



CLIPSTER

3D/Stereoscopy

Supplement User Guide

Supplement User Guide: CLIPSTER 3D/Stereoscopy
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CLIPSTER 3D/Stereoscopy Supplement User Guide

Introduction

Getting Started

Working with 3D Material

Generating 3D Material

Index



1

2

3

4

I



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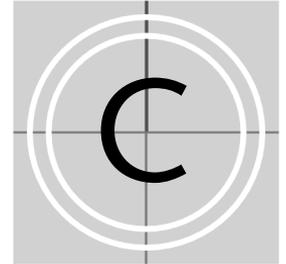
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Contents



1	Introduction	1-1
	1.1 Overview	1-2
	1.2 Target Group	1-2
	1.3 Conventions Used in this User Guide	1-3
	1.4 General Notes	1-3
2	Getting Started	2-1
	2.1 Types of 3D Material	2-2
	2.2 Preparing the Edit Tool for 3D	2-3
	2.2.1 Preparing Two Separate Clips as 3D Material	2-3
	2.2.2 Preparing Interleaved 3D Material	2-4
3	Working with 3D Material	3-1
	3.1 Merging and Unmerging Video Tracks	3-2
	3.1.1 Changing the Track Mode	3-2
	3.1.2 Setting the Track Properties	3-3
	3.1.3 Particulars about Merging and Unmerging	3-4
	3.2 Editing	3-6
	3.3 Viewing and Playing Out	3-7
	3.3.1 Configuring the Output Mode	3-7
	3.3.2 Configuring the Display	3-8
	3.3.3 Configuring the Output	3-9
4	Generating 3D Material	4-1
	4.1 Finalizing 3D Material	4-2
	4.2 Recording 3D Material	4-3

I Index I-1

Introduction



This document describes the optionally available 3D/stereoscopic workflow feature of CLIPSTER.

The 3D/stereoscopic workflow feature allows you to work with 3D material in CLIPSTER. The complete production chain from ingest over editing to output/finalizing is supported.

With this you can easily record or import 3D material, add it to a timeline and then edit it. During all work the end result can be comfortably controlled either in the video overlay or at the outputs of the DVS system. Once your work is finished, you can finalize the 3D material in all popular 3D methods (e.g. as separate clips, interleaved, anaglyph, side by side, etc.) or play it out via two separate HD-SDI or DVI outputs to feed two projectors or 3D monitors (also in all popular 3D methods).

1.1 Overview

This user guide describes the possibilities and user interface items of the 3D/stereoscopic workflow feature of CLIPSTER.

The chapters in this user guide contain the following information:

Chapter 1	Begins with a short introduction to the 3D/stereoscopic workflow feature, followed by a note regarding the audience this manual is written for and an explanation of the conventions used in this manual. Additionally, it details some general notes that you should observe.
Chapter 2	Describes the steps to get started using 3D material in CLIPSTER.
Chapter 3	Describes how to work with 3D material in the Edit Tool, for example, how to merge and unmerge video tracks or how to edit, view and play out 3D clips.
Chapter 4	Explains how to generate 3D material, i.e. how to finalize a project in 3D or how to record material in 3D.
Index	This chapter facilitates the search for specific terms.

1.2 Target Group

To use this manual and the 3D/stereoscopic workflow feature effectively you should be familiar with the DVS soft- and hardware as well as the manuals delivered with the DVS system.

1.3 Conventions Used in this User Guide

The following typographical conventions will be used in this documentation:

- Texts preceded by this symbol describe activities that you must perform in the order indicated.
- Texts preceded by this symbol are parts of a list.



Texts preceded by this symbol are general notes intended to facilitate work and help avoid errors.

“ ” Texts enclosed by quotation marks are references to other manuals, guides, chapters, or sections.

'Window'	Text in bold with single quotation marks indicates a window name
BUTTON	Text in small caps and bold indicates a push button
<i>Menu</i>	Text in italic and bold indicates either a menu name or options in a menu list
<i>Menu » Option</i>	In the specified menu select the stated item
Item	Text in bold only stands for other labeled items of a user interface
Entry	Parameters, selections or entries made in the program

1.4 General Notes

In the following you can find some general notes that may be helpful for your work with the 3D/stereoscopic workflow feature or this user guide:



The 3D/stereoscopic workflow is available as an optional feature.



For further details about user interface items not described in this document please refer to the other user guides delivered with the DVS system.

Getting Started



This chapter describes the steps to get started using 3D material in the Edit Tool. First, the different types of 3D material that can be used in the DVS software will be described, followed by a description of how to prepare the Edit Tool for 3D depending on the type of material available to you.

2.1 Types of 3D Material

Stereoscopic material provides for each human eye a separate video stream (clip), commonly called left eye and right eye clip. They can be stored differently on a storage and the following two types of 3D material can be used in the DVS software:

- Two separate video clips (one for the left eye and one for the right eye).
- A single video clip that contains both eyes by interleaving the two video streams (interleaved video clip):

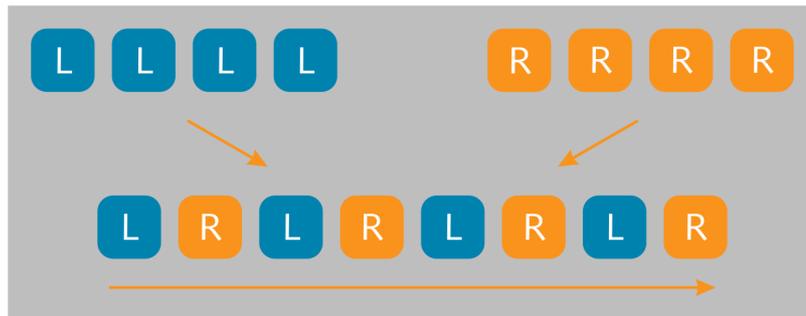


Figure 2-1: Interleaving of a 3D video clip



The DVS software starts an operation for 3D (such as a finalizing or play-out) with the left eye clip as the first frame. However, by setting the right eye clip to be the left eye clip this behavior can be changed (see section “Merging and Unmerging Video Tracks” on page 3-2).

Depending on the type of material that is available to you, the DVS software has to be prepared differently (see section “Preparing the Edit Tool for 3D” on page 2-3).

2.2 Preparing the Edit Tool for 3D

Depending on the type of material that is available to you (see section “Types of 3D Material” on page 2-2) the Edit Tool has to be prepared differently to be able to work in 3D. This section describes how to prepare the different types of 3D material.

2.2.1 Preparing Two Separate Clips as 3D Material

If two separate video clips are available as 3D material, you can add them to separate video tracks in the timeline of the Edit Tool and then merged these tracks to a single stereo track. For this perform the following:

- Add the two clips for the left and right eye to the bin, for example, by dragging them to the contents area of the bin from a file manager or by using the menu option **Add clip...** of the bin’s context menu.
- Next configure the timeline to show a second video track, for example, via the timeline output settings or by using the menu option **Add track** on the context menu of a video track.
- Add the video clips from the bin each to a video track in the timeline. It is recommended to add the left eye video clip to the first video track and the right eye video clip to the second video track.

Once this is done, the timeline of the Edit Tool will look similar to the following figure:

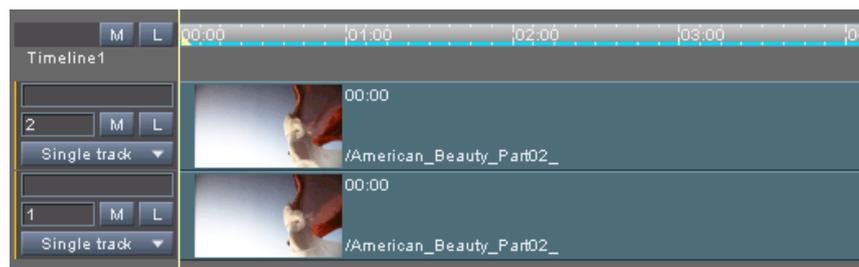


Figure 2-2: Left eye and right eye clip in the timeline

Then the two tracks can be merged to a single stereo track:

- Either perform a click on one of the items labelled **Single track** or click on the triangle to the right and select from the drop-down menu the entry **Stereoscopic 3D track**.

After this the track properties window of the respective track will be displayed on the screen.



For further information about the track properties window and the track mode item see section "Merging and Unmerging Video Tracks" on page 3-2.

- In this window activate the radio button **Stereoscopic 3D track** and configure the tracks according to where (in which track) you have added the respective clips.
- When finished confirm your settings with the **OK** button.

This will merge the two video tracks to a single 3D stereo track in the timeline:

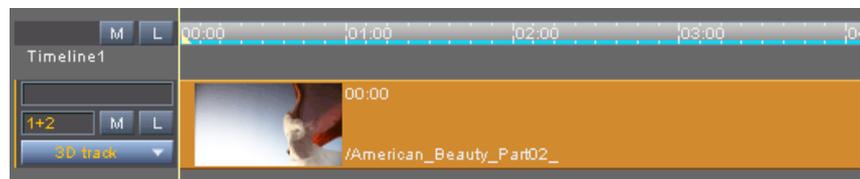


Figure 2-3: 3D stereo track in the timeline

Afterwards the preparations for two separate video clips as 3D material are finished and you can now start your work as described in chapter "Working with 3D Material" on page 3-1.

2.2.2 Preparing Interleaved 3D Material

When only a single video clip is available (i.e. an interleaved 3D clip), you have to alter its bin clip properties accordingly. Afterwards it can be added to a stereo track of the Edit Tool. For this perform the following:

- Add the interleaved 3D clip to the bin, for example, by dragging it to the contents area of the bin from a file manager or by using the menu option **Add clip...** of the bin's context menu.

Afterwards the interleaved clip will be visible in the contents area of the bin. However, because an interleaved clip is registered by the DVS software just as a normal clip you have to correct its properties to account for its 3D content:

- Open the properties of the interleaved video clip in the bin (context menu of bin clip » **Properties...**).

Then the properties window of the bin clip will be displayed on the screen.

- In this window configure the setting **Stereoscopic Clip** to **Interleaved Stereo** and confirm this with the **OK** button.



Figure 2-4: Configuring a clip to an interleaved clip

The clip will now be recognized by the DVS software as interleaved 3D material and, as a result, it can only be added to a 3D stereo track. Thus, you have to provide a 3D stereo track in the Edit Tool for it:

- Configure the timeline to show a second video track, for example, via the timeline output settings or by using the menu option **Add track** on the context menu of a video track.

Once this is done, the timeline of the Edit Tool will look similar to the following figure:

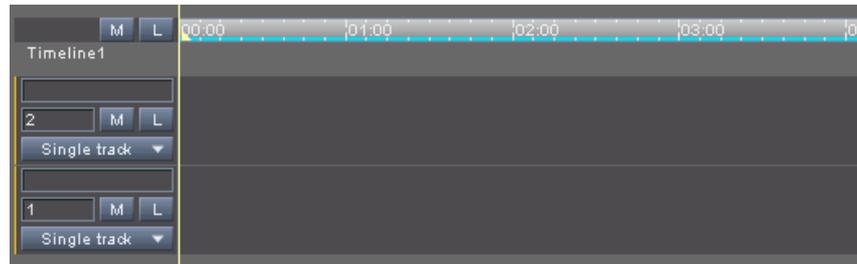


Figure 2-5: Two timeline tracks in the timeline

Then the two tracks can be merged to a single stereo track:

- Either perform a click on one of the items labelled **Single track** or click on the triangle to the right and select from the drop-down menu the entry **Stereoscopic 3D track**.

After this the track properties window of the respective track will be displayed on the screen.



For further information about the track properties window and the track mode item see section "Merging and Unmerging Video Tracks" on page 3-2.

- In this window activate the radio button **Stereoscopic 3D track** and configure the tracks so that track 1 is set to the left eye and track 2 to the right eye.
- When finished confirm your settings with the **OK** button.

This will merge the two video tracks to a single 3D stereo track in the timeline.

- Then add the interleaved video clip from the bin to the stereo track in the timeline.

Once this is done, the timeline of the Edit Tool will look similar to the following figure:

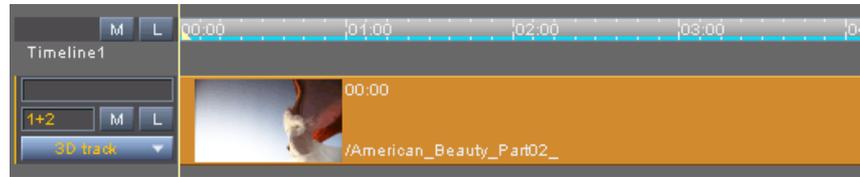


Figure 2-6: 3D stereo track in the timeline

The left eye and right eye video streams interleaved in the clip are now accessible to the DVS software. With this the preparations for an interleaved clip as 3D material are finished and you can now start your work as described in chapter “Working with 3D Material” on page 3-1.

Working with 3D Material



This chapter describes how to work with 3D material in the Edit Tool after it has been prepared and added correctly to the timeline (see section “Preparing the Edit Tool for 3D” on page 2-3). First the items for merging and unmerging video tracks will be described, followed by some particulars about this. After this it will be explained how to edit, view and play out 3D clips.

3.1 Merging and Unmerging Video Tracks

As soon as two or more video tracks are displayed in the timeline (see also section “Preparing the Edit Tool for 3D” on page 2-3), they can be merged to a stereoscopic 3D track (stereo track) as well as unmerged.

3.1.1 Changing the Track Mode

To merge or unmerge two video tracks you have to change its track mode. For this the track mode item right in front of a video track has to be used:

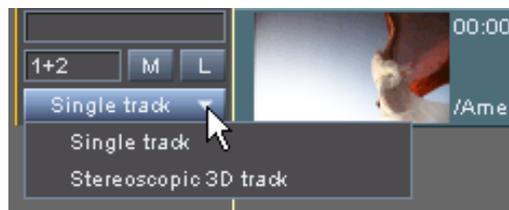


Figure 3-1: The track mode item

When clicking on the triangle to the right of the track mode item, a drop-down menu will be displayed which can be used to configure the tracks:

Single track	Configures the respective track to a standard single video track of the Edit Tool. If a 3D track already, it will be unmerged to two single tracks again, each holding the left eye/right eye clip. When unmerging a track containing an interleaved 3D clip, it will also be split into two separate clips.
Stereoscopic 3D track	Configures the respective track (and its partner track, if it was a 3D track before) to a 3D stereo track again. If the respective track has not been a 3D track yet, the properties window of the respective track will be opened (see section “Setting the Track Properties” on page 3-3).

When clicking the track mode item directly, the properties window of the respective track will be displayed immediately (see section “Setting the Track Properties” on page 3-3).

3.1.2 Setting the Track Properties

When configuring a track that has not been a stereo track before to a stereo track or when clicking on the track mode item directly, the properties window of the respective track will be opened:

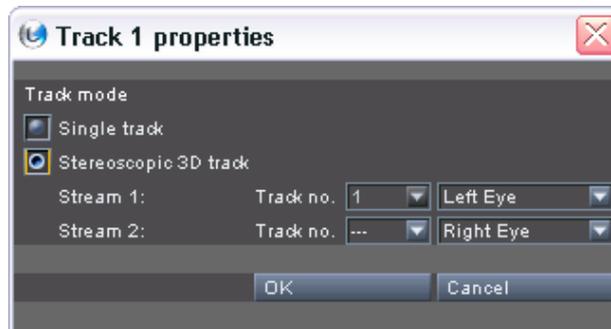


Figure 3-2: The track properties window

With the track properties window you can set and change the properties of a (stereo) track, for example, by assigning the streams. It provides the following settings items:

Single track	Same as the option Single track of the track mode item (see section “Changing the Track Mode” on page 3-2).
Stereoscopic 3D track	When this option is activated, the tracks as indicated by the items Stream 1 and Stream 2 will be configured to a 3D stereo track. Select the partner track of the first stream (i.e. of the track where the properties window has been invoked) with the Track no. combo box of Stream 2 . With the combo boxes to the right you have to assign the streams and determine which of the tracks contains the left and the right eye clip.



The DVS software starts an operation for 3D (such as a finalizing or play-out) with the left eye clip as the first frame. However, by configuring the track of the right eye clip to `Left Eye` this behavior can be changed.

Once everything is set correctly, you can confirm your settings by clicking the **OK** button. The **CANCEL** button will close the properties window without altering the states of the track(s).

3.1.3 Particulars about Merging and Unmerging

There are several particulars that you should be aware of when merging and unmerging video tracks:

Automatic Activation of Stereoscopic Output Mode

When video tracks are merged to a 3D stereo track, the stereoscopic output mode is automatically activated (button **SETTINGS...** of the timeline area, see section “Configuring the Output” on page 3-9) and it will remain activated for this project if not deactivated manually.

Interleaved Video Clips

A clip configured as an interleaved video clip can be added to a 3D stereo track only (see section “Preparing the Edit Tool for 3D” on page 2-3). Its two streams are then accessible to the DVS software. By unmerging a stereo track containing an interleaved video clip, the two streams can be accessed separately as two individual clips, one for the left and one for the right eye.

Track Numbers

The (first) number in front of a video track indicates the track number. If a second number is displayed with a plus sign in front, it details the respective partner track of this track (either if currently a 3D track or previously configured to one): <track no.>+<partner track no.>.

Synchronicity

When merging two video tracks to a 3D stereo track, the edit points of the timeline elements in both tracks must coincide, i.e. the timeline elements must be synchronous. If they are not synchronous, you will be informed about this and the respective elements will be particularly highlighted in the timeline area:

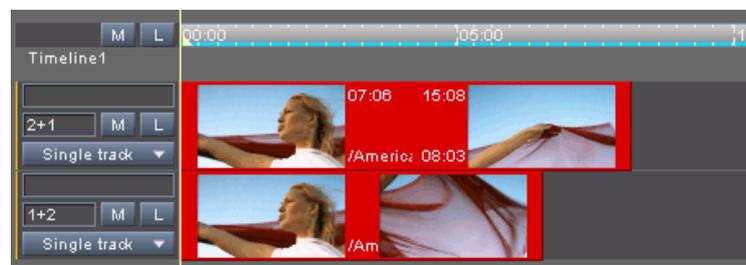


Figure 3-3: Error marked clips in the timeline area

To reset the highlighting you can resolve the cause for this error and then merge the two tracks, or call the context menu of a video clip in

the timeline and select the menu option ***Reset error status***. Afterwards the clips will be displayed with their normal color again.

No Partner Element

The complementary partner element of a left/right eye clip pair can be left out from the timeline, meaning timeline stretches on one of the tracks to be merged to a 3D track can be left empty. These tracks can still be merged to a 3D stereo track, as long as synchronicity is observed (see above). Then the timeline element without a partner will be duplicated and added to the empty track. When unmerging the track again, you will find instead of just one timeline element identical timeline elements in both tracks.

3.2 Editing

Once 3D material is properly prepared and available in the timeline of the Edit Tool (see section “Preparing the Edit Tool for 3D” on page 2-3), you can start editing it.

A stereo track available in the timeline area of the Edit Tool can be edited the same way as any standard single video track. The timeline elements on 3D stereo tracks can be, for example, cut or trimmed, or transitions and effects can be applied. All editing work will be applied to both streams at the same time.



When merging two video tracks with different effects applied to the timeline elements, the effects operators will be copied from the elements of the first stream to the elements of the second stream. The ones of the second stream will be deleted.

Furthermore, the effects operator 'Flip Flop' provides settings that can be used to correct the streams created by special stereo camera rigs. You can use it to mirror the streams independently:

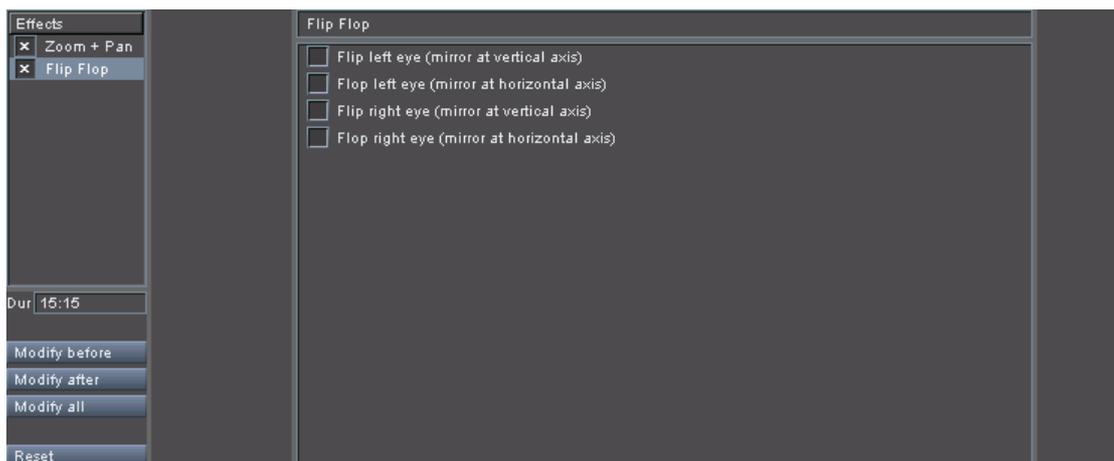


Figure 3-4: Flip/flop operator

With the check boxes in the settings pane of the flip/flop operator mirror the left and/or right eye clip according to your needs.

3.3 Viewing and Playing Out

Your work on 3D material can be easily controlled via the video overlay or a monitor connected to the outputs of the DVS system. For example, an anaglyph emulation mode allows you to control the 3D depth of the material on the fly in the video overlay, and afterwards it can be played out in all common 3D methods.

This section explains how to configure and set up the display of the 3D material in the DVS software as well as at the outputs of the DVS system.

3.3.1 Configuring the Output Mode

To determine what will be displayed in the video overlay and at the outputs of the DVS system the output mode combo box has to be used:

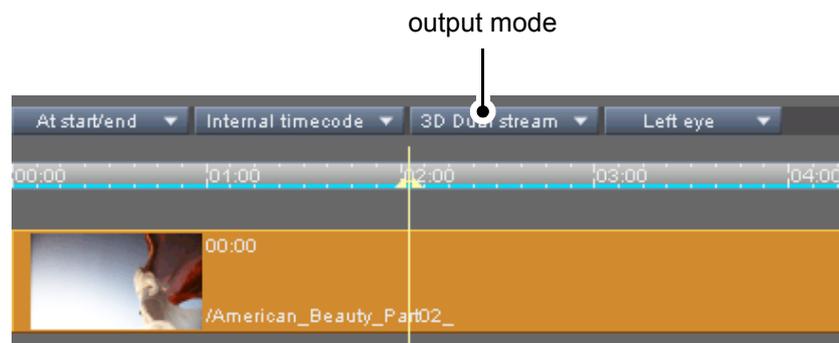


Figure 3-5: The output mode combo box



This item will be available when the stereoscopic output mode is activated (see section “Configuring the Output” on page 3-9) and/or video tracks are merged to a 3D stereo track in the timeline.

The output mode combo box provides the following options:

Single stream	When this option is selected, the 3D track in the timeline will be displayed as if it were a standard single video track. The video overlay as well as the outputs show all one stream of the 3D track only. You can select the stream that should be displayed with the left eye/right eye combo box (see section “Configuring the Display” on page 3-8).
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3D Dual stream	This option displays the two streams of the 3D track independently at two different output ports of the system. The output ports can be configured with the timeline output settings (see section “Configuring the Output” on page 3-9). With this the video overlay shows a single stream only, i.e. the one selected via the left eye/right eye combo box (see section “Configuring the Display” on page 3-8).
3D Anaglyph red/cyan stream	Combines the two streams of the 3D track to a single anaglyph stream for red/cyan glasses and displays it in the video overlay as well as at the outputs of the system. To activate it select one of the saturations (0 or 100%) for the color of the 3D material with the submenu of this option.
3D Anaglyph red/green stream	Same as 3D Anaglyph red/cyan stream , but the anaglyph stream is for red/green glasses.
3D Single stream	Combines the two streams of the 3D track to a single stream and displays it in the video overlay as well as at the system’s outputs (e.g. for special 3D displays). For this you have to select the way the streams will be combined with the submenu of this option. You can choose between displaying the two images side by side (left/right or top/bottom), interlaced or blended together.

3.3.2 Configuring the Display

What to display in the user interface of the DVS software can be configured with the left eye/right eye combo box:

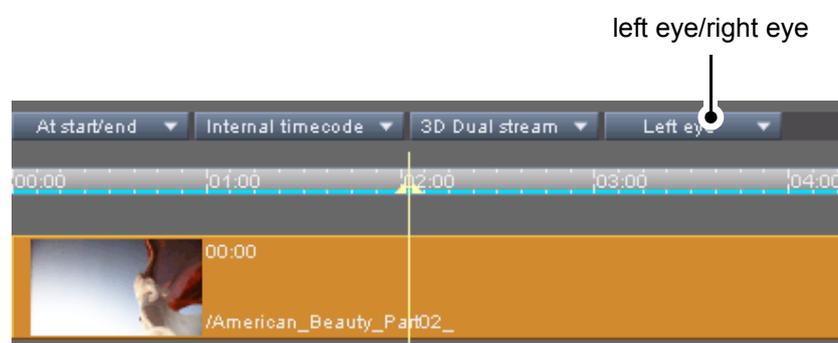


Figure 3-6: The left eye/right eye combo box



This item will be available when the stereoscopic output mode is activated (see section “Configuring the Output” on page 3-9) and/or video tracks are merged to a 3D stereo track in the timeline.

With the left eye/right eye combo box you can select, depending on the setting for the output mode (see section “Configuring the Output Mode” on page 3-7), which of the streams to view in the video overlay. Additionally, it controls whether the left eye or right eye stream/clip should be displayed by the representations of the video clips in the 3D track.

Furthermore, in the **Single stream** output mode it effects the signal displayed at the output ports of the DVS system (see section “Configuring the Output Mode” on page 3-7).

3.3.3 Configuring the Output

Via the **SETTINGS...** button you can set up and configure the output of stereoscopic material as well as the output ports that should be used for this. It is located at the top left side of the timeline area.

After pressing this button the ‘**Timeline output settings**’ window will be displayed on the screen. At the bottom of this window you can find the **Options** area where further optional settings are provided. To the right you can find the settings items for a configuration of the stereoscopic output.



Figure 3-7: Configuring the stereoscopic output

With the check box of the **Stereoscopic output** settings you can turn on or off the stereoscopic output mode of the DVS system. It will be automatically activated when tracks are merged to a 3D stereo track in the timeline. When deactivated manually, a single stream of a 3D track will be shown in the video overlay as well as at the outputs of the DVS system only (same as the setting **Single stream** of the output mode combo box, see section “Configuring the Output Mode” on page 3-7).

By clicking the button **3D OUTPUT PORTS...** the HD-SDI output ports of the DVS system can be configured. It opens the following window:

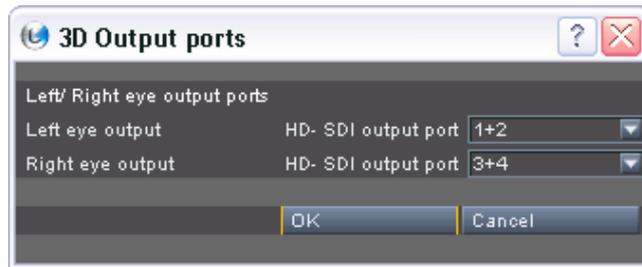


Figure 3-8: Configuring the output ports

In this window you determine on which of the HD-SDI output ports of the DVS system to give out the left eye and right eye stream of a 3D stereo track in the timeline when the output mode combo box is set to **3D Dual stream** (see section “Configuring the Output Mode” on page 3-7).

Once everything is set as desired, the configuration of the stereoscopic output is complete and you can view the 3D material as configured via the HD-SDI outputs of the DVS system.

Generating 3D Material



In this chapter it is explained how to generate 3D material with the DVS system and its software. It will be explained how to finalize a project in 3D and how to record material in 3D.

4.1 Finalizing 3D Material

3D material can be created via a finalizing. For this your content must be appropriately prepared with the video data in 3D stereo tracks (see section "Preparing the Edit Tool for 3D" on page 2-3). Then it can be finalized in 3D.

In the finalize dialog you can find among the optional items for a video output the setting **Stereoscopic output**:



Figure 4-1: Configuring the stereoscopic output for a finalizing

To create stereoscopic content via finalizing the check box of the **Stereoscopic output** setting must be activated. With the combo box to the right you can then configure the output format of the 3D material. The following settings are available:

3D Interleaved stream	The 3D stereo track will be finalized into an interleaved clip (see section "Types of 3D Material" on page 2-2).
3D Dual stream	Two separate clips, one for the left eye and one for the right eye, will be created.
3D Anaglyph R/C stream...	The two streams of the 3D track will be combined to a single anaglyph stream for red/cyan glasses and then finalized to a clip. There are two settings available for this that can be used to select the saturation of the images' colors (0 or 100%).
3D Anaglyph R/G stream...	Same as 3D Anaglyph R/C stream..., but the anaglyph stream is for red/green glasses.
3D Single stream...	The two streams of the 3D track will be combined to a single stream and then finalized to a clip. You can choose between finalizing the two images side by side (left/right or top/bottom) or interlaced.

With the **Stereoscopic output** setting activated the material will be finalized according to your configurations once the finalizing is initialized.

4.2 Recording 3D Material

With the DVS software you can also capture 3D material. This has to be performed in the I/O Tool software module of the DVS software. When configuring the input format, you can find sorted under the video format type 'Other' (button **OTHER**) several rasters tagged with 'STEREO' in the column 'Group':

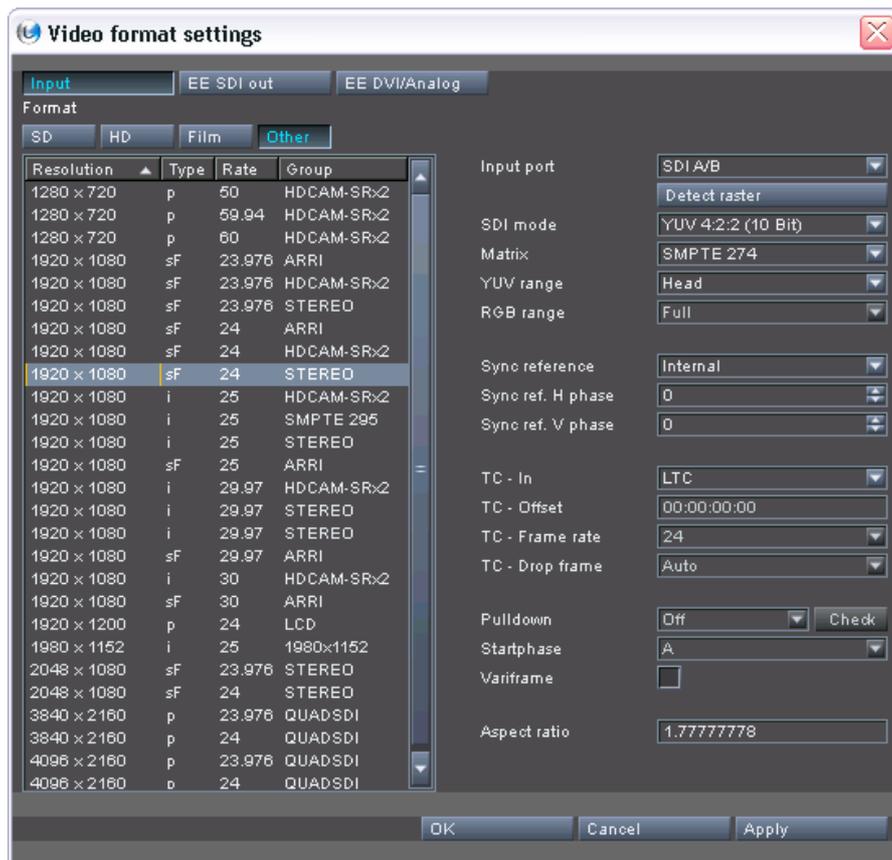


Figure 4-2: Configuring an input

These video rasters can be used to record a 3D dual stream. The two streams must be available in YUV at the input ports of the DVS system (HD-SDI input ports A and C). The left eye clip will be captured at port A and the right eye clip at port C. Once the video format settings are confirmed the combo box **Stereoscopic output** among the general settings for the record operation (storage information) will be available:

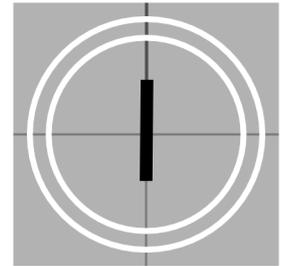


Figure 4-3: Configuring the stereoscopic output for a record

With it you can configure the format of the recorded 3D material (i.e. interleaved vs. dual stream, see section "Finalizing 3D Material" on page 4-2 and section "Types of 3D Material" on page 2-2).

With this the two streams will be captured according to your settings as soon as the record operation is started.

Index



Numerics

3D anaglyph R/C stream	3-8, 4-2
3D anaglyph R/G stream	3-8, 4-2
3D dual stream	3-8, 3-10, 4-2, 4-3
3D interleaved clip ...	2-2, 2-4, 3-4, 4-2, 4-4
3D single stream	3-8, 4-2
3D track	3-2
configuration	3-2
editing	3-6
empty timeline stretch	3-5
merging	3-2, 3-4
properties	3-3
synchronicity	3-4
track number	3-4
unmerging	3-2, 3-4
3D/stereoscopic workflow	1-1

A-C

anaglyph R/C stream	3-8, 4-2
anaglyph R/G stream	3-8, 4-2
button	
3D Output ports	3-9
Other	4-3
Settings	3-9
capturing	4-3
chapter overview	1-2
clip	
effect	3-6
interleaved ..	2-2, 2-4, 3-4, 4-2, 4-4
left eye/right eye ..	2-2, 2-3, 3-8, 4-3
preparation	2-3, 2-4
separate	2-2, 2-3, 4-2, 4-4
configuring	
capturing	4-3
display	3-8
finalizing	4-2

output	3-9
output mode	3-7
tracks	3-2
conventions of user guide	1-3

D-F

display configuration	3-8
dual stream	3-8
capturing	4-4
finalizing	4-2
output	3-10
editing	3-6
effect	3-6
empty timeline stretch	3-5
error status	3-4
reset	3-5
finalizing	4-2
flip/flop	3-6

G-I

HD-SDI	3-9, 4-3
I/O Tool	4-3
input format	4-3
interleaved clip	2-2, 2-4, 3-4
capturing	4-4
finalizing	4-2

J-L

left eye	2-2, 2-3, 3-8, 4-3
mirror	3-6
output	3-7

M-O

merging tracks	3-2, 3-4
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mirror left/right eye 3-6
monitor 3-7
notes 1-3
number of track 3-4
operation (start of) 2-2, 3-3
option 1-3
output 3-7, 3-9
 HD-SDI 3-9
 left eye 3-7
 right eye 3-7
output configuration 3-9
output mode 3-4, 3-9
 configuration 3-7
overview of chapters 1-2

P-R

preparing
 interleaved clip 2-4
 separate clips 2-3
properties of track 3-3
raster (STEREO) 4-3
resetting error status 3-5
right eye 2-2, 2-3, 3-8, 4-3
 mirror 3-6
 output 3-7

S-T

saturation (anaglyph) 3-8, 4-2
separate clips 2-2, 2-3
 capturing 4-4
 finalizing 4-2
single stream 3-7, 3-8
 3D 3-8, 4-2
single track 3-2, 3-3
start of operation (3D) 2-2, 3-3
STEREO (raster) 4-3
stereo track 3-2
 see 3D track
stereoscopic 3D track 3-2, 3-3
stereoscopic output mode 3-4, 3-9
synchronicity 3-4
target group 1-2
timeline output settings 3-8, 3-9
track mode item 3-2, 3-3
track number 3-4
track properties window 3-3
typographical conventions 1-3

U-Z

unmerging tracks 3-2, 3-4
video input format 4-3
video overlay 3-7, 3-9