



Composer for GV Director

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Introduction

1 Grass Valley Product Support

International Support Centers	France 24 x 7	+800 8080 2020 or +33 1 48 25 20 20	United States/Canada 24 x 7	+1 800 547 8949 or +1 530 478 4148
Local Support Centers (available during normal business hours)	Asia	Hong Kong, Taiwan, Korea, Macau: +852 2531 3058 Indian Subcontinent: +91 22 24933476 Southeast Asia/Malaysia: +603 7492 3303 Southeast Asia/Singapore: +65 6379 1313 China: +861 0660 159 450 Japan: +81 3 5484 6868		
		Australia and New Zealand: +61 1300 721 495	Central/South America: +55 11 5509 3443	
		Middle East: +971 4 299 64 40 Near East and Africa: +800 8080 2020 or +33 1 48 25 20 20		
	Europe	Belarus, Russia, Tadzikistan, Ukraine, Uzbekistan: +7 095 2580924 225 Switzerland: +41 1 487 80 02 S. Europe/Italy-Roma: +39 06 87 20 35 28 -Milan: +39 02 48 41 46 58 S. Europe/Spain: +34 91 512 03 50 Benelux/Belgium: +32 (0) 2 334 90 30 Benelux/Netherlands: +31 (0) 35 62 38 42 1 N. Europe: +45 45 96 88 70 Germany, Austria, Eastern Europe: +49 6150 104 444 UK, Ireland, Israel: +44 118 923 0499		

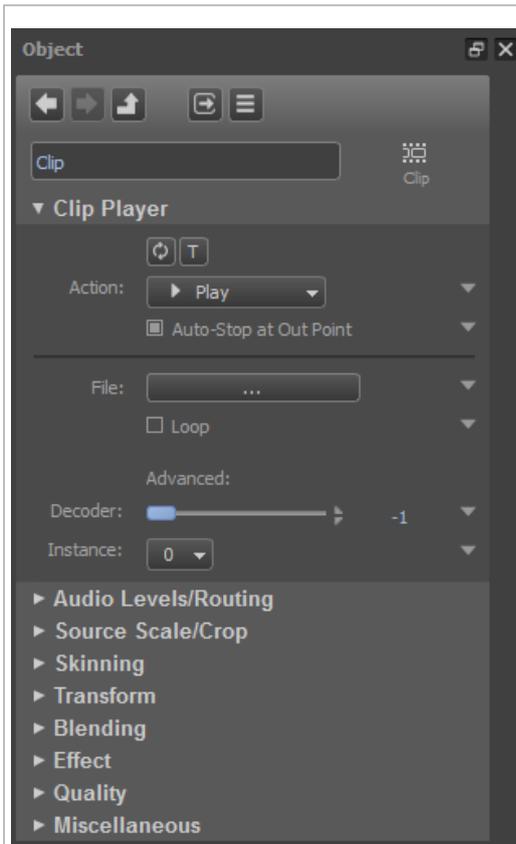
2 About his document

This document describes Composer for GV Director for release 1.7.2-gvd.

3 Composer

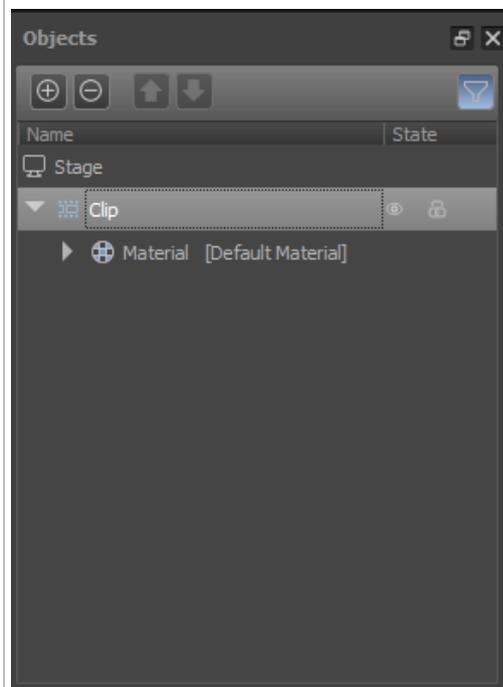
Composer is the animation and compositing tool for designing the look and feel of live productions. It allows for designing GV Director Production Elements (Effects, Transitions and Compound Elements).

3.1 Objects



Composer works with Objects such as Clip, Box, Still, Animation, Plane and so on. Objects have properties, such as opacity, position and scale that can be modified and animated.

The example shows the **Object** properties window for a Clip Object.



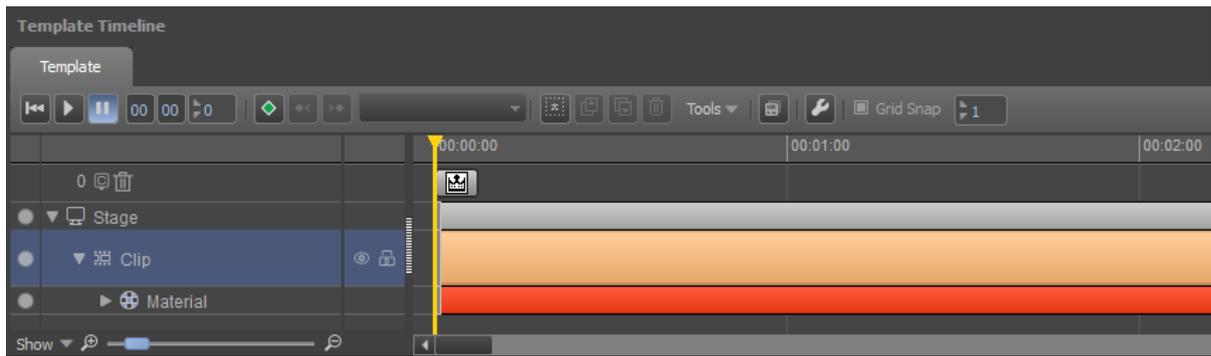
The **Objects** window lists all the Objects added to a Project (or all Objects included in the selected Template when the Filter icon is active as shown in the example on the left.)

Each Object is placed on its own layer. Objects on higher layers overlap Objects on lower layers.



One and the same Object can be used in different Templates while its properties can have different values per Template.

3.2 Templates



Templates are used to transform Objects' properties such as opacity, position and scale in time. The example above shows a Template used to play a Clip. The column on the left lists the Objects included in the Template. Each Object has its own track on the Timeline. The player head (the yellow vertical line) can be moved, paused and rewinded to preview animations on the Stage.

3.3 Project Assets, Scene Parameters and Test Media

3.3.1 Project Assets

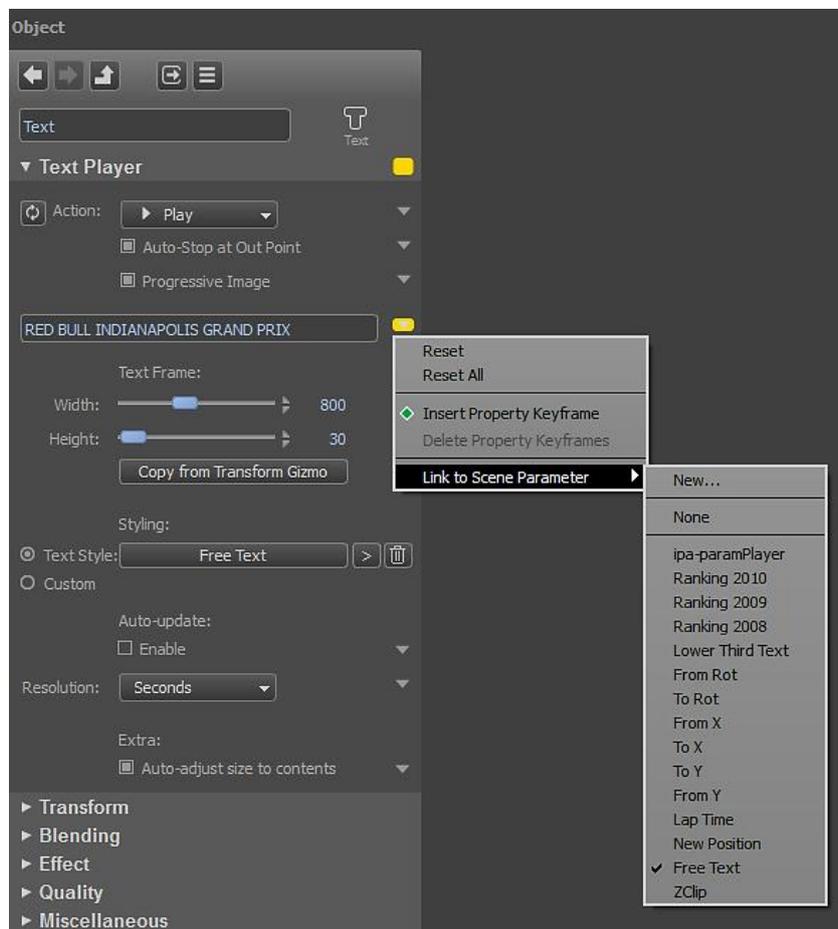
All the fixed files that belong to a Production design are added to the Project as Assets. These Assets are included in the Production Pack when the Project is exported to the GV Director system. Thus, all the fixed design elements needed for production are available on the GV Director system.

3.3.2 Scene Parameters

Objects can refer to fixed or dynamic values.

- Example fixed value: a fixed text string.
- Example dynamic value: specify the width of a banner or a logo file during production.

Scene Parameters are used to define dynamic values.



Example Text Object that uses a scene parameter Free Text.

3.3.3 Test media

For testing purposes, test media (images, videos) can be added to the Test Media library. Note that test media will not be included in the Production Pack when the Project is exported.

3.4 Projects and Production Packs

Production elements are authored in Composer:

- Transitions
- Templates (used to build Effects)
- Effects
- Compound Elements

These elements are edited in a Project. The Project also contains fixed design elements such as straps and logos. Once the design is ready for production, the Project is bundled in a Production Pack and exported to the GV Director system, thus making all design elements available for live production. Production Elements can then be assigned to buttons on the GV Director Panel.

Getting Started

4 Composer Installation



We recommend the following image editors:

- Windows: Paint.NET <http://www.getpaint.net/index.html>
- OSX: GIMP <http://www.gimp.org/>

These editors can export to the TARGA-format, Composer's native still format (with alpha support).

4.1 System Requirements (Mac)

- A Mac computer with a multi-core Intel processor (64-bit).
- Mac OS X v10.6 (Snow Leopard) or later.
- Memory: 4GB of RAM.
- Video card:
 - 512MB of VRAM or more.
 - OpenGL 2.1 and the following OpenGL extensions:
 - EXT_framebuffer_multisample
 - EXT_framebuffer_blit
 - ARB_texture_rectangle
 - APPLE_flush_buffer_range
 - NOT recommended: Nvidia Quadro cards.
 - Recommended: ATI Radeon HD5670 or better, Nvidia Geforce GT320 or better.

[See the following link for an overview of the OpenGL support on Mac OS X for your system and video card: <http://developer.apple.com/graphicsimaging/opengl/capabilities/>]

[See the *readme* included with the installation image for most recent requirements.]

4.2 Installation Mac

- Double-click the Composer image (.dmg file) to mount the disk image. The disk image icon appears on the desktop and the next window opens.
- Drag the Composer icon on the Applications folder, to copy Composer to your Applications folder.

You can now start Composer from the Applications folder.

4.3 Requirements (Windows)

- An Intel/AMD 64-bit multiprocessor PC.
- A 64bit edition of Windows Vista, Windows 7 or Windows 8.
- Memory: 4GB of RAM.
- Video card:
 - 512MB of VRAM or more.
 - OpenGL 2.1 and the following OpenGL extensions:
 - EXT_framebuffer_multisample
 - EXT_framebuffer_blit
 - ARB_texture_rectangle
 - ARB_map_buffer_range
 - NOT recommended: Nvidia Quadro cards.
 - Recommended: Nvidia Geforce GTS250 or better.

[See the *readme* included with the installation image for most recent requirements.]



It is not possible to run Composer via Windows Remote Desktop.

4.4 Installation Windows

- Double-click the installer exe file and follow the instructions.



It is recommended to run Composer as an Administrators group user. The easiest way to achieve this is to mark the application to run as Administrator: in Windows Explorer, access 'Composer.exe' properties, navigate to 'Compatibility' tab and tick 'Run as Administrator' checkbox. Composer does not really require elevated privileges to run, but in doing so a wider range of thread scheduling priorities become available thus allowing for faster response times. Note that Composer does not create or modify any files unless instructed by the user, i.e. to save a project on disk. To that effect it is perfectly safe to run Composer as Administrators group user.

5 Starting Composer

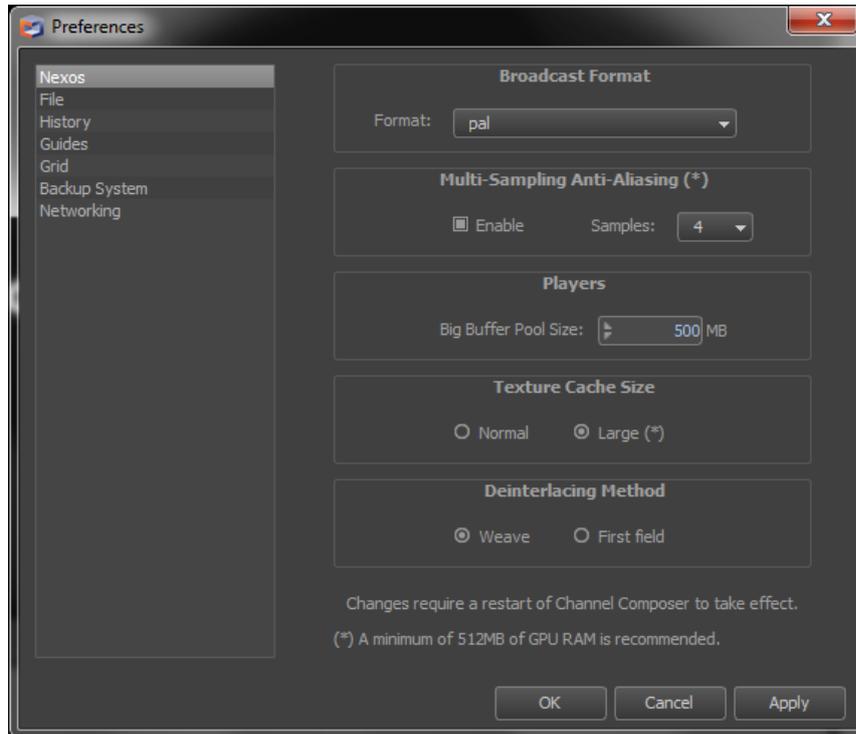
	<p>To start Composer, double-click the Composer icon.</p>
	<p>Composer opens. You can now start working on a Project.</p>

6 Setting Composer Preferences

File > Preferences > Nexus



Note that these settings only affect (the design's visual quality on) your workstation, not actual playback.

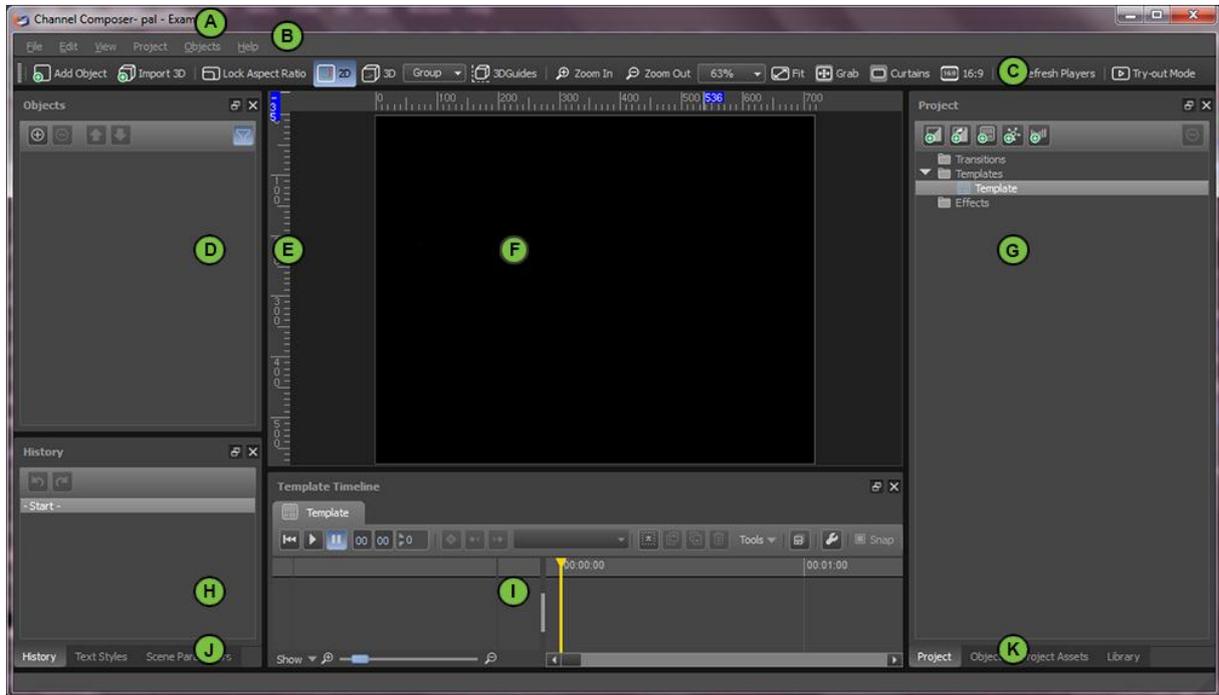


- **Format:** the broadcast format.
- **Multi-Sampling Anti Aliasing:** use to improve the design's visual quality on your workstation (remove edge line roughness and jagged edges). Note that higher sample rates impact performance of your workstation.
- **Players:** set the big buffer pool size in MB. Default 500. If a project includes a high number of HD-players, the player output can be blocked. In that case, the buffer pool size needs to be increased.
- **Texture Cache Size:** a higher cache size improves performance, but note that not all graphic cards have sufficient RAM. A minimum of 512 MB is required.
- **Deinterlacing Method:**
 - **Weave:** this is the default. Consecutive fields are added together and all lines are shown. For animations this can result in combing artifacts (jagged edges).
 - **First-field:** use to avoid combing effects. Keep in mind that for interlaced content, half of the fields' lines are missing.

File	<ul style="list-style-type: none"> Specify the default Project folder. Autosave: disable (this is the default) or enable autosave every x minutes.
History	<ul style="list-style-type: none"> The number of actions tracked in history.
Backup System	<ul style="list-style-type: none"> The number of backups to keep.
Networking	<ul style="list-style-type: none"> Specify the FTP transfer mode, passive or active.

7 The Composer Workspace

The Composer workspace consists of the Stage and a number of windows that can be arranged and customized. The example below shows a default empty Composer workspace (Mac) in Template editing mode.



A	The title bar shows the broadcast format and Project name.
B	The main menu.
C	The main toolbar.
D	The Objects window lists the Objects available in the Project and shows their layering.
E	The Stage's rulers.
F	The Stage represents the Production.
G	The Project window lists the Production Elements that have been defined for a Production. Three windows are docked on this window (K): the Object window (view and edit an Object's properties), the Library (the prefabs and test media libraries) and the Project Assets window (view and edit the Project's Assets and metadata). To dock more or less windows, on the main menu go to View > Windows .
H	Actions can be viewed and redone or undone in the History window. Two windows are docked on this window: the Scene Parameters window (view and edit Scene Parameters) and the Text Styles window (view and edit text styles) (J). To dock more or less windows, on the main menu go to View > Windows .
I	Objects are animated in time on the Template Timeline. Each Template is displayed on its own tab. Compound Elements are edited in the Compound Element Timeline (not activated in the example above). Each Production Element is displayed on its own tab.

8 Customizing the Composer Workspace

8.1 Windows

The Composer workspace can easily be customized.

- One way to do this is by displaying or hiding windows [**View > Windows**].
- Activate [**View > Clean View Mode**] to hide all windows and display the Stage only, deactivate to show windows and the Stage.
- Click  to close a window.
- Windows can be scaled by selecting the window's border and then drag while keeping the mouse pressed.
- Windows can be repositioned by selecting the title bar and then drag while keeping the mouse pressed. The white dotted line shows where the window will be placed. Windows can be docked by dragging one window on top of another.
- Double-click the window's title to dock and undock windows or click  to undock.

8.2 Zoom and Fit in Window

<p>Main menu > View</p> <p>Main toolbar</p> 	<ul style="list-style-type: none">• Zoom In: zoom in on the Stage.• Zoom Out: zoom out from the Stage.• Zoom to 100%: scale the Stage to 100%.• Fit in Window: fit the Stage in the available workspace.
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8.3 Curtains

Objects may be placed outside of the active Stage area to allow animation on to and off of the Stage. Use curtains to cover this outside area for a clear view of what the final output will be.



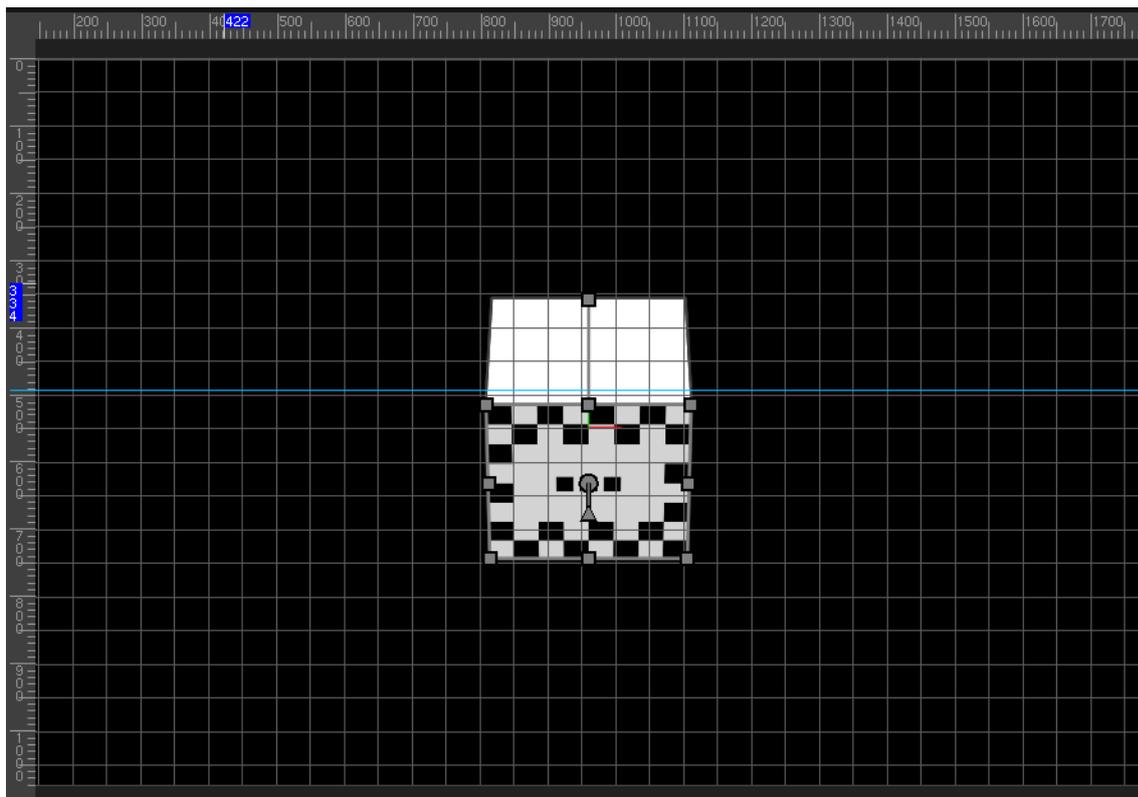
8.4 Rulers, Grid and Guides

Main menu > View	<ul style="list-style-type: none">• Rulers: show or hide rulers.• Grid: show or hide the grid.• Guides: show or hide guides. To add a guide, click the appropriate position on the ruler. To move, select and drag while keeping the mouse pressed.• Snap to Guides: enable or disable 'snap to guides'.• Snap to Grid: enable or disable 'snap to grid'.
----------------------------	--



To set the color of the guides and snap distance, go to **File > Preferences > Guides** or click the guide on top of the ruler.

To set the color of the grid, spacing and snap distance, go to **File > Preferences > Grid**.



Example Stage in 3D-mode showing rulers, the grid and a guide. The ruler's blue highlighted numbers show the position of the cursor on the stage.

Projects

Production elements are authored in Composer:

- Transitions
- Templates (used to build Effects)
- Effects
- Compound Elements

These elements are edited in a Project. The Project also contains fixed design elements such as straps and logos. Once the design is ready for production, the Project is bundled in a Production Pack and exported to the GV Director system, thus making all design elements available for live production. Production Elements can then be assigned to buttons on the GV Director Panel.

9 Working with Projects

9.1 Creating a new GV Director Project

You can create a new Project from the Composer Welcome window or if Composer is already opened, on the main menu go to **File**.

- Select **New Project > Type > GV Director**.
- Specify a **Name** and the **Location** where the Project will be saved.

The **Format** tab displays the following properties for the Project:

- Broadcast format
- Frame Size
- Frame Aspect Ratio
- FPS
- Interlaced settings



Composer opens with the broadcast format that was last used and new projects will automatically have this format. To change, go to **File > Preferences** or in the Welcome window click **Preferences**. You will have to restart Composer after you changed preferences. Then open or create the Project again with the new broadcast format.

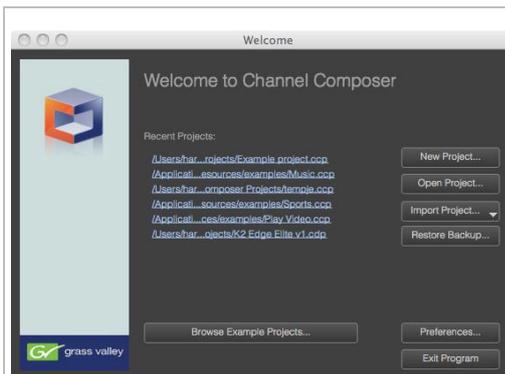
Info (optional)

- Author
- Description

Export

Do not use for GV Director Projects.

9.2 Opening on an existing Project

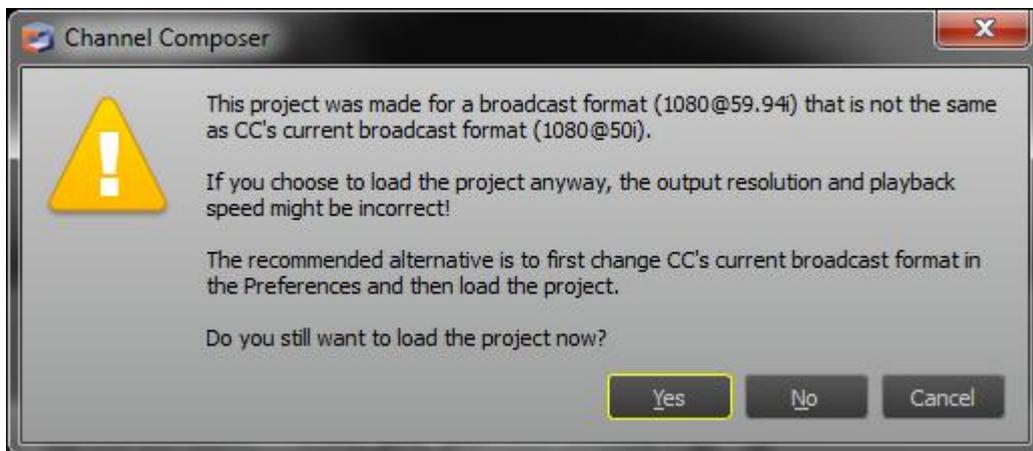


Following options are available from the Composer **Welcome** screen, and from the **File** option on the main menu:

- Open an existing Project from disk.
- Open an existing Project from a list of recent Projects.
- Import a Production Pack from disk and open as a Project.
- Restore a Project Backup.

Composer opens with the broadcast format that was last used and new Projects will automatically have this format. To change, go to **File > Preferences** or in the Welcome window click **Preferences**. You will have to restart Composer after you changed preferences. Then create the Project again with the new broadcast format.

When opening an existing Project and this Project was made for a different broadcast set than is currently active, a warning appears.



Example.

To change Composer's broadcast set, go to **File > Preferences** or in the Welcome window click **Preferences**. You will have to restart Composer after you changed preferences.

Instead of changing the broadcast format, you can load the Project with the currently active format and thus change the Project's broadcast format. Note that this can result in an incorrect output resolution and playback speed.

File > Merge Project

How should potential object- or asset name conflicts be resolved?

- Rename conflicting merged-in objects/assets
E.g., a merged-in object with name "Logo" becomes "Logo 2" if the original Project contains an object with name "Logo".
- Replace existing objects/assets with merged-in objects/assets
E.g., the merged-in object with name "Logo" replaces an object with the same name in the original Project.

Merging Projects is an easy means to reuse elements of a Project. To reuse elements, place these items in a separate Project and then merge this Project with other Projects to reuse. Merging Projects can also be useful when working with several people on a Project.

The Merge Project functionality includes the option to do a replacement merge. Using this type of merge, Objects and Assets in the merged-in project replace Objects and Assets with the same name in the original Project.

- Select **File > Merge Project**.
- Select the type of merge and Project you want to merge with the current projects.
- Select the appropriate option if performing a replacement merge.
- Click **Open** to merge, **Cancel** to discard.

File > Import Project > from Disk

Projects can be imported from a Production Pack on disk.

- Select **File > Import Project > from Disk**.
- Browse to the folder where the Production Pack is located and select the applicable Pack.
- Click **Next**, **Cancel** to discard.
- Select a destination folder and click **Next** to start import.

File > Restore Backup

Each time a Project is saved, a backup is automatically created. This backup contains all project data, except for Project Assets.

- Select **File > Restore Backup**.
- Close the Project that is currently open.
- Select the backup you want to restore and click **Restore** or **Cancel** to discard.

9.3 Saving the Project and Export to disk

While working on a Project, save the Project or export the Production Pack to disk. When sharing a Project, we advise to export the Project to disk; the Project is zipped in one single file (the Production Pack) that can be imported using the Composer import option.

- **File > Save Project | Save Project As.**
- **File > Export Project > to Disk.**

Once the design is ready for live production, the Project is exported to the GV Director system.

9.4 Exporting a Production Pack to the GV Director System

- To export a Project to the GV Director system, on the main menu click **File > Export Project > to GV Director**.
- Click the  icon, then specify the GV Director system's IP-address.
- Click **Next**, or **Cancel** to cancel.
- Specify a folder name. You cannot use the same folder name more than once.
- Click **Next** to start export, **Back** to go to the previous step or **Cancel** to cancel export.

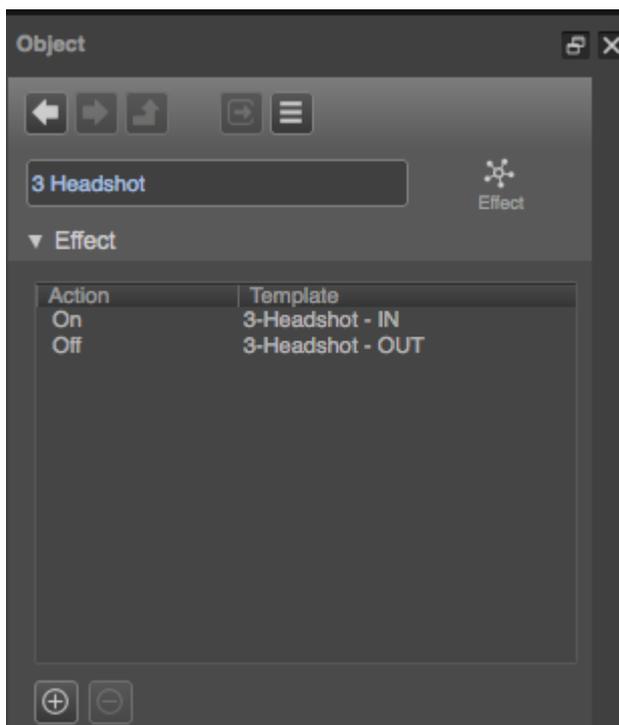
The Project is packed, exported to the GV Director system and unpacked.

Template Editing

10 Templates



Effects have Actions, each Action corresponds with a Template. A Template is a series of keyframes that animate one or more of your Objects' properties.



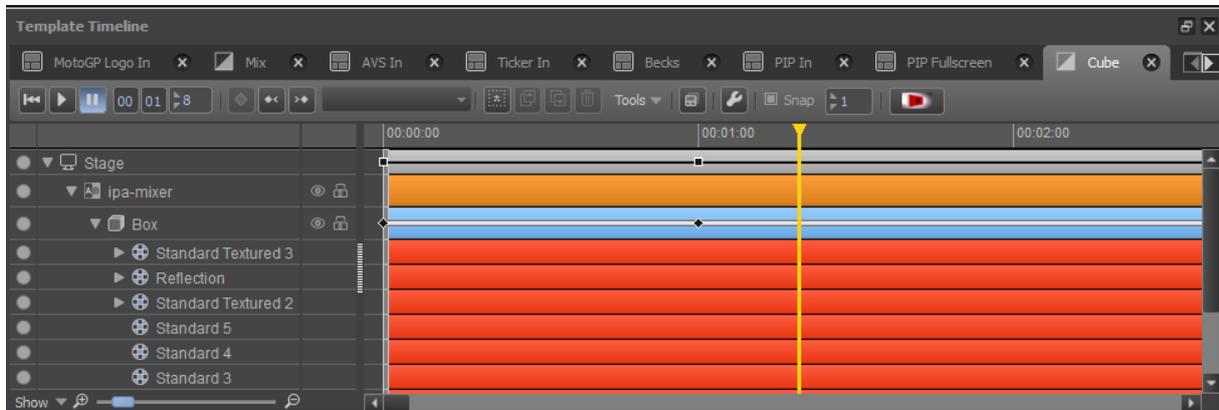
Example Headshot Effect built of actions On and Off, linked to Templates Headshot – IN and Headshot – OUT.



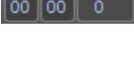
Template names are only used in Composer, while Action names are shown on the GV Director Panel.

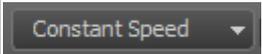
10.1 The Template Timeline

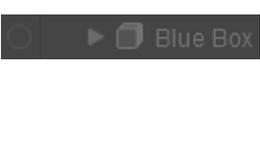
Double-click a Template in the **Project** window to open the Template Timeline. Each Template is displayed on its own tab.



Example.

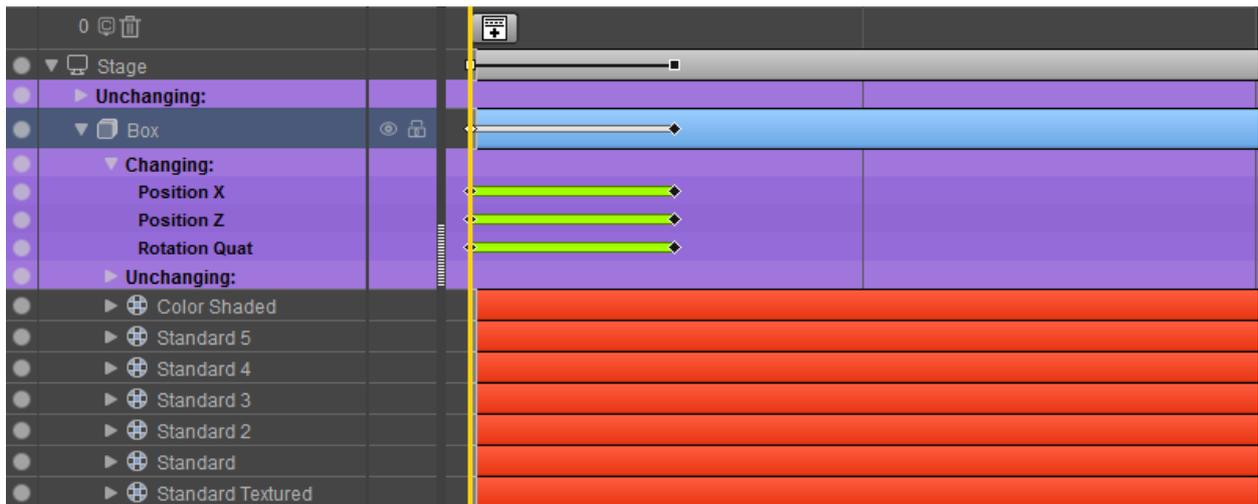
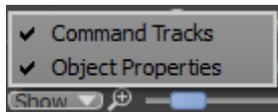
	Rewind (the player head on the Timeline).
	Play (the player head on the Timeline).
	Pause (the player head on the Timeline).
	Shows the position of the player head on the Timeline in mm:ss:ff, or enter values to place the player head on the Timeline.
	Click to add a keyframe. The  icon on the Timeline indicates the keyframe is added to an Object or property. The  icon indicates that the keyframe is added to an Object or sub-property on a lower level.
	Double-click a keyframe to select. The keyframe icon turns white when selected.
	Click to update the selected keyframe.

	Click to go to the previous or next keyframe.
	Define interpolation for the selected keyframes. Options are: <ul style="list-style-type: none"> • Constant Speed • Ease In • Ease Out • Ease In & Out • Step
	Select all items on the Timeline.
	Copy the selected keyframes or commands to the clipboard.
	Paste clipboard items on the Timeline.
	Delete the selected keyframes or commands.
	Reverse the selected keyframes / timescale the selected keyframes' duration (in frames).
	Duplicate a Template.  <p>Note that Objects in the source Template are not duplicated; in other words, both templates, the original and the source will use one and the same Object. If this Object is modified in Template A, it will also be modified in Template B.</p>
	Define settings for hard (default) or soft cuts. When soft cuts are used, the property values of this Template are slowly blended in.
	Enable or disable grid snap and set snap distance. The snap distance is in seconds.
	This option can be found in the bottom left corner of the Template Timeline. Click the arrow to define what information is displayed on the Template Timeline: <ul style="list-style-type: none"> • Command Tracks: Display or hide command tracks. • Object Properties: Display or hide Object properties.

	<p>When the pickup button is deactivated [as shown in the example on the left], the Object, sub object or property will not be modified by the Template.</p> <p>As a default, this option is activated: .</p>
	<p>Click the hide and lock icons to hide/unhide and lock/unlock Objects on the Stage.</p>
	<p>This option can be found in the bottom left corner of the Template Timeline. Use the slider to zoom the Timeline in or out.</p>



To display not only Objects, but also Object properties on the Timeline, select the **Show > Object Properties** option in the Timeline's left bottom corner.



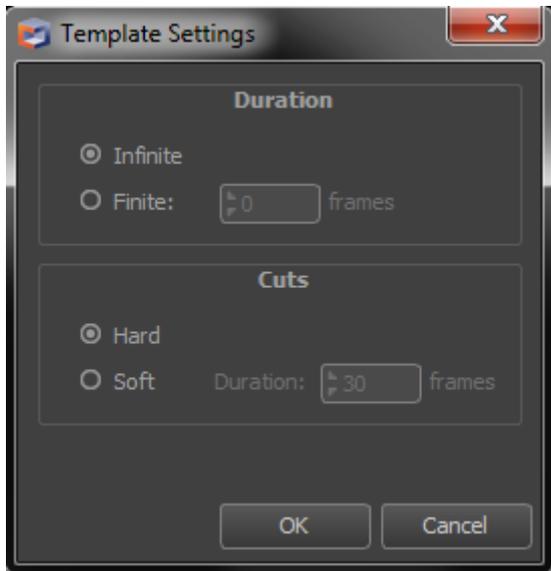
Example.

Note how the distinction between Changing and Unchanging properties is made.

A green segment between keyframes indicates that the property value changes in between the keyframes. When this segment is grey, property values do not change.

10.2 Basic editing

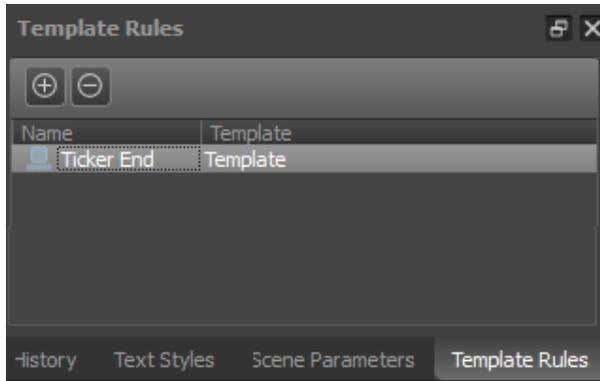
- To add a Template to your Project, in the **Project** window click the  icon, or on the main menu, click **Project > Add Template**.
- To rename, right-click in the **Project** window or double-click the Template tab in the Template Timeline, then rename.
- To edit an existing Template, double-click in the **Project** window or select the editor in the Template Timeline.
- To duplicate, right-click in the **Project** window and select **Duplicate**, or click the  icon in the Template Timeline.
- To edit settings, right-click in the **Project** window and select **Settings**.



- Folders can be used to organize elements in a Project. To add an element to a folder, either drag and drop into an existing folder, or right-click in the **Project** window and select **Add to Folder**. A new folder is created and the element is added to this folder. Note that folders only exist in Composer and not on the playout nodes, and can be used to organize elements.
- To delete a Template, right-click in the **Project** window and select **Delete**, or select and press the [Delete]-key, or select and click the  option in the Template Timeline.

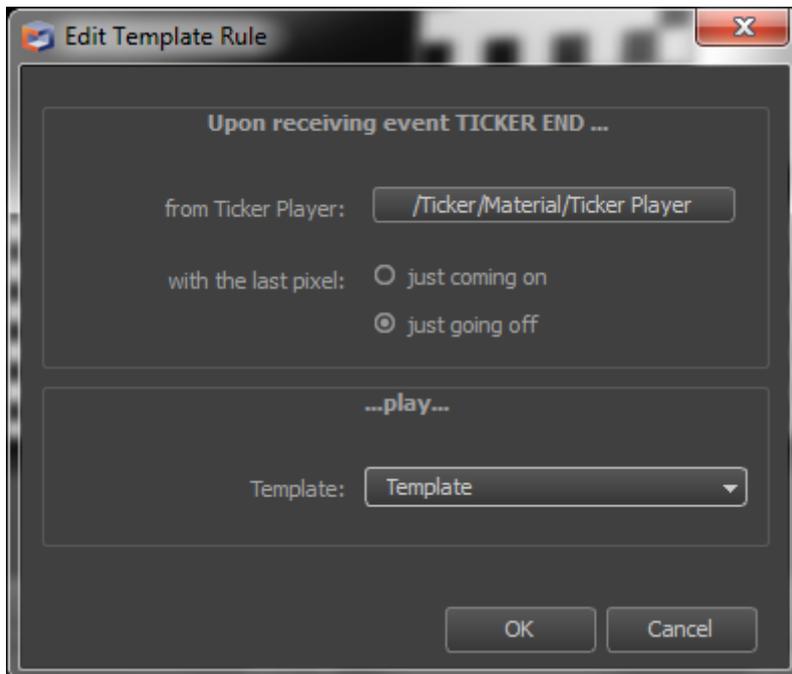
10.3 Template Rules

Template Rules can be used to start a Template based on a predefined Event, for example start a Template at Ticker End (the Event). A Ticker End Event is generated by the Ticker Player when the last pixel of the last ticker story has been played out.



The Template Rules window.

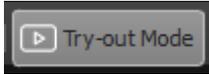
	: Click to add a Rule.
	: Click to delete the selected Rule.
Rule	: Click a Rule to edit.



Example Template Rule.

10.4 Previewing Templates

Preview Templates using the Template Timeline player options or in Try-out Mode.



Note that Players only run in Try-out mode.

	<p>In try-out mode, the Stage shows a preview of your Templates. Note that the output will be exactly the same as on the playout system, but will not be guaranteed real-time.</p> <p>Using the Opt-out filter makes it possible to preview each Channel separately.</p>
--	--

To preview Templates in try-out mode:

	<p>On the main toolbar, click the Try out mode icon to switch to try-out mode.</p> <p>Note that when in Tryout mode, you cannot edit.</p>
	<p>In the Try-out mode window, double-click Templates to cue.</p> <p>In the cue, drag Templates to change order.</p>
<p>Restart</p>	<p>Click Restart to empty the cue.</p>
<p>Exit</p>	<p>Click Exit to exit Tryout mode.</p>
<p>Colors</p>	<p>Orange indicates that Templates are loading.</p> <p>Blue indicates that Templates are playing.</p> <p>Grey indicates that Templates have been played.</p>

11 Objects

Composer works with different Object Types:

- Stage Objects, such as the Clip, Mixer, Box and Still Objects.
- Players, such as the Still Player, Clip Player and Text player.
- Controllers, such as Oscillate and Stack.
- Materials, such as Standard Texture and Gooch.
- Commands, such as the Ticker Command.
- Layer Effects, such as Blur, Pixelate and Ripple.
- Template Rules.
- Others: the Stage, Scene Parameters, Text Styles, GV Director Effects and Effect Actions.

This chapter describes a number of these Objects after explaining basic editing options for Objects.



Note that in Composer, one and the same Object can be used in different Templates with different properties per Template. The properties of an Object are saved uniquely in each Template.

11.1 Adding Objects to a Template

To add an Object to a Template:

On the Template Timeline , first select the Template you want to add the Object to.	
Now there are three different options for adding Objects:	
	On the toolbar , click the Add Object icon, then select the type of Object you want to add and double-click.
Assets window Test Media window Prefabs window	You can select an Asset from the Library (prefab or test media) or Project Assets (Asset) window and drag this Asset on the Stage. An Object that refers to this Asset is automatically created.
Objects window	You can also select an existing Object in the Objects window. Then right-click > Add to Template , or drag the Object on the Template.

11.2 Modifying Objects' properties

There are several ways to edit an Object's properties:

Object window	<p>To open an Object's properties window: click the Object on the Stage, in the Objects window or on the Template Timeline.</p> <p>(If the Object window is not visible, enable the window: toolbar > View > Windows > Object).</p> <p>Or double-click the Object in the Objects window, on the Template Timeline or Stage.</p>
Stage	<p>Objects can also be transformed on the Stage. Select the Object and drag the handles to modify the Object.</p>

11.3 2D and 3D-mode

Use this option to toggle the 2D and 3D handles of the transform gizmo:

	Click the 2D-icon to enable the 2D-handles.
	Click the 3D-icon to switch to 3D-handles.
	Show or hide 3D editing guides when editing a Group.

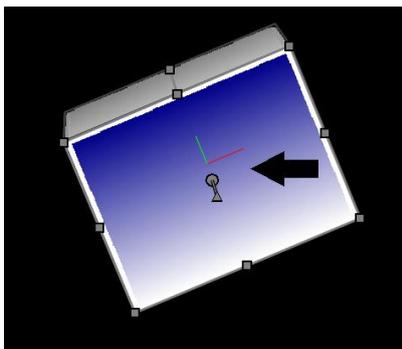
11.4 The Transform Gizmo

You can transform Objects (position, scale, rotation) either in the Object window, or on the Stage using the transform gizmo. Note that how the handles work depends on if the gizmo is in 2D or 3D-mode.

	Scale: move the cursor over the inside of the Object handlers until this cursor appears. Then drag to scale the object.
	Rotate: move the cursor over the Object handlers until this cursor appears. Then drag to rotate the Object around the Z-axis.
	Free rotate or arc ball rotate (3D only): move the cursor over the center of the Object's movement axes to activate this cursor and rotate the Object around its X, Y and Z-axes.
	Move the Object on the Z-axis (3D): move the cursor over the movement axes' arrow head to activate.
	Grab the Object to move on the Stage.

The movement axes can be customized in the main toolbar:

- **View:** the axes are aligned with the current view.
- **Group:** the axes are aligned with the group the Object is in.
- **Object:** the axes are aligned with the Object. When the Object rotates, the axes will rotate as well.



Example 3D Box with the X, Y and Z-movement axes aligned with the Object.

11.5 Layering Objects

The **Objects** window lists all Objects in a Project or Template. Each Object is placed on its own layer. Objects on higher layers overlap Objects on lower layers. To change, drag Objects into the appropriate order, or use the Arrow icons.

11.6 Grouping Objects

Objects can be grouped, so they can be modified and animated as a group. To group objects:

- Select the Object you want to group, either by [CTRL/CMD]+clicking them in the Objects window, or by drawing a selection with the cursor around the relevant Objects on the Stage.
- On the main menu select **Objects > Group**, or on the Stage right-click the selection > **Group**.
- You can open the group to edit individual Objects within the group: **Objects > Open Group**, or on the Stage right-click the group > **Open Group**. When finished, close the group.
- To ungroup Objects: **Objects > Ungroup**, or on the Stage right-click the group > **Ungroup**.

11.7 Locking Objects

Lock Objects to prevent unwanted selection, or to protect the Object from being selected and modified accidentally.

	To lock or unlock Objects, in the Objects window or on the Template Timeline , select the Object. Then click the Lock icon.
---	--

11.8 Copying Objects

To copy an Object (duplicate):

- In the Objects window or on the Stage, select the Object > right-click > **Copy**, or use the hotkeys.
- To paste > right-click the Objects window or the Stage > **Paste**, or use the hotkeys.

Note that the Object is also added to the active Template.

11.9 Prefabs

Objects and all the properties you defined for them can be exported to the Prefabs library for reuse.

	To export an Object to the Prefabs library: select the Object, then in the Object window click the Export icon.
	In the Library > Prefabs , the star icon (as shown in the example on the left) indicates that the prefab is a custom made Object.

11.10 Deleting Objects

When deleting an Object, there are two options:

- Remove the Object from a Template, but the Object is still available in the Project.
- Delete the Object from the Project.

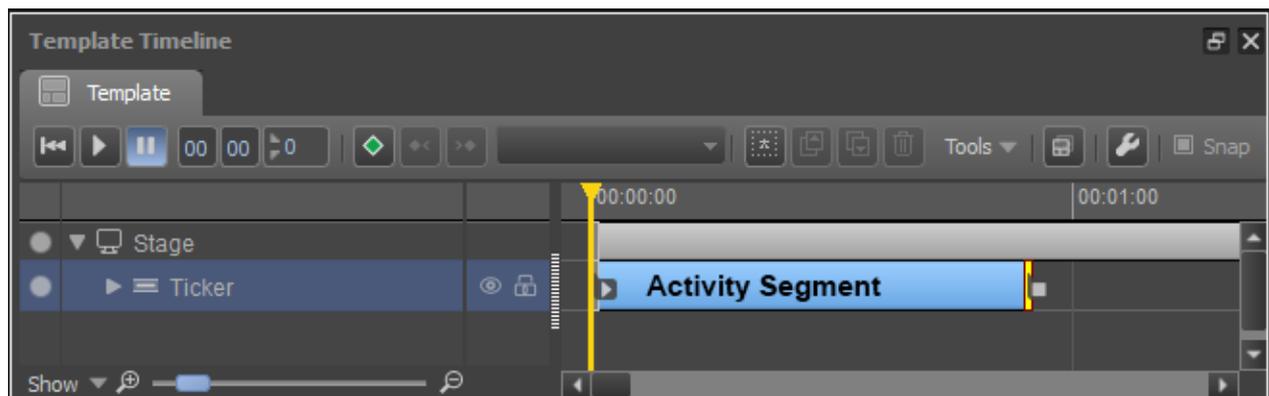
11.10.1 Removing an Object from a Template

- To remove an Object from a Template, select the Object on the Template Timeline or Stage > right-click > **Remove from Template**. Or select on the Stage and press the [Delete]+key.

11.10.2 Removing an Object from the Project

- To delete an Object from a Project, select the Object in the Objects window > **Delete**. Note that the Object will be removed from all Templates it was used in.

11.11 The Activity Segment: Objects' on-screen Audibility and Visibility



Example Play Ticker Template with an Out Point set.

The Objects' activity segment on the Template Timeline shows the Object's audibility and visibility. As a default, the In Point for Objects is set at 00:00:00 and no Out Point is defined. To remove an Object from screen (audio and visual), set an Out Point. Note that the Object Player will not automatically stop when the Object is no longer active (unless **Auto-stop at Out Point** is activated, which is the default).

11.12 In Points and Out Points

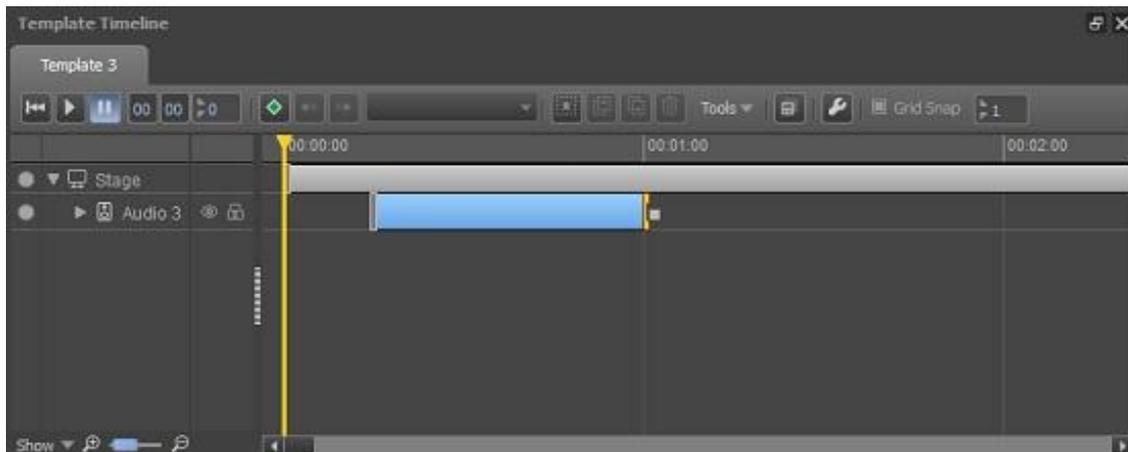
In and Out Points specify when an Object is active, i.e. audible, visible, and so on. As a default, the In Point is set at 00:00:0 and no Out Point is defined.

- To add an In Point, drag the Object's In Point (the Object's activity segment's start on the Timeline) to the appropriate position, or right-click the Timeline on the appropriate position > **Set In Point**.
- To add an Out Point, right-click the Object > **Enable Out Point**, or right-click the Timeline on the appropriate position > **Set Out Point**.
- Then drag the Object's Out Point (the activity segment's end) to the appropriate position, or right-click the Timeline on the appropriate position > **Set Out Point**.

When the **Player > Auto-stop at Out Point** option is activated (in the Object window), a Stop Playback action is automatically inserted when an Out Point is added on the Template Timeline.



The Example Project *Optimization* explains how to work with In and Out Points.



*Example Audio Object with In and Out Point. Because the **Auto-stop at Out Point** has been enabled for the Player, the Stop Player action is added to the Out Point, as indicated by the Stop Player icon*



11.13 Hints and Tips for navigating through the Object Window

Use the buttons below to navigate through the **Object** window:

	: Go to the previous Object.
	: Go to the next Object.
	: Go to the parent Object.
	: Export the Object to the prefabs library.
	: Close all groups in the properties window.

12 Transforming and Scaling Objects

These properties define the Stage Object's on-screen position and scaling.

12.1 Transform



See also the chapter on *Quality > Scaling* and *Pixel Perfect* and the example project *Scaling*.



To scale the Player's *output* (instead of the Object itself) edit the Player's **Source Scale/Crop** property.

	Use these options to position Objects from center (default), or from the upper left corner.
Place on 2D Plane	Place the front of the object on the 2D plane (i.e. on z-coordinate 0).
	Lock aspect ratio when scaling.
	Scale in pixels instead of in %.
	Reset the Object (scaling/rotation) to 100%.
Counter scale for 16:9	Select to scale back the Object in screen horizontal direction to counter the horizontal stretching that occurs when the object is viewed in 16:9 anamorphic widescreen mode.
Rotation	Angles are relative to the axes of the Group the Object resides in. For example, if the Object is on the Stage, the Stage is the Group. The Object is rotated in the following order: x, y, z. The Group's axes will not rotate.
Euler interpolation	Generate the Object's rotation by combining the individually animated rotation angles. Needed when animating individual rotation angles, for instance when using a Controller.
Camera	You can either use a perspective (depth) and specify its angle (default 55%), or use an orthographic view (no perspective).

	<p>Scaling Tools:</p> <ul style="list-style-type: none"> • Scale to fit screen: scale the Object to fit the output screen's dimensions; play out a full screen (no aspect ratio). • W: scale object to fit screen width (keeping aspect ratio). • H: scale object to fit screen height (keeping aspect ratio). • Scale 1:1: scale object to 1:1 aspect ratio, based on height. • Scale 4:3: scale object to 4:3 aspect ratio, based on height. • Scale 16:9: scale object to 16:9 aspect ratio, based on height. • Straighten: remove skewing. An Object is skewed if its axes are not perpendicular to each other. This sometimes happens to Objects within a Group when the Group is scaled and then ungrouped.
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12.2 Scaling

You can either scale the Object or the Player's output.



See also the chapter on *Quality > Scaling* and *Pixel Perfect* and the example project *Scaling*.

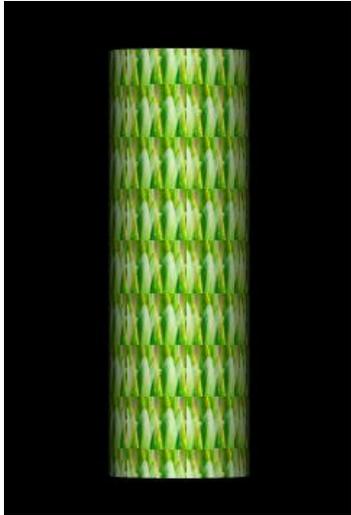
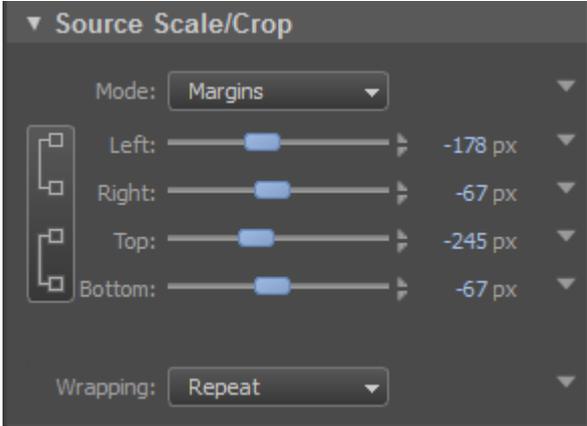
12.2.1 Scaling the Object

Use the **Transform** properties in the Object window to scale the Object, or scale on the Stage using the transform gizmo.

12.2.2 Scaling the Player's output

Use the **Source Scale/Crop** option in the **Object** window to scale the Player's output, instead of the Object.

Specify a rectangle that is scaled/cropped from the source (the Player's output) onto the Object's plane. If the scaled source is smaller than the Object, the source is either repeated or empty space is filled with the source's borders' pixels (clamp).

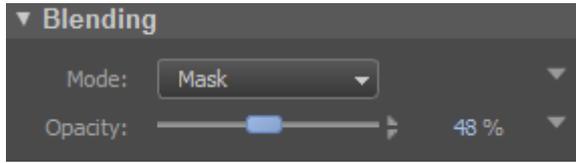
	<p>In this example a Still is scaled and repeated on a Cylinder's plane.</p>
	
<p>Mode</p>	<p>Coordinates: scale/crop the source to absolute coordinates on the Object. Margins: scale/crop relative to the Player's output borders.</p>
	<p>Use the slider to specify margins or coordinates in pixels.</p>
	<p>Select to lock the source's width and height. This option is highlighted as shown on the left when activated.</p>
<p>Wrapping</p>	<p>If the source is smaller than the Object: Repeat: the source is repeated. Clamp: empty space is filled with the source's borders' pixels.</p>



To scale the Object instead of the source, scale on the Stage or in the **Object** window > **Transform**.

13 Blending Objects

Use to blend an Object with the layer(s) beneath.



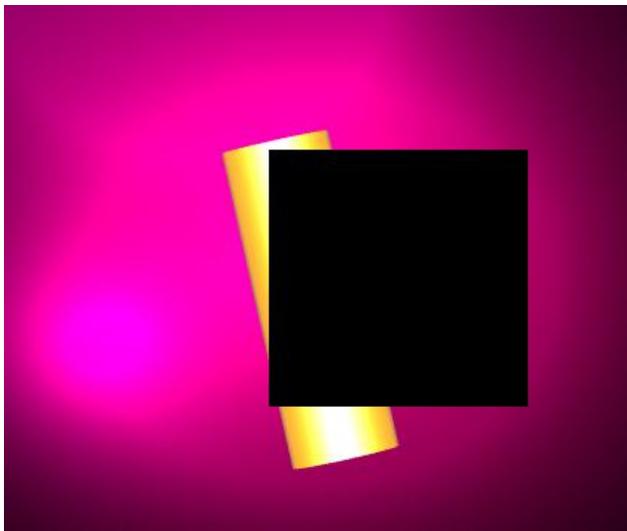
Example.

Following blending modes can be selected:

 <p><i>Blended Object.</i></p>	 <p><i>Background.</i></p>	<p>In the examples below, a Plane with a flower still is blended with a background that consists of a purple Plasma Plane and a yellow Cylinder.</p>
		<p>Normal: no blending, unless opacity is set. When opacity is set, the selected Object is blended without mixing colors with the background. Colors are blended based upon the source layer's alpha channel.</p> <p>In this example opacity is set to 50%.</p>



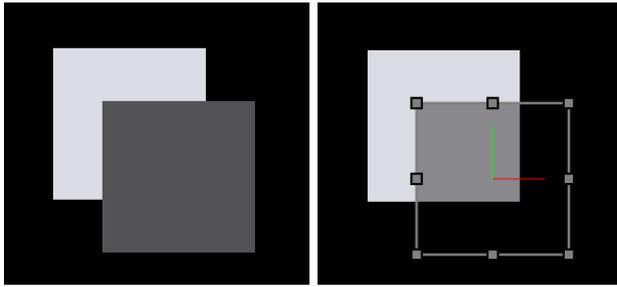
Lighten: adds RGB-color values from the selected Object to RGB-values from the background.



Multiply: multiplies RGB-color values from the selected Object with RGB-values from the background.

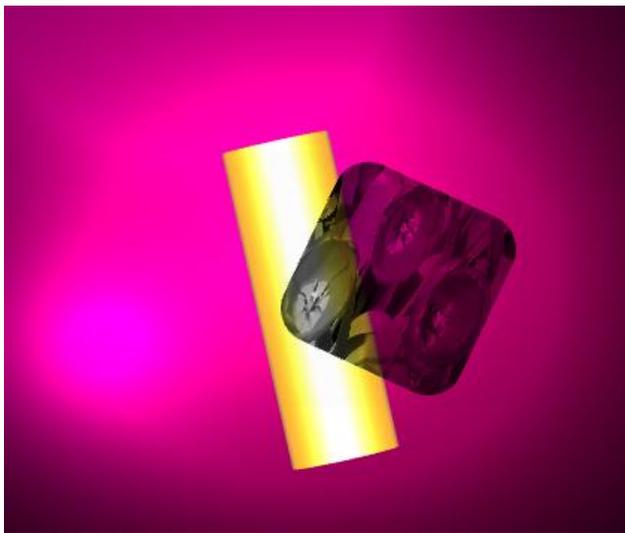


Maximum: the maximum of the selected Object's and the background's RGB-values.

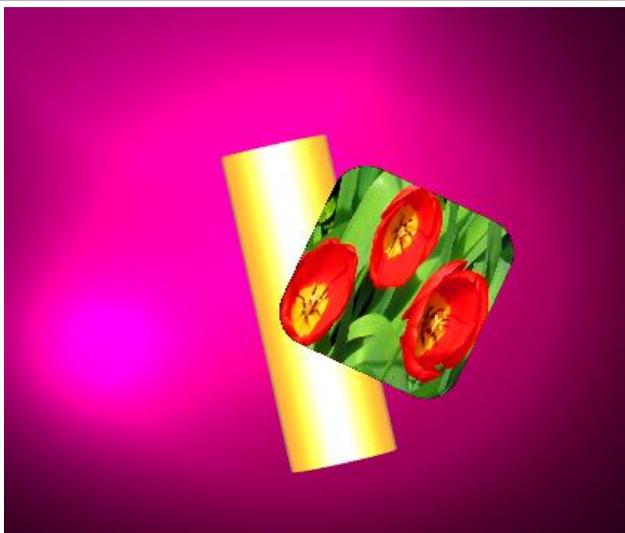


Darken: subtracts RGB-values from the selected Object from the background's RGB-values.

The example blends a grey Plane with a lighter grey Plane.



Mask: use the selected Object to mask the background, based on greyscales. In the mask, white is full transparency and the background is completely visible. Black completely hides the background.



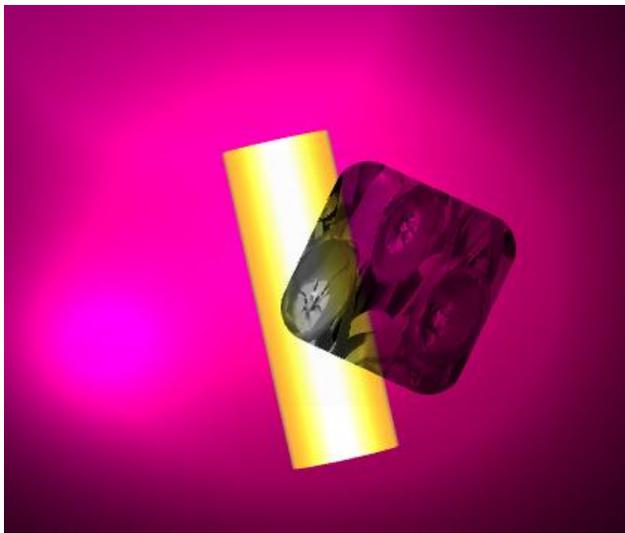
Opaque: No blending (no alpha channels).



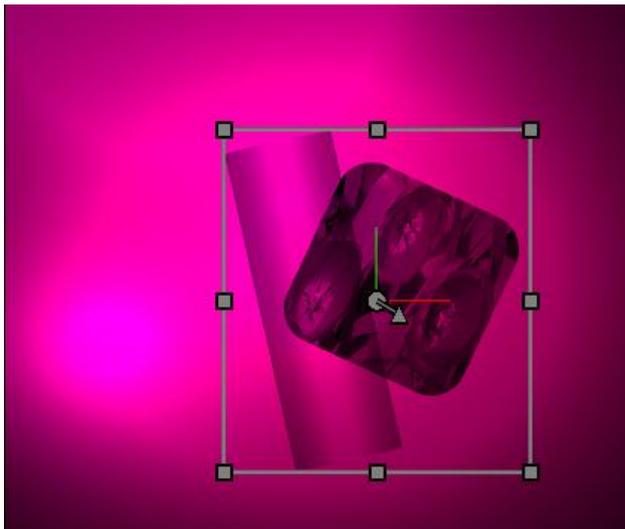
An Object blends with all Objects on all layers within the Group. Note that the Stage is also a Group and therefore the top Object will blend with all layers including the background. To only blend with specific Objects, place these Objects in a Group:

- Select the Objects you want to group, either by [CTRL/CMD]+clicking them in the Objects window, or by drawing a selection with the cursor around the relevant Objects on the Stage.
- On the main menu select **Objects > Group**, or on the Stage right-click the selection > **Group**.
- Open the group and specify blending for the top Object: **Objects > Open Group**, or on the Stage right-click the group > **Open Group**. When finished, close the group.

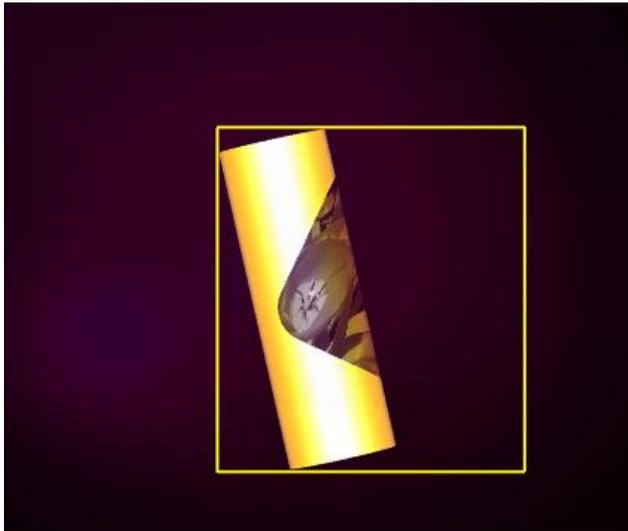
In the examples below in a Plane is used as a mask.



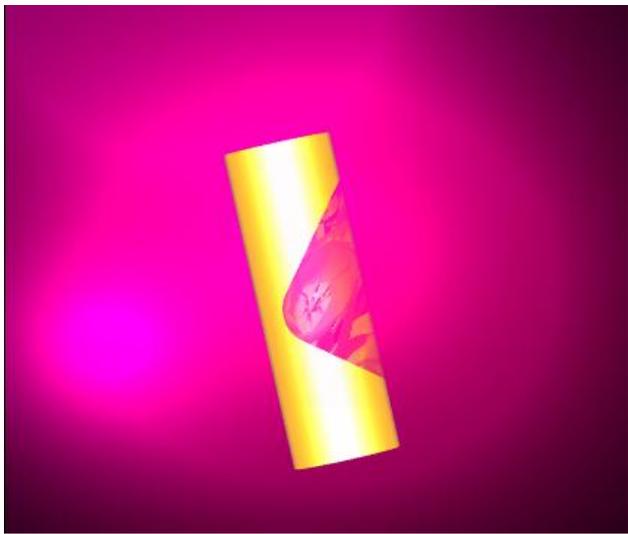
The Plane Object masks all layers in the background (Plasma and Cylinder).



The Plane and Cylinder are grouped and together mask the Plasma background.



The Plane and Cylinder are grouped. The group is opened and the Plane only masks the Cylinder (the layer beneath in the group). The Plasma background is not masked.

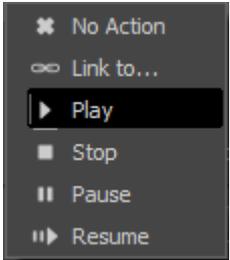


This is the result when the Group is closed again. The Plane masks the cylinder. The Plasma background is not masked.

14 Players

Objects such as 'Clip', 'Audio' and 'Still' use a Player to play out content. Players can be used to control payout. Different actions can be defined. The default is: *Play*. Players can be modified in the **Object** and **Objects** window. Example Players:

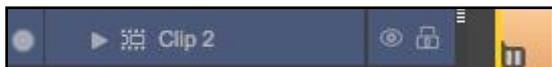
- Still Player
- Ani Player
- Plasma Player
- Clip Player
- Audio Player
- Gradient Player
- Live Player
- Text Player
- Ticker Player
- Subtitle Player

	<ul style="list-style-type: none"> • No Action: The Player's current action is continued. • Play: Start the Player. • Stop: Stop the Player. • Link to: Link this Player to another Player. The Object will now play out the content from the Player you linked to. This option can be used to save resources (only one stream will be used). <p>For clips, animations and tickers additional options are:</p> <ul style="list-style-type: none"> • Pause: Pause the Player. • Resume: Resume the Player after a Pause.
<p>Auto-stop at Out Point</p>	<p>If this option is selected, a Stop Playback action is automatically inserted when an Out Point is added to a Player on the Template Timeline. This will stop the Player.</p>

	<p>For some Objects, a test feed (procedurally generated video) can be used during editing.</p>
---	---



As a default, Player actions are defined from 00:00:00. To define an action at another point in time, work with keyframes or move the Object's In Point.



Example Pause player icon on the Timeline.

To stop a Player, three options are available:

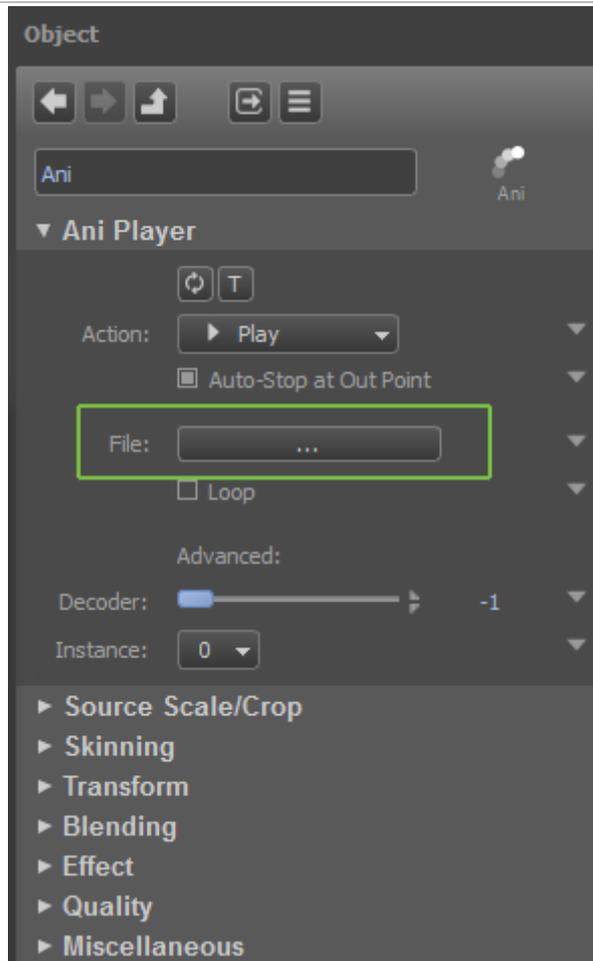
- Set an Out Point and leave the Player's **Auto-Stop at Out Point** option activated (default).
- Create a separate Template with a Player Stop Action.
- Keyframe a Player Stop Action.

An icon is inserted on the Timeline for each Player action:

	<p>Link the Player.</p>
	<p>No Action.</p>
	<p>Pause the Player.</p>
	<p>Start the Player.</p>
	<p>Resume the Player.</p>
	<p>Stop the Player.</p>

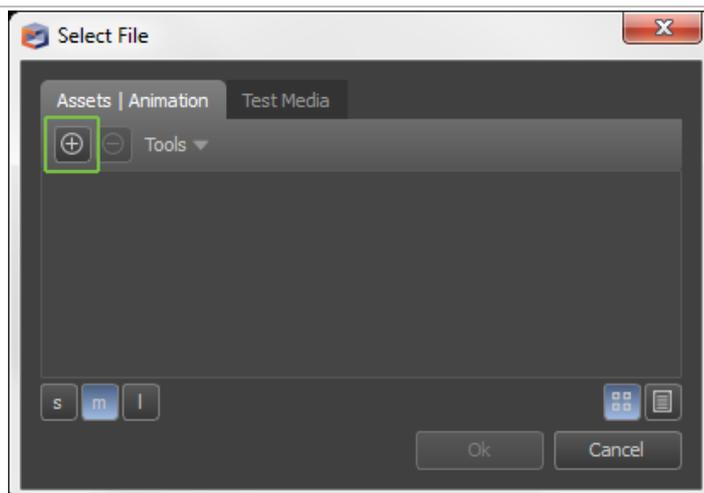
14.1 Linking a fixed file or Scene Parameter to a Player

14.1.1 Linking a fixed file

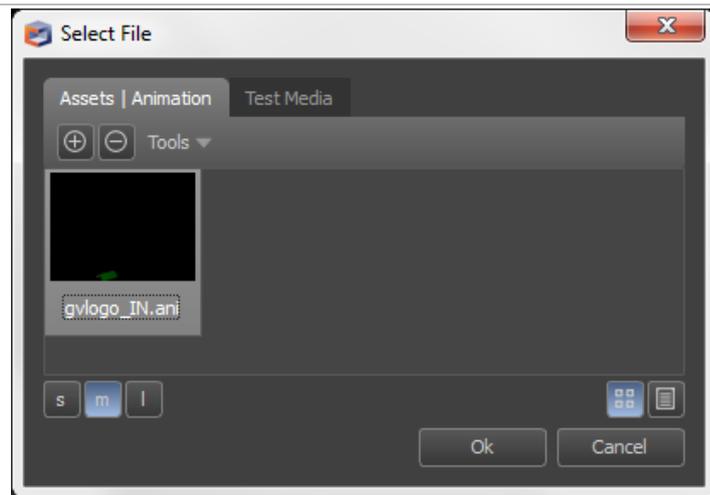


In the Object Window, go to the Player properties.

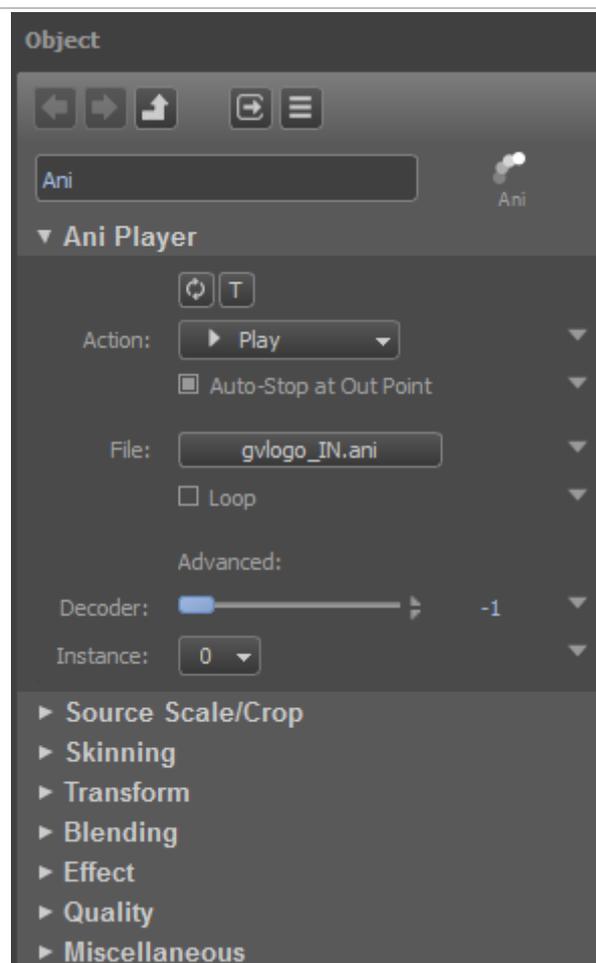
Click the **File** option.



Click the  sign, browse to the appropriate folder on your desktop or network and select the file you want to add.

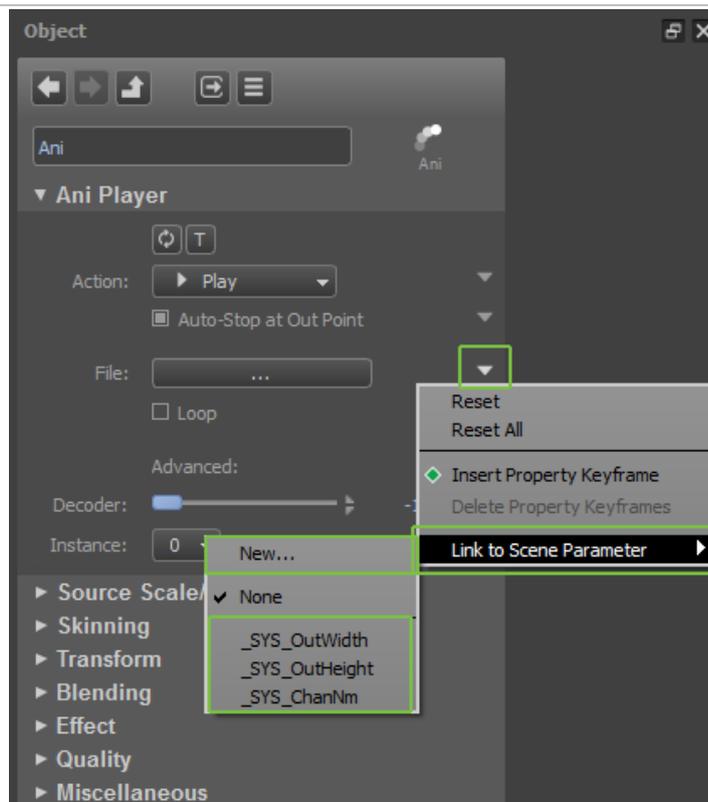


In this example an ANI-file has been added. Select and click **OK** to link to the Player.



In this example a fixed file has been linked to the Player.

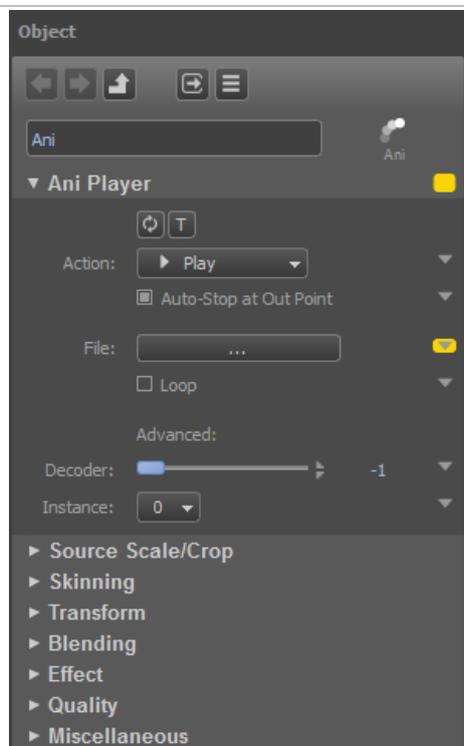
14.1.2 Linking a scene parameter



Select the  icon after the **File** option.

Select Link to Scene Parameter.

Select **New** to define a new parameter or select an existing parameter.



In this example a scene parameter has been added to the File property, as indicated by the  and  icons.

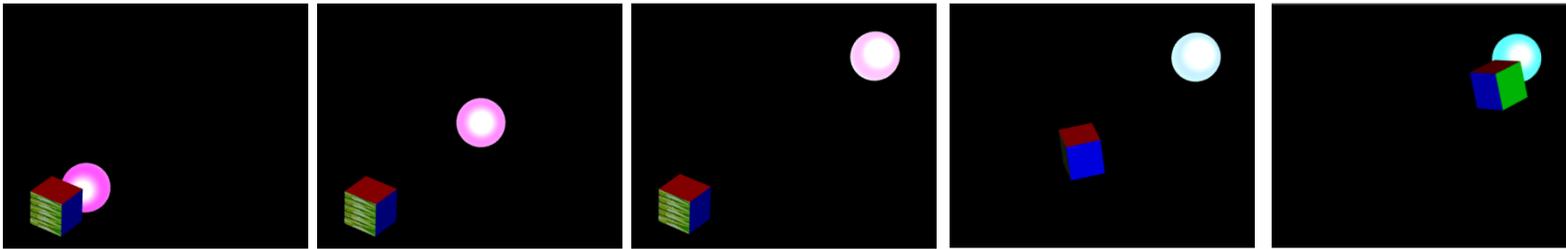
15 Keyframing

15.1 Introduction

Keyframes are used to animate Objects' properties such as position, size and effects over time. A keyframe is a snapshot of the properties of one or more Objects at a specific point in time. Keyframes are used to define start, intermediate and end points of an animation. The frames in between these keyframes are then automatically filled in by Composer.

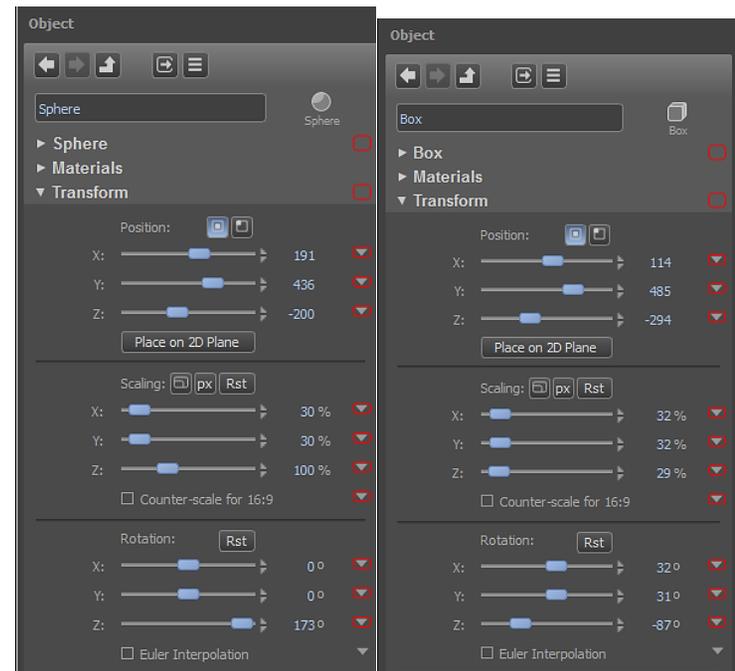
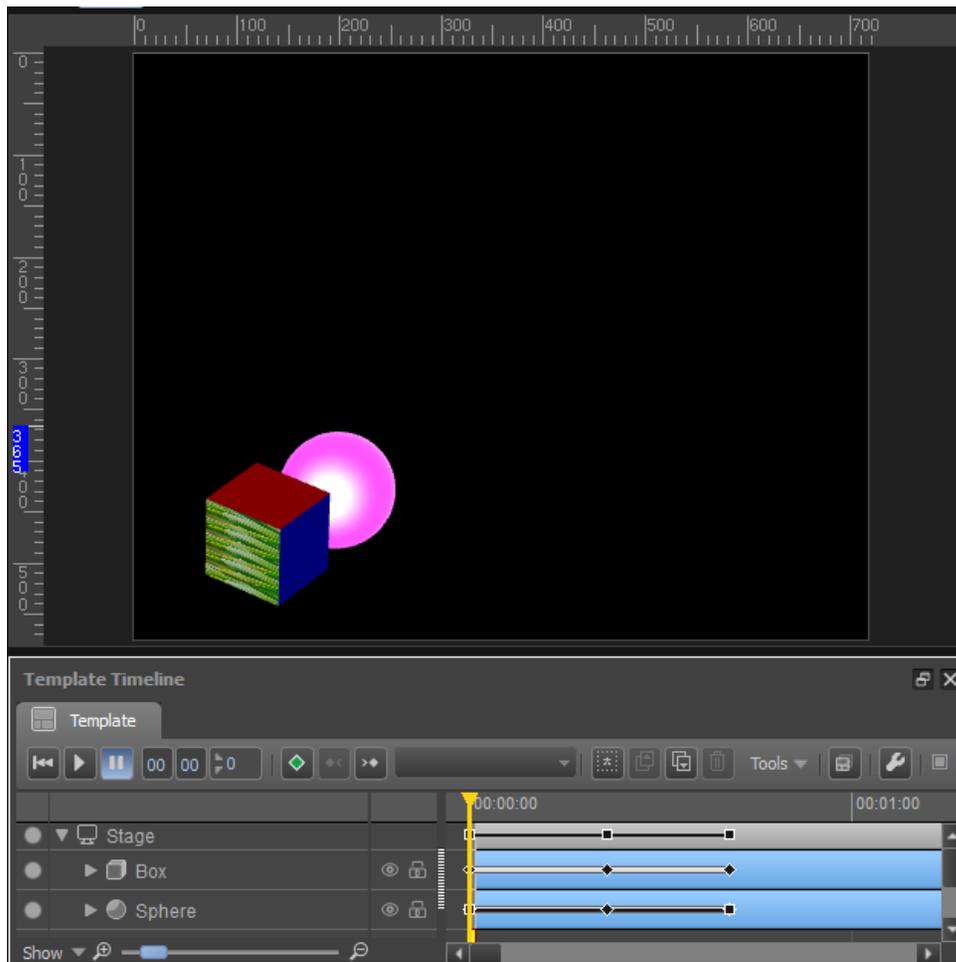


You can also use Controllers to animate Objects. For an explanation, see **File > Example Projects > Controllers**.



Example animation of a Box and Sphere Object using three keyframes. The frames in between these keyframes are automatically filled in by Composer.

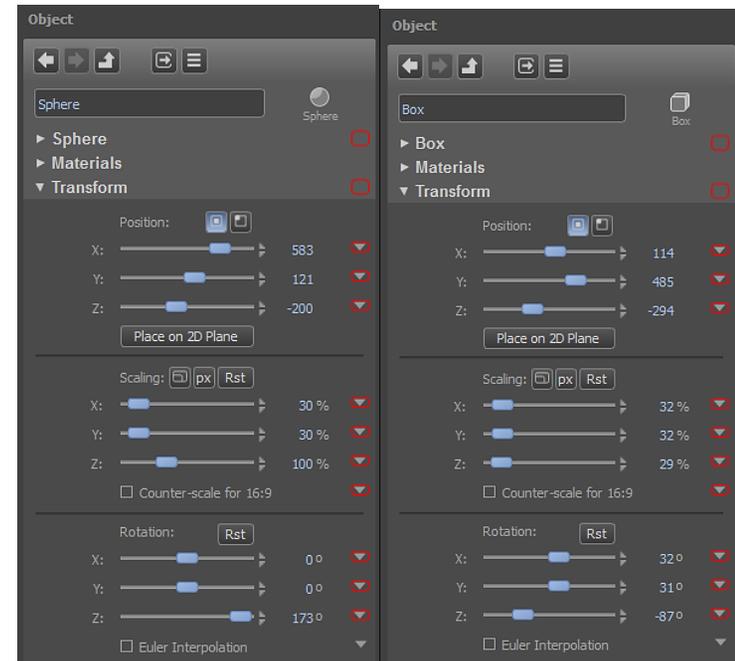
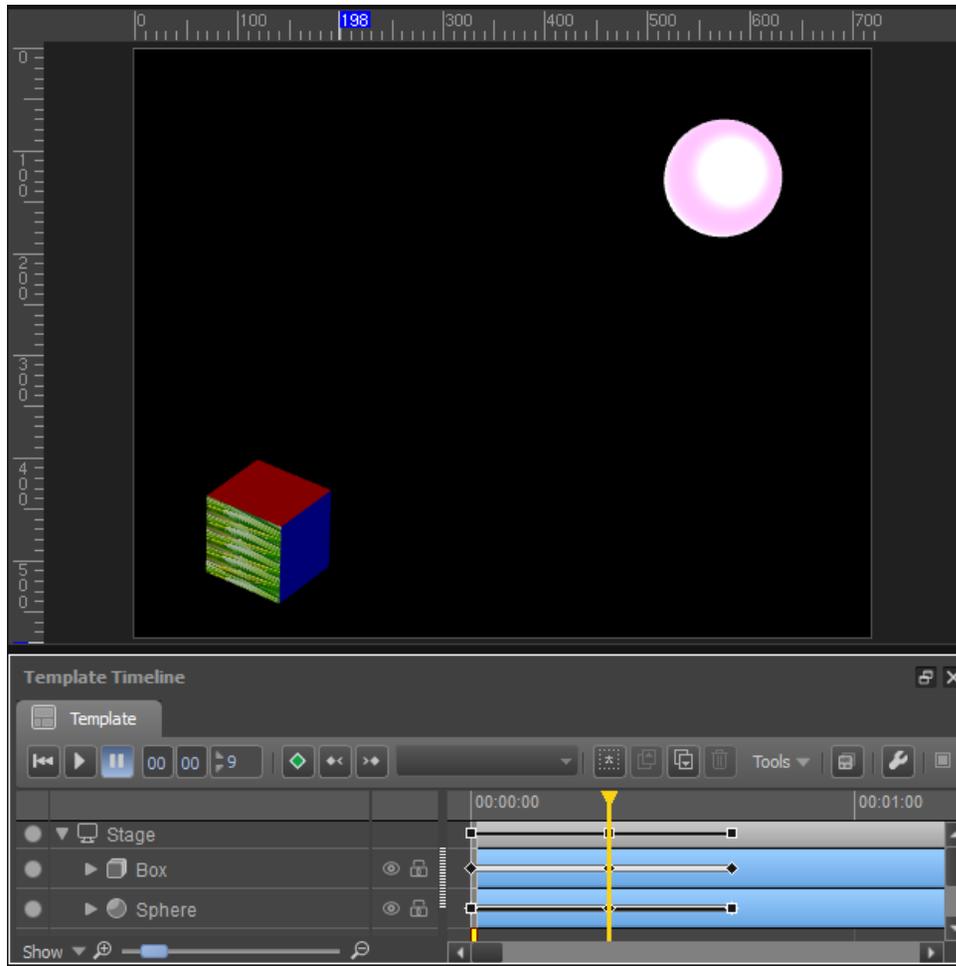
Keyframe 1



Keyframed Transform properties for this point in time of the Sphere and Box Objects.

The  and  icons indicate that properties have been keyframed.

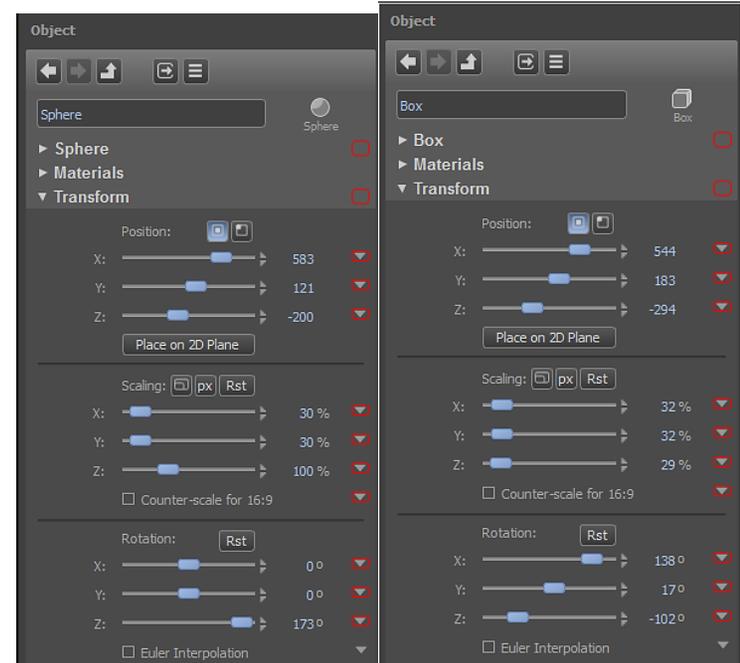
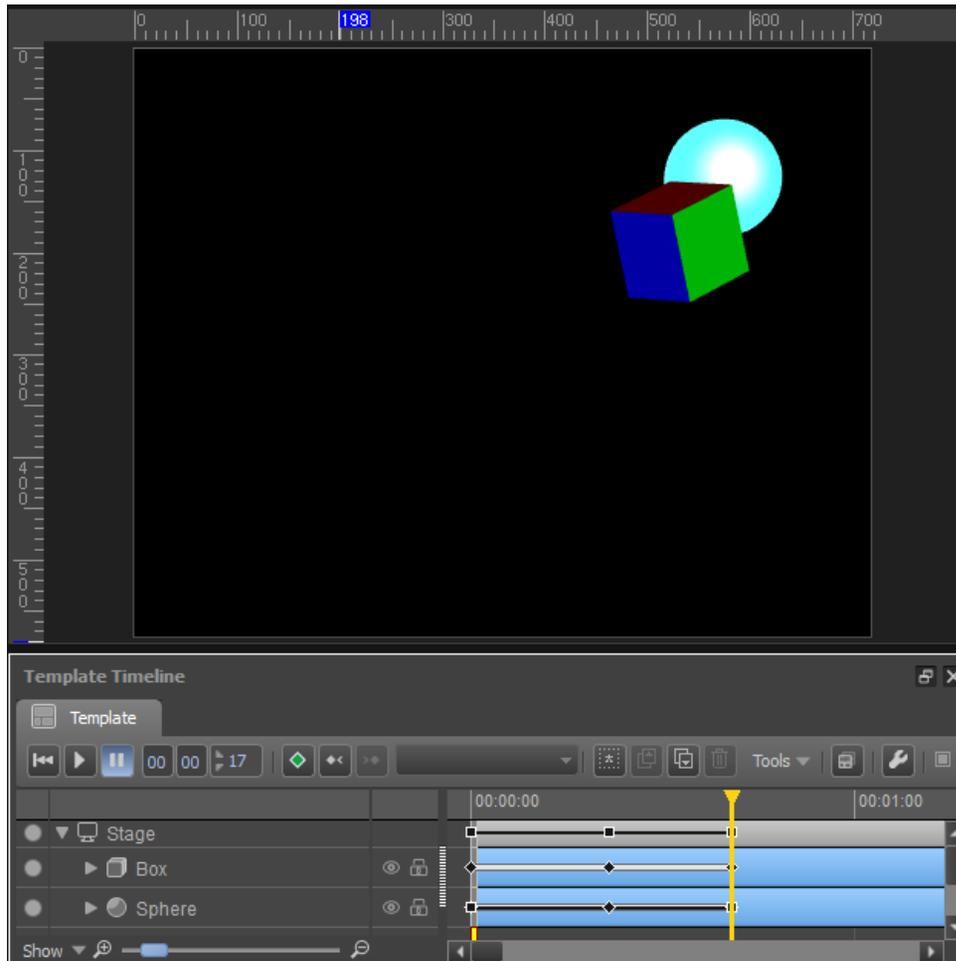
Keyframe 2



Keyframed Transform properties for this point in time of the Sphere and Box Objects.

The  and  icons indicate that properties have been keyframed.

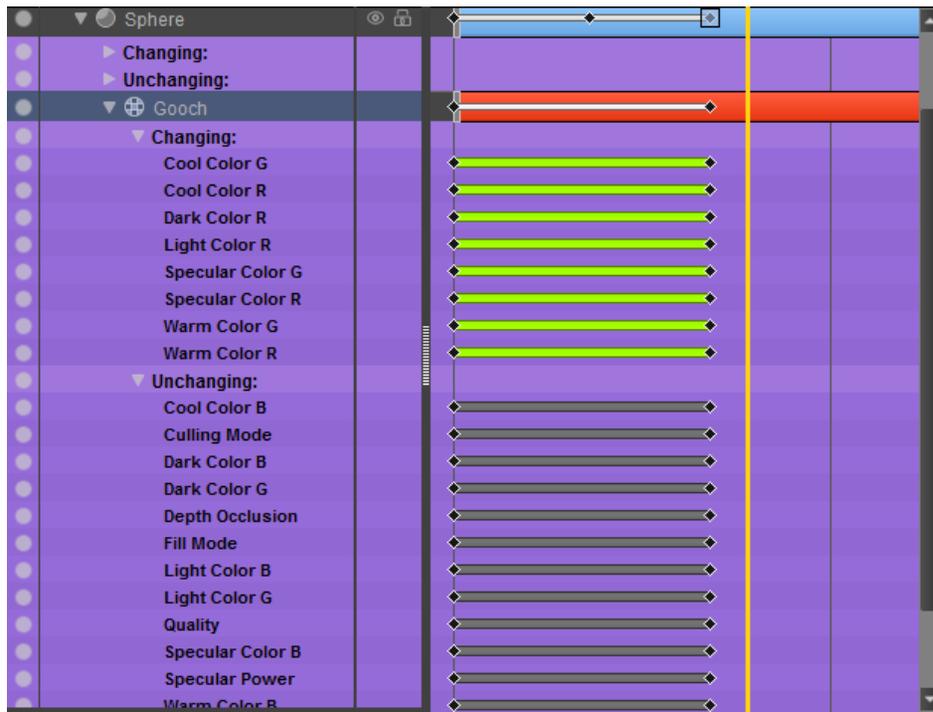
Keyframe 3



Keyframed Transform properties for this point in time of the Sphere and Box Objects.

The  and  icons indicate that properties have been keyframed.

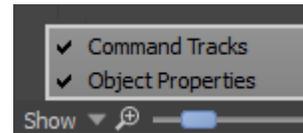
Animating the Material



The color of the Sphere (the Gooch Material) is animated using two keyframes.



To show not only Objects, but also the Objects' properties on the Template Timeline, click the **Show > Object Properties** option in the bottom left corner of the Template Timeline. Changing and unchanging properties are listed.

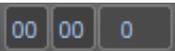
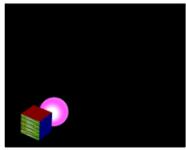


15.2 Adding a Keyframe

Animations consist of at least two keyframes, one for the start and one for the end point of the animation. Intermediate keyframes can be added. The frames in between two keyframes are automatically filled in by Composer.



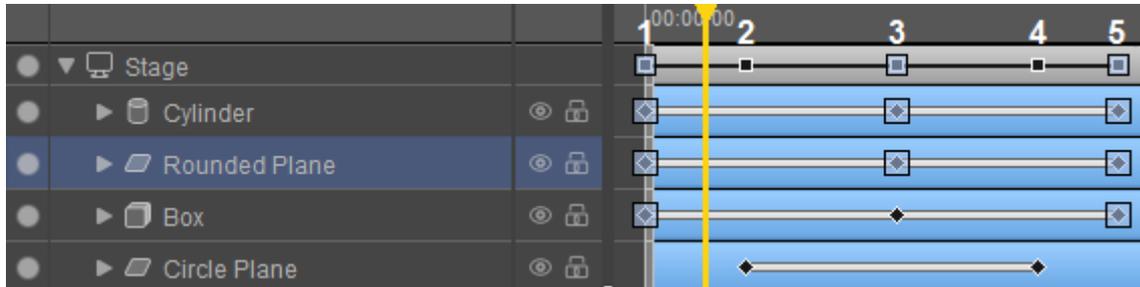
A keyframe can contain more than one Object.

<p>To create a keyframed animation, add at least two keyframes, one for the start and one for the end of the animation.</p> <p>To add a keyframe:</p>	
	<p>First select the Template you want to edit.</p>
	<p>On the Timeline select the point in time where you want to add the keyframe. Either specify mm:ss:ff , or move the player head to the appropriate position on the Timeline.</p>
	<p>Select the Object you want to animate. You can also create an animation that contains more than one Object. In that case select the Objects you want to animate.</p> <p>Define the Object's or Objects' properties at the specified point in time.</p>
	<p>Click the Add keyframe icon.</p> <p>A keyframe is added and the Objects' properties are keyframed.</p>
<p>On the Timeline:</p> <p>The  icon indicates that a keyframe has been added for an Object on a lower level at this point in time.</p> <p>The  icon indicates that a keyframe has been added at this point in time.</p> <p>In the Object window:</p> <p>The  icon indicates that the property has been keyframed.</p> <p>The  icon indicates that a property in the property group has been keyframed.</p> <p>Repeat these steps for each keyframe in the animation.</p>	



Move the player head on the Timeline to preview animations.

Example:

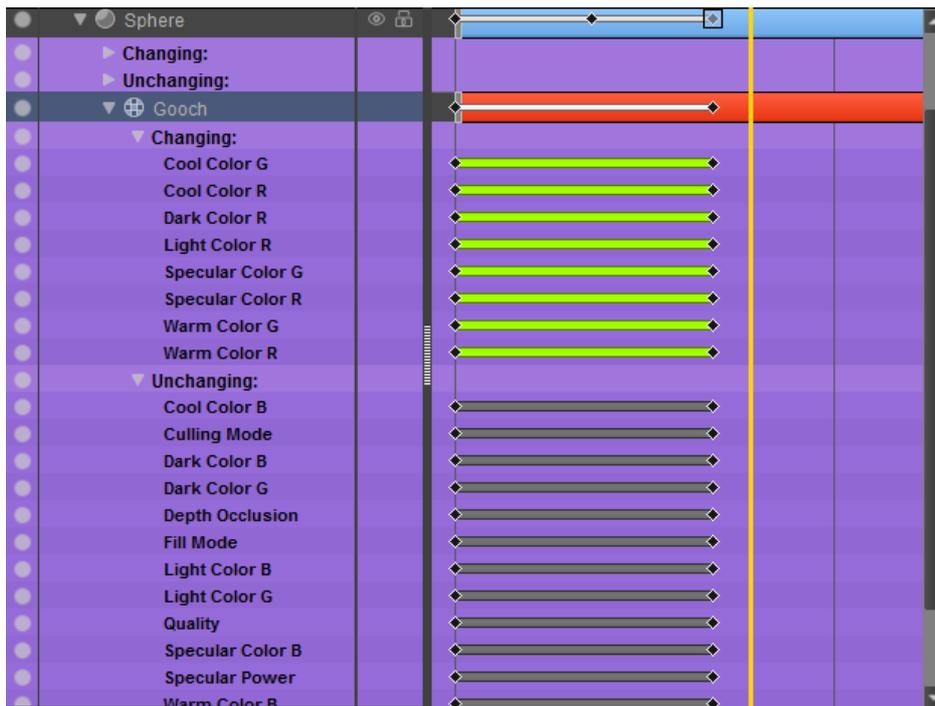
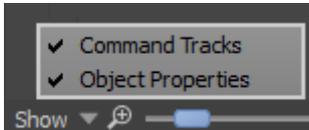


Example Timeline with five keyframes inserted.

<input type="checkbox"/>	The Stage row shows all keyframes that have been added to the Template. The <input type="checkbox"/> icon indicates that keyframes have been added for Objects on lower levels.
1, 3, 5	This animation consists of three keyframes and contains three Objects, the Cylinder, Rounded Plane and the Box. One of the Box's keyframes [3] has been detached from the animation and can thus be moved, copied or deleted independently from the Cylinder and Rounded Plane.
<input type="checkbox"/>	The grey color indicates that keyframes are selected, as described in more detail in the next paragraph.
2, 4	These keyframes animate one Object - the Circle Plane Object - and contain the properties of this Object at this point in time.



To show not only Objects, but also the Objects' properties on the Template Timeline, click the **Show > Object Properties** option in the bottom left corner of the Template Timeline. Changing and unchanging properties are listed.



Example.

15.3 Selecting a Keyframe

There are two reasons to select a keyframe:

- To update the keyframe with changed properties.
- To move, copy or delete the keyframe.

15.3.1 Selecting a keyframe for updating

There are several ways to select a keyframe for updating:

	Double-click the keyframe on the Timeline.
	Use the Next and Previous keyframe buttons to go to the next or previous keyframe on the Timeline.
]]	Use the hotkeys] and [to go to the next or previous keyframe.
 	The keyframe icon on the Timeline turns white when the keyframe is selected for updating and the player head is placed on top of the keyframe.

15.3.2 Selecting a keyframe for moving, copying or deletion

There are several ways to select a keyframe for moving, copying or deletion. You can select more than one keyframe:

	Click the keyframe on the Timeline. Keep the [CTRL] or [CMD] key pressed to select more than one keyframe.
Object Keyframes > Select	To select all keyframes for an Object, right-click the Object > Object Keyframes > Select > All or All + Ripple to select all keyframes for the Object plus its sub objects.
	To select all items on the Timeline, click the Select all button.
 	The keyframe icon on the Timeline turns grey when the keyframe is selected for moving, copying or deletion.

15.3.3 Example



The example shows:

- The animation contains three keyframes.
- The keyframes animate the Cylinder and Plane Objects' properties.
- The first keyframe is selected for updating (white).
- The first, second and third keyframes are selected for moving, copying or deleting (grey).
- The Box's keyframes are detached and not selected (black).

1.1 Updating a Keyframe

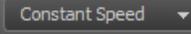
A keyframe is a snapshot of the properties of one or more Objects at a specific point in time. To modify keyframed properties, edit and then update the keyframe with the new properties.

To update a keyframe with new properties:

	Select the keyframe you want to edit.  The keyframe icon on the Timeline turns white when the keyframe is selected for updating.
	Edit the applicable Objects' properties.
	Click the update icon to update the selected keyframe with the properties defined for the Object(s).

To update all properties of a keyframe for all selected Objects, select the Object(s) > right-click > **Object Keyframes > Update Keyframe.**

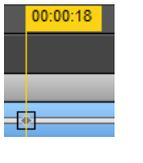
15.4 Reverse, Timescale and Speed

	<p>Reverse or timescale the selected keyframes.</p> <ul style="list-style-type: none">• Reverse: (part of) the animation is reversed; the first keyframe becomes the last keyframe and vice versa.• Timescale: scale (part of) the animation's duration, in percentage or frames. Either scale selected keyframes [of Keyframes] or all keyframes [All].
	<p>Define the type of interpolation for the selected keyframes. Options are:</p> <ul style="list-style-type: none">• Constant Speed• Ease In• Ease Out• Ease In & Out• Step

15.5 Copying Keyframes

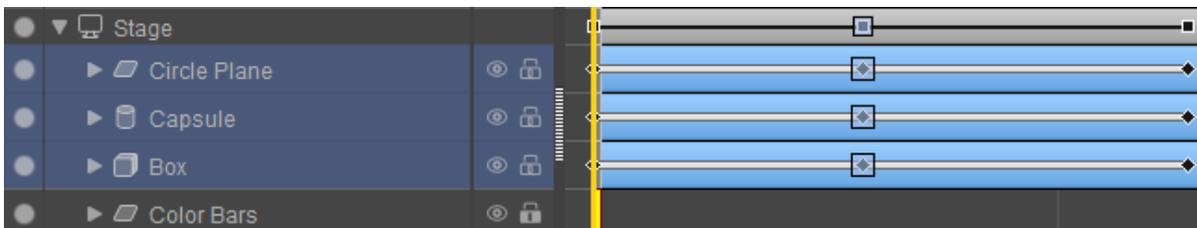
	<p>Use to copy a keyframe (or keyframes) and paste at another point in time:</p> <p>On the Timeline select the keyframe(s) you want to copy. Then click the Copy icon.</p>
	<p>To paste, select the position where you want to paste the keyframe and click the Paste icon.</p>
Copy All	<p>Use to copy an Object's keyframes and paste on another Object:</p> <p>Right-click the Object > Object Keyframes > Copy All.</p>
Paste	<p>Select the Object you want to paste the keyframes on, right-click > Object Keyframes > Paste.</p>

15.6 Repositioning a Keyframe

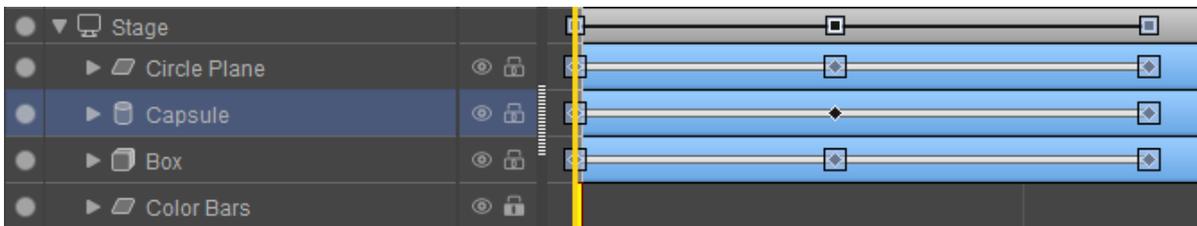
	<p>To reposition a keyframe on the Timeline, select and drag while keeping the mouse pressed. The position on the Timeline is indicated as shown in the example.</p>
---	--

15.7 Detaching Keyframes

When an animation contains several Objects, these Objects' keyframes are attached as shown in the example below. When you select a keyframe for one Object, the keyframe is selected for the other Objects in the animation as well.



Keyframes can be detached from an animation, as shown in the example below in which the Capsule's second keyframe is detached. You can now move, copy or delete the keyframe independently.



<p>Detach</p>	<p>To detach an Object from selected keyframes in an animation, right-click the Object > Object Keyframes > Detach. Options are:</p> <ul style="list-style-type: none">• From All: detach the Object from all keyframes.• From All + Ripple: detach an Object including its underlying objects from all keyframes.• From Selection: detach the Object from the selected keyframe(s) only.
----------------------	--

15.8 Deleting a Keyframe

	To delete keyframe(s): on the Timeline, select the keyframe(s) you want to delete. Then click the Delete icon.
All	To delete all keyframes for a selected Object: right-click the Object > Object Keyframes > Delete > From All .
All + Ripple	To delete all keyframes for a selected Object including its sub objects' keyframes: right-click the Object > Object Keyframes > Delete > All + Ripple .
From Selected	To delete the selected keyframes: right-click the Object > Object Keyframes > Delete > From Selected .

16 Scene Parameters

Use scene parameters to define dynamic values.

16.1 Defining Scene Parameters

- To define a Scene Parameter, go to the **Scene Parameters** window.
- Click the  icon to add a Scene Parameter, then specify a name (characters and/or numbers).

You can also create Scene Parameters directly in the Object window.

- Click the  icon for the property you want to link to a Scene Parameter.
- Select **Link to Scene Parameter > New** and specify a new Scene Parameter.
- Click the  icon to delete the selected Scene Parameter.

	<p>The yellow icons in the Object window and on the Properties page indicate that a Scene Parameter has been defined for an underlying Object , Object  or property .</p>
--	--

16.2 Linking a Property to a Scene Parameter

- In the Object window, go to the property that you want to link to a scene parameter and click the  icon.
- Select **Link to Scene Parameter** and select the appropriate Scene Parameter. You can also create a new Scene Parameter and link.

17 Controllers



A Controller automatically animates properties of an Object. Controllers can be an alternative to keyframing. Controllers are ideal for animations that are endlessly repeating, or animations that depend on real-time data.



Controllers are also described in the Example Project *Controllers*.

Available Controllers are:

- Anchor
- FromTo
- Link
- Oscillate
- Stack

All Objects' properties can be animated.

Per frame, the Object property values for rendering are determined as follows:

Value0 = a value from keyframes or the default Template value.

Value(N, for the Nth Controller for the property, with $N > 0$ and Wet-dry in $[0...1]$ =

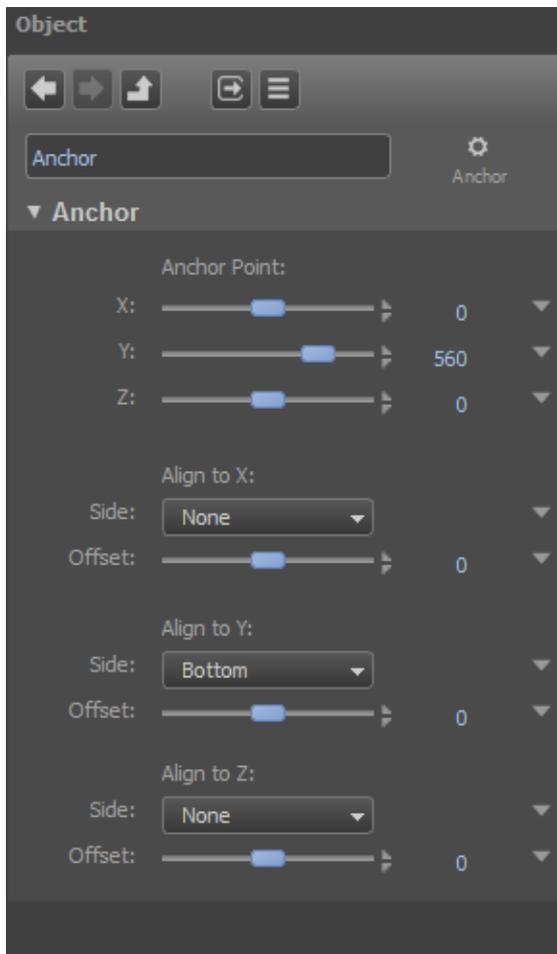
$(1 - \text{Wet-dry}) * \text{Value}(N - 1) + \text{Wet-dry} * \text{Controller-value}$.

Example: property Opacity has a constant value 50 and a Controller Link with Wet-dry 25% and Oscillate with Wet-dry 75%. The value for the Opacity property will be:

$(0.75 * 50 + 0.25 * \text{Link-value}) * 0.25 + \text{Oscillate-value} * 0.75$

17.1 Anchor

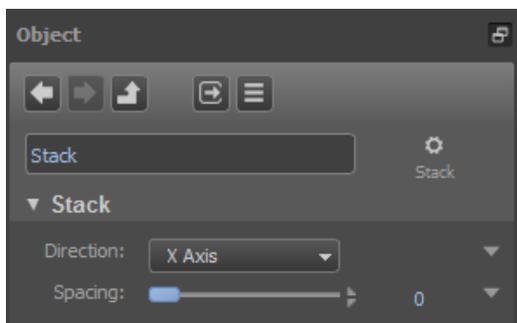
Use an Anchor to keep (one or more sides of) an Object in a specific position: align the Object's Left, Right, Bottom, Top, Back or Front to an Anchor Point X, Y or Z.



Example Anchor.

17.2 Stack

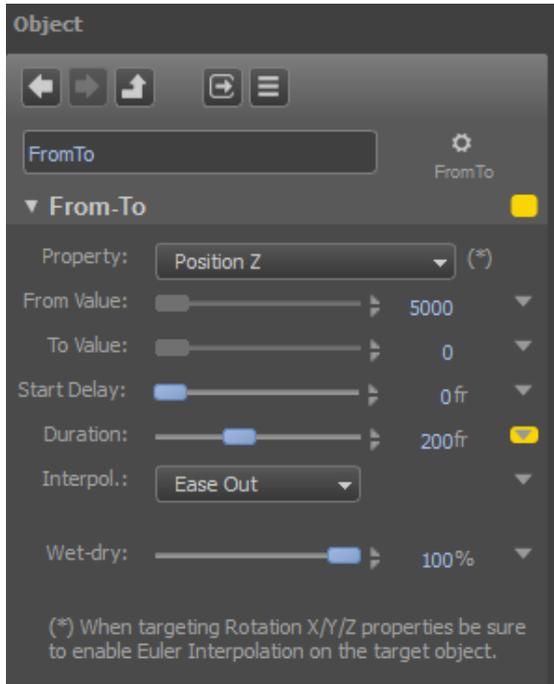
The Stack Controller is used to tightly stack grouped Objects on the X, Y or Z-axis and avoid overlap, for example to align a number of Text Groups. Note that this Controller can only be used for Groups.



Example Stack Controller for a Group.

17.3 FromTo

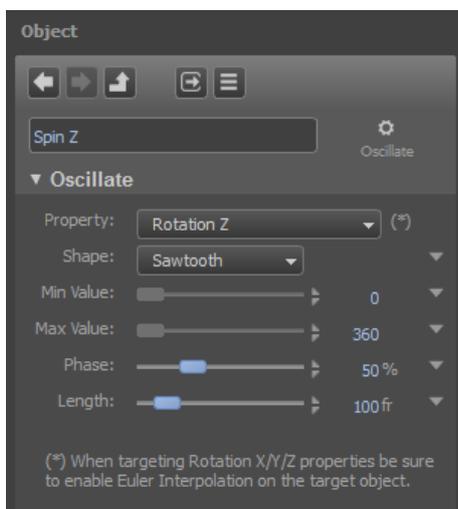
Use a FromTo Controller to animate a property from one to another value, for example move from Position Z 5000 to Position Z 0 using a FromTo controller with a Duration taken from the Scene Parameter *Move Duration*. This Controller is similar to a keyframed animation with two keyframes. However, the 'From' and 'To'-values can be linked to a Scene Parameter. This cannot be done with keyframes.



Example FromTo Controller.

17.4 Oscillate

Use an Oscillate Controller to oscillate (Sinus, Sawtooth, Square or Triangle) an Object's properties (note that only one property can be oscillated).

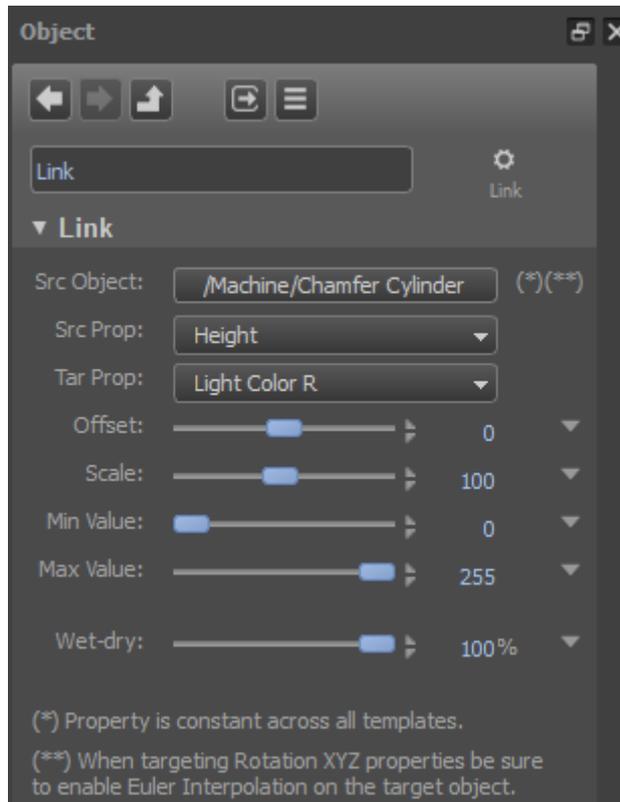


Example Oscillate Controller (Spin Z prefab).

17.5 Link

The Link Controller is used to link a property of a source Object to a property of a target Object. In the example below, the target's color amount is linked to the height of a Cylinder using a Link Controller.

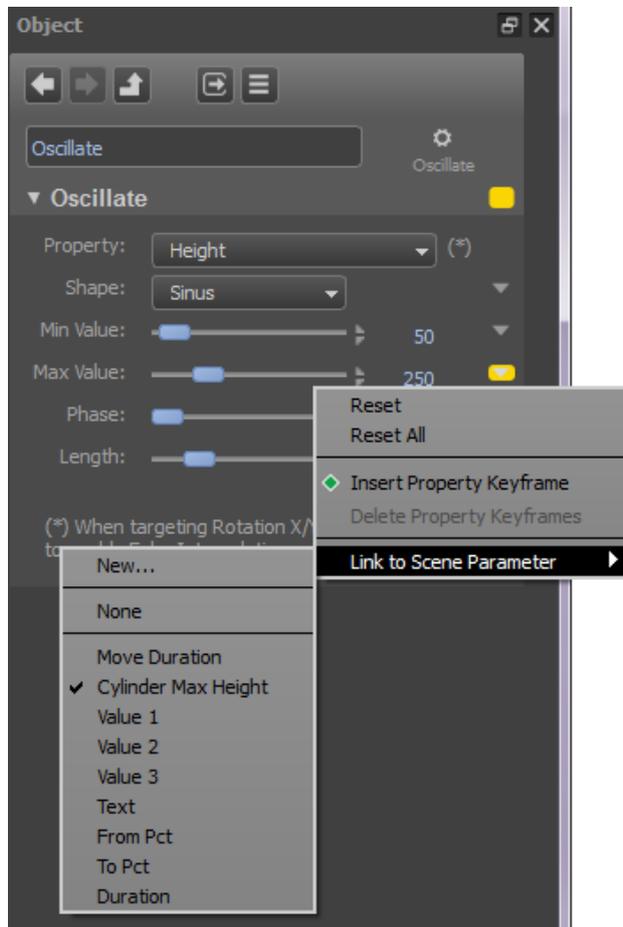
The target property is calculated as $\text{Offset} + \text{Scale} \times \text{Source}$.



Example Link Controller.

17.6 Controllers How to

- To add a Controller to an Object, right-click the Object in the **Objects** window or on the Stage > **Add Controller** > select the Controller you want to add > **OK**.
- Controllers are edited in the **Object** window.
- To work with real-time data to control properties, use Scene Parameters.



Example Controller using a Scene Parameter to dynamically set the Max Value for the oscillation of a Height property.



When animating individual Rotation properties, Euler Interpolation should be enabled for the target Object.



To rotate around separate axes (for example, only the y-axis), we advise to use Controllers. Also, you need to enable Euler interpolation.

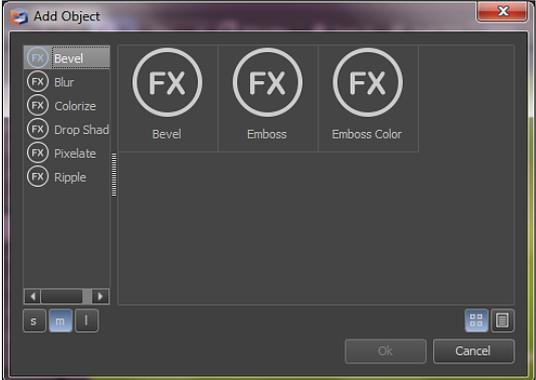
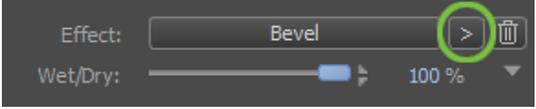
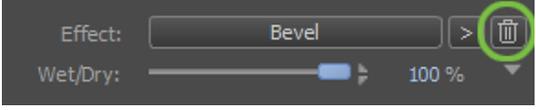
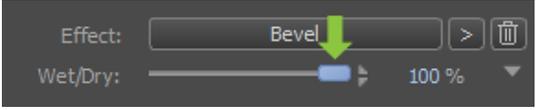
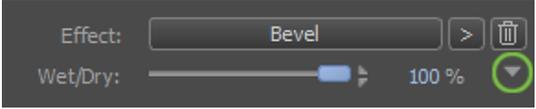


The example Project *Controllers* shows a number of examples of Controllers.

18 Layer Effects

Effects such as **Bevel** or **Drop Shadow** can be defined for Stage Objects. To define an Effect, go to the **Effect** section in the **Object** window.

18.1 Defining an Effect

	<p>Click the Effect button to open the Effects window.</p>
	<p>In the left menu and then in the main window, select the effect you want to add. .</p> <p>Click OK to confirm.</p>
<p><i>Example.</i></p>	
	<p>In the Object window in the Effect section, click the arrow to edit the effect.</p>
	<p>Click the Delete icon to delete the Effect.</p>
	<p>Wet/Dry: defines the balance between the effect (wet) and the original (dry).</p>
	<p>Click this arrow to link to a scene parameter, or add or edit a keyframe.</p>

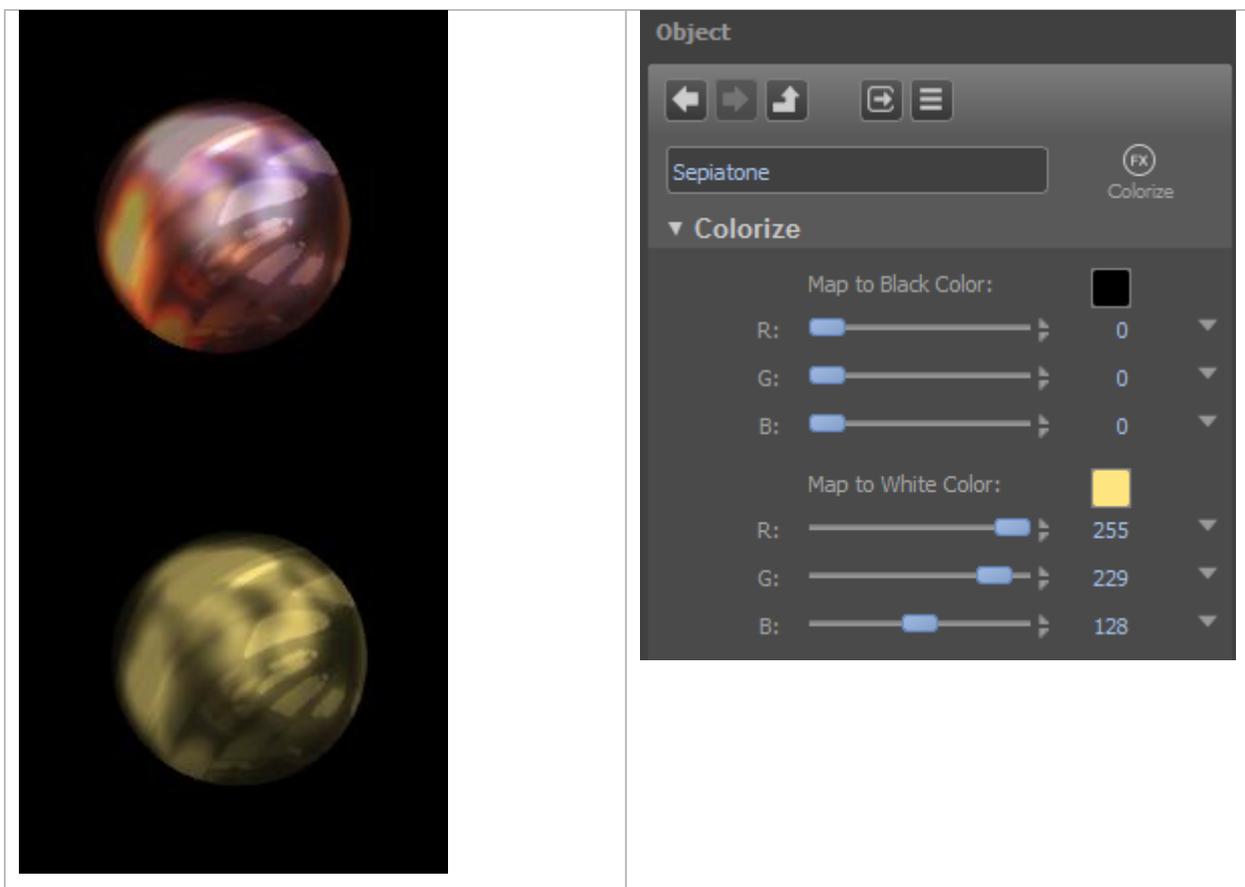
18.2 Colorize

Use the colorize effect to map a color to the Object's black and white tones.

Following prefabs are available:



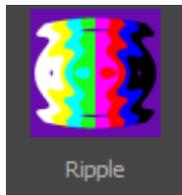
The example shows the colorize effect with settings that result in a sepia tone effect.



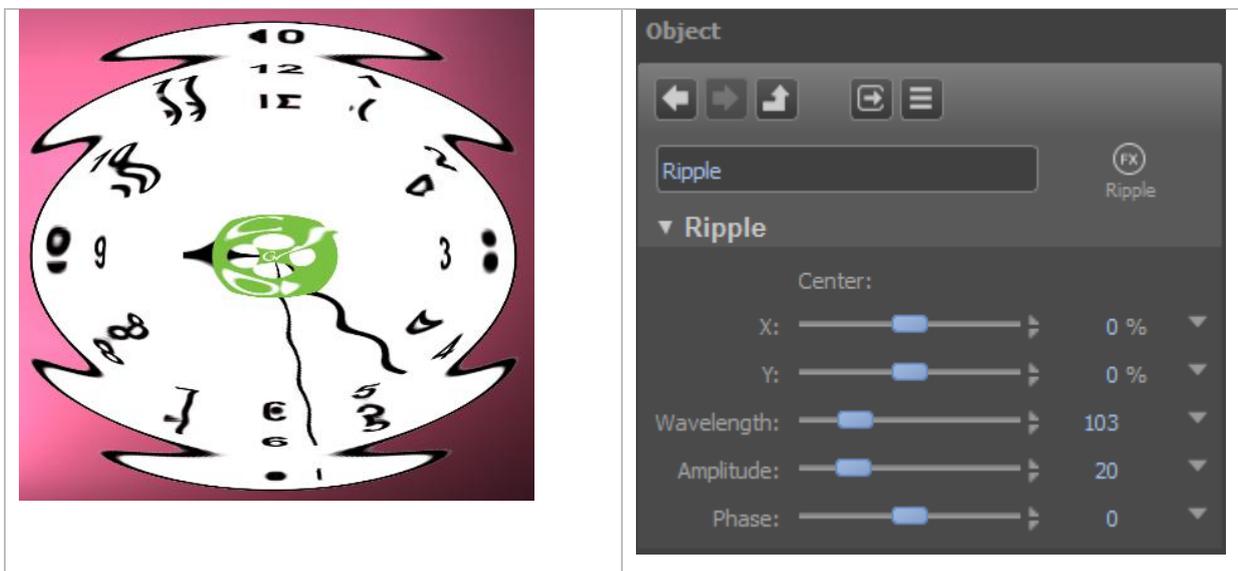
18.3 Ripple

Use to create a ripple effect.

Following prefabs are available:



Example rippled Clock Object and its properties:



Center: specifies the center of the ripple effect.

Wavelength: the distance from one ripple wave crest to the next crest.

Amplitude: height of the ripple waves.

Phase: specifies the point along the waveform at which a wave cycle begins.

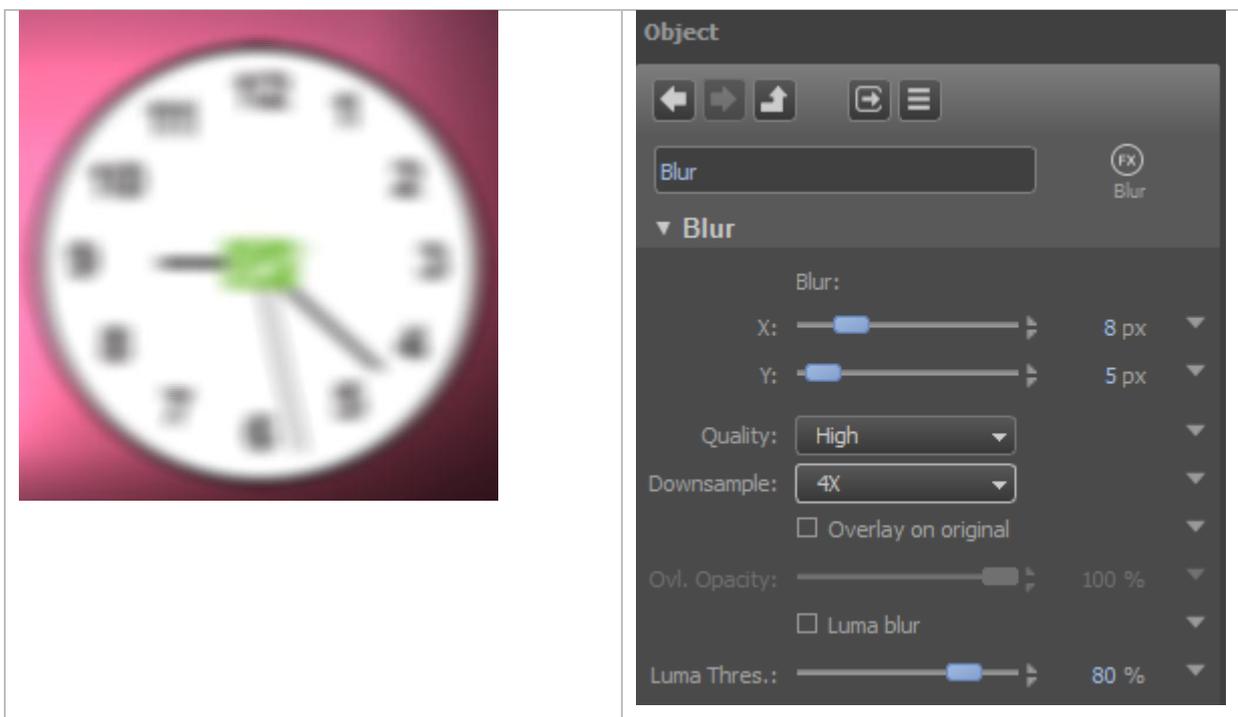
18.4 Blur

Use to add a blurring effect.

Following prefabs are available:



Example blurred Clock Object and its properties:



Blur: blur in x/y direction in pixels.

Quality: the number of samples taken.

Downsample: downscale the Object for a blurrier effect after applying the effect.

Overlay on original: overlay the blurred Object on the original, specify Opacity for the overlay.

Luma: blur bright sections only, specify a luminance threshold (Luma Thresh).

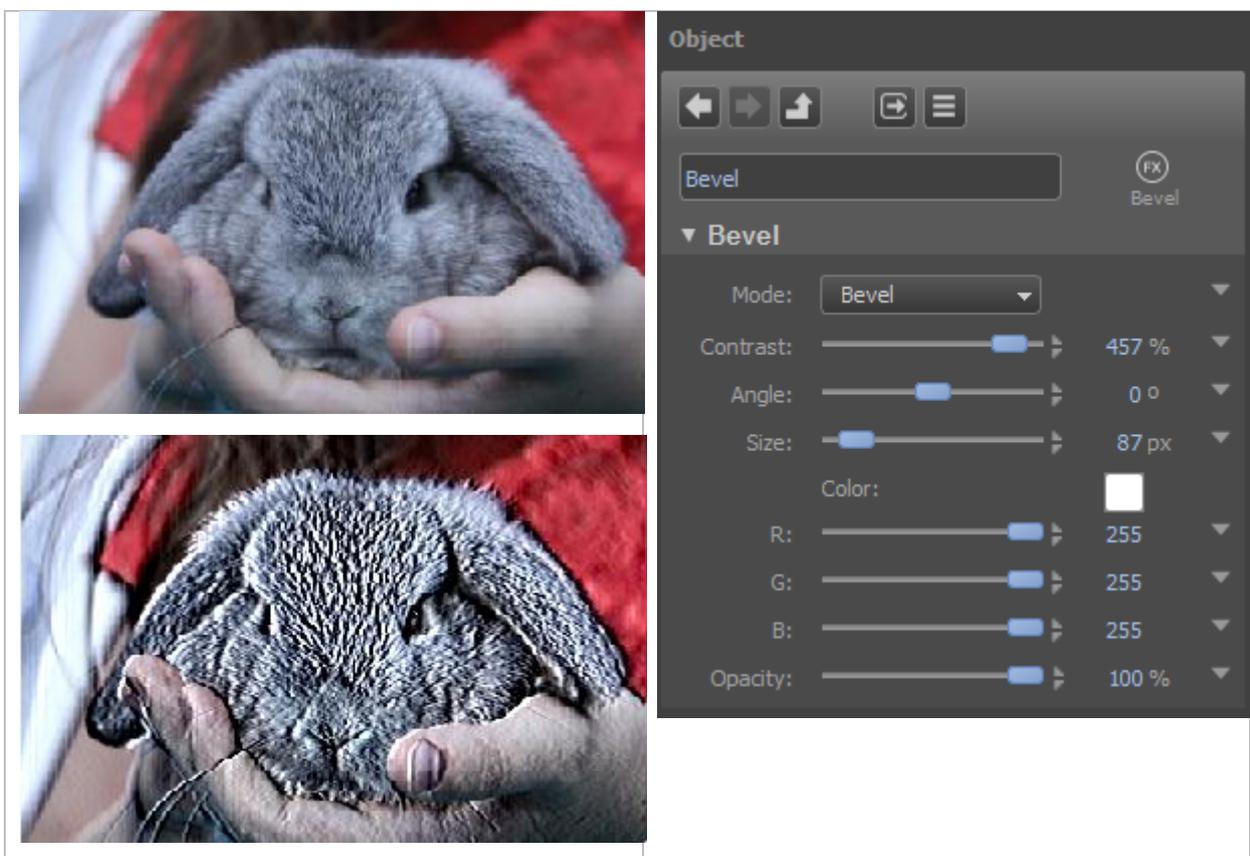
18.5 Bevel and Emboss

Use to add depth to Objects.

Following prefabs are available:



The example shows a Still before and after bevel and its properties when the effect has been applied:



Mode: select a mode: Bevel, Emboss or Emboss Overlay (emboss output with overlaid original).

Opacity: opacity.

Contrast: contrast used for the effect (higher contrasts will create the illusion of a deeper bevel).

Angle: specifies the light angle.

Size: depth in pixels.

Color: select a color for the bevel.

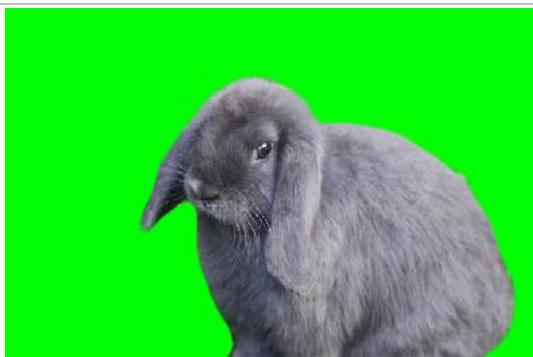
18.6 Chroma Keying

Use to create a chroma key.

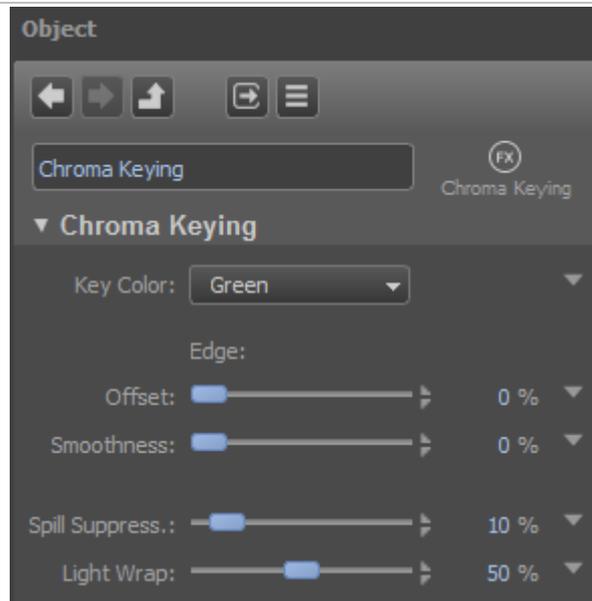
Following prefabs are available:



Example:



The example shows a rabbit against a key colored background



The Chroma Keying effect is applied and the background is keyed out.



The Object is placed against a grass background.

Key color: key color (blue or green).

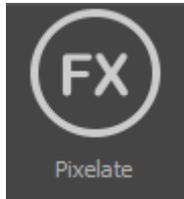
Edge:

- **Offset:** tolerance.
- **Smoothness:** smoothen edges.
- **Spill Suppress:** remove fringing from the key color around the foreground's edges.
- **Light Wrap:** blend colors and lightness values from the inserted background with the keyed foreground edges.

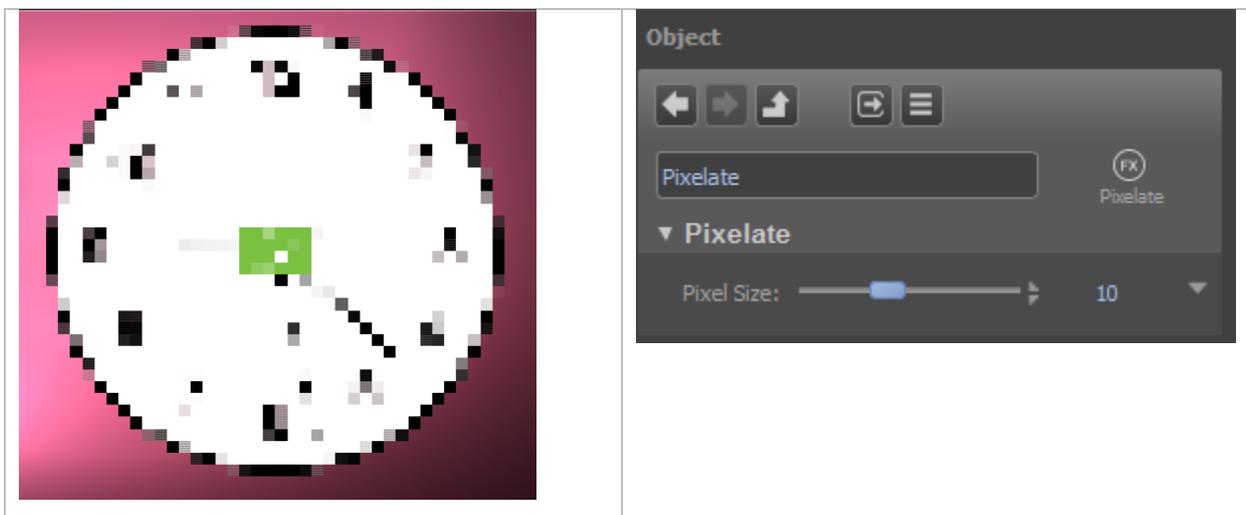
18.7 Pixelate

Use to create a mosaic effect.

Following prefabs are available:



Example:



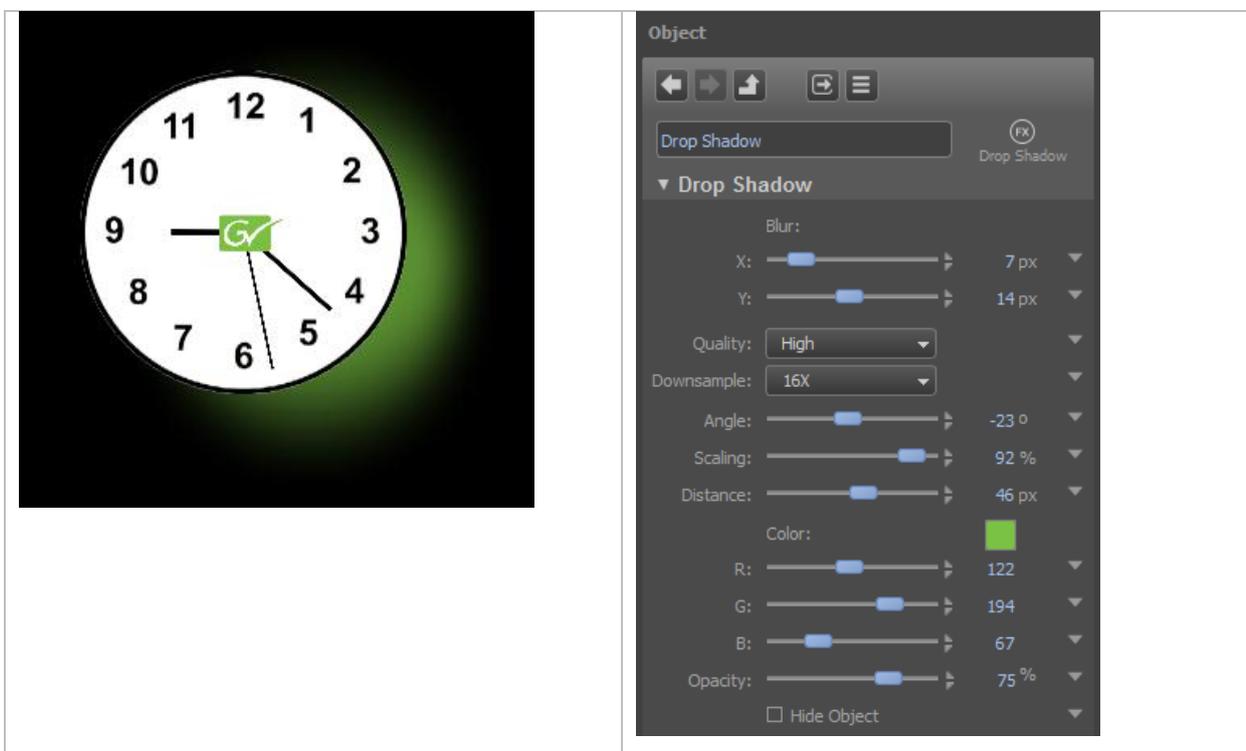
18.8 Drop Shadow

Use to add a shadow to an Object.

Following prefabs are available:



Example:



Blur: amount of blur.

Quality: the number of samples taken.

Downsample: downscale the Object for a blurrier effect after applying the effect.

Angle: angle of the shadow.

Scaling: size of the shadow relative to the original.

Distance: distance of the shadow relative to the original.

Color: shadow color.

Opacity: opacity.

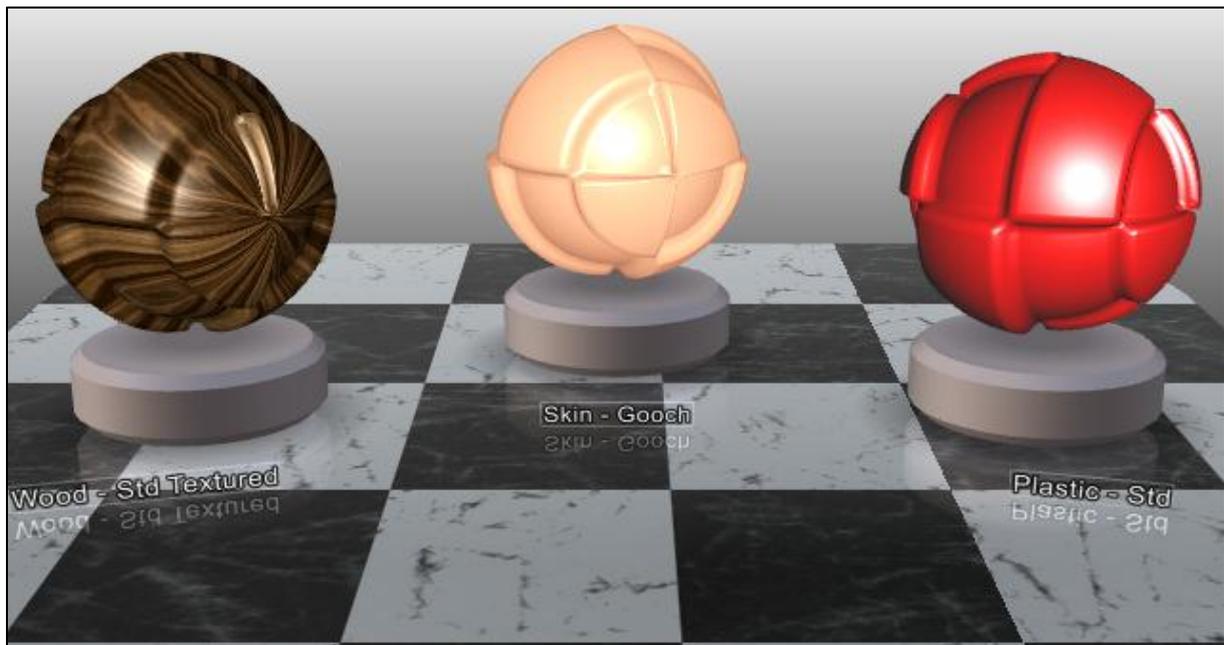
Hide Object: hide Object to edit shadow.

19 Materials



Composer offers a selection of material types that represent most of the popular real-time shading models:

- Standard (Textured): uses Phong shading. This is the most commonly used shading model.
- Gooch: a non-realistic shading model that is often used for technical illustrations.
- Reflections/Refraction: a material type specialized in sharp reflections and refractions.
- IBL: the Image Based Lighting shading model in which a capture of a real-world environment is used to lighten 3D objects.



Example Objects with Standard Textured Wood, Skin Gooch and Standard Plastic materials applied.



Most materials are available as prefabs, ready to use.

	<p>Meshes have roles that are filled in by a Material type.</p> <p>For example, a Box's Front Side role is filled in with the Material type <i>Standard Textured</i>.</p> <p>Standard Textured materials use a Player to generate a texture that is mapped on the Object. Example textures: a Still, Clip, Text, Gradient Plasma and so on.</p>
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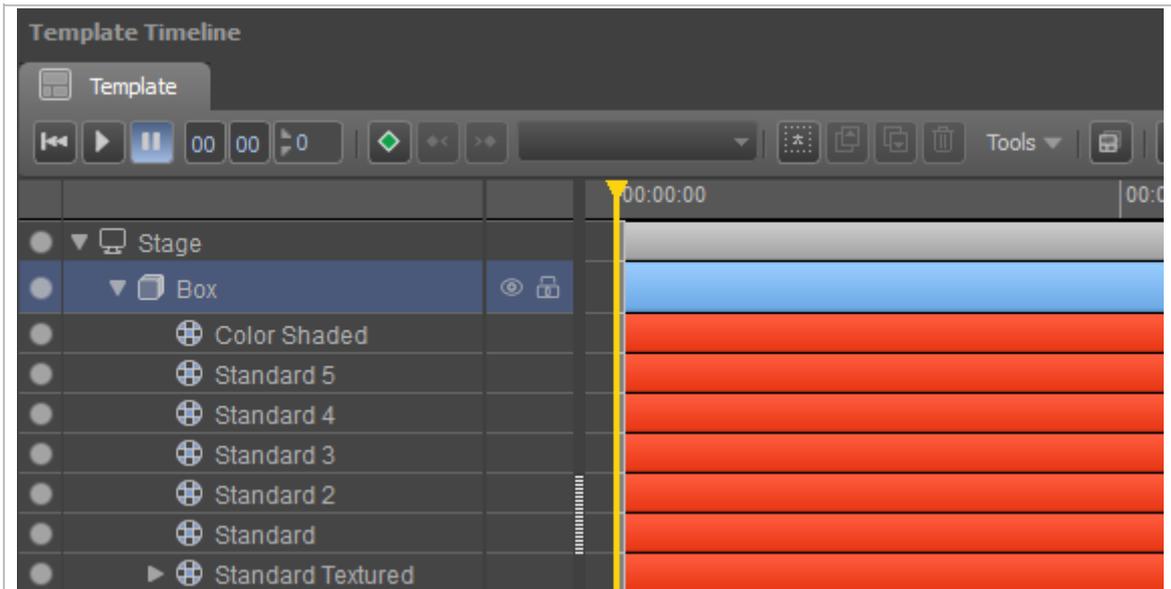


Example projects *Materials* and *Refraction* are available via **File > Example Projects**.

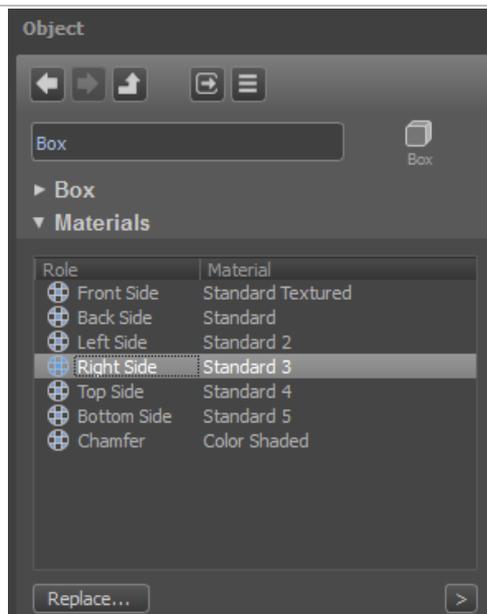
19.1 Working with Materials

- To edit a Material, select in the **Objects** window or in the **Template Editor**.
- Or, in the **Object** window > **Material**, select the Material you want to edit and click the  icon.
- Click **Replace** to replace with another Material.

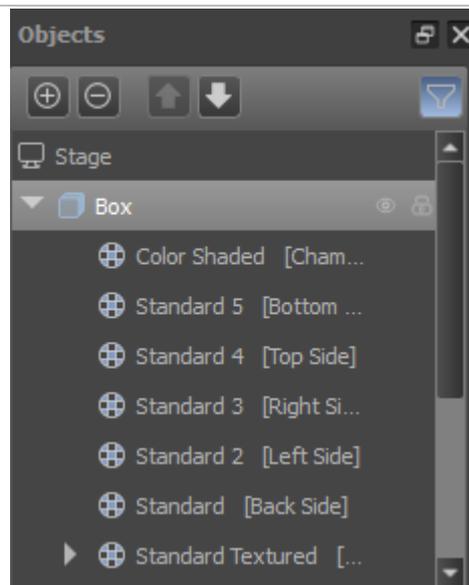
Example showing Materials for a Box Object:



Template Editor.

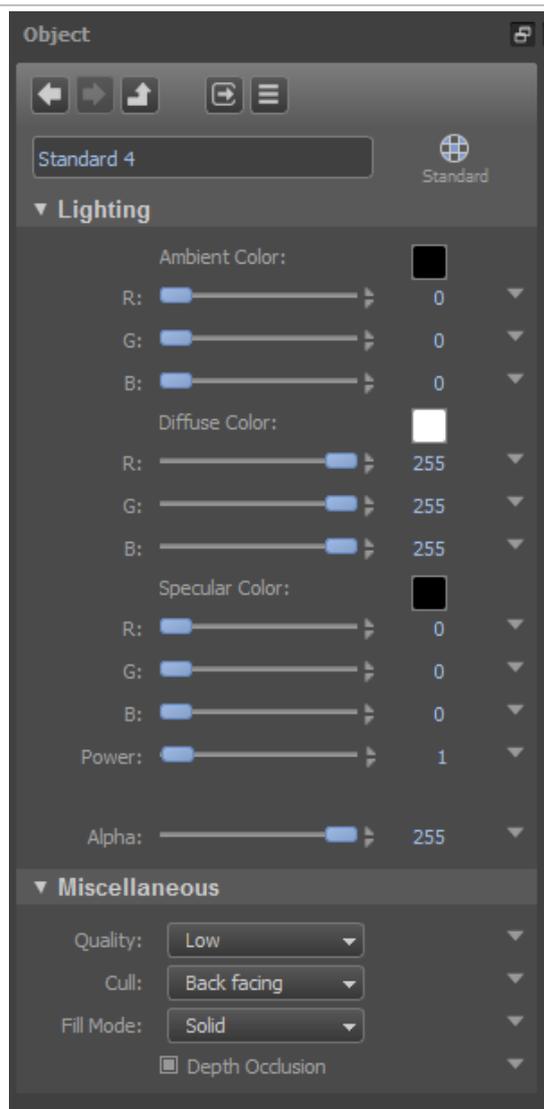


Object window.



Objects window.

19.2 Material Properties



Example material properties.

Lighting

Ambient: the color of the Object where it is not illuminated, i.e. in the shadow.

Diffuse: the color of the Object when it is illuminated. This is the color of the Object itself in pure white light.

Specular: the color of specular reflections (highlights).

Power: specular highlight's sharpness.

Alpha: defines transparency, ranging from 0 (full transparency) to 255 (no transparency).

Miscellaneous

Quality: Low, Medium, High or best.

Cull: Back facing, Front facing or none.

Fill Mode: Solid, Point or Wireframe (lines only).

Depth Occlusion: enable or disable depth occlusion.

19.3 Gooch Materials

Use gooch shading to create a technical illustration style.

Following prefabs are available:



19.4 Standard Materials

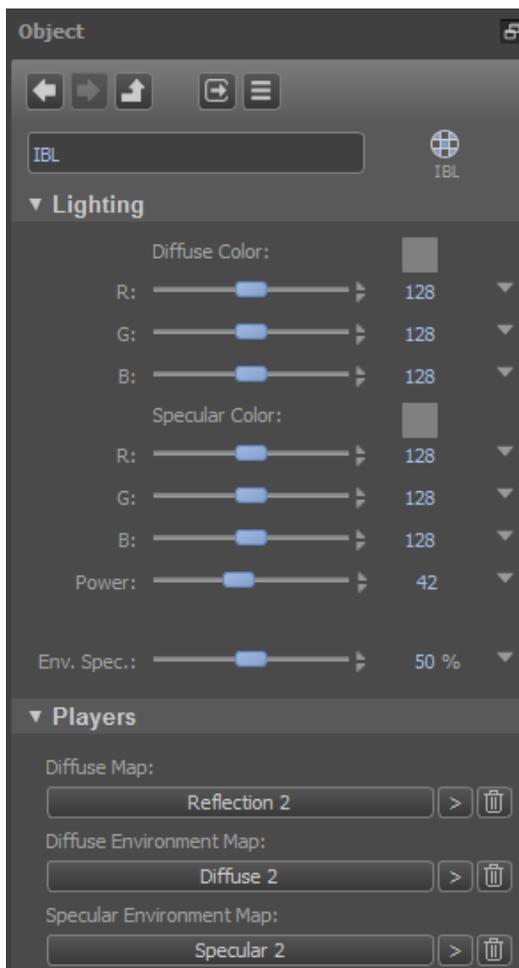
These are the standard materials. The Phong shading model is used. This is the most commonly used shading model. The following prefabs are available:



19.5 Image Based Lights (IBL) Materials

Image Based Lighting uses a capture of a real-world environment to lighten 3D-objects. The lighting information is stored in diffuse-, specular- and reflection stills (TGA or Clip).

Following prefabs are available:



Example IBL material using three stills for reflection, diffuse and specular lighting.

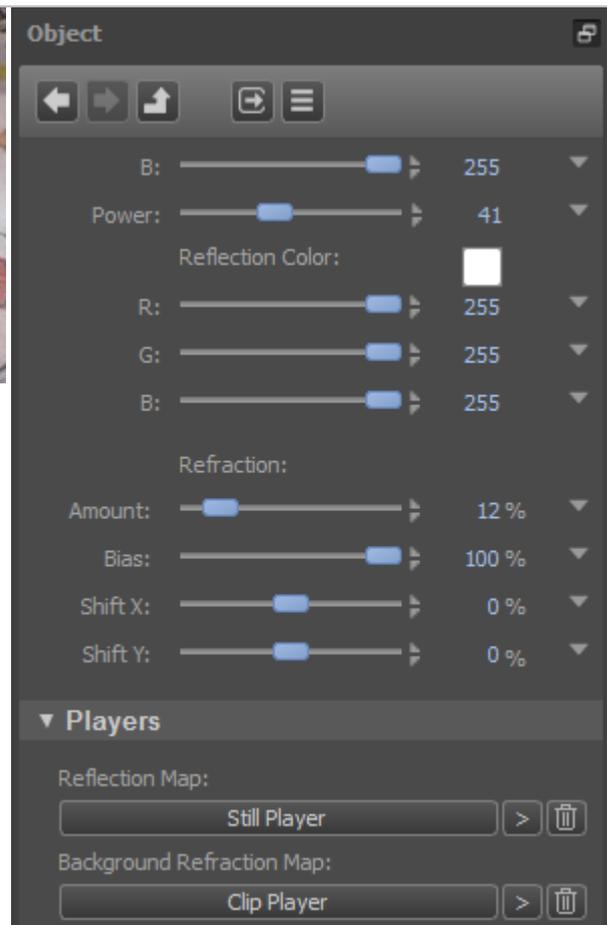
19.6 Reflection Materials

Reflections/Refraction is a material type specialized in sharp reflections and refractions (TGA or Clip).

Following prefabs are available:



Example Object with reflection and refraction.

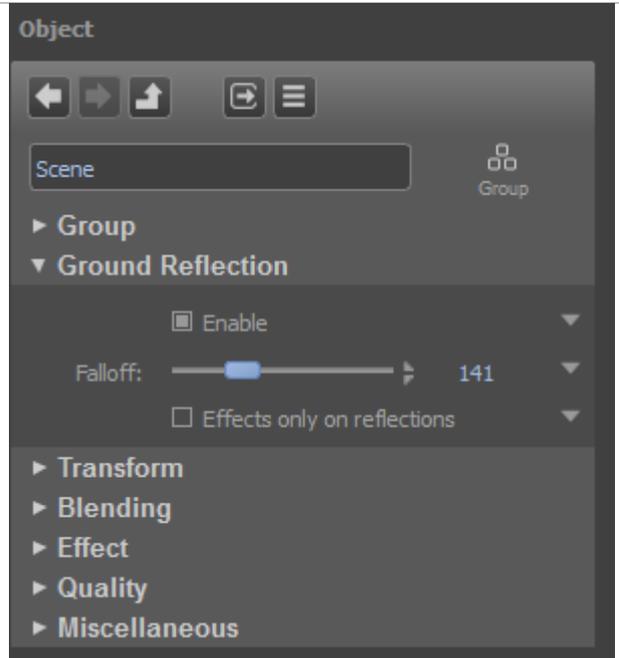




You can easily enable ground reflections for the members of a Group, as shown in the example below. See also the example project *Ground Reflections*.



Example Group with Ground Reflection enabled.



20 Clips



Use the Clip Object to play out a video clip.



The **File** > Example Project *Play Video* shows different options for Clip playback.



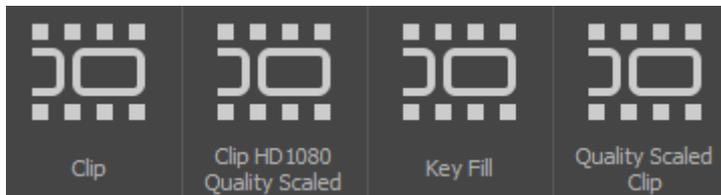
To play out Clips on other Objects than the Clip Object, for example on the side(s) of a Box, use the Standard Texture material with a Clip Player.



This chapter gives an overview of the Clip Object. For more detailed information on the topics mentioned here, please refer to this manual's applicable chapters.

20.1 Prefabs

A number of Clip prefabs are available in Composer.



- Clip: play out a video clip.
- Clip HD 1080 Quality Scaled: includes a Quality Scaler often used for downscaling from HD to SD.
- Key Fill: includes a Key Player (the clip is the fill).
- Quality Scaled clip: includes a Quality Scaler often used for downscaling.

20.2 Supported Formats

Format	Codec	Bit Rate Mb/s	Supported Wrappers
SMPTE D10 30 / IMX 30	SMPTE D10 (MPEG-2 4:2:2P@ML)	30	MXF
SMPTE D10 40 / IMX 40	SMPTE D10 (MPEG-2 4:2:2P@ML)	40	MXF
SMPTE D10 50 / IMX 50	SMPTE D10 (MPEG-2 4:2:2P@ML)	50	MXF
DV25	DV25	25	MOV, MXF
DVCPRO25	DVCPRO25	25	MOV, MXF
DVCPRO50	DVCPRO50	50	MOV, MXF
XDCAM HD (LP, SP, HQ)	MPEG HD (MPEG-2 MP@HL)	18, 25, 35	MXF
XDCAM HD422	MPEG HD422 (MPEG-2 4:2:2P@HL)	50	MXF
MPEG-2 4:2:0 SD	MPEG-2 MP@ML	Max 15	MPG, MXF
MPEG-2 4:2:2 SD	MPEG-2 4:2:2P@ML	Max 50	MPG, MXF
MPEG-2 4:2:0 HD	MPEG-2 MP@HL	Max 50	MPG, MXF
MPEG-2 4:2:2 HD	MPEG-2 4:2:2P@HL	Max 50	MPG, MXF

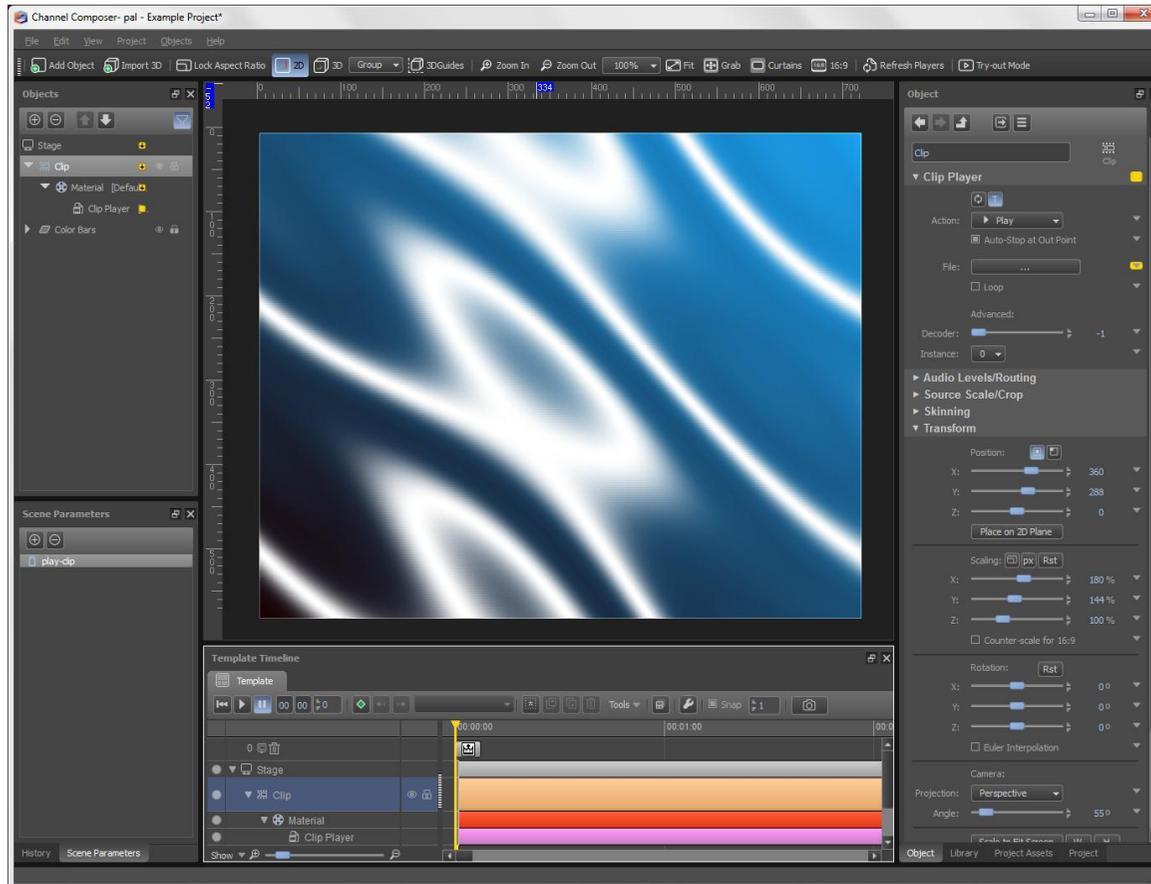
The following restrictions apply:

- Embedded Audio:

Format	Details
BWAV / WAV	16 or 24 bit LPCM, sampled at 48 kHz
MPEG 1 Layer 2 / MP2	16 bit, sampled at 48 kHz

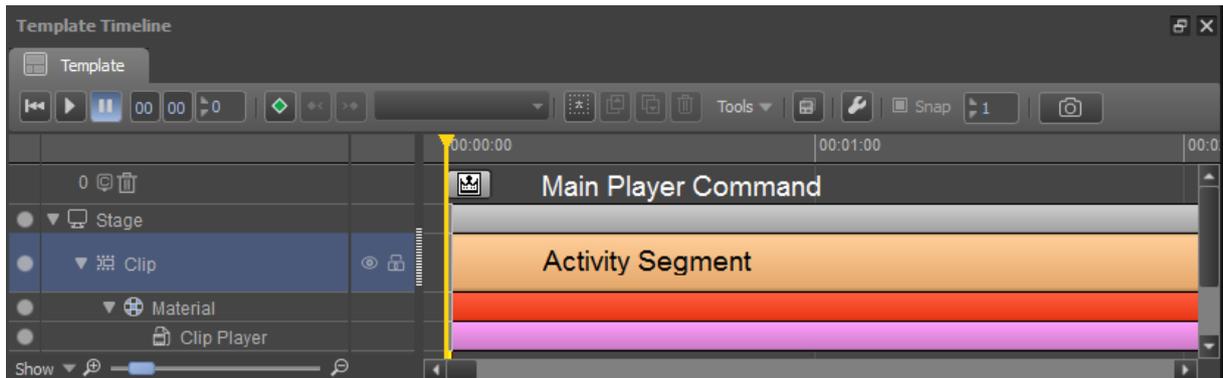
- GOP size:
The maximum GOP size for all video file formats/codecs is 15 frames.
- MPEG-2 4:2:0 SD, MPEG-2 4:2:2 SD, MPEG-2 4:2:0 HD, MPEG-2 4:2:2 HD formats:
Both I-frame only and long-GOP formats are supported. Note above restriction on GOP size.
- MPG wrapper:
Supported are MPEG-2 Transport Stream and MPEG-2 Program Stream.
- MXF wrapper:
Only Operational Pattern OP1a is supported.
A maximum number of 36 embedded streams are supported.

20.3 Example



Example Template that plays out a full screen Clip. The Clip is scaled to fit the output screen's dimensions and is placed on top of the color bars. The Stage shows a test feed. The Clip Player refers to a scene parameter 'play-clip'. On the Template Timeline, the Main Player Command is added to command track 0.

20.4 The Activity Segment: on-screen Audibility and Visibility

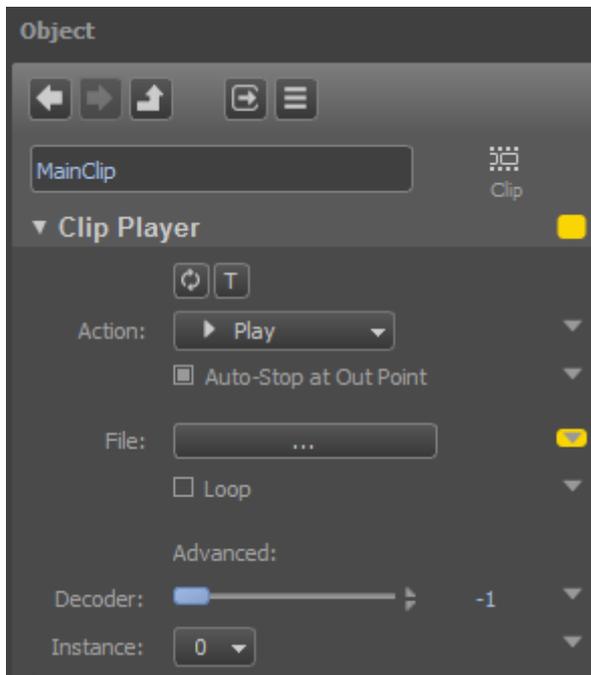


Example Play Clip Template.

The Clip Objects' activity segment shows the clip's audibility and visibility. As a default, the In Point for Objects is set at 00:00:00 and no Out Point is defined. Usually the Clip Object stays on-screen and when a clip finishes, the Clip Object will start play out of the next clip. To remove a Clip from screen (audio and visual), set an Out Point. Note that the Clip Player will not automatically stop when the Object is no longer active (unless **Auto-stop at Out Point** is activated).

20.5 The Clip Player

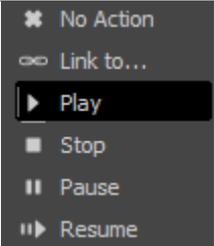
The Clip Object's Player plays out the video clip. Several actions can be defined, play, pause, stop, and more. The Player can play out a fixed clip or can be linked to a scene parameter.



Example Clip Player. The File property is linked to a scene parameter.

To view or edit the Player's properties, select the Object, either in the **Objects** window, on the **Stage** or the **Template Timeline**. Then select **(Material) > Clip Player**.

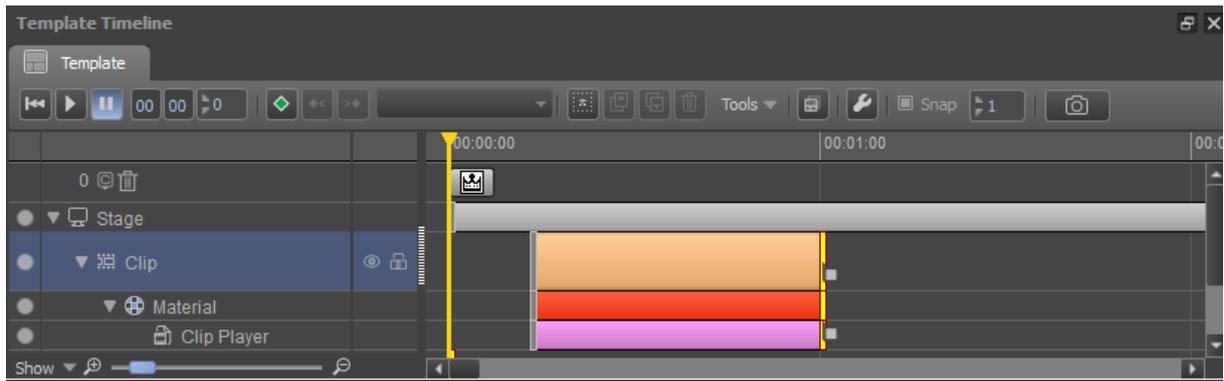
The Player properties are:

	Click to refresh the Clip Player with new settings.
	Click to enable a test feed.
	Action Player actions: <ul style="list-style-type: none"> • No Action • Link this Player to another Player. • Start playback. • Stop playback. • Pause playback. • Resume playback.
Auto-Stop at Out Point	When activated (default), the Player is stopped when an Out Point is inserted. The  icon shows that Stop Player action has been inserted at the Out Point.
File	Select a file (fixed Project Asset) or scene parameter (dynamic reference).
Loop	Select to loop the clip.
Advanced	Not used anymore.



Note that the Clip *Player* will not automatically stop when the *Object* is no longer active. There are several ways to stop the Clip Player (recommended to save resources):

- Insert an Out Point and make sure the Clip Player's **Auto-Stop at Out Point** property is enabled. This option is default enabled.
- Insert a Stop Player action.
- Use the Clear All Command. This command stops all Players except for the Players in the current Template.



Example Clip with an In and Out Point. The Clip Object is active (visible and audible) from 00:00:05 to 00:01:00. The  icon represents a Stop Player action that was automatically set at the Out Point.

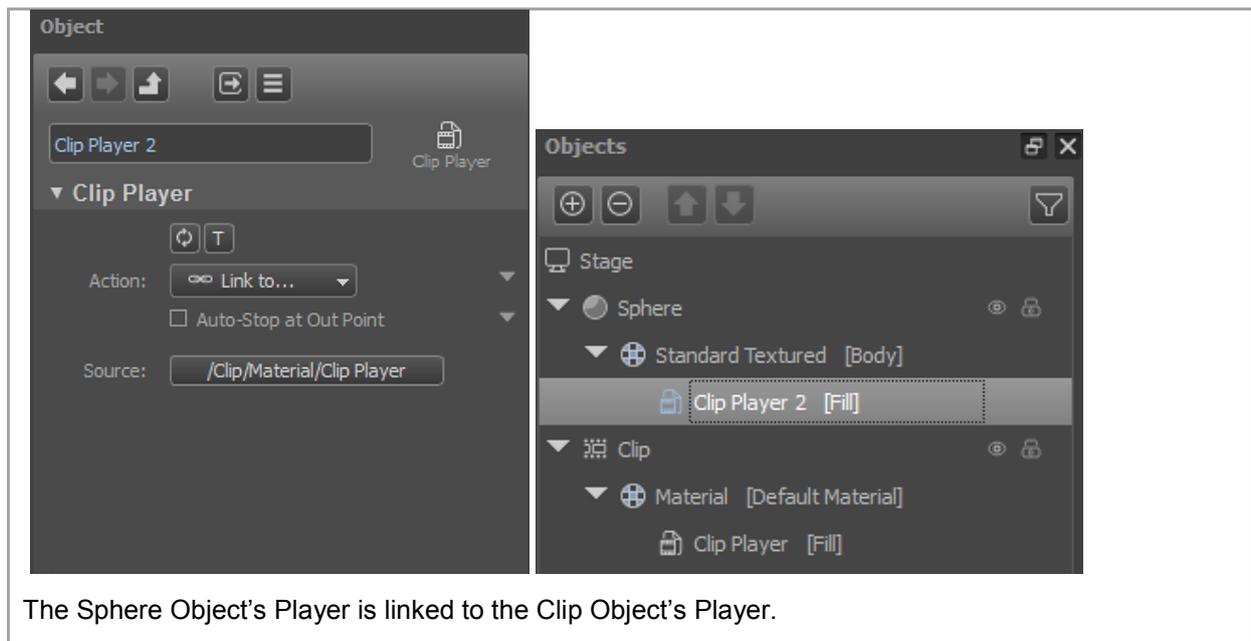
20.5.1 Linking Clips



Use the Player Action **Link** to play out the same Clip on more than one Object, linking Player A's output to Player B. This is more efficient in terms of performance than playing back the same video clip twice.



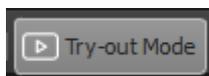
The example shows the Clip Object playing out a full screen clip and a Sphere Object playing out the same source.



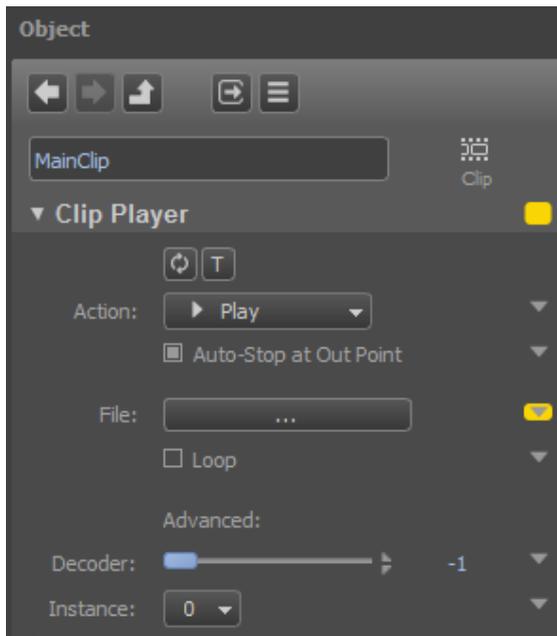
20.5.2 Previewing Player Actions



Preview Player actions in Try-out mode. Note that Players only run in Try-out mode.



20.6 Link to File or Scene Parameter



Example Clip Player. The File property is linked to a Scene Parameter.

The Clip Player can be linked to a fixed file from the **Project Assets** pool (use when always playing out the same Clip), or to a Scene Parameter. Scene Parameters are dynamically updated with the clip's filename, usually when Events are scheduled. Example:

Scene Parameter	Event ID	Scene Parameter Value when scheduled
clip	12345	a0000548.avf
clip	12346	a0000978.avf
clip	12347	a0000564.avf

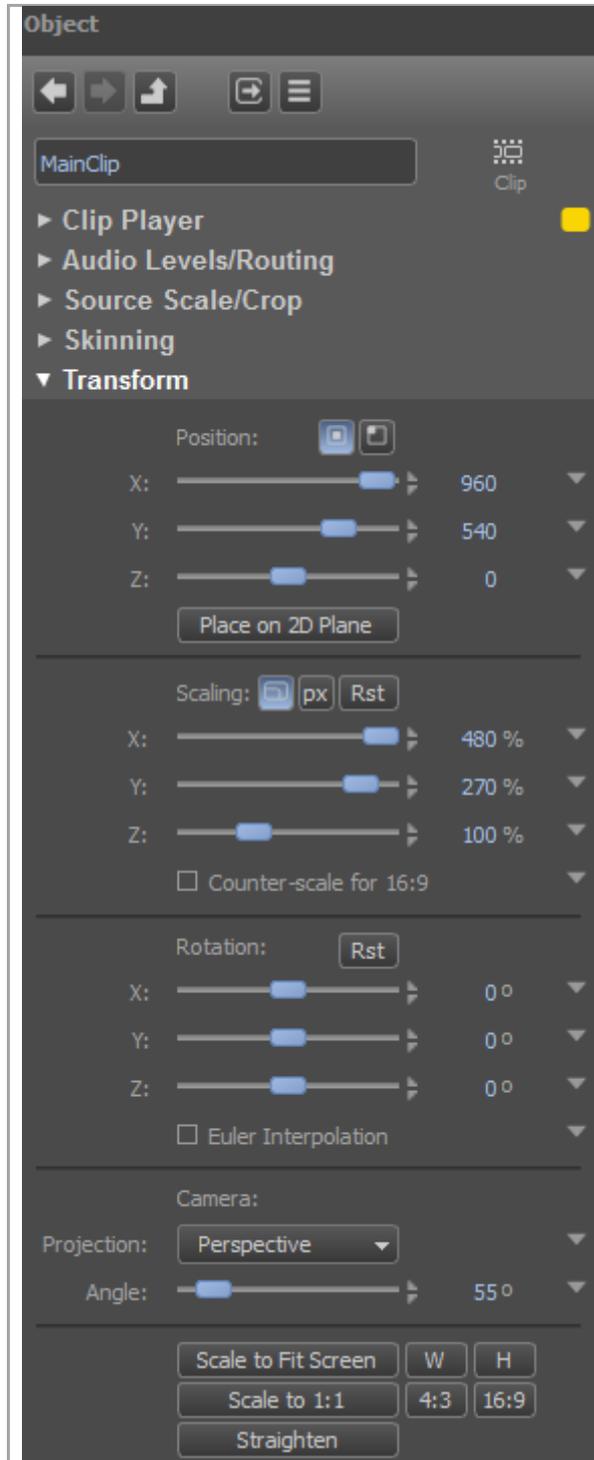
20.7 Layering

In the Objects window, if applicable place the Object on the correct layer. Objects on higher layers overlap Objects on lower layers. In this example, the Clip Object is placed (full screen) on top of the color bars which are thus hidden.

20.8 Scaling and on-screen Position



See the *Transform* paragraph for an explanation of all properties and options.



The Transform section defines the Clip Object's on-screen properties such as size and position.

To play out a full screen Clip, scale the Clip Object to fit the output screen's dimensions, click the **Scale to Fit Screen** Option.

Scale to Fit Screen

Other options:

W: scale object to fit screen width (keeping aspect ratio).

H: scale object to fit screen height (keeping aspect ratio).

Scale 1:1: scale object to 1:1 aspect ratio, based on height.

Scale 4:3: scale object to 4:3 aspect ratio, based on height.

Scale 16:9: scale object to 16:9 aspect ratio, based on height.

Straighten: remove skewing.

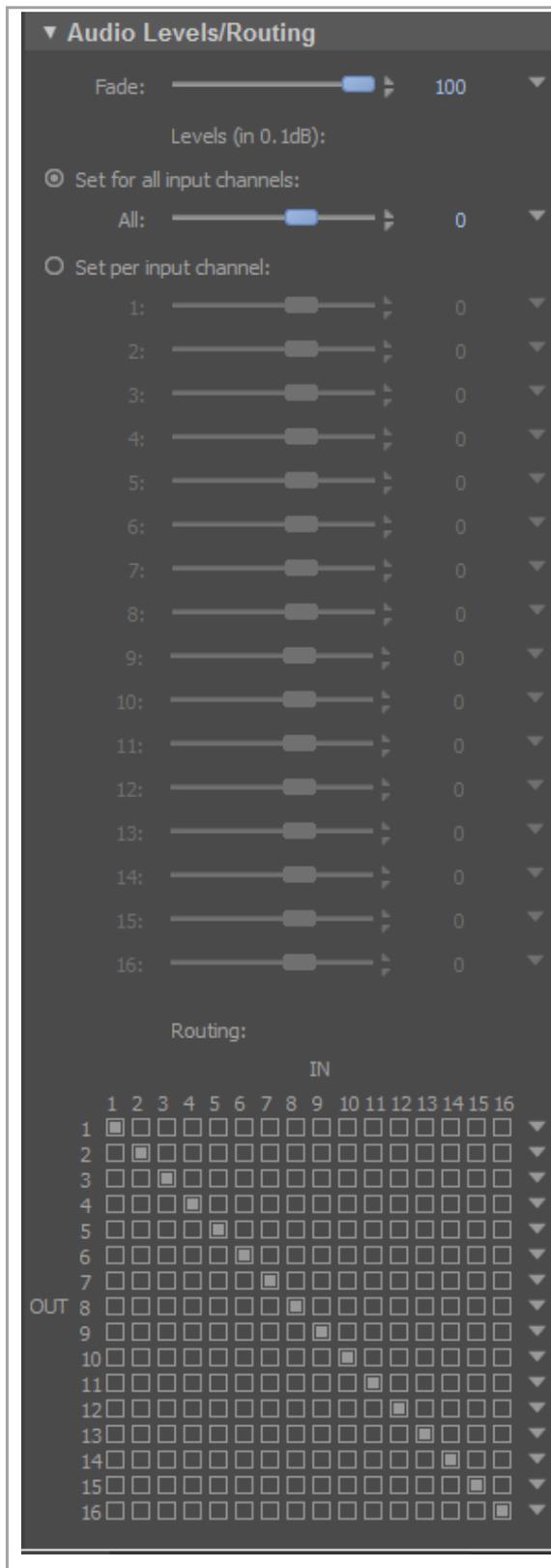


See also the chapter on *Quality > Scaling and Pixel Perfect*.



To scale the Player's *output* (instead of the Object itself) edit the Player's **Source Scale/Crop** property.

20.9 Audio Levels/Routing

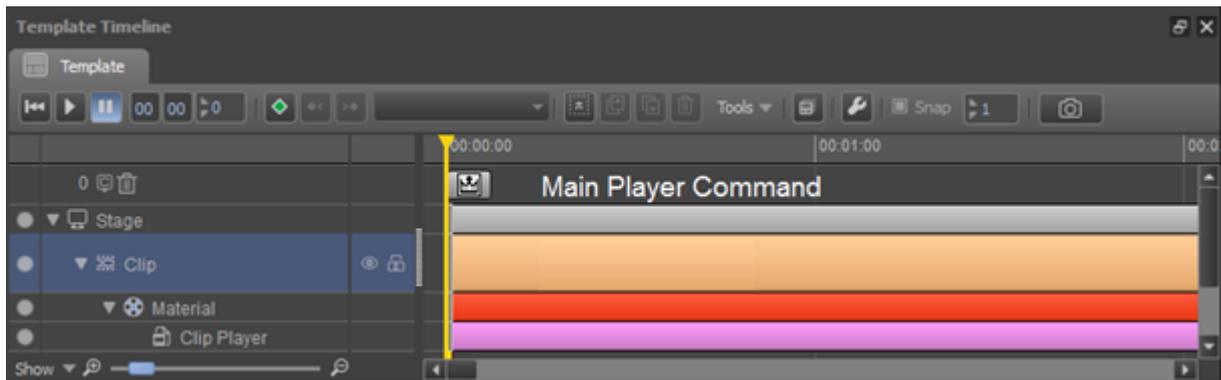


These properties define audio levels and routing (optional):

- **Fade:** specify a linear fade in % (for all audio channels).
- **Set for all input channels:** set output audio levels (in db).
- **Set per input channel:** set output audio levels (in db) per channel.
- **Routing:** link input channels to output channels.

-120 db is mute, or deselect in the routing table.

20.10 The Main Player



The main Player Command  is automatically added for the first Clip or Live Object that is added to a Template.

The main player has following properties [see also the chapter on the main player]:

- The main Player has priority over other Players when resources are assigned.
- If the main Player contains an embedded Closed Caption subtitle stream, this stream will be played out. If other Clips contain subtitle streams, these streams will not be played out. In other words, only the main Player's subtitle stream will be played out.

The main Player is the source for the ATC (HD) or VITC (SD) timecode signal in the SDI-output. Only one signal can be sent out, i.e. from the main Player.

21 Stills



Use the Still Object to play out a still.

21.1 Supported Formats

Format	Details
BMP	24 bit, uncompressed
TGA	32 bit, uncompressed, with alpha channel

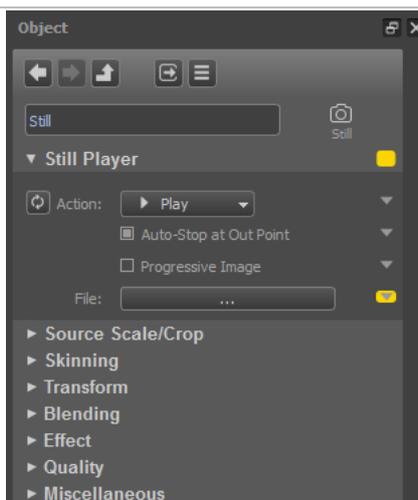
21.2 Prefabs

Following prefabs are available:



The Key Fill Still Object has two Players, for key and fill.

21.3 Example

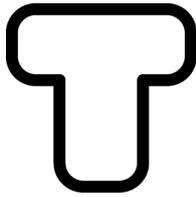


Example Still Object. The Player (File) is linked to a scene parameter.



Please refer to the relevant paragraphs for an explanation of Players, quality, on-screen visibility and audibility, properties such as transform and blending, and so on.

22 Text, Counters and Autoclocks

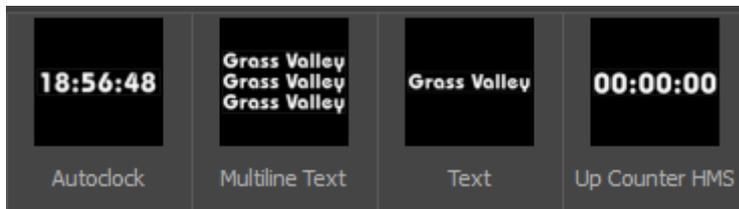


Use the Text Object to display a text, digital autoclock or counter.

22.1 Supported Formats

Format	Details
TTF	True Type Fonts

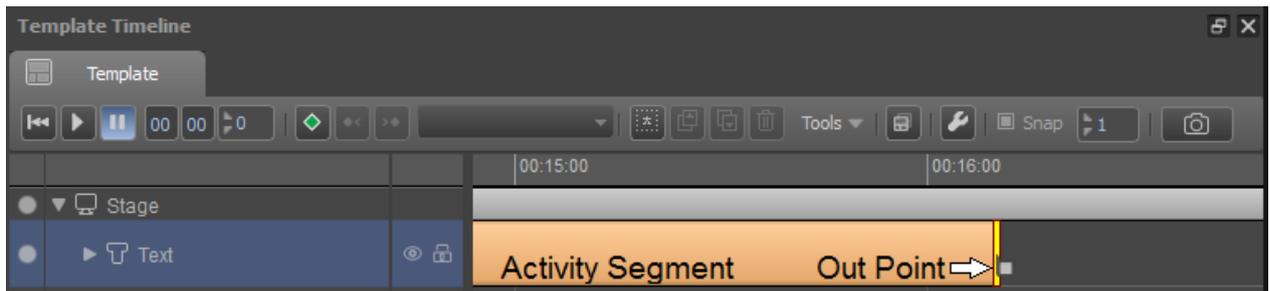
22.2 Prefabs



A number of prefabs are available:

- **Autoclock:** a digital clock (displays playout system time).
- **Multiline Text:** a multi-line text (with hard returns).
- **Text:** a single line text
- **Up Counter HMS:** an up counter in format: hh:mm:ss.

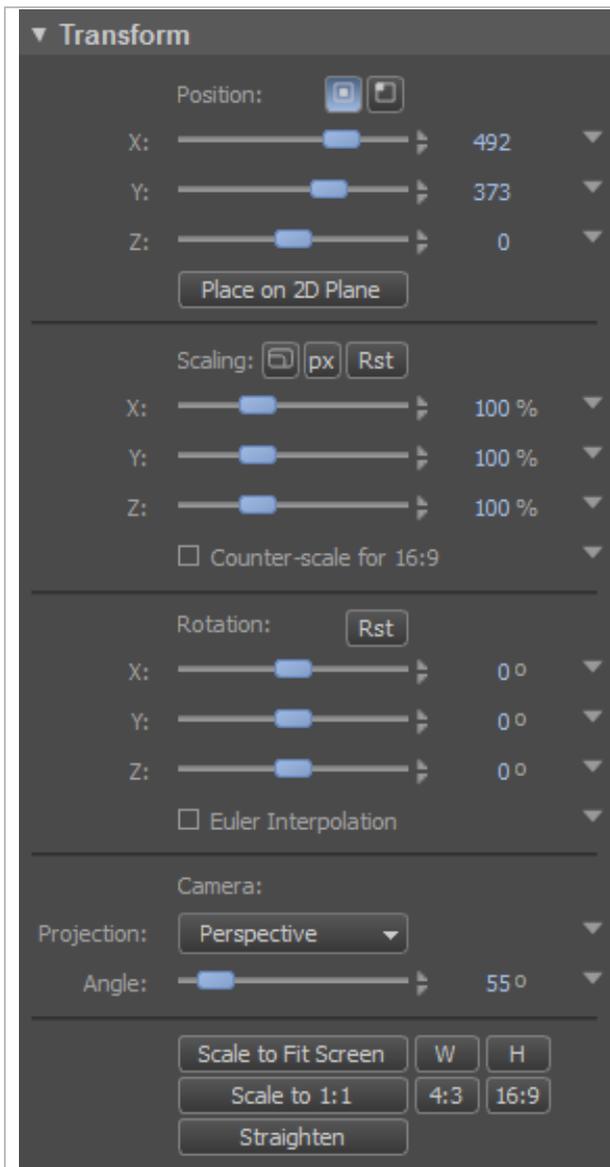
22.3 The Activity Segment: on-screen Visibility



Example Text Object with Out Point and Stop Player Command at Out Point.

The Text Objects' activity segment shows the text's on-screen visibility. As a default, the In Point for Objects is set at 00:00:00 and no Out Point is defined. To remove a Text from the screen, set an Out Point. Note that the Text Player will not automatically stop when the Object is no longer active (unless **Auto-stop at Out Point** is activated).

22.4 Scaling and on-screen Position



The Transform section defines the Text Object's on-screen properties such as size and position.

Options:

- **Scale to Fit Screen:** scale to fit the output screen's dimensions (full screen)
- **W:** scale object to fit screen width (keeping aspect ratio).
- **H:** scale object to fit screen height (keeping aspect ratio).
- **Scale 1:1:** scale object to 1:1 aspect ratio, based on height.
- **Scale 4:3:** scale object to 4:3 aspect ratio, based on height.
- **Scale 16:9:** scale object to 16:9 aspect ratio, based on height.
- **Straighten:** remove skewing.



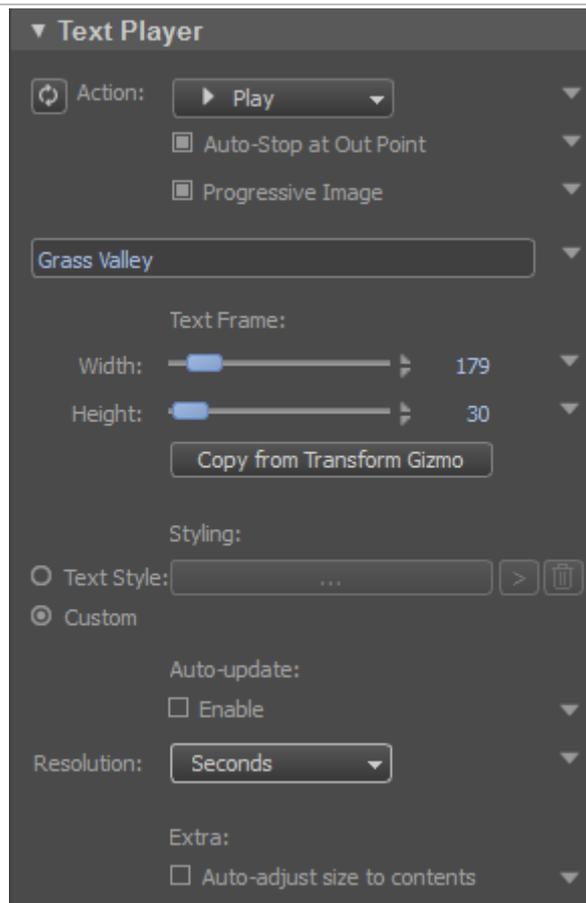
See also the chapter on *Quality > Scaling and Pixel Perfect*.

22.5 The Text Player

The Text Object uses a Text Player to play out text. The Player can play out a fixed text or can be linked to a scene parameter.



To play out Text on other Objects than the Text Object, for example on the side(s) of a Box, use the Standard Texture material with a Text Player.



Example Player linked to a fixed text: Grass Valley.



: Click to refresh the Text Player with new settings.

Action:

Player actions:

- No Action
- Link this Player to another Player.
- Start playback.
- Stop playback.
- Pause playback: *does not apply.*
- Resume playback: *does not apply.*

Auto-Stop at Out Point: When activated (default), the Player is stopped when an Out Point is inserted. On the Timeline, the  icon shows that a Stop Player action has been inserted at the Out Point.

Progressive Image: When scaling text, enable the Player's **Progressive Image** option. See the chapter on *Quality* for more information on scaling and quality.

Auto-update: Enable for clocks and counters and set an update **Resolution** in seconds or frames.

Auto-adjust: select to auto-adjust the text frame's size to its content.

22.6 Text Frame

Text lines are displayed in a text frame. The frame's size can be set in the properties window.

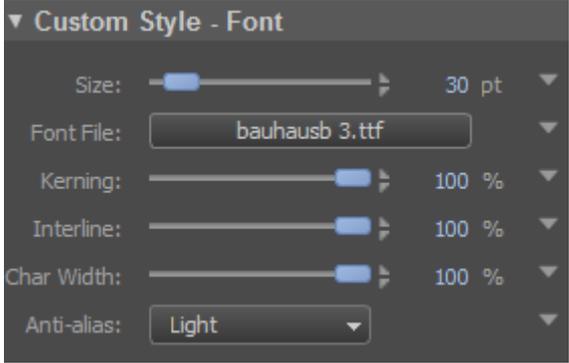
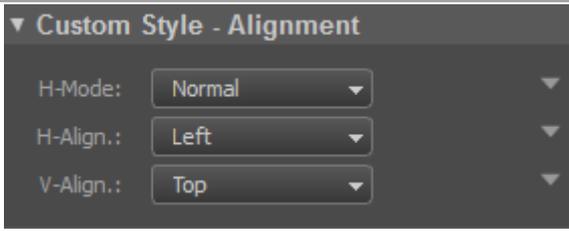


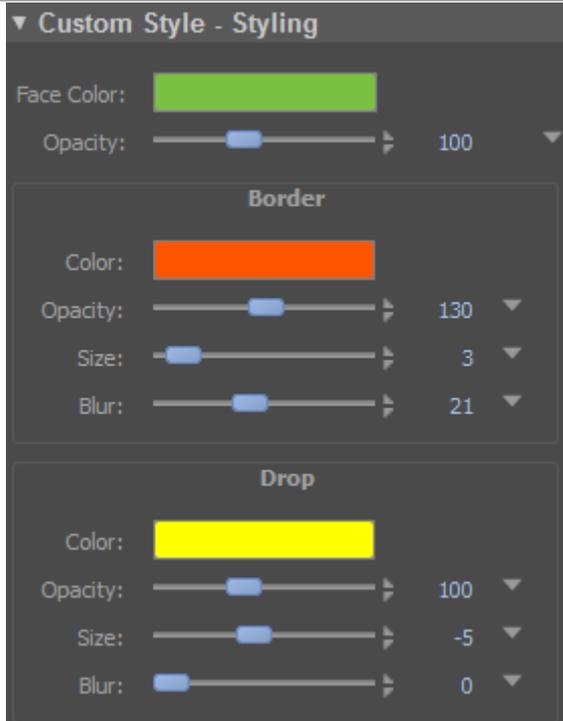
You can also specify width and height on the transform gizmo, and then use the **Copy from Transform Gizmo** option. Using this option, the text is automatically scaled to 100%.

22.7 Link to fixed Text or Scene Parameter

Link the Player to a fixed text, as shown in the example (*Grass Valley*), or to a Scene Parameter.

22.8 Style

	<h3>22.8.1 Font</h3> <p>Size: font size in points</p> <p>Font File: if applicable, select (or add first) a font file. This file is added to the Channel/Production Pack.</p> <p>True Type Font files are supported. The default font file is bauhaus.ttf (included in Composer).</p> <p>Kerning: kerning in %</p> <p>Interline: space between lines in %</p> <p>Char Width: character width in %</p> <p>Anti-alias: Light, Medium or Normal</p>
	<h3>22.8.2 Alignment</h3> <p>H-Mode (horizontal mode):</p> <p>Normal: normal mode</p> <p>Fill width: scale text horizontally (stretch or squeeze) to fit in the text frame</p> <p>Fill kern: horizontal kerning to fit text in the text frame</p> <p>AutoFit: scale text horizontally (squeeze only, no stretch) to fit in the text frame</p> <p>Word Wrap: word wrap text to fit in the text frame</p> <p>H-Align: horizontal alignment: left, center or right</p> <p>V-Align: vertical alignment: top, center or bottom</p>



22.8.3 Styling

Face Color: font face color

Opacity: font face opacity

Border and Drop

You can specify a font border and drop (shadow) with color, opacity, size and blur. The text below uses the settings as shown in the example on the left.



Example font with borders and drop.



Image used as fill.



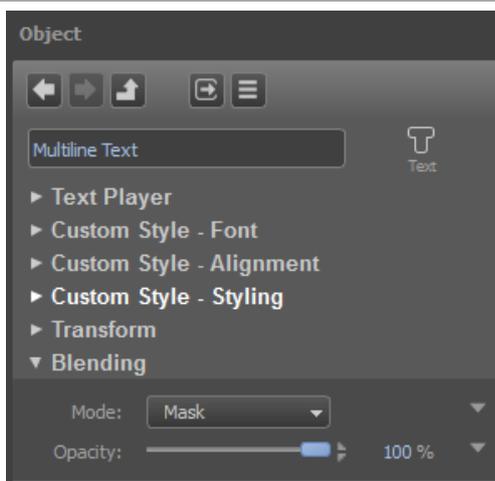
Text and Still Object.

22.8.4 Example Key – Fill with Image

In this example a Text Object is used as key and placed on top of a Still (keying by Object).



You can also key by Player, see also the example project *Keying*.



The Text Object is used as mask with a white font (full transparency).



Result.

22.9 Text Styles

	<p>The Text Styles window lists and lets you manage Text Styles for the Project.</p> <p>Composer supports True Type Font (.ttf) files.</p>
	<p>Add a Text style.</p>
	<p>Delete the selected Text style.</p>
	<p>Edit the Text style in the Object window. See the paragraph on <i>Style</i> for an explanation of available options.</p>

22.10 Special Strings for Character and Font Formatting

Use special strings to format texts. There are special strings for text formatting, counters and time.



All special string identifiers are case sensitive.

Character set

'\$3xxxx'	Set the character set, with xxxx = 1250 (Central Europe) 1251 (Cyrillic) 1252 (Latin I) 1253 (Greek) 1254 (Turkish) 1255 (Hebrew) 1256 (Arabic) 1257 (Baltic) 1258 (Vietnam)
-----------	---

Font size

'\$7xxx '	Change the font size (for the current line): values between 005 -150. NOTE: trailing space.
-----------	--

Foreground color

'\$1AABBGGRR '	Set the foreground color for text (ALPHA, B, G, R). Example: 'The color is \$1FF0000FF red!' NOTE: trailing space.
----------------	--

Indents

'\$9xxx '	Indent, use 3 digits: values between 0-999 in horizontal pixels. NOTE: trailing space.
-----------	---

Code

'\$4xxx'	Display the special character with decimal code (normal font mapping table), with xxx = decimal code. Example: '\$4128' displays the special character with code 128 in the normal font mapping table.
'\$5xxxx'	Interprets a string as unicode input (double byte characters), hexadecimal notation.
'\$6xxxx'	Interprets strings as glyph code (double byte characters), hexadecimal notation. Advised for special codes which are not in the normal character map. Example (Arabic text): 'Some Arabic text will follow \$603D2\$603B8\$603BB\$603F0\$6039B\$603AE\$6039B .'

Returns

'\$0 '	Return. NOTE: trailing space.
--------	--------------------------------------

Tabs

'\$2xxx '	Tab, offset in horizontal pixels from the utter left of the displayed font map. NOTE: trailing space.
-----------	--

Vertical offsets

'\$8xxxx '	Vertical offset in pixels, use 4 digits: values between -999 -9999. NOTE: trailing space.
------------	--

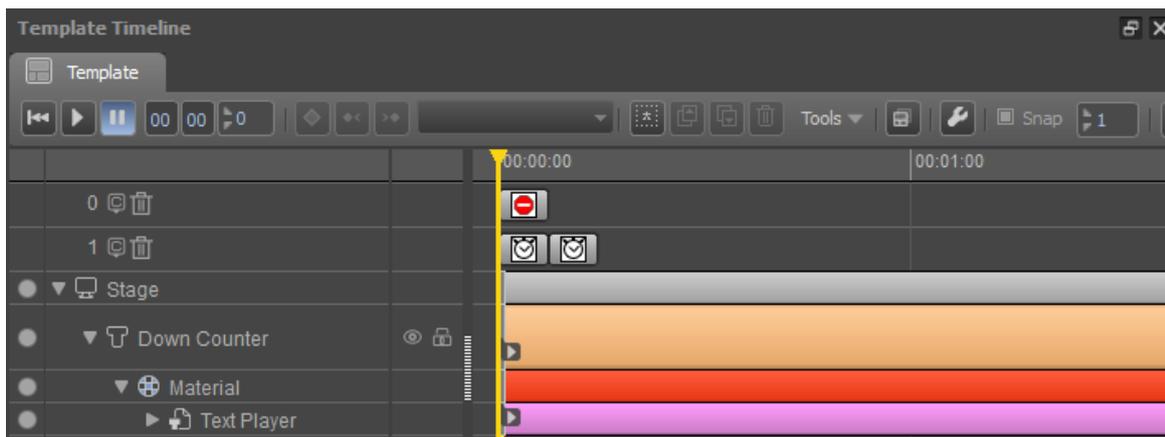
22.11 Counters

Counters are displayed using a Text Player. Counter Commands are used to set, start and stop the counter. Special strings specify the type of counter and format. Example:

- \$D: specifies an up counter.
- \$C: specifies a down counter.

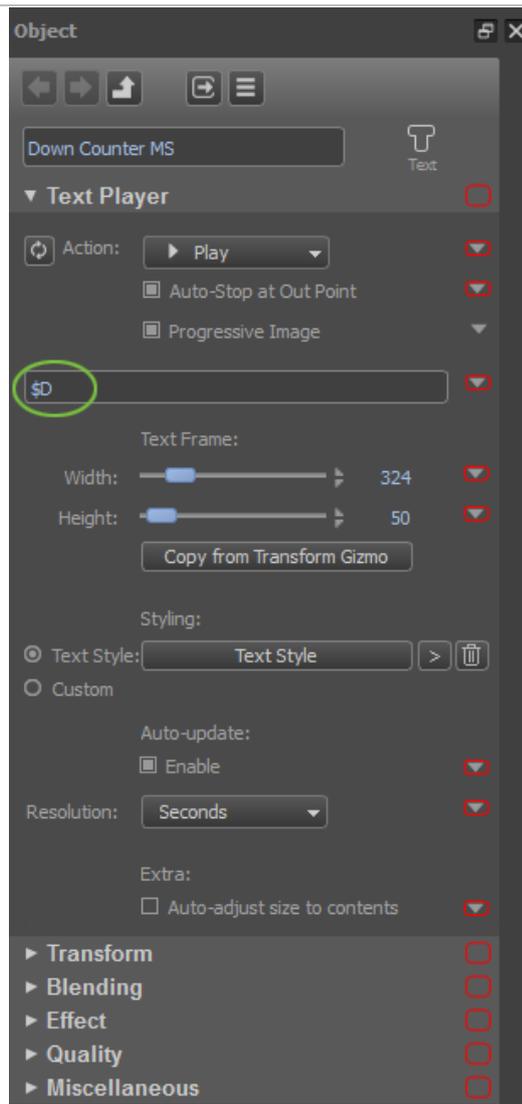


An example project *Clocks and Counters* is available in **File > Example Projects**.



Example Template that uses a Text Object to display the counter and Set and Stop Counter Commands. No Stop Command is added since this Project uses Clear All Commands to stop Players that are not used in the current Template.

22.11.1 Defining a Counter

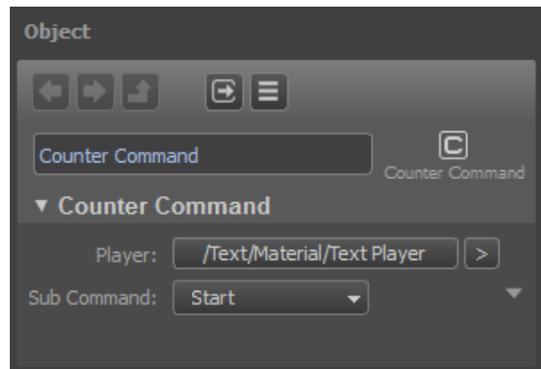


Example Text Object with the Text Player defining a down counter.



The steps for defining a counter are:

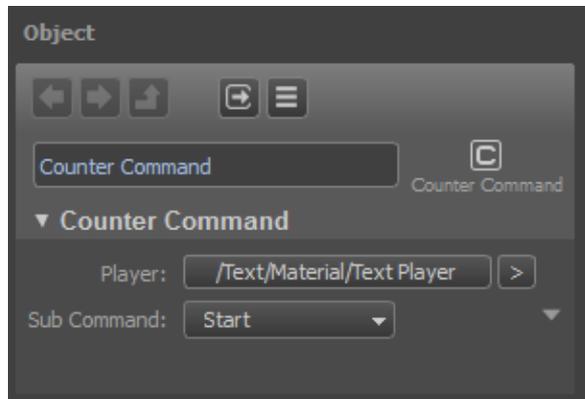
- Add an Object to the Stage to place the counter on-screen. This can be any Object that can be linked to a Text Player, for example a Text Object or a Box.
 - Specify the Object's look and feel.
 - Go to the Text Player tab and in the text field, specify the type of counter, using the counter special strings.
- Add separate Counter Commands to the Template Timeline to set, start and stop the counter. Link these Commands the counter's Text Player:
 1. Set Counter Value: set the counter's start value (in seconds).
 2. Start: start the counter.
 3. Stop: stop the counter's Text Player to save resources once the counter has been taken off-screen. You can also stop the counter using the Clear All Command or using Out Points.



Example Counter Command used to start the counter and linked to the counter's Text Player.

22.11.2 Counter Command

Use the Counter Command to stop, start or set a counter.



Example.

Properties

Player: select a Text Player (Text Players that have been added to the Canvas are listed).

Sub command:

- Set Counter Value: set the counter's start value (in seconds).
- Start: start the counter.
- Stop: stop the counter.

22.11.3 Special Strings for Counters

Use special strings to specify how a counter will be displayed.



All special string identifiers are case sensitive.

\$D	Specifies an up counter.
\$C	Specifies a down counter.
'\$C'	Down counter in format ":ss" if counting < 60 seconds, and "m:ss" if counting > 60 seconds.
'\$CD<C-syntax>'	Display formattable seconds count. Specify a C-language printf() style integer format string behind the D. Example: "\$CD%3d".
'\$CM'	Displays minutes from down counter.
'\$CS'	Displays seconds from down counter (always 2 digits 0-59).
'\$CX<C-syntax>'	Displays formattable string seconds from down counter. Specify a C-language printf() style integer format string behind the X. Example: "\$CXsec: %03d".
'\$CT'	Displays a down counter (>1 hour hh:mm) (>1 minute mm:ss) (< 1 > minute :ss).
'\$CF<C-syntax>'	Formattable string down counter, 2 arguments (h, m). Specify a C-language printf() style integer format string behind the F. Example: '\$CFtime: %02d.%02d' will result in: time: 09.34 Example: '\$CF%d:%02d' will result in: 9:34
'\$CG<C-syntax>'	Formattable string down counter, 2 arguments (m, s). Specify a C-language printf() style integer format string behind the G. Example: '\$CGmin and sec: %02d.%02d' will result in: min and sec: 34.56
'\$CV<C-syntax>'	Formattable string down counter, 3 arguments: (h, m, s). Specify a C-language printf() style integer format string behind the V. Example: '\$CVtime: %02d.%02d.%02d' will result in: time: 09.34.56

'\$CW<C-syntax>'	Formattable down counter, 4 arguments: days, h, m, s. Specify a C-language printf() style integer format string behind the W. Example: '\$CW%d days %02d:%02d:%02d' displays: 2 days 23:57:26
'\$D'	Up counter in format ":ss" if < 60 secs, and "m:ss" if > 60 seconds.
'\$DD<C-syntax>'	Display formattable seconds count. Specify a C-language printf() style integer format string behind the D. Example: "\$DD%3d".
'\$DM'	Minutes from up counter.
'\$DS'	Seconds from up counter (always 2 digits 0-59).
'\$DX<C-syntax>'	Displays formatable string seconds from up counter. Specify a C-language printf() style integer format string behind the X. Example: "\$DXsec: %03d".
'\$DT'	Up counter (>1 hour hh:mm) (>1 minute mm:ss) (< 1 minute :ss).
'\$DF<C-syntax>'	Formatable string up counter, 2 arguments (h, m). Specify a C-language printf() style integer format string behind the F. Example: '\$DFtime: %02d.%02d' will result in: time: 09.34 Example: '\$DF%d:%02d' will result in: 9:34
'\$DG<C-syntax>'	Formatable string up counter, 2 arguments (m, s). Specify a C-language printf() style integer format string behind the G. Example: '\$DGmin and sec: %02d.%02d' will result in: min and sec: 34.56
'\$DV<C-syntax>'	Formatable string up counter, 3 arguments: (h, m, s). Specify a C-language printf() style integer format string behind the V. Example: '\$DVtime: %02d.%02d.%02d' will result in: time: 09.34.56
'\$DW<C-syntax>'	Formatable string up counter, 3 arguments: (h, m, s). Specify a C-language printf() style integer format string behind the V. Example: '\$DVtime: %02d.%02d.%02d' will result in: time: 09.34.56

22.12 Autoclock (digital time)



Various examples of clocks can be found in **File > Example Projects > Clocks and Counters**.



The steps for defining a counter are:

- Add an Object to the Stage to place the clock on-screen. This can be any Object that can be linked to a Text Player, for example a Text Object or a Box.
- Specify the Object's look and feel.
- Go to the Text Player tab and in the text field, specify the type of time formatting, using the time formatting special strings.

22.12.1 Special Strings for Time Formatting

Formats

'\$T'	Displays time in h:mm (%2d:%02d).
'\$Th'	Will show hours only.
'\$Th0'	Will show hours only, always 2 digits with leading 0.
'\$Tm'	Will show minutes only.
'\$Tm0'	Will show minutes only, always 2 digits with leading 0.
'\$Ts'	Will show seconds only.
'\$Ts0'	Will show seconds only, always 2 digits with leading 0.
'\$TS'	Displays time with seconds h:mm:ss (%2d:%02d:%02d).
'\$TZ'	Will show seconds only, always 2 digits with leading 0.
'\$TQ'	Displays time with seconds h:mm:ss (%2d:%02d:%02d).

Offsets

'\$TO'	Time with offset defined in minutes, displayed in minutes. Example: '\$TO-3'
'\$TM'	Time with offset defined in seconds, displayed in minutes. Example: '\$TM-180' Example: 'it is \$TM10'
'\$TN'	Time with offset defined in minutes, displayed in seconds.

Some examples

'\$Th0+3'	Zero leading hours, +3 hours offset.
'\$Th03'	Zero leading hours, +3 hours offset.
'\$Th0-3'	Zero leading hours, -3 hours offset.
'\$Th-3'	Hours, -3 hours offset.



The same applies to \$Tm (minutes) and \$Ts (seconds).

23 Animations



Use the ANI Object to play out an animation.



Use the ANI Generator to create an animation from a series of TGAs.

23.1 Supported formats

Animated graphics are played back using the Composer native animation file format. Composer animation files are compressed video files and can be generated from TGA sequences. The TGA files must be in 32-bit, uncompressed, with alpha channel format.

23.2 Prefabs

Following prefabs are available:



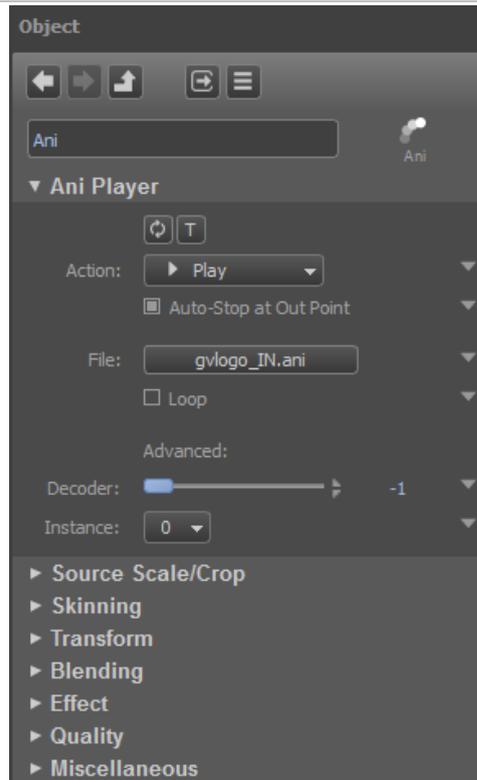
23.3 Example



Example ANI Object playing out a fixed ANI-file.



Please refer to the relevant paragraphs for an explanation of Players, quality, on-screen visibility and audibility, properties such as transform and blending, and so on.

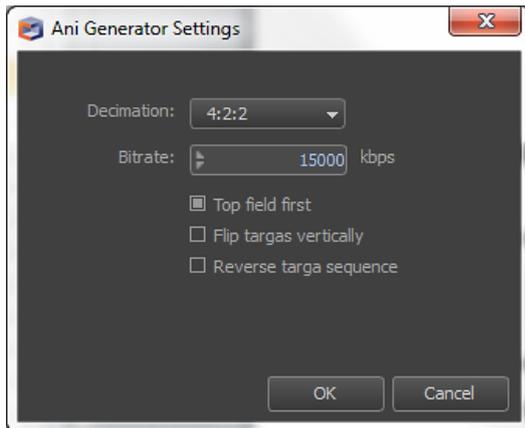


23.4 The ANI Generator

The ANI Generator converts a sequence of TARGA files to an animation (ANI-file). The animation is added as Project Asset and will be included in the Production Pack when the Project is exported, or as Test Asset in the Library.

23.4.1 Working with the ANI Generator

- To create an animation, go to **Project Assets > Tools > Generate Ani**.
- Select a TARGA from the directory that contains the files you want to add to the sequence. A sequence is created of all files with the same file name.



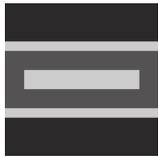
Example.

- Select a **Decimation** value. A higher quality results in a bigger file size.
- Select a **Bitrate**. A higher quality results in a bigger file size.
- Select applicable options:
 - Top field first: the top field of each frame in the animation is played out first in time.
 - Flip targas vertically.
 - Reverse targa sequence: the last TARGA in the sequence becomes the first frame in the animation.

23.4.2 TARGA Requirements

- Files must be 32-bits uncompressed TARGA-files.
- All files must have the same dimensions
- File dimensions must be a factor of 2; for example 32 and *not* 7.
- File dimensions must be a factor of 16. If not, the encoder will add pixels resulting in slightly larger dimensions than the input TARGAs.
- TARGAs should be numbered sequentially: for example *targa_01.tga*, *targa_02.tga*, *targa_03.tga* and *not targa_01.tga*, *targa_03.tga*, *targa_04.tga*. Numbering does not have to start at 0.
- Numbering should be added to the end of the filename: for example *targa_01.tga* and *not 01_targa.tga*.
- The sequence must contain at least 2 files.

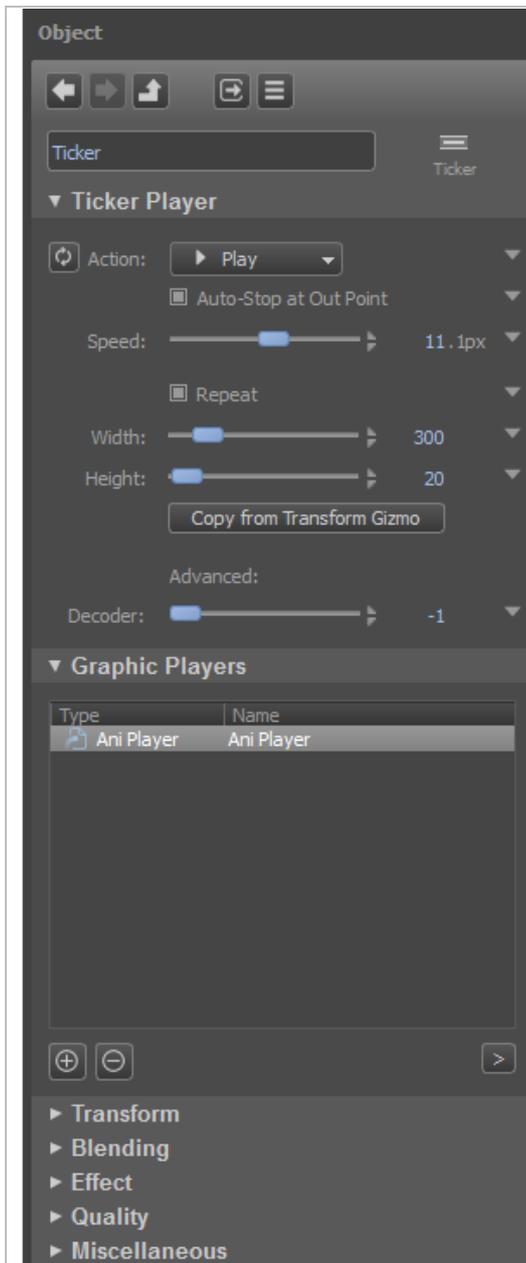
24 Tickers



Use the Ticker Object to place a ticker on-screen.

Use the Ticker and Add Ticker Story Commands to pause or unpause, and set or clear stories for a Ticker.

Please refer to the chapter on *Commands* for an explanation of these Commands.



Action: select a Ticker Player action:

Player actions:

- No Action
- Link this Player to another Player.
- Start playback.
- Stop playback.
- Pause playback.
- Resume playback.

T: click to refresh the Player settings.

Speed: ticker speed in 1/10th pixel

Repeat: repeat ticker stories after the last story has been played out.

Width: Ticker Object width.

Height: Ticker Object height.

Copy from Transform Gizmo: you can also specify width and height on the transform gizmo, and then click this option. Using this option, the text is automatically scaled to 100%.

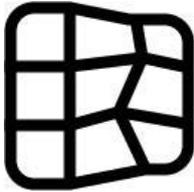
Graphic Players: add a still or ANI to the Ticker.

Please refer to the relevant chapters for an explanation of the **Transform**, **Blending**, **Effect**, **Quality** and **Miscellaneous** options.



Please refer to the chapter on Text for special strings that can be used for formatting.

25 Mesh Clips



Use to import and add a 3D-Object from Autodesk 3D Studio to your design.

25.1 Supported formats

The Mesh Clip format offers a simple but effective mesh animation system in which each frame of animation is defined by a 3D object. Industry standard 3D object files can be converted into Mesh Clips by an import feature in GVD Composer. The following standard 3D object file formats are supported by this conversion:

Format	Details
3ds	Autodesk 3D Studio file format

The following is imported:

- Mesh data (vertices, faces, uv coordinates, smoothing groups).
- Materials; a GVD Composer material is automatically made for each 3ds material.
- The first keyframe of the animation track.

The following is not imported:

- Any non-mesh objects, like lights and cameras.
- The rest of the keyframes.

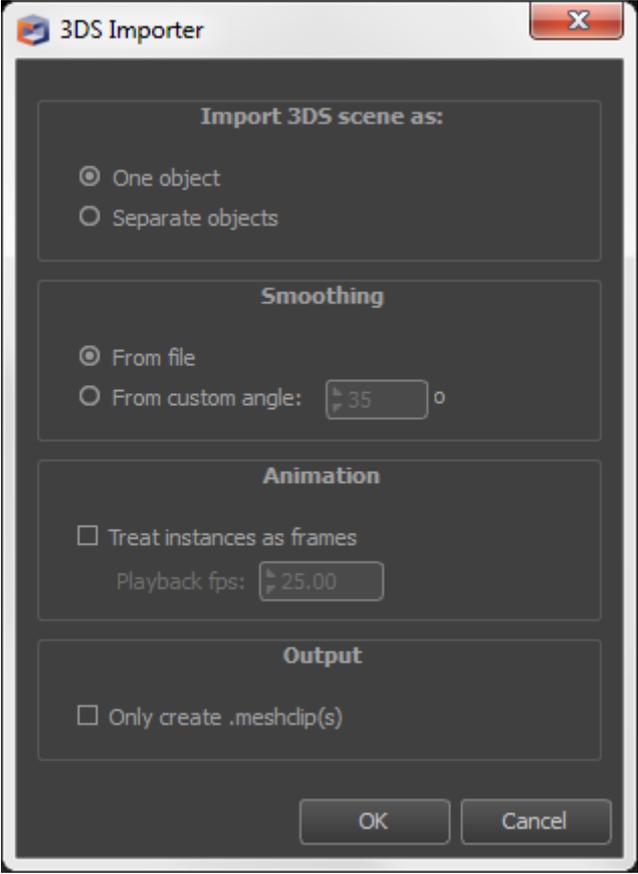
25.2 Prefabs

Following prefabs are predefined:



25.3 Importing a 3DS-file

When importing a mesh clip, the following window opens:



Import 3DS scene as:

One object: import as a single file

Separate objects: import separate objects in the file as separate Mesh Clip.

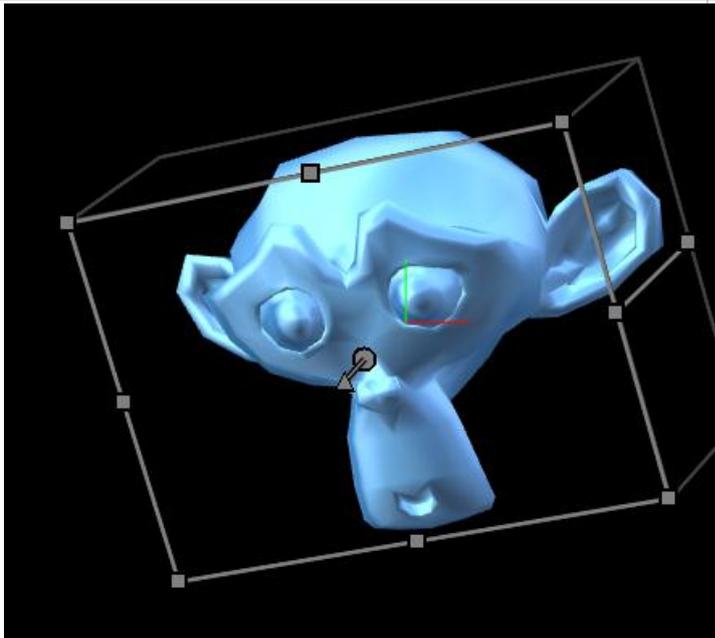
Smoothing

From file: import the normal map form 3DS.

From custom angle: generate normal based on a custom angle

Animation: not supported.

Output: Select the Only create .meshclip(s) option if you want to add the Mesh Clip(s) to the Production Pack only, and not to the Stage.



Example imported 3DS Object. The Object's material was imported and is replaced with the Composer Soft Plastic material.

Object

MONKEY

Mesh C

▼ Mesh Clip Player

↺ T

Action: ▶ Play

Auto-Stop at Out Point

File: MONKEY 2.meshclip

Loop

Advanced:

Decoder: -1

Instance: 0

▼ Materials

Role	Material
Material0	Soft Plastic

Replace...

▶ Transform

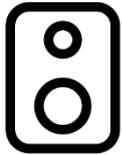
▶ Blending

▶ Effect

▶ Quality

▶ Miscellaneous

26 Audio Object



Use the Audio Object to play out audio.

26.1 Supported Formats

Format	Details
BWAV / WAV	16 or 24 bit LPCM, sampled at 48 kHz
MPEG 1 Layer 2 / MP2	16 bit, sampled at 48 kHz

26.2 Audio Levels/Routing

These properties define audio levels and routing (optional):

- **Fade:** specify a linear fade in % (for all audio channels).
- **Set for all input channels:** set output audio levels (in db).
- **Set per input channel:** set output audio levels (in db) per channel.
- **Routing:** link input channels to output channels.

-120 db is mute, or deselect in the routing table.

27 Commands

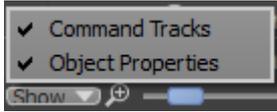


Use Composer Commands to run nexos commands.

27.1 Working with Commands

Commands can be found here: **Library > Prefabs > Commands**. Commands are edited on the Template Timeline, where they are placed on command tracks.

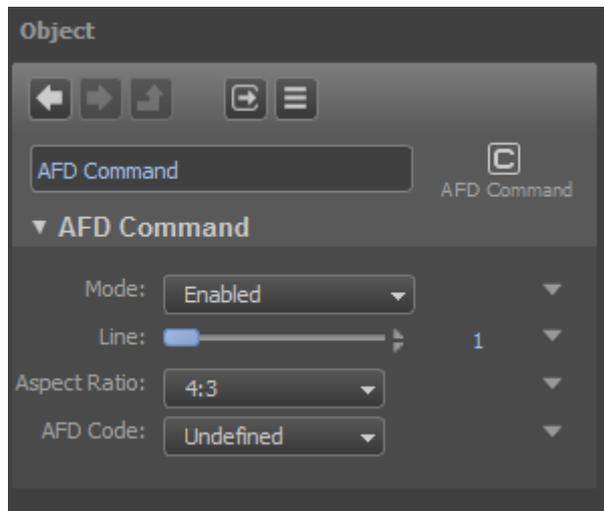
	<p>To add a Command to a Template, go to the Library > Prefabs > Commands drag the Command onto the applicable Template Editor.</p> <p>A command track is automatically inserted when a Command is dragged upon the Timeline, below any existing tracks.</p> <p>Once a command track has been added, you can also click the  icon to add a track.</p> <p>The example on the left shows the Timeline with two Commands inserted on two command tracks:</p> <ul style="list-style-type: none"> • A Clear all Command  on track 0. • A Ticker Command  on track 1.
	<p>To change the order of Commands within a track, or move between tracks, drag and drop the Command. The position on the Timeline is indicated as shown in the example on the left.</p>
	<p>Copy the selected Commands to the clipboard.</p>
	<p>Paste clipboard items onto the Timeline.</p>
	<p>To delete a Command, select and on the tool bar click the  icon.</p>
	<p>To delete a command track, click the  icon.</p>



To display or hide command tracks on the Template Timeline, click the **Show > Command Tracks** option. This option can be found in the bottom left corner of the Template Timeline.

27.2 AFD Command

Use to enable or disable AFD (Active Format Description) in the video signal. AFD can be used in all broadcast formats.



Example.

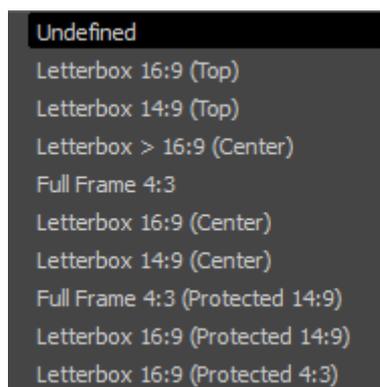
27.2.1 Properties

Mode: enable or disable AFD.

Line: the VBI line number. Line numbers start at 0.

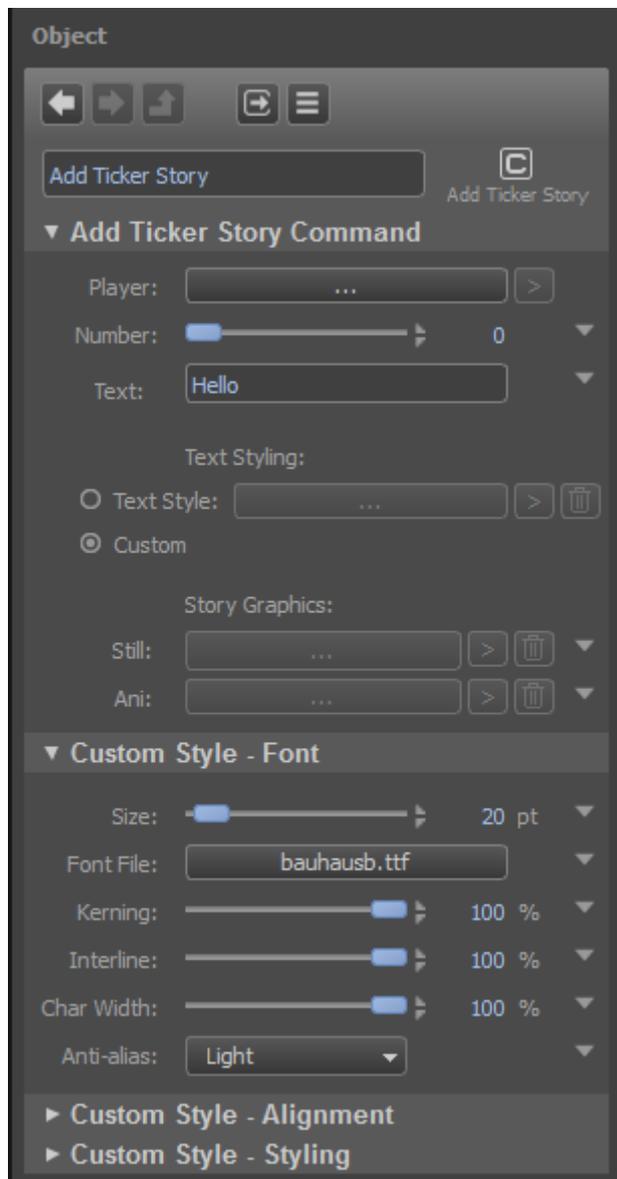
Aspect Ratio: 4:3 or 16:9.

AFD Code:



27.3 Add Ticker Story Command

Use to set stories for a Ticker.



Example.

27.3.1 Properties



Ticker stories are numbered starting from 0.

Player: the Ticker (Player) you want to update.

Number: the story number you want to update.

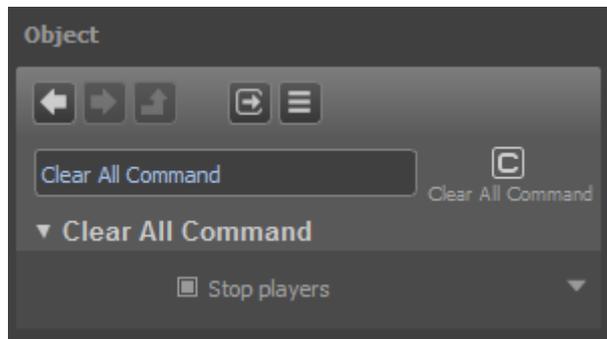
Text: a story (or a scene parameter).

Story Graphics: if you want to include stills or animations in your stories, select a Still or ANI-Player. You can either select a TGA-graphic or ANI-animation to include in your stories (or link a scene parameter).

Custom Font, Alignment and Styling: optional custom font, alignment and styling used for stories.

27.4 Clear All Command

Use the Clear All Command to stop all Players in all Templates, except for the Players in the current Template.



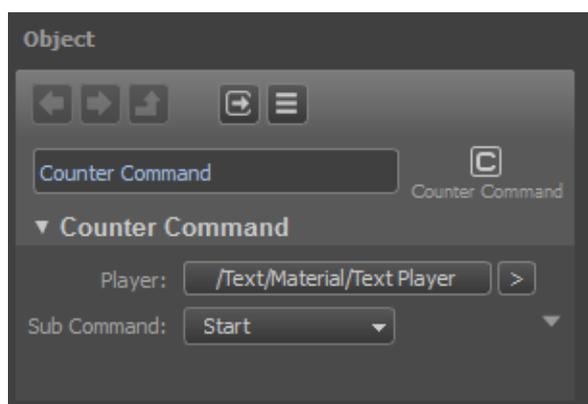
Example.

27.5 Counter Command

Use the Counter Command to stop, start or set a counter.



See also the chapter on counters in this manual for a more detailed explanation on how to define a counter.



Example.

27.5.1 Properties

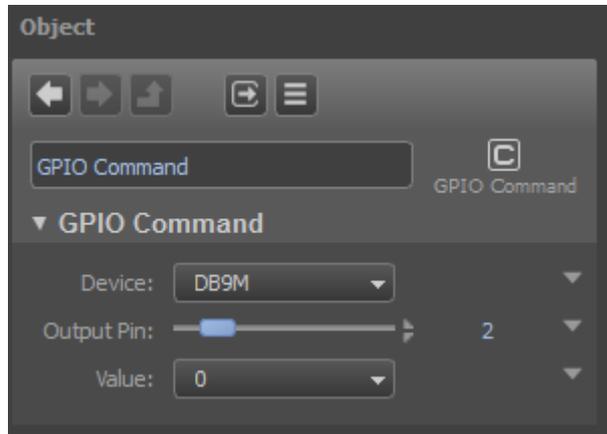
Player: select a Text Player (Text Players that have been added to the Canvas are listed).

Sub command:

- Set Counter Value: set the counter's start value (in seconds).
- Start: start the counter.
- Stop: stop the counter.

27.6 GPIO Command

The GPIO Command can be used to manipulate one of the configured GPIO devices' output pins.



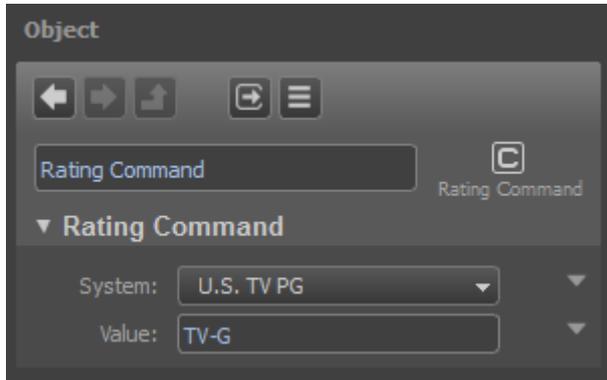
Example.

27.6.1 Properties

Device	<p>Supported device names are:</p> <ul style="list-style-type: none"> ▪ DB9M – Represents the internal GPIO device, available through the DB9 socket on the back of the machine. ▪ VBI – Represents the <i>virtual</i> GPIO device that does GPIO-over-VBI on the video output(s) of the associated nexos channel. Alternatively, <i>real</i> device names VBI0, VBI1, VBI2, etc. can be used to explicitly address the GPIO devices dedicated to channels 0, 1, 2, etc. <p> Note that GPIO devices must be defined in the nexos-gpio-params.txt file in order to use them here. In case of VBI devices, only the real devices VBI0, VBI1, etcetera should be defined.</p>
Output pin	The number of the GPIO output pin to be manipulated. The first pin is 1.
Value	<p>Supported values are:</p> <ul style="list-style-type: none"> ▪ 0 – Disables the pin, a logical 'off' or 'low'. ▪ 1 – Enables the pin, a logical 'on' or 'high'.

27.7 Rating Command

Use the rating Command to send rating messages (also known as Content Advisory, V-Chip or Program Rating) in the video signal.



Example.

27.7.1 Rating systems

The following Systems are supported.

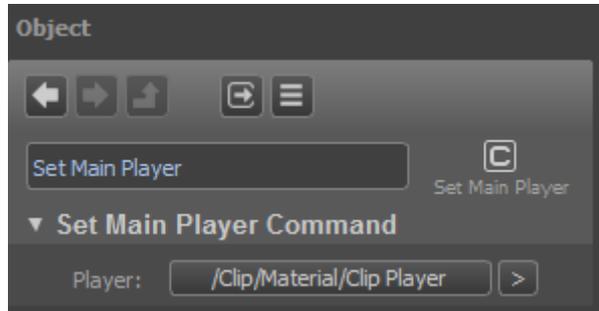
Value	Description
MPA	MPA
U.S.TV PG	U.S. TV Parental Guideline system
Canadian English	Canadian English Language Rating
Canadian French	Canadian French Language Rating

27.7.2 Rating values for U.S. Parental Guideline Rating system

Category	Field value	Description
TV-Y	TV-Y	All children.
TV-Y7	TV-Y7 TV-Y7,FV	Children aged 7 and above
TV-G	TV-G	General audience.

TV-PG	TV-PG TV-PG,D TV-PG,D,L TV-PG,D,L,S TV-PG,D,L,S,V TV-PG,D,L,V TV-PG,D,S TV-PG,D,S,V TV-PG,D,V TV-PG,L TV-PG,L,S TV-PG,L,S,V TV-PG,L,V TV-PG,S TV-PG,S,V TV-PG,V	Parental guidance suggested.
TV-14	TV-14 TV-14,D TV-14,D,L TV-14,D,L,S TV-14,D,L,S,V TV-14,D,L,V TV-14,D,S TV-14,D,S,V TV-14,D,V TV-14,L TV-14,L,S TV-14,L,S,V TV-14,L,V TV-14,S TV-14,S,V TV-14,V	Parents strongly cautioned.
TV-MA	TV-MA TV-MA,L TV-MA,L,S TV-MA,L,S,V TV-MA,L,V TV-MA,S TV-MA,S,V TV-MA,V	Mature audience only.
None	None	No blocking intended.

27.8 Set Main Player Command



The main Player Command is automatically added for the first Clip or Live Object that is added to a Template.

The main player has following properties [see also the chapter on the main player]:

- The main Player has priority over other Players when resources are assigned.
- If the main Player contains an embedded Closed Caption subtitle stream, this stream will be played out. If other Clips contain subtitle streams, these streams will not be played out. In other words, only the main Player's subtitle stream will be played out.

The main Player is also the source for the ATC (HD) or VITC (SD) timecode signal in the SDI-output. Only one signal can be sent out, i.e. from the main Player.

27.9 Ticker Command

Use the Ticker Command to clear, pause or unpause stories for a Ticker.

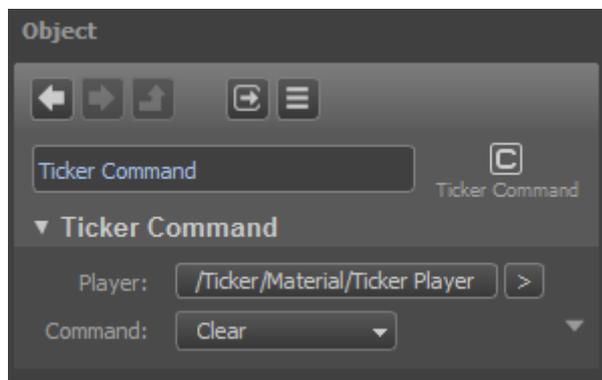


27.9.1 Properties

Player: the Ticker (Player).

Command:

- Clear
- Story Pause
- Story Unpause



Example.

27.10 Video Index Command

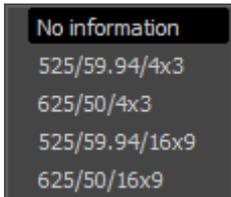
Use the VIC-command to blank certain VBI-lines, or to write Video Index data into VBI-lines.



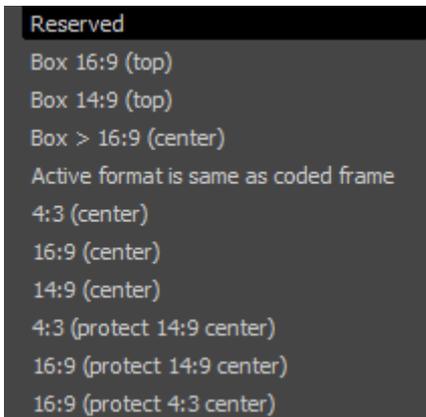
27.10.1 Properties

Line: the target VBI-line number. Line numbers start at 0.

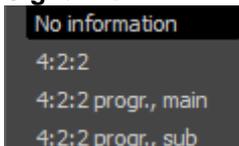
Scanning:



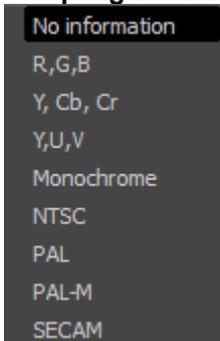
AFD:



Signal Form:



Sampling: select the sampling structure:

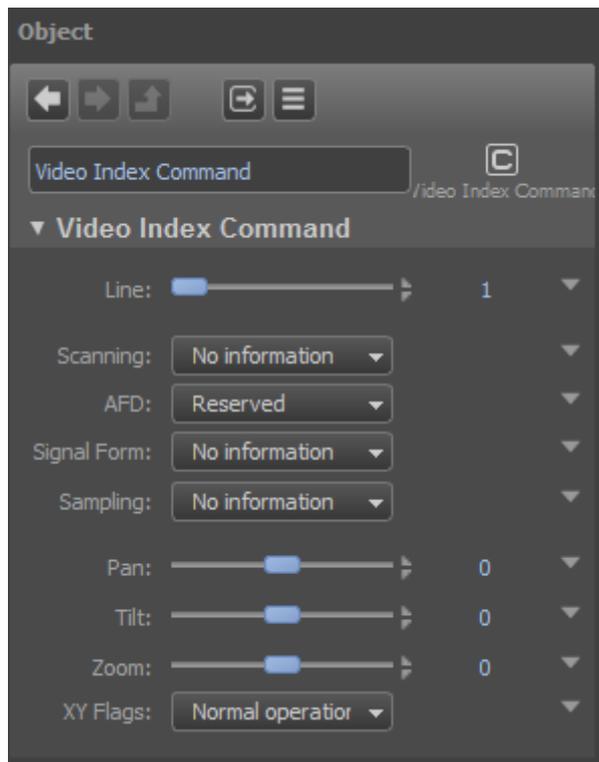
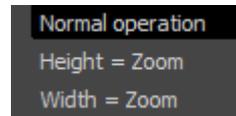


Pan: a number in the range [0, 127].

Tilt: a number in the range [0, 127].

Zoom: a number in the range [0, 127].

XY Flags:



Example.

28 Effects



Use Effects to define overlays.

Effects are built of Templates (actions). Create Templates first and then define Effect actions using these Templates.

28.1 Basic editing

- To create a new Effect, in the **Project** window, click the  icon.
- To rename, right-click in the **Project** window and then rename.
- To edit an existing Effect, double-click in the **Project** window.
- Add actions by clicking the  icon.
- The **Action Name** window opens.
- Specify a **Name** for the action. This is the name that will be displayed on the GV Director Panel.
- Click **OK** to confirm, **Cancel** to discard.

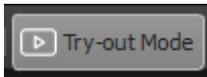
- To link a Template to an action, double-click the action in the actions list. The **Pick Template** window opens.
- Select a Template from the list.
- Click **OK** to confirm, **Cancel** to discard.

- To delete an action, click the  icon.
- Click **Yes** to confirm, **Cancel** to discard.

- To add the Effect to a folder, either drag and drop into an existing folder, or right-click in the **Project** window and select **Add to Folder**. A new folder is created and the element is added to this folder. Note that folders only exist in Composer and not on the production nodes, and can be used to organize elements.
- To delete an Effect, right-click in the **Project** window and select **Delete**, or select and press the [Delete]-key.

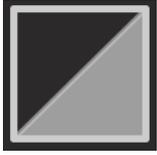
28.2 Previewing Effects

Preview Effects in Try-out Mode. Add the Templates that the Effect is built of to the Try-out list and preview.

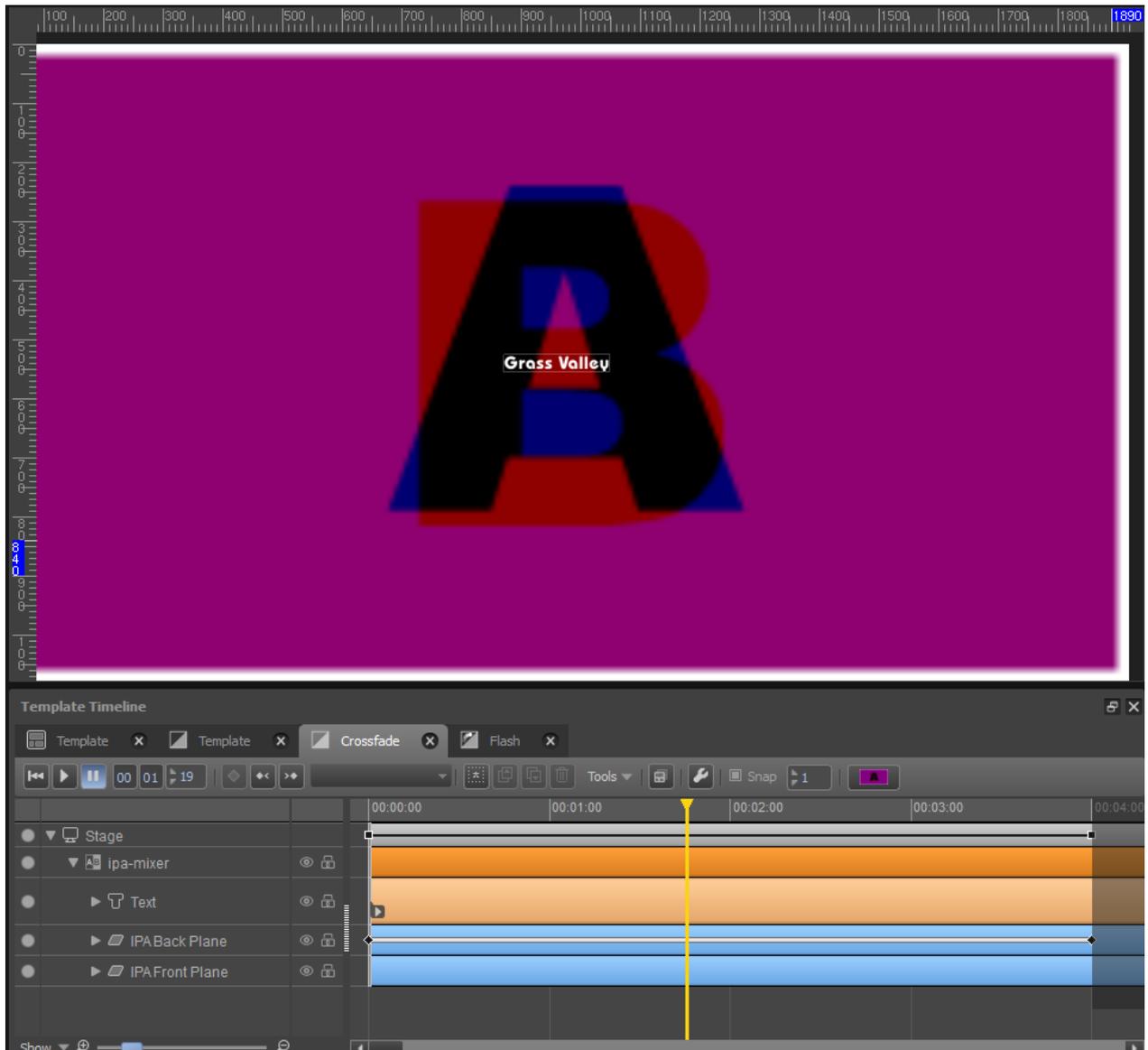


Note that Players only run in Try-out mode.

29 Transitions



Use to define a transition from one background (black, input or shotbox) to another background.



Example transition that crossfades (using a keyframed animation of the back plane's opacity) from a front plane (A) to a back plane (B) and plays out a text on top. Note that no streaming Players are used, and that all Players start at 0%.

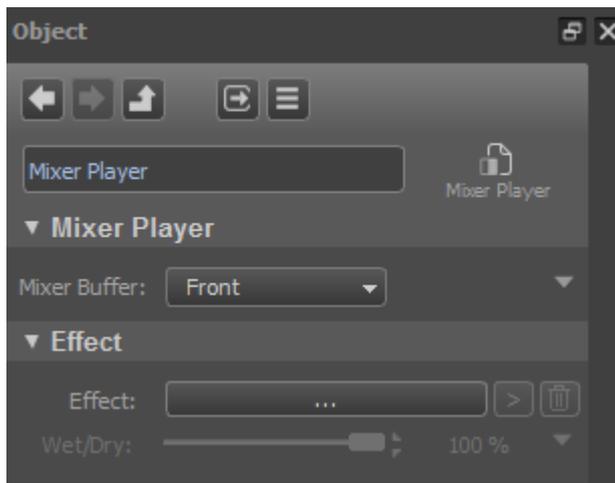
- Transitions use the Mixer Object.



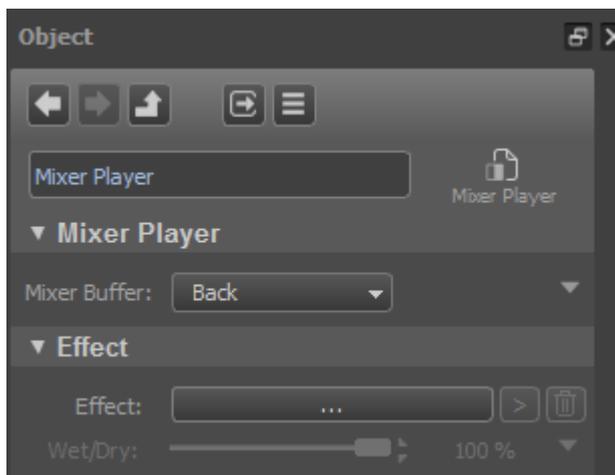
- Transitions use the Mixer Player, one for the front and one for the back.



- Transitions move from A (front) to B (back).



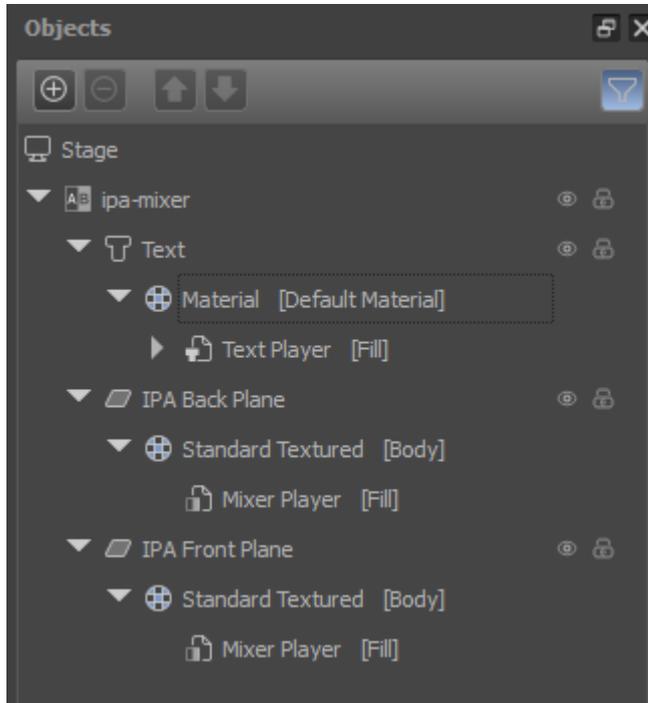
The Mixer Player for the front uses the Mixer Buffer Front.



The Mixer Player for the back uses the Mixer Buffer Back.

- Transitions move from 100% (Front) to 100% (Back).

- Transitions can be scratched, for example reversed or accelerated, for example using the T-bar on the GV Director Panel.
- All Objects in a Transition should be grouped under the Mixer Object, as shown in the example below.



- Prefabs *Back Plane* and *Front Plane* are available in the Objects Library. Note that you can also use other Objects than the Plane for the back and front, then link the Mixer Player to (one of the) the Object's material(s).

Restrictions

- You cannot add streaming Players such as Animations or Clips to a standard Transition.
- All Players in a standard Transition must start at 0%.



These restrictions do not apply for Animated Transitions.

29.1 Basic editing

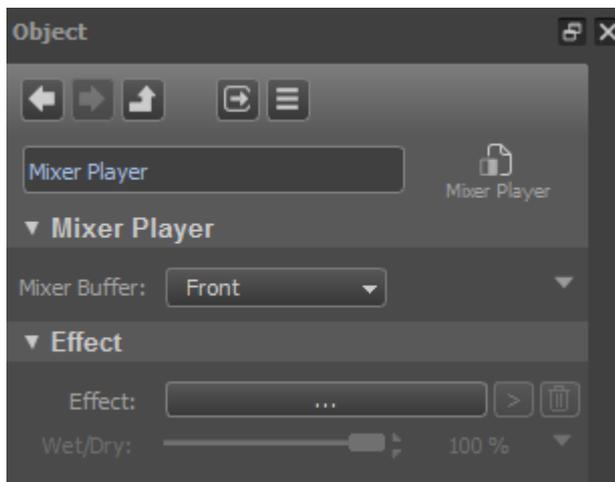
- To add a Transition to your Project, in the **Project** window click the  icon, or on the main menu, click **Project > Add a Transition**.
- To rename, right-click in the **Project** window or double-click the Transition tab in the Timeline, then rename.
- To edit an existing Transition, double-click in the **Project** window or select the editor in the Timeline.
- To duplicate, right-click in the **Project** window and select **Duplicate**, or click the  in the Timeline.
- To edit settings, right-click in the **Project** window and select **Settings**.
- To delete, right-click in the **Project** window and select **Delete**, or select and press the [Delete]-key, or select and click the  option in the Template Timeline.
- Folders can be used to organize elements in a Project. To add an element to a folder, either drag and drop into an existing folder, or right-click in the **Project** window and select **Add to Folder**. A new folder is created and the element is added to this folder.
Folders can be used to organize elements in Composer. Note that folders only exist in Composer and not on the GV Director system.

29.2 Defining a Transition

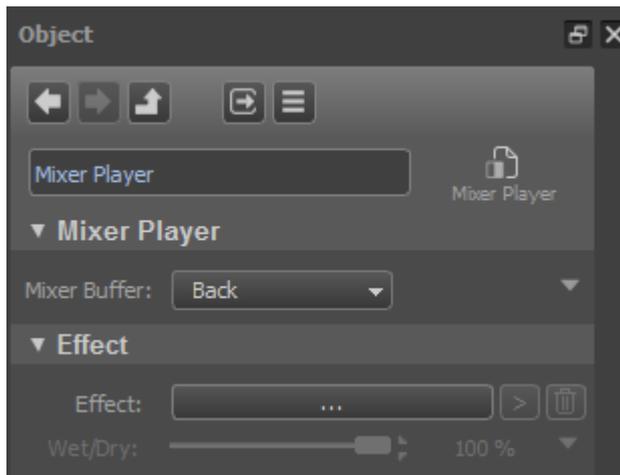
- To add a Transition to your project, in the **Project** window click the  icon. The Mixer Object is automatically added to the **Objects** window.
- To rename the Transition, right-click in the **Project** window or double-click the name tab in the Timeline, then rename.
- Add an Object to the Stage for the transition's front and an Object for the transition's back.
- Edit these Objects in the **Object** window and animate properties on the Timeline as described in the Composer manual. Note that all Objects should start at 0%.
- For both the back and front Object, link the Mixer Player to (one of the) the Object's material(s).
- Select the Material , either in the **Objects** or **Object** window.
- (Double)-click to edit. Select **Players > Fill: Mixer Player**.
- Select the Mixer Player Object in the **Objects** window , or click the arrow icon in the Object window to define the Mixer Player.



- The Mixer Player for the front uses the Mixer Buffer Front.



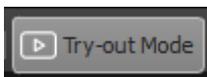
- The Mixer Player for the back uses the Mixer Buffer Back.



- If applicable, add more Objects to the Transition and finish your design. Note that you cannot add streaming Players to the design.
- Make sure all Objects are grouped under the Mixer Object.

29.3 Previewing Transitions

Preview Transitions using the Timeline player options, move the player head or in Try-out Mode.

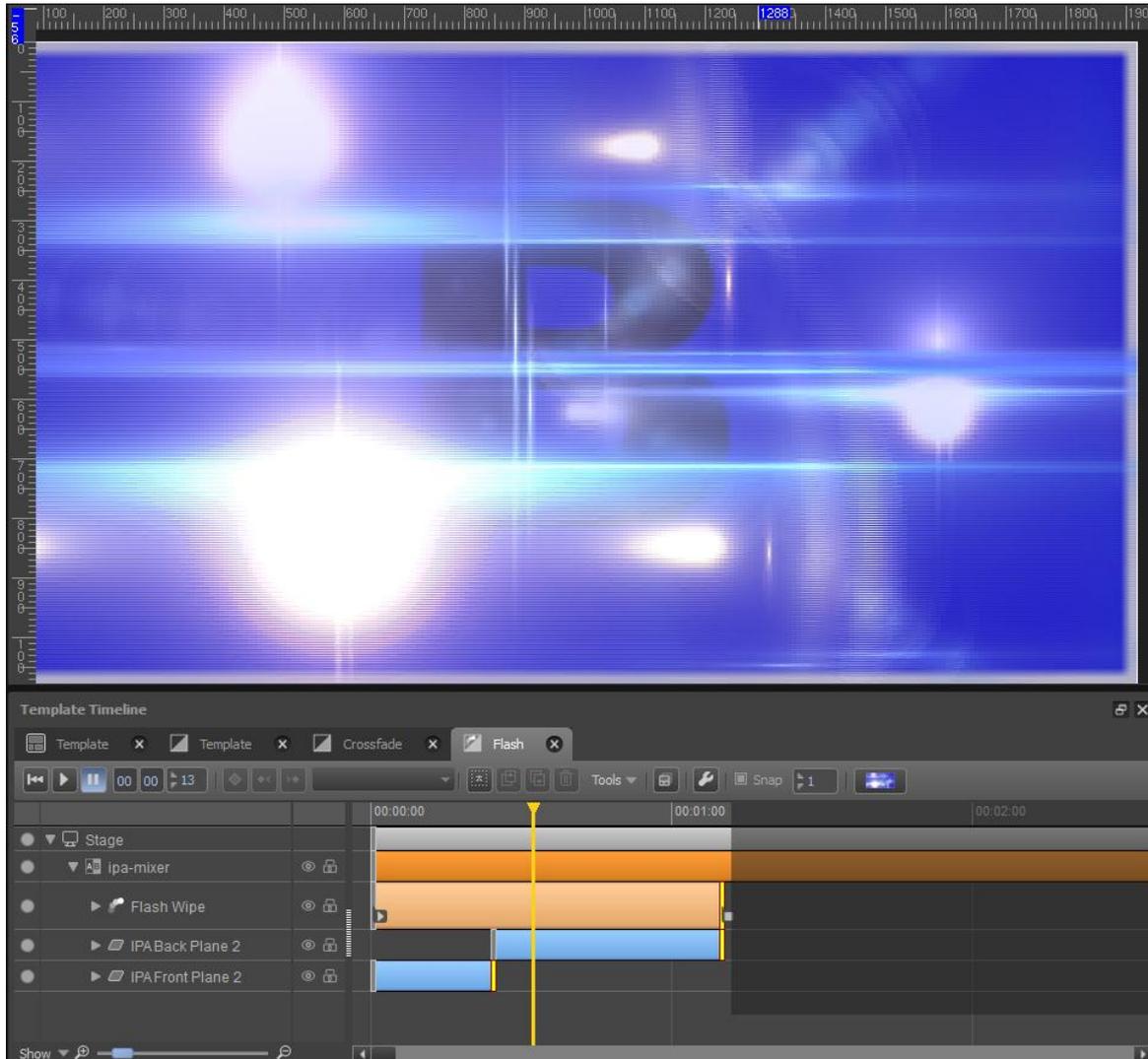


Note that Players only run in Try-out mode.

30 Animated Transitions



Use to define an animated transition from one background (black, input or shotbox) to another background. Animated Transitions can include streaming Players such as Animations, Clips and Tickers. Animated Transitions cannot be scratched but are always linear.



Example animated transition that crossfades from the Back Plane (A) to the Front Plane (B) and plays out an animation on top. Note that a streaming Player (animation) is used, and that not all Objects start at frame 0.

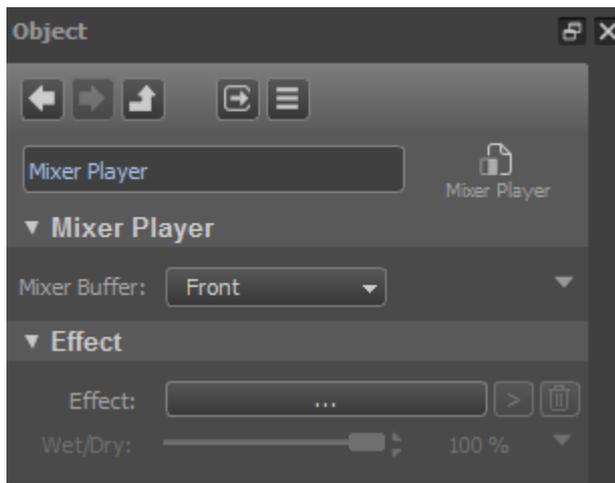
- Transitions use the Mixer Object.



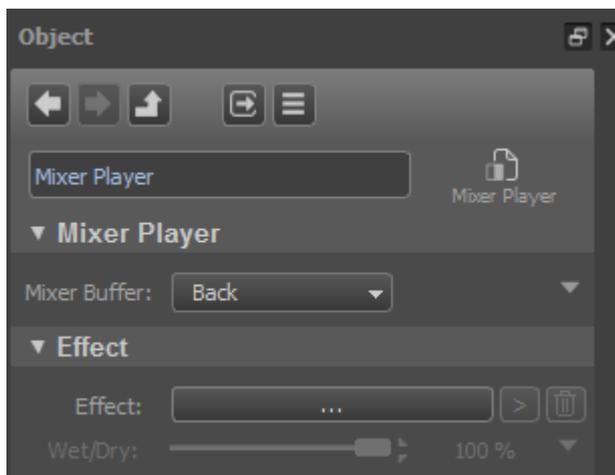
- Transitions use the Mixer Player, one for the front and one for the back.



- Animated Transitions move from A (Front) to B (Back).



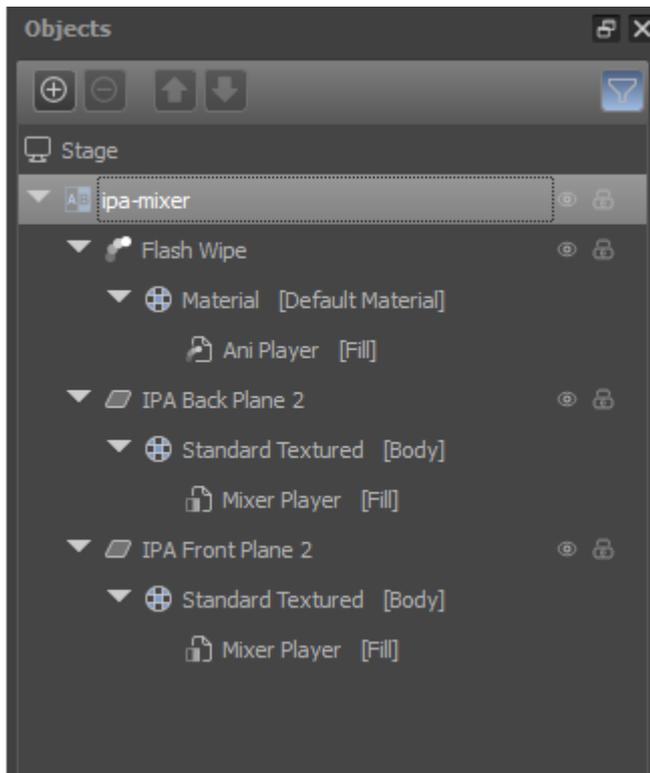
The Mixer Player for the front uses the Mixer Buffer Front.



The Mixer Player for the back uses the Mixer Buffer Back.

- Animated Transitions cannot be scratched, for example reversed or accelerated, but are linear.

- Streaming Players such as Animations or can be added to an Animated Transition.
- In an Animated Transitions, Objects do not have to start at frame 0.
- You must define a duration for Animated Transitions.
- All Objects in a Transition should be grouped under the Mixer Object, as shown in the example below.



- Prefabs *Back Plane* and *Front Plane* are available in the Objects Library. Note that you can also use other Objects than the Plane for the back and front, then link the Mixer Player to (one of the) the Object's material(s).

30.1 Basic editing

- To add an Animated Transition to your Project, in the **Project** window click the  icon, or on the main menu, click **Project > Add Animated Transition**.
- To rename, right-click in the **Project** window or double-click the Animated Transition tab in the Timeline, then rename.
- To edit an existing Transition, double-click in the **Project** window or select the editor in the Timeline.
- To duplicate, right-click in the **Project** window and select **Duplicate**, or click the  in the Timeline.
- To edit settings, right-click in the **Project** window and select **Settings**.
- Folders can be used to organize elements in a Project. To add an element to a folder, either drag and drop into an existing folder, or right-click in the **Project** window and select **Add to Folder**. A new folder is created and the element is added to this folder.
Folders can be used to organize elements in Composer. Note that folders only exist in Composer and not on the GV Director system.
- To delete a Transition, right-click in the **Project** window and select **Delete**, or select and press the [Delete]-key, or select and click the  option in the Template Timeline.

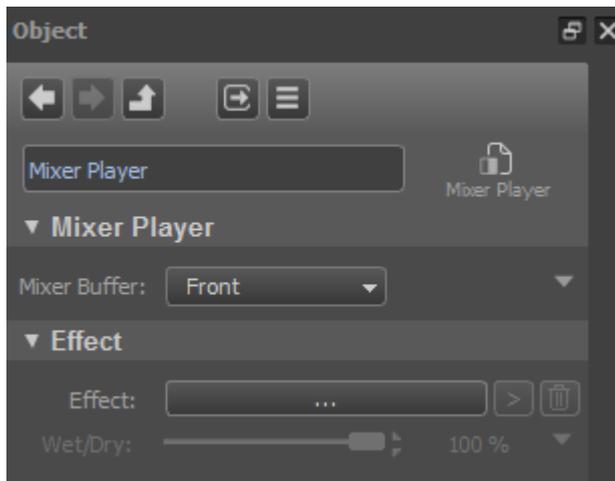
30.2 Defining an Animated Transition

- To add an Animated Transition to your Project, in the **Project** window click the  icon.
The Mixer Object is automatically added to the **Objects** window.
- To rename the Transition, right-click in the **Project** window or double-click the Transition tab in the Timeline, then rename.
- Add an Object to the Stage for the transition's front and an Object for the transition's back.
- Edit these Objects in the Object window and animate properties on the Timeline as described in the Composer manual.
- For both the back and front Object, link the Mixer Player to (one of the) the Object's material(s):
- Select the Material , either in the **Objects** or **Object** window.
- (Double)-click to edit. Select **Players > Fill: Mixer Player**.

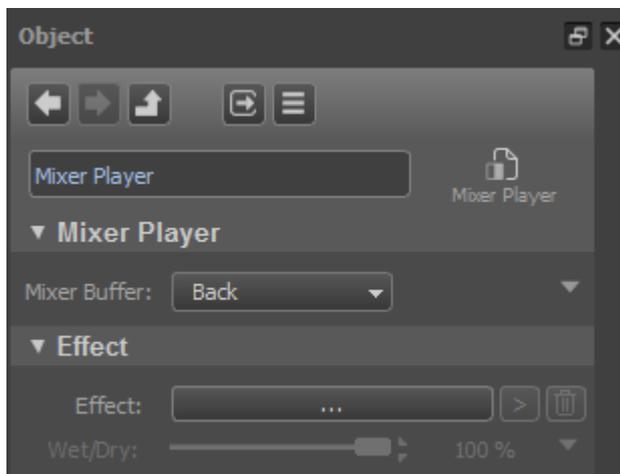
- Select the Mixer Player Object in the **Objects** window , or click the arrow icon in the Object window to define the Mixer Player.



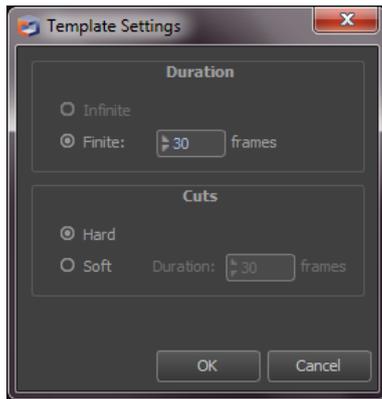
- The Mixer Player for the front uses the Mixer Buffer Front.



- The Mixer Player for the back uses the Mixer Buffer Back.



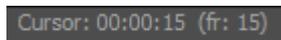
- If applicable, add more Objects to the Transition and finish your design.
- Make sure all Objects are grouped under the Mixer Object.
- Specify the duration for the transition. In the Timeline, click the  icon and specify **Duration**.



Example.



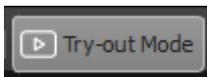
When hovering over the Timeline, the position on the Timeline is displayed in Composer's left bottom corner.



Example.

30.3 Previewing Animated Transitions

Preview Transitions using the Timeline player options, move the player head or in Try-out Mode.



Note that Players only run in Try-out mode.



To step through an animation, on the Timeline move the player head to the appropriate position and click the **Refresh Players** button, or press CTRL+F or CMD+F.



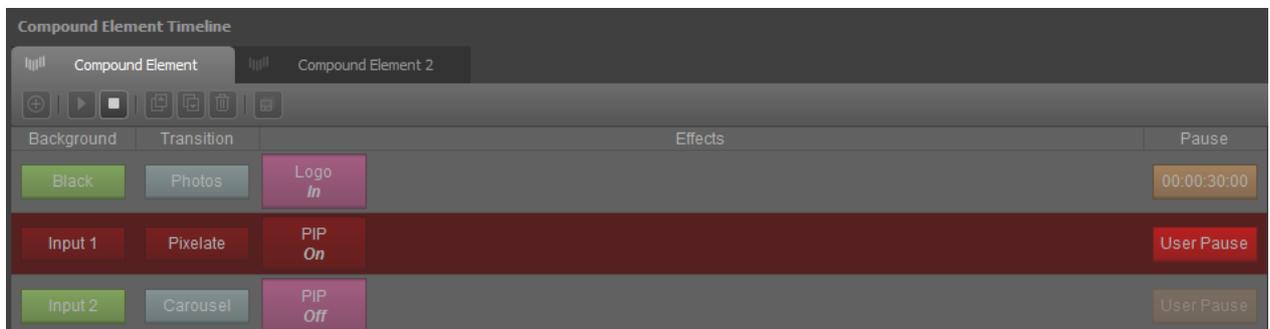
Compound Editing

31 Compound Elements



Compound elements are used to create timed, ordered lists of production elements.

Compound Elements are defined in the Compound Element Timeline. To open the Compound Element Timeline, double-click a Compound Element in the **Project** window.



Example.

Each row in the Compound Element Timeline represents an Effects Block or scene. Effect Blocks are composed of one or more of the following Production Elements:

- Background: either a black, input or shotbox (clip, animation or still)
- Transition: defines the transition from the previous background to this scene's background
- Effects: graphical overlays
- GPOs
- Pause: either a user or timed pause. This is a fixed element and cannot be removed.

The elements on each row (Background, Transition, Effects and Pause) are started simultaneously. Effect Blocks are run sequentially from top to bottom and are separated by pauses, either a user or timed pause.

When previewing the Compound, the currently active Effects Block is highlighted in red. User Pauses will start blinking.

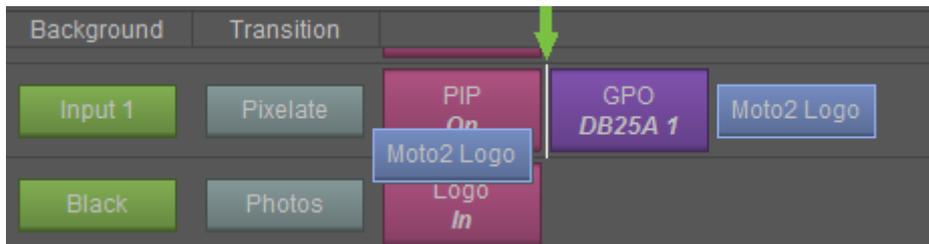
31.1 Basic editing: Compound Elements

- To create a new Compound Element, in the **Project** window, click the  icon, or on the main menu, click **Project > Add Compound Element**.
- To rename, right-click in the **Project** window or double-click the Compound tab in the Compound Element Timeline and then rename
- Folders can be used to organize elements in a Project. To add an element to a folder, either drag and drop into an existing folder, or right-click in the **Project** window and select **Add to Folder**. A new folder is created and the element is added to this folder. Note that folders only exist in Composer and not on the GV Director system.
- To delete the Compound Element, right-click in the **Project** window and select **Delete**, or select and press the [Delete]-key, or select and click the  option in the Compound Element Timeline.

31.2 Basic editing: the Compound Element Timeline

	Add an Effects Block.
	Start the player to preview the Compound. The Compound is played back on the Stage. Some elements are simulated.
	Stop the Player.
	Copy the selected Production Element or Effect Block. You can also use hotkeys.
	Paste the copied Production Element or Effect Block. You can also use hotkeys. When an element cannot be pasted, the Paste option is disabled.
	Remove the selected Production Element or Effect Block. You can also right-click and remove.
	Duplicate the Compound Effect.

To change the order of Elements or Blocks, select and drag while keeping the mouse pressed. The drop indicator shows where the Element or Block will be placed.

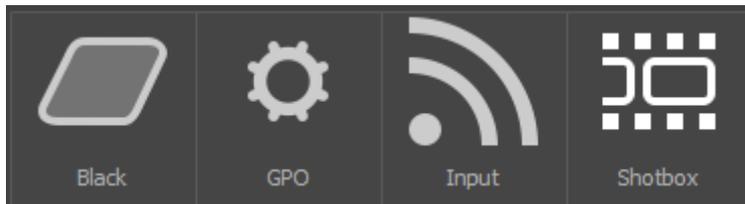


Example: the white drop indicator shows where the Element will be placed.

31.3 Effect Blocks

- To add an Effects Block, in the Compound Timeline click the  button.
- To remove an Effects Block, right-click and remove or click the  button.
- To copy click the  button, to paste click the  button, or use the CTRL|CMD+C and CTRL|CMD+V hotkeys.

31.4 Backgrounds



Following Backgrounds are available:

- Black: this is a full screen black plane.
 - Input: select an input number (SDI).
 - Shotbox: select a shotbox location. Clips, animations and stills are assigned to shotbox locations on the GVD-Panel.
-
- Backgrounds can be dragged and dropped from the Production Elements window onto the Effects Block in the Compound Element Timeline. If a Background is already defined for the Block, you can replace the existing Background, or cancel.

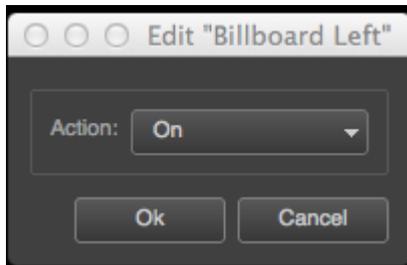
31.5 Transitions

- To add a Transition to an Effects Block, drag and drop from the **Project** window onto the Effects Block in the Compound Element Timeline. If a Transition is already defined for the Block, you can replace this Transition, or cancel.

31.6 Effects

- To add one or more Effects to an Effects Block, drag and drop from the **Project** window on to the Effects Block in the Compound Element Timeline.

- Double-click to select an action.



Example.

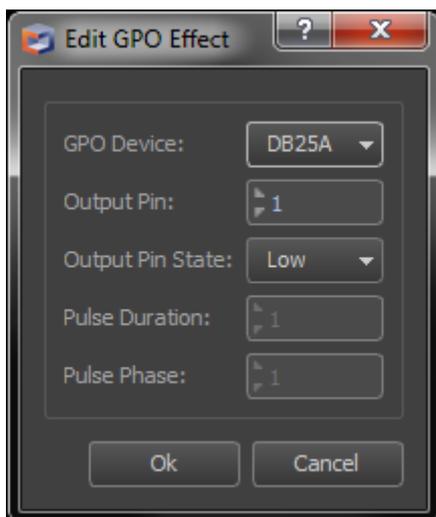


If no action is defined (NONE), actions are toggled.

31.7 GPOs

Use for third party automation purposes.

- To add a GPO to an Effects Block, drag and drop from the **Production Element** window onto the Effects Block in the Compound Element Timeline.
- Double-click to edit.

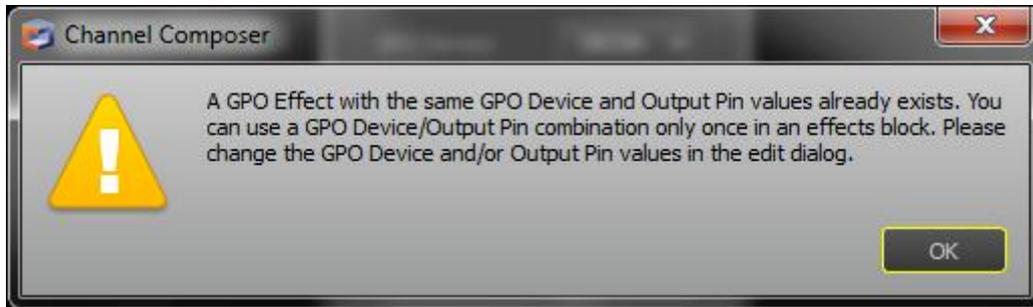


Example.

- Click **OK** to save changes, **Cancel** to discard.



You cannot use the same pin number twice in an Effects Block. Pin numbers are automatically incremented when dropping a GPO Object on an Effect Block from the **Production Element** window.



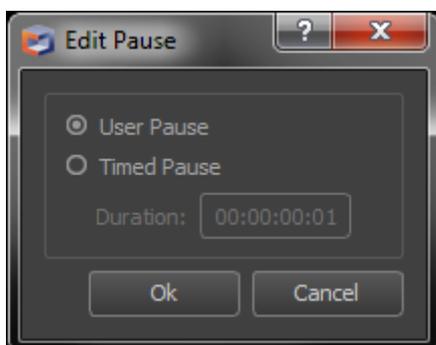
31.8 Pauses

Pauses define the time between Blocks. They can either be timed or user pauses. When a user pause is defined, playback will pause until the user continues playback by manual intervention, either on the Panel (press button) or in Composer (click pause). The last pause in a sequence of Effect Blocks keeps its properties but cannot be edited in Composer; the edit option is disabled.



When a Transition exceeds the Effect Blocks (timed pause) duration, A (front) and B (back) are not flipped.

- To edit a Pause, double-click.
- Select either User Pause or Timed pause.
- For timed pauses, specify a duration in hh:mm:ss:ff.
- Click **OK** to confirm, **Cancel** to discard.



Example.

32 Snapshots

Create a snapshot of a Transition or Effect, then display on the GV Director Panel, on the Panel button linked to the Transition or Effect.

- To create a snapshot, in the Timeline move the player head until the Stage displays the scene you want to take a snapshot of.

- Click the Snapshot button.



- A Snapshot is created and the snapshot icon is replaced by the snapshot.



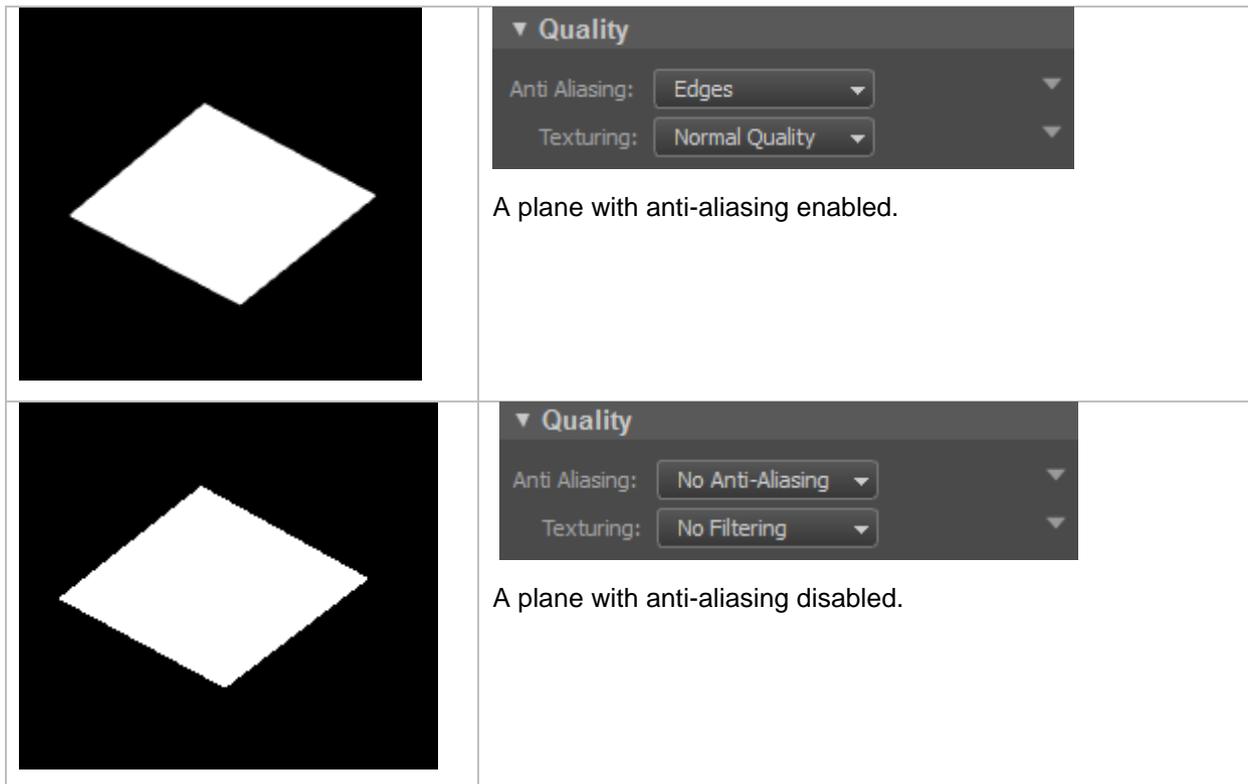
- To change, move the player head until the Stage displays the scene you want to take a snapshot of and click the Snapshot button again.

33 Quality

This chapter describes a number of options for Quality Assurance.

33.1 Anti-Aliasing

Use the Object's **Quality** > anti-aliasing option to avoid jagged edges.



This setting can be costly in terms of performance, so be sure to only enable for Objects for which anti-aliasing is really needed. Multi-sampling must be enabled in **File > Preferences** to see the effect.

33.2 Pixel Perfect

An Object is pixel perfect when it maps its content straight to playout and does not transform the content's pixels during the rendering process. Distortions can occur for many reasons. For example: the Object is rotated, scaled, positioned in front or behind the 2D plane or on sub pixel coordinates, the content is stretched over the surface of a 3D object, texture filtering and/or effects are applied, etcetera. These distortions are often unwanted, especially for 2D-elements such as text and main clips.

To display pixel perfect information, on the toolbar select the **View > Pixel Perfect** option or use the hotkey CTRL|CMD+P to toggle pixel perfect information.

An exact match is displayed in green: **Pixel perfect**. Discrepancies are displayed in red:

- **Material distortion:** the material applied transforms pixels.
- **Not on 2D plane:** the plane on which content is displayed is not on the 2D plane (not on the z-coordinate 0).
- **Shape/size mismatch:** the plane on which content is displayed is bigger or smaller than the content's dimensions.
- **Rotated:** the plane on which content is displayed is rotated.
- **Sub-pixel coordinates:** one or more edges of an Object are on sub-pixel coordinates.
- **Texture filtering on:** texture filtering is enabled.
- **Effect on:** the Object has an effect.
- **Height is not an even value:** the interlaced content is displayed on a plane that does not have a height that is an even number (in pixels).



The Example Project *Quality Assurance* explains various Composer techniques that can be used to counter graphics artifacts commonly seen in broadcasting.



Example pixel perfect information: *Shape/size mismatch*.
The Plane displays a Still that does not match the Plane's dimensions.

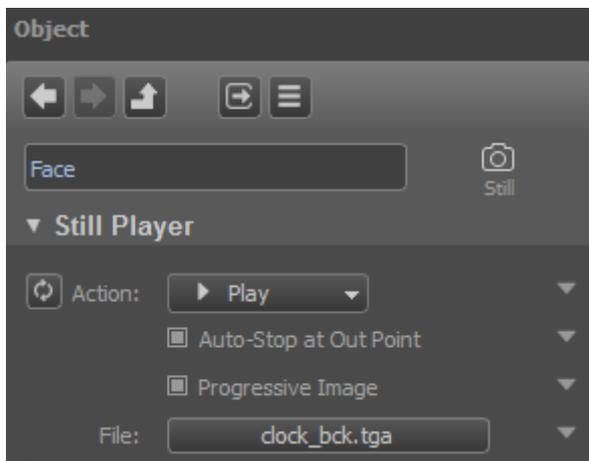
33.3 Scaling

There are several options for improving the quality of scaled clips, texts, stills, and so on:

Enable Progressive Image.	For texts and stills only.
Use Texture Filtering.	For all Objects.
Use a Quality Scaler.	For all Objects. results in the highest quality.

33.3.1 Progressive Image

(Only) when scaling, for stills and text: enable the Player's **Progressive Image** option.



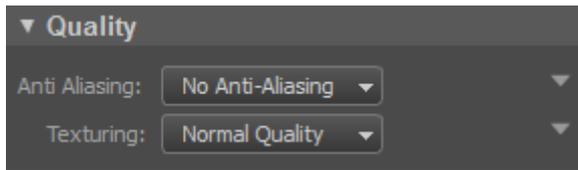
Example.

33.3.2 Texture Filtering

Texture Filtering can be used for all Objects.

To enable, set the Object's **Quality > Texturing** option to **Normal Quality**.

The **High Quality** option can be used for rotated (3D) Objects.



Example.

33.3.3 The Quality Scaler

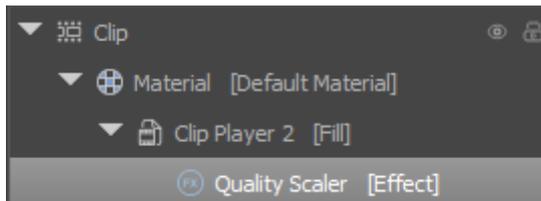
The Quality Scaler can be used for all Objects. Use when scaling an Object and quality is important.

Some examples:

- Scaling a clip from HD to SD or vice versa.
- Credit squeeze.
- Picture-in-picture.



Apply the Quality Scaler on the Player, not on the Object.

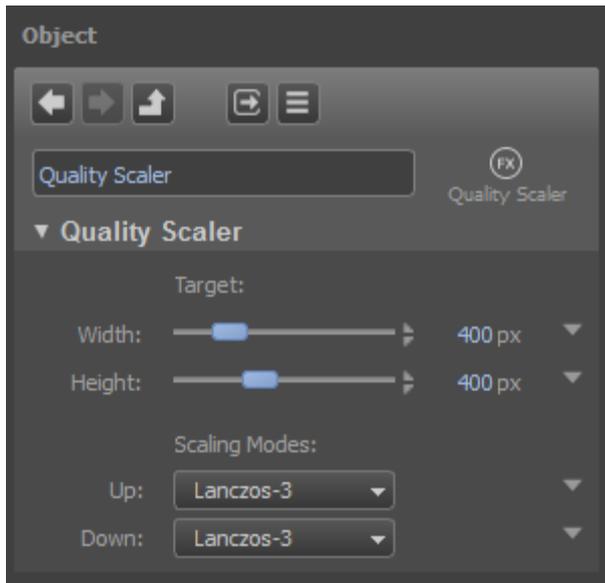


Example.

To enable the Quality Scaler, select the Player > **Effect** > select the Quality Scaler.

Specify the Quality Scaler's properties:

- **Target:** specify the target's width and height in pixels.
- **Scaling Modes:** select a scaling mode for up and down scaling. Different scaling methods produce slightly different effects. If you are not sure which one to use, try different options. Lanzcos-3 is the default. Options are:
 - Up: Bicubic/Lanzcos-3/Lanzcos-4
 - Down: Lanzcos-2/Lanzcos-3/Lanzcos-4



Example.



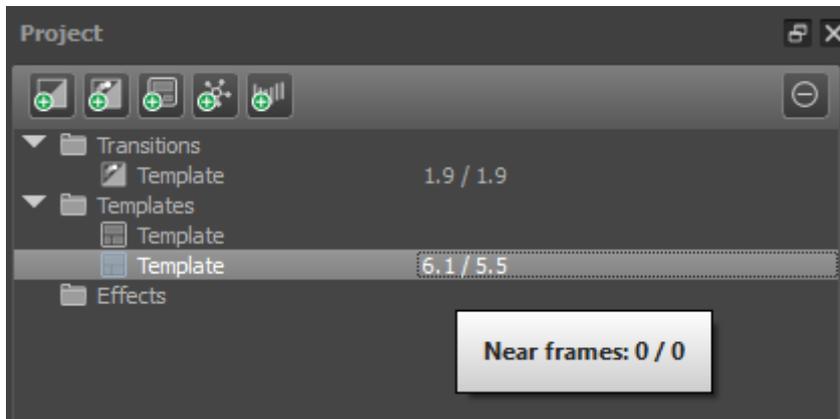
When using the Quality Scaler, make sure the Object's **Quality > Texturing** option is set to **No Filtering**.



Example.

33.4 Template Rating

Use the **Objects > Rate Templates** option to estimate the performance of Templates.



Example.

Two scores are shown:

- first score: the time in milliseconds to process the template (total)
- second score: time in milliseconds to process the template (GPU only)

Near frames shows on which frames these two values peak (in this example 0 because all In Points start at frame 0).

Values > 10 should be validated on the playout system



Please refer to the Example Project for an explanation n how values can be improved if load is too high.

34 Hotkeys



Replace the CMD-key with the CTRL-key when working on a Windows workstation.

34.1 Global

These hotkeys are accessible from everywhere.

CMD-O	: open Project.
CMD-P	: Toggle Pixel Perfect Information.
CMD-S	: save Project.
CMD-SHIFT-S	: save Project as.
CMD-Z	: undo.
CMD-Y	: redo.
CMD-C	: copy.
CMD-V	: paste.
CMD-A	: select all.
CMD-D	: select none.
CMD++	: zoom in.
CMD--	: zoom out.
CMD-ALT-F	: zoom to 100%.
CMD-ALT-N	: fit Stage in window.
CMD-ALT-R	: toggle ruler's visibility.

CMD-ALT-G	: toggle grid visibility.
CMD-ALT-U	: toggle guides' visibility.
CMD-SHIFT-G	: toggle snap to grid.
CMD-SHIFT-U	: toggle snap to guides.
CMD-1	: toggle Project Navigator visibility.
CMD-2	: toggle History visibility.
CMD-3	: toggle Library visibility.
CMD-4	: toggle Project Assets visibility.
CMD-5	: toggle Objects visibility.
CMD-6	: toggle Object Properties visibility.
CMD-7	: toggle Template Timeline visibility.
CMD-8	: toggle Text Styles visibility.
CMD-9	: toggle Scene Parameters visibility.
CMD-SHIFT-T	: new Template.
G	: group Objects.
U	: ungroup Object.
ALT-A	: add Object to Stage.
SHIFT-SPACE	: toggle Clean View Mode.

SHIFT-2	: toggle allow only 2D transformations.
SHIFT-3	: toggle allow 2D and 3D transformations.
SHIFT-A	: toggle lock Object aspect ratio.
SHIFT-M	: toggle 16:9 (anamorphic widescreen) mode
SHIFT-Z	: toggle 3D editing guides visibility.
O	: open group.
C	: close group.
SHIFT-C	: toggle curtains.
CMD-T	: toggle Template Try-out Mode.
CTRL+Shift+T	Add a Transition.
CTRL+Shift+R	Add an Animated Transition.
CTRL+Shift+E	Add a Template.
CTRL+Shift+C	Add a Compound Element.

34.2 Stage

Mouse wheel	: zoom in/out.
left/right/up/down/pgdn/pgup	: nudge (=move by one pix) left/right/up/down/fwd/bck
SHIFT + left/right/up/down/pgdn/pgup	: big nudge left/right/up/down/fwd/bck
Middle mouse (hold)	: grab Stage.
R	: reset rotation of selection.
SHIFT + Object movement	: constrain movement to X or Y axis.
Del	: remove selected Objects from Template.
Del	: delete selected Objects.

34.3 Template Timeline

A	: select all Timeline items.
D	: delete Timeline selection.
[/]	: go to previous/next keyframe.
left/right	: decrease/increase player head time by one frame.
+/-	: zoom in/out.
R	: rewind.
Space	: toggle play/pause.
K	: insert/update keyframe for selection.