

# MA 3D

# USER MANUAL

## of MA Lighting



# MA 3D User Manual

Version 3.3



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## 1. Help From MA Technical Support

If the MA 3D is not working as described in the manual, you can take the following steps:

- **Error message:** You cannot proceed with the next step of the description and you receive an error message:  
Refer to [Error Messages](#) and repeat the procedure.  
If the problem is still there, contact the technical support.
- **System is not working:** If you cannot proceed with the next step of the description and you do not receive an error message:  
Contact the technical support and describe the last steps you took.

## Technical Service and Support

MA Lighting and its extensive distributor network offer an unparalleled technical service.

Call on our expertise for help with any problem, no matter if it is regarding operation, software features, software installations or trouble shooting.

Please send an email (in English or German) to the tech support with your contact details and the technical question. See the email address of the technical support in the footer of this website.

This email service is monitored during MA Lighting's regular business hours in Germany from 8.30 a.m. until 5 p.m., Monday through Friday.

**For emergency services please contact your local MA distributor or the MA Lighting Service Hotline.**

**Call: +49 5251 688865-99. Please note that this is a 24/7 hotline which is used for emergency cases only. Use this hotline only if troubles occur shortly before an upcoming event.**

## 2. Symbols Used

The following symbols display possible danger, useful hints and information when using the device.

**Warning:**

The warning sign displays possible injury and hazard.

**Restriction:**

The restriction sign displays known limitations of functions.

**Information:**

The information sign displays possible damage of device.

**Hint:**

The hint sign displays additional hints when using the console.

## 3. Introduction

MA Lighting's visualizer and preprogramming studio – the PC software MA 3D – is an extremely powerful tool created for the visualization and design of three-dimensional stage layouts. Conventional and moving light fixtures can be displayed together with any grandMA2 console or the grandMA2 onPC program.

MA 3D allows a straight forward design and setup of any custom stage or scenery layout with its 2D drawing facilities and a library of basic graphical elements. Multiple windows – both in 2D or 3D view with any camera angle – can be opened simultaneously and are updated in real time. All stage elements can be positioned in x, y, z directions and can also be rotated about their axes. This equipment can be moved freely in the 3D space via the grandMA2 console.

One of the many advantages of MA 3D is that it is stored in the same show file in the grandMA2 system. No matter where you are or what type of grandMA2 console or MA equipment you use you always have the complete show file with you!

The MA 3D application runs on powerful Windows® PCs and communicates with the grandMA2 console via network.

## 4. Install and Uninstall

- [System Requirements](#)
- [Installation](#)
- [Uninstall](#)

### 4.1. System Requirements

If you want to run MA 3D on your PC, here's what it takes.

	Minimum	Recommended
<b>Operating system</b>	Windows® 7	
	Windows® 8	
	Windows® 8.1	
	Windows® 10	
	all with admin rights	
<b>Processor</b>	Dual Core 2.4 gigahertz (GHz)	Intel i7
	CPU or faster with support SSE2	
<b>RAM</b>	2 gigabyte (GB)	8 GB
<b>Hard disk</b>	32 GB available space	type SSD
<b>Graphic card</b>	3D with hardware acceleration	3GB graphic RAM
	and 1024 MB	
	Vertex Shader Version 3.0 or greater	
	Pixel Shader Version 3.0 or greater	
<b>Resolution</b>	1024 x 768 or higher	1920 x 1080
<b>Network card</b>	100/1000 TX/T	Gigabit-Ethernet

IBM® compatible PC or notebook is necessary.

Additional requirements for the use of certain features:

- To use the online help and to download the latest version of MA 3D, you need internet access.
- To save to a USB stick, you need a USB 2.0 or 3.0 port.

We recommend that you visit your PC manufacturer's website for information about updated drivers and hardware compatibility.

## 4.2. Installation

Download the latest version from <http://www.malighting.com>.

The installation is possible in every root directory or in the standard directory "MA Lighting Technologies\MA 3D" in the folder "program".

The different versions of the MA 3D are independent programs. There is no need to install or uninstall older versions.

It is possible to open shows from an older version in the newer version.

Shows saved in a newer version cannot be opened in an older version.



### Information:

You should have administration rights to install the program.

Installation on your PC:

If you downloaded only the MA 3D, start the installation file MA3D\_vx.x.x.x.exe with a double click.

If you downloaded the MA software release package, extract the file into a temporary folder and start the installation file MA3D\_vx.x.x.x.exe with a double click.

On the screen appears the installation program. You get detailed hints and information regarding the installation.

Watch out for the suggested directory and change it if you want to. The installation directory is not changeable in the program.

## 4.3. Uninstall MA 3D

The following topic describes how to uninstall MA 3D.

With the uninstall.exe you remove the MA 3D from your computer.

All created directories and program data in the start menu will be removed.

All files stored by you and which are not part of the installation file, especially the **show files**, will be kept in the folder **program data**. This folder is hidden by default from Windows®.

1. Click the **Start** button, click **All Programs**, click **MA Lighting**, click **MA 3D v.x.x.x.x**, and click **Uninstall MA 3D v.x.x.x.x**.  
If you are prompted for an administrator password or confirmation, type the password or provide confirmation.  
A pop-up asks, if you really want to uninstall MA 3D.
2. Click **Yes**.  
A pop-up confirms that MA 3D v.x.x.x.x is uninstalled.
3. Click **OK**.



## 5. First Steps

This chapter describes how you prepare the MA 3D for the usage.

The installation process creates a desktop link called **MA 3D v.x.x.x.x**

To start the MA 3D, double click on the desktop link.

Additional it creates a folder in the start menu (Start - Programs - MA Lighting).

To start the MA 3D from the start menu, click on MA 3D v.x.x.x.x .

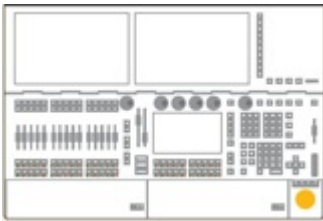
### 5.1. Hardware connection

This topic describes how to connect a computer and a grandMA2 console. If you want to create a session between the MA 3D and the grandMA2 console, you need a hardware connection.

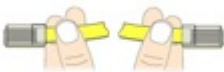
**Requirement:** Network cable or switch.

Connect the console and the computer with a network cable or switch, refer to [Console Backpanel](#).

grandMA2 Console:



Network Cable or Switch:



Computer:



The grandMA2 console and the computer are connected.

## 5.2. Start MA 3D

After installation start the MA 3D.

The installation process creates a desktop link called **MA 3D v.x.x.x.x** .

To start the MA 3D, double click on the desktop link.

Additional it creates a folder in the start menu (Start - Programs - MA Lighting).

To start the MA 3D from the start menu, click on MA 3D v.x.x.x.x .

### Open an existing showfile in MA 3D



**Hint:**

If you are in a session with a grandMA2 console/onPC there is no need to open showfiles via the MA 3D. Open the showfile directly in the [Backup Menu](#) of the grandMA2 console/onPC.

1. Open the Load Show Window "File - Load Show".



**Information:**

Showfiles saved in an older version of MA 3D can always be opened in a newer version.  
Showfiles saved in a newer version of MA 3D cannot be opened in an older version.

2. Select a showfile and click OK.  
You opened an existing showfile.



It is not possible to start a session from MA 3D and transfer the showfile to the desk.  
This is only possible if a session with the desk or onPC is already running.

## 5.3. Create a Session

Creating, joining a MA session, or inviting session members is an exclusive grandMA2 console or grandMA2 onPC feature.

**Requirement:** Hardware connection between a grandMA2 console and a computer, or a grandMA2 onPC and a MA 3D.

Sessions can be created from grandMA2 console/onPC only, refer to [MA Network Configuration - 3D](#).



### Information:

The software version of the MA 3D and the console/onPC needs to be the same.

MA 3D v.**3.0.0.5** fits to grandMA2 console or onPC version **3.0.0**.

Important are the first 3 numbers. If you have different version numbers, there is no connection possible.

Download the latest software version at [www.malighting.com](http://www.malighting.com).



### Information:

The IP addresses of the MA 3D and of the grandMA2 console/onPC have to fit. The first three sets of numbers have to be the same. The last number is different.

The default IP address of the MA 3D is 127.0.0.1. The default IP address from the MA 3D fits with the default address of the grandMA onPC.

If the IP address of the MA 3D and of the grandMA2 console/onPC is not the same, there is no network connection.

To double check the IP address of the grandMA2 console/onPC, refer to [Setting the IP address in the console](#).

## 6. Data Management

This section describes how data is managed by the grandMA2 console and the MA 3D visualizer. Both can work independently. If they are connected in a MA network session the grandMA2 console will be the master and send the current showfile to the connected MA 3D. Data changed within MA 3D is transferred to the grandMA2 console and vice versa. MA 3D and the grandMA2 console use the same show files (.show.gz).

### 6.1. Master/Slave

Creating an MA session, or inviting session members is an exclusive grandMA2 console or onPC feature. If the grandMA2 console is connected and a session is started within the console, the show file will be transferred to the 3D. So the synchronization of the grandMA2 console and the MA 3D data is guaranteed. The 2 possible states of the connection are indicated by the heart in the status bar. The blinking of the heart indicates the communication between the grandMA2 console and the MA 3D.



Heart is broken and red: MA 3D has not joined a session. The connection state is 'Standalone'.



Heart is blinking green: MA 3D has joined a session. The connection state is 'Slave'.













#### **Information:**

With the start of a new session (Create) the session founder (grandMA2 console or onPC) overwrites all data of the other members. Inviting can be disabled by changing the state of the button "Invite Enabled" to "Invite Disabled" in the sessions window.

## 6.2. Coordinate system

MA 3D geometric system lets you define and manipulate objects in 3D space. It features a geometric system architecture that defines the X-Y plane as the ground area with the height as Z -axis. All objects can be moved or rotated along the world- or their own object axis (if the object has been rotated) as described in chapter [Stage View](#). You can switch between the world or object axis via a toolbar button or the keyboard as shown in the following list:

Operating Elements	Symbols in 3D View	Description
<b>World axis</b>  or Ctrl + W		Objects can be <b>moved</b>  along the <b>world axis</b> .
		Objects can be <b>rotated</b>  along the <b>world axis</b> .
<b>Object axis</b>  or Ctrl + O		Objects can be <b>moved</b>  along the <b>object axis</b> .
		Objects can be <b>rotated</b>  along the <b>object axis</b> .

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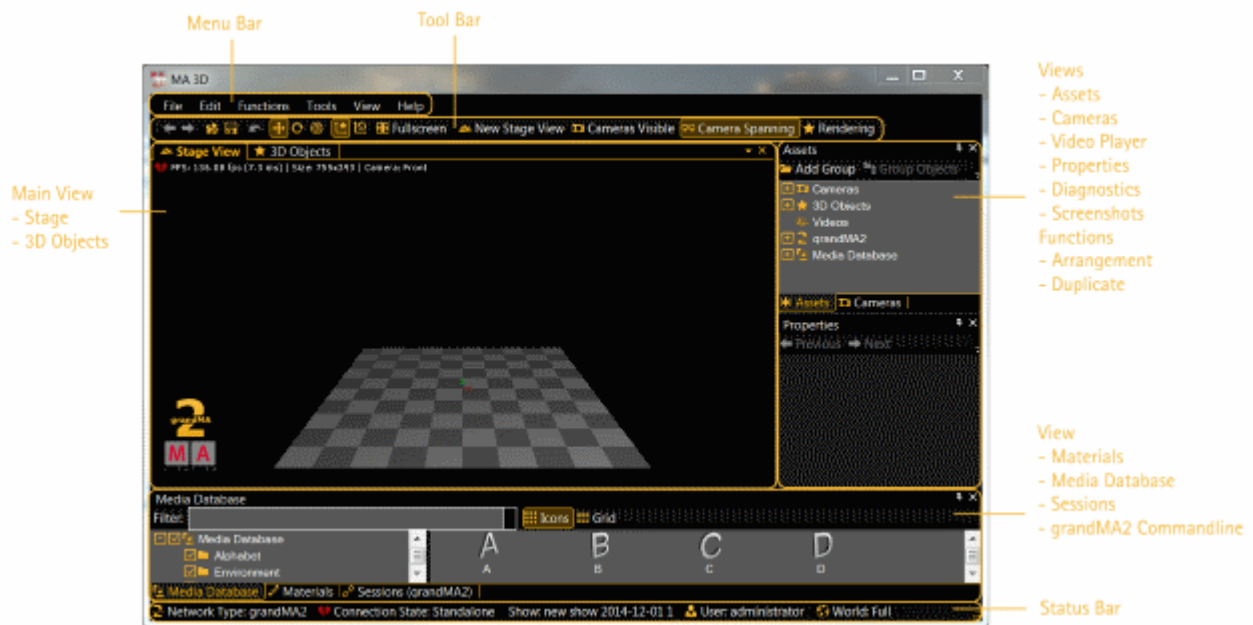
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## 7. Program Surface

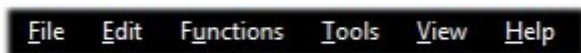
The program surface is structured in five areas.

- **Menu Bar** with different submenus for the most functions of the program.
- **Tool Bar** below the menu bar.
- **View Area** displays additional views.
- **Status Bar** with the status regarding your network.
- **Main View** visualize your show and displays the 3D Objects Window.



MA 3D - Program surface

### 7.1. Menu Bar



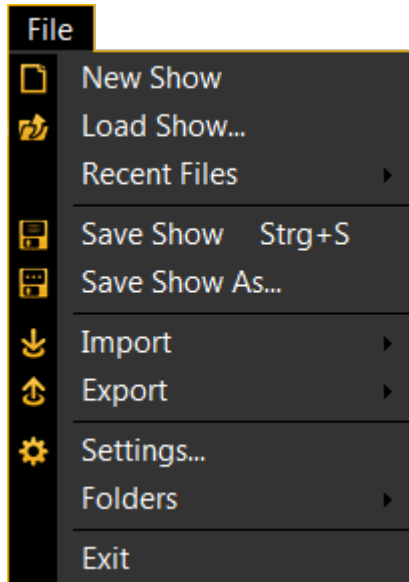
With the menu bar, you get access to the most features of the program.

Many features you can also reach with the toolbar, shortcuts or the context menu.

If you press Alt, some letters in the menu bar will be underlined. If you press Alt + the underlined letter, the menu opens.

## 7.1.1. Menu Bar - File Menu

The file menu in detail.



File menu

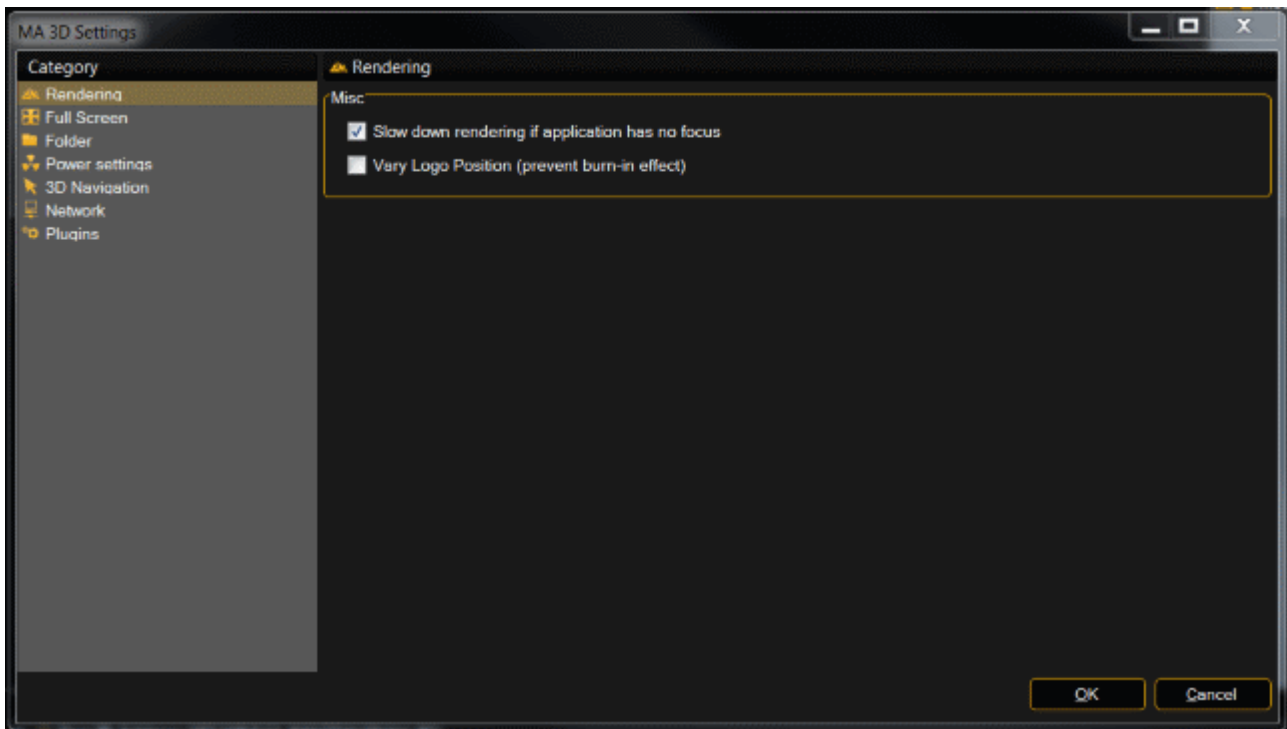
New Show	Creates a new show.
Load Show...	Opens the Load Show window.
Recent Files	Displays the recent opened show files.
Save Show	Saves the current show with the given filename. The show will also be saved on all connected desks or onPCs.
Save Show As...	Opens the windows explorer to save the current show with a new filename. The show will also be saved on all connected desks or onPCs.
Import	The following options are available: - Import Environment. Opens the window explorer to import an environment from a show file. - Import 3D Model. Opens the MA 3D - Import Window. Refer to, 3D Modeling and Import.
Export	Opens the windows explorer to export an environment to a show file.
Settings...	Opens the MA 3D Settings. Refer to: <a href="#">Menu Bar - Settings</a>
Folders	The following options are available: - Open show folder in explorer - Open gobo folder in explorer
Exit	Quits MA 3D.

## 7.1.2. Menu Bar - Settings

In the menu **File** **Settings** you adjust the basic settings for the look and the behavior of the MA 3D.

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MA 3D settings

The settings are independent from the show file and they will stay after leaving the program.



















After the first installation you should deal with the settings, to get an overview about it.

Category	Settings	Program function
<b>Rendering</b>		Slow down rendering if application has no focus
		Vary Logo Position (prevent burn-in effect)
<b>Full Screen</b>	Screen Alignment	Screen layout is part of a bigger screen layout
		Identify screens
<b>Folder</b>		Select Media folder
<b>Power Settings</b>	Windows Mode	Disable Screensaver for windows
		Disable Standby for windows
	Fullscreen Mode	Disable Screensaver only in fullscreen mode
		Disable Standby only in fullscreen mode
	All Modes	Shutdown all machines via "shutdown" command
<b>3D Navigation</b>	Mouse	Select Reverse Orbit
		Select Reverse Zoom
		Choose Mouse Speed
	3D Input Devices	Choose Move Speed
		Choose Rotate Speed
<b>Network</b>		Select IP Address for a MA Network
<b>Plugins</b>		Enable Plugins



## 7.1.3. Menu Bar - Edit

The edit menu in detail.

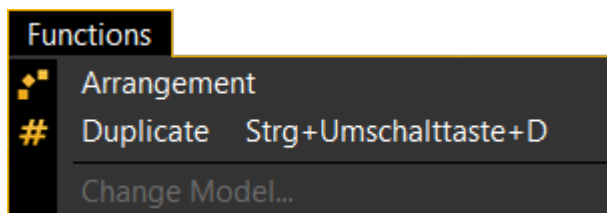
Edit		
	Oops: 3D-Object Translation	Strg+Z
	Cut	Strg+X
	Copy	Strg+C
	Paste	Strg+V
	Delete "A 1"	Strg+Entf
	Reset Selected Objects	Strg+Umschalttaste+Z
	Select All	Strg+A
	Select Parent	Strg+Subtract
	Select Children	Strg+Add
	Select Next Object	Strg+N
	Select Previous Object	Strg+B
	Simple Duplicate	Strg+D
	Add Group Object	Strg+Umschalttaste+G
	Group Selected Objects	Strg+G
	Rename	F2
	Move	Strg+M
	Rotate	Strg+R
	Follow	Strg+F
	Object-Axis	Strg+O
	World-Axis	Strg+W
	Previous Selection	Alt+Left
	Next Selection	Alt+Right

Oops: last action	Undo the last actions.
Cut	Cuts text in the Properties View.
Copy	Copies the selected 3D object in the clipboard. Only 3D Objects view.
Paste	Pastes a 3D object from the clipboard. Only 3D Objects view.
Delete: selected elements	Deletes the selected 3D object.
Reset selected Objects	Sets the selected elements to the origin, 0,0,0.
Select All	Selects all objects.
Select Parent	Selects the parent object of a selected object.

Select Children	Selects the children object of a selected object.
Select Next Object	Selects the next object.
Select Previous Object	Selects the previous object.
Simple Duplicate	Creates a simple duplicate of the selected object. Only for 3D objects without output.
Add Group Object	Creates a group folder.
Group Selected Objects	Creates a group folder for selected objects.
Rename	Rename a 3D object or a camera in the Assets window.
Move	Turns on the move function.
Rotate	Turns on the rotation function.
Follow	Turns on the follow function.
Object Axis	Move or rotate along the axis of the object.
World Axis	Move or rotate along the world axis.
Previous	Selects the previous selected object.
Next	Selects the next object, if previous was clicked before.

## 7.1.4. Menu Bar - Functions

The functions menu in detail.

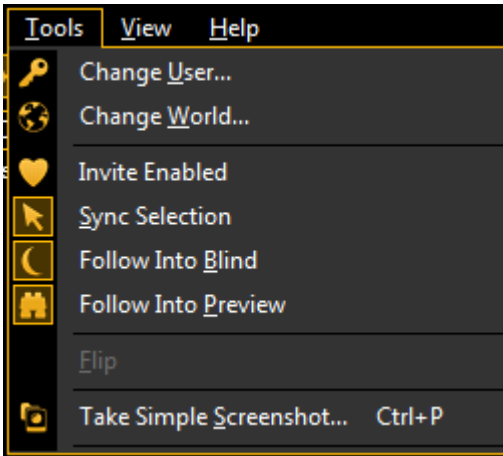


Functions menu

Arrangement	Opens the Arrangement window. Refer to: <a href="#">Arrangement of Objects</a> .
Duplicate	Opens the Duplicate window. Refer to: <a href="#">Duplicate 3D Objects</a> .
Change Model...	Opens the Media Database. Refer to: <a href="#">Media Database</a> .

## 7.1.5. Menu Bar - Tools

The tools menu in detail.

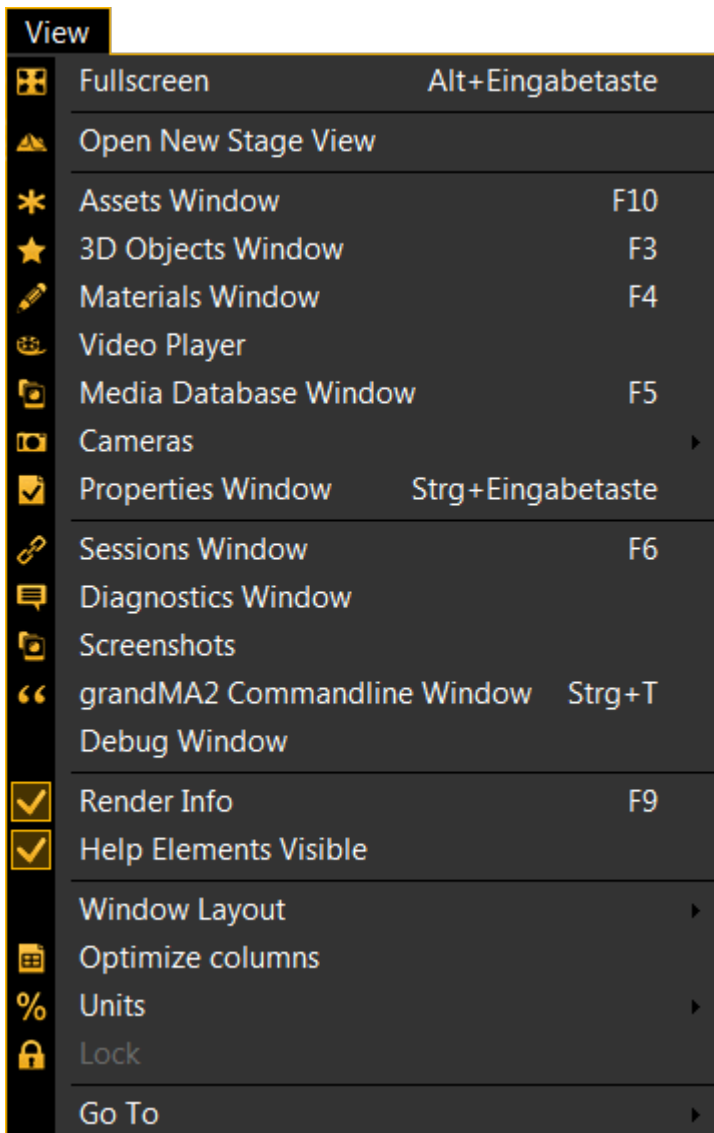


Tools menu

Change User...	Opens the login pop-up.
Change World...	Opens the select world pop-up.
Invite Enabled	Toggle between enabled and disabled. If invite is disabled, the MA 3D could not be invited from another grandMA2 console / onPC.
Sync Selection	Synchronize the selected fixtures in MA 3D with the same user profile in grandMA2 console / onPC. You have always the same fixtures selected.
Follow Into Blind	MA 3D follows the grandMA2 console / onPC into the edit blind function from the same user profile.
Follow Into Preview	MA 3D follows the grandMA2 console / onPC into preview function from the same user profile.
Flip	Flip will pan your fixtures 180 degrees and invert the tilt-angle. Effectively your fixtures are pointing in the same direction, but via another pan / tilt combination.
Take Simple Screenshot...	Takes a simple screenshot and opens the windows explorer to save it.

## 7.1.6. Menu Bar - View

The view menu in detail.



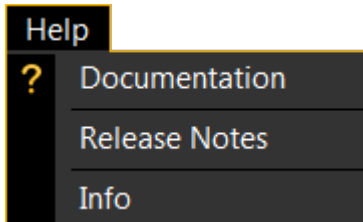
View menu

Fullscreen	Opens the stage view in full screen.
Open New Stage View	Opens a new Stage view. Refer to: <a href="#">Stage View</a> .
Assets Window	Opens the Assets window. Refer to: <a href="#">Assets Window</a> .
3D Objects Window	Opens the 3D Objects view. Refer to: <a href="#">3D Objects View</a> .
Materials Window	Opens the Materials window. Refer to: <a href="#">Materials Window</a> .
Video Player	Opens the Video Player view. The video player is used for video textures and CIP video streams.
Media Database Window	Opens the Media Database window. Refer to: <a href="#">Media Database Window</a> .
Cameras	The following options are available. The cameras / views are added in the stage view and the view is switched to the new camera / view position.

	- Add Front Camera
	- Add Front / Left Camera
	- Add Left Camera
	- Add Back / Left Camera
	- Add Back Camera
	- Add Back / Right Camera
	- Add Right Camera
	- Add Front / Right Camera
	- Add Top Camera
	- Add Front View (2D)
	- Add Side View (2D)
	- Add Top View (2D)
	- Add at Current Position. Adds a further camera at the current position. Double check in the Assets Window.
	- Use Selected. Uses the selected camera from the Assets Window / from the camera pool in the console / onPC.
	- Cameras Visible. Displays the cameras in the stage view as direction arrows.
	- Camera Spanning. Spans the cameras in stage view. This makes sense if you use more than one screen in the fullscreen mode.
	- Cameras Window. Opens the Cameras Window.
Properties Window	Opens the Properties windows. Refer to: <a href="#">Properties Window</a> .
Sessions Window	Opens the Sessions window. Refer to: <a href="#">Session Window</a> or to: <a href="#">Create a Session</a> .
Diagnostics Window	Opens the Diagnostics window.
Screenshots	Opens the Screenshots window.
grandMA2 Commandline Window	Opens the grandMA2 Commandline Window.
Debug Window	Opens the GMA2 Debug 3D Window (grandMA2 system monitor).
Render Info	Turns the render information at the upper left corner of the stage view on or off.
Help Elements Visible	Turns the X,Y,Z axis in the stage view on or off.
Window Layout	The following options are available: Refer to: <a href="#">Window Layout Arrangement</a> .
	- Load Window Layout. Opens the windows explorer to load a saved window layout.
	- Save Window Layout. Opens the windows explorer to save the current window layout.
	- Reset Window Layout. Resets the window layout to default.
Optimize Columns	Sets the columns in the 3D Objects grid to optimal size.
Units	The following options are available: This affects the Properties Window.
	- Size as Dimension. Sizes are displayed in physical units, e.g. meter and inch.
	- Size as Scaling Factor. Sizes are scaled in % of the original size.
Lock	Locks the Properties Window.
Go To	The following options are available:
	- Previous Selection. Selects the previous selection.
	- Next Selection. Selects the next selection.

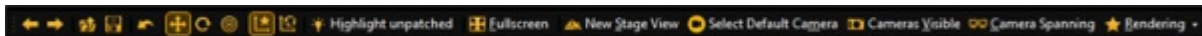
## 7.1.7. Help

The help menu in detail.











Documentation	Opens the pdf help file. A pdf reader is required.
Release Notes	Opens the release notes window.
Info	Opens the information window.

## 7.2. Tool Bar



The tool bar is located below the menu bar.

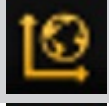
Icon	Name	Function	Shortcut
	Previous Selection	Selects previous selection. (Focus must be in the assert window)	Alt + Left
	Next Selection	Selects next selection. (Focus must be in the assert window)	Alt + Right
	Load Show	Opens the load show window.	None
	Save Show	Saves the show with the given filename.	Ctrl + S
	Oops	Undo the previous action.	Ctrl + Z
	Move	Turns on the move function.	Ctrl + M
	Rotate	Turns on the rotate function.	Ctrl + R
	Follow	Turns on the follow function.	Ctrl + F



Object-Axis

Turns on the object axis function.

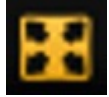
Ctrl + O



World-Axis

Turns on the world axis function.

Ctrl + W



Fullscreen

Opens the stage view on full screen.

Alt +  
Enter



New Stage View

Opens a new stage view.

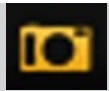
None



Select default  
Camera

Selects the defined default camera

Ctrl + M



Cameras Visible

Displays the camera in the stage view as direction arrows.

F7

Spans the cameras in several stage views, in the full screen mode.



Camera Spanning

Example with two monitors:



F8



Rendering

Opens the Rendering drop down.

None

## 7.3. Main Windows

Main windows are represented as tabbed windows:



Stage View

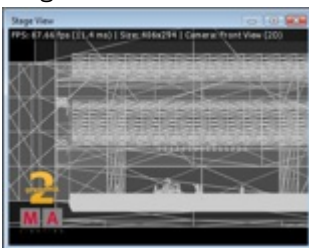
### 7.3.1. Stage View

The Stage View Window offers a photorealistic view from any camera perspective or a 2D draft view:

Stage View 3D:



Stage View 2D:



PPS: 75.63 fps (13.2 ms) | Size: 442x211 | Camera: Front

If the menu entry 'View - Render Info' is selected information about the frame rate (in **F**rames **P**er **S**econd), the window size (in pixels) and the selected camera are shown.

### 7.3.2. Mouse + Keyboard Actions



Generally:



+ **left mouse** button actions for **objects**,



**right mouse** button actions for **camera**



**Left Mouse Button: Moving and Rotating of Objects**

**World  
axis**

Ctrl +  
W



**Object  
Axis**

Ctrl +  
O



Objects can be moved or rotated along the world-or their own axis. Hold the **left mouse button** down to **change between Move and Rotate** and vice versa.

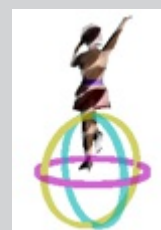
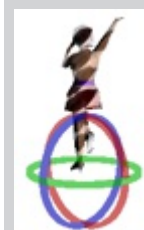
- Select the object

- Move or rotate it along the selected axis



**Left**

mouse button down to **move** object along world or object axis



**Left**

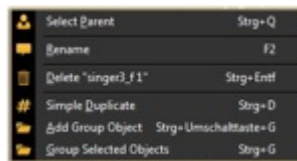
mouse button down to **rotate** object around world or object axis



**Right Mouse Button:  
Context Menu +  
Camera Actions**

# MA 3D User Manual

Version 3.3



Short **right** mouse **click** Menu for selecting, renaming deleting duplicating or grouping selected object



**Right** mouse button **down** Select action with scroll wheel or 'Shift + Ctrl'



**Middle Mouse Button: Select Camera or Zoom**



Mouse **wheel click** after that **Set camera** for this view via the mouse **wheel turn** or keyboard **space** or **1..9..0** button

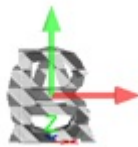
Mouse **wheel turn** **Zoom** in or out

## 7.3.3. Arrangement of Objects (Align Objects)

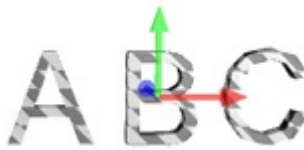
MA 3D allows automatic arrangement of 3D objects. Therefore select the objects to arrange via 'Ctrl + mouse click' or multiple selections in the assets tree. Via the menu entry 'Functions - Arrangement' the Arrangement Window opens:



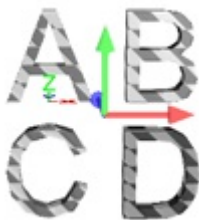
Objects can be arranged in several ways like:- Moved along the X,Y,Z axis- Moved along a circle line in X,Y,Z space- Arrange in a 2D matrix Corresponding to the grandMA2 console alignment function objects can be arranged in relation to the origin object like:- <, >, >>, and << If the 'Relative' flag is set every push of the 'Apply' button increments the arrangement by the given value. Note: The origin is 0,0,0 if the 'Relative' flag is off. Otherwise it is the own position.



Example: Several objects inserted into the Stage View at the origin (0,0,0).



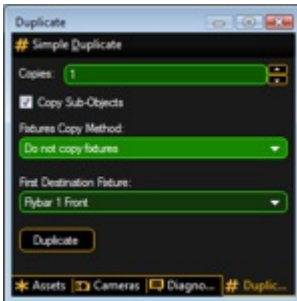
Objects aligned via 'Move' and 'Align <' function along the X-axis.



Objects aligned as a matrix via 'Matrix (2D)' function.

## 7.3.4. Duplicate (copy 3D Objects)

You can duplicate objects via a mechanism in a comfortably way. Therefore do a multi selection in any view via left mouse button + 'Ctrl or Shift' and select the menu entry 'Functions - Duplicate'. The Duplicate window appears:



You can set the number of desired copies. If the objects contain sub-objects select if these are copied too.

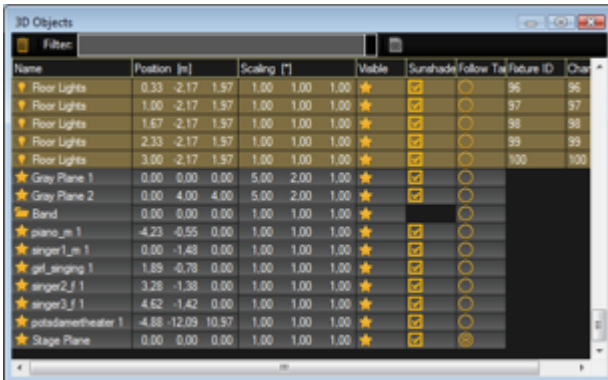


### Information:

It is not possible to create new fixtures within MA 3D!

If fixtures are selected to duplicate it is possible to select 'Use other Fixtures'. Select the 'First Destination Fixture' inside the list box. After pressing the 'Duplicate' button the 'First Destination Fixture' will be moved to the X,Y,Z position of the source fixture and so on. This mechanism is useful to create symmetrical stage sets. For example you have to setup the number of all used fixtures inside the set. Do the setup for the left side of trusses and lanterns. After that you can duplicate the left side and mirror it to the right side.

## 7.3.5. 3D Objects



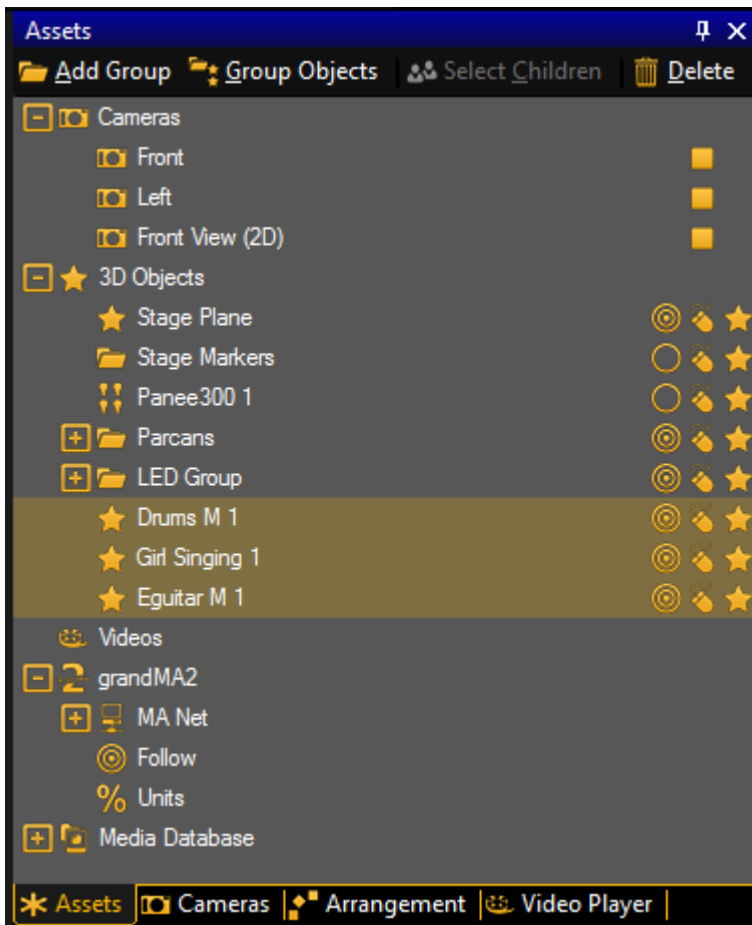
This view offers information about all used objects in a grid view. All used 3D objects and fixtures are listed in this grid. Single or multiple objects can be selected for manipulation or duplicating. The objects can be sorted by a left mouse click into the headline of a column.

The symbols inside the grid have the following meanings:

Name	Meaning
★	3D object
💡	Fixture object
📁	Grouping object

Property	Meaning
★ ☆	Object is visible or hidden in Stage View
☑ ☐	Sunshade is on or off
🎯 ○	Followspot is active or inactive on object surface

## 7.4. Assets (Information Window)



The default window layout gives you the assets window and the properties window at the right screen border.

It is useful to have them both visible together.

If you click on an element in the assets window, the properties window gives you the properties to the selected element.

The assets window is a tree structure view including





- Cameras
- 3D Objects
- Videos
- grandMA2
- Media Database

In the assets window you can

















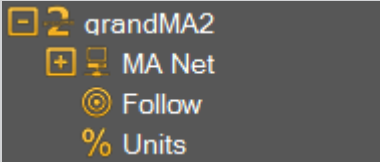








- select objects
- add groups
- group objects
- select children
- delete objects

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Titlebar Icon	Description
 <b>Add Group</b>	Adds a new group folder in the tree structure of the 3D Objects.
 <b>Group Objects</b>	Creates a new group of the selected 3D Objects.
 <b>Select Children</b>	Selects the children of a group.
 <b>Delete</b>	Deletes selected objects in the tree

The icons next to the cameras or the 3D objects displays the status. Click on the icon to change the status.

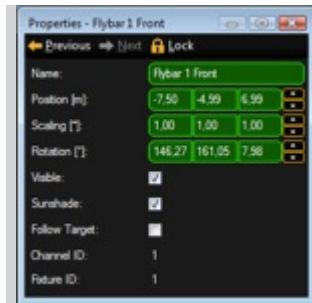
<table><tr><th>Camera Icon</th><th>Description</th></tr><tr><td></td><td>You can step via keyboard (space button) to the next camera. Not selected cameras are ignored.</td></tr></table>	Camera Icon	Description	 	You can step via keyboard (space button) to the next camera. Not selected cameras are ignored.	<table><tr><th>3D Object Icon</th><th>Description</th></tr><tr><td></td><td>Follow function of the 3D object surface is on / off.</td></tr><tr><td></td><td>3D object is selectable or not in the stage view.</td></tr><tr><td></td><td>3D object is visible / invisible in the stage view.</td></tr></table>	3D Object Icon	Description	 	Follow function of the 3D object surface is on / off.	 	3D object is selectable or not in the stage view.	 	3D object is visible / invisible in the stage view.	<div><p>Console properties like MA Net settings, Follow spot from console, Units (change units from meter to inch etc.)</p></div>
Camera Icon	Description													
 	You can step via keyboard (space button) to the next camera. Not selected cameras are ignored.													
3D Object Icon	Description													
 	Follow function of the 3D object surface is on / off.													
 	3D object is selectable or not in the stage view.													
 	3D object is visible / invisible in the stage view.													



## Hint:

If you want to change the unit e.g. from meters to feet open the grandMA2 tree in the assets window, select 'Units' and switch the unit to 'feet'.

## 7.5. Properties



The Property window informs about the properties of the actual selected object like fixtures or 3D objects. If several objects are selected e.g. via 'Ctrl + mouse' only the fields with equal information are filled, other fields are cross striped. You can change the settings of one or all selected objects here.



Numerical values can be in- or decremented via the mouse wheel (+Ctrl or +Shift) if the field is selected. Units can be changed in the Assets tree at 'Ma Net' see above. Also the sizes can be changed absolute or as scaling factor. This can be done via the menu entry 'View - Units'



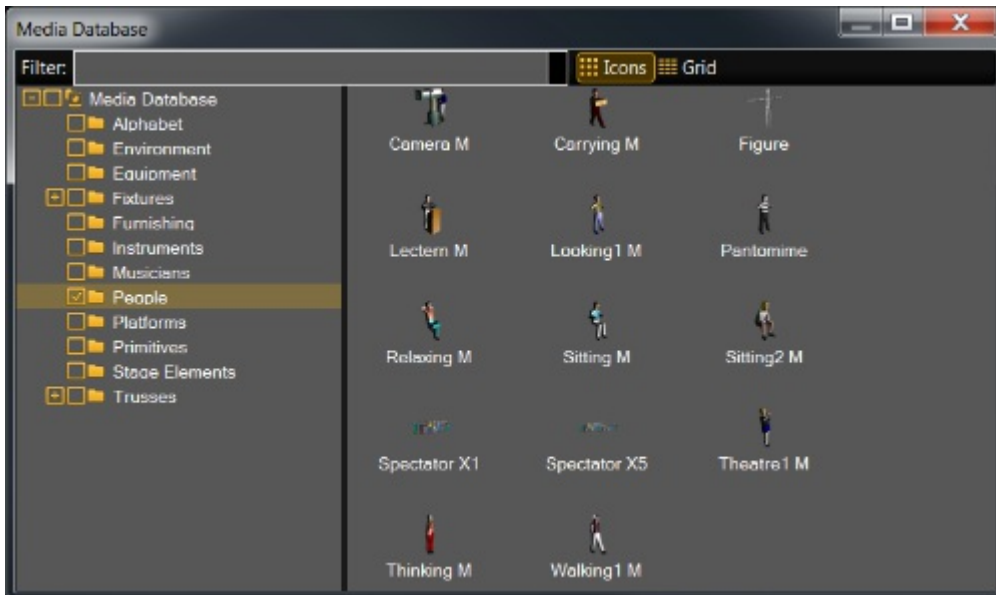
### Hint:

If you want to change the unit e.g. from meters to feet open the grandMA2 tree in the assets window, select 'Units' and switch the unit to 'feet'



## 7.6. Media Database

To open the media database, click on **View** in the menu bar and then **Media Database**. Import 3D objects from the media database into the stage view.



The media database provides 3D objects for the stage. There are 12 different folders available.

On the top is a **filter** field. Type the search word in the filter to search a specific object in the media database.

There are two views available. The icon view and the grid view.

The **icon** view displays an icon of the 3D object along with the name.

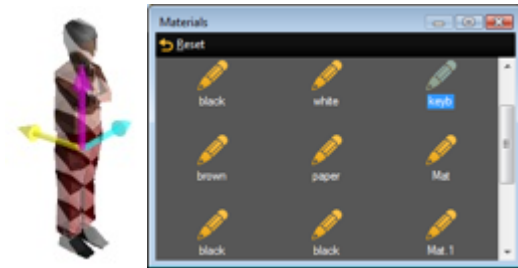
To import a 3D object from icons view into the stage view, select the object and move it via drag and drop into the stage view or double click on the icon.

The **grid** view displays additional in columns the

- category
- device class
- author of the 3D object
- model key
- size of the object in metric (length, width, height)
- vertices
- size of the 3D object in bytes

To import a 3D object from the grid view into the stage view, double click on the object row.

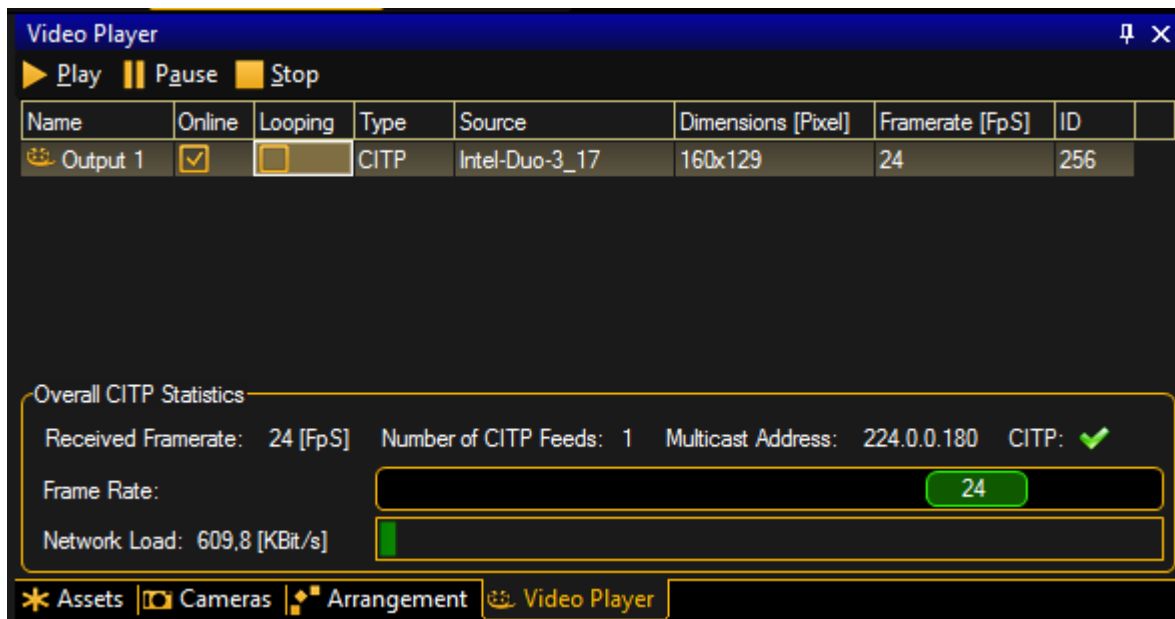
## 7.7. Materials



If an object is selected the Materials window shows all used materials (texture images) of the object. Select the material in the Material window and you can change its properties (diffuse color, emissive color, specular power, texture) in the property window. The results can be viewed directly in the Stage View window.

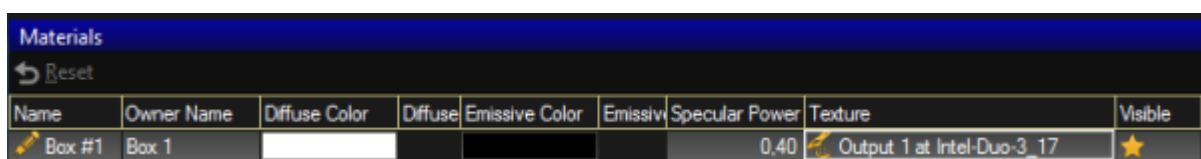
## 7.8. Video Player

You can cover surfaces of 3D Objects not only with textures but also with videos. These video files can be controlled by the Video Player



The local video can be looped or run once. The video file is handled by the Material Data base. If the video type is CITP the Frame Rate can be selected via the shown slider. If you want to load a new video file open the Materials window and select the texture field...

Here you can browse to the video file location.

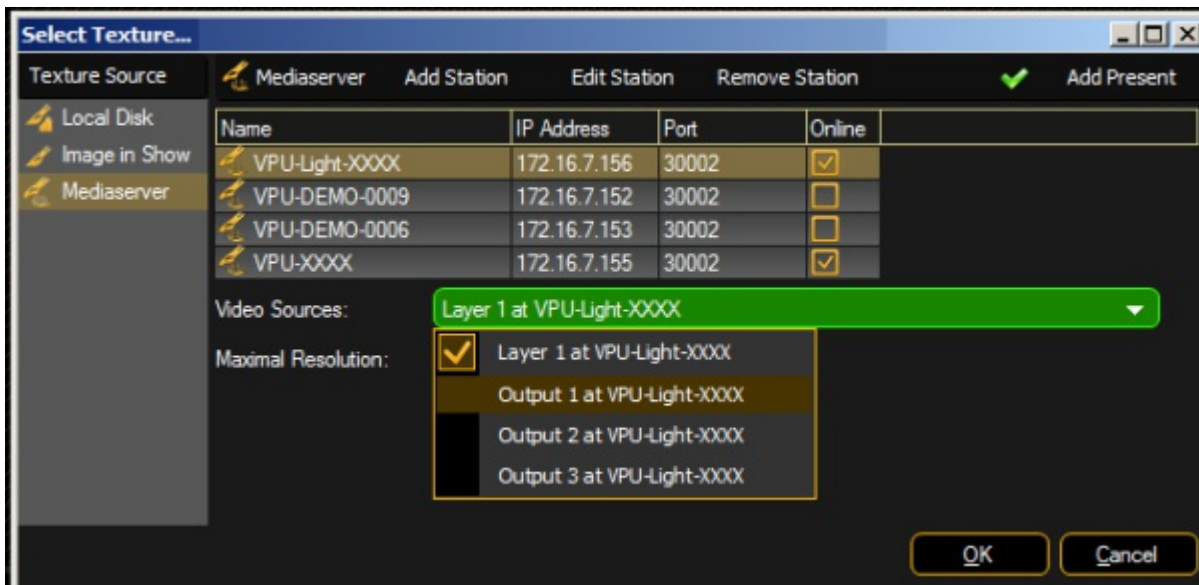




## Information:

The following file formats for videos located local disc are supported: Video(\*.drc, \*.mkv, \*.ogg, \*.ogv, \*.webm, \*.wmv)

If CITP is enabled in the Network Configuration of the grandMA2 or onPC you can select the video source in the CITP stream. Select the Mediaserver and the source:



## 7.9. Moving Paths

Moving Paths allow the movement of objects like trusses with their attached sub objects like fixtures, trusses etc..



Moving Paths are managed like fixture types in the desk. To setup a Moving Path, create a new fixture in the desk from the library. Choose the Manufacturer 'MA Lighting' and the type 'Moving Path...'. There are several types of Moving Paths. The type (Rotate, Scale...) specifies the parameters controlled by the desk:



The object rotates once around the axes of the Moving Path.



The object is scaled in X,Y and Z dimensions.



The object rotates continuously around the axes of the Moving Path. The rotation speed can be set in rotations per minute at the desk.

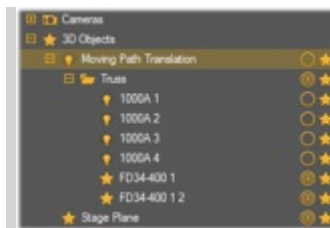


The object can be moved in X, Y and Z direction.



Combined Moving Path of Translation, Rotation and Scale. This type is more easy to use instead of concatenating the single types.

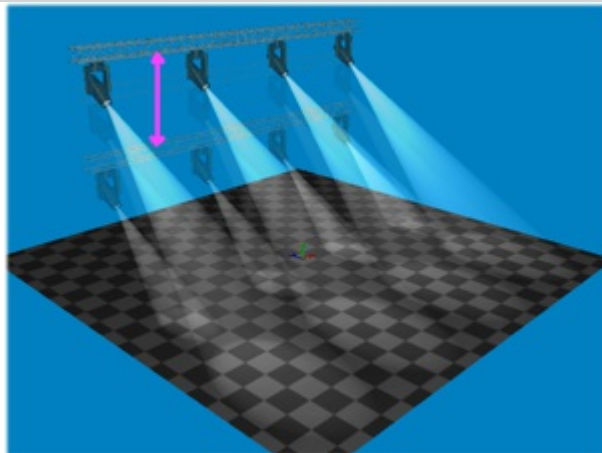
Controlling of the position is always done **relative** to the origin coordinates. I.e. if an object with moving paths is moved manually, the tracks of the Moving Paths are always moved parallel to the new object coordinates.



You can attach an object to a Moving Path via dragging the object in the tree.

Drop it onto the desired Moving Path.





The pictured example shows a truss with 4 moving head fixtures (1000A 1...4) mounted on a truss (FS34-400 1...2).



The example shows a 'Translation' Moving Path controlled in Z-direction.

The truss moves up and down controlled by the desk.

## 7.10. Sessions

Sessions (grandMA2)				
 Invite Enabled  User: guest  Own IP-Address: 192.168.1.26 (OTTOS-CORE-I7)				
Name	Session ID	State in Session	Streaming Version	
 new show 2014-02-24	1	Slave	3.0.187	








The Session window gives an overview about all running sessions in MA net. Name, ID and the state of the sessions are displayed. The streaming version is important for the compatibility.

Sessions can be created from grandMA2 console/onPC only, refer to [MA Network Configuration - 3D](#).

To suppress the automatic inviting to a session press the 'Invite Enabled' button. Then the inviting will be disabled.

## 7.11. Status Bar

The status bar is at the bottom border of the program window.

 Network Type: grandMA2
  Connection State: Slave (demo dimmer and more)
  Show: demo dimmer and more
  User: guest
  World: Full
  CITP State: Disabled
  1 Item Selected

The status bar includes the following elements:

- **Network Type:** Displays the network type.
- **Connection State:** The connection state displays, which connection the MA 3D has, along with the name of the session. To open the [Sessions Window](#), click on the connection state.



MA 3D has no connection to a session.



MA 3D has joined a session as a slave.

- **Show:** Displays the name of the show file.
- **User:** Displays which user is logged in. Click on user, to change the user. The login pop-up opens.
- **World:** Displays the world. Click on the world, to open the select world window.
- **CITP State:** Displays the CITP state. Enable or disable the CITP from in the [CITP Network Configuration](#) of the grandMA2 or onPC.



CITP is disabled.



CITP is enabled.

- **Item Selected:** Displays how many items are currently selected.

## 7.12. Windows Layout

For a better overview, you can arrange your window layout.



If you have a small screen, it could be better to fade out additional views.

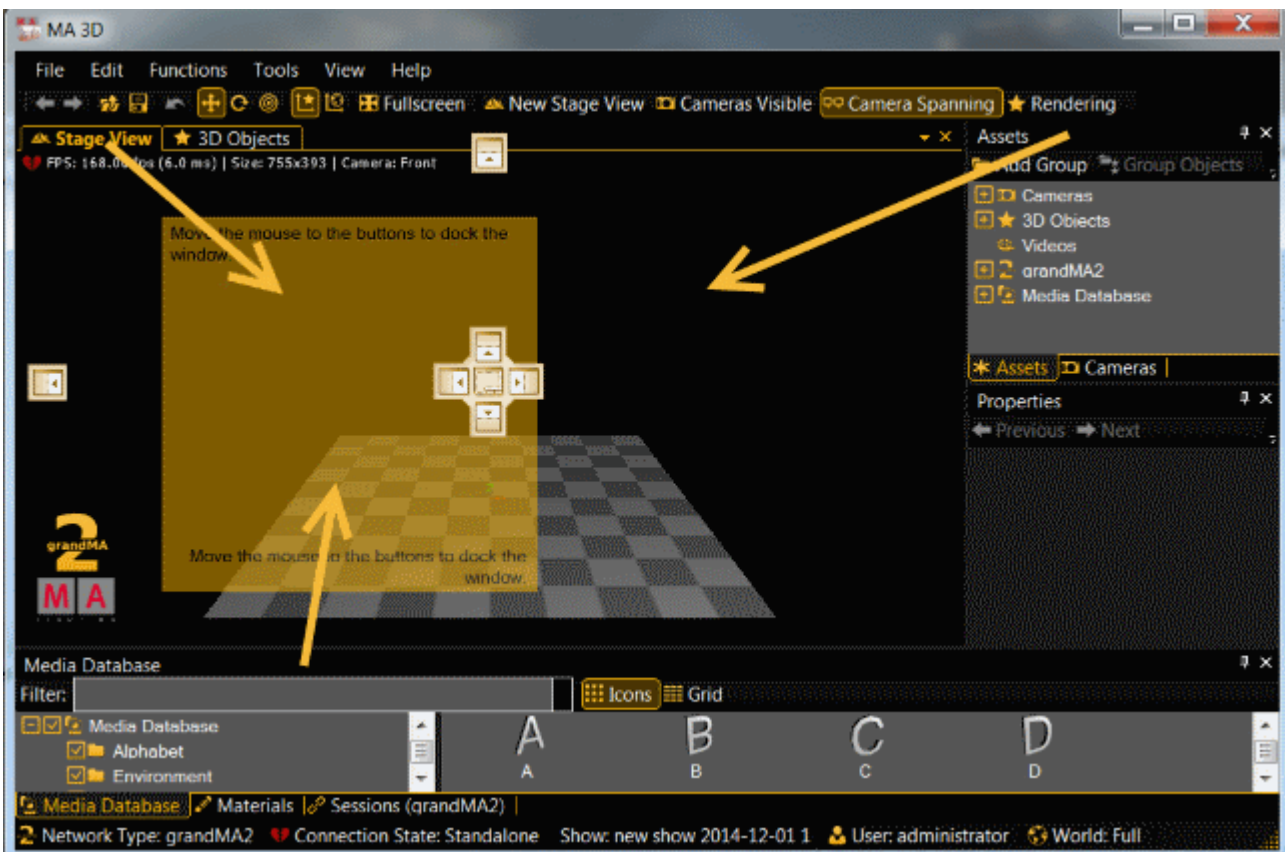
To fade out views, click on the little x. If you want to have the view later, got it in the menu bar.



Another option is to pin views on the screen border. Pined views creates view tabs on the right or bottom screen border. If you move the mouse over the tabs, the view appears.



To pin views, click on the pin needle. To deactivate the pin function, click on the pin needle again.



Another option is to move views on a different area. You can move and dock views on the left-, right-, upper-, and lower screen border.

To move a view, click and hold the title bar of a view, move it to an arrow and release the mouse button.

Another option is to undock views and open them in an own window.

To undock views, click and hold the title bar of a view, and move them out of the main screen. The view opens in an own window.

## ● **Save/Load/Reset/Delete Window Layout**

You can save the arranged window layout and load it.

Window Layouts will be saved in "C:\Users\xxx\AppData\Roaming\MA Lighting Technologies\ma3d\3.0.0\WindowLayouts".

You will find all actions and commands regarding the window layout in the menu bar "View - Window Layout".

## ● **Save Window Layout**

Save a window layout via "View - Window Layout - Save Window Layout".

## ● **Load Window Layout**

To load a previous saved window layout, open "View - Window Layout - Load Window Layout".

Choose the window layout. If there is no window layout available, you did not saved one.

If you cannot **find** your window layout, use the search function from the windows explorer and search for the end of the file name ".gma3dwindow".

## ● **Reset Window Layout**

Reset the window layout via "View - Window Layout - Reset Window Layout".

You get the default window layout back.

## ● Delete Window Layout

To delete a window layout there is **no** function in the **menu bar**. Use the windows explorer or go to "View - Window Layout - Load Window Layout", click on the window layout, right mouse button and delete.



## 8. Fixture Types

The following table gives an overview about the visualization effects in MA 3D.



### Information:

Unlike other effects all of these axes must be included in the basing 3d-model. This is a prerequisite for fixtures and moving paths. If the model has no axis nothing will move.

Effect in MA 3D	Description	Preset Type	Feature	Attribute	Subattribute	Unit of Measure
<b>Axis (axis of fixtures or moving paths)</b>						
Pan	Pan-axis of fixtures	POSITION	POSITION	PAN	PAN	Angle degree
Tilt	Tilt-axis of fixtures	POSITION	POSITION	TILT	TILT	Angle degree
Roll	Roll-axis of fixtures	POSITION	POSITION	ROLL	ROLL	Angle degree
Translation X, Translation Y, Translation Z,	Translation in x-, y- or z-direction, e.g. for moving paths	POSITION	MP_TR (MP Trans)	MP_TR_X (X), MP_TR_Y (Y), MP_TR_Z (Z)	MP_TR_X (X), MP_TR_Y (Y), MP_TR_Z (Z)	Translation range meter
Scaling X, Scaling Y, Scaling Z	Scaling of objects in x-, y- or z-direction, e.g. for moving paths	POSITION	MP_SC (MP Scale)	MP_SC_X (X), MP_SC_Y (Y), MP_SC_Z (Z)	MP_SC_X (X), MP_SC_Y (Y), MP_SC_Z (Z)	Scaling (must)
Rotation X, Rotation Y, Rotation Z	Rotation around x-, y- or z-axis, e.g. for moving paths	POSITION	MP_ROT (MP Rot)	MP_ROT_X (X), MP_ROT_Y (Y), MP_ROT_Z (Z)	MP_ROT_X (X), MP_ROT_Y (Y), MP_ROT_Z (Z)	Angle degree
Spin X, Spin Y, Spin Z	Continuous rotation around x-, y- or z-axis	POSITION	MP_SPIN (MP Spin)	MP_SPIN_X (X), MP_SPIN_Y (Y), MP_SPIN_Z (Z)	MP_SPIN_X (X), MP_SPIN_Y (Y), MP_SPIN_Z (Z)	Rotation speed rotational minute
Clamp	Pitch of the clamp	POSITION	MP_ROT (MP Rot)	CLAMP	CLAMP	Angle degree

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Barndoor 1, Barndoor 2, Barndoor 3, Barndoor 4	Pitch of barndoors in front of the lens	SHAPERS	BARNDOORS	BARNDOORS 1 (Bd1), BARNDOORS 2 (Bd2), BARNDOORS 3 (Bd3), BARNDOORS 4 (Bd4)	BARNDOORS 1 (Bd1), BARNDOORS 2 (Bd2), BARNDOORS 3 (Bd3), BARNDOORS 4 (Bd4)	Angle in deg = barr in sam positio model close barndo
Effect in MA 3D	Description	Preset Type	Feature	Attribute	Subattribute	Unit o Measu
<b>Light Output</b>						
Shutter		BEAM	SHUTTER	SHUTTER	SHUTTER	0 = sh closed shutte
Strobe/Strobe Frequency	Strobe effects with random and soft opening/closing option	BEAM	SHUTTER	SHUTTER	STROBE, STROBE_PULSE (Pulse), STROBE_PULSE_CLOSE (Pulse Close), STROBE_PULSE_OPEN (Pulse open), STROBE_RANDOM (Rnd), STROBE_RANDOM_PULSE (Rnd Pulse), STROBE_RANDOM_PULSE_CLOSE (Rnd Pulse Close), STROBE_RANDOM_PULSE_OPEN (Rnd Pulse Open)	Strobe freque Hz (big than C
Strobe Ratio		BEAM	SHUTTER	STROBE_RATIO	STROBE_RATIO (Duty Cycle)	Slice c means the sh open l strobe interv
Dimmer	Intensity of light source	DIMMER	DIMMER	DIM	DIM, DIM 2, DIM 3	Factor fixture intens off 1.0 maxim
Effect in MA 3D	Description	Preset Type	Feature	Attribute	Subattribute	Unit o Measu
<b>Light Effects</b>						
Color	Color of beam or led surfaces	COLOR	COLOR 1, COLOR 2, COLOR 3, COLOR 4	COLOR 1, COLOR 2, COLOR 3, COLOR 4	COLOR 1 (Select), COLOR 2 (Select 2), COLOR 3 (Select 3), COLOR 4 (Select 4)	Color
Scroller	Color of a beam	COLOR	COLORALL (Color)	SCROLLER	SCROLLERSELECT (Scroller)	Color

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Zoom		FOCUS	FOCUS	ZOOM	ZOOM	Angle degree
Iris		BEAM	BEAM1	IRIS	IRIS	Factor iris closed iris open
Prism		BEAM	BEAM1	PRISMA1 (Prism1)	PRISMA1 (Prism1)	Prism degree (angle between center beam prism with p Additio physic amount beams
Prism Position	Rotation of the prism	BEAM	BEAM1	PRISMA1_POS (Pos1)	PRISMA1_POS (Pos)	Angle degree
Prism Rotation	Continuous rotation of the prism	BEAM	BEAM1	PRISMA1_POS (Pos1)	PRISMA1_ROT (Rot)	Rotatio speed
Frost		BEAM	BEAM1	FROST	FROST	0.0 = 1.0 = maxim
<b>Effect in MA 3D</b>	<b>Description</b>	<b>Preset Type</b>	<b>Feature</b>	<b>Attribute</b>	<b>Subattribute</b>	<b>Unit o Measu</b>
<b>Gobo (3 wheels maximum)</b>						
Gobo X (Wheel Position)	Selects gobo from values inside functional block	GOBO	GOBO 1, GOBO 2, GOBO 3	GOBO1 (G1), GOBO2 (G2), GOBO3 (G3)	GOBO 1 (Select), GOBO 2 (Select2), GOBO 3 (Select3), GOBO1_SPIN (Spin), GOBO2_SPIN (Spin2), GOBO3_SPIN (Spin)	-
Gobo X - Position	Rotation of current gobo	GOBO	GOBO 1, GOBO 2, GOBO 3	GOBO1_POS (G1 <>), GOBO2_POS (G2 <>), GOBO3_POS (G3 <>)	GOBO1_POS (Index), GOBO2_POS (Index2), GOBO3_POS (Index3)	Angle degree

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Gobo X - Rotation	Continuous rotation of the current gobo	GOBO	GOBO 1, GOBO 2, GOBO 3	GOBO1_POS (G1 <>), GOBO2_POS (G2 <>), GOBO3_POS (G3 <>)	GOBO1_ROT (Rotate), GOBO2_ROT (Rotate2), GOBO3_ROT (Rotate3)	Rotation rpm
Effect in MA 3D	Description	Preset Type	Feature	Attribute	Subattribute	Unit of Measure
<b>Blades (4 blades maximum)</b>						
Blade X - Insertion (A)	Insertion of the blade into the beam. This attribute has to be present to visualize any blade.	SHAPERS	SHAPER (Frames)	BLADE1A (1A), BLADE2A (2A), BLADE3A (3A), BLADE4A (4A)	BLADE1A (1A), BLADE2A (2A), BLADE3A (3A), BLADE4A (4A)	0.0 = insertion = full c
Blade X - Insertion (B)	Second insertion range for every blade for rotation. If this option is used, you must no use the "Blade X - Rotation" - option.	SHAPERS	SHAPER (Frames)	BLADE1B (1B), BLADE2B (2B), BLADE3B (3B), BLADE4B (4B)	BLADE1B (1B), BLADE2B (2B), BLADE3B (3B), BLADE4B (4B)	0.0 = insertion = full c
Blade X - Rotation	Rotation of the blade. If this option is used, you must not use the "Blade X - Insertion (B)" option.	SHAPERS	SHAPER (Frames)	BLADE1ROT (1Rot), BLADE2ROT (2Rot), BLADE3ROT (3Rot), BLADE4ROT (4Rot)	BLADE1ROT (1Rot), BLADE2ROT (2Rot), BLADE3ROT (3Rot), BLADE4ROT (4Rot)	Angle degrees
Rotation of all blades		SHAPERS	SHAPER (Frames)	SHAPER ROT (FrameAssembly)	SHAPER ROT (Index)	Angle degrees

## 9. 3D Modeling and Import

MA 3D is created for the visualization of three-dimensional stage layouts to be utilized together with lighting control desks of MA. It comes with a library of common types of light fixtures e.g., par cans, moving mirror, moving heads and LED fixtures.

With this large number of different fixtures, it is not possible to cover all models. MA 3D offers the opportunity to import 3D models created via a 3D CAD program. Most of the 3D CAD programs offer the export into the .3ds format.

**Hint:**

This tutorial requires the knowledge of handling a 3D construction program.

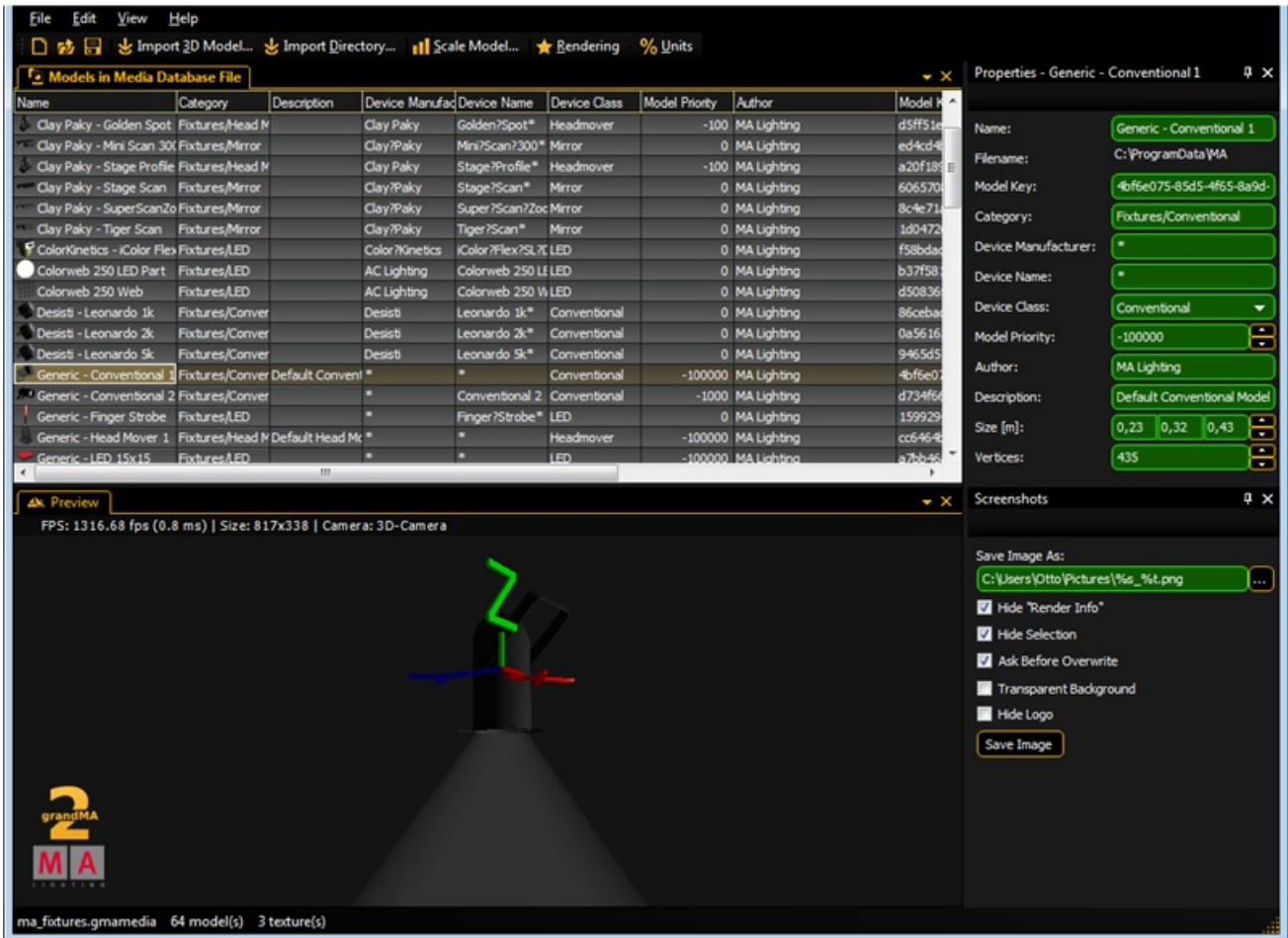
3D models are created with 3D design programs such as 'Cinema 4D', 3Ds Max, etc. After creation, the model is imported in .3ds format via the MA 3D import function. The import tool can be found using the menu entry: 'File – Import – Import 3D Model...'. Single files as well as complete directories can be imported.

It is possible to apply parameters to objects inside a 3D model. These parameters influence the behavior of the object within MA 3D.

The parameters are defined using the name of the object. They are organized in a hierarchic order.

A parameter block begins with '\_X'. The sub-parameter follows without separators, e.g., 'Test\_XAP' identifies the object as an axis of the pan movement.

For more information see [Creation of a 3D Fixture Model](#) and [Parameters](#).



## Import 3D Model dialog

The imported model can be viewed in the 'Model Test Area' window that can be operated similarly to the 3D 'Stage View'.

Properties such as 'Name', 'Category', etc. can also be edited. After the editing, the model can be stored in the media database and is ready to be used in MA 3D.

## 9.1. Workflow

Construct the new 3d model using an external 3D CAD tool such as Cinema 4D, 3Ds Max etc.



### Hint:

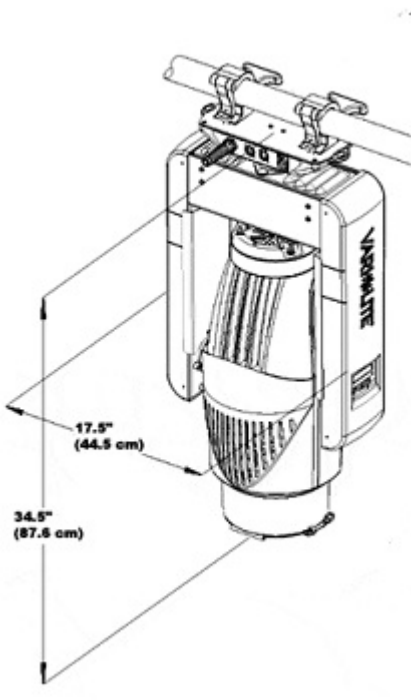
This example uses Cinema 4D, but any tool that can export the 3ds format can be used.

This is a short overview on the process of building 3D models and importing them into MA 3D:

## Technical Drawing

For the construction a drawing with the dimensions of the fixture is needed.

In this example a Vari-Lite VL1000 is used.

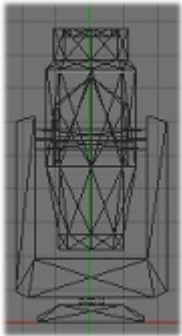


Vari-Lite VL1000

## Creation of the 3D Model

Create a 3D model with a 3D CAD program.

Respect the restrictions of the 3D objects and names.



2D wireframe of the Vari-Lite VL1000 model



Hierarchic structure of the 3D model

Export the CAD File into .3ds format.

# MA 3D User Manual

Version 3.3



## Import into MA 3D

Import the model into MA 3D.

The import tool generates a unique model key to identify it later. It saves all properties of the model into an .xml description file.



The final 3D model in MA 3D

After saving the model in the media database it is ready to be used in MA 3D. If the model is saved in an existing media database file, restart MA 3D. For more information see [Import 3D Model to MA 3D](#).



## 9.2. 3D Models Principles

The import tool does not subsequently edit the 3D model. The imported 3D model must contain all information.

To avoid determination on a specific modeling tool, choose the '3DS' file format. This format can be exported by most applications.

All parameters can be referred to using the names of the simple objects.

### Important Restrictions for 3D Objects:

- Names of objects max. 8 characters (incl. parameters)
- No special characters allowed
- Names must be unique - each object must have a unique name



#### **Important:**

Note that some modeling applications shorten names while exporting to 3DS. The name must stay unique after the export.

- All objects must consist of triangles  
(e.g., Cinema 4D 'Functions - Make Editable' & 'Functions - Triangulate')
- Only one material can be assigned to an object
- Only one texture can be assigned to a material

Follow these limitations even if you could use other file formats in the future. Furthermore, 3D objects should consist of as few triangles as possible. Curves can be pictured realistically using small triangles if the normal simulates this (Cinema 4D: 'Phong Tag').



#### **Important:**

The max. angle for curves is set to 89.5° in Cinema 4D (in 3DS).

## 9.3. Creation of a 3D Model

3D objects can be created with 3D CAD programs. The amount of polygons affects the performance because for each polygon the projection has to be calculated. The lesser the number of polygons, the better the frame rate.

MA 3D supports the following formats for 3D objects:

- .3ds - Format for drawing 3 dimensional objects



#### **Important:**

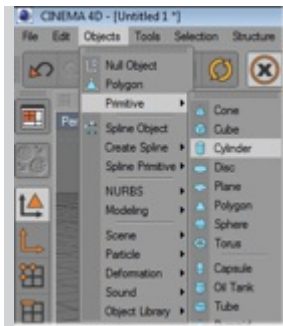
- The orientation of the object has to fit
- Normals have to be organized correctly
- UV coordinates for the textures have to be setup correctly

# MA 3D User Manual

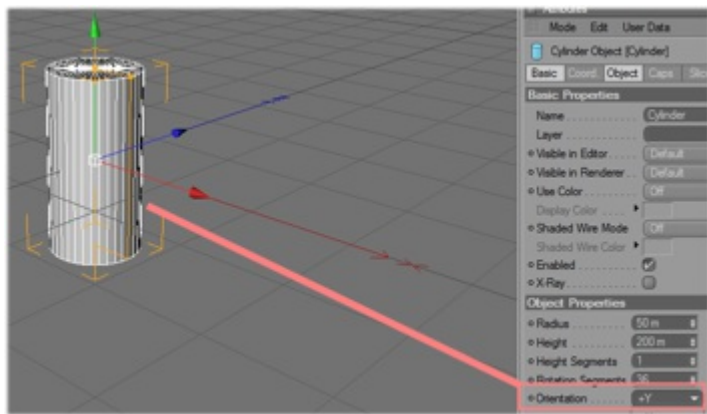
Version 3.3



This example shows the creation of a halved cylinder created with Cinema 4D:



Insert an object of type 'Cylinder'.

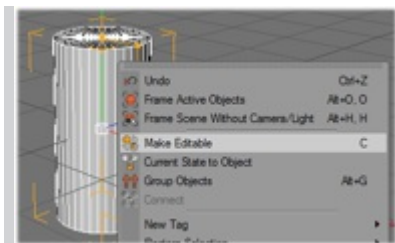


Set the orientation to "+Y".

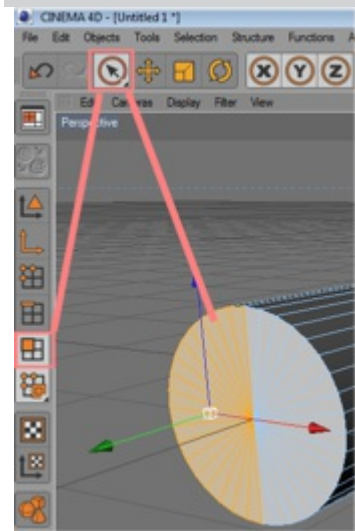
## Comparison of axes in MA 3D and Cinema

MA 3D	Cinema
X	X
Y	Z
Z	Y

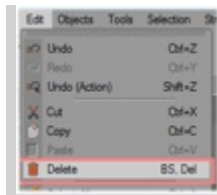
For the correct orientation of the object in MA 3D, it is correct orientation in Cinema 4D.



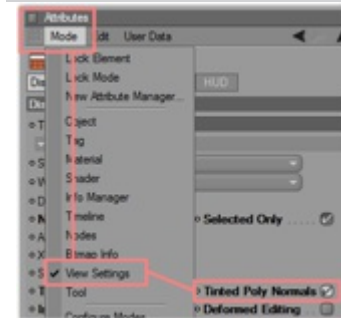
Make the object editable.



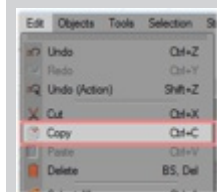
Select polygons that are not used.



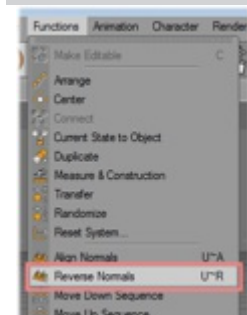
Delete them.



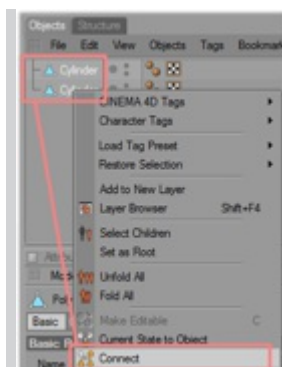
Set the option "Tinted Poly Normals" to On in the "View Settings".



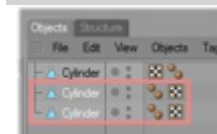
The next copy steps are only necessary if the object has a single side. The object has to be duplicated and the normals set in both directions. First copy the object.



Then reverse the normals of the copy.



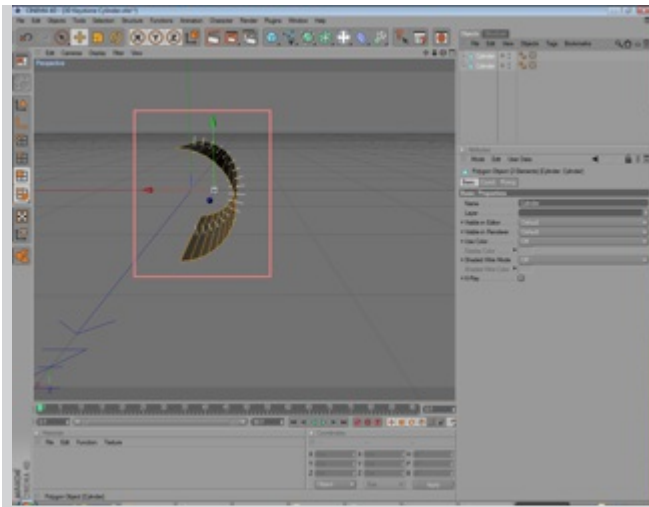
Select both cylinder objects and connect them to a new layer.



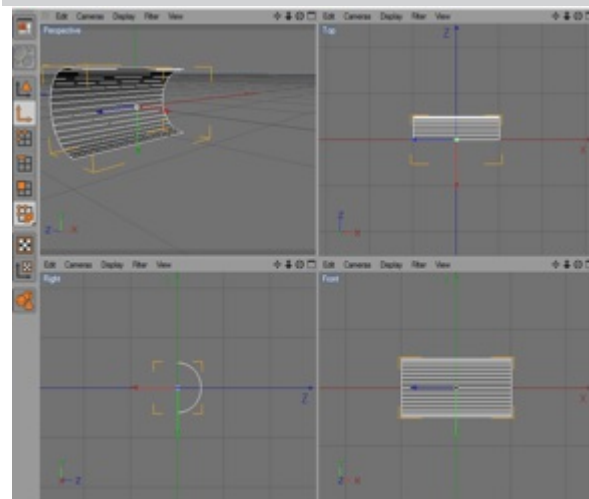
The old cylinder objects can be deleted.

# MA 3D User Manual

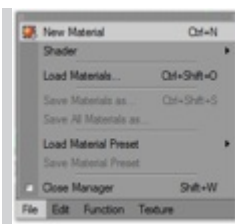
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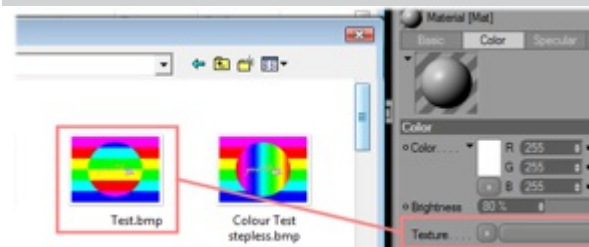
Now you can see two objects with normals in both directions.



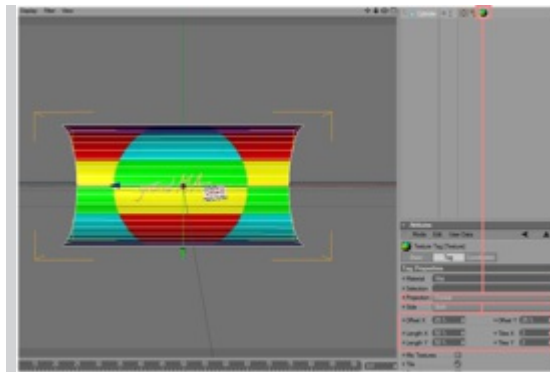
Check the orientation of the resulting object.



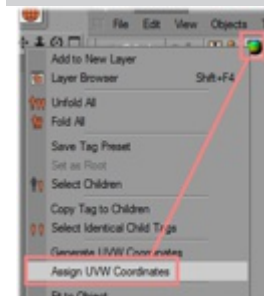
Insert a new material for the texturing.



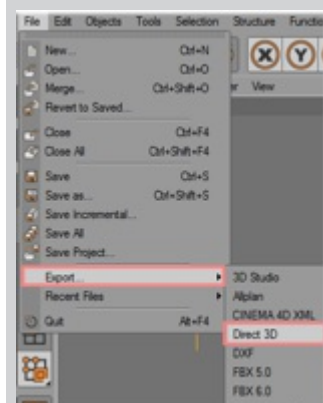
Assign an image to the texture and the material to the restriction of max. 8 characters + extension for the image.



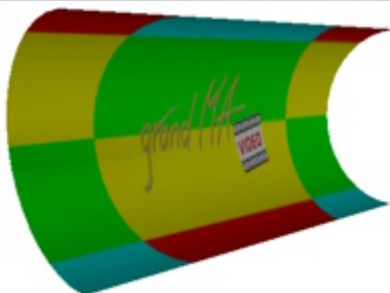
Adjust the texture mapping parameter.



Assign the UV coordinates for the texture mapping.



Export the object to 3D Studio format (.3ds). Objects can be added via the import tool.



The result.

## 9.4. Creation of a 3D Fixture Model

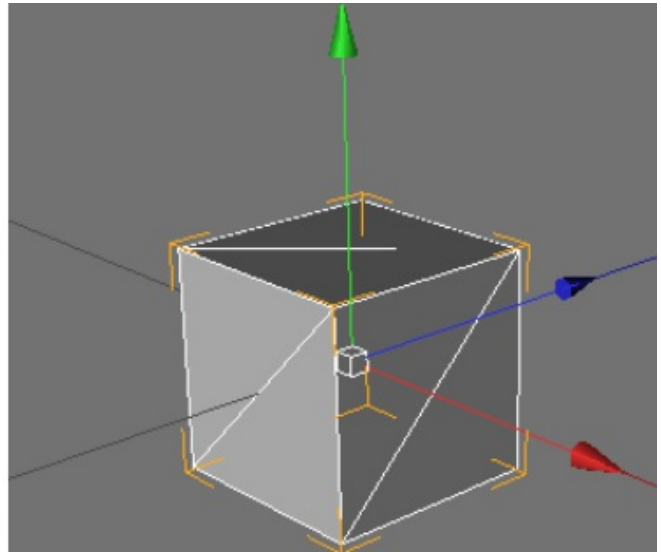
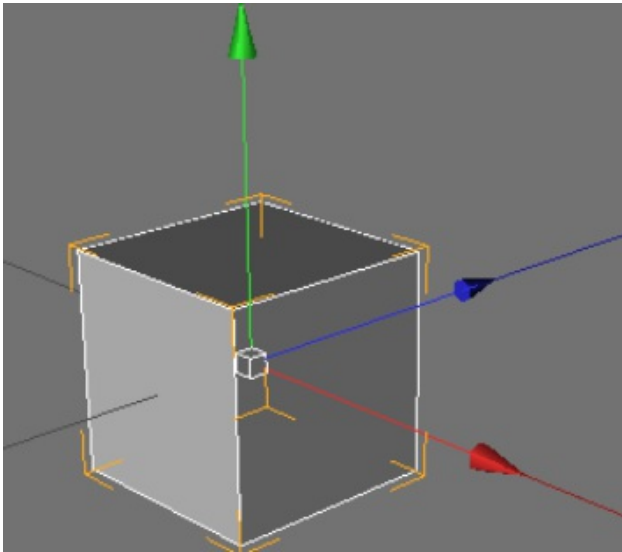
This example describes the construction of a Head Mover fixture on the example of a Vari-Lite VL-1000.



**Note:**

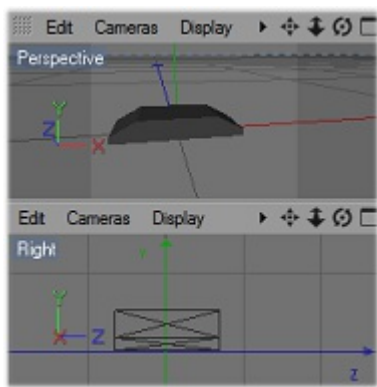
Whenever creating a new object triangulate it. If you do not triangulate the object, the MA3D import tool ignores the object.

You can triangulate an object in Cinema 4D in Functions → Make Editable and then Functions → Triangulate.

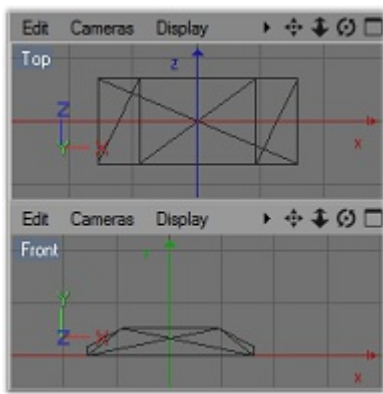


Cube before (left) and after (right) triangulation

## Create the Basement of the 3D Model



3D and 2D (from the right) view of the model



2D (top and front) views of the model

## Dimensions

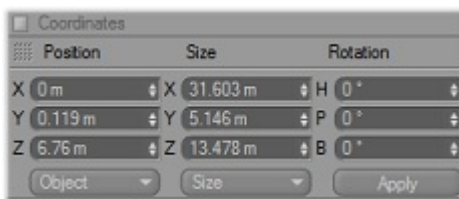
The size of the model can be rescaled using the import tool of MA 3D.

It is possible to use other scaling factors while creating the model.

In this case a scaling of 100 is used (1m = 1cm).

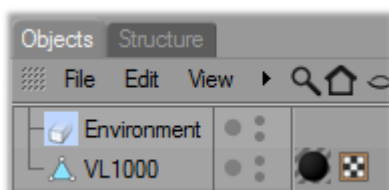
The xml description file then contains the following line:

```
<Scale>0.01</Scale>
```



Coordinate settings of a model in Cinema 4D

The housing of the basement is the root of the object tree and uses the name of the model name 'VL1000'. It consists of a low number of polygons joined to a flattened box. To reduce the number of polygons, use the **point collapse plugin** in Cinema 4D.



Hierarchic structure in Cinema 4D after creating the basement

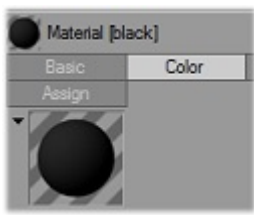
## Colors and Textures

Colors and textures are defined by the material. Add the UWW tag for texture mapping and a material by dragging the material to the object.



### Hint:

MA 3D uses the assigned texture. Therefore, the texture file (max. 8 characters) must be placed in the same folder as the .3ds file.



Color setting of a material in Cinema 4D

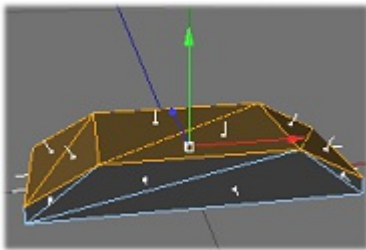
## Normals

Mark the visibility of the areas. In Cinema 4D they are marked with white lines.



### Hint:

To make both sides visible, duplicate the object and reverse the normals of the duplicate.



Marked visibility of the basement in Cinema 4D

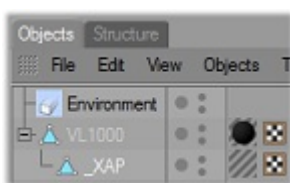
## Anchor for the Pan Axis [\_XAP]

To provide the pan movement in MA 3D, the name of the object has to begin with an **\_X**.

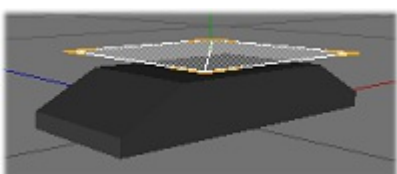
The **\_X** marks a parameter block. All child objects follow the pan movement.

The following sub parameters **AP** marks the axis **A** and defines the pan movement **P**. The name of the pan anchor is **\_XAP**.

The material is transparent.



Hierarchic structure with the added pan axis



Transparent material of the pan axis

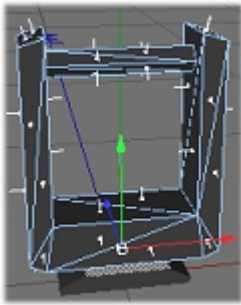


## Yoke for the Pan Axis [U\_XSX]

The yoke is a child object of the anchor of the pan axis.  
It has the same UVW tag and material as the basement.



Hierarchic structure after adding the yoke



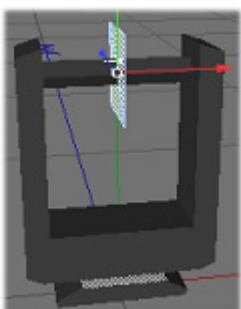
3D model in Cinema 4D with basement, pan axis and yoke

## Anchor for the Tilt Axis [\_XAT]

To provide the tilt movement, the object is named **\_XAT**. All child objects follow the tilt movement.  
The material is transparent.



Hierarchic structure with the newly added tilt axis



Current progress of the 3D model with the invisible material of the tilt axis

## Lamp Head [H\_XSX]

The lamp head is a child object of the anchor of the tilt axis.

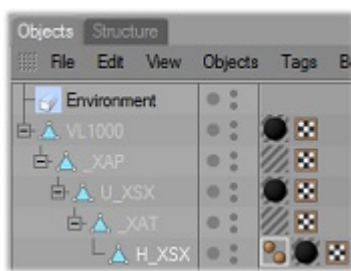
The name is **H\_XSX** this means:

**H** - is ignored

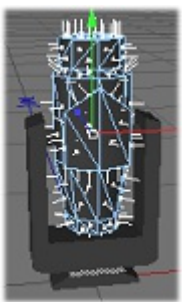
**\_X** - Parameter

**SX** - **S**unshade type **ex**cludes the own beam

It has the same UVW tag and material as the basement.



Hierarchic structure with the lamp head



3D model with the lamp head

## Lens [L\_XSN]

The lens is a child object of the lamp head.

The name is **L\_XSN** this means:

**L** - is ignored

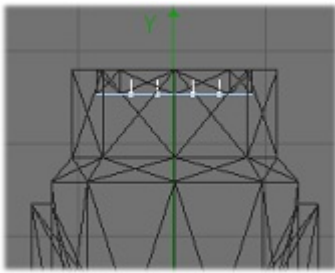
**\_X** - Parameter

**SN** - **S**unshade type is **N**one. Neither is the beam affected nor are the gobos projected on the object.

It has the same UVW tag and material as the basement housing.



Hierarchic structure after adding the lens



2D view with the lens

## Origin of the Beam [\_XB]

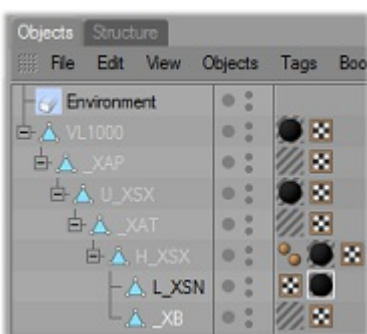
The origin of the beam is a child object of the lamp head.

The name is '\_XB' this means:

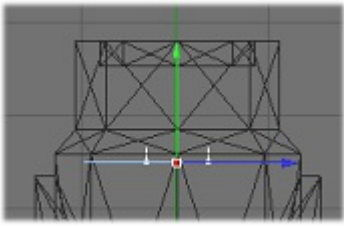
**\_X** - Parameter

**B** - Origin of the **B**eam cone

The material is transparent.



Final hierarchic structure after adding the beam



Beam object in 2D view

After you have created the model, export it into 3D Studio format (.3ds).

## 9.5. Import 3D Model to MA3D

Import 3D Models into MA 3D

Open MA 3D

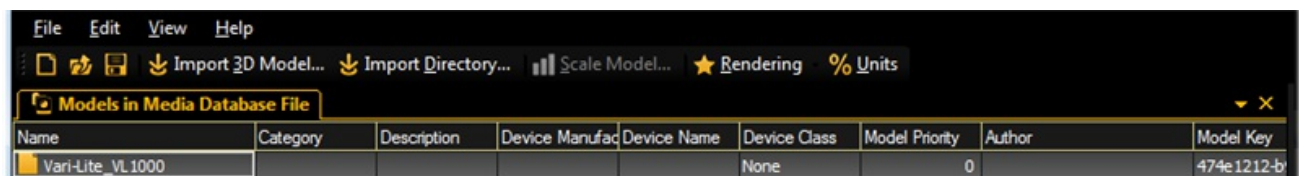


Media Database

In the Media Database (View - Media Database Window) you can find all 3D objects ordered in a hierarchical structure. Types of fixtures are located in the corresponding folder. All fixtures of the type Head Mover are located in the folder "Head Mover".

Open the Import Tool

1. Open the import tool the menu entry 'File – Import – Import 3D Model'.
2. Select 'Import 3D Model'.
3. Select the 3D file 'Vari-Lite\_VL1000.3ds' you have created.



The Import 3D Models tool

## Entering 3D Model Properties

When import is done an .xml description file is generated and stored in the folder parallel to the .3ds file. For example 'Vari-Lite\_VL1000.import.xml'.

This file is only created once during the first initiation of the import. The unique model key will be only generated in this step.

If the file already exists, the importer uses the data from this file to fill out the following fields:



Properties dialog

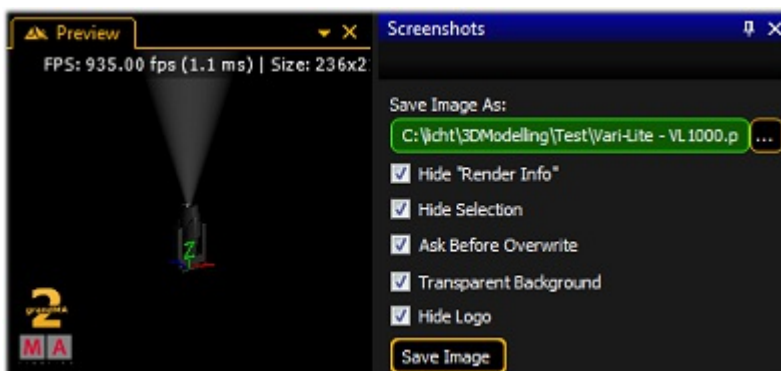
Fill out the property fields of the model.

Mandatory fields are:

- Category - places the model within the hierarchic structure of models
- Device Manufacturer and Name - finds the correct model in case of variant spelling
- Device Class - assigns the right parameters
- Model Priority - prioritization in the selection of a model. Higher numbers are more likely to be prioritized see also [Assigning of 3D models to fixture types](#)

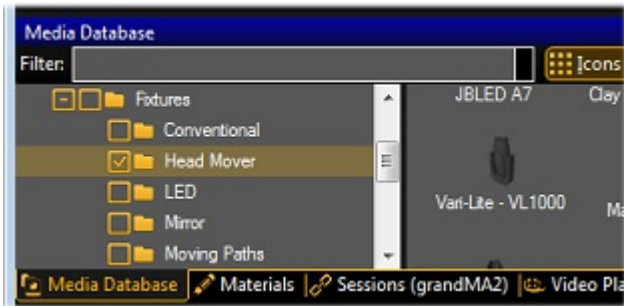
## Preview Image

1. Generate a significant preview image of the fixture position in the preview window.
2. Save the image as... (Browse to the folder of the .3ds file) parallel to your model. Use the model's name e.g., 'Vari-Lite-VL1000.png'.



## Save the 3D Model

To save the 3D model as grandMA Media file, use the save function 'File' - 'Save' e.g., 'test.gmamedia'.



Media database with the created 3D model

The fixture is now saved in the media database in the category Fixtures/Head Mover. The image is displayed as a thumbnail.

## 9.6. Assigning of Models to Fixture Types

Field	Description
<b>ModelKey</b>	Unique key of the model. This key is created with the first importing of the model and saved in the XML file (*.ImportSettings.xml). The key identifies exactly the model. If the model is imported again the same key will be used from the XML file.
<b>DeviceManufacturer</b>	Manufacturer of the fixture that is represented by the model.
<b>DeviceName</b>	Name of the fixture that is represented by the model.
<b>DeviceClass</b>	Type of the model if it represents a fixture. E.g. 'Headmover'
<b>ModelPriority</b>	Priority for selecting this model. High numbers are more probable. The standard value '0' should only be used if the meaning is clear, see description below.

At best the fixture type of a device is left in the data base. If the very same type is found by MA 3D (ModelKey == Model.ModelKey) it will be used without any validation. In this case a fixture type always will be assigned to the same model.

If no model key is found the application searches for a more suitable model, like same 'DeviceManufacturer', 'DeviceName' etc..



### Hint:

The fields 'DeviceManufacturer' and 'DeviceName' can be placeholders to find the right model for variant spellings. For example: 'Vari\*Lite' is often spelled as 'Vari-Lite', or a 'VL1000 AS' should use the same model as 'VL1000 AI'. In this case both fields should contain a 'Vari?Lite' and 'VL1000\*'.

Possible placeholders:

*	0-n any characters
+	1-n any characters
?	0-1 any characters
#	1 arbitrary character

Often there are several variants of fixture types in a model range. So the attachment of a '\*' is recommended - for example: 'VL1000\*'. The spelling is not case sensitive.

If a special 3D object shall be used for a model even though a model with the notation exists the 'ModelPriority' can be increased (in steps of 100). For example a 'VL1000AS' with the priority of 100 would be preferred instead of 'VL1000\*' with a standard priority of 0.

MA 3D is delivered with standard models for every 'DeviceClass' type. The standard model has the following setting: DeviceManufacturer = '\*', DeviceName = '\*' and ModelPriority = -100000. These models have a low priority and are used only if no other model with higher priority is found.

## 9.7. Checklist for 3D Modeling

Go through this checklist if you created a 3D model:

- Are the settings of the sunshade type in all objects correct?  
For example, were the calculations of shadow excluded in your own source of light of the fixture body, clamp and head?
- Do the names of objects have more than 8 characters (max. 8 characters)?
- Are the names of objects unique?
- Are objects made up of triangles only?
- Has information got lost during export? To check if the information got lost, open the exported file using the modeling tool.

## 9.8. Automated Import

Meta data of a 3D model can be left appropriately for the import. Later editing with the import tool is not required.

The placeholder [file] stands for the filename (without extension) that has to be imported. For example if the file 'test.3ds' has to be imported, '[file]' stands for 'test':

File	Description
<b>_global.import.xml</b>	Global import setting valid for the complete directory. Structure like [file].import.xml.
<b>[file].import.xml</b>	XML file with meta data for the model. If this file does not exist, it will be created automatically to store the model key.
<b>[file].import.png</b>	Preview image of the model. Size is 32x32 pixel (32 Bit RGBA). Will be created if it does not exist. Note: If you use “%o.png” instead of the file name the .png file is generated with the right name.
<b>[file].png</b>	If no preview image exists, the import tool tries to create it.
<b>[file].tif</b>	It searches in the given order on the side.
<b>[file].bmp</b>	The image should be exempted via alpha channel.
<b>[file].jpg</b>	Borders are cut automatically when the thumbnails are created.

Example for an '\*.import.xml' file:

```
<?xml version="1.0"?>
<GrandMA3DImportSettings xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/
  <Name>Generic - Head Mover</Name>
  <Category>Fixtures/Head Mover</Category>
  <ModelKey>cc6464b5-c992-4b9e-8a96-31691d9cdd90</ModelKey>
  <DeviceManufacturer>*</DeviceManufacturer>
  <DeviceName>*</DeviceName>
  <DeviceClass>Headmover</DeviceClass>
  <ModelPriority>100000</ModelPriority>
  <ModelManufacturer>MA Lighting</ModelManufacturer>
  <Description>Default Head Mover Model</Description>
```



```
<Scale>0.01</Scale>  
<Move>MoveBottomToZ0</Move>  
<AmbientFlare>0.02</AmbientFlare>  
</GrandMA3DImportSettings>
```

**Hint:**

This file is created once the import is initiated.

If the file already exists, the importer uses the data from this file to fill out the fields like

```
<Category>Fixtures/Head Mover</Category>.
```

So, these entries need not to be done twice if the model is corrected and imported again.

## Overview of possible fields

Field	Description
<b>Name</b>	Name of the model'/filename' will be replaced with the filename of the import file (without extension)
<b>Category</b>	Category in the 'Media Database' Sub categories can be separated with a '/'.e.g. 'Fixtures/Head Mover'
<b>ModelKey</b>	see <a href="#">Assigning of Models to Fixture Types</a>
<b>DeviceManufacturer</b>	see <a href="#">Assigning of Models to Fixture Types</a>
<b>DeviceName</b>	see <a href="#">Assigning of Models to Fixture Types</a>
<b>DeviceClass</b>	<p>see <a href="#">Assigning of Models to Fixture Types</a></p> <p>Possible values:</p> <ul style="list-style-type: none"> <li>None</li> <li>Mirror</li> <li>Headmover</li> <li>Conventional</li> <li>LED</li> <li>MovingPath</li> </ul>
<b>ModelPriority</b>	see <a href="#">Assigning of Models to Fixture Types</a>
<b>ModelManufacturer</b>	Designer of the model.
<b>Description</b>	Short description.
<b>Scale</b>	Object will be scaled by this factor.
<b>Move</b>	<p>Moves the object after the import.</p> <p>Possible values:</p> <ul style="list-style-type: none"> <li>None: No movement</li> <li>MoveBottomToZ0: Model is placed on XY plane <math>Z = 0</math></li> <li>MoveCenterToZ0: Center of the object is placed to <math>Z = 0</math></li> </ul>
<b>AmbientFlare</b>	Clarification grade of the fixture environment.
<b>DoubleAllFaces</b>	<p>Possible values:</p> <ul style="list-style-type: none"> <li>true: sets both sides of all planes to visible</li> <li>false: (default setting) only the sides with the normals are visible</li> </ul> <p>Can be set to true if the normals are not set correctly.</p> <p>Note: This will let to performance penalties because there will be created unnecessary faces/vertices.</p>



## Hint:

Fields that are not used can be omitted.

## 9.9. Parameters

Parameters can be added to the names of objects to set further properties of the object.

Example: The object name 'Test\_XAP' is a pan-axis.

A parameter block must start with '\_X' followed by the (sub) parameters without separators as shown in the following table:

Parameter	Sub-Parameter	Description
V	-	Available for user. The Object can be manipulated by the user. Per default the top object in the tree structure can always be manipulated by the user, sub objects not.
N	-	<b>N</b> ot available for the user. Object cannot be manipulated by the user. (Can only be used for sub objects.)
D	-	<b>D</b> elete: object will not be imported.
A	-	<b>A</b> xis (also see: <a href="#">Axes</a> ): object will be transformed to a movement axis. The parameter is only valid in association with one of the following sub parameters. The sub parameter specifies the type of axis.
	P	<b>P</b> an axis
	T	<b>T</b> ilt axis
	R	<b>R</b> oll
	X	Shift ( <b>X</b> axis)
	Y	Shift ( <b>Y</b> axis)
	Z	Shift ( <b>Z</b> axis)
	U	Scale (X axis)
	V	Scale (Y axis)
	W	Scale (Z axis)
	J	Rotation (round X axis)
	K	Rotation (round Y axis)
	L	Rotation (round Z axis)
	1	Axis of <b>1.</b> barndoor
	2	Axis of <b>2.</b> barndoor
	3	Axis of <b>3.</b> barndoor
	4	Axis of <b>4.</b> barndoor
	B	Barndoor Assembly
	G	Continuous rotation round (X axis)
	H	Continuous rotation round (Y axis)
	I	Continuous rotation round (Z axis)
	C	<b>C</b> lamp Rotation axis of the clamp
	A	Shaper blade <b>1</b> position

5	Shaper blade <b>1</b> angle
D	Shaper blade <b>1</b> rotation
E	Shaper blade <b>2</b> position
6	Shaper blade <b>2</b> angle
F	Shaper blade <b>2</b> rotation
M	Shaper blade <b>3</b> position
7	Shaper blade <b>3</b> angle
N	Shaper blade <b>3</b> rotation
O	Shaper blade <b>4</b> position
8	Shaper blade <b>4</b> angle
S	Shaper blade <b>4</b> rotation
9	Shaper blade assembly rotation
Q	Beam angle (Zoom)
S	<b>Sunshade type:</b> specifies how the object casts a shadow or how gobos are shown on the object.
N	<b>None:</b> has no influence on the object. Neither the beam is affected nor gobos are projected on the object. For example the object is a lens of a fixture. The lens does not block the beam, and no gobos are projected on the lens. The lens is fixed in the case so it doesn't cast a shadow if it is hit by an external beam.
R	<b>Regular:</b> the object casts a shadow and gobos are projected on the object. Default setting if nothing else is parameterized.
X	<b>Exclude own beam:</b> compared to other fixtures the object behaves like option 'R' and compared to the own source of light like option 'N'. This parameter should be set for example for the body of moving heads and the clamp, meaning the parts that are never lighted by the own beam. This simplifies the rendering and avoids the casting of a shadow by the own beam.
G	<b>Ghost (Currently not implemented):</b> the object casts a shadow and gobos are projected on the object. The object itself is not visible, only if it is hit by a beam. For example an LED panel consisting of several LEDs with one body. The LEDs can be excluded from the shadow via parameter 'N'. The body for the LEDs has the parameter 'G' for the common shadow. Note that color mixing will only work correctly if the diffuse color of the ghost object and of the covered objects is the same.
B	<b>Beam:</b> marks the origin of the beam. (also see: <a href="#">Beam of Light</a> )
LD	Marks the beam output of the cone frustum.
LC	Marks the frustum where the beam is cut.
I	<b>Diffuse Inking *:</b> extension parameter for other materials. The color specifies the ratio of the diffuse color to the fixture color. White means: the diffuse color gets brighter by 100% of the fixture color.
E	<b>Emissive Color *:</b> extension parameter for other materials. Specifies the color/texture of the object's self shine.
J	<b>Emissive Inking *:</b> extension parameter for other materials. The color specifies the ratio of the emissive color to the fixture color. White means that the emissive color gets 100% brighter with the fixture color.

C

**C**hildren Sub controls, to be placed in MA 3D below the object of a model. Other sub objects in MA 3D will be inserted below this item. Used for moving paths to create sub objects below an axis.

MD

**Modify Model / Double Faces:** this can be used to make both sides of a plane visible without doubling the faces inside the 3d modeling application. Also it can be used to import a bad model with incorrect normals. (But this will let to performance penalties because there will be created unnecessary faces / vertices. Anymore it can result in visible edges at rounded surfaces if the direction of the normals flips inside.) Example: Plane\_XMD - This plane is visible from both sides.

\* This parameter can only be used for materials. The material with the parameter extends the other material. For example 'Lens\_XJ' describes the emissive inking color for the material (without parameter) with the same name 'Lens'. The extended material must not be assigned to an object. This detour is necessary because the modeling software does support this functionality.

## 9.9.1. Axes

Objects can be configured with movement axes. The position of the axis is marked with an auxiliary object.

Objects ordered below the auxiliary object in the tree structure can be moved in the appropriate manner:



The image shows an object tree of a moving head fixture. The object 'VL1000' is the root of the fixture. '\_XAP' is the pan axis of the model. All objects below are rotated around this axis.

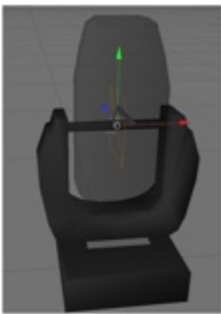
## 9.9.2. Rotation Axes

Rotation axes are marked with a square (consisting of two triangles). The name of this object must contain the appropriate parameter for the desired axis (e.g. `_XAT`) [see Parameter](#).

All normals of this object have to point in the same direction.

During its import the object is converted into an axis. It is aligned along the direction of the normals (vertical on the square) positioned in the center of the square.

In case of movement the right-hand rule can be applied: Thumb shows into direction of normals, objects rotate into the direction of the fingers (with positive values).



The image shows the tilt axis of a moving head fixture. The normals of the square show to the left. The lens moves away from the viewer if the tilt axis is driven with values greater than 0°.

## 9.9.3. Linear Axes

Linear axes are marked in the same manner as rotation axes.

The normal of the square shows the direction of movement.

## 9.9.4. Beam of Light (Cone)

Cone for conventional spots or washes

Parameter:

● `_XB`



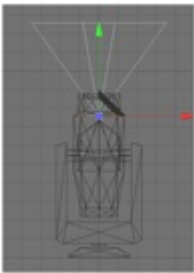
Similar to the rotation axes the position of the beam (cone) is marked with a square. The center of the square marks the origin of the cone (e.g. `_XB`).

The normals mark the direction. The position inside the fixture body can be determined with an auxiliary cone that is placed temporarily into the body.

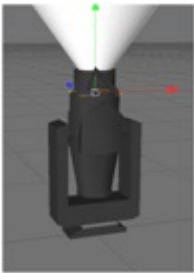
The radius ( $r$ ) of the cone can be calculated with the following formula:

$$r = \tan([\text{max. open radius} / 2]) * [\text{height of the cone}].$$

Normally the cone uses the complete lens hole of the fixture. The square is placed at the top of the cone:



Placement of cone in 2D



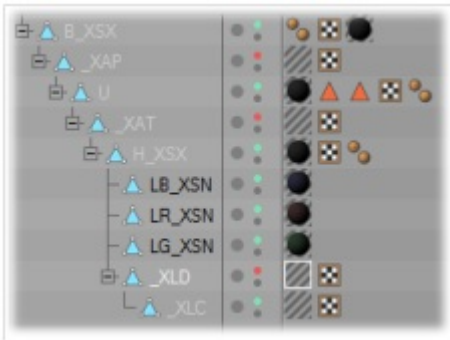
Placement of cone in 3D

Cone frustum for LED spots or washes

Parameters:

- `_XLD`
- `_XLC`

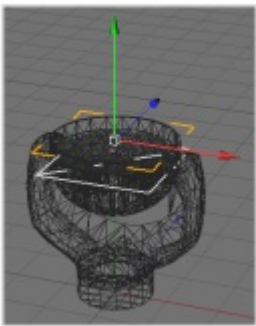




At LED spots with flat housings the light beam is a cone frustum.  
This needs 2 parameters (squares) for the beam

- LD marks the diameter of the beam output.
- LC marks the clipping plane of the beam where the beam is cut.

The direction of the beam is marked via the normals.



Placement of cone frustum in 3D

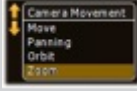
The upper square shows the \_XLD square and the lower square shows the \_XLC square where the beam is cut.



## 10. Keyboard Shortcuts

Many functions that can be reached via the menu entry are listed directly in the menu. Underlined characters in the menu mark the shortcuts that can be reached by pressing the 'Alt' + 'underlined character' simultaneously.

Depending on the window the keyboard shortcuts have different effects:

Shortcut	Window	Effect
	Stage View	
<b>Shift + Ctrl + right mouse</b>	::	 Several combinations of camera movements while mouse button is pressed
<b>Ctrl+ left mouse</b>	::	Move or rotate object with left mouse button
<b>Esc</b>	::	Deselect objects
<b>Arrows or Page up-down</b>	::	Move camera or + 'Ctrl' turn camera + 'Shift' faster
<b>Middle mouse button- Mouse wheel</b>	::	Wheel menu on / off. If menu is on: - select entry via mouse wheel - 1...9...0 select menu entry - 'Space' next menu entry- 'Shift + Space' one menu entry back
<b>Ctrl + 1...9...0</b>	All views	Change to camera 1...9...0. If focus is in Stage View no 'Ctrl' necessary
<b>Ctrl + Space</b>	::	Next camera. If focus is in Stage View no 'Ctrl' necessary
<b>Ctrl + change camera with mouse</b>	::	No soft camera changing
<b>Shift + camera change</b>	::	Spanning windows will not change their camera
<b>Ctrl + Return</b>	::	Switch to fullscreen or leave fullscreen view

## 11. MA 3D FAQ

Here you find frequently asked questions from users regarding the MA 3D.

Question/Problem	Solution
How can I change the model of a fixture?	Select the model, right click on it, select change model. The Change Model window opens.
How can I use grandMA series 1 with MA 3D.	Since version MA 3D v3.0.0.5, the MA 3D is not compatible with the grandMA series 1 anymore. Download MA 3D version 2.9.1.1 on <a href="http://www.malighting.com">www.malighting.com</a> .
Can I open show files saved in an older version of MA 3D, in a newer version?	Yes, you can always open show files saved in older versions in the latest version.
Can I open show files saved in a newer version of MA 3D, in an older version?	No, download the latest version on <a href="http://www.malighting.com">www.malighting.com</a> .
Can I run the MA 3D and the MA VPU on the same computer?	No, the MA 3D and the MA VPU at one computer need too many resources.
How can I disable screens in the full screen mode?	Go to File in the menu bar, select Settings, select the category Full Screen. Right mouse click on the screen you like to disable for the full screen mode. Click on Enabled.
Can I run the MA 3D and the grandMA2 on PC on the same computer?	Yes, use the default IP address. Refer to, Create a Session.
How can I use MA 3D on an Apple MacBook?	Boot your MacBook in windows, using Bootcamp.
Can I import .dxf or .dwg files in MA 3D?	No, MA 3D supports only .3ds files. Convert the .dxf or .dwg files in .3ds.
How can I import a .3ds environment into MA 3D?	Go to File in the menu bar, select Import, select Import 3D Model. The MA 3D Import window opens. This is used to import .3ds files.
How can I change meters into feet?	Go to View in the menu bar, select the Assets window and the Properties window. Select in the Assets window, grandMA2 and Units. Change the unit in the Properties window.
Are there any information about updates and news?	Yes, get registered for the newsMAIL and techMAIL on <a href="http://www.malighting.com">www.malighting.com</a> .

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