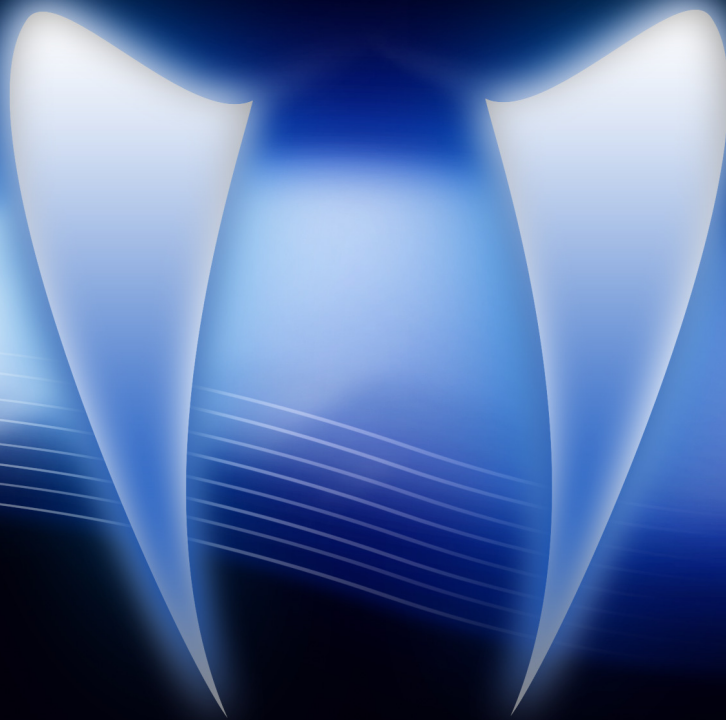


Mamba

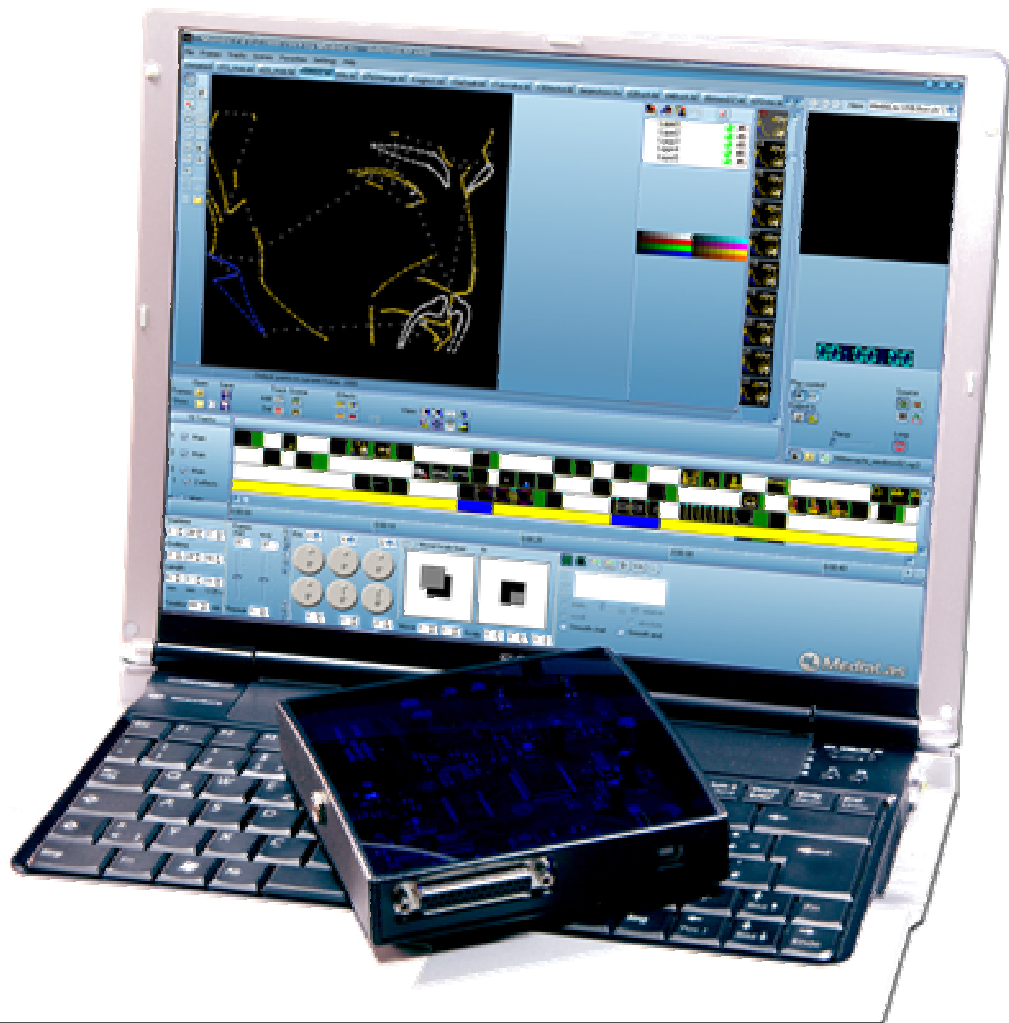
2.0



Your gateway to
professional Laser & Light shows

This manual is meant as an overview for the various Mamba functions, and might not be fully accurate to the latest version and release of Mamba 2.0. 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: Jul 08, 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!

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License policy for Mamba 2.0 Laser Software

Mamba 2.0 1.xx comes with a dongle key 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 2.0 software versions running with your dongle key. If your software starts up, but closes again after a few seconds, Mamba 2.0 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.

About this manual

The following content describes the various functions of Mamba 2.0 laser software. Due to the fact, that Mamba is updated constantly, not all functions will be described properly. Please check the Mamba 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 2.0 software**
- **Main frame editor and frame editing functions**
- **Show creation by using the tracks on the timeline**
- **Setting up Mamba to your laser projector and/or interface**
- **Import/export shows and frames**
- **Live player in Mamba**
- **VST Video Sequence Tracing software**

Mamba 2.0 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 2.0 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 user and show creator, you are welcome to join the great Mamba 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. .

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Hardware required

To run Mamba 2.0 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.

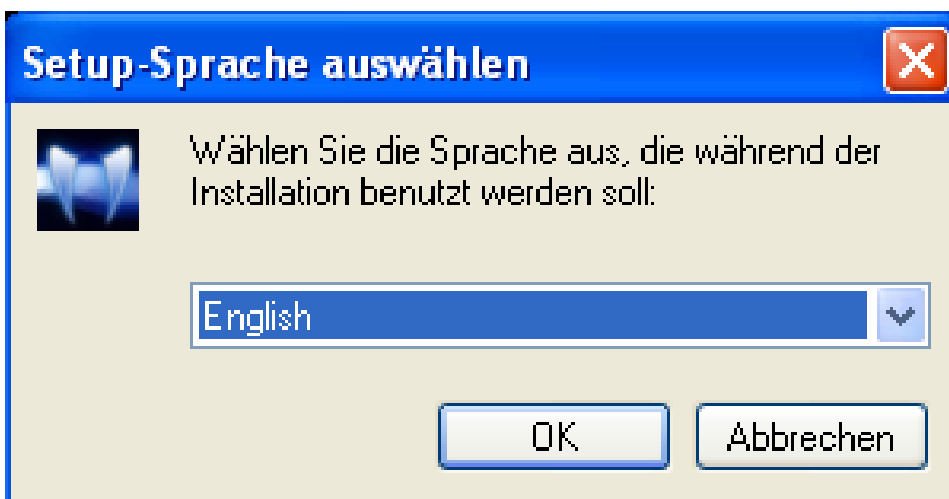
Installation

Installation of Mamba 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, you might get an error message on the screen. Discard this message, it will not interfere with proper function of Mamba 2.0.

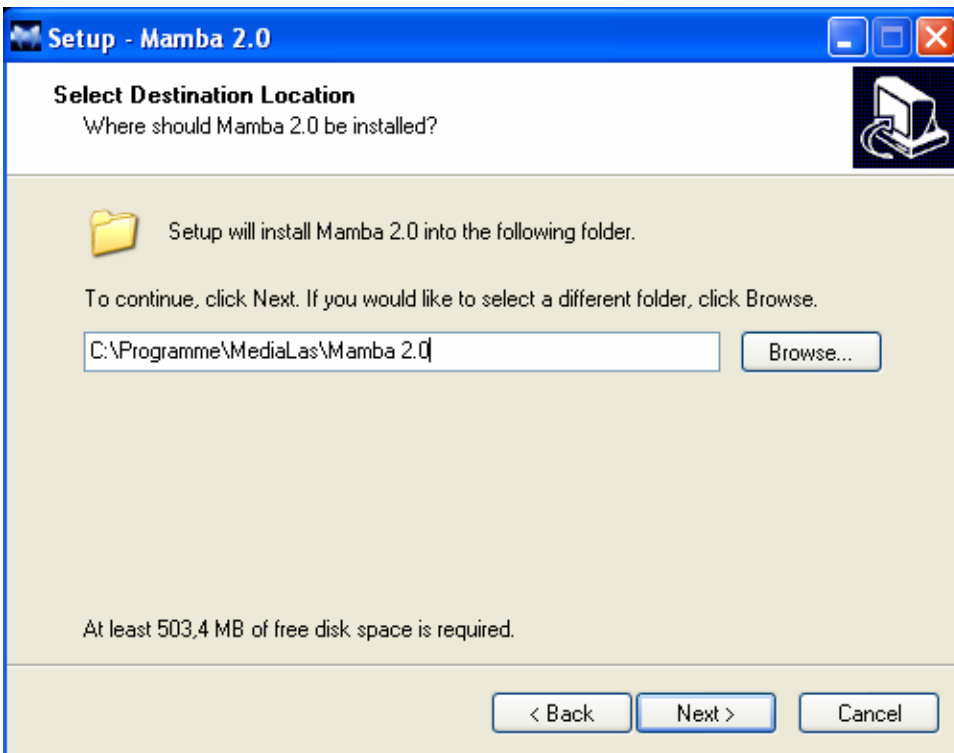
With the Mamba 2.0 installation package, you will receive two disks. One is the program disk, also holding shows and frames, and the second is your licence disk, which corresponds to your dongle key serial number. Please note, that the software does work with your dongle key. **ONLY** It will **NOT WORK** 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, make sure not to mix up your dongle keys.

Insert Mamba 2.0 program CD into your disk drive.

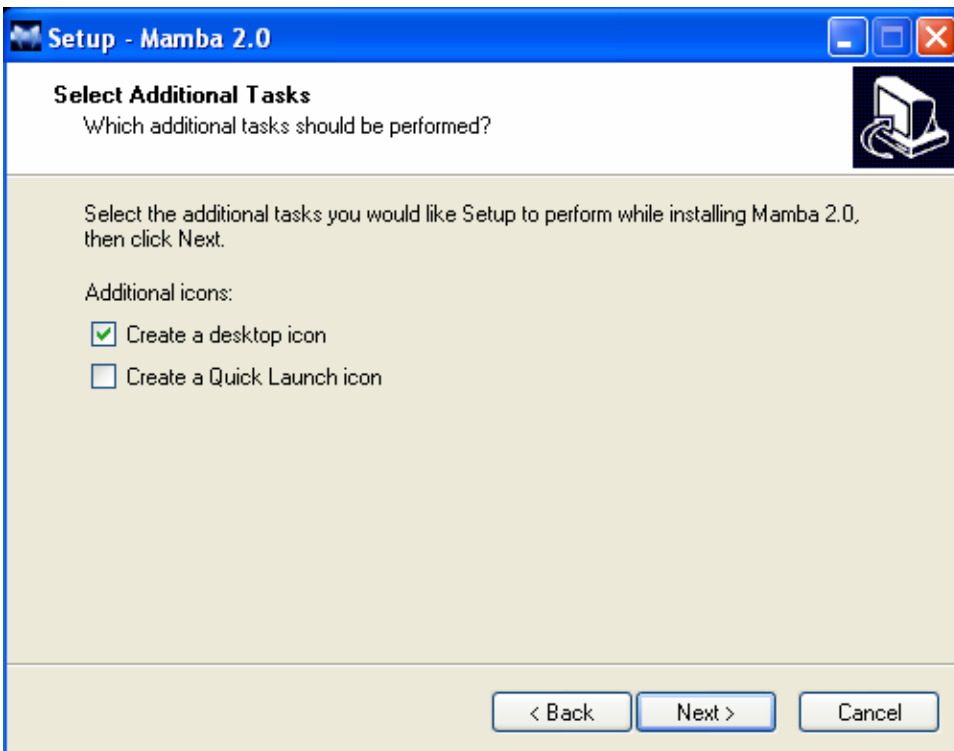


Choose your language, click “OK” and follow the installation guide. After you agreed to the license agreement, the installation path screen will pop up.

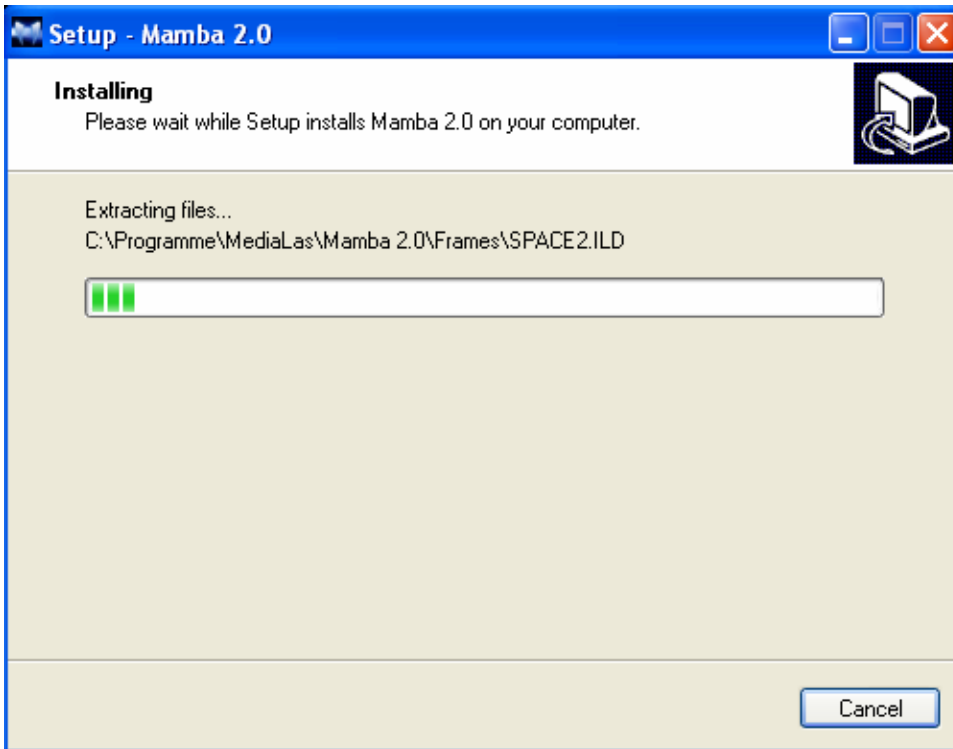


Enter the installation path, and confirm with “next” key.

Now select the different icon placement possibilities and resume with “next”.



After the installation setup is finally select, 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, please insert your mamba license disc and press “OK”.



Mamba is ready for first startup.

Glossary of laser creation and laser show programming

Beat markers	Mamba 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 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.</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 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	Some older laser show software programs offers linear cutting, where the cues are listed in a text file and be played one after the 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, 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.

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.

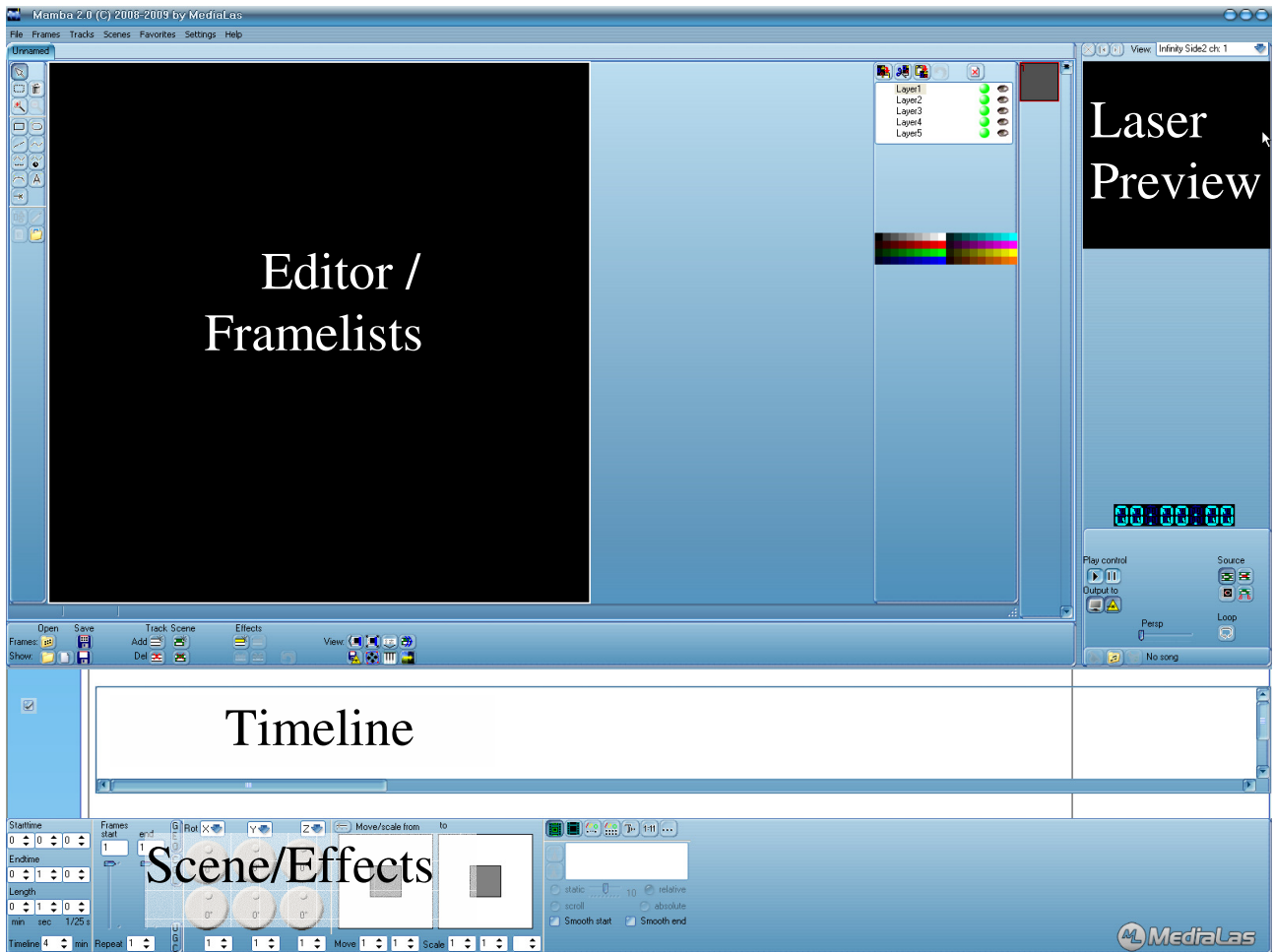
Adaptive graphical user interface

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 Main Screen User Interface

The 4 major parts of Mamba:



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

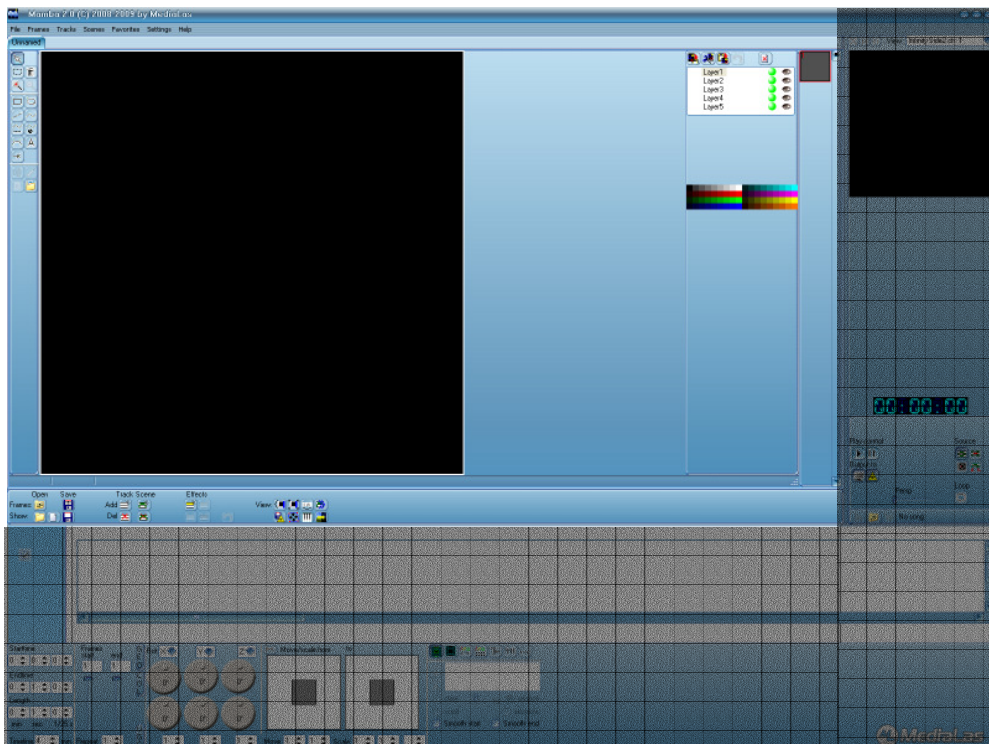
1. Editor for frames and framelists
2. The Timeline, that holds the animation tracks
3. The Scene/Effect panel
4. The Laser Preview with output and play control

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 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 “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.



Multiple layers are available in the sophisticated editor of Mamba. Furthermore, 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 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.



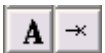
Polyline, Bspline left click for each point, right click to set last point.

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 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 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 objects. 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 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 in terms of laser safety, to avoid high power beams into the audience during audience scanning.

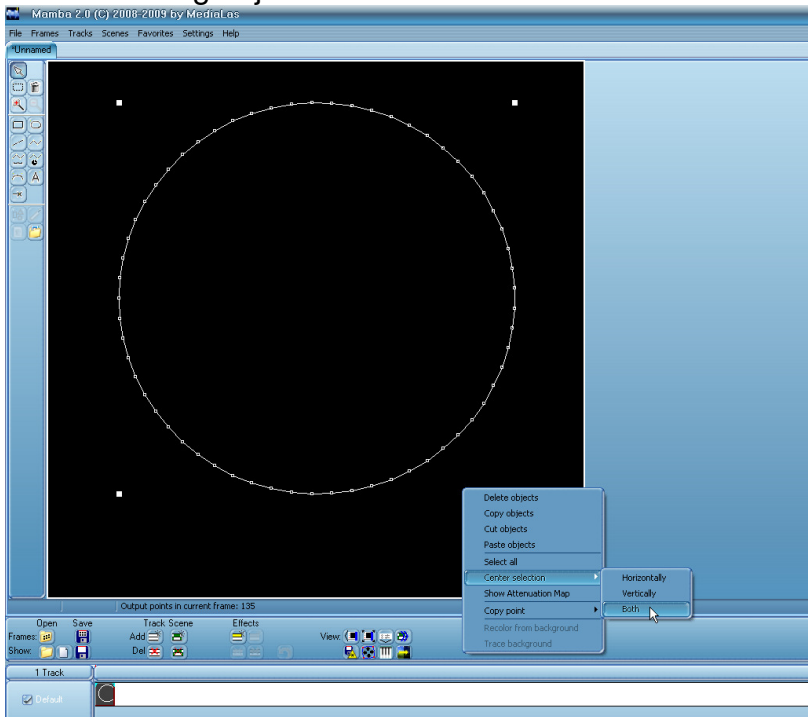


Select an object and change the value to increase the brightness of line points in an object. Press the “pick color” button, then a color on the color pick (see above) to change the color of these points. Tip: select an accentuation color, and then change the object to black if you want to show only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

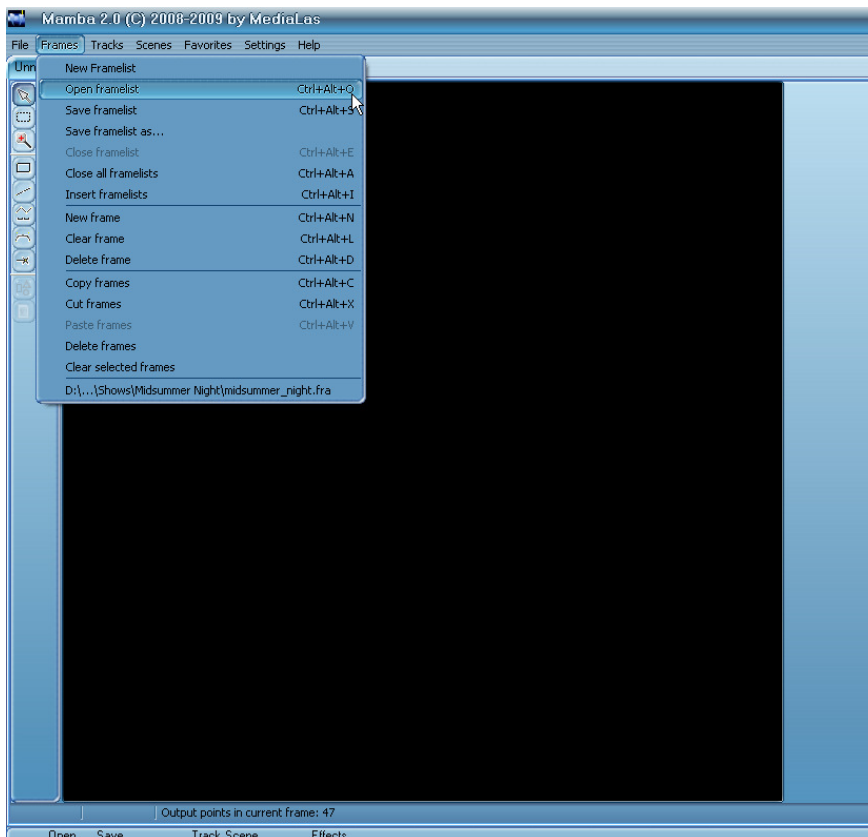
Close/scroll through frame lists using the buttons above the preview window. Be careful with the cross button – this one



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

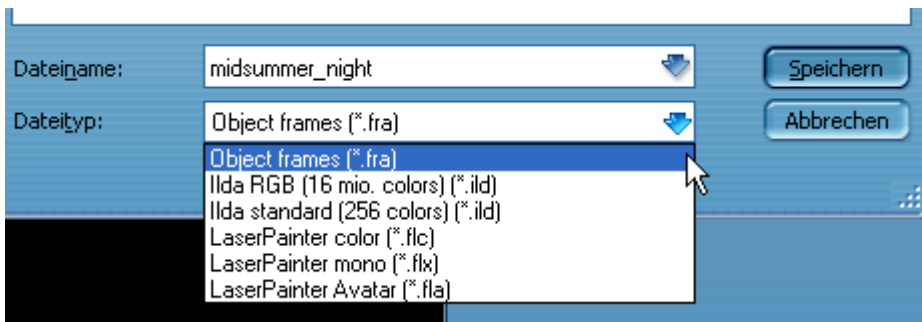


It is very important to save edited framelists after final editing, and from time to time during editing or frame creation, to avoid any data loss after sudden software instabilities. To save a framelist, or multiple framelists, simply open the dialog menu from the top menu list. Here you will also find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

The frame menu holds some other functions for frame manipulations or export utilities. Frames can be saved in various formats, just as the internal Mamba format, and, additionally, the various ILDA frame formats. For compatibility, also the old 8bit color ILDA frame format is included. If down compatibility is not necessary, we urgently recommend to save all frames in the most actual 24bit colored ILDA format.

To access ILDA file format, save the framelist with function “Save framelist as”. Here, you have access to the various frame formats available in Mamba.



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

ILDA RGB is the latest 24bit frame standard. Use this for maximum quality of your export. Once stored as ILDA file, object information is lost, and the frame is turned into a point oriented file. ILDA standard was the first ILDA standard for frame files, which uses a color palette instead of real RGB data. Use this for maximum compatibility during file exchange with other users. Note: Fading or coloring functions will not work properly in this format!

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

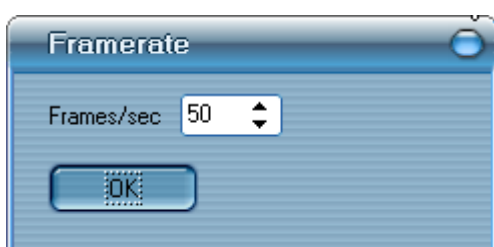
ILDA standard framelists can be imported in two different ways:

- 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”

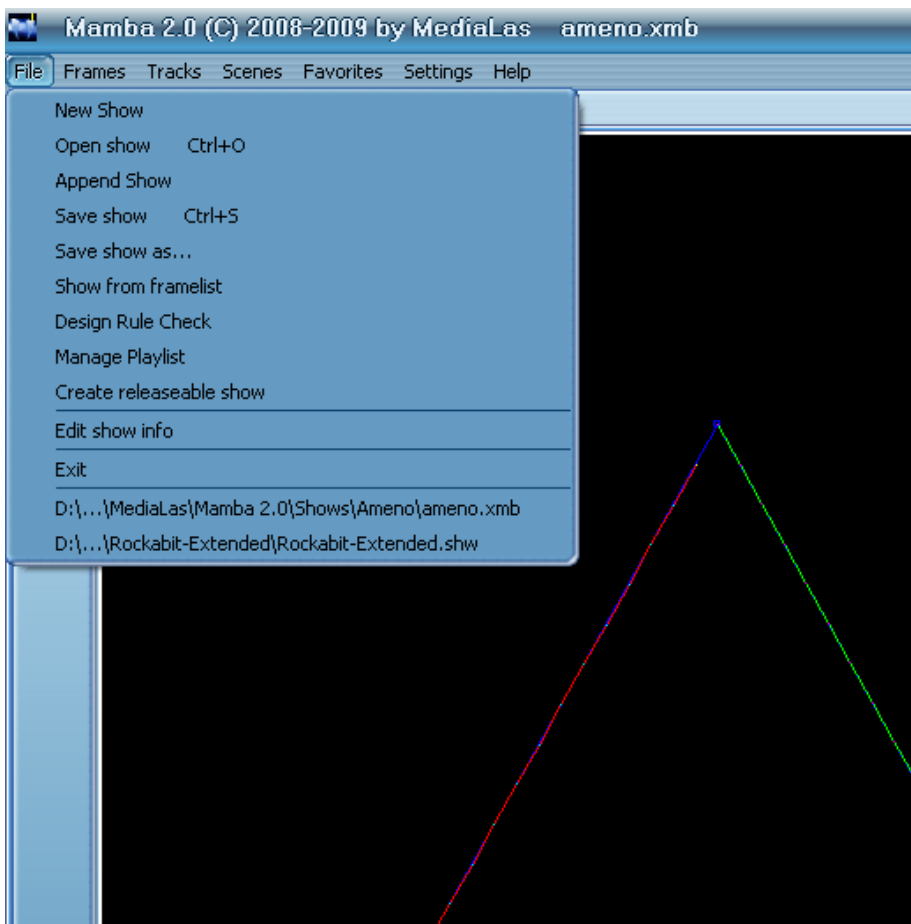
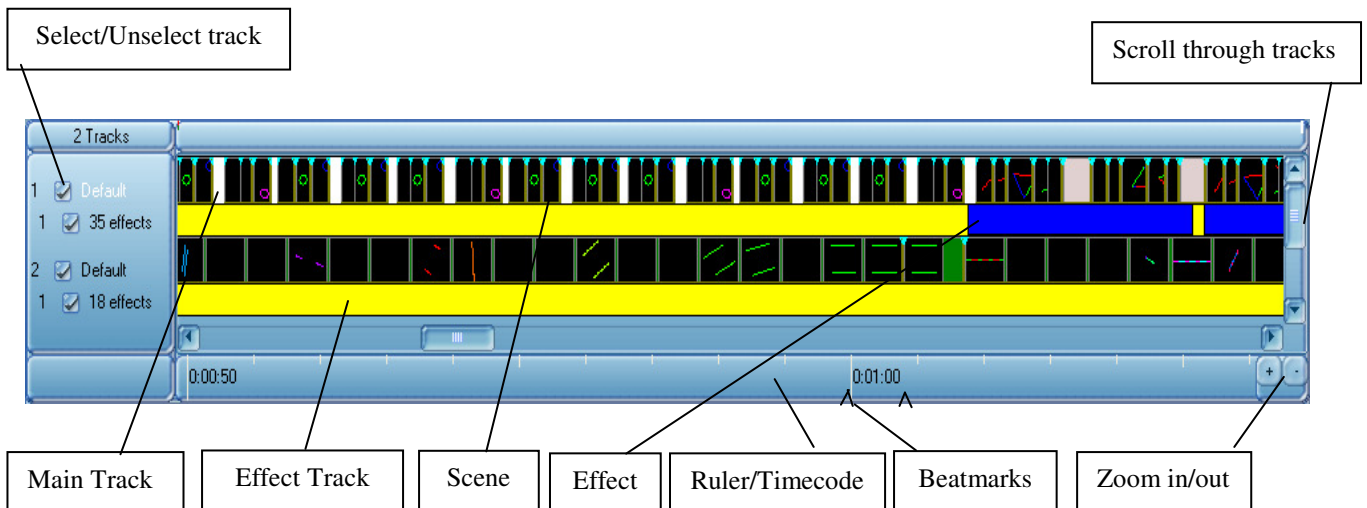
If a continuous framefile is available, Mamba can automatically create a show out of this frame file. Example could be to export an entire show to an ILDA frame file, with a fixed frame rate of 25 fps, and the import to Mamba. Any timing, that has been done on the show, will also be available in Mamba.



After the appropriate file is selected, Mamba 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, 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.



The screenshot on the left shows the file dialog to load or save shows, and to create or release shows with framelists. This very powerful tool is the first step to platform independant show release and distribution. Any show can be released as an ILDA frame stream, to be replayed on any ILDA compatible software system.

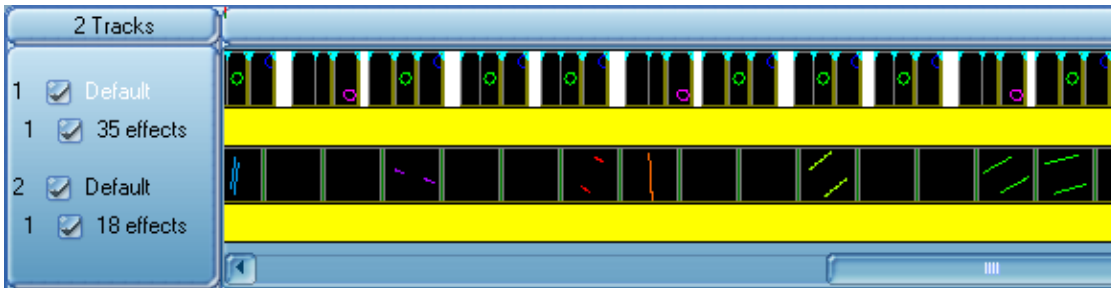
Tracks

On start up you will see one track 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.



Unlimited tracks can be assigned on the timeline by simply clicking the “Add Track” button, or by using the pull down menu “Tracks”.

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 can hold unlimited subtracks, 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



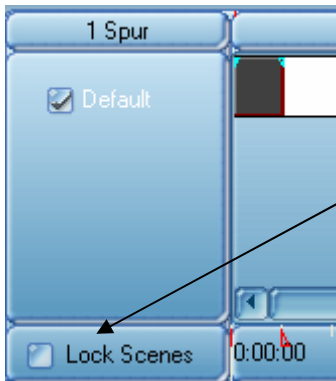
Each track on the timeline uses one scene track, while unlimited number of scenes can be placed on this track. A scene can hold a various number of frames from any opened framelist, or is capable of displaying the computer time, morph or pause or display a static or scrolling text.

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



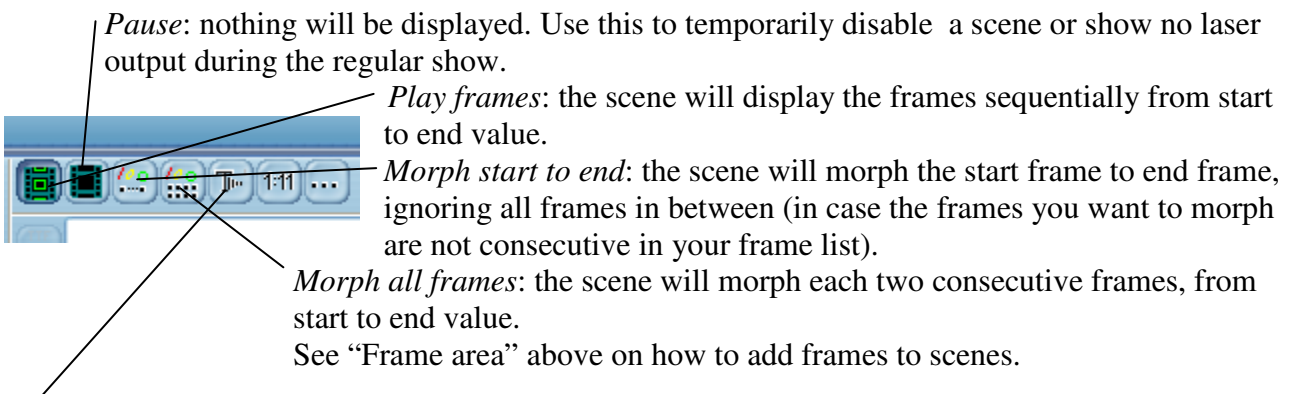
To add a scene to the timeline either the “Add scene” button is used or simply drag and drop a frame from the framelist onto the timeline to create a new scene with 1 second default play length. This default length can be changed at any time from 1 cue (1/25s) up to unlimited length. The frame will then 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.

Lock Scenes:

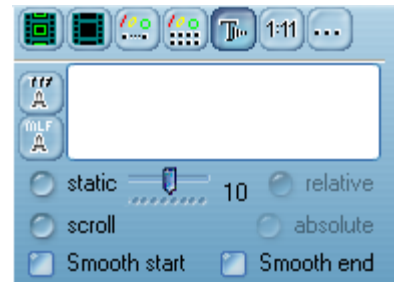


With this function, its possible to lock all scenes on the timeline. Now it is impossible change the start-, end- and length values of all scenes on the timeline. This feature has no influence to any other options! It simply locks the start-, end- and length values of scenes.

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



Text: A nice feature of Mamba 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



(for TrueType fonts) or



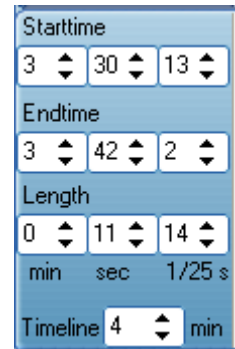
for simple fonts. These fonts are mainly used, if a high letter quantity is necessary, but font quality is not that important.

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.

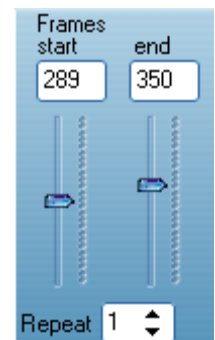
To select a scene simply click on it. Select/deselect multiple scenes with ctrl+click. You can also use “Select scenes” from the local menu (right mouse button) together with the begin/end markers to select a range of scenes on the currently active tracks.

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).

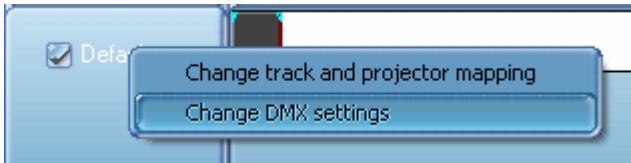
Screen Dimmer:

It is possible to dimm the screen of your computer (this could be necessary for the reason, that your screen is to bright). Simply click the screen dimmer button over the timeline(next to the Live! Button). To deactivate the screendimmer, simply leftclick on your screen (doesnt matter where).



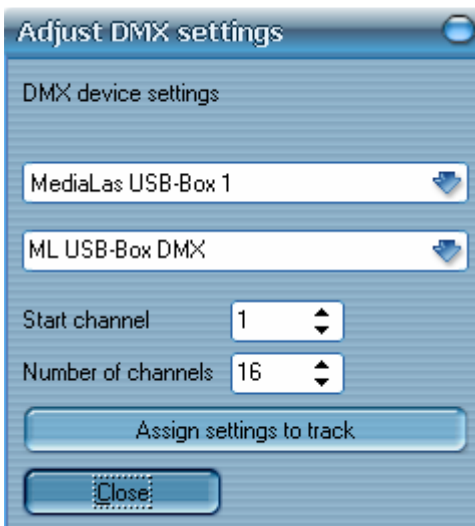
DMX Function

Create a new DMX track:



To control DMX devices, you have to convert a normal track into a DMX track. You can do this, by right clicking on the Name of the track and choosing „Change DMX Settings“. Now, a new window will open, where you can adjust DMX settings. Now you have to choose the interface which your DMX devices connected to (for example: MediaLas USB Box). You can adjust the DMX start address (0-512) and how many DMX channels your device is using (max. 16 channels per track). Then, click on „Assign settings to track“ and then the „Close“ button.

After that, all scenes on this track will be cleaned up and the track shown in the green color.



You can create as many DMX tracks on the timeline as you want.

Note: You have to route the DMX tracks to your physical interface at the projector mapping settings where your DMX devices are connected to.

Create a new DMX scene:

Choose the DMX track on the timeline where you want to create a new scene and simply click the „Add scene“ button. A scene with the default length of 1 second will be created. Now, you have to click on the scene in the timeline. The DMX settings for this scene will appear in the effects panel. Now you can adjust a DMX start value and a DMX end value. At playback, the DMX values will change over the length of the scene from start to end values.



With the „Start DMX Test“ button, you can see the output on your DMX device while adjusting the start- or end values.

You can create as many scenes on one track as you want.

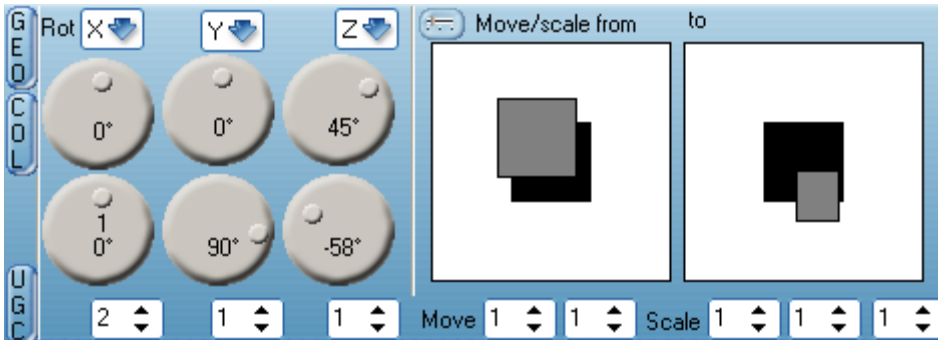
With the „This end“ button, the start values of the scene will be the same as the end values of the scene. By clicking „This Start“, the end values of the scene will be the same as the start values of the scene.

With „Last end“ the start values of the selected scene will be the same as the end values of the scene before the selected one. With „Next start“, the end values of the selected scenes will be the same as the start values of the next scene after the selected one.

Scene/Effects panel

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

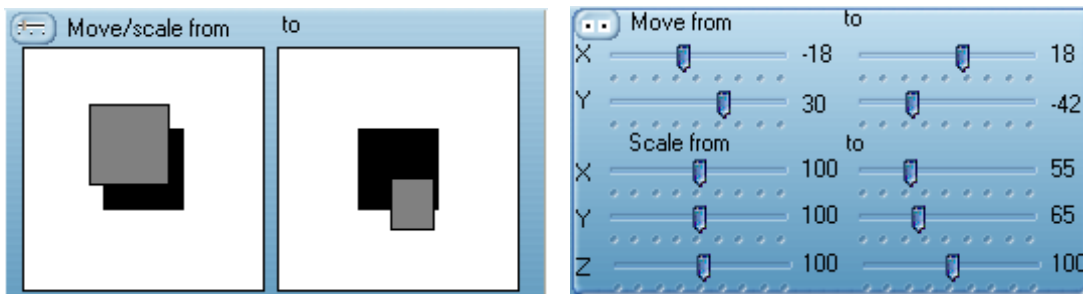


To lock start/end value while changing, hold shift key while changing the start value. To repeat the effect more than once adjust the “Rep” spin edit next to that value pair.

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.

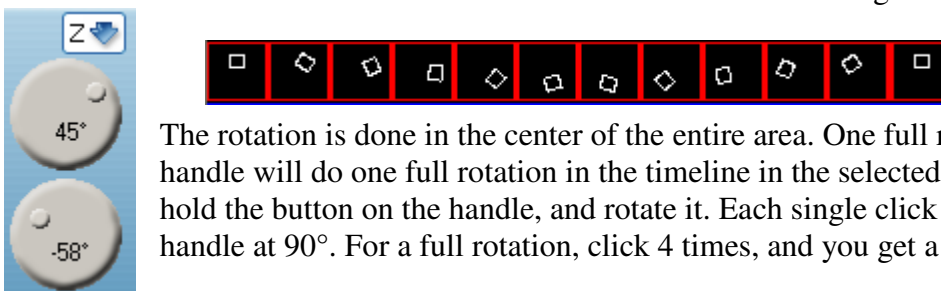
Double clicking the move/size areas will rest the size to 100/100% if it was changed, otherwise the position will be set to center.

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.

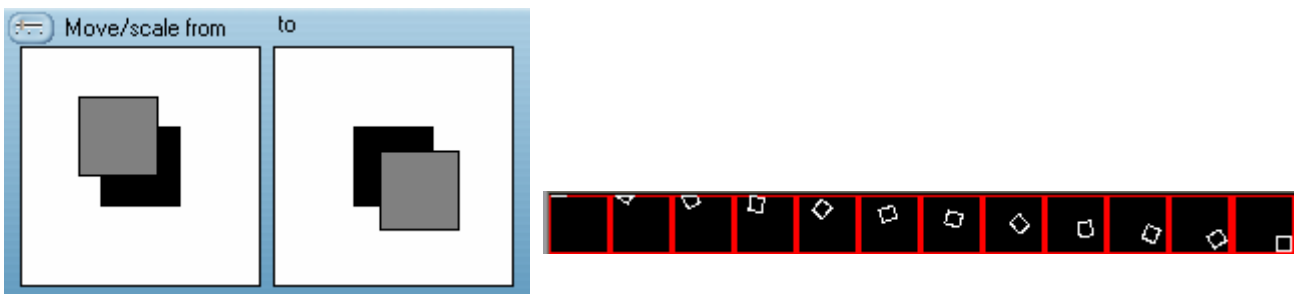
If an object should be rotated to a static position, move both handles to the same value.

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:

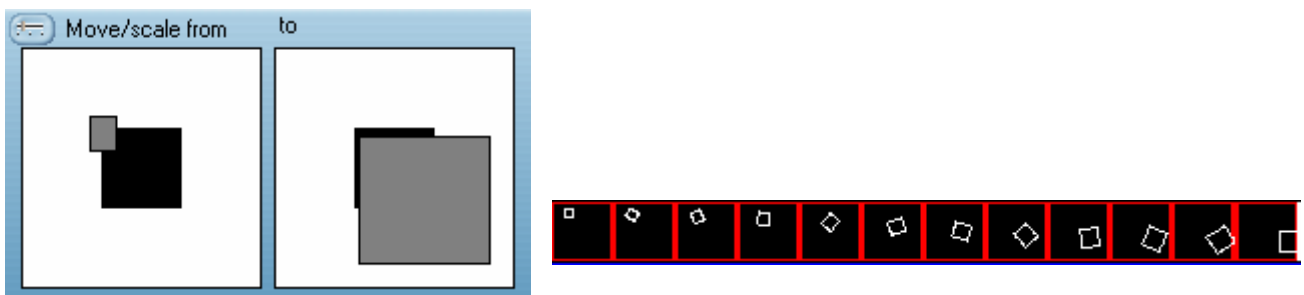


Position/Size

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:

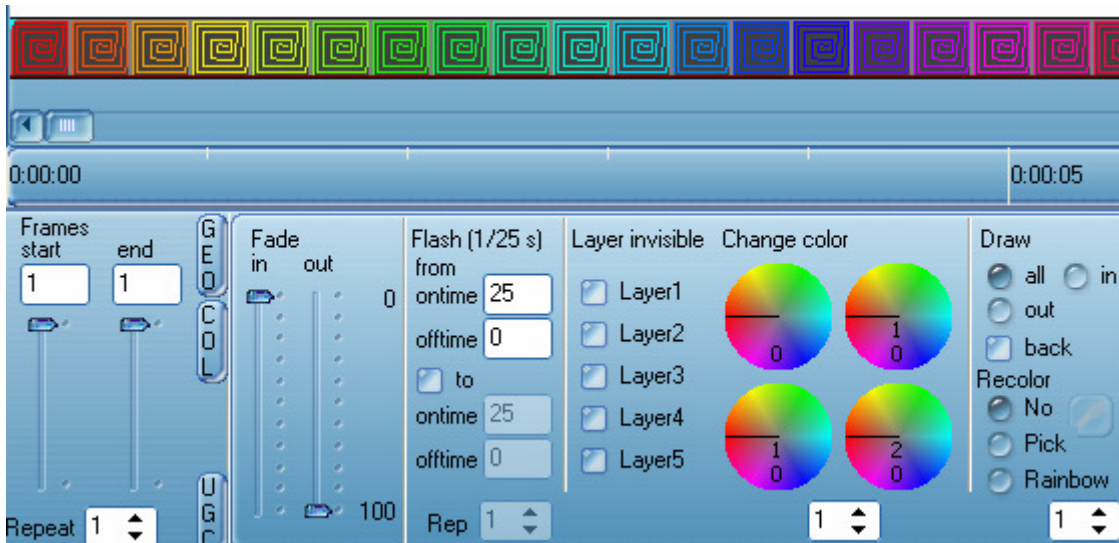


For a static repositioning of an object, simply move both areas to the same coordinates. Hold the Shift button to lock both start and end value, then move the areas with your mouse pointer to its desired position.



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.

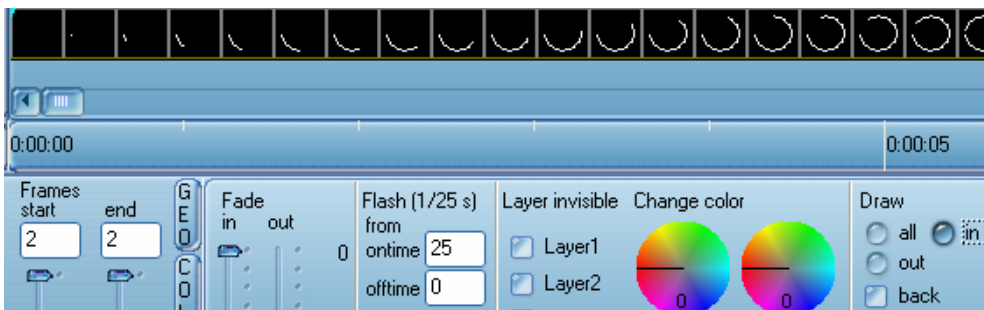
Color/intensity effects



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 of 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.

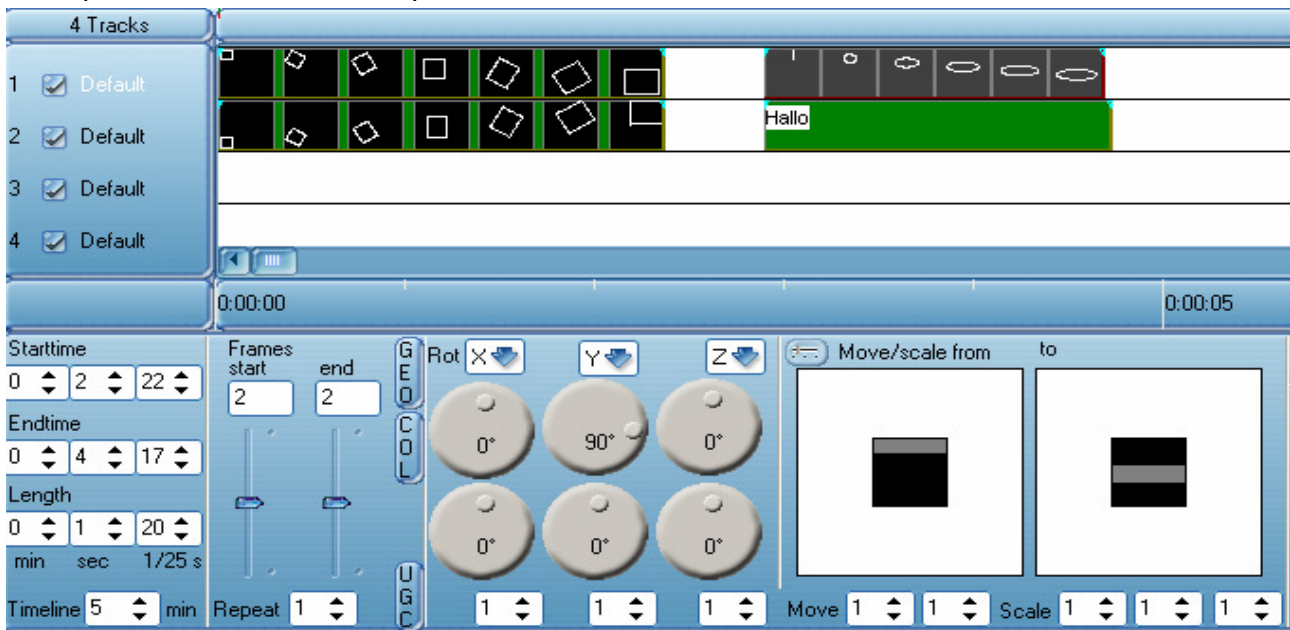


Draw in/out: select draw in out to draw in or draw out a scene point by point. If this function is used for a text, it looks like somebody is writing this text in realtime.

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



Here we have our example from above copied to the second track and then changed movement from bottom right to top left. An ellipse rotating around Y-axis with movement and stretching. And, additionally, a scrolling text.

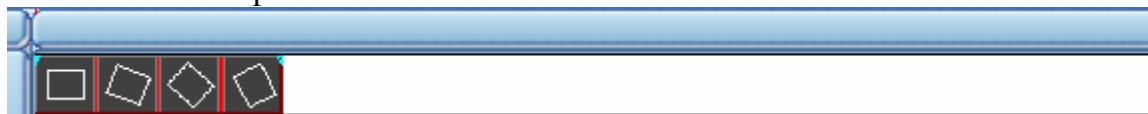
Please note when saving shows that use frames from the (unnamed) “editor” frame list, you should first save the frame list. Otherwise the show has no reference to the frames, and you will have to assign frames to scenes manually when reloading that show.

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, you can use “Bring to front” and “Send to back” from the local menu to change the stacking order of the scenes.

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 add additional effect tracks to each main track and place effects on those 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.

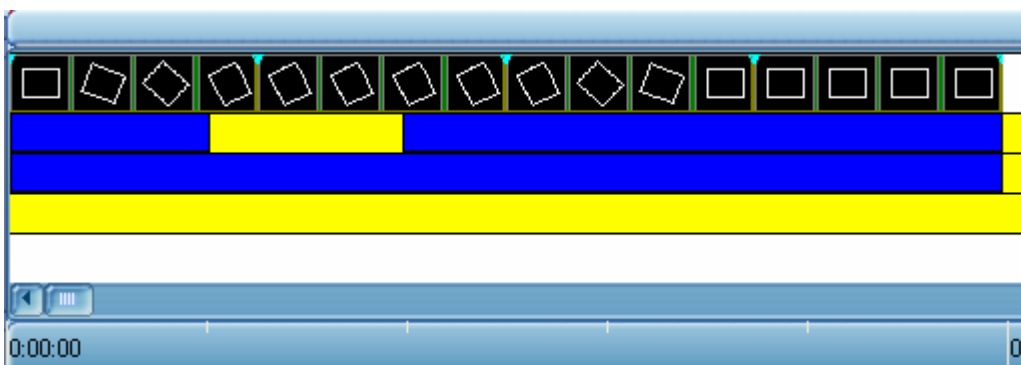


Adding effects:

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”.



This is an example of placing effect tracks and effects below normal scenes, to add more movement to the scenes. 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.

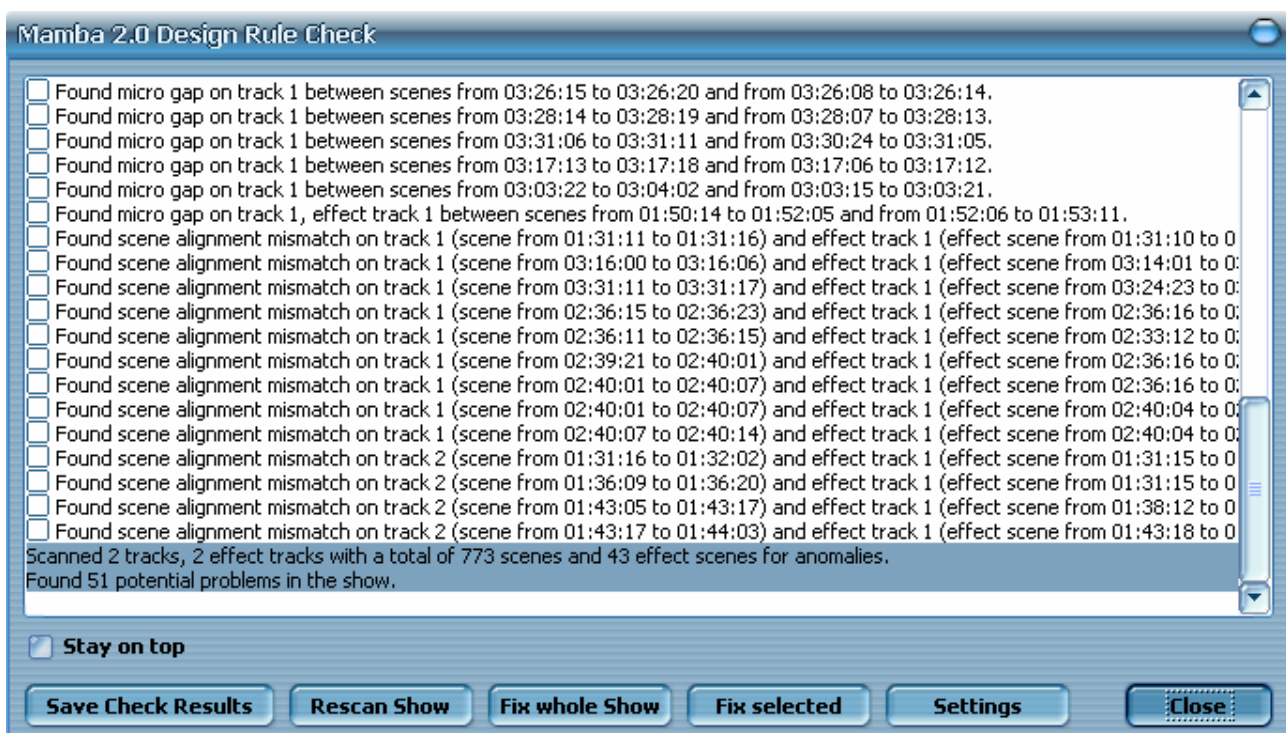
Sine: Add a sine wave to the animation. With this effect, phantastic effects can be achieved. Adjust the frequency and amplitude of the sine wave with the two sliders. If the checkbox in the lower left corner is checked, the effect is active. If this box is unchecked, the effect will be disabled.

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

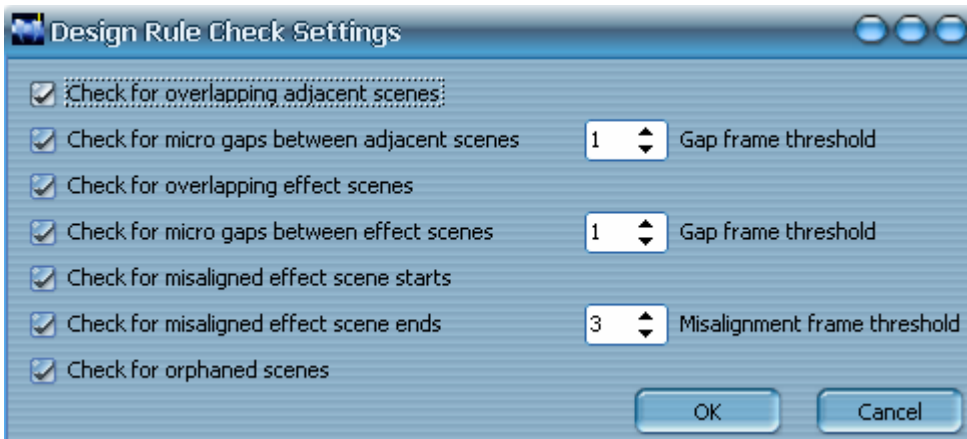
Design Rule Check

At the mainmenu, you will find the „Design Rule Check“. You can check your shows for mistakes like overlapping scenes and effect scenes, misaligned effect scenes, micro gaps between scenes and effect scenes and orphaned scenes. At this time you click on the „Design Rule Check“ button, your whole show will be checked for these mistakes.

The mistakes will be displayed at the main window of the Design Rule Check. Here, you can see the affected scenes and tracks and you are able to fix them manually. It is also possible to allow Mamba to fix these mistakes. You can check the scenes which you want to fix and then click „fix selected“ or fix the whole show with „fix whole show“. To avoid any damage to your show, first check the mistakes Mamba has found BEFORE you allow Mamba to fix them. Save your show at any time before you allow Mamba to fix mistakes!



At „Settings“, you can optimize and specify the Design Rule Check. Here you can adjust how long a micro gab can be or how many seconds a effect track can be missaligned. You also can select / deselect functions of the Design Rule Check.



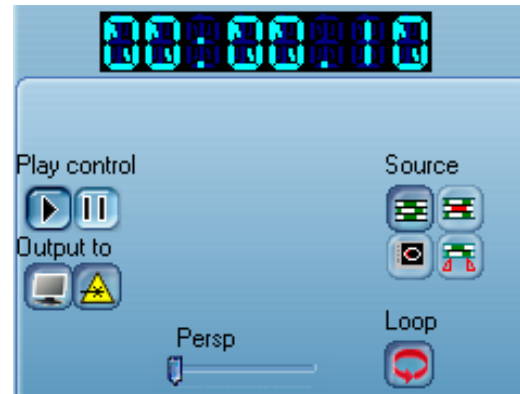
Play a show on your laser projector.

After designing of show is finished, the show should be saved onto your harddisk or flashdisk. We recommend futhermore, 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 continous 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:

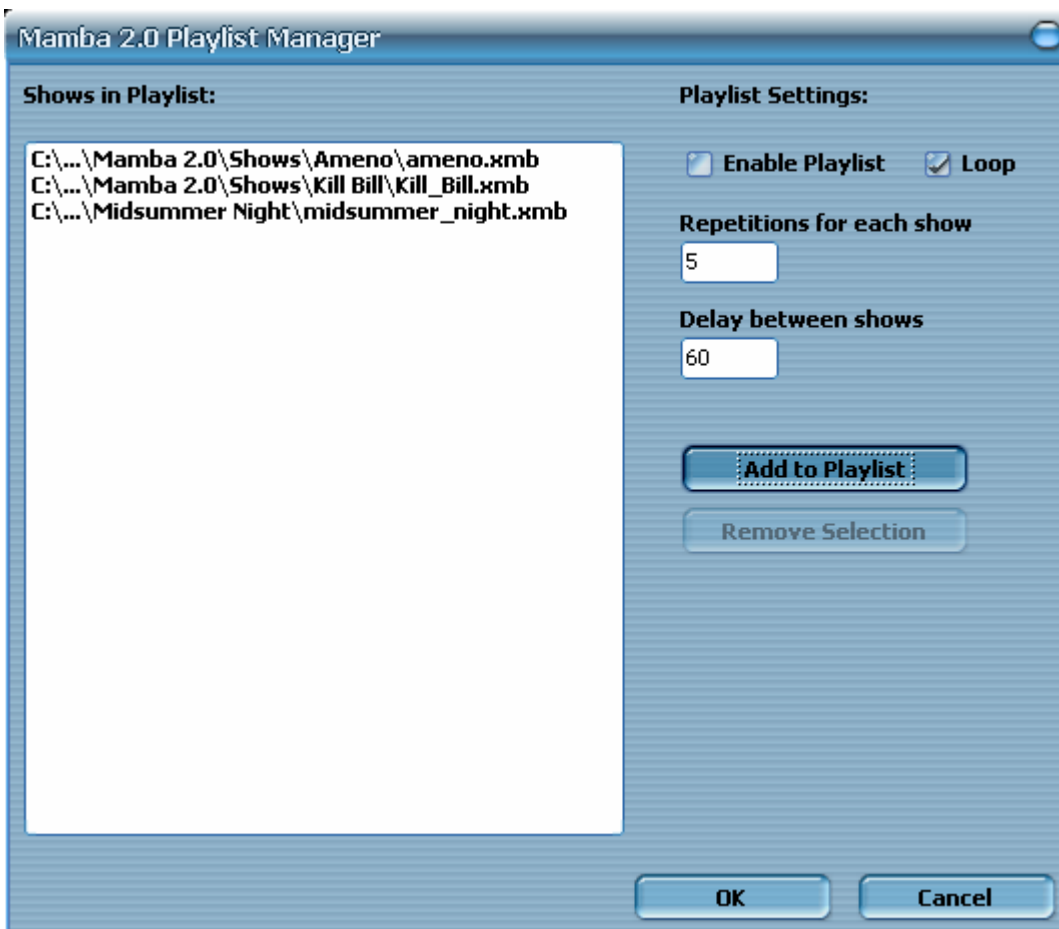
- ❖ Entire show from start to end
- ❖ The currently selected scene
- ❖ A single frame, which is currently displayed in the editor window
- ❖ User time from begin to end marker

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. If will even scroll automatically to the correct time frame, if source selector is set to other playback format than entire show.

Show Playlist (Autoplay)

In the mainmenu under „File“ you will find „Manage Playlist“. With this function, it is possible to play several shows automatically. In the new windows you can add shows to the playlist with the „Add to playlist“ button. With „Repetitions for each show“, you can adjust, how often a show will be played until another is loading. With „Delay between shows“, you can adjust the time between shows will be played. Just check „Enable playlist“ and click the „Run Playlist“ button to start the playback.



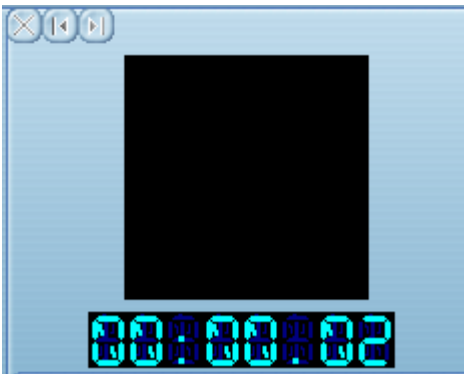
Mark highlights in the music with beat markers

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

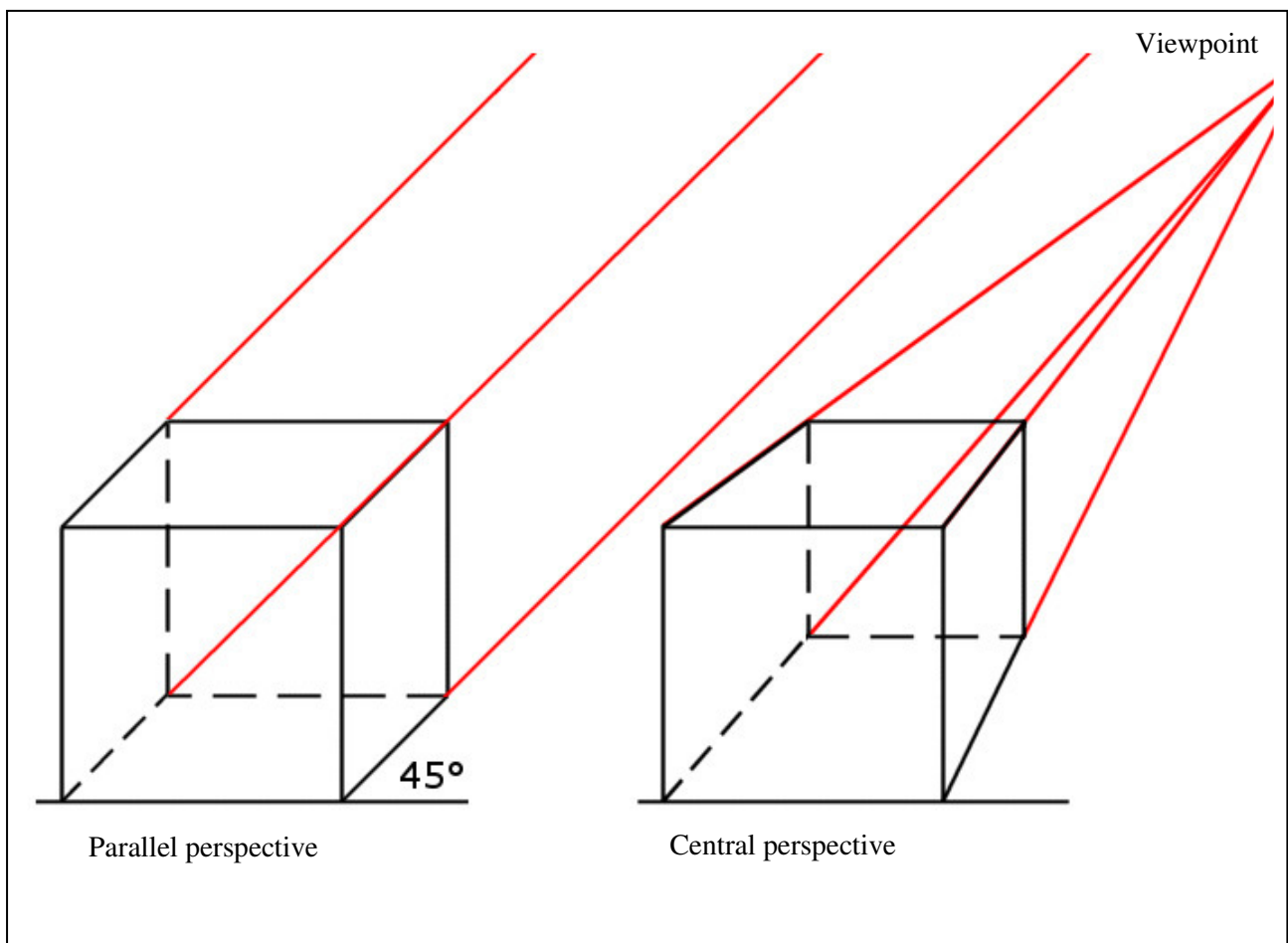
The button, right next to the Loop button, shows a very special debugging function, and should be carefully and properly used. After this function is selected, all the color and blanking outputs on your interface box will be set to fully high level. This means, all your lasers in your laser projectors 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 its 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 its size in the desired axis. All sides are parallel during rotation. This is not useful for graphical applications, but very useful for beamshow applications.

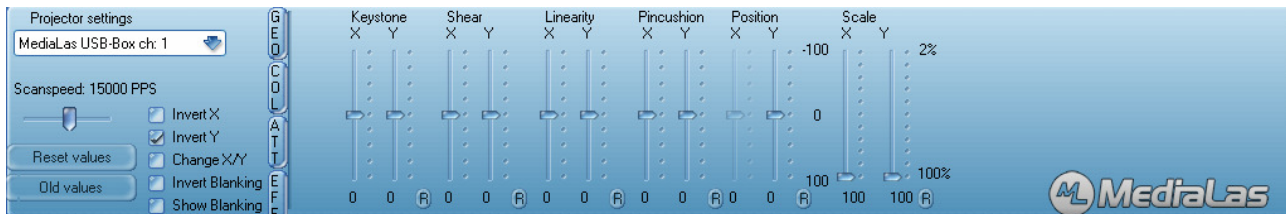
As soon as you apply a value to the perspective slider, an imaginary Z viewpoint is set “behind” the normal projection area. The same square, rotated by X or Y, will now zoom in 3D, in central perspective, where one end of the square, which rotates towards the viewpoint, gets smaller, and the other end, rotating towards the observer, will increase its 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

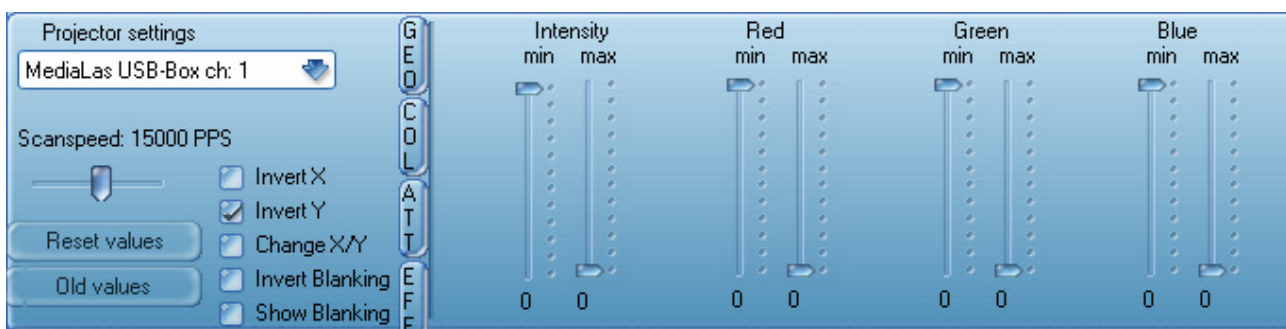
Mamba contains a very sophisticated geometric correction tool, that allows multiple correction to the projected image, including full geometrical functions, color alignment, and scan speed settings. Each physical projector holds fully independent functionality. Depending on the projection angle, the 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 the geometry, including 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.



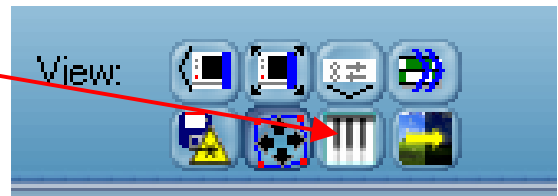
The min fader sets the start up value during modulation for each laser color. Laser drivers do not offer a 100% linear analog input voltage. Some lasers start to light up on different levels than others. With the min slider, these switch on levels can be adjusted.

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.

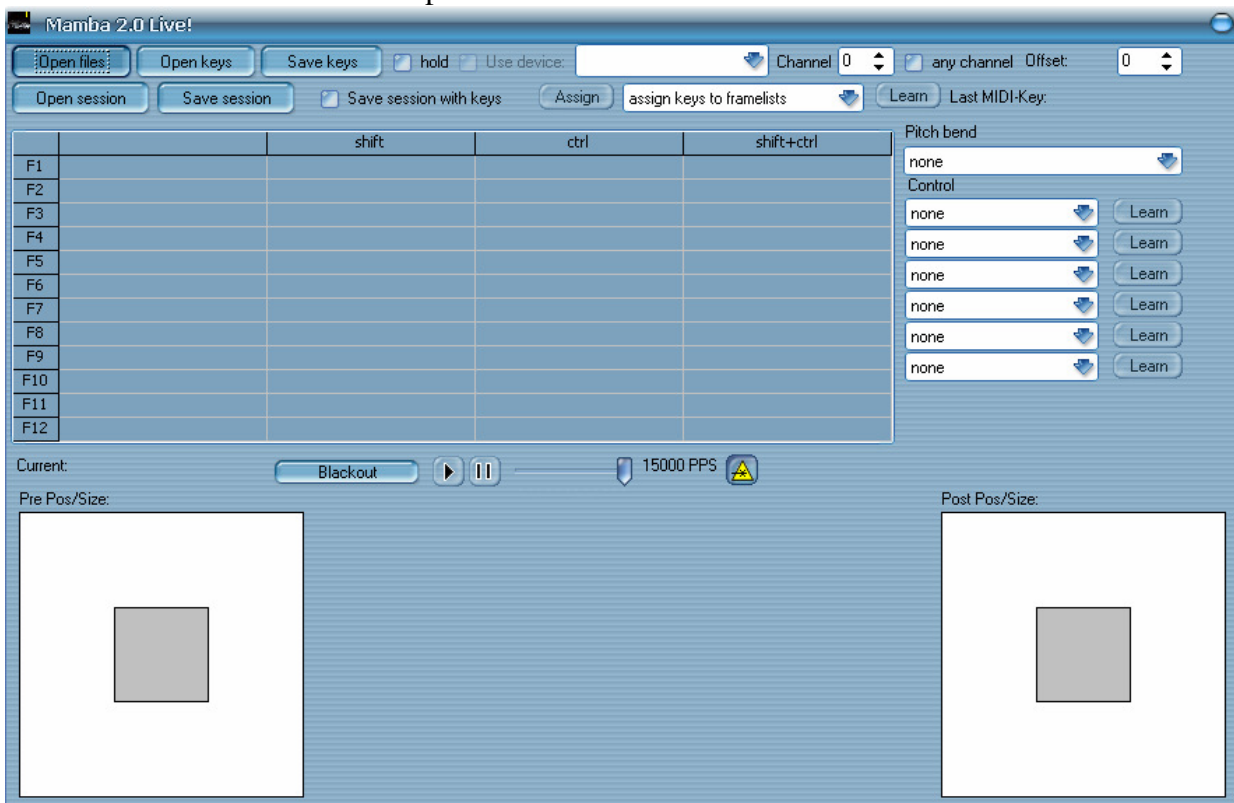
Intensity slider is mainly used for single color laser projectors, and offers the same functionality like color sliders.

Mamba Live!

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.

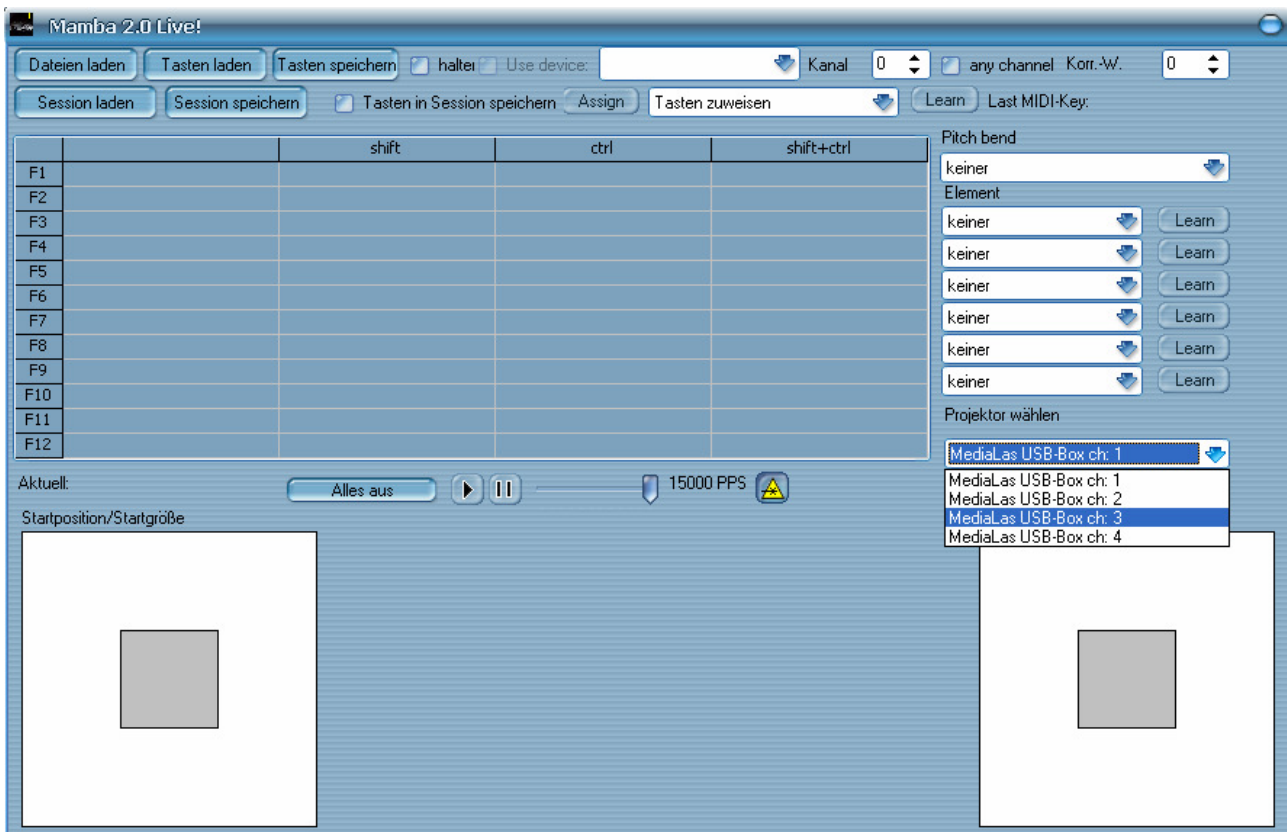
Midi control

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.

Use several projectors in Mamba Live!

If you connected several projectors over several interfaces to your computer, you can control them with Mamba Live!. This works like the old Mamba Live!. But now, for each interface which is connected to the pc, a separated list of patterns is available. You can choose the interface on the right, over the right position / scale function. Just choose your interface and load your patterns in the available slots. You also have to check “Use global control” if you want to control all of your Laser projectors. For example: You loaded a circle image in the list of the first interface on slot “F1” and a square image in the list of your second interface on slot “F1”. If you push the “F1” button on your computer keyboard, the laser connected to interface 1 will show the circle and the laser connected to interface 2 will show the square.



More info coming soon!

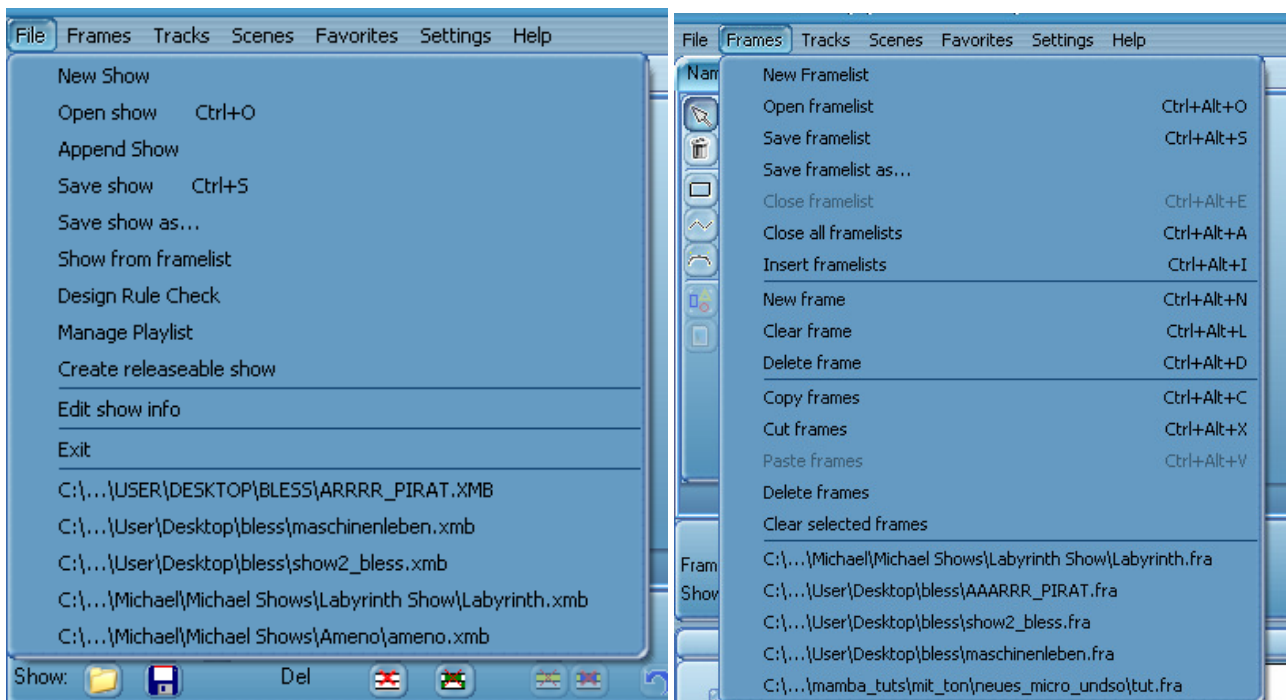
Import and export shows and frames

Mamba 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, 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 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! First check out, if the exported .ild file is fully compatible with the standard.

To ensure time synchronity on imported shows, Mamba allows the selection of a specific frame number per second. The standard frame speed is 25 fps (frames per second).

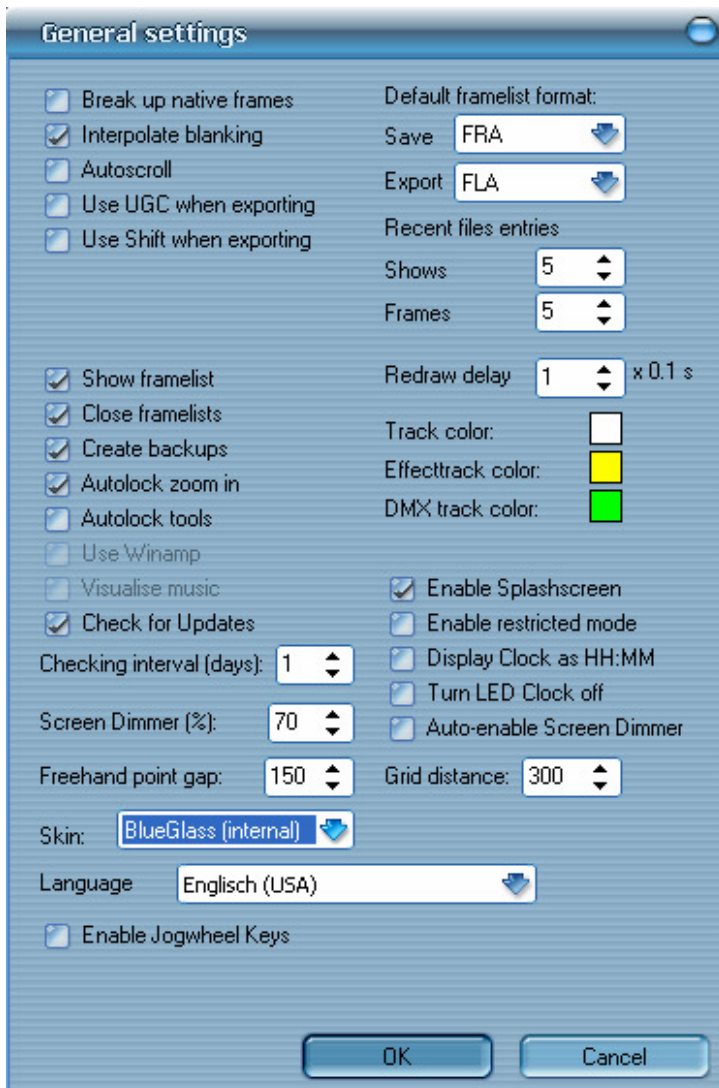
!!!! Only shows, which are legally owned to yourself, should be exported and transported to other software systems. Do NOT transfer unauthorized copied shows!!!!



More info is coming soon!

Setting up Mamba 2.0

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 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 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.

Skins: Choose your favorite skin.

Language: Choose your language.

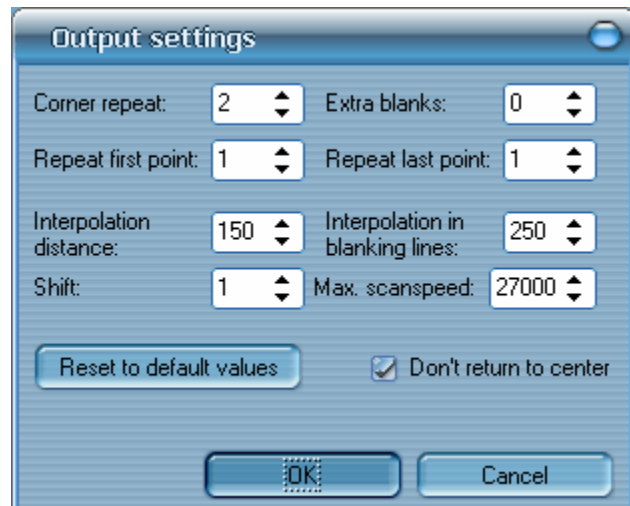
Auto enable screen dimmer: If checked, the screen will be dimmed anytime if a show is played back.

Enable Jogwheel Keys: If checked, you can spool the laser output while a show is played back. It's a very great feature to synchronize your taken laser show to an external audio source. To do this, simply use the cursor keys on your computer keyboard (right cursor to spool forward, left cursor to spool backward). The up/down keys will be reset these offset.

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 directory.

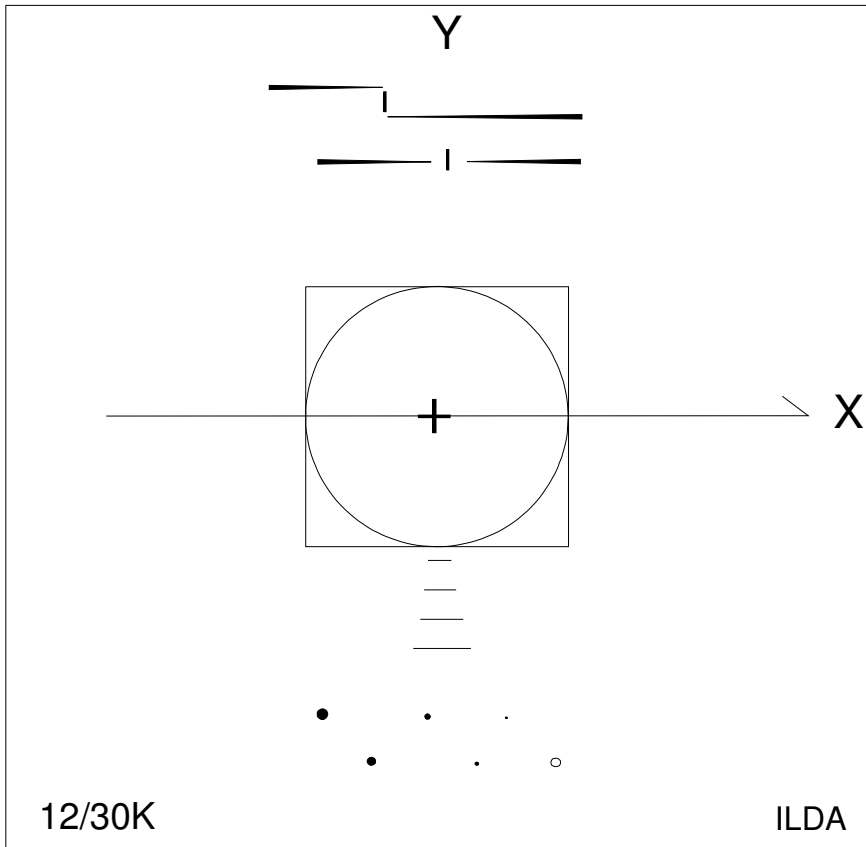


Figure 1

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.

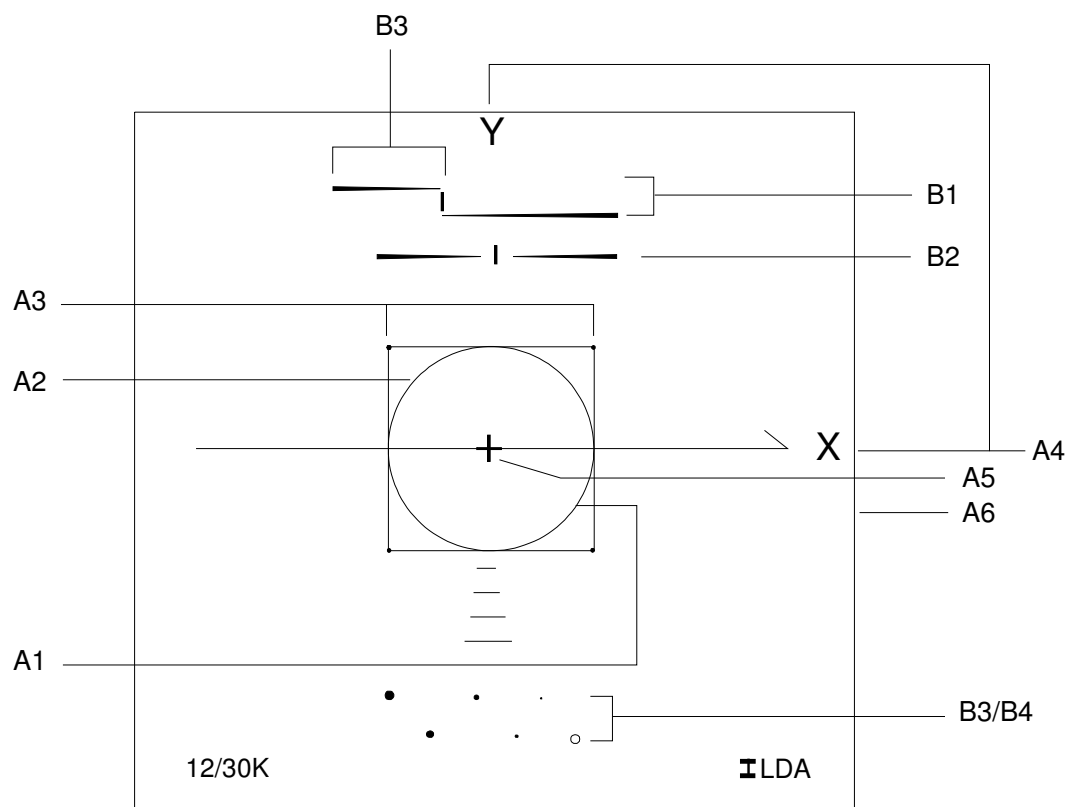


Figure 2

- | | |
|--|--|
| <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 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.

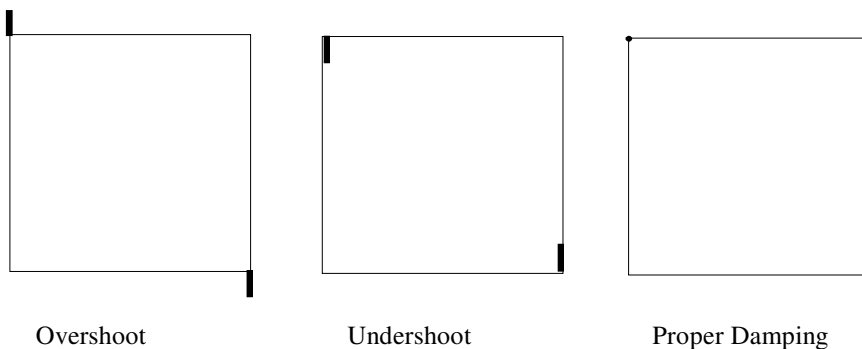


Figure 3

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.

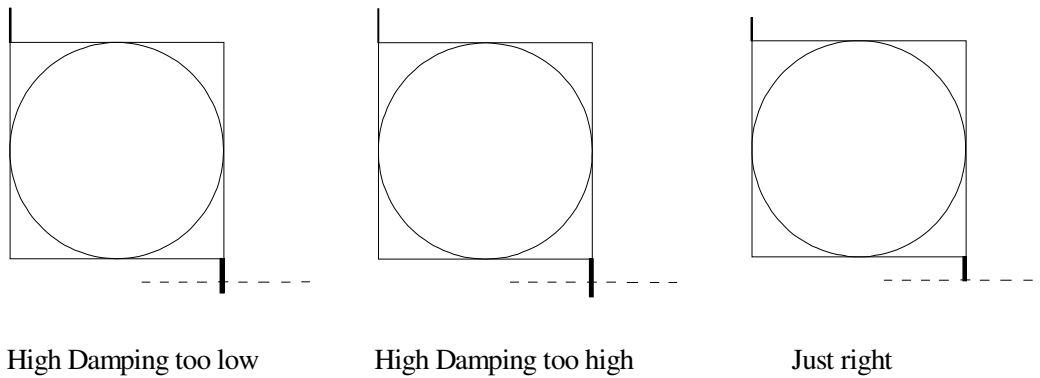


Figure 4

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.

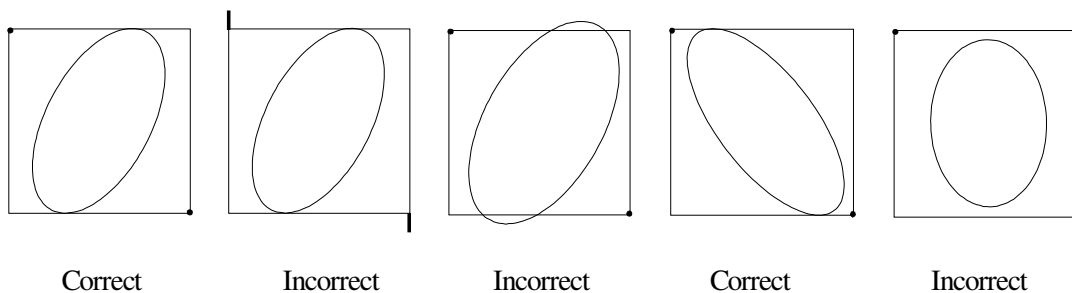


Figure 5

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".

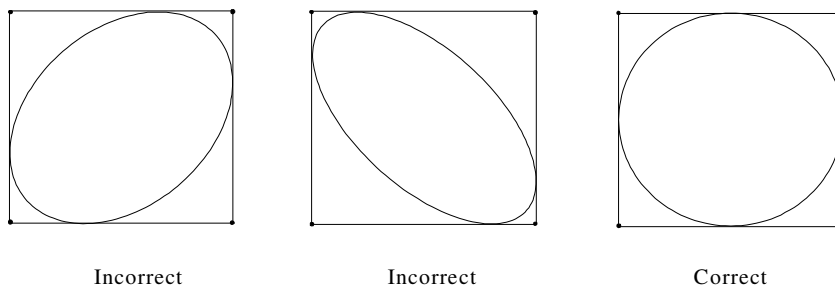


Figure 6

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.

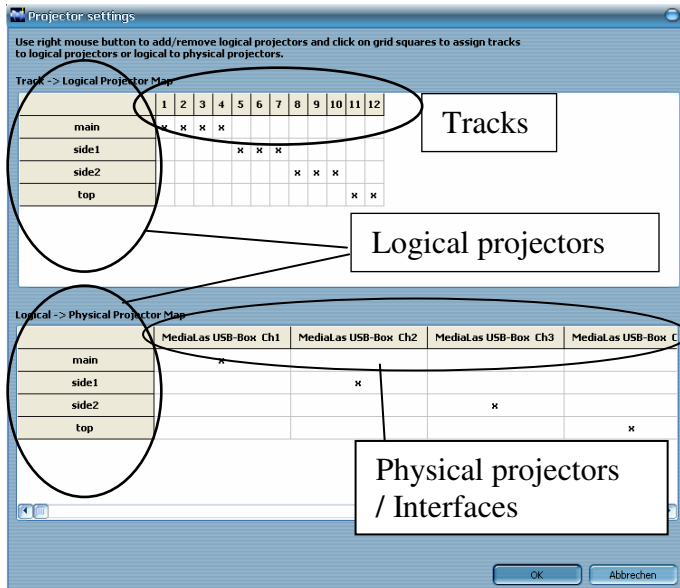
Scanners are inherently imperfect. A well adjusted XY set may be achieved with some compromise to perfection. However, the scanners of today are of higher quality and usually will tune near perfectly. Be patient, don't give up too soon!

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

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

Routing projectors – Logical projectors – Physical projectors

One of the most impressive features of the Mamba Software system, is the easy setup and routing from tracks to logical projectors to physical projectors. Since, again, there are no limitations inside Mamba, unlimited number of logical projectors can be designed, which is a massive easement for designing professional laser shows.



To help and make the setup easy, Mamba offers a dialog window:

The first part of the window shows all logical projectors. These projectors have to be routed to physical projectors, before there can be any laser output. A logical projector is basically a virtual area where your tracks are routed to. One or more of the tracks can be used in any logical projector.

The second part of the window shows the available physical projectors, if there are interfaces available or drivers installed. For each physical projector, any logical projector

can be selected from the matrix table. Just click on any position, to add a cross for a connection.

The routing table is stored as soon as Mamba is closed, and a .map file will be created in the Mamba directory.

A very simple way to enhance a single projector show to a multi projector show is to reroute existing tracks to various logical projectors. Since any logical projector can hold any number of tracks, some tracks will just be routed to all projectors, some tracks just to main or satellites.

First Beamshow Tutorial

Tips and examples how to create a lasershow.

First steps

First choose the right music file for your new show!
Try to find a song with good hearable beats in it, E.g. in dance music.
This is a very good way to practice repeatable scenes in your show.
Save this file in a separate folder on your pc.

Fill in the Edit Show Info function in the File menu.
This could be useful for others people to find the right music file in the future.
Use the following items:
Show name:
Show type:
Show length:
Show made by:
Audio file:

Save the show in the same folder and give it a numeric number, for example Show1.xmb.
Save your show every five minutes, but do not overwrite the previous one. TIP: Give it an ascending number. In this way you can easily go back to an old show if something goes wrong.

TIP: Set the Timeline length (setting bottom-left in the main menu) the same as the length of your song. In this way it's easy to zoom-in and zoom-out in the timeline)

Now playback the music for let's say 10 seconds. Tap on the spacebar when your hear the beat. The markers can be seen just below the timeline as small arrows.
Zoom-in on the timeline and replay the music part. Re-adjust the markers if necessary.

Frames and Scenes

Try to imagine what kind of figures you want to see back in your show when it's finished.
But beware. When you draw a point, you will eventually see a line! This is because the beam has to 'travel' from your laser to this point. When you draw a line, you will see a triangle in your show.

Draw a horizontal line at the top in the frame editor and drag it to the first beat mark on the timeline. With the Move-from and Move-to wheels you can let move the frame from top to bottom.
TIP: If you use a laser with analogue modulation, always fade-in and fade-out your scenes a little bit (let's say 10%) using the sliders. A scene with 100% intensity is ugly to view and bad for your eyes.

Playback this part of the show using the red begin marker and end marker.
If the scene is good enough, copy this scene and paste it exact to the other beat markers and save your show.

TIP: Because the beat comes back in other parts of the song, you can easily copy-paste whole groups of scenes in one time. This will save time.

TIP: For a better overview of your show, use multiple tracks. Track one for beat scenes, track two for lyrics scenes, track three for into scenes, for example.

TIP: To compose the rest of the show, continue with the easiest parts. Again, try to visualise the result at the end. Use your imagination. Once you're working on it, the difficult 'gaps' between the scenes will be filled automatically by you.

TIP: If you copy-paste scene(s) and use another colour for the second scene, the audience will hardly notice that the scenes are almost identical. This can save you time creating new scenes.

Another way to make beat scenes is to use the flash function. This is easier than explained in the previous example, because you just have to draw one scene. Adjust the flash on –and off setting to the beat rate of your music. TIP: A typical set value is 9/25s for flash-on and 3/25s for flash-off, if the beat rate is 130 bpm.

This beat per minute rate can be determined using the free BPM Analyzer software at <http://www.mixmeister.com/download.html>

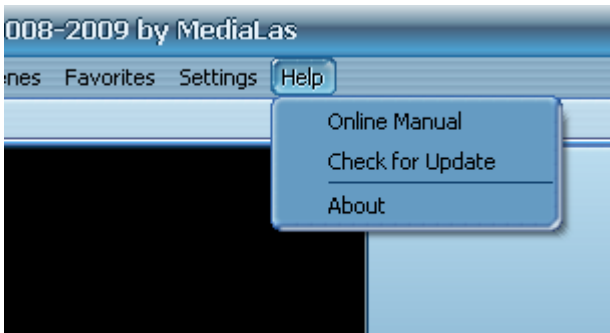
Move the scene a little bit to the left or right to get it exact to the beat.

Another funny way to train your ears to listen to the music is to make a beamshow based on the tune ladder. Use for this show a simple child song or something. Every note is then displayed at a different position of the window. So, a high notes will be seen as a high lines, low notes as low lines, with every note its own colour. Make the lines shorter if the tone is heard shorter as well.

Sine waves are often used during an intermezzo or break in a song. This is a part where there is no beat, just some vocal stuff. It can give you a nice creepy feeling if you create a sine wave that moves from bottom to top in multiple colours.

Another way to make spectacular scenes is to speed up scene movements at the same time as the music speeds up. This can be established by using scene effects. An example:

Draw a square and drag it to the timeline. Let it rotate clockwise. Add two scene effects to this track. The first effect starts 1/3 from beginning of the scene and ends at the end of the scene. Assign a rotate function to the first effect, set it to one turn clockwise. The second effect begins at 2/3 of the scene and also ends at the end of the scene. Again, assign the same rotate function. Result: the scene will rotate slowly at the beginning, then speeds up in the middle part and will spin at the end.



By clicking on the help menu, the dropdown opens. Here, you can check for updates, or 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.

The update check just checks for new updates, but does not automatically load or download a new update. This is due to our license policy, where one software is coded for one specific dongle key.

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



Hot key in Mamba

Mamba 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 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	Docks selected scene to previous scene
+ X	Cut Objects
+ C	Copy Objects
+ V	Paste Objects

Space

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

Double click

+ Rotation wheels	Resets values of rotating wheels
+ Moving areas	Resets values of moving areas

Double click

+ Move / Scaleslider	Changes values in 25 steps
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+ / -

+ Freehand	Changes drawing point distance (shown below editor window)
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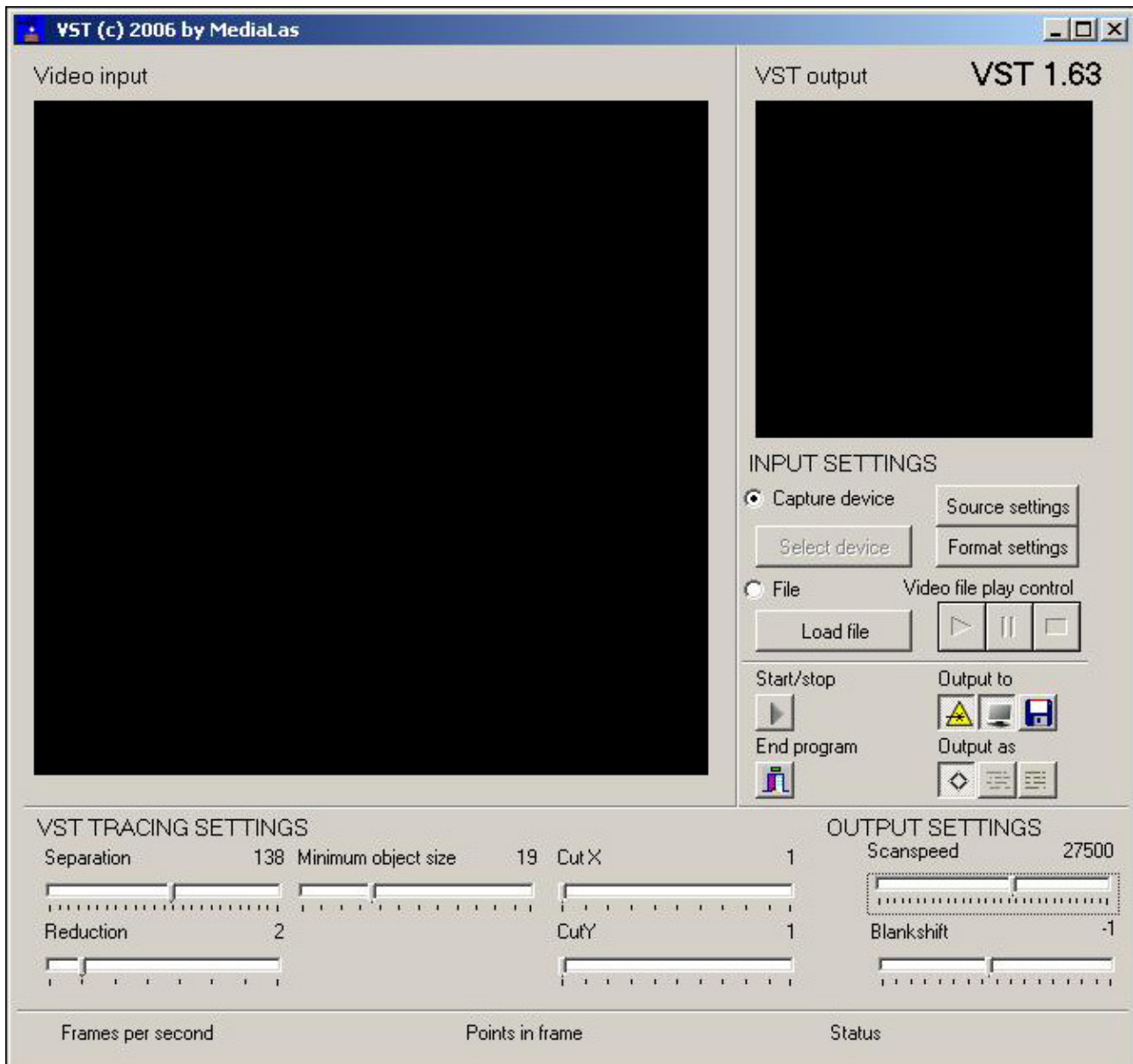
Direction keys

Right/Left while show paused	Will spool the show frame to frame
Up/Down while show paused	Will spool the show for 10seconds
Right/Left while show played	Spool the laser output for one frame (e.g. for sync. ext. music)
Up/Down while show played	Reset the taken show offset

VST Video Sequence Tracing

The VST-1 Video Sequence Tracing software was first developed in late 1999, and soon became famous as version VST-2000, where MediaLas sold a full trade license to Pangolin laser systems, where VST was added free to any LD Pro software system. Now, an easy version is available free with any Mamba 2.0 software. VST basically uses any stream video file, coming from disk or live from any cam source, webcam or capture device, and traces outlines in realtime, sorts them into a laser file, and projects it to a laser projecting device. Depending on the ambient light, the results can be tremendous, and many shows where already made with VST systems.

VST in version 1.63 can be found on the Mamba disk, or, if installed, on your hard disk.



Fast start

First of all make sure you have a capture device available. A simple webcam will do. Start VST, and you will immediately see the capturing video stream in the video input window. If more than one device is installed, VST offers a selection of the capture device. If there is no capture device available, or you want to trace a pre produced video file, simply check the "file" button, and select

the desired file. Now start the tracing sequence with the “Start/Stop” button. You will immediately see something in the VST output window. Play around with the sliders in the section below the preview window to find the best adjustment for your capture stream.

VST Tracing – how to...

The sliders allow to adjust various settings and corrections to your video stream. A good result very much depends on a good input picture quality. As usual in all tracing programs, only contrasted shapes and edges will bring good results, so make sure to have a high contrast between your object and background. Here is an example:

You want to trace a dancer. Make sure, your background is either fully dark or fully enlightened. If your background is dark, dress your dancer in white, and apply a good light on him/her. Now your tracing result will be perfect.

Pre produced video files can also be enhanced by using third party video software, of some freeware programs.

But also on worse backgrounds, your results can be good enough for a laser animation. On most video capturing device drivers, there is plenty of adjustment for enhancing brightness or contrast ratio. Some drivers even allow to reduce color depth, which tremendously helps the tracing algorithm to find edges. Under these circumstances, we recommend to play around for a while with various settings, BEFORE you start the trace or the live performance.

Hm, what can be traced? Well, everything can be. We have seen traces of girls, dancers, pets, animals, and even water fountains! Imagine, you have a dancer on a black stage, no light at all, and you light the dancer up with infrared light. Now use an IR sensitive camera, and project the dancers movements in real time in laser!

VST Tracing Settings

There are a number of slider for setting up VST. Here is a short description of the usage of these adjustments:

Separation: This is the adjustment for the separation between back and foreground. The larger the contrast, the better the separation. With this slider you adjust the brightness level of the separated edges.

Minimum object size: Very important slider to reduce the number of objects, and with this, the number of points in your tracing result. If there are a few small objects in your tracing result, which could be caused by light disturbance or by tracing errors, they can be filtered with this slider. Adjust the minimum size of the object, that will be traced, and decrease the number of dots in your laser frame.

Reduction: Here you reduce the number of points in your tracing result, by removing unnecessary points in the laser frame.

Cut X / Cut Y: Use these sliders, if you experience distortion on the edges of your picture, coming from camera overdriving, or capture errors.

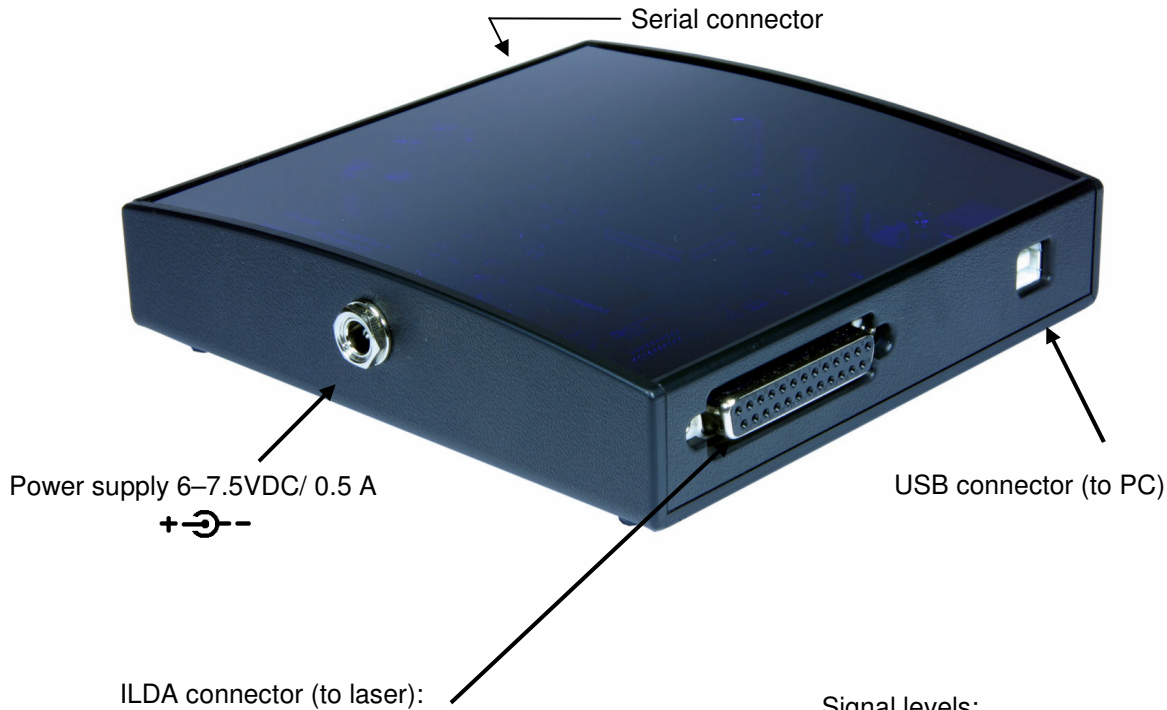
Output settings

Basically the same function as in Mamba. Set scanspeed and blankshift, until your image meets your expectations. Make sure, not to overdrive your galvo system!

More info coming soon!

MediaLas HyperPort^{V6}

- High speed USB-to-Laser interface for Mamba software systems.
- 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
- DMX output: 512 channels (for future use)



Pin 1 X+
Pin 2 Y+
Pin 3 blank/intensity +
Pin 4 interlock
Pin 5 red +
Pin 6 green +
Pin 7 blue +
Pin 11 DMX +
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 24 DMX -
Pin 25 ground

Signal levels:

Pin 1, 2	-5V..5V
Pin 13, 14	5V..-5V
Pin 3, 5, 6, 7	0V..2.5V
Pin 16, 18, 19, 20	0V..-2.5V

Pins 16, 18, 19, 20 can be connected to ground, Pins 3, 5, 6, 7, respectively, will then range from 0V..5V single ended.

Do NOT wire Pins 13 and 14 to ground!

Shutter signal 0V/5V

Use only original MediaLas power supply, to run the HyperPort. Any non original power supply could destroy internal electronics, and will void warranty!

Overview

The MediaLas HyperPort is a very versatile and powerful USB-to-Laser interface, offering a full standard ILDA connector, and a 512 channel DMX buffered line. By connecting the interface to any USB connector on any computer system, there is no need to use desktop PC or separate connector boxes. HyperPort runs even from smallest Netbook or any Notebook computer, running Windows operating system, available.

Each interface supports one projector channel. However, it is possible, to connect more than one laser projector to the ILDA connector, by using either a parallel splitter cable (available at MediaLas), or linking several projectors with ILDA in and out connectors. There is a maximum of 3-4 projectors, which can be connected to the HyperPort's ILDA connector.

Connecting to the computer's USB port

The HyperPort can be connected to any USB port from version 1.1 up to 2.0. Use a standard USB A-B cable, while the B-connector must be connected to the HyperPort. First install the USB cable, before powering up the HyperPort, to avoid any static electricity between the HyperPort and the computer's ground. It is also possible, to connect the HyperPort through a USB hub. MediaLas recommends, to use maximum two HyperPorts per USB port or hub, to avoid data transfer problems at large and high density frames between software and HyperPort. If more than two interfaces are connected on the same port, a sticking output could appear.

After the USB cable is connected, power up your HyperPort by inserting the plug type power supply to the main source, then insert the DC cable to the HyperPort. Now, the blue LED inside the box should start to flash. This shows the proper internal operation of the HyperPort.

Tests at the MediaLas labs had shown no problems, connecting 12 or more HyperPorts to one computer. An additional USB port card was used, and there where maximum two HyperPorts per port installed. Note, that one USB power usually shows two USB connectors. Each connector pair is one USB port. Further tests where done on notebook computers, where just 3 USB connectors where available. We connected 4 HyperPorts through two hubs. Basically, the function is perfect, but could result is a lower framerate at a high point density of the laser frames. This is not an error, but very normal, if more than two HyperPorts are installed on one USB port.

Connecting your laser projector to the HyperPort laser interface

Any laser projector with compatible DB25 ILDA connector can be connected to the HyperPort laser interface. Please note, that not every DB25 connector is automatically a compatible ILDA connector! Especially low cost suppliers offer many times incompatible projectors, where negative signal lines are not connected or just missing entirely. MediaLas does not offer any support for non ILDA compatible stuff!

Driver Installation

The following installation procedures are meant to be under Windows XP or Vista operating systems. On older, Windows 2000 or 98/MW systems, it might be necessary, to install the driver manually.

Mamba Package:

When a complete package is purchased, first install the entire software, before you connect the HyperPort to your computer. Drivers will be installed automatically on your system. After Mamba installation is complete, simply plug in the HyperPort to a USB port, then apply power to the HyperPort. The computer should find the hardware, and install the appropriate driver.

Standalone:

If no Mamba software was installed previously, connect the HyperPort to computer's USB port, then power up the HyperPort, and insert the installation/driver CD. The driver will be found by the operating system, and will be installed by itself.

Operation

A blue LED will flash with a period of one second, indicating that the HyperPort is ready. When data is received the LED will flash with any frame received.

Troubleshooting / If you experience problems with HyperPort:

General:

- Make sure you run the latest Windows updates.

- In case of any continuous problems, try on a different computer, if possible.

The LED won't flash:

- Make sure the power is connected properly.

- Reset the Box by removing the DC connector, and inserting again.

Mamba does not recognize the HyperPort:

- Check the USB section of the Windows Device Manager (My Computer/Properties/Hardware). The USB-Box should be listed, if not, check the USB connection. If it's still not listed, reinstall the driver (see section "Reinstalling the driver" below).

- Make sure the (Mamba-) dongle is connected and the dongle driver installed. In the USB section of the Device Manager there should be 2 (!) entries:

 - Feitian ROCKEY4

 - Feitian ROCKEY 4 USB

- If the second is missing, the dongle is not recognized. Check the connection.

- If one or both entries are missing, the driver may be installed incorrectly, or not at all. You can use the driver installation/repair tool on the Mamba CD (folder "dongle_install").

The HyperPort “hangs” after some time:

Reinstall the driver (see section “Reinstalling the driver” below).

Reinstalling the driver:

To uninstall the previous driver, disconnect the USB cable from the HyperPort (and of possible other USB devices using FTDI 2xx chip), go to Windows Control Panel/Software, locate the item “MediaLas USB Drivers” and click “Remove”.

Then reconnect the HyperPort and follow the installation procedure (you will need the CD).

Laser projection is just half the size:

Incompatible ILDA input connector of your laser projector. Usually, this happens if the negative signal lines are missing. Check if ground is wired to pin 25.

Laser projection is floating or jumping

- Ground loop, missing ground, or dual grounded cable. Check, if your laser projector uses a fully compatible ILDA connector.
- Try to disconnect Ground wire on projector side.
- Purchase ILDA compatible laser projector

If you still have problems, contact our technical support.

Credits

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

- Vince van Riet
- Tobias Gebuhr

Keep it coming!

