TRUE

TEMPORAL REASONING UNIVERSAL ELABORATION

True System dynamics software

MANUAL Part 09

Renders

Last release 2013/04/02

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www.true-world.com

Contents

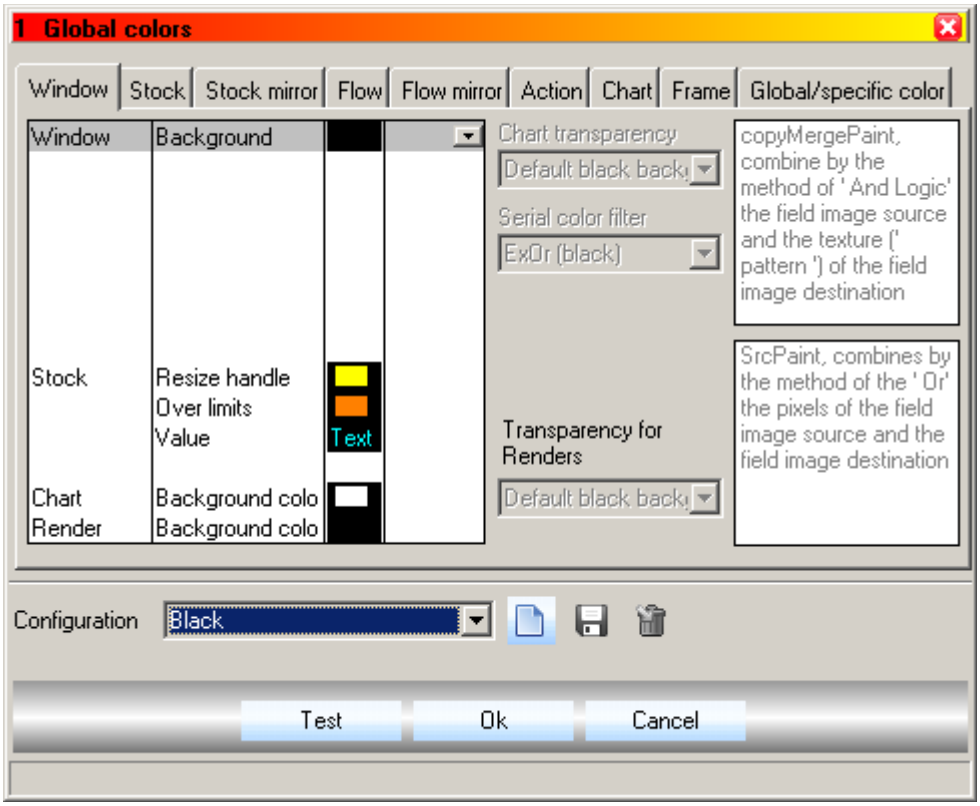
I - RENDERS

Renders are 3D animated graphics.
They display primitives of the OpenGL graphics library.
Refer to http://www.opengl.org/

See tutorial Working With 3D primitives http://www.true-world.com/htm/en/tutorials3D.htm

It is better to select the black color configuration for this model : Main Menu → View → Global colors.

'Global Color' window

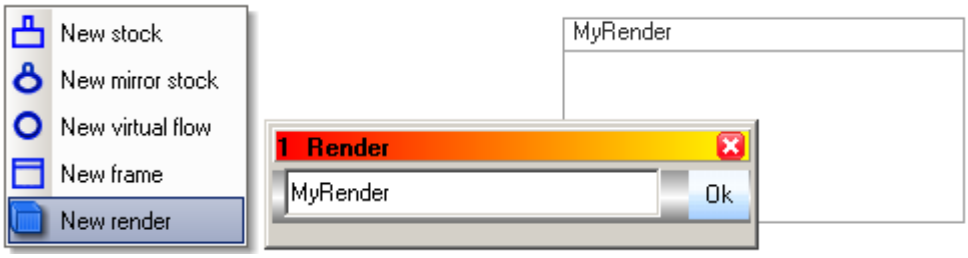


A) New render

1. Creating a render

- Select the option 'New render' from the main popup menu
- Enter a name
- Click on the 'Ok' button

Popup menu



or

- Click on the 'New 4D render' button from the toolbar
- Click on the model

Toolbar and the 'Render' button

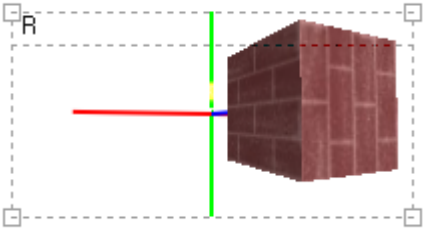
2. Moving, resizing and fixing a position

Moving a render :

- Drag-and-drop the render by its title bar

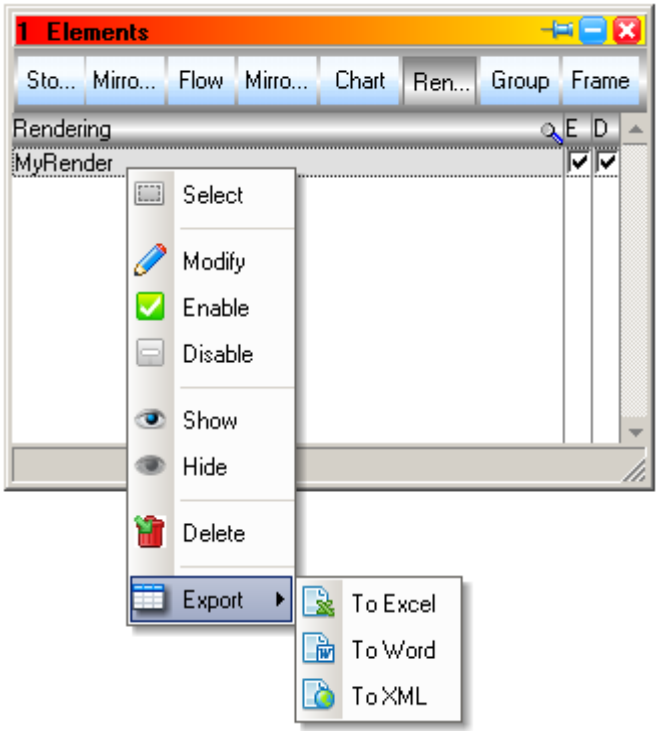
Resizing a render :

- Click on the title bar of a render to select it
- Drag-and-drop the handles

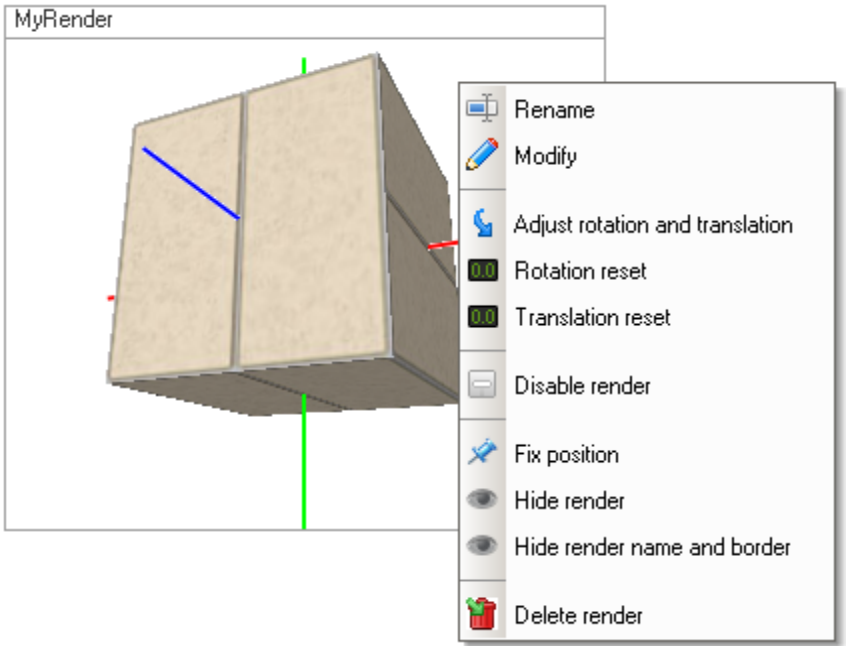


3. Popup menu of a render

Popup menu of a render in 'Elements' the window



Popup menu of a render in the model

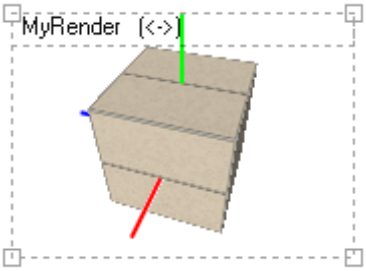


Options for the popup menu :

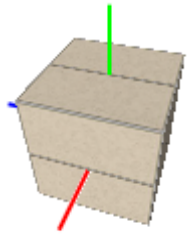
- 'Rename' : renames the render
- 'Modify' : opens and edits the render
- 'Adjust rotation and translation' :
  (or you can click on the button from the left toolbar with the 'Name' name)

  - adjusts the rotation and the translation of the render in the model
  (the string (↔) is added at the right of the title of the render)

  - Press the left button of the mouse and move it to adjust the rotation
  - Press the left button of the mouse and turn the wheel to adjust the translation
  - When finishing, select this option again



- 'Rotation or Translation reset' : resets these parameters
- 'Disable/Enable render' : displays only the frame of the render, the render being hidden
- 'Fix position' : fixs or frees the position of the render in the model
- 'Hide/display render' : hides or displays the render
- 'Hide render name and border' : hide the name and the border of the render



4. Modifying a render

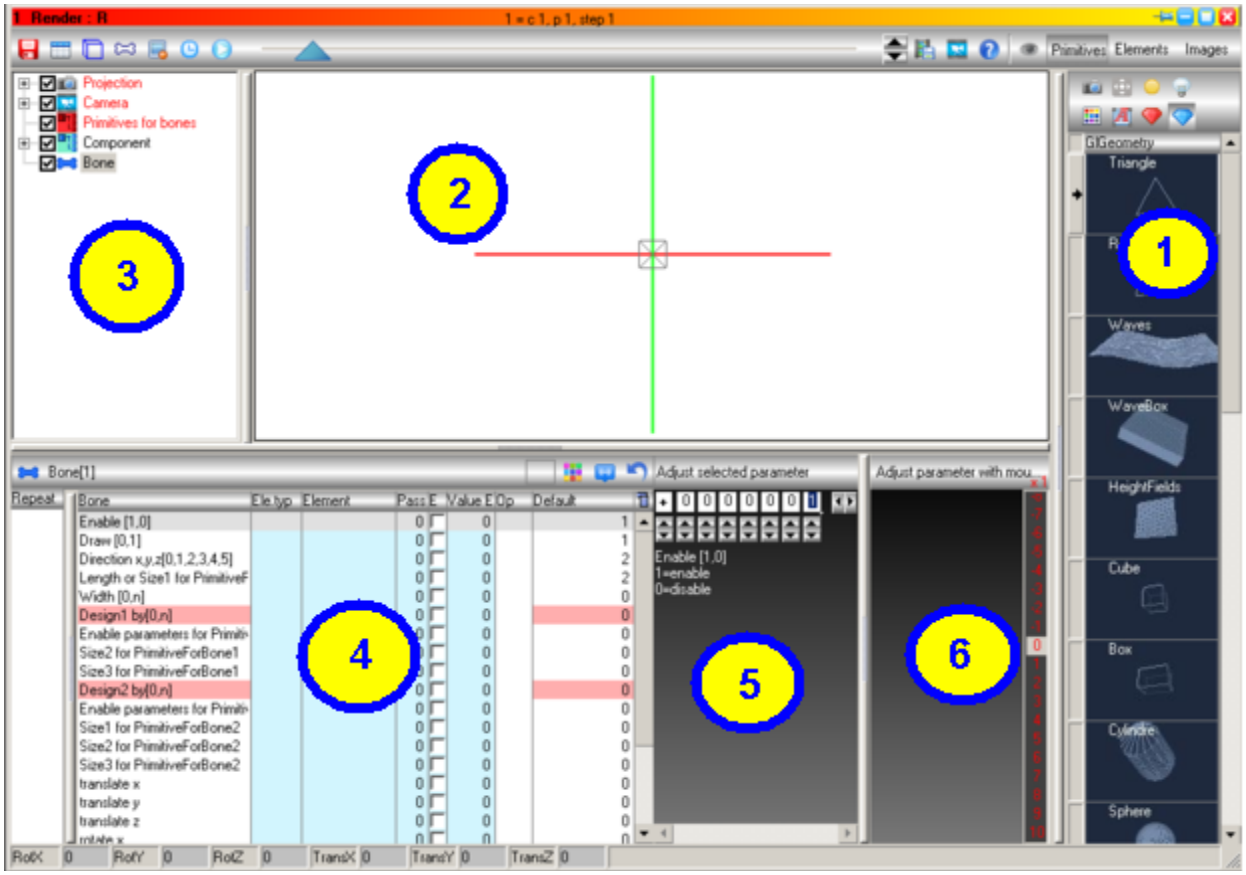
- Double-click on the title of the render
  or
- Delect the render and press the 'F3' key
  or
- Select the 'Modify' option from its popup menu
  or
- Click on the 'Modify' button from the right toolbar and click on the render

Right toolbar and 'Modify' modifiy

- Modify the render in its 'Render ' window'

II – 'RENDER' WINDOW

'Render' window



A) Adding primitives in a render

- Double-click or drag-and-drop one primitive from **part 1** over **part 2** (the render)
  or drag-and-drop one primitive from **part 1** over **part 3** (the TreeView)

- Select one primitive in **part 3** (TreeView)
- Select one parameter of the selected primitive, in **part 4** (table of parameters)

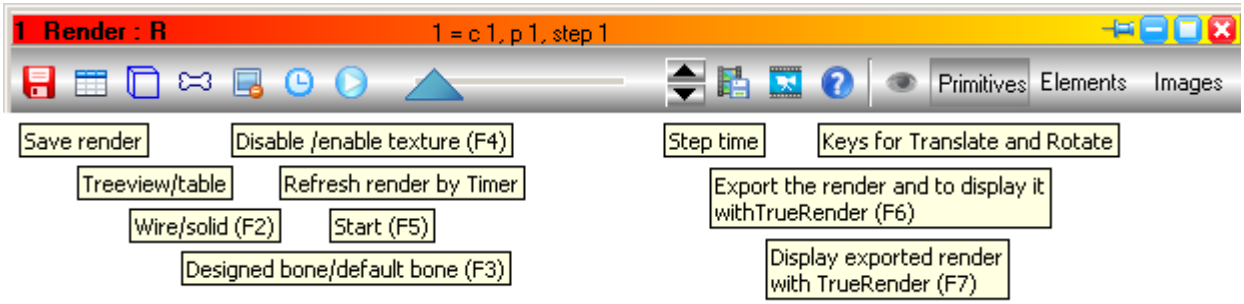
- Adjust the value of the parameter in the 'Default' column in **part 4**
  or adjust the value of the parameter with the fields or the spins of **part 5**
  or adjust the value of the parameter with the mouse in **part 6**
  or display the 'Elements' table in **part 1**, and drag-and-drop one element over the parameter
  or display the 'Images' table in **part 1**, and drag-and-drop one image over the parameter
  or drag-and-drop one image from explorer in **part 1** (size of the image = power of 2)

- In **part 2**, you can adjust the rotation and the translation of the render with the mouse (and scrool wheel) or the keyboard (click on the '?' button)

B) Toolbars

1. Buttons from the toolbar

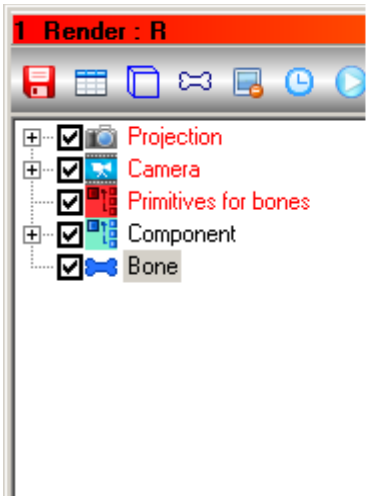
Toolbar

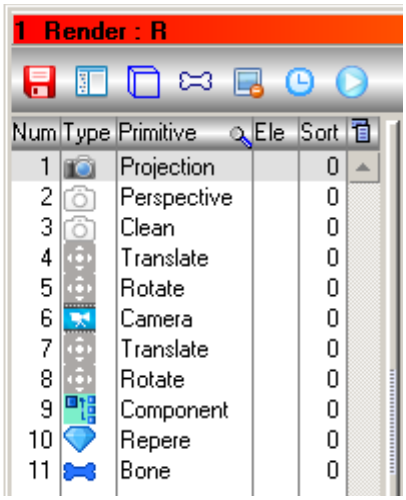


From left to right :

- 'Save render' : saves the render
- 'Treeview/table' : displays the TreeView of the primitives or the table of the primitives

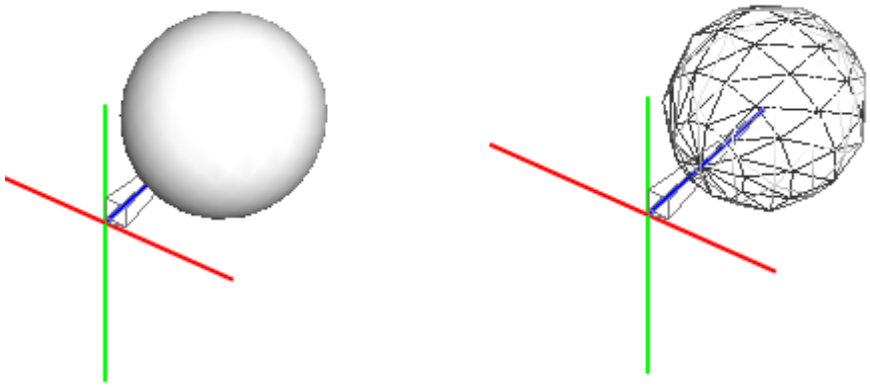
  On the left : Treeview, on the right : Table





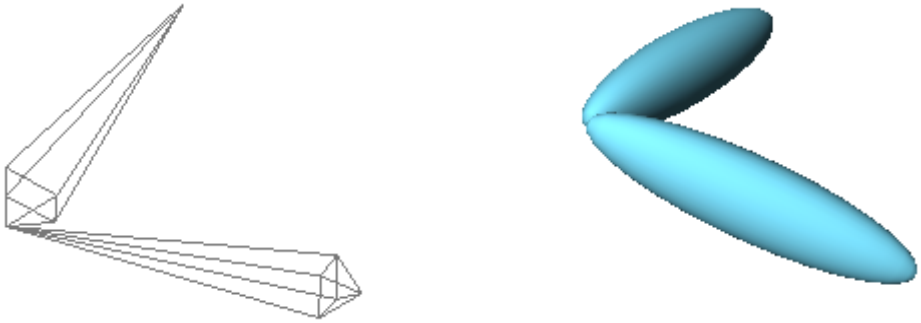
- 'Wire/solid ('F2' key) : displays the render in wire or solid mode

  On the left : solid mode, on the right : wire mode



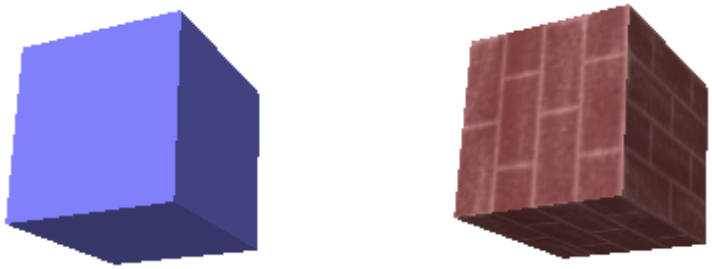
- 'Designed bone/default bone ('F3' key) : displays the bones with their designed primitives or not

  On the left : bones are not designed, on the right : bones are designed with one sphere



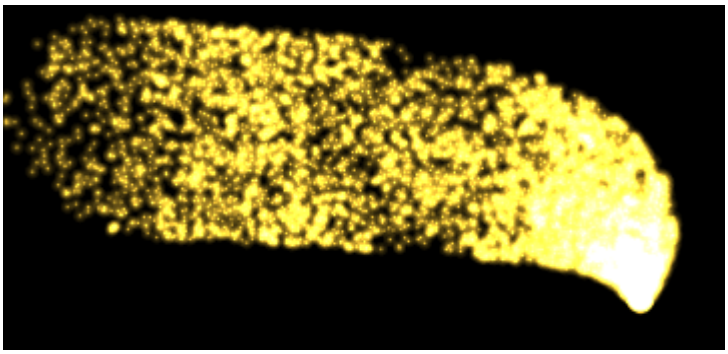
- 'Disable / enable texture ('F4' key) : displays the render with or without textures

  On the left : cube without texture, on the right : cube with texture



- 'Refresh render by timer' : enables the option - if one primitive in the render changes over time, such particles or fountain are displayed

  The particles can be displayed only if the render is refreshed by a timer (and the background model is black)



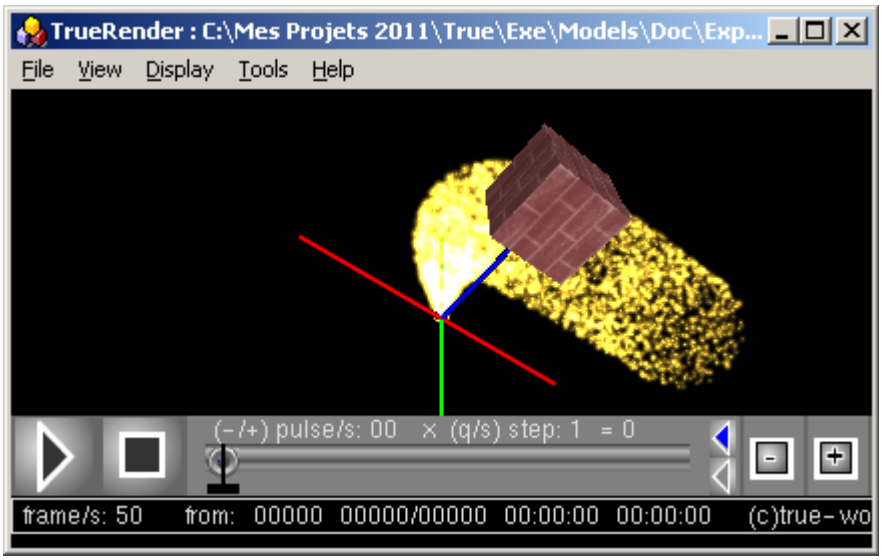
- 'Start/Stop ('F5' key) : displays the render according to the values of the elements, if they are driving parameters of the render : that is called 'procedural animation'
  You can also move the blue cursor to display the render manually according to the unit of time

- 'Step time' : this spin initializes the step, in unit of time, when playing the render with the 'Start' button

- 'Export the render to display it with TrueRender ('F6' key) : TrueRender is an external program. It can read binary files that contain the renders made with 'True' software.
  When clicking this button, the render together with the values of the elements, if they are linked to the parameters of the render's primitives, is exported in one external binary file (in the folder 'Export' from the model). The name of the binary file is the name of the render + '.tru'

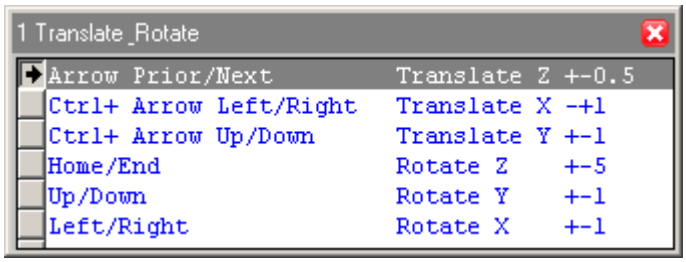
- 'Display exported render with TrueRender ('F7' key)' : this option opens the program TrueRender.exe with the exported binary file of the current render

  TrueRender program displaying exported binary file



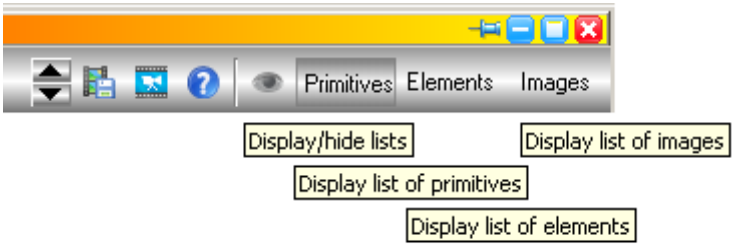
- 'Translate and Rotate' keys:

  Keys for the translating and rotating the render



2. Buttons on the right side of the toolbar

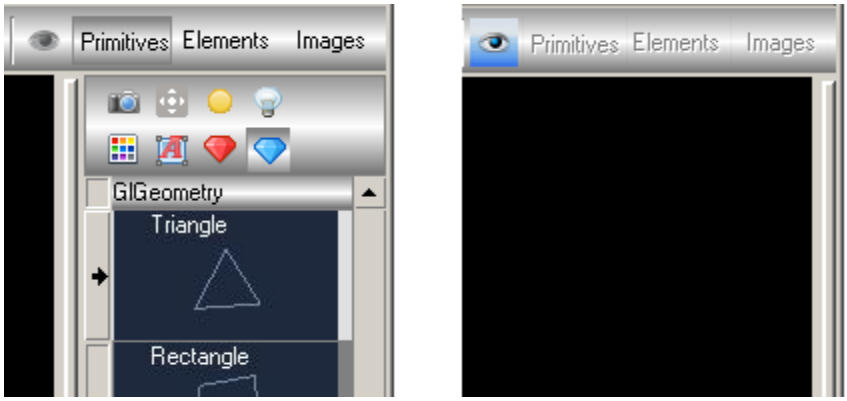
Right side of the toolbar



From left to right :

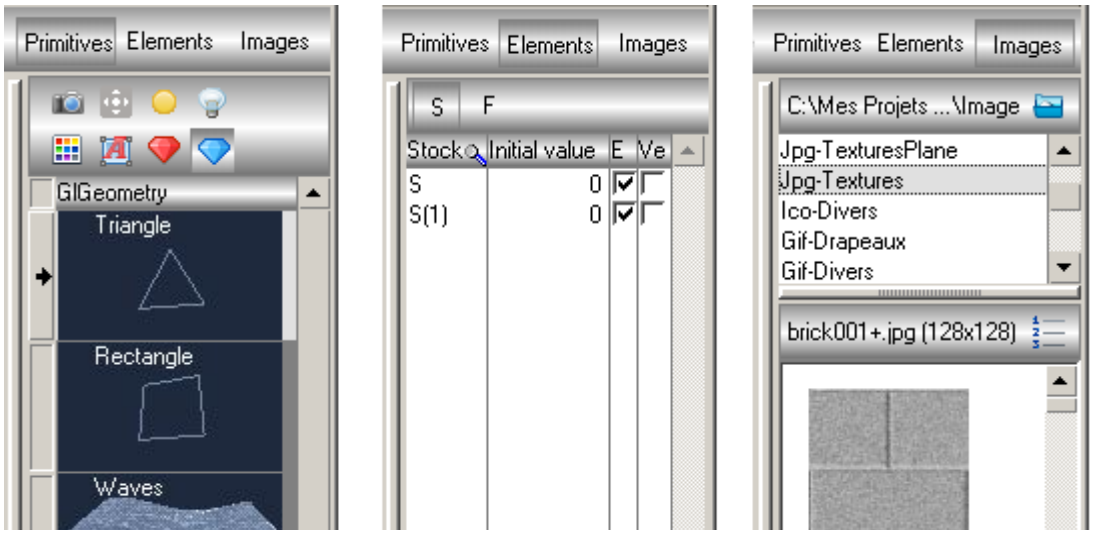
- 'Display/hide lists' : displays or hides the list on the right of the window

  On the left : the list of primitives is displayed, on the right : the list of the primitives is hidden



- 'Display list of primitives / elements / images' : these buttons allow the selection of the list to be displayed on the right side of the window

  On the left : list of primitives, in the middle : list of elements, on the right : list of images



III – THE 'TREEVIEW' OF PRIMITIVES

A) The 'TreeView' of primitives

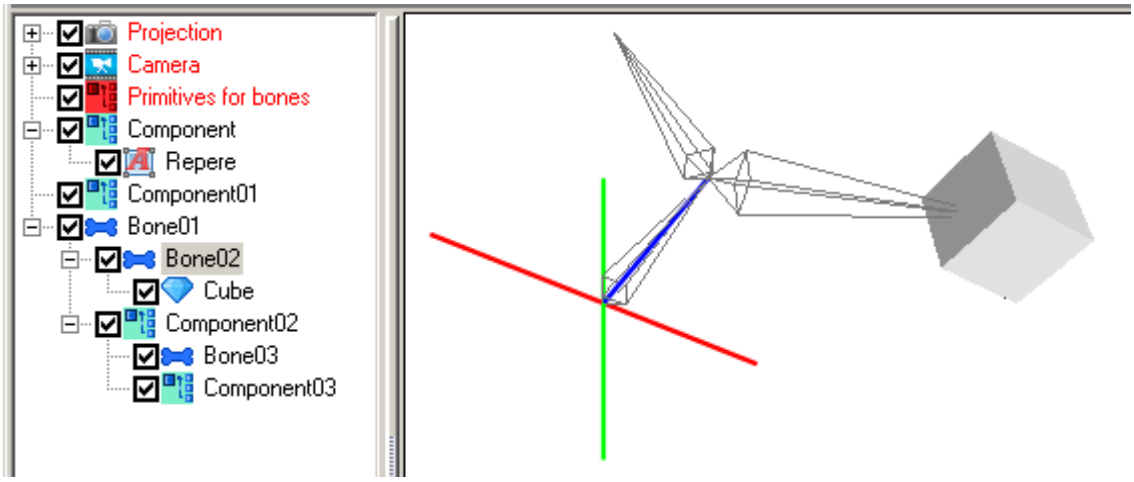
1. 'Treeview'

The 'TreeView' lists all the primitives of the render.
Displaying a render consists in displaying the primitives in the same order as they appear in the 'TreeView'.

One component may contain one or more components, bones or primitives.
A bone may contain one or more components, bones or primitives (see chapter IX)

The 'repeat' parameter of one component allows to repeat its elements.
The elements in a bone are translated and rotated by the values of its 'Translate and rotate' parameters.

Example : Components and bones



The 'TreeView' allows to :

- Creating new components or child components :
  - one component can contain primitives, bones and components

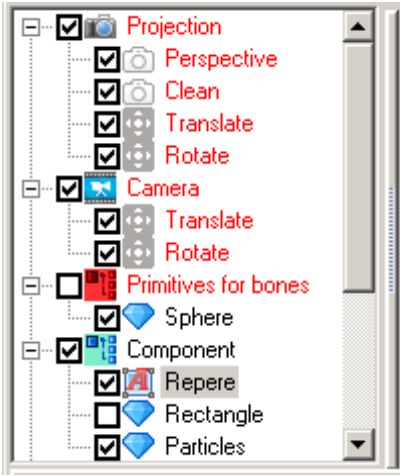
- Creating new bones or child bones :
  - one bone can contain primitives, bones and components

- Renaming (press 'F2' key), enabling or disabling (tick the box), droping, inserting, duplicating, moving or deleting primitives, bones or components

- Selecting one or more primitives to make a new component

- Copying and pasting primitives, bones or components in the render or to another render

The 'TreeView'



- Notes :

- the first primitives in red should not be deleted

- 'Primitives for bones' is a component that can contain primitives for drawing bones

- 'Component' can contain other primitives and other components :
  - if a component is disabled, the primitives following this component (in the 'TreeView') are also disabled

- Bones are special primitives :
  - all the primitives displayed after a bone in the 'TreeView' can be translated and rotated by its 'Translate and rotate' parameters (see chapter IX)

Moving primitive

Move one or more primitives :

- Select one or more primitives using the 'Shift' or 'Ctrl' key as with Explorer
- Drag-and-drop the selection on another component or on another primitive

Duplicating a component, bone or primitive

- Use the same method with the 'Ctrl' key pressed

Copy and paste a component, bone or primitive

Selecting a component or a primitive :

- Select the 'Copy' optionfrom the popup menu
- Select a component or a primitive from a render
- Select the 'Paste' option from the popup menu

Deleting a component, bone or primitive

Deleting a component :

- Select the component
- Select the 'Delete selection' option from the popup menu or
- Press the 'Delete' key

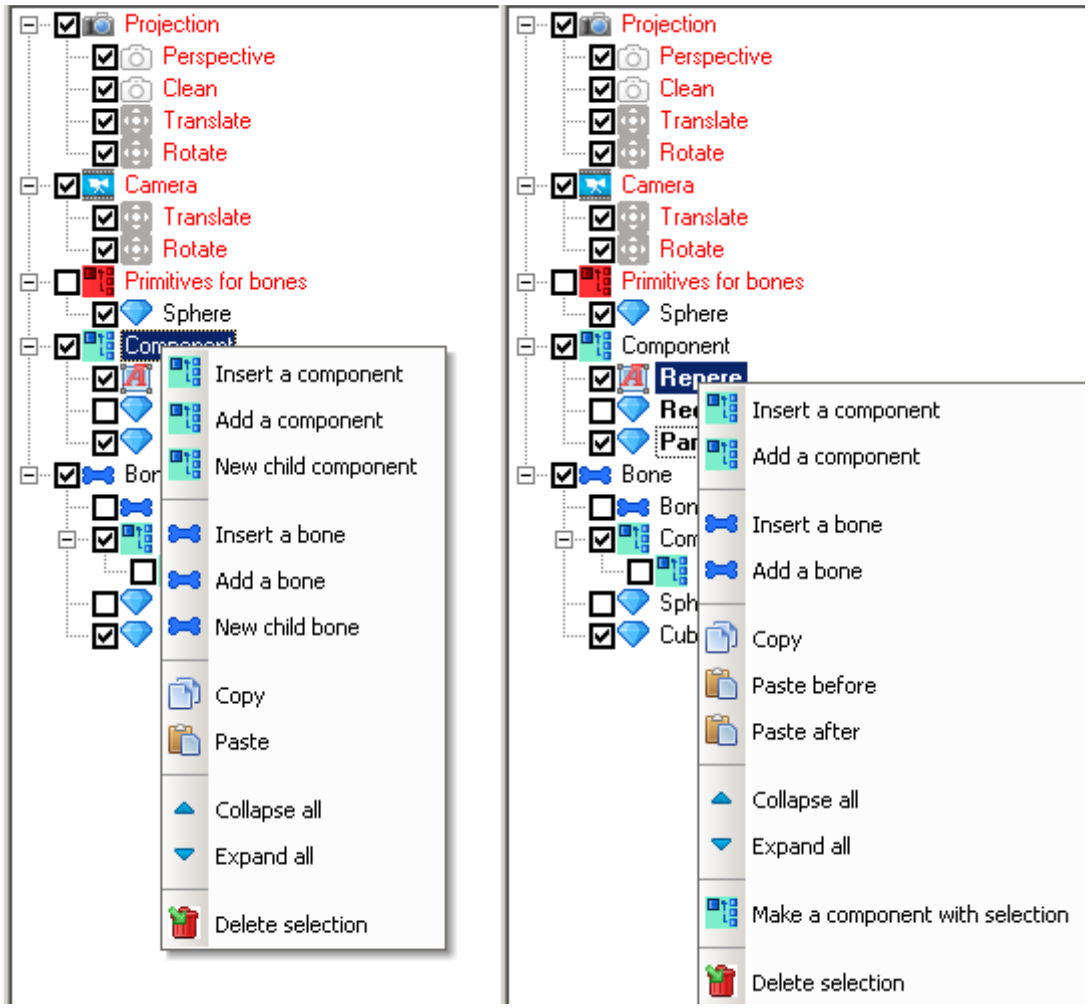
Deleting one or more primitives :

- Select one or more primitives using the 'Shift' or 'Ctrl' key as in Explorer
- Select the 'Delete selection' option from the popup menu or
- press the 'Delete' key

2. Popup menu

Popup menu of a component , Popup menu of a primitive

Popup menus



- Notes :

- to select several primitives :

- select the first primitive with the mouse
- press and hold the 'Shift' key
- select the last primitive with the mouse
- release the 'Shift' key

- The font of the selected primitives is in bold : see above, on the right, under the popup menu

To create a component with the same level as the selected component or bone :

- Select the 'Insert or add a component' option

To create a bone with the same level as the selected component or bone :

- Select the 'Insert or add a bone' option

To create a component in the selected component or bone :

- Select the 'New child component' option

To create a bone in the selected component or bone :

- Select the 'New child bone' option

To move a component or a bone :

- Drag-and-drop or move it with the mouse
- It will be at the same level as the component or bone on which it is dropped

To move a component or a bone on a lower level :

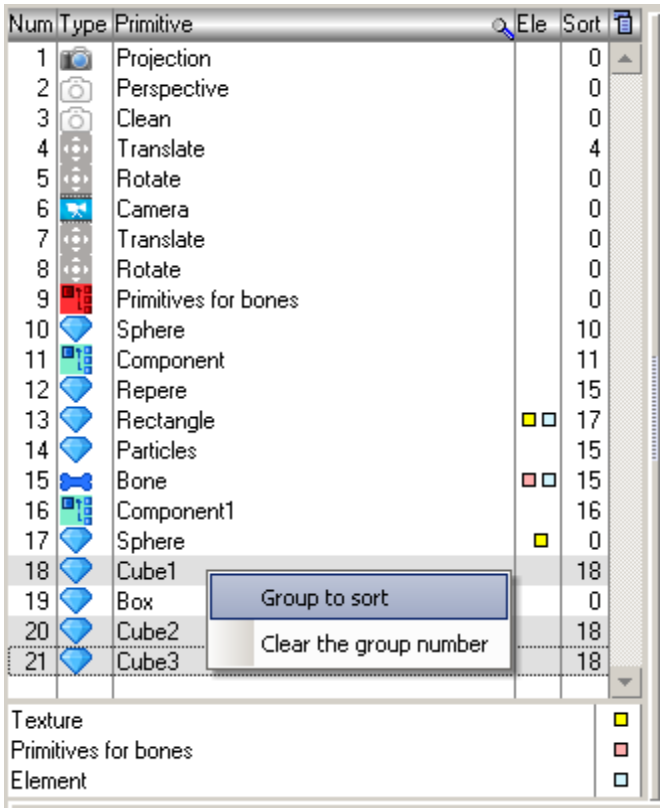
- A component or a bone of the lower level must be created before the component or bone with a higher level

B) Table of the primitives in the 'TreeView'

1. Table of primitives

The table lists all the primitives of the render.

Table of primitives



Columns :

- 'Num' : order of the primitive
- 'Type' : type of primitive
- 'Primitive' : name of the primitive
- 'Ele' : indicates according to the color (as displayed in the little table below)
  blue : the primitive is textured
  red : the primitive is a bone designed with a primitive for bone
  yellow : one or more parameters are drived by one or more elements in the model

- Sort : indicates the group number of the primitive
  - to sort the primitives by their group number, click on the title of the 'Sort' column

2. Grouping the primitives in the table

The primitives in the table can be grouped.
Once grouped, the primitives can be sorted by their group number.
Once sorted by their group number, the can be selected.
Then, the selected primitives can be changed according to the change made to the initially selected primitive.

Example : if you drop one image on the table of parameters of the initially selected primitive, the other selected primitives can be initialized with this image.

Grouping the primitives

- Select several primitives on the table (press 'Ctrl' key and click on the primitives)
- Right-click on the initial selected primitive to open popup menu
- Select the 'Group to sort' option from the popup menu
- The group number of the selected primitives will be the order number of the initially selected primitive

Sorting the primitives by their group number

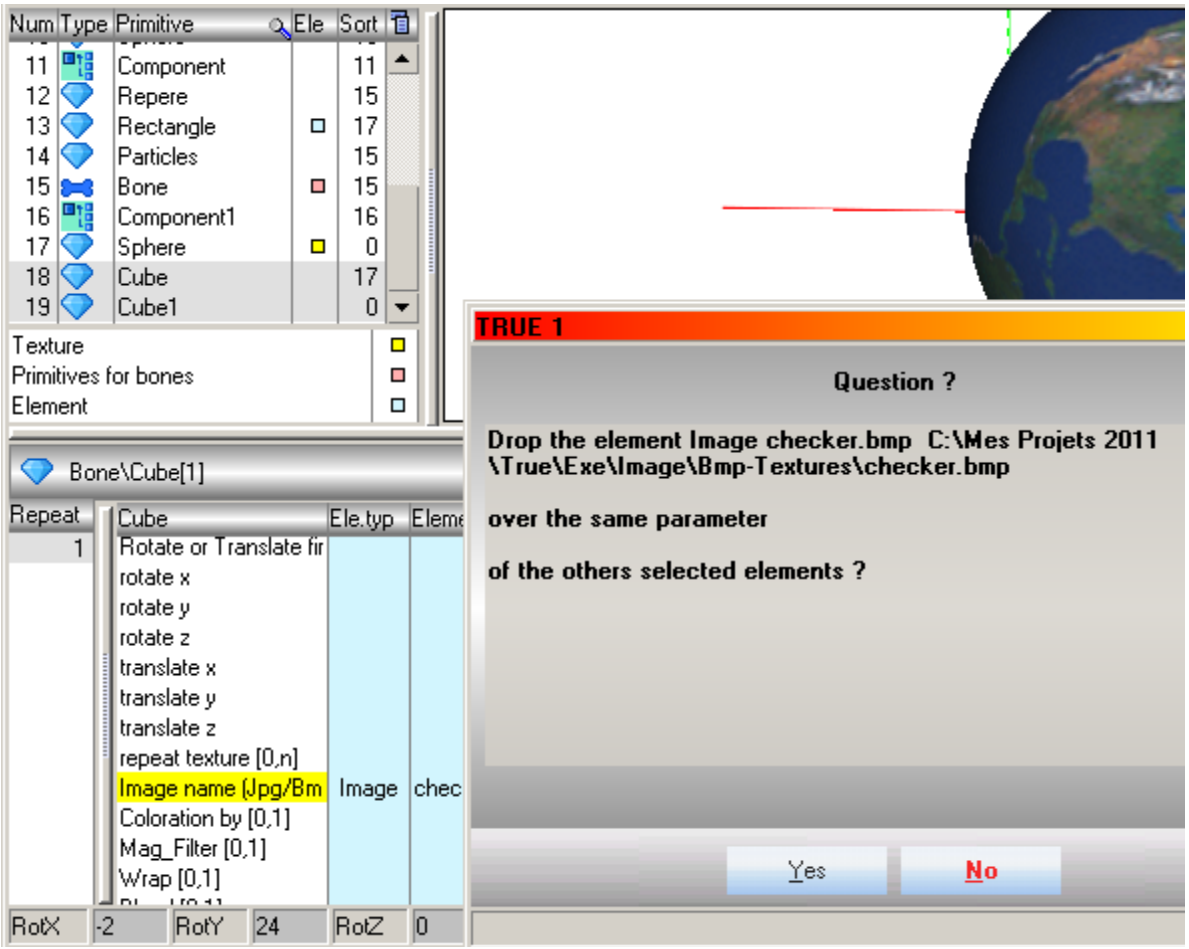
- Click on the title of the 'Sort' column

3. Initializing several selected primitives in the table

Initializing the selected primitives in the table :

- If several identic primitives are selected in the table, when you drop one element (stock, flow or image) over a parameter of the selected primitive, you can assign this element to the other selected primitives, this being the same situation as you remove an assigned element.

Below, 2 primitives are selected in the table : 'Cube and Cube1'
after one Image is dropped over the parameters 'Image name' of the primitive 'Cube[1],
you can accept assigning this image to the other selected 'Cube' primitive



IV – 'RENDER'

A) 'Render'

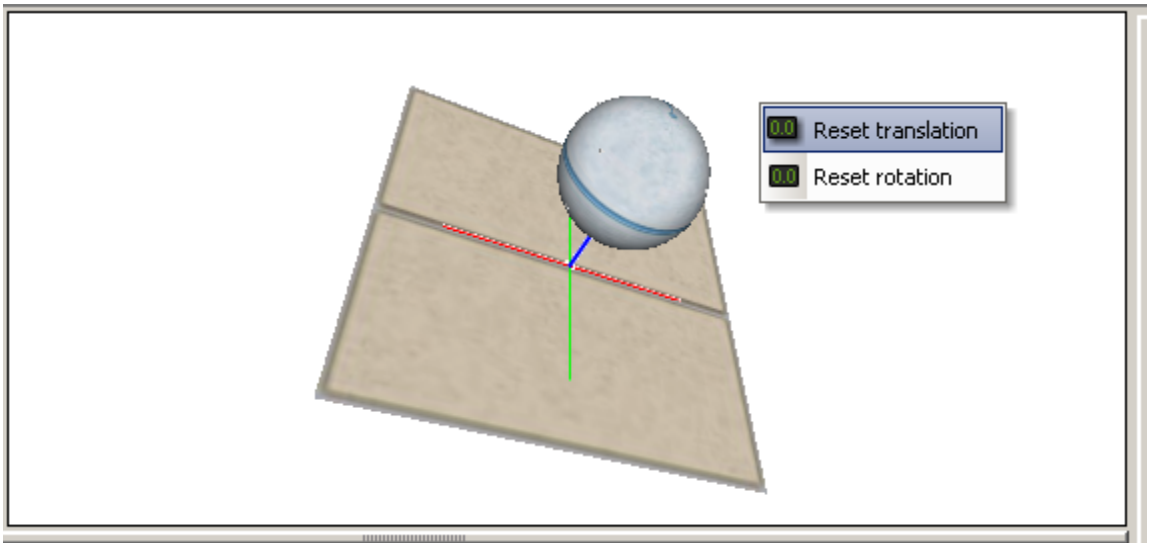
1) Adjusting the rotation and the translation

- Rotation X and Y : click on the render and move the mouse to the left, to the right, up or down
- Rotation Z : click on the render, press the 'Home' or 'End' keys
- Translation Z : click on the render, move the scrool wheel or press the 'Page Down' or 'Page Up' keys

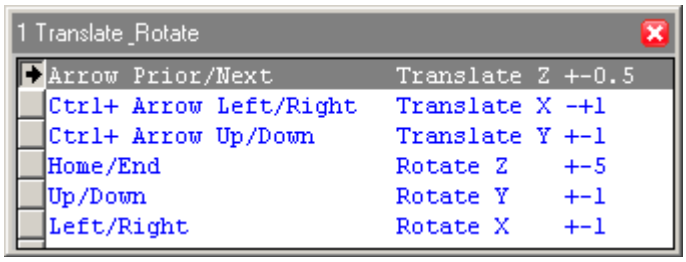
- Use popup menu to reset the rotation or translation

- Click on '?' button from the toolbar to display other keyboard shortcuts

A render with its popup menu



Keyboard shortcuts



1 Translate_Rotate

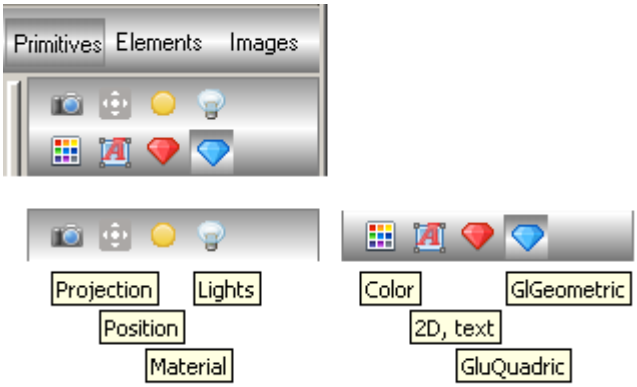
Arrow Prior/Next	Translate Z +-0.5
Ctrl+ Arrow Left/Right	Translate X -+1
Ctrl+ Arrow Up/Down	Translate Y +-1
Home/End	Rotate Z +-5
Up/Down	Rotate Y +-1
Left/Right	Rotate X +-1

V - TABLES ON RIGHT

Choose the table to be displayed on the right of the window with this buttons :

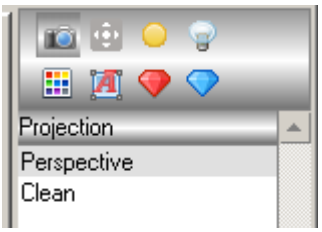
A) Tables of primitives

Choose the primitive table to be displayed on the right side of the windows with this buttons :



1. 'Projection' table

Primitives of the 'Projection' table



- 'Perspective' option : set the perspective of the render

Parameters of the 'Perspective' primitive

Perspective	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Fovy			0		0		45
zNear			0		0		0.01
zFar			0		0		1000

- 'Clean' option : clean the render

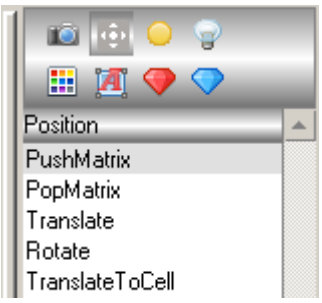
Parameter of the 'Clean' primitive

Clean	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1

- Note : if only the 'Enable' parameter is present, we will say that there is no parameter

2. 'Position' table

Primitives of the 'Position' table



- 'PushMatrix' option : saves the current rotation and translation of the render (no parameter)
- 'PopMatrix' option : restores the rotation and the translation saved by the previous PushMatrix (no parameter)

- Notes :
- in the render :
- 'PushMatrix' and 'PopMatrix' options work together
- between 'PushMatrix' and 'PopMatrix' options, you can insert 'Translate or Rotate' primitives

'Push matrix' and 'PopMatrix' example

- 'Translate' option : set the translation for the next primitives

Parameters of the 'Translate' primitive

Translate	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
x			0	☐	0		-0.0
y			0	☐	0		-0.0
z			0	☐	0		-0.0

- 'Rotate' option : sets the rotation for the next primitives

Parameters of the 'Rotate' primitive

Rotate	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
x			0	☐	0		0
y			0	☐	0		0
z			0	☐	0		0

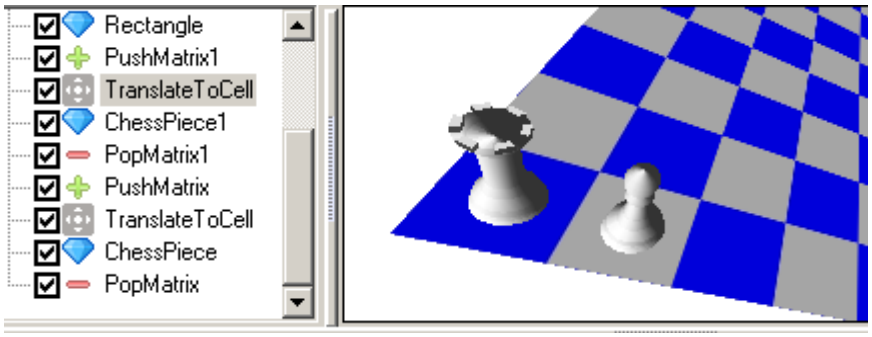
- 'TranslateToCell' option : sets the position of one 'ChessPiece' primitive on a chessboard

Parameters of the 'TranslateToCell' primitive

TranslateToCell	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Num cell			0		0		1
Nb cell by side			0		0		8
size			0		0		4

- 'Num cell' : sets the position from 1 to 64 on the chessboard,
  (from the left bottom corner to the right top corner)
- 'Nb cell by side' : sets the number of cells on the side of the chessboard
- 'size' : sets the size (width=height) of the chessboard

Example of a Chessboard

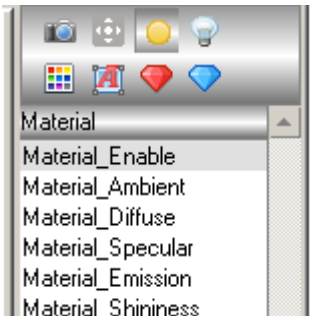


- the chessboard is a Rectangle (with=height = 4)
- first 'TranslateToCell' : Num cell =1
- second 'TranslateToCell' : Num cell =2

3. 'Material' table

Preferably use the 'Color' table instead of this table, because it needs the OpenGL knowledge.
Do not use the primitives of the 'Color' table with the 'Material' primitives.
Choose between the primitives of the 'Color' table and the primitives of the 'Material' table.

Primitives of the 'Material' table

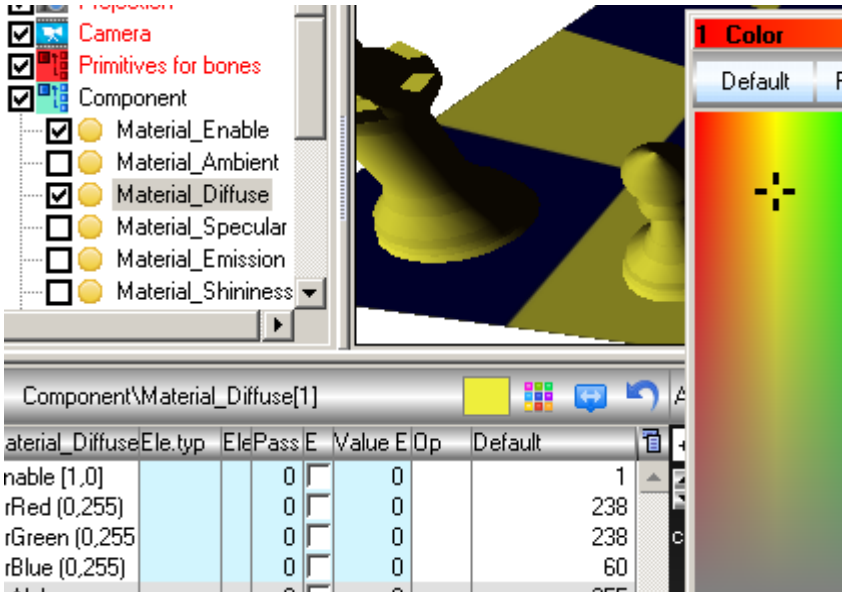


- 'Material Enable' option : enables or disables the other 'Material' primitives (no parameter)
- 'Material Ambient, Diffuse, Specular, Emission' : set the corresponding material colors

Parameters of the 'Material Ambient, Diffuse, Specular, Emission' primitives

Material_Ambient	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
clrRed (0,255)			0		0		51
clrGreen (0,255)			0		0		51
clrBlue (0,255)			0		0		51
clrAlpha			0		0		255

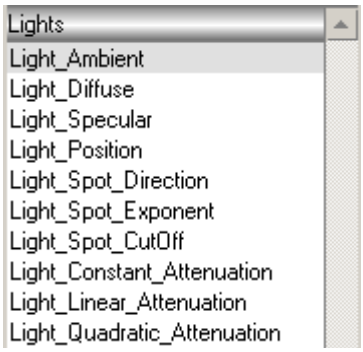
Example with 'Material Diffuse'



4. 'Lights' table

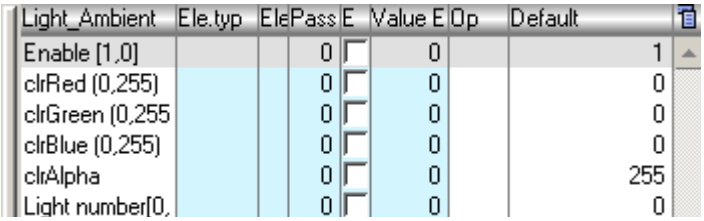
Preferably use the 'Color' table instead of this table, because it needs OpenGL knowledge.
Do not use the primitives of the 'Color' table with the 'Material' primitives.
Choose between the primitives of the 'Color' table and the primitives of the 'Lights' table.

Primitives of the 'Lights' table



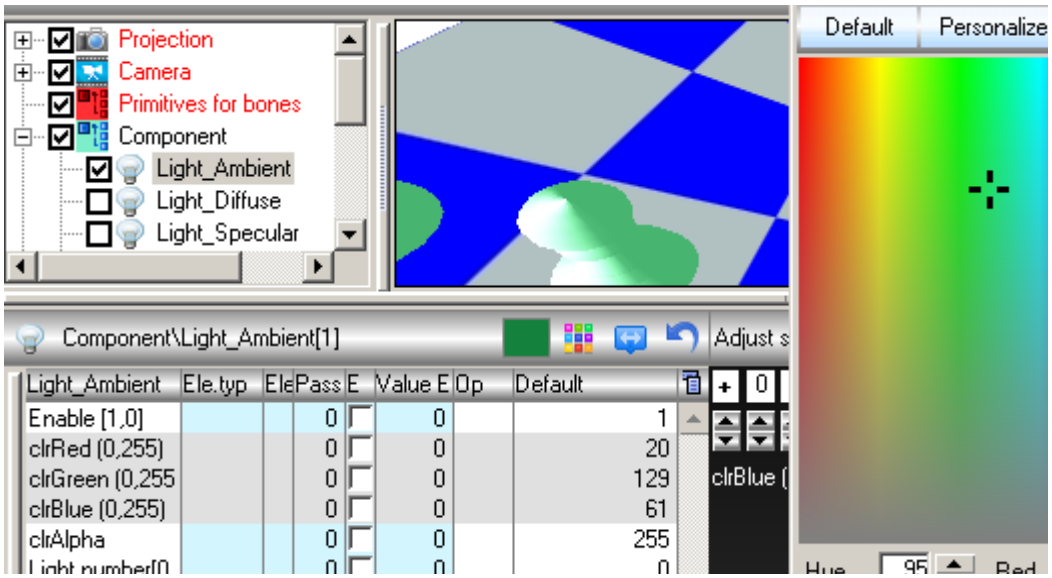
- 'Light Ambient, Diffuse, Specular' : set the corresponding light colors

Parameters of the 'Light Ambient, Diffuse, Specular' primitives



Light_Ambient	Ele.typ	ElePass	E	Value E	Op	Default
Enable [1,0]		0		0		1
clrRed (0,255)		0		0		0
clrGreen (0,255		0		0		0
clrBlue (0,255)		0		0		0
clrAlpha		0		0		255
Light number[0,		0		0		0

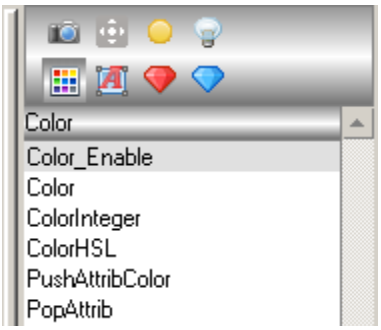
Example with 'Light Ambient'



5. 'Color' table

Preferably use this table ('Color' table) instead tables 'Material' and 'Lights'.
Do not use the primitives of the 'Color' table with the 'Material' primitives.
Choose between the primitives of the 'Color' table and the primitives of the 'Lights' or 'Material' tables.

Primitives of the 'Color' table

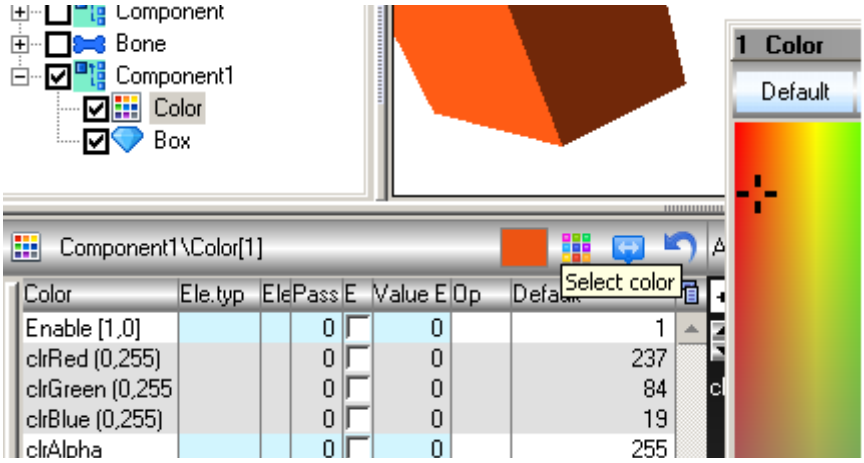


- 'Color_Enable' : enables or disables the parameter of this primitives
- 'Color' : sets the color for the next primitives (color = Red, Green, Blue)

Parameters of the 'Color' primitive

Color	Ele.typ	ElePass	E	Value E	Op	Default
Enable [1,0]		0		0		1
clrRed (0,255)		0		0		221
clrGreen (0,255		0		0		194
clrBlue (0,255)		0		0		102
clrAlpha		0		0		255

Example with 'Color'



- You can select the color from the 'Color' window by clicking on the 'Select Color' button

- 'ColorInteger' : sets the color for the next primitives (color = Integer)

Parameters of the 'ColorInteger' primitive

ColorInteger	Ele.typ	Ele	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Color1 Int. valu			0		0		2345863
clrAlpha			0		0		255

- 'ColorHSL' : sets the color for the next primitives (color = Hue, Saturation, Luminance)

Parameters of the 'ColorHSL' primitive

ColorHSL	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Hue (0,239)			0		0		74
Saturation (0,240)			0		0		163
Luminance (0,240)			0		0		143
clrAlpha			0		0		255

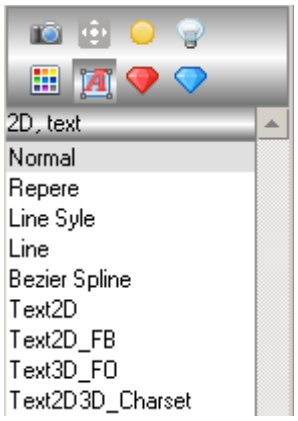
- 'PushAttribColor' : saves the current color (no parameter)

- 'PopAttrib' : restores the color saved by 'PushAttribColor' (no parameter)

- Notes :
- in the render :
- 'PushAttribColor' and 'PopAttrib' options work together
- between 'PushAttribColor' and 'PopAttrib', you can insert 'Color' primitives

6. '2D, text' table

Primitives of the '2D, text' table



- 'Normal' : sets the 'Normal' for the next primitive

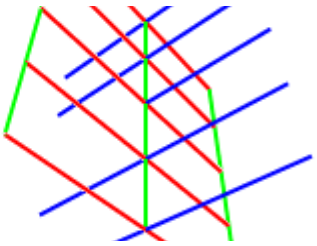
Parameters of the 'Normal' primitive

Normal	Ele.typ	Eleme	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
x			0		0		-0.0
y			0		0		-0.0
z			0		0		1.0

- 'Repere' : draw a repere

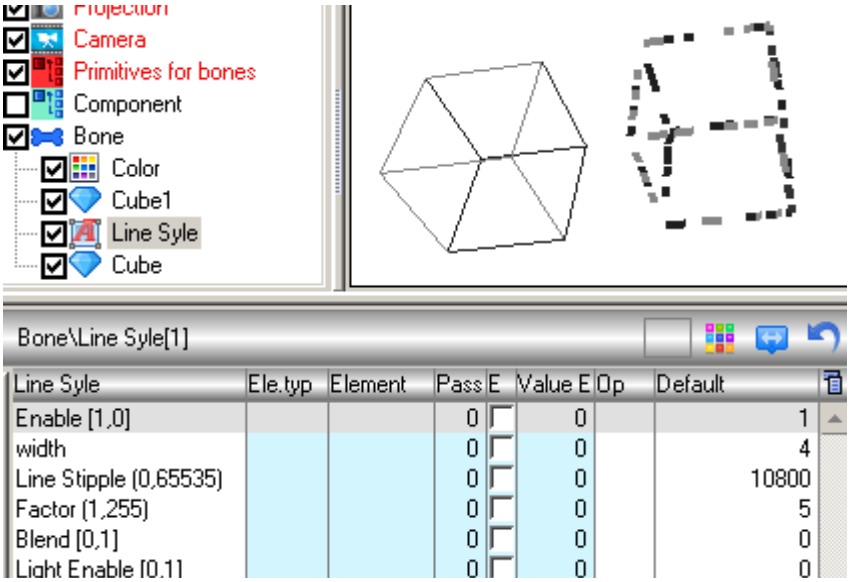
Parameters of the 'Repere' primitive, an example with Scale >0 on the right

Repere	Ele.typ	Eleme	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
size			0		0		2
width			0		0		2
ScaleX			0		0		0
ScaleY			0		0		0
ScaleZ			0		0		0



- 'Line style' : sets the line parameters for the next primitives

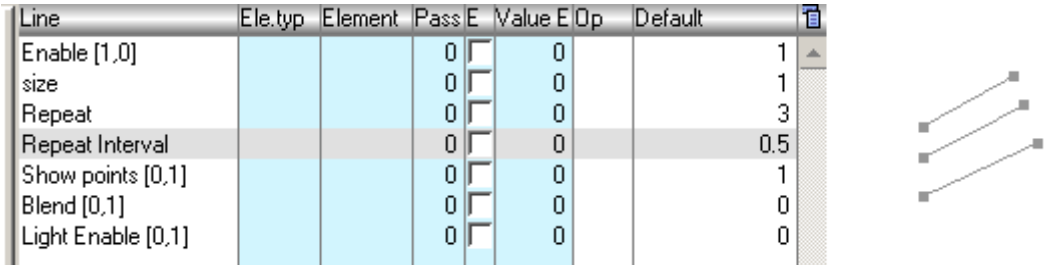
Parameters of the 'Line style' primitive with an example



- Lines of 'Cube1' are set by default
- Lines of 'Cube' are made with 'Line Style' parameters

- 'Line' : draw a line

Parameters of the 'Line' primitive with an example with 'Repeat' = 3



- 'Bezier Spline' : draw a Bezier spline

Parameters of the 'Bezier Spline' primitive with an example

Bezier Spline	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Grid			0	☐	0		30
y2			0	☐	0		2
z2			0	☐	0		0.5
y3			0	☐	0		-0.5
z3			0	☐	0		0.5
y4			0	☐	0		-2
z4			0	☐	0		1.5
size			0	☐	0		2
Show points [0,1]			0	☐	0		1
Blend [0,1]			0	☐	0		0
Light Enable [0,1]			0	☐	0		0

- y2,z2 are y,z of the control point 2
- y3,z3 are y,z of the control point 3
- y4,z4 are y,z of the control point 4

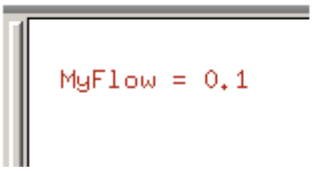
- 'Text2D' : draw a text in 2D

Parameters of the 'Text2D' primitive with an example

Text2D	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Draw what [0,1,2,3,4]			0	☐	0		2
Text from element	Flow	MyFlow	1	☑	0.1		0.1
Font [0,1,2,3,4,5,6]			0	☐	0		3
x			0	☐	0		15.8
y			0	☐	0		36.4

+ 0 0 0 0 0 0 2

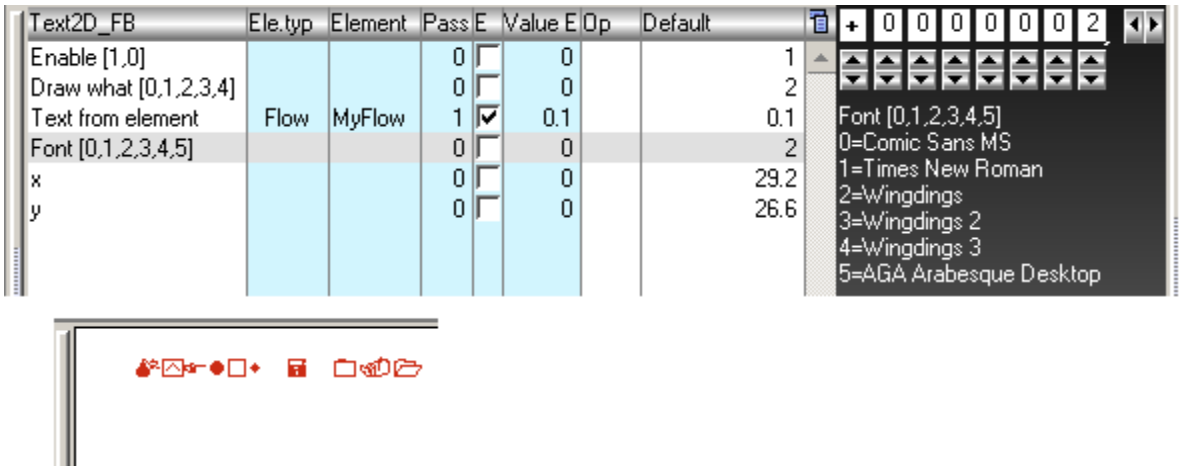
Draw what [0,1,2,3,4]
0=Name of the element
1=Value of the element
2=Name = Value
3=Name <rc> value
4=Frame rate



- Drag-and-drop an element from the 'Elements' table over the 'Text from element' parameter
- Adjust the 'Draw what' parameter as indicates on the right
- Adjust x and y to set the position of the text in the render

- 'Text2D_FB' : draws a text in 2D with choice of font

Parameters of the 'Text2D_FB' primitive with an example



- Drag-and-drop an element from the 'Elements' table over the 'Text from element' parameter
- Adjust the 'Draw what' parameter as it is indicated on the right
- Adjust the 'Font' parameter as it is indicated on the right
- Adjust x and y to set the position of the text in the render

- 'Text3D_FO' and 'Text2D_3D_Charset' : draw a text in 3D

Parameters of the 'Text3D_FO' primitive with an example

Text3D_FO	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Draw what [0,1,2,3,4]			0	☐	0		2
Text from element	Flow	MyFlow	1	☑	0.1		0.1
Font [0,1,2,3,4,5]			0	☐	0		0
Text centered on X [0,			0	☐	0		0
Text centered on Z [0,			0	☐	0		1
ScaleX			0	☐	0		1
ScaleY			0	☐	0		1
ScaleZ			0	☐	0		0.4
Caract rotate X			0	☐	0		-0.7
Caract rotate Y			0	☐	0		-1.5
Caract rotate Z			0	☐	0		-55.6
Color1 Int. value (<0=c			0	☐	0		5662955
Rotate or Translate firs			0	☐	0		0
rotate x			0	☐	0		0
rotate y			0	☐	0		0
rotate z			0	☐	0		0
translate x			0	☐	0		0
translate y			0	☐	0		0
translate z			0	☐	0		0

- Drag-and-drop an element from the 'Elements' table over the 'Text from element' parameter
- Adjust the 'Draw what' parameter as it is indicated on the right
- Adjust the others parameters

- Notes available for other primitives

- the color can be adjusted with the 'Color1 Int' parameter :
  - clicking on the 'Select color' button and selecting the color in the 'Color' window
- Adjust the 'Rotate.. to translate z' parameters to set the position of the text in the render

7. 'GluQuadric' table

Primitives of the 'GluQuadric' table

- 'CylinderGlu' : draws a cylinder

Parameters of the 'CylinderGlu' primitive

CylinderGlu	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Solid/wire [1,0]			0	☐	0		1
baseRadius			0	☐	0		2
topRadius			0	☐	0		1
height			0	☐	0		2
slices			0	☐	0		16
stack			0	☐	0		16
Color1 Int. value (<0=disabl			0	☐	0		6351497
Rotate or Translate first [0,1			0	☐	0		0
rotate x			0	☐	0		0
rotate y			0	☐	0		0
rotate z			0	☐	0		0
translate x			0	☐	0		0
translate y			0	☐	0		0
translate z			0	☐	0		0
Image name (Jpg/Bmp/Tga	Image	brick004r.jpg	0	☑	2		2
Coloration by [0,1]			0	☐	0		1
Mag_Filter [0,1]			0	☐	0		0
Wrap [0,1]			0	☐	0		1
Blend [0,1]			0	☐	0		0
Light Enable [0,1]			0	☐	0		1

X -47 RotY 11 RotZ 0 TransX 0 TransY 0 TransZ -5

- Drag-and-drop an image (texture) over the 'Image name (Jpg/Bmp/Tga)' parameter
  - Image size : width and height, should be numbers power of 2 ($2^{a)}$
  - example : 512 x 128 pixels (for 512, a = 9, for 128, a = 7)

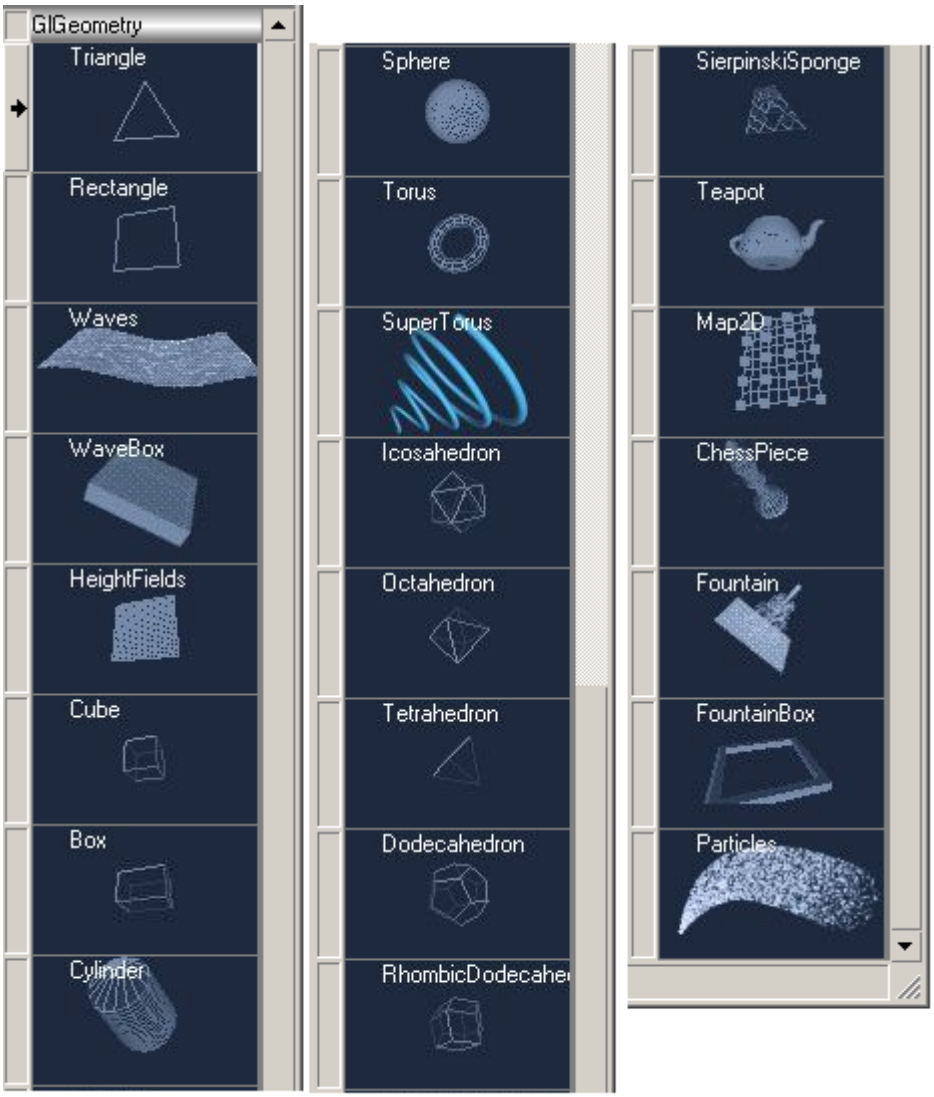
- Notes available for other primitives

- The color can be adjusted with the 'Color1 Int' parameter :
  Click on the 'Select color' button and select the color in the 'Color' window
- Adjust the 'Rotate.. to translate z' parameters to set the position of the text in the render
- Adjust the other parameters as your choose

- Use the same directions for the other primitives in this table

8. 'GlGeometry' table

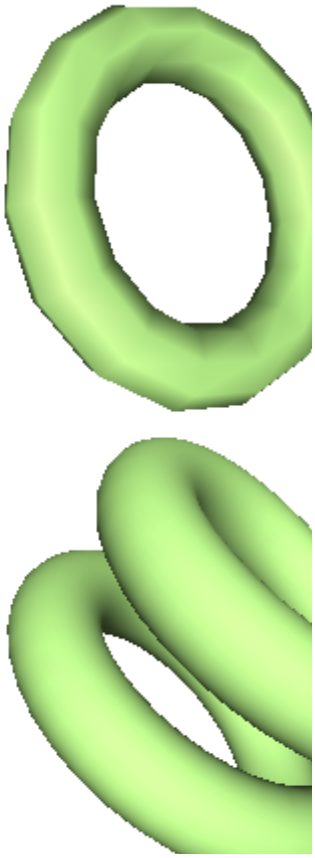
Primitives of the 'GlGeometry' table



- 'Torus' : draws a torus

Parameters of the 'Torus' primitive

Torus	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Solid/wire [1,0]			0		0		1
innerRadius			0		0		0.2
outerRadius			0		0		0.8
nsides			0		0		8
rings			0		0		15
Screw size (360°)			0		0		360
Screw step (z step)			0		0		0
startAngle			0		0		0
sweepAngle			0		0		360
Color1 Int. value (<0=disabl			0		0		8974775
Rotate or Translate first [0,1			0		0		0
rotate x			0		0		0
rotate y			0		0		0
rotate z			0		0		0
translate x			0		0		0
translate y			0		0		0
translate z			0		0		0
Repeat texture on torus par			0		0		11
repeat texture [0,n]			0		0		1
Image name (Jpg/Bmp/Tga			0		0		0
Coloration by [0,1]			0		0		1
Mag_Filter [0,1]			0		0		0
Wrap [0,1]			0		0		1
Blend [0,1]			0		0		0
Light Enable [0,1]			0		0		1
Normalize [0,1]			0		0		0



- Notes available for other primitives :

- Drag-and-drop ane image (texture) over the 'Image name...' parameter

- The color can be adjusted with the 'Color1 Int' parameter :
  - clicking on the 'Select color' button and selecting the color from the 'Color' window

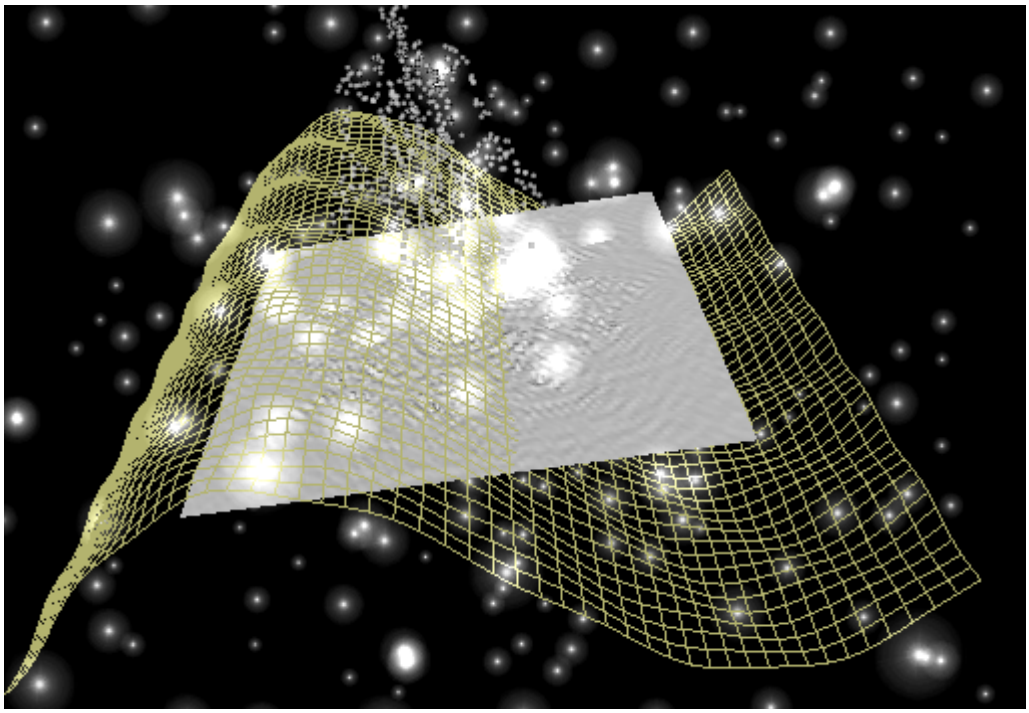
- Adjust the 'Rotate.. to translate z' parameters to set the position of the text in the render
- Adjust the other parameters as your choose

- Use the same direction for the other primitives in this table

- 'Waves, Fountain, Particles' :
  - Click on the 'Refresh by timer' button to refresh the dynamic display of these primitives

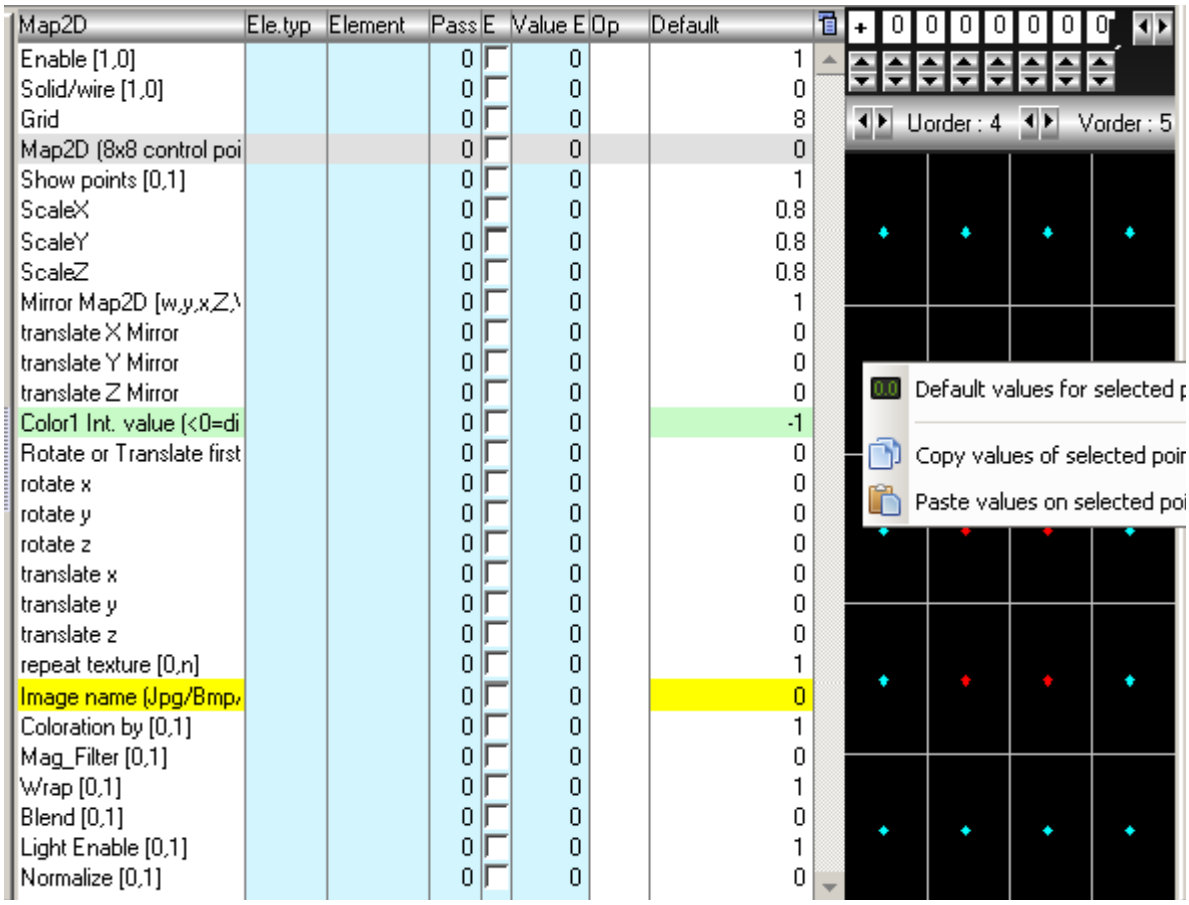
- 'Particles' :
  - The particles are not displaying if background color of the model is white, therefore choose black configuration

'Wave, Fountain, Particles'

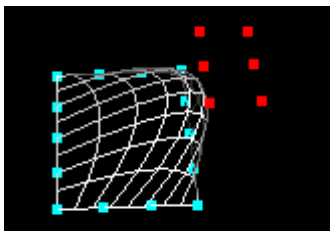


- 'Map2D' : draws a Bezier surface

Parameters of the 'Map2D' primitive



- select the 'Map2D (8x8 control point) parameter
- In the plan, on the right side of the parameters table :
- Adjust with the 'Uorder' and 'Vorder' spin the number of point
- Select the points with the mouse (lasso method)
- To deform the surface, adjust the position of the points (x,y,z) :
  - with the mouse (x,y, and z with the scrool wheel) in the 'Adjust parameter with mouse' plan
  - or with the spins on top adjust all the selected points together with same values for x,y,z



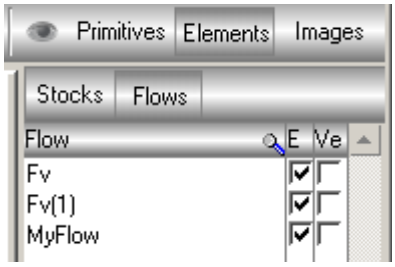
B) 'Elements' table

These tables contain the stocks and flows of the model.
When one element is added, modified or deleted in the model, the tables are updated.

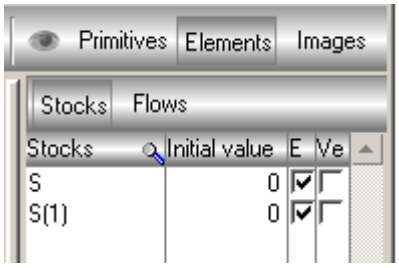
Drag-and-drop a stock or a flow over a parameter of the selected primitives
The value obtained is the parameter that will be initialized with the value of the element, following the current unit of time.

- Click on the 'Elements' button
- Click on the 'Stocks' button to display the list of stocks
- Click on the 'Flows' button to display the list of flows

Flows' table



'Stocks' table



Columns (they cannot be modified in theses tables)

- 'E' : if checked, the element is enabled
- 'Ve' : if checked, the element is vectorized

C) 'Images' table

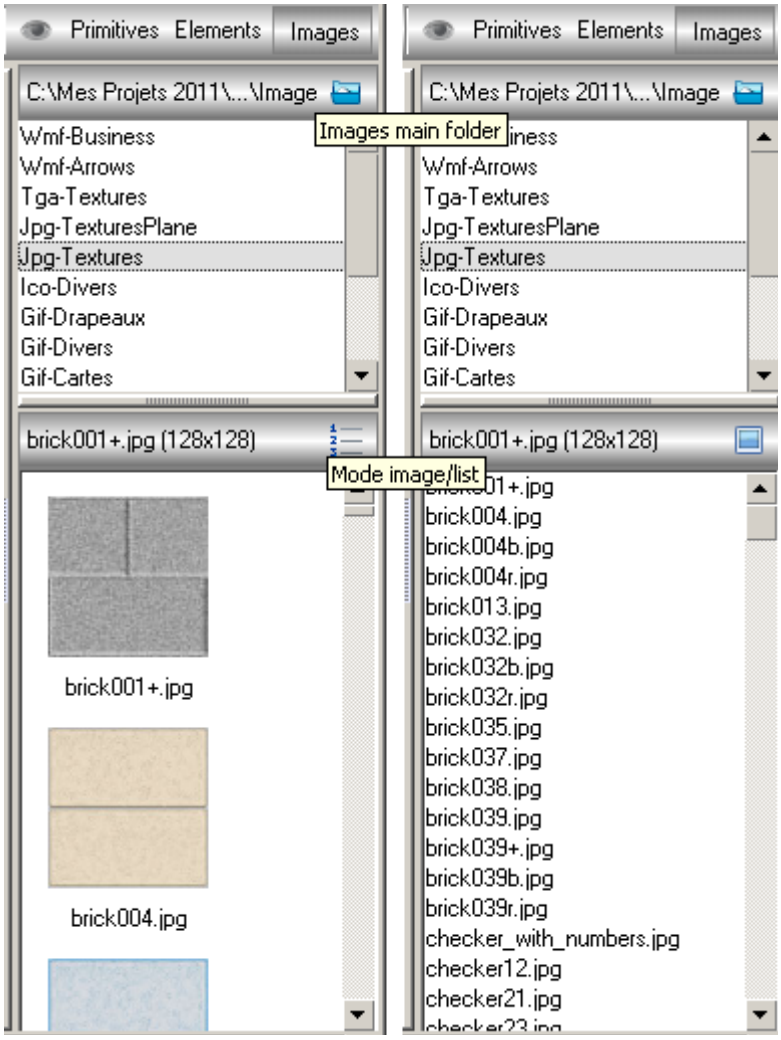
These tables contain images : the textures of the primitives.

The size of the images should be a number power of 2 (2^a, example 512 x 128 pixels)

- Click on the 'Images' button
- Click on the 'Images main folder' button to select the main folder of the images
- Click on the 'Mode image/list' button to select the displaying mode of the images

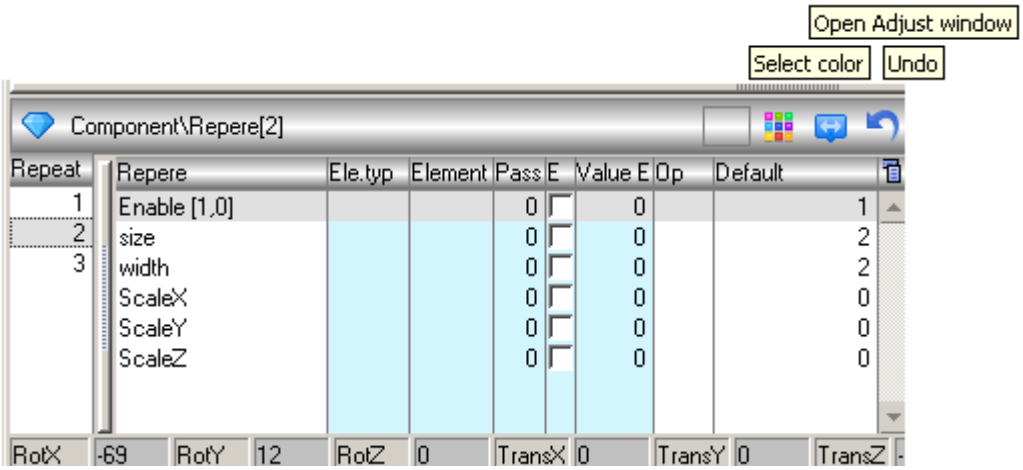
- Drag-and-drop an image over the table of the parameters of the selected primitive
- The primitive will be textured with this image

'Images' table



VI - TABLES OF PARAMETERS

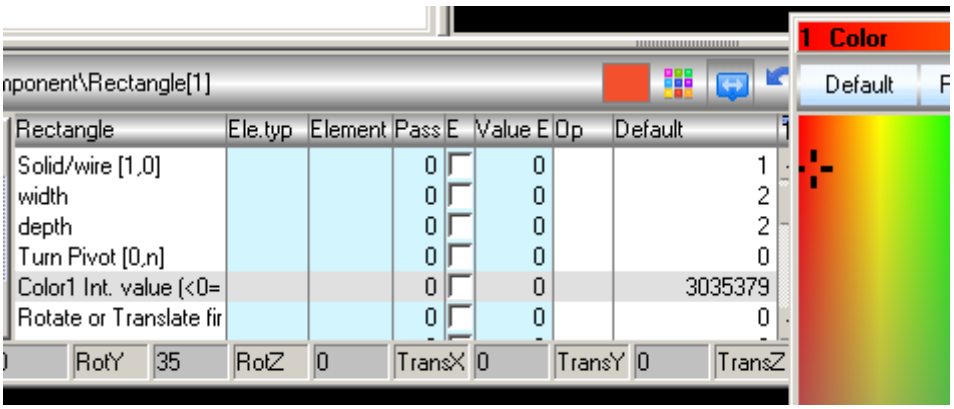
Buttons, 'Repeat' table, Parameters table



A) Buttons

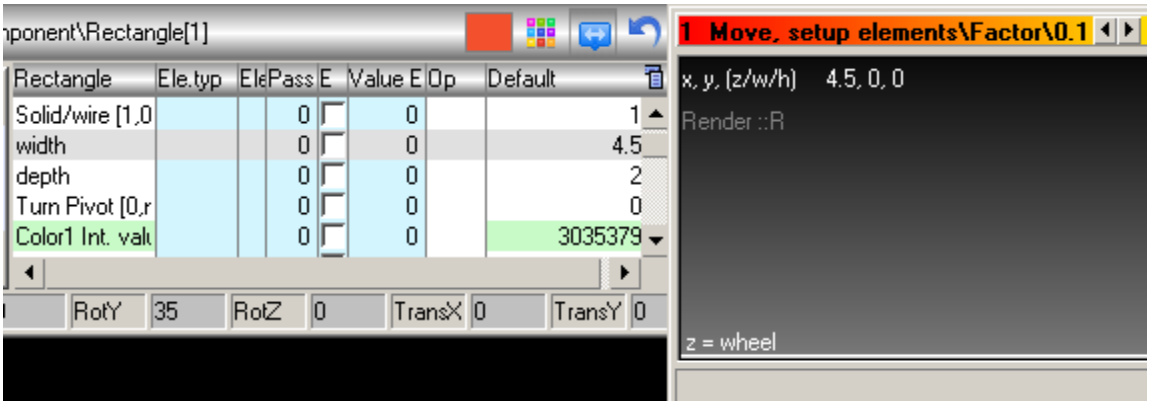
1. Buttons

- 'Select color' button : opens the 'Color' window to adjust the value of the selected 'Color' parameter



- 'Open Adjust window' button : open the 'Move, setup elements' window

'Move, setup elements' window



- Click on the spin on the right to adjust the factor
- Left-click and move the mouse to adjust the value of the selected parameter

- 'Undo' button : restore the last default value

B) 'Repeat' table

1. 'Repeat' table

If a component is repeated, the primitives of this component will be repeated.
The title of the table displays the repeating number : 'Component\Sphere[2]'

- Select one or more repeating number in the 'Repeat' table and adjust the default value of the parameter

A Component with repeating number = 3

Component[1]

Repeat	Node	Ele.typ	Element	Pass	E	Value E	Op	Default
	Enable [1,0]			0		0		1
	Repeat			0		0		3

Select Repeat '1' and initialize the 'translate x' parameter for the first repeat to '1'

Component\Sphere[1]

Repeat	Sphere	Ele.typ	Element	Pass	E	Value E	Op	Default
1	translate x			0		0		1
2	translate y			0		0		0
3	translate z			0		0		0

Select Repeat '2' and initialize the 'translate x' parameter for the second repeat to '3'

Component\Sphere[2]

Repeat	Sphere	Ele.typ	Element	Pass	E	Value E	Op	Default
1	translate x			0		0		3
2	translate y			0		0		0
3	translate z			0		0		0

Select Repeat 3 and initialize the parameter 'translate x' for the third repeat to '5'

Component\Sphere[3]

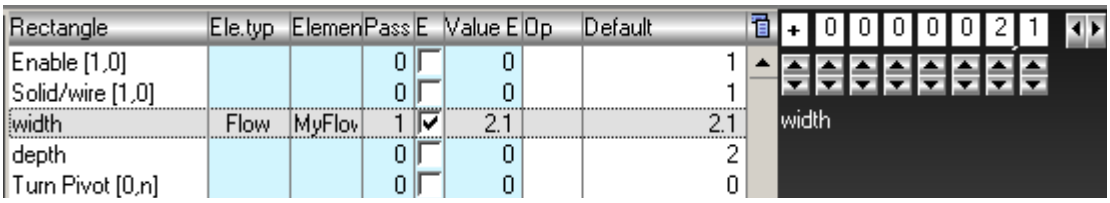
Repeat	Sphere	Ele.typ	Element	Pass	E	Value E	Op	Default
1	translate x			0		0		5
2	translate y			0		0		0
3	translate z			0		0		0

The 3 spheres, with translate x = 1,3,5

C) Table of parameters

1. Table of parameters

Table of parameters



Rectangle	Ele.typ	Elemen	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Solid/wire [1,0]			0	☐	0		1
width	Flow	MyFlov	1	☑	2.1		2.1
depth			0	☐	0		2
Turn Pivot [0,n]			0	☐	0		0

Columns :

- 'Rectangle...' : displays the name of the current primitive

- 'Ele.typ' : indicates the type of the element, 'Stock', 'Flow', 'Image' or 'Tuning' when dropped over the parameter
  - the element can be dropped from :
    - the 'Elements' table of this window (stock, flow, image)
    - the graphic of the model (stock, flow, image)
    - the 'Elements' window (stock, flow)
    - the 'Elements of the vector' window (stock, flow)
    - a tuning 'Tun : …' window, from the label of a tuning
    - an image from one frame in the graphic of the model
    - an image from Explorer

- 'Element' : name of the element dropped over the parameter

- 'Pass' : number of passage of the element dropped over the parameter (only stock and flow)

- 'E' : enables or disables the value of the dropped element :
  if the box is not ticked, the value of the parameter is the value from the 'Default' column,
  else the value is that of the element

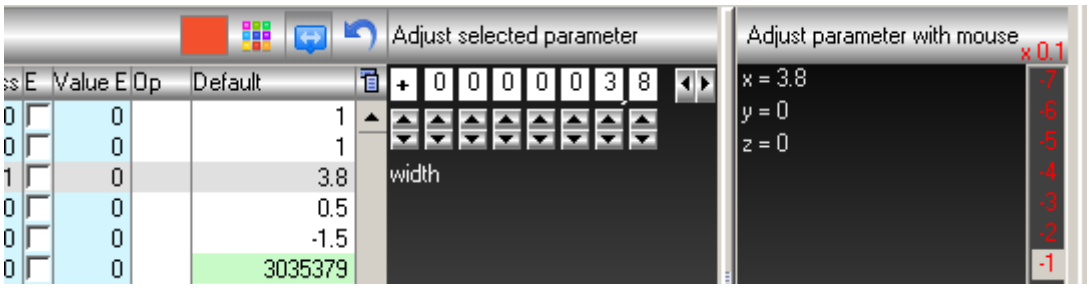
- 'Value E' : current value of the dropped element according to the current unit of time, it cannot be edited

- 'Default' : sets the default value of the parameter. To adjust the default value :

  - select one or more parameters in the table
  - enter the value in the 'Default' column
    or
  - initialize the value with the fields or with the spins on the right side of the table
    or
  - initialize the value with the mouse in the black zone : 'Adjust parameter with mouse' (select the factor in the red list)
    or
  - click on the 'Open adjust window' button and adjust the parameter with the mouse in this window

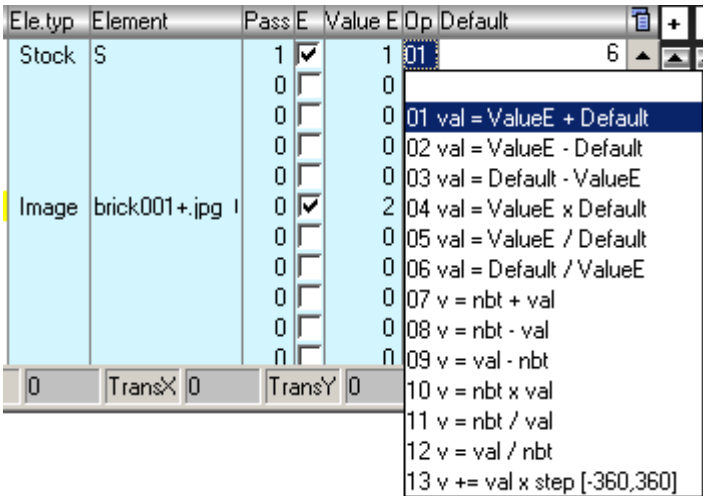
    else, for the 'Color' parameter :
  - click on the 'Select color' button and adjust the color in the 'Color' window

'Default' column, plans for adjusting the default value



- 'Op' : allows to calculate a new value for the parameter :

'Op' column, list of the options 01 to 13 :

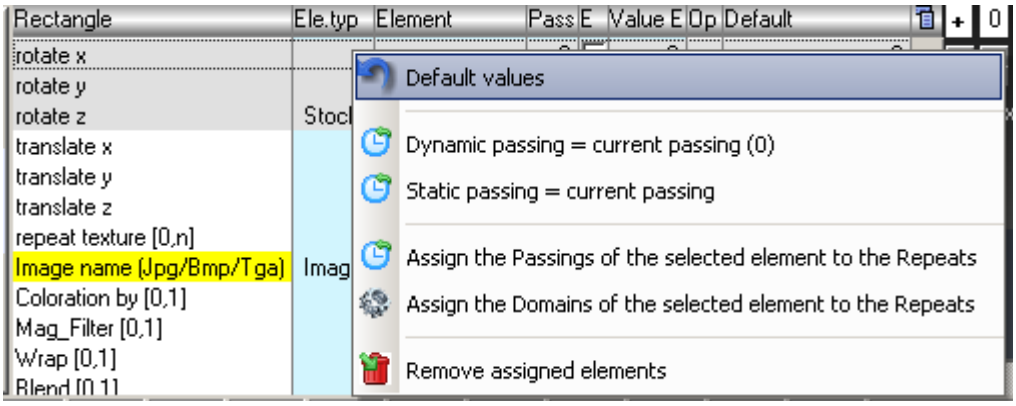


- a) Options 01 to 06 :
  - these options are only available if an element is assigned to the parameter
  - options :
    - 01 : the new value is equal to the *Value of the element + the Default value*
    - 02 : *the new value is equal to the Value of the element - the Default value*
    - …

- b) options 07 to 13
  - these options are only available for the external reader TrueRender
  - options :
    - 07 : the new value is equal to the *current number of time+ value of the parameter*
    - 08 : the new value is equal to the *current number of time- value of the parameter*
    - ...
    - 13 : new value += (value of the parameter x pulse_step)
      - if (new value > 360) new value =0
      - if (new value < -360) new value =0

2. Popup menu of the table of parameters

Popup menu of the table of parameters



- Select one or more parameters in the table :
  - Do not select the parameters with the mouse over the 'Element' column
  - This column is reserved to drag-and-drop an element from one parameter to another one
- Right-click on the table to display the popup menu

Options:

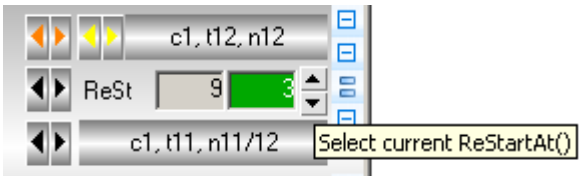
- 'Default values': resets the default values of the parameter
- 'Dynamic passing = current passing(0)'
  see 'Dynamic passing' paragraph
- 'Static passing = current passing'
  see 'Static passing' paragraph
- 'Assign the Passings of the selected element to the Repeats'
  see 'Assign the Passings to the Repeats' paragraph
- 'Assign the Domains of the selected element to the Repeats'
  see 'Assign the Domains to the Repeats' paragraph
- 'Remove assigned elements' : remove the assigned elements

3. 'Passing' assignment

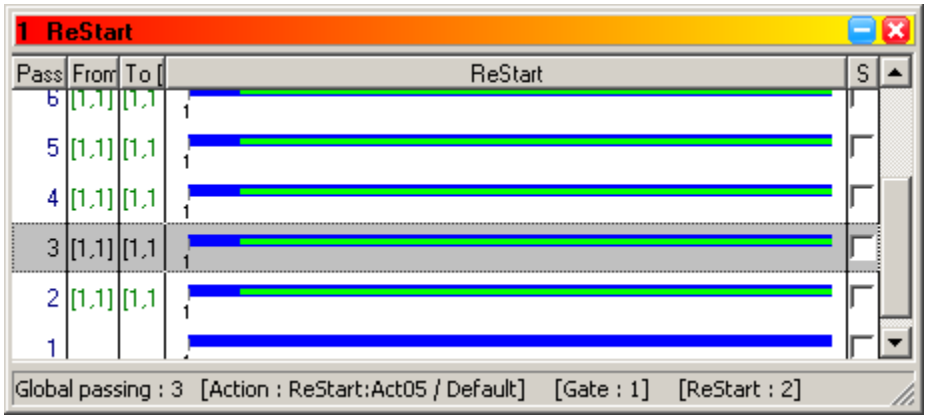
While computing, if in the model there is an action with the function **ReStartAt**(), its calculated values are stored with the current passing number, function of the current number of retro-calculation.

If a flow or a stock is assigned to a parameter, the value of the parameter will be a function of the current passing number, selected in the 'ReStart' window, or selected with the 'Select current ReStartAt()' spin of the model.

'Select current ReStartAt() spin of the model



'ReStart' window



4. Dynamic passing

To define the passing number function of the current selected passing number in the model :

- Select the 'Dynamic passing = current passing(0)' option from the popup menu
- Select a passing number from the 'ReStart' window or use the 'Select current ReStartAt()' spin

5. Static passing

To define the passing number, not function of the current selected passing number in the model :

- Select the current passing number from the 'ReStart' window or with the spin
- Select the 'Static passing = current passing' option from the popup menu

6. Assigning the 'Passings' to 'Repeats'

While computing, if in the model there is an action with the **ReStartAt**() function, its calculated values are stored with the current passing number, function of the current number of retro-calculation.

When the parameter 'Repeat' of a component is greater than 1, its primitives are repeated.

The parameters of a repeated primitive can be initialized with the value of the elements according its repeating number and its passing number :

- value for parameters for repeat 1 = value of the element for passing number = 1
- value for parameters for repeat 2 = value of the element for passing number = 2
- value for parameters for repeat 3 = value of the element for passing number = 3
- ...

To assign the 'Passings' to the 'Repeats' :

- Compute the model with an action with the **ReStartAt**() function

  example :

```
ReStartStat()
y = t * Random(1,10) / 10
y+=p:nb_passing

IF t=12
 ReStartAt(1,1,2) //we will have 3 passages in the model
END
```

- Select a component in the 'TreeView'
- Select the 'Repeat' parameter
- Initialize the default value of the parameter 'Repeat' with **3**

- Select a repeated primitive in the repeated component

- Assign an element to a parameter

- Right-click on the line of the parameter
- Select the 'Assign the Passings of the selected element to the Repeats' option from the popup menu

7. Assigning 'Domains' of the selected element to 'Repeats'

While computing, if in the model there is a vectorized flow, its calculated values are stored with the current domain of the assigned vector.

When the 'Repeat' parameter from a component is greater than 1, its primitives are repeated.

The parameters of a repeated primitive can be initialized with the value of the elements according to its repeating number and its domains :

- value for parameters for repeat 1 = value of the element for domain 1
- value for parameters for repeat 2 = value of the element for domain 2
- value for parameters for repeat 3 = value of the element for domain 3
- ...

To assign 'Domains' to 'Repeats' :

- Compute the model with a vectorized flow or stock

- Select a component from the 'TreeView'
- Select the 'Repeat' parameter
- Initialize the default value, 'Default', of the 'Repeat' parameter

- Select a repeated primitive in the repeated component

- Assign an element to a parameter

- Right-click on the line of the parameter
- Select the 'Assign the Domains of the selected element to the Repeats' option from the popup menu

VII - 'COLOR' WINDOW

- Select a 'Color' parameter
- Click on the 'Select Color' button
- Select a color in the 'Default' plan or in the 'Personalized' plan

'Color' window 'Default' and 'Personalized' plans

- the pipette allows you to choose a color from the entire screen

VIII - TEXTURES

A) Textures

The primitives in the 'GluQuadric' and 'GlGeometry' tables can be textured by images.

The format of the images should be : jpg, bmp or tga
If the format of an image is not good, you can convert it (see chapter XI : 'Converting an image')

The number of pixels (x and y) of the images should be a power of 2 : 16, 32, 64, 128, 256, 512, 1024,....
If the number of pixels of an image is not a power of 2, it will not be displayed in the model.

1. Textures

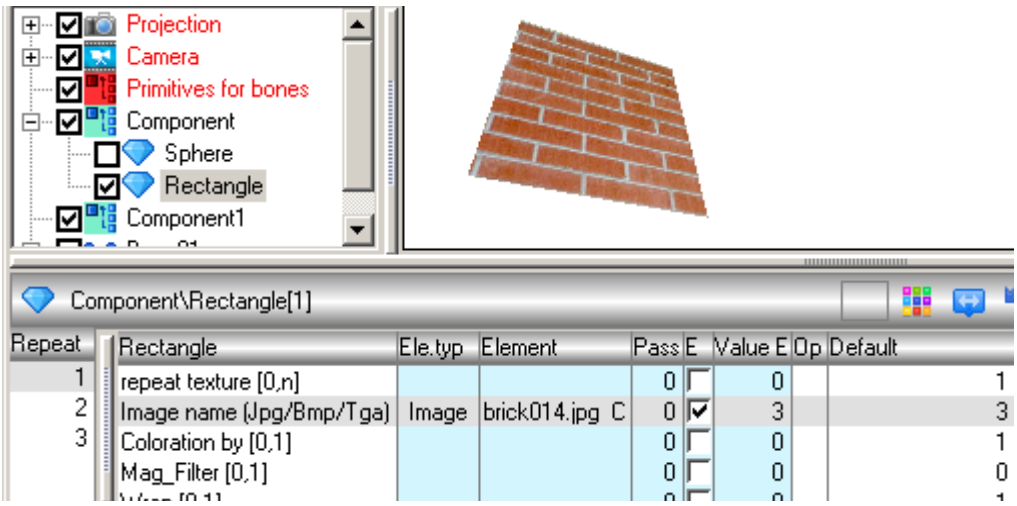
Adding a primitive in the render and texturizing it :

- Click on the 'Primitives' button
- Click on the 'GluQuadric' or 'GlGeometry' buttons
- Drag-and-drop one primitive over the render
- Click on the 'Images' button
- Drag-and-drop an image from the table of the image over the table of the parameter of the primitive

  or

- Drag-and-drop an image from Explorer over the table of the parameter of the primitive
- If the image has an unfitted format you can convert it (see chapter XI, 'Converting an image')

A textured rectangle

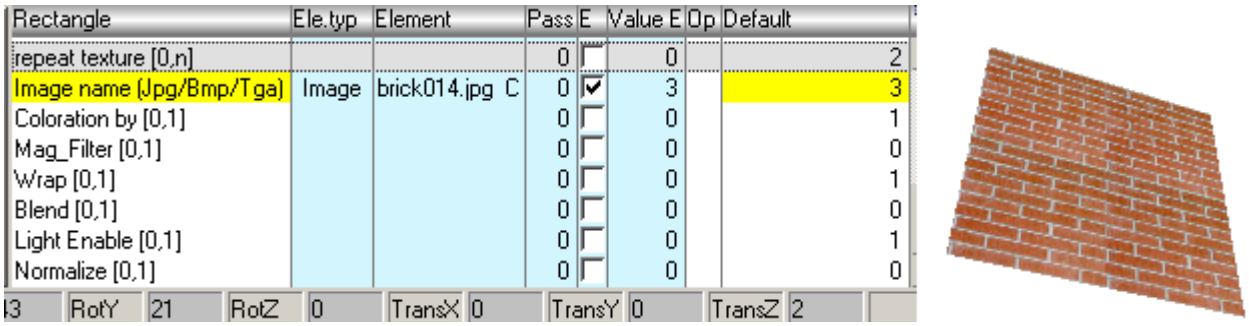


- the 'Image name..' parameter displays the name of the image in the 'Element' column

2. 'Ttexture' parameters

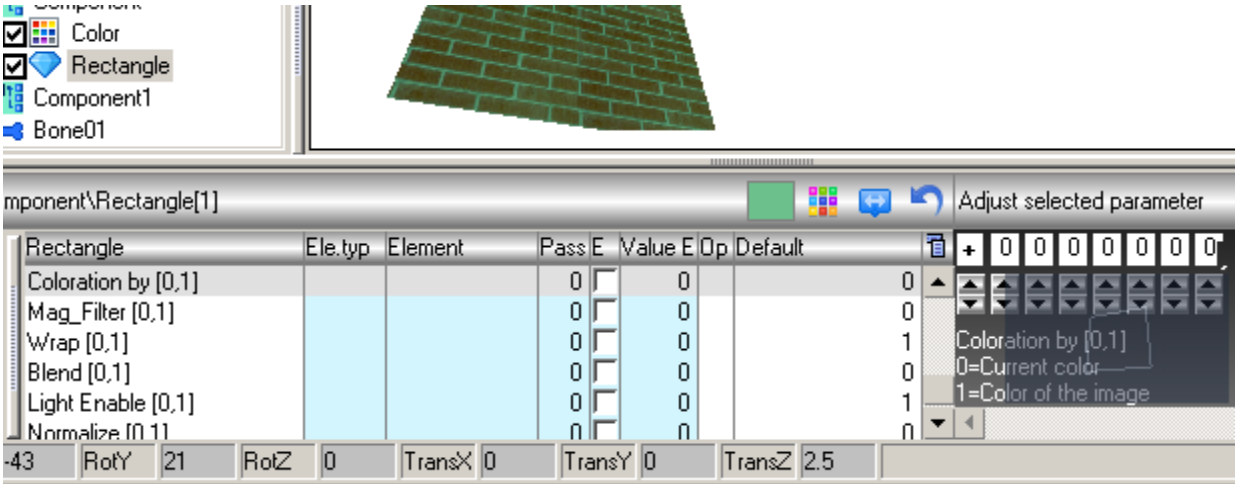
- 'repeat texture' : allows you to repeat the texture : see above

The texture is repeated twice



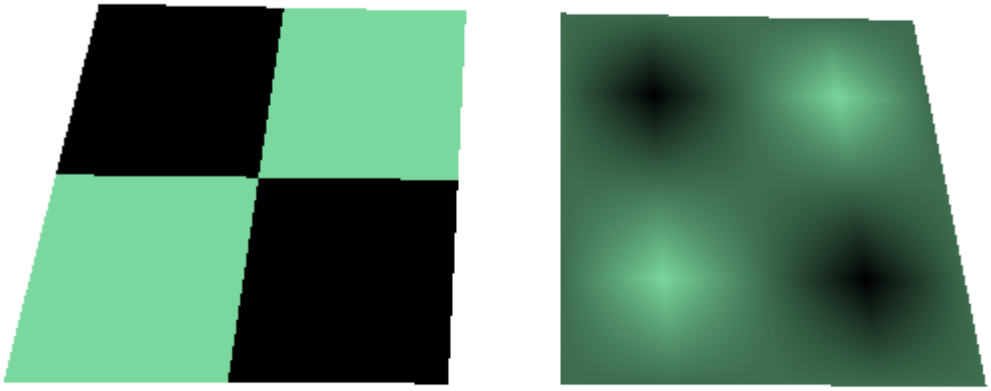
- 'Coloration by' : allows you to color the texture by the current color if it exist

The texture is coloured by the current color (green) of the 'Color' primitive



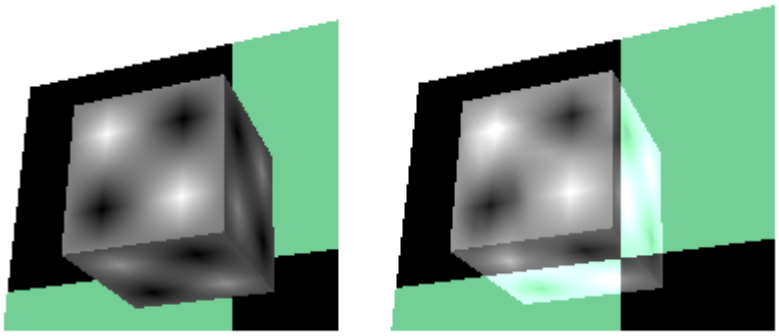
- 'Mag_Filter' : sets the 'Mag_Filter' to 'Linear' or 'Nearest'

Mag_Filter = Nearest (on the left), Linear (on the right)



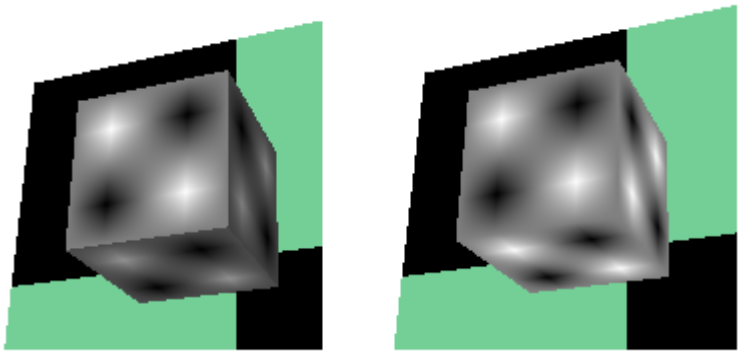
- 'Blend' : enables or disables the blend

Disabled blend for a cube (on the left); Enabled blend for a cube (on the right)



- 'Light' : enables or disables the Light

Disabled light for a cube (on the left); Enabled light for a cube (on the right)



3. 'TGA' Texture

A 'TGA' image assigned to a primitive allows transparency of the texture.

The tree is a 'TGA' image assigned to a rectangle

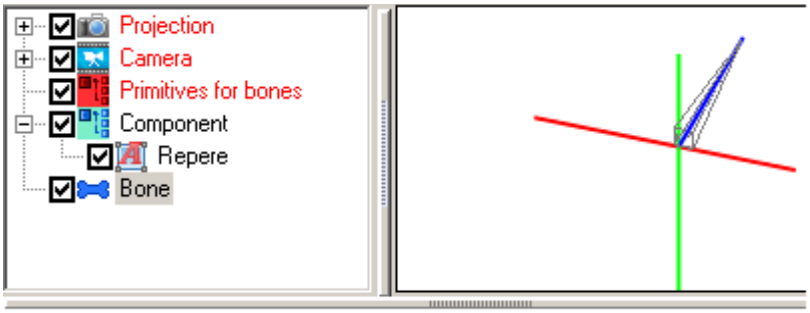
IX - BONES

A) Bones

- A 'Bone' is a particular primitive, like a component, but with more functionalities
- When creating a new render, the last primitive to be created is a bone
- All the primitives displayed after a bone in the TreeView,
  can be translated and rotated by its 'Translate and rotate' parameters

1. 'Bone'

The 'Repere' and the first 'Bone' are created by default



2. Parameters of a 'Bone'

The parameters of a 'Bone'

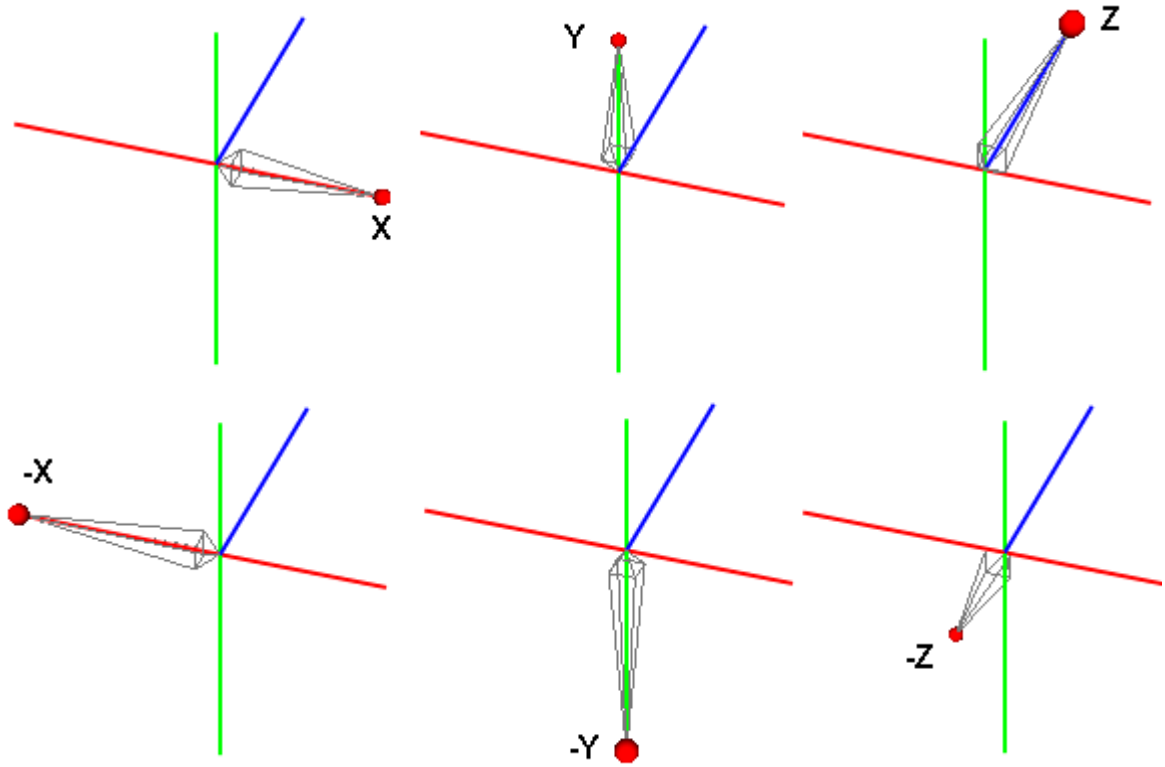
Bone	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Draw [0,1]			0		0		1
Direction x,y,z[0,1,2,3,			0		0		2
Length or Size1 for Pri			0		0		2
Width [0,n]			0		0		0
Design1 by[0,n]			0		0		0
Enable parameters for			0		0		0
Size2 for PrimitiveForB			0		0		0
Size3 for PrimitiveForB			0		0		0
Design2 by[0,n]			0		0		0
Enable parameters for			0		0		0
Size1 for PrimitiveForB			0		0		0
Size2 for PrimitiveForB			0		0		0
Size3 for PrimitiveForB			0		0		0
translate x			0		0		0
translate y			0		0		0
translate z			0		0		0
rotate x			0		0		0
rotate y			0		0		0
rotate z			0		0		0
Apply Rotate [0,1]			0		0		0
Color1 Int. value (<0=c			0		0		-1
Current color [0,1]			0		0		0
Light Enable [0,1]			0		0		0

+ 0 0 0 0 0 0 2

Direction x,y,z[0,1,2,3,4,5]
0=X
1=Y
2=Z
3=-X
4=-Y
5=-Z

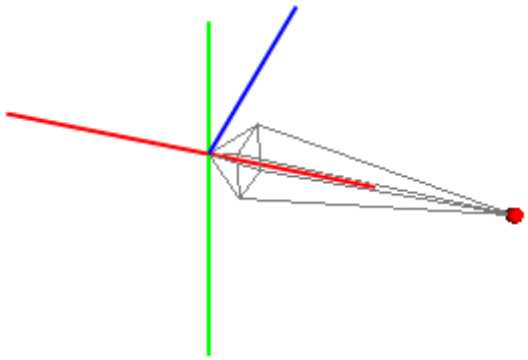
- Direction x,y,z[0,1,2,3,4,5] : selects the direction of the Bone

The 6 directions of a 'Bone'



- 'Length or Size1 for PrimitiveForBone' :
  initializes the length of the Bone
  or
  the size1 for PrimitiveForBone (see paragraph 'Primitives for Bones')

Length of the 'Bone' = 4



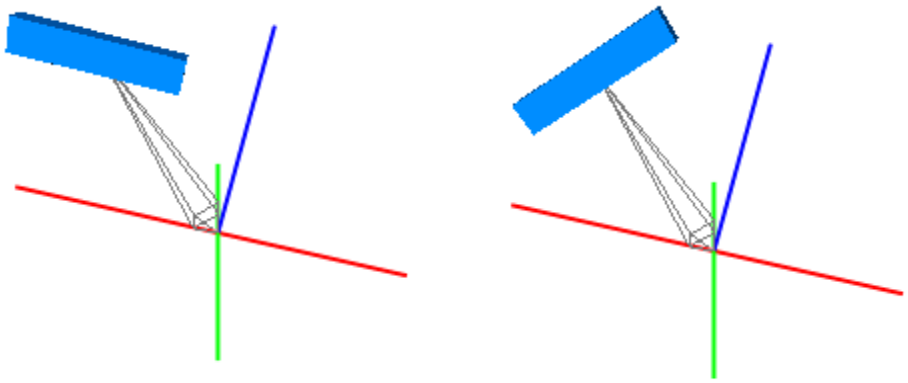
- 'Design1 … to Size3 for PrimitiveForBone' :
  - see paragraph 'Primitives for Bones'

- 'translate x,y,z' :
  - initializes the translation of the Bone

- 'rotate x,y,z' :
  - initializes the rotation of the Bone

- 'Apply rotate [0,1]'
  - applies, or not, the rotation of the Bone to the primitives behind the Bone

Rotate y = -45:
on the left : Appy rotate = 0
on the right : Apply rotate = 1



3. Primitives for 'Bones'

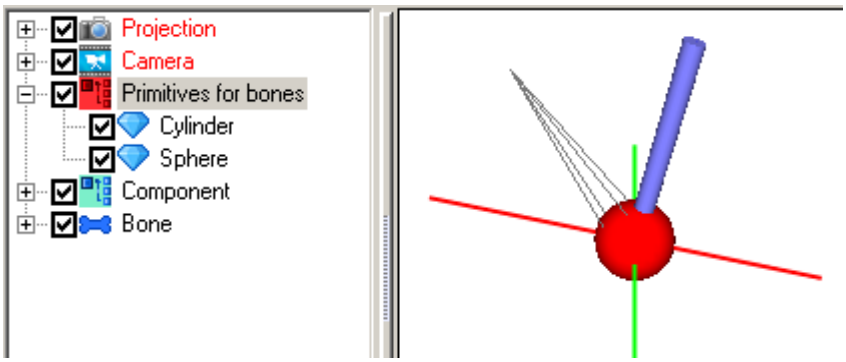
- A primitive is a 'primitive for bones' if it is dropped in the red component 'Primitives for bones' in the 'TreeView'

- When a primitive for bones is assigned to a bone, that primitive is displayed instead the bone

Adding primitives for bones in the 'Primitives for bones' component

- Drag-and-drop the primitives over the 'Primitives for bones' component
- Adjust the parameters of the primitives for bones
- Uncheck the box of the 'Primitives for bones' component to not display it

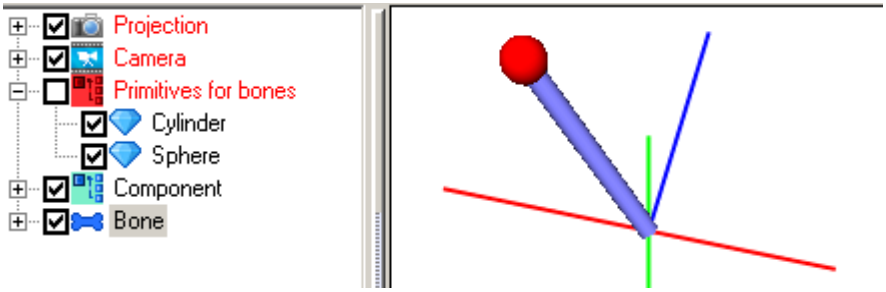
A cylinder and a sphere in the 'Primitives for bones' component



Assigning a 'Primitive for bone' to a bone

- Select a bone
- Drag-and-drop the primitive for bone 'Cylinder' over the parameter 'Design1 by[0,n]'
- Drag-and-drop the primitive for bone 'Sphere' over the parameter 'Design2 by[0,n]'

The cylinder replace the bone, the sphere is displayed at the end of the bone



- Note : A 'primitive for bone' can be assigned to several bones

4. Bone parameters for the assigned 'Primitives for bone'

Parameters for 'PrimitiveForBone1'

Parameters for 'PrimitiveForBone1'

Bone	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Draw [0,1]			0		0		1
Direction x,y,z[0,1,2,3,4,5]			0		0		2
Length or Size1 for PrimitiveForBone1			0		0		2
Width [0,n]			0		0		0
Design1 by[0,n]	Primitive	Cylinder	0		0		0
Enable parameters for PrimitiveForBone1			0		0		0
Size2 for PrimitiveForBone1			0		0		0
Size3 for PrimitiveForBone1			0		0		0

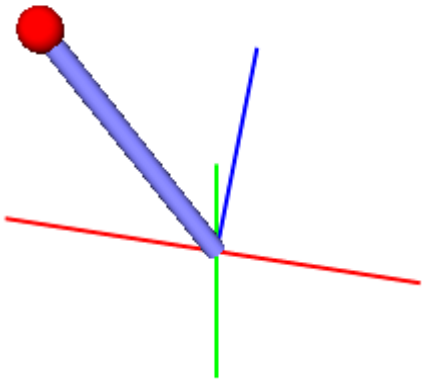
1 2 3

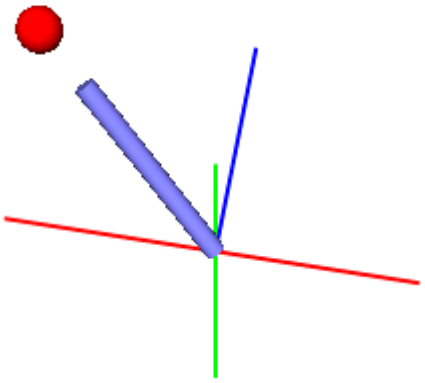
Enable parameters foBone1 [1,2,3]
1=Size 1
2=Size 2
3=Size 3

- 'Length or Size1 for PrimitiveForBone1' : initializes the length of the bone
- 'Enable parameters for PrimitiveForBone1[1,2,3]' :

  Box 1 :
  if ticked : the size1 of the primitiveForBone1 will be the 'length' of the bone
  if not ticked : the size1 of the primitiveForBone1 will be the 'height' of the cylinder

On the left, the 'Size1' box is ticked, on the right it is not ticked





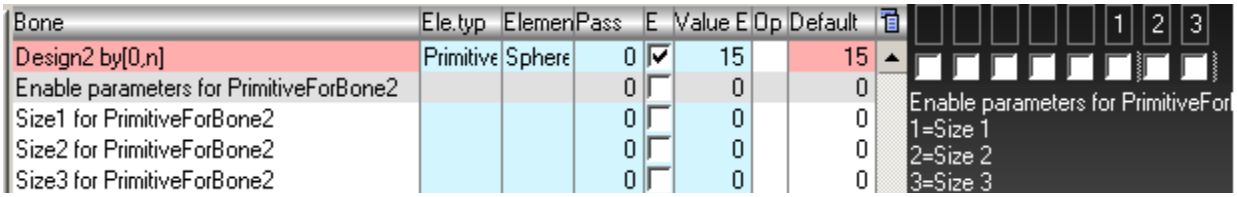
- 'Enable parameters for PrimitiveForBone1' :

  Box 2 :
  if ticked : the size2 of the primitiveForBone1 will be 'Size2 for PrimitiveForBone1'
  if not ticked : the size2 of the primitiveForBone1 will be the 'base radius' of the cylinder

  Box 3 :
  if ticked : the size3 of the primitiveForBone1 will be 'Size3 for PrimitiveForBone1'
  if not ticked : the size3 of the primitiveForBone1 will be the 'top radius' of the cylinder

Parameters for the 'PrimitiveForBone2'

Parameters for the 'PrimitiveForBone2'



Bone	Ele.typ	Elemen	Pass	E	Value E	Op	Default
Design2 by[0,n]	Primitive	Sphere	0	☑	15		15
Enable parameters for PrimitiveForBone2			0	☐	0		0
Size1 for PrimitiveForBone2			0	☐	0		0
Size2 for PrimitiveForBone2			0	☐	0		0
Size3 for PrimitiveForBone2			0	☐	0		0

1 2 3

Enable parameters for PrimitiveFor
1=Size 1
2=Size 2
3=Size 3

- 'Enable parameters for PrimitiveForBone2[1,2,3]' :

  Box 1 :
  if ticked : the size1 of the primitiveForBone2 will be 'Size1 for PrimitiveForbone2'
  if not ticked : the size1 of the primitiveForBone2 will be the radius of the sphere

  Box 2 :
  if ticked : the size2 of the primitiveForBone2 will be 'Size2 for PrimitiveForBone2'
  if not ticked : the size2 of the primitiveForBone2 will be the 'flat x' of the sphere

  Box 3 :
  if ticked : the size3 of the primitiveForBone2 will be 'Size3 for PrimitiveForBone2'
  if not ticked : the size3 of the primitiveForBone2 will be the 'flat y' of the sphere

X - SPECIAL PRIMITIVES

A) 'HeightFields' primitive

1. 'HeightFields'

The 'HeightFields' primitive displays an 3D image according to its coloration.
The 'HeightFields' displays the image with half-rectangles for which the vertices may undergo lying and color according to the parameters :

- 'Elevation by': check the boxes according the desired elevation
- 'Coloration by': check the boxes according to the desired criteria of color

'HeightFields' parameters

HeightFields	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0	☐	0		1
Solid/wire [1,0]			0	☐	0		1
Image name (Jpg/Bmp/Tga)	Image	yeuxparticle.bm	0	☑	11		11
Elevation by [I,H,S,L,R,G,B,(			0	☐	0		10000
Coloration by [I,H,S,L,R,G,B,			0	☐	0		1
SubDivX [0,n]			0	☐	0		60
SubDivY [0,n]			0	☐	0		60
ScaleX			0	☐	0		1
ScaleY			0	☐	0		1
ScaleZ			0	☐	0		0.9
AreteTransv[0,1]			0	☐	0		0
CullFaceBackHide[1,0]			0	☐	0		1

I	H	S	L	R	G	B	C
☐	☐	☐	☑	☐	☐	☐	☐

Elevation by [I,H,S,L,R,G,B,C]
I=Elevation inverse
H= Hue
S= Saturation
L= Luminance or GRAY
R= Red
G= Green
B= Blue
C= RGB()

Textured rectangle on the left
Textured HeightFields on the right

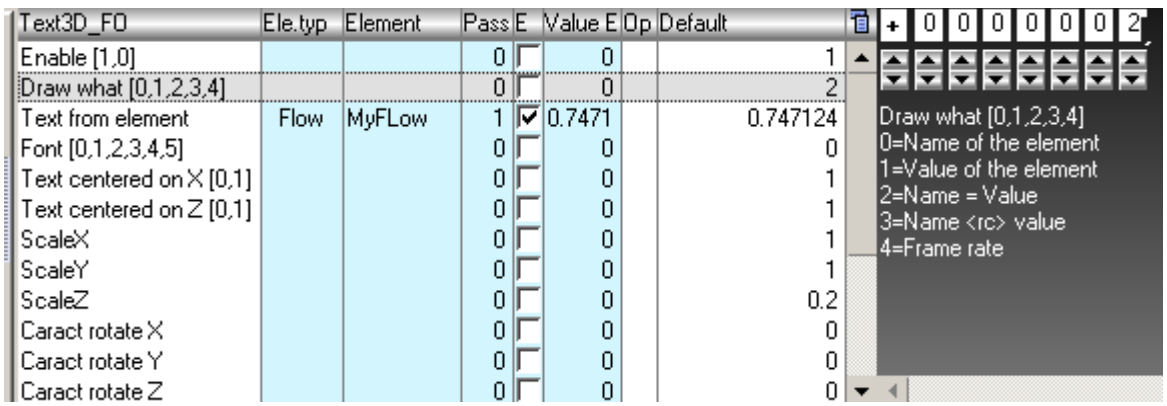
B) 'Text' primitives

1. 'Text' primitives

The 'Text' primitives display a 2D or 3D text by :

- Clicking on the '2D, Text' button
- Dragging-and-dropping the 'Text3D_FO' primitive over the render
- Clicking on the 'Elements' button
- Dragging-and-dropping a stock, flow or a frame, over the 'Text from element' parameter from the table of parameters

Parameters of 'Text3D_FO' primitive



Text3D_FO	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Draw what [0,1,2,3,4]			0		0		2
Text from element	Flow	MyFLow	1	☑	0.7471		0.747124
Font [0,1,2,3,4,5]			0		0		0
Text centered on X [0,1]			0		0		1
Text centered on Z [0,1]			0		0		1
ScaleX			0		0		1
ScaleY			0		0		1
ScaleZ			0		0		0.2
Caract rotate X			0		0		0
Caract rotate Y			0		0		0
Caract rotate Z			0		0		0

- Initializing the 'Draw what' parameter according to your choice

'Draw what' parameter = 2 : 'Name' = Value

'Caract rotate Z' parameter = -50

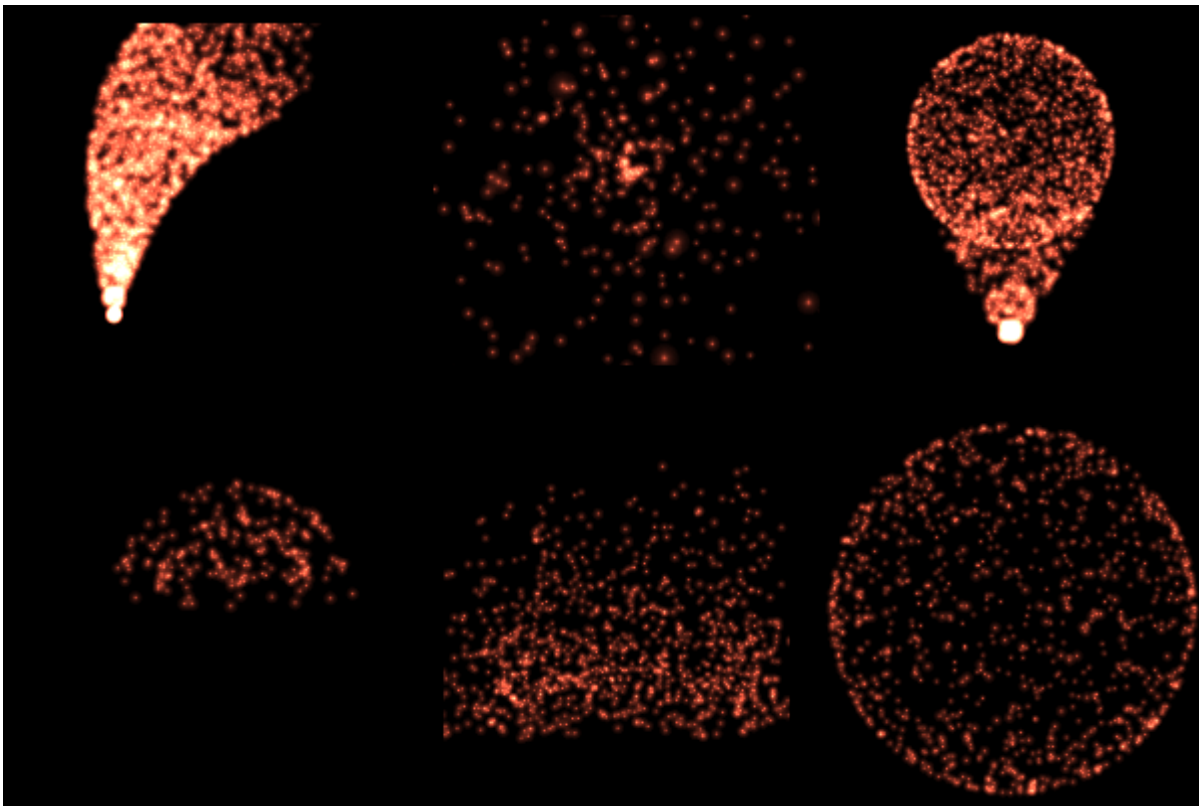
C) 'Particles' primitive

The 'Particles' primitive displays particles.
The background of the render must be dark in order display the particles

1. 'Particles' primitive

- Click on the 'GlGeometric' button
- Drag-and-drop the 'Particles' primitive over the render
- Click on the 'Refresh render by Timer' button, else the particle will not be displayed
- Initialize the 'Config selected[1,2,3,4,5,6]' parameter

6 configuration of 'Particles' primitive



Parameters of 'Particles'primitive :

Particles	Ele.typ	Element	Pass	E	Value E	Op	Default
Enable [1,0]			0		0		1
Config selected [1,2,3,4,			0		0		6
Max particles			0		0		1000
Num to release			0		0		1000
Release interval			0		0		0.05
Life cycle			0		0		0.5
Number of Lifes [0,n]			0		0		0
ReStart Lifes [0,1]			0		0		0
size			0		0		30
Velocity X			0		0		0
Velocity Y			0		0		0
Velocity Z			0		0		0
Gravity X			0		0		0
Gravity Y			0		0		0
Gravity Y			0		0		0
Wind X			0		0		0
Wind Y			0		0		0
Wind Z			0		0		0
AirResistence [0,1]			0		0		1
Velocity Far			0		0		10
CollisionPlane_Front [1,(			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
z_Front			0		0		0
CollisionPlane_Back [1,(			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
z_Back			0		0		0
CollisionPlane_Floor [1,0			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
y_Floor			0		0		0
CollisionPlane_Ceiling [1			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
y_Ceiling			0		0		0
CollisionPlane_Left [1,0]			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
x_Left			0		0		0
CollisionPlane_Right [1,(			0		0		0
bounceFactor			0		0		1
collisionResult [0,1,2]			0		0		0
x_Right			0		0		0
ScaleX			0		0		1
ScaleY			0		0		1
ScaleZ			0		0		1
Color1 Int. value (<0=dis			0		0		-1
Rotate or Translate first [			0		0		0
rotate x			0		0		0
rotate y			0		0		0
rotate z			0		0		0

XI - CONVERTING AN IMAGE

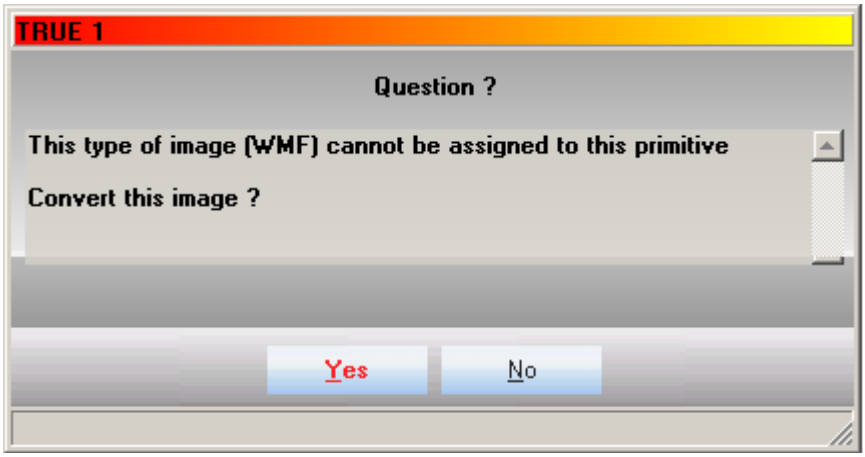
When an image is dropped on a primitive, if its format is not correct, you can convert it.

A) Dropping an image with a wrong format

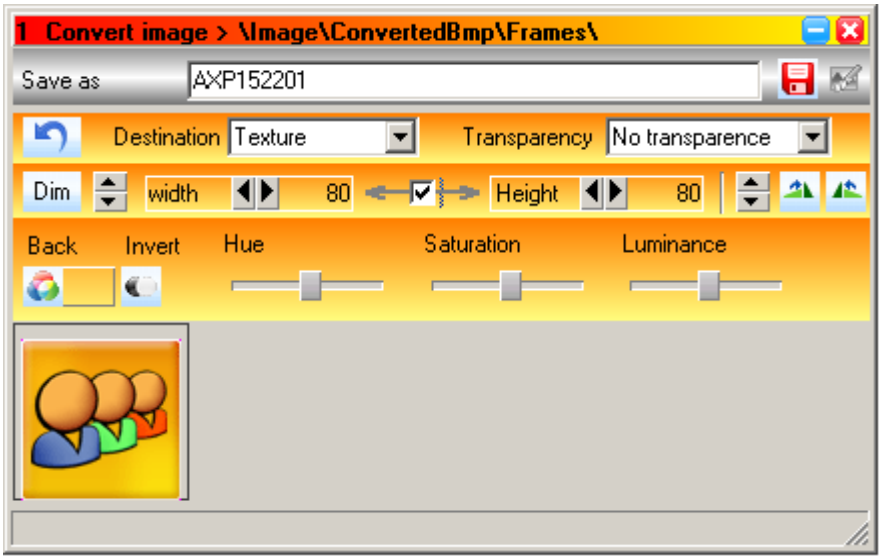
1. While dropping an image with a wrong format

- Click on the 'Yes' button (when the question 'Convert this image ?' appears) to convert the image

'Convert this image' question



'Convert image' window :



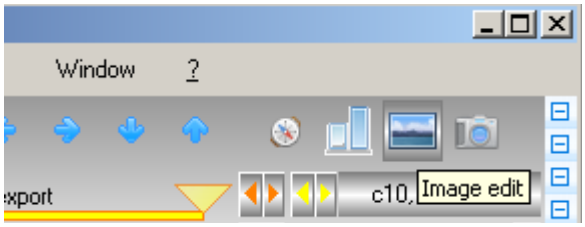
- See next paragraph : 'Converting an image'

B) Converting an image

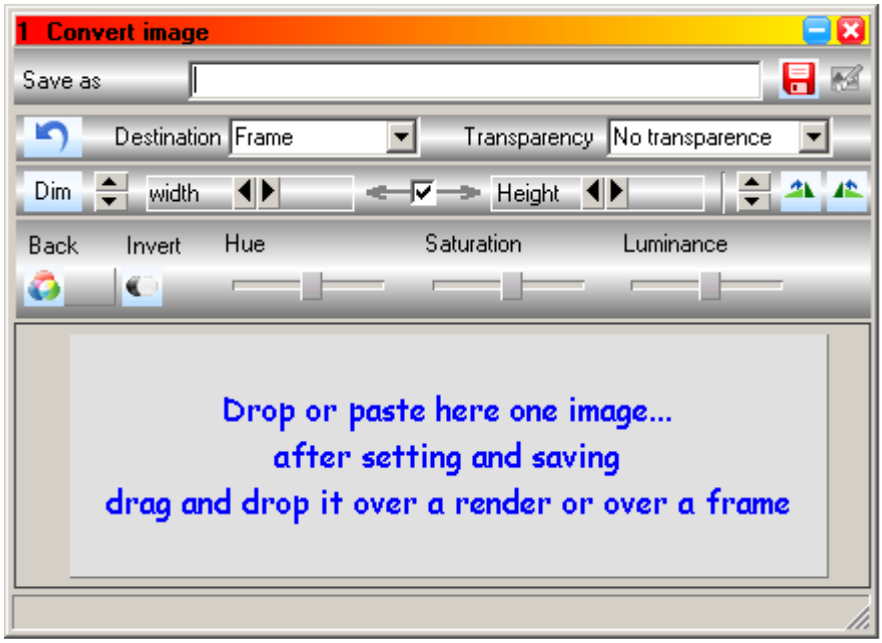
1. Opening the 'Image edit' window

- Click on the 'Image edit' button of the main window
  or
- Click on the 'Yes' button of the question 'Convert this image ?' while dropping an image with a wrong format

'Image edit' button



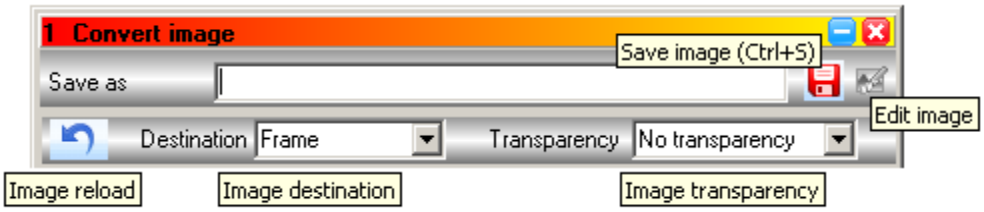
'Convert image' window opened with the 'Image edit' button



- Drag-and-drop an image in this window or, from the table of images of the 'Setup Frame' window of one frame, or from Explorer.

2. Buttons

Top buttons



- 'Save image (Press and hold 'Ctrl+'S' keys)
  - saves the image as does the 'Save as' field in the folder selected by the 'Image destination' combo

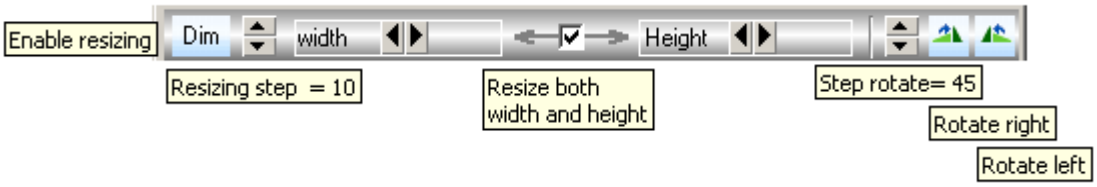
- 'Edit image'
  - edits the image with the default image editor of your computer (Mspaint)

- 'Image reload'
  - reloads the image, cancels changes if the image is not saved

- 'Image Destination'
  - selects the destination folder of the image: \Image\ConvertedBmp\Textures, \Heightfields, \Frames

- 'Image transparency'
  - selects the type of transparency : No transparency, Magenta, Top left corner

Middle buttons



- 'Enable resizing'
  - click on the button 'Enable resizing' to enable image resizing, then adjust spins on right

- 'Resizing step = '
  - adjusts of the resizing pixels by using the spins

- 'width'
  - adjusts the width using this spin, according to the pixels step

- 'Resize both width and height'
  - when resizing , resizes both width and height

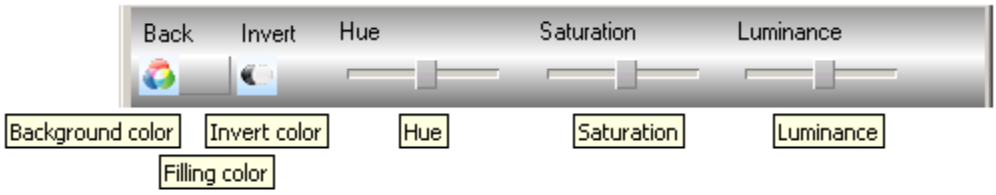
- 'height'
  - adjusts the height using this spin, according to the pixels step

- 'Step rotate = ..'
  - adjusts the rotating angle step using this spin

- 'Rotate right'
  - rotates the image to the right

- 'Rotate left'
  - rotates the image to the left

Bottoms buttons



- 'Background color'
  - click on the button to open the 'Color' window to set the background color

- 'Filling color'
  - indicates the background color

- 'Invert color'
  - inverts the colors of the image

- 'Hue, Saturation, Luminance'
  - adjusts this parameters of the image

XII - 'TRUERENDER'

'TrueRender' is an external program that can read the renders, once exported in a '.tru' file.

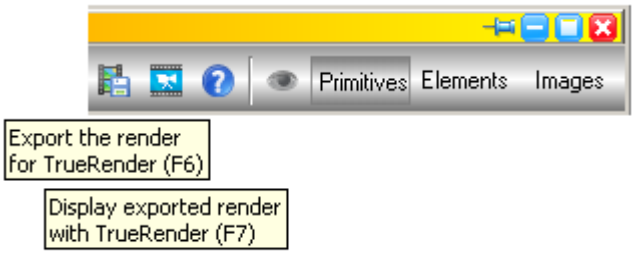
This '.tru' file contains the render, the textures and the values of the variables assigned to the parameters of the primitives.

A) Exporting a render

1. Creating and exporting a render

- Add primitives in the render
- Assign elements of the model to the parameters of primitives
- Click on the 'Export the render for TrueRender (F6)' button
- Click on the 'Display exported render with TrueRender (F7)' button

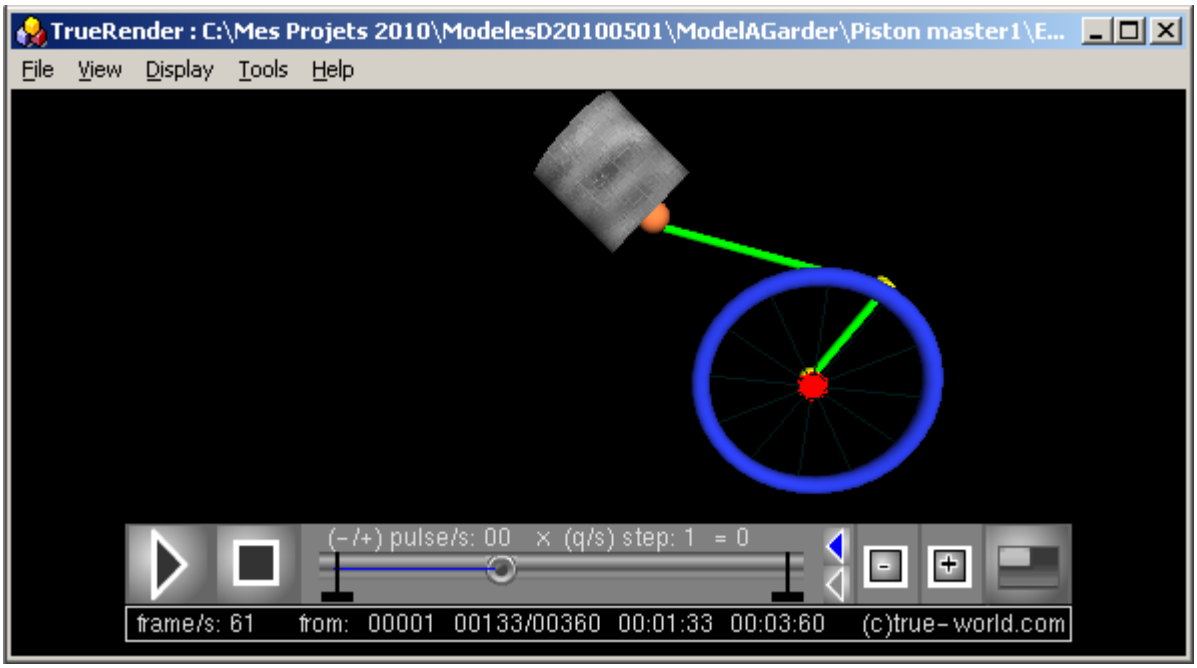
Toolbar



B) 'TrueRender'

1. Buttons

Bottom buttons



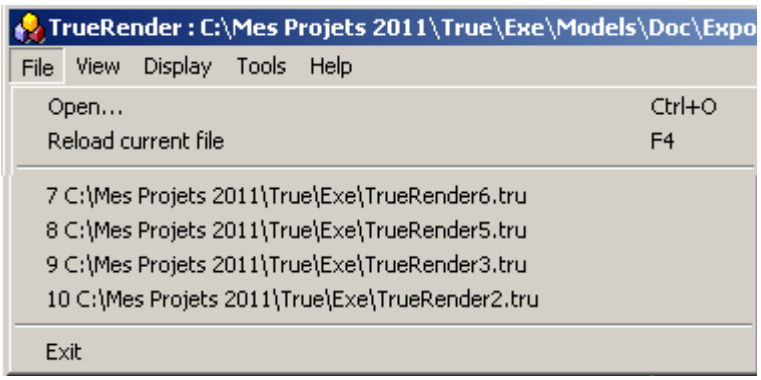
Reading the exported render :

- Click on the 'Play' button to read the exported render or press the 'Space' key
- Click on the 'Stop' button to stop playing or press the 'Space' key
- Click on the '-' or '+' button to change the current unit of time
  or
- Drag the cursor
- Click on the grey triangle to select the first and the last unit of time to be read
- Click on the '-' or '+' button to change the current 'from' or 'to' cursors
  or
- Drag the 'from' or 'to' cursors
- Move the scene with the keyboard, the mouse and the scrool wheel (see the 'Menu Help' paragraph)
- Press '-' or '+' keys to adjust the speed
- Press 'q' or 's' keys to increase or decrease the step of unit of time

2. Menus

'File' menu

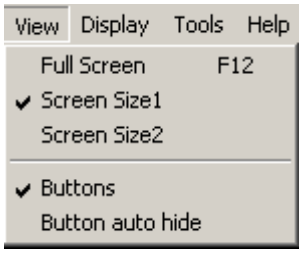
'File' menu



- Select the exported render you wish to open
  or
- Press the '0 ... 9' keys to open the default exported render

'View' menu

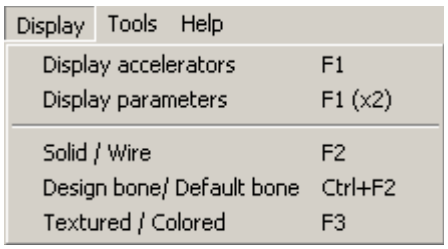
'View' menu



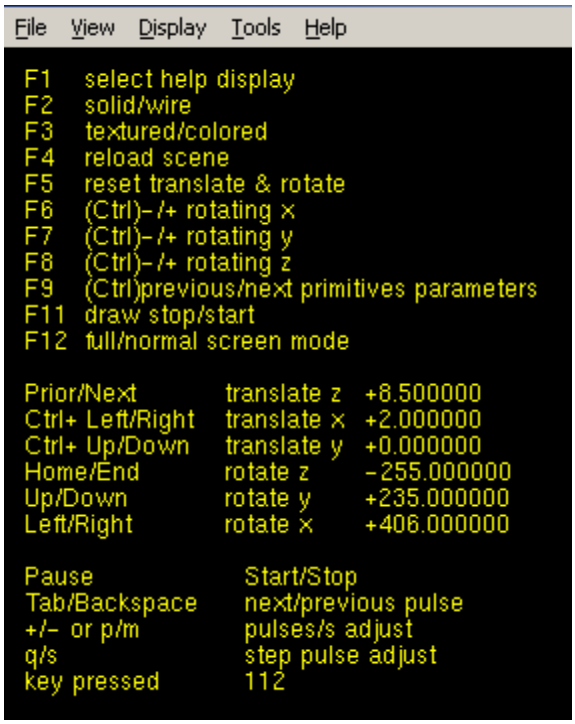
- Press 'F12' key to display in full screen mode
  or
- Select the default size, or adjust the size of the window with the mouse
- Display or hide the buttons with the 'Buttons' option
- Check the 'Button auto display' : hides the buttons, displays the buttons when mouse I sover the buttons

'Display' menu

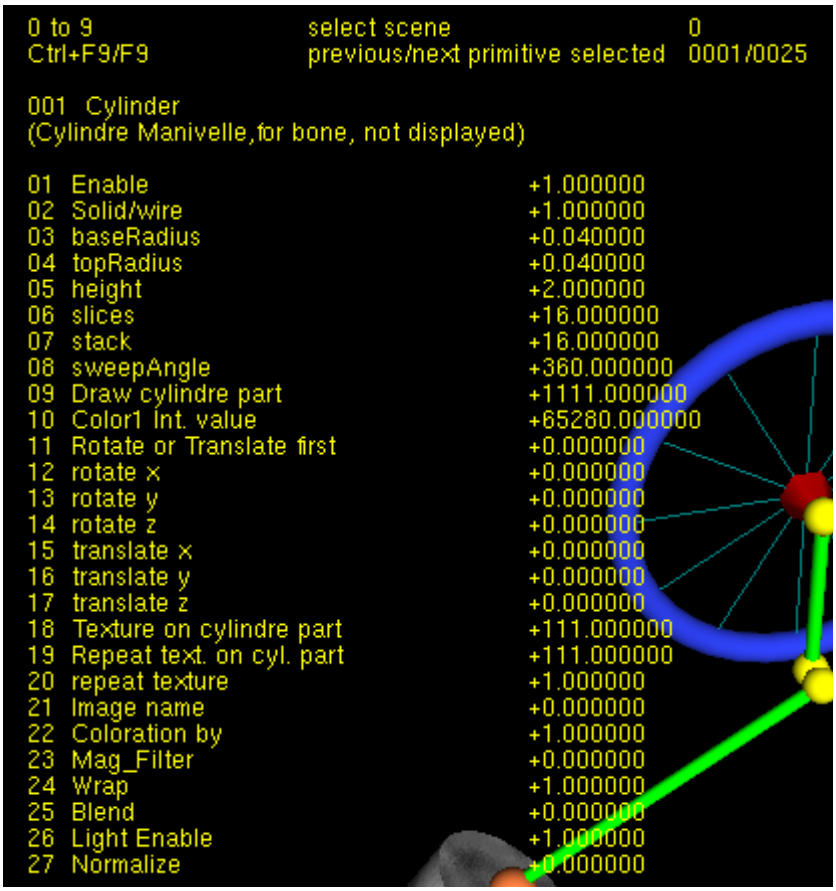
'Display' menu



Display accelerators



Display parameters



- press 'F9' or press and hold 'Ctrl'+'F9' keys to select the primitive

'Tools' menu