

Mamba **Elements**



This manual is meant as an overview for the various Mamba Elements functions, and might not be fully accurate to the latest version and release of Mamba Elements. MediaLas will try to update this manual as often as possible. Please use also the "what's new" papers and documentations for most actual enhancement and releases.



Release of this Manual: Jan 16, 2009

Here, at MediaLas, we truly believe that Laser is the world's most beautiful lighting entertainment technology today. We do not mean to disrespect or degrade any other lighting effect, but the homogenous coherent light beam of a laser is the most unique lighting entertainment effect ever created.

"Everything we do is dedicated to the laser light", founder and president of MediaLas, Dirk Baur, says. "We envision a world where those who work with lasers in live shows and presentations can bring out the very best from any performance, and where the possibilities of laser light performances are endless."

Our mission is lead by a simple rule:

Bring the best performance at highest possible level for a humanized and affordable cost.

So this is how we create our show laser tools. This is how we created legends like CATWEAZLE scanner, Mystique showlasers, or the new thrilling and freshly awarded Infinity showlaser system. It also means, that there is a group of engineers and technicians, research specialists and laserists sitting in Balingen/Germany, who spend most of their living time on the dedicated love to laser lights. This passion creates legends!

Our products focus on removing barriers and bringing the best possible laser technology with inspiring creativity in performance. Check out our range and features on our website, or visit us during a demo day or trade show worldwide!

Copyright Notice

Mamba Elements and Mamba Elements are trademarks of MediaLas Germany. All unauthorized copy or manipulation of the software is prohibited and will be prosecuted by international law.

License policy for Mamba Elements Laser Software

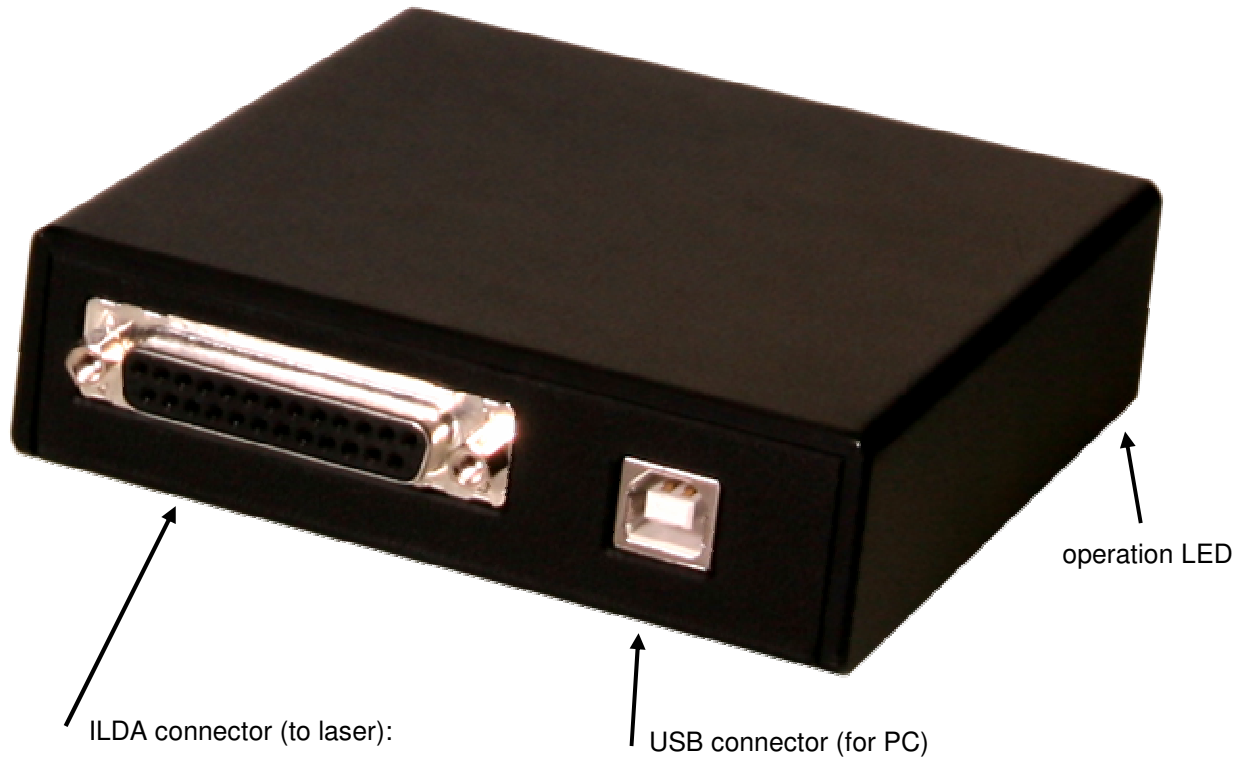
Mamba Elements comes with a dongle key (MediaLas QuickPort) for software protection. This dongle key is one full software license! If this key gets lost, a new software license must be purchased! So please be careful with your dongle key, do not lose it.

Furthermore, your personal software version is coded for your personal dongle key only! It is NOT possible, to have other Mamba Elements software versions running with your dongle key. If your software starts up, but closes again after a few seconds, Mamba Elements did not find the appropriate key, and will not start up. This was done for two reasons:

- To avoid theft on your stage system – thieves cannot use a solo dongle key, since they need the appropriate software for it, so there is no need to steal a dongle key
- To easily transport your license from one computer to the other. In this way, you can install the software as many times as you want, on any computer you like.

MediaLas QuickPort

- High speed USB-to-Laser interface for Mamba Elements software system.
- Transfer up to 1MB per second ensures a very smooth and fast output of up to 100,000 pps.
- ILDA output connector with full XY, blank and RGB.
- Easy driver installation
- USB - powered
- small construction



Pin 1 X+
Pin 2 Y+
Pin 3 blank/intensity +
Pin 4 interlock
Pin 5 red +
Pin 6 green +
Pin 7 blue +
Pin 13 shutter

Pin 14 X-
Pin 15 Y-
Pin 16 blank/intensity -
Pin 17 interlock
Pin 18 red -
Pin 19 green -
Pin 20 blue -
Pin 25 ground

About this manual

The following content describes the various functions of Mamba Elements laser software. Due to the fact, that Mamba Elements is updated constantly, not all functions will be described properly. Please check the Mamba Elements support site for actual manual updates, or simply check online with Help/Check for updates.

This manual is split into different categories:

- **Setup and installation of Mamba Elements software**
- **Main frame editor and frame editing functions**
- **Show creation by using the tracks on the timeline**
- **Setting up Mamba Elements to your laser projector and/or interface**
- **Import/export shows and frames**
- **Live player in Mamba Elements**
- **VST Video Sequence Tracing software**

Mamba Elements users, which are interested in adding content to the manual, are greatly welcome to send us their doc files with updated content. After reviewing, we are happy to add your input to the most actual Mamba Elements manual. Of course, your input will be marked with the name of the originator and creator. So if you want to see your name in this manual, and present yourself to the community as an experienced Mamba Elements user and show creator, you are welcome to join the great Mamba Elements community and help, to make this manual better than any other manual in the world. Simply send your edition or changes to software@medialas.com , either in a plain .txt file, or use a pdf editor, to add some info or data to this pdf document. .

Hardware required

To run Mamba Elements properly, the following setup of hard- and software is recommended:

Processor speed:	> 1.5GHz. recommended 2 GHz or more
Memory:	min. 512MB, recommended >1GB, optimum 2GB or more
Graphics adaptor:	Fast 3D adaptor recommended
Harddisk space:	Approx 500MB
Screen resolution:	min 1024 x 768, recommended 1280x 1024 or better
Operating system:	Win 2000 or Win XP SP2/SP3 or Windows Vista
USB Ports:	Min 2. Maximum 2 USB interfaces per port.

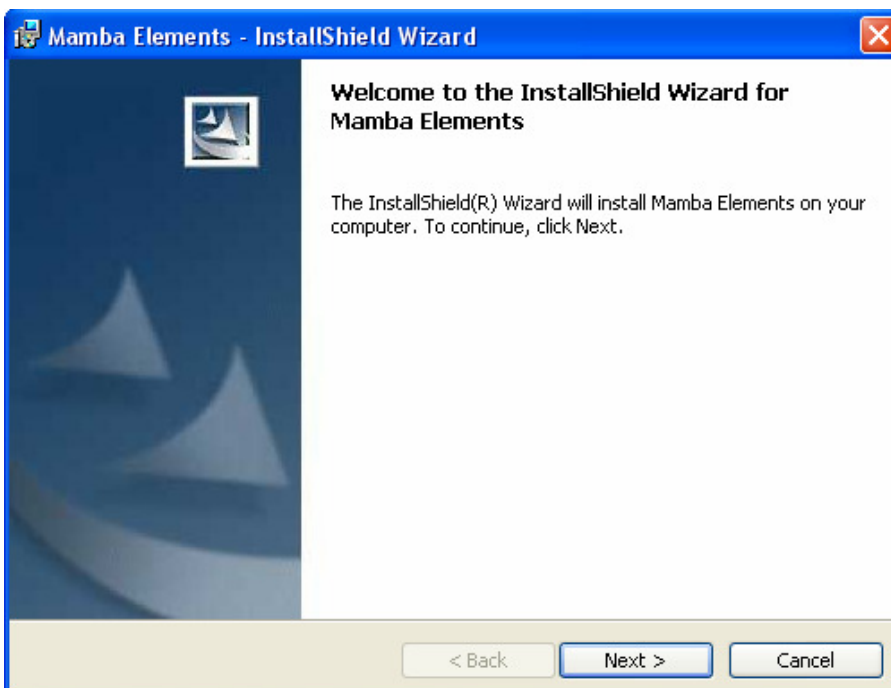
Installation

Installation of Mamba Elements is quite easy. During the installation process, necessary drivers for dongle key or USB Interface will be copied and installed after connecting the desired hardware. So if you did not connect the USB Box before starting Mamba Elements, you might get an error message on the screen. Discard this message, it will not interfere with proper function of Mamba Elements.

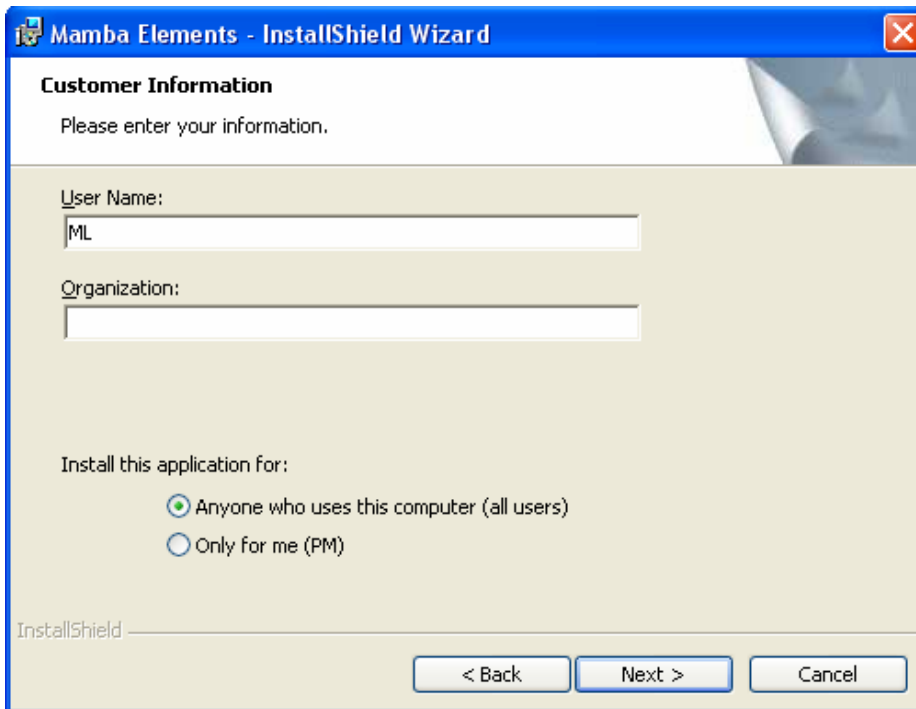
With the Mamba Elements installation package, you will receive two disks. One is the program disk, also holding shows and frames, and the second is your licence disk, which corresponds to your dongle key serial number. Please note, that the software does work with your dongle key. **ONLY** It will **NOT WORK** with any other dongle key. Each single key is licenses and compiled to the software version on your disk.

If you run more than one version of Mamba Elements, make sure not to mix up your dongle keys.

Insert Mamba Elements program CD into your disk drive.

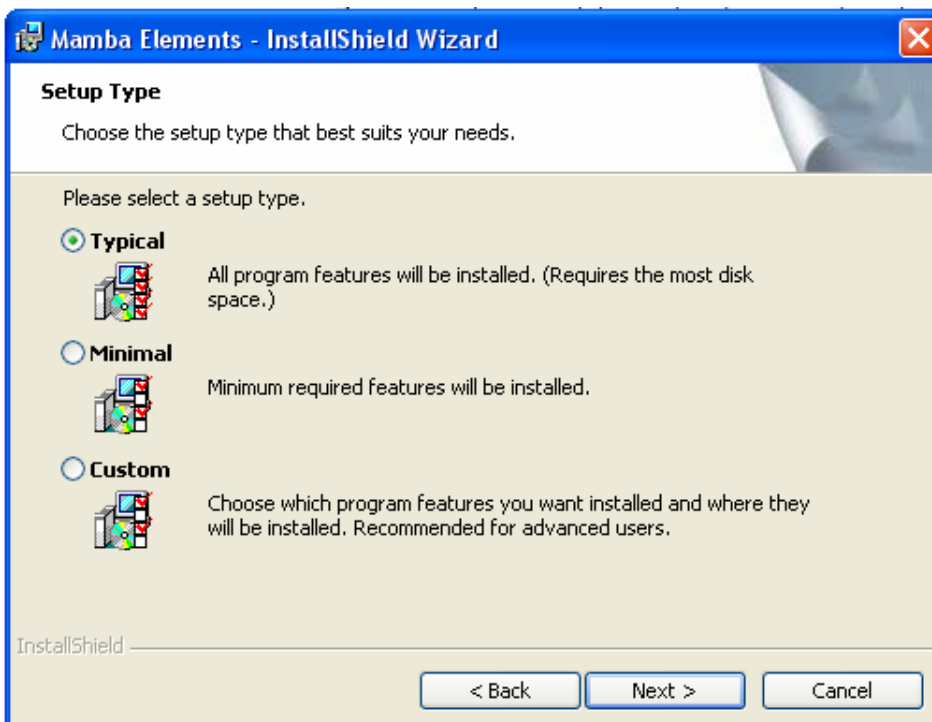


Click “next” and follow the installation guide. After you agreed to the license agreement, the customer identification screen will pop up.



Enter your name and organization, if applicable, and confirm with “next” key.

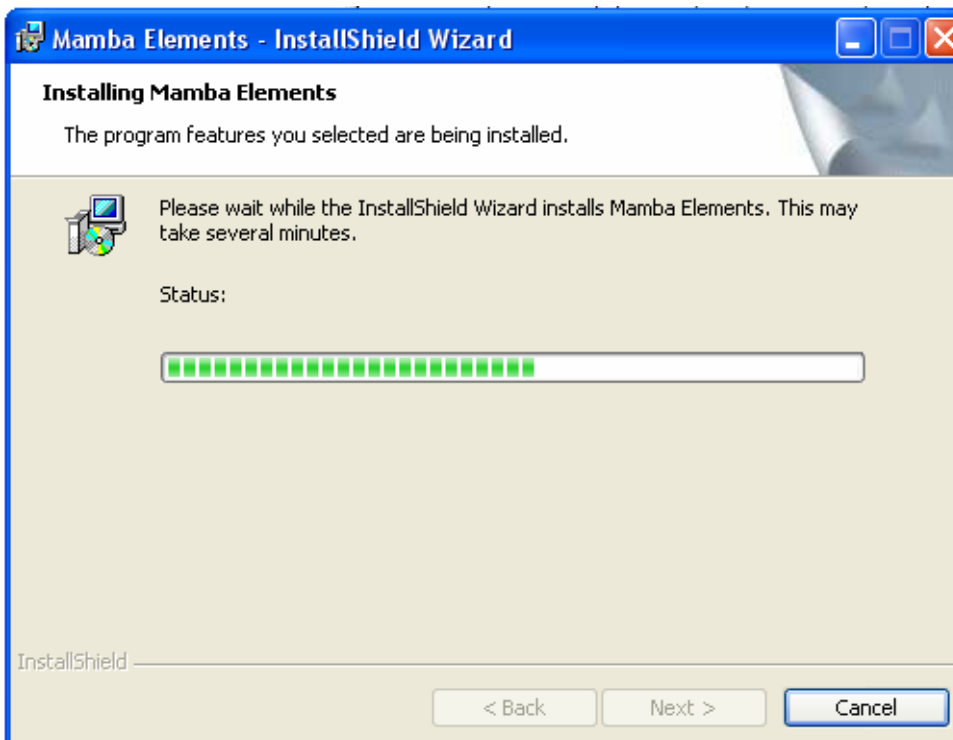
Now select the type of the setup process. For most users, the standard setup is the best option. Here, all relevant program files, frame files and shows are copied and installed onto your computers hard disk. If, however, you select a custom setup, you have the following choices:



Custom setup

- Show
Installs all available free shows on the harddisk
- Frames
Installs all available free frames on the harddisk
- Manuals
Installs the actually available manuals in pdf format onto the harddisk

After the installation setup is finally selectn, click “next” for installation. Files are copied and installed onto your computer’s harddisk.



After the normal software setup process, drivers for USB interface are already copied to your hard disk. Please connect your USB interface box to the computer to finish the hardware setup. After hardware is installed correctly, Mamba Elements is ready for first startup.

Glossary of laser creation and laser show programming

Beat markers	Mamba Elements offers a powerful programming tool, named beat markers. During play back of a music piece, markers can be set onto the timeline to highlight events or beat parts, to have a better overview on the music parts.
Blanking	Switching off the laser means blanking. Between two laser objects, there must be a blanked line. If this line isn't blanked, you will see a connecting laser line between those objects.
Blankshift	Since a laser projector normally uses a mechanical deflection system called galvo scanner, and a faster color modulation device, usually a direct laser modulation or a crystal color modulation device, the time between point moving time and modulation time is different. Depending on the scanspeed, there must be a delay for the color modulation, which is set with blankshift.
Corner repeat	Especially on rectangle or cornered objects, just as a square, a triangle or similar, the galvo scanner needs a specific time to reach the reversal point, where the beam moves in a different direction. Since this reversal process takes some time to decelerate and accelerate the galvo mirror, there must be a delay on these points, which is called "corner repeat". The corner point will be repeated an adjustable number of times. The higher this number, the sharper the corners, but also gets the corners brighter for the longer projection time at this point. The optimum number must be figured out during projection tests.
Cue	"Cues" are placed on the timeline. A cue is a scene, that can hold single or multiple frames on the timeline, and starts at its desired time where it is placed on the timeline. Usually, a cue is parallel to a beat, but can also be a start of a long animation frame at a specific music point.
Frame	A so called "frame" is one picture, or one drawing, in an entire list of frames. In this frame, there is a vectorized content of lines and dots, which shows the laser drawing during output to the laser.
Galvo / Galvanometer	A galvo, commonly called "scanner", is the heart of a laser projector. It is a mechanical device, which works like a fast servo motor. It moves a mirror to a specific position. This is done usually quite fast. The speed of a galvo for entertainment use is usually measured in PPS (points per second), displayed with the ILDA test pattern at a specified angle.
ILDA format	The International Laser Display Association developed an image format suitable for interchanging image data between laser controllers and laser fixtures. The information may also be stored as frames, which can then be stored on a computer or other controlling device. Companies in charge of the technical committee of ILDA are LaserMedia, Image Engineering, Foresight, and Laser Dream. Since ILDA's inception in the early 1990s, profit for large laser companies, which developed the technology, have plummeted. This may be due to the fact that the technology has become more widespread in manufacture and affordable. More information at ILDA's website at www.laserist.org

ILDA standard	<p>ILDA developed several standards in the last couple of years. The usual and most common ILDA standards are:</p> <ul style="list-style-type: none"> - Frame format standardized - Scanspeed standardized to standard ILDA test pattern - Connector standardized to DB 25 pin connector <p>More information about the ILDA standard is available at ILDA´s website at www.laserist.org</p>
Interface	<p>An interface is a device between your PC and your laser projector. It will convert digital signals, coming from the laser software, to analog signals, used by most laser projectors. For an international standard, the International Laser Display Association ILDA created the so called ILDA Standard connector, which exactly describes the necessary signals at the correct pin. > See ILDA standard. Mamba Elements works with various interfaces. The most used is the USB Box Interface.</p>
Interpolation	<p>Interpolation is a method of adding extra laser points to a laser projection line between it´s start and end point.. Between these two line end points, additional points are added, to ensure the mechanical mirror movement of the galvo runs smooth between the two end points. This greatly reduces overshoot at corner points, and increases the overall brightness of the inner line elements. Interpolation distance can be set in Mamba Elements.</p>
Key frame morphing	<p>Morphing between frames can be done in different ways. Key frame morphing is meant by a morph between different “key frames”, where just these key frames are used for the morph. The results are different to the normal morph.</p>
Logical projector	<p>Non physical projector. Mamba Elements offers logical projectors and physical projectors in the projector setup. A logical projector holds routings from different tracks. This logical projector can now be routed to any physical projector. If two or more interfaces and physical projectors are available, it might make sense to design a logical projector, that is routed to both physical projectors, and two logical projectors that are routed to each individual physical projectors. During show programming on the timeline, an effect can now be programmed to one of the three logical projectors, which now automatically route the content to the physical projectors. By using this powerful tool, one track can be routed to virtually and number of physical projectors.</p>
Modulation	<p>Modulation of a laser means, switching a laser on and off. There are basically two ways of laser modulation: TTL On/Off or analog from 0-100%. Depending on the quality of the laser projector, both methods are used on the actual market. TTL modulation is mostly used by cheap laser projectors, while analog modulation can result in unstable laser operation, also mostly on cheap laser projectors. A good analog linear fading modulation is only acheaved at professional lasers. On TTL modulated RGB lasers, the color range offers just the seven basic colors, which analog modulated lasers can theoretically display all available colors in it´s color range, including smooth fade ins and fade outs.</p>
Non linear cutting	<p>Some older laser show software programs offers linear cutting, where the cues are listed in a text file and be played one after the</p>

	other. With a non linear cutting, you are able to access any timeplace on the timeline at any time, you are not restricted to do “one after the other”. If you like, you can start by creating the end of the show before the start of the show.
Object oriented editor	Drawings are split into objects. Each drawn object, circle, line, square, text, etc., is handled and can be edited individually at any time.
Point oriented editor	A drawn object is recalculated to a point oriented format during drawing. After the object is recalculated, no more changes can be accomplished on the objects, just on single points. This makes it hard to edit frames afterwards.
PPS (points per second)	This is the speed, where galvos scanners can be compared. Furthermore, the PPS nominates the output speed, how fast a frame can be projected. The faster the scanner, the less flickering you will notice. PPS for entertainment and lasershow is measured with the original ILDA test pattern at a scan angle of 8° optical. Unfortunately, many non professional companies declare their scanners way faster than these scanners are able to work, by manipulating the ILDA test pattern or simply using a different test frame. For this reason, scanners can only be compared, if tested with original ILDA test pattern at desired scan angle.
Physical projector	This is the “real” laser projector, a piece of hardware, scanners, lasers and so on. See “Projector”.
Projector	The laser projector is a unit, that holds the most necessary components for projecting laser images or a laser show – the laser, the galvos system and usually the power supply. A projector can be simple, or it can be sophisticated for professional use, like an Infinity or Mystique.
Scanners	See “Galvos”
Scanspeed	The speed, how frames, scenes or a show will be played back on your laser projector, is measured in PPS (points per second) In Mamba Elements, the scanspeed can be adjusted from 1,000 pps to 130,000pps. The faster the scanspeed, the less is the flickering of the laser projection, but more scanspeed could cause more distortion on your galvo scanners.
Timeline	The timeline holds various tracks and runs from time zero to unlimited time. Start of the timeline is exactly the start of the desired song at time zero. Parallel to the timeline, the loaded music piece is playing time sync.
Track	Tracks holds cues and scenes on the timeline. Each track on the timeline starts at time zero. Many tracks, in theory unlimited, can be assigned, while each track starts at time zero. Cues and scenes, which are placed on different timelines, will be played exactly at their starting time, no matter what the contents on other tracks are.
Audience scanning	If laserbeams from your lasershow are going into the audience. This could be very harmful for your audience, so be sure that the laser safety rules are observed!

Understanding show creation with Mamba

Mamba was designed for easiest and most convenient show design within shortest time. To understand the principles of Mamba, here are a few explanations.

- Designing shows

A show is designed of frames (pictures), which are set on a timeline with linear and absolute timings, and are either just played back or manipulated and animated with various effects. The timeline shows the absolute time from point zero until – in theory – unlimited time. Each second on the timeline is divided into 25 frames, which allows to have up to 25 cues per second, and up to 1,500 cues per minute. A show of 4 minute length can hold up to 6,000 cues. Each cue can store one or more frames. The number of frames per cue, is dependend of the cue length, the frame content (how many point are in the frame) and the scanspeed. Here is an example:

Your frame (picture) holds 200 points, which is not much. Some frames can hold up to 5,000 points, which, on the contrary, IS much. A normal frame content could be something around 500 – 1,500 points. But for now, we assume, that your frame has 200 points. At the same time, your scanspeed is adjusted to 20,000 points per second. We divide now the number of points, which are outputted to galvo scan system, by the number of points each frame contains, and we will get the repeatability rate of the projection system. In our case:

$$20,000 \text{ points per second} / 200 \text{ points} = 100 \text{ frames per second.}$$

The picture we designed, will be repeated 100 times within one second of time.

Since we learned, that the Mamba timeline can hold up to 25 cues per second, we divide our 100 frames per second with 25 cues:

$$100 \text{ frames per second} / 25 \text{ cues per second} = 4 \text{ frames per cue}$$

So each one of the 25 cues will play 4 frames.

The more points a frame contains, the less often it can be played back within one cue.

Note:

A cue is an absolute moment on the timeline, which is repeated 25 times per second.

On the timeline, scenes are designed with editable start and end time. Each scene can hold a various number of frames, from one single frame to unlimited number of frames, which will be played and shown on the laser output within this scene`s start and end time. Many scenes can be chained on the timeline and will be played back at the desired time frame, shown on the timeline.

Talking about scenes – a scene in Mamba is a very powerful object to bring your ideas into lasers. In a scene, you can do much more than “just” project a frame or a frame list. Animate, rotate. zoom or move them, morph them, set the scene to a scrolling text or display the current time – it is that easy!

On the main screen of Mamba you see the absolute time your show is running at. This timeline is 100% parallel to your music timing. Once you selected a song, the timeline will show you exactly the time of your song with 25 cues per second.

The scenes you create on the timeline will play exactly the time where they set to – start and end time. The start and end time of each scene is free adjustable with your pointing device, and can be moved everywhere on your timeline, even between different tracks. Simply drag and drop them around.

An entire show is made of various scenes, which can hold single frames, frame lists, running text, realtime clock display or a pause. Many scenes lead up to an entire show, while a good and well timed show can easily hold a few thousand scenes as single cues! Sometimes less is more, and sometimes a show lives from cues. This depends not just on your taste, but also on the artists attitude, or music style. Mamba comes with a large number of different shows in different styles. Simply load a show and enjoy it while watching the artists expressions. After you have seen the show, scroll through the timeline and check out how this show was created with the various tools and effect modules. It might be confusing for the first time, but once you got the feeling for Mamba (which usually happens pretty fast), your mind will flow and shows come by some simple clicks. You will be delighted, how fast a show is created in Mamba, with professional look and amazing effects.

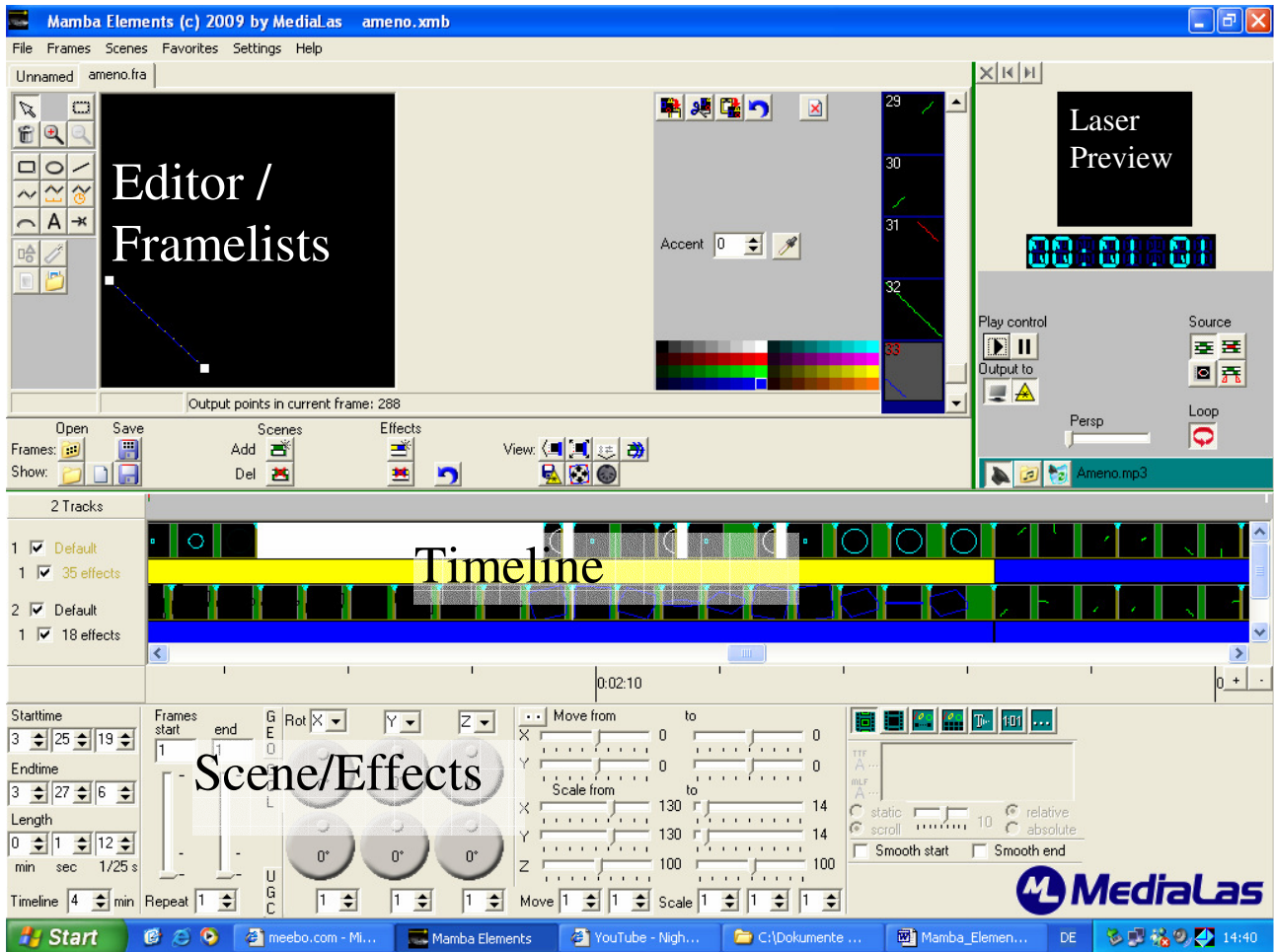
Adaptive graphical user interface

What do these guys wanna tell me? A user interface that adapts to what? Well, the time when we designed Mamba, we have already been experienced lasershow artists, who worked with different kind of software programs, and knew about pros and cons of existing systems. While every software system has it's advantages, we where thinking about Mamba being the "easy part" of the laser scene - a software, able to run on notebook computers, no need for expensive interfaces, easy to use and fast to learn. This required to have only one main user interface on the computer monitor, other than having many different programs with various windows on the desktop. So we decided to design a variable, adaptive user interface, which basically looks the same all the time, but offers different tools and content to the user, depending on the workspace he requires.

While Mamba in the upper part of the main window, constantly shows the most important information, frames and previews, the lower part of the main interface changes in it's content to fit Mamba to the operators actions. After a few hours of use, you most probably will not miss this tremendous feature anymore.

Introducing Mamba Elements Main Screen User Interface

The 4 major parts of Mamba Elements:



Basically, the main Mamba Elements screen is divided into 4 major sections, which will be described separately in this manual:

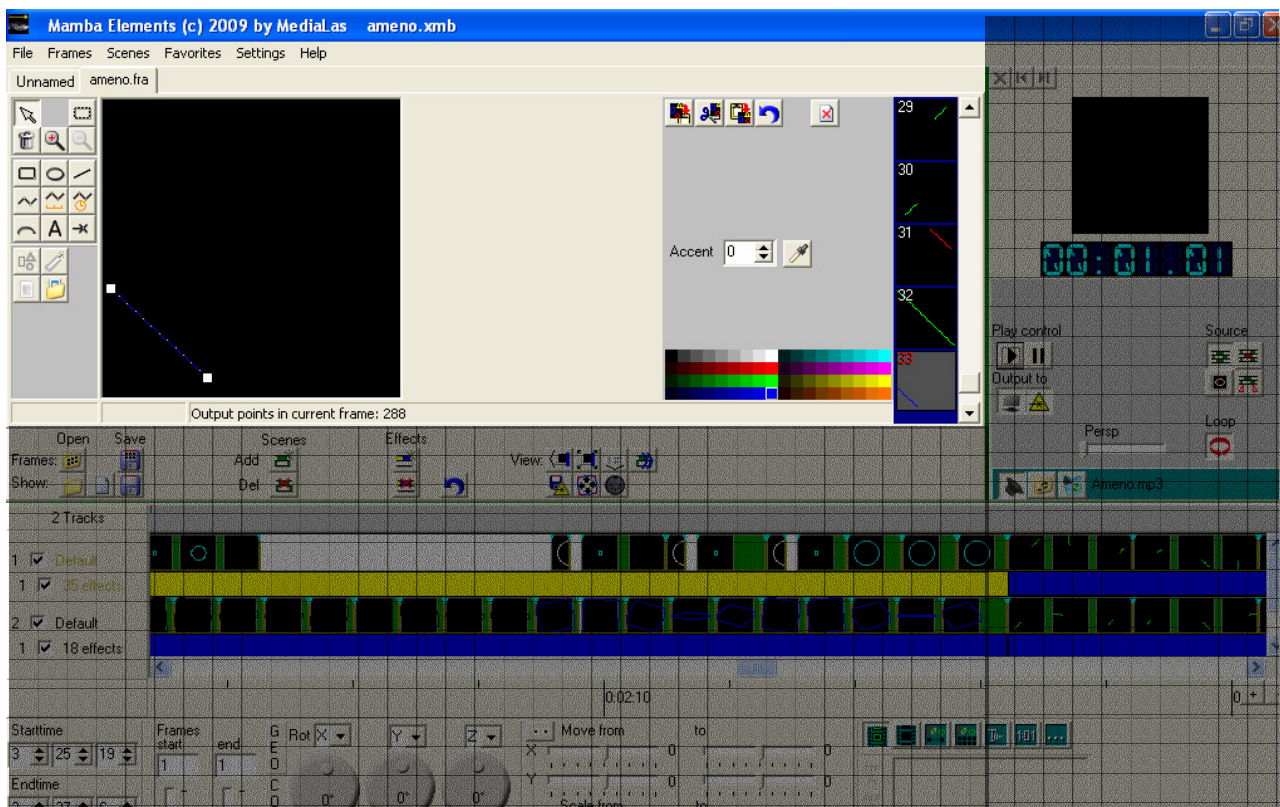
- 1. Editor for frames and framelists**
- 2. The Timeline, that holds the animation tracks**
- 3. The Scene/Effect panel**
- 4. The Laser Preview with output and play control**

All 4 parts are set onto one interface screen, which allows to oversee all necessary information at once. However, the screen can be set to different width and variances, just as increased timeline window, increased laser preview window, increased editor window etc. To move or change dimensions of screen parts, just click, hold and move the mouse pointer to separator lines on the screen.

Editor/Framelists

The frame and drawing editor of Mamba Elements is a bit different, compared to other kind of laser software. The main difference is the handling of the drawn figures, the “objects”. Each single object is handled individually, you are not restricted by single points or areas. Even texts can be edited at any time and changed or manipulated easily at any time during, before or after the show. Therefore, we call Mamba Elements “fully object oriented”.

Logos can be traced by loading a background bmp image, and following the outer lines with the polyline tool. To avoid any image distortion on the bmp image, we recommend to hold the bmp image in an exact square shape. Use a simple painting tool to create a square picture, and insert your desired logo or bitmap, that you wanted to use as background.



The editor holds an unlimited number of framelists. The left, large window shows a selected frame with all corner points and colors, the overview list next to the Laser Preview window offers a scrollbar to scroll through the framelist for easy and fast access, and additionally acts as an overview. By double clicking on a preview frame in this list, the frame will be opened in the editor window for editing, recoloring etc.

Each frame in this overview window can be dragged and dropped onto the timeline into scenes or to create new scenes.

By clicking onto one of these frames with the right mouse button, a menu will open, which lets you add, copy, paste or delete frames from this list.

Create a new frame

Either use the drop down menu “Frames” or the right mouse button in the overview window, select “New frame” and confirm. A new frame is added to the list, but it is not yet active in the editor

window. Now double click on this new frame in the overview window, and it will appear in the editor's window.

The tools

The editor of Mamba Elements offers various tools to create and draw images, logos, cartoons or text, for later use on the timeline in the showeditor. To select a tool, simply click on the tool button. If you want to work continuously with the same tool, simply hold down the shift key while clicking the tool button. It is then locked until you select another tool. If you simply click on the tool buttons, the buttons will stay for one drawing movement, and then release to their off position. To activate a drawing tool permanently, hold down Shift-key while clicking on the tool button. Now you can use this tool until you select other tools or press other buttons or hit the ESC key.



Rectangle, ellipse, line click to activate. Use the mouse pointer to draw shapes in the editors window. Click and hold the left mouse button to draw the figure, after releasing the mouse button, the drawing will be finalized and is now available in the editor window as a new object.



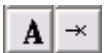
Polyline, B-spline left click for each point, right click to set last point.

Polyline is a very powerful tool, and is mostly used to trace lines or outlines from a background bitmap image. Also, the polyline tool lets you draw closed objects with no blanking lines. By left clicking, a new corner point is set. For finishing drawing with the polyline tool, simply right click.



Free hand press left mouse button and drag. Press the ctrl key to round the current coordinates to multiples of 100. The gap between the points can be adjusted in the settings menu, see Settings.

When finished drawing, the object is active and the tool "Select" is activated.



Text, beam click on the canvas to position. Select the text tool. Now hit desired position on the drawing window, and the text box right to the drawing window will open. The toolbox will allow you to select the desired font and to enter some text into the text line. This text will immediately appear in the editor window. It behaves like all other tools, and acts as an object, which can be moved, resized or recolored at any time. Text objects can also be changed at any time, even during a show.

The beam tool is very powerful for setting single or multiple beams onto mirrors or simply in the air. Each beam consists of one single point, which is repeated a specific time. By default, it is repeated 40 times. How many times each point is repeated is shown in the accent box right to the editor window. (Refer to the Accentuation section later in the manual) A beam can be moved or recolored at any time.

Warning! Single static beams can be very harmful, if aimed to audience!

Background images



Mamba Elements offers very powerful tools in combination with background images. You can load a background image by clicking on the button. This is useful when creating logos. All bitmap files will be loaded. Be careful! Mamba Elements will stretch bmp files to a square format. If your file is not square, it will be stretched in one direction. So be sure to prepare bmp files in a

square pixel format, just as 300x300 or 400x400 pixels. The most simple way is to use the Paint program from MS Windows.




Turn the background image on/off. The images will not be projected in lasers, they are simply used as a background image for tracing or drawing logos and/or figures. With this button, you can switch the background bmp image on and off, to either see your tracing results or to switch off the image after finishing your frame.

Selecting drawn objects

Click on, or close to, any object (at a corner point or the lines in between) to select objects. You can drag and move any object to another place, or change the shape by dragging the markers on the corner points.

When you hold down the alt key while selecting an object you can change the size of the object.

To select/unselect multiple objects hold down the ctrl-key or use the  region button.

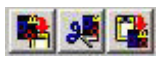


You can group objects with the “group objects” button. To select/unselect multiple objects hold down the ctrl-key and click the objects you want to select for a group. After selection, press the “group” button. Your selected objects will now be grouped. Now, these group can be manipulated with other tools, such as move, resize etc.

But even within a group, a single object can be selected. To select a single object within a group hold down the shift key while clicking.



Ungroup with the “ungroup objects” button. First select the group, that has to be ungrouped, and press the “ungroup” button.



Copy/cut/paste objects with the buttons above the layer list. All marked or grouped objects are copied or cutted out with a mouse click, and re pasted the same way.

Selecting a text object allows to edit text, or change the font or letter size at any time. The changes will be affected immediately within a show.

Adding colors to your laser show



Re-color selected objects by clicking a color on the color pick.

The color in the top left corner is black, which is good for changing colored objects (or parts of them) black, which results in blanked lines.

Double click to change a color. You can save / load a palette from the local menu (right mouse button) of the color pick area.

The selected color stays active, new objects will be drawn in the active color.



If you want to color only parts of the frame use the “Select rectangle” tool to select a rectangular region, and then click on a color.

Another very powerful recoloring tool is the “recolor from background” tool, available with your right mouse key in the effect editor. You can use background images to recolor objetos. In the folder “colors” of the program folder you will find example background images, created with CorelDraw drawing software. When the background image is loaded, select “Recolor from background” from the local menu (right mouse button) of the editor area. If no selection is active all

objects will be recolored. You can select objects and/or regions, to recolor the selected objects/regions only. All non selected objects or regions will stay on the default color.

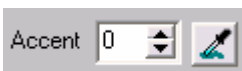
Example:

Draw a simple square in white color. Now open a background color image with “open background”. Select a background bitmap file from the “colors” folder in your Mamba Elements directory. Select the rectangle, click the right mouse button and select “recolor from background”.

Colored bitmaps can be imported and created at any time, using various software programs on the market. Please make sure, that the final bmp file has a squared shape with similar number of points for both sides. Open the colored botmap same way as opening background images. Now right click on the object, and select “recolor from background”. After finishing, just turn the background image off.

Accentuation

Accents are another very powerful tool for making your lasershow brighter and adjust objects to different scanspeeds. It has to be used carefully interms of laser safety, to avoid high power beams into the audience during audience scanning.

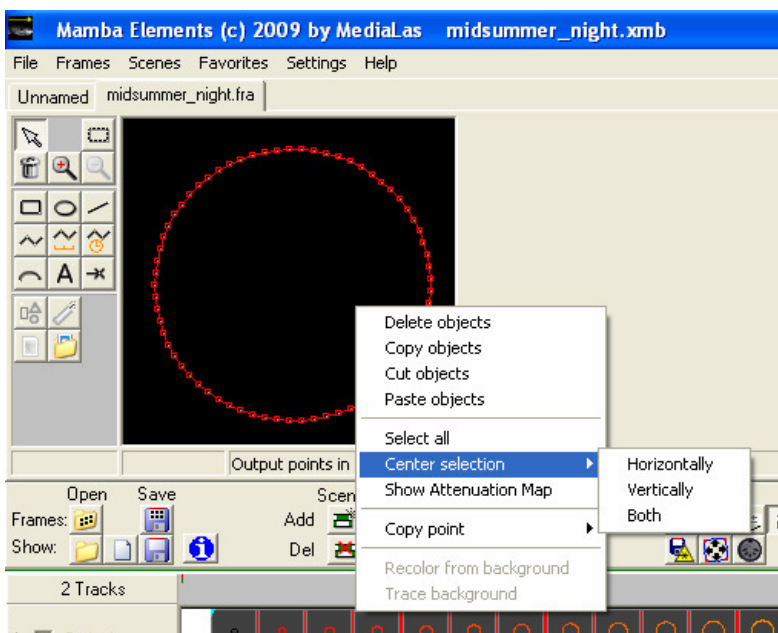


Select an object and change the value to increase the brightness of line points in an object. Press the “pick color” button, then a color on the color pick (see above) to change the color of these points. Tip: select an accentuation color, and then change the object to black if you want to show only the intermediate points.

Changing the accentuation of beams will increase the time, the beam is displayed within dots on the shape, it will then appear brighter. At the same time, it decreases the frame repeat speed. In large frames, a non wanted flicker can occur. But sometimes, this is wanted and results in some nice artistic effects.

To learn more about this powerful tool, simply draw some different shapes, just as a rectangle or circle, and play around with the accent tool during laser output.

Auto centering objects



You can center selected objects by choosing “Center objects” from the local menu, or simply click on the object with the right mouse button to open the dialog. Here, various centering processes can be initiated, such as centering horizontally, vertically, or both.

“Copy point” from the local menu annotates a point from the selected objects or the current location for later use in the show editor, for example as rotation centers.

Single objects can be duplicated, removed, cutted out, or pasted in.

The frame area

Edit framelists

The frame area shows all the frames in the current frame list. Right click on a frame, or use the menu, to add/delete/clear frames or open/save frame lists.

Double click on a frame to open it in the editor.

You can copy/paste frames between framelists. To select the frames click on the start frame, then hold shift and click on the end frame, the selected frames are marked with red frame numbers. To copy/paste click the right mouse button.

Use Ctrl+Tab and Shift+Ctrl+Tab to move to the next/previous frame list. Ctrl+F4 closes the current framelist.

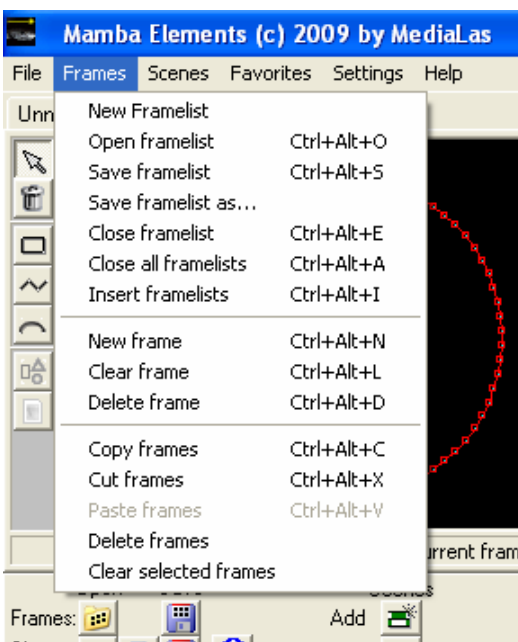
Close/scroll through frame lists using the buttons above the preview window. Be careful with the cross button – this one



deletes the actual open framelist from the list tabs!

Adding frame lists: you can add a frame list into an open frame list from the local menu (“Insert framelists”), and additionally from the drop down menu box. From the local menu you can also close all open frame lists.

Saving or loading framelists



It is very important to save edited framelists after final editing, and from time to time during editing or frame creation, to avoid any data loss after sudden software instabilities. To save a framelist, or multiple framelists, simply open the dialog menu from the top menu list. Here you will also find the latest accessed framelists.

Please note: Saving just the framelist does not mean, you also saved the show file! If a show was created before, also save the show by dropping down the file menu.

Object frames – this is the Mamba Elements internal standard file, which saves frames as object oriented frames.

Just behind the menu points, you will find the direct key access codes to these functions. Experienced artists and programmers will find it very useful to use the key codes instead of dropdown menus.

Import ILDA framelists

Note: You only can import ILDA framelists with max. 250 frames! In case of the framelist has more than 250 frames, the other frames will be cutted and will not load!

ILDA standard framelists can be imported in two different ways:

- Open frame file in the “Frames” menu as a framelist

If a regular .ild framelist is opened or loaded with the “Open framelist” command, all frames are available in a regular framelist, and can be used like normal frames within a show. Frames have to be moved or dragged to the timeline, and there has to be a scene or show created. This is usually done, if a framelist contains different frames, which does not relate to each other, just as a ongoing comic etc. Also, this mode is used for opening single ILDA frames.

- Open framefile in the “File” menu “Show from framelist”

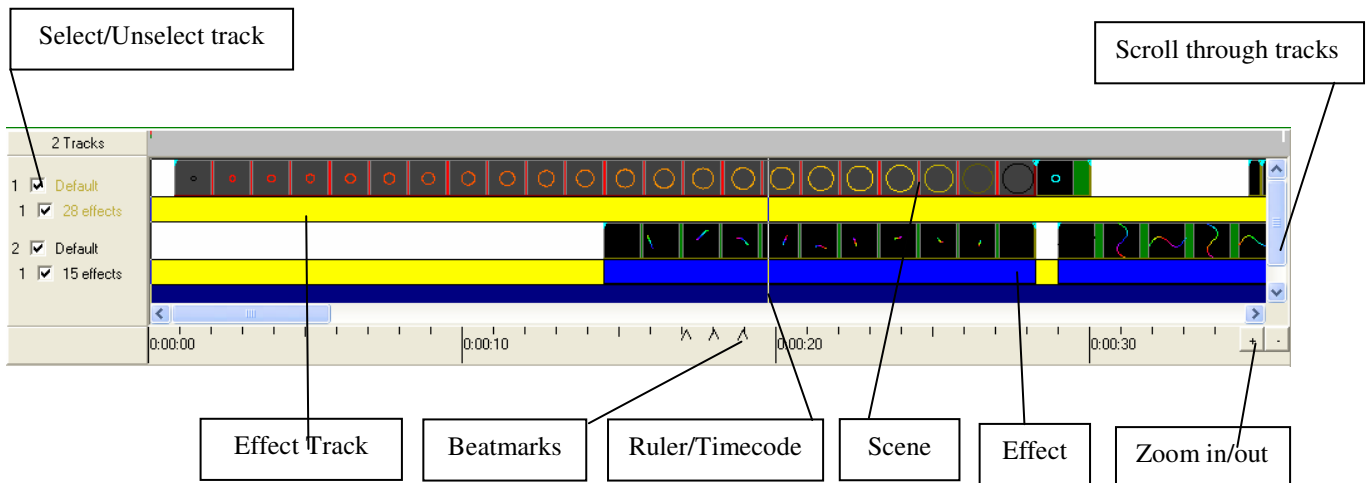
If a continuous framefile is available, Mamba Elements can automatically create a show out of this frame file. Example could be to export an entire show to an ILDA frame file, with a fixed frame rate of 50 fps, and the import to Mamba Elements. Any timing, that has been done on the show, will also be available in Mamba Elements.



After the appropriate file is selected, Mamba Elements asks for the frame rate. If a show was exported with a specific frame rate, enter the correct value to make sure, the original timing of the show is reproduced.

Timeline/Show editor

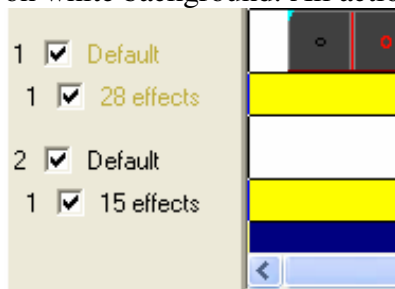
The show editor is located below the frame editor window. A show is basically a collection of various scenes. In Mamba Elements, the number of scenes on the timeline is not limited. After a scene is placed, it can be moved and changed at any time. What happens in a scene is also displayed on the timeline in the frame previews. Any change that is made during creation, is immediately displayed in the scene content pictures. Movements, animations, rotations, zooms etc are done in the scene directly, there is no need to create a separate effect to move a frame.



Tracks

On start up you will see 2 tracks on the timeline in white color. This color can be changed in the setup menus. However, we recommend to leave it in the preset colors for user compatibility.

To select a track click on the name to the left of it. The text of the selected track will be displayed on white background. All actions will now affect this selected track.



The checkbox to the left controls visibility of the track during laser and screen output, uncheck to temporarily disable the track. This could be necessary during programming or on special presentations. By selecting tracks, various laser projections and images can be displayed within the same show at the same time.

Each track holds 1 subtrack, so called “Effect tracks”, which are displayed in yellow color below the selected main track. Additional effects on this sub tracks control more movements and increases the freedom of artistic use. Effect tracks uses processor power, so depending on your computer’s processor speed, effect tracks could effect the projection speed.

Scenes



Each track on the timeline uses one scene track, while unlimited number of scenes can be placed on this track. A scene can hold a various number of frames from any opened framelist, or is capable of displaying the computer time, morph or pause or display a static or scrolling text.

Scenes can be added onto tracks, which are displayed on the timeline:



To add a scene to the timeline either the “Add scene” button is used or simply drag and drop a frame from the framelist onto the timeline to create a new scene with 1 second default play length. This default length can be changed at any time from 1 cue (1/25s) up to unlimited length. The frame will then automatically become the start frame of that scene. If the scene is created with the “Add scene” button, it will be added on the leftmost empty spot of the selected track and will be 1 second long.

The buttons on the bottom right lets you select the type of scene:

Pause: nothing will be displayed. Use this to temporarily disable a scene or show no laser output during the regular show.

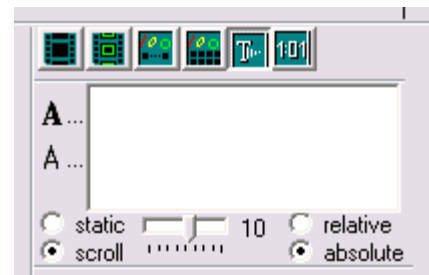
Play frames: the scene will display the frames sequentially from start to end value.

Morph start to end: the scene will morph the start frame to end frame, ignoring all frames in between (in case the frames you want to morph are not consecutive in your frame list).

Morph all frames: the scene will morph each two consecutive frames, from start to end value.

See “Frame area” above on how to add frames to scenes.

Text: A nice feature of Mamba Elements is the ability to run a simple scrolling text on the timeline, without programming frames before. You can enter text in the text area below the buttons and select whether the text should be scrolling or static. For scrolling text you can adjust the speed with the slider either relative to the scene’s length (a value of 10 means once from right to left, -20 2 times from left to right, etc.), or absolute (so if you change the length of the scene the scrolling speed won’t change). For static text the slider will change the horizontal position of the text.



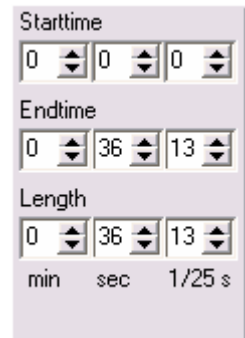
To change fonts, click

A... (for TrueType fonts) or

A... for simple fonts. These fonts are mainly used, if a high letter quantity is necessary, but font quality is not that important.

Clock: Displays the current real time of the internal computer clock. The time will be displayed, as long as the scene is running on the track. Create a new empty scene, then press the Clock button, and the laser will display the real time laser clock.

Each scene has a position and length on the track, which is shown on the lower left of the screen. Adjust the values with the spin edits, or drag the scene or its borders to the desired values. Holding the Ctrl key while dragging a scene or its start/end will snap the values to the tick marks.

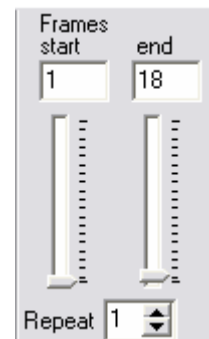


To select a scene simply click on it. Select/deselect multiple scenes with ctrl+click. You can also use “Select scenes” from the local menu (right mouse button) together with the begin/end markers to select a range of scenes on the currently active tracks.

To save the selected scenes into a separate show file use save scenes from the local menu. You can also add an existing show from there.

Adding frames to your show

Drag a frame to a scene/track to include the frame in the current show. To add multiple frames, or an entire frame list, add one as described before, then adjust the frames start/end value of the scene to the desired values. As an alternative, you can select a sequence of frames with the Shift button, and drag the whole sequence to a scene or an empty part of a track. The frames that are currently used in the selected scene, are marked with a red frame in the frame list. Change the repeat value, if you want to repeat the frame sequence more than once within that scene.



Frames are saved in the .FRA format. This format saves the object information.

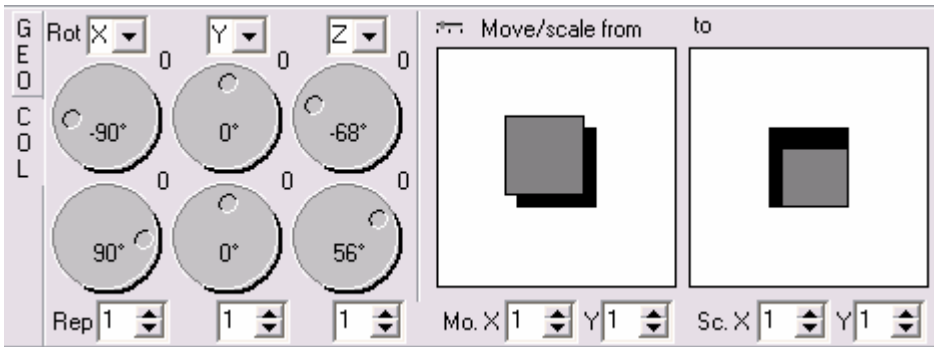
You can also save in ILDA (.ild) or MediaLas’ older frame formats (.FL*). The object information will then be lost; the frames are saved as an (unstructured) list of points. Use this option to export to other editors or for playback (on MediaLas’ Avatar or Hotboard devices).

Scene/Effects panel

Now here comes the real deal. You are now about to enter the most powerful tool of Mamba Elements.

The content of each scene can be manipulated by assigning effects. The effect editor appears underneath the timeline when a scene is selected.


The tab labelled GEO contains adjustments for rotations, size, and position of the scene, each with a start and end value. The scene content will smoothly change from start to end value over its duration.

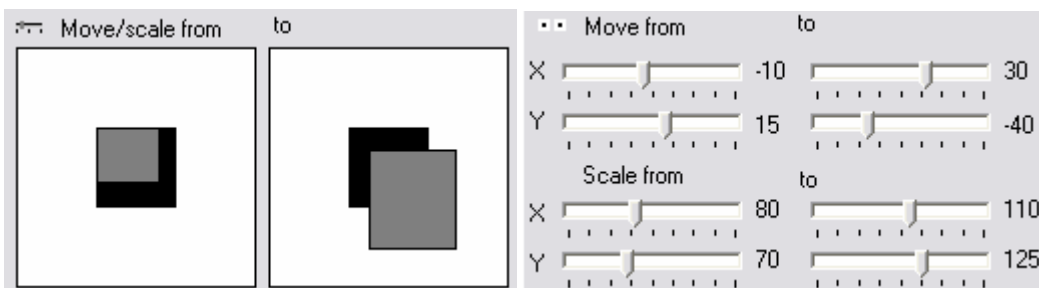


To lock start/end value while changing, hold shift key while changing the start value. To repeat the effect more than once adjust the “Rep” spin edit next to that value pair.

Double clicking the rotation handles sets the value to 90, 180, 270, 360 degrees if the value was 0, 90, 180, 270 degrees respectively, and to 0 otherwise. Holding the Ctrl key when changing will round the values to multiples of 5 degrees.

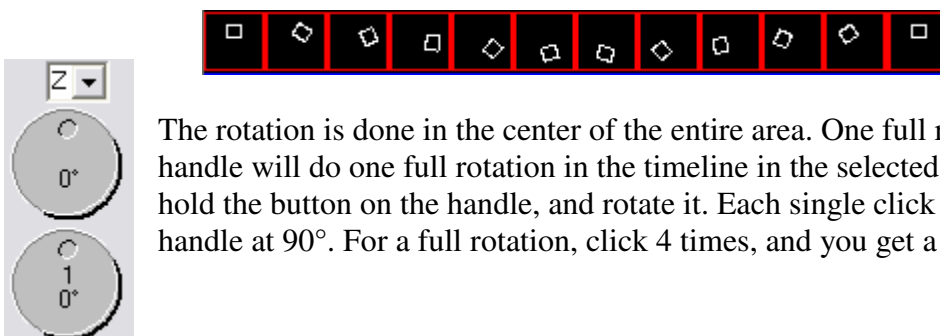
Double clicking the move/size areas will rest the size to 100/100% if it was changed, otherwise the position will be set to center.

Click on the  Button to change Move/scale controls to sliders, as in the image below. Double clicking the sliders (in the lower part, where the tick marks are) will reset the values.



Rotations

The following example uses a small rectangle in the upper half of the frame. Let's add a full rotation about z. The scene will look as following:



The rotation is done in the center of the entire area. One full rotation on the rotation handle will do one full rotation in the timeline in the selected scene. Simply click and hold the button on the handle, and rotate it. Each single click onto a handle rotates the handle at 90°. For a full rotation, click 4 times, and you get a full 360° rotation.

The first handle shows you the start value of the rotation, the second handle the end value. Furthermore, the numbers in the handles show you the number of full 360° rotations, that will be performed in the scene. If you read 1, and additionally 0°, you get one full rotation. If the start position of the rotation should be changed, rotate the first handle for the rotation start position, then rotate the second handle for the rotation end position.

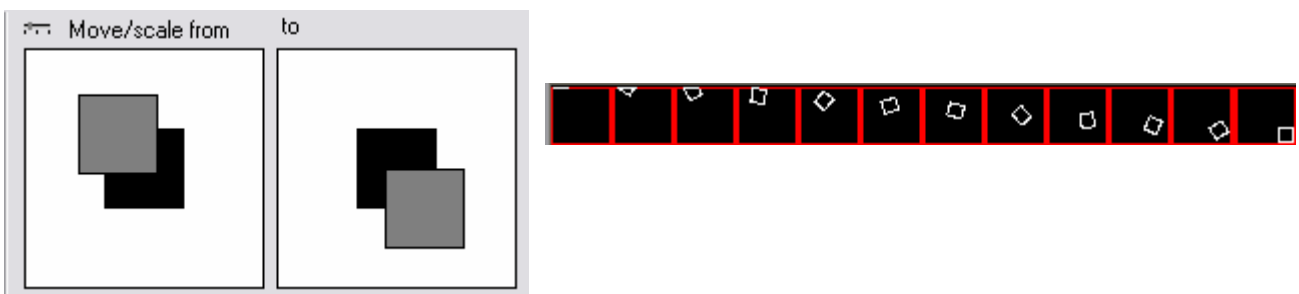
If an object should be rotated to a static position, move both handles to the same value.

To change the centre of the rotation itself, you can right click on the rotation handle. From the menu select "center from selection". This allows you to change the rotation centre to the corner points or the centre of the currently selected object(s) in the editor window. So, select the rectangle in the editor and use "center" from the local menu of the rotation handle. Now, the center of the selected object is used as the rotation center. The object will not rotate about the center of the projection area, it rotates about itself. The scene will look like this:

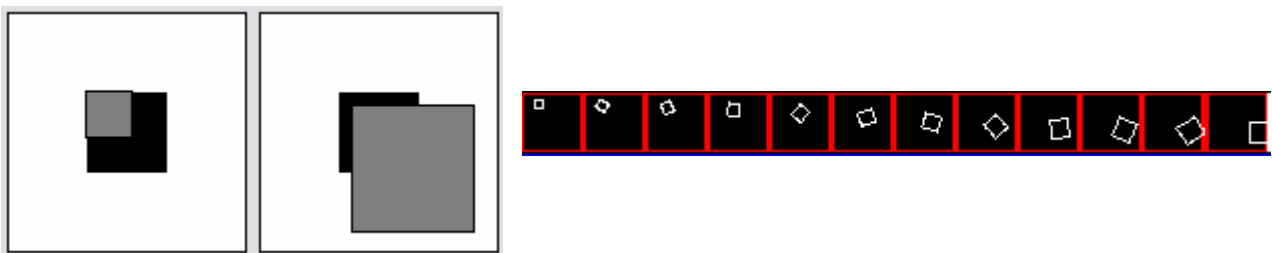


Position/Size

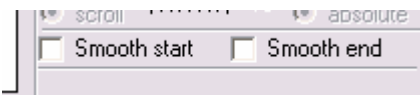
To move the frames from one point to another, you simply drag the grey areas in the Move/Scale area. Just place the mouse cursor onto one of the areas, click on it, and move it to any position within the entire projection space. For example, to move the frame (the one we have rotated in the example before) from top left to bottom right, move the start area to top left, and the end area to bottom right. The movement is now done over the entire scene from start to end value.



If you drag the border of the grey areas you can change the size of the frame:

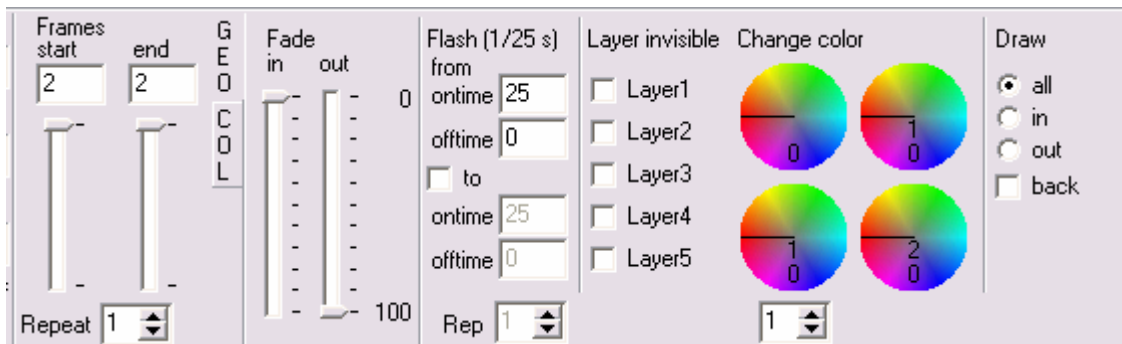


For a static repositioning of an object, simply move both areas to the same coordinates. Hold the Shift button to lock both start and end value, then move the areas with your mouse pointer to its desired position.



You can accelerate/decelerate the effect speed at the beginning/end of a scene by checking the appropriate boxes. These values are relative within a scene.

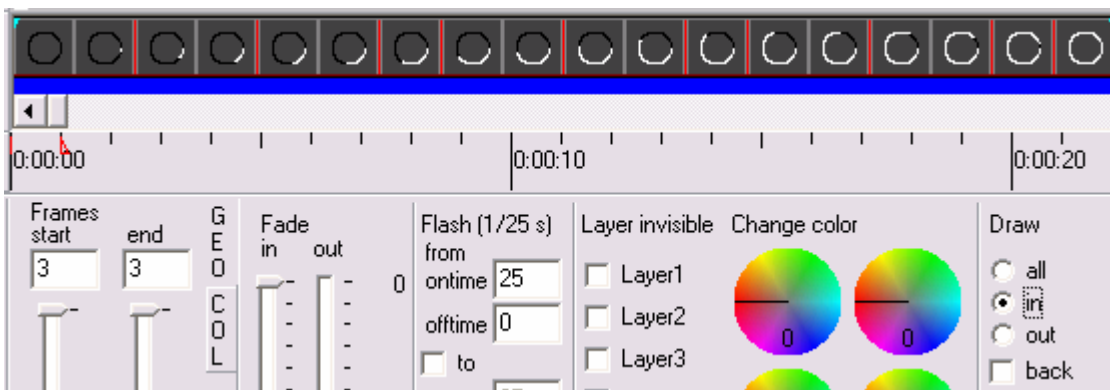
Color/intensity effects



The tab labelled “COL” selects color and intensity effects for the selected scene. Use the Fade in/out sliders to fade in/out the scene from/to black. The sliders show the relative percentage of the scene length. Add a flashing by entering the desired on and off time, values of 25/25 give one second on and one second off. Check “To” to change flashing speed, values of 0/25 and 25/0 will start with a black scene, then increase flashing until the scene is permanently on.

Check layers that you want to disable in the scene. If you designed frames in the frame editor under different layers, now is the time to use them.

With the color morpher, you can select a color range that is morphed into a new color range. The settings in the image below select the whole range (second dial is turned one time), to be morphed once around the color circle (the lower two dials are turned one and two times respectively). Tip: You can select this setting (one complete morph) from the local menu (right mouse button) of the dials. Also set the dials to zero from the local menu. Holding down the shift key and rotate the left dial, will let the right dial rotate simultaneously.

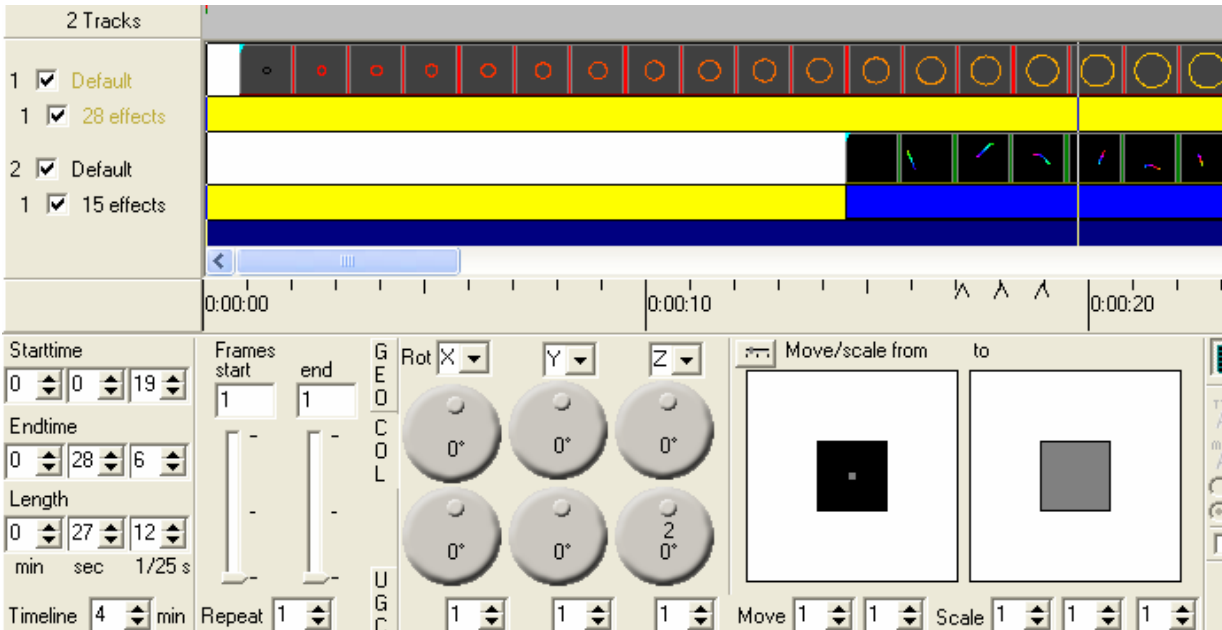


Draw in/out: select draw in out to draw in or draw out a scene point by point. If this function is used for a text, it looks like somebody is writing this text in realtime.

Re-color: you can re-color the scene, either with one color (select pick then press the button to the right and select the color from the color pick in the frame editor area), or using a rainbow color scheme. With the latter you can increase the number of times the rainbow colors are repeated.



Compose a show from multiple scenes



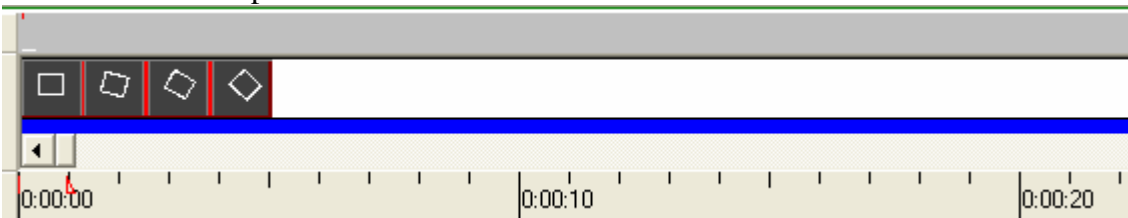
Please note when saving shows that use frames from the (unnamed) “editor” frame list, you should first save the frame list. Otherwise the show has no reference to the frames, and you will have to assign frames to scenes manually when reloading that show.

A selected scene can be copied/pasted. It will be pasted at the current time position on the current track (to change these see below) if you use the paste button. You can also right click and paste at the current mouse position.

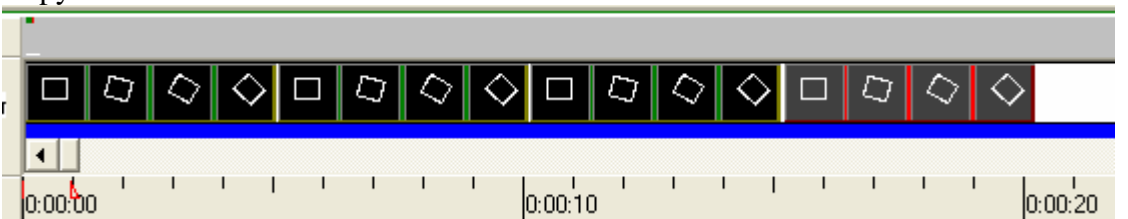
You can select/unselect multiple scenes by holding the Ctrl button. Multiple scenes can be moved or copied/pasted. Press Ctrl+A to select all scenes.

From the local menu you can swap/assign the start/end effects of a scene. This can be helpful when copying scenes as in the following simple example:

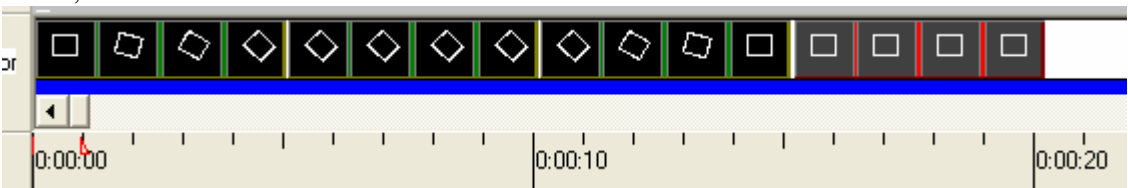
We start with a simple rotation:



Copy the scene 3 times:



Now from the local menu select “Change effects” and then “Set all to end vals” for the second scene, “Reverse all effects” for the third and “Set all to start vals” for the last scene



Now we have a rotation to the right followed by a static picture, then rotation back, and static again.

Scenes can overlap, although this is not recommended. When scenes overlap you may not be able to access a scene by clicking it.

Overview area

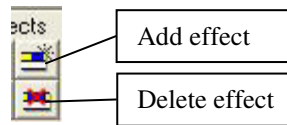


Located above the track area, there is an overview over the current timeline content. Green lines indicate scenes, the currently selected scene is shown in red. On the bottom and right, a white line shows the currently visible track area (the “ruler” below the tracks). A red line on the bottom shows the begin/end marker. You can also click on the overview to position the time marker. In the image above you can see one scene on track one and 3 scenes (the second of which is selected) on track two.

Tip: Set the length of the timeline (bottom left corner) to the same length as your audio file. This makes it easier to zoom in and out.

Effect tracks

You can place effects on the 2 effect tracks independently from scenes. This is quite helpful when a certain effect should span over more than one scene, or only part of the scene. Also, various effects can be used at the same time to get interesting movements.



Adding effects:

Select the track for which you want to add an effect track (click on the label). Then add an effect track with the “Add Effect Track” button, and then add an effect with the “Add Effect” button above the timeline.

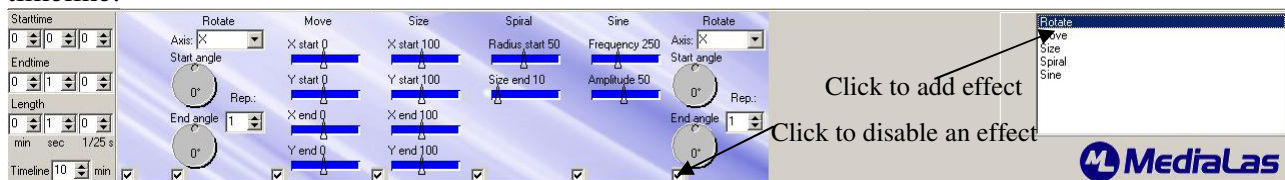
Deleting effects:

Use either the buttons or simply right click onto a scene and select “delete scene”.

Each effect can be stretched to any desired length, by using the mouse pointer. Click left on the end or the beginning of an effect, hold mouse button, and stretch the effect length. The length is not limited to a specific scene. You can use an effect over the entire timeline, if you want to do so.

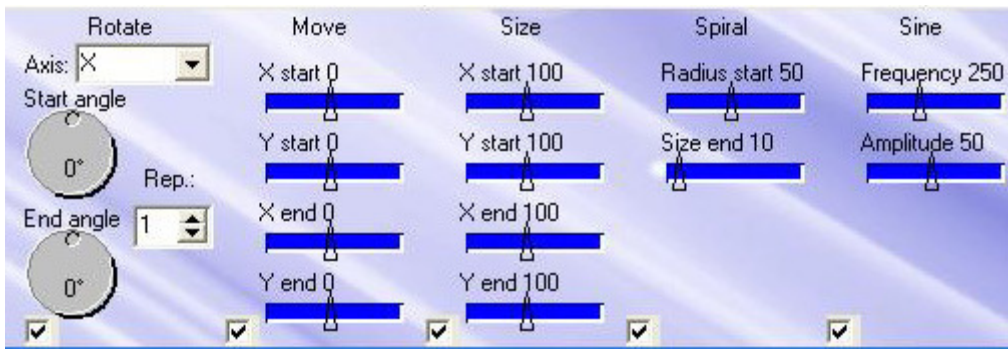
The Effects

The following picture shows the currently available effects, which can be placed anywhere on the timeline:



Add single effects by clicking on the desired effect on the list on the right. Use the check boxes below the effects to turn them off, the checkbox on the left disables all effects. To delete effects use the local menu (right mouse button).

Available effects:



Rotate: Allows to rotate a frame or framelist or scene in all axis. Very useful: By using two different axis, both rotations add themselves for very interesting effects. Dropdown box selects the rotation axis X, Y or Z. Adjust the rotation with the two handles, and set the repetition rate in the select box. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

Move: Allows to move a frame or framelist or scene in X and Y. Adjust the starting coordinates with the two top sliders, adjust the end coordinates with the lower two sliders. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

Size: Allows to resize any frames, framelist or scene static or dynamic. Adjust the starting size with the two top sliders, adjust the end size with the lower two sliders. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

Spiral: Absolute effect tool. Place an adjustable spiral movement to your timeline! Adjust the effect with the two sliders, while Radius start adjusts the large radius of the spiral, Size end adjusts the end radius of the spiral. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

Sine: Add a sine wave to the animation. With this effect, phantastic effects can be achieved. Adjust the frequency and amplitude of the sine wave with the two sliders. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

All effects can be used multiple times in one effect layer.

Play a show on your laser projector.

After designing of show is finished, the show should be saved onto your harddisk or flashdisk. We recommend furthermore, to save the show on a regular basis all 10 minutes or so. It can be done easily by clicking on the dropdown menu “file”.

Playback control

The buttons labeled “Play control” start/end/pause the playback. If you click on “Play”, your show, or part of the show, starts to play on the selected output device, depending on the selected source.

“Output to” lets you select monitor and/or output to laser projector. If the laser symbol is not selected, the entire show plays in the preview window only. Also, if you experience a slowdown of your computer while outputting to the preview window, simply unselect the preview.

“Loop” plays the show in a continuous loop. Be careful not to use this button during a normal laser show, or your show will start again from beginning.

When both play and pause buttons are pressed, you can set and/or drag a position marker by clicking on the “ruler” below the tracks or the overview area above the tracks. Move this position marker on the timeline, this allows to scroll through the show. At the same time you are able to scroll frame by frame through the entire show, by using the cursor keys Left and Right on your computer keyboard. With the Up and Down keys, the show is scrolled in 10 second steps. If music playback is selected, also the music will be played. The more you scroll, the stranger the music sounds.

User selected time:

You can press Ctrl+B and Ctrl+E to set a begin/end marker anywhere on the timeline. Please note, that an end marker can only be set after the begin marker.

Source selection

The buttons in the “Source” section select the part of the timeline that is displayed:

- ❖ Entire show from start to end
- ❖ The currently selected scene
- ❖ A single frame, which is currently displayed in the editor window
- ❖ User time from begin to end marker

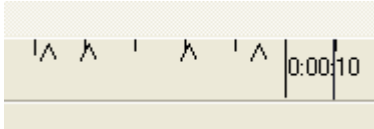
Add music to your show

You can load a song to be played with the show. Open a music piece with the folder button. Now select the wave or mp3 file, or even a song from a music CD. Press the speaker button to enable music playback. Now, the music plays on any output. It will even scroll automatically to the correct time frame, if source selector is set to other playback format than entire show.



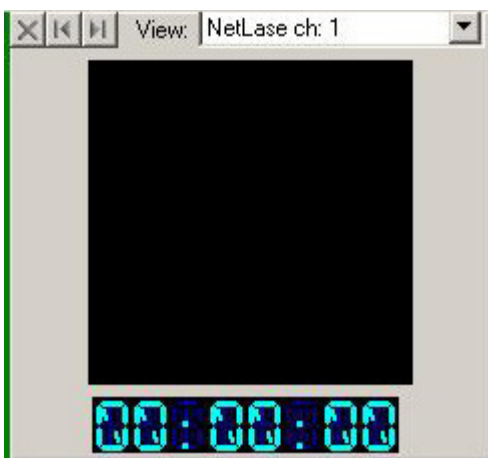
Mark highlights in the music with beat markers

Beat markers are very useful, if a new beam show is created. Open a music file, and press play. Now, during listening to the music, you can hit the space key to put markers on the timeline while the show is played back. This allows you to put scenes to specific positions, which are premarked in the timeline. The marks will be displayed as black triangles on the “ruler”.



To delete the marks after show creation is finished, press Ctrl+space.

Preview window



If not in playback mode, or during frame editing, the preview window on the top right on the main screen shows an overview of the frame editor. Otherwise, the preview window will display the current content, played back on the selected physical projector, when monitor output is enabled. The drop down box on the top of the preview window shows you all available physical projectors, which are currently in the setup up. Depending on the selection, the preview window will show the content of the selected projector.

When zoomed in, you can drag the visible grey area around to see high resolution previews of specific scene content.

The time code display, based below the preview window, shows the exact running time, in minutes-seconds-frames, while frames can be 0 - 25

Special function: Show blanking lines

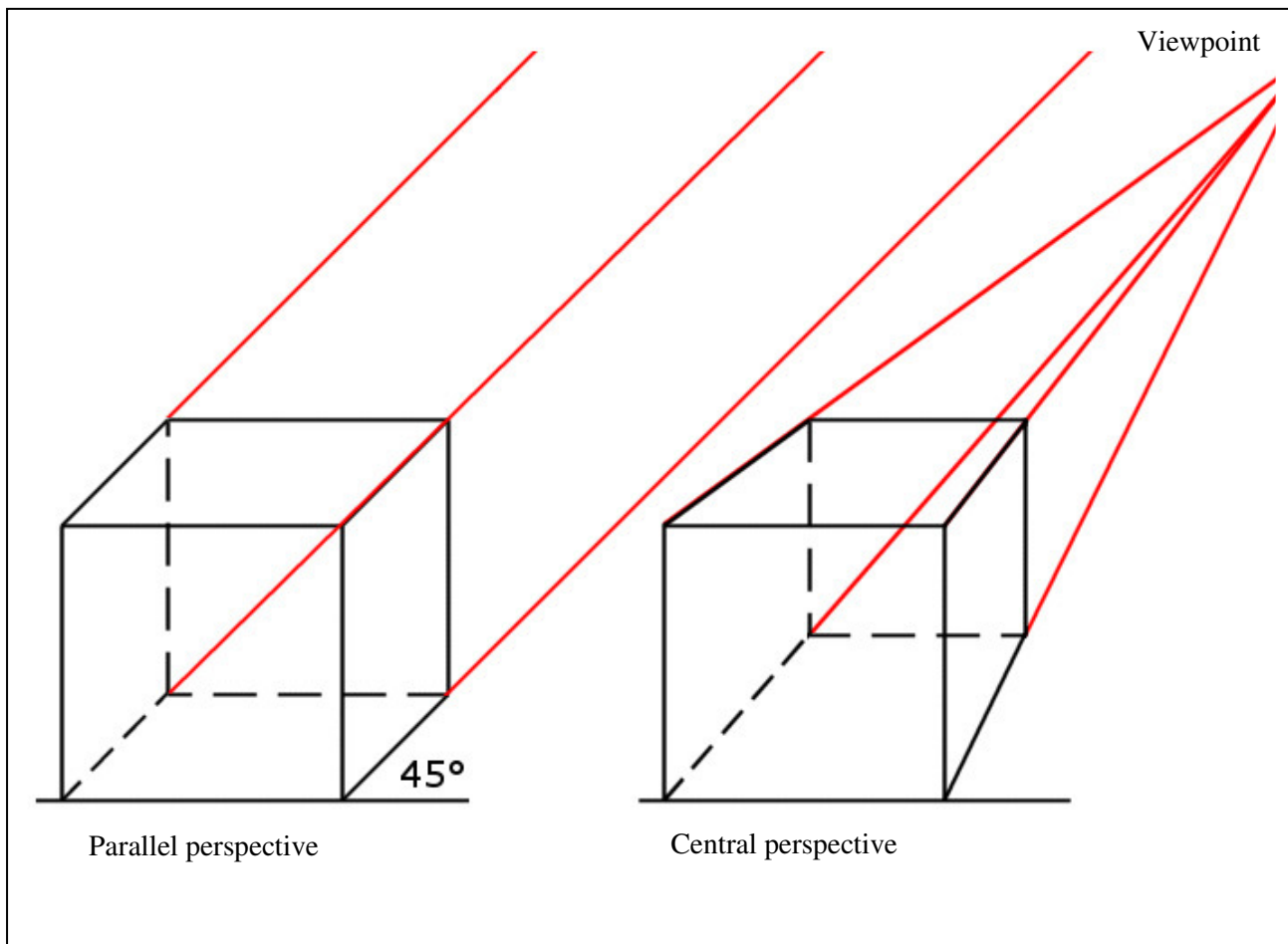
The button, which you can find in the UGC settings, shows a very special debugging function, and should be carefully and properly used. After this function is selected, all the color and blanking outputs on your interface box will be set to fully high level. This means, all your lasers in your laser projectors are set to full power, and do not modulate anymore. This allows to debug errors in the frame, or to measure your laser output power without any blankings in between. All lasers are set to 100%, and the accurate output power of the lasers can be measured accurate.

Special function: Perspective (Persp)

Another special function is built into the playback module – the perspective slider. It could be interesting to play around with this slider a bit, since you cannot destroy anything in the show.

Under normal circumstance, or if the slider is fully in it's left position, all rotations, movements and other 3D functions, are played back in parallel perspective, where there is no imaginary viewpoint in the Z-coordinate. A square, which is rotated in X or Y, will just increase or decrease it's size in the desired axis. All sides are parallel during rotation. This is not useful for graphical applications, but very useful for beamshow applications.

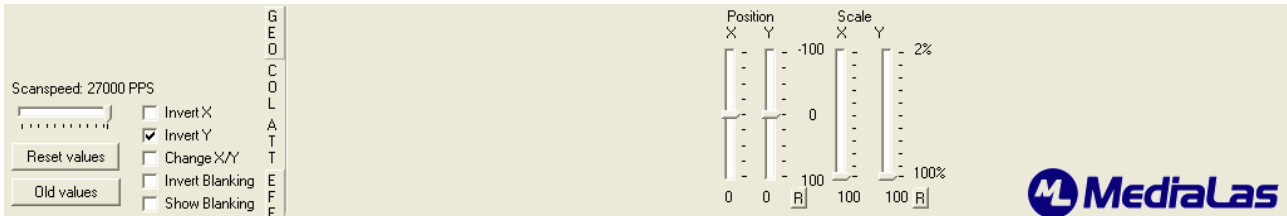
As soon as you apply a value to the perspective slider, an imaginary Z viewpoint is set "behind" the normal projection area. The same square, rotated by X or Y, will now zoom in 3D, in central perspective, where one end of the square, which rotates towards the viewpoint, gets smaller, and the other end, rotating towards the observer, will increase it's size. The rotating parts are no more parallel.



To learn more about this slider, simply create a square in the editor, move it to the timeline, and apply a 360° X rotation. Now play back this rotation in loop mode, and move the slider back and forth. Interesting, isn't it?

The Universal Geometric Corrector

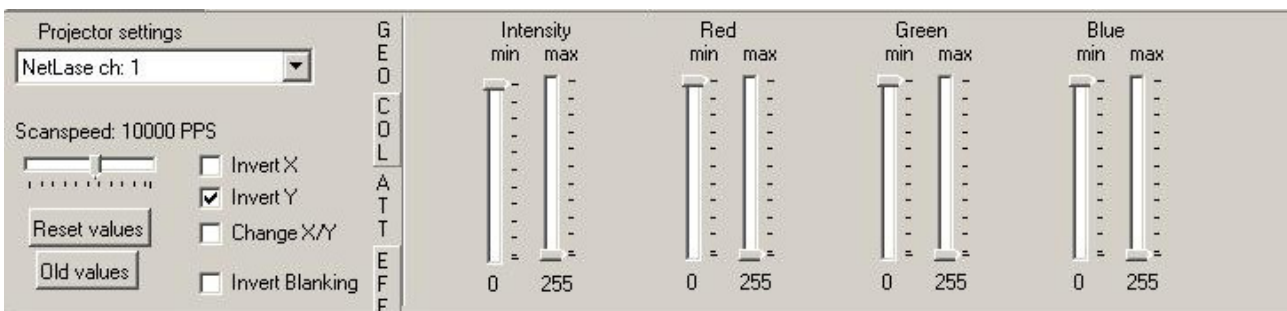
Mamba Elements contains a very sophisticated geometric correction tool, that allows multiple correction to the projected image, like position, size color alignment and scan speed settings. Each physical projector holds fully independant functionality. Depending on the projection angle, the projecting image could be distorted in many ways and directions. These distortions can be corrected to almost any projection surface.



This is the panel interface of the UGC, which shows now the geometric correction, and the scanner settings. On the left hand side, the projector can be set up in basic geometry and speed. Each axis, X or Y, has it's own mirror or invert checkbox. Furthermore, X and Y can be interchanged. This could be necessary, if the projector is mounted 90° turned on a side truss. For some older style lasers or incompatible projectors, the blanking can be inverted. The scanspeed slider sets the scanspeed per physical projector from around 1,000 pps to the maximum range. This maximum range can be set to a specific maximum value in the settings menu, to avoid accidental overdrive of the galvos in the projector.

The sliders adjust position and scale. Please note, that position and scale can hold a maximum value of 100 in addition. If you like to adjust the position, the scale must be less than 100%.

To set the color balance of an RGB system, click the COL-tab between projector settings and UGC sliders. There are two sliders for each color.



The min fader sets the start up value during modulation for each laser color. Laser drivers do not offer a 100% linear analog input voltage. Some lasers start to light up on different levels than others. With the min slider, these switch on levels can be adjusted.

The max fader sets the maximum output power per laser color. If your color balance is bad, single colors can be reduced in output power. This could be necessary on cheaper systems, where green is too powerful, and does not match to red and blue.

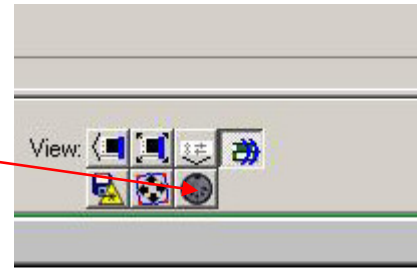
Intensity slider is mainly used for single color laser projectors, and offers the same functionality like color sliders.

The attenuation map

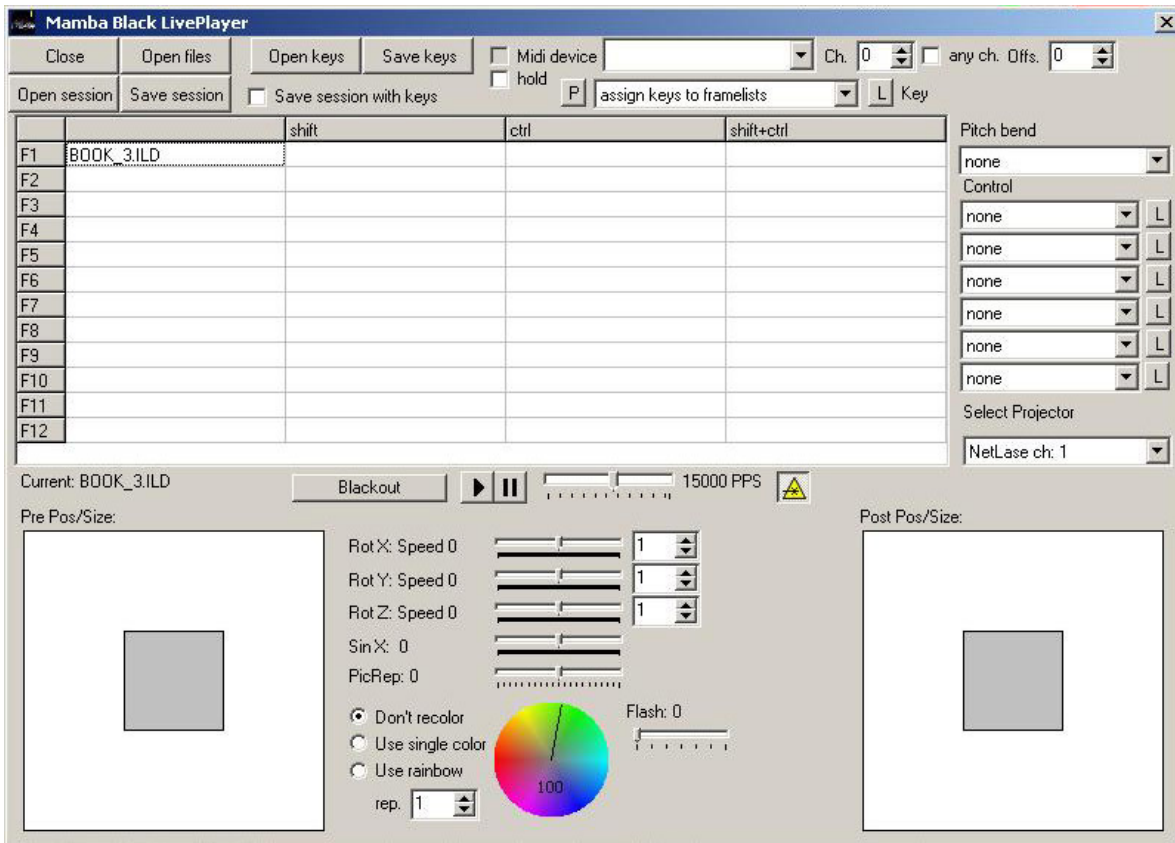
With the Attenuation Map, it is possible to set various laser safety zones to your Laser Output. This could be very important for laser safety in case of audience scanning. Click on the “ATT” button, which appears in the effects panel if you click the UGC Button, to adjust the attenuation map. On first time you do this, it will appear a small window in the effects panel which is completely white, which means that there are no laser safety zones adjusted. To adjust your own safety zones, first enter a number between 0 and 100 in the box next to the attenuation window. The number is a percentage. For example: 0 means no attenuation, 100 that the laser will be fully blanked and 50 means that the laserpower is alleviated for 50 percent. Note: Lasers do not offer a 100% linear analog input voltage. If you entered a number, simply draw rectangles, with the rectangle tool, everywhere in the frame editor where you want to add the safety zones with that special percentage. After that, simply click the “Apply Attenuation” button. Your attenuations will directly appear in the attenuation window. The more black the rectangles are displayed the bigger the percentage for that zone. You can adjust as many zones (with specificated percentage) as you want, but be sure that you are always entering the percentage before you click the apply button. To delete the whole attenuation map, simply enter 0 in der percentage box and draw one big rectangle over the whole frame, then click “Apply Attenuation”. Your attenuation window will be completely white again. Tip: It could be very helpful (for editing the various zones later) to draw various ractangles, with different percentages, in one own frame and safe this as a frame list. This will allow you, to adjust the percentages of the zones easier later.

Live player

The built in LivePlayer is a cool tool for doing live laser shows in real time. Start the Live Player by clicking on the button:



The Live interface main screen opens:



As long as there are no frames or shows assigned to the cue buttons, the sliders for rotation etc. will not show up.

You can only use framelists, not shows, since shows are just a part of a final running laser show. If you want to use a show in Live, export it to a frame list, and assign the frame list to a button (slot).

Open files will load the frame lists starting with the first slot. To assign frame lists to a specific slot, double-click that slot.

Start playback (Play has to be active) by pressing the function key and modifier keys, or mouse click. Stop with escape or the stop button. Make sure to press the laser output button, or there will be no laser projection.

Live Effects

The effect sliders offer realtime effects, which can be used during playback of a live show. Add a rotation about x/y/z by pressing the x/y/z keys. Decrease speed with shift+x/y/z. Reset with CTRL+x/y/z. Similarly use the s key for a sine wave and r (picture repeat) for changing playback speed. If you are more familiar with your mouse or trackball, simply use the mouse to move the sliders.

For resetting slider values to zero, simply move your mouse on the desired slider, and press the right mouse button.

Use the grey areas to move/resize the output before or after the effects.

Midi control

Any standard Midi device can be used to trigger realtime live output. Check Midi device and select the device from the list. Select the channel your device is sending on. Note 0 (49, etc) will stop playback, notes 1-48 (50-97, etc.) select the frame lists, adjust the offset to shift the range on the keyboard. When hold is checked the frame list will be played until another is selected, otherwise just as long as the key is pressed.

To teach in the Midi notes, you can find a button "L" to the right of the Midi control fields. Press L and simply touch the desired key on your Midi keyboard. Now this key is assigned to the appropriate slot/frames.

More info coming soon!

Import and export shows and frames

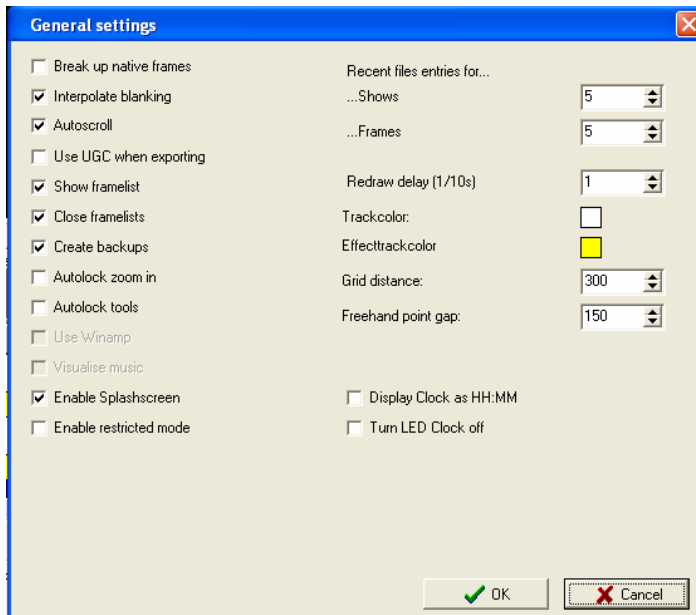
Mamba Elements is created with the idea of maximum flexibility in interacting with other laser software programs, and in the ability to create a lasershow, which is licensed to a specific dongle number. This allows a professional show user, to handle licenses easy and sell laser shows without the risk of illegal duplications to non licensed users.

Any standard .ild frame can be imported to Mamba Elements, as long as the standards of the International Laser Display Association is followed in the frames. Unfortunately, not all laser software programs follow these standards, even if they claim so. If Mamba Elements finds a frame format incompatible, it will either refuse to load the frames, or load it with point errors. If a point error occurs, do not condemn Mamba Elements! First check out, if the exported .ild file is fully compatible with the standard.

To ensure time synchronity on imported shows, Mamba Elements allows the selection of a specific frame number per second. The standard frame speed is 50 fps (frames per second).

!!!! Only shows, which are legally owned you yourself, should be exported and transported to other software systems. Do NOT transfer unauthorized copied shows!!!!

General settings



Break up native frames: When checked, point oriented frames (.ild, .fl?) will be separated into different objects at blanking points. If unchecked, they will be treated as one object (needs less memory). Has no effect on .fra frames.

Interpolate blanking : Adds additional interpolation points to the blanking lines. This should be checked, if you experience unnecessary fading lines between displayed objects, especially on slow scanners.

Autoscroll: The timeline will scroll to the right when playback time reaches the end of the visible area. This should be checked

only if a fast graphics adaptor and computer is used. On slow computers, it might interfere with the laser output, and the output could stuck during scrolling.

Use UGC when exporting: When checked, the “save output to file” function will use the current UGC settings. Images in the frame list could be distorted. Do not use this function, if you want to transport a show from one software to another software. Use this function, if a framefile for the live player is exported.

Use shift when exporting : If a framelist will be exported as .ild point oriented format, it might be necessary to check this box. This will include your blank shift settings during export process.

Show framelist: Selecting a scene will automatically change to the frame list, which holds the frames used in this scene.

Close framelists: When checked, all frame lists are closed before opening a show or selecting new show. If unchecked, frame lists will stay in the memory.

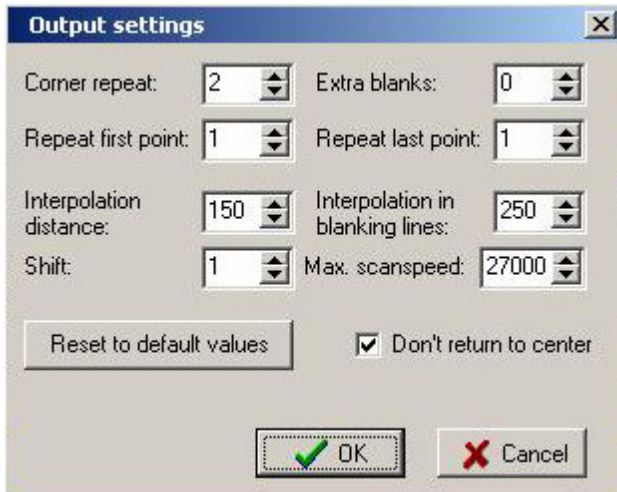
Redraw delay: Increase this value if the scrolling of the timeline gets too slow, especially on slow computers. The redraw of the timeline will be delayed, which is time saving on slow computers. On fast computers, set to 1.

Check for updates: If an internet connection is established, Mamba Elements will check for updates on each start up. Additionally, the checking interval can be set. If you do not have internet available on your computer, uncheck this function. Mamba Elements will show a warning, if this function is activated, but there is no internet access.

Freehand point gap: Distance for interpolation during free hand drawing in the frame editor.

Enable splashscreen: Displays the MediaLas logo during startup of Mamba Elements.

Output settings



Here, the quality of the output to the laser projector is set up. Depending on scan speed, galvo quality, and kind of projection, these settings have to be adjusted for proper function of your projector.

Use some test patterns and play around with the settings, for a better understanding of your galvo system and speed.

Corner repeat: Sets repetition rate on corner points.

Repeat first point: Sets repetition rate at the first point of the frame. Could be necessary on slow laser drivers.

Extra blanks: Sets extra blanking points. Could be necessary, if laser driver does not switch off immediately.

Repeat last point: Repeats the last point of a frame. Could be necessary on slow scanners.

Interpolation distance: Has a large influence on the projection quality, and on projection speed. The faster your galvo scanner can go, the high this value can be set. Each line will automatically be interpolated during output. This value sets the point distance. The lower the distance, the more interpolating points will be added during output.

Interpolation in blanking lines: During blanking, the blanking jumps can be interpolated to ensure a good projection quality. This function is only available, if activated in the general settings menu.

Shift: (Also called blank shift) Is the delay time between galvo speed and laser modulation speed. Since usually both speeds differ, there might be an adjustment necessary, which can be done with the Shift value.

Max scanspeed: This sets the maximum value of the scanspeed slider in the UGC interface.

Adjust the output settings

To adjust output settings to your projector or XY scan system, the usage of the standard ILDA test pattern is recommended. The following pages will display a summary of this test pattern, the basic functions of the pattern contents, and tuning procedure of your galvo systems, according to this test pattern. If a MediaLas scanning system, such as TeraScan or CT-Set is used, the setup and alignment is very easy. More help and information can be found in the MicroAmp manuals. The following pages are provided by the International Laser Display Association ILDA.

ILDA TEST PATTERN TUNING PROCEDURE

This procedure covers the standard 30K ILDA Test Pattern tuning. This pattern can be found in the frames folder in the Mamba Elements directory.

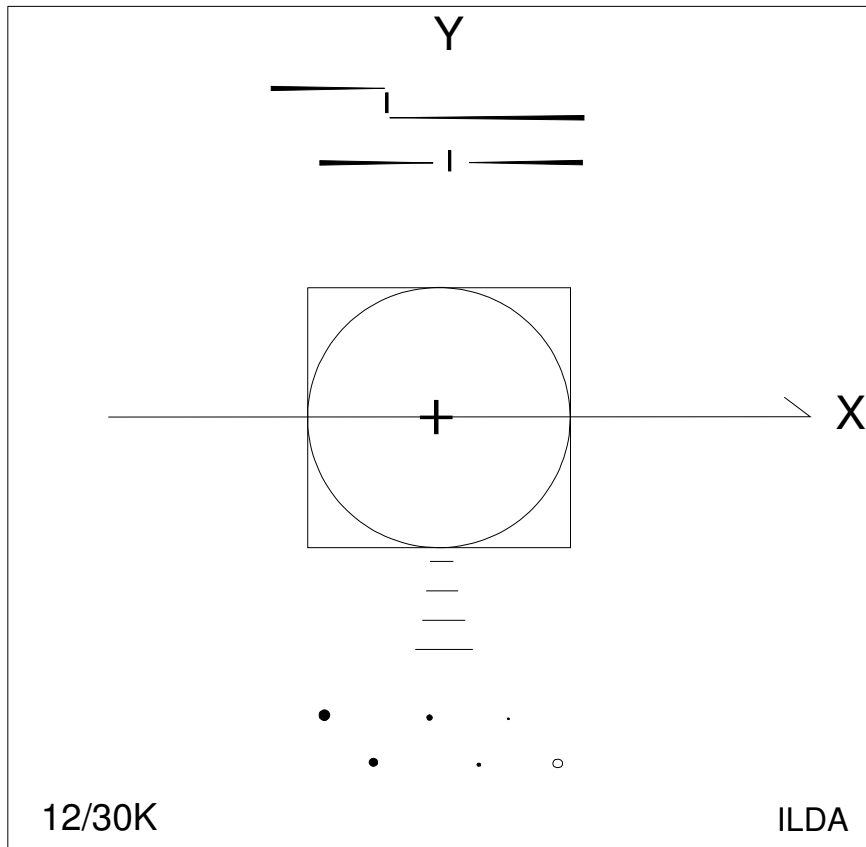


Figure 1

INTRODUCTION

The ILDA test pattern very accurately defines mechanical laser scanner response. The test pattern's primary use is in alignment and calibration of galvanometer based laser vector graphic projection systems. This known response is crucial to proper reproduction of interchanged imagery. Use this test pattern to calibrate programming and playback equipment prior to the commencement of image creation.

The point output rate associated with this ILDA Standard defines only the rate which must be used during scanner adjustment. This standard does not effect the point rate at which subsequent images may be generated or reproduced.

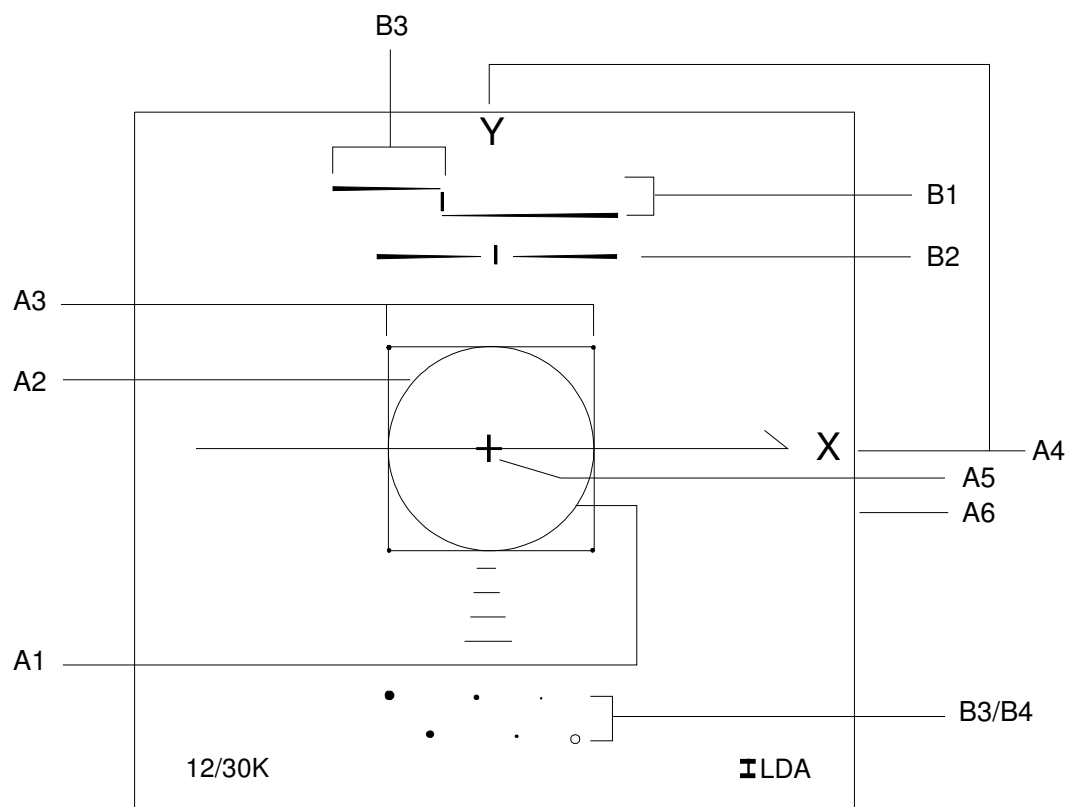


Figure 2

- | | |
|--|--|
| <p>A. XY Scanner</p> <ol style="list-style-type: none"> 1) Correct scanner speed 2) Correct damping 3) Same scanner speed 4) Inverts 5) Amplitude 6) Centering | <p>B. Blanking signals (use blank shift to correct)</p> <ol style="list-style-type: none"> 1) Correct scanner speed 2) Correct damping 3) Amplitude 4) DC offset |
|--|--|

Note: The 12/30K indicates the output speed for this test pattern in points per second. Your image source must output points at 12,000 or 30,000 points per second (+/- 1%) for this test pattern to work.

ADJUST XY SCANNERS

This procedure assumes scanners and blanking system are pre-tuned to a state of stable operation. Consult manufacturer's documentation for information on scanner start-up from a completely inoperative state.

Use caution when adjusting scanners. Galvanometer and motor scanners can be easily damaged through careless or rough adjustment. Tuning should be performed by personnel with suitable knowledge and experience. Always watch the output carefully, when images begin to break-up this

is a warning that harm may be near. Never allow scanners to oscillate! Read manufacturers data on scanner adjustment carefully before commencing any tuning.

For additional information about use of the ILDA Test Pattern read, "Using the ILDA Standard Test Pattern".

1. DISPLAY TEST PATTERN

Display the ILDA Test Pattern image at 12,000 (12K) or 30,000 (30K) points per second depending on desired tuning, or simply adjust to the scanspeed you want to tune to. Example: If you like to tune your scanners to 40k, adjust scanspeed to 40k with the scanspeed slider. If the slider does not show the value up to 40k, change settings in the "output settings" menu point.

To use the test pattern correctly, it must be scanned small to prevent distortion of the circle. For 30K tuning this about 8 degrees optical, which equals to a projection size of 14cm at 1m projection distance.

2. ADJUST INVERTS

Refer to figure 2; A4.

The Y should appear at the top of the image. The X should appear at the right hand side of the image. If either of these is reversed, invert the signal at the driver card or at the source as appropriate. Mamba Elements also offers the invert switches in the UGC, please read this manual for proper usage.

3. ADJUST Y DAMPING

Refer to figure 2; A2.

Observe the lower right corner of the inner square, adjust the low frequency damping until a small amount of "overshoot" is observed. See figure 3. The length of this overshoot should equal approximately 2/3 the height of the word "ILDA" in the test pattern.

For scanner drivers equipped with only a single damping control: Perform all adjustments for low frequency damping and omit high frequency damping procedures.

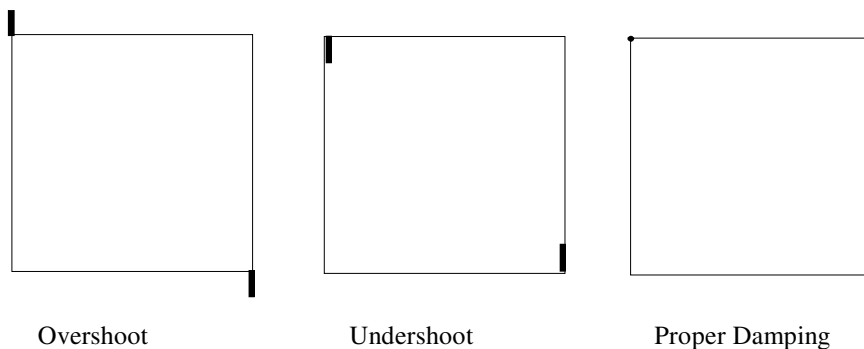


Figure 3

Adjust the high frequency damping up or down a small amount. Notice that the overshoot line becomes slightly longer or shorter as you do this. If you increase or decrease the high damping too far in either direction, the overshoot will become longer. By carefully adjusting in *both directions* you will find the point where the overshoot is at its shortest length.

Use extreme precision and diligence, the perceived change is very slight. This adjustment is of utmost importance for proper tuning.

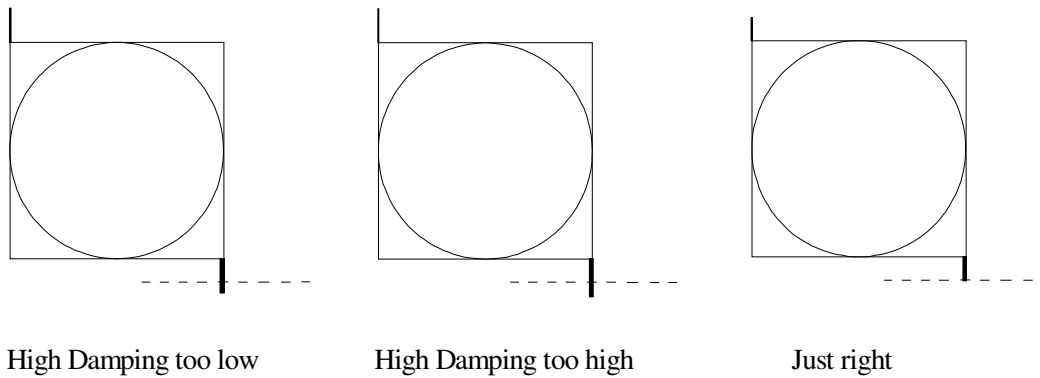


Figure 4

Return to the low frequency damping and decrease to “tuck” the overshoot back into the dot at the corner of the square. Use caution not to create undershoot which is very difficult to see. See figure 3.

If top and bottom of the circle touch the top and bottom edges of the square (regardless of the phase of the circle), skip to step 5, "ADJUST X DAMPING". See figure 5.

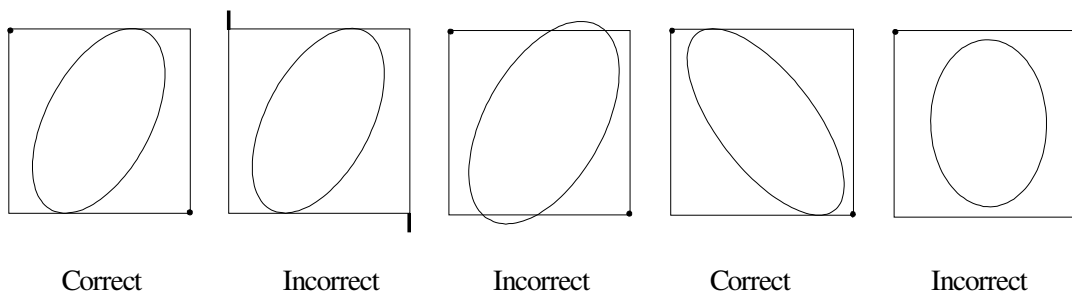


Figure 5

4. ADJUST Y SERVO GAIN

Refer to figure 2; A1

If top and bottom of circle are smaller, or inside the square, increase servo gain and return to step 3, "ADJUST Y DAMPING".

If top and bottom of circle are larger, or outside the square, decrease servo gain and return to step 3, "ADJUST Y DAMPING".

5. ADJUST X DAMPING

Now that the Y axis is correctly adjusted, do not adjust it again.

Observe the upper right corner of the inner square. Adjust the low frequency damping until a small amount of overshoot is observed. The amount of overshoot should equal approximately 2/3 the height of the word "ILDA" in the test pattern.

Adjust the high frequency damping to where the length of the overshoot line is minimized, as was done in step 3 for the Y axis.

Decrease the low frequency damping to "tuck" the overshoot back into the dot at the corner of the square. Again, use caution to not go too far and create undershoot.

6. ADJUST X SERVO GAIN

If the circle is smaller than the square in the X axis, increase the servo gain and return to step 5, "ADJUST X DAMPING".

If the circle is larger than the square in the X axis, decrease the servo gain and return to step 5, "ADJUST X DAMPING".

At this point the circle should touch the square at four points and be perfectly round. If so, go to step 7, "ADJUST IMAGE SIZE".

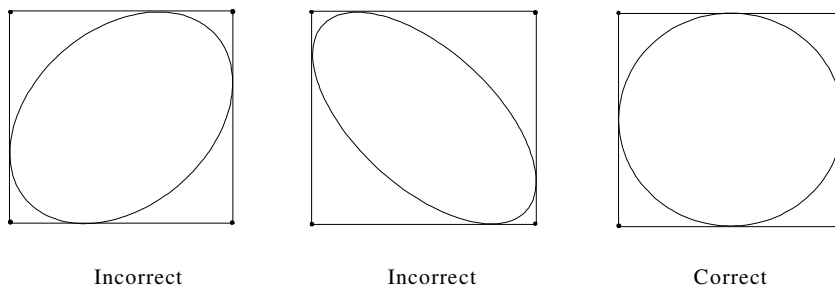


Figure 6

If the circle touches the square in both axis, but the circle is not perfectly round, very carefully fine tune damping and servo gain with step 5, "ADJUST X DAMPING", repeatedly, until circle is as round as possible.

If perfect circularity is still not attained, fine tune adjustments for damping and servo gain carefully for Y axis again. Return to step 3, "ADJUST Y DAMPING".

If phase of circle is still not perfect, repeat damping and servo procedures for the X-axis while slowly increasing or decreasing the servo gain. In worst cases,

Repeat previous step until the circle is perfectly phased and damping is correct. Refer to figure 6.

7. ADJUST IMAGE SIZE

Refer to figure 2; A5.

Reset image signal size to normal at the signal source.

Adjust X and Y image amplitudes to fill screen. If screen area is not square, adjust sizes to fill the largest square that fits on the screen. The outside edge of the test pattern is the maximum scan area.

8. ADJUST DC OFFSET

Adjust the DC offsets so the cross in the middle of the test pattern is at the center of the screen area. Make only minor adjustments with DC offsets. Larger adjustments should be made by physically rotating the scanners in their mounts.

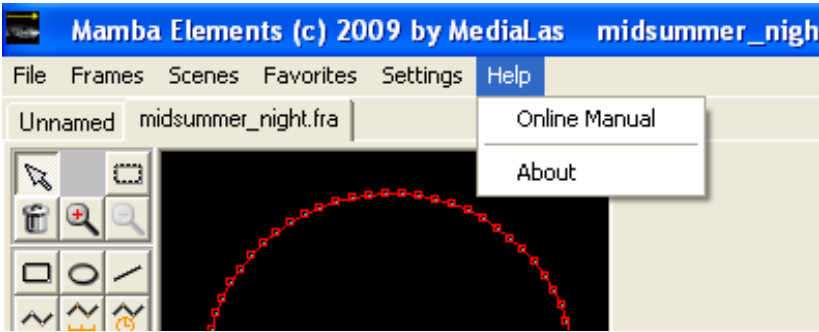
TIPS:

Any time you adjust servo gain, the damping(s) must be adjusted as well. The inverse of this is also true.

Scanners are inherently imperfect. A well adjusted XY set may be achieved with some compromise to perfection. However, the scanners of today are of higher quality and usually will tune near perfectly. Be patient, don't give up too soon!

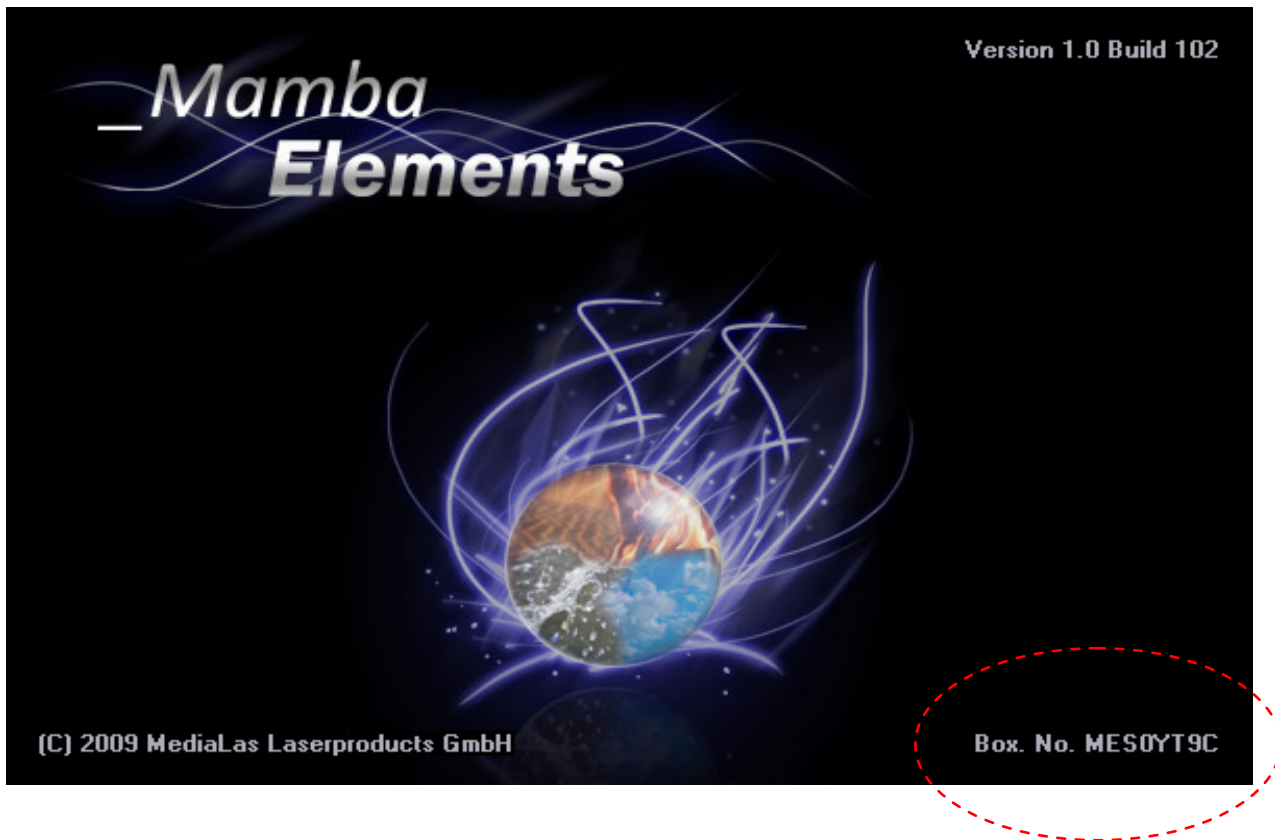
Correct wrong blanking lines on top of the image (B1) with the blank shift adjustment in Mamba Elements.

----- End of test pattern procedure. C by ILDA -----



By clicking on the help menu, the dropdown opens. Here, you find the latest version of the manual in pdf format. To check for one of these, a working internet connection must be established on your computer.

If you select the About field, a window opens with the Mamba Elements logo, and the serial number of your dongle key. This serial number is needed for any update request.



Hot key in Mamba Elements

Mamba Elements offers a large number of hot key functions, which helps a professional laserist to fasten up his daily work in creating professional laser shows. Below is a list of available hot key functions. The headline states the hot key, while the “+ xxx” mark states the action, in addition to the hot key.

Strg

+ Objects/Scenes	Multiple marking
+ C	Copy Scene / Object into memory
+ V	Add scene/object from clipboard
+ Rotation wheels	Rotation wheel values changes in 5° steps
+ Color wheels	Color wheel values changes in 5° steps
+ Editor	Actual object gets caught in the grid
+ B	Sets begin marker for user time
+ E	Sets end marker for user time
+ Space	Clears all beatmarks
+ A	Selects all scenes on the timeline
+ O	Open Show
+ S	Save Show
+ N	Add Scene
+ D	Delete Scene
+ L	Toggle autoscroll

Shift

+ Rotation wheels	Rotation wheels end and starting values are locked and change simultaneously
+ Sliders/Moving areas	Start & End position or scale are locked and change simultaneously
+ Frames in List	Selects all frames in the framelist, beginning from highlighted frame
+ Tool	Selected tool is locked for multiple use
+ Rectangle/Circle/	Insert of proportional objects
+ Select region/Zoom	Insert of proportional objects
+ Freehand, Polyline, Line	Line is caught in 45° steps
+ UGC / Scale	Proportional scale

Strg + Alt

+ O	Open Framelist
+ S	Save Framelist
+ E	Close Framelist
+ A	Close all Framelists
+ I	Insert Framelist
+ N	New Frame
+ L	Clear Frame
+ D	Delete Frame
+ X	Cut Frame
+ C	Copy Frame
+ V	Paste Frame

Strg + Shift

- + Scene
- + X
- + C
- + V

Docks selected scene to previous scene
Cut Objects
Copy Objects
Paste Objects

Space

Sets beatmarks on the timeline while a show or a song is playing

Double click

- + Rotation wheels
- + Moving areas

Resets values of rotating wheels
Resets values of moving areas

Double click

- + Move / Scaleslider

Changes values in 25 steps

+ / -

- + Freehand

Changes drawing point distance (shown below editor window)

Credits

MediaLas would like to thank the following people and entities, which helped to make this manual better:

- Vince van Riet (DixiScan)
- Tobias Gebuhr

Keep it coming!

