MODELER

Introduction

The Modeler is a module of the MSD software package. The Modeler enables you design and create objects and save them into libraries. You can use these objects to later create a scene in the ShowDesigner.
You can create an object by constructing it with a number of primitives. Each primitive also has a number of parameters to adjust its shape to fit your needs (see 'Primitive properties starting on page 15). There are seven primitives. For each primitive we show you the basic shape and some adjusted forms of the primitive:

Cube:			
Cylinder:			
Sphere:			
Toroid:			
Triangle:			
Rectangle (2D):			
Circle (2D):			

Table 1: Primitives

MSD Modeler

Layout

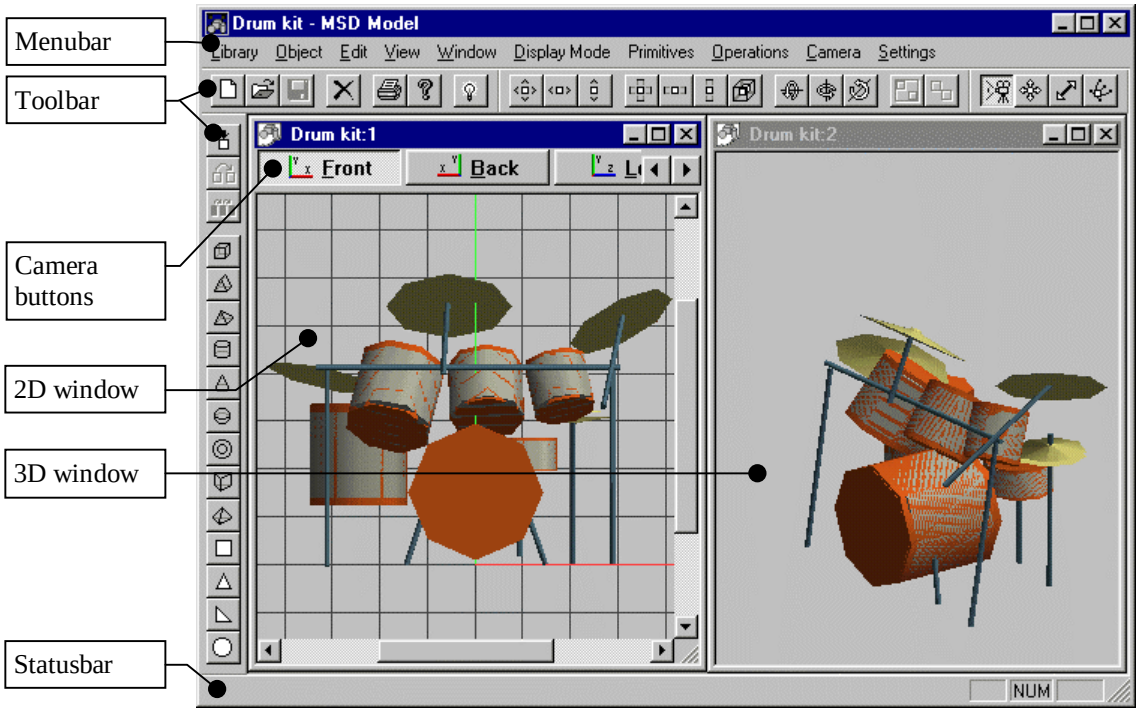


Figure 1: The application window

The application window has a menubar, a statusbar, toolbars, 2D windows and 3D windows. The menubar will be covered in ‘Menu bar’ (see page 20), the toolbars in ‘Toolbars’ (see page 41), 2D windows and 3D windows in ‘
Window types’ (see page 5).

System of Axis

Because MSD is a three-dimensional (3D) graphical program, a system with three axes has to be determined: the X-axis, Y-axis and Z-axis. The axes represent respectively the spatial horizontal, vertical and depth axis. In the program, the X-axis is red, the Y-axis is green and the Z-axis is blue.

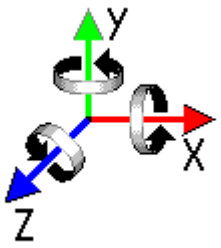


Figure 2: Spatial axes

NOTE: If (in case of a window) the horizontal, vertical and depth axes are mentioned, these axes concern the window axes. These window axes are not necessarily the same as the spatial X-, Y- and Z-axis.

Display modes

There are 4 different display modes (Wireframe, Wireframe lighted, Solid and Render). Each display mode shows you a different representation of the object. In the lighted display modes (Wireframe lighted, Solid and Render), the way they are lighted depends on whether you are in the 'Lightmode' or not. In normal mode, the object is lighted by a single system light-source. In lightmode, the object is lighted by up to 8 simple light-sources. These simple light-sources have adjustable color, intensity and zoom angle to allow you to realize a nice preview of an object

Wireframe

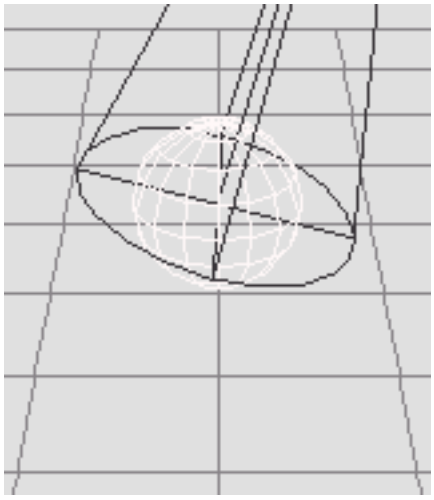


Figure 3: Wireframe

This option will show the object in wireframe mode. This will show your objects as solid lines with a single color.

Wireframe (Lighted)

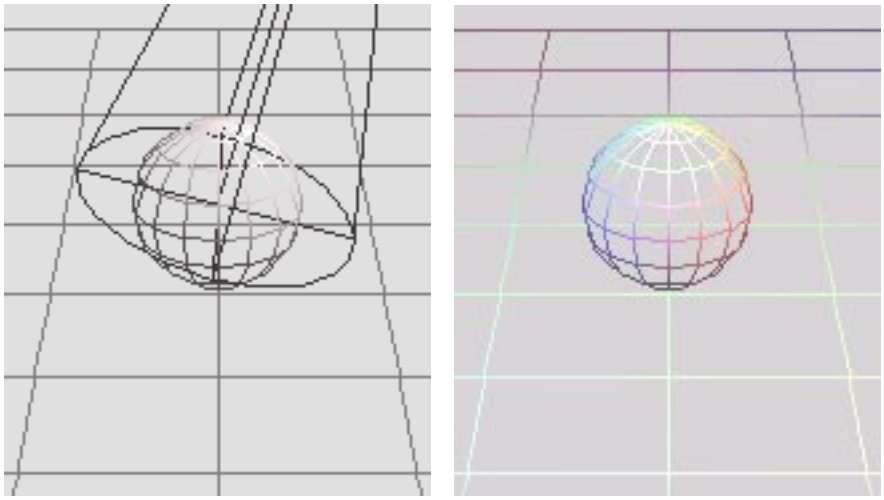


Figure 4: Wireframe lighted (normal and lightmode)

This option will show the object in lighted wireframe mode. This will show your objects as colored lines, lighted by one ore more light-sources.

Solid

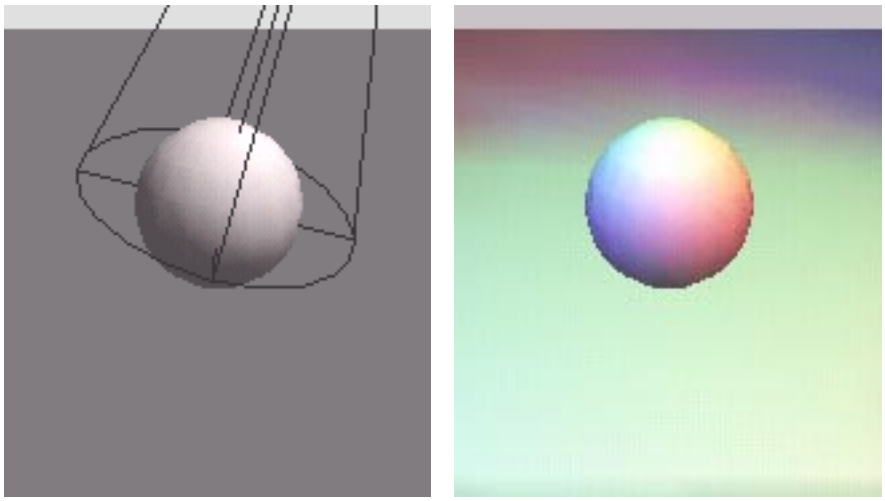


Figure 5: Solid (normal and lightmode)

This option will show the object in solid mode. This will show your objects as fast, solid, simple shaded objects, lighted by one ore more light-sources.

Render

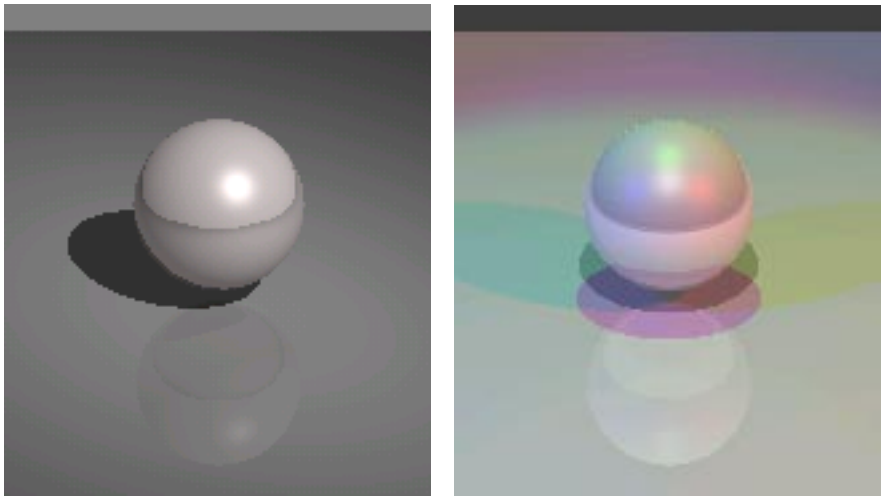


Figure 6: Render (normal and lightmode)

This option will calculate a realistic image of the object, lighted by one ore more light-sources. During the calculation of the image, shadows, reflections and transparency can be taken into account. Depending on the complexity of the object and the selected options, this calculation may take a while.

Window types

The program has 2 types of windows, namely 2D windows and 3D windows. Each window has it's own capabilities, although many are available in both. You can not change one type of window into the other, but you can open as many windows of both types as you like. (Opening a window can be done by selecting 'New 2D window' or 'New 3D window' from the menu (see 'Window Menu' on page 25). Both types of windows are further explained in the following sections.

2D Windows

2D windows give you an orthographic view of your object. You can work in on of six views, namely Front, Back, Left, Right, Top and Bottom. You can change between these views by selecting a camera by clicking one of the 'Camera buttons' in the top of a 2D window (see Figure 1). By clicking on the current (down) camera button, the position and scale of the camera will be adjusted so the entire object will be visible. If only a part of the object is visible (when you are zoomed in) you can pan through the object with the vertical and horizontal scrollbars at the right and bottom of the window.
The 2D window also has a grid to enhance orientation in the object. The size and color(s) of the grid can be set in 'Grid tab' (see page 36).

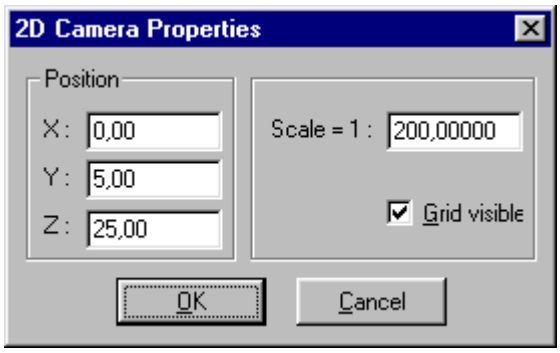


Figure 7: 2D Camera properties

In the 2D camera properties dialog of a 2D window you can set the camera position, the scale and if the grid should be visible in this view.

3D Windows

3D windows give you a perspective view of your object. Here you can view the object from any point and with different camera angles. The 3D window has some features the 2D window has not:

- You can use the 'Render' display mode to calculate a realistic image.
- You have an inspect mode, which will rotate your camera around the Y-axis of the object. You can start and stop the inspect mode by clicking the right mouse button in a 3D window and selecting 'Other', "Inspect Object' for the appearing context menu.

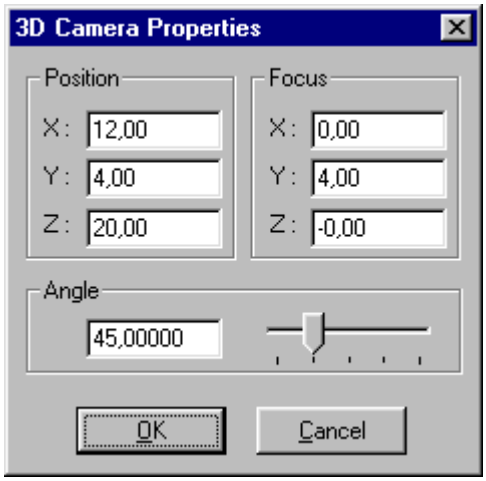


Figure 8: 3D Camera properties

In the 3D camera properties dialog of a 3D window you can set the camera position, the focus point (the point you are looking to) and the camera angle.

List Windows

Object List

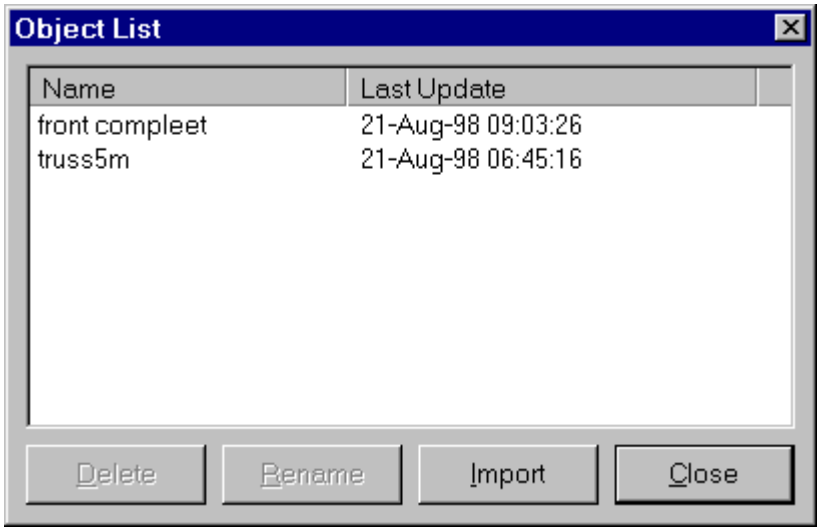


Figure 9: Object List

This list shows all the objects that are in this library. To open this window you must select the object list menu item. In new libraries this list will be empty, the above example is taken from a demo library. As you can see there are two objects defined in this library. The name of the objects is in the first column and the second column of the list shows you when the object was last saved. At the bottom of the window are four buttons. The delete and rename buttons in the example are grayed, this means that they can not be used at the moment. As soon as you select one of the objects, by clicking on the name with the left mouse button, these two buttons will become available. The functions of these buttons are described below. At the top of the list you see a gray area with the text 'Name' and 'Last Update' in it, this is called the header. In the header you can also see two vertical lines. If you move your mouse cursor over these lines, you will see the cursor of the mouse change into a vertical line with two little arrows. When this happens you can click the left button of the mouse and while holding it down, move the mouse left and right. As you are moving the mouse you will see that the column width of the list will change. A double click on the vertical line will change the width of the column to the minimal width required to display all text in that column. All objects in this list can be inserted in the current object using the insert operation, which is activated by clicking the  button.

- The **Delete** button:
  The delete button simply allows you the remove the selected object from the list. You will be asked to confirm this action. Deleting the object from the list will not affect any inserts of this object. You can however no longer insert this object.
- The **Rename** button:
  The rename button allows you the change the name of the selected object. After you have clicked on this button, a box will appear around the selected object. In this box you can type a new name it. After you press the enter-key the object will be renamed. If the name you typed already exists in this library you will see an error box and the rename operation is canceled.

- The **Import** button:
  The import button allows you the get objects from model libraries into this library. You will be presented with the standard file open dialog box in the modellib directory. You can now select the library from which you want an object. After opening the library you will see a list of all objects in that library. You can now select an object from this list and press the OK button. The object you selected will be copied into this library and it will be shown in this list. If the object you selected has a name which is already used in this library the new object will be renamed by adding a '.x' to the name, where the x represents a number starting from 1 and increasing until a name if found that is not used.
- The **Close** button :
  The close button will close this window. You can leave this window open while you work with the program, but often you will close it you have more space on the screen for your other windows. This window can be opened again by selecting the Object list menu item

Material List

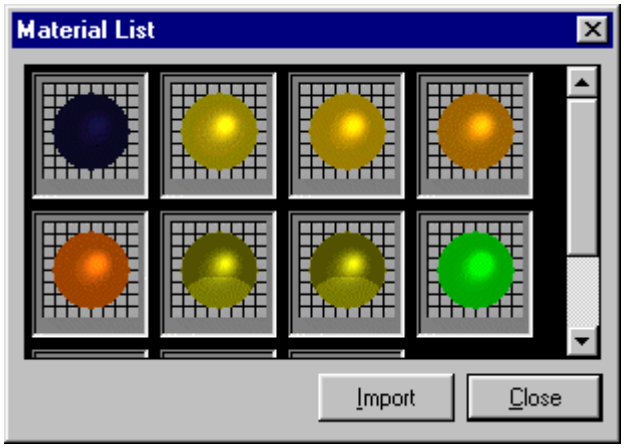


Figure 10: Material List

This list shows all the materials defined in the library. To open this window you must select the 'Material list' menu item in the 'File' menu. In new libraries this list will be empty, the above example is taken from a demo library. As you can see there are number of material defined. At the bottom of the window are two buttons. If you click your right mouse button in the black area or on one of the previews, a context menu will be displayed (see Figure 11). The functions of the buttons and the context menu are described below. All materials in this list can be assigned to object parts by selecting the 'Parts tab' in the 'Primitive properties' (see page 15).

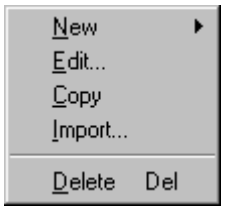


Figure 11: Material list context menu

- Import

The **Import** button and the **Import** option of the context menu both have the same function. They allow you to get materials from material libraries, scene files and other model libraries. When you start the import, a file dialog will appear in which you can select the file from which you want import materials. When you have opened the file, you will be given a list of all materials in that file. You can now select all the materials you want to import into this library.

- New and Edit
  The 'New' option from the context menu gives you a option of two types of material to create and the 'Edit' option allows you to edit the selected material. On information about the different types of material and the parameters you edit you can look at 'Materials' at page 11 in this manual.
- Copy:
  The 'Copy' options lets you copy the selected material. A dialog (see Figure 12) will appear in which you can enter the new name for the material.
-

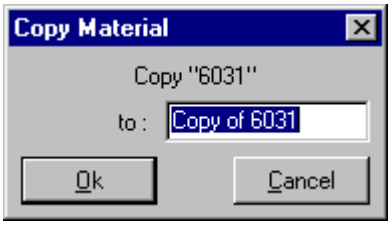


Figure 12: Copy material

- Delete:
  The 'Delete' options is used to delete the select material from the list. You will be asked to confirm this action. Deleting the material from the list will not affect any objects using this material. You can however nolonger assign this material to other object parts.
- The **Close** button:
  The 'Close' button will close this window. You can leave this window open while you work with the program, but often you will close it you have more room on the screen for your other windows. This window can be opened again by selecting the 'Material list' menu item in the 'File' menu.

Working with primitives

You can perform various interactive operations on primitives (like move, scale and rotate). A lot of these operations are available from the toolbar; the rest can be selected from the menu. To use one of these operations you do the following:

1. Select the operation from the toolbar or the menu.
2. Click on the primitive you want to use with this operation, this primitive will become picked.
3. While holding down the left mouse button, drag the mouse
4. You can now cancel the operation by clicking the right mouse button.
5. If you let the left mouse button go, the operation will be finished and the changes will be shown in all the windows currently open (except windows in the render display mode).
6. If you want to perform the same operation again you can start at item 2.

We recommend you use the interactive operations in the 2D window only, because using them in the 3D window can have strange results.
You can pick a primitive is by clicking the left mouse button inside the primitive. There can be only one picked primitive at one time, and this primitive will have a red box drawn around it. Because primitives can be behind other objects, you will need a method to pick these obscured primitives. This is done by repeatedly clicking (not to fast, because this will count as a double-click) without moving the mouse. On the first click the primitive nearest to the camera will be picked, the next click will pick a primitive further away. This continues until the furthest primitive is picked, the next click will then pick the nearest primitive again.
If you want to perform an operation on a primitive that is obscured by others, it is often helpful to first pick the correct primitive and then select the correct operation. To start this operation however you would need to click in the window again, possibly picking another primitive. To avoid this picking of another primitive, you can hold down the 'ALT' key. When the operation is started you can let go of the 'ALT' key.
In short, the 'ALT' key prevents the system from picking another primitive when starting an operation.

Some operations, like group and align, require more than one primitive to work with. In an object there can only be one picked primitive at one time, so these operations require something else, they require selected primitives!
Before you can select a primitive you first have to pick it. After you have picked the primitive you can open the context menu of the window (by right clicking in the window); in this menu you see an option called 'Select'. This option will select the primitive. Primitives that are selected are drawn with a green box around them. To unselect or deselect the primitive; you use the same menu option.
A quick way to deselect all primitives in the object, is by using the menu option 'Edit | Deselect All'. (This menu item has the shortcut Shift-Esc).

Besides the interactive operations described above there are also so called 'property sheets'. Property sheets are dialogs containing a number of tabs (or pages). These are described in ‘Properties’ starting on page 15 of this manual.

Materials

All work with materials is done in the 'Material List' (see page 8). Using the context menu of this window, you can create new, edit, copy, import and delete materials. There are two kinds of materials in the MSD package. We have simple materials and textures. Simple materials have a single color combined with reflectance and transparency parameters. The textures extend the simple materials with a bitmap and some mapping options.

Simple materials

All the parameters of the simple material can be set using the following dialog.

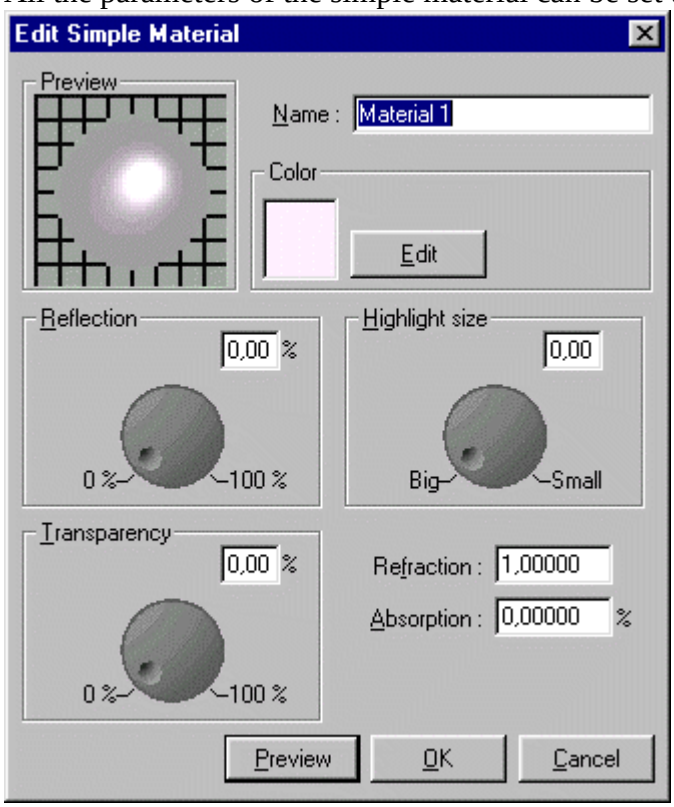


Figure 13: Simple material parameters

At the top right you see a preview. This preview is rendered when you press the 'Preview' button at the bottom of the dialog, or when you click 'OK' to close the dialog. This preview is used to visually select the materials in the rest of the program. The preview consists of a sphere in front of a wall with gridlines on it. Below the sphere is a floor. The sphere will be of the material you are editing. The gridlines can be used to check the transparency parameters. The floor will become visible as a reflection in the sphere when you make the material reflective. The scene is lit by a spot from the top right to allow you to check the highlights of the material. Next to the preview you see a box with the name of the material, there you can change the name of the material. Below the name you see box called 'Color'. This box contains a rectangle with the color of the material. You can change the color of the material by clicking on the 'Edit' button; this will display a dialog in which you can select a new color (see page 14). Below the 'Preview' and the 'Color' box you see the Reflection parameters. There are two parameters that define the reflectance of a material. The first (on the left) is the reflection. This is the percentage of light that is reflected back. 0% indicates a dull surface and 100% indicated a perfect mirror. The second parameter (on the right) is the 'Highlight size'. This value is an indication of the

smoothness of the material. If a material is rough, a big highlight can be seen on the surface. If a material is very smooth, the size of the highlight will be small. Below the reflection parameters you see the transparency parameters. On the left you see the transparency percentage, this percentage indicates the amount of light going in through the material, the rest of the material will be reflected back or used to color the object depending on the amount of reflectance you have set. Next to the transparency percentage you see the other two transparency parameters. The refraction indicates the refraction index of the material, see Table 2 for a few examples. The absorption finally indicates how much light is lost in the material; this also depends on the thickness of the material. The value set here is the percentage of light lost per meter.

Diamond	2.42
Glass	1.55
Ice	1.31
Quartz	1.55
Perspex	1.49
Water	1.34

Table 2: Refraction indices

Textures

The parameters of textures can be set in two dialogs. One is very similar to Figure 13, the only difference is an extra button marked 'Bitmap' next to the
'Edit' button. If you click on this button you get the following dialog

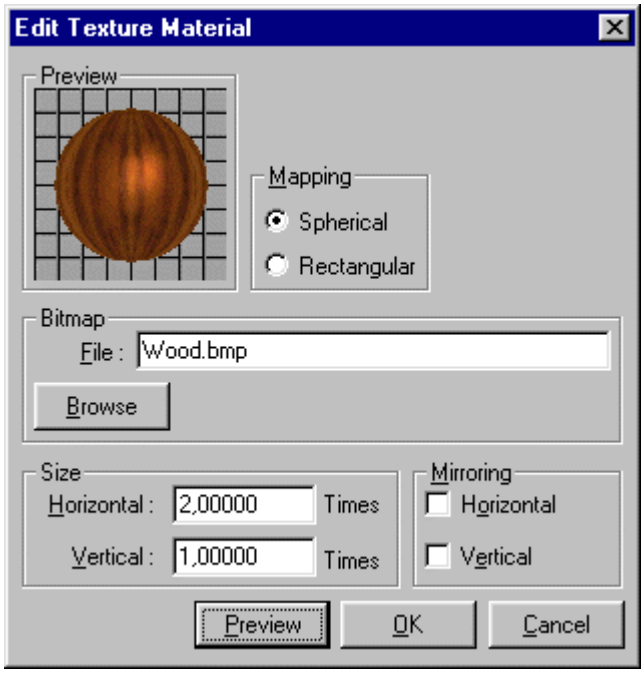


Figure 14: Texture parameters

The top left corner shown the preview just like in the 'Simple material parameters' dialog. To the right of the preview you can see a box called 'Mapping'. Here you can select how the bitmap will be 'pasted' on the object. If you select 'Spherical' the bitmap will be wrapped around the object. If you select 'Rectangular' the bitmap will be pasted on the front of the object. If you select 'Rectangular' mapping, some options in this dialog will change (see Figure 13). The bitmaps that is used for the texture can be typed in or selected from a list by clicking on the

'Browse' button. Below the 'Browse' button you can see a box called 'Size'. This is where the 'Rectangular' and 'Spherical' dialogs differ. If have selected a 'Spherical' mapping, than you enter the number of repetitions here. The horizontal number indicates the number of times the bitmap is repeated from the back of the object to around the front to the back of the object again. The vertical number indicates the repetition count from top to bottom. In 'Rectangular mapping' you should enter the size of the bitmap (the size of the object that the bitmap represents). Next to the 'Size' box you see a box called 'Mirroring'. These options take effect only when the bitmap needs to be repeated, If these options are on, the bitmap will be mirrored every time the bitmap is repeated in that direction.

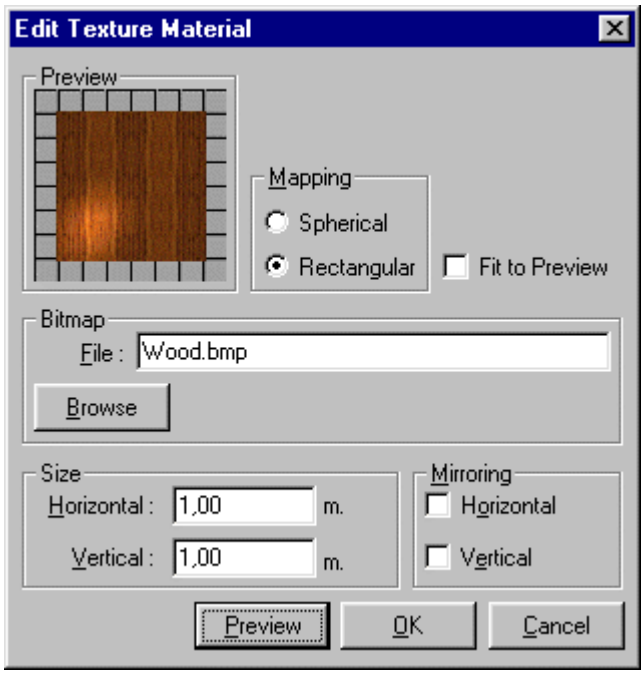


Figure 15: Rectangular mapped texture

Another option only available to Rectangular mapped textures, is the 'Fit to Preview' option. This option changes only the preview, when you activate this option; the size of the texture will be ignored when the preview is calculated. Instead of the size you entered, the size will be scaled to fit the cube in the preview exactly.

Color Selection

Whenever you need to enter a color, the MSD software will display the following dialog.

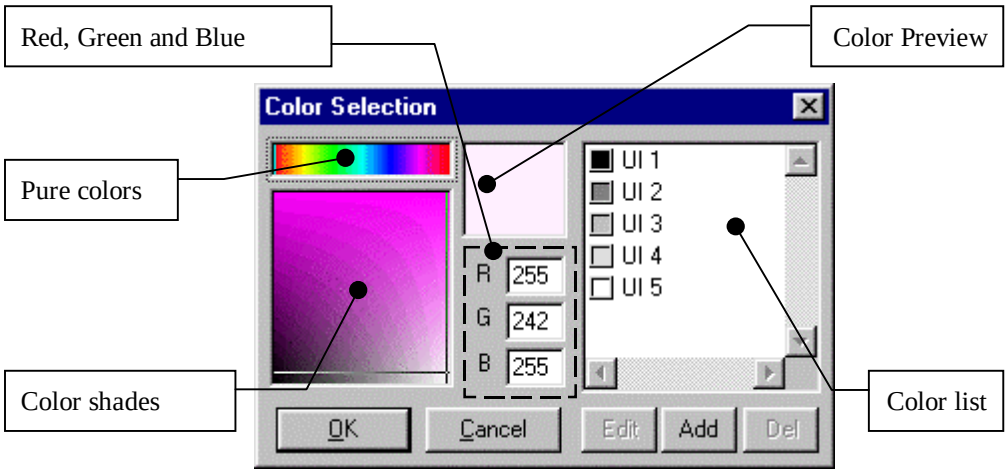


Figure 16: Color Selection

This dialog is divided in two parts, the left part allows you to enter a color using the mouse or by typing in the Red, Green and Blue values directly. On the right is a list of colors from which you can choose.

Selecting a new color

The 'Pure colors' field can be used to select the color display in the top of the 'Color shades' field. The 'Color shades' field can then be used to select the desired shade. On the left of the field all the shades between the pure color and black are displayed. On right you will find all the shades between the pure color and white. While you are dragging the mouse in these fields, you can see the selected color in the 'Color Preview'.

Using the color list

The list can be used to quickly select a previously saved color. You can use the 'Add' button to add the selected color to the list. If you select a color from the list, the 'Edit' and 'Del' buttons will become available. With the 'Del' button you can delete the selected color from the list. When you click on the 'Edit' button, the following dialog will appear

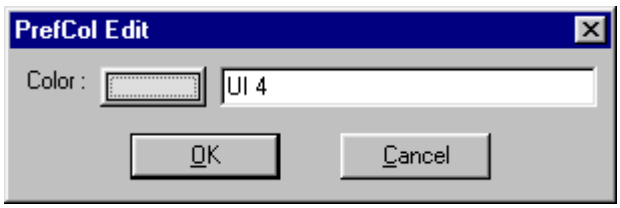


Figure 17: Color list color edit

In this dialog you can change the name of the color and change the color by clicking on the button next to the name. When you click on the color button you will get a dialog very similar to the dialog in Figure 16, except for the buttons beneath the list.

Properties

You can change most of the parameters of primitives and light-sources by using the property sheets. You can get the property sheet of picked primitives by right clicking in one of the windows containing the object. Doing this will show you the context menu, in which you can select options specific for that window. One of these options is ‘Properties’. Selecting this menu option will display a dialog with multiple tabs (see Figure 18). This dialog is called a property sheet. Below the tab windows you see three buttons, called ‘OK’, ‘Cancel’ and ‘Apply’ (We used a Dutch version of windows to create the images, so the text differs). You use the ‘OK’ button to accept the changes and close the property sheet. The ‘Cancel’ button just closes the property sheet without accepting the changes. The ‘Apply’ button can be used to accept the changes without closing the property sheet, this allows you to check the new settings and edit them if necessary without repeatedly opening the property sheet.
Following is description of the properties of primitives and the light-sources, beginning with the tabs common to all primitives, and ending with the tabs for the light-sources.

Primitive properties

Orientation tab

The following two tabs can be found in the property sheet of all primitives.

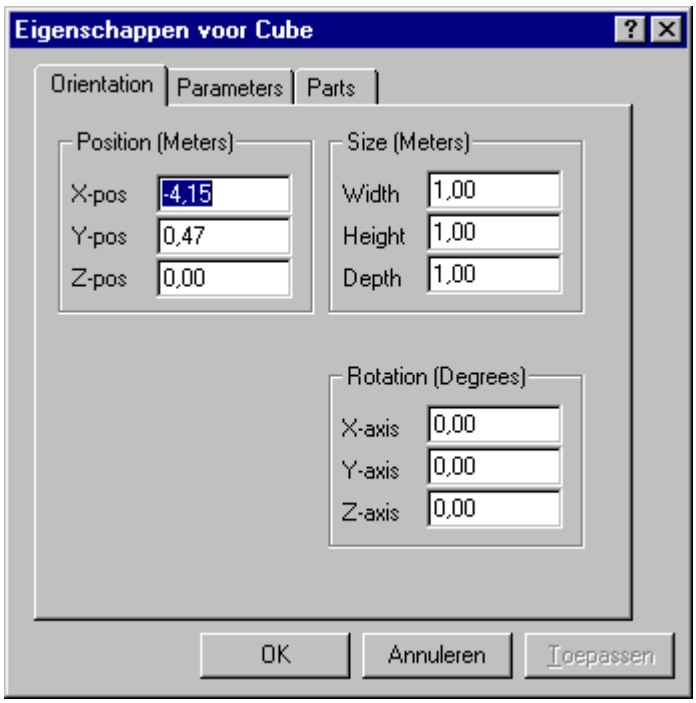


Figure 18: Primitive orientation tab

This tab lets you enter the exact position, size and orientation of the picked primitive. The tab is divided into three parts. At the top left you see three edit fields for the position. Next to the position you can see the fields for the size and below that you see the fields for the orientation. In this tab you can enter the position and size in meters and the orientation in degrees, this can be changed in the user settings property sheet (see 'Settings Menu' on page 34).

Parts tab

The second common tab is the 'Parts' tab

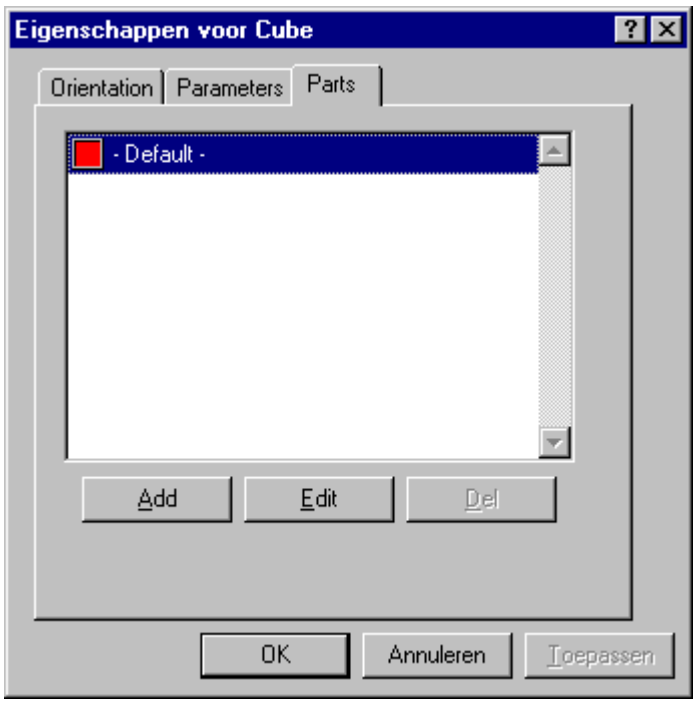


Figure 19: Parts tab

The parts tab allows you to manage parts in this object. All primitive used in the open object belong to a part. All primitives belonging to the same part have the same color or material.
Every new part will automatically belong to the '- Default -' part. This '- Default -' part is special, because it can be overwritten in groups or inserts in other objects. When you select a part for a group or inserted object, all primitives contained in that group (or insert) that belong to the '- Default -' part will become part of the selected part for the group (or insert).
With the buttons under the list you can 'Add' new parts, 'Edit' parts and 'Del'ete them. After clicking on the 'OK' or the 'Apply' button, the picked primitive will belong to the selected part. When you add a new part or edit an existing one, you will be presented with the following dialog.

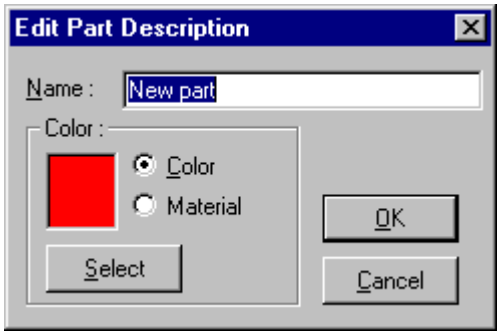


Figure 20: Edit part description

In this dialog you can change the name of the part and change the color or material attached to that part. By default a part has a color, which can be changed by clicking on the Select button.

The color selection dialog (see page 14) will then be display, letting you select another color. By selecting the 'Material' button you can attach a material to the part, again you can use the 'Select' button to select the correct material. A list of available materials will be displayed, in which you can select the correct material. This list is managed using the 'Material List' described on page 8 of this manual. An exception to this is the '- Default -' part; this part can not have a material.

Parameters tab

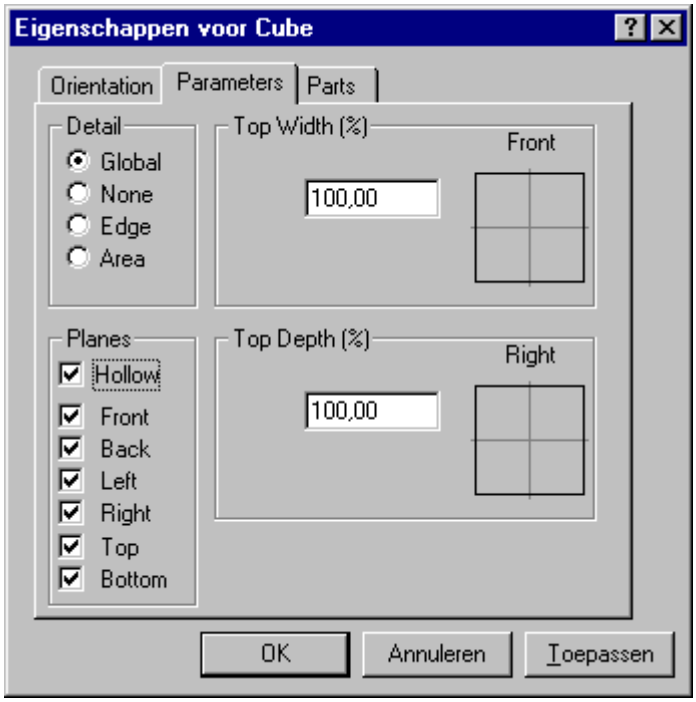


Figure 21: Cube parameter tab

This tab is use to change the appearance of the picked primitive.
In the top left corner you can see an area labelled 'Detail'. This is used to change the subdivision of large areas. The quality of solid-mode lighting will improve with a higher subdivision. There are four options for this detail level.

- 'Global' : The subdivision is controled by the global system settings (see page 37)
- 'None' : No subdivision is performed
- 'Edge' : All curves will be more subdivided
- 'Area' : Curves, as will as large planes will be subdivided

On the right side there are two areas called 'Top width' and 'Top depth'. The fields in these areas can be used to change the dimension of the top plane relative to the bottom. Making both these parameter 0 will result in a pyramid for instance. The drawing next to the fields gives a impression of the result of the changes.

The last area in this tab is the 'Planes' field. In this field you can make the primitive solid or hollow. When you select hollow, you can also remove some of the planes. (there should be at least one plane selected).

Figure 21 shows the tab for cubes (pyramids and triangles), but the other primitives offer a simular tab.

Light-source properties

Orientation tab

The ‘Orientation’ tab looks like this

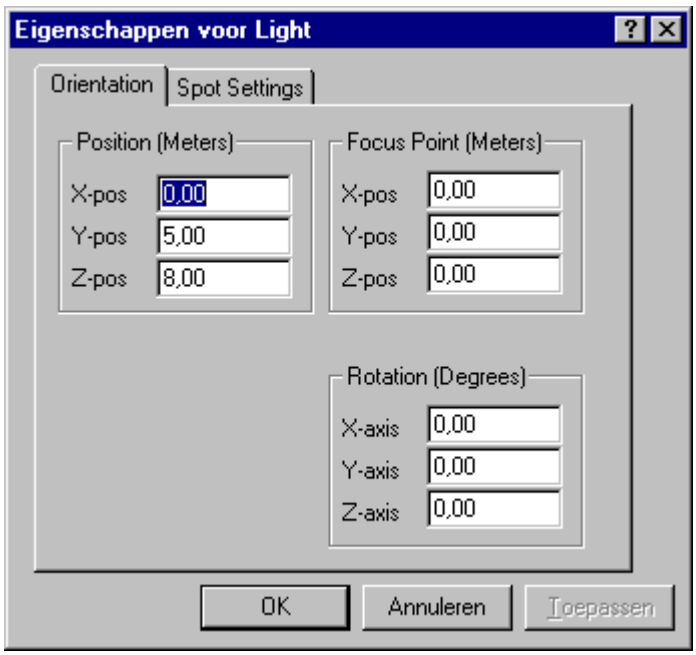


Figure 22: Light-sources orientation tab

This tab looks a lot like the tab described in Primitive Properties. The difference is the ‘Focus Point’ fields instead of the size. The ‘Focus Point’ fields can be used to focus the spot on a known position.

Settings tab

The 'settings' tab is the dialog where you set up a light-source. It looks like this

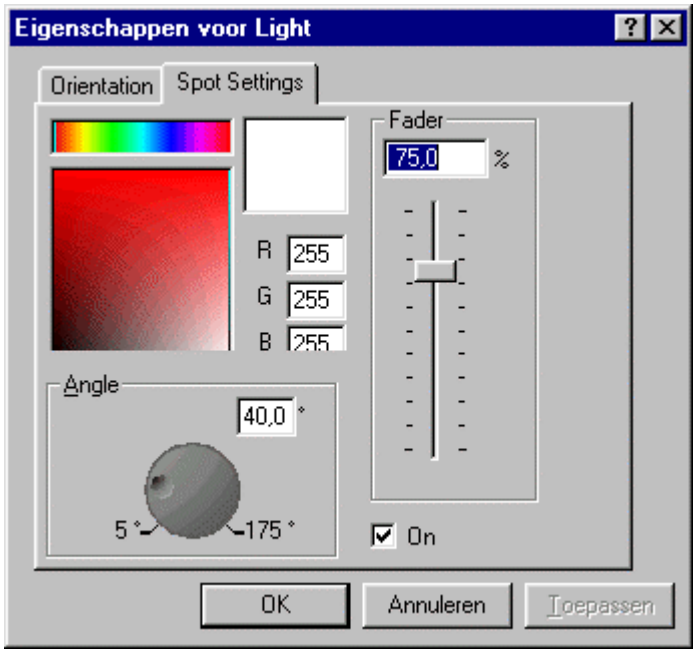


Figure 23: Spot settings tab

In this tab you can change the color of the light-source, change it intensity and change it beam angle.
The color of the light-source is changed in the same manner as the 'Color Selection' (see page 14). The intensity is change with the slider, or by typing in the correct percentage and the beam angle can be changed by moveing the wheel or typing in the correct value.
Below the fader you see an option labeled 'On'. This option is used to turn the light on or off. In the drawing you can recognize light-sources that are on, by a beam. Light-sources that are turned off have no beam.

The settings of the light-sources will be stored with the object. New objects will use the light settings that are in effect at the time you created the object.

Menu bar

Library Menu

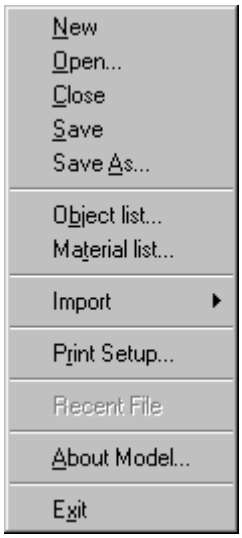


Figure 24: Library menu

You will use the entries in this menu to open, close and save model libraries, show the various lists, setup the printer, get information about the program and exit the program.

Library | New

This menu is used to create a new library. The system will ask to save any changes to the current library if a library is already open.

Library | Open...

This menu is used to open an existing library. You will be presented with the standard file dialog in the modellib directory. After you selected a library the current library will be closed and the new library will be opened. If the current library was changed since the last save you will get the opportunity the save these changes or cancel the open command.

Library | Close

Use this menu item to close the current library. If the current library has any unsaved changes you will get the opportunity to save these before the library is closed.

Library | Save

Save is used to save the current library. If the current library was never saved before, you must enter a name for the new library.

Library | Save As...

This menu item is use to give the library a new name. If you use this option you must select a new name for the library. The library is then saved using this name. Any subsequent saves of the library will be done using this name.

Library | Object list...

This option shows the ‘Object List’ window (see page 7). In this window you can delete, rename and import objects. In a new library this list will be initially empty.

Library | Material list...

This option shows the ‘Material List’ window (see page 8). In this window you can Edit, Copy, Import, Delete and Create new materials. In a new library this list will be initially empty.

Library | Import

Figure 25: Import menu

This menu allows you to import other types of libraries.

Library | Import | DXF File

This option allows you to import a DXF file (up to release 12). After selecting this option, you will be presented by a DXF options dialog:

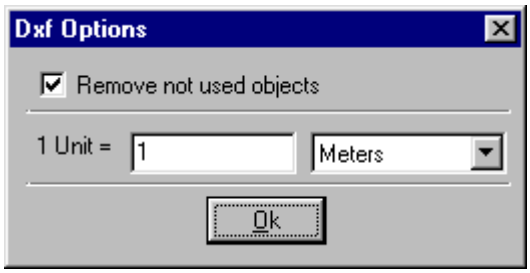


Figure 26: Dxf options dialog

First of all you can specify if you want to remove any not used objects from the DXF file. Further more, you can specify what 1 unit in the DXF file represents in real world coordinates.
When you import a DXF file, objects defined in the DXF file will be imported as objects in the model library. The total scene in the DXF file will also be imported as an object and will get the name of the DXF file. For example, if you import a DXF file called 'c:\room.dxf' which contains a scene with 3 objects in it (a table and 2 chairs), There will appear 3 objects in the model library called ‘room’, ‘chair’ and ‘table’, where the object room will contain the complete scene. If there was also an object ‘painting’ in the DXF file which was not put in the ‘room’ scene, it will or will not be in the model library, depending on how the checkbox ‘Remove not used object’ was checked or not.
Since the Modeller is a 3D graphics program, it will only import 3D DXF objects.

Library | Import | DirectX File

This option allows you to import a X file (in the Microsoft DirectX format).

Library | Print Setup...

This option allows you to setup the current printer

Library | Recent files

Here you will find the 4 last saved/opened files. By selecting one of these files you can open the selected library.

Library | About Model...

This option will display a window in which you can get information about the program. By clicking on the info button you will see information about the current installed version, the installation date, the serialno of the program and the name with which the program was installed.

Library | Exit

Shortcut : Alt+F4
This option will shut down the program. If there is a library open and if this library has any unsaved changes you will be asked to save these changes or cancel the operation.

Object Menu

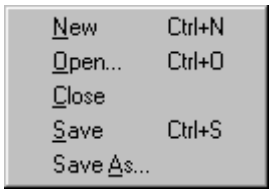


Figure 27: Object menu

You will use the entries in this menu to create, open, close and save objects.

Object | New

Shortcut : Ctrl+N 

This menu is used to create a new object. The system will ask to save any changes to the current object if an object is already open.

Object | Open...

Shortcut : Ctrl+O 

This menu is used to open an existing object. You will be presented with a list of objects present in the current model library. After you selected an object, the current object will be closed and the new object will be opened. If the current object was changed since the last save you will get the opportunity the save these changes or cancel the open command.

Object | Close

Use this menu item to close the current object. If the current object has any unsaved changes you will get the opportunity to save these before the object is closed.

Object | Save

Shortcut : Ctrl+S 

Save is used to save the current object. If the current was never saved before, you must enter a name for the new object.

Object | Save As...

This menu item is used to save the object with a new name. If you use this option you must select a new name for the object. The object is then saved using this name. Any subsequent saves of the object will be done using this name.

Edit Menu

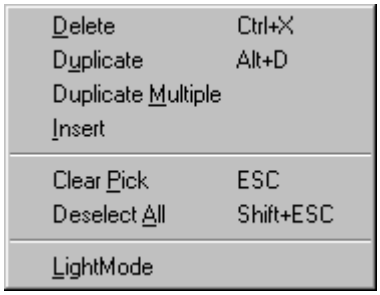


Figure 28: Edit menu

You will use the entries in this menu to delete, copy and insert primitives, clear pick or selection and switch between ‘Light Mode’ and ‘Normal Mode’.

Edit | Delete

Shortcut : Ctrl+X 

This option will delete the picked primitive.

Edit | Duplicate

Shortcut : Alt+D 

This option will copy the picked primitive. When you click with your left mouse button inside a window, the copy will be inserted into the current object. If you keep the mouse button down, you can directly move the inserted copy around until you release the mouse button.

Edit | Duplicate Multiple

This option will make multiple copies of the picked primitive. When you click with your left mouse button inside a window, a dialog will appear.

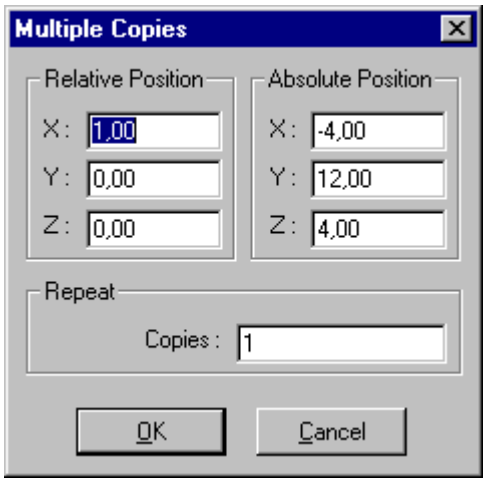


Figure 29: Multiple copies dialog

In de 'Multiple Copies' dialog, you can enter the position where the first copy of the picked primitive should come. You can do this relative to the position of the original, or absolute by giving the world coordinates. For example (see Figure 29), if you have a primitive on position (-5.0, 12.0, 4.0), you can set the first copy 1.0 meter to the right (relative) or set it on position (-4.0, 12.0, 4.0) (absolute). All other copies will be positioned relative to the previous copy in the same way as the first copy is positioned relative to the original. What this means is that in the previous example, the second copy would be on position (-3.0, 12.0, 4.0), so 1.0 meter to the right from the first copy.
In the 'copies' field you can enter how many copies you want.

Edit | Insert

This option allows you to insert an object from the object list into the current object. See 'Object List' on page 7 for more information about objects. When you click in a window after selecting this option a list of available objects will appear. The desired object will be inserted after clicking on it in the list.

Edit | Clear Pick

Shortcut : Esc
This option clears the current pick. If you had something picked, it will be unpicked.

Edit | Deselect All

Shortcut : Shift+Esc
This option clears the selection. If you have one or more primitives selected, they will be deselected.

Edit | Lightmode

This option activates and deactivates the Lightmode. When you are working in normal mode, the object is lighted by a single simple lightsource, which always seems to come form top right. When you are working in Lightmode, you have up to 8 simple light-sources. These simple light-sources have an adjustable intensity, a zoom angle and a color and can be aimed.

View Menu

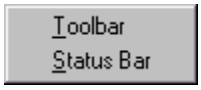


Figure 30: View menu

You will use the entries in this menu to view or hide the toolbars holding the buttons and the status bar at the bottom of the main window. If an item is visible a checkmark will be displayed in front of the menu item.

View | Toolbar

This menu is used to show or hide the toolbars. For an overview of all the buttons in the toolbars you can look at the 'Toolbars' entry in this manual (see page 41).

View | Status Bar

This menu is used to show or hide the status bar.

Window Menu

Figure 31: Window menu

You will use the entries in this menu to open or arrange windows and to save or print windows.

Window | New 2D window

This option opens a new 2D window.

Window | New 3D window

This option opens a new 3D window.

Window | Cascade

This option will arrange all open windows to be all the same size, stacked one on top of another.

Window | Tile

This option will arrange all open windows to be tiled side by side, so all windows will be totally visible.

Window | Arrange Icons

This option will arrange all icons to be at the bottom of the main window.

Window | Save as Bitmap...

This option allows you to save a window as a Windows bitmap (BMP).

Window | Print...

Shortcut : Ctrl+P 

This option allows you to print a window. The print will always be in wireframe mode.

Window | Print Preview

This option allows you to preview how a window will be printed.

Display Mode Menu

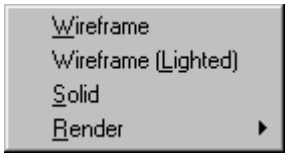


Figure 32: Display mode menu

This menu allows you to select the display mode of a window. If gives you a range of representations of an object.

Display Mode | Wireframe

This option will show the object in wireframe mode. This will show your primitives as solid lines.

Display Mode | Wireframe (Lighted)

This option will show the object in lighted wireframe mode. This will show your primitives as lines, which are shaded by using a light source.

Display Mode | Solid

This option will show the object in solid mode. This will show your primitives as solid, shaded objects.

Display Mode | Render

Figure 33: Render menu

This menu will only be available in a 3D window. It allows you to realistic render your object, taking into account lighting, reflection, shadows etc.

Display Mode | Render | Start

The start option will start the rendering of the object (see page 5).

Display Mode | Render | Hold

The Hold option will temporarily stop rendering the window. This might be useful if you are rendering a complex object. By setting the rendering on hold, you get more time to do other things (in this application or another). This option is only available if you are currently rendering in the window.

Display Mode | Render | Resume

The Resume option will resume rendering a window, which was previously stopped by using the Hold option. This option is only available if the window is currently in a 'hold rendering' mode.

Display | Render | Exclusive

The Exclusive option is a special case of the Start option. The exclusive option also will start rendering a window, but if you choose this option, the Modeler application will turn its full attention to the rendering process of the window. This means that nothing else can be done with the Modeler until the rendering process is completed. It can not be stopped! So be very careful to use this option. The only advantage of this way of rendering is that it is faster.

Primitive Menu

Figure 34: Primitive menu

This menu allows you to insert a primitive.

Primitive | Cubes

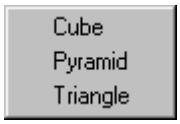


Figure 35: Cube primitives

These menu options allow you to insert various cube shapes.

Primitive | Cylinders

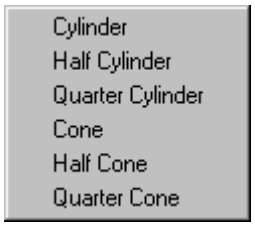


Figure 36: Cylinders primitives

These menu options allow you to insert various cylinder shapes.

Primitive | Sphere

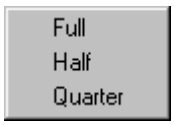


Figure 37: Sphere primitives

These menu options allow you to insert various sphere shapes.

Primitive | Toroid

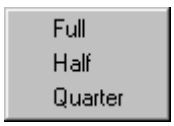


Figure 38: Toroid primitives

These menu options allow you to insert various toroid shapes.

Primitive | Triangles

Figure 39: Triangle primitives

These menu options allow you to insert various triangle shapes.

Primitive | Surfaces

Figure 40: Surface primitives

These menu options allow you to insert various surface shapes.

Primitive | Circles

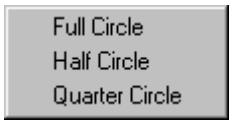


Figure 41: Circle primitives

These menu options allow you to insert various circle shapes.

Operation Menu

Figure 42: Operation menu

This menu allows you to start an operation one or more primitives.

Operation | Move

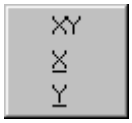


Figure 43: Operation, Move menu

The Move operations allow you to interactively manipulate the position horizontally and/or vertically by moving the mouse.

Operation | Move | XY

This option allows you to move something both horizontally and vertically.

Operation | Move | X

This option allows you to move something only horizontally.

Operation | Move | Y

This option allows you to move something only vertically.

Operation | Rotate

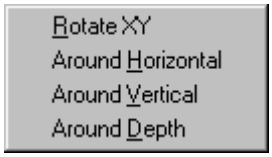


Figure 44: Operation, Rotate menu

The Rotate operations allow you to interactively manipulate the orientation of one or more primitives.

Operation | Rotate | Rotate XY

This option allows you to rotate something around both the horizontal and vertical axis.

Operation | Rotate | Around Horizontal

This option allows you to rotate something around the horizontal axis.

Operation | Rotate | Around Vertical

This option allows you to rotate something around the vertical axis.

Operation | Rotate | Around Depth

This option allows you to rotate something around the depth axis.

Operation | Scale

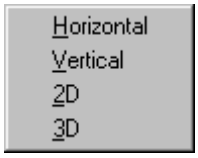


Figure 45: Operation, Scale menu

The Scale operations allow you to interactively manipulate the size of one or more primitives.

Operation | Scale | Horizontal

This option allows you to scale something horizontally.

Operation | Scale | Vertical

This option allows you to scale something vertically.

Operation | Scale | 2D

This option allows you to scale something horizontally and vertically.

Operation | Scale | 3D

This option allows you to scale something uniformly by scaling the whole primitive by the same amount.

Operation | Align Chain

This option allows you to align two or more selected primitives in a chain like way. The selection order for this align operation is very important. The primitive that is first selected will stay where it is, so you first have to make sure that this primitive is in the right place. The second selected primitive will be aligned to the first one, the third selected primitive to the second and so on. There are several ways that two primitives can be aligned. The one that will be used is the same as the one that is default calculated for a normal align operation (see the next menu option 'Align…' for more information on the different align possibilities.)

Operation | Align...

This option allows you to align one or more selected primitive(s) to the active (picked) primitive. When you select this option, a dialog will appear.

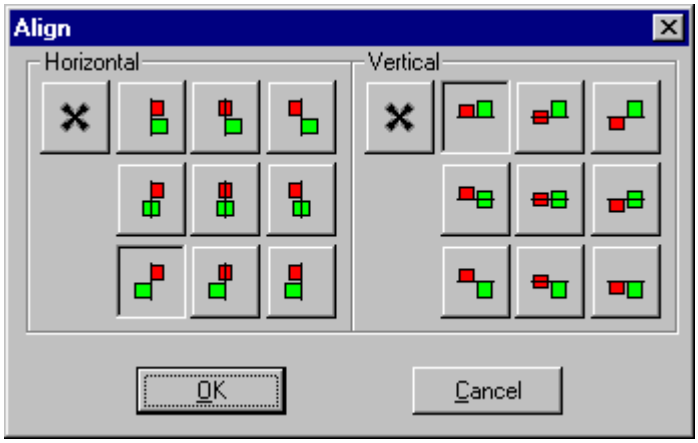
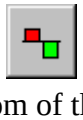


Figure 46: Align dialog

In this dialog, the green square represents the selected primitive(s), and the red square the active primitive. The 'Align' operation will not move the active (picked) primitive. It will align the selected primitive(s) to the active primitive. You can align the primitives horizontally and/or vertically. Horizontally you can align the left, center and right. Vertically you can align the top, center and bottom. Default, the program will make a guess how you want to align the primitives. It does this by comparing the distances between the active primitive and the first selected primitive. Horizontally, it will compare the distances left-left, left-center, left-right, center-left, center-center, center-right, right-left, right-center and right-right, and chooses the minimal distance. It does this again for the vertical alignment. These default horizontal and vertical alignments are visible as the two pushed down buttons. You can always select another (or no) alignment by pushing down the desired alignment button.

Example:
Say you have an object with a pipe hanging 2 meters of the floor. You roughly place a number of curtains hanging below the pipe. You can now select the curtains and then pick the pipe. When you now select the 'Align' operation, and push down the  button for no horizontal alignment, and the  button for vertical alignment, it will snap the top of all the selected curtains to the bottom of the active pipe.

Operation | Group

This option allows you to group the selected primitives together. The resulting group can be treated as a single primitive from then on. Such a group can always be split again by picking it and selecting the ‘Ungroup’ operation.

Operation | Ungroup

This option allows you to split a group into its components. Each component will be added to the selection.

Camera Menu

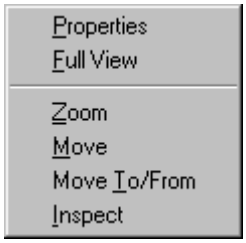


Figure 47: Camera menu

This menu allows you to manipulate the camera or a window.

Camera | Properties

For information on the camera properties, see Figure 7 and Figure 8 in ‘Window types’ starting on page 5.

Camera | Full View

This option will try to adjust the camera so that the entire object will be visible.

Camera | Zoom

This option allows you to interactively zoom in/out. In 2D windows, the scale will change and in 3D windows, it will be the camera angle that changes.

Camera | Move

This option allows you to look around with the camera. In 2D windows, you can move around then view plane and in 3D windows, you can look around by tilting the camera from left to right and from top to bottom.

Camera | Move To/From

This option allows you to move the camera to and from. In 2D windows, this does the same as the 'Zoom' operation. In 3D windows, the camera is moved forwards or backwards.

Camera | Inspect

This option allows you to inspect an object by moving the camera around a point. In 2D windows this can only be done if you have an active (picked) primitive. The camera will move around the center of the primitive. In 3D windows the camera will move around the center of an active primitive if there is an active primitive, otherwise the camera will move around the focus point of the camera.

Settings Menu

Figure 48: Settings menu

This menu allows you to adjust the programs appearance and preferences.

Settings | Main Background

This option allows you to change the appearance of the background of the main application window.

Settings | Window color

This option allows you to change the background color of the 2D-and 3D windows.

Settings | Preferences

In the preferences dialog you can set your preferences. Some are local (apply only to the Martin Modeler), some are global (they may apply to all Martin ShowDesigner modules). The preferences are arranged into groups, with each it's own tab (page). Each tab (Units, Grid, Detail, Render Settings, Auto Save and Paths) will be explained below.

Units tab

The units tab contains global preferences.

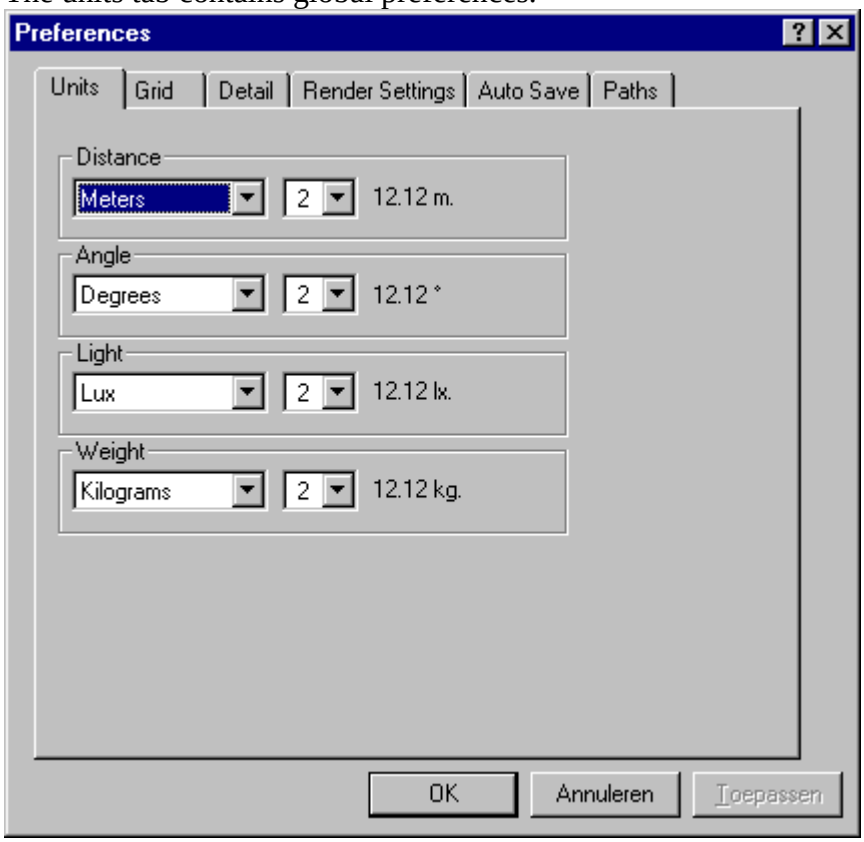


Figure 49: Units tab

In the Units tab, you can select which units the applications should use:

- Distance: Meters, Millimeters, Inches or Feet & Inches.
- Angle: Degrees (360°), Radials (2π) or Gradients (400°).
- Light: Lux or Foot-candle.
- Weight: Grams, Kilograms or Pounds.

Grid tab

The grid tab contains local preferences.

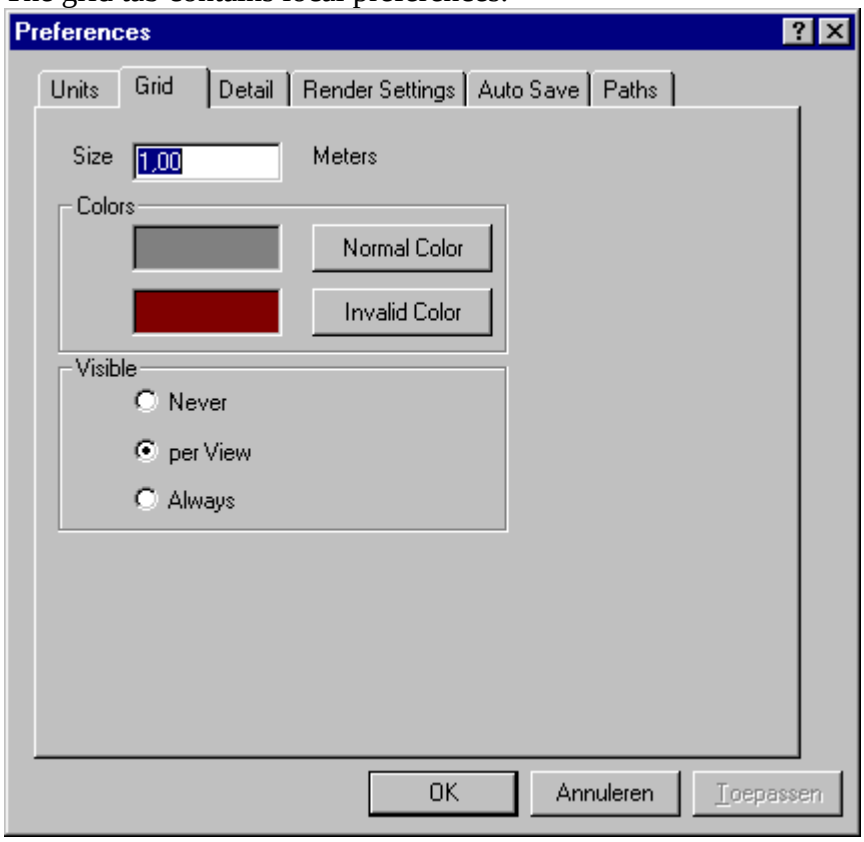


Figure 50: Grid tab

In the Grid tab, you specify the grid settings for 2D windows.
You can specify how far apart the grid lines should be (in the example every meter).
The color of the grid is selected by pressing the 'Normal Color' button. If you zoom out in a window, the grid lines could become to close together. The grid size is then automatically adjusted (temporarily). So if you zoom out, the grid size will go from 1 meter to 10, 100, 1000 etc. meters. To inform you that the grid size is not the specified grid size, the color of the grid will become the 'Invalid Color'.
In the 'Visible' section of the grid tab, you can specify if the grid should be OFF for all windows (Never), if the grid should be ON for all windows (Always), or that you can specify for each window whether or not the grid is on (per View).

Detail tab

The detail tab contains local preferences.

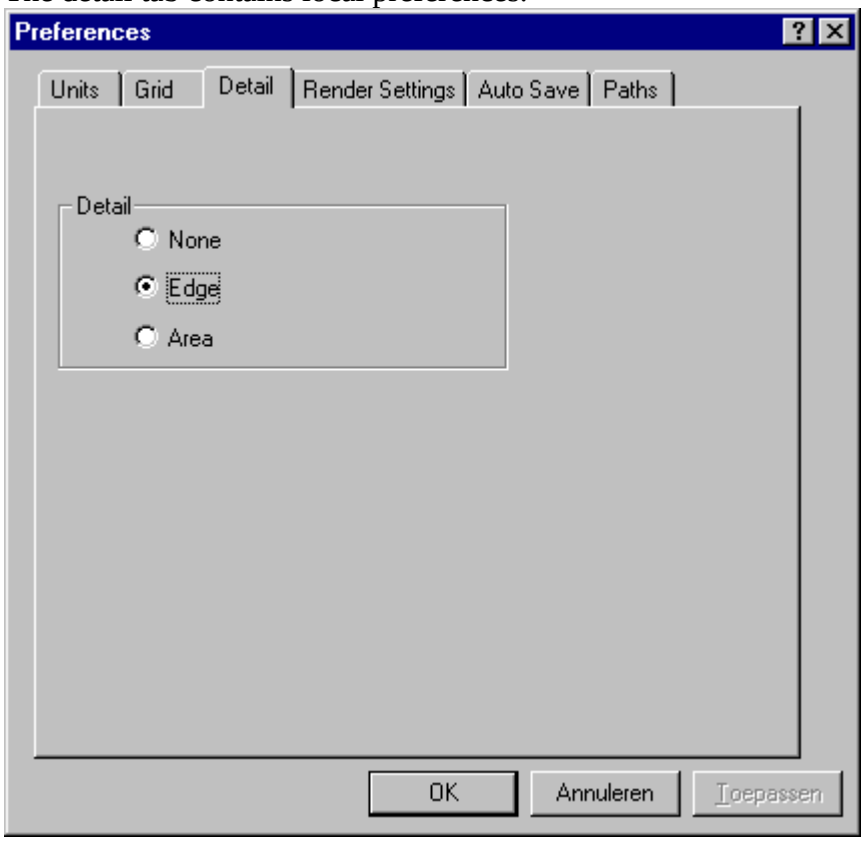


Figure 51: Detail tab

In the Detail tab, you can specify the detail level of primitives.

Render Settings tab

The render settings tab contains local preferences.

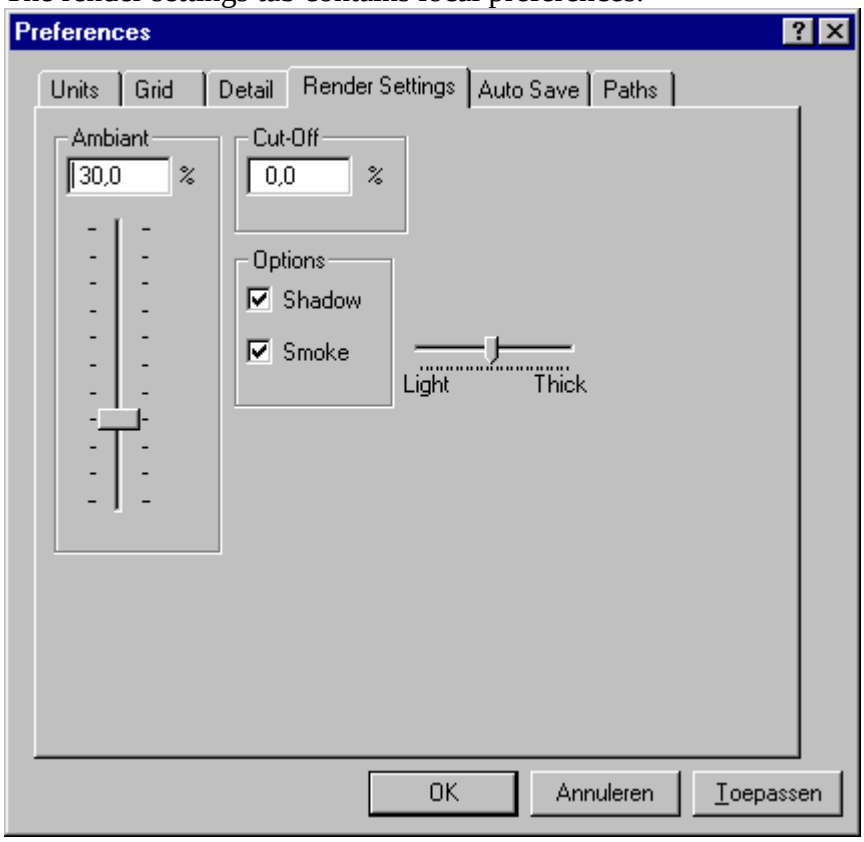


Figure 52: Render Settings tab

In the Render Settings tab, you specify the default render settings for rendering in 3D windows.

- Ambient: Here you can set the amount of ambient light to use in a rendering.
- Cut-Off: During rendering, the light of a spotlight is ignored if its fader if below the Cut-Off value (which means that the light of a spot with a low fadersetting is not used for the rendering).
- Options: Set default options for the render process. If smoke is enabled, you can select a smoke level.

Auto Save tab

The detail tab contains local preferences.

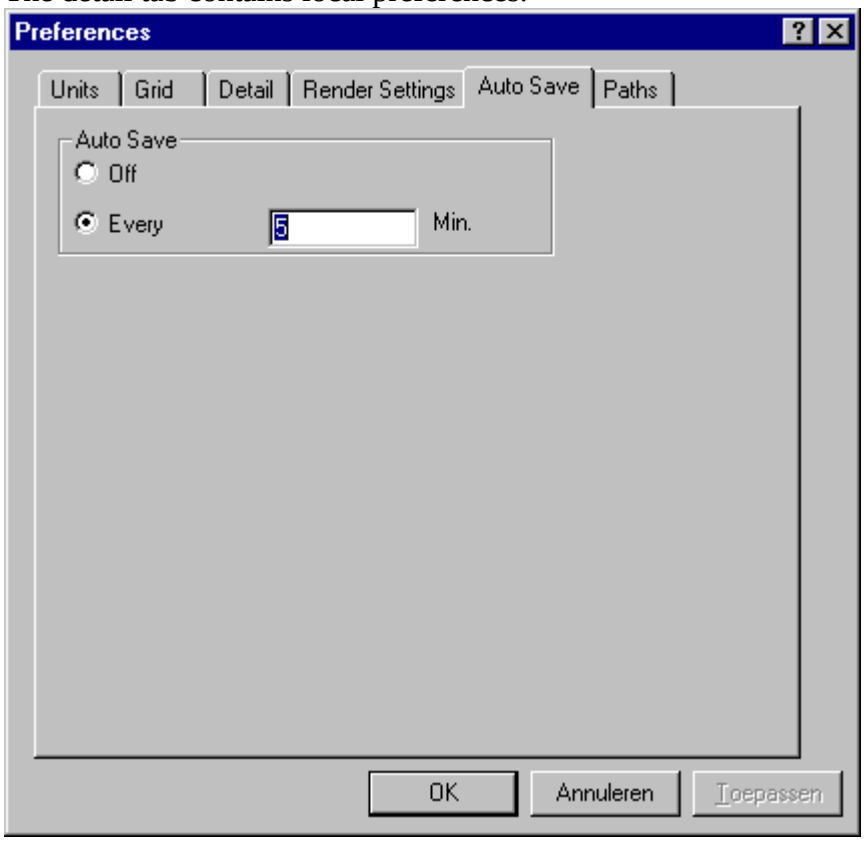


Figure 53: Auto Save tab

In the Auto Save tab, you specify if you want the program to automatically save your object and library, and if so, how often.
The autosave will save the library in the 'Other' directory (If you installed MSD in 'C:\Program Files\MSD4', it will be the 'C:\Program Files\MSD4\Other' directory).
The temporary file will look something like 'Backup 15-Oct-98 15_43_18.mlb', which means its a Model Library backup, created at 15:43 on October the 15th 1998.

Paths tab

The Paths tab contains global preferences.

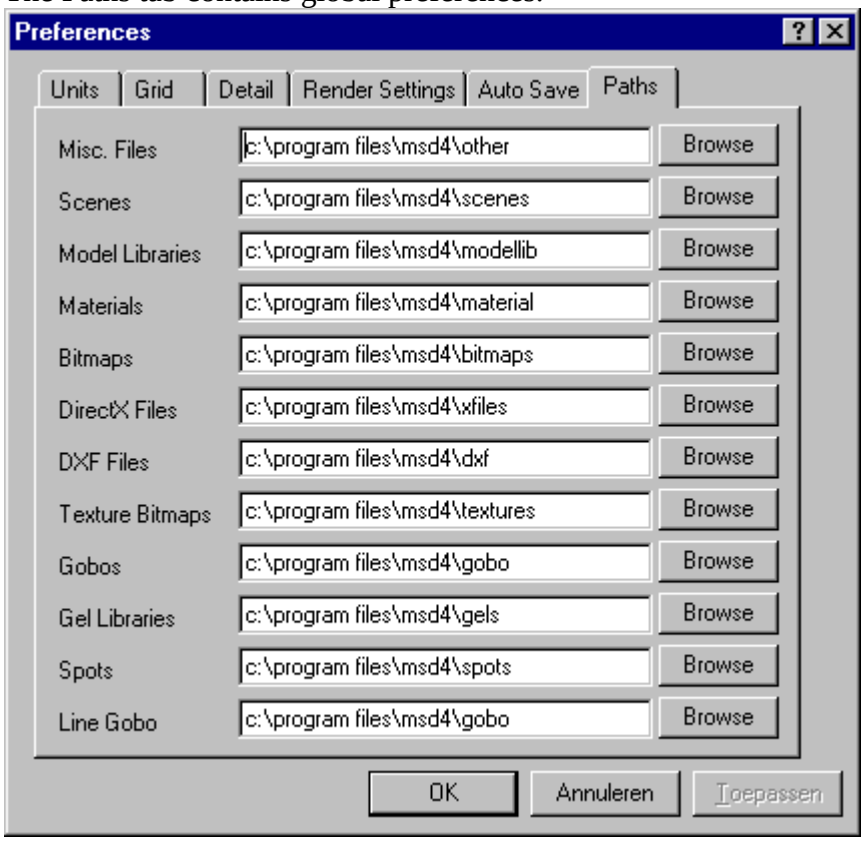


Figure 54: Paths tab

In the Paths tab, the default paths to the different kind of files are set. By default they point to the installed subdirectories. Normally you don't have to change any of them.

Settings | Store layout

This option allows you to save the layout of the program. It will store positions and sizes of the application windows, the 2D and 3D windows, and the lists (Object and Material).

Settings | Restore layout

This option allows you to restore the layout of the program by loading the saved settings.

Toolbars

The following table shows all the buttons that are in the toolbars. In the first column the button is shown and in the second column the menu name where the '|' indicates a submenu

	File | New
	File | Open
	File | Save
	Edit | Delete
	Window | Print
	File | About Modeler
	Edit | Lightmode
	Edit | Insert
	Edit | Duplicate
	Edit | Duplicate Multiple
	Primitives | Cubes | Cube
	Primitives | Cubes | Triangle
	Primitives | Cubes | Pyramid
	Primitives | Cylinders | Cylinder
	Primitives | Cylinders | Cone
	Primitives | Sphere | Full
	Primitives | Toroid | Full
	Primitives | Triangles | Triangle
	Primitives | Triangles | Pyramid
	Primitives | Surfaces | Rectangle
	Primitives | Surfaces | Triangle
	Primitives | Surfaces | Corner
	Primitives | Circles | Full
	Operations | Move | XY
	Operations | Move | X
	Operations | Move | Y

	Operations | Scale | 2D
	Operations | Scale | Horizontal
	Operations | Scale | Vertical
	Operations | Scale | 3D
	Operations | Rotate | Around Horizontal
	Operations | Rotate | Around Vertical
	Operations | Rotate | Around Depth
	Operations | Group
	Operations | Ungroup
	Camera | Zoom
	Camera | Move
	Camera | Move To/From
	Camera | Inspect

Table 3 : Toolbar buttons

Reference

Figure List

Table List