What's New

Contents

Chapter: New Features and Enhancements

1

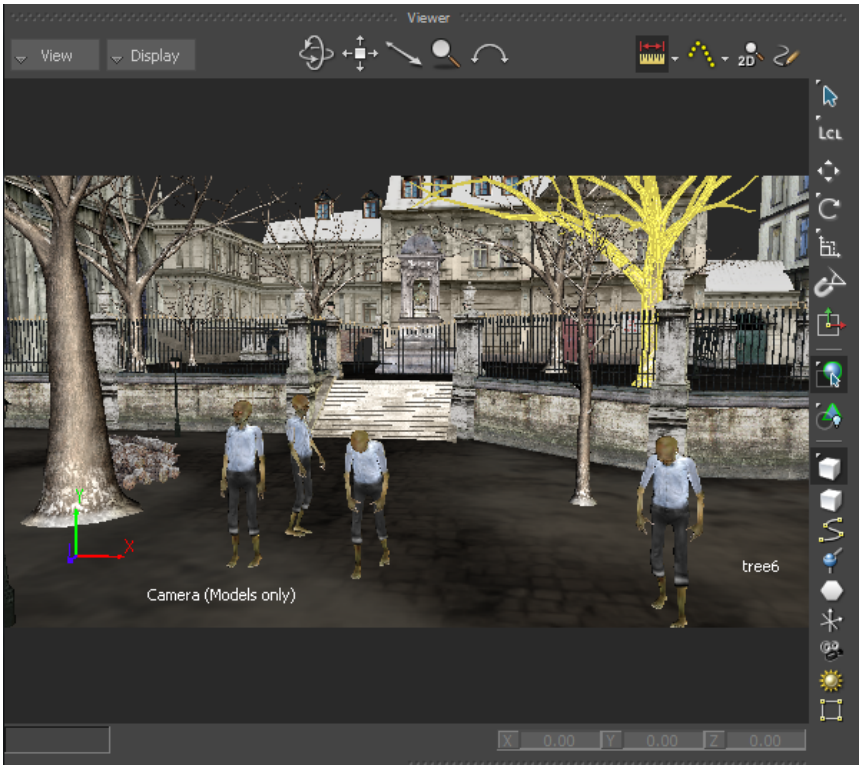
Ruler Tool

The **Ruler** tool is a distance measuring tool that enables you to measure and display the distance between two objects or elements in the scene.

The **Ruler** tool () is located at the top right of the **Viewer** window, alongside the Camera View Display toolbar options.

When you click the **Ruler** tool () or use the Ruler keyboard shortcut `Ctrl-Shift-R`, the cursor changes to a 2D cursor ().

When you click the **Ruler** tool () and hover over an object or element in the scene, the object is highlighted in yellow by default and the name of the object is displayed at the bottom right of the **Viewer** window, as shown in the following figure.

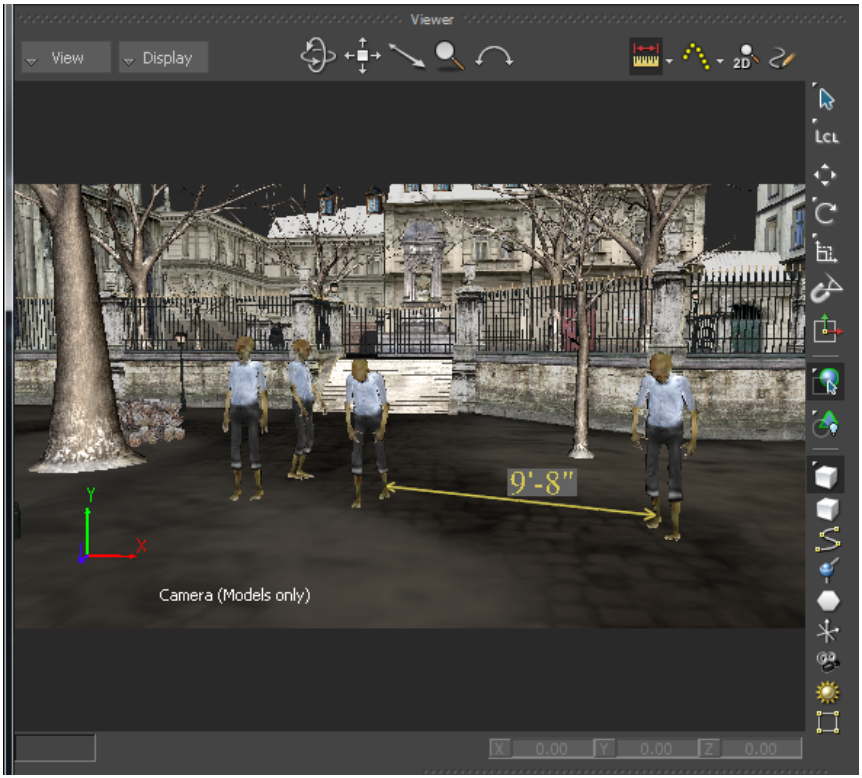


If you are working on a large scene, the highlighting of objects enables you to quickly identify and select in the scene the objects whose distance you want to measure.

When you click the **Ruler** tool (), hover over an object in the scene and click-hold the object, the cursor changes from a 2D cursor () to a 3D cursor () enabling you to snap to the surface of the object. Snapping a Ruler to the surface of an object gives you a visual feedback on where you are snapping the object.

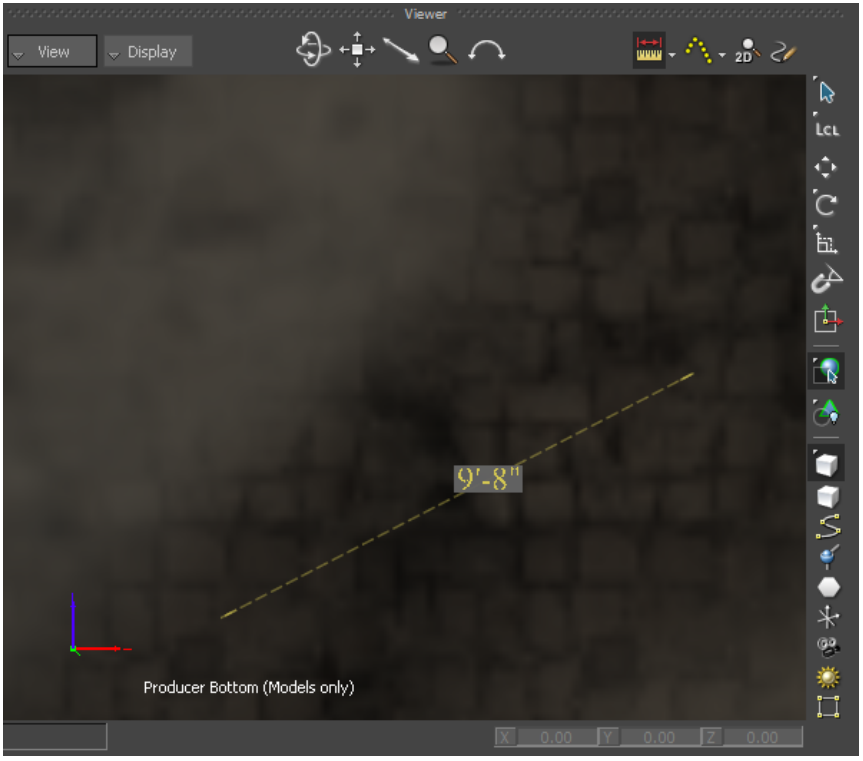
When you click the **Ruler** tool (), hover over an element such as a light in the scene and click the light, the cursor changes from a 2D cursor () to a 3D cursor () enabling you to snap to the centre of the element. Unlike other elements, if you choose to snap a Ruler to a camera, the Ruler snaps automatically to the camera film back—the camera's default rotation pivot.

When you measure the distance between two objects or elements in the scene, the measured distance is displayed by default by a yellow line with arrows at the start and end points and the measurement units above the line. This measured distance is a system **Ruler** "object".



Ruler "object" displayed in the scene

The distance measurement units always face the current camera view, enabling you to see the measured distance irregardless of the camera view.

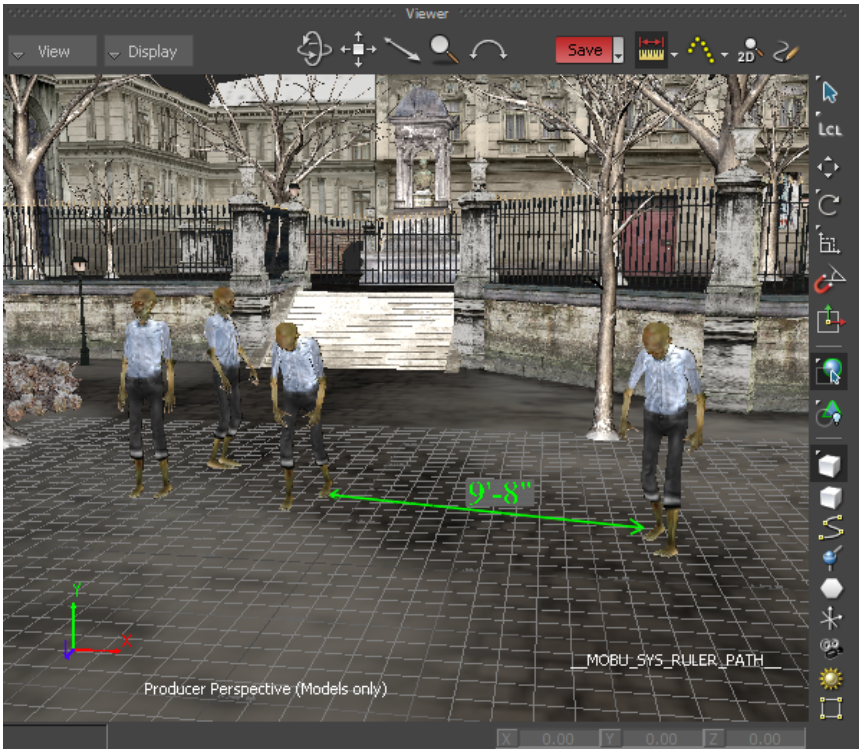


Measured distance facing the Orthographic Producer Bottom view

The distance measurement units are set by default in Architectural units to match the AutoCAD default measurement units. You can change the default **Ruler** settings via the **Ruler** preference settings.

See Ruler preference settings (page 6).

The system **Ruler** "object" is displayed in green when selected and the **Viewer** window indicates it is selected by displaying **__MOBU_SYS_RULER_PATH__** at the bottom right, as shown in the following figure.



Ruler "object" shown selected

The system **Ruler** "object" is a system **Ruler** path. It is not an asset nor a model object. It has no properties and therefore is not available in the **Asset** browser, the **Navigator Scene** browser, and nor in the Schematic view.

You can toggle on or off the display of the system **Ruler** "object" in the scene by clicking the **Ruler** tool (). Depending on what the system **Ruler** "object" is snapped to, it is visible in **Normal**, **X-Ray**, **Models Only** and **Models Display Wireframe** display modes.

Although you cannot save the system **Ruler** "object" with the scene, you can save the measured distance between two objects or elements by converting the system **Ruler** "object" into a **Dimension** object.

See Saving the measured distance between two objects in the scene (page 26)..

You cannot undo an action when using the **Ruler** tool. You can however update the distance between two objects or elements by dragging either of

the objects or elements. Standard path HUD elements are not displayed in the **Viewer** window when you are using the **Ruler** "object".

Ruler preference settings

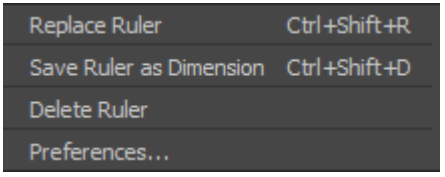
The **Ruler** preference settings enable you to change the default **Ruler** measurement units and display the settings.

The **Ruler** preferences settings include the **Ruler** display settings and the **Ruler** measurement units.

NOTE **Dimension** objects retain the preference settings of the **Ruler** "object".

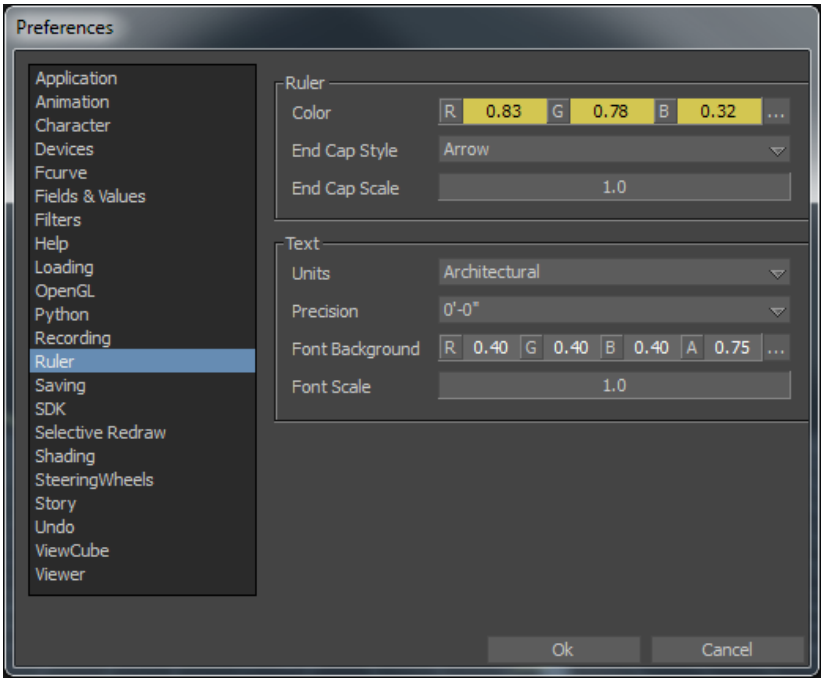
To access the Ruler preferences, do either of the following:

- In the **Viewer** window, left-click the **Ruler** tool () arrow (context menu) in the Camera View Display toolbar options () and choose **Preferences** from the context menu.

  Ruler tool context menu

- From the menu bar, select **Settings ➤ Preferences** and in the **Preferences** window, click the **Ruler** preference option.



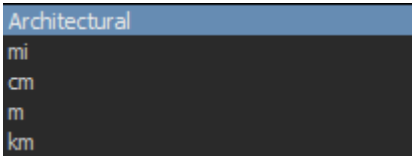
Ruler preferences

The following tables describe the **Ruler** preference settings.

Ruler preference settings	Description
Color	The **Color** setting enables you to change the default color of the system **Ruler** "object" (as displayed in the **Viewer** window) and of the highlighted object or element.
End Cap Style	The **End Cap Style** setting enables you to specify the start and end point style of the system **Ruler** "object".
End Cap Scale	The **End Cap Scale** setting enables you to specify the size of the start and end point of the system **Ruler** "object". The value can be set between 0.1 and 10.

Ruler preference settings	Description
Font Background	The **Font Background** setting enables you to change the background color of the measurement units display of the system **Ruler** "object".
Font Scale	The **Font Scale** setting enables you to specify the size of the measurement units display of the system **Ruler** "object". The value can be set between 0.1 and 10.

The **Ruler** measurement unit options include **Architectural** (feet and inches), **mi** (miles), **cm** (centimetres), **m** (metres), and **km** (kilometres). The default measurement unit is set to **Architectural** unit. The **Architectural** measurement unit is imperial.



You can specify the measurement unit precision for each of these options. The following table shows the **Ruler** measurement unit precision options for each of the measurement units.

Ruler Measurement Unit options	Ruler Measurement Unit Precision options
Architectural	

Ruler Measurement Unit options	Ruler Measurement Unit Precision options
mi	
cm	
m	
km	

See Changing the Ruler preferences (page 31).

Measuring the distance between two objects in the scene

You can measure the distance between two objects in the scene using the **Ruler** tool. When a measured distance is displayed, it is always displayed at the current camera view, enabling you to see the measured distance when working in **Orthographic** view (**Producer Front**, **Producer Back**,

Producer Top, **Producer Right**, **Producer Left**, **Producer Top**, or **Producer Bottom**).

The **Ruler** tool () enables you to draw a segment in the **Viewer** window.

The **Ruler** tool enables you to measure the distance between two objects or elements in a scene:

- from the surface of objects
- from the Rotation Pivot, Scaling pivots or Bounding Box centre of objects or elements

The **Ruler** tool () enables you to view the measured distance update in real time as you translate the objects.

The Ruler remains snapped to non-deforming models because deformations are calculated on the GPU.

If you snap a Ruler onto an object that deforms in time, such as the dress or shirt of a model, the Ruler unsnaps. If you want the Ruler to remain snapped to a model, snap it to an object or element that does not deform in time such as a joint of a model as opposed to the dress or shirt of a model.

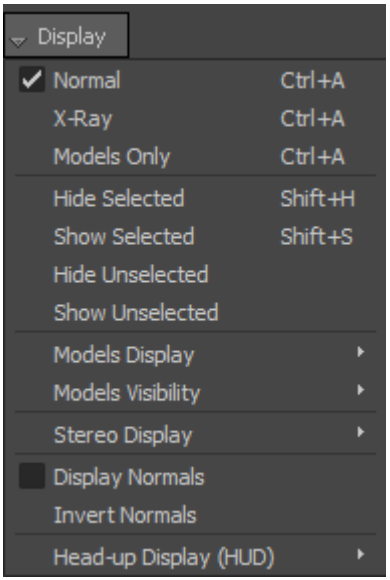
You can only have one Ruler in the scene. If you want to create another Ruler, you must first replace or delete the Ruler in the scene.

The **Ruler** tool () enables you to save the measured distance between two objects or elements in a scene as a Dimension object.

See Saving the measured distance between two objects in the scene (page 26).

To measure the distance between two objects in a scene:

1. In the **Viewer** window **Display** menu, set the display to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** display mode.



Setting the Display mode to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** enables you to see objects and models, their bounding box centre (displayed as a Magenta hexagon), and their **Rotation** and **Scaling** pivots.

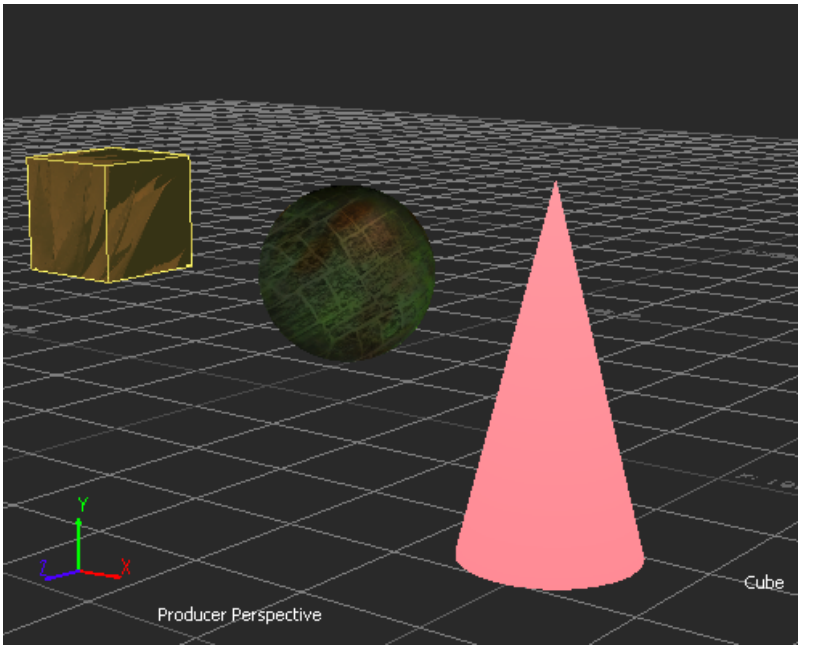
NOTE Elements such as lights and cameras are not displayed in **Models Only** display mode.

2 In the **Viewer** window, click the **Ruler** tool () in the Camera View Display toolbar options () (or press `Ctrl-Shift-R`).

The cursor changes to a 2D cursor ().

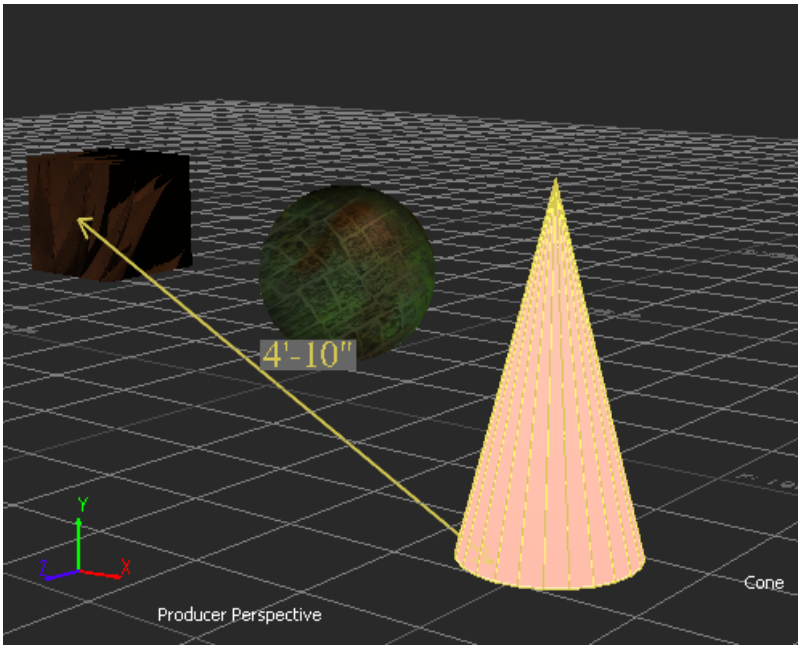
3 Hover over an object.

The object highlights.



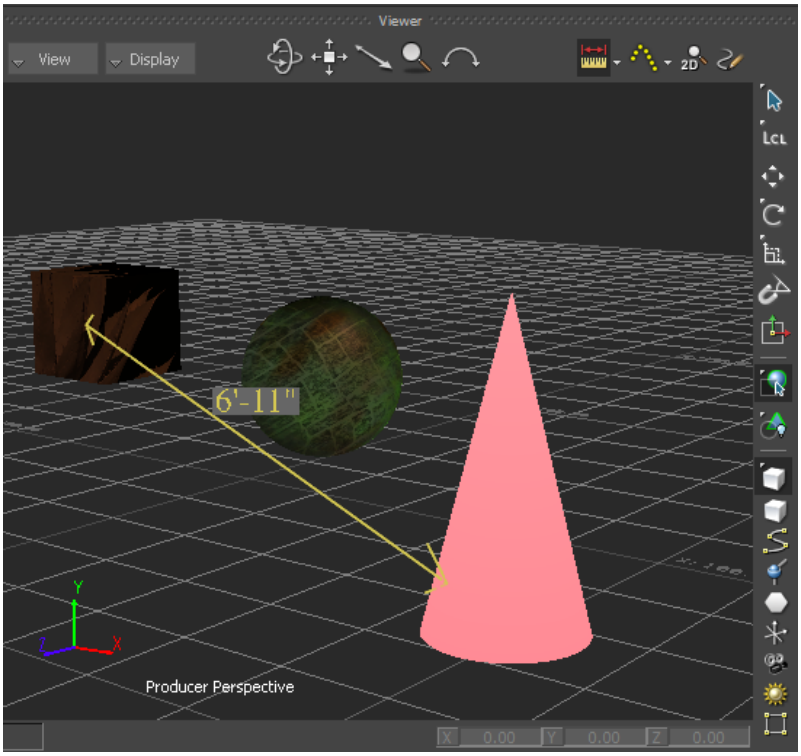
4 Click the object and go to the next object.

The measuring distance displays and updates dynamically as you start to move the cursor.



5 Click the second object.

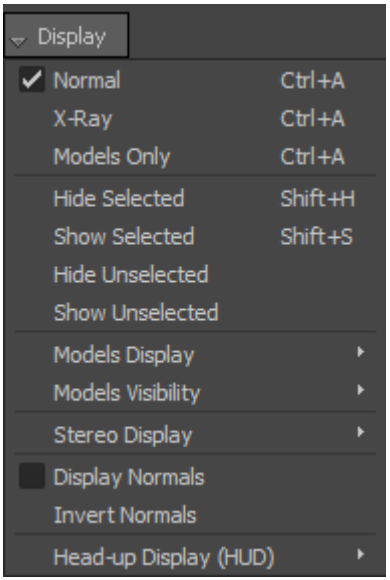
The system **Ruler** "object" is created and displays the distance between the two objects.



Ruler "object" displaying the distance between two objects

To measure the distance between two objects from their surfaces:

1 In the **Viewer** window **Display** menu, set the display to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** mode.



Setting the **Display** mode to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** mode enables you to see objects and models, their bounding box centre (displayed as a Magenta hexagon), and their **Rotation** and **Scaling** pivots.

NOTE Elements such as lights and cameras are not displayed in **Models Only** display mode.

2 In the **Viewer** window, click the **Ruler** tool () in the Camera View Display toolbar options () (or press `Ctrl-Shift-R`).

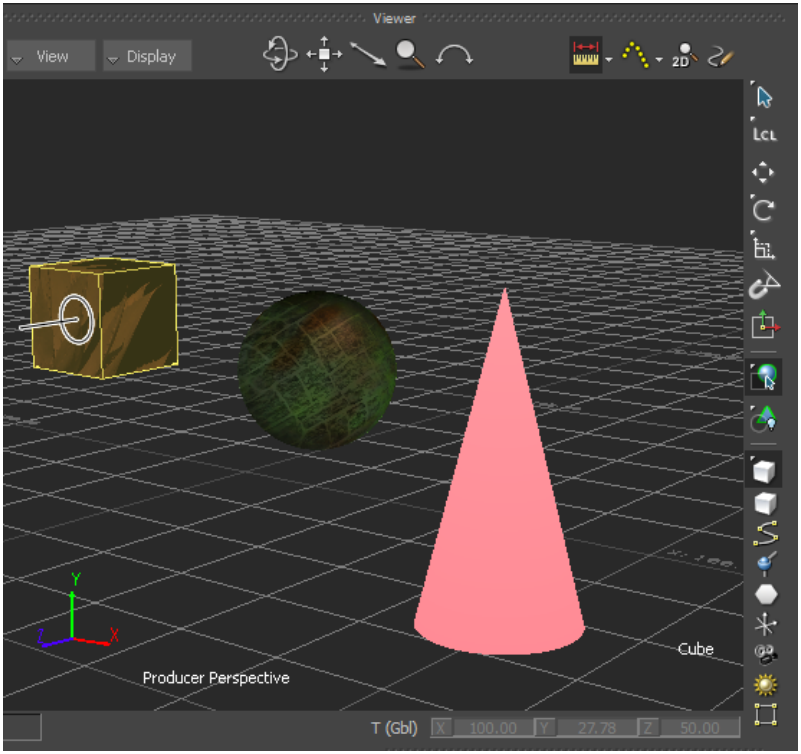
The cursor changes to a 2D cursor ().

3 Hover over an object.

The object highlights.

4 Click-hold until the cursor changes to a 3D cursor () enabling you to snap to the surface of the object.

The 3D cursor is shown snapping to the surface of the cube.

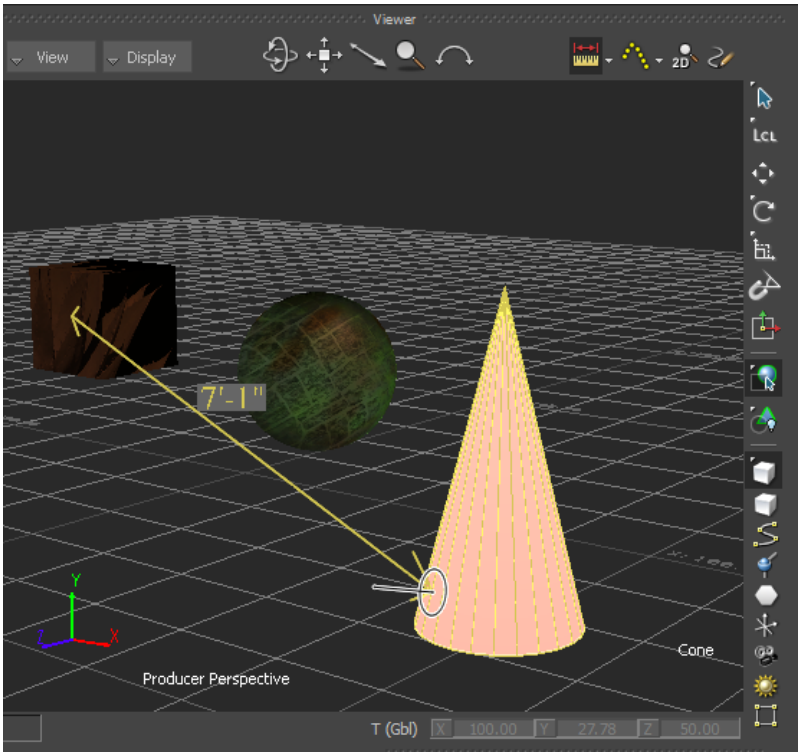


5 Position the cursor and release.

The system **Ruler** "object" start point snaps to the surface of the object. The measuring distance displays and updates dynamically as you start to move the cursor.

6 Position the cursor to the desired location on the surface of the second object and click-hold.

The cursor changes to a 3D cursor () enabling you to snap to the surface of the object.



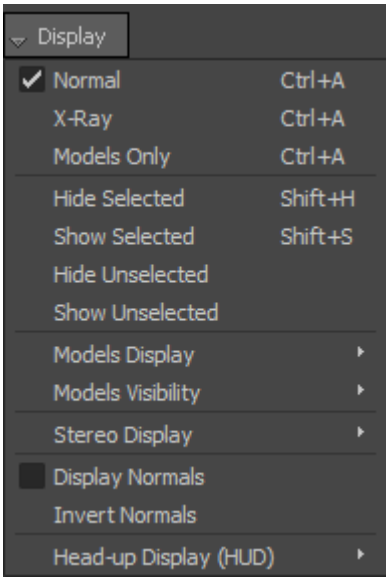
3D cursor is shown snapping to the surface of the second object

7 Release the cursor.

The system **Ruler** "object" end point snaps to the surface of the second object and displays the distance between the two objects from their surfaces.

To measure the distance between elements in a scene:

1 In the **Viewer** window **Display** menu, set the display to **Normal**, **X-Ray**, or **Models DisplayWireframe** mode.



Setting the **Display** mode to **Normal**, **X-Ray**, or **Models DisplayWireframe** enables you to see objects and models, their bounding box centre (displayed as a Magenta hexagon), and their **Rotation** and **Scaling** pivots.

NOTE Elements such as lights and cameras are not displayed in **Models Only** display mode.

2 In the **Viewer** window, click the **Ruler** tool () in the Camera View Display toolbar (or press `Ctrl-Shift-R`).

The cursor changes to a 2D cursor ().

3 Hover over an element.

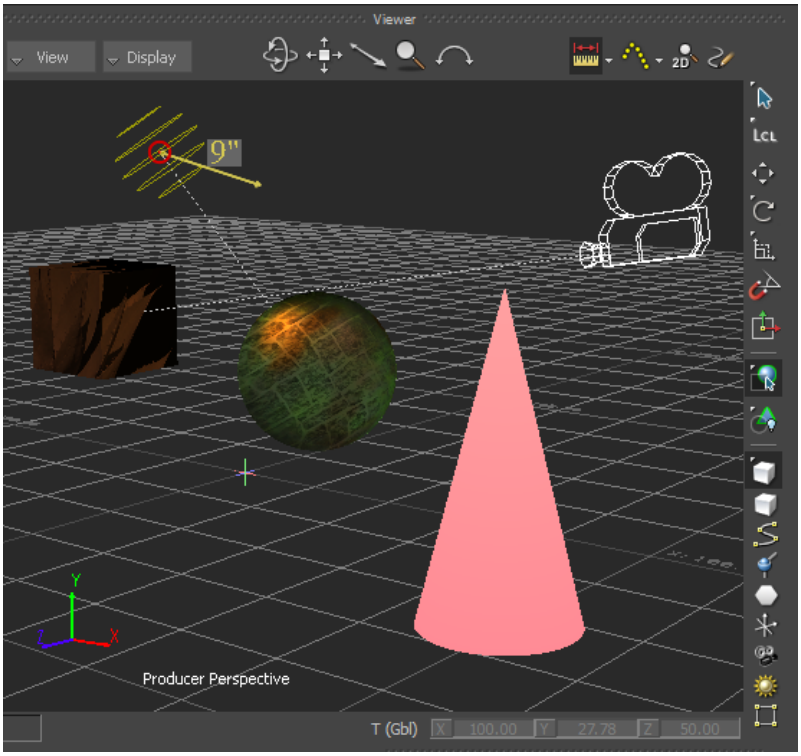
The element highlights.

4 Click the element.

The system **Ruler** "object" start point snaps to the center of the element.

5 Move the cursor toward the second element.

The measuring distance displays and updates dynamically as you start to move the cursor.



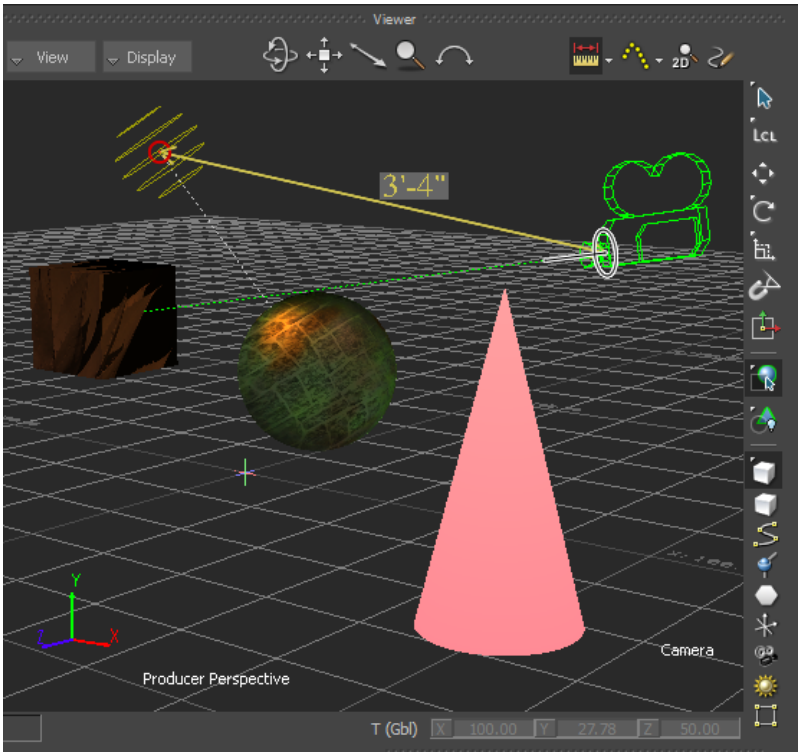
Ruler "object" start point shown snapped to the center of the light

6 Move the cursor () over the camera.

The system **Ruler** "object" end point is automatically positioned at the centre of the camera film back regardless of where you position the cursor.

7 Click-hold the cursor over the camera.

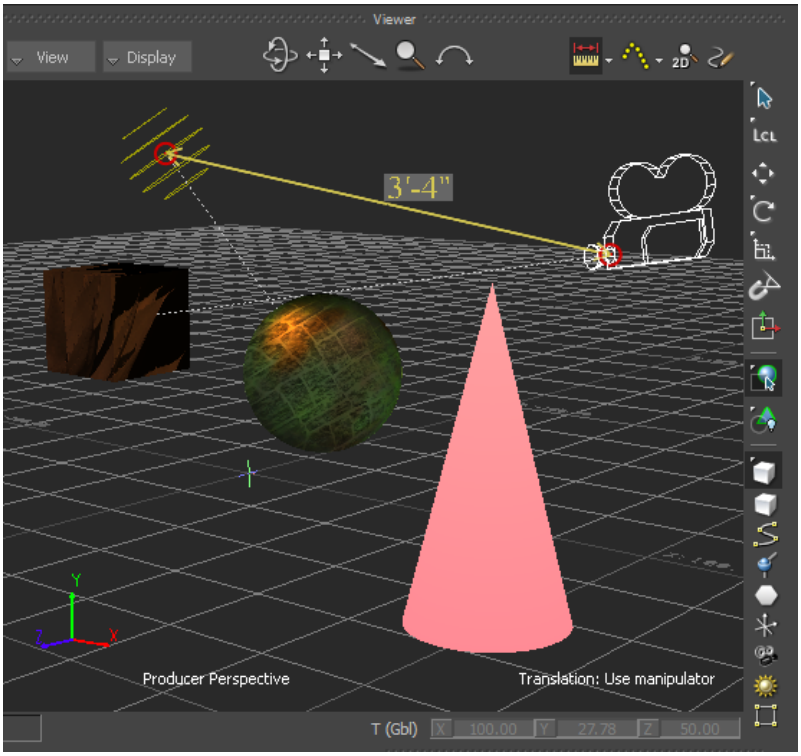
The position of the 3D cursor () follows your cursor movement whereas the 3D cursor () is automatically positioned by default at the centre of the camera film back—the camera's default Rotation pivot.



Distance measured from the centre point of a light to the centre point of the camera film back

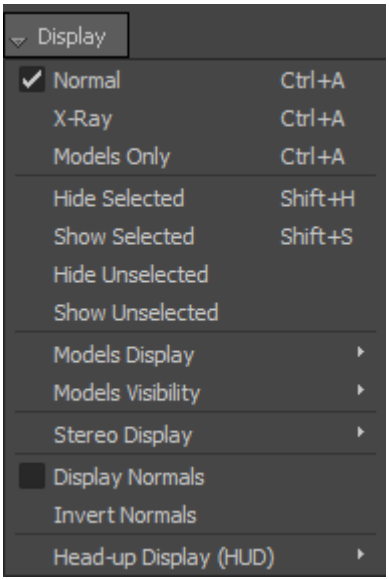
8 Release the cursor.

The system **Ruler** "object" displays the distance between the centre point of the light and the centre point of the camera film back.



To measure the distance between a pivot offset of an object and the surface of another object:

1 In the **Viewer** window **Display** menu, set the display to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** mode.



Setting the **Display** mode to **Normal**, **X-Ray**, **Models Only**, or **Models DisplayWireframe** mode enables you to see objects and models, their bounding box centre (displayed as a Magenta hexagon), and their Rotate and Scale pivots.

NOTE Elements such as lights and cameras are not displayed in**Models Only** display mode.

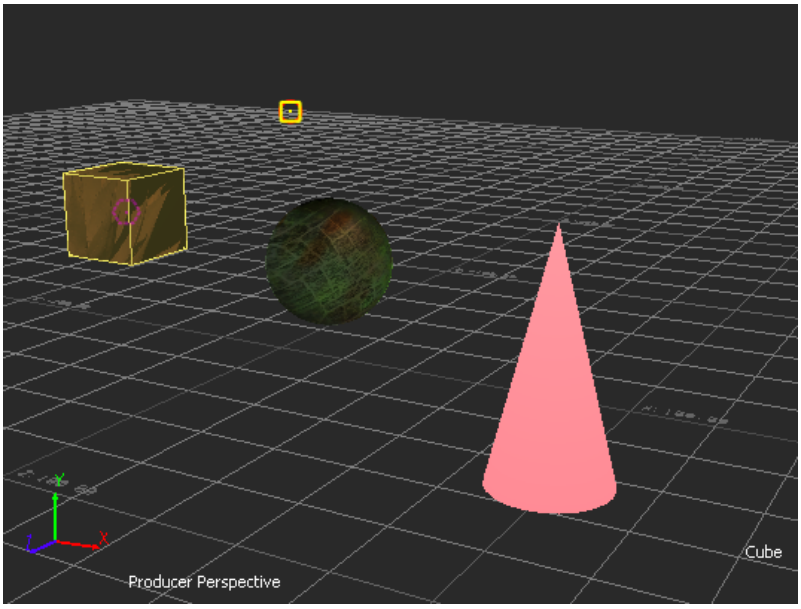
2 In the **Viewer** window, click the **Ruler** Tool () in the Camera View Display toolbar (or press `Ctrl-Shift-R`).

The cursor changes to a 2D cursor ().

3 Hover over the object whose pivot is offset and press `B`.

NOTE Unless a Ruler is being created, the keyboard shortcut `B` is also used when working with optical data to multi-select items to create a Rigid body or a Rigid body constraint.

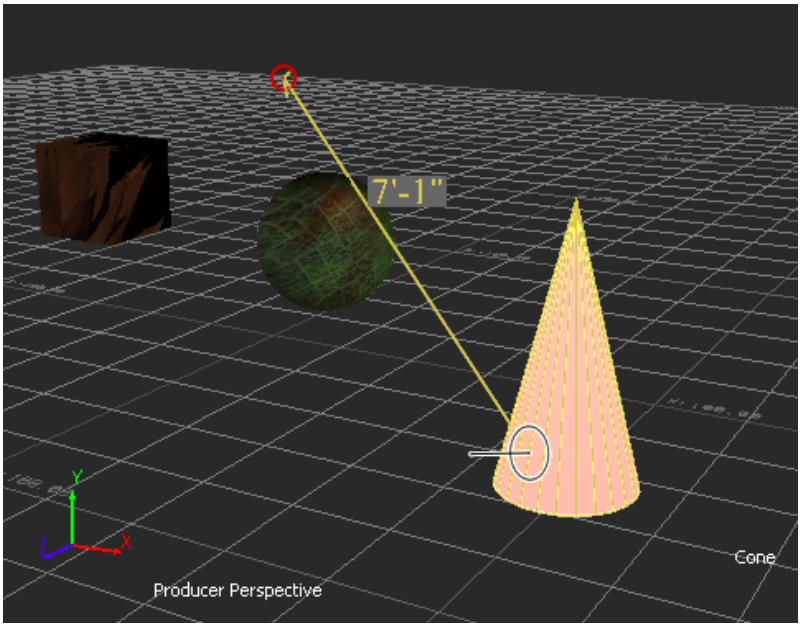
The object is highlighted, and the object's bounding box centre (displayed as a Magenta hexagon) and the Rotate and Scale pivots are displayed, enabling you to snap to the bounding box centre of the object.



4 Click the pivot offset and then release the keyboard shortcut.
The system **Ruler** "object" start point snaps to object's pivot offset.

5 Hover over the second object.
The measuring distance updates as you start to move the cursor.

6 Click-hold to select a surface of the second object.
The cursor changes to a 3D cursor ().



7 Release the cursor.

The system **Ruler** "object" end point snaps to the surface of the second object. The measured distance between the pivot offset of the first object and the surface of the second object is displayed.

To edit the distance between two objects:

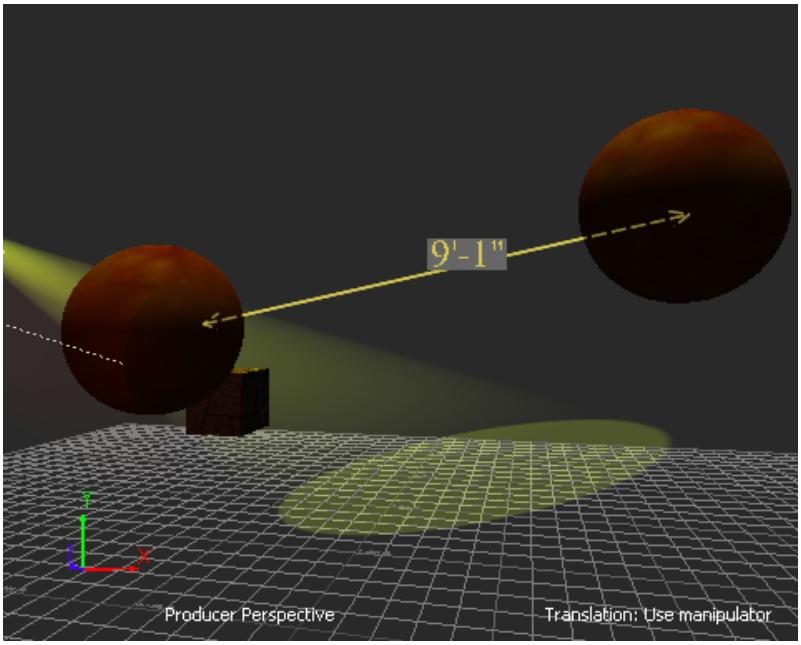
1 In the **Viewer** window, click either of the two objects whose distance is measured.

2 In the **Viewer** window toolbar, click the Translate tool () (or press `T`).

3 In the **Viewer** window, drag the object to the desired position.

The system **Ruler** "object" remains snapped to the objects and the distance between the two objects updates dynamically.

The system **Ruler** "object" is shown as a dashed line when it is occluded, as seen in the following figure.



Ruler shown partially occluded

Deleting and replacing the Ruler

You can delete the Ruler via the **Ruler** tool () arrow (context menu) or via the **Ruler** context menu in the scene. You can replace the Ruler via the Ruler tool context menu or by using the keyboard shortcut.

Since you can only have one Ruler in the scene, you need to either replace or delete the Ruler before you can create another Ruler.

To delete the Ruler:

- Do either of the following:
  - In the **Viewer** window Camera View Display toolbar options (), left-click the **Ruler** tool () arrow (context menu) and choose **Delete Ruler**.

- In the scene, right-click the Ruler measurement units and choose **Delete** from the context menu.

To replace the Ruler:

1. Do either of the following:
   - In the **Viewer** window Camera View Display toolbar options (), left-click the **Ruler** tool () arrow (context menu) and choose **Replace Ruler**.
   - Press `Ctrl-Shift-R`.

   The cursor changes to a 2D cursor ().
2. Hover over an object or element and click or click-hold to snap the **Ruler** "object" start point to the object or element.
3. Hover over the second object or element and click or click-hold to snap the **Ruler** "object" end point to the object or element.

Saving the measured distance between two objects in the scene

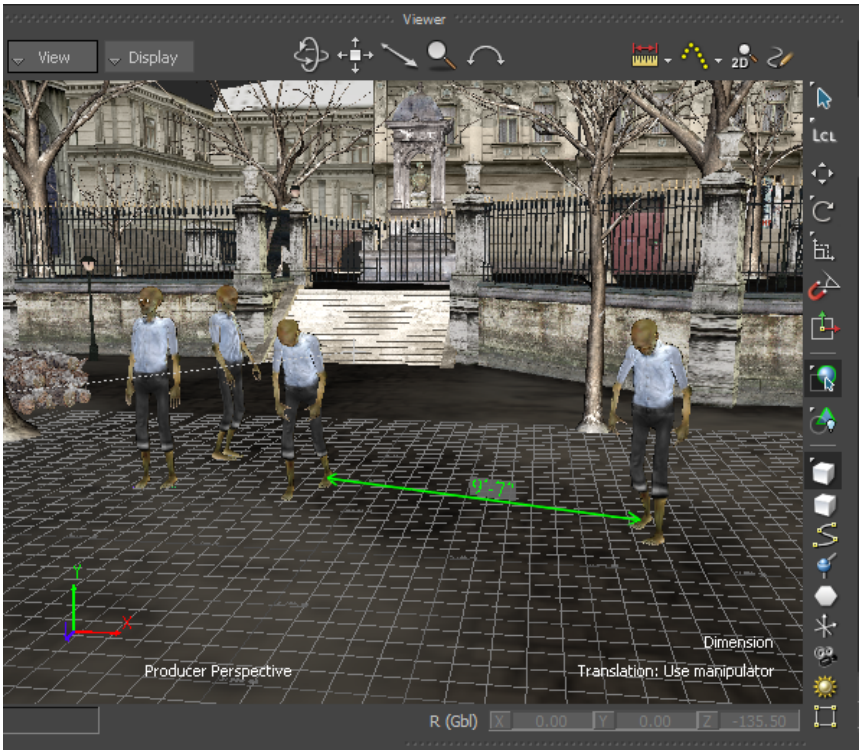
You can save with the scene the distance measured between two objects by converting the system **Ruler** "object" into a **Dimension** object.

When you convert the system **Ruler** "object" into a **Dimension** object, the **Dimension** object retains all the preference settings of the system **Ruler** "object". The **Dimension** object is visible in **Normal**, **X-Ray**, and **Models DisplayWireframe** mode. As the **Ruler** "object", the **Dimension** object always faces the current camera view in **Orthographic** view, enabling you to see the measured distance irregardless of the camera view. In the Perspective views, the dimension units become part of the scene and are 3D objects.

Unlike the **Ruler** "object", the **Dimension** object is an asset. It is a 3D path. It has properties and is accessible via the Asset browser, the Navigator Scene browser, and in Schematic view. You can change what the **Dimension** object

is snapping to, you can add the **Dimension** object as a HUD element, set an offset.

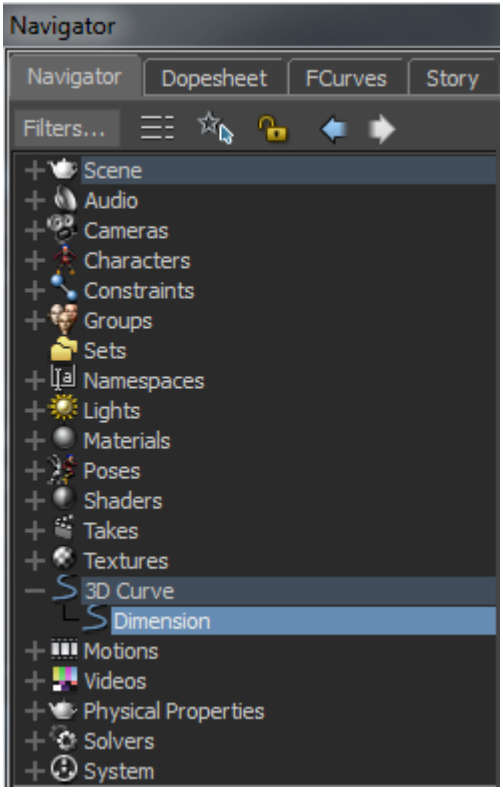
The **Dimension** object is displayed in green when selected and the **Viewer** window indicates it is selected by displaying **Dimension** at the bottom right, as shown in the following figure.



Dimension object shown selected

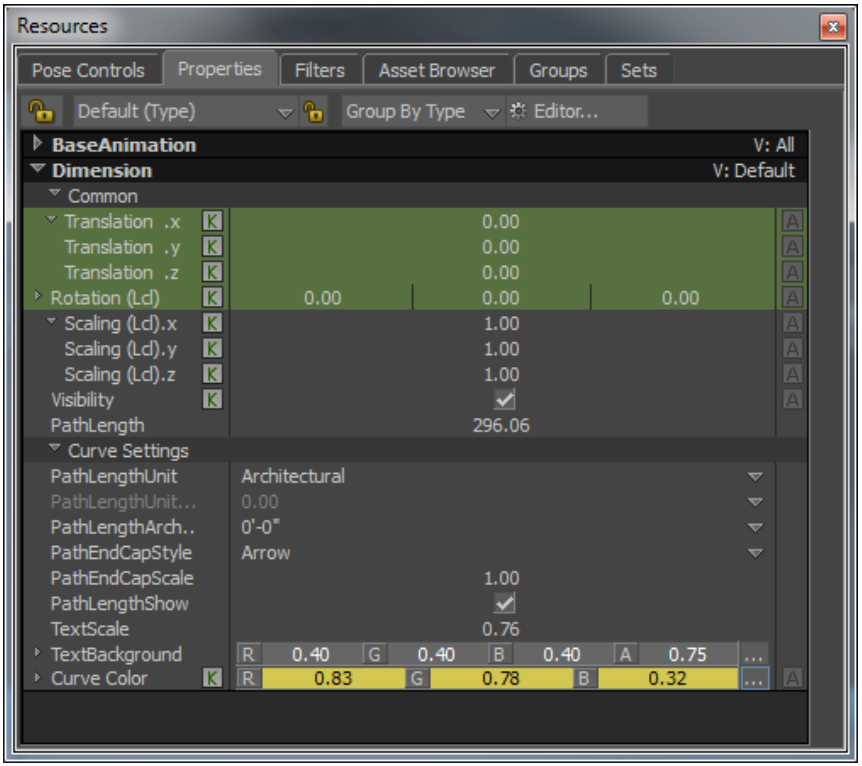
As the **Ruler** "object", the **Dimension** object remains snapped to animated objects or elements.

When you save the **Ruler** "object" as a Dimension object, the **Dimension** object is saved as a 3D path. You can access the **Dimension** object in the Navigator Scene browser, in the 3D Curve branch.



Dimension object saved as a 3D path

If you click the **Dimension** object in the Navigator Scene browser, its properties are displayed in the Property Resources window.



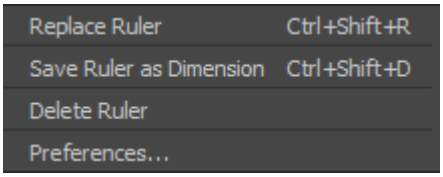
Dimension object properties

The **Dimension** object properties in the Property Resources window are the **Dimension** object properties you can animate, enable, or disable.

Unlike the **Ruler** "object", the **Dimension** object supports "undo" operations.

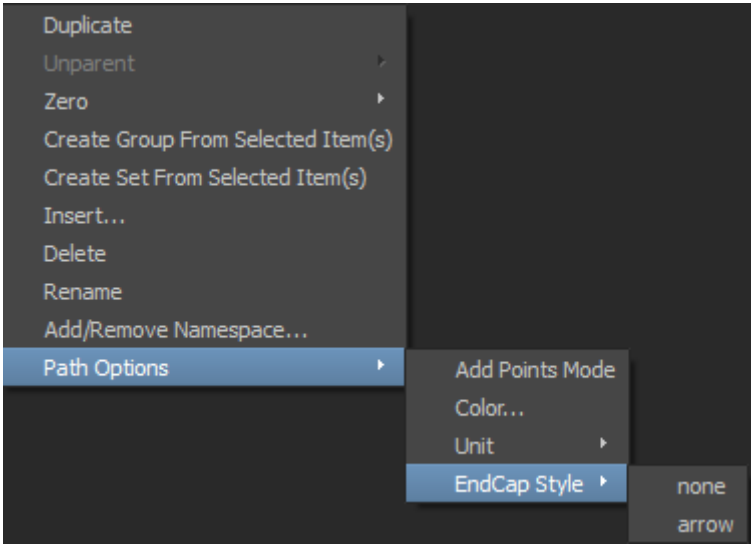
To save with the scene the measured distance between two objects or elements:

- In the **Viewer** window Camera View Display toolbar options (), left-click the **Ruler** tool () arrow (context menu) in the Camera View Display toolbar and choose **Save Ruler as Dimension** from the context menu (or press `Ctrl-Shift-D`).

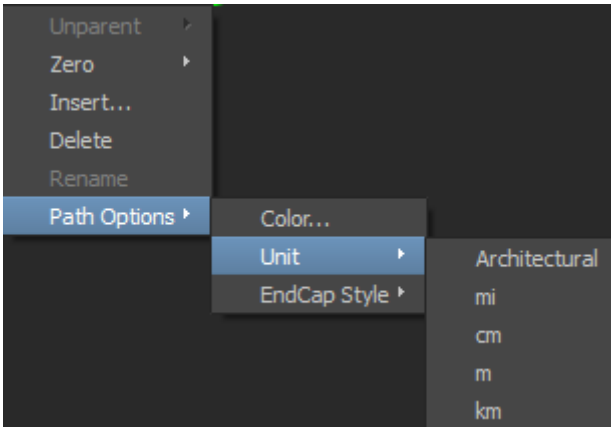


The **Ruler** "object" is saved as a **Dimension** object with the scene. You can now animate the **Dimension** object properties and change the **Dimension** preferences.

The **Dimension** preferences are accessible via the **Ruler** tool () Preferences context menu, via the menu bar **Settings ➤ Preferences**, and via the **Dimension** object context menu in the **Viewer** window.



Dimension object context menu



Dimension object context menu

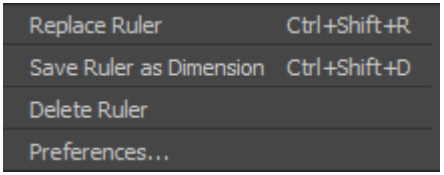
Changes to the Preferences take effect the next time you launch the software.

Changing the Ruler preferences

You can change the settings of the **Ruler** in the **Ruler** preferences via the **Settings ➤ Preferences** menu, via the **Ruler** tool context menu, or via the Ruler context menu in the scene.

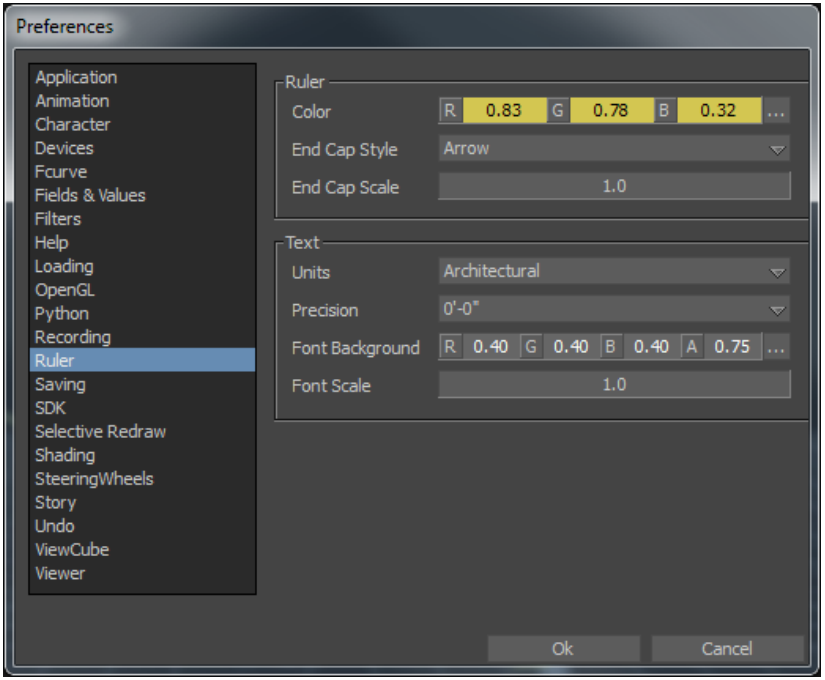
To access the Ruler preferences, do either of the following:

- In the **Viewer** window, left-click the **Ruler** tool () arrow (context menu) in the Camera View Display toolbar options () and choose **Preferences** from the context menu.



Ruler tool context menu

■ From the menu bar, select **Settings ➤ Preferences** and in the **Preferences** window, click the **Ruler** preference option.

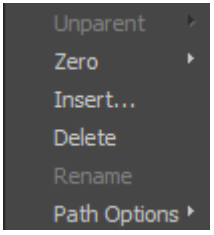


Ruler preferences

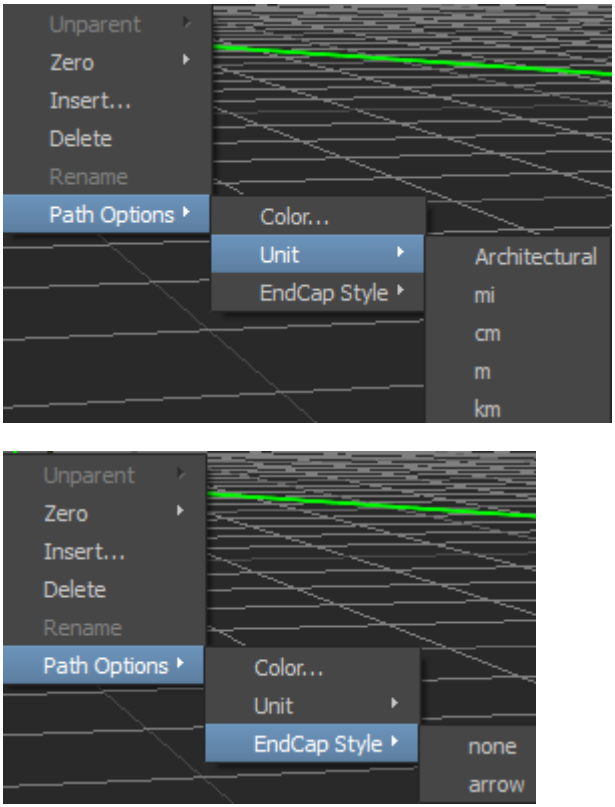
To change the Ruler default settings via the Viewer window:

NOTE A system **Ruler** "object" is required in the scene.

1 In the **Viewer** window, right-click the system **Ruler** "object".
A context menu displays.



2 Choose the **Path Options** context menu to access the **Ruler** preference settings.



See Ruler preference settings (page 1).

Locking and Muting Properties and Channels

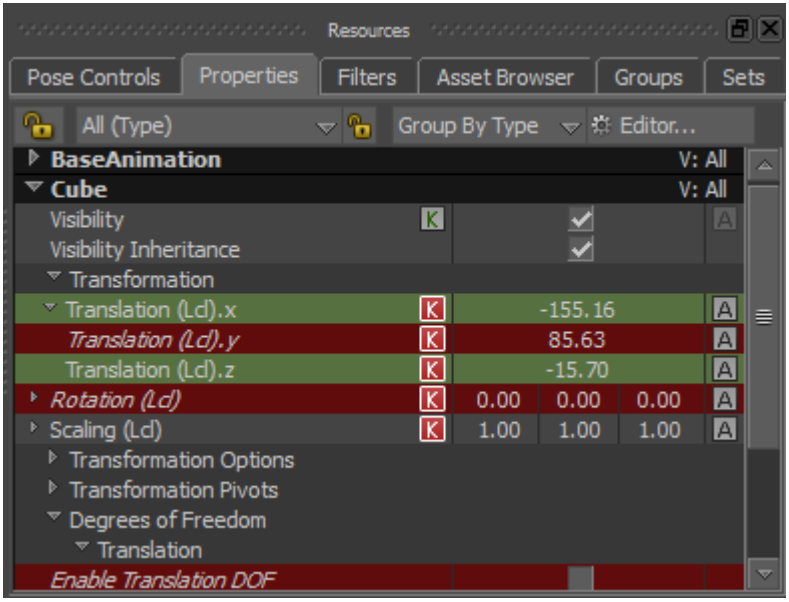
Technical Directors and animators need to have the ability to prevent body parts from receiving keys. For example, if there is more than one animator working on a character rig and the Technical Director does not want animation to be created to parts of the character, one way of achieving this is to lock or mute properties and channels.

You can lock or mute properties or channels to prevent any changes to the animation from happening on the selected property or channel. You cannot merge animation on a locked property or channel. Locked and muted properties and channels are retained when the *.fbx* file is exported and imported to the Maya software and re-imported to MotionBuilder.

Locking properties and channels

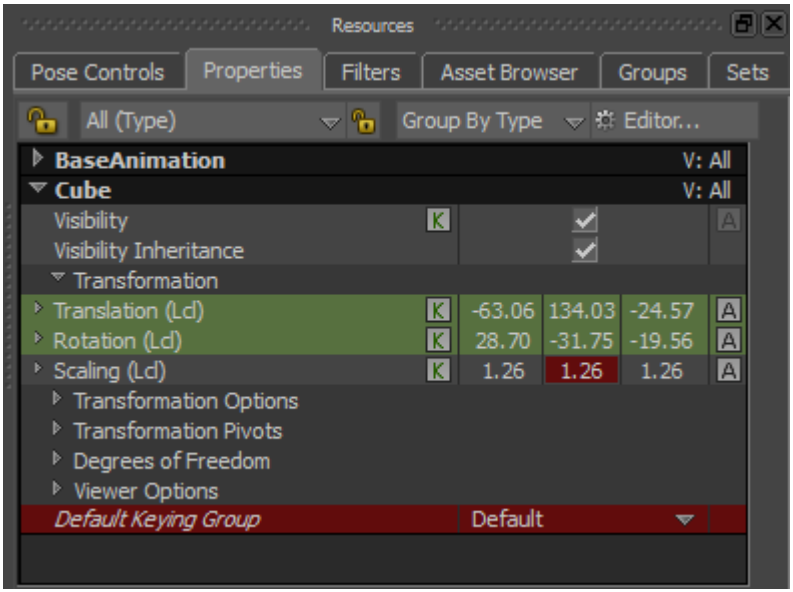
You can lock properties or channels to prevent any changes to the animation from happening on the selected property or channel. You cannot change values nor add keyframes on a locked property or channel and you cannot merge animation on a locked property or channel. Locked properties and channels are retained when the *.fbx* file is exported and imported to the Maya software and re-imported to MotionBuilder.

Properties and channels are accessible via the Property Resources and Properties window, Dopesheet Property list, and the FCurves Property list. The properties displayed are the properties of the selected object, model or element. Locked properties and channels are displayed on a red background in the Resources and Properties windows, as well as in the Navigator window and FCurves Property list.



Locked Properties and channels are displayed on a red background

A collapsed property that shows a value on a red background (as in the following figure) indicates a channel is locked.



Y Scaling channel shown locked

Once you choose to lock or unlock a property, you can undo (`Ctrl-Z`) your action.

You can choose to lock to a local value a channel or property that is set as a global value by using a relation constraint.

Locked properties and channels are locked and reflected in all the applicable Viewer Reference modes (Global Reference mode 

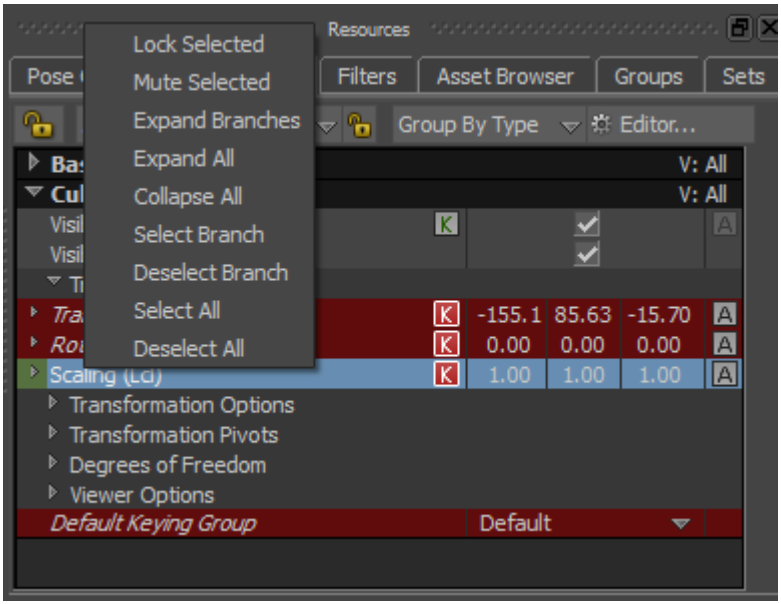
, Local Reference mode 

, and Additive Reference mode 

), even if you switch Reference modes as you work on the scene.

To lock a property in the Resources window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.
2. In the Resources window, click the Properties tab.
3. In the Properties pane, right-click the property you want to lock.



The context menu displays the options available for the selected property.

4 Choose Lock Selected.

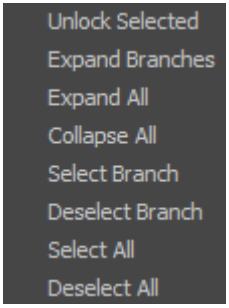
The selected property is displayed on a red background.

To lock multiple properties simultaneously:

- `Ctrl`-click the properties and choose Lock Selected from the context menu.

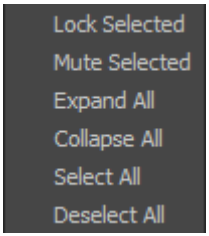
To unlock a property:

- Right-click the property you want to unlock and choose Unlock Selected from the context menu.



To lock a channel in the Resources window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.
2. In the Resources window, click the Properties tab.
3. In the Properties pane, expand a property if required to access its channels.
4. Right-click the channel you want to lock and choose Lock Selected from the context menu.



The context menu displays the options available for the selected channel.

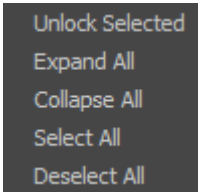
The selected property is displayed on a red background.

To lock multiple channels simultaneously:

- `Ctrl`-click the channels and choose Lock Selected from the context menu.

To unlock a channel:

- Right-click the channel you want to unlock and choose Unlock Selected from the context menu.



The context menu displays the options available for the selected channel.

Visual feedback of locked transforms on manipulators

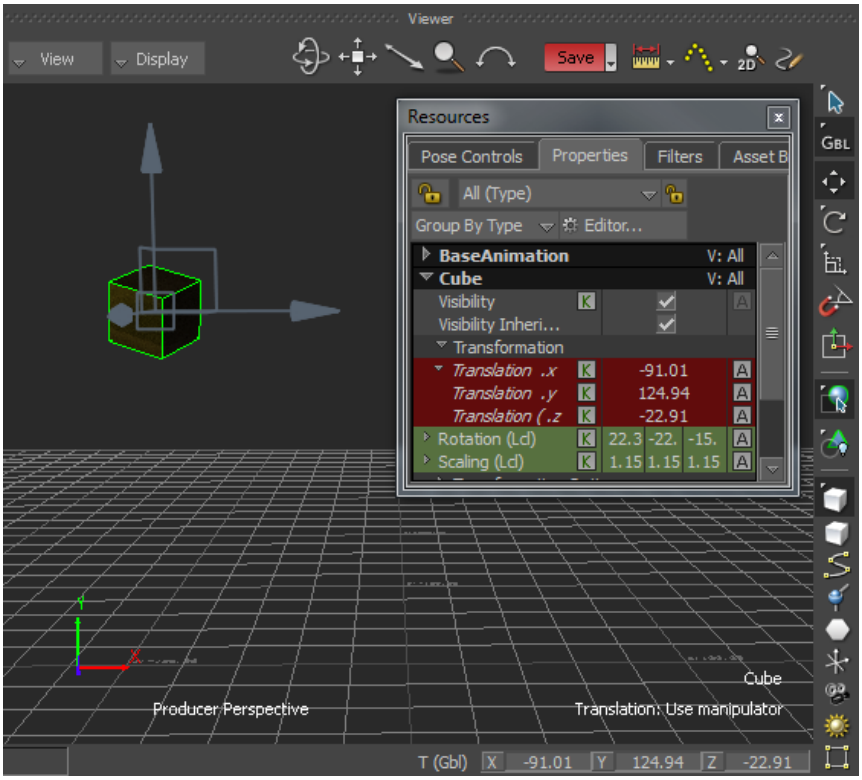
The visual feedback of locked transforms on manipulators enables you to quickly identify what is locked or partially locked. This visual feedback is very useful especially if (for example) multiple individuals work on the same character rig and the Technical Director does not want animation to be created to parts of the character.

A locked Translation property displays gray X, Y, Z Translation handles in the Viewport, whether you are in the Global Reference mode (

) or in the Local Reference mode (

).

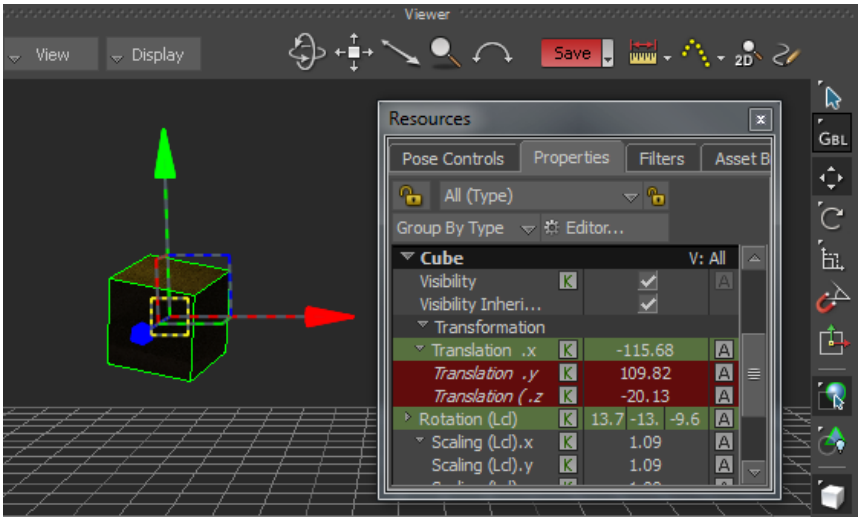
The following figure displays locked Translation property in the Global Reference mode.



Locked Translation property displays gray X, Y, Z Translation handles

A locked Translation channel or two locked Translation channels display colored dash X, Y, Z Translation handles in the Viewport, whether you are in the Global Reference mode () or in the Local Reference mode ().

The locked Translation (Lcl),y and Translation (Lcl),z channels in the Resources window in the following figure are displayed by a colored dash X, Y, Z Translation handles in the Viewport, in the Global Reference mode.



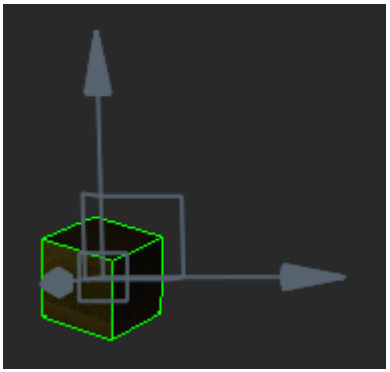
Locked Y and Z Translation channels display colored dash X, Y, Z Translation handles

To display a locked Translation property or channel in the Viewer window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.

2. In the Viewer window toolbar select the Translate tool ( ), or use the Translate keyboard shortcut `T` in the Viewer window.

   Gray X, Y, Z Translation handles indicate a locked Translation property, whether you are in the Global Reference mode (GBL) or in the Local Reference mode (LCL).

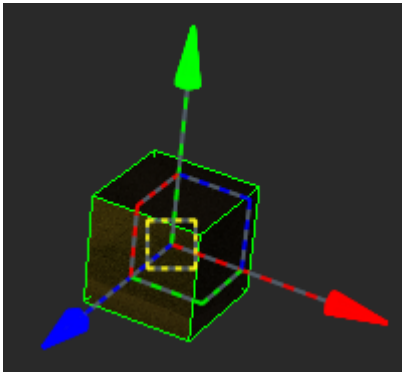


Locked Translation property displays gray X, Y, Z Translation handles

Colored dash X, Y, Z Translation handles indicate one or two of the three Translation channels are locked, whether you are in the Global Reference mode (

) or in the Local Reference mode (

).



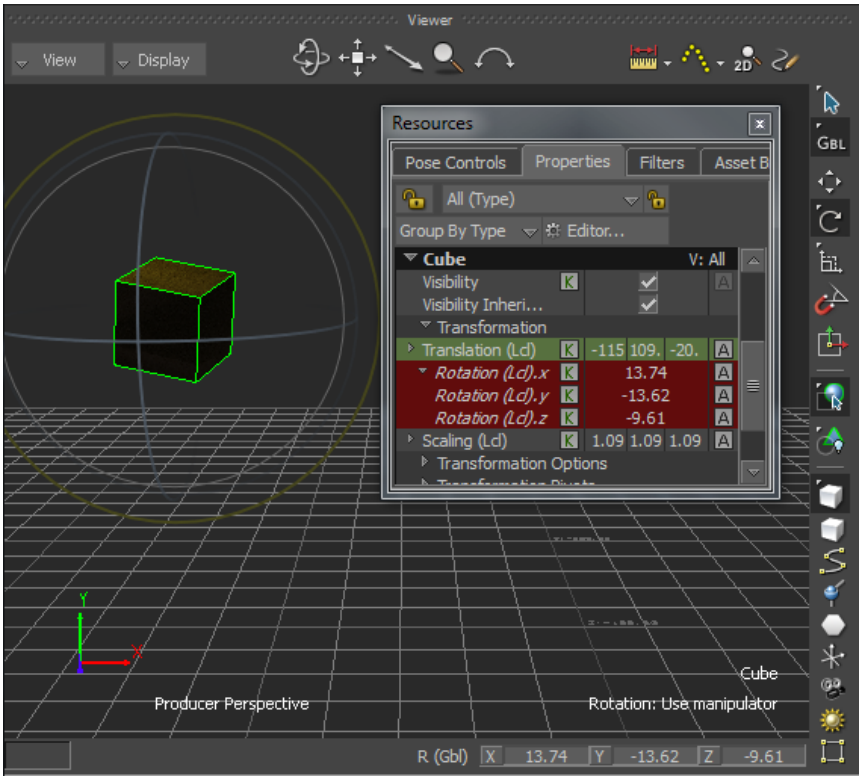
Locked Translation channels display colored dash X, Y, Z Translation handles

A locked Rotation property displays gray X, Y, Z Rotation handles in the Viewport, whether you are in the Global Reference mode (

), the Local Reference mode (

), or the Additive Reference mode (

).



Locked X, Y, Z Rotation channels display gray X, Y, Z Rotation handles

The visual feedback in the Viewer window for locked Rotation channels differs depending on the selected Viewer Reference mode (

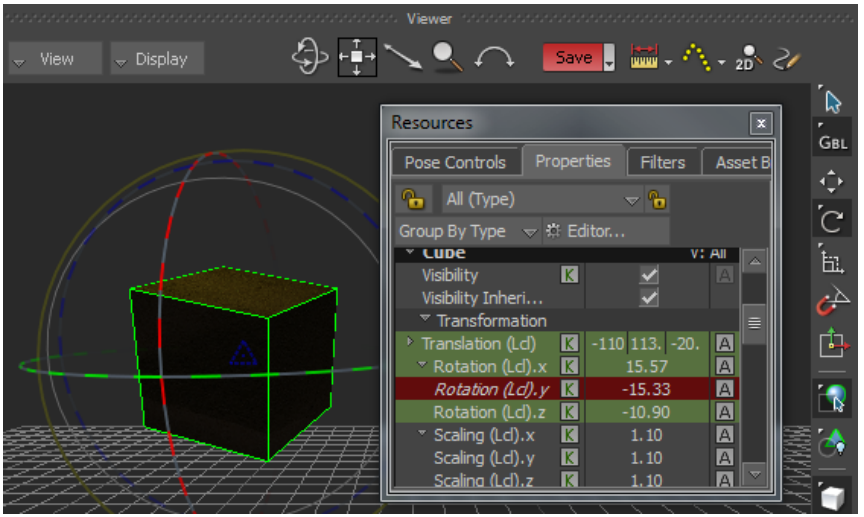
, 

, or 

).

If you are in Global Reference mode (

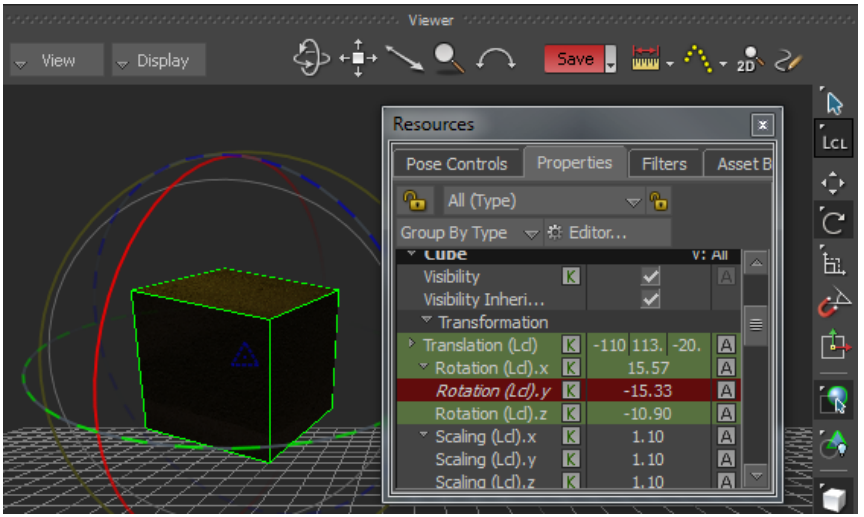
) and a Rotation channel is locked, the X, Y , Z Rotation handles in the Viewer window are colored dash, as shown in the following figure.



Locked Rotation (Lcl),y channel displays colored dash X, Y, Z Rotation handles

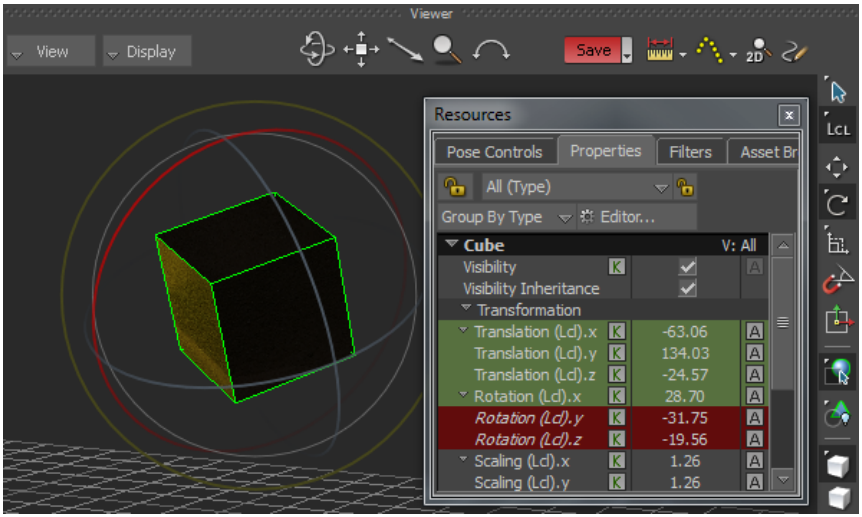
If you are in Local Reference mode (

) and the Rotation (Lcl),y channel or Rotation (Lcl),z channel is locked, the Y and Z Rotation handles are colored dash, as shown in the following figure.



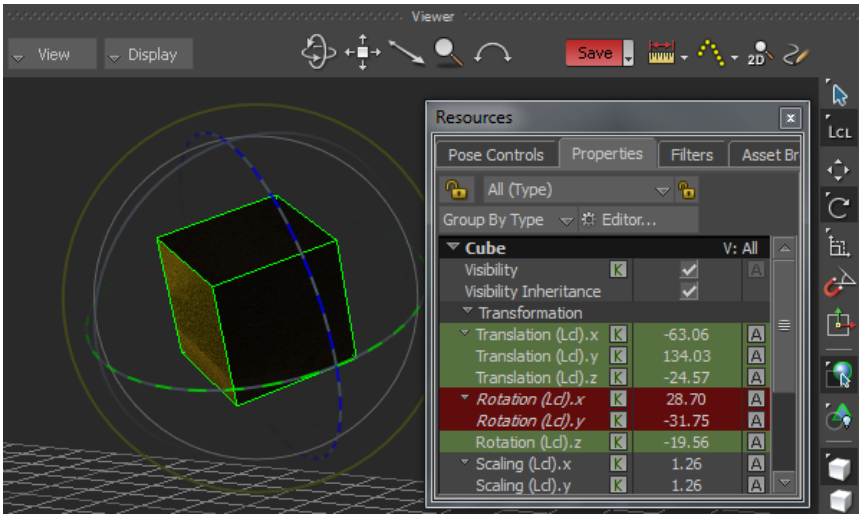
Locked Rotation (Lcl),y channel displays colored dash Y and Z Rotation handles

If you are in Local Reference mode () and the Rotation (Lcl),y and Rotation (Lcl),z channels are locked, their Rotation handles are gray, as shown in the following figure.



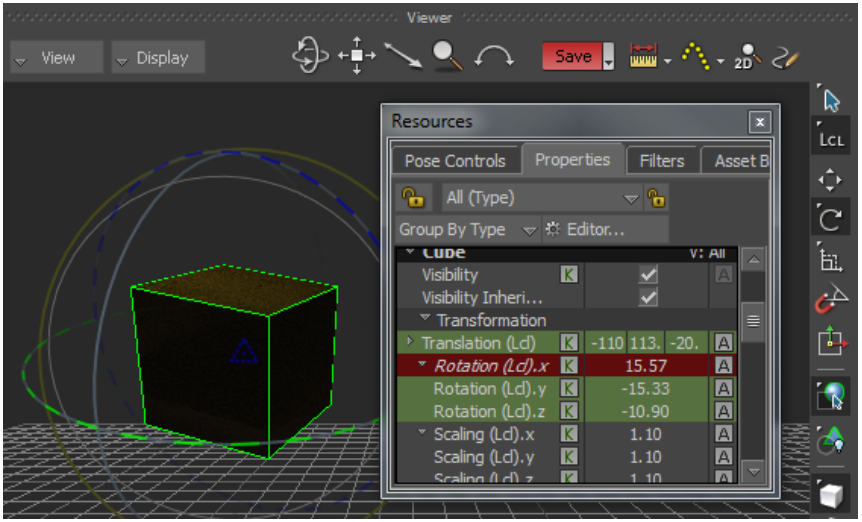
Locked Rotation (Lcl),y and z channels display gray Y and Z Rotation handles

If you are in Local Reference mode () and the Rotation (Lcl),x and Rotation (Lcl),y channels are locked while the Rotation (Lcl),z channel is unlocked, the Rotation handle for the Rotation (Lcl),x channel is gray and the Rotation handles for the Rotation (Lcl),y and Rotation (Lcl),z channels are colored dash.



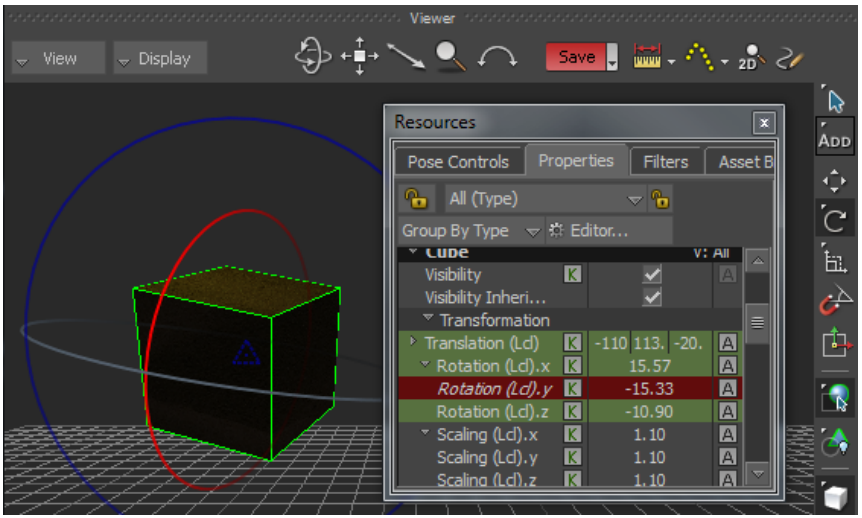
Locked Rotation (Lcl),x and y channels display gray X Rotation handle and colored dash Y and Z Rotation handles

If you are in Local Reference mode () and the Rotation (Lcl),x channel is locked, the X Rotation handle is gray and the Y and Z Rotation handles are colored dash, as shown in the following figure.



Locked Rotation (Lcl),x channel displays a gray X Rotation handle and colored dash Y and Z Rotation handles

If you are in Additive Reference mode () and a Rotation channel is locked, the locked Rotation channel displays a gray Rotation handle, as shown in the following figure.



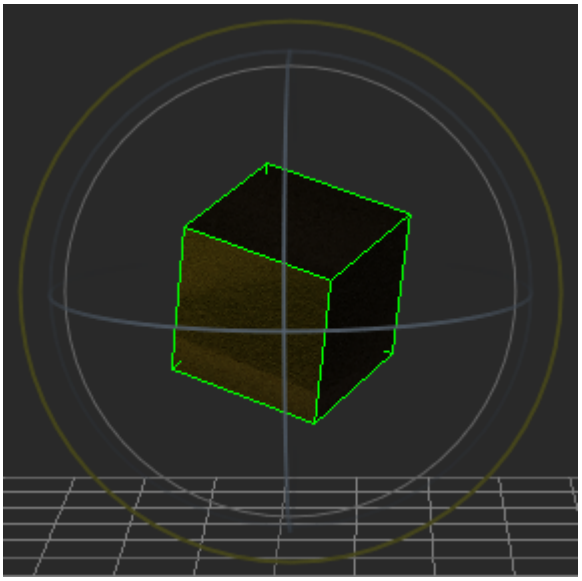
Locked Rotation (Lcl),y channel displays a gray Y Rotation handle

To display a locked Rotation property or channel in the Viewer window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.

2. In the Viewer window toolbar select the Rotate tool () or the Rotate Around tool (), or use the Rotate keyboard shortcut `R` in the Viewer window.

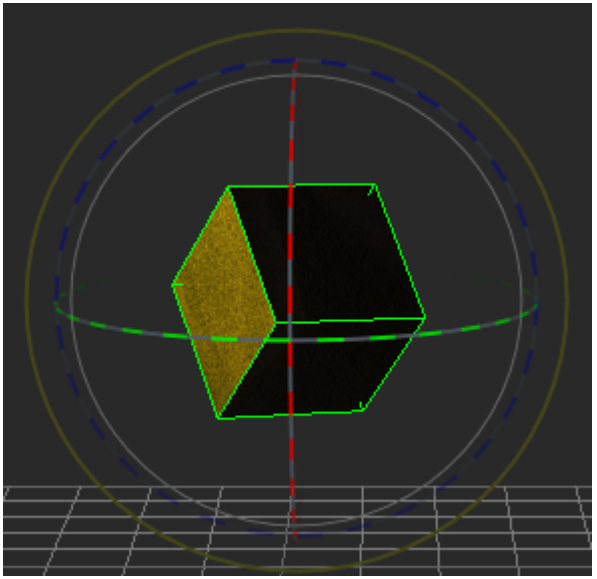
   Gray X, Y, Z Rotation handles indicate a locked Rotation property, whether you are in the Global Reference mode (), the Local Reference mode (), or the Additive Reference mode.



Locked Rotation property displays gray X, Y, Z Rotation handles

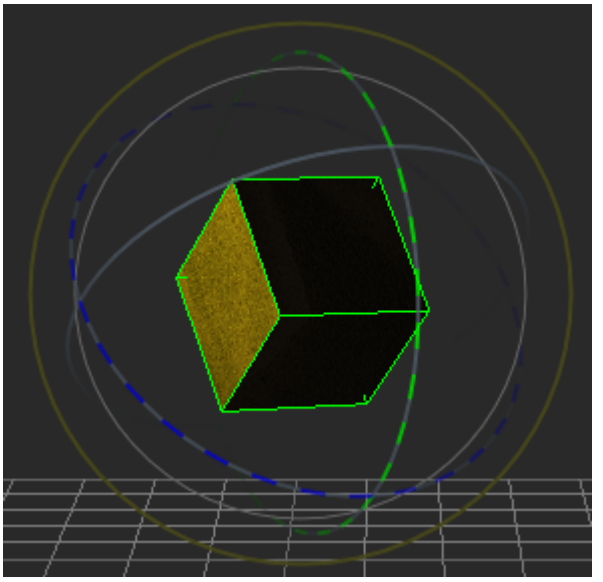
In Global Reference mode (

), colored dash X, Y, Z Rotation handles indicate one or two of the Rotation channels are locked.



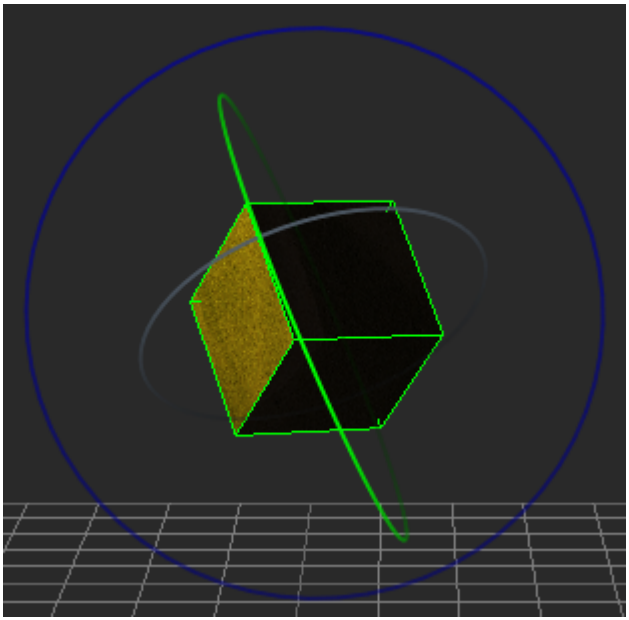
In Local Reference mode (

), a gray Rotation handle indicates a locked Rotation channel and colored dash Rotation handles indicate channels are not locked. The following figure shows the X Rotation channel is locked.



In Additive Reference mode (

), a gray Rotation handle indicates a locked Rotation channel and colored Rotation handles indicate channels that are not locked. The following figure shows the X Rotation channel is locked.



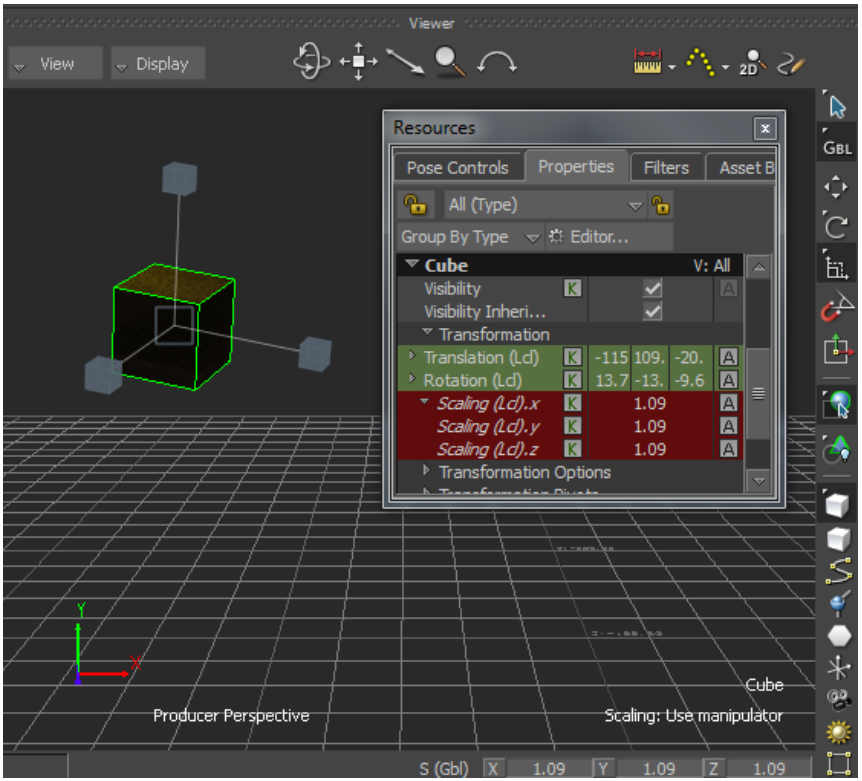
A locked Scaling property displays gray X, Y, Z Scaling handles in the Viewport, whether you are in the Global Reference mode (

), the Local Reference mode (

), or the Additive Reference mode (

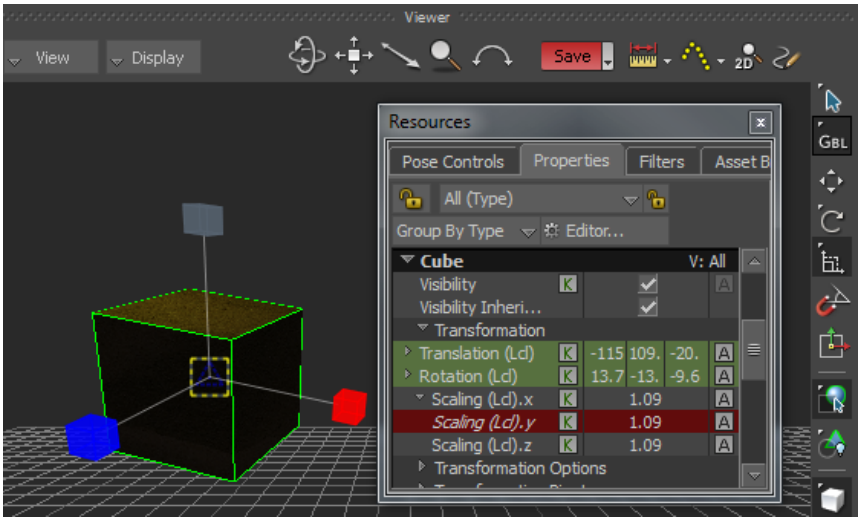
).

The following figure displays locked Scaling in the Global Reference mode.



Locked Scaling displays gray X, Y, Z Scaling handles

If you lock a Scaling channel, the Scaling handle in the Viewer window is gray as shown in the following figure, whether you are in the Global Reference mode () or in the Local Reference mode ().



Locked Scaling channel displays a gray Scaling handle

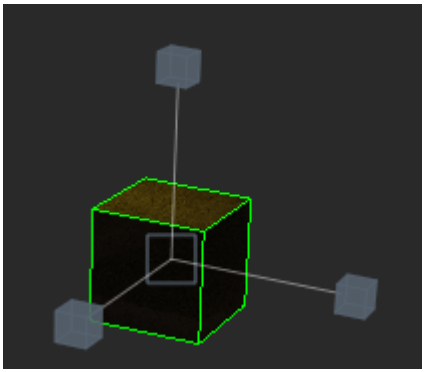
To display a locked Scaling property or channel in the Viewer window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.

2. In the Viewer window toolbar select the Scale Uniform tool () or the Scale Volumetric tool (), or use the Scale keyboard shortcut `S` in the Viewer window.

   Gray X, Y, Z Scaling handles indicate a locked Scaling property, whether you are in the Global Reference mode (), Local Reference mode (), or Additive Reference mode.

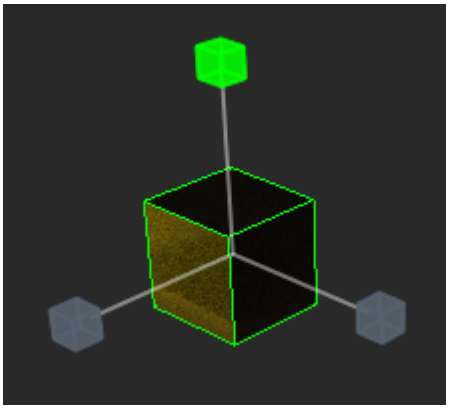
   The following figure shows the Scaling property is locked and displayed by gray X, Y, Z Scaling handles in the Global Reference mode () with the Scale Uniform tool () selected.



Locked Scaling property displays gray X, Y, Z Scaling handles

The following figure shows the Scaling (Lcl),x and Scaling (Lcl),z channels are locked and displayed by gray X and Z Scaling handles in Global Reference mode (

) with the Scale Volumetric tool selected.



Locked X and Z Scaling channels display gray X and Z Scaling handles

Muting animated Transforms

You mute and unmute animated Transformation properties and channels similarly to locking and unlocking Transformation properties and channels to prevent any changes to the animation from happening on the selected property or channel. When an animated Transformation property or channel is muted, its current value becomes the static value for this property or channel.

Muted properties and channels are retained when the *.fbx* file is exported and imported to the Maya software and re-imported to MotionBuilder.

Properties and channels are accessible via the Property Resources and Properties window, Dopesheet Property list, and the FCurves Property list. The properties displayed are the properties of the selected object, model or element. You can mute unlocked and locked animated channels and properties. If you want to mute a locked property or channel, you must first unlock the property or channel.

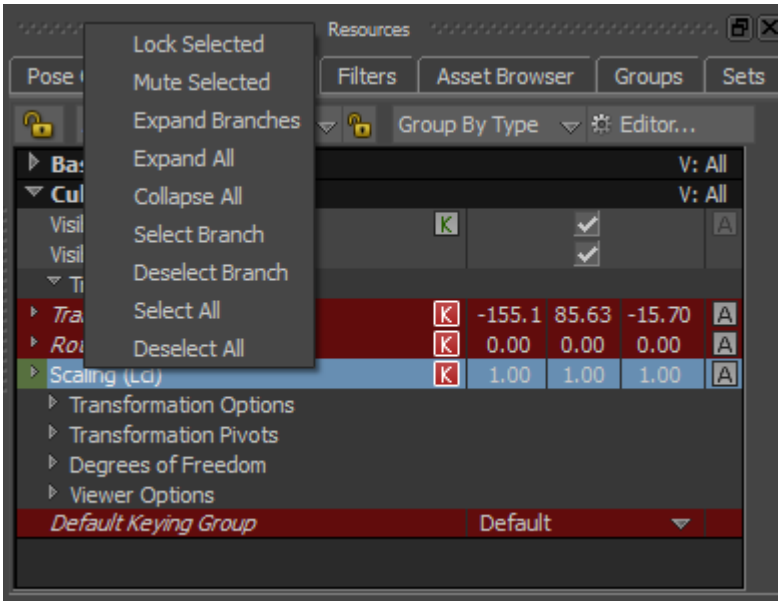
You can only mute animated Transformation properties or channels.

Regardless of the state of the Transformation property or channel, if there is no keyframe on the current frame, a gray keyframe button () is displayed next to the property or channel. If there is a keyframe on the current frame, a red keyframe button () is displayed next to the property or channel. Deleting the keyframe on the current frame displays a gray keyframe button (). Changing values and clicking the red keyframe button () creates a keyframe () for the current value.

Clicking the Animate button ()of a muted Transformation channel or property clears all the animation of the property and unmutes the property.

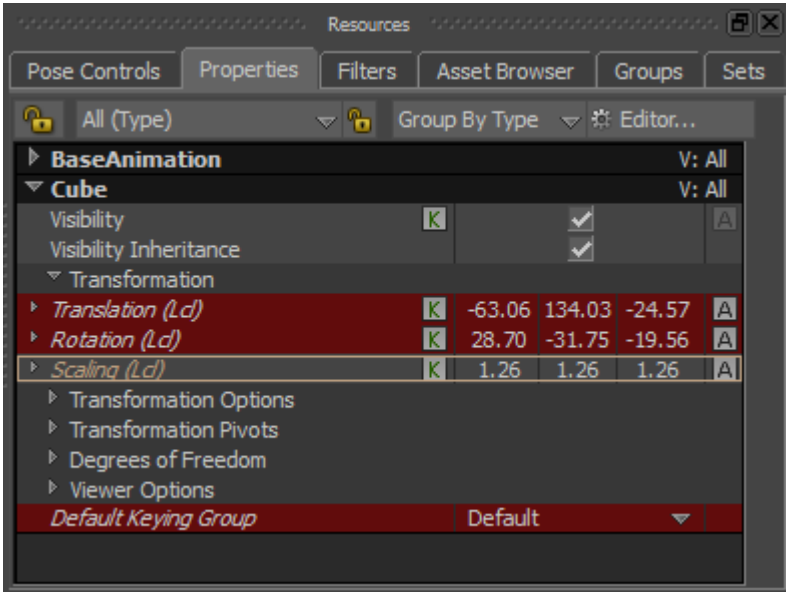
To mute an animated property in the Resources window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.
2. In the Resources window, click the Properties tab.
3. In the Properties pane, right-click the property you want to mute.



The context menu displays the options available for the selected property.

4 Choose Mute Selected.



Scaling property is shown muted

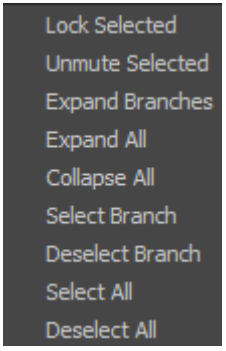
5 (Optional) Expand the muted property to see how muted properties are displayed.

To mute multiple animated properties simultaneously:

- `Ctrl`-click the properties and choose Mute Selected from the context menu.

To unmute a property:

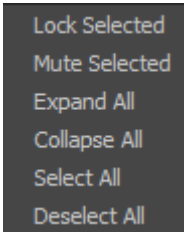
- Right-click the property you want to unmute and choose Unmute Selected from the context menu.



The context menu displays the options available for the selected property.

To mute an animated channel in the Resources window:

1. In the Navigator window Scene browser or in the Viewer window, select an object or element.
2. In the Resources window, click the Properties tab.
3. In the Properties pane, expand a property if required to access its channels.
4. Right-click the channel you want to mute and choose Mute Selected from the context menu.



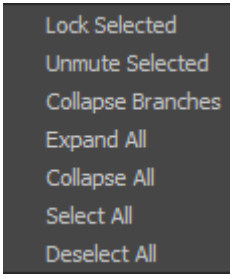
The context menu displays the options available for the selected channel.

To mute multiple animated channels simultaneously:

- `Ctrl`-click the channels and choose Mute Selected from the context menu.

To unmute a channel:

- Right-click the channel you want to unmute and choose Unmute Selected from the context menu.



The context menu displays the options available for the selected property.

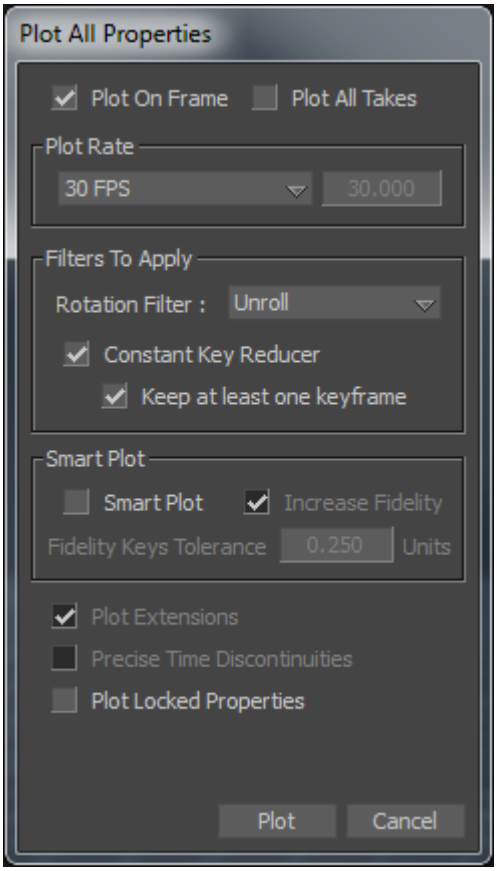
Baking (plotting) and clearing locked and muted properties

Now that you can lock and mute properties, you can also Bake (plot) these properties. When doing this, you can choose to clear the locked properties after the baking process automatically. Unlike locked properties, muted properties are Baked (plotted), cleared, and unmuted by default.

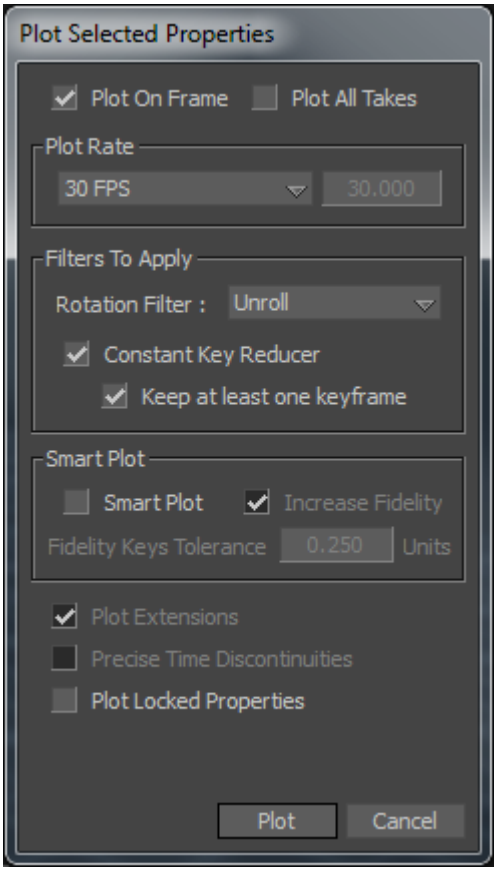
Locked properties and channels are not Baked (plotted) nor cleared by default. When you choose to bake (plot) Skeleton, Control Rig, Body Part properties, you can enable **Plot Locked Properties**. The **Plot Locked Properties** option is disabled by default however, after enabling the **Plot Locked Properties** once, MotionBuilder retains this change the next time you choose to Bake/plot.

Depending on the selection, the Plot options and dialogues are available via the Character Controls menu, the Key Controls Animation menu, the Character Settings in the Navigator window, and the Story window.

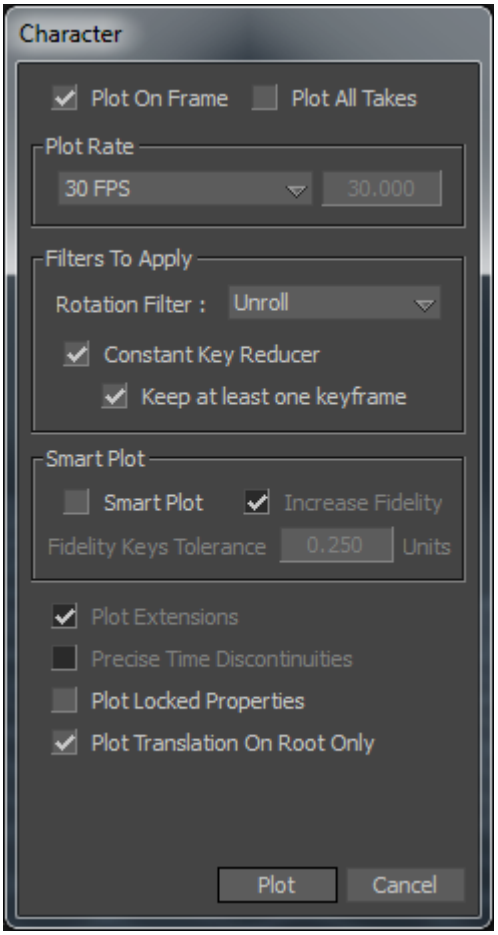
The Plot Locked Properties option is available in the following Plot dialogues.



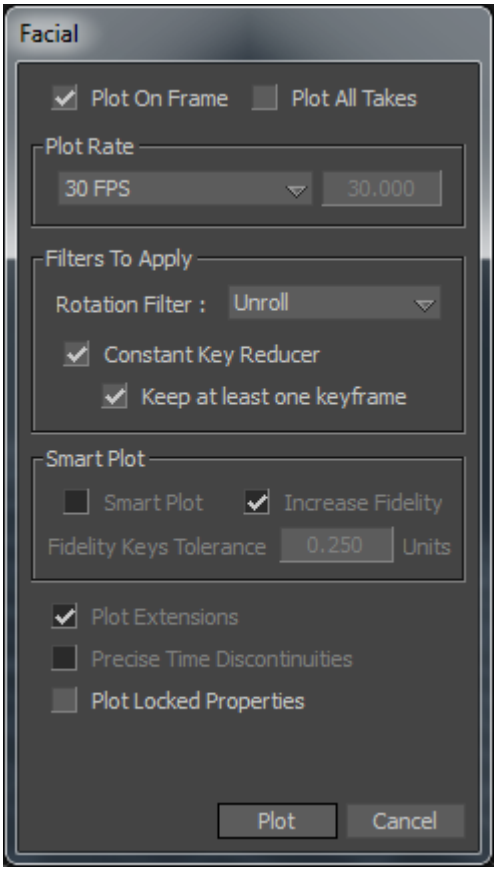
Plot All Properties dialog



Plot Selected Properties dialog

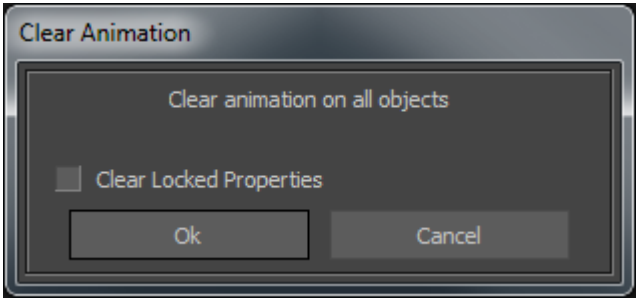


Character dialog

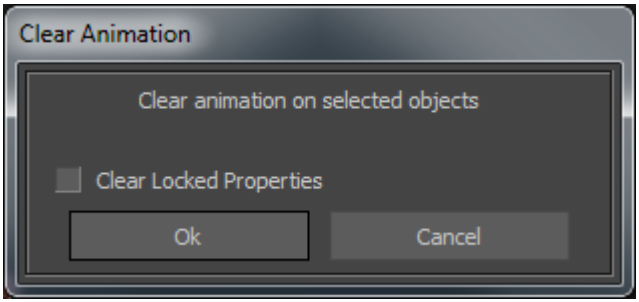


Facial dialog

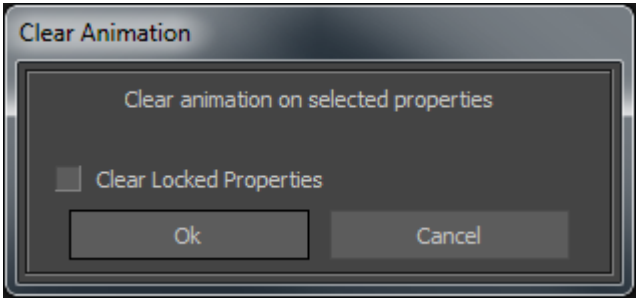
You also have the option to clear the animation on locked properties.



Clear Animation on all objects



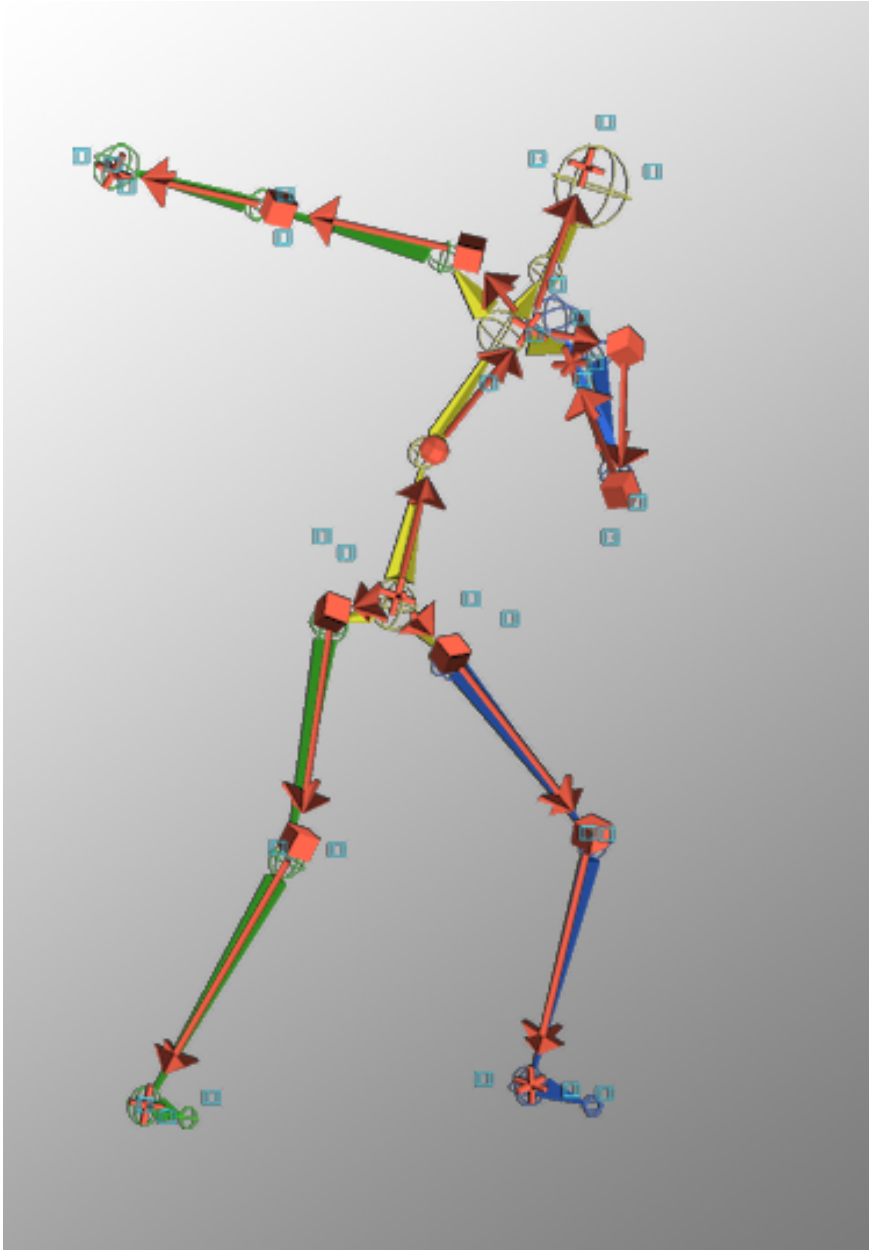
Clear Animation on selected objects



Clear Animation on selected properties

Flexible Mocap

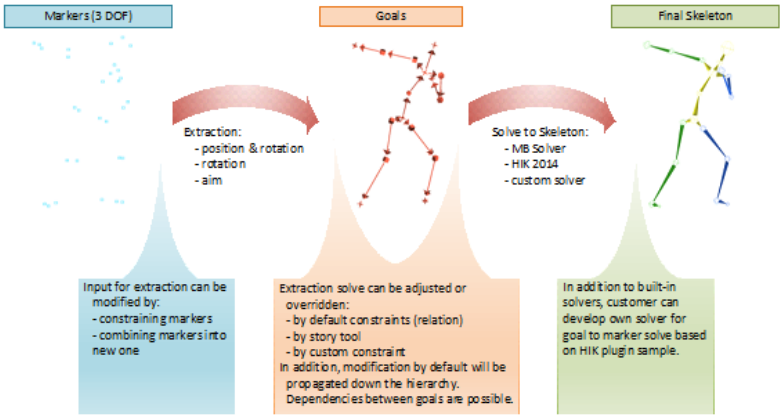
The Flexible Mocap workflow enables you to use a flexible and open solving solution based on HIK or your custom solver and to efficiently apply with ease and precision optical motion capture data to your HIK defined character skeleton. The ability to select markers as a source, modify the input markers, adjust or override the extraction solve, and stretch the characters spine and neck all contribute to the precision and realism of the resulting solve.



Flexible Mocap

Flexible pipeline

The flexible mocap pipeline entails two main steps: "Extraction" and "Goals". "Extraction" takes as an input a set of optical markers and extracts from these (optical markers) a set of "Goals". These goals which can be interpreted as controlling the character's rig are then used to solve to the final skeleton and get the actual character animated. These two steps give open access to input, intermediate and output data, which allows a great deal of flexibility. There are multiple ways user can inject custom logic in the pipeline.



Flexible mocap pipeline

The simplest way to influence the motion capture pipeline is to modify the input markers. This allows "low-level" corrections targeted at the motion capture data. For instance, markers can be constrained in different ways to enforce a given configuration or to correct artifacts such as marker sliding. More complex operations can also be done on markers, such as combining several markers into new ones. This can allow average or filtering schemes to be applied in real-time instead of offline by motion capture hardware manufacturer's clean-up software.

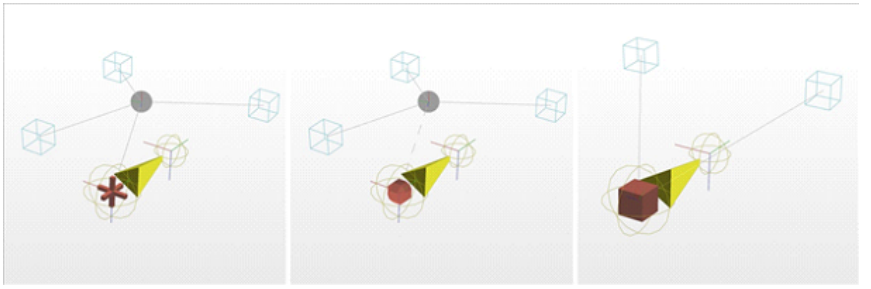
Custom logic can be injected on extracted goals. These goals can be thought of as temporary (IK) goals that the next solving step uses as an input. Those extracted goals are a nice higher-level, more intelligible place to apply correction then lower-level input markers or output bones. They also take into account the whole character structure to perform corrections which is more easily done on high-level goals than on low-level markers. Relation constraints can also be used to add custom logic to the extraction. For instance, goals can be constrained not to allow knee snapping. In addition, the Story tool can be used to add animation on top of extracted goals which can be very useful, for

instance, to fix mesh penetration issues. It's also possible to use custom constraints on goals to achieve pretty much any type of correction, such as custom control over the way rotation is spread on each part of the spine for example. The constraints can either take extracted goals as an input and modify them or simply override the value that came out of extraction step.

Finally, solving from goals to bones can also be customized. While this solving is usually performed by HIK solver or the MotionBuilder solver, you can use a custom solver. Parts of solve output, for instance only an arm in a complex rig situation, can also be modified or overridden as a post-processing step.

Extraction types

Three extraction types are available to use on a given set of markers to get the rotation and the translation of a given goal: Position and rotate joint in marker(s), Rotate joint in marker(s), and Aim joint at marker(s).



Extraction types

The **Position and rotate joint in marker(s)** extraction type requires at least three markers to be assigned to a given joint. If less than three markers are assigned, "Aim joint at marker(s)" extraction type is used. Translation vector can easily be extracted from a set of three markers simply by computing their average. Extracting a rotation can also be done in different ways: MotionBuilder does it by creating a rotated referential from the three markers. First, a vector is defined from the first marker to the second, and a second vector from the first marker to the third. The cross-product of these vectors gives the Z axis of the rotated referential. The sum of these two vectors is perpendicular to the Z axis (by property of cross-product) and is used as the X axis of the rotated referential. The remaining Y axis can easily be computed as the cross-product of Z axis and X axis. This rotated referential constitutes rotation extracted from the three markers.

This rotation is not used directly as the goal rotation. At snap time, i.e. when markers were assigned to the joint, a "snap offset" was computed as the

difference between the joint's rotation and translation and the extracted rotation and translation at snap time. These offsets allow computation of goal position and rotation at any time by simply removing them from extracted rotation and translation. If more than three markers are available for this extraction type, the extracted position and rotation are averaged between all possible combinations of three markers to get the final extracted values.

NOTE Rotations are average using quaternion linear addition followed by normalization of the result.

The **Rotate joint in marker(s)** extraction type computes goal rotation in exactly the same way as the **Position and rotate joint in marker(s)** extraction type. However, instead of using markers to compute goal position, it simply uses hierarchical information from the character to position the goal at the same place as its associated joint. Therefore, markers are only used to extract rotation in this extraction type. "Snap offsets" are used the same way as before to compute actual goal rotation.

The **Aim joint at marker(s)** extraction type can take only two markers to extract rotation. The joint position coming from the hierarchy (i.e. the one used for position in previous extraction type) is used as a third point to perform the same rotation extraction as in the **Position and rotate joint in marker(s)** extraction type and **Rotate joint in marker(s)** extraction type. Like all extraction types, "snap offsets" are used to compute actual goal rotation.

If the **Aim joint at marker(s)** extraction type is used because a **Position and rotate joint in marker(s)** and **Rotate joint in marker(s)** extraction was chosen but only two markers were available, the position extracted from the set of points composed by the two markers and the joint position from the hierarchy are used as the extracted position. This one can be different than the joint position from the hierarchy if the three points do not perfectly respect a rigid body constraint.

Extraction is performed from the root of the hierarchy (i.e. the hips) and follows hierarchy down. For this reason, hips joint should always use the **Position and rotate joint in marker(s)** extraction type for the hierarchy root to be positioned properly. Once the hips are positioned, anything down the hierarchy can either use position information from extraction (i.e. use **Position and rotate joint in marker(s)** type) or use position that is coming from the hierarchy (i.e. use **Rotate joint in marker(s)** or **Aim joint at marker(s)** extraction types) because the hips position is known and thus can be propagated down the hierarchy.

Goal to IK/FK state

Before the solving step, goals must be converted to an IK/FK state so they can be used by the solver to output a skeleton state.

Converting goals to an IK/FK state is straightforward. The IK state uses both the goals' rotation and translation and the FK state uses only the goals' extracted rotation. FK and IK effectors that don't have corresponding goals (because no markers were assigned to corresponding bones) simply take values from default stance pose.

Reaches can be adjusted to reach IK goals or keep the FK ones. When reaching IK translation, rotations up the hierarchy might be changed so that the translation is reached. For this reason, IK effectors have the same rotation as FK effectors so that if the rotation is kept, you can also reach this rotation. For example, if translation is set to be reached on the IK wrist effector, solving can change the extracted rotation on the elbow so that the wrist reaches the right position. If the elbow rotation (i.e. its angle) is important, reach can be set on the elbow rotation so that it is maintained during the solve (which might result in the shoulder getting pulled for example). This is why IK effectors have the same rotation as FK effectors.

Modifying DOF values

You can adjust the DOF Rotation properties during the solving setup process while the character is active. Previously, you could only modify the DOF Translation values post characterization.

Previously, you would set Degrees of Freedom (DOF) on properties on the resulting solve to prevent body parts from moving however, the results were inaccurate and sometimes undesirable. Now, you can lock the DOF properties on the skeleton and thererfore have the HIK solver faithfully follow the joint limits in the final resulting solve. This is called locking DOF channels.

See also:

HIK Spine and Neck Stretch

Linux Support

This release of MotionBuilder is the first release supported on Linux Operating System (OS).

This release of MotionBuilder is supported on Red Hat® Enterprise Linux® 6.2 WS and Fedora™ 14 OS.

See: *http://www.autodesk.com/products/motionbuilder/system-requirements*.

Selecting Occluded Textured Geometric Elements

The selection of occluded textured geometric objects in the Viewer window has been revisited in this release to provide an enhanced user-experience and at the same time an ease of use if you are familiar with the Maya software product.

Selecting textured geometric elements in a dense scene via the Viewer window can be challenging and time consuming especially if the elements are occluded by other elements. You can change the camera view or use the Navigator window to access and select objects behind other elements but this workflow may be quite inefficient particularly with large scenes. To facilitate the selection of such elements, you can use the **Transparency Selection** tool () and the **Z Depth Selection** tool () in the Viewer window toolbar.

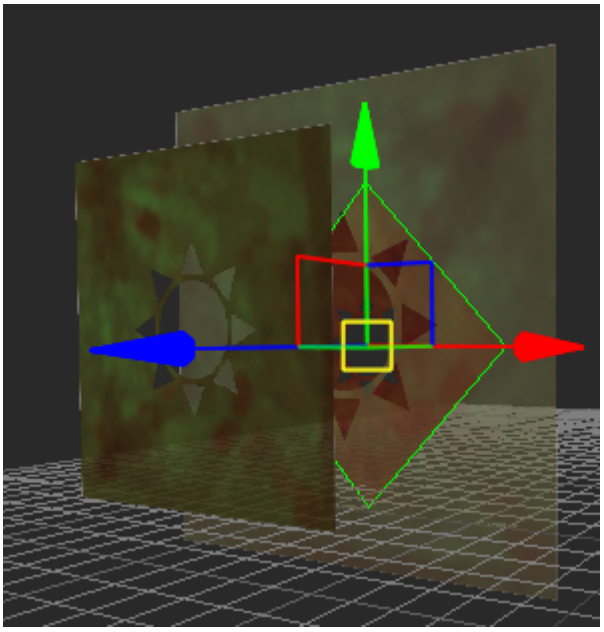
When you use the **Transparency Selection** tool () and the **Z Depth Selection** tool () and choose a context menu, HUD elements appear in the **Viewer** window giving you additional information on how to perform actions.

Selecting occluded geometric elements through alpha channels

If you have a dense scene with many geometric elements and you need to select a partially occluded geometric element in the background, you can select the element in the background through the alpha channels of partially transparent textured geometric elements in the foreground.

You can select occluded textured geometric elements through alpha channels by using the **Transparency Selection** tool () in the **Viewer** window toolbar or the keyboard shortcuts `Alt-Shift-A`.

Transparency Selection is on by default (in the Viewer preference settings).

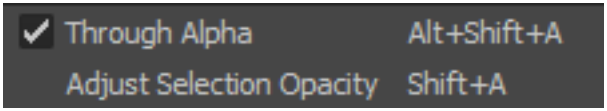


Selecting occluded geometric elements through partially transparent textures

Similarly to selecting occluded geometric elements through alpha channels, you can select occluded elements through partially transparent objects by using the **Transparency Selection** tool and adjusting the texture's transparency threshold.

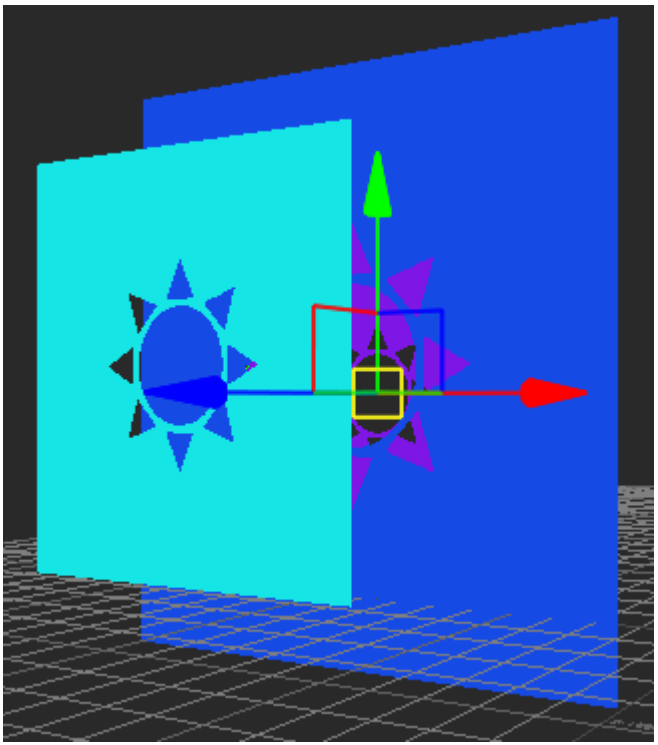
If you want to adjust the transparency threshold, ensure the **Transparency Selection** tool is enabled () then, right-click the **Transparency**

Selection tool () and from the context menu



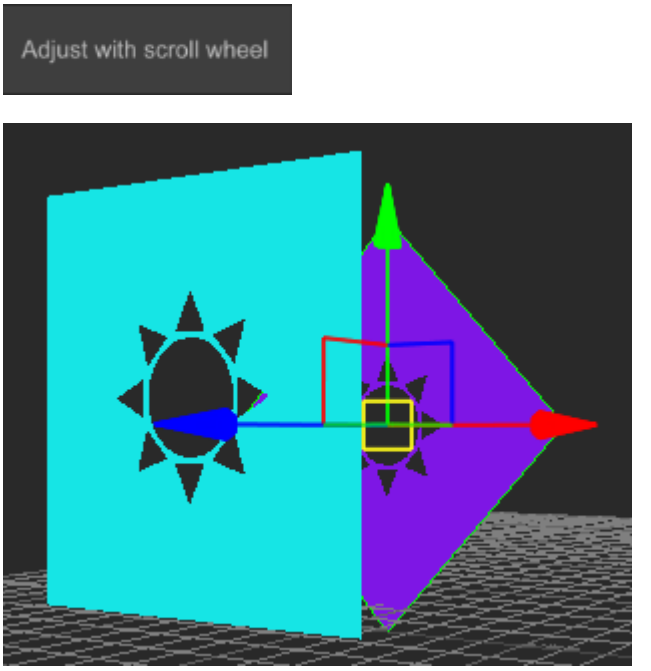
, choose **Adjust Selection Opacity** (`Shift-A`).

The following figure shows the transparency threshold of the elements' textures shown in the Viewer window.



The color of the elements is based on the camera frustum and z depth. For example, when you pan or tilt the view, the color of the elements change. The same is true when you reposition the elements in the Z axis.

To adjust the opacity or transparency threshold, in the Viewer window, scroll with your mouse wheel, as indicated by the HUD element that displays at the top centre of the Viewer window.



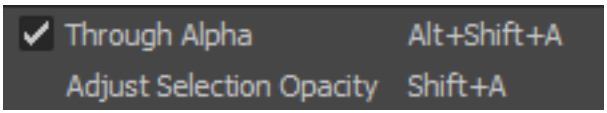
When you adjust the transparency threshold, the Transformation handles are disabled. The Transparency threshold in this example is set to approximately 0.70. If the Transparency threshold is set to 1, 100% of the texture's transparency is considered when selecting occluded geometry.

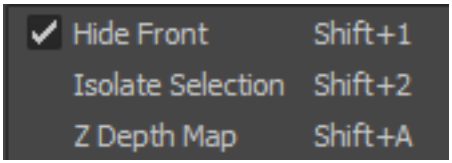
NOTE You can only pick elements that are visible.

When you choose **Adjust Selection Opacity**, the **Z Depth Selection** changes to **Z Depth Map** ( ).

Selecting occluded geometric elements in z-depth

You can select occluded elements in the background through partially transparent objects in the front by using a combination of the **Transparency Selection** tool and the **Z Depth Selection** tool () tool.

If you want to select an occluded element in the background, ensure the **Transparency Selection** tool is enabled () then, right-click the **Transparency Selection** tool () and from the context menu 

, choose **Adjust Selection Opacity** (`Shift-A`). In the **Viewer** window, scroll with your mouse wheel to adjust the opacity of the elements. Right-click the **Z Depth Selection** tool () tool and from the context menu (

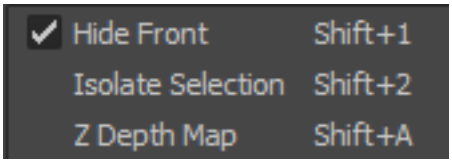
) choose **Hide Front** (`Shift-1`). Adjust the transparency threshold of the elements' textures if required and then click the element.

Showing only selected element

You can choose to show only the selected geometric element in the **Viewer** window.

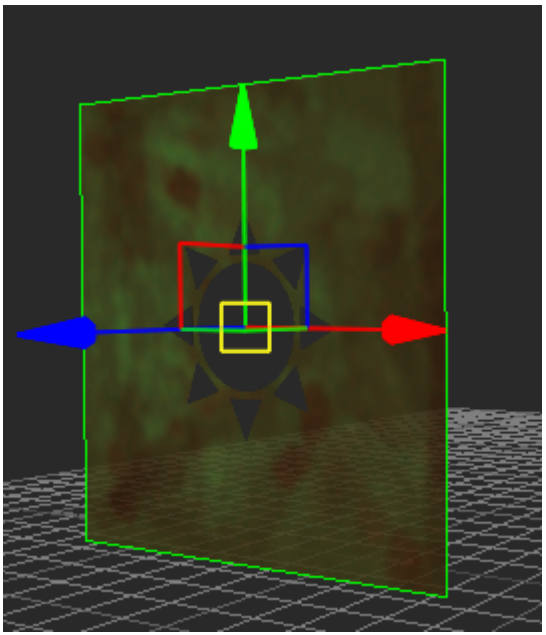
Depending whether you want to show only a partially occluded selected element or just any element you can pick the desired element and right-click

Z Depth Selection tool () tool and from the context menu (



) choose Isolate Selection (`Shift-2`).

Whe you choose **Isolate Selection**, the Z Depth Selection tool () changes to the Isolate Selection tool (). Pick an element in the scene. Only the selected element is shown in the **Viewer** window.



To pick an occluded geometric element behind the selected element, use your mouse scroll wheel to change the selection. Adjust the transparency threshold if you want to be able to pick any geometric element in the scene.

Chapter: Additional Changes

2

Additional Changes

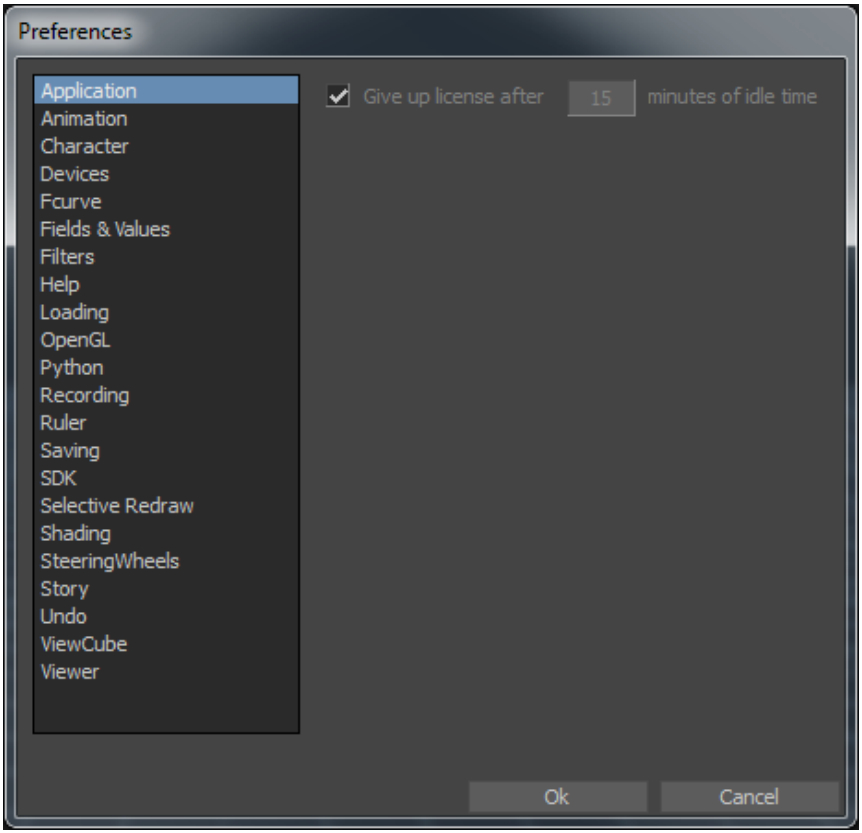
The following topics describe additional changes to this release of the MotionBuilder software product.

MotionBuilder Preferences

The MotionBuilder preferences have been updated to include changes to the Application, Character, FCurves,OpenGL, Recording (previously referred to as Memory), and Story preferences. The Ruler preferences is a new preference.

Application preferences

A network license is reclaimed by the license server by default after 15 minutes of idle time.



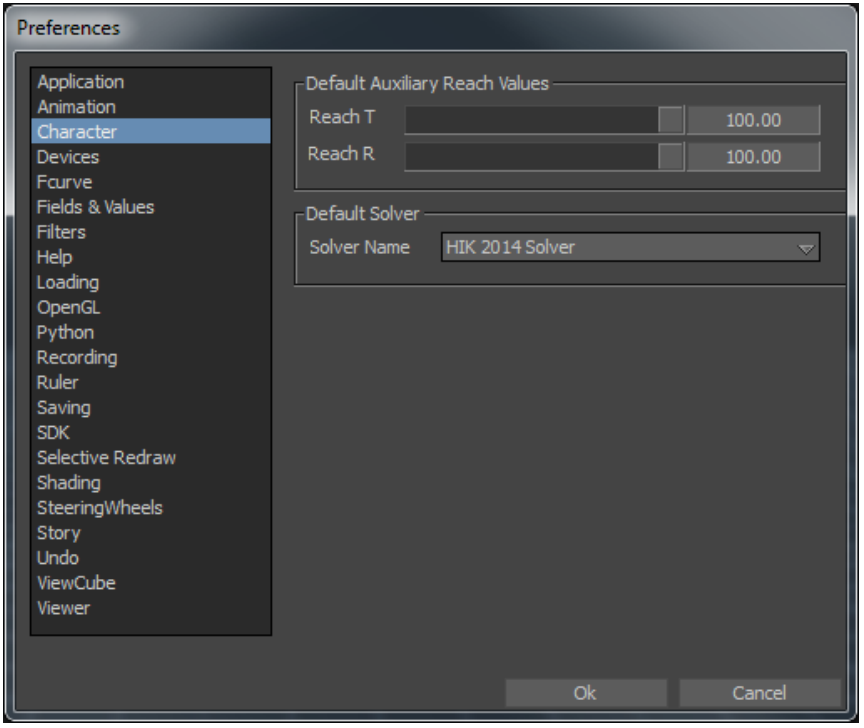
MotionBuilder Preferences

A lost license server connection is detected after two minutes. Following this "disconnect" event, MotionBuilder attempts to recover the license. If the license connection cannot be restored within the 120-minute "Recovery Period", a dialog appears stating two hours have passed since the connection to the license server was lost and the application will exit in 10 minutes. The 10-minute "Grace Period" begins after you click OK. You can save your work during the "Grace Period".

NOTE If MotionBuilder is busy (rendering, cache writing, executing script, etc.) when the Recovery period is up, the Grace Period begins only after MotionBuilder is back from the busy state.

Character preferences

The Character default Solver is set to HIK 2014 Solver.

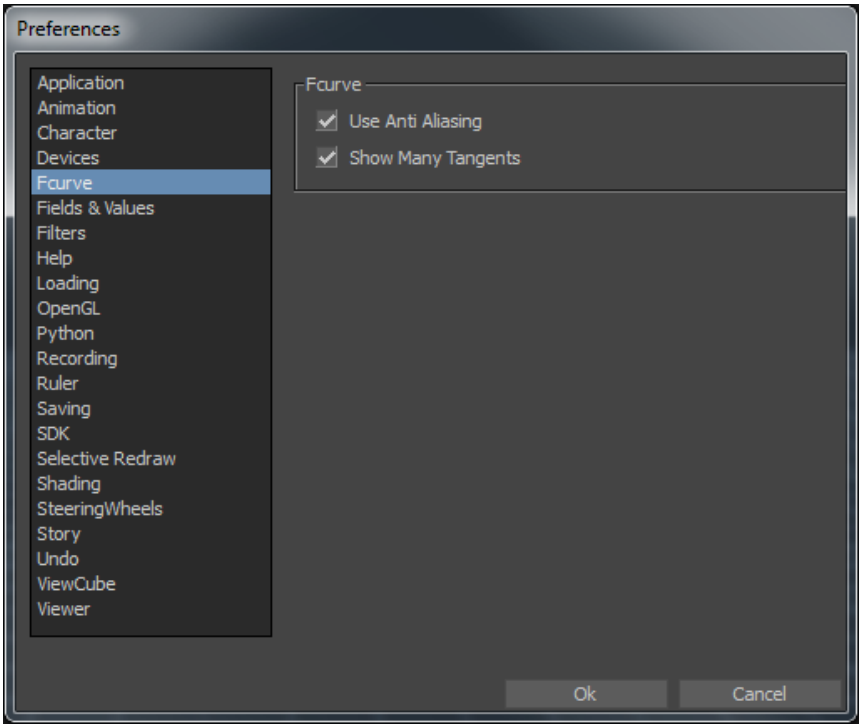


Character preference settings

FCurves preferences

The FCurves default tangent type setting is no longer in the FCurves preferences but rather in the Key Controls window and the FCurves Editor.

See Key Controls window (page 81) and Key Interpolation Type (page 79).



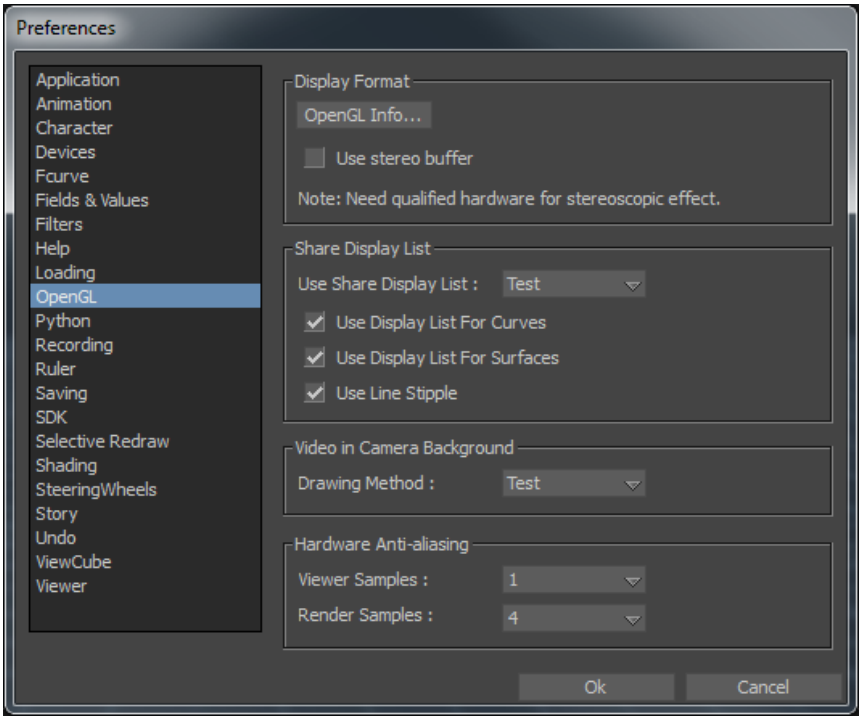
FCurves preference settings

OpenGL preferences

The minor changes to the OpenGL preferences include changes in the nomenclature.

The following describes the changes to the OpenGL preferences.

- **Pixel Format** is renamed to **Display Format**
- **Pixel Format** user configuration settings have been integrated into the OpenGL Viewer Info window
- **Anti-aliasing** is renamed to **Hardware Anti-aliasing**



OpenGL preference settings

Memory preferences

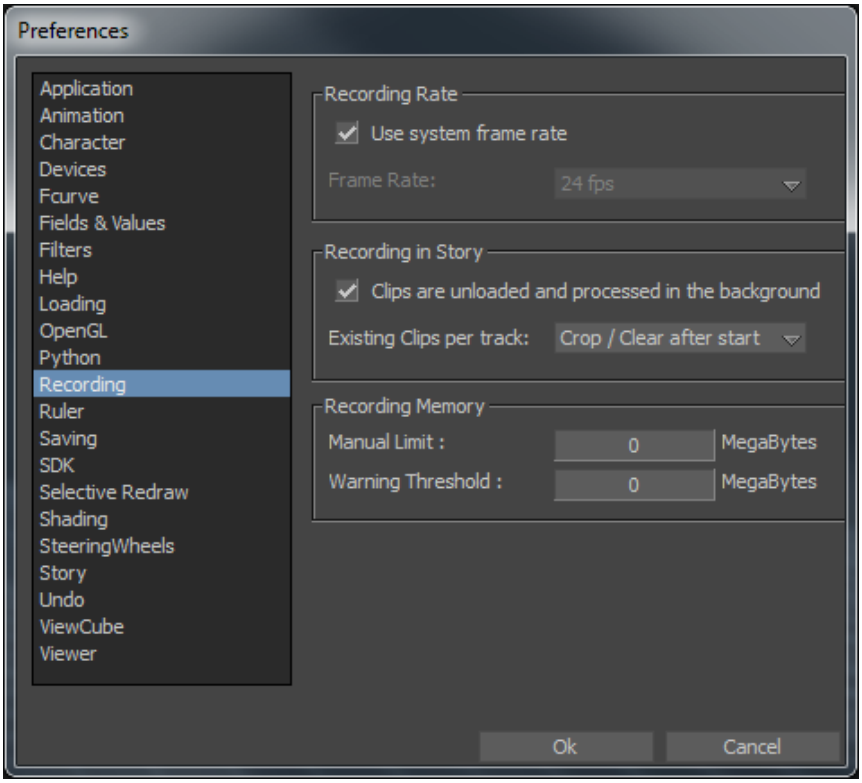
The Memory preferences are superseded by the Recording preferences. As a result, the Recording Memory settings are included in the Recording preferences.

Recording preferences

The Recording preferences include the recording rate, the recording in the Story, and the recording memory.

The Recording preferences enable you to:

- define the recording rate
- define the behaviour of recording in the Story
- specify the recording memory limit and a warning threshold



Recording preference settings

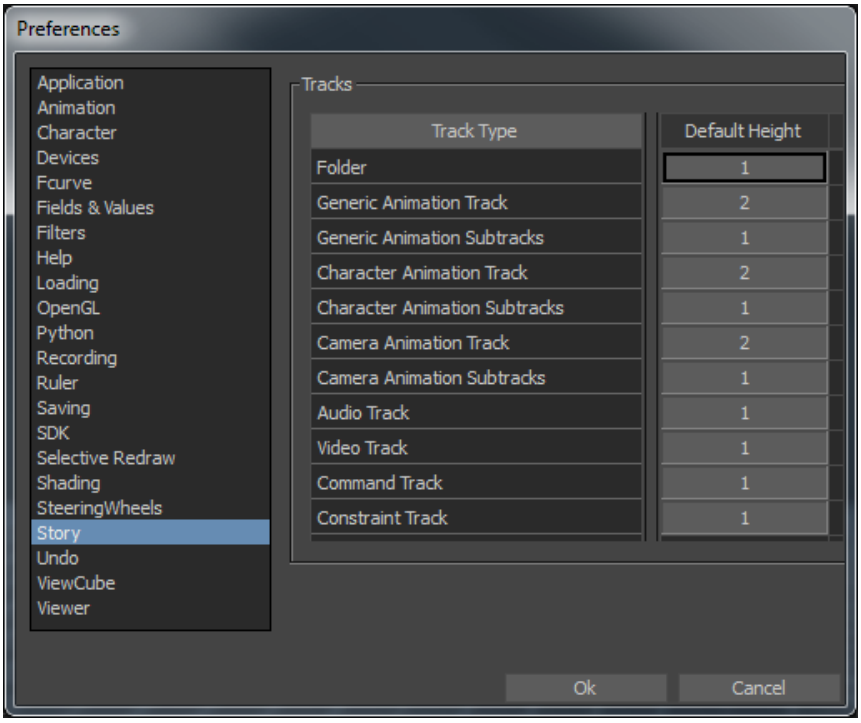
Ruler preferences

The Ruler preferences is a new preference in this release.

See *Ruler preference settings*.

Story preferences

The Story preference settings no longer include the Story recording settings.



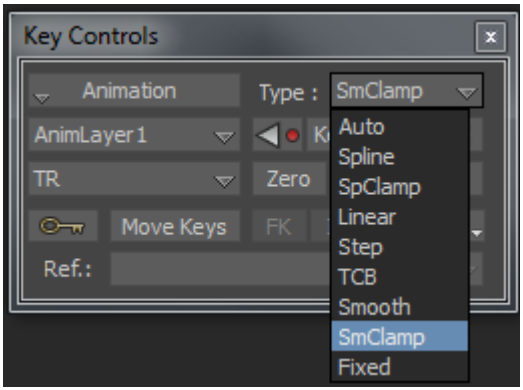
Story preference settings

The settings for the Recording in Story are now part of the Recording preferences.

See *Recording preferences*.

Key Interpolation Type

The key interpolation type menu includes four additional options that enable you to define the default keyframe interpolation for your animation.



Key Controls display the key interpolation types

The following key interpolation types have been added in this release of the software product.

- **SmClamp**
- **Spline**
- **SpClamp**
- **Smooth**

The **Stepped** key interpolation type is renamed **Step** in this release of the software product.

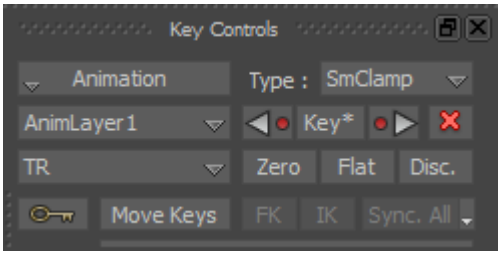
The following table describes the new key interpolation types.

Option	Function
SmClamp	The **SmClamp** (**Smooth Clamp**) key interpolation type is the default key interpolation type. The tangents are smooth and the values are clamped to prevent overshooting maximum and minimum values.
Spline	The **Spline** key interpolation type is a time-independent interpolation type. The tangents are not affected by a change in the time value. A Spline tangent is automatically calculated based upon the slope between the previous and next key values.
SpClamp	The **SpClamp** (**Spline Clamp**) key interpolation type is a time-independent interpolation type with clamped values to prevent overshooting maximum and minimum values.

Option	Function
Smooth	The **Smooth** key interpolation type is a time-dependent interpolation type. The tangents are smooth and affected by a change in the time value.

Key Controls window

The default key interpolation type is **SmClamp** (**Smooth Clamp**).



Key Controls display the default SmClamp key interpolation type

FCurves Pane

The **FCurves** pane includes four new key interpolation types in the Classic mode and in the default mode. These key interpolation types are also accessible via the **FCurves** context menu. See Key Interpolation Type (page 79) for a description of these key interpolation types.

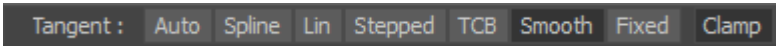
The **FCurves** pane toolbar in the default mode includes four additional tools for defining the interpolation for your animation.

FCurves pane toolbar in default mode

- **Spline tangents** ()
- **Spline Clamp tangents** ()
- **Smooth tangents** ()

- **Smooth Clamp tangents** ()

The **FCurves** pane toolbar in the Classic mode includes the same four additional options for defining the interpolation for your animation. **Clamp** is available only with **Smooth** or with **Spline.**



FCurves pane toolbar in classic mode

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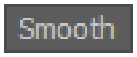
- 

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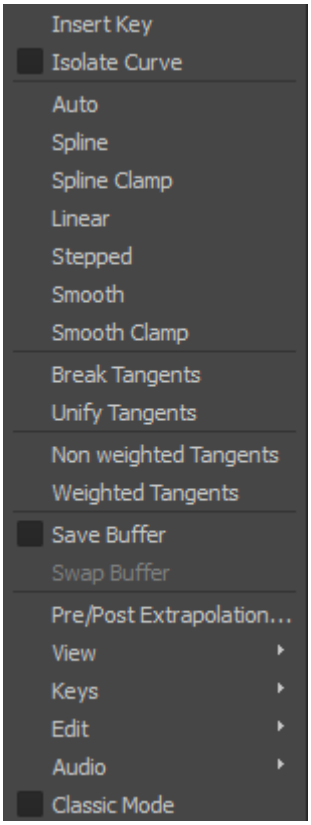


Keyboard Shortcuts

A number of keyboard shortcuts have been updated to reflect changes to the software. Some of these changes impact the interaction mode keyboard shortcuts.

Various keyboard shortcuts have been updated to take into account the new features and workflows.

Keyboard shortcut B

The keyboard shortcut `B` is used by the MotionBuilder optical tool and Ruler tool and is used in the default Softimage interaction mode. The keyboard

shortcut B is replaced by the keyboard shortcut T in the default 3ds Max and Lightwave interaction modes.

The following describes the changes to the keyboard shortcuts.

- You can use the keyboard shortcut B when working with optical data to multi-select items to create a Rigid body or a Rigid body constraint.
- You can use the keyboard shortcut B to create a Ruler and snap it to an optical marker.
- You can use the keyboard shortcut B with the Ruler while the optical tool is active and the Ruler is visible or active.
- In the default 3ds Max interaction mode, the keyboard shortcut B used to view the Producer Bottom Orthographic view is replaced by the keyboard shortcut T which enables you to cycle through the Producer Top and Producer Bottom Orthographic views.
- In the default Lightwave interaction mode, the keyboard shortcut B used to view the Producer Bottom Orthographic view is replaced by the keyboard shortcut 2 which enables you to cycle through the Producer Top and Producer Bottom Orthographic views.
- In the default Softimage interaction mode, the keyboard shortcut B used to set the picking mode for models is no longer used.

Keyboard shortcut Ctrl-Shift-T

The keyboard shortcut CtrlShift-T replaces the keyboard shortcut CtrlShift-D for GPU/CPU skinning.

Keyboard shortcut Ctrl-Shift-D

The keyboard shortcut CtrlShift-D is used for in the **Ruler** tool to save the **Ruler** object as a **Dimension** object (**Save Ruler as Dimension**).

HIK 2014 Solver

This release includes the support of the HIK 2014 Solver, Library version 2013.2.0.

The default Solver in this release is the HIK 2014 Solver.

The major updates from the HIK 2013 Solver to the HIK 2014 Solver are:

- HIK Spine and Neck Stretch
- Improved HIK integration
- Double Solve HIK support
- Over 50 issues resolved

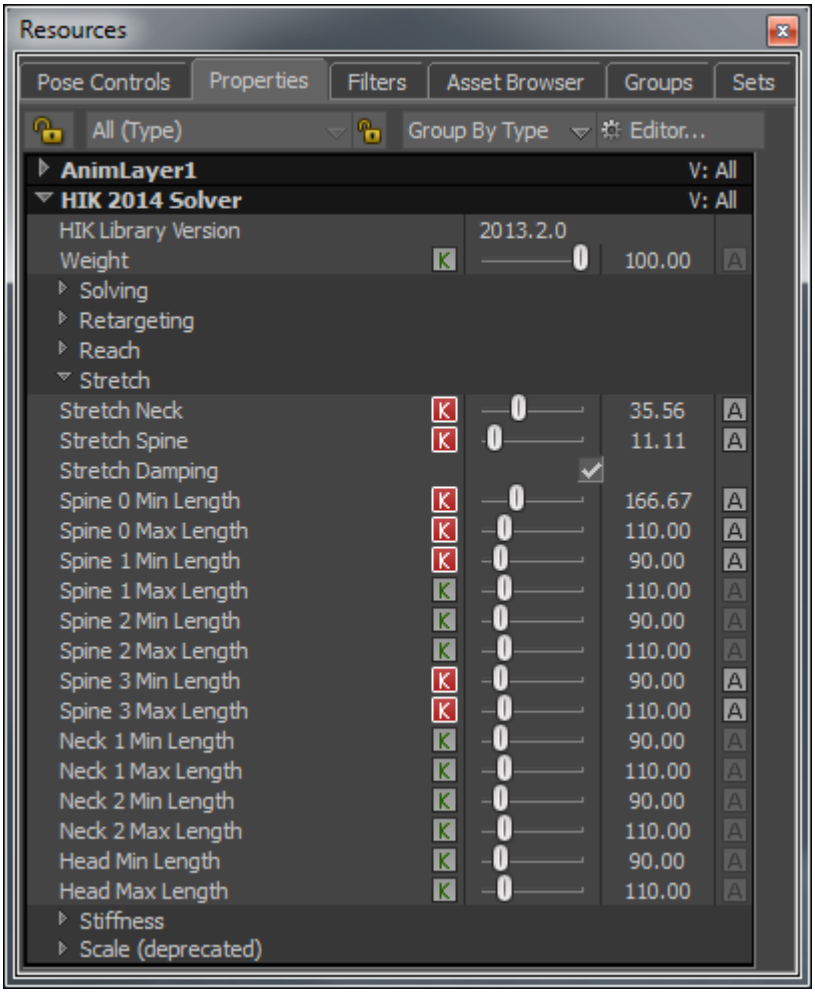
HIK Spine and Neck Stretch

When we stretch our spine and neck, the connective tissues that hold the cells of the body together stretch and contract with the movement thus preventing our bodies from snapping when fully stretched or contracted. Flexible Mocap introduces a greater human solving quality with the ability to define a minimum and maximum spine and neck stretch while avoiding snapping when attempting to reach the maximum and minimum stretch lengths. The HIK 2014 Solver includes Stretch solving properties for the neck and spine to produce a more realistic HIK solving.

When you set the full maximum and minimum stretch limits, the spine reaches the full rotation extension and when you set the full maximum and minimum contraction limits, the spine reaches the full rotation contraction. The extension and contraction maximum and minimum lengths are set once the "normal extension" solution is solved to ensure the joints translate back to their normal translation extension before full rotations are applied when animated.

To produce a realistic stretch and contraction of a spine and neck, you can define the minimum and maximum length for each spine and neck joint defined by the HIK skeleton in the HIK 2014 Solver Properties and enable Stretch Damping.

NOTE The Stretch Damping is not applicable to Control Rigs regardless whether the Stretch Damping is enabled or disabled.

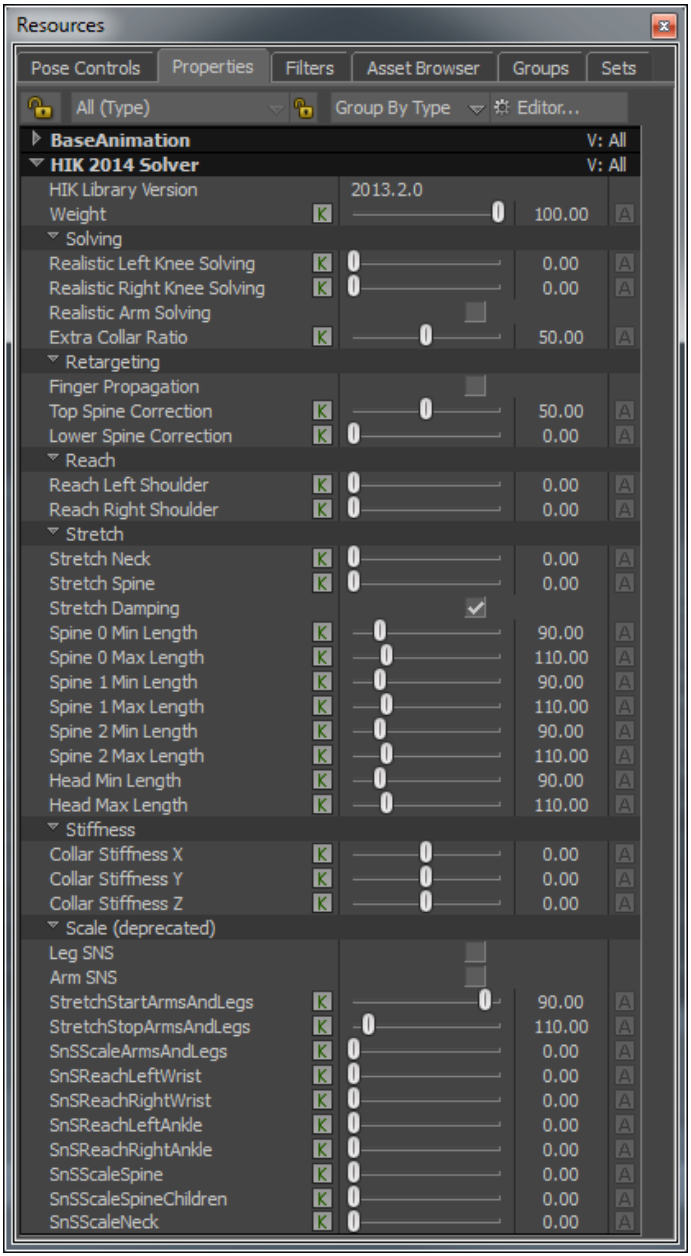


The new Stretch solving properties include the following:

- Stretch Neck

- Stretch Spine
- Stretch Damping
- Spine 0 Min Length
- Spine 0 Max Length
- Spine 1 Min Length
- Spine 1 Max Length
- Neck 0 Min Length
- Neck 0 Max Length
- Head Min Length
- Head Max Length

NOTE The number of Spine and Neck Length properties is defined by the HIK defined skeleton.



HIK 2014 Solver properties displayed

Defining the minimum and maximum length properties (Min Length and Max Length) for the neck and spine enables you to stretch and compress the neck and spine up to a certain percentage of it's normal extension and avoid at the same time a snapping effect when reaching a full normal extension. This can be referred to as a smoothing effect. This effect is achieved by enabling the Stretch Damping property. This is useful in a retargeting context but not in a Control rig context where you add keyframes to the Control rig.

Double Solving HIK support

If you have a scene in which you are using the MB Character Solver, you can switch to use the HIK 2013 Solver or the HIK 2014 Solver and the double solving behaviour remains intact when switching from one Solver to the other Solver.

Improved HIK integration

This release includes the resolution of various issues to ensure the HIK 2014 Solver can be used in production in the context of the new Flexible Mocap feature and workflows.

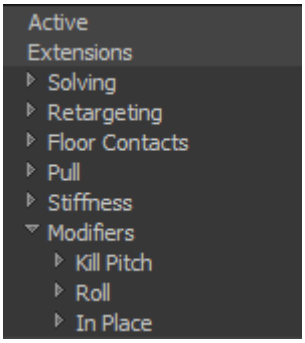
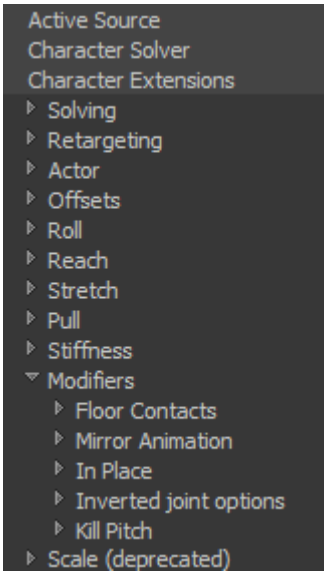
The resolved issues include:

- performance issues,
- evaluation issues,
- manipulation issues,
- plotting issues,
- Data exchange between MotionBuilder and the HIK plugin issues,
- algorithms issues, and
- roll extraction and keying issues.

Character properties

The changes to the Character properties include changes to the categories and terminology changes.

The following shows the changes to the Character properties from MotionBuilder version 2013 to MotionBuilder 2014.

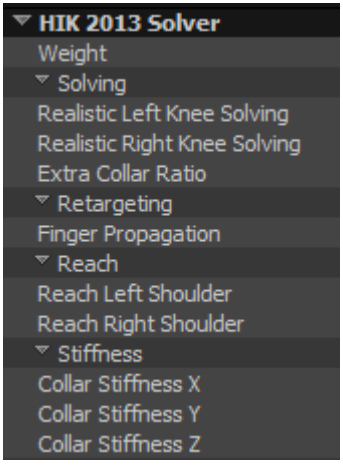
Character properties in MotionBuilder 2013	Character properties in MotionBuilder 2014
	

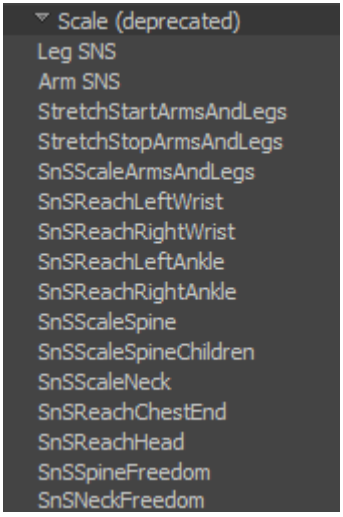
Character HIK Solver properties

The changes to the Character HIK Solver properties include changes to the categories, terminology changes, and the HIK 2014 Solver support.

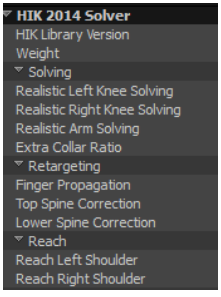
The following shows the Character HIK 2013 Solver properties and the Character HIK 2014 Solver properties in this release.

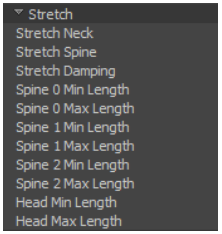
Character HIK 2013 Solver properties

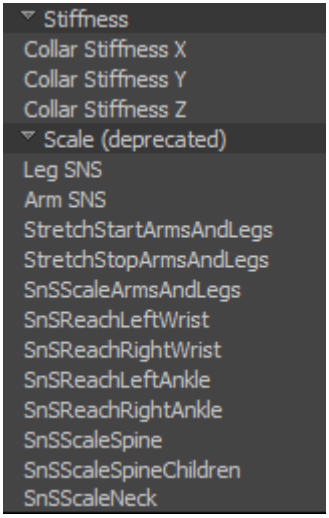




Character HIK 2014 Solver properties







Orphan FBX properties in Character properties

The properties in the Character Settings no longer include undesired and non-functional FBX properties that were dynamically added to the Character Settings properties.

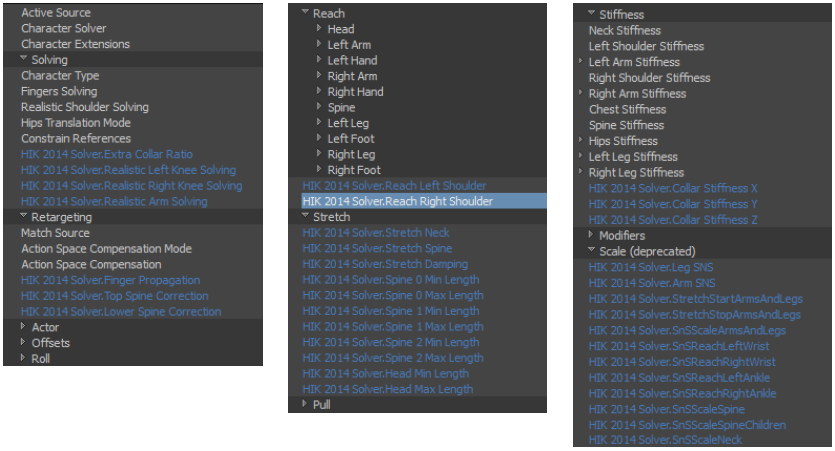
Character HIK Solver properties

The HIK Solver properties are dynamically exposed in the Character Settings as reference or alias properties. The values of the Solver properties can be updated on the Solver as well as in the Character Settings referenced properties.

The Character HIK Solver properties are accessible via the Character Settings pane and via the Properties window. The blue Solver properties are referenced or aliased properties. They are distinct HIK 2014 Solver properties as opposed to Character Settings properties. The MB Character Solver and the HIK 2013 Solver do not have these properties.

The following lists the HIK 2014 Solver properties.

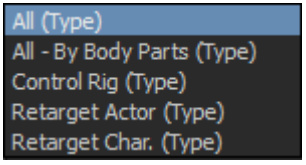
HIK 2014 Solver Properties



Character Settings filter

The update to the Character Settings filter include a Control Rig (Type) filter that replaces the (previous) Control Rig - Basic (Type) and Control Rig - Expert (Type).

Since there is no longer a concept of "Basic" mode and "Expert" mode, the update to the Character Settings filter merely reflects this change. Therefore, there is only one Control Rig type.



Character Settings filter

Custom Renderer

Software Plugin developers can use a custom Renderer as a plugin for MotionBuilder using the Custom Renderer API.

You can select the Renderer via the Render window, in the Render Source area. To accommodate the needs of higher quality renderers, the following changes have been made in this release of the software product.

- several objects have been updated
- lights include additional features such as animatable barndoors
- Spot lights include inner and outer cone settings
- area lights have been added but are only available for the custom renderer
- new light properties are supported in Maya
- Primary Visiblity, Casts Shadows and Receive Shadows properties have been added to the models to enable the custom renderer to access pe rmodel shadow setting. These properties are enabled by default.

The custom renderer has the ability to distinguish objects that are hidden by rendering only the objects selected to be shown.

See the MotionBuilder SDK Help at *http://www.www.autodesk.com.motionbuilder-sdkdoc-2014-enu*.

File format support for custom renderer

Although MotionBuilder does not support OpenEXR and DDS file formats, you can load an arbitrary video file format such as OpenEXR or DDS to render using a custom renderer. The custom renderer would be able to draw the OpenEXR or DDS image type.

Once the file is loaded, MotionBuilder does not display the object but rather creates a blank textured object with a path.

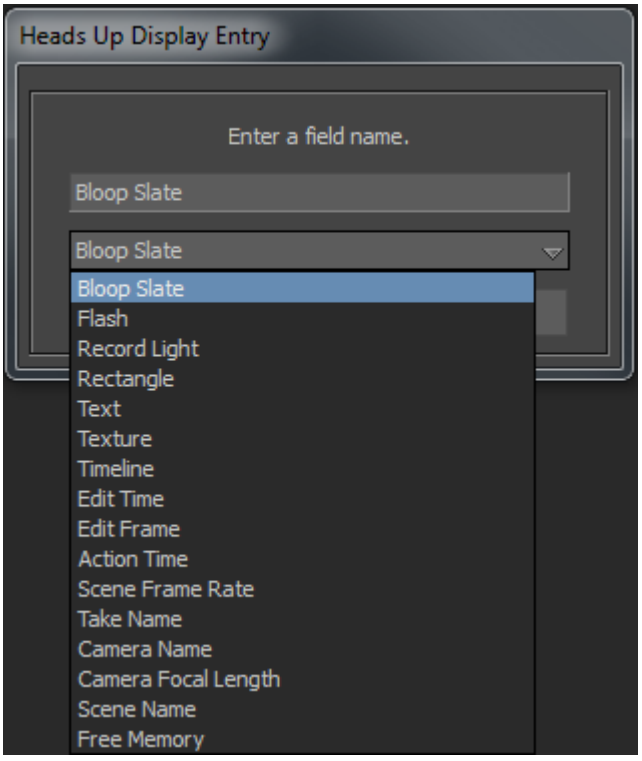
Assigning Viewer panes for custom renderer

You can specify a renderer for each Viewer pane via the Viewer Renderer menu similarly as you choose a Display mode for each View pane.

The custom renderer's name is displayed in the View pane.

Heads Up Display Elements

Two new HUD elements – the HUD Timeline (a non-interactive timeline) and the HUD Bloop Slate element enhance visual feedback when recording.



HUD elements

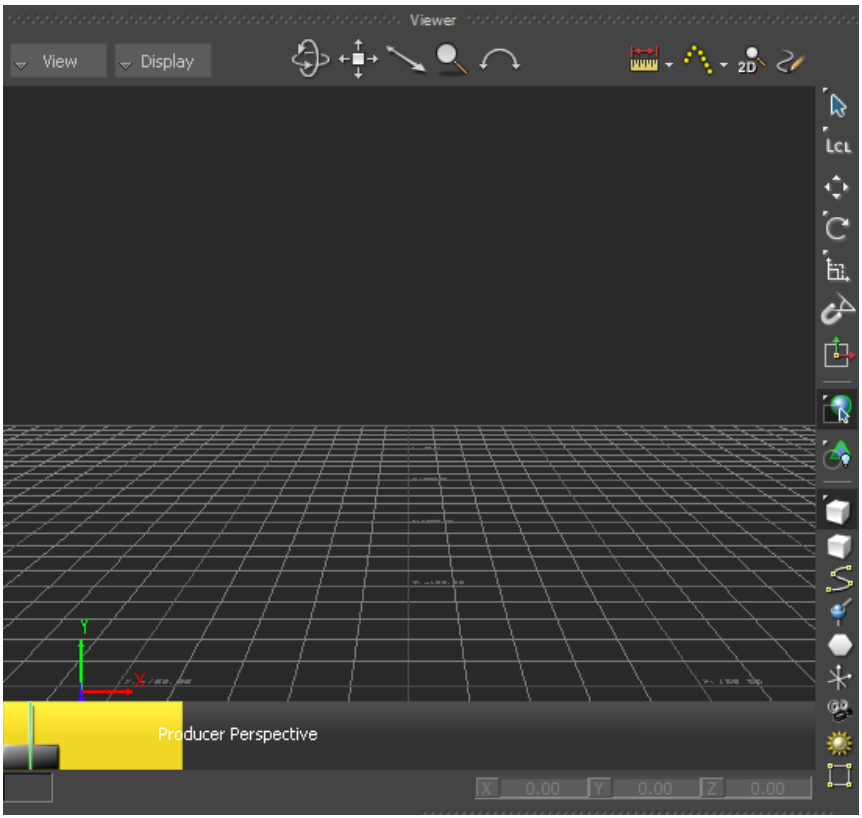
Timeline HUD Element

The non interactive Timeline HUD element gives you a visual feedback in the Viewer window of where the recording begins and is about to stop, and of all the recording cuts.

When you interact with the scene and you only have access to the video output of MotionBuilder, you don't know when the scene starts or stops because you can't see the GUI Timeline. An operator can see the GUI Timeline because his view of th 3D scene isn't full screen.

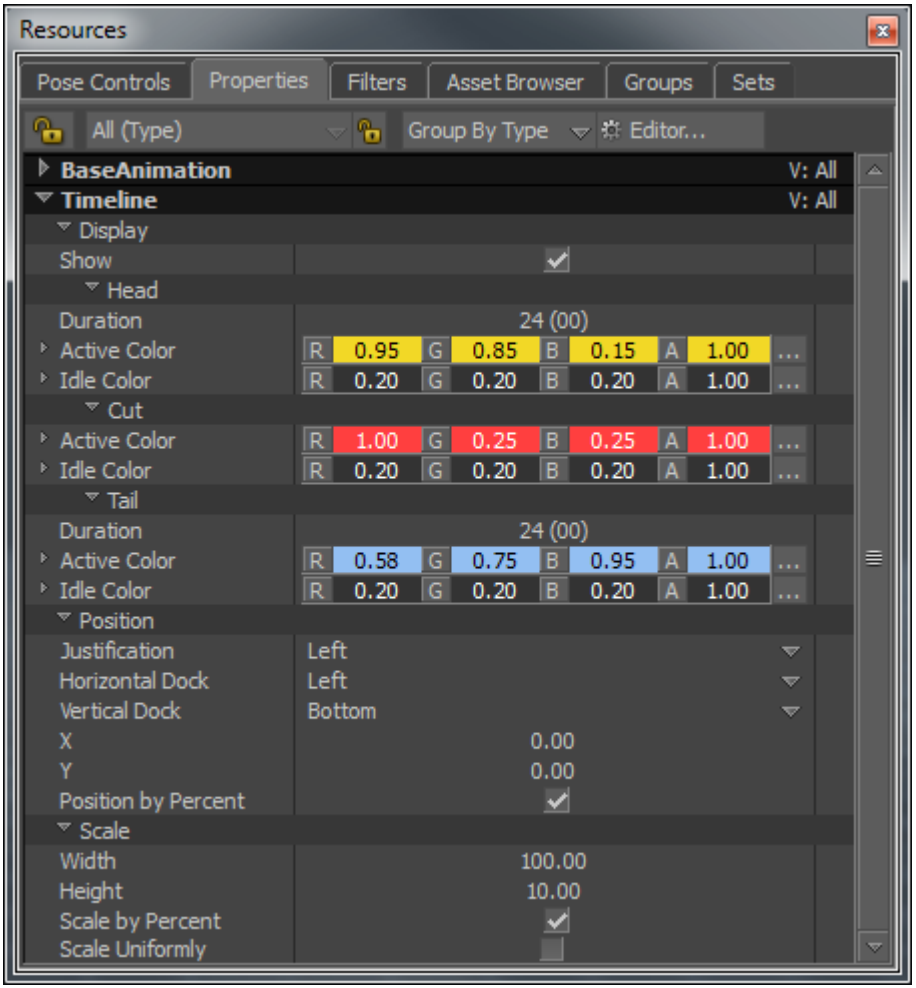
The Timeline HUD element is displayed at the bottom of the Viewer window. The default colors are yellow for the head (as shown in the following screen shot), red for the cut, and blue for the tail when the head, cut and tail are active and gray when the head, cut and tail are not active.

For example when the Timeline indicator is positioned on the head of the Timeline HUD element, the head is yellow and the cut and tail are gray as shown in the following screen shot.



Timeline HUD element head is displayed in yellow by default

You can change the properties of the Timeline HUD element via the Property Resources window or the Navigator window. The following screen shot shows the default Timeline HUD element property settings.



Timeline HUD element properties

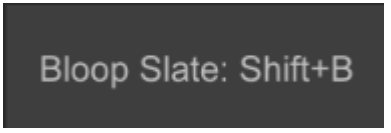
With the exception of the color, you can only edit the properties of the current Timeline HUD element section. To change the head or tail of the Timeline HUD element, simply adjust their time values in the properties of the HUD elements. By default, they're set to one second. You can scale the Timeline HUD element in X and Y axes. The Timeline HUD element update is synchronous to the Transport Controls.

Updates to the Transport Controls frame rate and frame duration are reflected in the Timeline HUD element.

Bloop Slate HUD Element

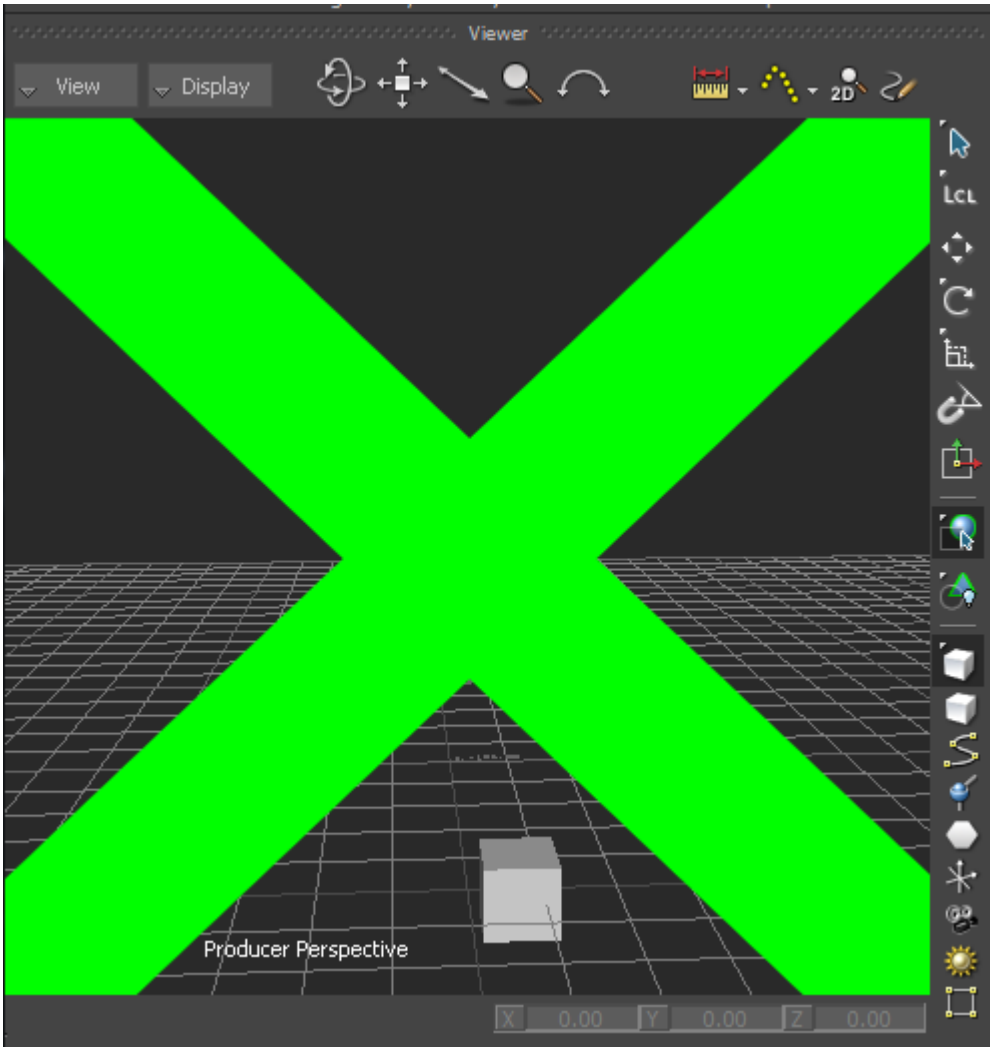
The Bloop Slate HUD element is similar to the Bloop Slate in traditional documentary films. Bloop slates usually emit a sound and flash a light so the cameras and sound can be easily synchronized in post production.

When you add a Bloop Slate HUD element to the scene, the Viewer window displays the following to indicate a Bloop Slate is added to the scene.



The Bloop Slate displays a green "x" on a transparent background. It is always displayed on top of all other elements in the scene.

Use the keyboard shortcut **Shift**-**B** to display the Bloop Slate in the Viewer window.

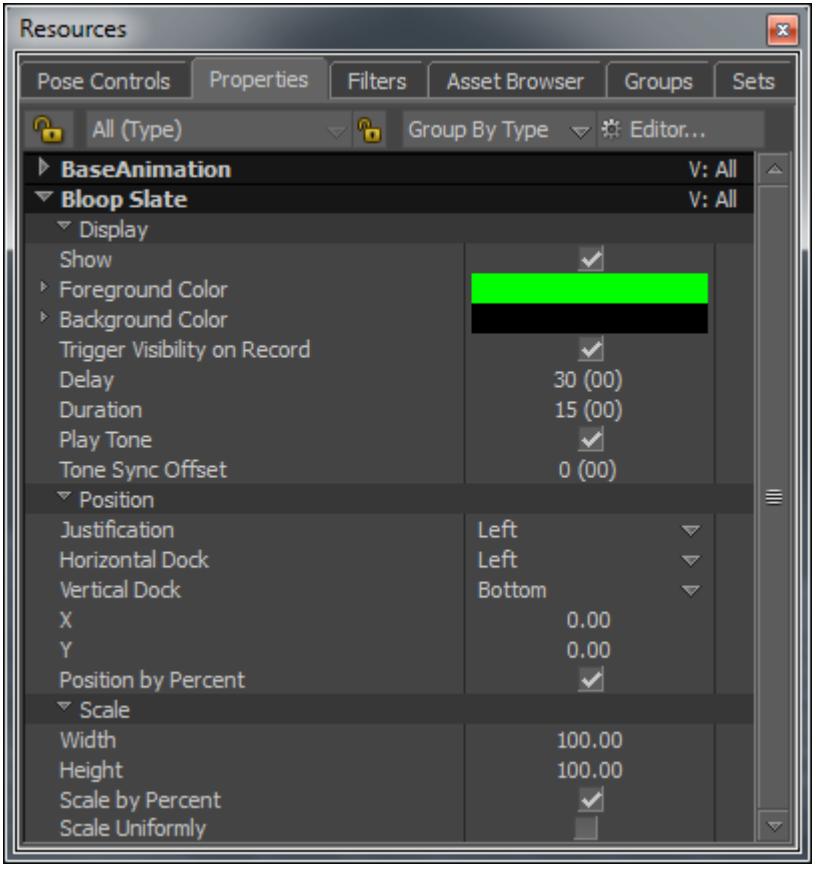


Bloop Slate HUD element

The Bloop Slate plays by default a 1khz tone after you press the Record button (`Shift-B`) in the Transport Controls Playback and the playback is set in frames.

NOTE While not normally needed, use Tone Sync Offset to calibrate the timing of the sound and X. Some systems or heavy scene combinations may require an offset.

You can change the properties of the Bloop Slate HUD element via the Property Resources window or the Navigator window. The following screen shot shows the default Bloop Slate HUD element property settings.



Bloop Slate HUD element properties

You can map the keyboard shortcut **Shift-B** to a hardware device.

The Bloop Slate can also be used in an SDI Video Output.

HUD Element Ordering

You can change the order of the HUD elements via the Navigator window Scene browser. This includes moving Multiple HUD elements simultaneously.

DOF Import option

When you import a motion capture file, in the Import Options dialog, you can either choose to import or not import Degrees of Freedom.

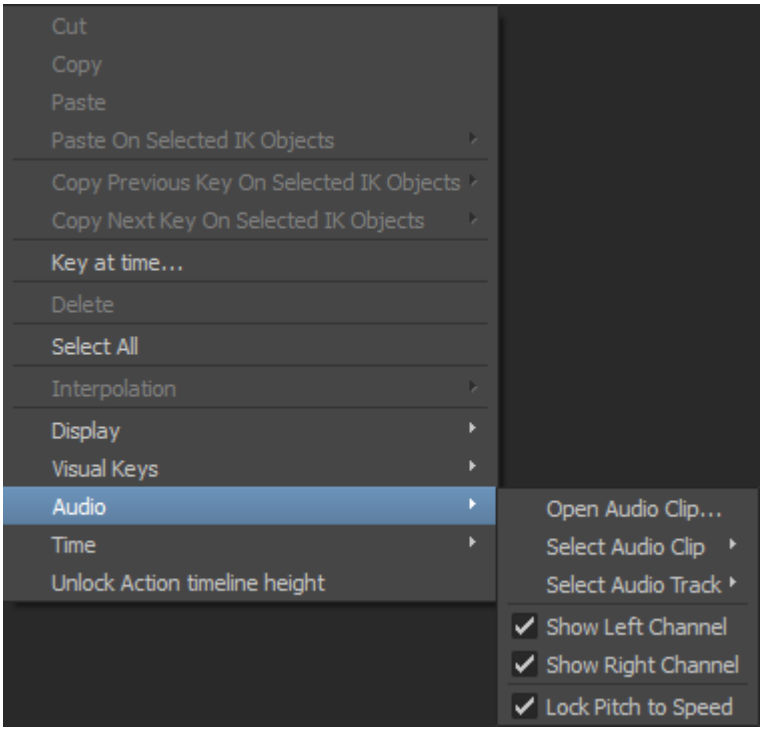
Adding an image sequence to Story track

When you drag an image that is part of an image sequence into a Story track, MotionBuilder loads the image sequence.

Adjusting Audio Speed

You can adjust the audio speed to provide frame accurate audio time stretch.

The **Lock Pitch to Speed** menu option gives you the ability to either play the audio file in its original sound or play the audio by changing the playback speed to be in sync for the duration of the Timeline.



The **Lock Pitch to Speed** menu option is enabled by default. When it is enabled, the original audio sound is preserved. When it is disabled, you can choose to play the audio pitch faster or slower when the Play speed in the Transport Controls Action Timeline is set to a speed other than ALL FR (all frames) or 1x. When the audio is resampled, the sound is distorted.

MotionBuilder SDK Help

To find out about the latest updates to the MotionBuilder 2014 SDK, see the MotionBuilder 2014 SDK Help on the web at: *http://www.autodesk.com/motion-builder-sdkdoc-2014-enu*.

Python Support

The MotionBuilder libraries are upgraded to Python® version 2.7.3—the same Python version as the version used in the latest Autodesk® Maya® software product.

This release (as the previous two releases) of the MotionBuilder software product includes the entire Python Package – a benefit to users who no longer need to download the entire package from *http://www.python.org* to make use of functions that ship with the standard Python install.

Autodesk FBX SDK Support

This release of the MotionBuilder software product supports Autodesk® FBX® SDK version 2014.

Refer to the MotionBuilder 2014 SDK Help on the web at: *http://www.autodesk.com/motionbuilder-sdkdoc-2014-enu*.

Qt Support

This release of the MotionBuilder software product supports Qt version 4.8.4.

The Qt cross-platform application framework is supported on Windows® and Linux® Operating Systems (OS). The Qt application framework edition must match your OS.

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