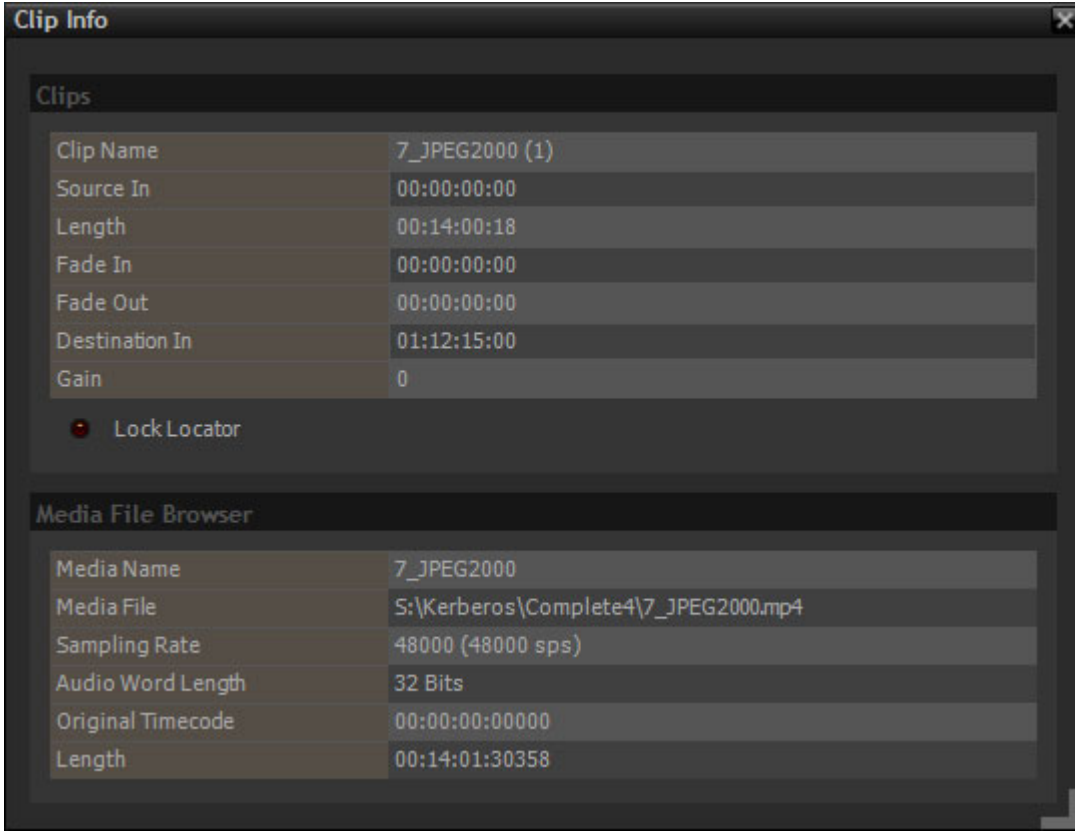
**Note:** A single Still Image File is always imported as a 5 Second Clip.

<b>Compression</b>	shows the codec used with this Media File.
<b>Word Length</b>	shows the number of bits used for frame sampling.
<b>Size</b>	shows the number of horizontal and vertical pixels used to sample the image.
<b>Source Rect</b>	(Source Rectangle) displays the Layer's size and position settings.
<b>Dest Rect</b>	(Destination Rectangle) displays Layers size and position settings.
<b>Frame Layout</b>	shows if the media is interleaved or not.
<b>Aspect Ratio</b>	shows the original pixel aspect ratio of the media.
<b>Down Sampling</b>	shows how colors have been sampled.

Please see: **Color Sampling 4.1.1 on page 211**

<b>Component Word Length</b>	shows the precision of the sampling process for each component.
<b>Black Ref Level</b>	is the digital value corresponding to the deepest black in the picture.
<b>White Ref Level</b>	is the digital value corresponding to the brightest white in the picture.
<b>Color Range</b>	is the number of possible values for the color components.

# Audio Clip



Audio Clip Info

## Clips

- Clip Name** Shows the name used in the Timeline.
- Source In** Is the original TimeCode in point for the Clip in the current Composition. Double-click in the field to modify.
- Length** Is the Clip's duration in the current Composition. Double-click in field to modify.
- Fade In** Is the length of the Clip's fade in for the current Composition. Double-click in the field to modify.
- Fade Out** Is the length of the Clip's fade out in the current Composition. Double-click in the field to modify.
- Destination In** Shows the TimeCode for the first frame of the Clip used in the current Composition. Double-click in the field to modify.
- Level** Shows the Gain ratio in dB of the Clip in the current Composition. Double-click in the field to modify.



Gain icon appears on the Audio Clip when gain setting is other than unity.

### Lock Locator



Lock Locator prevents editing actions on the selected Clip. A selection including a locked clip will also be locked.

## Media File Browser

- Media Name** Could be different from the Media File name. (In an OMF Composition)
- Media File** Shows the path to the Media File.
- Sampling Rate** Is the original Media File Sampling Rate.



**Audio Word Length**

Is the original Media File Bit Depth

**Original Timecode**

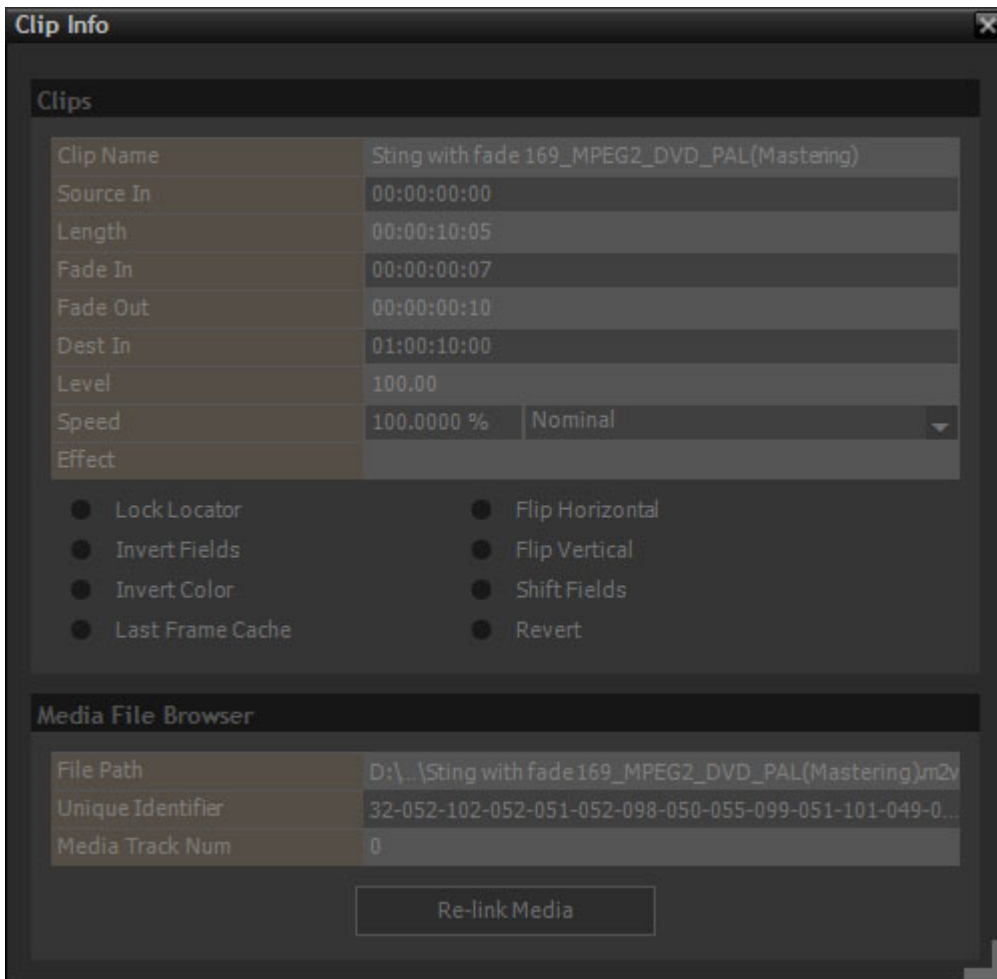
The Timecode stamped into the Media File when it was created.

**Length**

Is the total duration of the Media File

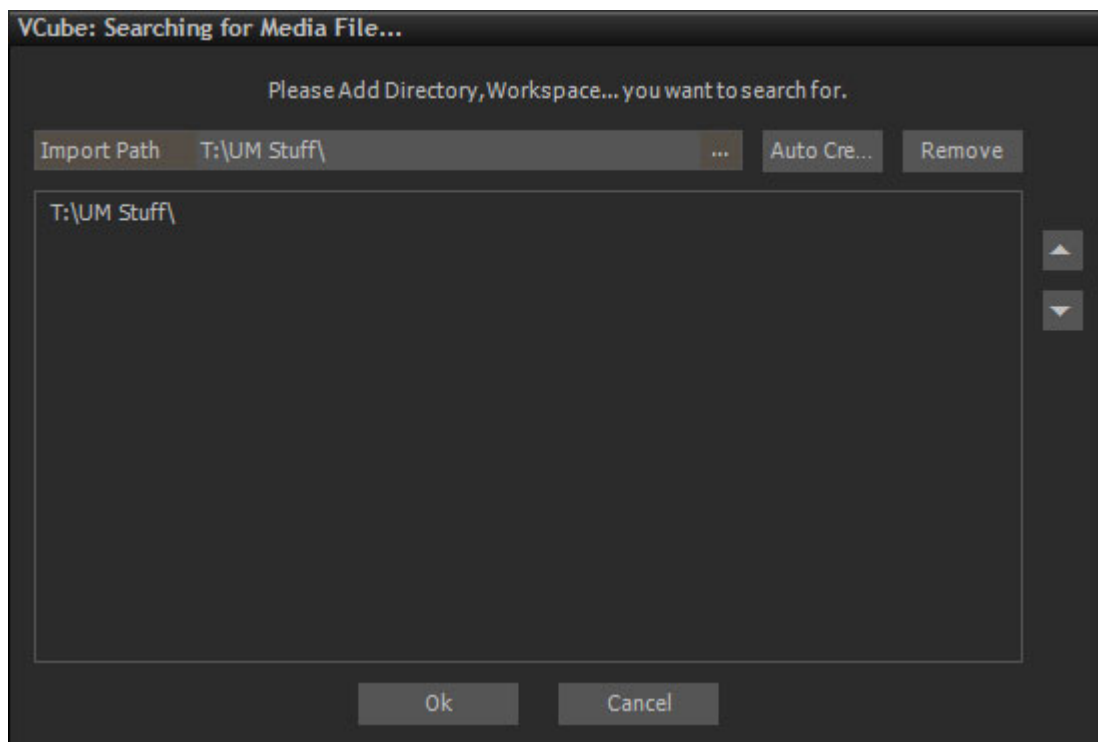


## Re-link Media



Re-link Media

The **Re-link Media** button will appear if one or more Media Files are missing or offline (Zebra Clips in the Timeline). Clicking on the button opens the **VCube: Searching for Media File...** dialog :



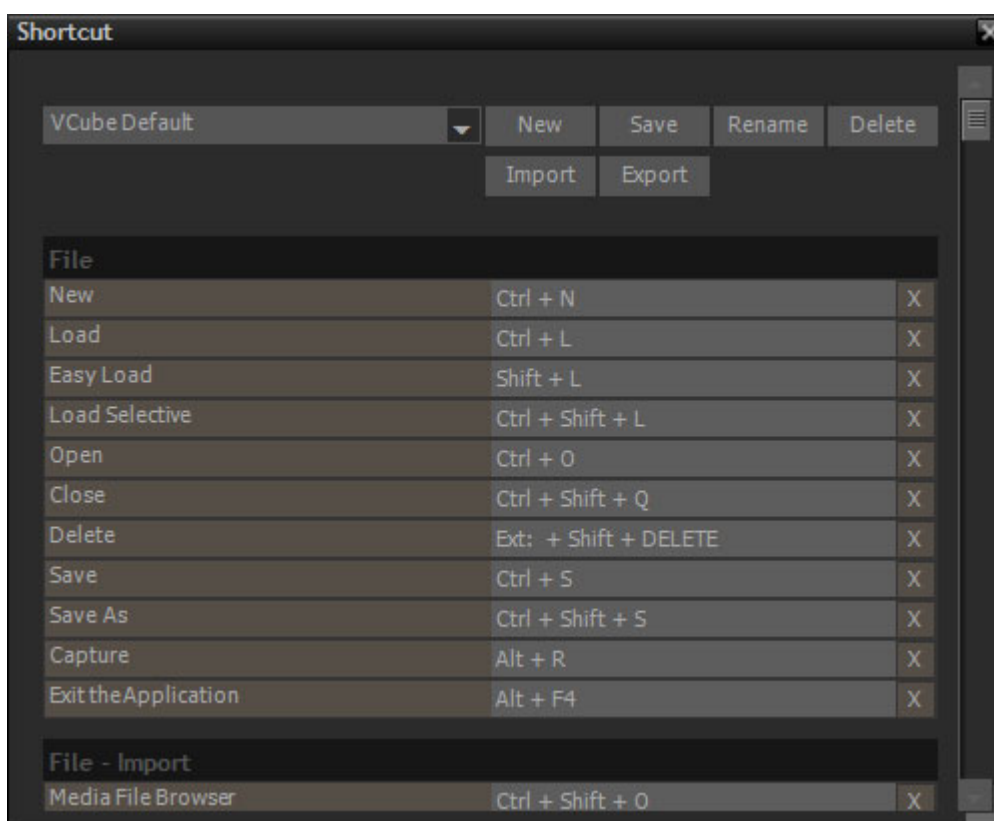
VCube: Searching for Media File... dialog

- Import Path** Click on the ... button to open a Windows browser Window. Use this to navigate to the location you believe contains the missing Media File(s)
- Add** Adds the location selected to the search path.
- Remove** Click on a path in the main pane to select it. Click on Remove to remove it from the list of search paths. (Useful if you inadvertently select a root directory with many thousands of files, which would take forever to search.)
- Up Down arrows** Step the selection up and down in the main list pane.
- OK** Click on OK to accept the choices and begin the search
- Cancel** Click on Cancel to reject any changes and exit the dialog.

## Shortcut

The **Shortcut** Tab provides the complete list of current Keyboard Shortcuts. It also enables Shortcuts to be altered and managed. Different sets of Shortcuts can be saved, Imported and Exported.

**Note: Please see: Default Shortcuts on page 163** for the full list of Default Shortcuts.



Keyboard Shortcuts settings

- VCube Default Drop-down** Shows the name of the Shortcut file loaded currently.
- New** Enables new Shortcut Settings to be defined.
- Save** Records current Shortcut Settings.
- Rename** Enables the current preset to be renamed.
- Delete** Erases the current shortcut settings.
- Import** Opens a Windows Browser to load Shortcut Settings from a specific folder.
- Export** Opens a Windows Browser to save current shortcut settings in a specific folder.

**Note:** The current set of Shortcuts is stored with the Project and will be reloaded with it unless excluded by a **Load Selective**.

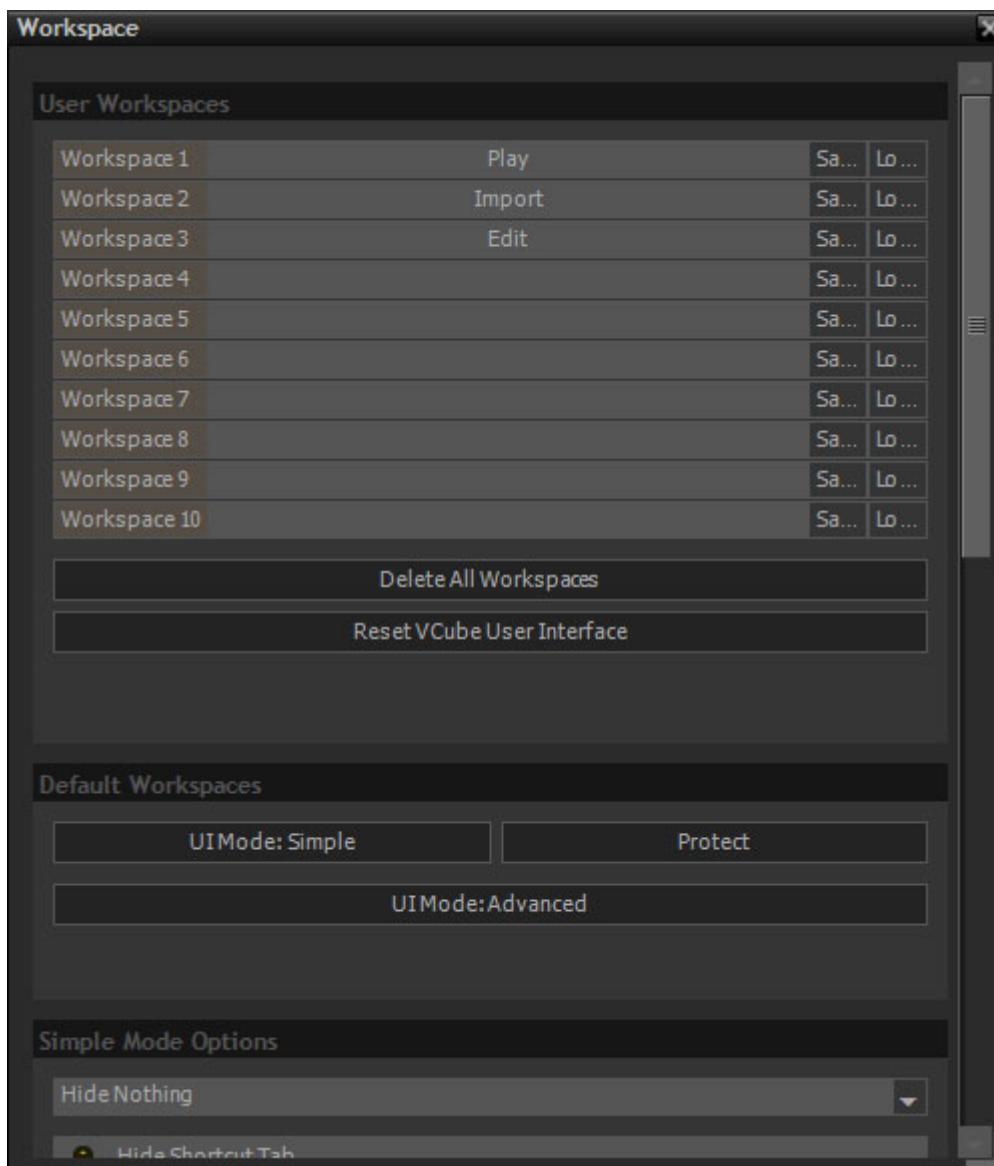
## Workspace

### Workspaces

Workspaces are a convenient means of storing alternative desktop layouts. The main User Modes, **Simple** and **Advanced** are built in examples of Workspaces.

**Note:** The current set of Workspaces is stored with the Project and will be reloaded with it unless excluded by a **Load Selective**.

**Note:** The **Workspace Tab** manages Workspaces :



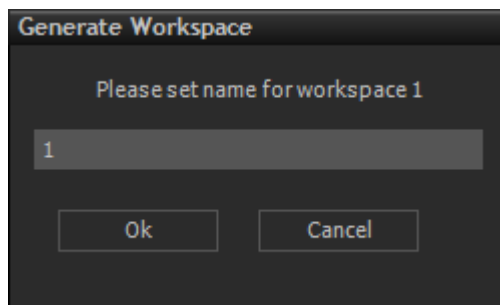
Workspace settings

**Note:** Use the right-hand scroll bar to view the rest of the Tab. (Shown below)

## User Workspaces

### Workspace 1 to 10

Click on the **G...** buttons to Generate the respective Workspace. Or use **[Ctrl + Key Number]**



Generate Workspace dialog

Type a name for the Workspace and Click on **OK** to **Generate**.

### Workspace 1 to 10

Click on the **Lo...** buttons to Load the respective Workspace. Or use **[Shift + Key Number]**

### Delete All Workspaces

Deletes all the Workspaces loaded currently.

### Reset VCube User Interface

Resets the entire VCube User Interface to the factory defaults.

## Default Workspaces

### UIMode: Simple

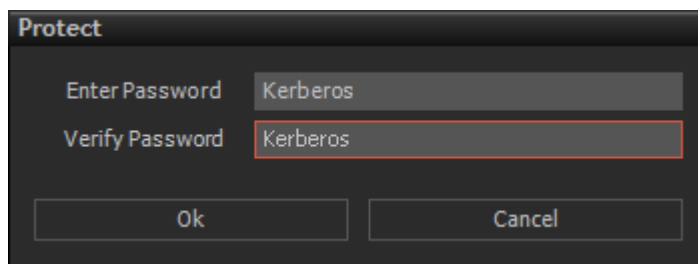
Click the button to change the UIMode to Simple

### UIMode: Advanced

Click the button to change the UIMode to Advanced

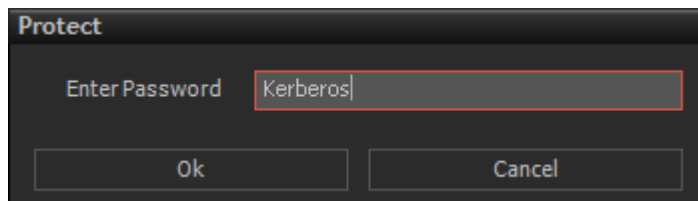
### Protect

If the User Interface is Unprotected clicking on the Protect button pops-up the Protect dialog to enable a Password to be entered and Protection to be activated.



Password Protect dialog Lock

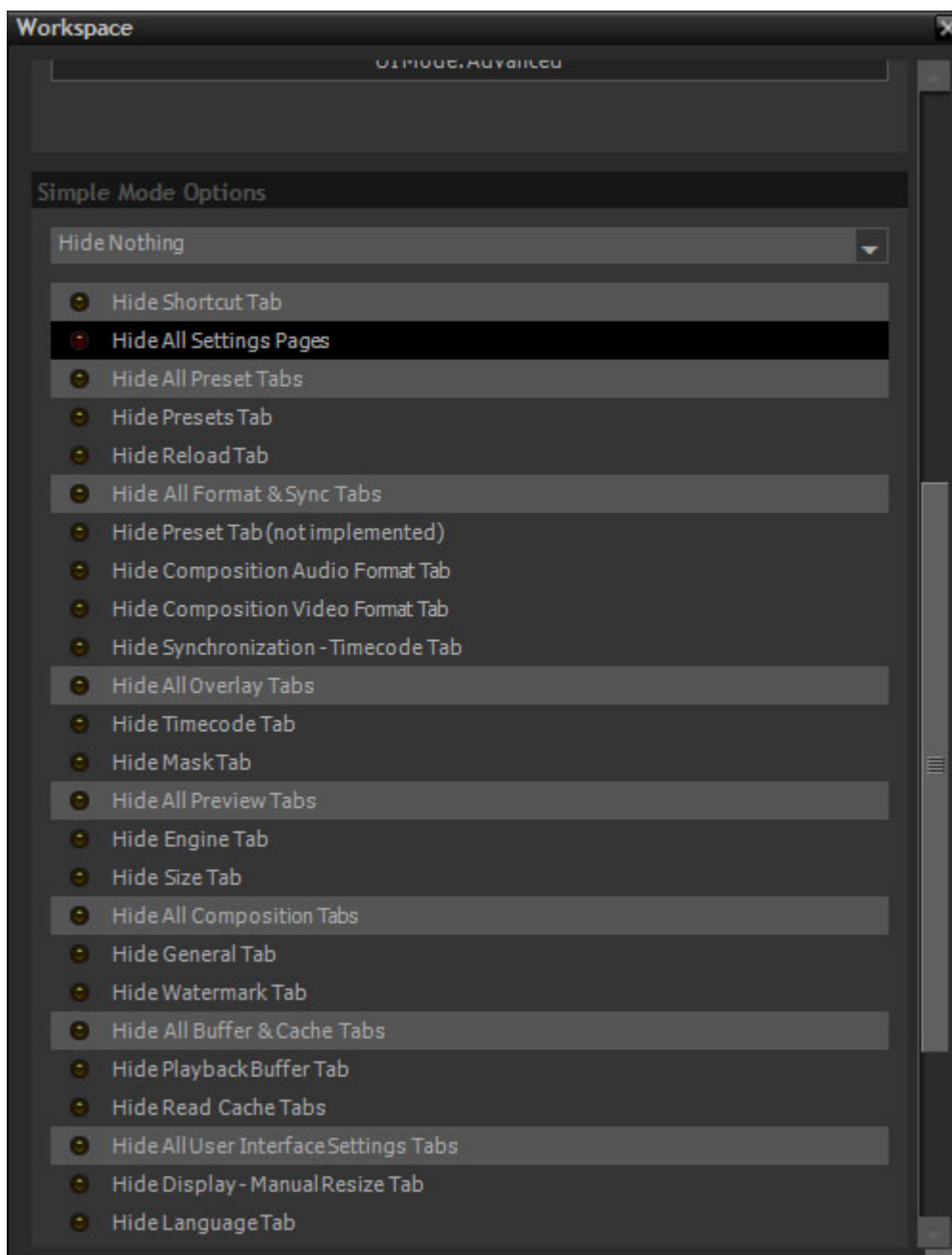
If the User Interface is already Protected attempting to change the User Interface mode pops-up the Protect dialog to enable the Password to be entered to unprotect the UI.



Password Protect dialog Unlock

**Note:** The **Simple Mode** password is different from the **Composition** protection password.

## Simple Mode Options



Workspace - Simple Mode settings

### Hide Nothing

The drop-down list gives the choice of:

- Hide Nothing
- Hide All
- Hide All But Views
- Hide All But Settings

Otherwise any of the individual **Tabs** listed below can be hidden in **Simple Mode** when the buttons are checked. Clicking on one of the Folders will also activate hide for all the panels in that folder.

#### Hide Shortcut Tab

#### Hide All Settings Pages

#### Hide All Preset Tabs

#### Hide Preset Tab

#### Hide Reload Tab

**Hide All Format & Sync Tabs**

- Hide Preset Tab (not implemented)**
- Hide Composition Audio Format Tab**
- Hide Composition Video Format Tab**
- Hide Synchronization - Timecode Tab**

**Hide All Overlay tabs**

- Hide Timecode Tab**
- Hide Mask Tab**

**Hide All Preview Tabs**

- Hide Engine Tab**
- Hide Size Tab**

**Hide All Composition Tabs**

- Hide General Tab**
- Hide Watermark Tab**

**Hide All Buffer & cache Tabs**

- Hide Playback Buffer Tab**
- Hide Read Cache Tabs**

**Hide All User Interface Settings Tabs**

- Hide Display - Manual Resize Tab**
- Hide Language Tab**

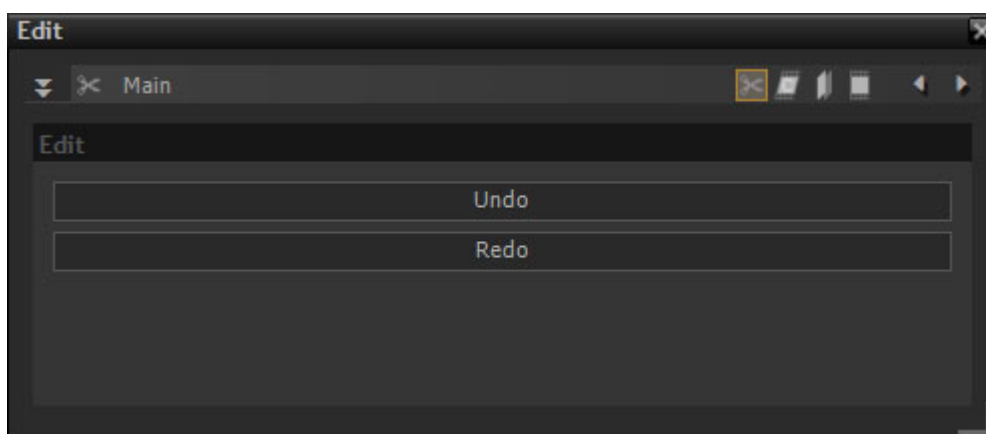
**Note:** In **Full Screen** and **Floating** modes, all VCube functions can also be accessed from a context menu with a **Right-Click** on the Preview area. In **Simple Mode** only those functions not hidden will be available.

## Edit

The **Edit** Tab Page has four Tabs. **Main**, **Clips**, **Layers** and **Tracks**

### Main

**Main** gives access to the other **Edit** Tabs and provides two buttons to **Undo** and **Redo**.



**Edit - Main Tab page**

The other Tabs can be accessed via the drop-down list on the left, the icons or the left-right arrows on the right.

### Edit

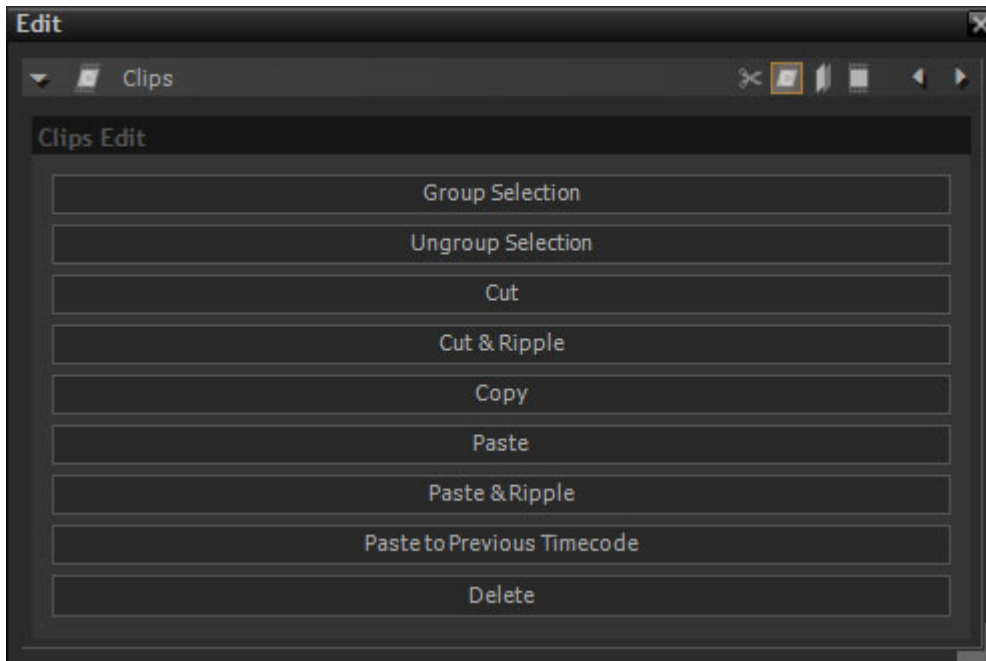
**Undo**

Undoes the last Edit action.

**Redo** Redoes the last Edit Action to be Undone.

## Clips

The **Clips** Tab deals with manipulating and editing Clips.



Edit - Clips Tab page

### Clips Edit

<b>Group Selection</b>	Groups the Selected Clips
<b>Ungroup Selection</b>	Ungroups all Clips in the current Selection when Grouped
<b>Cut</b>	Cuts all selected Clips
<b>Cut &amp; Ripple</b>	Cuts all selected Clips and Ripples (Moves all subsequent Clips to the left in the Timeline (earlier) by the amount corresponding to the duration of the Clip(s) removed.
<b>Copy</b>	Copies the selected Clips to the Clipboard
<b>Paste</b>	Pastes the contents of the Clipboard to the current playhead cursor position starting on the Selected Track/Layer. If no Layer is selected, a new Layer will be created. If Clipboard content includes both Video and Audio, both Video and Audio Layers must to be selected to avoid creating additional Layers.
<b>Paste &amp; Ripple</b>	Pastes the contents of the Clipboard to the current Playhead Cursor position starting on the Selected Track/Layer and Ripples all subsequent Clips to the right in the Timeline (later) by the amount corresponding to the Clip(s) inserted. If no Layer is selected, a new Layer will be created. If Clipboard content includes both Video and Audio, both Video and Audio Layers must to be selected to avoid creating additional Layers.
<b>Paste to Previous Timecode</b>	Pastes the contents of the Clipboard to the position in the Timeline it was last positioned at.
<b>Delete</b>	Deletes the Selected Clip(s) leaving every other Clip in place.

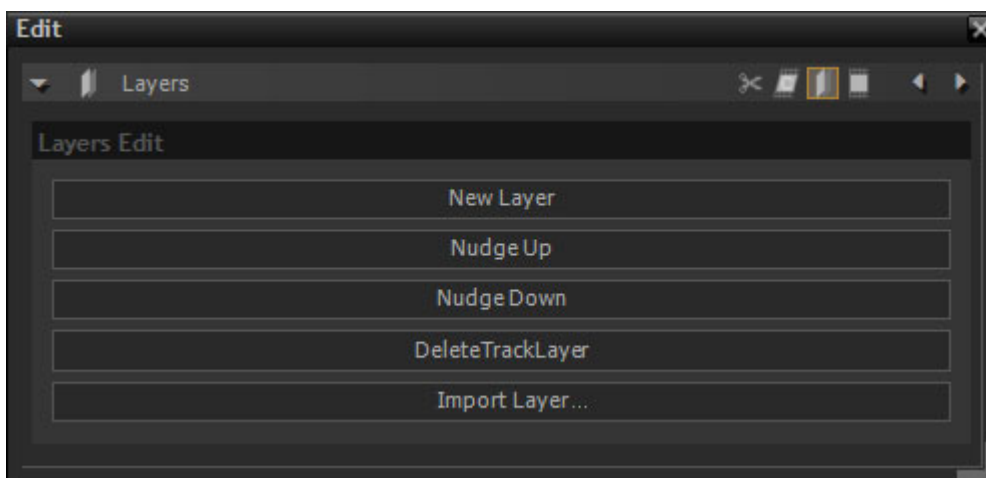
**Note:** Use [**Shift + Click**] to select multiple Clips to be Grouped. [**Ctrl + G**] Groups [**Ctrl + U**] Ungroups.

- A Clip with embedded Audio appears in the Timeline as a Group with one Video Track with one Layer and one Audio Track with as many Channels as there are in the Media File.
- A Group of this type can be moved synchronously in the Timeline until such time that it is Ungrouped.

- If the order of Video Clips needs to be changed for Preview Nudge Up / Down Layer is used. Select the relevant Video Layer(s) and use Nudge Up / Down or **[Ctrl + Up]** or **[Ctrl + Down]**

## Layers

The **Layers** Tab manages and manipulates **Layers** in **Tracks**.



Edit - Layers Tab page

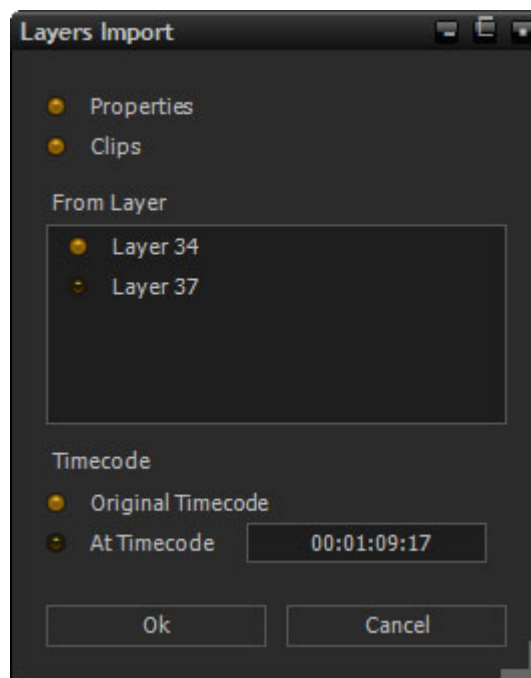
### Layers Edit

<b>New Layer</b>	Creates a new Layer on the selected track. <b>[Ctrl + Shift + N]</b>
<b>Move Up Selected</b>	Moves the selected item up a Layer. <b>[Ctrl + UP]</b> Note that moving a Layer to another Track deletes the Track if it has no remaining Layers. Note also that the Layer number is not linked to a specific Layer but to its position.
<b>Move Down Selected</b>	Moves the selected item down a Layer. <b>[Ctrl + DOWN]</b> Note that moving a Layer to another Track deletes the Track if it has no remaining Layers. Note also that the Layer number is not linked to a specific Layer but to its position.
<b>Delete Selected Layer</b>	Removes the selected Layer from the Track. <b>[Ctrl + DELETE]</b> Note that a Track with only one Layer will be deleted.



## Import Layer...

Enables import of a Layer from another Composition. [Ctrl + Alt + L] Opens a Windows Browser to locate the Composition you wish to import a Layer or Layers from. When the Composition has been selected and Open clicked the layers Import dialog opens :



Layers Import dialog

**Note:** The Layers shown in the Source project will depend on whether a Video Layer or Audio Track Channel is selected in the current Composition. Unless you wish the imported Layer to overwrite existing Video or Audio then create new Tracks, Layers and Channels to accommodate the Import and select these, one by one, to import the required material.

### Layers Import

#### Properties

When checked the Layer Properties will be imported

#### Clips

When checked the Clips on the selected Layer will be imported

#### From Layer

Click on the Layer you wish to import. When the button is checked, the Layer will be imported.

### Timecode

#### Original Timecode

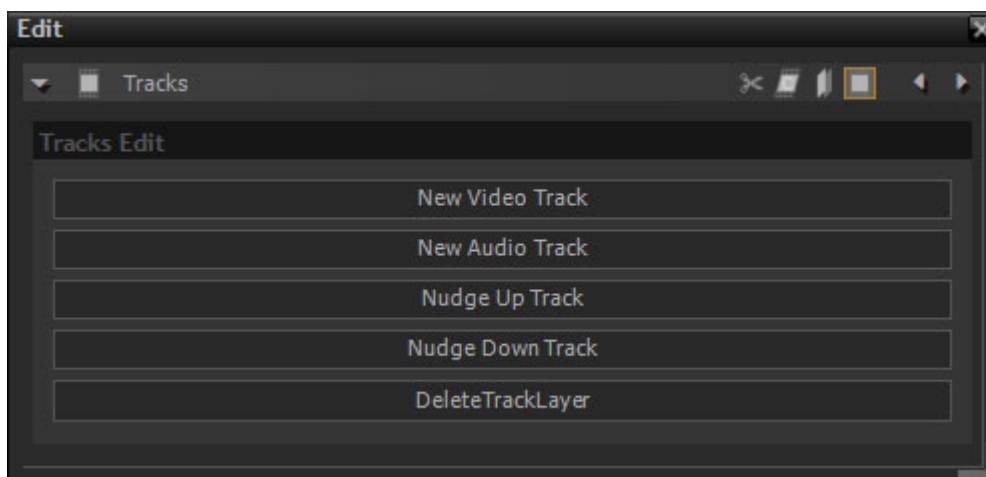
When checked the Clip(s) on the selected Layer will be imported at the same Timecode they are positioned at in the donor Project

#### At Timecode

When checked the Clip(s) on the selected Layer will be positioned to start at the Timecode shown in the field. The field shows the current Playhead Cursor position in the destination Project. Double-click in the field to enter an alternative Timecode.

## Tracks

The **Tracks** Tab manages and manipulates **Tracks**.



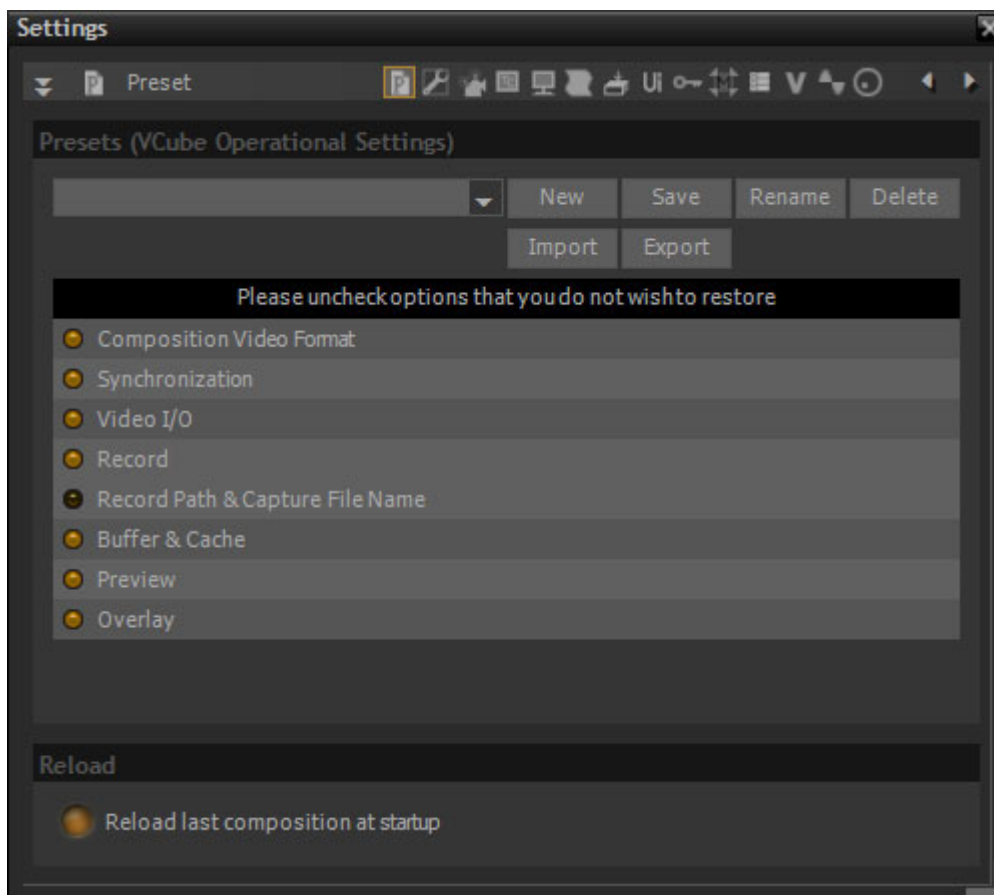
Edit - Tracks Tab page

### Tracks Edit

<b>New Video Track</b>	Creates a new Track for Video Clips. [Ctrl + Shift + T]
<b>New Audio Track</b>	Creates a new track for Audio Clips. [Ctrl + Alt + T] Note that a New Audio Track is automatically created when a Video Clip with embedded Audio is placed in the Timeline.
<b>Move Up Selected</b>	Moves selected Track Up. [Ctrl + Shift + UP] Note that the Track number is not linked to a specific Track but to its position in the Timeline layout.
<b>Move Down Selected</b>	Moves selected Track Down [Ctrl + Shift + DOWN] Note that the Track number is not linked to a specific Track but to its position in the Timeline layout.
<b>Delete Selected</b>	Removes the selected Track from the Timeline. [Ctrl + DELETE]

## Settings Page

The **Settings** Tab Page gives access to the many parameter Tabs :



Settings Tab page

### Preset

[P] A VCube **Preset** gathers all current Settings together in a global preset.

**Note:** The specific codec settings are **not** included in Presets. Only the codec type is included and specific Settings must be made for the Project in hand.

#### Presets (VCube Operational Settings)

**New, Save, Rename and Delete** Work as normal.

**Import** Opens a Windows File Browser to locate an existing Preset. When a Preset is selected, click on Open to load the Preset parameters.

**Export** Opens a Windows File Browser. Type a suitable name for the Preset in the File name field and navigate to a suitable location to write an Export file of the current Settings as a Preset. When the desired location is established Click on Save to save the Preset or Cancel to exit the dialog without saving.

#### **Please uncheck options that you do not wish to restore**

This is a filter. Items with unchecked buttons will NOT be changed when **Presets** are recalled.

#### **Composition Video Format**

## Synchronization

### Video I/O

### Record

### Record Path & Capture File Name

### Buffer & Cache

### Preview

### Overlay

### Reload

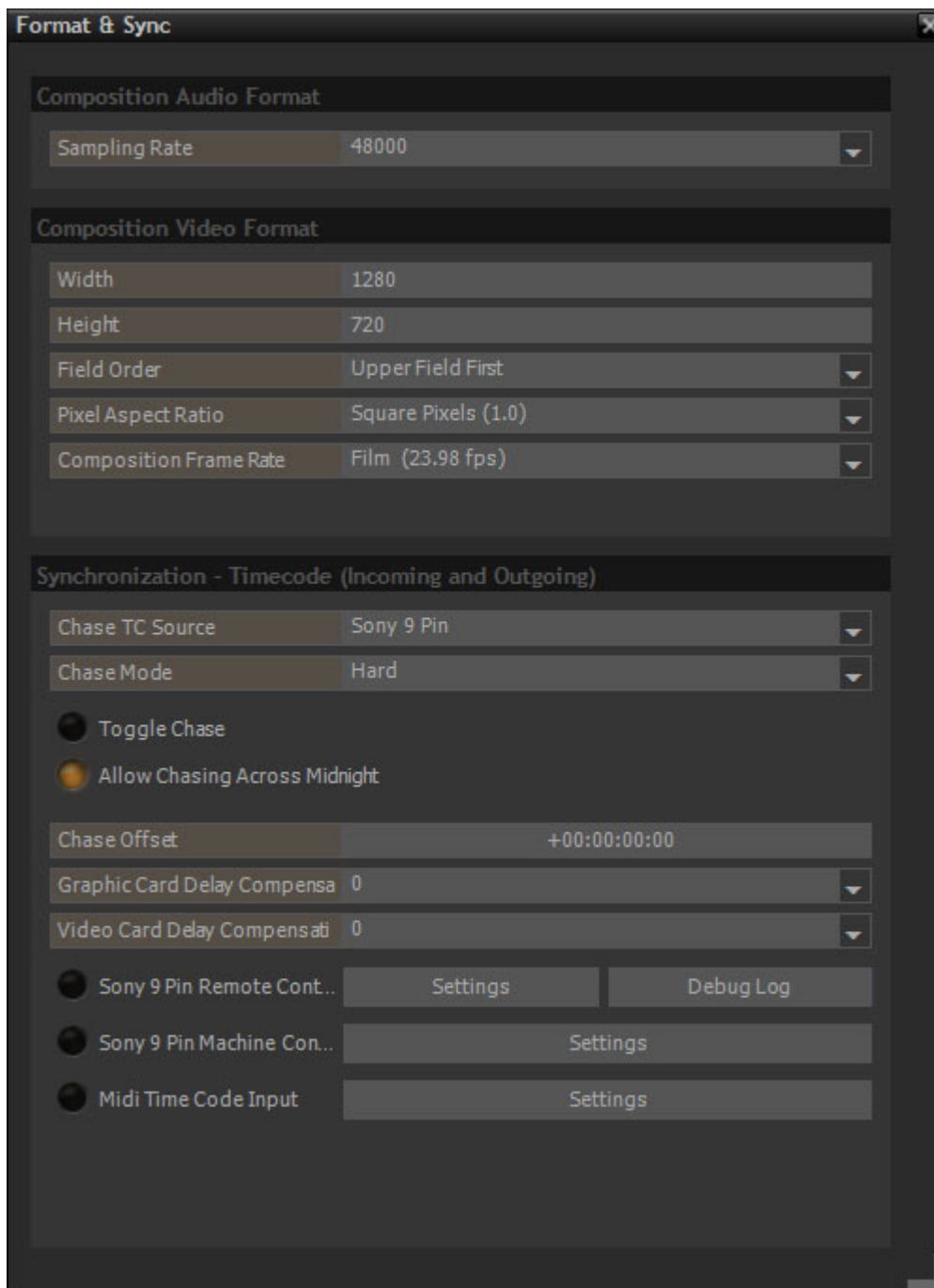
**Reload Last Composition at Startup** When checked, VCube will reload the last Composition loaded when the application is started.

## *Creating Global Presets*

1. Enable the video I/O [**Shift + Alt + P**] plug-in according the video card present in the machine.
2. Choose an **HD** or **SD** video standard according to your requirements. The simplest manner is to use the Quick SD Settings [**Alt + F5**] or Quick HD Settings [**Alt + F6**]
3. Set the synchronization [**Alt + P**] for VCube.
4. Set the Record settings **F12**
5. **Save** this configuration. It can be recalled later if you have to deal with different video formats, different video I/O or synchronization configurations.

## Format & Sync

One of the most important Tabs in the Settings Tab Page, Format & Sync options set the fundamental Composition and Synchronization parameters.



Format & Sync Tab page

### Composition Audio Format

#### Sampling Rate

The field shows the current Audio Sampling Rate. Use the drop-down list to choose the Audio Sampling Rate (Contents of the list will depend on the hardware (if any) and the VCube version).

### Composition Video Format

This section determines how the video signal is displayed.

**Note:** that all the possible settings supported by the computer graphics card are not supported by the video card. If an unsupported setting is selected a warning message will be displayed on the video output.

- Any Format conversion required is applied to the entire Composition including resized Layers on both Preview and Video outputs.

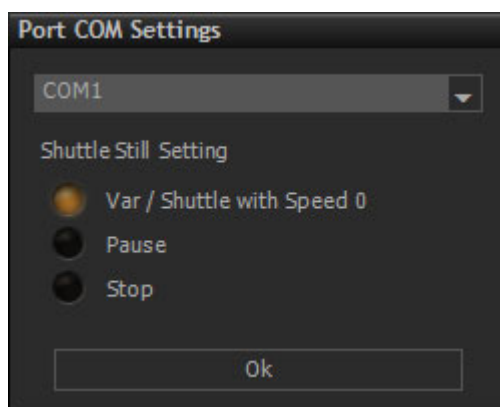
<b>Width</b>	Enables Width in pixels to be trimmed for the Composition.
<b>Height</b>	Enables Height in pixels to be trimmed for the Composition.
<b>Field Order</b>	Offers the choice of whether Upper or Lower Field is displayed First when interlaced or None if the Media is formatted as Progressive Scan.
<b>Pixel Aspect Ratio</b>	The field show the current Pixel Aspect Ratio This is the shape of the individual pixels. HD video systems mainly use a square pixel with aspect ratio of 1:1. NTSC uses an aspect ratio of 0.9:1 resulting in a 648 x 480 display. NTSC 16:9 uses an aspect ratio of 1.2 resulting in an 864 x 483 display. PAL uses an aspect ratio of 1.07 resulting in a 768 x 576 display. PAL 16:9 uses an aspect ratio of 1.42 resulting in a 1024 x 576 display

**Note:** Anamorphic Wide Screen formats do not use a greater number of pixels to produce the picture. It is the Pixel aspect ratio which determines the shape of the frame. (Assuming the correct flag is set.)

**Composition Frame Rate** The field shows the current frame rate. The drop-down list has all alternatives available.

### Synchronization - TimeCode (Incoming and Outgoing)

<b>Chase TC Source</b>	Shows Current TimeCode Chase Source. Click to drop-down the list of all sources available. LTC, Sony 9-pin, Midi TimeCode (MTC)
<b>Chase Mode</b>	Shows current Chase Mode. Click to change from Hard to Soft or vice-versa
<b>Toggle Chase</b>	When checked, Chase is enabled.
<b>Allow Chasing Across Midnight</b>	When checked, chasing across TimeCode midnight is possible 23:59:59:24 changes to 00:00:00:00 one frame later.
<b>Chase Offset</b>	Shows current Chase Offset. Click in the field to type an Offset.
<b>Graphic Card Delay Compensation</b>	Shows current delay compensation in frames. Click to drop-down a list of values between -10 and +10
<b>Video Card Delay Compensation</b>	Shows current delay compensation in frames. Click to drop-down a list of values between -10 and +10
<b>Sony 9 Pin Remote Control</b>	When checked 9-pin Remote control is active.
<b>Settings</b>	Opens the Port COM Settings dialog:



Port COM Settings dialog

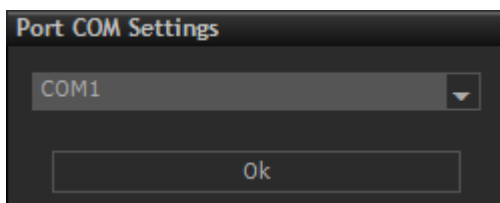
<b>COM1</b>	Current COM Port. Click to drop-down a list of available COM Ports.
<b>Var / Shuttle with Speed 0</b>	When checked VCube issues a <b>Var / Shuttle 0 Speed</b> command when stopped.

- Pause** When checked VCube issues a **Pause** command when stopped. Audio data is retained in buffers.
- Stop** When checked VCube issues a **Stop** command when stopped. Audio data is flushed from buffers.

**Debug Log**

**Sony 9-Pin Machine Control** When checked 9-pin Machine control is active.

**Settings** Opens the Port COM Settings dialog:



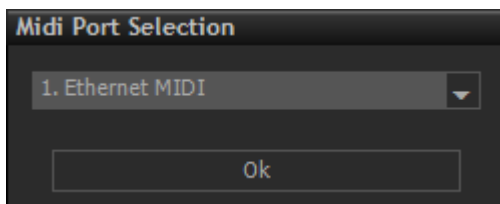
**Port COM Settings dialog**

**COM1** Current COM Port. Click to drop-down a list of available COM Ports.

**Note:** The Transport Panel [T] can also be used to select the **TC Source** for Chasing and to enable the **Chase** function.

**Midi Time Code Input** When checked, Midi TimeCode (MTC) is active.

**Settings** Opens the Midi Port Selection dialog:



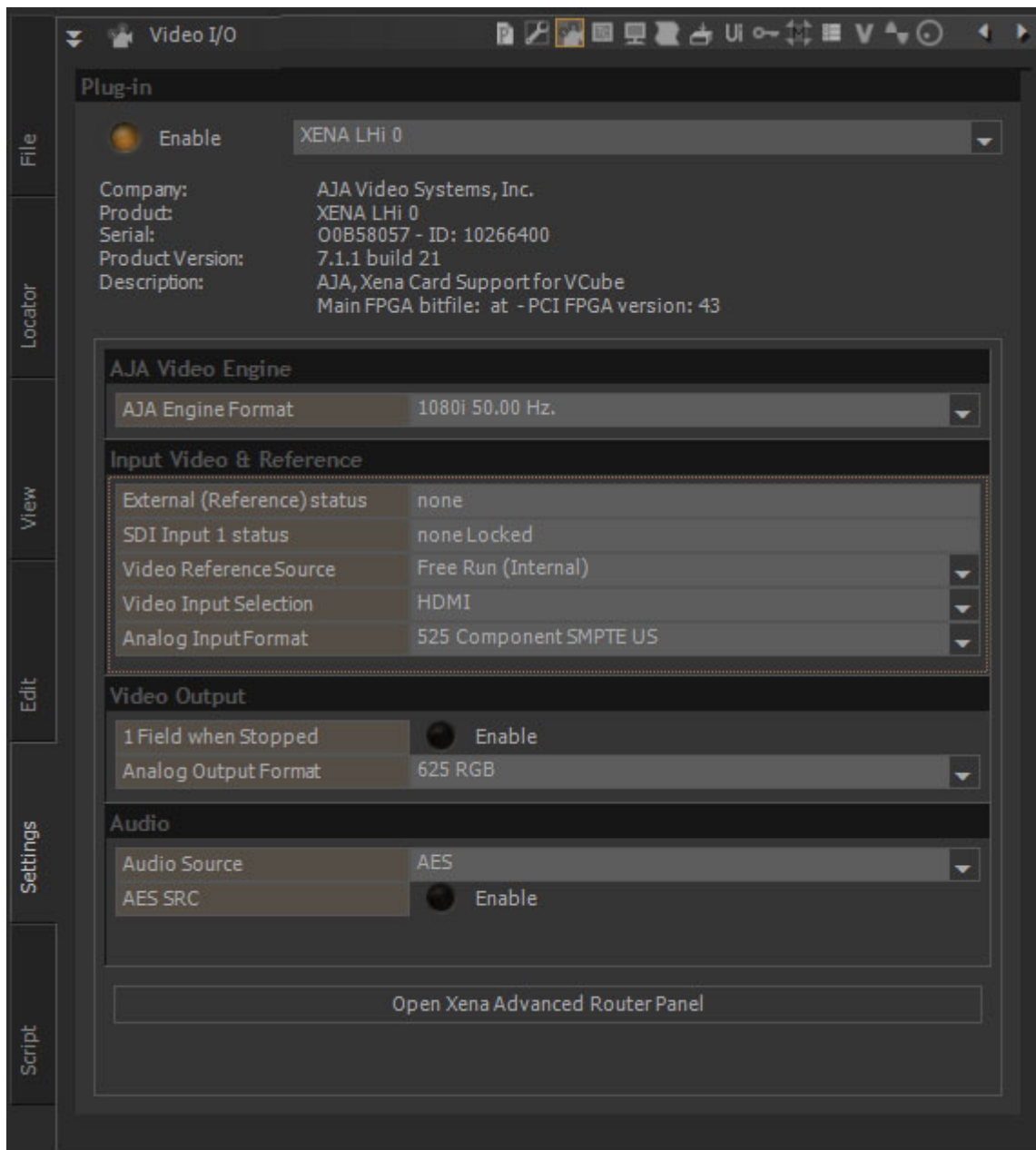
**Midi Port Selection dialog**

**1. Ethernet MIDI** Current Midi Port. Click to drop-down a list of available ports.

## Video I/O

**VCube Players** do not include a dedicated video card. The video is monitored via the graphics card.

**VCube Recorders** include a Video card. The video can be monitored in the same way as a Player and also from the video card dedicated output(s).



Video I/O Tab page

The plug-in corresponding to the video card installed must be chosen from the drop-down menu. Depending on the optional hardware (if any) inside the VCube workstation any of a variety of Plug-ins will be shown here.

Once the plug-in has been selected it must be enabled in order to make it available for the VCube software.





**Right - Top**  
**Left - Center**  
**Center - Center**  
**Right - Center**  
**Left - Bottom**  
**Center - Bottom**  
**Right Bottom**

- X Offset** Shows current horizontal TC Counter position offset value in pixels. Click to type an alternative value.
- Y Offset** Shows current horizontal TC Counter position offset value in pixels. Click to type an alternative value.
- TC Color** Field shows the current TimeCode Counter color. Click in the color window to open the Color Picker. Please see: Color Picker on page 15

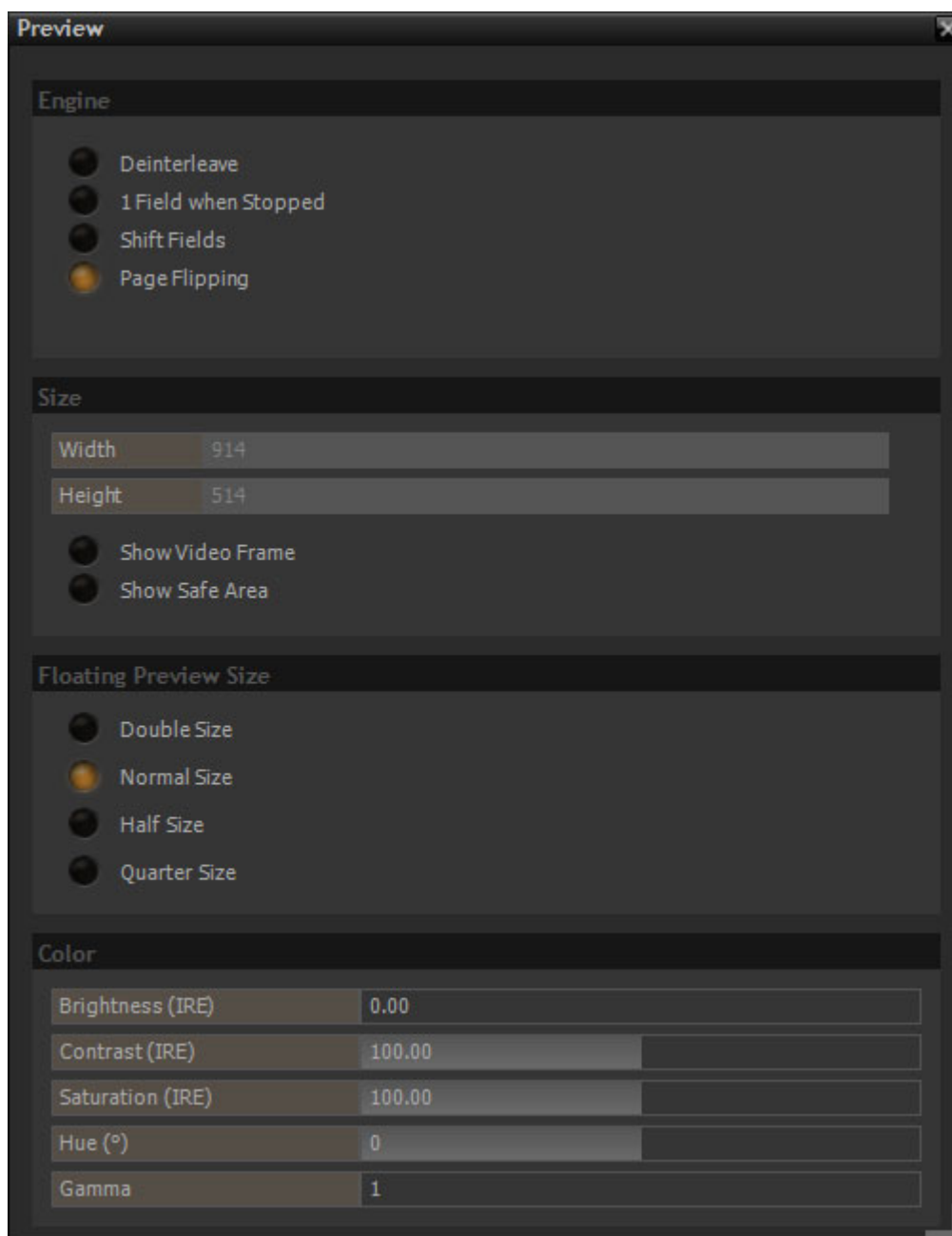
### Mask

The **Mask** function hides symmetrical areas of the screen Left and Right (**Horizontal**) and Top and Bottom (**Vertical**).

- Enable** When checked Mask is active.
- Horizontal** Field shows current Horizontal Mask setting. Click and drag the slider to alter the setting. Results are shown instantly in the Preview area.
- Vertical** Field shows current Vertical Mask setting. Click and drag the slider to alter the setting. Results are shown instantly in the Preview area.

## Preview

Preview shows settings that affect the way the Composition is displayed.



Preview Tab page

### Engine

#### Deinterleave

When checked, interleaved Fields will be integrated into single Progressive Frames. Use this option if the source is interlaced and Output is Progressive.

**Note:** Automatic video resize may produce wave-like artefacts when an interlaced Media File has to be stretched to match the output format.

#### One Field When Stopped

When checked the graphics card is able to output a stable picture on its video output when in Stop.

<b>Shift Fields</b>	When checked Field Order is reversed. Thus the Preview and video graphic card output have the converse Field Order to the Composition.
<b>Page Flipping</b>	When checked can cancel split artefacts in slow progressive mode. Depending on the model of graphic card, this function may or may not need to be enabled to allow correct refresh of the Preview area. If split artefacts are evident try the opposite setting.
<b>Size</b>	
<b>Width</b>	Information only - Set in User Interface E.g. by Click and dragging Splitters.
<b>Height</b>	Information only - Set in User Interface E.g. by Click and dragging Splitters.
<b>Show Video Frame</b>	When checked a white hairline frame is shown around the edges of the selected scan format.
<b>Show Safe Area</b>	When checked the standard cut off on a consumer display is shown as the outer dashed box. The inner dashed box shows the Graphics safe area.

### Floating Preview Size

The button checked determines the size of the Preview Window when in Floating Mode. ([F4] toggles.)

- Double Size**
- Normal Size**
- Half Size**
- Quarter Size**

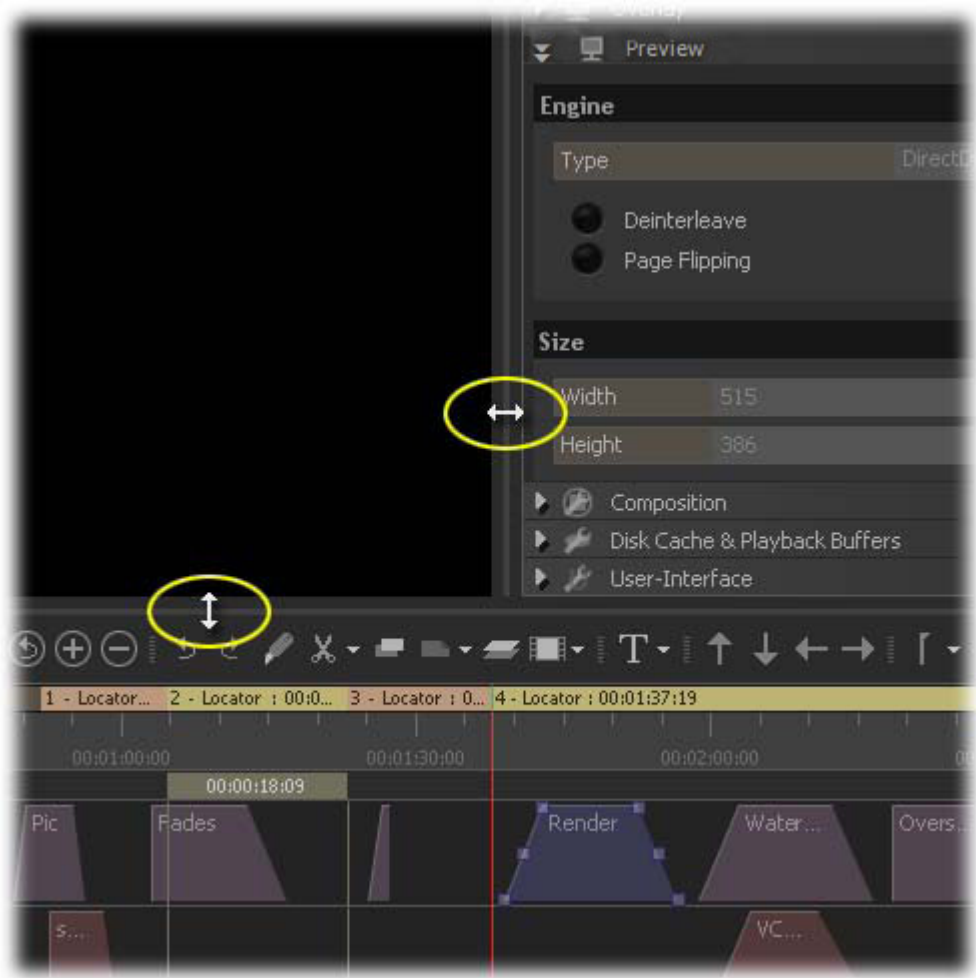
### Color

Color settings are only applied to the graphic card).They don't affect the video output.

Default values are set by Double-clicking on the corresponding slider.

<b>Brightness (IRE)</b>	Shows current Brightness Value
<b>Contrast (IRE)</b>	Shows current Contrast value
<b>Hue ( ° )</b>	Shows current Hue value in degrees Kelvin
<b>Gamma</b>	Shows current Gamma value.

**Note:** Preview size can also be changed by clicking and dragging the splitter under the preview pane and at the splitter between the Preview pane and the Settings pane (when visible).

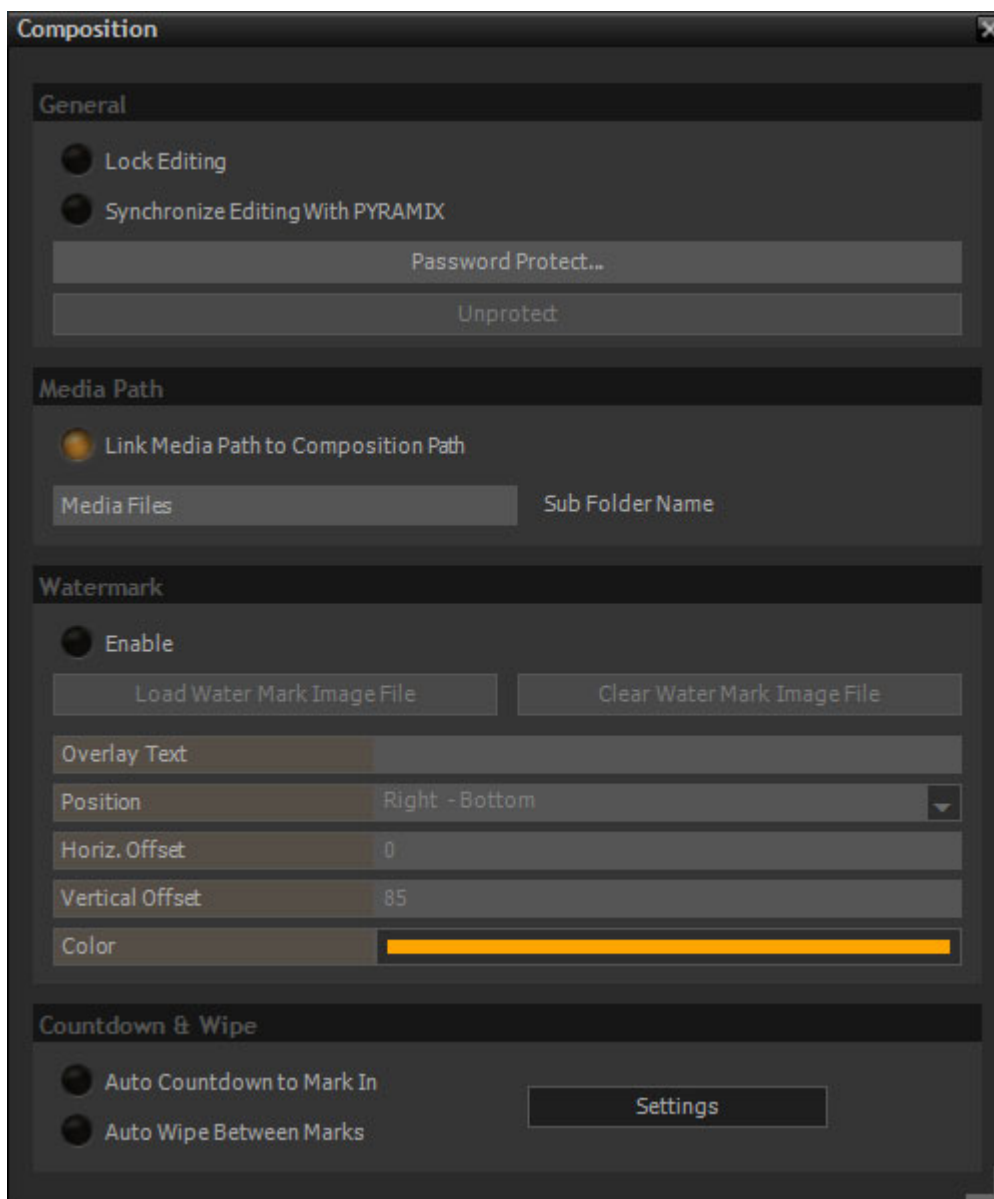


**Preview Size Adjust**

Double-clicking when the Cursor is in double-headed arrow mode resets the positions to the default value corresponding to the current format.

## Composition

The **Composition** Tab includes information about Synchronization, Formats and Overlays used in the current Project.



Composition Tab page

### General

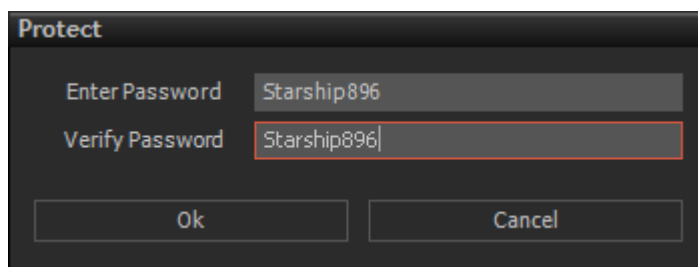
#### Lock Editing

Prevents unwanted modifications to the Composition. This includes each and every setting except the locators. The Lock/unlock Editing button itself is locked when the Composition is Protected.

Locators remain editable when the Composition is Locked .  
Use Save As to preserve Locators.

**Synchronize Editing With PYRAMIX** When checked edits are synchronized between the two applications.

**Password Protect...** Clicking on the **Protect** button opens the **Protect** dialog :

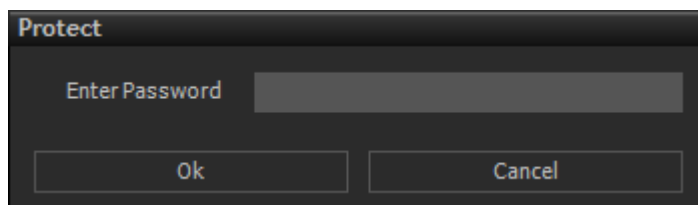


**Protect Lock dialog**

Type in a **Password** in the **Enter Password** and the identical one in the **Verify Password** fields  
Click on **OK** to Protect the Composition or **Cancel** to exit.

**Unprotect**

Clicking on the **Unprotect** opens the **Unprotect** dialog :



**Protect Unlock dialog**

Enter the correct **Password** in the **Enter Password** field and Click on **OK** to Unprotect or **Cancel** to exit the dialog.

**WARNING:** There is no way to unprotect a Composition if the password is lost. The XML file is encrypted.  
Contact us for Composition salvage:

<http://www.merging.com>

## Media Path

**Link Media Path to Composition Path** When checked a Media Files folder is created in the Folder selected when Saving or Saving As the current composition. This Media Files folder is selected by default as the destination folder for recording.

**Sub Folder Name**

Click in the field to enter an alternative name instead of Media Files

## Watermark

**Enable**

When Enable is checked a user selected Watermark image will be added, in real-time, to every video output. Both Text and still image are possible.

**Load Watermark Image File**

Opens a Windows File Browser to locate and open the desired image file.  
Image transparency, size and position must be set in the image file in a suitable Image Editor, matching the current video format.

**Clear Watermark Image File**

Unloads the current Watermark Image file

**Overlay Text**

Type any text required in the field

**Position**

The drop-down list offers a wide range of positions on screen for the text.

**Horiz. Offset**

Offsets the text by the number of pixels typed in the box to the right or left depending on the anchor position chosen above. When **Center - xx** is chosen no offset is possible.

**Vertical Offset**

Offsets the text by the number of pixels typed in the box downwards or upwards depending on the anchor position chosen above. When **xxx - Center** is chosen no offset is possible.

**Color**

The field shows the color selected currently. Click in the field to pop-up a color picker. **Please see: Color Picker on page 15**

## Countdown & Wipe

### Auto Countdown to Mark In

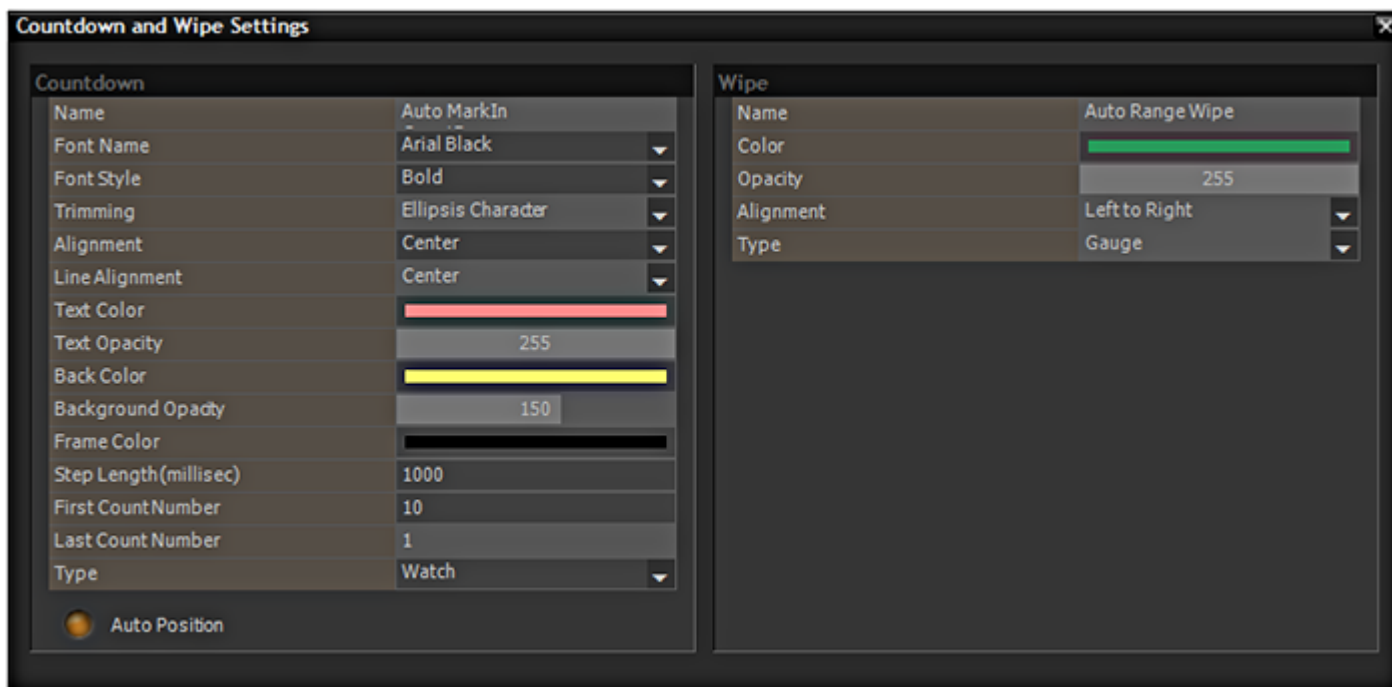
When active the countdown clock will be shown before the In marker of a range. This feature uses hidden Clips not visible in the Timeline.

### Auto Wipe Between Marks

When active a wipe will be superimposed on the picture range between the In and Out markers. This feature uses hidden Clips not visible in the Timeline.

## Settings

Click on the **Settings** button to open the **Countdown and Wipes Settings** dialog :



Countdown and Wipe Settings dialog

Double-clicking on the **Countdown** or **Wipe** title bars will break the panes away into free floating Tabs. Double-clicking the title bar once again re-docks.

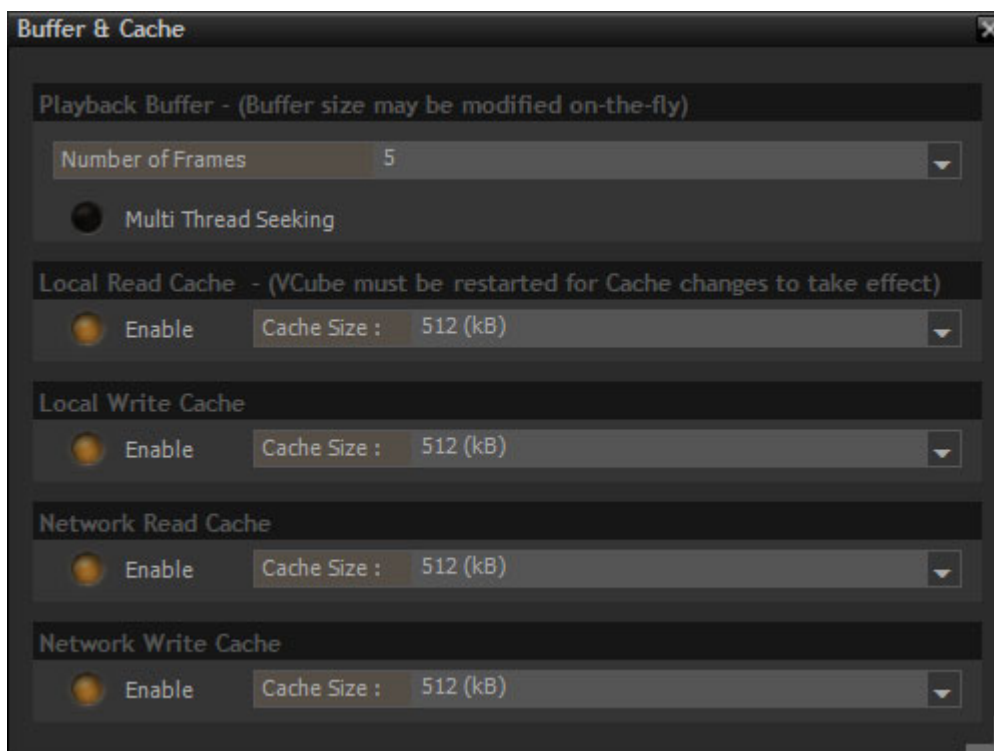
**Note:** When you have finished making changes to **Countdown and Wipes** settings Click on the **X** close box at top-right to accept the changes and close the dialog.

**Note:** Please see also: **Countdown Clip** on page 75 and **Wipe Clip** on page 77



## Buffer & Cache

The **Buffer & Cache** manages the buffers which affect VCube performance:



Buffer & Cache Settings

### Playback Buffer

#### Number of Frames

The drop-down list offers a choice of values between **3** and **20** frames for fine-tuning Playback performance to the specific configuration. The lower the number, the greater the demand will be on hard-disk or network streaming performance. A setting of **5** is good starting point.

#### Multi Thread Seeking

When checked enables VCube to run several simultaneous threads in order to reduce overall disk access time.

### Local Read Cache

#### Enable & Cache Size drop-down

### Local Write Cache

#### Enable & Cache Size drop-down

### Network Read Cache

#### Enable & Cache Size drop-down

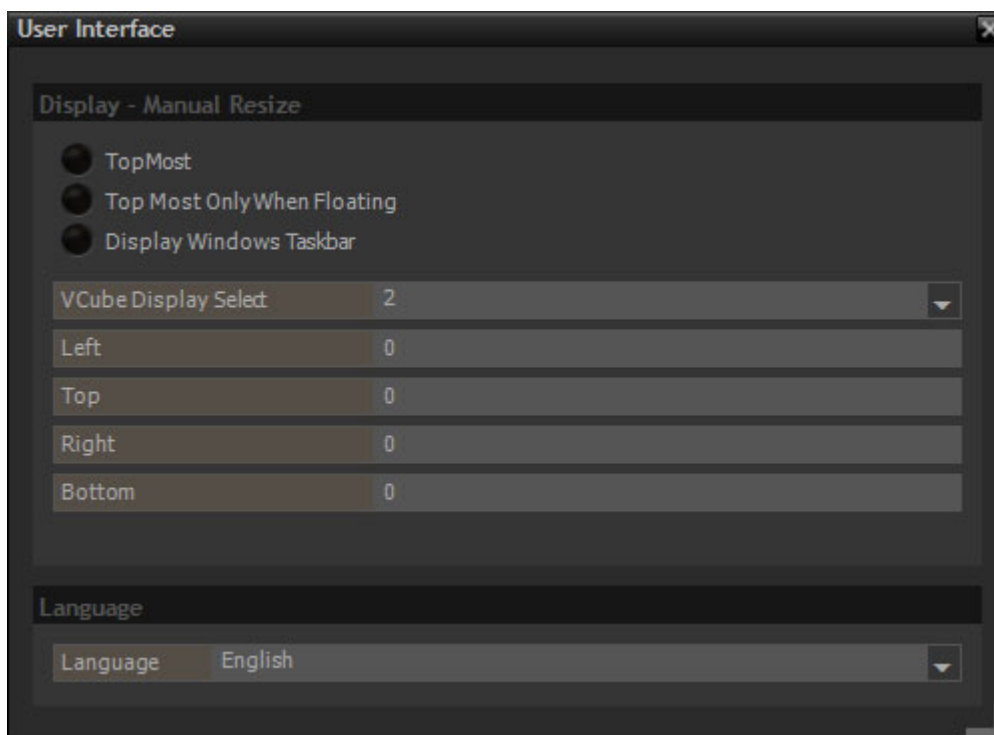
### Network Write Cache

#### Enable & Cache Size drop-down

**Note:** Caches are disabled by default. The application must be restarted to Change Cache values or to Enable/Disable Caches. Values determine the amount of memory, in bytes, allocated to Cache Memory. The effectiveness of these settings can be monitored using the dedicated **Output View** [Ctrl + F9] and [Ctrl + F 10].

## User Interface

The **User Interface** Tab brings together a number of display options.



User Interface Tab page

### Display - Manual Resize

<b>Topmost</b>	When checked the VCube window is always on the top of all open windows on screen.
<b>Topmost Only When Floating</b>	When checked the VCube window will only be on top of all other windows when it is in floating mode. ([F4] toggles Floating mode.)
<b>Display Windows Taskbar</b>	When checked the Windows Taskbar is visible at all times in a single monitor configuration. The Taskbar, Status Bar or System Tray remains on the main monitor (number one) in a double monitor configuration.
<b>VCube Display Select</b>	The drop-down list shows all available monitors. Simply choose the Screen you wish the VCube user interface to use.
<b>Left</b>	Entering a positive value reduces the width of the VCube display on the left-hand side by the number of pixels entered.
<b>Top</b>	Entering a positive value reduces the height of the VCube display at the top by the number of pixels entered.
<b>Right</b>	Entering a positive value reduces the width of the VCube display on the right-hand side by the number of pixels entered.
<b>Bottom</b>	Entering a positive value reduces the height of the VCube display at the top by the number of pixels entered.

**Note:** The VCube Window size reduction feature above can be useful with certain models of video projector.

### Language

**Language** The drop-down list offers the following languages for the VCube User Interface

**Chinese - Simplified**  
**Chinese - Traditional**  
**English**  
**Français**  
**German**

Japanese

Russian

## Encryption

Locking, Encryption and Decryption of Media Files can be performed in real time by VCube. This process is based on MTAK technology. (Merging Technologies Active Key).

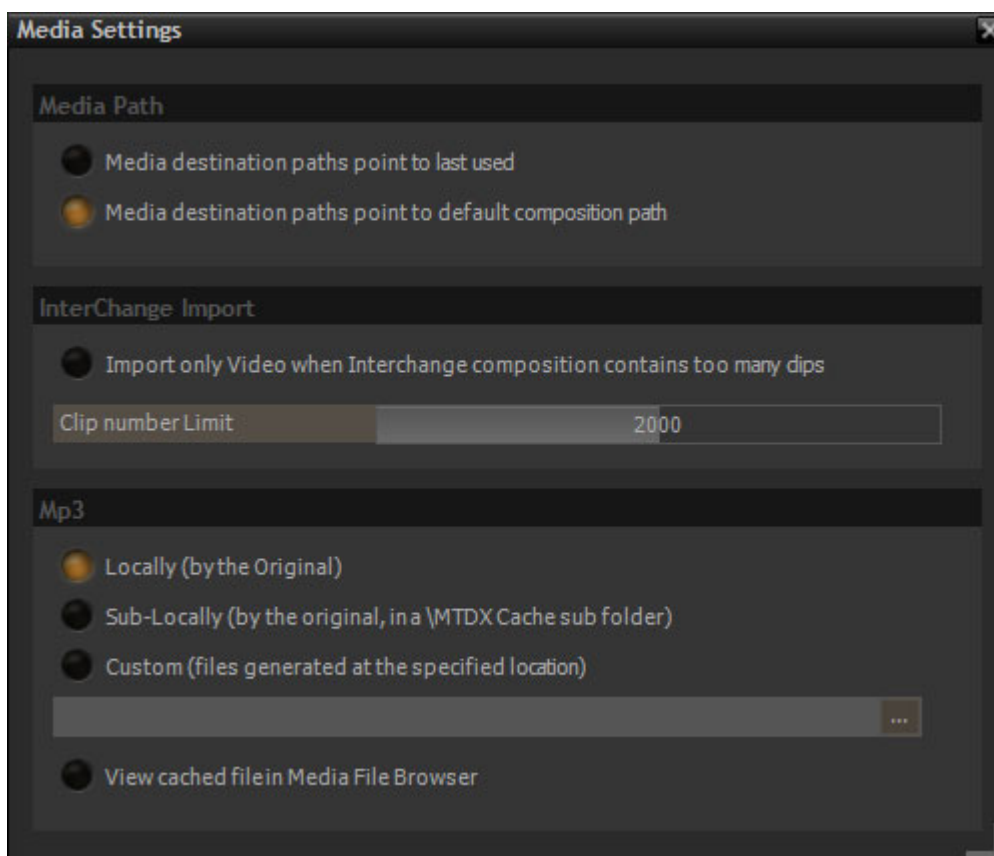
Active Key does two things:

1. Protects non-encrypted Media Files from un-authorized use. This enables Media Files created by VCube or Pyramix to be locked out from Playback or Processing in a VCube or Pyramix Timeline by using a metadata flag in the files themselves. This first level of security prevents media files from Playout but the actual data streams in the files are not encrypted so they remain CPU efficient since they do not require real-time encoding or decoding when they are created or played back.
2. Protects and encrypts media at the time of creation making un-authorized use of these files virtually impossible. 128bit data encryption of the actual media files themselves is applied in real time as well as a metadata flag indicating to VCube and Pyramix that the files in question are protected from playback via Active Key and must be authorized before they may be decoded in real-time for playback or further processing.

**Note:** If you are interested in this optional feature please contact your Merging Technologies Sales Partner for further detailed information.

## Media Settings

The Media Settings Tab manages Media Paths, InterChange Import options for AAF etc and the manner in which QuickTime and Mp3 files are handled by VCube.



Media Settings Tab page

### Media Path

**Media destination paths point to last used** As it says when active, toggles with:

**Media destination paths point to default composition path**

## InterChange Import

**Import only Video when Interchange composition contains too many clips** When checked only Video Clips are imported if the source composition/project contains more than the number of clips specified in the field below:

**Clip number Limit** Type in the field to set the maximum number of Audio clips to be imported.

**Note:** To force video only import check the option and set the maximum number value to **0**

**Note:** In the case of AAF linking to MXF media the maximum number of files which can be relinked is currently 2000.

## Mp3

**Locally (by the Original)** When checked new uncompressed Audio Files will be created in the same folder as the originals.

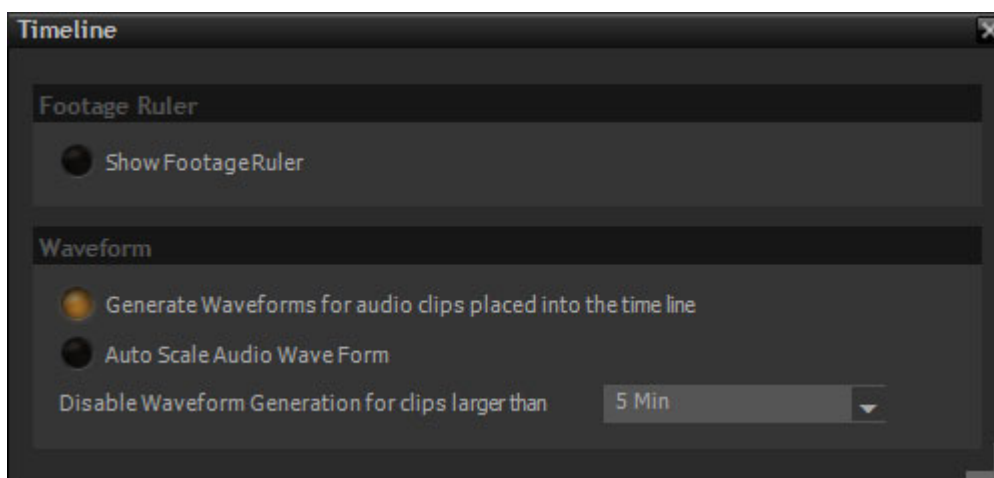
**Sub-locally (by the Original in a \MTDX Cache sub folder** When checked new uncompressed Audio Files will be created in an \MTDX Cache sub folder in the same folder as the originals.

**Custom (files generated at the specified location** When checked new uncompressed Audio Files will be created in the location specified by the user in the field below. Clicking on the ... button opens a browser to navigate to the required location.

**View cached file in Media File Browser** When checked, the cached file will be visible in the Media File Browser Tab.

## Timeline

This Tab allows determines whether the Film Feet Ruler will be displayed in the Timeline and if Waveforms are generated and whether they are automatically scaled.



Timeline Tab page

**Show Feet Ruler** When checked, a Film Feet ruler is displayed above the main Timeline Time ruler.

The **Feet Ruler Options** dialog can be accessed via **Settings > Show Feet Ruler Options Dialog** or **[CTRL + F]**

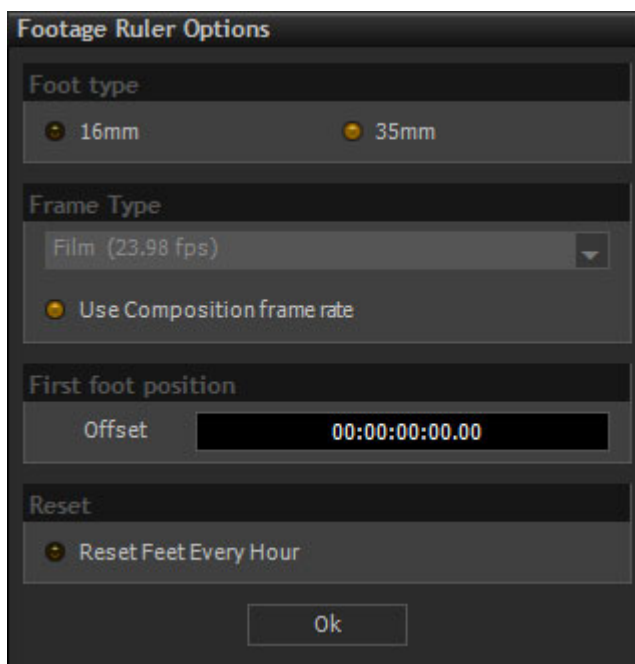
**Generate WaveForms for audio clips placed into the timeline** Checked by default. If waveforms are not required uncheck.

**Auto Scale Audio Wave Form** When checked, the Waveform (not the audio) of Audio Clips is normalized.

**Disable Waveform Generation for clips larger than** The drop-down offers the choice of:

- 5 Min
- 10 Min
- 20 Min
- 60 Min
- Unlimited

## Feet Ruler Options Dialog



Feet ruler options dialog

Accessed via **Settings > Show Footage Ruler Options Dialog** or **[CTRL + F]**

### Foot type

**16mm**

When checked Film Feet are counted in units of 40 Frames

**35mm**

When checked Film Feet are counted in units of 16 Frames

### Frame Type

**Use Composition frame rate**

When checked the time-base is the same as the Composition Frame Rate. When unchecked the time-base can be selected from the drop-down list above.

### First Foot Position

**First foot position**

The Time field enables an offset to be entered if required. For example when a leader precedes the first frame of action and the first frame of action should show **0000 Feet** For example for a film with a 15 foot leader with the cross at **01:00:00:00** enter an offset of

### Reset

**Reset Feet Every Hour**

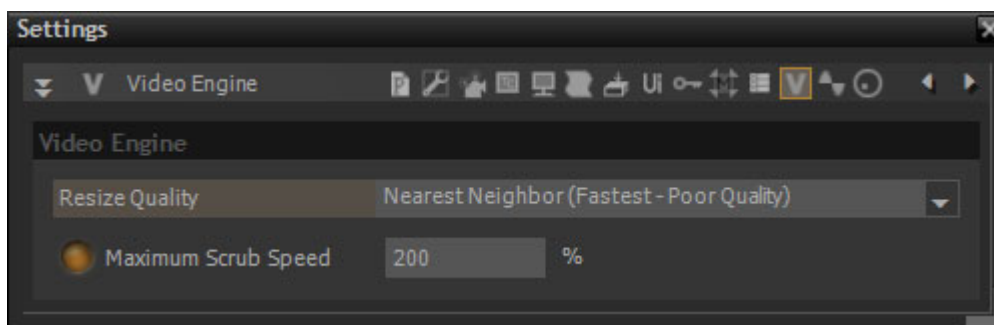
When checked the Footage count is zeroed every 60 minutes.

**OK**

Click on **OK** to accept any changes and exit the dialog

## Video Engine

The VCube Video Engine Tab enables tuning to suit the circumstances



Video Engine Tab page

When a interlaced video format must be resized, VCube offers different algorithms to process the picture depending on the CPU capabilities or the visual quality requirements.

### Video Engine

#### Resize Quality

The field displays the option selected currently. The drop-down list offers the choice of:

**Nearest neighbour**

**Fastest but poor quality**

**Linear (Bi Linear)**

**Fast and poor quality**

**Cubic**

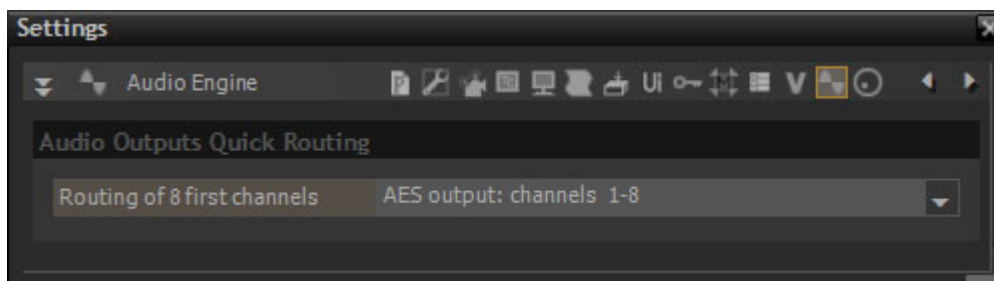
**Slow but very good quality**

**Lanczos**

**Very Slow but excellent quality**

## Audio Engine

The Audio Engine is selected and set in the **VS3 Control Panel**. The VCube Audio Engine Tab Sets **Audio Outputs Quick Routing**.



Audio Engine Tab page

### Audio Outputs Quick Routing

#### Routing of 8 first channels

Applies to the first 8 Layers (Channels) in an Audio Track. Default is (Monitor Stereo) Select from the drop-down list to route to the ASIO device or Black Magic / AJA outputs etc. where these are installed.

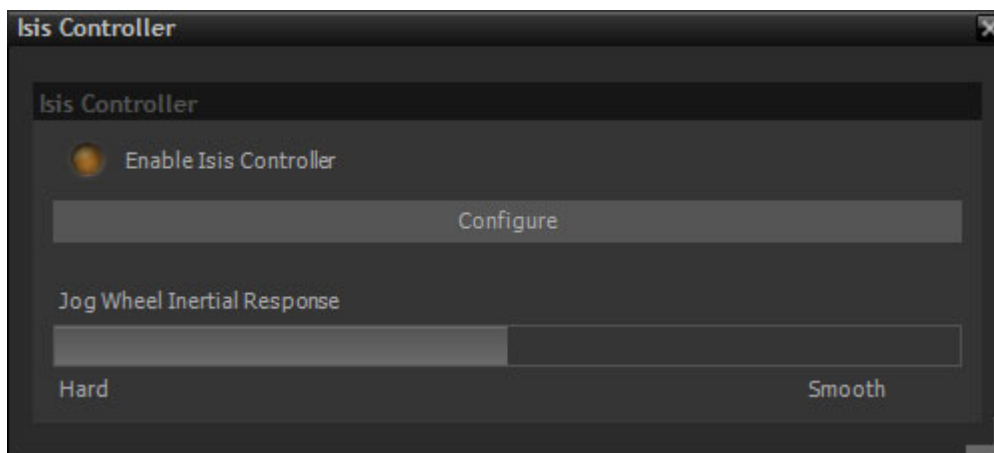
### ASIO Driver

The ASIO Driver is selected and set in the **VS3 Control Panel**

## Isis Controller

The **ISIS** remote control from Merging Technologies is supported by VCube. VCube SE does not support this feature.

Please refer to the **Isis User Manual** for full operational and Isis specific settings details.



Isis Controller Tab page

### Isis Controller

#### Enable Isis Controller

When checked Isis can control the VCube in addition to the on-screen controls.

#### Configure

Click on the button to open the Isis Configuration dialog.

#### Jog Wheel Inertial Response

Click and drag the slider to change the hysteresis of the Isis Jog Wheel between Hard (tight lock) and Smooth (for greater 'flywheel' effect)

# Tool Bar

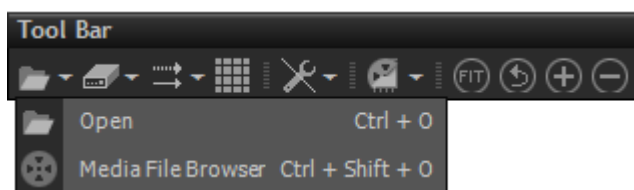
The Toolbar Contains a range of Icons for performing common tasks. Many Icons also have a 'Tool Picker' down arrow adjacent. Clicking on the down arrow enables the user to choose from a range of grouped tools. When a Tool picker is present the Icon displayed in the Toolbar is the last tool selected.





VCube Toolbar

## Tools and Toolpickers

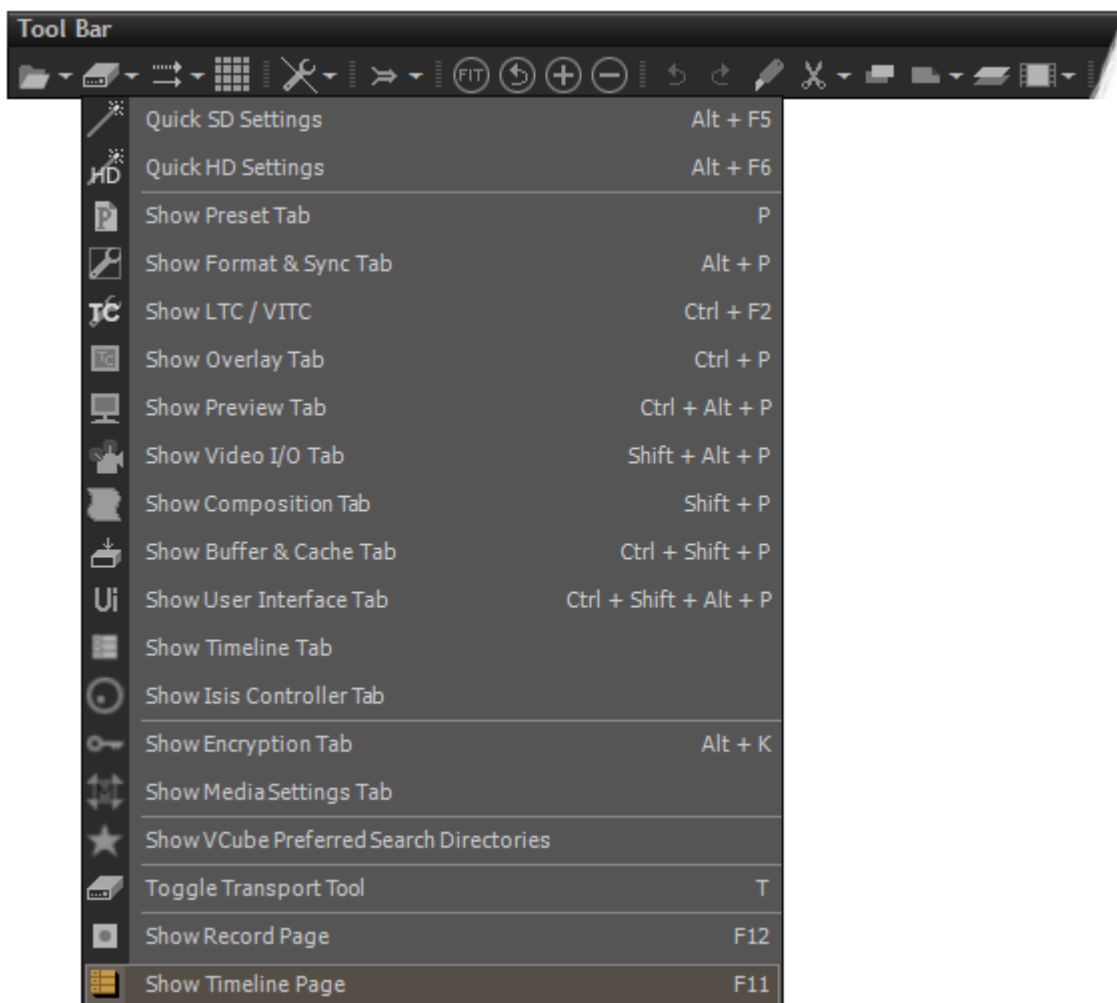
### File Toolpicker



- |  |                           |                           |   |
|--|---------------------------|---------------------------|---|
|   | <b>Open Composition</b>   | <b>[Ctrl + O]</b>         | Opens the <b>VCube Compositions</b> Browser |
|  | <b>Media File Browser</b> | <b>[Ctrl + Shift + O]</b> | Opens the <b>Media File Browser</b>         |



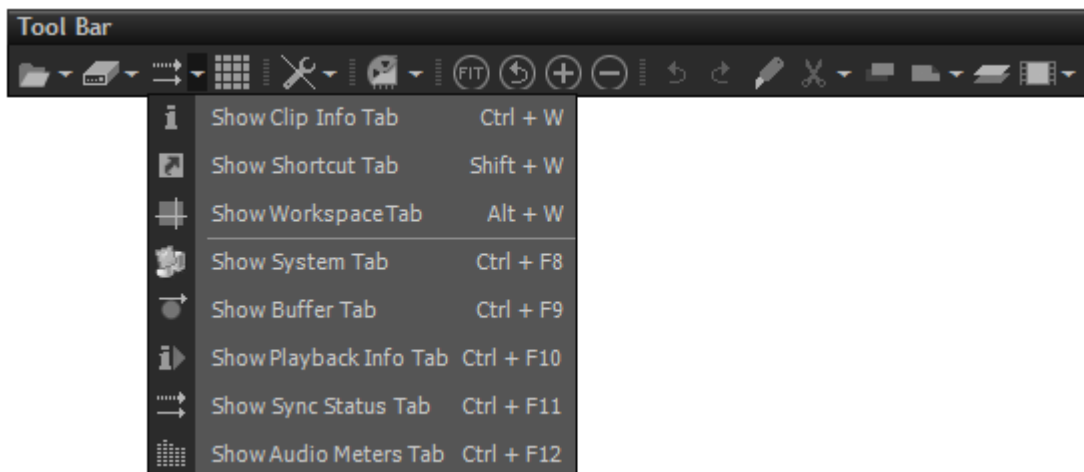
## Show Settings Tabs Toolpicker



	<b>Quick SD Settings</b>	<b>[Alt + F5]</b>	Opens the <b>Quick SD Settings</b> Tab
	<b>Quick HD Settings</b>	<b>[Alt + F6]</b>	Opens the <b>Quick HD Settings</b> Tab
	<b>Show Preset Tab</b>	<b>[P]</b>	Opens the <b>Preset</b> Tab
	<b>Show Format &amp; Sync Tab</b>	<b>[Alt + P]</b>	Opens the <b>Formats &amp; Sync</b> Tab
	<b>Show LTC / VITC</b>	<b>[Ctrl + F2]</b>	Opens the <b>LTC / VITC Settings</b> Tab
	<b>Show Overlay Tab</b>	<b>[Ctrl + P]</b>	Opens the <b>Overlay</b> Tab
	<b>Show Preview Tab</b>	<b>[Ctrl + ALt + P]</b>	Opens the <b>Preview</b> Tab
	<b>Show Video I/O Tab</b>	<b>[Shift + Alt + P]</b>	Opens the <b>Video I/O</b> Tab
	<b>Show Composition Tab</b>	<b>[Shift + P]</b>	Opens the <b>Composition</b> Tab
	<b>Show Buffer &amp; Cache Tab</b>	<b>[Ctrl + Shift +P]</b>	Opens the <b>Buffer &amp; Cache</b> Tab
	<b>Show User Interface Tab</b>	<b>[Ctrl+Shift+Alt+P]</b>	Opens the <b>User Interface</b> Tab
	<b>Show Timeline Tab</b>		Opens the <b>Timeline</b> Tab
	<b>Show Isis Controller Tab</b>		Opens the <b>Isis Controller</b> Tab

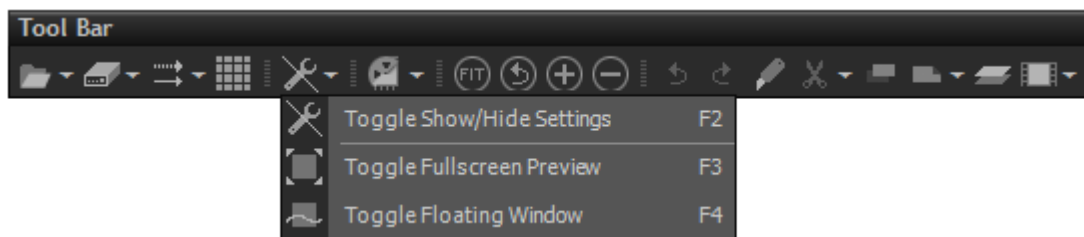
	<b>Show Encryption Tab</b>	<b>[Alt + K]</b>	Opens the <b>Encryption Tab</b>
	<b>Show Media Settings Tab</b>		Opens the <b>Media Settings Tab</b>
	<b>Show VCube Preferred Search Directories</b>		Opens the <b>VCube Preferred Search Directories Tab</b>
	<b>Toggle Transport Tool</b>	<b>[T]</b>	Toggles the <b>Transport Control Panel</b> Open/Close
	<b>Show Record Page</b>	<b>[F12]</b>	Shows the <b>Record Page</b> in the lower pane
	<b>Show Timeline Page</b>	<b>[F11]</b>	Shows the <b>Timeline</b> in the lower panel

### Show Info Tabs Toolpicker





	<b>Show Clip Info Tab</b>	<b>[Ctrl + W]</b>	Opens the <b>Clip Info Tab</b>
	<b>Show Shortcut Tab</b>	<b>[Shift + W]</b>	Opens the Keyboard <b>Shortcut Tab</b>
	<b>Show Workspace Tab</b>	<b>[Alt + W]</b>	Opens the <b>Workspace Tab</b>
	<b>Show System Tab</b>	<b>[Ctrl + F8]</b>	Opens the <b>System Tab</b>
	<b>Show Buffer Tab</b>	<b>[Ctrl + F9]</b>	Opens the <b>Buffer Tab</b>
	<b>Show Playback Info Tab</b>	<b>[Ctrl + F10]</b>	Opens the <b>Playback Info Tab</b>
	<b>Show Sync Status Tab</b>	<b>[Ctrl + F11]</b>	Opens the <b>Sync Status Tab</b>
	<b>Show Audio Meters Tab</b>	<b>[Ctrl + F12]</b>	Opens the <b>Audio Meters Tab</b>

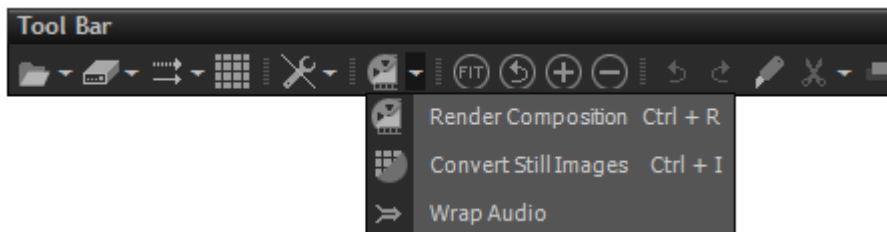
### View Toolpicker






	<b>Toggle Show/Hide Settings [F2]</b>	Toggles the Control <b>Settings</b> pane <b>Show/Hide</b>
--	---------------------------------------	---





- 
**Toggle Fullscreen Preview [F3]** Toggles VCube between the User Interface and Full Screen Preview
- 
**Toggle Floating Window [F4]** Toggles VCube between the UI and Preview Floating floating at half size (default)

### Convert Toolpicker






- 
**Render Composition [Ctrl + R]** Opens the **Render Composition** Tab
- 
**Convert Still Images [Ctrl + I]** Opens the **Import Image Sequence** Tab
- 
**Wrap Audio** Opens the **Wrap Audio** Tab

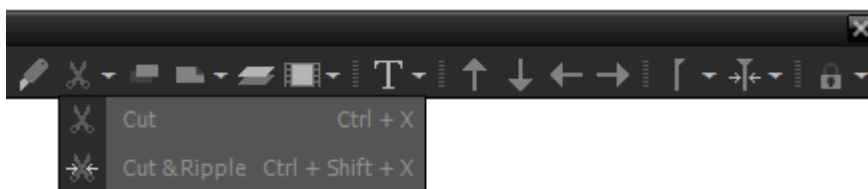
### Zoom Tools



- 
**Fit Selection Zoom [Alt + 1]** Adjusts the Zoom level so that the current selection fills the full visible width of the Timeline
- 
**Zoom Undo [Alt + 2]** Restores Zoom level to previous value
- 
**Zoom In [Alt + 3]** Zooms In to Timeline with each press
- 
**Zoom Out [Alt + 4]** Zooms Out of Timeline with each press

### Editing Tools


- 
**Undo Edit [Ctrl + Z]** Undo the previous **Edit**
- 
**Redo Edit [Ctrl + Shift + Z]** Redo the last edit undone
- 
**Split Selection [Ctrl + T]** Splits a Selected Clip or Clips at the current Cursor position into separate Clips Left and Right of the Cursor

### Edit Cut Toolpicker

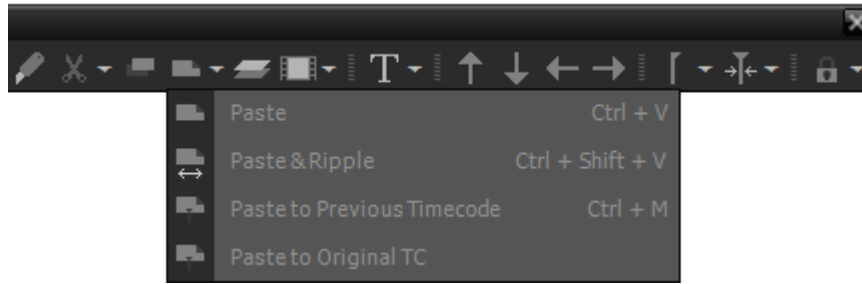






- 
**Cut [Ctrl + X]** Deletes the selected Clip(s)
- 
**Cut & Ripple [Ctrl + Shift + X]** Deletes the selected Clip(s) and moves subsequent Clips to the Left (earlier) by the same amount

### Copy


- 
**Copy [Ctrl + C]** Copies the selected Clip(s) to the Clipboard

## Edit Paste Toolpicker

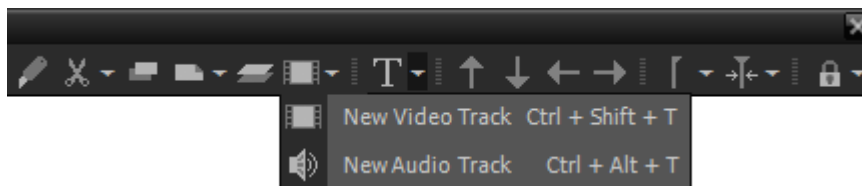




- 
**Paste** [Ctrl + V] Pastes contents of Clipboard to the current Cursor Position starting with the Selected Track
- 
**Paste & Ripple** [Ctrl + Shift + V] Pastes contents of Clipboard at the current Cursor Position starting with the Selected Track moving existing content to the Right (later)
- 
**Paste to Previous Timecode** [Ctrl + M] Pastes contents of the Clipboard back to the position it was in before.
- 
**Paste to Original Timecode** Pastes contents of the Clipboard back to the original position in the Timeline

## Timeline Tools

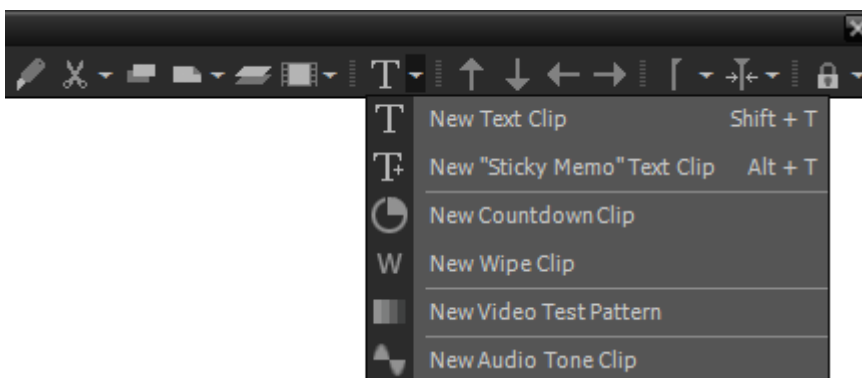
- 
**New Layer** [Ctrl + Shift + N] Creates a New Layer in the Selected Track



## New Track Toolpicker



- 
**New Video Track** [Ctrl + Shift + T] Inserts a **New Video Track**
- 
**New Audio Track** [Ctrl + Alt + T] Inserts a **New Audio Track**

## New Clip Toolpicker



- 
**New Text Clip** [Shift + T] Creates a 5 seconds Text holder Clip in the Timeline at the current TimeCode in the selected Track. The Text Properties dialog appears in the **View** Tab.
- 
**New "Sticky Memo"(Text Clip)**[Alt + T] Creates an overlaid text box of 5 seconds duration from the current Cursor position in the selected Track.

**New Countdown Clip**

Creates a **Countdown Clip** (10 seconds duration) corresponding to the current Composition settings. Default duration is adjustable in the **Clip Info** panel.

**New Wipe Clip**

Creates a Wipe Clip representing a time remaining to the end of the Clip.





**New Video Test Pattern**

Creates a Video Test Pattern Clip in accord with current Composition Settings.

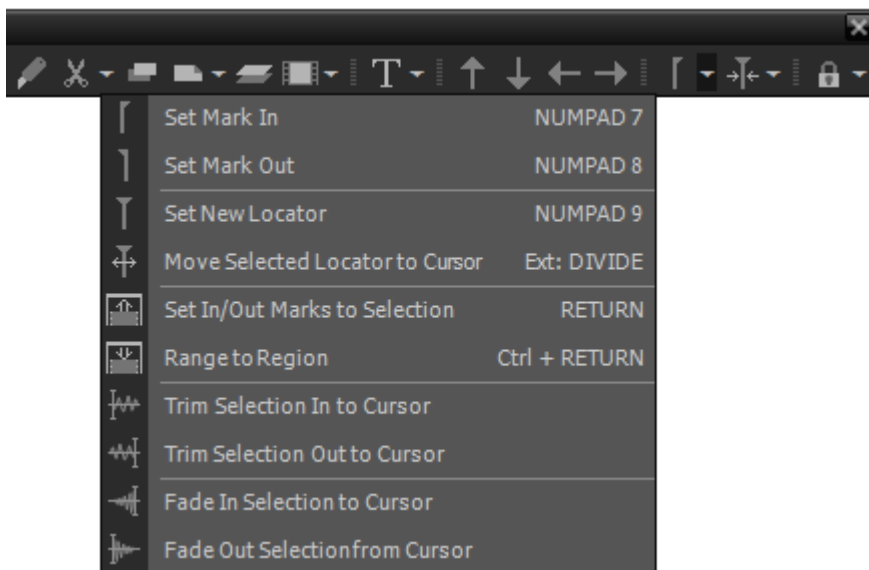
**New Audio Tone Clip**








Creates a new ten second sine wave **Audio Clip**. Frequency and level can be adjusted from the **Clip Info** panel.

## Nudge Tools

	<b>Move Layer Up</b>	[Up]	Move Selected Layer <b>Up</b>
		[Ctrl + Up]	Move Selection <b>Up</b>
		[Shift+Ctrl+Up]	nudge track
		[Down]	Move Selected Layer <b>Down</b>
		[Ctrl + Down]	Move Selection <b>Down</b>
		[Shift+Ctrl+Down]	nudge track
	<b>Nudge Playhead Left</b>	[Left]	
		[Ctrl + Left]	Nudge Selection <b>Left</b>
		[Shift+Ctrl+Left]	Nudge Overlap <b>Left</b>
	<b>Nudge Playhead Right</b>	[Right]	
		[Ctrl + Right]	Nudge Selection <b>Right</b>
		[Shift+Ctrl+Right]	Nudge Overlap <b>Right</b>

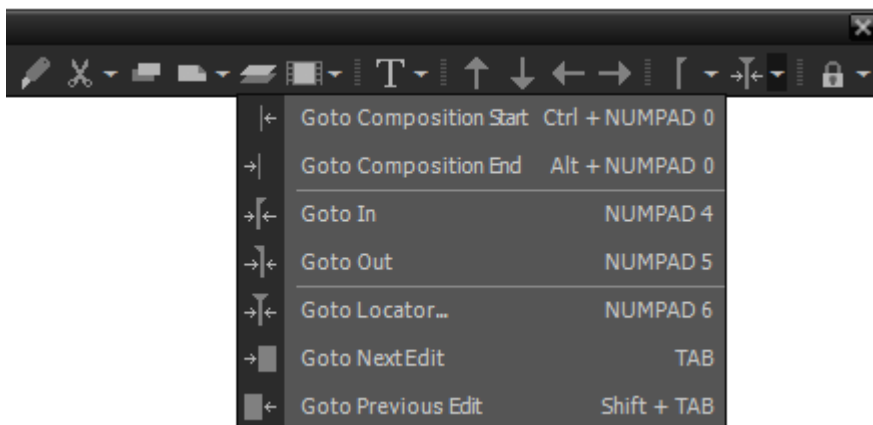
## Mark and Fade Toolpicker



	<b>Set Mark In</b>	[Num 7]	Set <b>Range In</b> marker
	<b>Set Mark Out</b>	[Num 8]	Set <b>Range Out</b> marker
	<b>Set New Locator</b>	[Num 9]	Set <b>New Locator</b>
	<b>Move Selected Locator to Cursor</b>	Ext: [DIVIDE]	
	<b>Set In/Out marks to Selection</b>	[RETURN]	Set <b>In/Out Markers to Selection</b>
	<b>Range to Region</b>	[Ctrl + RETURN]	
	<b>Trim Selection In to Cursor</b>		

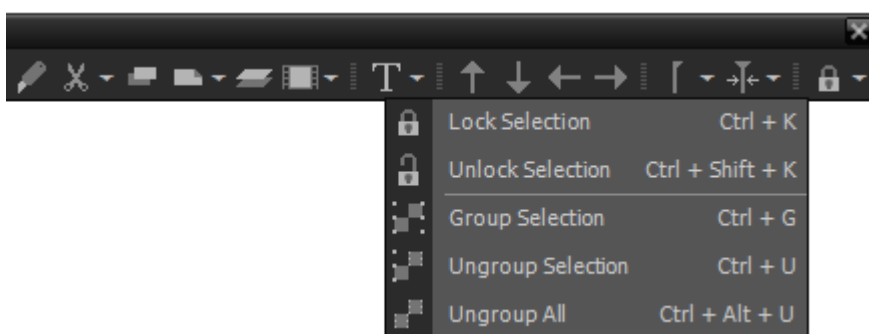
- Trim Selection Out to Cursor**
- Fade In Selection to Cursor**
- Fade Out Selection from Cursor**

### Locate Toolpicker



- Goto Composition Start** [Ctrl + Num 0]
- Goto Composition End** [Alt + Num 0]
- Goto In** [Num 4]
- Goto Out** [Num 5]
- Goto Locator ...** [Num 6] Opens the **Goto Locator** dialog
- Goto Next Edit** [Tab]
- Goto Previous Edit** [Shift + Tab]

### Lock and Group Toolpicker



- Lock Selection** [Ctrl + K] Locks Selected Clip(s)
- Unlock Selection** [Ctrl+Shift+K] Unlocks Selected Clip(s)
- Group Selection** [Ctrl + G] Groups Selected Clips
- Ungroup Selection** [Ctrl + U] Ungroup Selected Clips
- Ungroup All** [Ctrl+Alt+U] Ungroup all Groups in Composition

# Applications

## Non Compensated Telecine at 24 fps

A non-compensated telecine can be used with VCube. A film frame corresponds to a video frame, VCube can playback a 25 fps video capture at 24 fps in order to respect the real duration of the film and to avoid typical pitch/time audio processing.

After a regular PAL capture, the Composition must be set to 24 fps. The fps information embedded in the Media File cannot be changed from 24 fps to 25 fps to give correct playback. However it is possible to change the playback speed of the Clip in the VCube Timeline:

To change the Composition frame rate:

**Settings > Format & Sync : Composition Video Format : Composition Frame Rate**

To change the Clip Playback Speed: Double-click on the corresponding Clip in the Timeline to display **Clip Info**

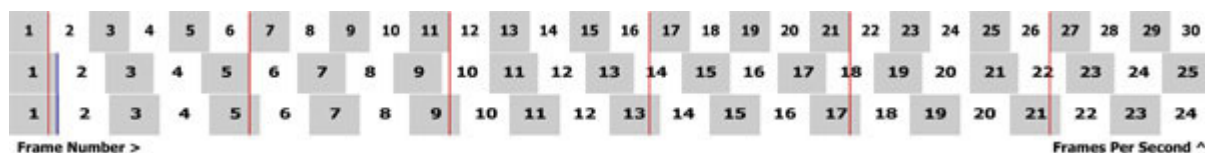
**Clips : Speed**, set to **24->25** (96%).

**Note:** 1. VCube can still be synchronized to a 25 fps house clock.

**Note:** 2. Both external (25fps) or internal (24fps) TimeCodes can be displayed.

## 24fps Composition Chasing other Timecodes

VCube is able to play a 24 frames per second Composition, chasing a 25, 29.97 or 30 frames per second TimeCode. VCube doesn't interpolate frames. It only uses its own ultra precise internal clock to manage the Composition playback. The external reference TimeCode is only used to synchronize the internal clock.



When the reference TimeCode is different from the Composition TimeCode, it produces artefacts when seeking a particular frame in the Composition. In the above example, red lines indicate that two different 30 fps TimeCode positions can recall the same frame in a 24 fps Composition. The blue line does the same for a 25 fps reference TimeCode.

**Note:** In nominal playback, such artefacts will only appear if Clips with mismatched frame rates are included in the Composition. The Playback speed can be edited in Clips Info, enabling correct playback. This feature is very useful at 25 fps for uncompensated telecine (frame per frame capture on a PAL video).



## Remote Control

VCube is extremely versatile in its remote control options.

Apart from the obvious synergy with Pyramix via Virtual Transport, VCube can chase TimeCode, be controlled by a Sony 9-pin (P2 protocol) master and accepts MIDI Machine Control commands via Virtual Transport.

### VCube Chasing Pyramix Via Virtual Transport 2 in the Same PC (PyraCube)

VCube can be remote controlled by and chase Pyramix when both applications are installed in the same PC.

No special settings are required in VCube. Video and Audio References are optional. The VCube will show up as a Transport Control Panel in Pyramix when Pyramix is configured correctly to use VT2 in the **All Settings > Settings > Remote Control > Virtual Transport 2**. Please see the Pyramix User Manual for details.

### VCube Chasing Pyramix Using Virtual Transport Via Network

VCube can be remote controlled by and chase Pyramix across a network via Virtual Transport 2.

The VCube will show up as a Transport Control Panel in Pyramix when Pyramix is configured correctly to use VT2 in the **All Settings > Settings > Remote Control > Virtual Transport 2**.

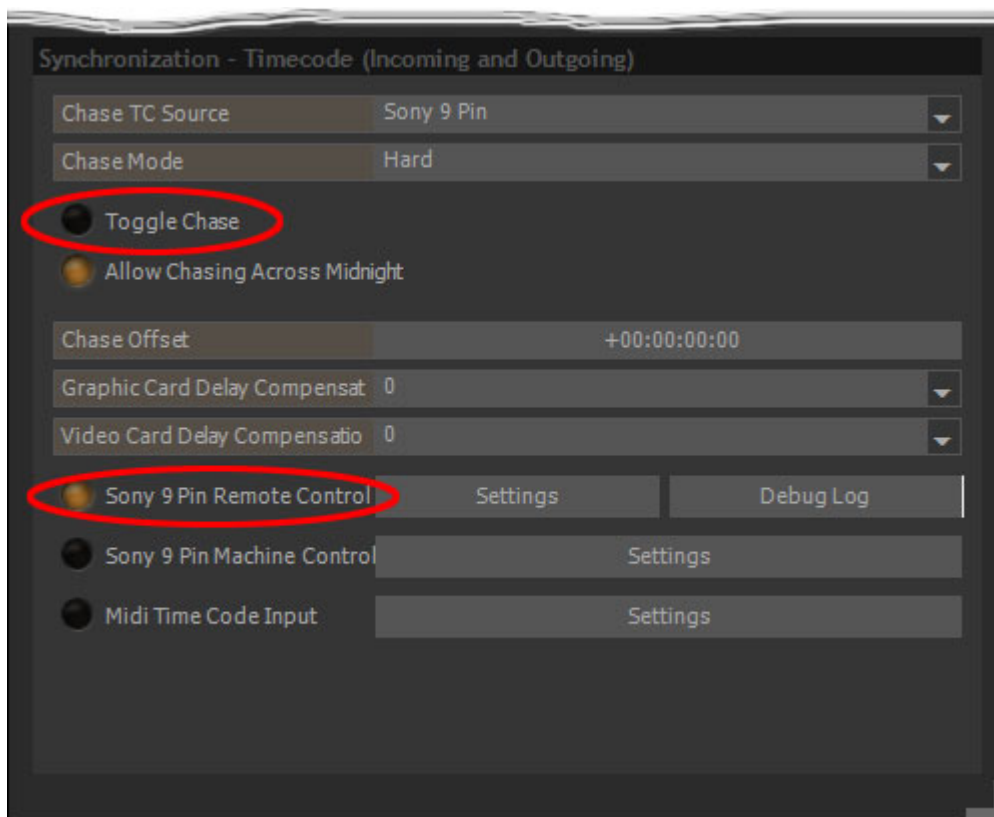
When **Synchronize Editing with Pyramix** is active in the **Composition** Tab every Video Clip handle move in Pyramix will be visible in the VCube outputs. The frame displayed while moving handles is at the TC position of the handle moved in Pyramix.

Please see the Pyramix User Manual for details.

# Remote Control VCube with a Sony 9-pin Controller

VCube can be remote controlled by a Sony 9-pin compatible device.

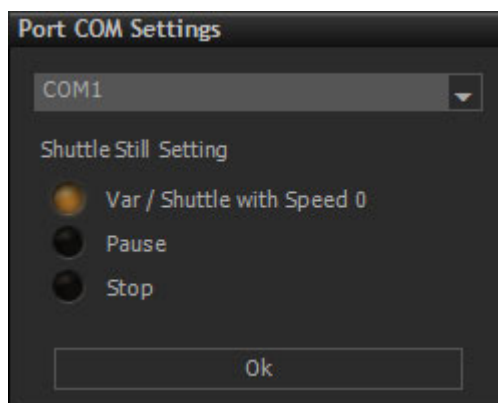
1. In the **Format & Sync Tab : Synchronization** section configure as below:



Formats & Sync Tab - Synchronization section

- Toggle Chase**                      **Unchecked**
- Sony 9 Pin Remote Control**    **Checked**

2. Set the **COM** port required.



Port COM Settings

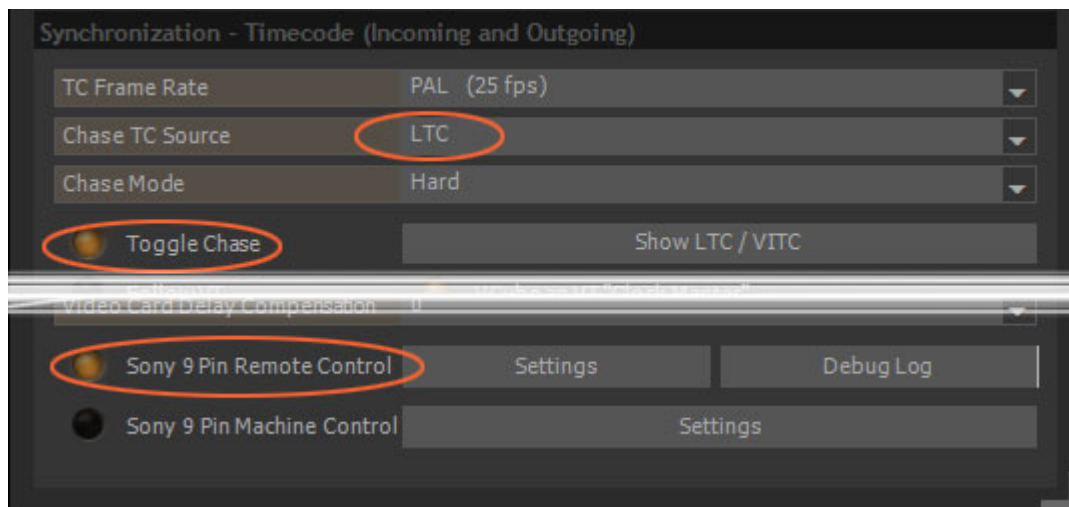
- COM1**                      Current **COM** Port. Click to drop-down a list of available COM Ports.
- Var / Shuttle with Speed 0**    When checked VCube issues a **Var / Shuttle 0 Speed** command when stopped.
- Pause**                      When checked VCube issues a **Pause** command when stopped. Audio data is retained in buffers.
- Stop**                        When checked VCube issues a **Stop** command when stopped. Audio data is flushed from buffers.

3. Video Reference should always be used.

# VCube Controlled by Sony 9-pin, Chasing an LTC Source

VCube can be controlled by Sony 9-pin while chasing an LTC source.

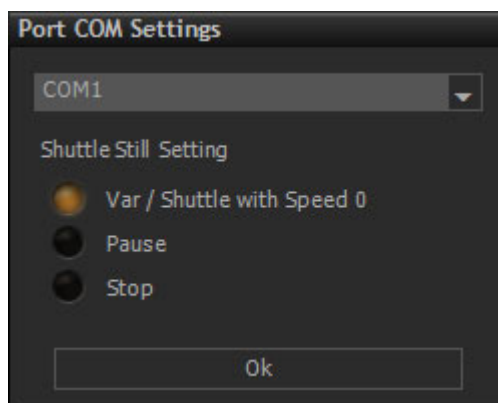
1. In the **Format & Sync Tab : Synchronization** section configure as below:



Formats & Sync Tab - Synchronization section

- Chase TC Source**                    **LTC**
- Toggle Chase**                    **Unchecked**
- Sony 9 Pin Remote Control**    **Checked**

2. Set the **COM**port required.



Port COM Settings

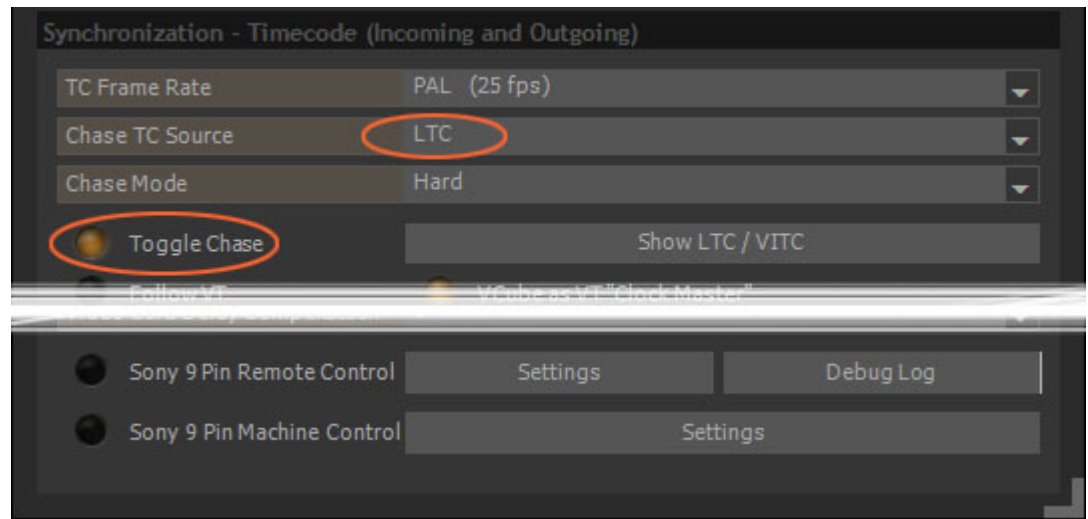
- COM1**                    Current **COM** Port. Click to drop-down a list of available COM Ports.
- Var / Shuttle with Speed 0**    When checked VCube issues a **Var / Shuttle 0 Speed** command when stopped.
- Pause**                    When checked VCube issues a **Pause** command when stopped. Audio data is retained in buffers.
- Stop**                    When checked VCube issues a **Stop** command when stopped. Audio data is flushed from buffers.

3. A Video References should always be used.

# Synchronize VCube with an LTC Source

VCube can chase an LTC source.

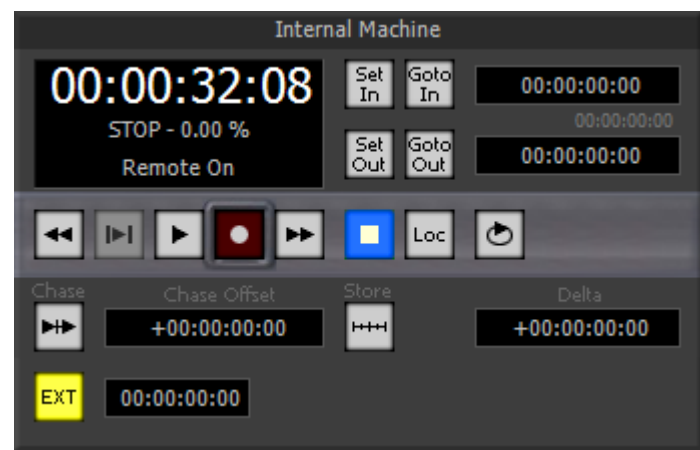
1. In the **Format & Sync Tab : Synchronization** section configure as below:



Formats & Sync Tab - Synchronization section

**Chase TC Source**                      **LTC**  
**Toggle Chase**                        **Checked**

Or set from the **Transport Tool** :



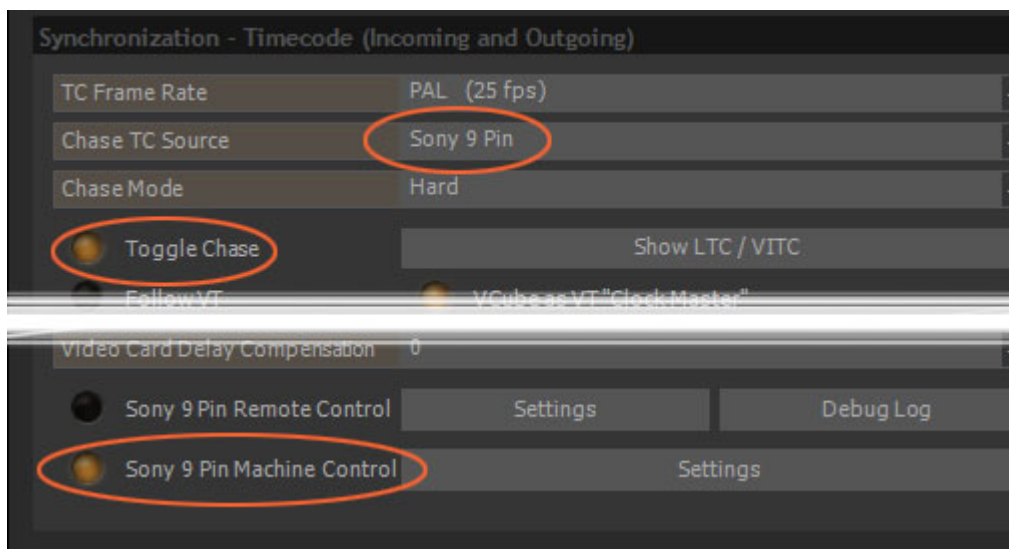
Transport Tool - Internal Machine

2. A Video Reference should always be used.

## VCube Controlling & Chasing a Sony 9-pin

VCube can remote control and chase another machine via Sony 9-pin (P2 protocol) commands. The following configuration can be used during capture:

1. In the **Format & Sync Tab : Synchronization** section configure as below:



Formats & Sync Tab - Synchronization section

<b>Chase TC Source</b>	<b>Sony 9 Pin</b>
<b>Toggle Chase</b>	<b>Checked</b>
<b>Sony 9 Pin Machine Control</b>	<b>Checked</b>

- The 9-pin machine is controlled from the VCube Transport Control Panel :



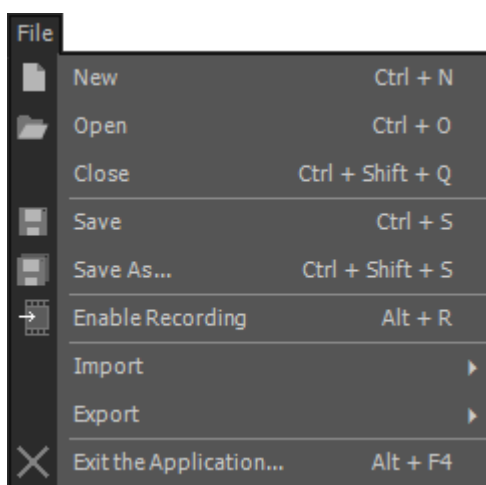
Transport Control Panel

Vcube **Chases TimeCode** from the target machine.

**Note:** Ensure that the Video Card Reference Input is referenced to the same genlock, black&burst, or video signal. This is the only way to ensure precise timing for video signal.

**Note:** The **Record** button in the **Internal Machine** control panel must be enabled **only** when **"Chasing..."** is no longer displayed in the Preview.

## File



**New**

**Open**

**Close**

**Save**

**Save As...**

**Enable Recording**

**Import>**

**Media File Browser**

**Composition (Create new)**

**Composition (Add to Existing)**

**Import Composition & Export Changes**

**Import Layer ...**

**Convert Still Images**

**Export>**

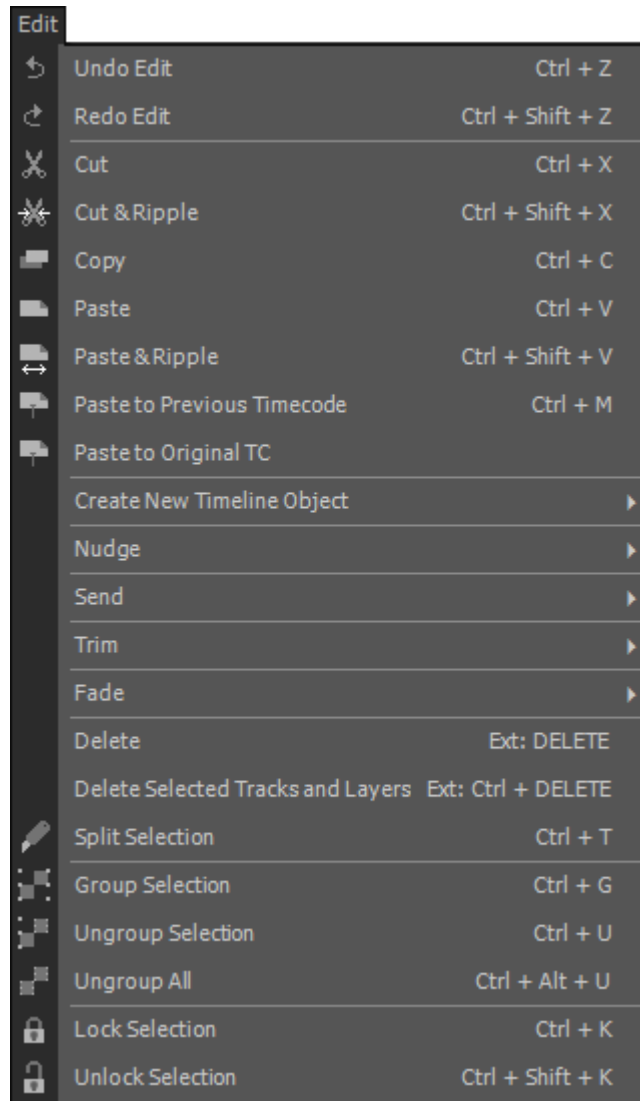
**Export Composition**

**Render Composition**

**Wrap Audio**

**Exit the Application**

# Edit



**Undo Edit**

**Redo Edit**

**Cut**

**Cut & Ripple**

**Copy**

**Paste**

**Paste & Ripple**

**Paste to Previous Timecode**

**Paste to Original Timecode**

**Create New Timeline Object>**

**New Video Track**

**New Audio Track**

**New Layer**

**New Text Clip**

**New "Sticky Memo" (Text Clip)**

**New Countdown Clip**



**New Wipe Clip**  
**New Audio Tone Clip**  
**New Video Test Pattern**

**Nudge>**

**Nudge Left**  
**Nudge Right**  
**Nudge Up**  
**Nudge Down**  
**Nudge Overwrite>**  
     **Nudge Left Overwrite**  
     **Nudge Right Overwrite**  
     **Nudge Up Overwrite**  
     **Nudge Down Overwrite**

**Tracks>**

**Nudge Up Track**  
**Nudge Down Track**

**Send>**

**Send Selection to Mark In**  
**Send Selection to Mark Out**  
**Send Selection to Cursor**  
**Send Selection to Original Timecode**

**Trim>**

**Trim Selection In to Cursor**  
**Trim Selection Out to Cursor**  
**Jog Trim Selection In to Cursor**  
**Jog Trim Selection Out to Cursor**

**Fade>**

**Fade In Selection to Cursor**  
**Fade Out Selection from Cursor**

**Delete**

**Delete Selected Tracks and Layers**

**Split Selection**

**Group Selection**

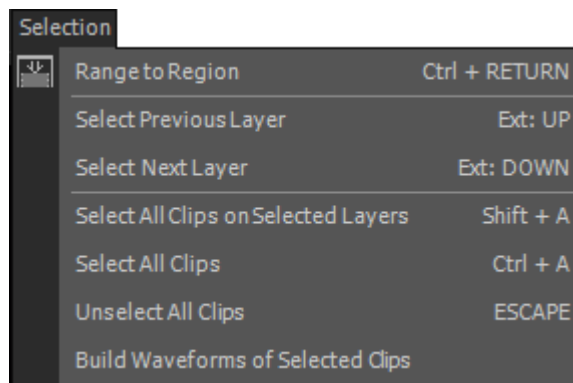
**Ungroup Selection**

**Ungroup All**

**Lock Selection**

**Unlock Selection**

## Selection



**Range to region**

**Select Previous Layer**

**Select Next Layer**

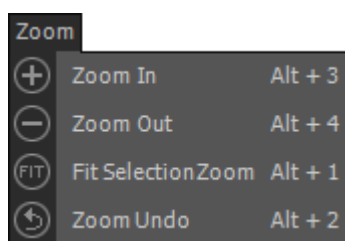
**Select All Clips on Selected Layers**

**Select All Clips**

**Unselect All Clips**

**Build Waveforms of Selected Clips**

## Zoom



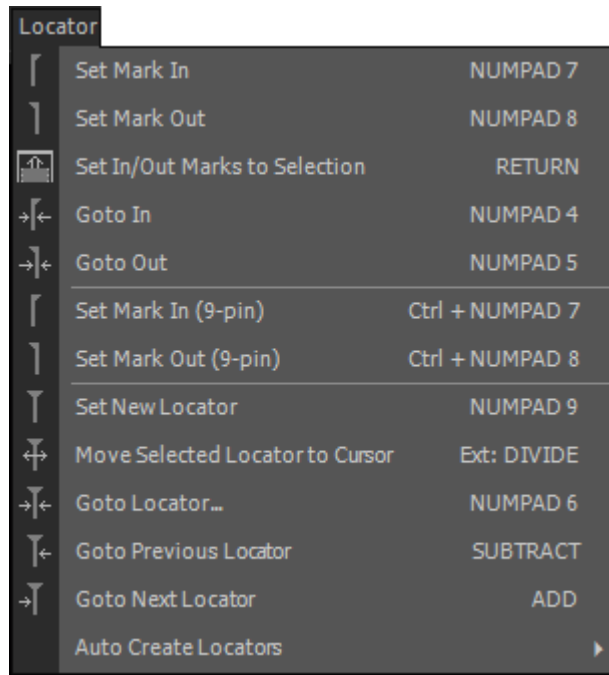
**Zoom In**

**Zoom Out**

**Fit Selection Zoom**

**Zoom Undo**

# Locator



**Set Mark In**

**Set Mark Out**

**Set In/Out Marks to Selection**

**Goto In**

**Goto Out**

**Set Mark In (9-pin)**

**Set Mark Out (9-pin)**

**Set New Locator**

**Move Selected Locator to Cursor**

**Goto Locator...**

**Goto Previous Locator**

**Goto next Locator**

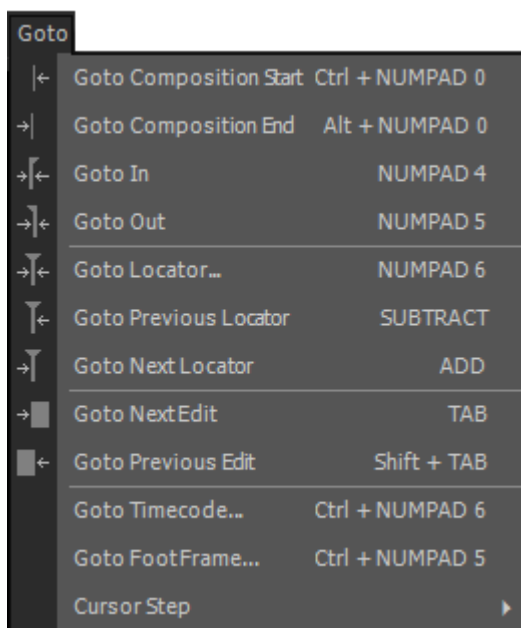
**Auto Create Locators>**

**Auto Create Locators - All layers (Destructive)**

**Auto Create Locators - Selected Layer (Destructive)**

**Auto Create Locators - Selected Layer (Add)**

# Goto



**Goto Composition Start**

**Goto Composition End**

**Goto In**

**Goto Out**

**Goto Locator...**

**Goto Previous Locator**

**Goto Next Locator**

**Goto Next Edit**

**Goto Previous Edit**

**Goto Timecode**

**Goto Foot Frame**

**Cursor Step>**

**Step Forward 1 Frame**

**Step Forward 1 Second**

**Step Forward 10 Seconds**

**Step Forward 1 Minute**

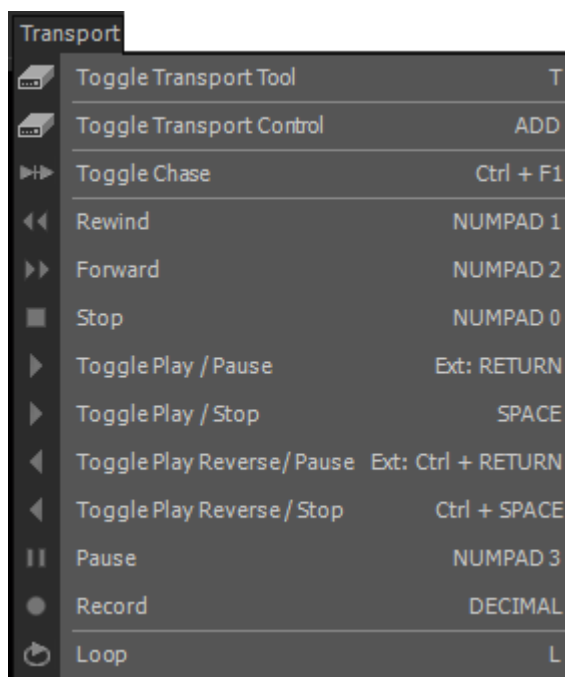
**Step Backward 1 Frame**

**Step Backward 1 Second**

**Step Backward 10 Seconds**

**Step Backward 1 Minute**

# Transport



**Toggle Transport Tool**

**Toggle Transport Control**

**Toggle Chase**

Turns Chase On/Off.

**Rewind**

**Forward**

**Stop**

**Toggle Play / Pause**

**Toggle Play / Stop**

**Toggle Play Reverse / Pause**

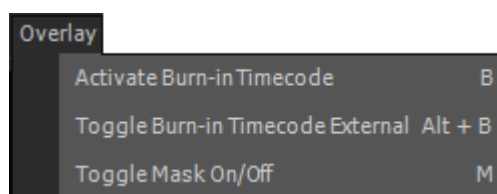
**Toggle Play Reverse / Stop**

**Pause**

**Record**

**Loop**

# Overlay






















**Activate Burn-in Timecode**

**Toggle Burn-in Timecode External**

**Toggle Mask On/Off**

# Settings

Settings		
	Quick SD Settings	Alt + F5
	Quick HD Settings	Alt + F6
	Show Record Settings Tab	Shift + R
	Show Record Log Tab	Ctrl + R
	Show Preset Tab	P
	Show Format & Sync Tab	Alt + P
	Show LTC	Ctrl + F2
	Show Video I/O Tab	Shift + Alt + P
	Show Overlay Tab	Ctrl + P
	Show Preview Tab	Ctrl + Alt + P
	Show Composition Tab	Shift + P
	Show Footage Ruler Options Dialog	Ctrl + F
	Show Buffer & Cache Tab	Ctrl + Shift + P
	Show User Interface Tab	Ctrl + Shift + Alt + P
	Show Encryption Tab	Alt + K
	Show Media Settings Tab	
	Show Timeline Tab	
	Show Isis Controller Tab	
	Show VCube Preferred Search Directories	
	Show All Settings	Ctrl + F4
	Restart in Software Only Mode	

**Quick SD Settings**

**Quick HD Settings**

**Show Record Settings Tab**

**Show Record Log Tab**

**Show Preset Tab**

**Show Format & Sync Tab**

**Show LTC**

**Show Video I/O Tab**

**Show Overlay Tab**

**Show Preview Tab**

**Show Composition Tab**

**Show Footage Ruler Options Dialog**

**Show Buffer & Cache Tab**

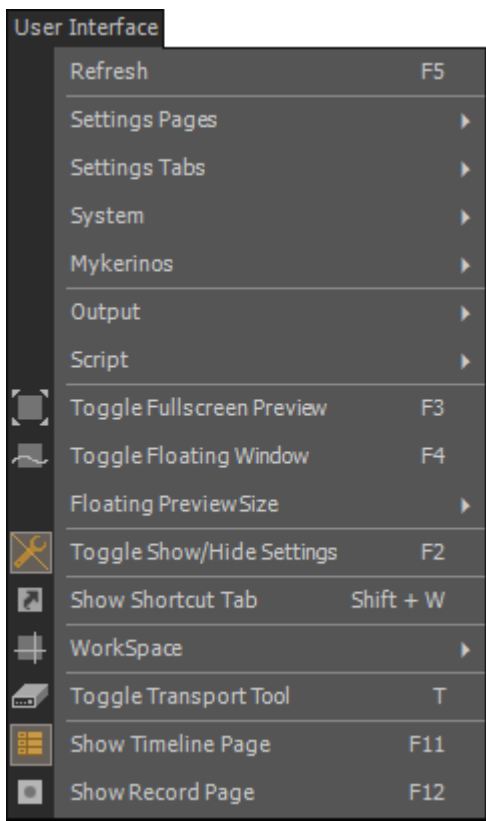
**Show User Interface Tab**

**Show Encryption Tab**

**Show Media Settings Tab**

- Show Timeline Tab
- Show Isis Controller Tab (Only present when an Isis is active)
- Show VCube Preferred Search Directories
- Show All Settings
- Restart in Software Only Mode

## User Interface



**Refresh** Updates the list of Media Files in a specific location.

### Settings Pages >

- Previous Settings Page** Steps through the **Control Settings Tab Pages** when they are displayed to the right of the Preview pane
- Next Settings Page** Steps through the **Control Settings Tab Pages** when they are displayed to the right of the Preview pane
- Show File page** Opens the **Locator Tab** pane in a floating window
- Show Locator Page** Opens the **Edit Tabs** in a floating window
- Show view Page** Opens the **View Tabs** in a floating window
- Show Edit Page** Opens the **Edit Tabs** in a floating window
- Show Settings Page** Opens the **Control Settings Tabs** in a floating window.

### Settings Tabs >

- Show Previous Settings Tab** Steps through the Tabs available in individual **Control Settings Pages**
- Show Next Settings Tab** Steps through the Tabs available in individual **Control Settings Pages**

- File>**
- Show VCube Files** Opens the **VCube Compositions** Browser in a floating Tab Window
- Show Media File Browser Tab** Opens the **Media File Browser** in a floating Tab Window

**View>**

- Show clip Info Tab
- Show Shortcut Tab
- Show Workspace Tab

**Edit>**

- Show Edit Main
- Show Clip Edit
- Show Layer Edit
- Show Track Edit

**Settings>**

- Show Preset Tab
- Show Format & Sync Tab
- Show Video I/O Tab
- Show Overlay Tab
- Show Preview Tab
- Show Composition Tab
- Show Buffer & Cache Tab
- Show user Interface Tab
- Show Isis Controller Tab
- Show Encryption Tab
- Show Media Settings Tab
- Show Timeline Tab

**System>**

- Show Windows Display Settings Dialog
- Show Virtual Transport      Redundant thanks to Virtual Transport 2

**Output>**

- Show Output Page
- Show System Tab
- Show Buffer Tab
- Show Playback Info Tab
- Show Sync Status Tab
- Show Audio Meters Tab

**Toggle Fullscreen Preview**

**Toggle Floating Window**

**Floating Preview Size>**

- Double Size
- Normal Size
- Half Size
- Quarter Size

**Toggle Show/Hide Settings**      Toggles the Control Settings Tab pane Show/Hide in the right-hand side of the Preview Pane

**Show Shortcut Tab**

**WorkSpace>**

- Load>
  - Load Workspace 1



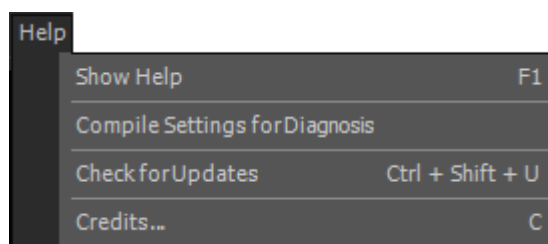
to...  
**Load Workspace 10**  
**Generate>**  
**Generate Workspace 1**  
to...  
**Generate Workspace 10**  
**UI Mode: Simple**  
**UI Mode: Advanced**

**Toggle transport Tool**

**Show Timeline Page**

**Show Record Page**

## Help



The **Help** Menu gives quick on-line access to this document.

<b>Show Help</b>	Opens this document
<b>Compile Settings for Diagnosis</b>	This function collects the Vcube registry settings from the installation for use by Merging support. This can speed up the process of understanding a bug dramatically , so please use it when reporting a bug. When the process is complete a dialog opens which offers the choice of sending the file directly on a connected computer or saving it to the desktop for attaching to an email.
<b>Check For Updates</b>	goes online to check for more recent versions of the VCube Software. (If your VCube PC is connected to the Internet.)
<b>Credits...</b>	pops up a Window with the VCube logo. Credits and version information scrolls upwards on the left-hand side.

# Output View

The **Output** Page is one of the three Tabs below the Toolbar. It can also be accessed by **[Ctrl + F7]**

This Page is intended to help expert users to fine tune their VCube configuration to suit local circumstances.

There are five Tabs:

## Output Page Diagnostic Tools

The Output page has five diagnostic monitoring pages which enable you to read the current status of different points of system resource consumption, synchronisation and audio levels and can potentially detect a "bottle-neck" which is hindering smooth and reliable playback of the most demanding HD video files.

1. **System**
2. **Buffer**
3. **Playback Info**
4. **Sync Status**
5. **Audio Meters**

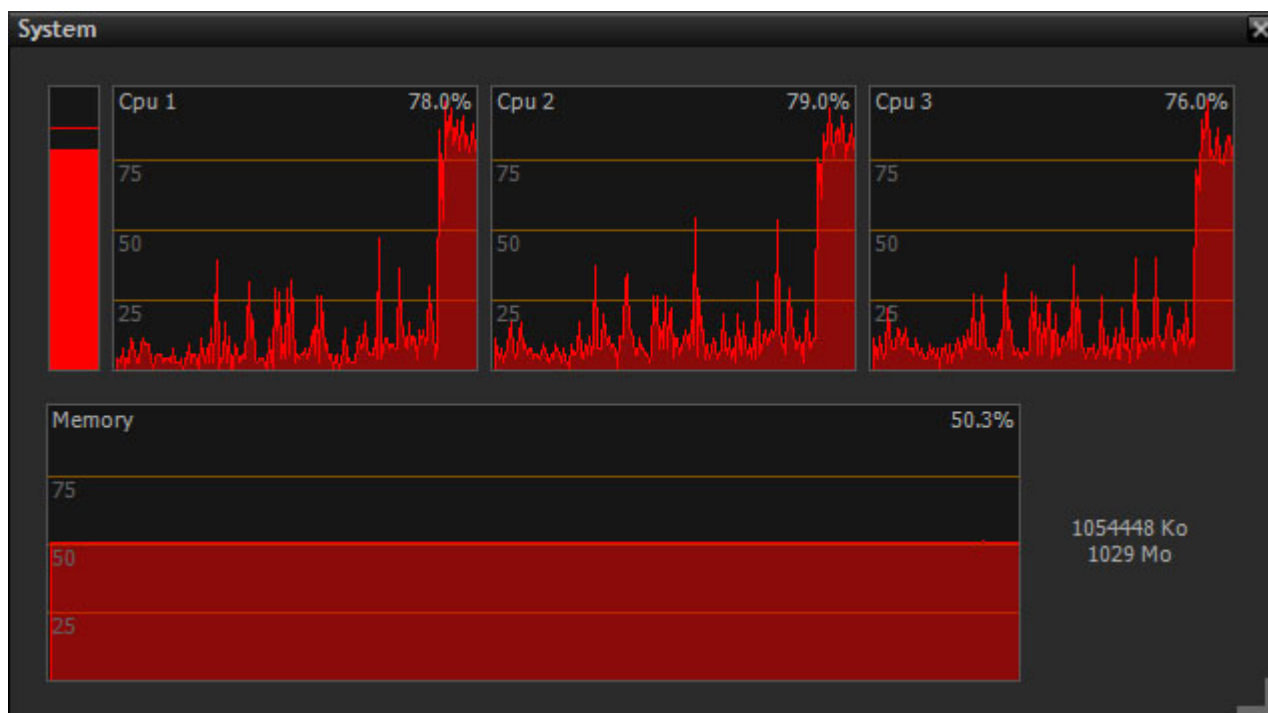
So if you encounter a file that just does not play out smoothly, or as you expect, check these diagnostic tools first in order to determine where the bottleneck or problem is so that you may find a solution such as:

1. Changing the buffering scheme of VCube
2. Moving the Media file to a faster drive
3. Replacing the Media File itself in favor of a new version encoded using a faster, more efficient codec than that used for the original encode.
4. Correcting the sync sources settings or sync source.
5. Replacing the audio Media File(s) with alternative versions.

### *System Tab*

The first diagnostic tool in the Output page is the **System Tab**. This shows a real-time graph of the overall **CPU** usage and the **Memory** consumption of VCube itself. The CPU display shows a graphical percentage plot of each

CPU core for use by VCube under Windows to the right and on the left an average percentage of all cores combined.



Output Page - System Tab

**System** displays processor and memory activity. On Pyracube systems running MassCore expect to see one or more cores maxed out. This is a function of how MassCore works and is not a matter for concern.

## CPU

In order to understand what is to be investigated while comparing the CPU consumption and the other indicators in the diagnostic tabs, it is first necessary to understand the two extremes of the HD video file scale.

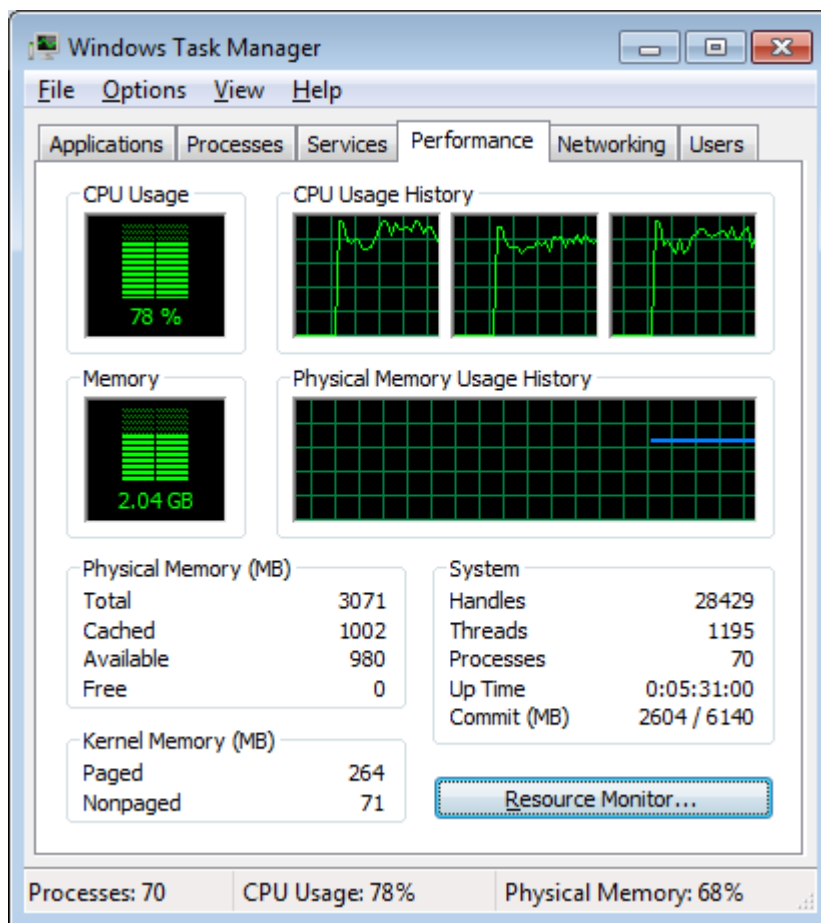
At one end of the scale is video that is encoded with a high data compression ratio and therefore uses a large amount of CPU resources at the moment of decoding but has a very small file size and therefore a reduced bit rate (requiring less disk performance). At the other extreme are totally uncompressed (**RGB, YCrCb, YCbCr**) type video formats that require almost no CPU usage (due to the absence of decoding) but require huge amounts of disk data throughput do to extreme bit rates.

So if your CPU is exceeding 100% while playing a certain file, the file is most likely highly data compressed or encoded with a codec that is too CPU intensive for your system. Try increasing the Playback Buffer or use a file that is encoded with a lower data compression ratio (higher bit rate) or encoded with a different and more efficient codec altogether.

## Memory

Below the CPU graphs is a graph showing the estimated memory consumption of VCube. This memory consumption graph does not include the other processes running under Windows so it is good to compare the memory consumption graphs of the **Windows Task Manager** under the **Performance** tab with that of VCube for compari-

son purposes. To access the Windows Task Manager key **Ctrl + Shift + Esc** (or **Ctrl + Alt + Del** and choose **Start Task Manager**) and click on the **Performance** tab.



Windows Task Manager - Performance Tab

Memory consumption is critical in any system and VCube can potentially consume large amounts of memory depending on three main factors:

1. Resolution and frame rate of the VCube Timeline.
2. Number of Frames set in the Playback Buffer (**Settings** Page : **Buffer & Cache**).
3. The codec used to encode the video file in question.
4. The number of Clips playing simultaneously in the Timeline at any given moment

**Warning:** The system memory consumption should be kept as low as possible and never exceed approximately 75-80% of the total amount of RAM installed in the system. This is especially critical in 32-bit versions of Windows as only the first 3 gigabytes of RAM are actually addressable by Windows and therefore VCube should never take so much of the RAM for itself as to hinder Pyramix and Windows itself. Exceeding the 80% mark of memory consumption for any reason can render any system unresponsive and even critically unstable.

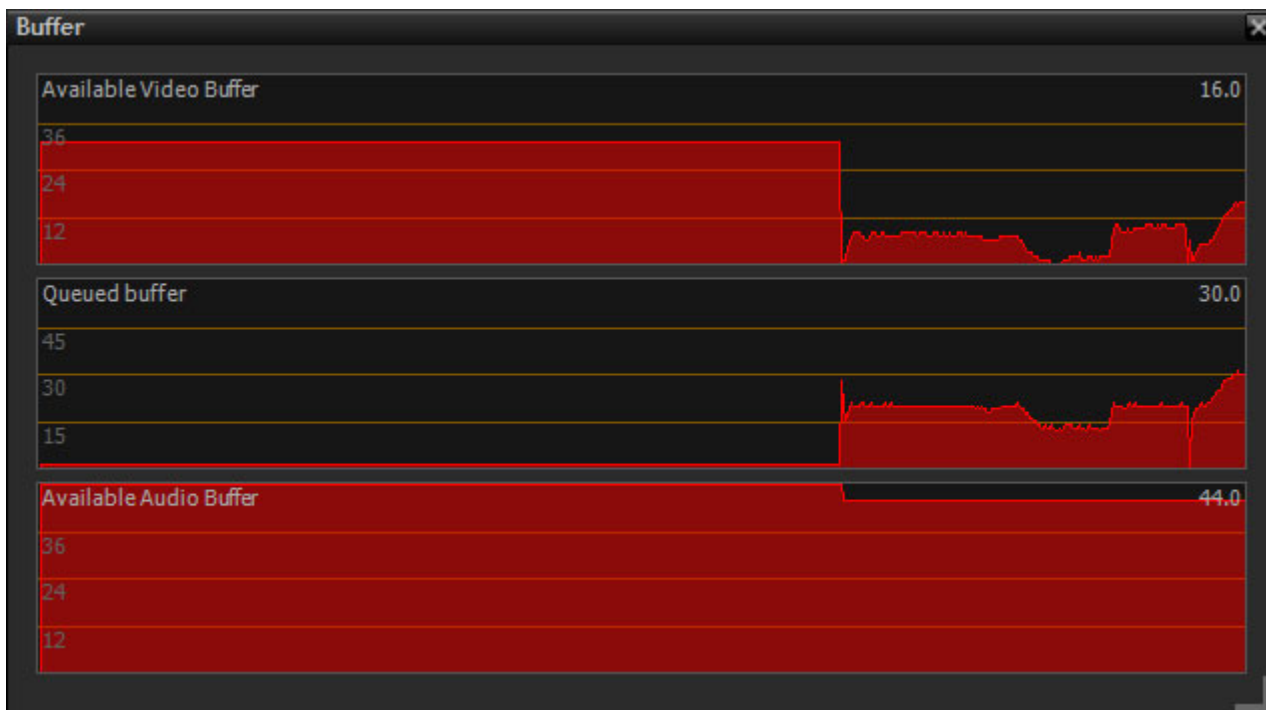
The Playback buffer can be either an ally or an enemy in cases where HD video files do not seem to playback well. Increasing the Number of Frames in the Buffer helps to remedy playback stalls but increases the memory consumption footprint of VCube proportionally leaving less memory for Pyramix and Windows.

When determining what the optimum size should be, begin with the default value of **7** Frames and increase the number of Frames incrementally until playback is satisfactory whilst keeping an eye on memory consumption during playback. There is no point pushing the buffer to an excessive value in the hope that you will have smooth playback all the time if it means sacrificing precious memory elsewhere and causing the system to become unstable. For this reason keep the buffers as small as possible without stalling. If an increase in Playback Buffer size does not remedy playback stalls then investigate further to determine if your media volume is adequately outputting media to VCube or use a smaller more efficient version of the HD video encoded in a different format or at a different bit rate.

## Buffer Tab

The Buffer tab shows three graphical plots:

1. **Available Video Buffer**
2. **Queued Buffer**
3. **Available Audio Buffer**



Output Page - Buffers Tab

All three of these graphs show a direct correlation of the scale of available buffer resources in relation to the **Playback Buffer** frame size. Raising or lowering the number of frames in the buffer also raises or lowers the scales of the graphs. The **Available Video Buffer** and **Available Audio Buffer** scales are subtractive and the red line is lower as the buffers are used in playback while the **Queued Buffer** graph is additive and rises to show the overall headroom of both the Video and Audio buffers. None of the three buffers should ever bottom out during playback. If they do this indicates a stall in the system due either to a CPU problem, a data throughput problem from the Media Volume to the playback engine or even possibly a PCI(e) bus problem on the Motherboard due to a saturation of activity in the system (although this is rare).

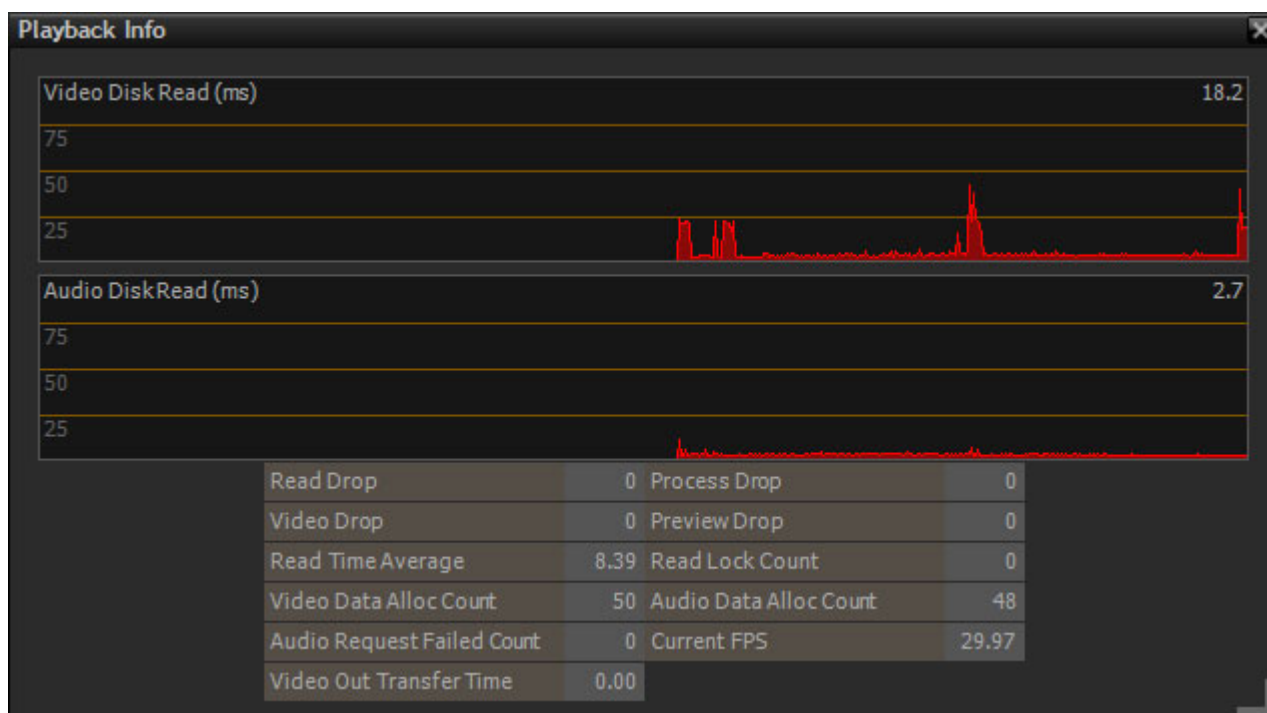
The Buffers should remain relatively flat and stable without bottoming out so, once again, watch for dips in buffers and adjust the Number of Frames in the Playback Buffer accordingly without over consuming system memory.

## Playback Info Tab

The **Playback Info** tab shows two graphical plots with **Video Disk Read (ms)** and **Audio Disk Read (ms)** timings and 11 individual diagnostic numeric value boxes. The principal indicators, which are relevant to VCube Essentials and therefore that will be explained here, are:

1. **Video Disk Read** graph
2. **Audio Disk Read** graph
3. **Read Drop** counter
4. **Read Time Average**
5. **Preview Drop** counter
6. **Current FPS**

## Playback Info



Output Page - Playback Info Tab

**Note:** The remaining counters not listed above either only apply to systems which include an AJA® video board or are not helpful in determining the cause of poor playback.

### Video and Audio Disk Read graphs

The **Video** and **Audio Disk Read** graphs show the delays between the moment a media frame is requested from a disk volume and the moment it is available for use by VCube. These graphs therefore show the transfer time before the media is decoded and placed into the **Playback Buffer**. So the number of Frames in the buffer itself has no bearing on this information. As the bit-rate of the media increases so will the time it takes to read it from a disk volume. The overall transfer time in milliseconds, displayed in the upper right corners of each graph as well as plotted out in red, should never exceed the delay in milliseconds of the duration of one frame of video of the current VCube playback engine. Just to be on the safe side it should even be considered that a safe ratio of Disk Read delay to a single frame of video should be about half that of the time of a single frame to allow for occasional media volume transfer bottlenecks. These bottlenecks may occur in very short periods of time but must never exceed the remaining number of frames in the Playback Buffer. That is what the Playback Buffer is there for.

Here is a quick table to show the length of a single frame of video in milliseconds for each major frame rate and the subsequent approximate target Disk Read delays that should give reliable play out performance.

Frame rate	Milliseconds	Safe Delay
24	41.67	20.83-30
25	40	20-30
29.97	33.37	16.68-28

If the **Disk Read** delays systematically exceed the safe delay values then the Buffer will quickly empty out causing stalling and skipped frames during playback.

**Remedy:** Use higher performance disk volumes that transfer the media files uninterrupted and fast enough for VCube to process them and put them into the Play Buffer continuously or use a Media File with a lower bit rate.

## Read Drop Counter

The **Read Drop** Counter shows a continuous display of how many frames of video were dropped (due to insufficient throughput of the media volume to the VCube playback engine) during a single playback pass. If the raw media data arrives late to VCube because the disks are too slow, then VCube does not even have a chance to process them.

**Note:** Stopping and restarting playback resets the values in all the counters so consult them during playback.

## Read Time Average

The **Read Time Average** shows the delay of processed video frames (post playback engine) from disk-to-Playback Engine to the Playback Buffer. This value must never exceed the Safe Delay values listed above for a succession of frames larger than the size of the Number of Frames in the Playback Buffer. If it does the result is a playback stall.

## Preview Drop Counter

The **Preview Drop** counter shows the number of frames dropped in the VCube Preview Window running on the display engine of the computers graphic board (as opposed to video frames dropped on the AJA board shown in the **Video Drop** counter). When in doubt as to if VCube is dropping frames, consult this counter during playback. It is also displayed at the lower left-hand side of the VCube interface **Drop=0**.

## Current FPS

The **Current FPS** counter shows the real-time frame rate per second of the VCube playback engine. If this value varies after the initial lock cycle of VCube is established then VCube has detected a drift in the playback speed. This is most likely due to a problem between the lock reference of VCube and the incoming TimeCode value. It may also be due to a conflict between the frame rate of VCube and that of Pyramix or Virtual Transport.

**Remedy:** Verify that all three are running at the same frame.

### **Note: Buffer & Cache Tab**

The **Buffer and Cache** Tab located on the **Settings** Page is crucial to the proper setup of VCube and, as discussed in the previous section, must be carefully adjusted for the type of Media being played back by VCube.

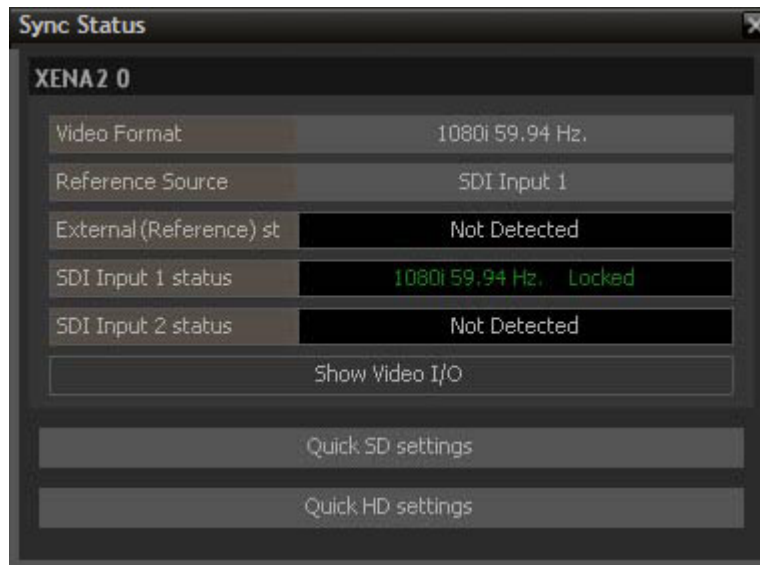
It has been found that the best general default parameters are:

1. Start with a Buffer value of **7** for SD picture and **15** for HD picture
2. Deactivate all four of the read and write caches and restart VCube for the cache changes to take effect.

Adjustments may be made to facilitate certain HD files that prove to be problematic during playback but the Buffer itself should be gradually increased and not just set to it's maximum value at all times which (like any buffer) may seriously hinder the performance and reliability of the system by consuming excessive amounts of precious RAM, especially on a 32-bit operating system.

**Note:** The Multi Thread Seeking button has negligible effect due to the vast improvements in IT hardware in general since the introduction of VCube v1.0 and may be left off.

## Sync Status

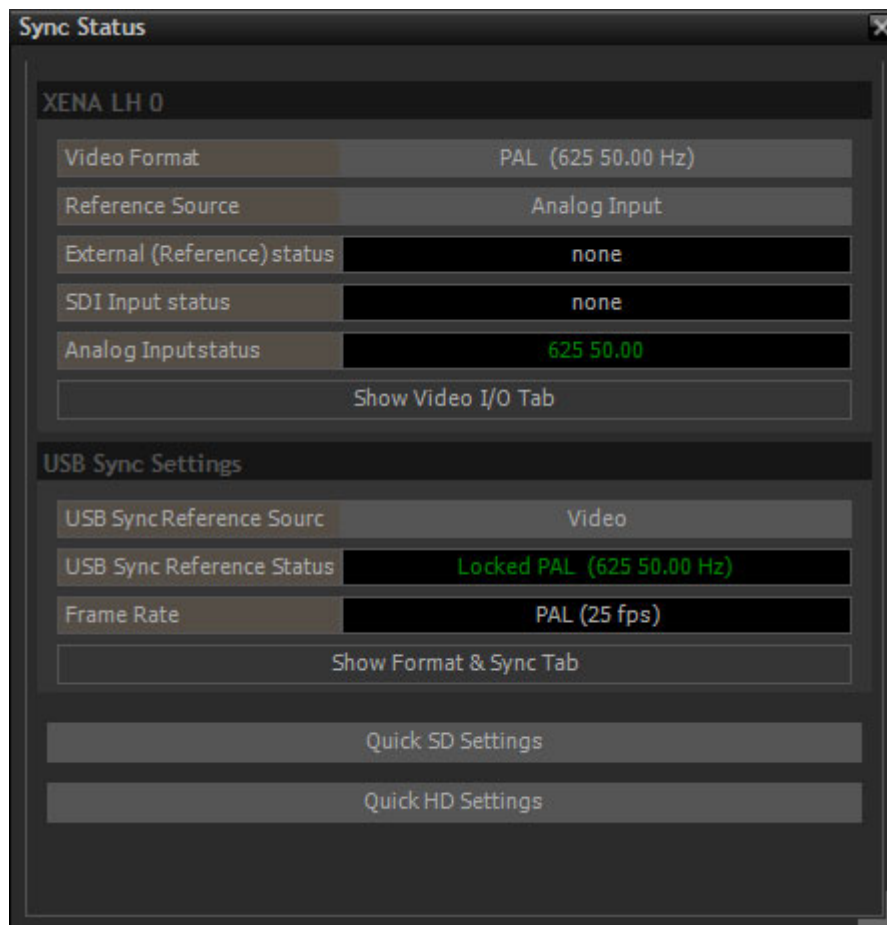


Output Page - Sync Status

Shows all video, audio, synchronization and clock status. This panel also appears when clock, format or sync are inconsistent. The mismatched parameter flashes red until a valid setting is made whereupon it changes to green.

**Note:** The devices displayed depend on what you have installed on the system.

### Sync Status with XENA LH and USB Sync Option

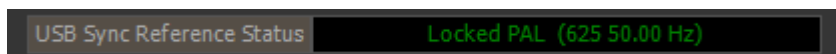


Output Page - Sync Status

If the USB Sync Reference Source is Video, one of the following statuses is possible :



- Locked to the Video:



- Locked to the Video but the framerate is incompatible with the video framerate:



- No video present or video is not decoded:



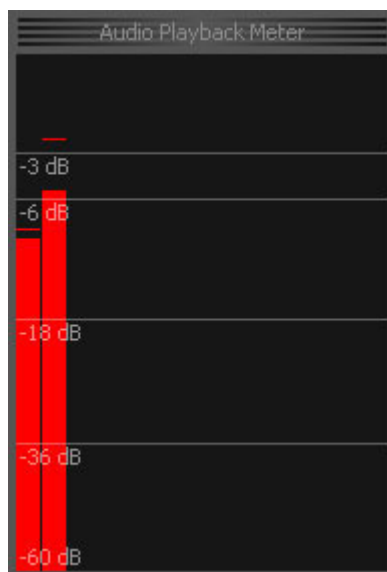
If the reference source is Internal :



If the reference source is LTC :



### Audio Meters



Output Page - Audio Meters

Shows audio Playback levels.

# Troubleshooting

For troubleshooting advice please see the Merging Technologies website.

<http://www.merging.com/products/vcube/downloads>

## Default Shortcuts

	<b>Shortcut</b>
<b>File</b>	
<b>New</b>	<b>Ctrl + N</b>
<b>Load</b>	<b>Ctrl + L</b>
<b>Easy Load</b>	<b>Shift + L</b>
<b>Load Selective</b>	<b>Ctrl + Shift + L</b>
<b>Show VCube Files</b>	<b>Ctrl + O</b>
<b>Close</b>	<b>Ctrl + Shift + Q</b>
<b>Delete</b>	<b>Ext: + Shift + DELETE</b>
<b>Save</b>	<b>Ctrl + S</b>
<b>Save As</b>	<b>Ctrl + Shift + S</b>
<b>Capture</b>	<b>Alt + R</b>
<b>Exit the Application...</b>	<b>Alt + F4</b>
<b>Import</b>	
<b>Media Files</b>	<b>Ctrl + Shift + O</b>
<b>OMF, MXF, AAF, Apple XML Import (Create New)</b>	<b>Alt + O</b>
<b>Import Composition &amp; Export Changes</b>	
<b>Import Layer</b>	<b>Ctrl + Alt + L</b>
<b>Convert Still Images</b>	<b>Ctrl + I</b>
<b>Export</b>	
<b>Export Composition</b>	
<b>Render Composition</b>	<b>Ctrl + R</b>
<b>Wrapper</b>	
<b>Edit</b>	
<b>Undo</b>	<b>Ctrl + Z</b>
<b>Redo</b>	<b>Ctrl + Shift + Z</b>
<b>Cut</b>	<b>Ctrl + X</b>
<b>Cut &amp; Ripple</b>	<b>Ctrl + Shift + X</b>
<b>Copy</b>	<b>Ctrl + C</b>
<b>Paste</b>	<b>Ctrl + V</b>
<b>Paste &amp; Ripple</b>	<b>Ctrl + Shift + V</b>
<b>Paste at Previous TimeCode</b>	<b>Ctrl + M</b>
<b>Paste at Original TC</b>	
<b>Delete Selected</b>	<b>Ext: DELETE</b>
<b>Delete Track(s) or Layer(s)</b>	<b>Ext: Ctrl + DELETE</b>
<b>Split Clip(s)</b>	<b>Ctrl + T</b>
<b>Group</b>	<b>Ctrl + G</b>
<b>UnGroup</b>	<b>Ctrl + U</b>
<b>UnGroup All</b>	<b>Ctrl + Alt + U</b>

<b>Lock Selected Clips</b>	<b>Ctrl + K</b>
<b>UnLock Selected Clips</b>	<b>Ctrl + Shift + K</b>
<b>Add</b>	
<b>New Video Track</b>	<b>Ctrl + Shift + T</b>
<b>New Audio Track</b>	<b>Ctrl + Alt + T</b>
<b>New Layer</b>	<b>Ctrl + Shift + N</b>
<b>New Text Clip</b>	<b>Shift + T</b>
<b>New Post-it (Text Clip)</b>	<b>Alt + T</b>
<b>New Countdown Clip</b>	
<b>New Wipe Clip</b>	
<b>New Audio Tone Clip</b>	
<b>New Video Test Pattern Clip</b>	
<b>Nudge</b>	
<b>Nudge to Left</b>	<b>Ext: Ctrl + LEFT</b>
<b>Nudge to Right</b>	<b>Ext: Ctrl + RIGHT</b>
<b>Nudge Up</b>	<b>Ext: Ctrl + UP</b>
<b>Nudge Down</b>	<b>Ext: Ctrl + DOWN</b>
<b>Nudge Override</b>	
<b>Nudge to Left Override</b>	<b>Ext: + Shift + LEFT</b>
<b>Nudge to Right Override</b>	<b>Ext: + Shift + RIGHT</b>
<b>Nudge Up Override</b>	<b>Ext: + Shift + UP</b>
<b>Nudge Down Override</b>	<b>Ext: + Shift + DOWN</b>
<b>Tracks</b>	
<b>Nudge Up Track</b>	<b>Ext: Ctrl + Shift + UP</b>
<b>Nudge Down Track</b>	<b>Ext: Ctrl + Shift + DOWN</b>
<b>Selection</b>	
<b>Range To Region</b>	<b>Ctrl + RETURN</b>
<b>Select Previous Layer</b>	<b>Ext: UP</b>
<b>Select Next Layer</b>	<b>Ext: DOWN</b>
<b>Select All Clips on Selected Layers</b>	<b>Shift + A</b>
<b>Select All Clips</b>	<b>Ctrl + A</b>
<b>UnSelect All Clips</b>	<b>Esc</b>
<b>Zoom</b>	
<b>Zoom In</b>	<b>Alt + 3</b>
<b>Zoom Out</b>	<b>Alt + 4</b>
<b>Zoom All</b>	<b>Alt + 1</b>
<b>Zoom Undo</b>	<b>Alt + 2</b>
<b>Locators</b>	
<b>Set mark In</b>	<b>NUMPAD 7</b>
<b>Set mark Out</b>	<b>NUMPAD 8</b>
<b>Set Mark I/O From Selection</b>	<b>RETURN</b>
<b>Go to In</b>	<b>NUMPAD 4</b>
<b>Go to Out</b>	<b>NUMPAD 5</b>
<b>Set Locator</b>	<b>NUMPAD 9</b>
<b>Set Locator at Cursor</b>	<b>Ext: DIVIDE</b>
<b>Go to Locator</b>	<b>NUMPAD 6</b>

<b>Go to Previous Locator</b>	<b>SUBTRACT</b>
<b>Go to Next Locator</b>	<b>ADD</b>
<b>Add</b>	
<b>Auto Create Locators All Layers</b>	<b>Ctrl + Alt + NUMPAD 9</b>
<b>Auto Create Locators on Selected Layer</b>	<b>Alt + NUMPAD 9</b>
<b>Auto Create Locators on Selected Layer (Add)</b>	<b>Ctrl + NUMPAD 9</b>
<b>Go to</b>	
<b>Goto Composition Start</b>	<b>Ctrl + NUMPAD 0</b>
<b>Goto Composition End</b>	<b>Alt + NUMPAD 0</b>
<b>Go to In</b>	<b>NUMPAD 4</b>
<b>Go to Out</b>	<b>NUMPAD 5</b>
<b>Go to Locator</b>	<b>NUMPAD 6</b>
<b>Go to Previous Locator</b>	<b>SUBTRACT</b>
<b>Go to Next Locator</b>	<b>ADD</b>
<b>Goto Next Edit</b>	<b>TAB</b>
<b>Goto Previous Edit</b>	<b>Shift + TAB</b>
<b>GoToTC</b>	<b>Ctrl + NUMPAD 6</b>
<b>Goto Foot</b>	<b>Ctrl + NUMPAD 5</b>
<b>Step</b>	
<b>Step Forward 1 frame</b>	<b>Ext: RIGHT</b>
<b>Step Forward 1 second</b>	<b>Ext: + Alt + RIGHT</b>
<b>Step Forward 10 seconds</b>	<b>Ext: Ctrl + Alt + RIGHT</b>
<b>Step Forward 1 minute</b>	<b>Ext: + Shift + Alt + RIGHT</b>
<b>Step Backward 1 frame</b>	<b>Ext: LEFT</b>
<b>Step Backward 1 second</b>	<b>Ext: + Alt + LEFT</b>
<b>Step Backward 10 seconds</b>	<b>Ext: Ctrl + Alt + LEFT</b>
<b>Step Backward 1 minute</b>	<b>Ext: + Shift + Alt + LEFT</b>
<b>Transport</b>	
<b>Show / Hide Transport Frame</b>	<b>T</b>
<b>Chase Enable</b>	<b>Ctrl + F1</b>
<b>Rewind</b>	<b>NUMPAD 1</b>
<b>Forward</b>	<b>NUMPAD 2</b>
<b>Stop</b>	<b>NUMPAD 0</b>
<b>Toggle Play / Pause</b>	<b>Ext: RETURN</b>
<b>Toggle Play / Stop</b>	<b>SPACE</b>
<b>Toggle Play Reverse / Pause</b>	<b>Ext: Ctrl + RETURN</b>
<b>Toggle Play Reverse / Stop</b>	<b>Ctrl + SPACE</b>
<b>Pause</b>	<b>NUMPAD 3</b>
<b>Record</b>	<b>DECIMAL</b>
<b>Loop</b>	<b>L</b>
<b>Overlay</b>	
<b>Toggle Burn In Timecode</b>	<b>B</b>
<b>Toggle External TC</b>	<b>Alt + B</b>
<b>Toggle Mask On/Off</b>	<b>M</b>

<b>Settings</b>	
<b>Show Quick Settings for SD video formats</b>	<b>Alt + F5</b>
<b>Show Quick Settings for HD video formats</b>	<b>Alt + F6</b>
<b>Show Settings Preset</b>	<b>P</b>
<b>Show Format &amp; Synchro Settings</b>	<b>Alt + P</b>
<b>Show LTC / VITC Settings</b>	<b>Ctrl + F2</b>
<b>Show Video I/O</b>	<b>Shift + Alt + P</b>
<b>Show Overlay Settings</b>	<b>Ctrl + P</b>
<b>Show Preview Settings</b>	<b>Ctrl + Alt + P</b>
<b>Show Composition Settings</b>	<b>Shift + P</b>
<b>Show Disk Cache &amp; Playback Buffer Settings</b>	<b>Ctrl + Shift + P</b>
<b>Show User Interface Settings</b>	<b>Ctrl + Shift + Alt + P</b>
<b>Show Isis Settings</b>	
<b>Show Encryption Settings</b>	<b>Alt + K</b>
<b>Show Media Settings</b>	
<b>Show Timeline Settings</b>	
<b>Show VCube Preferred Search Directories</b>	
<b>Show All Settings</b>	<b>Ctrl + F4</b>
<b>Toggle VCube version</b>	
<b>User-Interface</b>	
<b>Refresh</b>	<b>F5</b>
<b>Simple Mode</b>	<b>Alt + F1</b>
<b>Advanced Mode</b>	<b>Alt + F3</b>
<b>Show / Hide Transport Frame</b>	<b>T</b>
<b>Show Timeline</b>	<b>F11</b>
<b>Show Record Page</b>	<b>F12</b>
<b>Page</b>	
<b>Previous Page</b>	<b>Ext: HOME</b>
<b>Next Page</b>	<b>Ext: END</b>
<b>Show Files Page</b>	<b>F6</b>
<b>Show Locators Page</b>	<b>F7</b>
<b>Show View Page</b>	<b>F8</b>
<b>Show Edit Page</b>	<b>F9</b>
<b>Show Settings Page</b>	<b>F10</b>
<b>Folder</b>	
<b>Show Prior Folder</b>	<b>Ext: PRIOR</b>
<b>Show Next Folder</b>	<b>Ext: NEXT</b>
<b>File</b>	
<b>Show VCube Files</b>	<b>Ctrl + O</b>
<b>Show OMF Import</b>	<b>Shift + O</b>
<b>Show Media Files</b>	<b>Ctrl + Shift + O</b>
<b>View</b>	
<b>Show Clip Info</b>	<b>Ctrl + W</b>
<b>Show Shortcuts</b>	<b>Shift + W</b>

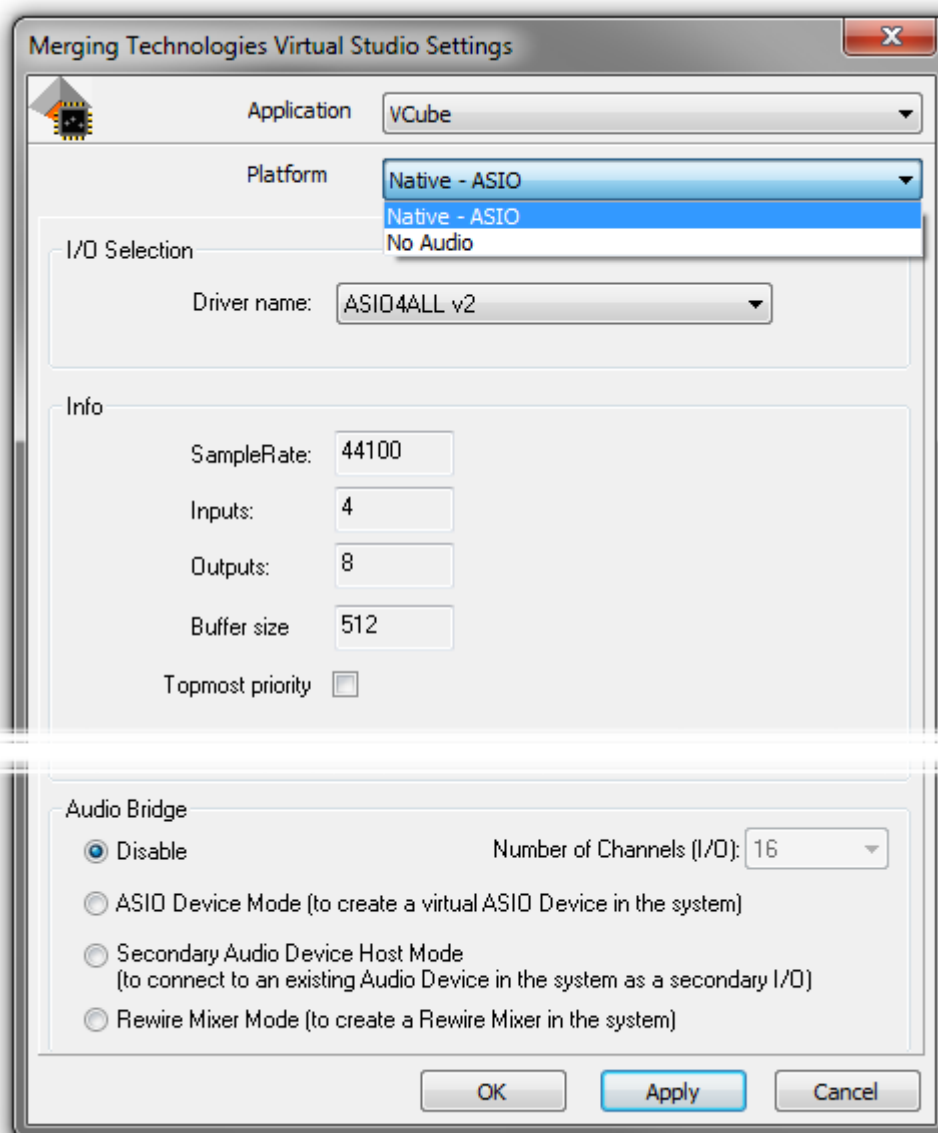
<b>Show Workspaces</b>	<b>Alt + W</b>
<b>Edit</b>	
<b>Show Edit Main</b>	<b>Ctrl + D</b>
<b>Show Clip Edit</b>	<b>Shift + D</b>
<b>Show Layer Edit</b>	<b>Alt + D</b>
<b>Show Track Edit</b>	<b>Ctrl + Shift + D</b>
<b>Settings</b>	
<b>Show Settings Preset</b>	<b>P</b>
<b>Show Format &amp; Sync Settings</b>	<b>Alt + P</b>
<b>Show Video I/O</b>	<b>Shift + Alt + P</b>
<b>Show Overlay Settings</b>	<b>Ctrl + P</b>
<b>Show Preview Settings</b>	<b>Ctrl + Alt + P</b>
<b>Show Composition Settings</b>	<b>Shift + P</b>
<b>Show Disk Cache &amp; Playback Buffer Settings</b>	<b>Ctrl + Shift + P</b>
<b>Show User Interface Settings</b>	<b>Ctrl + Shift + Alt + P</b>
<b>System</b>	
<b>Show Windows Display Settings Dialog</b>	<b>D</b>
<b>Show Virtual Transport</b>	<b>Alt + V</b>
<b>Output</b>	
<b>Show Output Page</b>	<b>Ctrl + F7</b>
<b>Show System Output</b>	<b>Ctrl + F8</b>
<b>Show Buffers Output</b>	<b>Ctrl + F9</b>
<b>Show Playback Infos Output</b>	<b>Ctrl + F10</b>
<b>Show Sync Status Output</b>	<b>Ctrl + F11</b>
<b>Show Playback Monitor Output</b>	<b>Ctrl + F12</b>
<b>Script</b>	
<b>Show Script Page</b>	<b>Ctrl + F6</b>
<b>Toggle Fullscreen Preview</b>	<b>F3</b>
<b>Toggle Floating Window</b>	<b>F4</b>
<b>Toggle Show/Hide Settings</b>	<b>F2</b>
<b>Show Shortcuts</b>	<b>Shift + W</b>
<b>UIWorkSpacesGroup</b>	
<b>Load Workspace 1</b>	<b>Shift + 1</b>
<b>Load Workspace 2</b>	<b>Shift + 2</b>
<b>Load Workspace 3</b>	<b>Shift + 3</b>
<b>Load Workspace 4</b>	<b>Shift + 4</b>
<b>Load Workspace 5</b>	<b>Shift + 5</b>
<b>Load Workspace 6</b>	<b>Shift + 6</b>
<b>Load Workspace 7</b>	<b>Shift + 7</b>
<b>Load Workspace 8</b>	<b>Shift + 8</b>
<b>Load Workspace 9</b>	<b>Shift + 9</b>
<b>Load Workspace 10</b>	<b>Shift + 0</b>
<b>Generate Workspace 1</b>	<b>Ctrl + 1</b>

<b>Generate WorkSpace 2</b>	<b>Ctrl + 2</b>
<b>Generate WorkSpace 3</b>	<b>Ctrl + 3</b>
<b>Generate WorkSpace 4</b>	<b>Ctrl + 4</b>
<b>Generate WorkSpace 5</b>	<b>Ctrl + 5</b>
<b>Generate WorkSpace 6</b>	<b>Ctrl + 6</b>
<b>Generate WorkSpace 7</b>	<b>Ctrl + 7</b>
<b>Generate WorkSpace 8</b>	<b>Ctrl + 8</b>
<b>Generate WorkSpace 9</b>	<b>Ctrl + 9</b>
<b>Generate WorkSpace 10</b>	<b>Ctrl + 0</b>
<b>Help</b>	
<b>Show Help</b>	<b>F1</b>
<b>Credits...</b>	<b>C</b>



## VS3 Control Panel

The **VS3 Control Panel** is a separate application. It can be found in **Start > All Programs > Merging Technologies > VS3 Runtime**. It must be used to select and set up the Audio Engine before launching VCube or to change the Audio Engine.



VS3 Control Panel

- Application** In a system with a Pyramix in addition to VCube choose **VCube** from the drop-down list.
- Platform** The drop-down list will contain options for all ASIO devices on the system, (Mass-Core)RAVENNA if installed and No Audio. Select the desired output Audio Engine from the list.
- I/O Selection** Select the appropriate Driver from the drop-down list.
- Info** Keep the default settings here.
- Audio Bridge** If you are using an ASIO device choose **ASIO Device Mode**.

Click on **OK** to apply the settings and close the dialog. When the VS3 panel Do you want to save routing? dialog box appears, click on **OK**.

## VCube Hardware Sync Connections

A VCube chassis is equipped with these sync connections.

- LTC In                    XLR
- LTC Out                 XLR
- 75 ohm switch        Terminates the Video Reference Input
- Video Ref In          BNC Ref / VITC
- Video Ref Out        BNC Ref / VITC
- Audio Word Clock In / Out BNC
- RS-422 Config switch
- RS-422 In / Out     9-pin D-Sub

### 15.1 Connections for synchronization

#### RS-422

The switch labelled **To Machine** and **From Controller** helps to configure this port correctly depending on what is connected to it.

**To Machine** means that VCube will control an external Machine

**From Controller** means that an external controller will control VCube.

This connection is used by the Sony 9-pin (P2) protocol.

**COM 3 (COM 2** on early VCubes) is the designation of this port in the **Sony 9-pin Machine Control** and **Sony 9-pin Remote Control Settings** dialogs.

#### Video Reference Out and Video Reference In

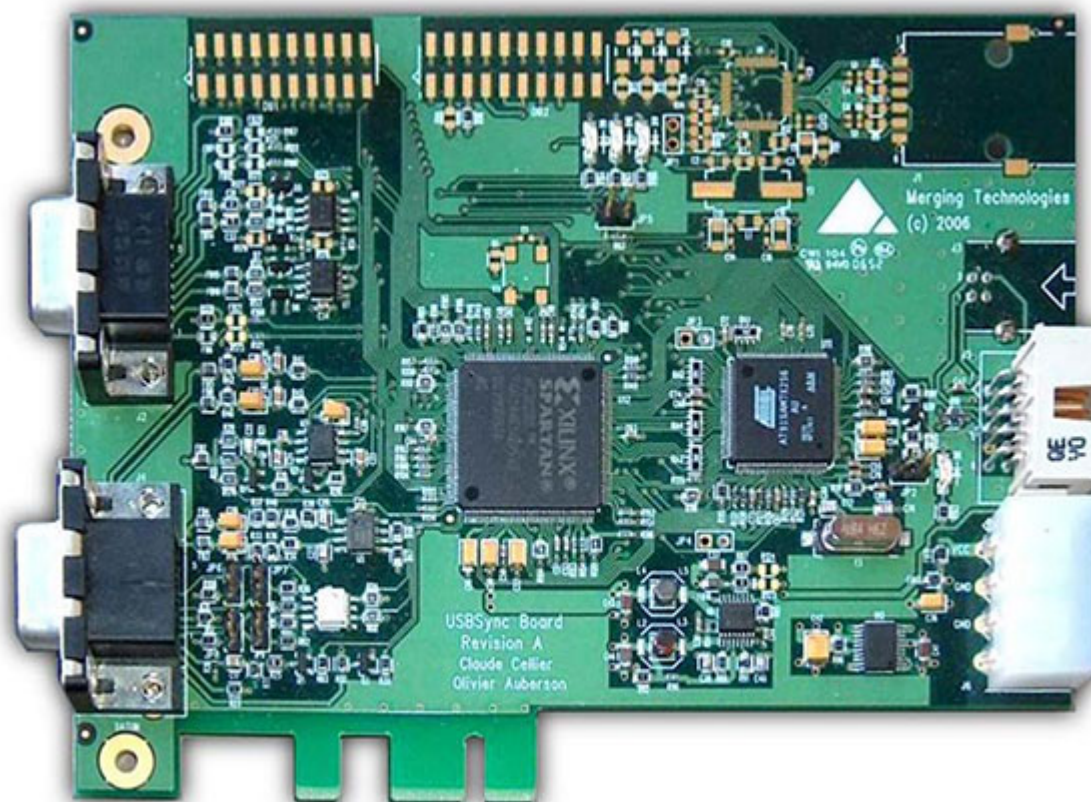
A switch enables/disables the 75 Ohms termination for the incoming video signal.

**Note:** A Video Reference should be present on the **Video Reference Input** to enable the VCube to generate a VITC output on the **Video Ref Output** connector.

## USB Sync Board Option

VCube SE, XE, and LE require a dedicated hardware (PRO Option) to support RS-422, LTC, MIDI or optional Bi Phase-synchronization.

This Bi-Phase option is also supported by VCube turnkey systems.



Merging Technologies USB Sync board

The card can be inserted in a PCI or PCIe slot. There are no electrical connections to the slot. An internal USB cable makes the connection to the motherboard.

### External Connections

#### 9-pin D-Sub Connector

**RS422** (Sony 9-pin (P2) protocol)

#### 15-pin mini D-Sub Connector (VGA type) for Breakout Cable

**Video Reference Input** BNC

**2 x Biphase I/O (4 connectors)** DIN 5p 180°

**2 x MIDI I/O** (uses the Biphase connectors)

**LTC In** XLR

**LTC Out** XLR

### Driver Installation

The necessary Drivers are installed with VCube

# Blackmagic Design Video Cards

## Installation/Setup:

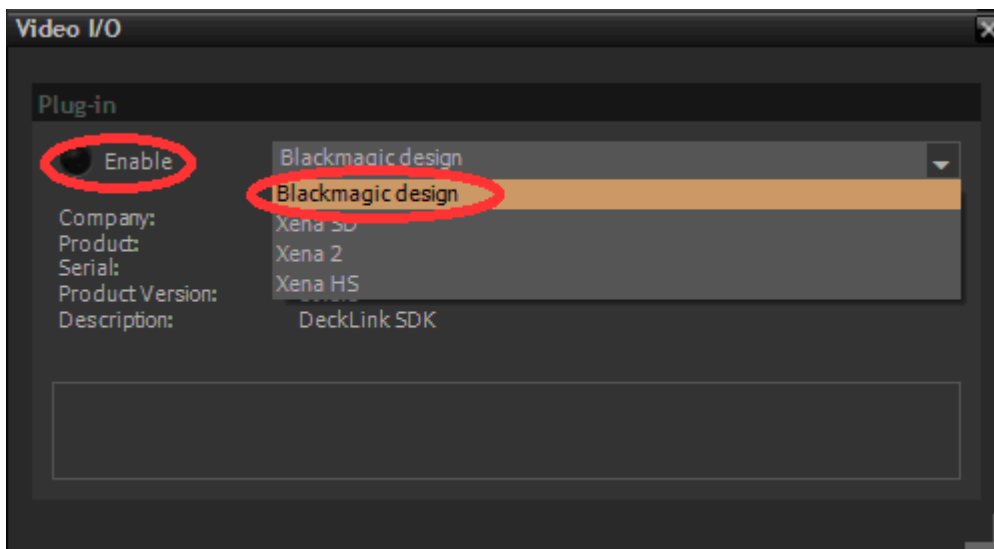
1. Go to: <http://www.blackmagicdesign.com/support>
2. Click on **Capture and Playback**.
3. Click on **Desktop Video** (The latest version)
4. Download the **Windows** package.

**Note:** You don't have to register, just click on the **Download Only** button.

5. Once downloaded, un-zip the package.
6. Run the **DesktopVideo\_x.x.x.msi** installer and follow the specific instructions.
7. Restart your system once the installation is completed.
- 8.

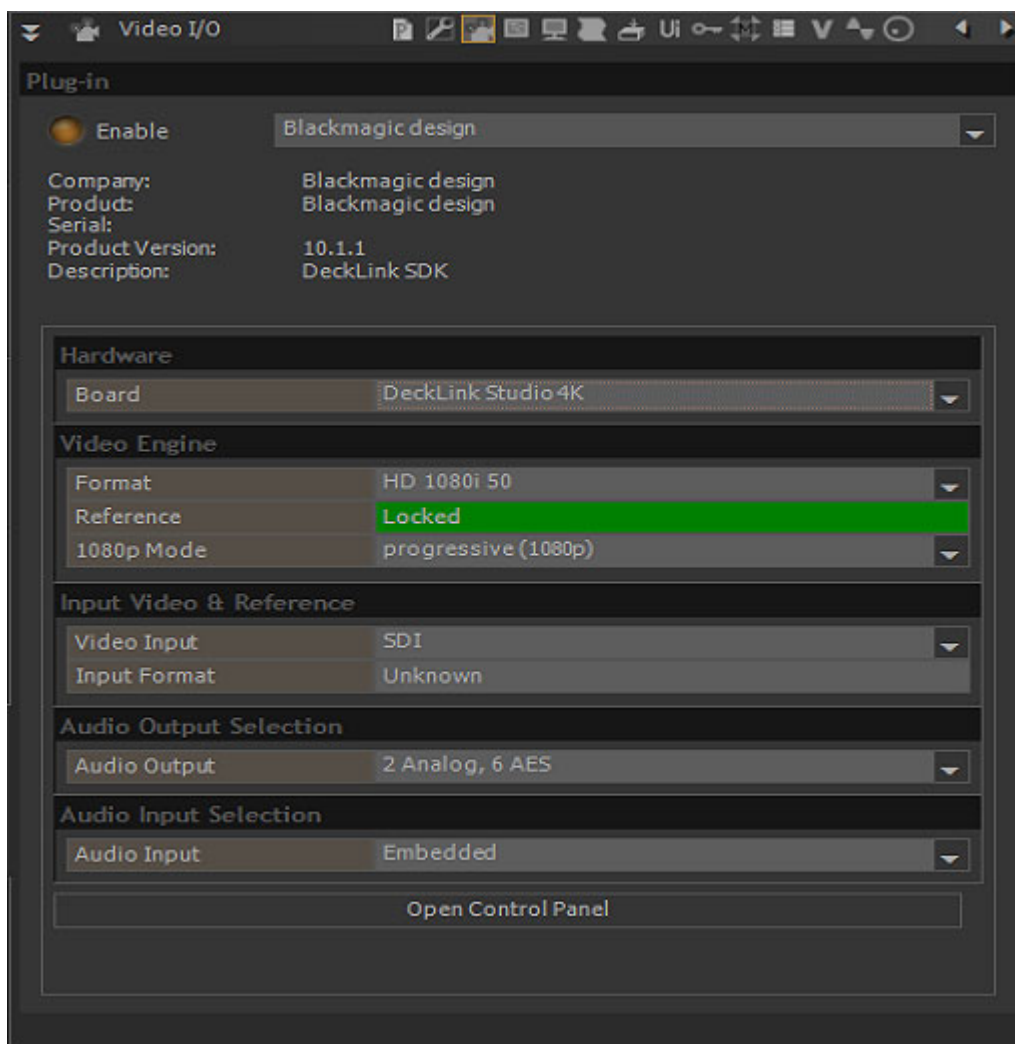
## Enable Blackmagic design video I/O in VCube

1. Start VCube.
2. Open the Video I/O setting tab [**SHIFT + ALT + P**]
4. From the drop-down menu select **Blackmagic design** and enable the card:



Settings - Video I/O tab

Once the Plug-in is selected and enabled the **Video I/O** tab then gives access to a number of options depending on options and card properties:



## Hardware

If several Blackmagic design cards are installed, select the one you wish to control from the **Board** dropdown.

## Video Engine

**Format** Choose video format / resolution. HD formats will require the correct keys.

**Reference** Indicates the video reference status.

**Note:** Some cards may not support this.

**1080p mode** Progressive or Segmented Frame modes (for VTRs supporting Interleave).

**Note:** We recommend using the VCube **Quick SD Settings** [ALT+F5] or **Quick HD Settings** [ALT+F6] in order to configure the **Format** and **1080p Mode** automatically.

## Input Video & Reference

**Video Input** Only valid for some Blackmagic cards which support input.

**Note:** This option is only available for **VCube SE** users. Enables the video input source (connector) to be selected. Choices can include; **SDI, HDMI, Component, Composite, S-Video**

**Input Format** Only available on some Blackmagic cards. Indicates the input video format. Only active when in **Record Mode**.

## Audio Output Selection

### Audio Output

Choice available varies with different Blackmagic cards. The audio output must be selected here. Possible physical output choices available (for example with a **DeckLink-Studio**); **4 analog, 2AES** or **2 Analog, 6AES**

## Audio Input Selection

### Audio Input:

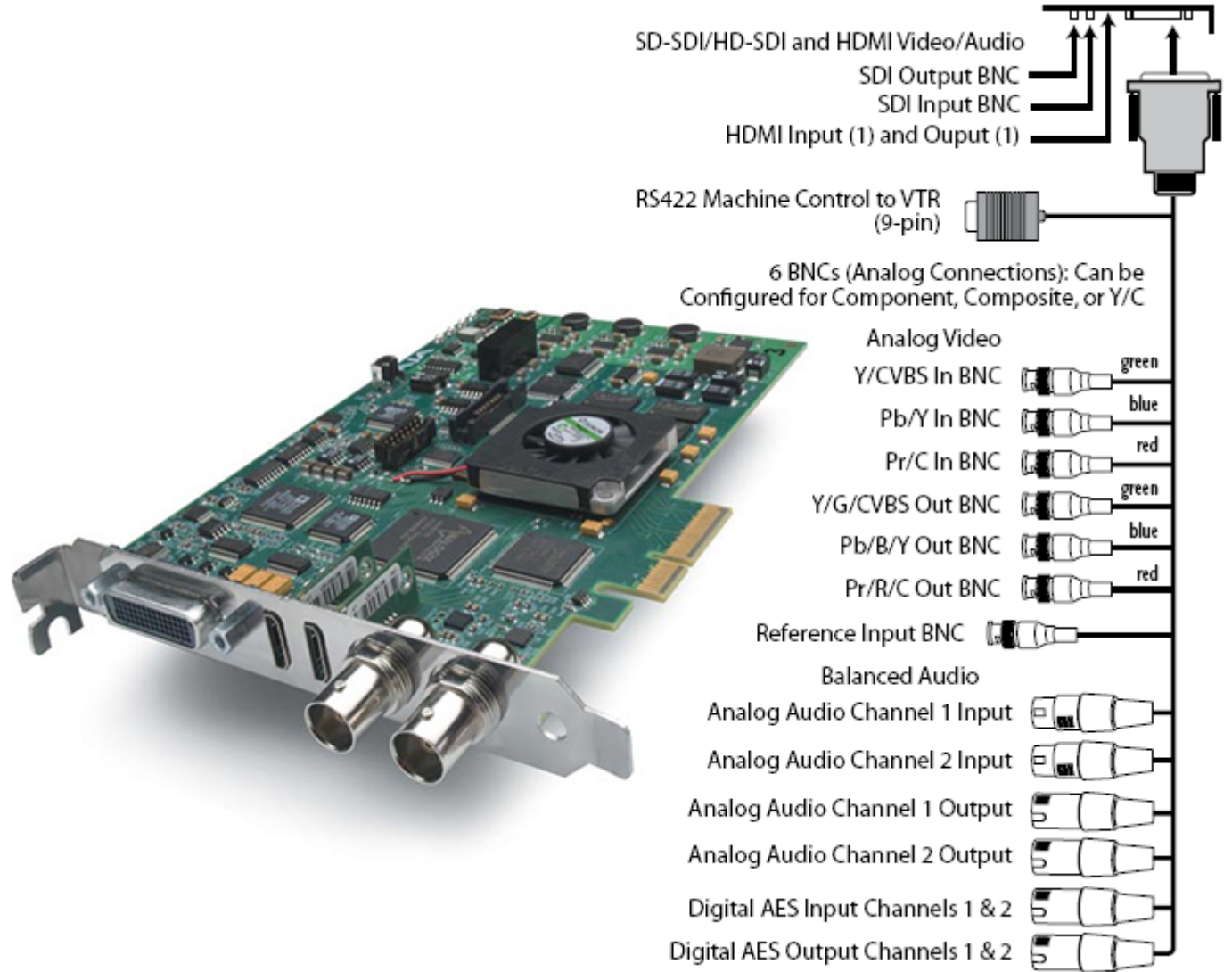
Choice can vary with different Blackmagic cards. The audio input source must be selected here. Possible physical input choices available (for example: with a DeckLink-Studio); **Embedded, AES/EBU, Analog.**

### Open Control Panel

Opens the Blackmagic Design control panel.

# AJA Video Cards and Plugins

## LH-i - SD-SDI/HD-SDI/HDMI/Analog



**Notes:**

- SDI embedded audio and the Merging Technologies' audio option cannot be used to capture audio simultaneously.
- VCube does not use the RS422 connector on the breakout cable currently.

## **Video Formats Supported**

### **Video Formats**

**525i 29.97**

**625i 25**

**720p 23.98 (PC)**

**720p 24 (PC)**

**720p 25 (PC)**

**720p 29.97 (PC)**

**720p 30 (PC)**

**720p 50**

**720p 59.94**

**720p 60**

**1080i 25**

**1080i 29.97**

**1080i 30**

**1080PsF 23.98**

**1080PsF 24**

**1080PsF 25 (PC)**

**1080PsF 29.97 (PC)**

**1080PsF 30 (PC)**

**1080P 23.98**

**1080P 24**

**1080P 25**

**1080P 29.97**

**1080P 30**

**1080P 50**

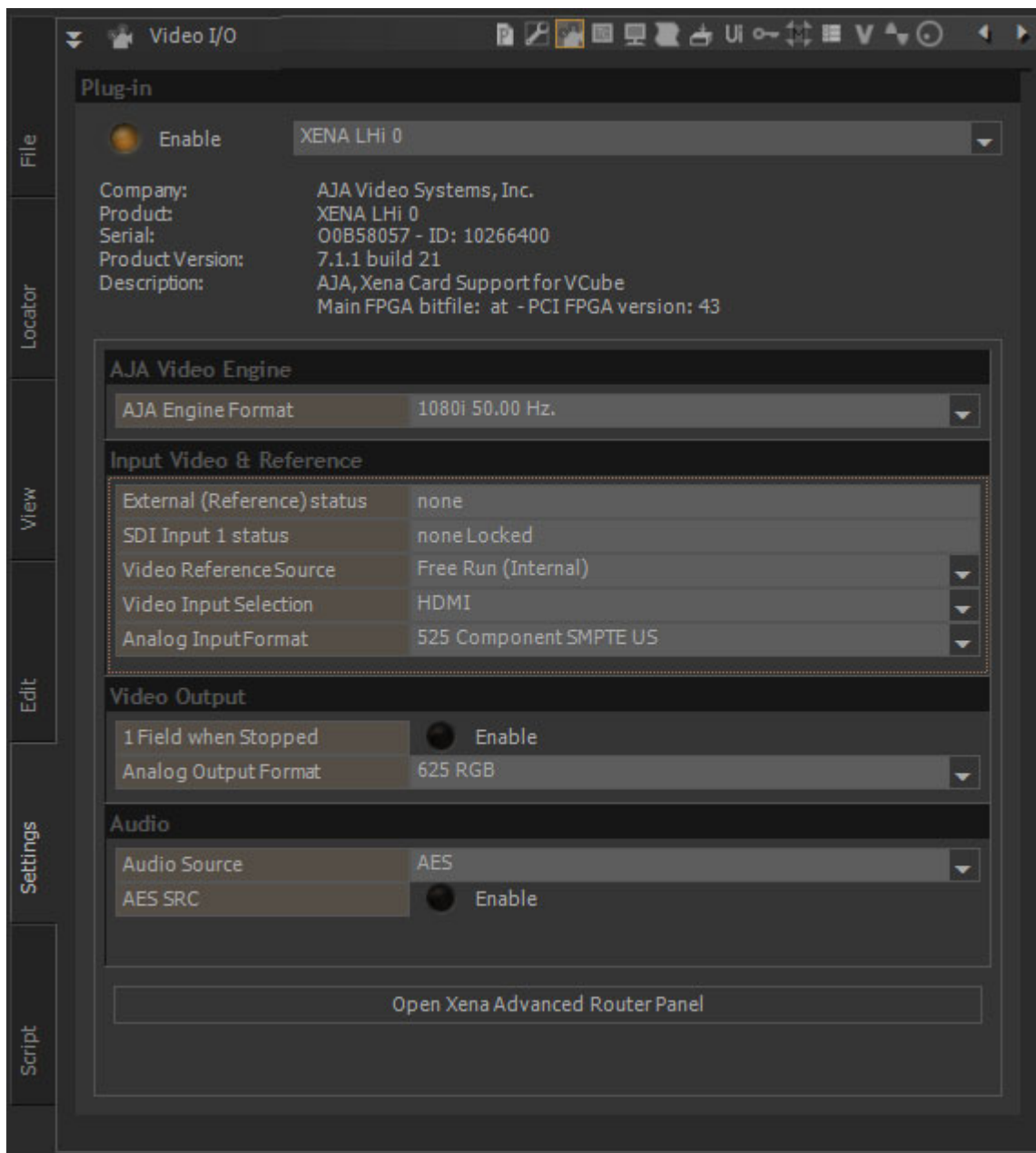
**1080P 59.94**

**1080P 60**



## LH-i Plug-in

The LH-i and 2K/3G plug-ins are almost identical. LH-i is one of the possible AJA video capture hardware options inside your VCube station. It supports Analog Component / Composite, HDMI and SDI video for both SD and HD formats..



AJA LH-i Video I/O Settings

### Plug-in

**Enable** When lit the plug-in/card selected in the drop-down list is active.

Card and plug-in details are shown under the **Enable** button.

### AJA Video Engine

**AJA Video Engine Format** The current internal AJA Engine format is shown. Alternatives are selected in the drop-down list.

### Input Video & Reference

**External (Reference) status** Displays the video format of the incoming genlock signal if present. Otherwise none is shown

**SDI Input 1 status** Displays the format of SDI video arriving at SDI Input 1 if any. Otherwise none is shown.

Analog Input status	Displays the format of analog video arriving at the analog input.
Video Reference Source	Displays the current Video Reference Source. The drop-down list offers a choice of all available sources. If no external source is available this defaults to Free Run (internal). External (Genlock) or Analog Input (video input) are possible.
Video Input Selection	Displays the video Input selected currently. The drop-down offers a choice of Analog (Component / Composite) or SDI (digital).
Video Analog Input Format	Displays the Analog Input format selected currently. Alternatives are selected in the drop-down list.

### **Video Output**

1 Field when Stopped	Must be Enabled to allow a stable picture for interlaced video formats on stop.
Video Analog Output Format	Displays the Analog Video Output format selected currently. The drop-down list offers a choice of all available formats.

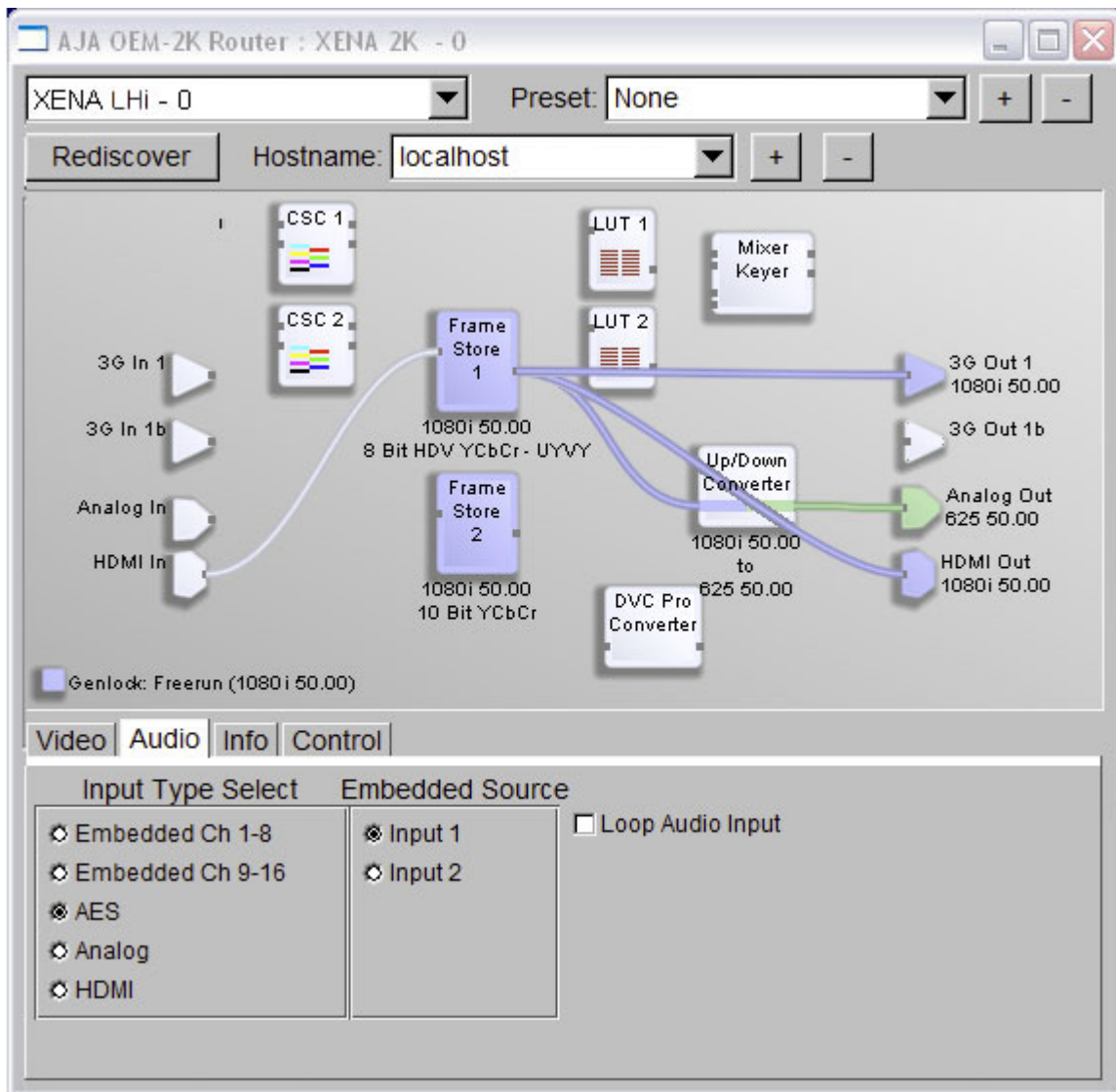
### **Audio**

Audio Source	Displays the Audio Source selected currently. Alternatives are selected from the drop-down list.
AES SRC	When lit Sample Rate Conversion is enabled for the AES/EBU inputs.
Audio Analog Level	Displays the Analog Audio Level selected currently. Alternatives are selected from the drop-down list.

**Note:** During capture the reference source is toggled to the active video input.

### Open Advanced Router Panel

Click the button to open the Advanced Router Panel.

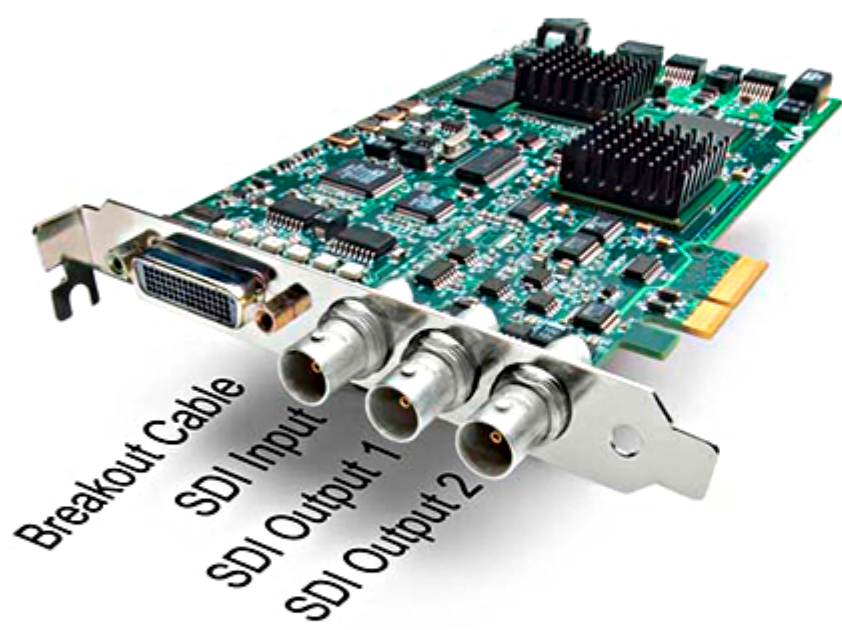


AJA LH-i/2K Router Control Panel

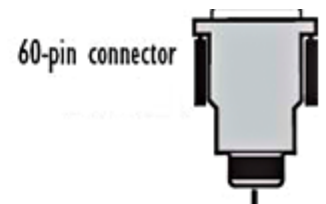
The screenshot shows the default playback routing for HD.

- Click-and-Drag connects the different elements.
- Right-click accesses the context drop-down list of settings for every element.
- User configurations can be saved as presets.
- The configuration last used is recalled automatically when the PC is started up.

# Xena LHe - SD-SDI/HD-SDI/Analog

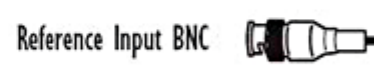
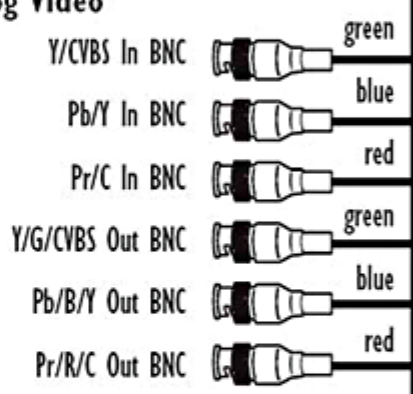


- 1 Input + 2 Outputs
- PAL and NTSC complying to SMPTE 259/292/296
- Genlock (BNC)
- Component/Composite/S Video Input (3 x BNC)
- Component/Composite/S Video Output (3 x BNC)
- Balanced Audio In (2 x XLR)
- Balanced Audio Out (2x XLR)
- 8 channels 24 Bit/48Khz of embedded audio (SDI/HDSDI)
- 2 AES audio channels In (1XLR)
- 2 AES audio channels Out (1XLR)

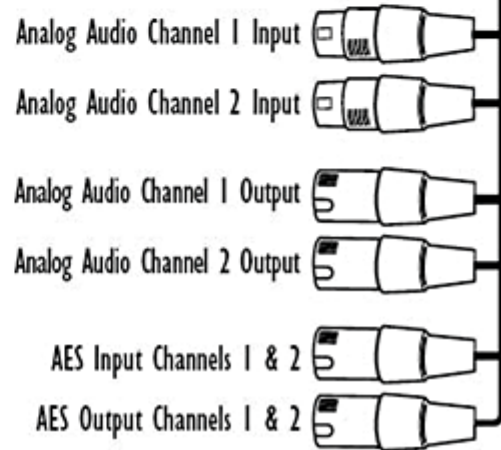


6 BNCs (Analog Connections): Can be Configured for Component or Composite/YC

### Analog Video



### Balanced Audio



## SD Video Formats Supported

PAL	
PAL 4/3 D1	
PAL 4/3 DV	
PAL 16/9 D1	
PAL 16/9 DV	
NTSC	
NTSC 4/3 D1	
NTSC 4/3 DV	
NTSC 16/9 D1	
NTSC 16/9 DV	

- PAL 4/3 D1
- PAL 4/3 DV
- PAL 16/9 D1
- PAL 16/9 DV
- NTSC 4/3 D1
- NTSC 4/3 DV
- NTSC 16/9 D1
- NTSC 16/9 DV

## HD Video Formats Supported

720p	
720p 50.00 Hz	
720p 59.94 Hz	
720p 60.00 Hz	
1080i	
1080i 50.00 Hz	
1080i 59.94 Hz	
1080i 60.00 Hz	
1080p <i>sf</i>	
1080p <i>sf</i> 23.98 Hz	
1080p <i>sf</i> 24.00 Hz	
1080p	
1080p 23.98 Hz	
1080p 24.00 Hz	
1080p 25.00 Hz	
1080p 29.97 Hz	
1080p 30.00 Hz	

- 720p 50.00 Hz
- 720p 59.94 Hz
- 720p 60Hz
- 1080i 50.00 Hz
- 1080i 59.94 Hz
- 1080i 60.00 Hz
- 1080p *sf* 23.98 Hz
- 1080p *sf* 24.00 Hz
- 1080p 23.98 Hz
- 1080p 24.00 Hz
- 1080p 25.00 Hz
- 1080p 29.97 Hz
- 1080p 30.00 Hz

### Notes:

- SDI embedded audio and the Merging Technologies' audio option cannot be used to capture audio simultaneously.
- The SDI embedded audio is not available for capture if the analog video input is selected for recording.
- SDI embedded audio cannot be captured if the analog video input is selected for recording.
- The video card analog **Video Reference Input** is not connected internally to the VCube video Reference input. Both must to be fed by the same video reference signal.

### **Reference Input (video card):**

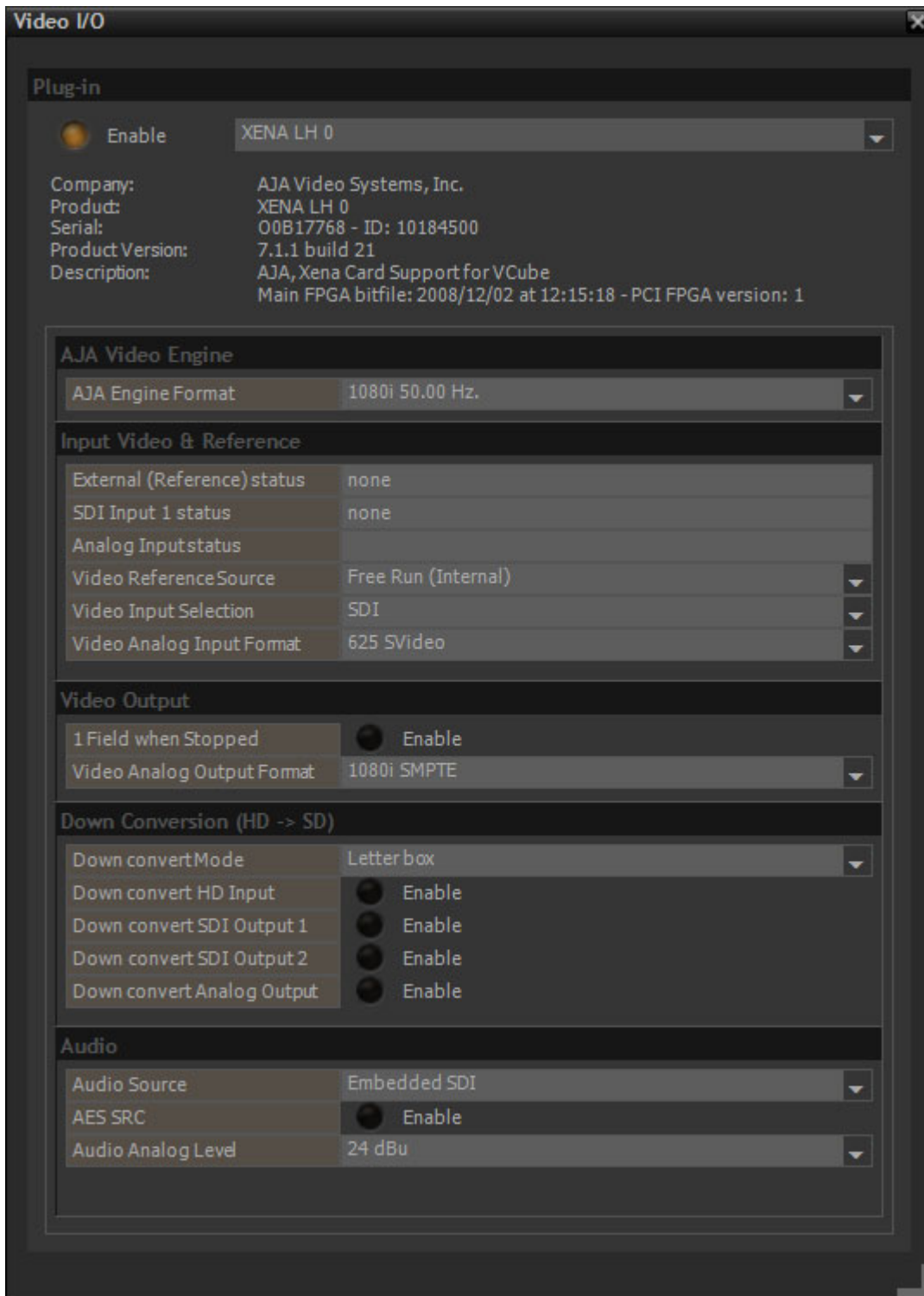
- This BNC connector allows you to synchronize outputs to your house reference video signal (or black burst). If you have a sync generator or central piece of video equipment to use for synchronizing other video equipment in your studio, then connect its composite output here. When Xena outputs video it uses this reference signal to lock to. For 1080i and 720p modes only, you may also use analog 525 or 625 **black & burst**

### **Sampling Rate**

- The **Composition Sampling Rate** must be set to **48 KHz** when the **Xena** audio channels are used for capture or playback.
- During capture audio monitoring must be done from the card outputs where audio inputs are connected.

## Xena LH Plug-in

Xena LH is one of the possible AJA video capture hardware options inside your VCube station. It supports Analog Component / Composite and SDI video for both SD and HD formats.



AJA LH Plug-in

### Plug-in

Enable

When lit the plug-in/card selected in the drop-down list is active.

Card and plug-in details are shown under the **Enable** button.

### AJA Video Engine

AJA Video Engine Format                      The current internal AJA Engine format is shown. Alternatives are selected in the drop-down list.

### **Input Video & Reference**

External (Reference) status                      Displays the video format of the incoming genlock signal if present. Otherwise none is shown

SDI Input 1 status                                Displays the format of SDI video arriving at SDI Input 1 if any. Otherwise none is shown.

Analog Input status                              Displays the format of analog video arriving at the analog input.

Video Reference Source                         Displays the current Video Reference Source. The drop-down list offers a choice of all available sources. If no external source is available this defaults to Free Run (internal). External (Genlock) or Analog Input (video input) are possible.

Video Input Selection                          Displays the video Input selected currently. The drop-down offers a choice of Analog (Component / Composite) or SDI (digital).

Video Analog Input Format                      Displays the Analog Input format selected currently. Alternatives are selected in the drop-down list.

### **Video Output**

1 Field when Stopped                          Must be Enabled to allow a stable picture for interlaced video formats on stop.

Video Analog Output Format                      Displays the Analog Video Output format selected currently. The drop-down list offers a choice of all available formats.

### **Down Conversion (HD -> SD)**

Down ConvertMode                              Displays the Down ConvertMode selected currently. Alternatives are available in the drop-down list. Can be Letter Box, Crop or Anamorphic for picture resize.

Down Convert HD Input                         When lit, Down Conversion is enabled.

Down Convert SDI Output 1                      Individual Output enable for SDI output 1.

Down Convert SDI Output 2                      Individual Output enable for SDI output 2.

Down Convert Analog Output                      Individual Output enable for Analog output.

### **Audio**

Audio Source                                      Displays the Audio Source selected currently. Alternatives are selected from the drop-down list.

AES SRC    When lit Sample Rate Conversion is enabled for the AES/EBU inputs.

Audio Analog Level                                Displays the Analog Audio Level selected currently. Alternatives are selected from the drop-down list.

**Note:** During capture the reference source is toggled to the active video input.



## Number of Pixels:



The number of pixels is only a part of the equation leading to the bandwidth, storage and streaming requirements computation. But since it's a two dimensional value, we must use it as the starting point of the computations.

### SD Video Standards

The world is divided in two zones. One using the PAL system and one using the NTSC system. The SECAM system is almost dead for production equipment and is only used in some countries for broadcasting purpose only.

**NTSC** is a **720** points x **480** lines format at **29.97** frames per second.

**PAL** is a **720** points x **576** lines format at **25** frames par second.

Despite a greater number of elements per frame in the PAL system, it uses almost the same bandwidth as the NTSC system because of its lower frame rate. PAL transmits 10,368,000 points per second and NTSC transmits 10,487,102 points every second.

## HD Video Standards

HD video systems exist in two main standards. The first one is 1280 pixels x 720 lines. It's also called 1K. The second one is 1980 pixels x 1080 lines. It's also called 2K. The frame rate may vary from 23.98 fps to 60 fps, leading to very different results in terms of the bandwidth used.

A 720 HD video at 23.98 fps requires 22,096,303 points per second transmission and a 1080 HD video at 29.97 fps needs 62,145,792 points per second transmission.

## Pixel Aspect Ratio

This is the shape of the individual pixels.

HD video systems use mainly square pixels with aspect ratio equal to 1:1

NTSC uses an aspect ratio of 0.9:1 resulting in a 648 x 480 display.

NTSC wide uses an aspect ratio of 1.2:1 resulting in a 864 x 483 display.

PAL uses an aspect ratio of 1.07:1 resulting in a 768 x 576 display.

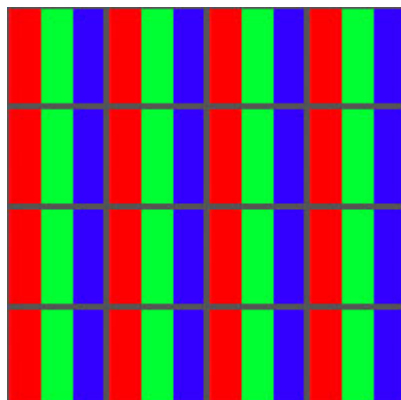
PAL wide uses an aspect ratio of 1.42:1 resulting in a 1024 x 576 display.

**Note:** that wide screen formats don't use a greater number of pixels to produce a larger picture.

## Color Sampling

### RGB

**RGB** means Red, Green and Blue. Every pixel is sampled for three values representing Chroma and Luma.



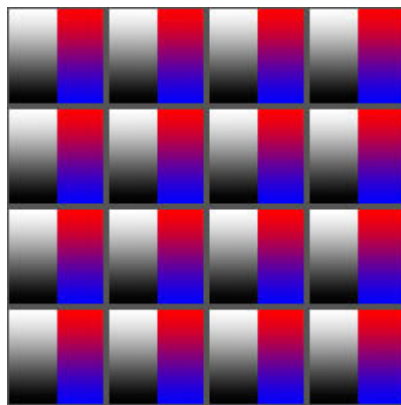
**4.4.4** means that every pixel is sampled for **Chroma** and **Luma** value.

The two Chroma values are the result of:

***Luma minus Red value***

and

***Luma minus Blue value***



The RGB and 4.4,4 color sampling systems lead to a high bandwidth requirement while preserving color definition.

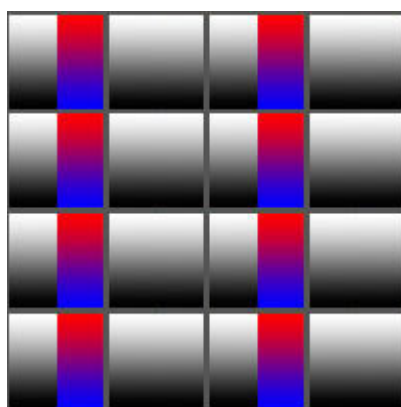
They are used by graphics and special effects designers. The maximum Chroma information is required to avoid artefacts when the picture is processed. There are 3 values per pixel.

Since high bandwidth requirement means expensive equipment, video engineers have developed ingenious strategies to reduce these requirements in a transparent manner. Fortunately, human vision is less acute for color than for luminosity. For this reason color sampling can be undertaken at a lower resolution than the luminance sampling in order to reduce overall bandwidth requirement with no visible impact.

**4.2.2**

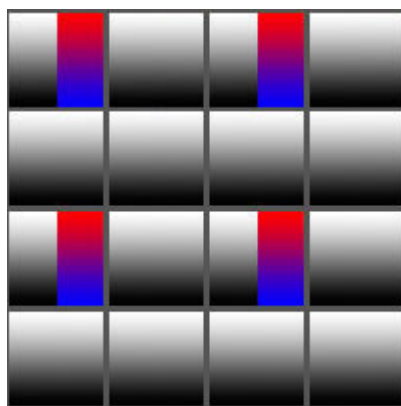
**4.2.2** has been widely adopted by the video industry and broadcasters because of its good quality to bandwidth ratio.

Here, for every four luminance samples, there are two samples of each color difference channel. We have 4 values for 2 pixels leading to 2 for computation purposes.



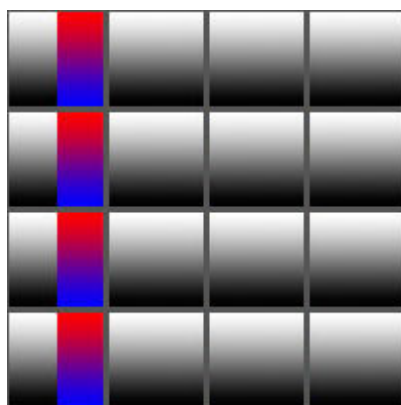
#### 4.2.0

**4.2.0** Is the color sampling mode used in DV PAL. It's also used for HD video broadcast. There are 6 values for 4 pixels leading to 1.5 for computation purposes.



#### 4.1.1

**4.1.1** Is the color sampling mode used in DV NTSC. There are 6 values for 4 pixels leading to 1.5 for computation purposes.



### Color Space

Color space as a color model is an abstract mathematical model describing the way colors can be represented as numbers, typically as three or four values or color components (e.g. RGB and CMYK are color models). However, a color model with no associated mapping function to a reference color space is a more or less arbitrary color system with little connection to the requirements of any given application.

RGB uses additive color mixing, because it describes what kind of light needs to be emitted to produce a given color. Light is added together to create form from out of the darkness. RGB stores individual values for red, green and blue. RGBA is RGB with an additional channel, alpha, to indicate transparency.

YPbPr (also referred to as "YPrPb", "PrPbY", and "PbPrY") is a color space used in video electronics. It is numerically equivalent to the YCbCr colour space, but is designed for use in analogue systems whereas YCbCr is intended for digital video.

YCbCr is a family of color spaces used in video systems. Y is the luma component and Cb and Cr the chroma components. It is often confused with the YUV colour space and typically the terms YCbCr and YUV are used interchangeably, leading to confusion. In fact, when referring to signals in digital form, the term "YUV" probably really means "YCbCr" more often than not.

### Bit Depth

As usual in digital conversion of values, the higher the bit depth, the higher the resolution.

As usual, more bits means more information, higher bandwidth, higher technical requirements.

- -8 bit leads to 256 possible values
- 10 bit leads to 1024 possible values

- 12 bit leads to 4096 possible values
- More bits for pixel sampling is only used for special cases like film color calibration and other computing intensive processes.
- Linear scale means that the input value is reflected with no change to the output
- Logarithmic scale is a scale of measurement that outputs the logarithm of a physical quantity instead of the quantity itself.

This is often used if the underlying quantity can take on a huge range of values; the logarithm reduces this to a more manageable range. Some of our senses operate in a logarithmic fashion (doubling the input strength adds a constant to the subjective signal strength), which makes logarithmic scales for these input quantities especially appropriate. This type of scale is use in digital cinema to emulate the 35 mm film capability of high light transmission.

### Frame Rate

- 23.98 HD
- 24 Film, HD
- 25 PAL, HD
- 29.97 NTSC, HD
- 30 HD
- 50 HD
- 59.94 HD
- 60 HD

We are using the term **frames**, but most common video formats use 2 fields per frame since they're interleaved. This means that a frame is constructed from 2 fields (one for odd lines, one for even lines) displayed at twice the frame rate of the video standard. To simplify the bandwidth computation, the frames value will be used.

### Bandwidth Computation

**Number of pixels per frame x color sampling value x bit depth x frame rate = number of bits per second**

We will compute the required bandwidth for NTSC format with 8 bit 4.2.2 broadcast color sampling and 1080p with 12 bit 4.4.4 for processing quality.

**NTSC -> 159.5 Mbps -> 20 MB / s**

**1080 @ 29.98 fps -> 2133.6 Mbps -> 266.7 MB / s**

These are the absolute minimum sustained performances required for network and storage.

These data rates can be reduced by using a data compression codec.

### Compression Codecs

The previous computations show that video is a bit gluttonous. This bandwidth requirement has its price. That why a data compression is frequently applied in order to reduce the data flow demands.

#### **Loss-less**

Loss-less codecs are mathematical solutions which regenerate the compressed data exactly. The compression ratio is often lower than 3:1

#### **Lossy**

Lossy codecs are also mathematical solutions. But they are a compromise between efficiency and quality. The compression ratio can vary from 3:1 (the quality is almost the same as the original) to more than 100:1 with visible artefacts.

#### **Intra Frame:**

DV, MJPEG, IMX. Every frame is processed individually.

### Inter Frame:

MPEG with groups of pictures (GOPs). The use of GOPs is a very efficient way to compress video. But for post production purposes, intra frame codecs are to be preferred since every frame is individually encoded, allowing instant access with a lower computational overhead.

VCube features a DV codec (compression ratio ~ 1:5) and a MJPEG codec (possible compression ratio from 1:2.4 to 1:23) if required during capture or render processes.

## Audio

Since video media can also feature a sound track, audio data flow must be added to the video streaming requirements.

## PullUp - PullDown

One of the key features of VCube is the capability of changing the playback speed of Clips.

This function allows VCube to accomplish both PullUp and PullDown operations.

### PullDown

All the story is around the NTSC video standard. In the NTSC world, a second lasts 1001 mS. That means that 30 fps (SMPTTE norm) media is displayed at 29.97 frame per second. This conversion is called pulldown.

- VCube can convert a 30 fps Media to 29.97 fps : In the Timeline (29.97 fps) select the Clip(s) you need to change the frame rate properties of. Double-click on the selection to display the **Clips Information** page. Here, the speed can be set to **99.9%** (PullDown). Once done, the Clip(s) length remains the same in the Timeline. Now 1 frame will be missing every 1001 frames. You can use the Clip's handle to extend the Clips duration reflecting their new fps value.
- Film production in the NTSC zone uses 24 to 23.98 fps conversion to facilitate transfers to tape etc.. In this case, the speed value is also **99.9%** (PullDown). With this new frame rate an integer number of film frames corresponds to an integer number of video (NTSC) frames for telecine. This telecine technique is called the 3:2 pulldown. There are 4 frames of film for every 5 frames of NTSC video.

### PullUp:

Is the reciprocal process. 1001ms becomes one second.

## Drop Frame

Drop Frame is a SMPTE TimeCode format that counts 30 frames per second continuously but drops 2 frames from the count every minute except for every tenth minute (i.e. it drops a total of 108 frames every hour) to maintain synchronization of TimeCode with clock time. This is necessary because the actual frame rate of NTSC video is 29.97 frames per second rather than an integer 30 frames.

VCube displays "drop frame" TimeCode in this form 00:00:00;00 Notice the semi-colon separator before the frames instead of the normal colon.

# MPEG Settings (MainConcept Encoder)

## MPEG Overview

**MPEG is both a compression codec and a file format (.mpeg,.mpg etc.)**

### MPEG Types

The following MPEG types are available as outputs for the Encoder. This list introduces the different formats; for a detailed explanation, please refer to a specialized technical reference book.

**MPEG-1** — The MPEG-1 format has been developed by the Motion Pictures Experts Group, and it enables you to compress video and audio data with lower bitrates using a specific standard. You can save the format on a computer or a normal CD-ROM, and play it back using a software or hardware decoder. The MPEG-1 format is used for VCDs.

**VCD (Video CD)** — This profile produces MPEG-1 output suitable for burning to a recordable CD in a special format that can be played in Video CD players, computers and many standalone DVD players. The maximum resolution for MPEG-1 VCD is 352x288 with 25 frames per second and 352x240 with 30 frames per second respectively.

**MPEG-2** — The MPEG-2 format has been created by the Motion Pictures Experts Group, and it enables you to compress video and audio data with a higher bitrates for best quality using a specific standard. You can save the format on a computer as well as a normal CD-ROM or DVD, and play it back using a software or hardware decoder. The MPEG-2 format is used for SVCDs and DVDs.

**SVCD (Super Video CD)** — This option generates MPEG-2 output suitable for burning to a Super Video CD. This format is similar to Video CD, but offers higher quality. The disadvantages are that Super Video CDs require more processing power when played back on computers. They are generally not as compatible with standalone DVD players, and they cannot hold as much video as standard Video CDs.

**DVD** — Please select this MPEG type to produce high quality MPEG-2 output for DVD (Digital Versatile Disc), which can be played back on normal DVD-Player.

**CableLabs** — Produces a very low constant bitrate and can be used for both SD or HD formats

**DVB** — Is the abbreviation for Digital Video Broadcast, i.e. it is a standardized process for digital video and television transmission. Using this method, the video and audio streams are combined. The data will be compressed in MPEG-2. There are several DVB standards for different transmission methods, such as DVB-T, DVB-S, DVB-C etc.

**MicroMV** — The MMV format is generated by Sony MICROMV camcorders. The video footage is recorded in MPEG-2 format with a data rate of 12 MBit. It needs less space in a quality which is only slightly worse than DV. When you convert video files with the MPEG Encoder into MMV, you can play them back to the MIRCUMV camcorder afterwards.

**DVHS** — D-VHS (Digital Data-Video Home System) is a specific extension of the popular VHS format. It can process ATSC, HDV and DVB data streams. D-VHS allows digital high-definition MPEG-2 transport streams recordings and playback.

**HDV HD1 (720p)** — 720p is a HDV (High-Definition Video) format for digital video, which has been introduced by several companies (Canon, Sony JVC and Sharp). HD1 has a resolution of 1280x720 pixels progressive (frame based), and it always has an aspect ratio of 16:9. Depending on the video standard 720p uses 60, 50, 30 or 25 frames per second. HDV is an MPEG-2 format, which can store high-resolution HD video footage on a normal DV tape.

**HDV HD2 (1080i)** — 1080i has been developed along with the HDV format 720p, and it is not quite certain yet which of the two standards will establish itself in the end. HD2 has a resolution of 1440x1080 pixels interlaced (field based), and is always displayed in 16:9. Depending on the video standard 1080i uses 50 or 60 frames per second. HDV is an MPEG-2 format, which can store high-resolution HD video footage on a normal DV tape.

**ATSC** — This is the abbreviation for Advanced Television Systems Committee, the name of the group, who originated the standard for digital television in the USA. ATSC offers norm specifications for high-definition digital television (HDTV) as well as for normal standard digital television (SDTV) in MPEG format. It supports resolutions such as 720p and 1080i. The i stands for interlaced (field based), and the p for progressive (frame based).

**D10** — Is a professional video format using a I frame every picture. No GOP with a constant bitrate.

**XDCAM IMX** — Is the Sony version of the D10. Embedded AC3 audio isn't supported by VCube for this format.

**XDCAM HD**— Is the HD version of the XDCAM IMX. It uses GOP to fit into almost the same bitrate as SD. Embedded AC3 audio isn't supported by VCube for this format.



# Media Storage Requirements

	Name	MB per second	GB per minute	GB per hour	Recommended Capacity GB per hour	
<b>Generic</b>	MPEG2 4.2.2	6.25	0.37	21.9	32.9	
	MPEG2 4.2.0	2.5	0.15	8.7	13.1	
	MJPEG 8 bit	21	1.23	73.8	110.7	
	MJPEG 10 bit	26	1.52	91.4	137.1	
	DV25	3.6	0.21	12.6	18.9	
	DV50	7.2	0.42	25.3	37.9	
	DV/DVCAM	3.6	0.21	12.6	18.9	
	DVCPRO 50	7.2	0.42	25.3	37.9	
	DVCPRO HD	14.4	0.84	50.6	75.9	
	Digital 8	3.1	0.18	10.8	16.3	
	SDTI (QSDI)	8.44	0.5	29.6	44.5	
	NTSC 150k/frame	4.5	0.26	15.8	23.7	
	PAL 180k/frame	4.5	0.26	15.8	23.7	
	NTSC 300k/frame	9	0.52	31.6	47.4	
	PAL 360k/frame	9	0.52	31.6	47.4	
	Uncompressed YUV	21	1.23	73.8	110.7	
	Uncompressed RGBA	30	1.75	105.4	158.4	
	<b>Apple FCP</b>	DV PAL/NTSC	3.6	0.21	12.6	18.9
		CineWave HD Mac	125	7.32	439.4	659.1
		CineWave SD	21	1.23	73.8	110.7
D1 Desktop 64 8 bit		21	1.23	73.8	110.7	
D1 Desktop 64 10 bit		30	1.75	105.4	158.2	
D1 Desktop 128 HD 10 bit		170	9.96	597.6	896.4	
RTMac DV 25		3.6	0.21	12.6	18.9	
<b>Avid</b>	Avid DS HD Nitris	125	7.32	439.4	659.1	
	Avid DS	21	1.23	73.8	110.7	
	Media Composer Offline XL	4.5	0.26	15.8	23.7	
	Media Composer AVR75	6.3	0.37	22.1	33.25	
	Media Composer AVR77	9	0.52	31.6	47.4	
	Media Composer Uncompressed	21	1.23	73.8	110.7	
	Symphony	21	1.23	73.8	110.7	
	Xpress	9	0.52	31.6	47.4	
	Xpress DV25	3.6	0.21	12.6	18.9	
<b>Incite</b>	Digisuite LX DV 25	3.6	0.21	12.6	18.9	
	Digisuite LX MPEG2 25 Mbit	3.1	0.18	10.8	16.3	
	Digisuite	21	1.23	73.8	110.7	
	Digisuite LE	15	0.88	52.7	79.1	
	Digisuite DTV DV 25	3.6	0.21	12.6	18.9	
	Digisuite DTV DV 50	7.2	0.42	25.3	37.9	
	Digisuite DTV MPEG2 25 Mbit	3.1	0.18	10.8	16.3	
	Digisuite DTV MPEG2 50 Mbit	6.2	0.36	21.7	32.6	
<b>Media100</b>	Media 100 i 150/180 Kb/frame	4.5	0.26	15.8	23.7	
	Media 100 i 300/360 Kb/frame	9	0.52	31.6	47.4	
	iFinish 150/180 Kb/frame	4.5	0.26	15.8	23.7	
	iFinish 300/360 Kb/frame	9	0.52	31.6	47.4	
	CineStream	3.6	0.21	12.6	18.9	
	Cleaner	3.6	0.21	12.6	18.9	
<b>Pinnacle</b>	CineWave HD Mac	125	7.32	439.4	659.1	
	CineWave SD	21	1.23	73.8	110.7	
	ReelTime	14.4	0.84	50.6	75.9	
	ReelTime NITRO	14.4	0.84	50.6	75.9	
	Targa 2000/DTX/RTX/SDX	14.4	0.84	50.6	75.9	
	Targa 3000 MPEG	6.25	0.37	21.9	32.9	
	Targa 3000 YUV	21	1.23	73.8	110.7	
	Targa 3000 RGB	42	2.46	147.6	221.4	

There is no specific information for VCube in this table because it supports almost all SD and HD standards and codecs.

(DVCPRO and IMX are available as options)

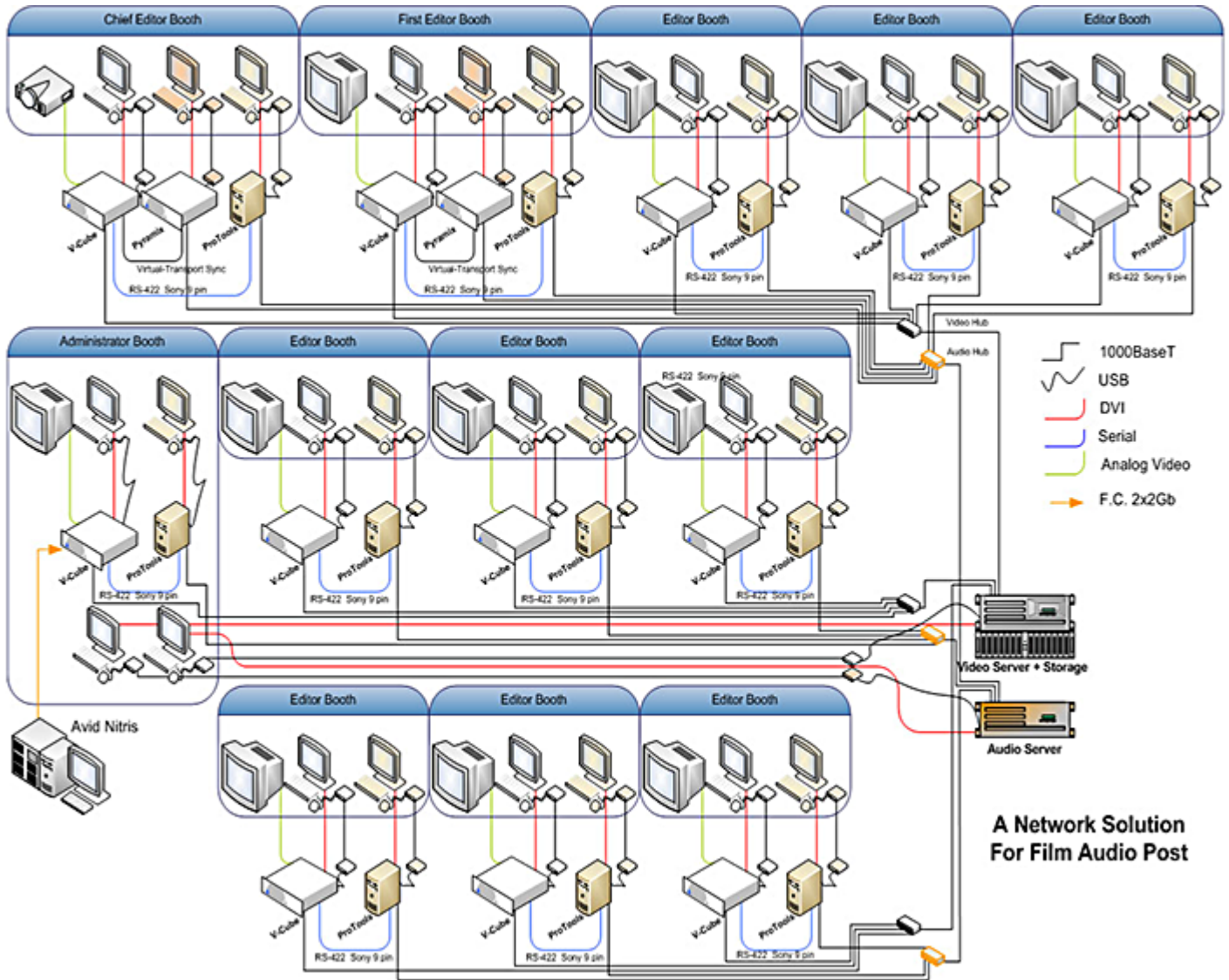
# Installation Examples

## A Great Solution for Audio Post for Film

This is an example of SD streaming configuration:

- Pro Tools workstations control VCube via Sony 9-pin protocol.
- Pyramix workstations control VCube via Ethernet (Virtual-Transport).

Note that one VCube can be controlled by two editing workstations.

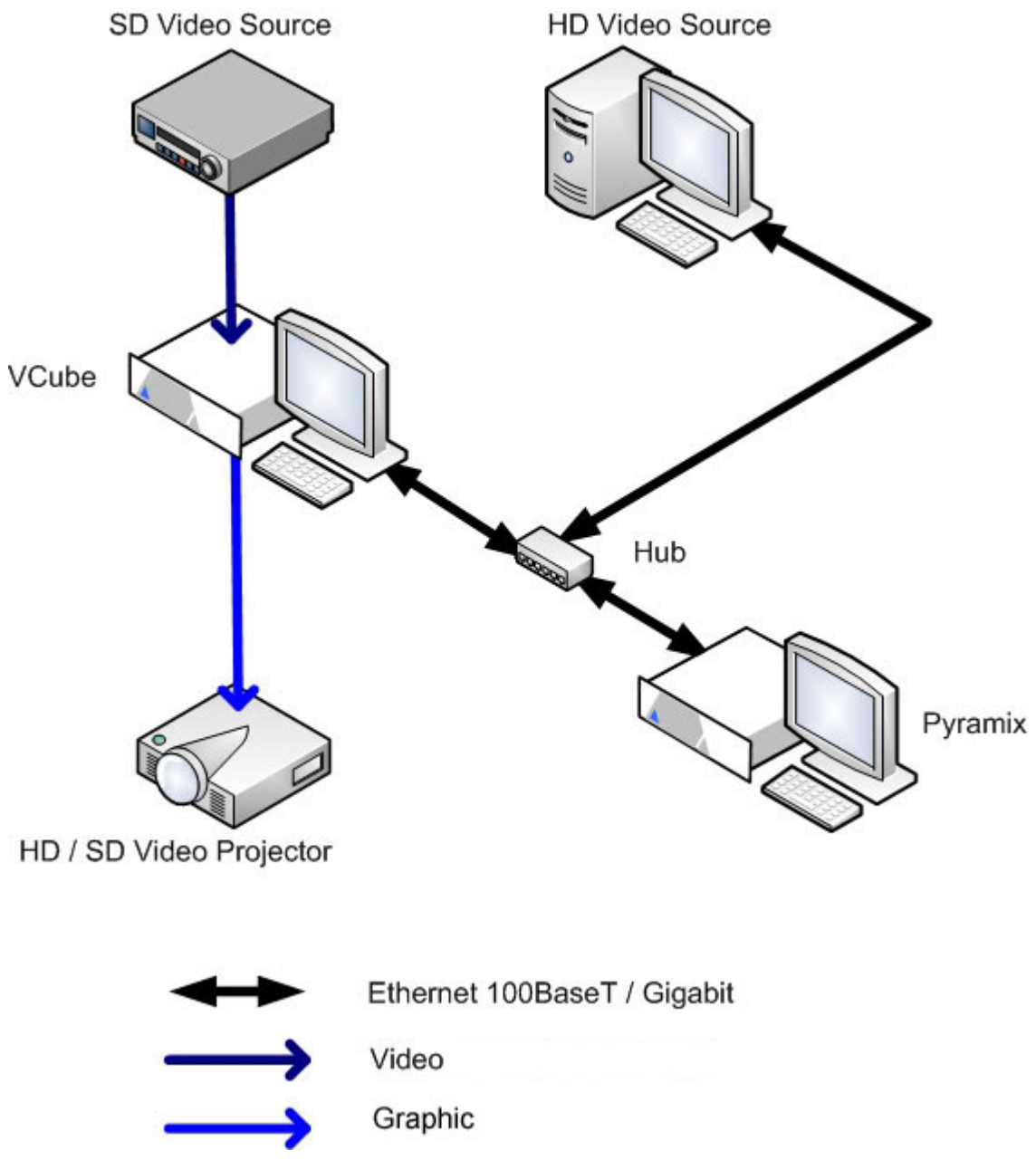


The Video Server is fed through the network by an Avid Nitris even while audio editors are using the streaming video flow from this server.

The same network can be used for both Virtual-Transport chasing and video streaming. In this example, an extra Ethernet card for Pyramix and VCube was preferred because both racks were in the same machine room.

# Basic VCube Operation

## Basic VCube Operation



This is a typical VCube set up:

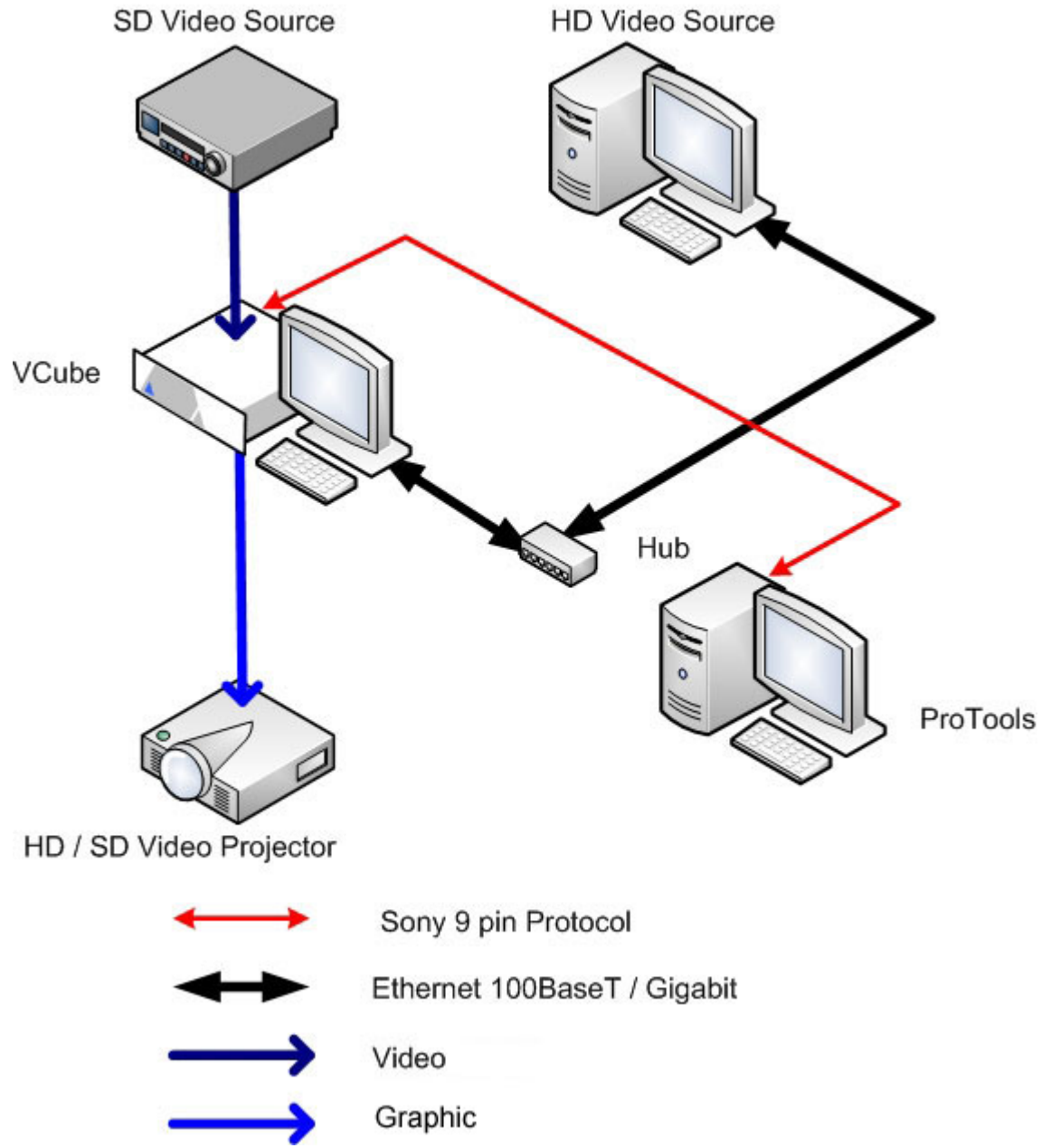
- The network is used to synchronize VCube and Pyramix DAW. It's also used to transfer HD or SD material on the VCube's local hard disk.
- A SD VCR is connected to the video input allowing SD capture.
- The graphic output is connected to an HD video projector allowing compressed HD to be displayed (authorization key required) at full resolution.

**Note:** Due to the storage transfer speed limitation of the single SATA disk, only MJPEG 1/10 (90% quality) compressed 2K HD can be used. You also need the 2K (for Composition) authorization key. Uncompressed 2K HD can be converted to 1/10 compressed by VCube render feature.

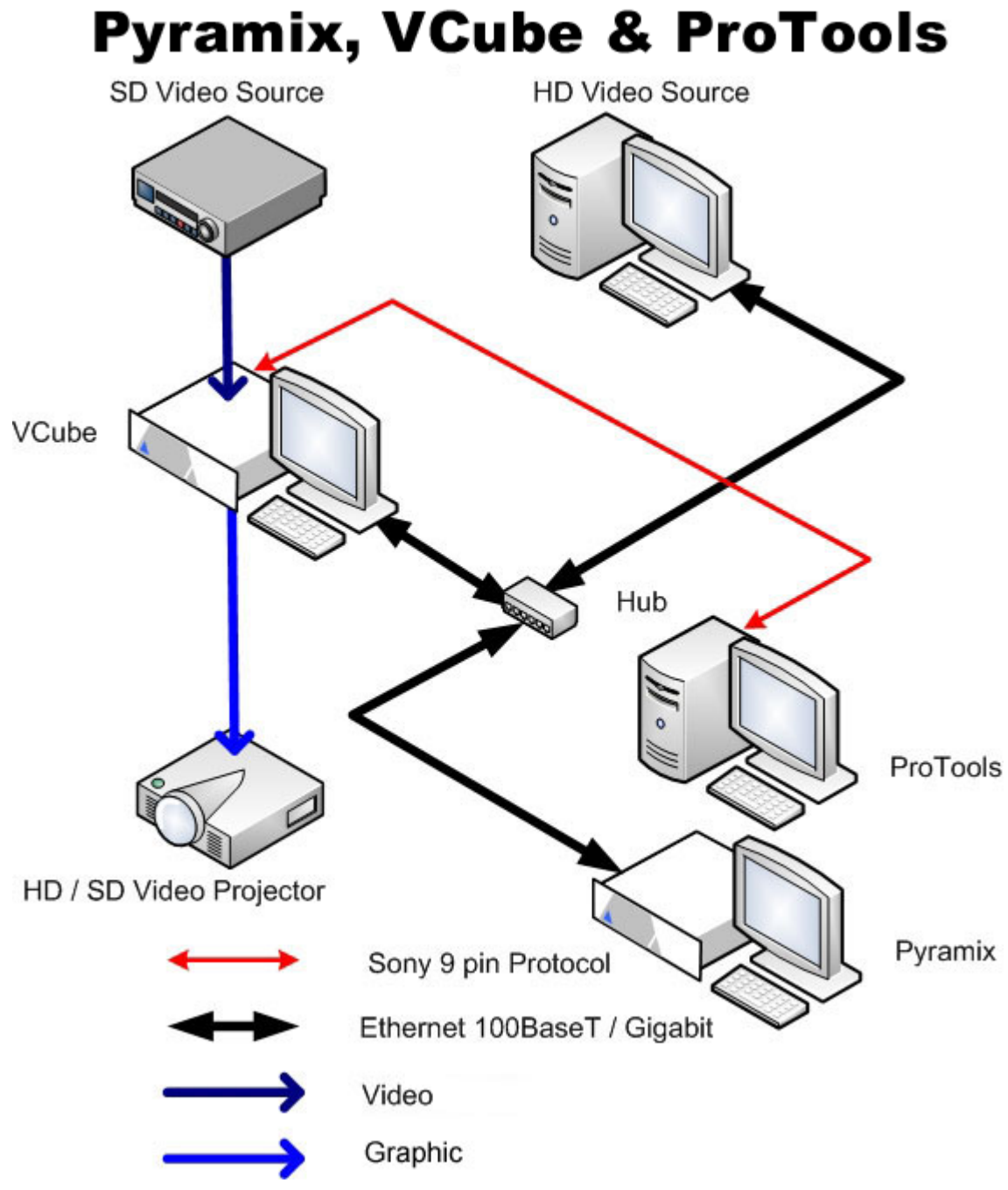
HD Media Files can be used into a SD Composition without this authorization key.

Pro Tools & VCube Operation

# ProTools & VCube Operation



# Pyramix, VCube and ProTools



## Avid Unity and VCube

VCube can import OMF Compositions and stream linked/referenced Media Files directly from a Unity server.

There are two ways of accessing the Unity server:

1. Install a Fiber Channel Adapter in the VCube and connect to an available port on the server. The currently recommended Fiber Channel Adapter is the ATTO FC 3300.

**Note:** Never install the ATTO drivers delivered with the adapter but use those delivered by Avid along with the current version of the Unity server to connect to. Please ask the system administrator responsible for the server for the proper drivers installer.

- The Unity server can include a so-called Port Server Pro which allows connection through a standard Gigabit Ethernet network. In this case just plug the VCube into this network to access the server files.

**Note:** This configuration does not always allow for streaming Media Files very efficiently. The use of a Port Server Pro should be limited to copying files from the server to the local VCube hard disks.

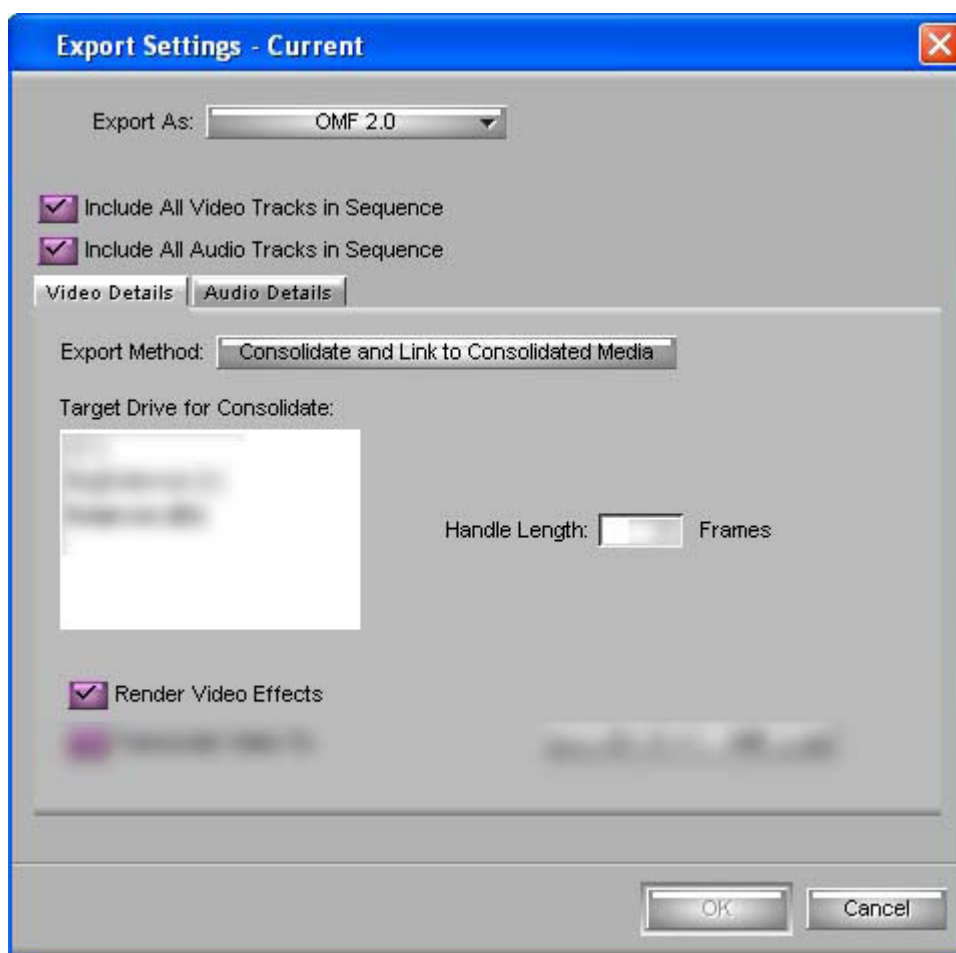
When connecting to the Unity server with a Fiber Channel Adapter directly, some settings can be adjusted to optimize the streaming performance in a multi-user environment. On the VCube side go to **Settings > Show Buffer & Cache Tab : Read Cache**. There are two ways of adjusting the cache size:

Set the Mode to **Unity** and set the **Nb Drives** value to the number of discs installed on the Unity server partition the VCube is connected to. The cache size will then be automatically adjusted to optimal.

If the above solution is not applicable (unknown number of discs for instance), then keeping the Mode to **Default** and setting the Cache Size to **4 (MB)** will ensure reasonable performance.

To import OMF Compositions and access referenced Media Files from the Unity server, go to Files : OMF Composition and choose a path for the Compositions (to the Unity), for the Media Files (also in Unity), and for the OMF database (this can be on the VCube local disk). Scanning OMF Media Files will then generate a local media database in the VCube for best performance.

Available Compositions should then appear in the list. Just load the desired one and play it.



On an Avid NLE, the Composition must be consolidated in OMF2 as in the screenshot above.

Embedded Compositions aren't currently supported by VCube.

## Fairlight Controlling a VCube

### Fairlight DREAM/MFX3

#### Jogsh

The **jogsh** modifier is used to modify the behavior of the DREAM Console transport when acting as a master, controlling slave 9-pin devices in jog or shuttle mode. The default setting is **jogsh=1**.

When **jogsh=0** the DREAM Console sends jog commands to the slave and then reads and chases the slave's TimeCode. This provides uniform picture jogging but in some cases may cause excessive variations in audio jog speed.

#### SYSTEM FILES

When **jogsh=1** the DREAM Console sends jog commands to the slave, the slave then reads and chases the DREAM Console's TimeCode. This provides uniform audio jogging but in some cases may cause excessive variations in video jog speed.

Add **jogsh=#** to the end of the device definition you wish to modify, where # is 1 or 0.

#### 9- PIN CONTROL

In the configuration file, **SYS:cd /dd/usr/sys/tcs\_cfg** file, be sure the **ALT\_JOG** option is removed by adding an asterisk before the **@SETENV ALT\_JOG** entry in **tcs\_cfg**.

Additional **tcs\_cfg** settings required for control of VCube via 9-pin are:

**RETRY\_LIMIT = 50**

**SONY-TIMEOUT = 50**

**LAME-SLAVE-DELAY = 2**

**\*@SETENV ALT\_JOG**

In VCube the port COM settings for the **Sony 9-pin Remote Control** must be set to **Var / Shuttle / Jog with speed 0**

Then the VCube no longer interprets these commands.

For correct behavior of VCube with the **FFW** and **REW** commands from the Fairlight station, on the MFX3 the **Unlace** parameter must be set to **off** and the **Lace** parameter must be set to **0 sec**.

### Fairlight DREAM Satellite

#### Enabling the LTC Generator

The LTC generator will output the current TimeCode when in **PLAY**, and output a short burst of TimeCode when locating the transport.

Press **GEN** to toggle the generator on or off.

### Fairlight DREAM Station

#### Enabling the LTC Generator

The LTC generator will output the current TimeCode when in **PLAY**, and output a short burst of TimeCode when locating the transport. MIDI TimeCode is also output when GEN is enabled.

Press **GEN** to toggle the generator on or off.

## Pro Tools and VCube

### Pro Tools 6.4.1, Mac OS 10.3 and a KeySpan

Pro Tools cannot generate a TimeCode when it's in chase mode or using Sony 9-pin. Of course your transport control should be set to **On Line** in Pro Tools.

You absolutely must disable all the generate TimeCode options in the **Session Setup** window as shown in the **Peripheral - Machine Control** screen shot.

Sample Rate: 48 kHz    Audio Format: BWF (.WAV)    Session Start: 01:00:00:00  
 Bit Depth: 24-bit    Mac<->PC: Enforced    Incoming Time: 01:00:00:04  
 Clock Source: Internal    Ch 1-2 Input: Analog    Timecode Rate: 24  
 Fader Gain: +6 dB    Feet+Frames Rate: 24

▼ **USD Setup & Session Offsets**

Universal Slave Driver Setup

Clock Reference: Video Reference  
 Positional Reference: Serial Time Code  
 Video Format: PAL

VSO    0.00 semitones.cents  
 Locked:     Speed Cal:

Session Start Offsets

— MMC: 00:00:00:00  
 Link  — 9-Pin: 00:00:00:00  
 — Sync: 00:00:00:00

▼ **Time Code Settings**

Generator

Using USD  
 MTC To Port: none

Freewheel

None  
 8 frames  
 Jam Sync

Pull Up/Down

Audio Rate Pull Up/Down: None  
 Video Rate Pull Up/Down: None

Time Code Reader Offset: 0 samples

**Peripherals**

Synchronization    Machine Control    MIDI Controllers    Ethernet Controllers    Mic Preamps

Device: USD    Port: DigiSerial Port

Minimum Sync Delay: 15 Frames

Enable Control Of Pro Tools Via MMC    ID: 107

USD Setup

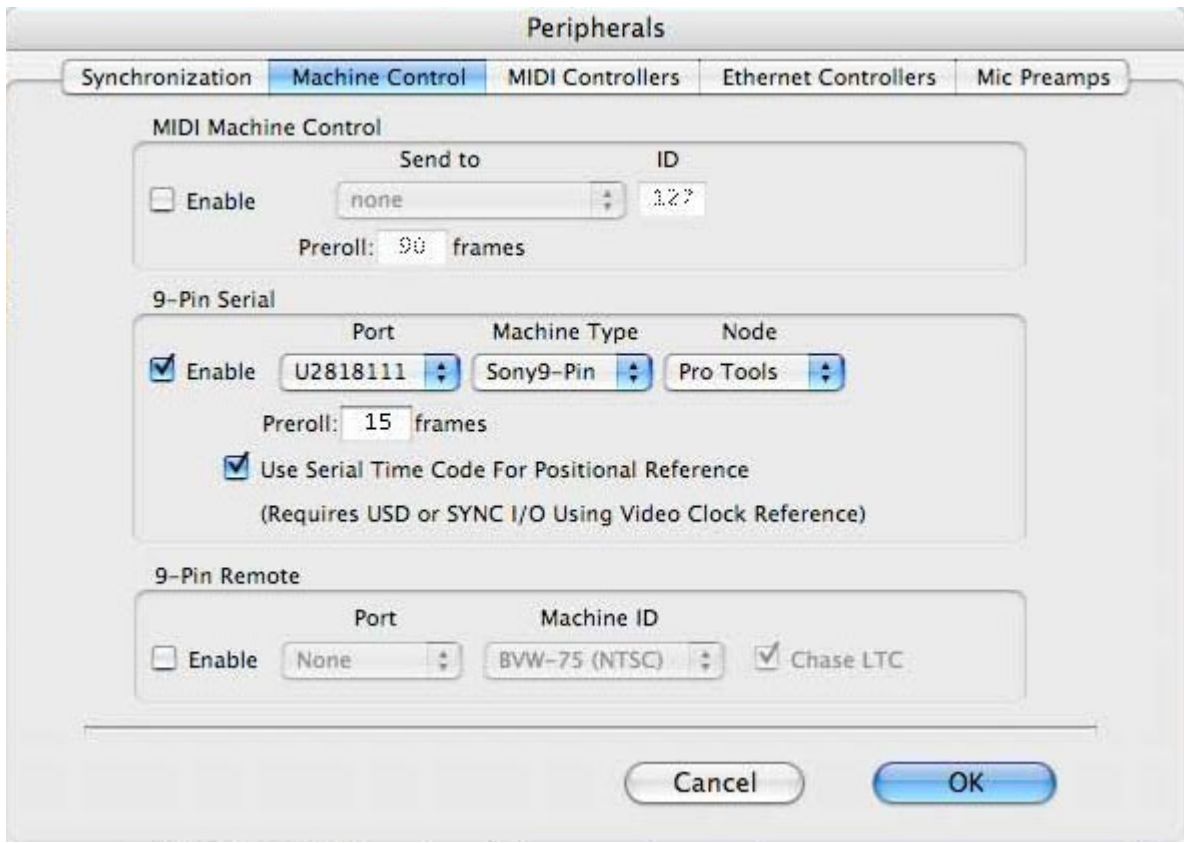
Enable USD Setup     Enable Dub Window

Size:    Vertical Position:    Horizontal Position:    Color:

Update USD Firmware

Cancel    OK





- **Minimum Sync Delay** should be as small as possible (works with 15 frames on mixplus)
- Enable 9-Pin Serial machine control. Select the correct Keyspan **Port**, **Machine Type: Sony9-Pin** mode, **Node**: If your VCube is configured correctly, Pro Tools should see it in the node list (as a generic2). Set Pro-Tools film or PAL or NTSC (depending on your project).
- Enable **Use Serial Time Code For Positional Reference**. ProTools must be supplied with a video reference signal.

### Pro Tools Preferences

Display
Operation
Editing
Automation
Processing
MIDI
Machine Control

- Timeline Insertion Follows Playback
- Edit Insertion Follows Scrub/Shuttle
- Sends Default To "-INF"
- Audio During Fast Forward/Rewind
- Convert imported ".wav" files to AES31/BroadcastWave

- Latch Record Enable Buttons
- Latch Solo Buttons
- Link Mix And Edit Group Enables
- Link Record And Play Faders
- Use F11 Key for Wait For Note
- Automatically Copy Files on Import

**Numeric Keypad Mode**

- Classic
- Transport
- Shuttle

**AutoSave**

Enable Session File Auto Backup

Keep:  most recent backups

Backup every:  minutes

**Online Options**

- Record Online At Time Code (or ADAT) Lock
- Record Online At Insertion/Selection

**Open Ended Record Allocation**

- Use All Available Space
- Limit To:  minutes

Auto Region Fade In/Out Length:  msec

Calibration Reference Level:  dB

Custom Shuttle Lock Speed:  %

Done

### Pro Tools Preferences

Display
Operation
Editing
Automation
Processing
MIDI
Machine Control

**Machine Control**

- Machine Chases Memory Location
- Machine Follows Edit Insertion/Scrub
- Machine Cues Intelligently
- Stop At Shuttle Speed Zero

Delay Before Locking To LTC:

**Remote Mode**

Punch In Frame Offset:

Punch Out Frame Offset:

Delay After Play Command:

Ignore Track Arming

Done

### **Preferences / Machine Control tab**

- Disable **Machine Cues Intelligently**.
- Enable **Stop At Shuttle Speed Zero**.

### **In Session Setup :**

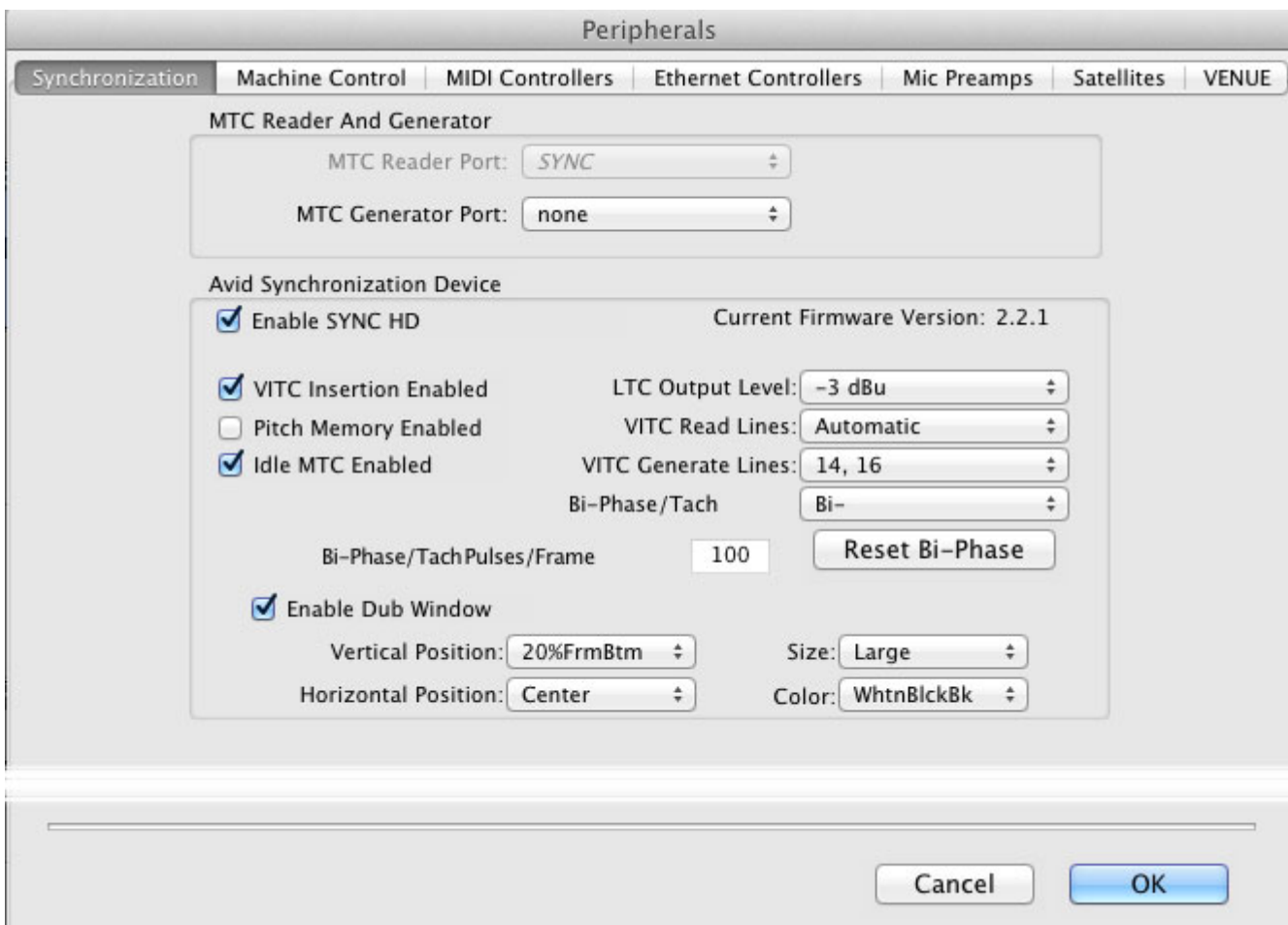
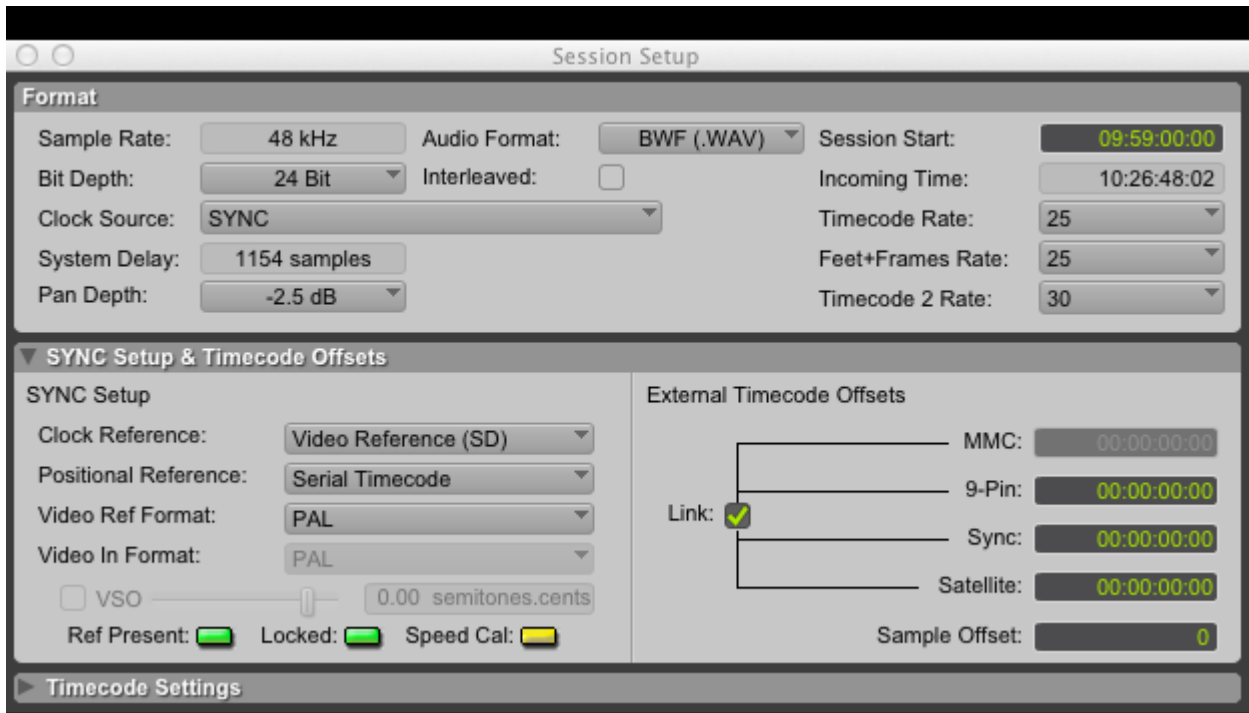
- Ensure that Serial Time Code is used as Incoming Time also ensure **Video Ref** is set correctly and Choose the correct **fps** setting.

### **VCube configuration:**

- In **Settings > Format & Sync : Synchronization - TimeCode (Incoming and Outgoing** verify that **Toggle Chase** is **OFF**
- In **Settings > Format & Sync : Audio Ref Status** check that **Audio Ref** is set to **Video Input** if you have connected the Video ref to VCube; otherwise it should be **Internal**.
- Sampling Rate: As required.
- Width: 720 (in SD)
- Height: 480 (in SD)
- Field Order: Lower Field First
- Pixel Aspect Ratio: 0.9 or 1.2 if you are in WideScreen.
- Composition Frame Rate: NTSC (29.97)
- Link Frame Rate: On
- TC Frame Rate: NTSC (29.97)
- TC Clock Ref: "Video Input" if you have connected the Video ref to VCube; otherwise it should be "Internal".
- TC Clock Ref: NTSC (this settings is available only if "TC Clock Ref" is set to "Video Input"
- Chase TC Source: Auto (we are not going to use the chase but leave the setting as default)
- Chase Mode: Hard (we are not going to use the chase but leave the setting as default)
- Chase Enable: Off Chase Offset: 00:00:00:00
- Graphic Card delay compensation: 0
- Video Card delay compensation: 0
- Sony 9 Pin Remote Control: On
- About Sony 9 pin Remote Control Settings: Shuttle Still Settings: "Stop"
- Serial Port: "COM 2"
- Sony 9 Pin Machine Control: Off

## Pro Tools HD

The following screen shots show a representative setup for Pro Tools HD as used in Swiss TV. Since individual set-ups will inevitably differ some settings may need to be altered to suit your circumstances. If you encounter insoluble difficulties please contact your Merging Technologies Sales Partner.



Peripherals

Synchronization | **Machine Control** | MIDI Controllers | Ethernet Controllers | Mic Preamps | Satellites | VENUE

**MIDI Machine Control (Master)**

Enable    none    ID: 127    Preroll: 90 frames

**MIDI Machine Control Remote (Slave)**

Enable    ID: 127

**9-Pin Machine Control (Deck Control)**

Enable    Port: SYNC9P1    Machine Type: Generic 2    Preroll: 10 frames

**9-Pin Remote (Deck Emulation)**

Enable    Port: None    Machine Type: BVW-75     Chase LTC

Cancel    OK

Pro Tools HD Preferences

### Transport

- Timeline Insertion/Play Start Marker Follows Playback
- Edit Insertion Follows Scrub/Shuttle
- Audio During Fast Forward/Rewind
- Latch Forward/Rewind
- Play Start Marker Follows Timeline Selection
- Reserve Voices For Preview In Context

Custom Shuttle Lock Speed:  %

Custom FF/REW Speed:  %

Back/Forward Amount:

Numeric Keypad:

- Classic
- Transport
- Shuttle

Use Separate Play and Stop Keys

### Record

- Latch Record Enable Buttons
- Link Record and Play Faders
- Audio Track Record Lock
- Transport Record Lock
- Disable "Input" when Disarming Track (In "Stop")
- Mute Record-Armed Tracks while Stopped
- PEC/Direct Style Input Monitoring
- Automatically Create New Playlists When Loop Recording

Online Options:

- Record Online at Timecode (or ADAT) Lock
- Record Online at Insertion/Selection

DestructivePunch File Length:  minutes

### Auto Backup

- Enable Session File Auto Backup

Keep:  most recent backups

Backup every:  minutes

### Misc

Clip Auto Fade In/Out Length:  msec

Calibration Reference Level: -  dB

Delay Compensation Time Mode:

### Video

- High Quality QuickTime Image (DV25 Only)

# Sony 9-Pin RS422 Wiring Chart

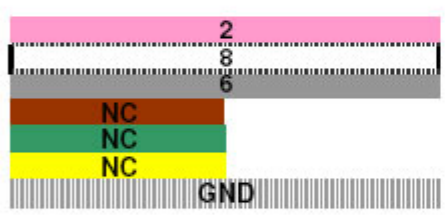
## 1) RS232 to/from RS422 acting as a Slave Port

RS422 → RS232 VCube Slave from Controller Master

FUNCTION (RS 422)	RS422 SUB-D 9P MALE	→	RS232 SUB-D 9P FEMALE	FUNCTION (RS232)
		NC	1	DCD/RLSD
TX-	2	→	3	TX
		NC		
		NC	4	DTR
GND	1+(9,4,6)	→	5	GND
		NC	6	DSR
		NC	7	RTS
RX-	8	→	2	RX
		NC	9	RI
	SHIELD	→	SHIELD	

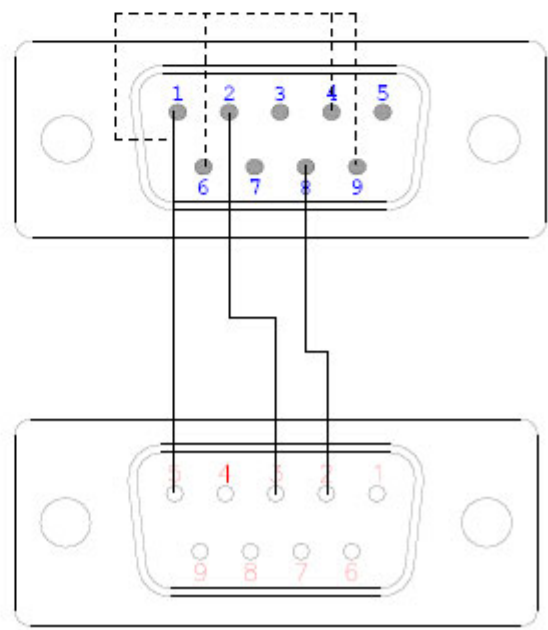
NOTE:  
NC = NOT CONNECTED

### CABLE COLOUR CODE



**SUB-D 9P MALE**  
**RS422 (Sony 9pin)**

**SUB-D 9P FEMALE**  
**RS232**



## 2) RS232 to/from RS422 acting as a Master Port

RS232 → RS422

VCube Master to External Machine Slave

FUNCTION (RS 232)	RS232 SUB-D 9P FEMALE	→	RS422 SUB-D 9P MALE	FUNCTION (RS422)
DCD/RLSD	1	NC		
RX	2	→	2	RX-
TX	3	→	8	TX-
DTR	4	NC		
GND	5	→	1+(9,4,6) LINKED TOGETHER	GND
DSR	6	NC		
RTS	7	NC		
CTS	8	NC		
RI	9	NC		
	SHIELD	→	SHIELD	

NOTE:

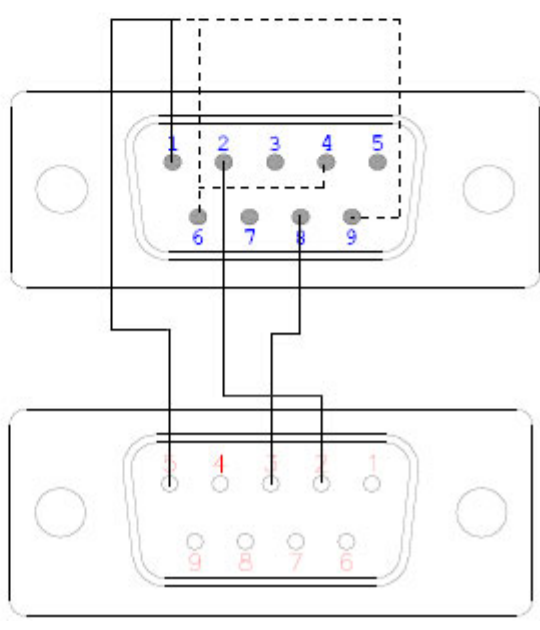
NC = NOT CONNECTED

### CABLE COLOUR CODE



**SUB-D 9P MALE  
RS422 (Sony 9pin)**

**SUB-D 9P FEMALE  
RS232**





### 3) USB (EasySync) or PCI RS-485 (RS422 industrial) Adapter to/from a RS-422 acting as Slave port

Adapter → RS422

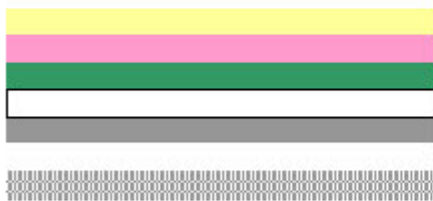
VCube Slave from Controller Master

FONCTION Adapter	RS422 Industrial SUB-D 9P FEMALE	→	RS422 Sony 9 pin SUB-D 9P FEMALE	FONCTION (RS422)
TXD-(A)	1	→	2	TXD-(A)
TXD+(B)	2	→	7	TXD+(B)
RXD+(B)	3	→	3	RXD+(B)
RXD-(A)	4	→	8	RXD-(A)
GND	5	→	1+ (9,4,6)	GND
RTS-(A)	6	NC		
RTS+(B)	7	NC		
CTS+(B)	8	NC		
CTS-(A)	9	NC		
	SHIELD	→	SHIELD	

NOTE:

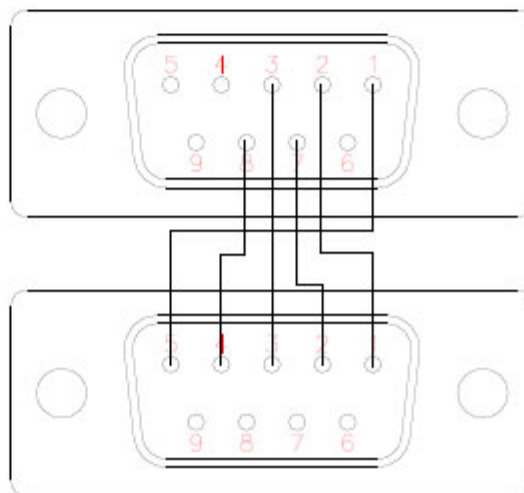
NC = NOT CONNECTED

#### CABLE COLOUR CODE



**SUB-D 9P FEMALE**  
**RS422 (Sony 9pin)**

**SUB-D 9P FEMALE**  
**RS422 (Industrial)**



### 4) USB (EasySync) or PCI RS-485 (RS422 industrial) Adapter to/from a RS-422 acting as a Master port

Adapter → RS422

VCube Master to External Machine Slave

FUNCTION (Adapter)	RS422 Industrial SUB-D 9P FEMALE	→	RS422 Sony 9 pin SUB-D 9P FEMALE	FONCTION (RS422)
TXD-(A)	1	→	8	TXD-(A)
TXD+(B)	2	→	3	TXD+(B)
RXD+(B)	3	→	7	RXD+(B)
RXD-(A)	4	→	2	RXD-(A)
GND	5	→	1+(9,4,6)	GND
RTS-(A)	6	NC		
RTS+(B)	7	NC		
CTS+(B)	8	NC		
CTS-(A)	9	NC		
	SHIELD	→	SHIELD	

NOTE:

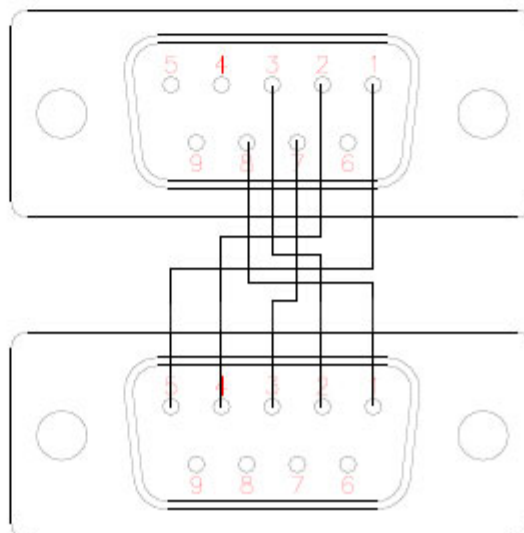
NC = NOT CONNECTED

#### CABLE COLOUR CODE



**SUB-D 9P FEMALE**  
**RS422 (Sony 9pin)**

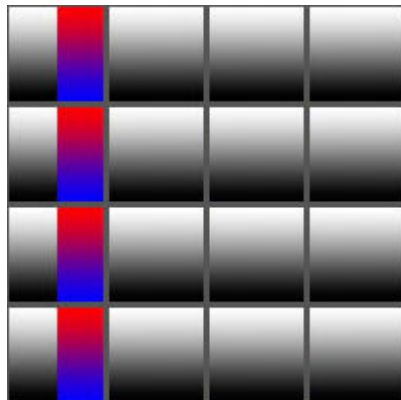
**SUB-D 9P FEMALE**  
**RS 422 (Industrial)**



# Glossary

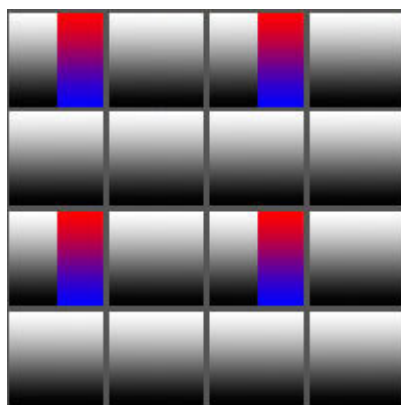
## 4.1.1

- Is the color sampling mode used in DV NTSC.



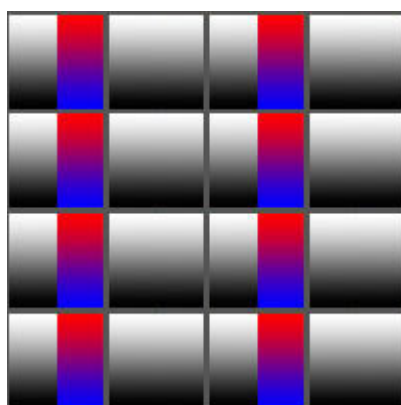
## 4.2.0

- Is the color sampling mode used in DV PAL.



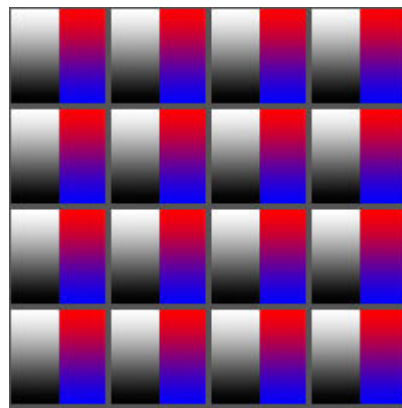
## 4.2.2

- A commonly used term for a component digital video format. The details of the format are specified in the ITU-R BT.601-2 standard document. The numerals 4.2.2 denote the ratio of the sampling frequencies of the single luminance channel to the two color difference channels. For every four luminance samples, there are two samples of each color difference channel. See ITU-R BT.601-2.



#### 4.4.4

- Similar to 4:2:2 except that for every four luminance samples, the color channels are also sampled four times.



#### A

- **AES/EBU:** Informal name for a digital audio standard established jointly by the AES and EBU organizations. The sampling frequency for this standard varies depending on the format being used; the sampling frequency for D1 and D2 audio tracks is 48 kHz.
- **alpha channel:** is really a mask. It specifies how the pixel's colors should be merged with another pixel when the two are overlaid, one on top of the other. It all allows transparencies inside a picture.
- **aspect ratio:** The ratio of television picture width to height. In NTSC and PAL video, the present standard is 4:3.
- **Autoconform:** Where the Audio media files associated with an EDL are not available to the Pyramix PC, Pyramix can control a tape deck or other device to import the required audio.
- **AVI:** an acronym for Audio Video Interleave, is a file format designed to store both audio and video data in a standard package to allow its simultaneous playback. It's part of the Video for Windows technology.

#### B

- **black level:** The lowest transmittable luminance level that can occur during the active picture portion of a video signal. When viewed on a monitor this signal level portrays the color black.
- **buffer:** A digital storage device used to compensate for a difference in the rate of flow of information or the time of occurrence of events when transmitting information from one device to another.

#### C

- **caption:** Text or titles to be inserted in video.
- **chrominance:** That portion of the video signal, which contains the color information (hue and saturation). Video picture information contains two components: luminance (brightness and contrast) and chrominance (hue and saturation).
- **clip:** In desktop editing, a pointer to a piece of digitized video or audio that serves as source material for editing.
- **codec:** Coder-decoder. A device that converts analog video and audio signals into a digital format for transmission over telecommunications facilities and also converts received digital signals back into analog format.
- **Conform:** Conforming is the process of making and positioning audio Cues in the Timeline from Audio media files already present in a folder available to the Pyramix PC in conformity with an imported EDL (Edit Decision List.) or video project, for example, AAF, Final Cut Pro or OMF.
- **component:** Video signal the keeps luminance and chrominance separate for better picture quality.
- **composite:** Video signal the combines luminance and chrominance in a single signal. Less expensive than component video, but lower picture quality.
- **compression:** Reduction of the size of digital data files by removing redundant information (non-lossy) or removing non-critical data (lossy). Also used to describe reduction in dynamic range.

- **conforming:** Transferring EDL (Edit Decision List) information gathered from an off-line edit to an on-line edit for final assembly.

## D

- **D1:** Sony's D1 format was the first major push towards fully digital videotape operations. D1 used a 19mm (3/4") tape loaded into cassettes as its media. Component video was encoded as YUV 4:2:2 with PCM audio tracks as well as TimeCode. D1 was notoriously expensive and the equipment required very large infrastructure changes in facilities which upgraded to this format. Early D1 operations were plagued with difficulties, though the format quickly stabilized and was renowned for its superlative image quality.
- **D10:** is the SMPTE specification for a professional video format, it is composed of MPEG Video 4:2:2 I-frame only and 8-channel AES3 audio streams. These AES3 audio usually contain 24bit PCM audio samples. It is possible to find video bit rates of 50, 40 and 30 MBits/s.
- **DV:** uses DCT (Discrete Cosine Transform) intraframe compression, which is similar to MJPEG, at a fixed bit rate of 25 Megabit per second, which amounts to roughly 3.6 Megabytes per second or 4 minutes per Gigabyte. The chroma subsampling is 4:1:1 for NTSC or 4:2:0 for PAL, which reduces the amount of color resolution stored. Therefore, not all analog formats are outperformed by DV. The lower sampling of the color space is also a reason why DV is sometimes avoided in applications where chroma-key will be used. However, a large contingent feel the benefits (no generation loss, small format, digital audio) are an acceptable trade off given the compromise in color sampling rate. DV allows either 2 digital audio channels (usually stereo) at 16 bit resolution and 48 kHz sampling rate, or 4 digital audio channels at 12 bit resolution and 32 kHz sampling rate. For professional or broadcast applications, 48 kHz is used almost exclusively. The IEEE 1394 or Firewire serial data transfer bus is not a part of the DV specification, but co-evolved with it. Nearly all DV cameras have a IEEE 1394 interface and analog composite video and Y/C outputs. High end DV VCRs may have additional professional outputs such as SDI, or analog component video.
- **drop-frame TimeCode:** SMPTE TimeCode format that continuously counts 30 frames per second but drops 2 frames from the count every minute except for every tenth minute (drops 108 frames every hour) to maintain synchronization of TimeCode with clock time. This is necessary because the actual frame rate of NTSC video is 29.97 frames per second rather than an even 30 frames.

## E

- **edit decision list (EDL):** A list of edit decisions accumulated in a video editor. The list typically includes the source reel, track(s), in time, and out time and destination track(s) In time and Out time for each edit.
- **embedded audio:** Digital audio that is multiplexed onto a serial digital video data stream.
- **essence:** The raw encoded form of audio and video data is often called essence, to distinguish it from the metadata information that together make up the information content of the stream and any "container" data that is then added to aid access to or improve the robustness of the stream.

## F

- **fade:** The gradual disappearance of a picture to black (fade, fade-out, fade-to-black), or the gradual appearance of a new picture from black (fade-in, fade-up).
- **field:** Half of the interlaced horizontal lines (262.5 in NTSC, 312.5 in PAL) needed to create a complete frame. A correct field order must be applied to produce a smooth motion. Odd / Upper / Top or Even / Lower / Bottom are fortunately the two possible solutions.
- **flywheel:** Condition in which a sync generator has been locked to an outside source, which is no longer present. Sync generator continues to provide sync on the basis of the last rate received from the outside source related to its own internal clock.
- **frame:** A complete video picture composed of two fields (two complete interlaced scans of the monitor screen). A frame consists of 525 interlaced horizontal lines of picture information in NTSC, 625 in PAL. In HD a frame can consist of 720 or 1080 horizontal lines of pixels which may be interlaced or progressive (non-interlaced).
- **free-run:** Condition in which a sync generator is not locked to any outside source but is providing sync on derived from its own internal clock.

## G

- **gen-lock (genlock):** To phase-lock the timing of one piece of equipment to another.

## H

- **house sync:** Video sync signal generated within the studio and used as a reference for generating and/or timing other video signals.

## I

- **IMX:** is the Sony implementation of the MXF for the D10 video format.
- **interlaced:** Short for interlaced scanning. Also called line interlace. A system of video scanning whereby the odd- and even-numbered lines of a picture are transmitted consecutively as two separate interleaved fields.
- **IRE (Institute of Radio Engineers):** Units of measurement dividing the area from the bottom of sync to peak white level into 140 equal units. One hundred and forty IRE equals 1 volt peak-to-peak. The range of active video is 100 IRE.
- **ITU-R BT.601-2:** Formerly known as CCIR 601. An international standard for component digital television from which was derived SMPTE 125M (was RP-125) and EBU 3246E standards. This International Telecommunications Union (ITU) recommendation defines the sampling systems, matrix values, and filter characteristics for both Y, B-Y, R-Y and RGB component digital television.
- **ITU-R BT.656** Formerly known as CCIR 656. The physical parallel and serial interconnect scheme for ITU-R BT.601-2 (CCIR 601). ITU-R BT.656 defines the parallel connector pinouts as well as the blanking, sync, and multiplexing schemes used in both parallel and serial interfaces. Reflects definitions in EBU Tech 3267 (for 625 line signals) and in SMPTE 125M (parallel 525) and SMPTE 259M (serial 525).

## J

- **jog, jogging:** Process of moving the video forward or backward one field or frame at a time. Also refers to the use of a **jog wheel** to move the picture slowly backwards and forwards.

## K

## L

- **LAN:** Local area network.
- **Layer:** A single video image that is processed so that it can be inserted into the final composite image. There may be other Layers in the image, and they can be prioritized as to Layer location.
- **LTC:** Linear TimeCode. TimeCode recorded on a linear analog track on a video tape. It is audible and can be read at high speeds, but not when the tape is stationary.
- **luminance:** is the measure of the intensity of the combined color (white) portion of a video signal.

## M

- **Metadata:** is data about data. An example is a library catalog card, which contains data about the nature and location of a book: It is data about the data in the book referred to by the card.
- **MJPEG** is a video codec where each video field is separately compressed into a JPEG image. The resulting quality is independent from the motion in the image which differs from MPEG video where quality often decreases when footage contains lots of movement. M-JPEG is best suited for broadcast resolution interlaced video (720x486 D1 NTSC or 720x576 PAL). Because it is designed for interlaced video, M-JPEG is not well suited for movies that are smaller than television resolution. Movies designed to be viewed on progressive scan computer monitors (like web movies or CD-ROM video games) are ill suited for M-JPEG.
- **MPEG:** Compression standards for moving images conceived by the Motion Pictures Expert Group, an international group of industry experts set up to standardize compressed moving pictures and audio. The moving picture coding systems such as MPEG-1, MPEG-2, and MPEG-4 add an extra step, where the picture content is predicted from past reconstructed images before coding, and only the differences from the reconstructed pictures, and any extra information needed to perform the prediction, are coded.
- **MXF:** is a "container" or "wrapper" format that supports a number of different streams of coded "essence", encoded with any of a variety of codecs, together with a metadata wrapper which describes the material contained within the MXF file. MXF has been designed to address a number of problems with non-professional formats. MXF has full TimeCode and metadata support, and is intended as a platform-agnostic stable standard for future professional video and audio applications. VCube supports currently OP-Atom (a very simple and highly constrained layout for simple MXF files) and OP-1a (the layout options for a minimal simple MXF file).

## N

- **NTSC:** signal The standard composite video signal adopted by the NTSC that has 525 interlaced lines at a frame rate of 29.97 frames per second. AKA Never Twice the Same Color due to the constantly changing color rendition in early analogue TV broadcasts.

## O

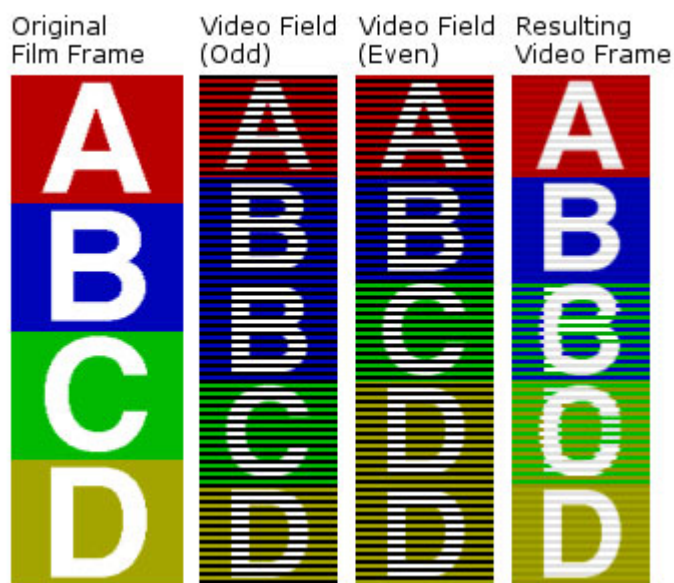
- **overscan:** A video monitor condition in which the raster extends slightly beyond the physical edges of the CRT screen, cutting off the outer edges of the picture.

## P

- **PAL:** signal The most common composite video signal used in Europe. Describes the way in which color used to be encoded in analogue signals, Phase Alternating Line. It has a frame rate of 25 fps.
- **pixel:** A single picture element. The smallest element in a graphic image. Pixels are combined with other pixels to make up a graphic image. Picture quality increases as the number of pixels increase in a measured area of an image.
- **postroll:** is a preset period of time during a preview when a Clip will continue to play past the OUT point before stopping or rewinding.
- **preroll:** is the process of rewinding videotapes to a predetermined cue point (for example, 6 seconds) so the tapes are stabilized and up to speed when they reach the selected edit point (during recording or digitizing of source material from a video deck).
- **pulldown:** In countries that use the PAL or SECAM video standards, film destined for television is photographed at 25 frames per second. The PAL video standard broadcasts at 25 frames per second, so the transfer from film to video is simple; for every film frame, one video frame is captured. Theatrical features originally photographed at 24 frame/s are simply sped up by 4% to 25 frame/s. This can cause a noticeable increase in audio pitch, which is sometimes corrected using a pitch shifter. In the United States and other countries that use the NTSC television standard, film is generally photographed at 24 frame/s. Color NTSC video is broadcast at 29.97 frame/s. For the film's motion to be accurately rendered on the video signal, an NTSC telecine must use a technique called the 3:2 pulldown to convert from 24 to 29.97 frame/s. The 3:2 pulldown is accomplished in two steps.
  - The first step is to slow down, or "pulldown" the film motion by 0.1%. This speed change is unnoticeable to the viewer, and makes the film travel at 23.976 frame/s.
  - The second step of the 3:2 pulldown is the 3:2 step. At 23.976 frame/s, there are 4 frames of film for every 5 frames of NTSC video:

$$\frac{23.976}{29.97} = \frac{4}{5}$$

- These four frames are "stretched" into five by exploiting the interlaced nature of NTSC video. For every NTSC frame, there are actually two complete images or "fields," one for the odd-numbered lines of the image, and one for the even-numbered lines. There are, therefore, ten fields for every 4 film frames, and the telecine alternately places one film frame across two fields, the next across three, the next across two, and so on. The cycle repeats itself completely after four film frames have been exposed, and in the telecine cycle these are called the "A," "B," "C," and "D" frames, thus:

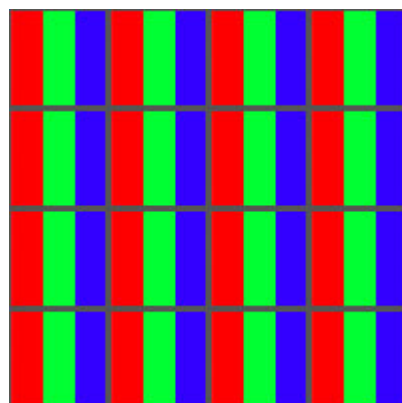


**Q**

- **quantization:** The process of sampling an analog waveform to convert its voltage levels into digital data.
- **QuickTime:** is a multimedia technology developed by Apple Computer, capable of handling various formats of digital video, sound, text, animation, music. A QuickTime file functions as a multimedia container file that contains one or more tracks, each of which store a particular type of data, such as audio, video, effects, or text (for subtitles, for example). Each track in turn contains track media, either the digitally encoded media stream.

**R**

- **Reconform:** Pyramix can conform audio to match a several flavours of EDL and also reconform an existing project to match a CMX change EDL.
- **reference video signal:** A composite video signal to which other signals are compared or locked for timing purposes.
- **RGB:** Every pixel is sampled for red, green and blue.



- **RP 188:** is a SMPTE recommended Practice describing the transmission of the TimeCode in the ancillary data space of a television data stream. The Xena LS and the Canopus video cards don't support this feature.
- **RS-232:** A standard, single-ended (unbalanced) interconnection scheme for serial data communications. The maximum permissible line length under the specification is approximately 15 meters.
- **RS-422:** A standard, balanced interconnection scheme for serial data communications. It allows for higher data rates and an extended line length to approximately 1200 meters.



- **ruler:** A graphic element of a video editing application that shows time or TimeCode along a horizontal axis. Similar to the ruler in word processing applications except calibrated in units of time.

## S

- **safe action area:** and **safe title area:** are the regions of the video image considered safe from cropping for either the action or on-screen titles, taking into account variations in adjustments for video monitors or television receivers. Safe action is 90 percent of the screen measured from the center, and safe title is 80 percent.
- **SDI Serial Digital Interface;** standardized in ITU-R 656, is a digitized video format used for broadcast grade video. It typically uses 75 Ohm BNC coaxial cables (which makes it easily upgradeable from analog video setups, which use the same cables). Uncompressed digital component signals are transmitted. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a data rate of 270 Mbit/s. A SDI signal may also contain embedded AES/EBU 48kHz, 16bit audio channels along with the video.
- **SMPTE TimeCode:** TimeCode that conforms to SMPTE standards. It consists of an eight-digit number specifying hours: minutes: seconds: frames. Each number identifies one frame on a videotape. SMPTE TimeCode may be of either the drop-frame or non-drop frame type.
- **shuttle:** is the process of viewing of footage at speeds greater than real time.

## T

- **TBC:** Time base corrector. Device used to correct for time base errors and stabilize the timing of the video output from a tape machine.
- **TCP/IP (Transmission Control Protocol/Internet Protocol):** Transmission control protocol/Internet protocol. TCP/IP is a combined set of protocols that perform the transfers of data between two computers. TCP monitors and ensures correct transfer of data. IP receives the data from TCP, breaks it up into packets, and sends it to a network within the Internet. Every computer on the Internet supports TCP/IP.
- **telecine:** A device for capturing movie film as a video signal.
- **TimeCode:**
  - The time, measured in hours, minutes, seconds and frames, which is recorded on a tape along with program material and user bit information. The TimeCode is used to locate particular points on a tape.
  - A method of identifying video frames on a recorded format. A TimeCode number is a series of 8 digits (SMPTE TimeCode) which represents the hour, minute, second, and frame number of video. Two popular systems are: Longitudinal TimeCode (LTC) and Vertical Interval TimeCode (VITC).
- **Timeline:** A window within a video editing application where Clips and other production elements can be graphically arranged to create a fully edited production. The horizontal axis of the timeline window represents a timeline of the show.
- **toggle:** To change back and forth between two states (for instance: on, off, on, off, etc.)
- **track:** Levels in the timeline window of an editing application where video and audio elements can be placed to insert them into the production.
- **tri-level:** Synchronization signal dedicated to HD. The signal consists of a three-level sync pulse (zero volts (0V) Blank, -0.3 V pulse, +0.3 V pulse) followed by the video image data. Like analog sync, the signal is repeated every scan line as it creates an entire HD video frame.
- **trim:** In video editing systems, to add or subtract TimeCode to adjust edit points.

## U

- **Underscan:** The process of displaying a TV picture on an area smaller than the TV picture tube size permitting view of the entire video picture, including sync and blanking. Many professional TV monitors have an underscan button or switch to allow for viewing the entire TV picture.

## V

- **VCR:** Video cassette recorder.
- **VITC:** Vertical interval TimeCode. TimeCode encoded into the vertical interval of the video. It can usually be read out even when a VTR is still-framed or running at slower or faster than play speed.

**W**

**X**

**Y**

- **Y, U, V:** PAL luminance & color difference components. U and V are the names of the B-Y and R-Y color difference signals (respectively) when they are modulated onto subcarrier.

- **YUY2:** see 4:2:2.

**Z**

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