

# **Manual**

# **m.objects v9**

**Edition July 2020**



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# General

## What is m.objects?

m.objects is an extremely flexible and powerful software for creating audiovisual productions (AV shows) and for playing and exporting them. The range of applications varies from classic photo slideshows over effectively designed arrangements of pictures and videos to the control of highly complex AV systems consisting of a large number of projectors and other peripheral devices and using numerous sound channels.

m.objects is fully graphically orientated and can be operated intuitively due to its clearly structured interface. Both the arrangement of freeze frames (photos and graphics) and videos as well as the complete soundtrack and the control of other devices can be defined directly with the mouse in the program interface.

Tools for image, video and sound processing and for organizing the media files used are available within m.objects. This ranges from integrated image and video editing to audio recording functions for analog and digital sound sources and the use of sound effects.

m.objects consistently uses two important principles:

The arrangement and the media used are processed *non-destructively*, i.e. without loss of quality in the source material. All processing steps can be reversed at any time or carried out again in a modified form. The source files such as photos, videos or sound recordings remain completely untouched. This gives the user an unprecedented space for his creativity, because it can be experimented without irreversible changes.

The playback of a production can be started at any time and at any point in the arrangement and immediately delivers full picture and sound quality. Edits that have just been carried out are immediately audible and visible without the need for lengthy and quality-reducing calculation processes (rendering). This means you can see the end result of each processing instantly. Since the principle of immediate availability in full quality in m.objects is extended to all media, the term *real-time rendering* is used for this.

Due to these features, many users are able to use m.objects effectively without

having to study additional documentations. However, to get started as quickly as possible, reading the chapter "First Steps" is recommended at least.

The video training courses at [www.mobjects.com](http://www.mobjects.com) also offer a thorough and easy-to-understand introduction to working with m.objects.

State-of-the-art software technology, studios optimization and efficient use of the capabilities of the available computer hardware ensure that m.objects achieves first-class output quality. The main strengths are:

- Practically no software restrictions on the input and output resolution: high definition even above the UHD or 4K standard per output device, optional use of multiple output devices to further increase the overall resolution
- Ability to display colors correctly: full ICC color management, correct handling of calibrated output devices such as monitors, digital projectors
- Processing of practically all common sound and video file formats with the best possible integration of the available hardware capacities (graphics card-based video decoding)
- Smooth dynamic effects such as cross-fading, zoom and tracking shots, rotation and more: Real-time output of progressive single images with a constantly high refresh rate synchronized to the output device
- Lowest possible requirements for the computer hardware: Largely automatic adaptation of the program to available hardware by using the latest software technology

In order to optimally process complex arrangements, a certain minimum level of equipment is required despite the high degree of optimization of m.objects. You can find more information about this in the chapter *System requirements* on page 280.

## **Possibilities and limits**

With m.objects you produce and present multivision shows at a professional level. You make optimal use of the quality of your high-resolution image material and achieve color-accurate reproduction using color management. Fading effects, tracking shots through pictures, zooming down to the smallest details, rotations and 3D animations - m.objects ensures practically smooth movement even with a large number of picture tracks. It is not necessary to resize or sharpen photos in advance, even unfavorable in many cases. You can integrate the images directly into the

m.objects. Apart from the manufacturer- and camera-specific RAW files, m.objects can read and process all common image formats.

m.objects also supports the integration of high-resolution videos. You can arrange sound effects on the soundtracks exactly as they fit best in the course of your presentation. Pieces of music can be conveniently imported into the program from CD and other sources and in the best quality, spoken comments can be recorded directly via m.objects. With just a few mouseclicks, you can achieve the optimal mix of sounds, so that over- or under-controls are avoided without effort.

m.objects also offers you all possibilities on the output side. A fully-fledged ICC-compliant color management - with color-calibrated output devices - automatically ensures that the colors are displayed correctly. Seamless large-screen presentations with immensely highresolution are possible with automatic distribution of the image signal to a large number of digital projectors. In addition, m.objects continues to support the presentation of classic, analog slides. Almost all slide projectors available on the market or previously available can be controlled with m.objects.

m.objects combines all of this with an intuitive user interface in which professionals work efficiently and even beginners can find their way around quickly. In general, m.objects supports the workflow with a number of useful editing options. Important image processing functions such as regulating the brightness, adjusting the contrast, color correction, sharpening or blurring are integrated into the program, as are frequently used filter effects. The same applies to video and sound editing. Videos and sound samples can be cut and edited in m.objects. So instead of switching back and forth between different applications, you can work quickly and conveniently in one program.

m.objects does not claim to completely replace specialized software solutions for image, sound or video editing. Appropriate specialist software can be used for special applications such as complex exemptions, complex video editing or differentiated sound processing and the result can be integrated into the m.objects presentation.

You should allow yourself a certain amount of familiarization with the software, despite the intuitive way of working. The first steps in the program are done quickly and short shows can be created without much effort. However, some experience is required to create a full-length presentation which casts a spell over your audience. But then there are almost unlimited possibilities for creative work.

## Application range

The applications with m.objects are as diverse as the possibilities: presentations can be shown on a smaller scale using the computer monitor or the television screen.

The presentation via a digital projector can be even more interesting, because good devices provide excellent detail, brilliance and brightness. Here also, the range of applications is very wide, from demonstrations in private settings on smaller screens to shows in large halls on correspondingly large-sized screens, which lecturers run with mobile presentation equipment. The decisive factor is the performance of the projector used in each case. In the meantime, digital projectors have become particularly interesting for ambitious amateur photographers and photo clubs, because good devices are already available at moderate prices.

There are also fixed installations with a large number of projectors, which are used to show impressive panorama shows.

On the m.objects website you will find a number of examples of installations and live lectures with m.objects in the references:

<https://www.mobjects.com/ueber-m-objects/referenz/>

## Live support during the service period

We offer extensive support for your AV software m.objects. This also means that within the service period (period for free updates, see form under *Options / Activation*) you can make use of our free-of-charge remote diagnosis, respectively problem solving with PC remote control (TeamViewer) concerning questions that cannot be answered simply by a manual or by telephone. You can find the required



module for this directly in the menu *Help* under *Live Support*.

An appointment for the remote control support should of course be done by phone or email in advance.

# Installation

## Information on updating acurrent program version:

**In order to make the setup as simple as possible, it is strongly recommended for program updates not to uninstall the present program beforehand. Install the new version over the current one while maintaining all specifications . The installation program automatically replaces all files to be updated.**

You can install and run m.objects on Microsoft Windows XP, Vista, Windows 7, Windows 8, Windows 8.1 and Windows 10. The expansion level of the operating system (e.g. Windows 7 Home Premium or Ultimate) is irrelevant for m.objects. The program is compatible with all available service packs (as of 03/2018). Newer program versions are constantly adapted to the current operating systems and requirements. Before you start working with m.objects, the software has to be copied , for example, from the installation CD to your hard drive and configured. An automatic installation program does this for you. Copying the files "by hand" into a directory on your hard drive is not sufficient.

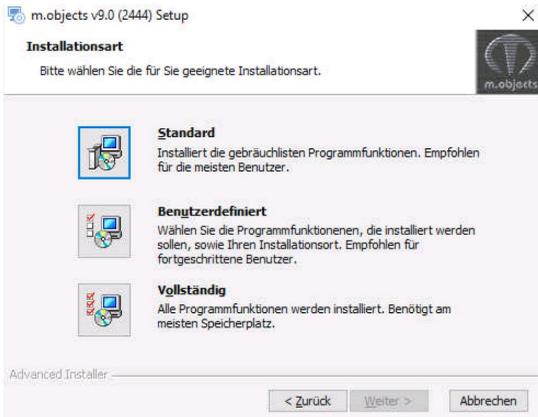
The professional full versions of the program (m.objects live, creative and ultimate) are supplied with a license dongle for the USB port. If you have purchased m.objects with such a dongle, please only plug it into the corresponding port on your PC after the initial installation of the software.



× If you install a version downloaded from the Internet, please simply run the file received (e.g. mobjects\_v80\_intl\_2404.exe or similar). To install from CD, it is usually sufficient to insert the m.objects CD into the drive - the installation routine then starts automatically. If it does not start however, e.g. because the autostart function is deactivated for you or the CD was already in

the drive when Windows was started, double-click the drive symbol of your CD-ROM drive with the left mouse button in *My Computer* or Windows Explorer or start *Setup.exe* from the main directory of the installation CD by double-clicking. A message may appear under XP or Vista, indicating that the software publisher is unknown to the system. Ignore the message and continue with the setup.

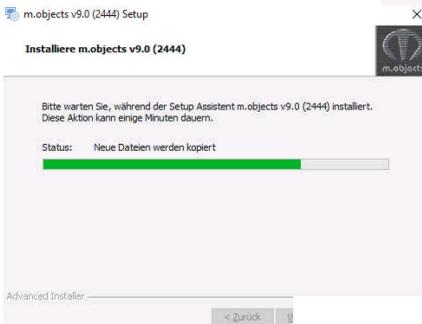
The start screen of the setup wizard appears first. Click *Next* here. In the subsequent window, select the type of installation.



If you click on *Complete*, sample files will also be installed in addition to the actual program, which demonstrate various program functions and which are also referred to here in the manual. If you do not want to install m.objects in the standard directory, select the *Custom* option instead. If *Standard* is selected, the program will be installed without sample files.

If m.objects is already installed

and you start the exact same setup again, the *Repair* option appears at this point, with which you can install the program again over the existing version.



Then click on *Install* to start the actual installation.

After installation, confirm by clicking on *Finish* to end the installation wizard.

After installation, a browser window with information on the current version will open. If you have connected a printer, you can print this text and add it to your m.objects documents. Then close the text window.



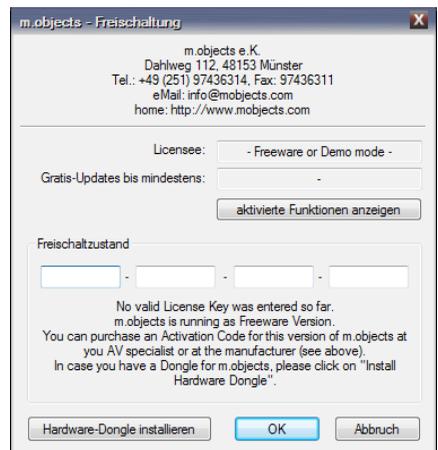
## New license, update, freeware or demo

After successful installation, you can open m.objects via the icon on the desktop or via the Windows Start menu. When the program is started for the first time, the operating mode selection window usually appears.

If you do not yet have a license, you can run the program free of charge either in freeware or in demo mode. In freeware mode there are only two tracks for pictures and videos and one for stereo sound, but presentations of any length can be created and played back. The export of presentations and the suitability for

sophisticated live lectures are also limited. Click on *Full Version Demo* to test the full functionality of m.objects. Here, almost all functions of the m.objects creative expansion level are available. In this way, content can be arranged on any number of image and audio tracks. However, the maximum duration of a production created in this operating mode is limited to 2 minutes.

You can use the *Activate license* button to enter the activation code you have purchased for an m.objects basic license or



to install the driver required for the USB dongle (m.objects live, creative, pro and ultimate licenses).

Enter the basic license code into the input fields under *Activation status*. The license code for m.objects basic consists of four blocks of 8 letters and numbers. You can find more information on the various expansion levels under *m.objects - the system*.

## Install hardware dongle

If you are using an m.objects live, creative or ultimate license and the option *Activate license* is displayed when you start the program despite the connected dongle, you must first install the dongle driver. To do this, click on *Activate license* after starting the program and in the following window on the button *Install hardware dongle*. If you have already started m.objects in demo mode or if you are using a basic license, you will also find this button under *Options / Activation*.



After clicking on *Install hardware dongle*, you will first be asked to remove the dongle from the USB port.

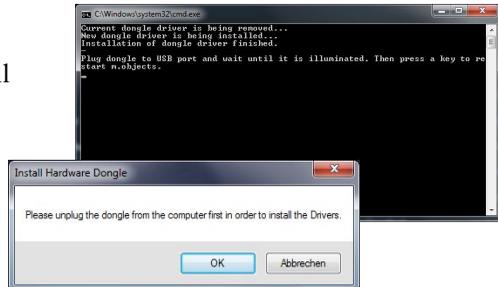
Confirm in the next window with *Yes*.

The driver installation then starts and the current status is displayed in another window. As soon as the driver installation is complete, you will be asked to plug in the dongle again.

Wait for a red lamp to light up in the dongle and then press any key to restart m.objects. Your

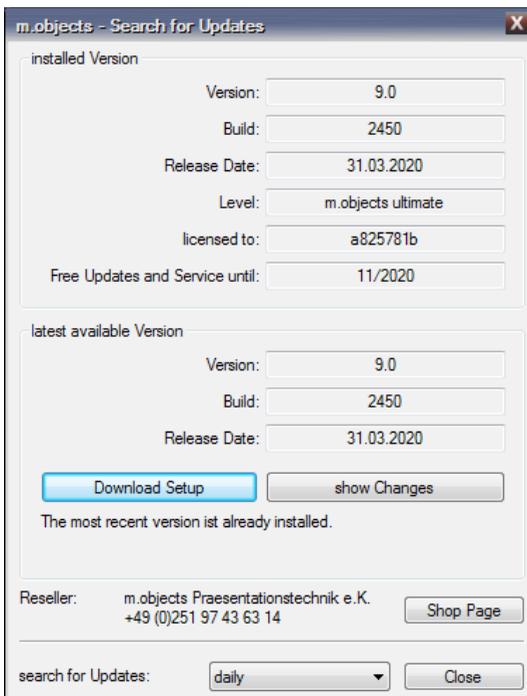
license is now ready for use.

The USB dongle is compatible with all USB 1.1, USB 2.0 or USB 3.0 ports. Normally, it can also be easily connected to all types of USB hubs. If there should still be problems with the detection of the dongle, please try a USB port directly on the computer instead of a hub.



## Free and paid updates

Via the menu item *Help / search for Update* you can directly check whether your m.objects version is up-to-date or whether there are newer updates. The installed and the available version are displayed and it is shown whether it is a free update within your service period.



By clicking on the button *Show changes* you will see a short description of the newest functions and changes in m.objects. By clicking on *Download Setup* you can download and install the latest version directly. A link to the online shop is available for paid updates.

The checking for updates can be done automatically or manually. Enter the desired value under the *search for Update* option. At the selected time interval, m.objects then automatically points out available updates. If you want to deactivate this message, only enter the value manually. Under no circumstances does m.objects transact updates automatically, it only indicates their availability!

If m.objects starts with the message *The Activation Key is not valid for the m.objects version running*, it is a version for which the license you purchased is no longer valid. The expiry date for free updates can be found below the *identification number*. It doesn't matter when you install an update. The note only appears if you install a version that was released significantly after the free update period. In this case, if you are interested in an update, please contact your AV specialist or the manufacturer. More information on updates and prices can be found at [www.mobjects.com](http://www.mobjects.com).



If you have already purchased a program update or upgrade, you have received the required new activation code together with the delivery.

After entering the new code and pressing the *OK* button, the message *Software key accepted* appears.

The activation codes can be checked and changed at any time using the *Options / Activation* program menu.

The period for free updates shown in this window is also the

service period for your m.objects license. Free live support is available during this period. More information can be found in chapter *Live support during the service period* on page 10.

# Setup

The majority of the program options are set by m.objects to reasonable default settings during the first installation. Any parameters changed by the user are retained during an update of an existing installation.

## Setup for the presentation

In principle, no further settings on your computer are necessary to edit and play back an m.objects production.

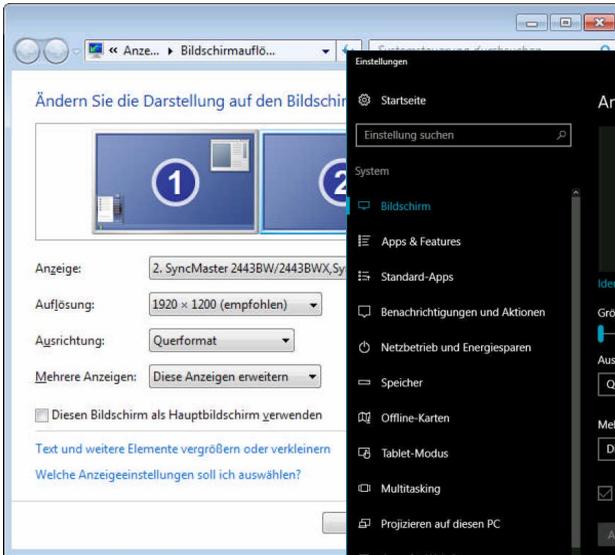
If you work with two or more display devices, for example with two monitors, or with a laptop and connected TV or digital projector, you should first set up the extended desktop under Windows. This gives you the opportunity to view the m.objects user interface and the m.objects Screen separately on two devices. This means that on one device you can see the timeline of your production, while on the other you can see the result of your work in full screen and in high resolution. Thus, working in the extended desktop is very helpful already in the production phase.

In this way, also, most of the lectures in front of an audience are held: The speaker has a view of the timeline and, if applicable, comments or the speaker preview, he controls the course of the presentation using Time Markers and other functions of the so-called Speaker Support, while the audience sees only the actual presentation, for example in a large projection.

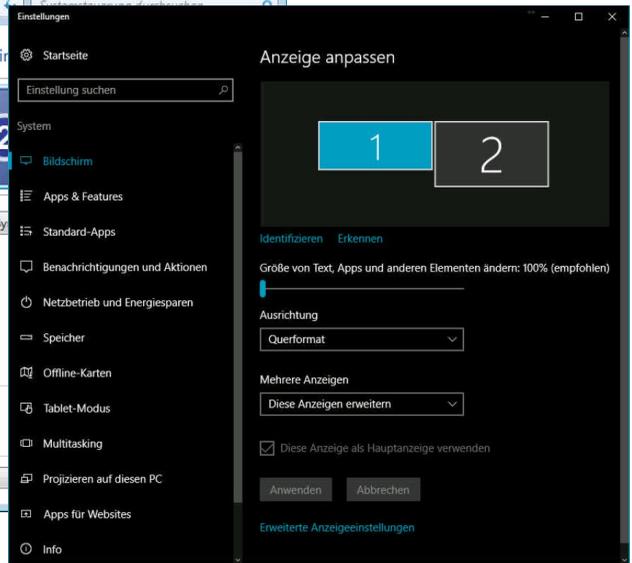
### Extended desktop in Windows 7, 8 and 10

The fastest and easiest way to activate the extended desktop is to use the key combination *[Windows] + P* on the keyboard. Then select the *Expand* mode.

Should it ever be necessary to make more differentiated settings (e.g. to swap the arrangement of the displays), you can use a corresponding form. In Windows 7, right-click on the empty desktop and select *Screen resolution* from the context menu. In Windows 8 or 10, the corresponding command in the context menu is called *Display Settings*.



Windows 7



Windows 10

In order to supply both output devices with separate image content, select the option *Expand these displays under Multiple displays* and then check the resolution set for the two output devices. The native resolution that should be chosen is usually the recommended one. In Windows 10, the link *Advanced display settings* must be clicked for this.

After you have made the necessary inputs and confirmed them with the *Apply* button, the second output device should already receive a separate image signal. You will usually only see the desktop background image there at first. If you move the cursor to the right over the edge of the first screen, it will appear on the left edge of the second display. The usable desktop area is now the sum of the two screen areas. In this mode, program windows and symbols can now be positioned anywhere on one of the two devices. Of course, this also applies to the m.objects Screen, i.e. the image output module from m.objects.

## Different scaling of multiple display devices

As of Windows 8.1, you can scale multiple display devices differently, so in addition to the actual resolution, you can also set the scaling of the display for each device. m.objects fully supports this function. However, please note that after changing the scaling factor for the primary display device, logging out and logging in again or restarting Windows is necessary so that all elements are displayed in correct scale.

Also read the chapter *Adjust the User Interface to the display resolution* on page 30.

## Show control

The use of m.objects for complex show controls as well as the integration with other show control systems and the control of other peripheral devices requires m.objects ultimate. For more information on the setup for these issues, please refer to the documentation for the respective program module.

## Slide projection

The use of m.objects for projection with analog slide projectors is also possible - also in combination with digital playback and complex show controls. However, since this area of application is of comparatively little importance, the setup of slide projector drivers has been excluded to a separate documentation, which can be requested from the software manufacturer.

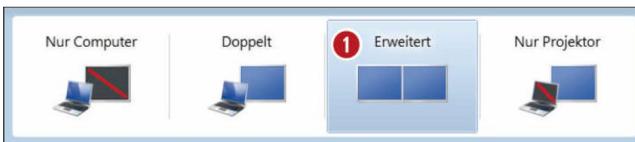
# Creating a live presentation in 12 steps

To begin with, the word „image“ is often used both for picture and video material throughout the manual. Generally, except from the obvious differences between pictures and videos and the resulting varied options for editing, m.objects handles them similarly in most cases.

The following chapter shows you how to create your own live audiovision show quickly and effectively in 12 basic steps from images and sound. Please note that the tools belonging to the previously clicked tracks are displayed in the m.objects tool window. You can also call up many of the functions described via the context menu by clicking with the right mouse button.

In several cases, functions are used that are available with the m.objects expansion level live and upwards. These are marked accordingly. If you do not have a license or are working with m.objects basic, you may skip these steps or test the functions in demo mode. You can select this mode immediately after starting the program; basic users can find it in the program entry in the Windows Start menu.

There is also a video training on this chapter on our website at <https://www.mobjects.com/service/videotrainings/>



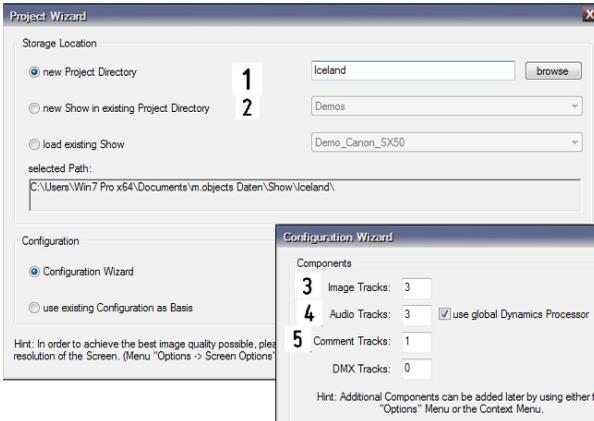
## Using extended desktop

Presenting with m.objects is particularly convenient if you activate the extended desktop under Windows. This allows you to disperse the screen content over several output devices so that



you can operate the m.objects working surface on the monitor of your PC or laptop, while your audience watches the presentation on the TV screen or on the big screen via a projector. To activate the extended desktop, simply press the key combination *Windows Key + P* and then select the option (1) *Extended* or (2) *Extend* (Windows 10).

## Wizards help with the start



To prepare a new presentation, select the *New Show* command from the *File* menu and set up the m.objects desktop with the *Project Wizard* in just a few steps. Here you can either create a completely (1) new Project Directory or use one (2) that already exists if, for example, you have already created a presentation

on the same topic. With the automatic configuration, you then determine the number of tracks, for example three (3) image and (4) audio tracks and one (5) comment track. You can easily change all of these values later.

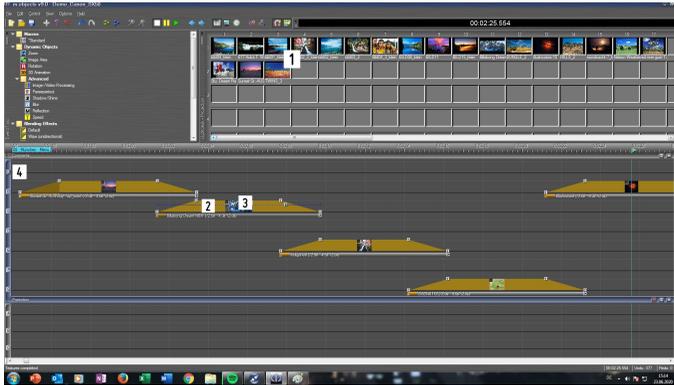
## Select images in the Image Pool



You can use the Image Pool to select and sort the image material. Single or multiple images, but also entire image directories can be stored here directly from Windows Explorer. Alternatively, use

the context menu for this. In the Image Pool, you can then use the left mouse button to drag an image onto another to swap the two. You can also place an image between two others by placing it on the bridge in between. Press the *Shift* key to enlarge the image under the cursor (1). By dragging with the right mouse button pressed, you can call up a preview with a transition in full output resolution in the Screen window.

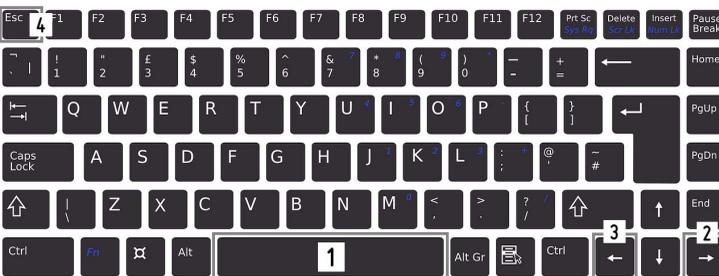
## Place images on tracks



Now mark all the images in the Image Pool that you want to insert into your show. To do this, either use the key combination *Ctrl* + *A* to select all images, or drag the mouse along the bottom edge of the (1) desired images. Then move the

selection to the image tracks and the flashy (2) dark yellow light curves appear with the (3) associated image miniatures. A tip: By clicking on the letter A on the left edge you can mute the upper (4) image track beforehand so that it remains free. This way you will still have space later to insert titles here.

## Present the show manually



In the previous step, you have already created a first sequence of images with the specified values for the Projection and Transition times and can demonstrate them. To

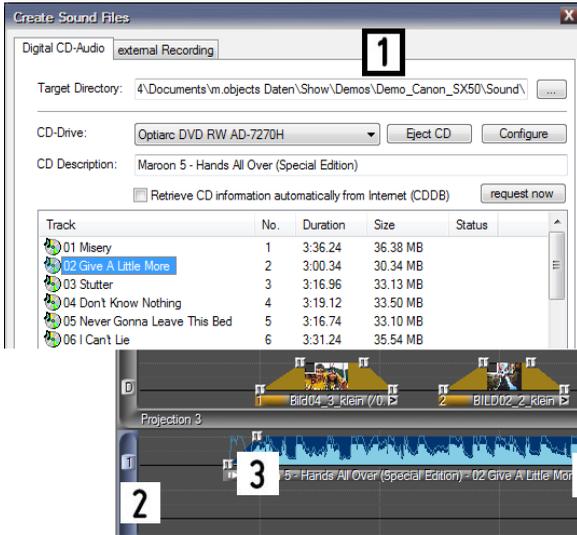
control your presentation, you will find the corresponding buttons *Playback*, *Pause* and *Stop* in the toolbar. It is even easier if you control the playback via the keyboard: By pressing the *space bar* (1) you can switch between Pause mode and Playback. With the *arrow keys* (2) *right* and (3) *left* you can now navigate image by image back and forth manually. Press the (4) *Esc* key to return to the stop mode.

## Create and edit titles



First switch the (1) image track A back on. Then right-click in the upper image track and select *Insert text Object*. In the following window, select the (2) font and enter the text. You can use the (3) *Pipette* to pick up a color from an image on the Screen and select it as the text color. With a click on *OK* and another click in the image track, the (4) text is inserted there. To improve readability, drag a (5) *Shadow/Shine* object onto the text light curve from the *Tools* window so that it is underlaid with a shadow. This shadow can then be modified in the options of the *Shadow/Shine* object.

## Insert music into the audio track



In order to set the show to music, m.objects (1) can read music tracks from an audio CD and store them directly in the (2) audio tracks. To do this, select the command *record/insert Audio File* from the context menu. You can also drag and drop existing audio files into the audio tracks. There you can cut the

audio - right-click at the desired point, split sample - and also adjust the (3) fade-in and (4) fade-out phase by moving the handles on the envelope. In addition, further handles can be created with a double click so that the volume envelope can be varied freely.

## Adjust timing precisely

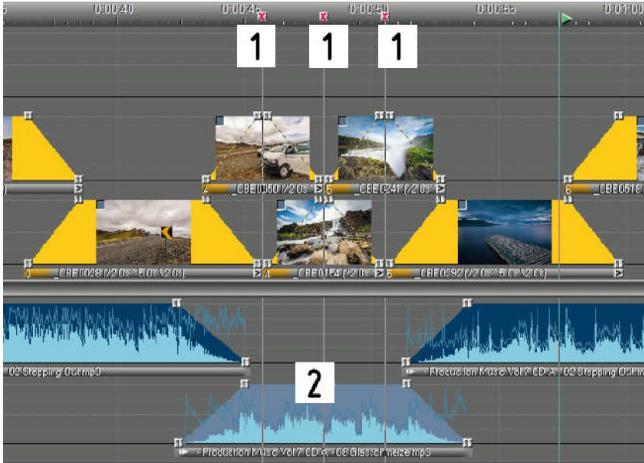


Every handle on a light curve can also be moved freely in the image tracks. To extend a transition phase, drag a (1) frame around the (2) lower right handle of the first and the (3) upper left handle of

the second image and then drag to the right by clicking one of the two. **Tip:** If you click with the right and left mouse button at the same time, you will mark all the content on the image tracks to the right of the cursor and then move them backwards together. In addition, you can quickly and precisely adjust the timing of entire image sequences with the *expand/compress or unify timing Wizard* from the *Edit* menu.

## Live commentary with Wait Markers

Available in m.objects live and upwards



For variable live comments on individual images, the use of Wait Markers is recommended. The presentation remains paused until you activate *Continue*. (1) You can place Wait Markers manually on the timeline or insert them using a Wizard by marking the relevant images beforehand. In order to not interrupt the

background audio at a Wait Marker, you can define individual (2) audio passages as asynchronous. For spontaneous live commentary, use manual ducking: lower the volume by pressing a key on the keyboard or a remote control and then use the same key to raise it again later.

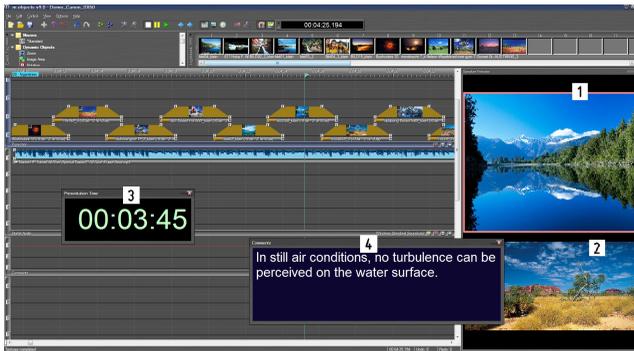
## Remote control as a comfort turbo

Available in m.objects live and upwards

Controlling your live presentation with a radio remote control is even more convenient than using a mouse or keyboard. m.objects supports all common models. Especially in combination with Wait Markers, the use of a remote control is the instrument of choice: You simply activate the Wait Marker at the push of a button, no matter where you are positioned in the room. In the *Options* menu, m.objects offers the option of freely assigning all important control functions to the buttons on the remote control. In this way you can save the operating profile that is best suited to your personal style of presentation.



## Speaker preview



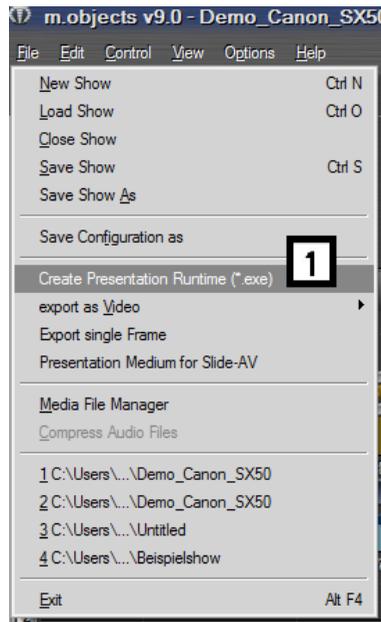
Available in m.objects live and upwards

The speaker support for live shows offers further possibilities: The *Speaker Preview* from the *View* menu shows you (1) the current image on the Screen, next to or below it (2) the subsequent image appears so that

you can focus on the next part of your story in advance. The (3) *Presentation Time* window shows the total elapsed time. You can also use it in *Countdown mode* (double-click into the Presentation Time window and tick the *Countdown mode* box) to see how much of the pre-set presentation time is left. You can also (4) put texts on the comment track that act as a reminder or script during the lecture.

## Export show

Instead of presenting from the timeline, you can also save and demonstrate the (1) production as a compact executable file. Such a presentation runs without loss of quality with almost all program functions on every Windows PC, even if m.objects is not installed at all. This is advantageous if you want to present with a third-party computer. To create a backup of your production or to transfer it to another PC, you can use the *Media File Manager* from the *File* menu to copy all files used into the project directory and transfer them to an external data medium.



## ***A few more hints***

- The Screen window has the functionality of showing the high-quality output of all visual content. For this, it should be switched to full-screen mode during playback.
- The context menu, which is opened by using the right mouse button is almost always a good tool because it always contains a number of commands relevant to the current mouse position.
- For all drag & drop operations (dragging and dropping with the mouse), the cursor symbolizes whether the action is valid or not. This, for instance prevents you from dropping a video whose length is longer than the available gap into the selected image track.
- You can select individual objects on the tracks in addition to those already selected or deselect them from an existing selection by holding down the *Ctrl* key while clicking on the objects or moving over them while holding down the mouse button.
- You can duplicate individual objects or a group of objects by moving them to the target point and pressing and holding the *Ctrl* key before releasing the left mouse button.
- You can edit objects of the same type such as photos, videos, audio passages, but also dynamic objects such as Zoom, 3D Animation or similar on the image tracks together. To do this, a selection of the objects must first be made, e.g. by circling the desired area with a lasso. It is irrelevant whether objects of a different type are also selected. Then call *Edit Object* (context menu) for one of the objects to be edited and make the desired changes. After confirming the corresponding form, the changes are selectively transferred to the other similar objects in the selection.
- You can exchange images between two light curves directly on the image tracks. To do this, click on the small gray square in the top left of the image thumbnail, drag the image to another light curve while holding down and letting go of the mouse button.
- You can use the *View / Media File Manager* menu to display and print a list of the events in your entire show. Muted tracks are excluded here, and sorting according to various criteria is also possible. In this way, the relevant information can be extracted for various purposes. By clicking the media list, the locator jumps directly to the corresponding position in the show.
- There is nothing in an m.objects show that cannot be changed afterwards. For example, if you want to use more tracks than originally intended for the audio,

simply modify the properties of the component: Right-click within the existing tracks, select *Edit Component* from the context menu.

- You can simply insert additional handles in light curves and volume envelopes and modify them as you like. The context menu via the right mouse button is the correct way to do this again, but it is even faster with a double click at the desired position.

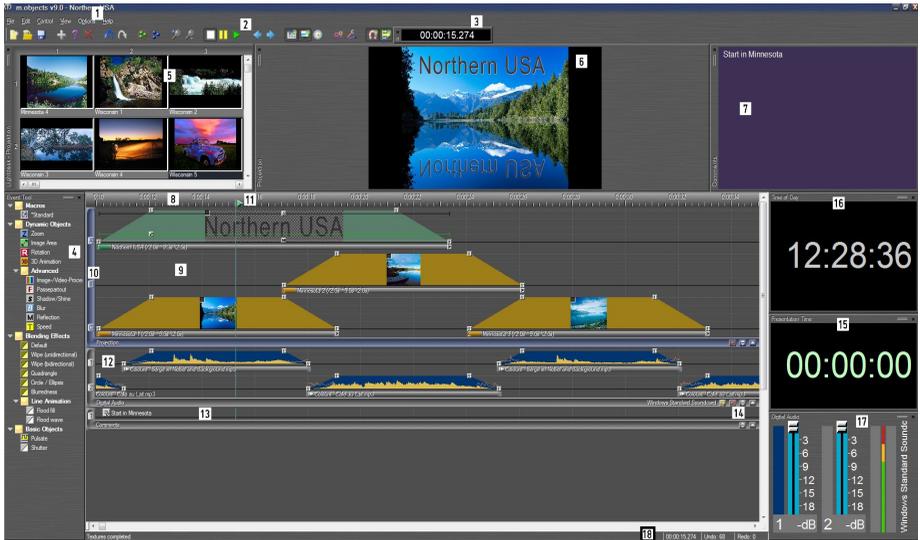
- You can record audio from external audio sources into your PC with practically any sound card, i.e. create samples for integration into m.objects. This can be, for example, audio from old tapes and records, but of course also commentary directly from a microphone. You will find the required functions under *record / insert Audio* form, in which you can also read in music from a CD. In this case, however, switch to the *external Recording* tab.

- You can trim the beginning of a sample by moving the first two handles of the volume envelope to the right together. Similarly, you can shorten the sample at the end by dragging the rear handles to the left.

- If possible, deactivate the Power Management (sleep mode) and the screensaver on your PC or set both in a way so that their activity cannot collide with the playback of m.objects productions. Starting a screen saver can consume a large percentage of the computing power of a PC and thus lead to playback problems. Lowering computing power through energy saving features can have the same impact.

# m.objects – practice

## The m.objects program interface



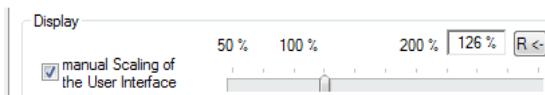
1. Command menu
2. Toolbar
3. Time display
4. Tools window
5. Image Pool
6. Screen, scaled down and docked
7. Comments window
8. Time ruler
9. Image tracks
10. Track names / activation switch
11. Locator
12. Audio tracks
13. Comment track
14. Buttons for quick change of audio output etc.
15. Display of the Presentation time
16. Time of Day display
17. Audio status window
18. Status line

The active component of the m.objects program interface is shown with a colored frame. The Projection component - i.e. the image tracks - is active in the image, which can be recognized by the blue L-shaped frame. The tools belonging to the active component are displayed in the *Tools* window.

## Adjust the User Interface to the display resolution

To ensure that m.objects remains easy to use with particularly high-resolution monitors, so that the fonts and symbols do not become too small, the workspace can be scaled as required.

As a standard, m.objects initially uses the preset options of the systems software for scaling the fonts. However, you can individually adjust the magnification factor for m.objects. Under *Options / Program Options*, tick the option *manual Scaling of the User Interface* and move the slider to the desired value.



Depending on your needs, you can increase the scaling value for relaxed work or improved visibility for several viewers,

or reduce it for a better overview when you are close to the monitor. All control elements of the editor as well as menus, toolbar, window elements, forms and messages are immediately adapted. It is not necessary to restart the program.

## Customize the User Interface

The individual components of the m.objects User Interface can be moved and rearranged as required. In this way you can create exactly the environment that makes working with m.objects the most pleasant.

With many windows in the program interface, you will see a double bar that can be gripped and dragged to move the window from its current position to another position and dock it there again on the User Interface. If you grab the frame of the window elsewhere, it can also be moved, but no longer docks.



Double-click the frame to detach a window from the surface so that it is shown as a separate window. Double-clicking the frame again returns the window to its previous, docked position.

You can also change the arrangement of the components and, for example, place the image tracks under the audio tracks. To

do this, simply drag the angle with the label (for example, projection or digital audio) in the desired direction. You can restore the original arrangement in the same way.

A customized work surface can be saved as a configuration: *File / Save Configuration as*. So when you set up the next m.objects project, you can use this configuration as a basis. A more detailed description follows in the chapter *What is a project?* on page 40.

## The timeline with time ruler and tracks

The timeline is the central element within m.objects. It contains the time ruler and the image and audio tracks as well as other tracks if necessary. All time sequences are regulated via the timeline: the order of the images, the Projection time of the images and sound samples, Fade-in and Fade-out times, the duration of cross-fades, zoom runs, rotations and other effects, ultimately the duration of the entire show.

To set up the chronological order in an m.objects presentation as precisely as possible, it can be helpful to enlarge the display of the User Interface:



Use the magnifying glass with the plus sign in the toolbar to widen the timeline and tracks so that the time intervals are visually drawn apart.

Exact placement of objects becomes much easier this way. Alternatively, you can use the *Plus* key on the keyboard to achieve this effect. Conversely, the magnifying glass symbol with the minus sign or the *Minus* button narrows the display again, which then leads to a better overview.

A second option for a more detailed display is offered by the double arrow underneath the tracks.



Hold the mouse button down and move this double arrow up or down to enlarge or reduce the respective tracks.

The changes in the display size obviously only have an effect on the processing within m.objects. This does not change the representation on the Screen.

### The time ruler



The time ruler shows the exact time position within the show on a scale. Depending on the magnification selected with the magnifying glass symbol, accuracy down to the millisecond range is possible.

When scrolling vertically in projects with many tracks, the time ruler remains in place, provided that it is arranged above the tracks. However, you can also arrange it below the tracks or, for example, between image and audio tracks by moving the mouse. In this case, the time ruler is moved with the vertical scrolling.

### ***Projection and Transition times in the tracks***

The wider the light curve of an image, the longer its Projection time, the more time passes between fading in and fading out of the image. If you want to shorten the Projection time, push the light curve together. Accordingly, pull them apart to extend the Projection time. To do this, use the cursor to mark the upper and lower handles for the fade-in or fade-out, then hold down one of the selected handles with the left mouse button pressed and drag the mouse pointer in the desired direction.

To change the fade-in or fade-out, just grab the lower handle and pull it towards the light curve to shorten the time or drag it away from the light curve to extend the time. Do the same with the tone samples.

The image and audio tracks (and consequently others such as comment tracks) are always directly related to the time ruler.

### ***Navigate through the timeline***

To navigate through the timeline, you can use the scroll bars at the bottom or right edge. It is more convenient, however, with the scroll wheel of the mouse or with the right mouse button: by turning the scroll wheel you move step by step to the right and left. If you instead press and hold the right mouse button over the tracks, you can drag the tracks to the right and left as well as up and down continuously.

To jump to the very beginning of the timeline, simply press the *Home* key on your keyboard. Pressing the *End* key, on the other hand, takes you to the end of the timeline, i.e. the last object that is stored on the tracks or on the time ruler.

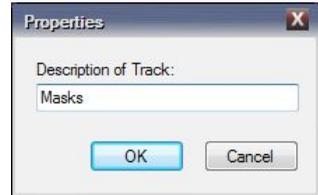
Use the arrow keys *right* and *left* to move the locator, i.e. the playhead of m.objects, step by step by 20ms (i.e. 1/50 second) in the corresponding direction. However, if the locator is positioned within a video, it moves exactly one video frame back and forth with the arrow keys, which takes more or less time depending on the frame rate of the video.

If you have selected an object on an image track and press the *Ctrl* key, the locator can be moved to the next or previous object on the same image track with the arrow keys.

## Naming tracks and displaying object properties

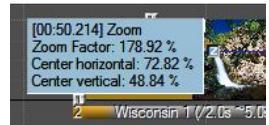
In addition to the alphabetical or numerical names of the image and audio tracks, which you can find in the frame to the left of the tracks, you can give individual tracks an individual name, for example to describe their use. Thus, for example, the image track B can be called masks if you want to place masks specifically on this track. Right-click in the track and choose *Edit Track* from the context menu.

Enter the desired name in the following form and confirm with *OK*. If you now move the mouse over an empty area of this track with the *Shift* key pressed, this name will be shown next to the cursor. This procedure can also be applied in the same way to the audio tracks and, if used, to the tracks of other components.



If you move the cursor, also with the *Shift* key pressed, over an object on a track, the most important set parameters of this object are displayed.

For example, you can have the Zoom Factor and the position of the Zoom Center of a Zoom object displayed precisely without having to open the properties window for this object. This also applies to the properties of all other dynamic objects, for the locator, for all curve handles and for objects on the time ruler.



## The color coding of the light curves

If you insert an image into a track of the m.objects User Interface, it normally appears in a dark yellow light curve. This means that image blending in *additive* mode is set here. If the light curve appears green, the *overlapping* mode is selected here. This is the case, for example, if you are working with an Image Area Object. You can read more about this topic in chapter *Image blending* on page 66.

If an image is used as a mask, m.objects displays the light curve in gray. You can find more information on this topic in the section *Masks* on page 139.

## General information about objects

All elements shown on the tracks within m.objects are objects that can be edited directly with the mouse. In the case of the image tracks, these are the small squares at

the corners of the trapezes. The major part of the work on a production consists of moving the objects horizontally in order to coordinate them over time.

## Selection

In order to be able to move objects, they must first be selected. In the simplest case, the selection is made by positioning the tip of the cursor over an object and simply clicking the left mouse button once. A selected object is shown dark, while unselected objects are light gray. By moving with the mouse button pressed, you can change the duration of fade-ins and fade-outs separately, for example. The neighboring image Projection times on the respective track change accordingly, provided that these objects are not selected at the same time and thus moved at the same time.

There are various techniques for selecting multiple objects:

After one object has already been selected, more can be selected by left-clicking additional objects with the *Ctrl* key pressed.

By dragging a frame, all objects in this area are selected. A frame can be opened by left-clicking next to an object and dragging the mouse with the mouse button pressed.

The context menu in the free areas of the tracks provides commands for the selection of all objects on the right, left or on both sides of the cursor. The selection can be limited to the current track or the current component (e.g. image tracks), or include all components.

By clicking with the left and right mouse button at the same time, all objects from the current mouse position in the current component are selected. This technique is likely to be one of the most frequently used, as it is very useful for synchronizing images and audio, among other things.

After selecting several objects, only one of them needs to be moved in order to move all of the selected objects at the same time. Since most of the work with m.objects consists of moving the objects, it is worthwhile for beginners to get some practice by clicking and dragging, so to familiarize themselves with this way of working.

The undo function can be helpful during that process, since you may not always be able to achieve what you were going to do at the beginning.

### **Magnet**

In the toolbar you will find the magnet icon on the right, which is activated



by default.

The magnet helps you to position objects exactly synchronously on top of each other. If you manually align image transitions, the magnet causes the start of the fade-in of one image to lock exactly over the start of the fade-out of another image. This functionality is very helpful if you are experimenting with the order of the images and therefore often moving them back and forth on the timeline. You can put the images in the right position with little effort this way.

The magnet works in the same way with the audio tracks - so that you can precisely align the fade between audio samples - and also between image and audio tracks. The exact alignment of tone envelopes with light curves is also possible.

If you want to work without the magnet function, simply press the *Alt* key when dragging to temporarily deactivate the magnet. If you want to switch it off completely, click on the icon so that it is no longer selected. You can then activate the deactivated magnet again temporarily by pressing the *Alt* key.

## **Clipboard**

The clipboard is a suitable instrument when it comes to moving sequences from one show to another, copying them or repeating a sequence elsewhere. To do this, use the *Cut Selection* or *Copy Selection* function in the *Edit* menu. One or multiple objects are then stored in the Windows clipboard. They remain there until they are overwritten by other content or until Windows is closed. The difference is that when you cut objects, they are removed from their original context, while they are preserved when copied. With the command *Edit / Insert Clipboard Contents*, they can be inserted from the clipboard into the same or a different show. A condition for the success of the operation is that a suitable area (corresponding components with a corresponding number of tracks) is available. If this is not the case, a note appears.

There is another interesting application for the clipboard. Imagine working on a show for a long time and eventually deleting a sequence that you did not like at first. In retrospect, however, you realize that you would still like to use this sequence. Instead of creating a new one, use the *Undo* function to go back the required number of processing steps and copy the sequence. It is now stored in the clipboard.

To avoid having to produce all of the following steps again by clicking *Redo*, go back to the last created state of the show with *Edit / Repeat*. Now you can paste the desired sequence from the clipboard. Please note, however, that you should not make any changes during this process, as this will result in the saved repeat steps being lost.

## Macros

Groups of events (event units) can be easily formed into new tools with the *Edit / Create Macro* command and stored in the Tool window for repeated use. For this purpose, the desired objects first have to be marked within the Show Editor, and then the corresponding command from the command menu or the context menu (right mouse button on one of the objects involved) has to be selected. You will then have the opportunity to name the new macro. This must differ from the names of any existing macros.

If a macro ranges over various components, it is assigned to the event patterns of the component that was active during creation.

Existing groupings of events are included in macros, but the object property Event is not fixed.

Macros are saved when a show file is saved, so that they are available again the next time the show is loaded. The macros are also created within the configuration files (*File / Save Configuration as*) in order to be available for new projects. Of course, macros can also be transferred from one show to another via the clipboard.

If a macro is used, an image of the events defined therein is created on the tracks. There is no longer any connection between the events and the macro, so changing the events does not affect the macro or other events generated by the same macro. To change a macro, insert it, change the event objects as desired and create a new macro off of it, if necessary after deleting the old one.

Macros can be used, among other things, to preprocess sound material. So you can e.g. Simply break down an unsorted recording of spoken text into smaller parts, name them appropriately and store them as individual macros in the tool window??. Individual intros, verses, breaks, choruses can be stored just as well for later assembly. Of course, this procedure does not take up any additional storage space for audio data on the hard disk.

## Fixation

You can freeze objects on the timeline to avoid accidentally deleting or moving them. To do this, select the relevant objects and then fix them with the command *Edit / Fix Event(s)*. The objects are then framed by a blue line.

With the command *Edit / Unfix Events* you can detach fixed objects and can then move or delete them as usual.

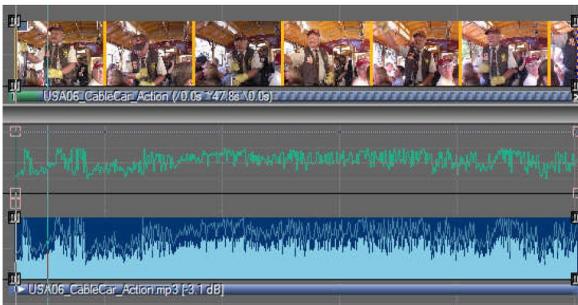
## Event groups

You can group objects into event groups in order to fix their relative position to one another, e.g. multiple images or images and sound samples. Events belonging to a group are shown with a dark frame around the handles.

The menu command *Edit / Create Event Groups* is used to create event groups. With the menu command *Edit / Split Event groups* all event groups included in the current selection are dissolved again.

In certain cases, m.objects also creates event groups automatically, for example if you separate the audio from a video so that it is saved as a sound sample on an audio track. Video and audio then form an event group.

If you select an object of an event group, this selection is automatically extended to all other objects in the group. Moving, copying and deleting is only possible for all objects in the group at the same time, with one exception: If an event group extends

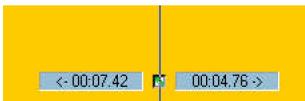


over several components, as in the case of video and audio, the tracks can be changed later within one component.

For example, you can move the audio of the video to another audio track without affecting the orientation to the video in the image tracks.

## Display of object times

In the bars under the light curves of the images you will find information on the fade-in, Projection and fade-out time of the respective image in m.objects.



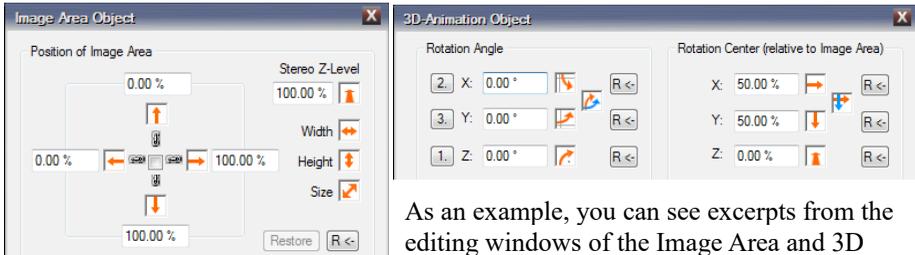
In addition, when clicking or moving objects, m.objects shows the time intervals that remain to the next objects of the same type to the right and left of the mouse pointer.

For example, if you click an Image Area Object on a light curve, m.objects shows the time interval to the previous Image Area Object in the same image track on the left and the time interval to the next Image Area Object on the right. This is particularly

helpful when it comes to positioning Image Field or other Objects at exact time intervals.

## Working with the arrow controls

In many situations in m.objects you will encounter the orange arrow controls with which you can change certain values. These offer very simple as well as convenient operations, as they can be used to make both normal and particularly fine-tuned changes.



As an example, you can see excerpts from the editing windows of the Image Area and 3D Objects.

You can see that the arrow controls have different shapes and orientations. These different forms of appearance always relate to the respective value that can be changed with them. For example, the arrow at the top of the left image represents the top edge of an Image Area, which can be moved using the control. The width, height and size, on the other hand, are provided with double arrows. This means that here two values change simultaneously and in opposite directions, as it applies for example to the position of the right and left edge of the Image Area when the width gets changed. For the 3D object on the right you will find curved arrows, meaning that the Rotation angle can be changed.

To edit, click on an arrow and then hold down the left mouse button and drag into the direction shown. In the m.objects Screen you can keep track of the changes. If you move the cursor in the opposite direction, you change the respective value vice versa.

Click and drag with the right mouse button instead to change the respective value much more slowly. This is how you do the fine tuning.

The controls with an additional blue arrow are special. This means that the two adjacent controls can be operated simultaneously.



Use the reset buttons to reset the respective values to the standard.

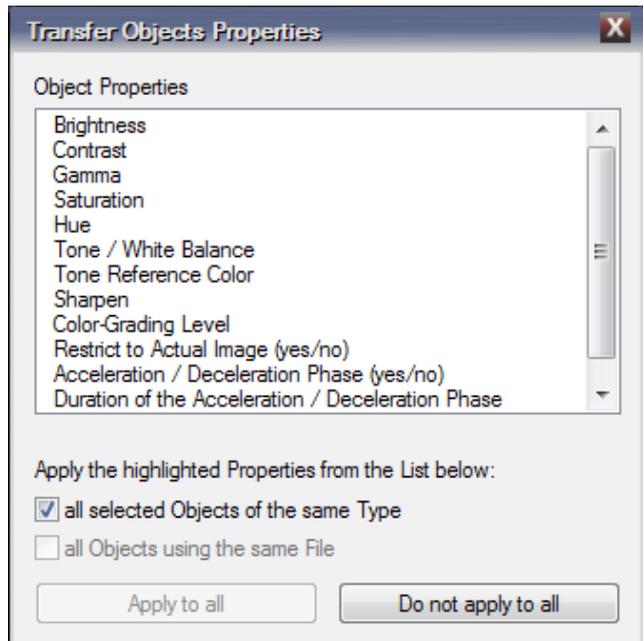
Instead of using the orange arrow controls, you can alternatively set the relevant values using the mouse wheel. The special keys *Shift* and *Ctrl* are used to switch the respective selected value. The *Alt* key is used for fine adjustment - analogous to the right mouse button in the arrow control.

## Multi-editing for all object types

For all objects stored on the timeline, there is an option for automatically adjusting individual or all properties. To do this, you first have to create a selection that contains all objects to be changed, e.g. by pulling a frame around them. It is irrelevant whether objects of other types are also selected. By double-clicking on one of the objects or via its context menu (click with the right mouse button), the associated object form is called up. Enter the desired changes here and exit the form by clicking the *OK* button. A selection list of all object properties of this object type then appears. The

values just changed are marked with a \* and preselected. By selecting and deselecting individual properties, you can now define which of these should be automatically transferred to the other objects.

For example, a gamma correction can subsequently be applied to a whole group of images without touching other filters that have already been set individually. It is also possible to modify the Font Family of several selected texts at once, but without changing the differently set color and Font Style.



# New show - a project in m.objects

In the introductory chapter of this manual, *Creating a live presentation in 12 steps* from page 20, you have received compact instructions in just a few steps, which you can use to create and present your own show. But there is a lot more hidden under the program interface than these first steps show. Not that it will be particularly difficult from here, but it will be really exciting, because the possibilities that m.objects offers you are extremely diverse. The following chapter gives you a comprehensive overview over the different functions and options when editing an AV show.

## What is a project?

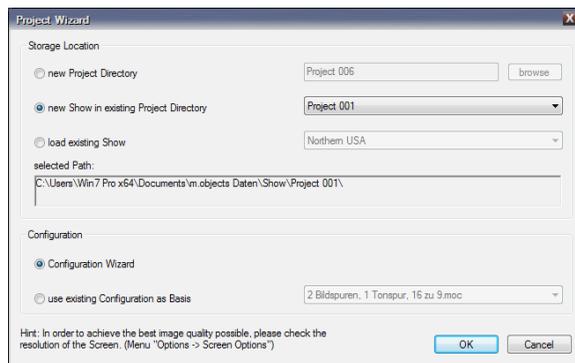
First of all, every AV show that you create with m.objects is a project. With that being said, the chapter could end now on principle. But for a good reason it does not, because it is especially important at the start of work to avoid some potential pitfalls.

When you create an AV show from images, sound material and videos, you rarely have a very clear idea from the start of which photos will be cross-faded in which order, how long the individual Projection times should be, in which positions you want to insert videos and when you want to use which audio. In fact, an AV show develops from a creative process, ideas are tested and rejected, new ideas arise. You will delete photos that you initially used or replace them with others, and new ones will be added. The more extensive the show, the more data you are using.

You probably have a clue as to what this amounts to: Without effective file management, sooner or later you would be faced with a data chaos that can hardly be overviewed. The good news: m.objects provides you with highly effective file

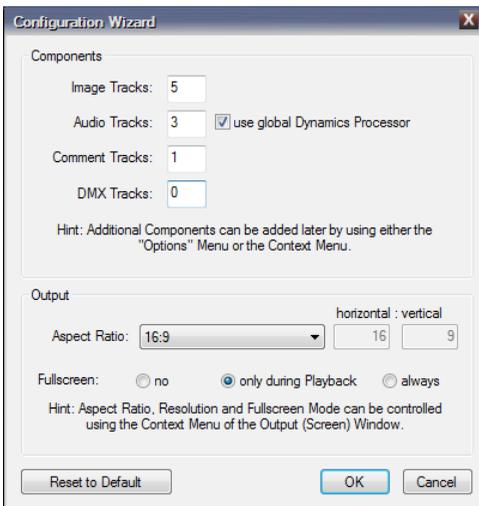
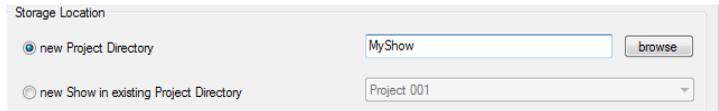
management in form of the project directories and the internal file management. If you keep a few points in mind when creating your productions, you can concentrate on the actual creative process unconcernedly.

If you now want to create a new project, select *File / New Show* from the program



menu. The Project Wizard opens. Under *Storage location* you have the choice to save the new show in a *new* or in an *existing directory*. If you want to create different variations of a project, they should be in the same directory, because in this case the productions use the same source material. To do this, click on the option *new Show in existing Project Directory*. Use the drop-down menu on the right to select the desired directory.

It is best to create a show on a new topic in a new directory. In this case, select *new Project Directory* and enter a name.

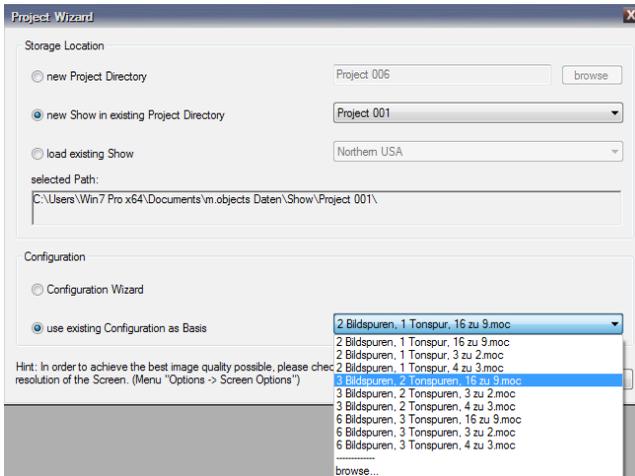


In the lower part of the window you have the choice between the options *Configuration Wizard* and *use existing Configuration as Basis*. If you choose *Configuration Wizard* and confirm the window with *OK*, simply enter the number of Image and Audio Tracks and - if desired - the Comment and DMX Tracks in the following window. You also determine the aspect ratio of the m.objects Screen and determine whether it is always, only during playback or never (no) displayed in full-screen mode.

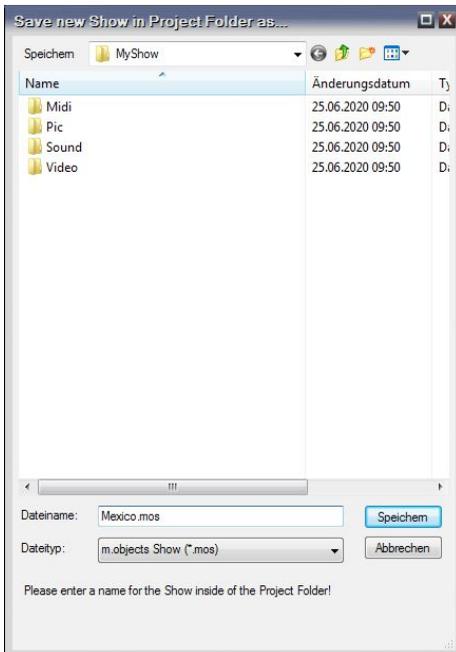
At this point, you can also make it as easy as possible for yourself and select a finished configuration by clicking on the *Reset to Default* button. All entries that you make here can be changed later.

If you select the option *Use existing Configuration as Basis* in the *Project Wizard* instead, you can select from a series of pre-assembled configurations using the drop-down menu.

The number of image and audio tracks and the aspect ratio of the Screen are specified here. You can also change these settings later if required.



Please note, however, that changes in the aspect ratio of the Screen may also require further changes within the production at a later point in time, especially if you work with complex animations. More on this topic will be said in chapter *Set the aspect ratio* on page 48.



Whichever path you choose, by clicking on *OK* the window *Save new Show in Project Folder as ...* appears, in which you give the new production a name and then confirm with *Save*.

If you have selected a new project directory, m.objects now creates it in the background. It automatically contains the subfolders *Midi*, *Pic*, *Sound* and *Video*. This is an important step towards a clear file structure, because these folders will later contain all the data relevant for the show.

*Midi* stands for music files that can be played by a PC-integrated or external synthesizer, *Pic* for the images, *Sound* and *Video* accordingly for sound and video files. As you work on your project, m.objects will automatically add additional folders. This includes

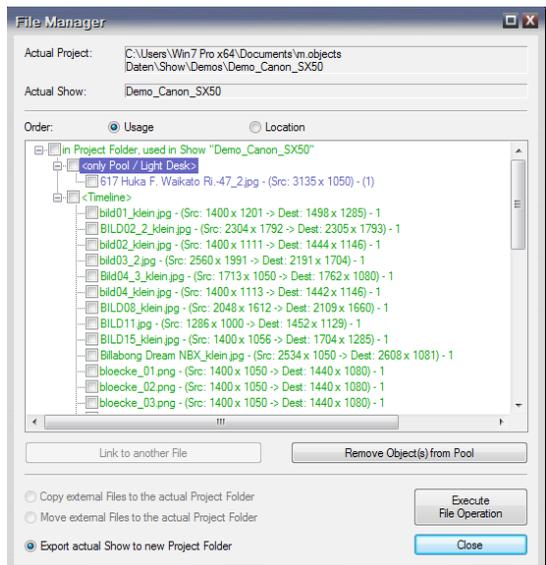
the folder *mob\_Auto* with the texture data - files derived from the original images, which m.objects uses for the actual presentation. As a rule, you do not need to worry about the content of *mob\_Auto*, m.objects manages the files itself. If you delete this directory, m.objects will automatically create the required texture data from the original images the next time the show is loaded, if they can be accessed. In addition, the *.mos file*, the actual core of the production, in which the structure of the show, cross-fades, projection times, zoom effects etc. are stored is saved in the project directory.

The project folders are usually located in the *m.objects data / Show* directory. You can save yourself a lot of potential mistakes and thus time and effort if you leave the project folders as they are. Although you can add your own folders without hesitation, it is neither necessary nor reasonable to change or delete files or folders from this structure. On the contrary: incorrectly deleted or moved files may result in m.objects no longer being able to play a show correctly. Because the program can only access the data from which it knows the storage location.

So if you remove an image from a show, you don't need to delete it here. As you will see in the next section, m.objects ensures that there is no unnecessary data in the project folder in a very elegant and convenient way, and gives you a good overview of the files used in your show.

## File management

In the program menu, open the selection *File* and then the option *Media File Manager*. This helpful m.objects tool shows you at a glance which source material is used in your AV production. The figure above shows an overview of image and audio files from a m.objects project. All files are in the project directory and are also used in the show. They are located either on the image and audio tracks (shown in green letters) or in the file pool (shown in blue letters), i.e. in the Image Pool or in the



case of the sound samples in the tool window.

You can remove files that are only available in the file pool from the project using the file manager, if desired. To do this, mark the relevant files in the list and click on the *Remove Object(s) from Pool* button.



The files are only removed from the file pool, but not deleted from the hard disk.

The individual file entries in the list are linked. Clicking on an entry takes you directly to the corresponding point in the image or audio tracks, the locator is positioned there and the light curve or volume envelope is selected. If you click on an image from the Image Pool, it will be opened and the image will be displayed there.

The number of uses in the show is indicated before each file entry. If you use files more than once in your show, each time you click on the entry you will jump to the next occurrence on the tracks or in the Image Pool. With this procedure you can easily and comfortably navigate through your show and select individual files.

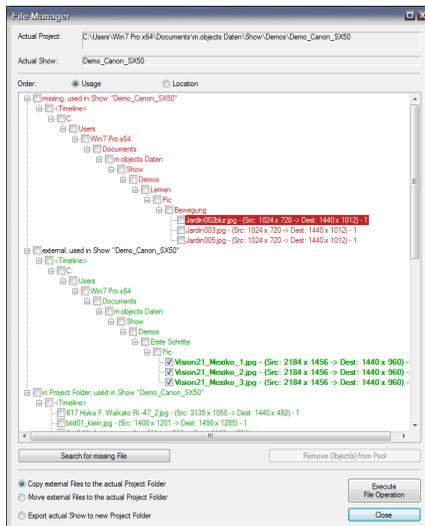


If you right-click an entry in the file management, the option *Link to another File* appears. You can also mark the file with a mouse click and then click the *Link to another File* button below the list.

This allows you to replace the inserted file with another one, which then appears in the particular place or places. This function is especially helpful if you want to re-insert missing files. The following figure shows what is meant:

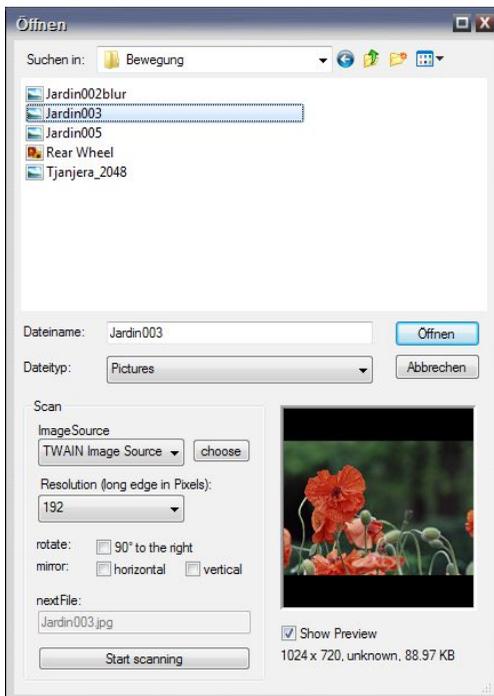
Some files are marked in red and designated as *missing, used in Show*. Below this, the entry *external, used in Show* appears. Such a structure implies risks and errors.

For the files marked in red, m.objects does not know the storage space. One reason for this may be that the images, videos or sound samples have been moved to another



directory on the computer or come from an external hard drive that is no longer connected. In the case of images, m.objects can still use the existing textures. If the output resolution is changed, the absence of the original data inevitably leads to a loss of quality, since the optimal display cannot be derived from the original image again. As an additional warning, the image miniatures are shown shaded in red in the light curves.

Missing videos or sound samples are not shown at all in the presentation. For these files there is no counterpart to the textures, which m.objects could still fall back on.

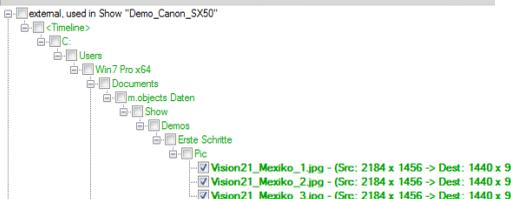


To restore the missing link, right-click on the file entry and select *Link to another File*. If the files are stored on an external hard drive, make sure that it is connected. Alternatively, mark the file in the list and click on the button *Search for missing File* below the list.

In the following *Open* window, select the folder in which the corresponding file is located under *Search in*, select it and confirm with *Open*. Now the link is corrected again and the file is no longer marked as missing. If there are other missing files in the same folder, m.objects will now automatically assign them correctly.

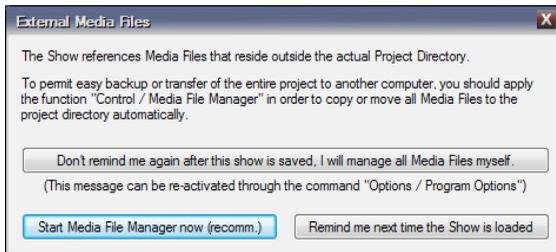
The files marked with external in the file management should also be handled with caution.

These are images, videos or audio data that are not stored in the project directory of your show. As long as it is guaranteed that m.objects can access these files and knows the location, there are



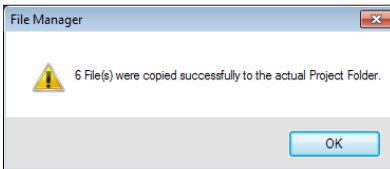
no problems with the playback. To prevent possible problems, you should copy all the files used into the project directory - the easiest and safest way is to use m.objects file management.

If you use external files in your show or insert them into the show, a corresponding message appears once per working session.



Click the *Start Media File Manager now (recomm.)* button. In the file management, the option *Copy external Files to the actual Project Folder* is already selected below. All you have to do now is click *Execute File Operation* and m.objects will copy the files to

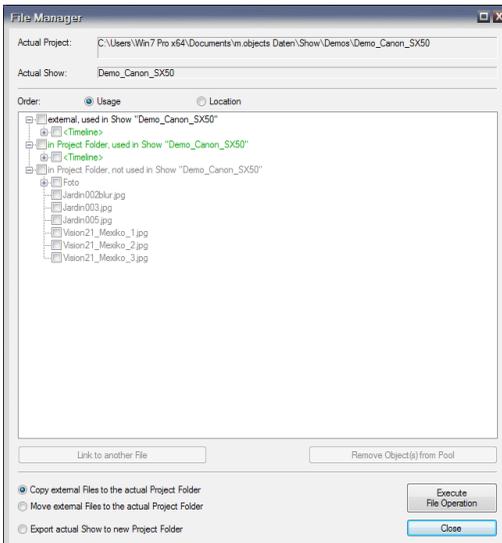
the project directory. You will then receive a confirmation message.



If desired, m.objects can also move the files instead of copying them. To do this, select the option *Move external files to the actual Project Folder*. However, keep in mind that in this case other applications may no longer be able to access the files in their original location.

The files marked in gray are not used on the image and audio tracks, nor in the Image Pool or Event Tool window.

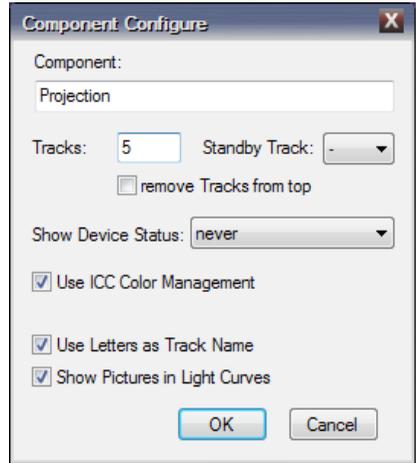
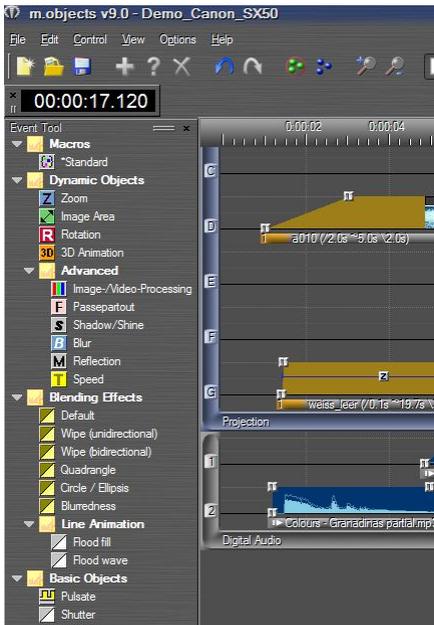
This means that they are ultimately unnecessary and can be removed from the project directory. You should also leave this to the file management, because the overview is quickly lost, especially with large productions. In the *File Manager*,



select the bottom option *Export actual Show to new Project Folder* and *Execute File Operation*. All unused files are ignored with this action. Your AV show is then available in an adjusted form in the new directory. You can do this before saving the project to an external hard drive or CD / DVD to avoid taking up unnecessary storage space.

## Change configuration

If you want to change the number of image tracks or audio tracks subsequently, double-click the bar labeled *Projection* or *Digital Audio* below the respective tracks. Enter the desired number in the window that appears. Depending on the expansion level, there are different numbers of image and audio tracks available in m.objects. Users of m.objects creative or ultimate can therefore enter any values here.



Note that if you delete a track, you may also delete the objects it contains. (Of course, this does not delete any original files, only the objects and their properties on the relevant track.)

You can adapt the appearance of m.objects to your personal preferences with just a few mouse clicks. If, for example, you would prefer to have the audio tracks above the image tracks, click on the bar below the audio tracks (Digital Audio) and drag the tracks upwards while holding down the left mouse button. The toolbar, the Comments window, the Event Tool

window and all other parts of the program interface can also be positioned anywhere on the screen by dragging with the mouse. You always have the option of positioning the individual windows separately so that they can be moved freely at any time. Or you can dock the windows at another point on the program interface, where they are then firmly anchored on the one hand, but on the other hand remain scalable in terms of width and height.

With this 'docking functionality' of the windows, you can design the m.objects desktop exactly as it best suits your personal way of working.

The same applies to the appearance and properties of the Screen. If you have not already done so, open the Screen using the corresponding icon in the toolbar.



Right-click on the Screen to open the context menu. In the course of your work with m.objects, you will often use this context menu because it contains important functions that you will need again and again. Here you specify, for example, whether the Screen is shown in full screen mode or as a window. You also have the option of hiding the screen in stop mode or switching from full screen to window. In the window display it can of course also be moved and scaled as desired. In the extensive *Virtual Screen Options*, which you can also call up via the context menu, you can set the resolution and aspect ratio, among other things. We will discuss this separately in the next chapter.

All of these options affect the appearance of m.objects on your screen. If you have already experimented a little with it, your program interface may differ significantly from the standard.

It is reasonable to save these personal settings so that they are available again when you create the next production. To do this, select *File / Save Configuration as* and give your configuration a suitable name. In this way, you can of course also create several configurations for different applications and make working with m.objects even easier.

## Set the aspect ratio

There is one important decision you should make at the very beginning of every new project: What aspect ratio should the show be created in?

While you can easily change all other program settings such as the number of tracks in the course of the project work, later changes in the aspect ratio should be avoided if possible. The reason for this is simple: If you change the aspect ratio from 4:3 to 16:9, for example, all inserted Image Area Objects, all Zoom Centers and Rotations

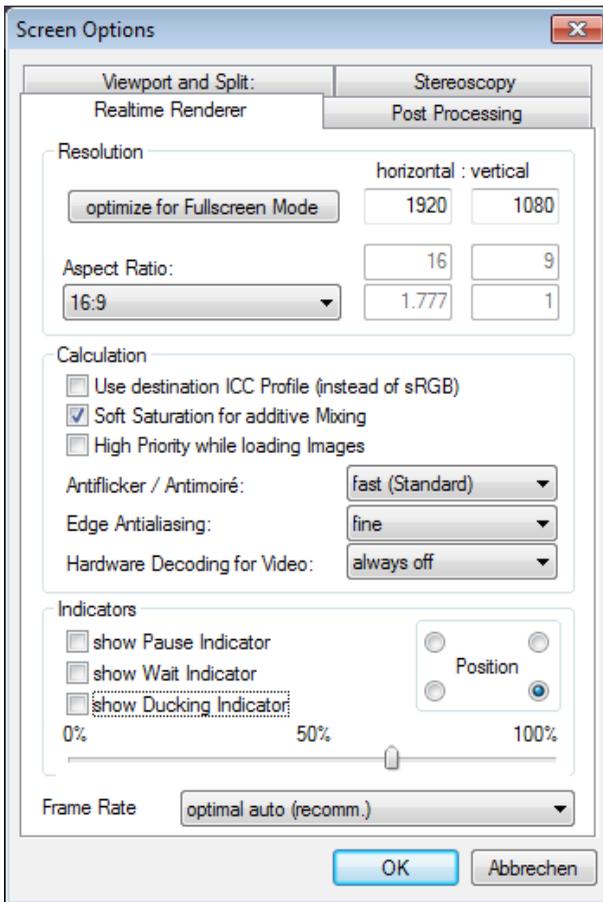
will inevitably shift - in short: the show can only be corrected in the new aspect ratio with additional effort so that it runs in the desired way. Because you can't avoid editing each of these effects individually. It is therefore all the more important to make some considerations in advance.

The aspect ratio of an AV show is essentially based on two criteria: the aspect ratio of the output medium (silver screen, computer monitor, TV screen) and the aspect ratio of the image material used. Of course, the desired effects can also play a role, so that,

for example, the decision is made to choose an extremely wide format. On the other hand, it is not always clear from the start which output medium will be used. Or the images are only available in different formats.

So the decision will not always be easy, and in some cases it will also be favorable to accept the extra work of a second production in a different aspect ratio. A general recommendation is not possible in this regard.

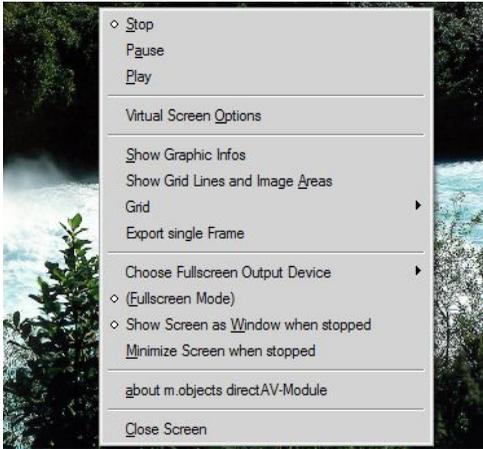
After you have decided on a suitable aspect ratio, you define it in `m.objects`. To do this, right-click the Screen again and select the *Virtual Screen Options* from the context menu. Under *Realtime Renderer* you will find the settings for the *Aspect*



*Ratio*. In addition to predefined values, you can also enter your own ratio manually.

If images in your show deviate from the selected aspect ratio, they will be shown on the Screen in such a way that - depending on the format - black bars appear on the right and left or above and below. You can use the *fit Images to Aspect Ratio Wizard* to make the necessary corrections. Read more in the chapter *Wizard: fit Images to Aspect Ratio* on page 184.

## The m.objects Screen



The Screen is one of the central components of m.objects. The presentation runs on it and you can see the processing steps and changes as you create your show there. You can display the Screen in full screen, as a separate, scaled-down window or docked in the user interface. The last named option has the advantage that the Screen does not cover other parts of the user interface when working, which is particularly practical when working with just one monitor.

When the Screen is docked, you can switch to window mode by double-clicking on the double bar in the frame of the Screen. The Screen can now be moved and positioned as required. Double-click the bar again to dock it to the surface.

You have already seen that a context menu appears when you right-click on the Screen. Here you will find important functions for operation.

Resolution

optimize for Fullscreen Mode

horizontal : vertical

|       |      |
|-------|------|
| 1920  | 1080 |
| 16    | 9    |
| 1.777 | 1    |

Aspect Ratio:

16:9

With *Stop*, *Pause* and *Playback* you can control the playback of the show.

In the *Virtual Screen Options*, as described in the previous section, you define the aspect ratio of the Screen first. With a click on the button *optimize for Fullscreen*

*Mode*, *m.objects* then calculates the output resolution to match the output device that is used to display the Screen in full screen. For example, if you select 16: 9 as the aspect ratio, a resolution of 1920 x 1080 pixels results for a FullHD monitor, whereas with an aspect ratio of 3: 2 the resulting resolution will be 1620 x 1080 pixels.

You should only activate the *Use destination ICC profile (instead of sRGB)* option if you have calibrated the output device used and a corresponding profile is stored on your computer. This option is not selected as the default, so that sRGB is used as the color space for the display of the images - without further ado a universally applicable setting that ensures high display quality.

The following option *Soft saturation for additive Mixing* should not be selected normally. This option is only useful if you want to work artistically with additive image blending in special cases and want to avoid overexposure in areas of the image that contain light components in several of the media that are displayed at the same time.

The *Edge Antialiasing* affects images that are shown rotated. If you deactivate this option, the edges of the image appear pixelated and you can see clear steps.

Activated smoothing, on the other hand, ensures that the edges of the image are displayed clearly:

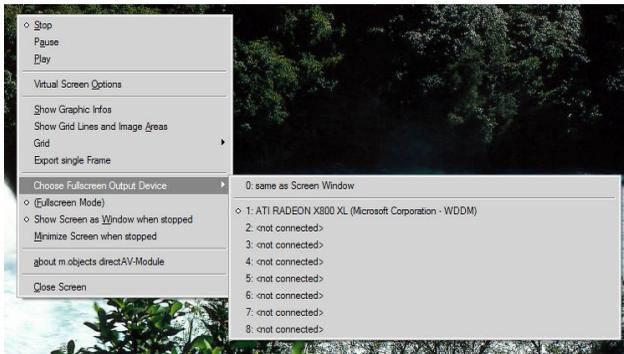


The indicators you can set for this functionality are described in detail in the chapter *Speaker Support* on page 225. The operation and functions of the *Viewport and Split*, *Stereoscopy* and *Post Processing* tabs can be found in the chapters *Multiscreen and softedge* on page 216, *Stereoscopy with m.objects* on page 193 and *Post processing* on page 94.

In the context menu of the Screen you will find the option *Show Graphic Infos* below the *Virtual Screen Options*. With this option, m.objects displays information about the resolution of the Screen, namely for full-screen display and for the current, reduced display. You will also find the current frame rate here, which should be equal to the frame rate required by the screen, projector or TV set as constantly as possible - usually 60 or 50 fps. Significantly fluctuating values indicate that the system and especially the graphics card are reaching their limits.

Below are the options for grid lines. Here you can insert horizontal and vertical grid lines to make it easier to align images and arrange them on the Screen. You can simply move these grid lines with the cursor and position them as desired. With the *Show Grid Lines and Image Areas* option, the grid lines are shown or hidden on the Screen. The *Snap to Grid Lines* option, which can be found under *Grid* in the context menu helps to align objects on the Screen. If you no longer need a grid line, simply push it out of the Screen.

*Choose Fullscreen Output Device* is an important option when it comes to using two or more output devices, for example a monitor and digital projector.



Here, another menu opens up, in which you can select the device for displaying the Screen in full screen mode. If you do not make a separate choice, the top option 0 applies: like Screen window. The Screen is then shown in full screen where it was previously seen as a reduced window. 1 is usually the

primary screen with the desktop?(desktop oder user interface) (this does not necessarily have to be the case, if in doubt please try it), 2 the extended screen. You can see which graphics card is used to control each device aside. In the constellation mentioned above, the screen would normally be option 1 and the digital projector option 2, which you then also select for the full screen.

With (*Fullscreen Mode*), you can switch back and forth between full screen Screen and reduced Screen.

Especially for the use with only one screen, the options *Show Screen as Window when stopped* and *Minimize Screen when stopped* are listed below. If you select one of them, the Screen will be displayed as a window, docked or just hidden as long as the show is in Stop Mode. This way you can work on the show. As soon as you switch to Pause or Play, the Screen switches to Fullscreen Mode. With Stop, it returns to windowed or docked state.

## The Tools window

The Tools window is one of the central components of the m.objects user interface when it comes to editing your Multivision. If it is not currently opened, you can find it in the menu under *View / Tools Window*. For a good overview, it is advisable to place the Tools window next to the tracks.



The Tools window is context sensitive. This means that different objects are displayed here depending on the selected component. If, for example, the *Time Ruler* is clicked, you will see tools such as *Time Marker*, *Wait Marker* or *Index/Jump Marker*. If, on the other hand, the image tracks are clicked, you will find the *Dynamic Objects* such as *Zoom*, *Image Area* or *3D Animation* in the Tools window. This applies accordingly to the audio tracks and, if used, to comment tracks and possibly other components such as the light control.

The Tools window displays the available objects in a hierarchical tree structure, the individual branches of which can be opened and closed. In addition to the tools mentioned above, you will also find macros, media files, apertures? and sound effects.



To use an object from the Tools window, left-click it, hold the mouse button down and drag the object into the corresponding component. For example, you can drag a *Zoom* object from the Tools window onto a light curve and drop it there.

# Images

## Images in the m.objects show

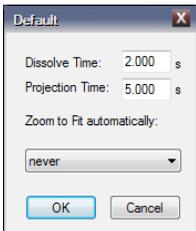
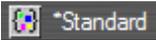
One of the first steps in the production of an AV show is to insert images into the image tracks. On principle, m.objects distributes the images evenly across all image tracks. However, you can exclude one or more tracks from this distribution, for example to keep the upper one free for titles.

To do this, click on the symbol for the track name at the very left. If it is marked with a cross, the track is muted and is omitted when the images are inserted. As long as the image track is muted, it is not taken into account when moving the images within the show. To reactivate the image track, click the icon again so that it is no longer marked with a cross.



By clicking on the symbol with the right mouse button, all tracks except the selected one are switched inactive or active.

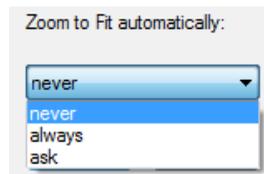
All images are first inserted into the image tracks with specified Projection and Transition times. You can, of course, change these as you wish while editing the presentation. The values for this standard specification are defined in the *Standard* tool, which you can find in the *Tools* window. If it is not visible there, simply click anywhere in an image track.



Double-clicking on the object takes you to its editing window, where you can change the time specifications individually.

You will also find the *Zoom to Fit automatically* option here. With this option you can ensure that images that

deviate from the aspect ratio of the Screen are nonetheless integrated in the format - for example, if you insert a 3: 2 image into a 16: 9 Screen. For this purpose, m.objects inserts a *Zoom* object, which automatically scales the respective image exactly to the necessary size so that it completely fills the Screen. If you change the aspect ratio of the Screen later, the zoom factor automatically adjusts accordingly. You can specify whether this adjustment should always be made or only after consultation.



Read more on this topic in the chapter *Zoom object* on page 104.

## **Replace individual images**

You can simply replace individual images that are already on the image tracks with other images using Drag and Drop. The information of the light curve such as Fade-in and Fade-out, Projection time and any existing animations are completely preserved.



The thumbnails in the light curves have a handle for this purpose on the top left. If you click this handle with the left mouse button, the mouse pointer becomes a curved double arrow, which symbolizes the possibility of replacement.

While keeping the mouse button pressed, drag the thumbnail to another light curve and release the mouse button there, to swap places of the two images. In this way, the order of the images in the presentation can be changed directly on the image tracks.

Similarly, you can also drag an image from the Image Pool onto an image in a track so that both are exchanged. The image from the Image Pool now lies in the light curve and the other way around. You can also use Drag & Drop to place another image on an existing light curve from Windows Explorer or from a selection in Photoshop.

When it comes to exchanging several images at the same time or assigning the contents of all light curves to other images, use the extensive possibilities of the Tray Editor, as described in the following chapter.

### **Note on RAW files**

The RAW format is very popular with professionals and ambitious amateurs because it has no loss and stores the largest possible amount of image information. Image corrections and changes are therefore possible without further ado and with the potentially best quality that can be achieved. On the other hand, RAW is not a uniform format: each camera manufacturer has its own RAW specifications, and different camera models from one manufacturer also deliver different RAW files, depending on the image sensor used. With reasonable effort, it is not possible to integrate all RAW specifications into m.objects and to bring them up to date at all times. For this reason, images in RAW format cannot be integrated directly into m.objects, but must first be saved in a different format using suitable software (camera software, Adobe Lightroom, etc.). Primarily, jpg and tiff are used for this. The jpg format compresses the image data effectively and optionally with relatively little loss (depending on the quality set) and creates relatively small file sizes, while

tiff works loss-free, but generates quite large files.

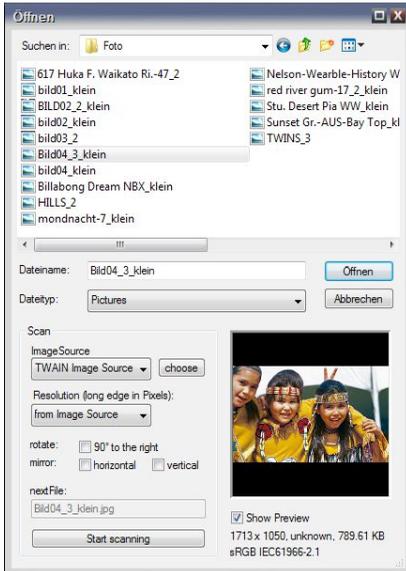
## Insert images using Windows Explorer

An easy way to insert images into an m.objects presentation is by using Windows Explorer. You open the Explorer (for example with the key combination *Windows key + E*) and then select the desired images directly in the file directory. To do this, mark the images with the cursor and then drag them with the left mouse button pressed onto the image tracks in m.objects. Release the mouse button as soon as you have reached the position where you want to place the image material.

M.objects now automatically distributes the images evenly across the available (active) tracks. The Projection times of the individual images correspond to the specified standard Projection time and can of course be changed individually. You will learn how to do this later in this chapter.

Using Windows Explorer, you can also integrate video material into m.objects in the same way as fixed-images.

If you would like to insert all the images within a folder into your show, you can simply drag the folder symbol onto the tracks. Existing subfolders are also taken into account.



Please note: If you insert images directly from a folder in the file directory into your show, they are still not included in the m.objects project directory. A corresponding warning is also displayed on the screen when you insert it. As already described, it is recommended to copy the images into the project directory of your m.objects show so that they are still available when the show is exported later or when the original files are moved. To do this, simply open the file management in m.objects (*File / Media File Manager*) and select the option *Copy external files to the actual Project Folder* in the lower area.

## Insert images using the red dot

The red dot below the image and sound

tracks on the right side allows you to quickly insert files into your show.

Click on the red dot below the image tracks and select the option *Insert image(s)*. A selection window will open up that shows you all the image files in the *Pic* folder of the project directory. You can also use the drop-down menu at the top to select any other folder in the file directory of your computer and look for the desired image material there. In the preview window, the selected image is displayed in a reduced form.

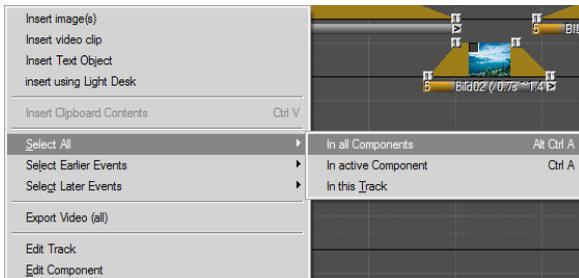


Select the images you want to insert, then click *Open*. If you now drag the mouse pointer onto the image tracks, you will notice that the images 'stick' to the cursor. You can now look for the right place in the show to use the images and click there with the left mouse button. Only now the images are inserted.

If an insertion is not possible and a crossed-out circle is displayed next to the mouse pointer, there is not enough space at the respective point.

You can then either insert the images elsewhere or move the following images until there is enough space. A trick can be helpful here: Click with the right and left mouse button at the same time at the point where you want to insert the images. Thus, the images to the right of the cursor are marked in all image tracks and can then be easily moved with the mouse. Of course, the associated Image Area, Zoom and Rotation Objects are also moved together with the images.

If you also want to move audio samples, click with the right mouse button in the desired location and select *Select Later Events / In all Components* in the context menu. As a result, all images in all image tracks and all audio samples to the right of the cursor are now marked. Then they can be moved until the space for the new images to be inserted is sufficient.



## Insert images via Image Pool



The m.objects Image Pool offers you the most convenient way of inserting images into a presentation, because like the classic model from slide photography, it offers you the option of viewing images, comparing them with one another and sorting them in the right order beforehand.

This may save a lot of time and effort when editing the show later.

In the toolbar you will find the corresponding icon right next to the *Screen* icon. Clicking on it (or on *View / Image Pool*) opens the Image Pool and initially presents several rows of empty image compartments. Like any other window in m.objects, you can place the Image Pool anywhere on the screen and enlarge or reduce it as required. The display size can also be varied: right-click in the Image Pool, under the menu item *Display* you will find the specifications *small*, *medium*, *large* and *extra large*.

Now, to begin with, double-click in an empty image compartment on the Image Pool. The file selection menu appears. Here you select the desired images by marking them and then confirming with *Open*. The selected images can now be found in the Image Pool. The warning message that some of the images are stored outside the project directory may also appear here. The things you should consider in this case are already described in the chapter *File management*.

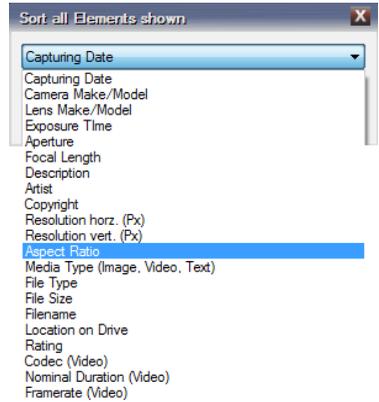
By holding down the left mouse button, you can move the images in the Image Pool to other positions as required and thus determine a rough sequence in a first step. Of course, you can also move several images at the same time by marking these images with the *Shift* key pressed beforehand. If you want to swap one image for another, just slide this image onto the other and release the mouse button.



If you want to move an image between two other images, drag the relevant image with the left mouse button pressed onto the bar between the two images until an arrow symbol appears for the insertion. Now release the mouse button and the image will be moved to this new position. You can also replace an image in the Image Pool by a new one: To do this, right-click on the image and select *Load Picture/Video File(s)*. Here you choose the new image and confirm again with *Open*.

### Sorting function of the Image Pool

You can also sort the images in the Image Pool by certain criteria. You will find the *Sort Elements...* option in the context menu of the Image Pool for it. Clicking on it will open a window with a selection menu that offers you a whole range of different criteria for sorting, from the *Capturing Date* to the *Exposure Time* to the *Framerate* for videos.



Select the desired option here and confirm with *OK*. For example, you can use the *Aspect Ratio* option to simply sort the images in the Image Pool according to portrait and landscape formats.



### Preview enlargement and test transitions

You can quickly and easily enlarge individual images in the Image Pool by moving the cursor over them and pressing the *Shift* key. If you have loaded a video into the Image Pool, the first frame of the video is displayed.

The sample crossfades are a particularly helpful function of the Image Pool. To use these, open up the Screen and position it

so that you can see both the Image Pool and the Screen. You may have to reduce the two windows in size a little bit. In this case it is convenient to work with a second screen on which you can show the Screen in full screen mode. If you now drag an image in the Image Pool onto another image with the right mouse button and hold the mouse button down, you will see the blending effect between these two images on the Screen. In this way, you can easily assess to which extent the images are suitable for a transition or whether you would rather choose a different combination without much effort and without integrating the images into the show. In order to simulate different Transition times, there are several options to choose from in the context menu of the Image Pool (click with the right mouse button) under *Test Transition Time*.

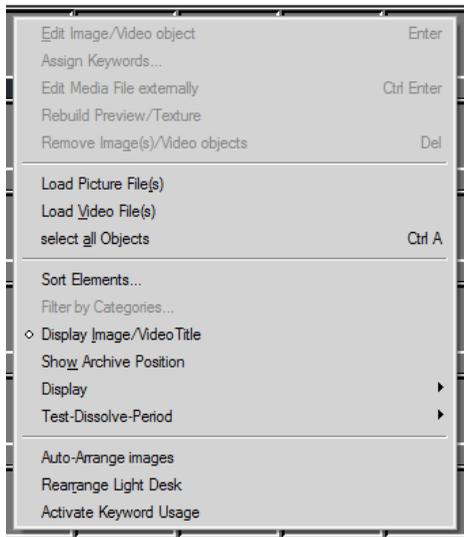
### ***Insert images into the tracks***

After you have finished sorting, the next step follows: You import the images from the Image Pool into the m.objects show. To do this, first make a selection by marking the corresponding images. Select a single image by clicking on it. If you would like to select further images, hold the *Shift* key and click on another image to also mark all the images in between. Or you can hold down the *Ctrl* key to select additional single images with the cursor. After you have finished marking images, hold the left mouse button down and drag your selection to a free space in the image tracks and release the mouse button. m.objects now distributes the images evenly across the available active image tracks.

### ***Clean up the Image Pool***

Unless you have dragged all of the images into the image tracks, the rest will remain on the Image Pool. The resulting gaps can be easily closed by right-clicking in the Image Pool again and selecting the *Rearrange Image Pool* option.

Or you can right-click in the Image Pool and choose the option *Auto-Arrange Images*. The images are then moved to a new line if necessary to match the width of the Image Pool. In addition, the



images move together automatically, so that all gaps in the Image Pool are closed.

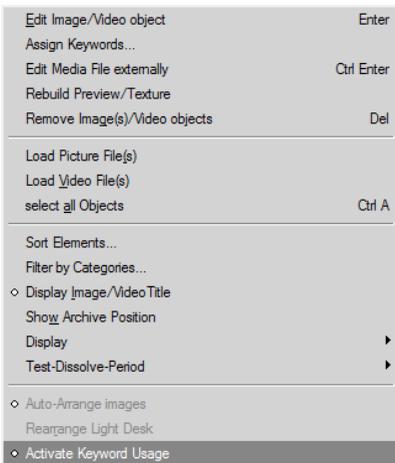
Images that you delete from the image tracks are placed back on the Image Pool and inserted at the bottom in the sequence of the images. If you delete several images from the tracks at the same time, they keep the pre-assigned order in the Image Pool. In addition, deleted images are automatically assigned to the keyword **deleted from the timeline**. You can read more about keyword management in the following chapter.

## Keyword management - the Image Pool becomes a storyboard

With the m.objects keyword management, you can significantly expand the functionality of the Image Pool and make it the storyboard of your production. Keywords help you to keep an overview even in large productions with extensive picture and video material.

You can create your own keywords in m.objects and organize them hierarchically. If you work with Adobe Lightroom to edit your images and assign keywords there, you can easily import them into m.objects and add other keywords if necessary.

### Create your own keywords



Now you can start assigning your own keywords. The sorting function of the

To be able to work with keywords, the option *Activate Keyword Usage* must first be activated in the context menu of the Image Pool.

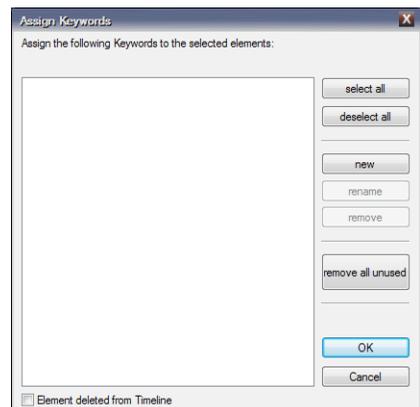
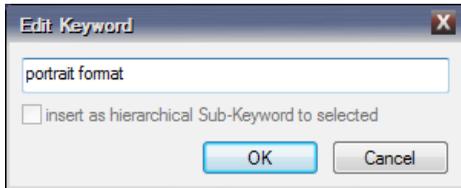


Image Pool (see above) can also be beneficial here. For example, sort the images by the aspect ratio so that the portrait formats are displayed first, followed by the landscape formats. Now mark all portrait format images and right-click in the Image Pool. Select *Assign Keywords...* here. The corresponding window opens.

If no keywords have been assigned yet, an empty window shows up, otherwise the existing keywords can be seen here in their hierarchical arrangement.

Click the button *new* and enter the name for the keyword in the following window, in this case portrait format and confirm with *OK*.



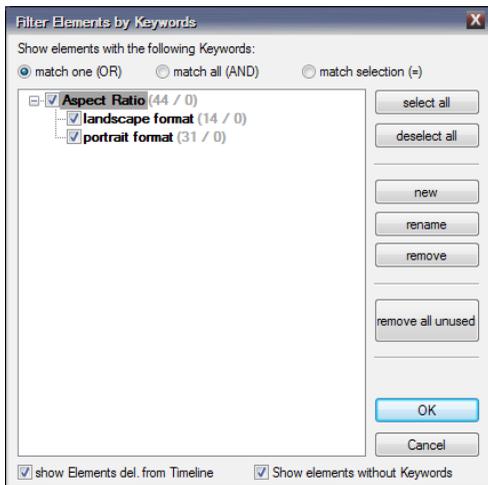
The new keyword now appears in the window. Click *OK* again.

In the context menu of the Image Pool you will also find the option *Filter by Keywords...* This is used to select the display of the pictures or videos in the Image Pool using the existing keywords,

so that only the pictures / videos that are assigned to the selected keywords are shown. You will see two numbers in brackets behind the keywords. The first shows how many pictures / videos are assigned to the keyword, the second how many of them are used in the image tracks.

In this window, click *deselect all* so no keyword is selected. Activate the *Show elements without Keywords* option, if it is not already. If you now confirm with *OK*, in our example the portrait format images will disappear from the Image Pool and only the landscape formats are displayed. Select these and assign a new keyword called landscape format using the *Assign Keywords...* option as described. Then call the *Assign Keywords...* option again and create the new keyword aspect ratio.

The three keywords you have created, portrait format, landscape format and aspect ratio, are now arranged one below the other in the list. To create a hierarchical structure, use the cursor to drag the keyword portrait format to the entry Aspect ratio. As a result, portrait format is inserted under aspect ratio, so it is subordinate to this keyword. Do the same with landscape format.



In this way you can now create further keywords, for example on certain topics or motifs, assign them to the corresponding images and, if necessary, structure them hierarchically. In the *Filter by Categories* window, you can select images based on these keywords when producing your show. To do this, check the box in front of the desired keyword.

Here you will also find the options *match one (OR)*, *match all (AND)* and *match selection (=)*. If there is a large number of keywords, you have the option of modifying the selection

of images accordingly: An image must either be assigned to at least one of the selected keywords or all keywords or correspond exactly to the specified selection.

You can also *rename* or *remove* keywords here, or *remove all unused* keywords from the list. The option *Show Elements del. from Timeline*, if activated, ensures that in addition to the selection made, all images that you removed from the image tracks during the production process also appear in the Image Pool.

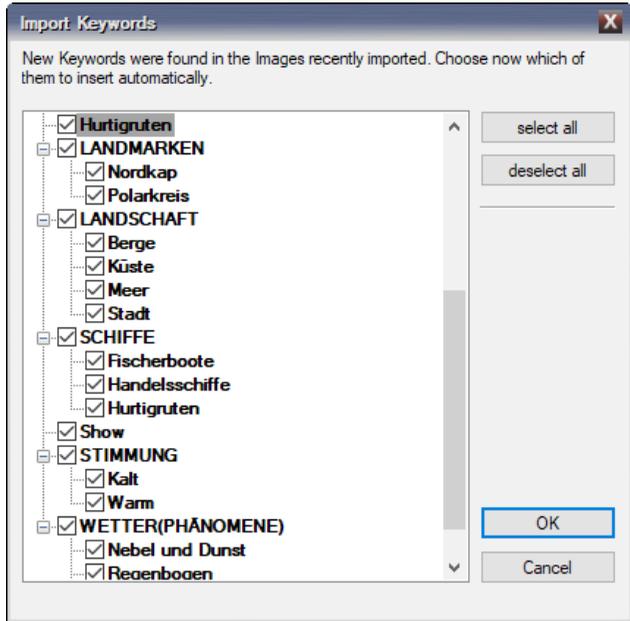
If you want to use the Image Pool again without keywords, simply deselect the *Activate Keyword Usage* option in the context menu.

m.objects saves the keywords within a show. If you copy images from one show to another, m.objects adopts the keywords there.

## Import keywords from Adobe Lightroom

Adobe Lightroom is one of the most widely used RAW converters and programs for managing and post-processing images. Here, also, you can assign keywords.

When importing images into the Image Pool, m.objects offers to take keywords from Lightroom. After calculating the textures, m.objects automatically opens the *Import Keywords* window, in which all existing keywords are shown in a list.



Here you can choose whether to include all of these keywords, none of them, or a selection of them in m.objects. At the start, all keywords are selected, if necessary, remove the checkmarks from the keywords that you do not want to import. By clicking on *deselect all*, all check marks will be removed accordingly.

The selected keywords are then added to the keyword list of your project, a hierarchical structure created in Lightroom is also adopted by m.objects. The keywords can then be further processed as described in the previous chapter.

This import option is particularly useful if you already manage a large amount of images with Lightroom and have worked intensively with keywords. This ensures a seamless workflow from recording to Lightroom to production in m.objects.

## Preview Enlargement

If you work with a lot of image tracks, the preview enlargement in m.objects offers a convenient way to provide a better overview.



To do this, simply drag the cursor while holding down the *Shift* key over the light curves of the images. The corresponding preview image at the respective point is enlarged so that you can quickly find individual images

even in more complex productions.

In addition, important Exif data of the image is displayed under the enlarged preview, provided that it is stored in the image: *date*, *time*, *camera model*, *lens*, *exposure time* and *aperture*.

## The Tray Editor

The Tray Editor is only useful in a few applications for working on digital presentations. Its functions are primarily designed for working on presentations for classic slide projection.

To open the Tray Editor, select *View / Tray Editor* in the program menu.



In contrast to the Image Pool, it shows the exact content of the image tracks. This means that you will find as many rows in the Tray Editor as there are image tracks in your presentation. All images on the tracks are displayed in the

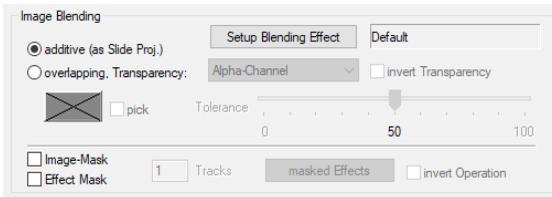
exact order.

The Tray Editor is of particular interest if you switch from analog to digital presentation. In general, the scanned images for your slide shows have a relatively low resolution. The first step is to digitize the slides using a much higher resolution. As soon as these are available as high-resolution digital images, proceed as follows: After double-clicking on an image in the Tray Editor, you can use the *Search* button to assign the corresponding counterpart with the high resolution. Projection times, fade-in and fade-out times and soundtrack remain from the analog show and are simply adopted. So instead of recreating the whole presentation, you can just swap the images.

## Image blending

The Image blending has an important influence on how several completely or partially overlapping images are displayed in the m.objects Screen. This applies, for example, to transitions in which one image is fading out and the next image is already fading in at the same time. This also applies to picture-in-picture displays, in which a picture is placed in front of a background picture.

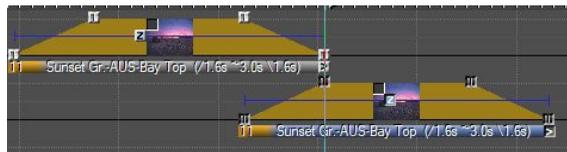
m.objects always builds up the display in the Screen starting with the bottom image track, similar to the processing of layers in Adobe Photoshop or many other image processing programs.

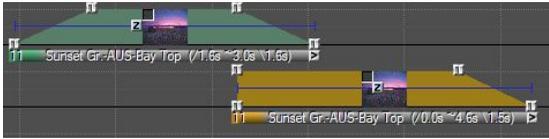


m.objects generally uses the option *additive* as the default mode. This is very well suited for soft transitions from one image to the next. Also for special effects such as the artistic montage of image

content, additive image blending is the right attitude.

In additive mode, the current height of the light curve defines how much of the brightness of the corresponding object is added to the underlying tracks. In this way, targeted overexposures can also be realized.





In the *overlapping* image blending, however, an image covers an image below it. This type of image blending is used for example in picture-in-

picture montages or also for texts that you create with the title editor.

In this mode, the light curve defines the opacity of the object over the underlying tracks.

The light curve of an image is also marked accordingly: A dark yellow light curve clearly shows that the additive mode is selected. If the light curve is green, on the other hand, the overlapping mode is set here.

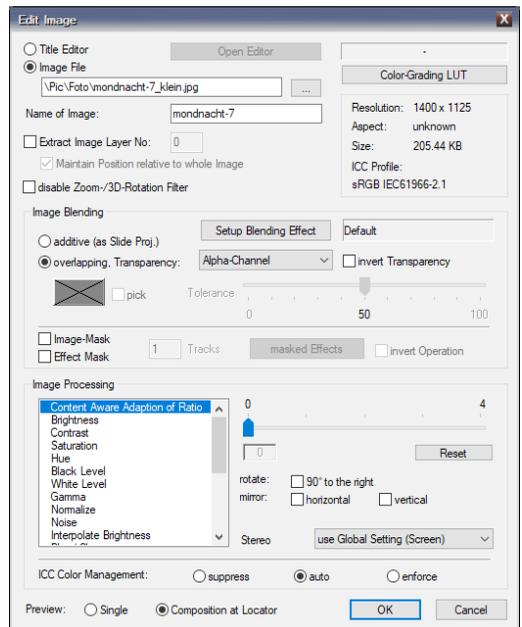
The two previous screenshots each show a transition process. In the first screenshot, both pictures are set in additive mode, so one picture is fading out while the second is fading in. In the second screenshot, the top image is set in overlapping mode. Since the brightness values are not added here, the lower image must already be fully faded in when the image above it begins to fade out. The result on the Screen is identical in both cases.

## Image properties - the *Edit Image* window

Under the light curve of each image you will see a bar with the image name as well as information on projection and transition times. If you double-click this bar, the *Edit Image* window will open up.

Here you will find a lot of information and setting options for the respective image.

In the upper area of the window there the name of the image, which m.objects takes from the name of the image file. You can also enter a custom name here, which is then displayed under the light curve in

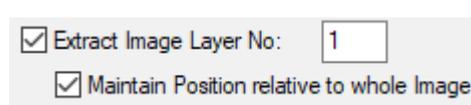


the image track.

Below you will find the image file with the specification of the file name and the file path. If necessary, you can use the ... button to link another image with the associated light curve.

The *Title Editor* option is automatically selected if the image is text that you created using the m.objects *Titeleditor*. With the button *Open Editor* you will then get to the *Titeleditor*, where you can edit the text. If the picture is not text, this button is inactive. You can read more about creating texts in the chapter *Create titles with the Titeleditor* on page 82.

At the top right of the window you will also find information on the *Resolution*, *Aspect ratio*, *File Size* and *ICC Profile* of the image.



The *Extract Image Layer* option gives you the option of displaying individual layers from Photoshop files, i.e. files with the ending .psd in isolation, so that

all other layers are hidden.

If a .psd file contains several layers, enter the value for the desired layer under *No*. The lowest layer of an image in Photoshop has the value 0, the layer above it has the value 1, and so on. The option *Maintain Position relative to whole Image* is pre-selected. As a result, a cut-out shape is displayed in the same size and position as in the original image, for example. If you remove the check mark with this option, m.objects displays the cut-out shape so that it fills the format. If you isolate an image layer, you should also select the *overlapping* option under *Image Blending* and the option *Alpha-Channel* under *Transparency*. In this way, m.objects can process possible information on transparency and display the image accordingly.



Below the *Maintain Position relative to whole Image* option you will find the option *disable Zoom-/3D-Rotation Filter*.

The *Zoom-/3D-Rotation Filter* is used to avoid flickering effects in 3D animations or extreme zooming by reducing the sharpness of the image. If the image sharpness should be retained in such cases - especially in static applications - or if flickering must be accepted, the filter can be switched off with this option.

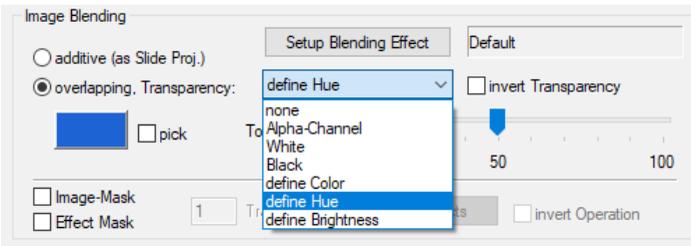
The following area in the editing window applies to *Image Blending*. Further information can also be found in chapter *Image blending* on page 66.

The *overlapping* mode of *Image Blending* offers the possibility to work with partial transparency (cut-out).

The following screenshot shows an image in an image track in which the sky is to be cut out.



To do this, the *overlapping* mode must be set. In such a case, in the selection menu under Transparency, select the *define Hue* option.



To select the sky, first click on the box next to *pick*. Then move the cursor to the Screen, where it will take the form of a pipette, and then click in an area with a medium shade of blue.



The sky is then no longer displayed, but instead a checkerboard pattern as a symbol for transparency. This is only the case, if the option *Single* is set for *Preview* at the bottom of the *Edit Image* window.

If the exemption has not been completely successful or perhaps an area from the rest of the image has also become transparent, you can still adjust the result with the tolerance slider.

This technique is also used in conjunction with chroma keying, which is primarily used to exempt video content from a plain background (bluebox or green screen method). Read more in chapter *Real-time chroma keying* on page 171.



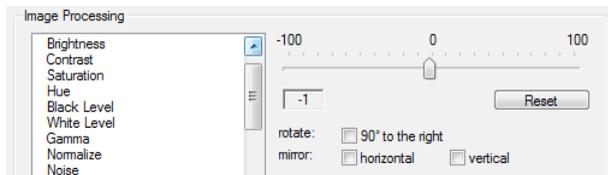
If you select *define Color* instead of *define Hue*, only the area that exactly corresponds to the selected color is exempted. With the options *White* and *Black*, you can exempt white and black areas of the image. Here, also, the *Tolerance* controller may help to optimize the result of the exemption. The *Brightness* option exempts by brightness values in the image and not by color or hue. Finally, *Alpha-Channel* offers you the option of using transparency information that is already contained in an image. This is useful, if the picture has already been exempted in another program such as Photoshop.

The *invert Transparency* option swaps the exempted and non-exempted areas in the image. With this you can e.g. create a text with the title editor, add a suitable color and then ensure that an image below is only shown in the contours of the text with *invert Transparency*. More on working with the Titeleditor in chapter *Create titles with the Titeleditor* on page 82.

Under *Image Blending* you will also find the *Image-Mask* and *Effect Mask* options. For detailed information on working with masks, refer to the chapter *Masks* on page 139.

The *Image Processing* area offers you extensive options for correcting and post-processing images, as well as for using a number of effect filters.

A detailed description of this can be found in the chapter *Image processing* on page 90.



ICC Color Management:  suppress  auto  enforce

ICC Color Management is activated by default in m.objects and should normally not be switched off. Should this still be necessary in exceptional cases, you have the option to *suppress* or *enforce* color management here.

For more information on ICC Color Management, see *Color management and calibration* on page 96.

Finally, in the lower line of the editing window for *Preview*, you will find the options *Single Image* and *Composition at Locator*.

Preview:  Single  Composition at Locator

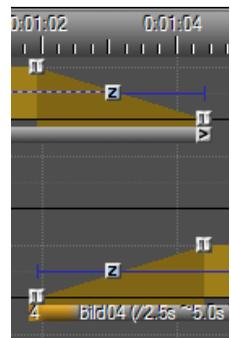
With *Single*, you can selectively only display one image on the Screen while editing this image, for example

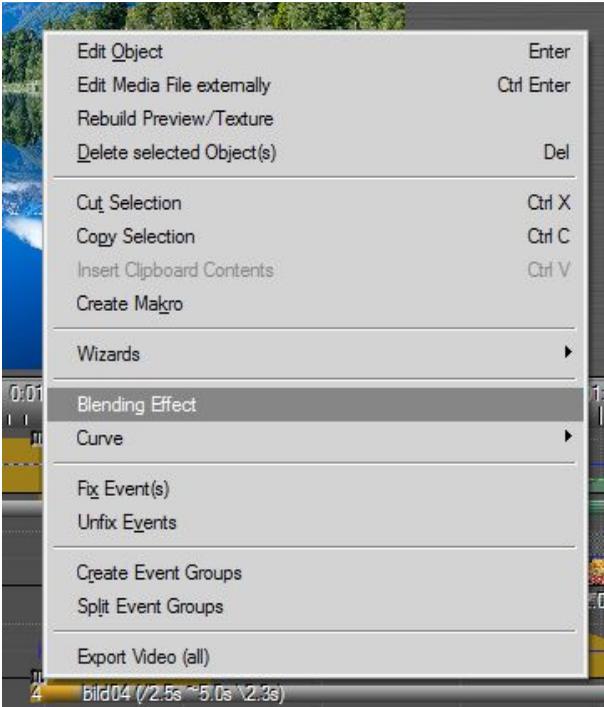
if you want to exempt part of the image, without previewing the other image tracks. On the other hand, with the option *Composition at Locator*, the image appears on the Screen in its full context, i.e. including all images in the other tracks that can be seen at the current position of the locator.

## QuickBlending

With the QuickBlending options, m.objects image transitions can be varied in a variety of ways and provided with a number of freely adjustable effects. The application can be done directly in the existing image sequence on the image tracks. You can either change certain image transitions or you can apply the Quick Blending effects to individual images and specifically modify their fade-in and / or fade-out. All fade-ins and fade-outs processed in this way are immediately recognizable in the light curves by the dark yellow display.

To change a transition between two images, simply drag a frame around the handles of this transition with the left mouse button pressed so that they are marked. If you now right-click on one of the marked handles, you will find the entry *Blending Effect* in the context menu.





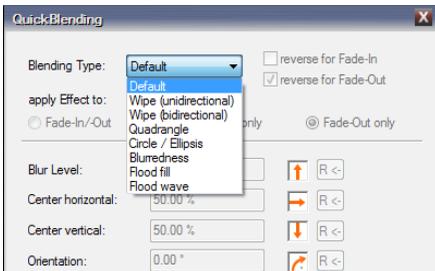
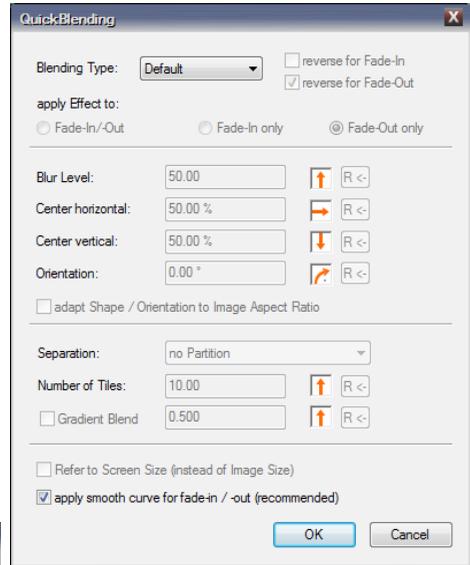
Select this entry to access the options for the QuickBlending effects.

Alternatively, you can find the QuickBlending effects in the Tools window under *Blending Effects*. In this case, use the mouse to drag the desired blending to the corresponding transition phase.

You will now see an animated preview of the selected transition type on the Screen. This gives you the opportunity to directly control the outcome of the effects described below and to set the parameters appropriately.

Under the *Blending Type* option you will find the entry *Default*. This stands for the default transition, i.e. fade-out of one and fade-in of the following image. If you click on this entry, a selection menu opens up with a number of other options.

Once you have selected one of these, you can also edit the other options on this form. With *Wipe* you create wipe blendings as image transitions, which run either from one side over the entire image (*unidirectional*) or from both sides to the center of the image (*bidirectional*). In addition, the option

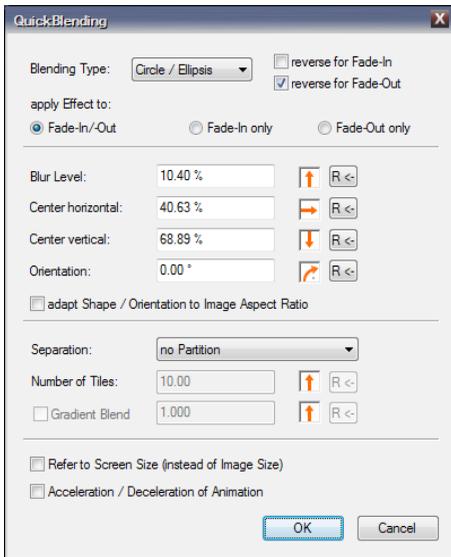


*Reverse for Fade-Out* is activated in the form by default. If you instead tick the box on *Reverse for Fade-In*, the movement runs in the opposite direction.

With the options *Quadrangle* or *Circle / Ellipsis* you create transitions in the corresponding geometrical shapes.

The edges can be blurred using the *Blur Level* option. With *Center horizontal* and *Center vertical*, you can move the starting point of the transition animation to match the image motive.





In the example at the top, the center has been moved a bit to the bottom left, so that the transition animation starts just above the beetle. *Circle / Ellipsis* is selected as the *Blending Type*.

If you select the *adapt Shape / Orientation to Image Aspect Ratio*, i.e. tick the box here, the blending shape adapts to the aspect ratio of the image, i.e. it is stretched here.

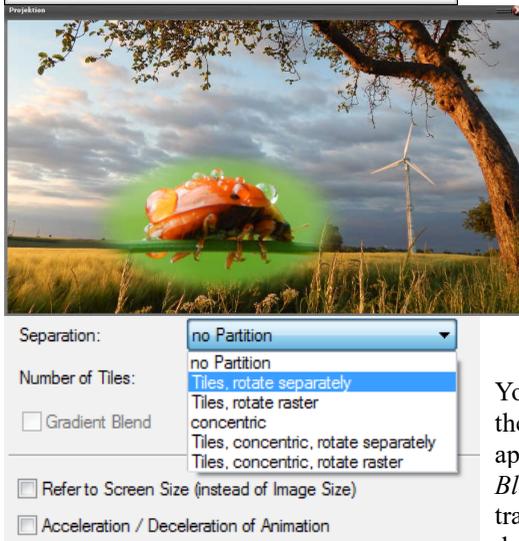
Using the *Orientation* option, you can turn the selected blending as you like.

Under the *Separation* option you can further modify the effect. In this way, you can divide the blending pattern into a freely selectable number of tiles or

concentrically arranged shapes, with the option of rotating either the entire grid created in this way or each tile individually.

In another example, the option *Tiles, concentric, rotate seperately* is selected here.

If you instead use the option *Tiles, concentric, rotate raster*, the entire raster with the tiles is rotated by the value selected for *Orientation*.



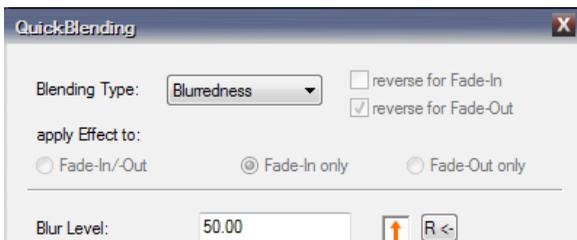
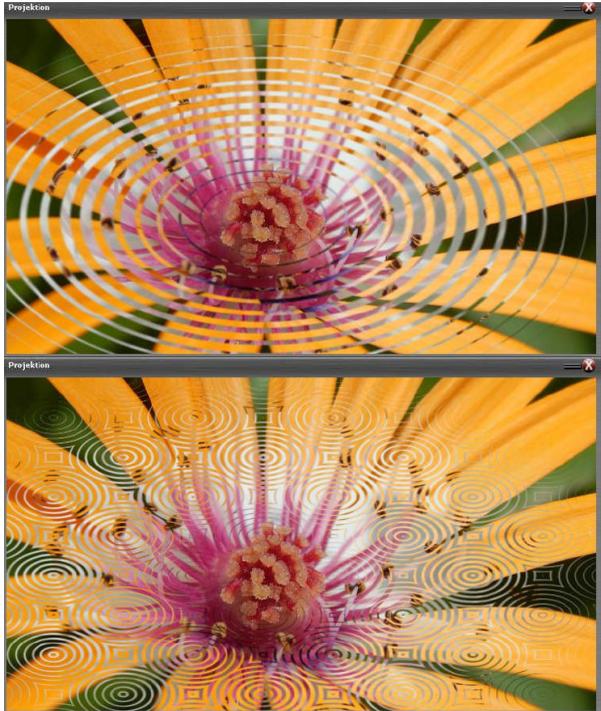
You can also add a *Gradient Blend* to the animation. To do this, tick the appropriate option. The *Gradient Blend* is like a gradient for the entire transition, which makes sure that it does not run evenly across the entire image, but runs from the specified

center to the outside or vice versa from the outside to the center.

The extent of the Gradient Blend is determined by the value that you enter in the input field or set with the arrow control.

With the selection of soft *Acceleration / Deceleration of Animation*, the fade-in or fade-out no longer takes place at a constant speed, but begins slowly and is slowed down again at the end.

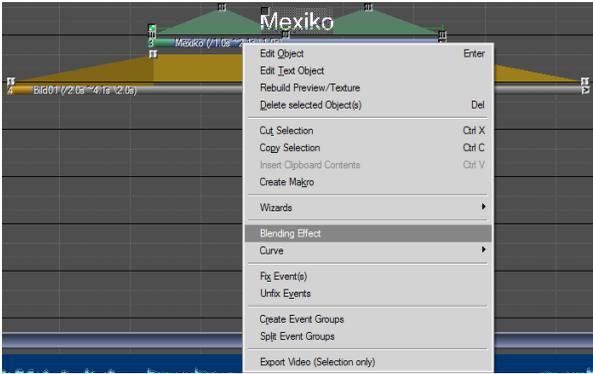
If you select *Blurredness* as the *Blending Type*, a Gaussian blur is used in addition to the normal fade-in and fade-out or transition, the intensity of which you can be varied individually.



By the way, you can also apply QuickBlending to several transitions at the same time. In this case, mark all the desired transition phases and set the values as described. All selected transitions are then modified

in the same way.

Alternatively, m.objects QuickBlending can also be applied on individual images. This is particularly useful for images in *overlapping* mode such as title overlays and other inserts. For example, you can overlay a title with a Wipe Blending Effect and then hide it again in the same way after the desired projection time.



To do this, right-click on the bar below the light curve and select the option *Blending Effect* in the context menu or drag the desired Blending Effect from the Tool window directly onto the light curve.

The window for *QuickBlending* editing opens. If you now select one of the options under

*Blending Type*, you can also specify directly below under *apply Effect to* whether the selected effects are applied to *Fade-In/-Out*, or to the *Fade-In only* or to the *Fade-Out only*. M.objects specifies fade-in and fade-out as standard.

So if you want to show a title on the Screen using a wiping animation, simply select the *Wipe (unidirectional)* option and confirm with *OK*.



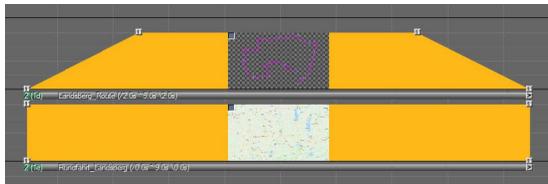
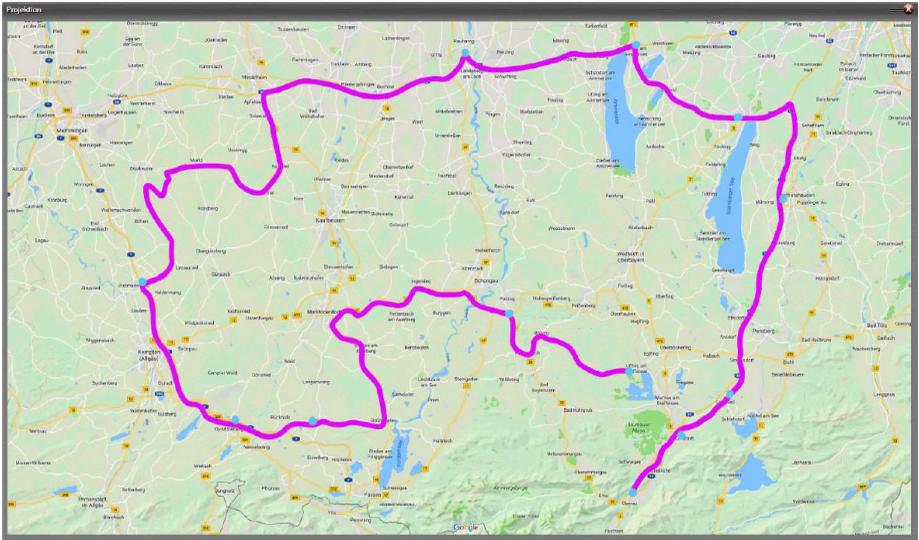
When playing the show, you will notice that the Fade-Out of the title occurs in the opposite direction to the reading direction. To change this, activate the *Reverse for Fade-Out* option in the *QuickBlending* form. The title is

then faded out in the same direction as the fade-in.

Here, also, it is of course possible to mark several images or titles at the same time and edit them in the same way with the *QuickBlending* effects.

## Animation of travel routes

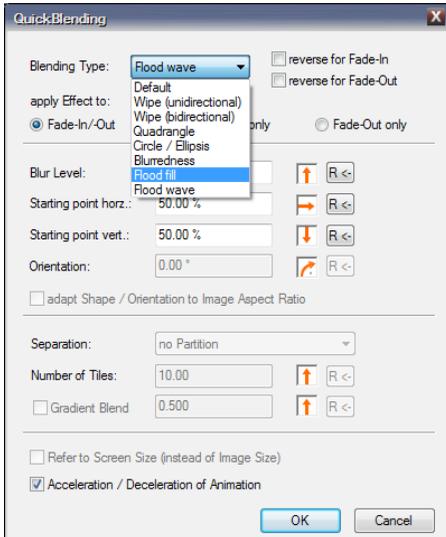
Especially in travel lectures, it is a popular stylistic device to trace the course of the trip on a map or road map with a line.



In order to dynamically display the route as an animation, you need two pictures: On the one hand you need the picture of the map as the background, and on the other hand the course of the travel route in the form of an

exempted line. You can create such a line in any image processing program. Make sure to save the image in a file format that supports transparency information, e.g. png or tiff. If you work with Photoshop, you can also use the psd format.

In m.objects, arrange the two pictures so that they lie one above the other in the picture tracks. It is important that the picture of the map is below the picture with the travel route.



Now double-click on the bar of the travel route picture to open the Editing window. Here you select the option *overlapping* under *Image Blending* and for the *Transparency* the *Alpha-Channel* (these options are already selected for png files). As a result, m.objects now interprets the line as an exempt form.

Then click on *Setup Blending Effect* to get to the *QuickBlending* form. For *Blending Type*, select the *Flood fill* option.

In the Screen you can see the exempt line indicated in gray color. You now need to determine where the starting point of the travel route animation should be, i.e. where the journey begins. To do this, simply click on the corresponding point on the line and a preview of the animation appears on the Screen.



Alternatively, you can also enter the starting point numerically in the form under the options *Starting point horz.* and *Starting*

*point vert.* or set it using the arrow controls. It is crucial that the green dot touches the exempt line. As long as this is not the case, there is no animation.

The *Blur Level* affects the appearance of the front edge of the animated line. As a rule, a value slightly above 0 leads to an appealing result. For this reason, m.objects specifies the value 5.00% by default.

As with the other types of blendings in *QuickBlending*, you can also apply the blending to *Fade-In/-Out*, to *Fade-In only* or to *Fade-Out only*. In the case of *Fade-*

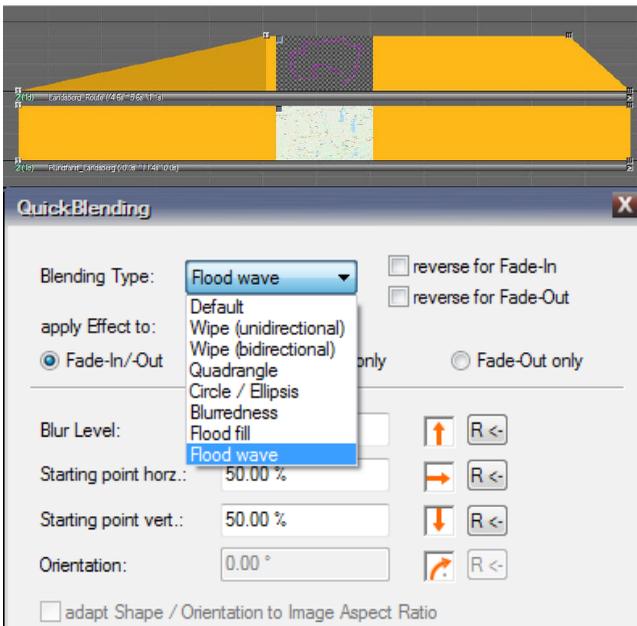
*In-/Out*, use the *Reverse for Fade-Out* option to ensure that the travel route is removed in the same direction in which it was initially drawn after its Projection Time. With the option *Fade-In only*, the travel route is first drawn and later faded out with a default transition.



If you select a point in the middle of the exempt line as the start for the animation, the animation takes place simultaneously in both directions to the end points of the line.

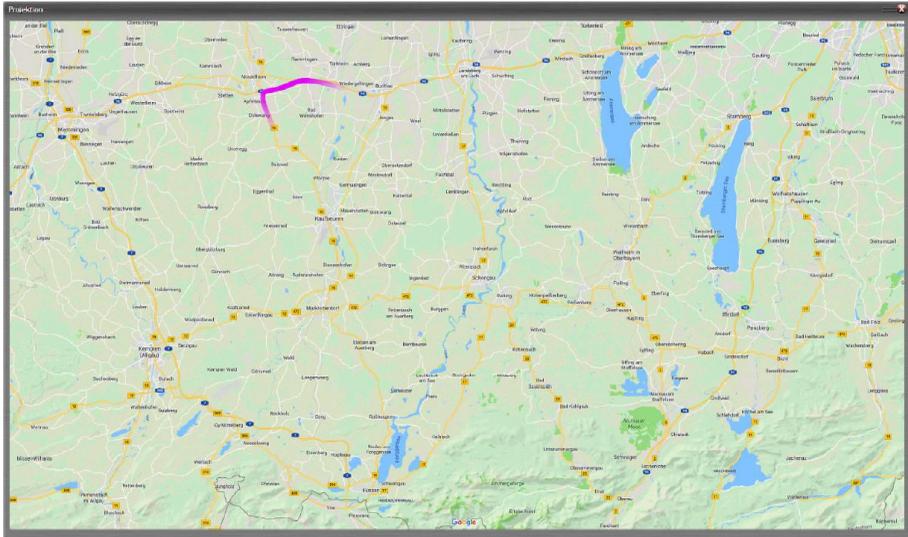
After you have entered the desired values, confirm the forms with *OK*. As with the other types of QuickBlending, you

control the speed of the route animation with the length of the *Fade-In* and *Fade-Out time* of the image. So, for example, to slow down the animation when fading in, extend the *Fade-In* time of the image. The animation is accelerated accordingly with a shortening.



Underneath the *Flood fill* option, you will also find the *Flood wave* option for the *Blending Type*, which

you can also use to animate travel routes.



The name of this *Blending Type* already indicates what is happening here: Instead of tracing the entire line of the travel route in one animation, only partial sections of the line are drawn gradually in this case, which run from the start point to the end point.

You can use the *Blur Level* in the *QuickBlending* window to influence the length of one section. The larger the value for the *Blur Level*, the larger the individual sections of the travel route.

If you select a starting point in the middle of the line, two separate animations now appear, each moving to one end point of the line.

The *Blending Types Flood fill* and *Flood wave* can also be found in the

*Tools* window, just like the other blending effects, from where they can simply be dragged onto the corresponding image. Of course, they cannot only be used for the animated display of travel routes. Basically, they work with all optional shapes, so that - depending on the motif - they offer many creative options for designing overlays.

## Intelligent adjustment of the aspect ratio

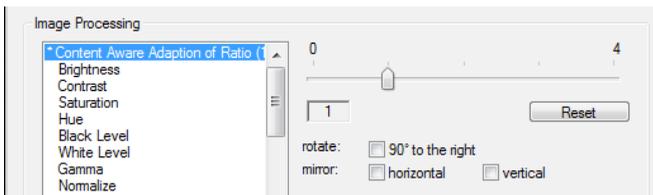
m.objects includes an intelligent technology for content-based adaptation of images to the aspect ratio of the display, i.e. to the aspect ratio of the Screen or the image area. This technique can evaluate image content and automatically decide which part of an image may or may not be blurred. The method, also known as Content Aware Scaling, leaves the important parts untouched, while less relevant ones - such as the horizon line or a blurred background - are stretched unobtrusively.



In the example image you can see a photo that deviates from the aspect ratio of the Screen, clearly recognizable by the black bars on the right and left. One possibility would be to enlarge the image with a Zoom Object or with the wizard to *fit Images to Aspect Ratio* (for more information, see the chapter *Wizard: fit Images to Aspect Ratio* on page 184) so that it completely fills the Screen, as shown in the following image .



In this case, however, important parts of the motif are cut off at the top and bottom. Content Aware Scaling works differently here. Double-clicking on the bar under the light curve of the image takes you to the *Edit Image* window.



Here, in turn, you will find the option *Content Aware Adaption of Ratio* as the first point listed under *Image Processing*. If you select this with a

mouse click, you will now see a slider on the right with setting levels 0 to 4. At level 0, the image is not adjusted, levels 1 to 4 represent different gradations of intelligent adjustment. Basically, levels 1 and 3 process only vertical lines for spreading, while levels 2 and 4 also process diagonally running lines within the image. The appropriate setting level therefore depends on the respective motif; if in doubt, compare the results on the Screen. Of course, not every picture is equally suitable for intelligent spreading.



After clicking *OK*, you will now see the full format image on the Screen. The crucial subject area has remained unchanged, while the necessary spreads have occurred in the rest of the image area.

This is a static effect for pictures, it cannot be applied to video material. Since it is a very computationally intensive process, it sometimes takes a few seconds for a change in the controller to have an effect on the Screen. However, once the image (i.e. the texture) has been calculated by *m.objects*, no computing power is required for it during playback.

By the way, this technique also works in the opposite direction, so you can also "squeeze" a suitable panorama into a 16: 9 screen or e.g. convert a 3: 2 landscape format to a portrait format. Of course, the method works non-destructively, so it leaves your original images untouched.

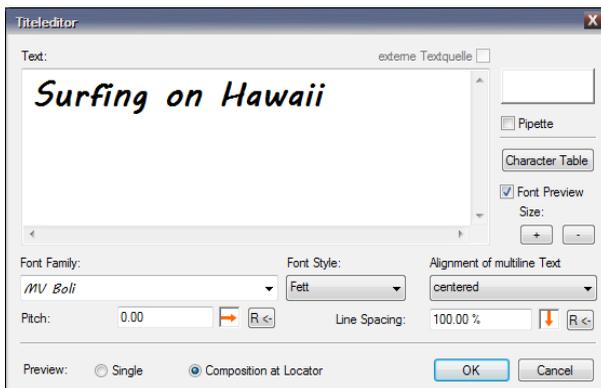
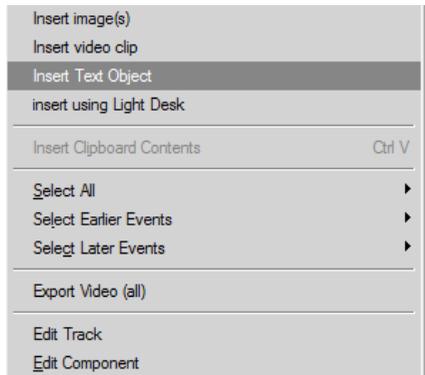
## Create titles with the Titeleditor

There are two ways to insert titles into an *m.objects* show. In most cases you will use the internal title editor. For elaborate title designs that go beyond the possibilities of the internal title editor, use an external image editing software.

## Use the Titeleditor

You open up the m.objects title editor by simply right-clicking on an empty space in an image track. In the context menu that opens up, select the *Insert Text Object* option and now you have the *Titeleditor* window in front of you.

Here you enter a text and format it. The text is displayed directly in the appropriate font in the input text box. You can adjust the display *Size* using the + and - buttons.



more practical for fragile or strongly decorated fonts not to edit the text in the original font, the *Font Preview* can also be deactivated by simply removing the checkmark next to *Font Preview*.

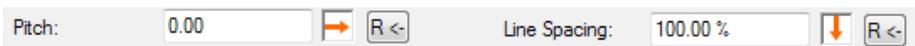
You select the color of the text either using the button at the top right, so that the *Choose Color* window opens up. Or you can click

on the box next to the *Pipette*.



Now you can pick up a color for the text directly from the m.objects Screen.

Use the selection fields for *Font Family*, *Font Style* and *Alignment of multiline Text* to enter the appropriate formatting options. Below you will also find options for the running width of the text (*Pitch*) and the *Line Spacing* for multi-line text.



Entries can be made numerically in the input fields as well as via the arrow controls.

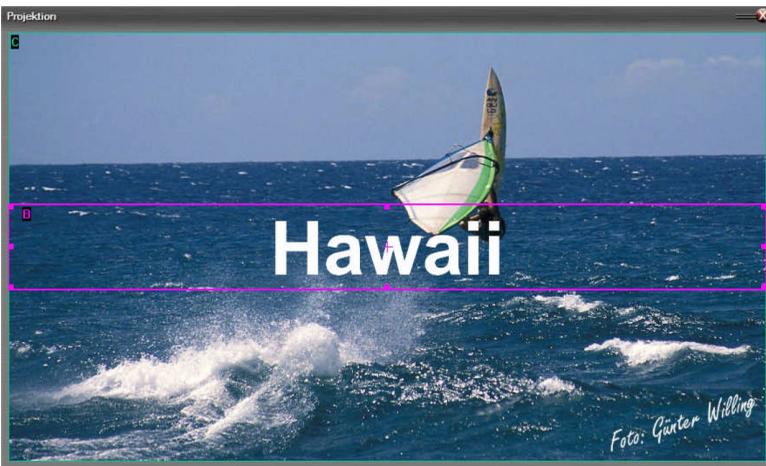
You can read more about operating the arrow controls in m.objects in chapter *Working with the arrow controls* on page 38. You can follow the changes you make here on the Screen.

Now confirm your entries in the editing window with *OK* and position the title on the image track. You then change the Fade-In and Fade-Out Time as well as the Projection Time of the title in the same way as for any other image. By default, a title out of the Titeleditor is inserted with the attribute *overlapping* in *Image Blending* settings, since it is usually positioned above a background image and should be completely overlaid on it. Of course, this can be changed if necessary.

### **Font size and positioning of the text**

There is no input field for the font size here. This can be explained quite simply by the way m.objects basically works: The software inserts the title as an image, more precisely as a texture. At the same time, an *Image Area Object* is automatically placed on its light curve. If you click on this *Image Area Object*, a pink frame appears around the text on the Screen. Click and move this frame to position the text on the Screen, and drag the edges to change the size. This allows you to align and scale the title as required for the presentation. Alternatively, you can double-click on the Image Area Object symbol to get to the associated editing window, where you can also change the size and positioning of the text.

The Titeleditor first creates the Image Area object in a way where it takes up the full



width of the Screen, which can also be recognized in the following picture by the pink frame (after clicking on the Image Area object).

In this way, texts of different lengths are displayed in the same size.



If you also want a title to be left-aligned in its Image Area, add an additional *Zoom Object*, double-click on the symbol and set the *horizontal* value for the *Center* to 0%.

Analogously, set it to 100% for a right-aligned orientation.

You can then use the Image Area to adjust the size and position of the text to the background motif.



If you want to edit the finished text again later, double-click the bar below the title in the image track and select the *Open Editor* option in the editing window. This will take you back to the *Titeleditor*.

### **Applying Dynamic objects to titles**

You can of course animate a title created in this way with the Dynamic Objects of m.objects or distort it with the 3D-Animation Object. In this way, almost any effects can be implemented with the Titeleditor.

In our sample file, the creation of the title is not limited to the entry in the Titeleditor. In addition, a 3D-Animation Object is used here, with which the title is tilted in perspective to match the water surface. In addition, a copy of the title in track B in black font color and with a slightly offset Image Area creates an interesting shadow effect.

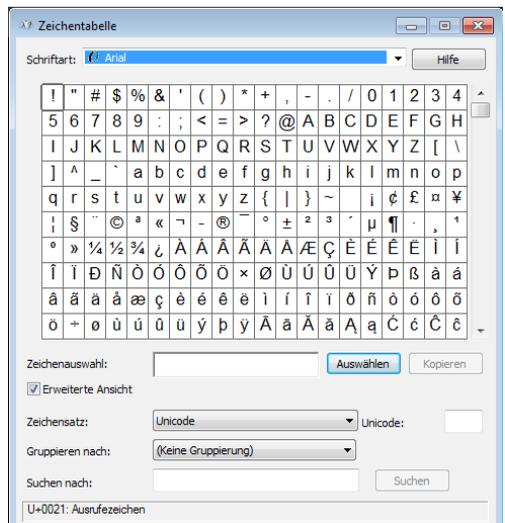


The m.objects internal Titeleditor can be used creatively and flexibly, especially in connection with Dynamic Objects. In the example this happens statically, but since a title is handled by the software in the same way as any other image, you can of course also zoom, rotate or move it in three dimensions.

### **Use of special characters in the Titeleditor**

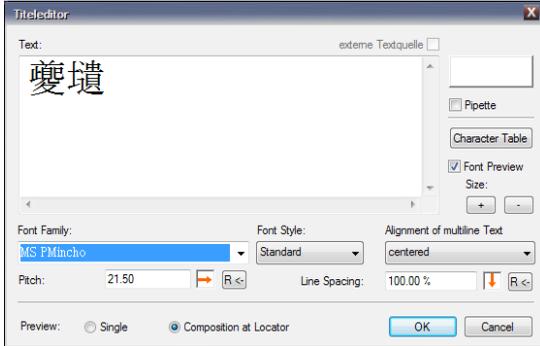
The m.objects Titeleditor masters the Unicode character set, so that special characters are also available here. This allows titles and texts to be created in almost all languages.

If you want to insert special characters, click the *Character Table* button. The *character table* (*Zeichentabelle*) then opens up, in which you first select the desired



font (Schriftart) above.

Below you can see an overview with the available special characters. Select the right one with a mouseclick and confirm by clicking on *Select (Auswählen)* and *Copy (Kopieren)*. The special character is now in the clipboard.



In the *Titeeditor*, click on the desired position and insert the special character via the context menu (right-click and *paste*) or with the key combination *Ctrl + V*.

## Use on different computers

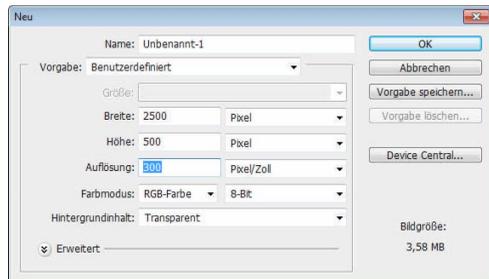
If you want to edit or present a mos file with title(s) on multiple computers, the font used must be installed on each of them. If, for example, the output resolution changes and all textures are then recalculated, m.objects must be able to access this font so that the title can be displayed correctly.

The situation is different with EXE files. These already contain the information for displaying the font, so that existing titles are displayed regardless of the installation of the font. This means that nothing stands in the way of a presentation on different computers.

## Create titles with external image processing software

m.objects offers a convenient connection to external image processing programs. Communication is most efficient with Adobe Photoshop (from v6. Photoshop Elements is similarly suitable for this.

If you are using other software than Photoshop, some steps will differ more or less from the procedure described here.

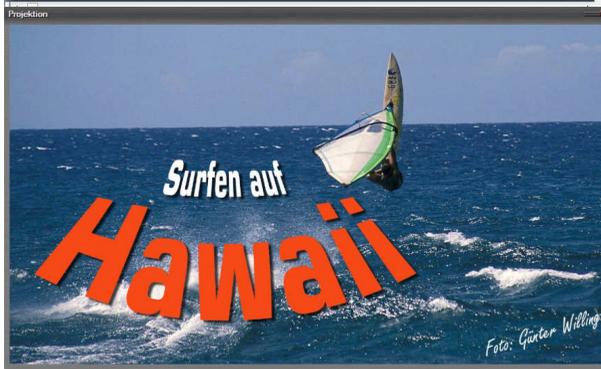
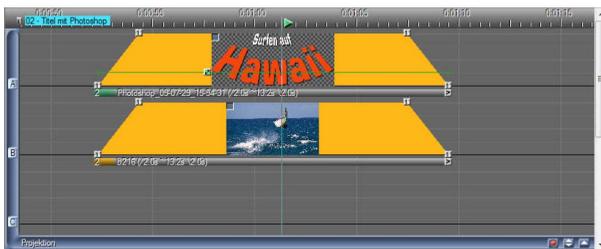


Create a new image in Photoshop or a similar program. Choose a sufficiently high resolution for the text, for example 2,500 x 500 pixels. The color mode should be *RGB color, 8 bit*, for the *Background Contents* choose *transparent*.

Now create your text using the Photoshop text tool. You can use layer effects, the Transform tool, or other possibilities to edit the text and create the desired effects.



When the text is done, choose the *Move* tool from the Photoshop Tools palette. Click on the image and drag the content out of Photoshop directly onto the free area of the upper image track within m.objects. If you are working with one screen and the m.objects main window is currently covered by Photoshop, first drag the image onto the m.objects icon in the task bar at the bottom of the screen to bring m.objects to the foreground, and from there without letting go directly onto the image track.



m.objects now shows the relevant part of the created title on the image track. The name displayed in the bar below the title

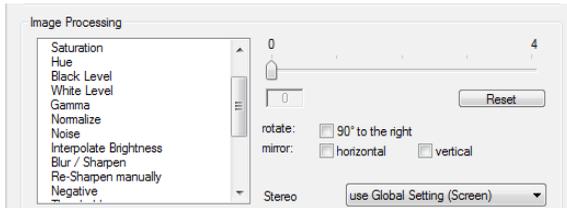
is approximately *Photoshop\_Date\_Time*.

You can now quit the image processing program, because m.objects has already created a file in PNG format from the dragged image content within the current project folder (in the Pic/Dropped subdirectory). The file format PNG (Portable

Network Graphics) has the advantage of containing the transparency information of the image.

The text integrated in this way into m.objects is already set as *overlapping* in the Image Blending settings so that it completely overlaps the background image below. With an Image Area Object, you then ensure the appropriate size and positioning of the title.

## Image processing



Before you present your photos, you will usually edit or optimize them first. m.objects, in turn, offers powerful internal image processing with which you can carry out essential post-processing steps. Therefore,

you have the option of inserting image material directly into m.objects and refining it further here. A very important point is that m.objects works non-destructively. That means: the program does not change anything in your original files. These remain unchanged so that you do not run the risk of permanently and irretrievably changing your image material through intensive experimentation. The processing steps you perform in m.objects are only included in the display on the Screen.

You can access the image editor by double-clicking on the bar below the respective image on the image track. In the lower area of the window that now opens you will find a list with the individual editing options. On the right you will see a slider with which you can set the processing value. With the screen open, you can observe and modify the change of the image. Depending on the image size and computer performance, it may take a moment for the change to appear on the Screen. Use the *Reset* button to return to the respective initial value.

For the Content Aware Adaption of Ratio option you will find a separate chapter with a detailed description: *Intelligent adjustment of the aspect ratio* on page 81.

An important note at this point: Starting with the expansion level m.objects live, the Dynamic Objects *Picture-/Video-Processing* and *Blur* provide further options for post-processing important parameters of images and also using these changes as dynamic animation. On the other hand, a purely static correction - for example the brightness or sharpness of an image or a deliberately used blur - should be carried out

in the editing window of the image, not with the Dynamic Objects. The difference is that the static image processing is included in the textures of an image even before the presentation, whereas corrections and effects with Dynamic Objects are calculated in real time during the show and use the computer's graphic resources accordingly.

You can read more about dynamic image processing in the chapter *Picture-/Video-Processing* on page 129.

Static image processing options:

### *Brightness*

With the brightness correction you change the overall brightness of the image, in the case of underexposure or overexposure a simple and effective way. However, make sure that bright areas do not 'hollow out' or the dark

areas do not lose their drawing too much.

### *Contrast*

For low-contrast images, increase the value here, images with contrasts that are too extreme can be softened accordingly.

### *Saturation*

Saturation refers to the intensity of the colors. Images with a flat appearance gain brilliance here by optimizing them. If the colors appear too gaudy, you can reduce the saturation accordingly. By completely reducing the color information (slider on the far left) you can, for example, create a suitable background image for a title overlay.

### *Hue*

It is best to try out the effect of the color correction on your own photos. With a slight change in the value, you can correct slight color shifts in the image. As soon as you move the slider a little further, the color correction becomes more like an effect filter with which you can achieve interesting color shifts.



### *Black Level / White Level*

The example shows a photo that contains neither real black nor real white. Instead, the corresponding areas appear in a washed-out shade of gray. In such a case, move the *Black Level* correction slider so far to the left that you can see a real black hue on the screen. A new black point is now assigned to the image, which has a significant effect on the brightness distribution.



The procedure for correcting the white level is similar. Move the slider so far to the left that you get a real white hue for these areas.

If you set the slider too far when correcting the black level, you place it at areas where no black should actually be. As a result, the dark areas of the picture 'run in', i.e. no longer

have a drawing.

A too strong correction of the white level leads to the bright areas being 'hollowed out'. There is no detailed drawing then, which usually results in a much more disturbing result than an overly strong correction of the black point.

In contrast to the brightness correction, the entire image does not become lighter or darker when the white or black level is shifted. The value for the white level is retained when the black level is corrected and vice versa.

### *Gamma*

While the black and white points denote the outer areas of the brightness, i.e. completely black or completely white, the gamma value of an image relates to the middle brightness areas.

### *Normalize*

If you move the slider to 1, you apply this image correction. Normalize here means an automatic correction of the image, which is carried out entirely by the program. This function can be used for motifs that have a 'normal' distribution of light and dark areas and may save a lot of time. You should not use it to edit subjects such as a

sunset, because the software would detect underexposure here and would correct the image accordingly far too brightly.

### *Noise*

This function can be used, for example, to remove small amounts of dust on scans. The more you drag the slider here to the left, the more the image loses focus. A moderate use of the function therefore makes sense. On the other hand, drag the slider to the right and add noise patterns to the image, which can be used as an effect if necessary.

### *Interpolate Brightness*

This function works similarly to the *Noise* filter. Significant differences in brightness in neighboring pixels that look like image disturbances such as noise are compensated. Contours are largely preserved. However, when used very heavily, this function also leads to a loss of sharpness and detail.

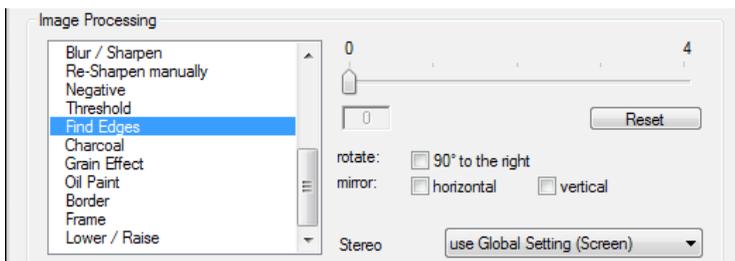
### *Blur / Sharpen*

If you drag the slider to the left, the image is blurred, similar to the Gaussian blur. Moved to the right, it sharpens the image. The sharpening in particular here is done in relatively clear gradations and quickly leads to clear artifacts in the image, as is customary when resharping. If, on the other hand, you want to sharpen in finer gradations, select the next function:

### *Resharpen manually*

Here you sharpen an image in very fine gradations, similar to what you might know from blurred masking from Photoshop.

In addition to these correction options, m.objects' internal image processing also offers a range of effect filters that are not so easy to explain, but rather want to be tried out.



## Post processing

In the last section you saw how you can edit individual images of your presentation with `m.objects`. In addition, you also have the option of carrying out global processing steps that affect the entire presentation. We refer to this form of processing here as post processing, since it is the last step in the creation of the presentation or can even be carried out just before the presentation starts..

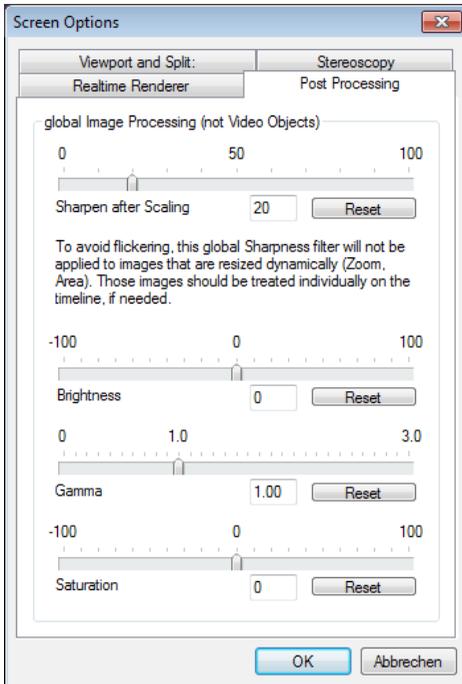
An example: You would like to present your show in a hall in front of a larger audience using a digital projector. The projection conditions are not ideal because disturbing extraneous light falls on the screen. The projector you are presenting with has a good brightness output, but you still want to optimize the display even further. To do this, you can increase the brightness of the entire presentation a bit globally to provide more light on the screen. Or you might work with a projector whose gamma value is not optimally set, so that certain brightness levels are emphasized more than others. With a global correction of the gamma value you compensate for this error. If,

on the other hand, the colors in the projection appear too pale, a global increase in saturation is advisable.

The global image corrections can be found in the settings of the Screen. So right-click in the `m.objects` Screen, select *Virtual Screen Options* and here the Post Processing window. You will see global correction options for Sharpness (*Sharpen after Scaling*), *Brightness*, *Gamma* and *Saturation*. The mode of operation does not differ from the corrections for single images, but it does affect the entire presentation.

To a certain extent, sharpening has a special position here. This is already indicated by the note below:

To avoid flickering, this global Sharpness filter will not be applied to images that are resized dynamically (*Zoom*, *Area*). Those images should be



treated individually on the timeline, if needed.

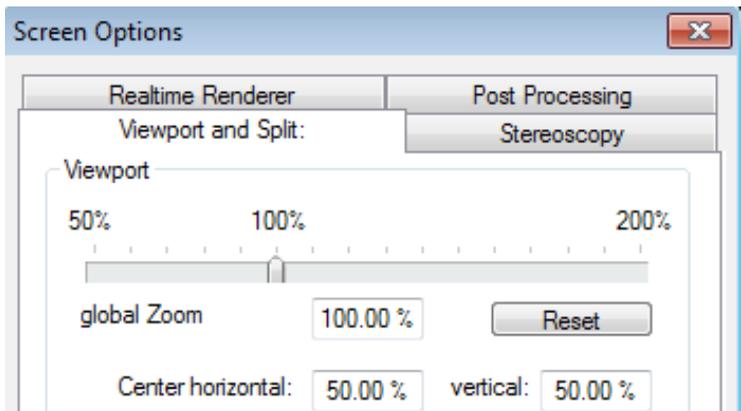
Sharpening shows clear artifacts with increasing intensity. If you apply them globally to images with zoom or enlarging Image Areas, these artifacts may be very clearly visible. Therefore, the global Sharpening is not applied to such images.

In addition, the global sharpening on single images can be corrected a little if necessary. So if you find that overall successful global sharpening looks too strong on a few images, you can weaken the sharpness there by editing the individual images. This means that the individual sharpening value of an image can overwrite the global sharpening.

This does not apply to the other global corrections, and it would not make sense either. You first adjust the Brightness, Gamma and Saturation individually and then adjust them to the respective presentation conditions.

In the Virtual Screen Options you will also find the *global Zoom* under *Viewport and Split*. You can use the slider to zoom into an image at the desired intensity, and you can also correct the horizontal and vertical alignment of the Zoom center. Since this is also a global application, all images of your show are changed in the same way. This type of correction is useful if you want to perform a projection with a large distance between the digital projector and the screen. It can happen that the projected image protrudes beyond the screen, so it is simply too large. With the global Zoom you can reduce the size so far that the projection fits entirely on the screen. A certain loss of resolution and sharpness cannot be avoided with this application.

But please note the following: Global corrections mean that m.objects has to recalculate the textures. This might take an hour for larger presentations. Therefore, you should definitely allow enough time for the recalculation beforehand.



## Color management and calibration

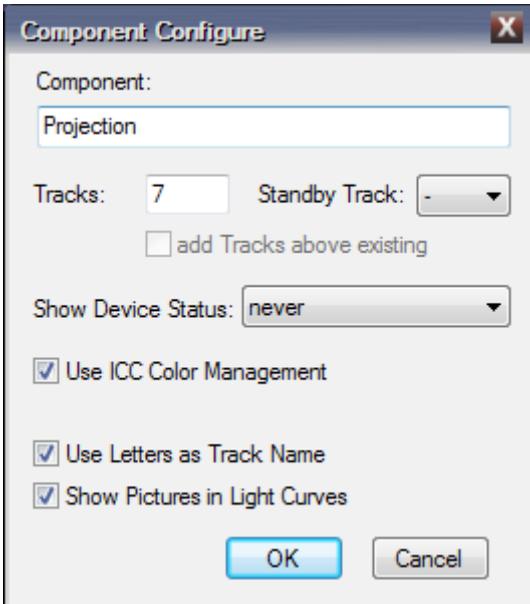
m.objects has a professional, integrated color management. The correct display of digital images on the projector or monitor must follow certain rules throughout the processing chain. Color management therefore simply means the ability to correctly interpret color information from an image and pass it on correctly to the projector or monitor.

To make it possible for the various components involved, such as digital cameras or scanners, image processing and presentation software and output devices, to find a common denominator, the ICC (International Color Consortium) has developed a standard for color profiles (ICC profiles). Different color profiles reflect the different extents of the color spaces of specific technologies and devices.

Color management is the decisive criterion for the color-correct presentation of your photos and thus an important ability of m.objects. After all, you don't want to see your pictures on the screen with roughly matching colors, but exactly as you took the pictures.

First of all, the digital photo itself provides the necessary information. Its colors are saved according to the standards of a certain color space, such as sRGB and Adobe RGB. You encounter these two color spaces quite often in photography.

The sRGB color space is a common denominator for many devices and is well suited for presentations such as projection. It is identical to the HDTV RGB aimed at for HDTV devices, and good digital projectors such as the Canon XEED series offer the possibility of projecting in accordance with sRGB. However, since sRGB is reduced compared to other common color spaces, it would be disadvantageous to work in this way from the beginning of the processing chain. Filtering in an image processing potentially entails loss of the image information, and so it is beneficial to initially create a more differentiated color space. AdobeRGB is very common, and numerous digital cameras optionally display in this color space. Images captured in this way immediately contain the appropriate color profile, and so it is possible for all downstream applications to interpret the images correctly.



You should use the more extensive color information from Adobe RGB to take more detailed photos and then present them achromatically. So if your digital camera can take photos in the Adobe RGB color space, you should definitely choose this option.

The entire processing can therefore take place in this color space, preferably with 16 bits per color channel. With its integrated color management, m.objects is able to automatically carry out the transformation into the required sRGB color space.

Color management is usually done automatically. However, it can be switched off within m.objects via the component properties of the projection. Therefore, click on *Edit Component* in the context menu of the Projection area and deselect *Use ICC Color Management*.

If desired, the setting made there can be overwritten for individual images by ticking *suppress* or *enforce* for *ICC Color Management* in the m.objects *Edit Image* window.

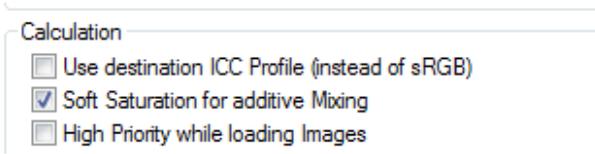
In addition, m.objects has the ability to consider any color correction profile created for the monitor or projector, even with smooth full-screen display. So if you want to work with precise color accuracy, you should calibrate your monitor or projector in conjunction with the graphics card.

Devices that can be placed on the screen and that measure the displayed color values are best suited for color calibration.

Such devices provide very good results when calibrating. Pure software solutions, on the other hand, are too imprecise for usable calibration

Color management does important tasks without you as a user having to worry about it. The only thing you have to tell m.objects is whether the program for the output

device should use the target color space of the image or not. To do this, you can select *Use destination ICC Profile (instead of sRGB)* in the *Virtual Screen Options* under *Realtime Renderer*.



As long as the output device is not calibrated, you should not select this

option. This could even lead to problems. However, if the device is calibrated, you can use this option to take full advantage of color management and present your photos in the best possible way.

## Quality characteristics of image files

Some general comments on the general handling of images in m.objects. One of the key features of an image is its resolution. An image can practically not be too high-resolved for processing in m.objects, because m.objects automatically calculates the image size to the required format. If desired, m.objects can also sharpen the scaled image, since any conversion of the size of digital images is initially accompanied by a more or less pronounced loss of sharpness.

For optimal results with digital photography for m.objects:

- Always take pictures with the maximum resolution of the camera. Even if the screen or projector cannot usually fully reproduce this resolution. This ensures maximum flexibility and quality for further processing and arranging.
- If possible, use the RAW format and later convert it into a general file format using the PC software belonging to the camera or a suitable program (e.g. Lightroom). Formats with 16 bit color depth per color channel are very suitable, e.g. the 16-bit TIFF format. These do not have any visible quantization effects later when filtering.
- If the camera allows it, Adobe RGB should be used in the color space. It covers a wider range than e.g. sRGB and is therefore better suited for all post-processing steps in which e.g. Color and gamma are affected. The necessary conversion to sRGB is carried out at the very end, with m.objects it is done automatically.
- Do not, or at least only slightly sharpen images with image editing. If necessary, sharpening should always be the last processing step, especially after scaling. And since m.objects still has to perform scaling as required, sharpening should also be left to it.

So much for the theory. In practice, there could be at least one reason against compliance with the rules above:

- The maximum resolution requires more capacity on the memory card and later on the hard disk than smaller images. The without any loss compressed RAW format in particular is very demanding. If memory or computing power is scarce, a compromise between quality / flexibility and handling can make sense.

There is a common misunderstanding when it comes to specifying pixels per inch (dots per inch, dpi). It is completely irrelevant for processing in m.objects. There are no absolute sizes there, because the projection image can only be 1 meter or 10 meters wide. And the images can grow dynamically or be embedded in image areas. However, the specification of dpi is important for the preparation of printed material, because in connection with the image resolution it represents an indication of the absolute size.

## Interesting facts about file formats

m.objects can process practically all common file formats of image files. If you open the file selection form for image files - for example by double-clicking in an empty compartment of the *Image Pool* - you will be shown files of approximately 20 common types. To see image files of other formats, select *All Files (\*.\*)* in the File type field.

For images with partial transparency (cutout), the PNG format is suitable in most cases. But also other file formats such as TIFF can transport transparency information via a separate alpha channel.

In contrast to formats such as bitmap or standard TIFF, JPEG is a lossy compressed file format. Its advantage is the rather small file size. If you are using external applications such as Adobe Photoshop to create or edit images, you should not choose a quality level (strong compression) that is too low for saving in JPEG format. It is not possible to make a general statement about the resulting image quality depending on the quality set. However, with settings from approx. 85% (in Photoshop even from level 10) most images are at a level that is well suited for screen display and projection. If it cannot be avoided to save JPEG images in JPEG format again after processing with an image processing program, a high quality level should always be used. With each new compression of a previously compressed file, the compression losses become more clearly visible.

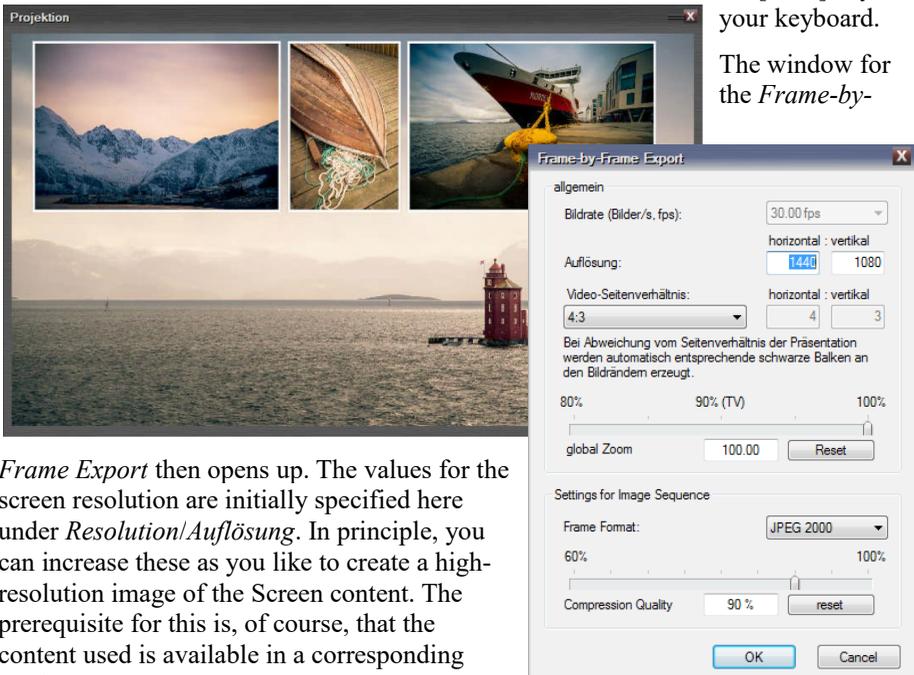
The more recent JPEG2000 format can also be read by m.objects, but does not offer

any advantages for presentation applications with high quality standards, because it is only more efficient with strong compression, which should be avoided here anyway.

## Exporting the content of the Screen as an individual image

You can capture compositions worth seeing in the Screen as individual images in high resolution and use them, for example, for high-quality prints, flyers or posters, for your website or as a preview image of a YouTube video. To do this, simply press the [Print] key on your keyboard.

The window for the *Frame-by-*



*Frame Export* then opens up. The values for the screen resolution are initially specified here under *Resolution/Auflösung*. In principle, you can increase these as you like to create a high-resolution image of the Screen content. The prerequisite for this is, of course, that the content used is available in a corresponding resolution in your project.

If you change the aspect ratio, due to the deviation from the aspect ratio of the Screen, black borders are added to the right and left or top and bottom of the exported image when exporting.

The global zoom should always be set to 100% for the export of the Screen content as an individual image.

In the lower section of the dialog box, under *Frame Format*, enter the format in

which you want to export the image. You can choose between JPEG, BMP, TIFF, PNG and JPEG 2000. For JPEG and JPEG 2000 you also have to specify the compression quality.

So make the desired selection of the format here and confirm with *OK*. In the following window you determine in which directory the image is saved. By default, m.objects chooses the *Mixdown* folder in the *m.objects data* directory. The individual image is created by clicking on the *Save* button.

## Dynamic objects

Animations are a decisive factor for making a presentation appealing for the audience, they bring movement to an AV show, provide excitement and variety, direct the viewer's gaze to crucial details. In this way, static images become moving objects.



With Zoom, Image Area, Rotation and 3D Animation, m.objects provides you with powerful tools that can be used individually or in combination with each other to implement all possible motion sequences and can also be used to adapt or correct individual images.

From expansion level m.objects live, other dynamic objects are also available with

Passepartout, Shadow/Shine, Blur, Picture-/Video-Processing, Reflection and Speed, which offer exciting possibilities for special effects and animations.

### General information about Dynamic objects

You will find certain working techniques and options in all m.objects dynamic objects. Therefore, these should be explained at the beginning, which makes it easier to understand and deal with the dynamic objects.

### Application of Dynamic objects

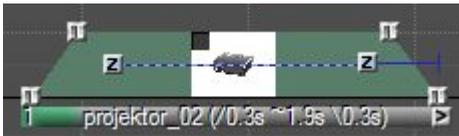
You will find the Dynamic objects in the *Tools* window. This window is context-sensitive, which means that depending on the selected component (timeline, image tracks, sound tracks, etc.), the associated tools or objects are displayed. In this case, the image tracks must be selected, if necessary simply click on one of the image tracks.

Now drag the desired dynamic object from the *Tools* window onto a light curve with

the left mouse button pressed and release the mouse button there. A corresponding icon is then created on the light curve, and the associated editing window opens in which you can edit the parameters of the dynamic object. You can also switch off the direct opening of the editing window by deactivating the option *Automatically open Properties on Insertion of Dynamic Objects (Keyframes)* under *Options / Program Options*. Now open the editing window by double-clicking the icon in the light curve.

## Dynamic options

For a dynamic movement, or animation, always use at least two dynamic objects in m.objects, for example two Zoom objects. The first forms the starting point of the animation, the second the end point. If you now change the *Zoom Level* for the second Zoom object - how to do this will be explained in detail - m.objects automatically creates an animation between these two objects.

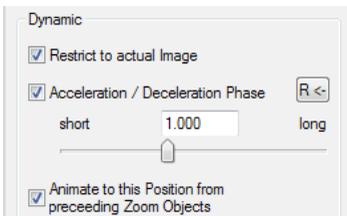


The dashed line between the two square symbols indicates that animation is taking place here. If, on the other hand, the line is solid, both Dynamic objects have identical values, so that no change and therefore no animation takes place.

You add intermediate stations to the animation by adding Dynamic objects between the first and the last.

The speed of an animation results from the distance between the Dynamic objects: the shorter the distance, the faster the animation. So if you want to change the animation speed, simply change the distance between the Dynamic objects.

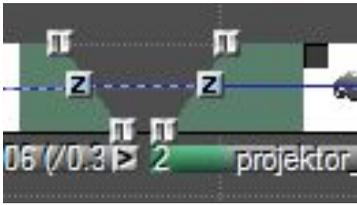
There are separate setting options for each Dynamic object. You will find three of them in (almost) identical form in all of them:



All three options are selected by default. The only difference between them is that the name of the selected Dynamic object is shown in the lower option.

*Restrict to actual Image:* If you deselect this option, m.objects will include Dynamic objects of the same type that are in the same image track in

front of and behind the light curve in the animation.



*Acceleration / Deceleration Phase:* The m.objects animations start and stop smoothly. With this option you can influence how short or long the acceleration and braking phases last. Especially with longer animations such as panning through a panorama, shortening this value can achieve a more uniform speed in the middle part of the animation. Deselect the option, and the animation

stops and starts abruptly and then runs at a constant speed.

*Animate to this Position from preceding Zoom Objects:* This option ensures that animation takes place between two Dynamic objects. If you deselect this, the change between the two objects takes place without flowing movement.

## Anti-flicker and anti-moiré

The reproduction of high-resolution images with sharply contoured or finely structured motifs - especially in animations such as tracking shots / Ken Burns effects - can generally lead to clearly visible scaling effects such as the expression of undesirable geometric patterns (moiré) and flickering. m.objects reduces these undesired effects to a minimum without sacrificing sharpness in the display. This technology is advantageous in all applications and is therefore always switched on. Please also ensure that sharpening is not activated for the output device (e.g. TV or projector), since this in turn can cause flickering effects.

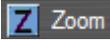


The specifications for *Antiflicker / Antimoiré* can be found under *Options / Screen Options*.

m.objects specifies the *fast (Standard)* option here. The option *gamma corrected* also carries out the static scaling of the images with a specific gamma correction, which scientifically provides the correct result, but slows down the generation of the textures. In this respect, the recommended setting is *fast (Standard)*, because a dynamic correction is already carried out here, and this effectively prevents flicker and moiré effects.

# Zoom object

With the Zoom object you can zoom into an image or into another object, i.e. enlarge a section of it instead of the complete view on the Screen. The zoom center can also be moved as desired.

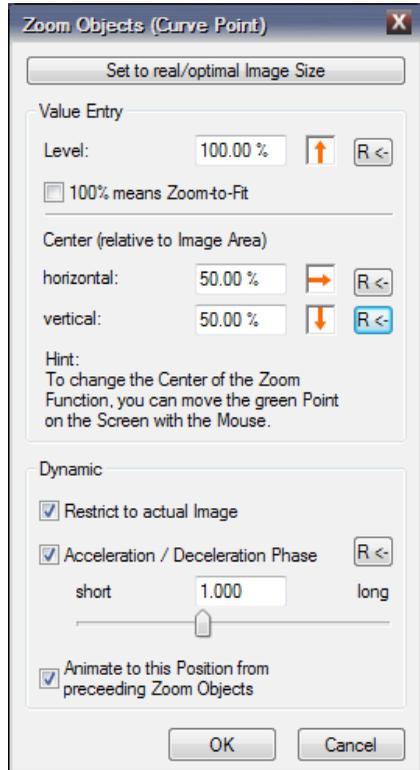


To assign a Zoom object to an image, click on the blue square with the black Z and the label *Zoom* in the *Tools* window, hold the mouse button down and drag the symbol onto the yellow light curve of the image.

The editing window of the Zoom object now opens up automatically. If you have deactivated this automatic system or have already closed the window, double-click on the Z icon in the light curve.

The upper value indicates the *Zoom Level*, which is initially set to 100%. If you change this value by dragging upwards with the orange arrow, i.e. increasing the Zoom Level, the image will be zoomed in on. Accordingly, you zoom out again when you drag down the arrow. Alternatively, you can of course also enter the Zoom Level numerically.

A detailed description of how to work with the arrow controls can be found in chapter *Working with the arrow controls* on page 38.





In the middle of the Screen you will see a green dot in a green circle. This point marks the Zoom Center.

If you position the cursor over it, it becomes a four-way arrow. If the Zoom Level is greater than 100%, i.e. you have zoomed into the image, you can use it to move the image section freely. You can achieve the same effect if you change the values for the *Zoom Center* in the editing window. However, working directly on the screen is often more intuitive. In order to be able to move the Zoom Center in the Screen, the editing window of the Zoom object does not have to be open. It is sufficient if you click on the *Z* icon in the light curve beforehand.

At the top of the editing window you will find the button *Set to real/actual Image Size*. This allows you to enlarge the image so that it exactly adapts to the selected output resolution of the Screen. A pixel of the image file then corresponds to a Screen pixel when the Screen is displayed in full screen. This is the largest possible loss-free representation of the image. You can enlarge it even further, but then the Screen has to interpolate additional pixels, which affects the image quality. It is therefore advisable to include images in their original resolution in m.objects in order to have enough resolution reserve for zoom effects. A previous down calculation is therefore counterproductive.

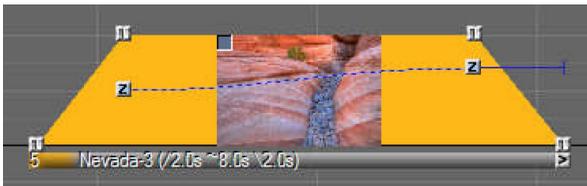
In the upper area of the editing window you will also find the option *100% means Zoom-to-Fit*.



If you select this option, the Zoom Level will be interpreted as 100% in another way, namely in relation to the Screen or - if the image is displayed in a reduced size on the Screen using an image area - in relation to the image area. The value 100% now means that the image is scaled exactly so that it always completely fills the Screen or the image area, even if it deviates from the aspect ratio of the Screen or the image area. The Zoom Level automatically adjusts to the current dimensions and changes in the image area. Read more about working with image areas in the following chapter.

So far you have learned about the basic functions and options of the Zoom object. It gets really exciting when several Zoom objects are used and static images are set in motion.

So drag a second Zoom object onto the light curve. In the following exemplary image, the first Zoom object is positioned at the beginning and the second at the end of the image's Projection time.



For the second Zoom object, choose a significantly higher Zoom Level; if necessary, also shift the image section. Confirm the changes with *OK* and start the locator just before the

light curve. The Screen shows a zoom drive through the image. On the light curve you can see that the line between the two Zoom objects now runs in a curve and is also dashed. So there is a movement between the Zoom objects.

The steeper the curve, the greater the change in the Zoom Level. The distance between the Zoom objects determines how fast the animation runs.

A description of the dynamic settings in the lower area of the editing window can be found in the chapter *Dynamic options* on page 102.

You can now insert further Zoom objects in the existing animation and highlight different image sections there, for example. As a rule, it will make sense to extend the Projection time of the image accordingly so that the movements do not run too

quickly. You will quickly see that with the Zoom object alone you have many options for exciting dynamic effects.

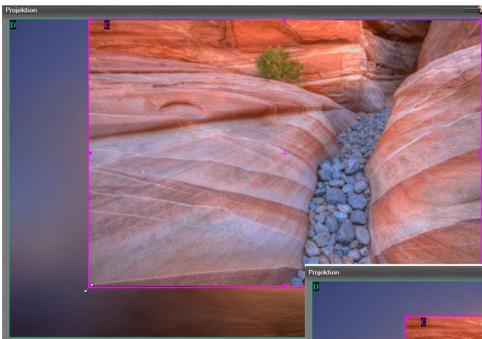
## Image Area object

The Image Area object allows you to limit the display of an image or other object to a part of the Screen. For example, you can place a reduced image in front of a background image or divide the Screen into several areas in which you can then show pictures, zoom runs or videos. Of particular interest is the possibility of showing titles or even realizing credits at the end of the presentation.

If Image Area objects are used to position images within the Screen (picture-in-picture), the overlapping mode in the Image Blending is practically always required. For this reason, an Image Area object is automatically switched to the overlapping mode. Of course, every image can still be put into additive mode if necessary. You can read more about Image Blending in the chapter *Image blending* on page 66.



The *Image Area* object can be found in the Tools window when the last mouseclick was made in the image tracks: the green square with the diagonal double arrow and the label *Image Area*.



To use, drag the Image Area object onto the desired light curve. The properties window that opens (if necessary, open it by double-clicking the icon in the light curve) offers you the options for setting the size and position of the Image Area. As with

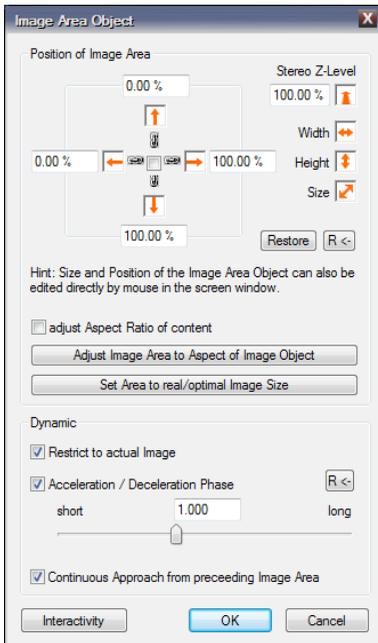


the Zoom object, you can also make the settings here directly on the Screen.

To do this, the Image Area object must be activated, if necessary click on it with the mouse. You will now see a pink frame on the Screen around the outer edge of the image. Grab a corner of this frame with the left mouse button. The cursor becomes a diagonal double arrow. Hold the mouse button down and move the frame a little inwards. You can see that the image is getting smaller and is no longer filling the entire Screen.

If you now release the mouse button and move the cursor further onto the image, it will turn into a four-way arrow with which you can move the image yourself.

If you hold down the *Shift* key while moving the mouse, you can only move it in either the vertical or horizontal direction. If you hold down the *Shift* key while changing the Image Area on one of the handles, the size changes proportionally, so the aspect ratio of the Image Area is retained.



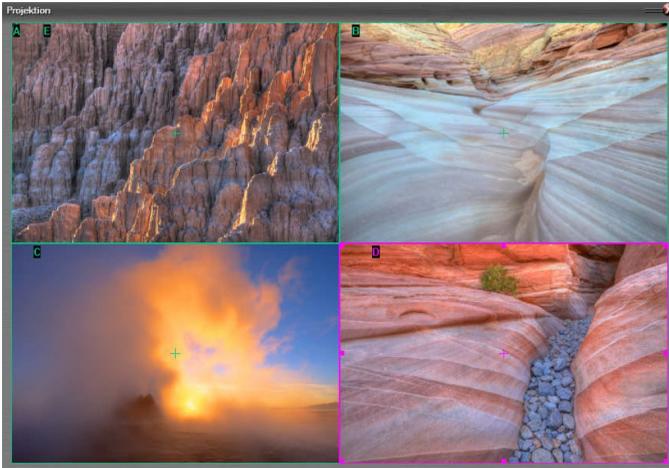
By zooming in and out of the Image Area frame and moving the image itself, you can now do the fine tuning until the result meets your expectations.

In the properties window of the Image Area object, you first notice the four areas with the values for the position of the Image Area and the associated orange arrows. You can make changes here using the arrow controls or enter specific numerical values. This is particularly useful if an Image Area is supposed to be in a precisely specified position, or if several Image Areas of exactly the same size are supposed to divide the Screen into parts of the same size.

The four values for the position of the Image Area are to be understood as follows: The upper and lower values indicate the distance between the top edge and the bottom edge of the Image Area from the top edge of the Screen.

Analogously, the left and right values denote the distance between the left and right edge of

the Image Area from the left edge of the Screen.

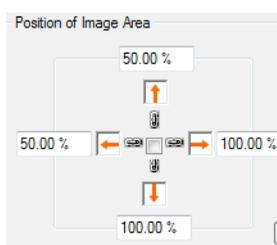
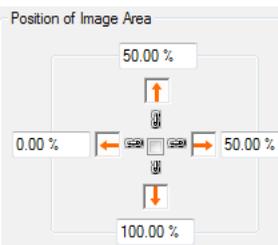
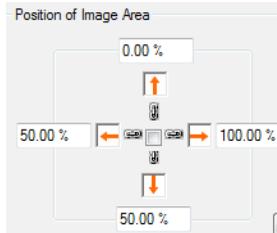
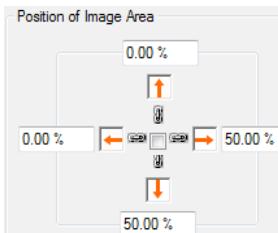


You will also notice that when you change a value, the opposite value also changes. As long as the check mark in the middle of the chaining symbols is set, the four values are dependent on each other. If you remove the check mark, you can change the values individually and thus also redefine

the size of the Image Area.

In this way you can, for example, divide the Screen into four areas of exactly the same size.

The diagram shows the settings for the Image Areas according to the fitting arrangement of the images on the Screen:



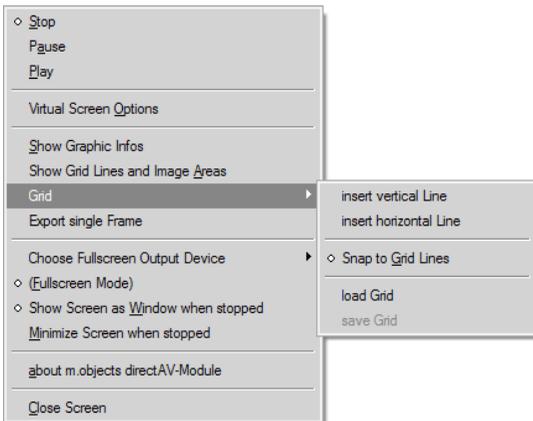
If an image deviates from the aspect ratio of its Image Area, insert a Zoom object in the light curve and increase the Zoom Level until the image completely fills its Image Area. There is also the option *adjust Aspect Ratio of content* in the Image Area object properties. With this activated, an image is distorted until it corresponds to the aspect ratio of the Image Area. This is usually not desired, but there may be

cases in which a distortion is a desired effect or the deviation is so slight that the distortion is not noticeable.

The arrow controls for *Width*, *Height* and *Size*, which you can see on the right side in the editing window of the Image Area object, result in a corresponding enlargement or reduction of the Image Area from its center in both directions.

The *Stereo Z-Level* option only applies to stereoscopic, i.e. 3D presentation, and enables the stereo level to be moved and changed in a simple manner. A detailed description of this function can be found in chapter *Stereoscopy with m.objects* on page 193.

  Use the *R* button to reset all values for the position of the Image Area and, if necessary, the Stereo Z-Level to the original values.



If you do not use numerical values to position the Image Areas on the Screen, you can also create grid lines here, which significantly simplify the alignment. To do this, right-click on the Screen and move the cursor onto *Grid* in the context menu. Here you have the option to *insert a vertical or horizontal Line*. Click on the desired selection and the grid line will appear in the center of the Screen. Use the mouse to move the line to the desired position.

Add additional lines as required. In the context menu of the Screen, as another subitem for *Grid* you will also find the *Snap to Grid Lines* option, which ensures that Image Areas automatically 'snap' onto a grid line when they are moved as soon as they come close to them. To hide or show grid lines again, select the *Show Grid Lines and Image Areas* option. To delete a grid line, simply move it to the edge of the Screen until it is no longer visible.

Further options for the Image Area object:

*Adjust Image Area to Aspect of Image Object*: The Image Area is adapted to the previous Image Area in the corresponding image track. This option is useful if an

exact match is required.

*Set Area to real/optimal Image Size:* As with the options of the Zoom object, you can set the image here so that its resolution corresponds to the Screen resolution.

As with Zoom, you create an animation for the Image Area object by using two or more objects.

If, for example, you would like an image or text to run across the Screen from bottom to top, in the style of movie credits, create a first Image Area object in the relevant light curve. A text that you created with the title editor already has an Image Area object at the beginning of its Projection time.

Enter 100% for the upper value in the position of the Image Area. Make sure that the check mark is ticked between the chaining symbols. Reminder: This value marks the distance from the top edge of the Image Area to the top edge of the Screen. This means that the Image Area and thus the text are now exactly below the Screen and cannot be seen.

Then insert a second Image Area object at the end of the Projection time. This will initially take over the values of the first Image Area object. Enter 0% for the lower value for the position of the Image Area. Accordingly, the Image Area is located exactly above the Screen, so it cannot be seen.

A sequence of movements now takes place between the two objects, the text moves from bottom to top. When playing back, however, you will notice that the speed of movement is not even. In this case, you should therefore deactivate the *Acceleration / Deceleration Phase* option. You influence the speed itself by the distance between the two Image Area objects.

You can now add additional text or images to complete the credits. The distance between the light curves in the image tracks causes the chronological sequence of the credits. If the images were all standing at the same point on the timeline, all lines of the credits would be shown at the same time and run upwards at the same time.

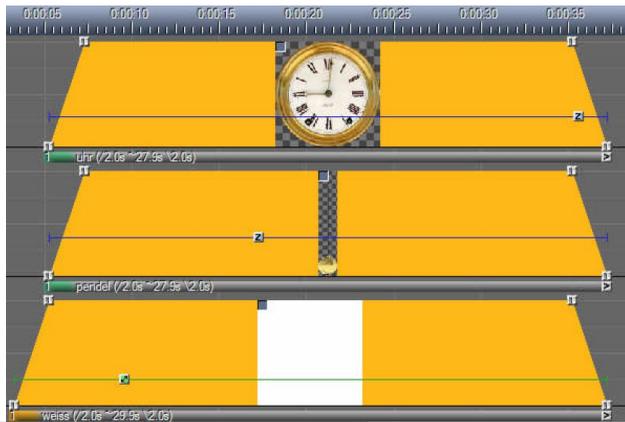
Further information can be found in chapter *Create titles with the Titeleditor* on page 82.

## **Rotation object**

You can use the Rotation object to rotate an image around a certain point. You can use this effect statically, for example to straighten an oblique horizon line, but you can also use it dynamically by creating a rotational movement.

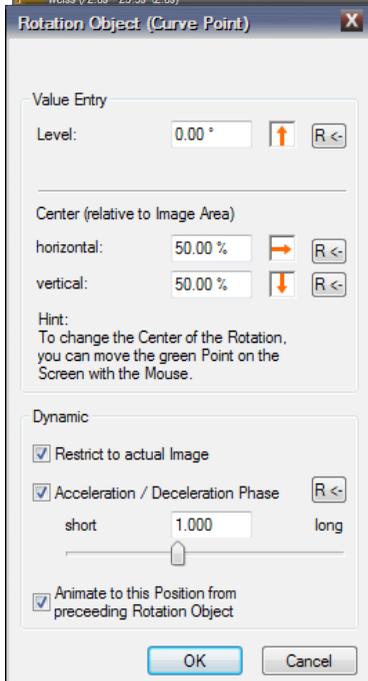
## R Rotation

The rotation object can be found in the Tools window with activated image tracks as a red icon with a white *R* and the label *Rotation*.



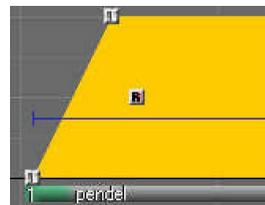
The example of a clock pendulum is intended to illustrate the animation options with the Rotation object.

Therefore, there is the image of a clock face in the upper image track, in the track below there is the pendulum as a separate image. The third image track only creates the white background.



This division is necessary in order to be able to animate the pendulum separately. The aim should now be to create a smooth pendulum movement that is repeated over the Projection time of the images.

To do this, a Rotation object is first inserted into the light curve of the pendulum and positioned just behind the fade-in. You can set the degree of efficiency of the object in the editing window (if necessary, open it by double-clicking the *R* icon in the light curve).

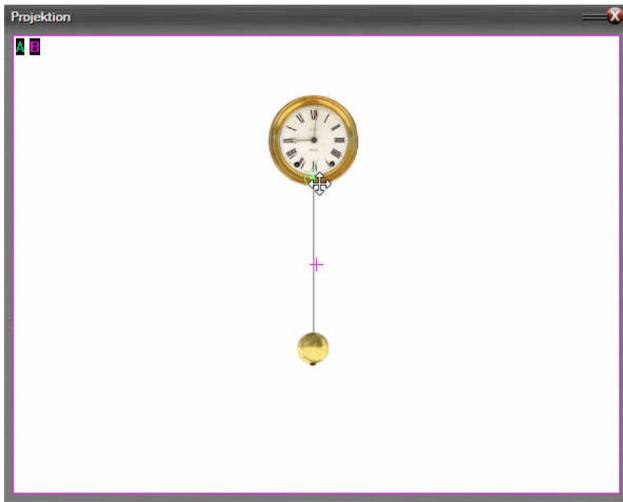


An increase in the Rotation *Level* causes the pendulum to rotate clockwise, a decrease accordingly causes it to rotate counterclockwise. Change the *Level* with the arrow control or enter it numerically. Clicking on the upper button with

the label *R* will reset the image to its starting position, i.e. the Rotation Level is at  $0^\circ$  again.

The *Center* of the rotation is now still set in the middle of the pendulum cord. For the desired movement, however, it has to be on the upper edge of it to create a realistic movement so that the pendulum swings beneath the clock in a known manner.

The Center of rotation can be seen on the Screen as a green circle with a green center. When you move the cursor over it, it changes to a four-way arrow.



Now use the mouse to move the Center of rotation upwards until it is just above the lower edge of the clock face. If you now change the Rotation Level again, you will see that the pendulum movement is correct.

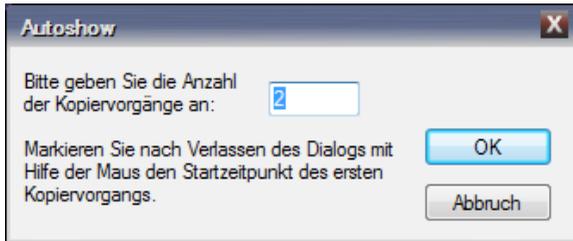
The rotation is now given a Level of  $20^\circ$  so that the pendulum points to the left. To make it swing to the right, you need a second Rotation

object, which you drag from the Tools window onto the light curve and place to the right of the first object. The second Rotation object automatically takes over the settings of the first, so you don't have to adjust the Rotation Center again here. You just change the Rotation Level to  $-20^\circ$  so that the pendulum swings to the right at the same height. The distance between the two Rotation objects determines how fast or slow the pendulum movement is.

In order to achieve a smooth back and forth movement, only a few simple steps are necessary:

You first mark both Rotation objects, right-click on one of them and select *Wizards / Autoshow, copy selection multiple times* from the context menu.

With Autoshow the selected animation is copied several times - how often has to be entered in the dialog window - and can then be added to the already existing



animation. For example, enter the value 7 here and confirm with *OK*. Then the copied animations 'stick' to the mouse pointer. Now position the cursor behind the second Rotation object so that the distance is the same as between the two existing

objects. As soon as you click the left mouse button, the copied Rotation objects are placed on the light curve. A message on the screen confirms the successful copying process.

The goal is thus achieved: the clock pendulum swings back and forth while the images are projected. A slight correction of the Projection times may now be necessary.

The Rotation object can also be used to make image corrections, for example if the horizon line is a bit crooked in a photo. In such a case, drag a Rotation object onto the light curve and change the Rotation Level with the slider until the horizon is straight. Then drag another Image Area object onto the light curve and enlarge it until the photo fills the entire Screen again and the black corners have disappeared. The arrow controls, which you can find in the properties window of the Image Area object, are particularly practical. Simply drag the mouse to enlarge the Image Area until the image completely fills the Screen again.

Note: You can easily create three-dimensional rotations with the 3D object. For example, when it comes to rotating an object several times around its own axis, such an animation is created with the 3D object with just a few mouse clicks. Read more in the following chapter *3D object* on page 114.

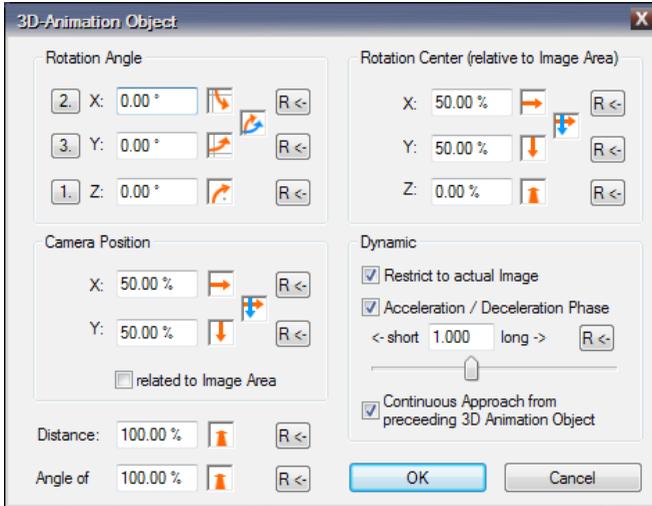
## 3D object

**3D** 3D Animation The 3D object is probably the most complex Dynamic Object in *m.objects*. It enables movements on all three spatial axes and allows settings in all decisive parameters. This allows spatial movements to be displayed extremely realistically. In addition, the 3D object is also used specifically in stereoscopy. You can find more on this topic in chapter *Stereoscopy with m.objects*

on page 193.

To use it, drag the small orange square with the text *3D Animation* from the Tools window onto the relevant light curve when the image tracks are active.

The associated properties window opens up, which can be achieved alternatively by double-clicking the icon in the light curve.



The most important parameters of the 3D object can be found at the top left under *Rotation Angle*: The values for *X*, *Y* and *Z* determine the orientation of an object in space.

You can change these values with the arrow controls. As soon as you drag over the arrows with the

 mouse button pressed, you can see on the Screen how this changes the position of the image. You can also change the values for *X* and *Y* together with the double arrow control, which enables an even more intuitive way of working.

You can of course also enter numerical values in the fields next to the arrow controls.

As in a coordinate system, *X* represents the axis that runs horizontally through an image. *Y* is the vertical image axis and *Z* is the axis that is perpendicular to the image. If *X* and *Y* each have the value 0, the *Z* axis points directly out of the image towards the viewer. As soon as you enter other values for *X* and *Y*, the position of the *Z* axis in space also changes.

For a better understanding: The display of an image is limited by its Image Area. If you have not dragged a separate Image Area object onto the light curve, the Image Area is initially as large as the Screen window. The 3D object now changes the position of the Image Area. For example, you can use the value 45° for the *Y* axis to

ensure that the Image Area and thus the image are angled in the room.

Like all other m.objects Dynamic objects, you can use the 3D object for static corrections as well as for dynamic effects. The latter requires at least two objects that represent the starting and ending point of an animation.

At the top right of the editing window you will find the values for the *Rotation Center*. These primarily affect dynamic applications. If, for example, you would like to animate an image so that it opens like a door to the side, set the X value to 0 for both the beginning and the end of the movement. Under *Rotation Angle*, set the Y value to  $-110^\circ$ , for example. In the course of the animation, the image now swings to the rear left. The imaginary door hinge is therefore on the left side.

Accordingly, the center of a three-dimensional movement can also be shifted on the Y and Z axes. In the following image you can see a lettering that rotates spatially around an imaginary point, this point being moved backwards along the Z axis. The letters are individually animated and each have their own image track.



The crucial point is that the X, Y and Z axes always refer to the Image Area, not the Screen window.

For most applications of the 3D object, it is sufficient to make settings for the Rotation Angle and Rotation Center. The other

options that you can find in the editing window of this Dynamic object are only used in special applications.

The *Camera Position* values allow you to correct the perspective. However, this presumes that at least one of the rotation angles X or Y is not at 0. If you increase the value for X in the Camera Position, you basically move the position of the camera -

i.e. the shooting position - to the right, by decreasing it you move the camera to the left. Accordingly, you can use Y to adjust the camera position up and down. At best, slight corrections are recommended, since the image only contains a certain perspective. Strong corrections therefore quickly appear unnatural.

If you insert an Image Area object onto the light curve and move it to the right and left or up and down, the viewing angle on the image changes. The best way to understand this is to change the value for the Y axis or the X axis under *Rotation Angle* as described. However, if you tick the option related to Image Area, the viewing angle remains unchanged when you move the Image Area. Without the check mark, you usually achieve a more realistic effect, because this way the perspective of the image is adjusted to the position of the Image Area in the overall scene.

The parameter *Distance* describes the distance of the object from the viewer. The default value is set at 100%. If you increase this value, the object, for example an image, moves to the rear, so it becomes smaller. The distance doubles at 200%. At values below 100%, the object moves towards the viewer and becomes larger. In contrast to the Zoom object, which enlarges or reduces an object on the Screen level until it is no longer visible, it is moved back and forth in the room and remains visible even at a very large distance.

The *Angle of view* influences the focal length in a similar way. At values below 100%, viewing the Screen creates a wide-angle effect, whereas a higher value is equivalent to a telephoto lens. At 100% it corresponds to a normal focal length. With the Angle of view you can increase or decrease the perspective effect of a three-dimensional object. Doubling the value corresponds to doubling the distance from the Center of rotation while doubling the focal length. This also presumes that at least one of the Rotation Angles X or Y is not at 0.

The following information is only relevant in very special cases. Experienced users should reserve the appropriate settings:

In the editing window of the 3D object, you can see the order of application in front of the *Rotation Angles X, Y and Z*. Normally you should not deviate from the standard settings there, as can be seen in the following image.

In the case of animations, there may be cases in which, for example, rotation should not take place around an object-related Z axis, but rather around a scene-related Z axis. In this case, you can change the order by clicking on the buttons in front of X, Y or Z.



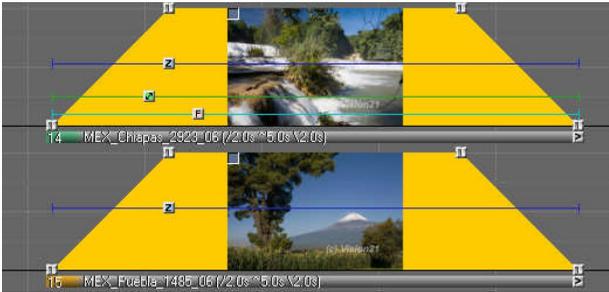
# Passepartout

This dynamic tool is available from the expansion level m.objects live upwards.

With the Passepartout object, you create passe-partouts around pictures, texts and videos, whereby the size, transparency and color of the frame can be changed as desired. This tool is particularly suitable for placing images in front of a background or for text with a colored frame so that they stand out clearly. You will see some examples of applications of the Passepartout object below.

Like all other dynamic tools, the Passepartout can be used statically as well as for animations. For example, you can enlarge a frame around an image in a dynamic movement.

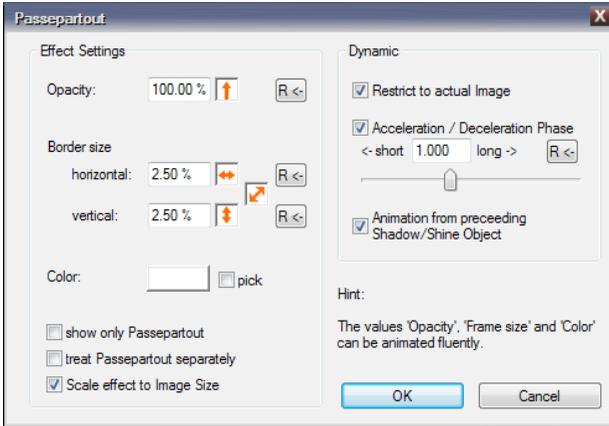
**F** **Passepartout** The Passepartout object is used according to the well-known m.objects principle: With the image tracks activated, select the pale red icon with the black *F* in the *Tools* window and hold it down while dragging the cursor onto the light curve of the image you want to edit. As soon as you release the mouse button here, such an icon appears on the light curve.



In our example you see an image that is scaled down in front of a background. This image should be provided with a frame so that it stands out better from the background. As soon as you have placed a Passepartout object on a light curve, m.objects creates a predefined frame, as a look at the Screen in our example shows.

It is now time to adapt this frame. If you have closed the editing window of the Passepartout object after inserting it, open it again by double-clicking on the new icon in the light curve.





First of all, we take care of the *Effect Settings* in the left part of the window. Use the upper slider to change the *Opacity*, i.e. the transparency of the frame. Here values from 0% (fully transparent) to 100% (full opacity) are possible. Use the arrow controls (more on this in the chapter *Working with the arrow controls* on page 38) upward or

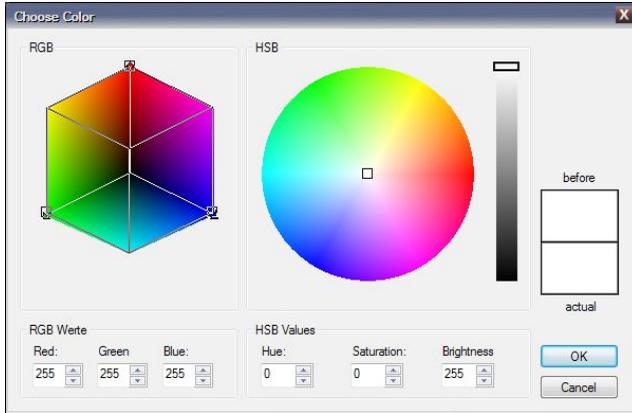
downward to increase or decrease the value. As usual, you can also directly enter a value in the field.

Below you will find the setting options for the *Border size* of the frame. *Horizontal* and *vertical* dimensions can be entered separately. For example, you can underlay a text across the entire width of the Screen with a background color, while the height of the background remains limited to the text height.



The values for the Border size can also be changed using the arrow controls or by entering numerical values.

Click on the *Color* field below to open up the *Choose Color* window to choose a color for the Passepartout.



Here you can click directly in one of the color fields with the mouse and move the mouse until you have found the right color. The preview on the right shows the selected color. Alternatively, you can also enter numerical values here. Then confirm with *OK*.

If needed, you can also use the Pipette to select a color directly from the Screen. To do this, tick the option *pick* next to the color field in the Passepartout properties. Now click on a spot on the Screen to



pick up the desired color.

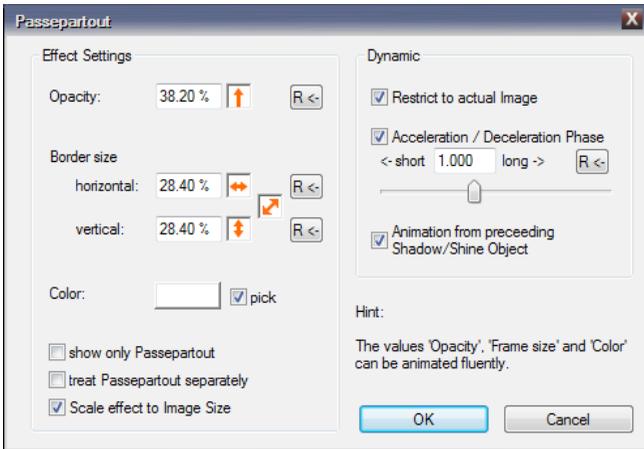
Beneath the *Color* selection you will find three more options in the editing window:

Firstly, you have the possibility to *Show only the Passe*

*partout* without the actual image. For example, colored areas can be displayed on the Screen for design purposes.

The *treat Passepartout seperately* option refers to the other Dynamic objects Shadow/Shine and Blur. You have the option of applying shadow effects or blurring to the Passepartout by using one or both of these Dynamic objects. However, if you select the *treat Passepartout seperately* option, the Passepartout is excluded from the effect, i.e. without shadow or blurring.

The option *Scale effect to Image Size* offers the possibility to enlarge or reduce the size of the border proportionally to an enlarged or reduced image. If this option is not selected, the frame around the image will keep its width.



As with other dynamic effects in m.objects, you can create an animation by using two or more Passepartout objects. So we drag a second Passepartout object from the *Tools* window onto the back part of the light curve.

The opacity as well as the horizontal and vertical width can be changed dynamically. Again by double-clicking the icon, we now open the editing window of the second Passepartout and change the values accordingly:

In this example, the *Opacity* was reduced and the *Border size* increased in all directions. Click *OK* to apply these changes.

If you now run the locator over the light curve, the change in the frame appears as a dynamic animation.

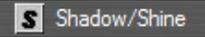
In the editing window

you will find the *Dynamic* options on the right. More information can be found in section *Dynamic options* on page 102.

## Shadow/Shine

This dynamic tool is available from the expansion level `m.objects live upwards`.

As the name suggests, the Shadow/Shine tool provides objects with shadows and glow effects on the image tracks. Possible uses include picture-in-picture constructions, texts and any objects of any shape to effectively separate them from the background. All key values can be set individually.

 The Shadow/Shine object can be found in the *Tools* window as usual - with activated image tracks. You recognize it as the gray square with the black *S*.

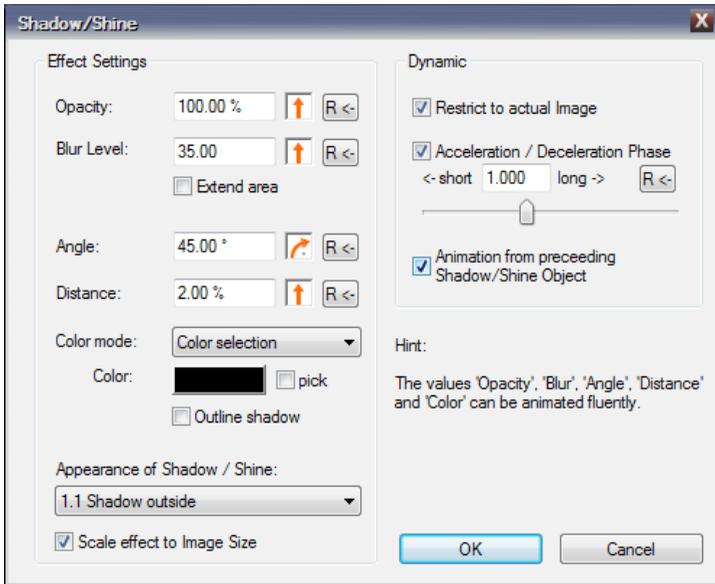
Hold the mouse button down and drag the object from the tool window onto a light curve. As soon as you release the mouse button, a corresponding icon appears on the light curve.



You can see that the text that we want to use as an example is already shaded.

That is because `m.objects` specifies a standard value. The editing window opens automatically after insertion. If you have closed it, open it again by double-clicking the icon.



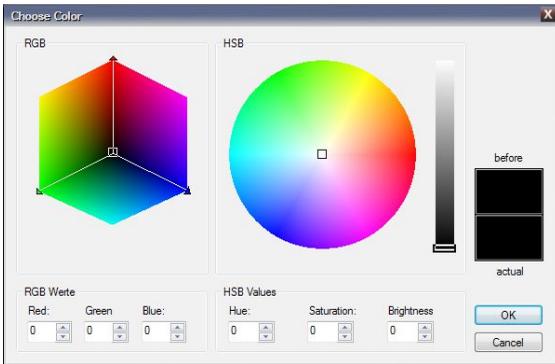


On the left side of the form you will find the *Effect Settings*. The first value affects the strength of the shadow's *Opacity*, which you can change from 0% (fully transparent) to 100% (full opacity). Directly underneath is the option *Blur Level*. The higher the set value here, the more the shadow is blurred, whereas the value 0 gives the shadow a completely sharp edge.

You can read more about setting the values with the arrow controls in the chapter *Working with the arrow controls* on page 38.

*Opacity* and *Blur Level* also offer the option to *Extend* the *area*. If you select this option, the efficiency of the two values is increased on the shadow, which increases its size. It is best to experiment a bit with the effect of this option, as you will see the results immediately on the Screen.

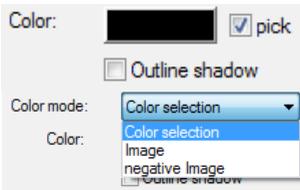
*Angle* and *Distance* determine the orientation of the Shadow/Shine and its distance from the object. Here, also, you can review all changes that you enter in the form directly on the Screen and thus adjust the effect appropriately.



By default, m.objects initially creates a black shadow. You can change this in several ways. In the Shadow/Shine properties you will find the option *Color mode* with the entry *Color selection*. With this option being chosen, click on the *Color* button below and this will take you to the familiar *Choose Color* window.

Here you select a color and confirm with *OK*. The field then takes on the selected color and the Shadow/Shine is colored accordingly.

Here, also, you can use the Pipette to select a color directly from the Screen. To do this, tick the option *pick* next to the color field.



Click on a spot on the Screen to pick up the desired color.

Now click on the drop-down menu for *Color mode*.

You'll see two more options, *Image* and *negative Image*. With these options, the Shadow/Shine is filled with the image itself or with the negative of the image.

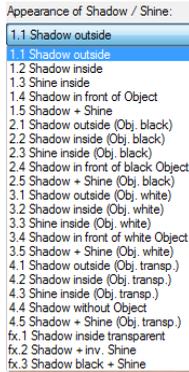
As long as you use a single-color font, as in our example, the shadow is filled with the same color, here with white. If you choose *negative Image* instead, the shadow will turn black. The *Color* button below is crossed out, because it cannot be used in this setting.

Underneath the color settings you can see the *Outline shadow* option. It has the effect that the Shadow/Shine effect is only displayed as a contour, as if it were the outline of the object.



The real highlight of this Dynamic Tool, however, follows under the setting *Appearance of Shadow / Shine*. As a standard, m.objects gives you the selection of

*Shadow outside*, so that the effect appears as a 'normal' shadow. But the tool can do a lot more. You can see this if you expand the selection list here:



You can choose which of the 23 shadow effects suits you best. And ultimately only one thing helps here: try it out.

Underneath the drop-down menu you will also find the option *Scale effect to Image Size*. This gives you the option of displaying the actual object - in our example, the text - larger or smaller and, in relation to this, to increase or decrease the shadow effect. If the option is not selected, the strength of the effect will not be adjusted.

The following pictures show examples of a selection of the available shadow effects.



1.1 Shadow outside



1.2 Shadow inside



1.3 Shine inside



# Im Land der Maya

1.4 Shadow in front of Object



# Im Land der Maya

1.5 Shadow + Shine



# Im Land der Maya

4.1 Shadow outside (Obj. transp.)



# Im Land der Maya

fx.3 Shadow black + Shine

The *Effect Settings Opacity, Blur Level, Angle, Distance* and even the *Color* of the Shadow/Shine object can be animated, so they change in a flowing movement. The settings for the *Dynamic* effects can be found in the editing window on the right. A detailed description can be found in chapter *Dynamic options* on page 102.

## Blur tool

The Blur tool is available from the expansion level *m.objects live* upwards.

This dynamic tool offers exciting opportunities for creative play with sharpness and blur. It uses the Gaussian blur, which ensures a particularly high quality of display. You can use the Blur object to dynamically change images, texts and videos from

being sharp to being blurred and of course in the opposite direction as well.



You can find the *Blur* object with activated image tracks in the *Tools* window as a blue square with a white *B*.

Hold the mouse button down, drag the object onto a light curve and release the mouse button. A corresponding icon will appear in the light curve.

The following image shows a scene from the Venice Carnival, which is composed of two photos: a background picture with the building and another picture with two persons who were previously cut out from another image. Below you can see the constellation on the image tracks.

An impressive animation can be created here with little effort. In a first step, we insert a *Blur* object into the front part of the light curve of the background image and another one into the back part.



Double-clicking on the second *Blur* object in the light curve opens the associated editing window.

You can see that there are not too many adjustable values here. Working with the *Blur* object is really easy. Essentially, you use the upper value to control the *Level* of blurring. You can read more about operating the arrow controls in the chapter *Working with the arrow controls* on page 38.

There are two options below: First, you can *Scale the effect to the Image Size*, so that the magnification of the *Blur* effect is also increased or decreased when the image is

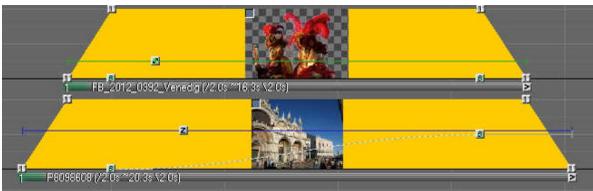
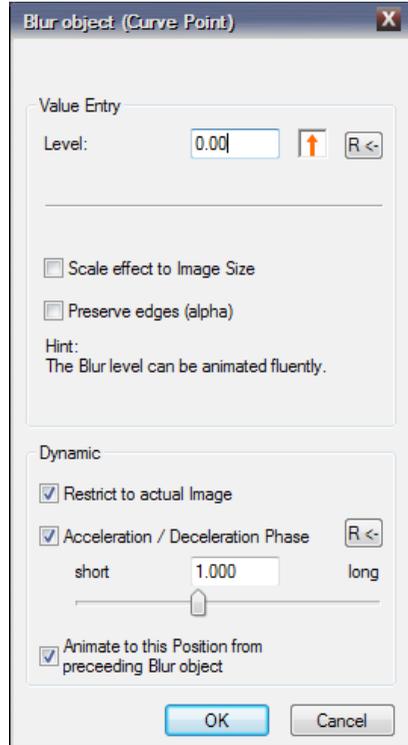
enlarged or reduced. On the other hand, there is the option *Preserve edges (alpha)*. It offers the possibility of obtaining a sharp image edge despite a blurring of the image or, in the case of cut-out shapes, a sharp contour edge.

In our example, we change the blur *Level* to around 50, which leads to a clear blur of the background image and confirm with *OK*. This is the first animation that changes the building in the background from being sharp to being blurred.

The next step is easy. We also insert two Blur objects into the light curve of the image with the cut-out persons, which should lie exactly above the Blur objects of the background image.

Here the animation should run in the opposite direction. Therefore, we change the blur *Level* to around 50 for the first object, while it remains at 0 for the second object. With that our animation is already finished. The two persons virtually come to the fore, while the building in the background becomes increasingly blurred. You can easily change the speed of this animation by changing the distance between the Blur objects.

The settings for the *Dynamic* effects can be



found in the editing window of the object in the lower area. A detailed description of this can be found in chapter *Dynamic options* on page 102.



## Picture-/Video-Processing

Note: This chapter deals with dynamic picture and video processing. For pure image correction the static image processing, which in comparison to dynamic processing requires less graphics power from the computer, should be used instead. A description of static image processing can be found in chapter *Image processing* on page 90.

The Dynamic object Picture-/Video-Processing is available from the expansion level

m.objects live upwards.



It offers important editing functions that can be used both statically and dynamically for animations. You can find the *Picture-/Video-Processing* object - like all other Dynamic objects - with activated image tracks in the *Tools* window.

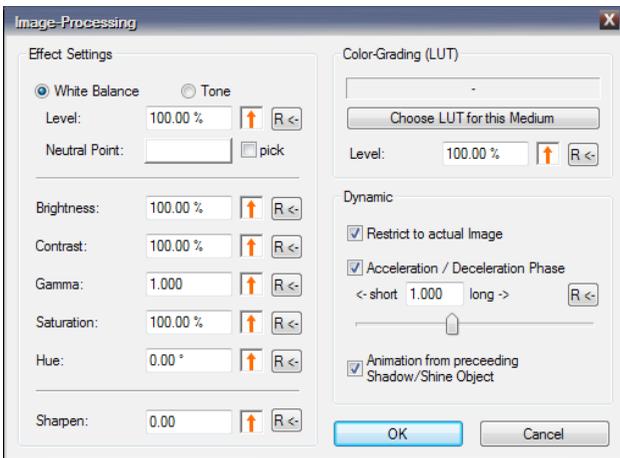
The peculiarity of this object already hints at its name: it can be applied equally to pictures as well as video sequences. This means that m.objects offers extensive options for post-processing images and videos, which in many cases makes the use of external programs unnecessary. The object works non-destructively, so the original files are not changed in any way.



To use, drag the *Picture-/Video-Processing* object onto an image or a video in the image tracks in the known

manner. A corresponding icon appears in the light curve and the associated editing window opens up. At a later point in time, double-click the icon to get to the editing window.

On the left side you can see the *Effect Settings* and the first point there is a choice between *White Balance* and *Tint*.



With *White Balance*, you can correct a picture or video if it has a color fault, for example. To use, first tick the *pick* option below. If you now drag the cursor onto the m.objects Screen, it will become the form of a Pipette with which you can pick a suitable color value for the white balance. To do this, click

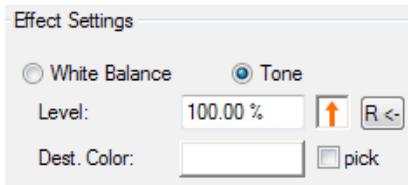
on a point in the image that is as bright as possible. This point should have a neutral color value in the subsequent result, i.e. should be displayed in white or light gray. The result of the correction can be seen directly on the Screen, while the color previously selected from the uncorrected picture or video is displayed in the *Neutral Point* color field in the form window. The example shows the uncorrected part of the image compared to the correction with the white balance.



If you are not yet satisfied with the result, repeat the steps described above and choose a different point in the image as the neutral point.

Since the m.objects Picture-/Video-Processing is a Dynamic object, you can also change the white balance

dynamically. This can be particularly useful for videos with tracked white balance by the camera, in order to adapt the white balance to the respective scene.



If you want to tint a picture or video with a specific color instead of white balance, first select the *Tint* option.

Clicking in the *Dest. Color* field opens up the *Choose Color* selection in which you can determine any color. You can see the effect of your selection as a live preview directly

on the Screen. Alternatively, you can of course also use the Pipette here and record a color value from the Screen for the tint. In this case, the cursor retains its Pipette function even after a mouse click, so that you can repeat and change your selection several times. With the setting *Level* you determine the intensity of the tint either by

entering a value there or by setting it with the arrow control. These changes also appear on the Screen immediately. In this way, interesting effects can be achieved, such as a coloring in a sepia tone, which artificially ages a picture or video, thus giving it a antique-like appearance.



If the *Dest. Color* is set to white and the *Level* is set to 100%, you will receive a black and white image or video in this way - an effect which, depending on the subject, is further enhanced by the additional correction options *Brightness*, *Contrast* and *Gamma* which allows

Picture-/Video-Processing to be refined effectively.

Under the settings for *White Balance* or *Tint*, you will find the other correction options *Brightness*, *Contrast*, *Gamma*, *Saturation* and *Hue* as well as the *Sharpen* option, some of which have been just mentioned in the editing window for Picture-/Video-Processing.

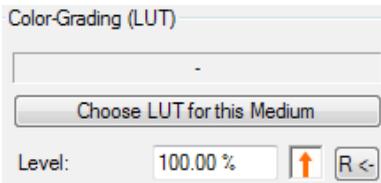


You make the desired changes and corrections either manually by entering numerical values or even more intuitively by clicking and dragging using the arrow controls. You can read more about operating the arrow controls in the chapter *Working with the arrow controls* on page 38. The respective changes can be followed in real time on the Screen.

As already described using the example of white balance, you can also change all these values dynamically. To do this, add another Picture-/Video-Processing object to the right of the light curve and change the desired value. As with all other Dynamic objects, m.objects automatically takes care of the animation between these objects. If necessary, add further objects to refine the animation with

intermediate steps. For example, you can work with different *Brightness* values or change the color *Saturation* dynamically.

Further settings for the dynamic effects can be found in the editing window of the object on the right under *Dynamic*. A detailed description of this can be found in chapter *Dynamic options* on page 102.



At the top right of the editing window for Picture-/Video-Processing you will find *Color-Grading (LUT)*, with which you can change the color effect of videos and pictures in a variety of ways and creatively alienate them.

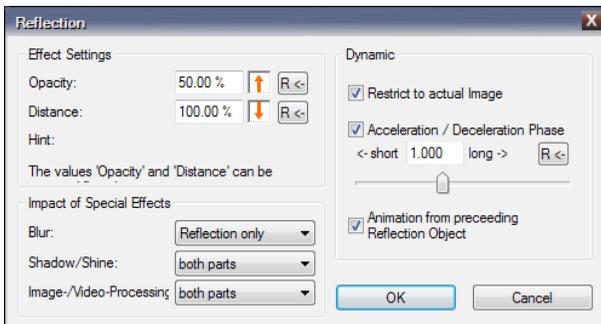
A detailed description of this can be found in the separate chapter *Color grading for pictures and videos* on page 174.

## Reflection

**M Reflection** The Dynamic object Reflection is available from the expansion level m.objects live upwards.

With this object, reflections of pictures, videos and texts can be created in the simplest way, which also follow the correct perspective even with movements such as 3D Animations. To use the Dynamic object, drag the gray icon with the letter *M* and the label *Reflection* from the *Tools* window (with activated image tracks) to the light curve of the desired image, text or video.

A corresponding icon then appears on the light curve and the associated properties window opens. At a later time, open this window by double-clicking the icon in the light curve.



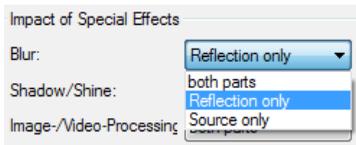
If you want to mirror a picture or video, there must of course be enough space on the Screen for the reflection. So you will have to reduce the picture or video with an Image Area object accordingly. The reflection automatically adapts to the set size. Texts that you

create with the Titeleditor are already provided with an Image Area; here, also, the size can of course be adjusted as desired

By default, the *Opacity* of the Reflection is reduced to 50% in order to achieve a realistic reflection effect. With the arrow control or with a numerical entry next to it, you can now change the value for the *Opacity* as desired. Below you will find the value for the *Distance* between the original and its reflection, which you can of course also adjust as desired.

Like all Dynamic objects in m.objects, the object Reflection can be used both statically and dynamically. If you insert several Reflection objects into a light curve and set different values for each in the properties window, you will get a dynamic movement.

The Reflection can be used particularly effectively in conjunction with other special effects. For this purpose, you will find additional options in the lower part of the properties window, with which you can determine how these additional effects will affect the outcome. For example, by inserting a Blur object, you can ensure that a reflection, for example on a water surface, has a certain blur and thus looks even more realistic, while the original image is excluded from blurring. To do this, select the value *Reflection only* for the *Blur* option.

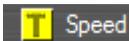


Similarly, for the special effects Shadow/Shine and Picture-/Video-Processing, you will also find the option *both parts*, with which the effect affects the original and reflection, as well as *Reflection only* and *Source only*, which applies the effect on the reflection or on the Original only.

The settings for *Dynamic* effects with the Reflection object can be found in the properties window on the right. A detailed description of this can be found in chapter *Dynamic options* on page 102.

## Speed - dynamic slow motion / time lapse

The Dynamic object *Speed* is available from the expansion level m.objects live upwards.



In contrast to the other Dynamic objects in m.objects, you can use the object Speed in the *Projection* component, i.e. in the image tracks, as well as in the *Digital Audio* component, i.e. in the audio tracks. Clicking on the respective component shows the symbol of the Speed object,

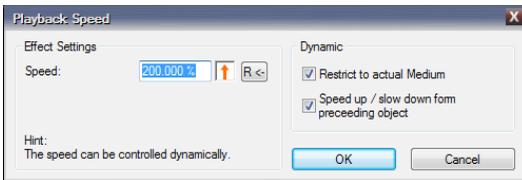
the letter *T* (for timebase) against a yellow background, in the *Tools* window.

Use this Dynamic object within the image tracks to influence the playback speed of video sequences. In the audio tracks, it is applied accordingly to sound samples.

The application is the same as for all other Dynamic objects: With the left mouse button pressed, drag the *T* symbol from the *Tools* window onto the light curve of a video or onto the volume envelope of a sound sample and release the mouse button there. The properties window will open up in which you can make the desired changes. Later, open the properties window by double-clicking the symbol in the light curve or the volume envelope.

### **Change playback speed of videos**

By default, a video clip that you have placed on an image track is played back at nominal speed. This is usually the speed at which the scene actually played out. With the Speed object you can now slow down (slow motion) or accelerate (time lapse) the playback.

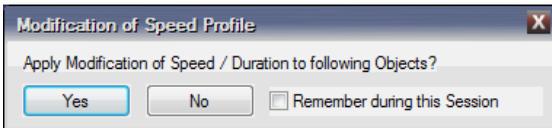


To do this, drag a *T*-object from the *Tools* window onto the light curve of the video. Enter the value 200% for the *Speed* in the properties. Confirm with *OK*. With that, you have already created a time-lapse effect in

which the video is played back at twice the speed. If you enter 50% instead, create a slow motion effect in which the video only runs at half speed.

### **Adjust timing**

After clicking *OK*, the *Modification of Speed Profile* window appears, which offers you the option of adapting the duration of the video on the timeline to the changed timing.



Because a video that runs at twice the speed only needs half the length on the timeline. In the reverse case of slow motion, the required Projection

time is extended accordingly. If you confirm the window with *Yes*, m.objects shortens or lengthens the light curve of the video to the length actually required.

If the check mark for *Remember during this Session* is ticked, m.objects will automatically make the necessary adjustments if the timing is changed as long as the current m.objects show is open. This applies both when changing T values and when moving, duplicating or deleting corresponding objects or when pasting via the clipboard.

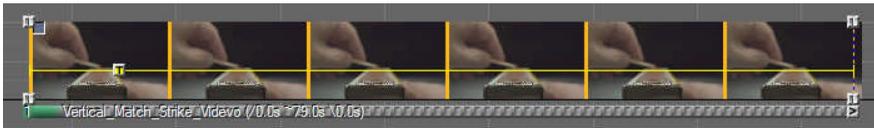
On the other hand, if you click *No* in the *Modification of Speed Profile* window, the light curve of the video initially remains unchanged. By manually extending or shortening the light curve, you can adjust the timing later if necessary. In this case, a vertical red line shows you the exact limit of the time required on the timeline.



### **Dynamic change in speed**

Changes in speed can also be displayed dynamically. One application for this is, for example, the start of a video scene with a freeze frame.

To do this, drag a first *T*-object from the *Tools* window onto the light curve of the video and place it at the point up to which the freeze frame phase should last. In the properties window, the value 100% is initially entered, which corresponds to the nominal speed of the video. To create a still image, enter the value 0% and confirm with *OK*.



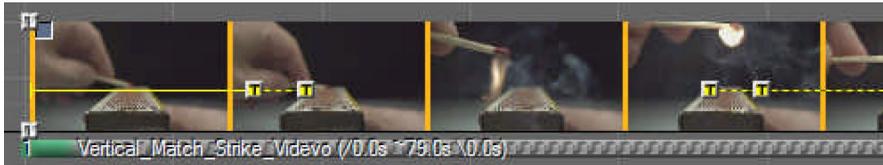
Shortly behind the first one, i.e. to the right, place another *T*-object, and when you click the *R* button in the properties, the value 100% will be set again. If you now let the locator run over the video you can see that the freeze frame becomes a moving image. The duration of the animation from the freeze frame to the moving image determines the distance between the two T objects.

Of course, the animation can also be designed in the other direction if a scene should be slowed down to the freeze frame from the running video in order to



enable it to be viewed in detail. In this case, change the *Speed* from 100% in the first to 0% in the following T object.

As with all m.objects Dynamic objects, you can of course use any number of T objects to dynamically change the playback speed. For example, after dynamic braking by additional objects, you can return to normal speed to particularly accentuate a certain section of the video.



Fast decelerations to a freeze frame or accelerations from a freeze frame are possible with almost any video clip without problems and in appealing quality.

In addition, you can of course also reduce the playback speed without slowing down to the freeze frame. Whether such a slow motion delivers an appealing quality depends on the characteristics of the video clip used, primarily on the frame rate of the recording.

If the video, for example was only created at 30 frames / s, reducing the playback speed to 50% results in a frame rate of only 15 frames / s. This can lead to visibly jerky playback. Whether this is the case depends heavily on the content. In general, a reproduction of less than 20 frames / s can be perceived as visually disturbing.

However, the frame blending performed automatically by m.objects to improve the smooth playback (see chapter *Smoothing the playback of video clips with unsuitable frame rates* on page 164) significantly alleviates this potential problem. Likewise, the following two content considerations may allow lower frame rates:

- Content /Contours: If the video in the moving parts of the image shows softly delineated and low-contrast contours (e.g. clouds or fog, but also objects with blurred motion), it is often possible to drop below 20 frames / s without the scene jerking.
- Content /Movement: If sharply contoured objects move slowly within the scene, a slow motion with less than 20 frames / s can often be set up well.

To put it another way using a practical example: If a dark bird, shown perfectly sharp against a light background, attacks another bird in a daring flight maneuver and the camera was not pulled along with the fast movement during the recording, a strong

slow motion of this scene will only work well if a corresponding number of frames / s were recorded (e.g. 120fps or more). When recording scenes, of which slow motion is later planned, you should make sure that the frame rate is as high as possible - possibly also at the expense of resolution. Many cameras enable significantly higher frame rates with a lower resolution.

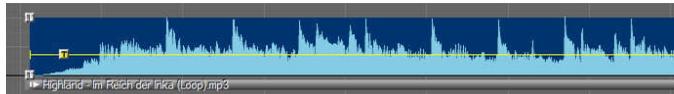
With many cameras it is usually the case that in high-speed mode, the record is taken with a corresponding number of frames / s (e.g. 240fps), but the video stored on the memory card is marked with a low frame rate (e.g. 30fps). In normal player software, such a video already runs as 8 times slow motion. You can also process such a video dynamically in m.objects: By accelerating to 800% it runs at nominal speed, dynamically reducing the speed down to 100% runs smoothly in a technically good slow motion.

Regarding hardware support for decoding videos (see chapter *Hardware support for video decoding* on page 161), it should be noted that your graphics card may not be able to decode 240 frames / s. It might make sense here to explicitly deactivate the hardware decoding for a corresponding video by removing the checkmark for *Use Graphics Hardware for Decoding if possible (recommended)* in its properties (double-click on the bar below the video in the image track). This in turn places a higher load on the CPU. If the CPU is also not capable of reproducing the full frame rate, it is recommended to export the video already processed with the corresponding T Dynamic objects as a new video with 60 frames / s (see chapter *Export video* on page 252) and integrate the new video into the image tracks.

### **Change the playback speed of audio**

An audio sample can be influenced in its playback speed in a similar way as a video sequence. So if you drag a single T-object onto a volume envelope, you change the speed of the entire sample with the value for *Speed*: 100% corresponds to the nominal value, i.e.

the normal playback speed, a lower value leads to slower playback, a higher value for faster playback.



As with the application to videos, m.objects also offers to adapt the object, in this case the length of the volume envelope, to the changed timing in the case of audio files.



The procedure is the same as for videos, read more in chapter *Adjust timing* on page 135.

Atmospheric o-tones from nature, for example, or noises such as the sound of a bell can be well suited for this. By changing the speed, you achieve a different sound and in many cases a completely new effect, for example to underpin scenes with a particularly impressive or dramatic tone. Instrumental music can also be suitable for such a purpose. However, a value of 0% does not work here, in this case there will simply be no sound.

Speech and vocals are generally not suitable for such effects. A changed playback speed makes them appear unnatural. Dynamic changes in speed are also possible with audio, but should be used with care, because they also cause a dynamic change in pitch. As an effect, this can of course be deliberate.

If you extract audio from a video and place it on an audio track, the extracted audio will take over any Speed objects that may be present in the video. Here, also, it is of course important to pay attention to whether the audio is suitable for a change in speed or whether it should be replaced by another audio. You can also remove the Speed objects from the sound sample. To do this, you must first use the *Split Event Group(s)* icon in the toolbar to ungroup the video's audio with the image track.

## Masks

Masks are an important tool in the creative work with m.objects. They offer countless ways to implement ideas and are easy to use.

### Image masks

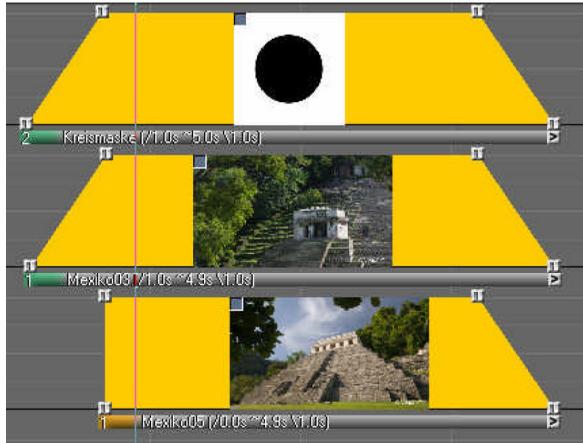
The basic principle of an image mask is very simple: it hides parts of an image or - as an inverse mask - makes certain parts of an image visible. It can have practically any shape, from a rectangle over a cut-out object to a text.

With the help of the Dynamic Tools, you can also animate masks in every imaginable way, for example dynamically enlarging, moving over an image or rotating.

Note: You can create image transitions in simple geometric shapes or in the form of wipers with just a few mouse clicks using *QuickBlending*. Read more in chapter *QuickBlending* on page 71.

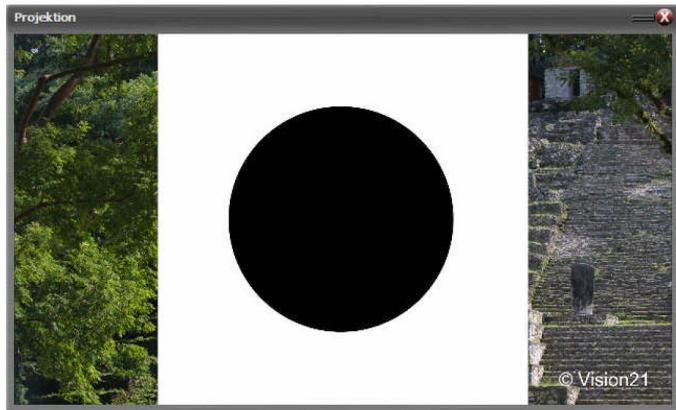
## Application of image masks

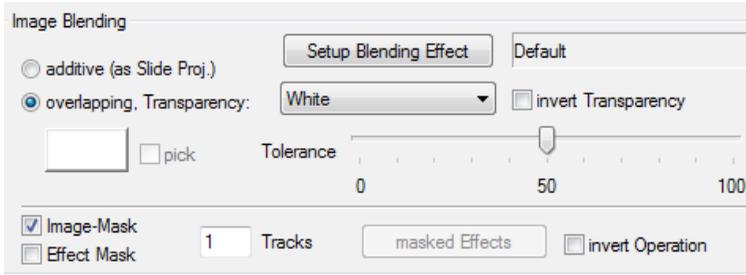
Here you can see two pictures on the timeline, which are directly one above the other in tracks B and C. The image in track B is set in *overlapping* mode so that it completely covers the image below. In track A there is an image above it, which consists of a black circle against a white background and is to be used here as a mask. This can be done with little effort in any image editing or drawing program.



If the locator is positioned at this point, you will now see a white square with a black circle in front of the background on the Screen as expected.

Now you have to set the circle image so that it becomes a mask. To do this, open the *Edit Image* window by double-clicking on the bar below the light curve and tick the Image-Mask option in the middle-left of the window.

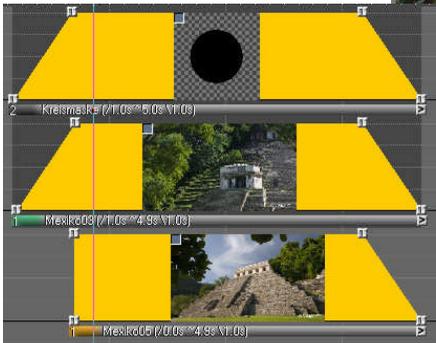




To the right of this you will find the entry *1 Tracks*, which causes the image mask to affect an image track underneath. If more image tracks are to be masked, increase the number accordingly. For *overlapping, Transparency*, select the option *White* so that the white background of the circular image becomes transparent, because in this example only the circle should serve as a mask. The value for *Tolerance* should be at 50 percent, which m.objects also specifies by default. Confirm with *OK*.

You can now see that the white square has disappeared and the background image appears in the circle.

Now only the black circle can be

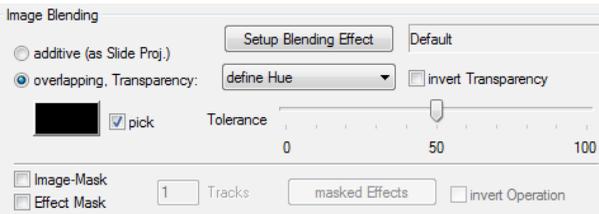


seen in the light curve on the image track. You will also see a dark shadow behind the light curves in the two upper lanes. This indicates that a mask is used here.

## ***Cut-out shapes as image masks***

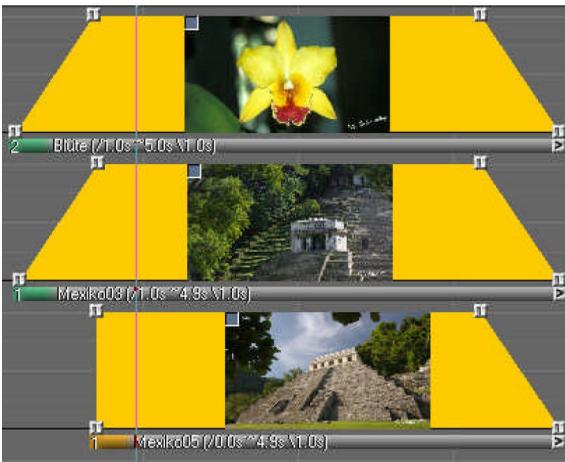
Cut-out shapes that you have created in an image processing program and saved in a suitable file format such as png, tif or psd are also very suitable as masks (transparencies can be saved in these formats). Like the circular mask in the example

described above, insert the corresponding image into the image track above the image(s) to be masked.

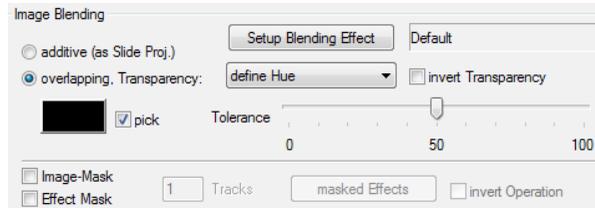


In the *Edit Image* window (double-click on the bar below the light curve), choose the option *Alpha-Channel* for *overlapping, Transparency*. Then proceed as described above. Now the cut-out

form becomes a mask.



Certain motifs are also suitable for cutting-out directly in m.objects, especially if they have a uniform color. As an example, you can see a photo of a flower that is now placed in the upper image track instead of the circular mask.



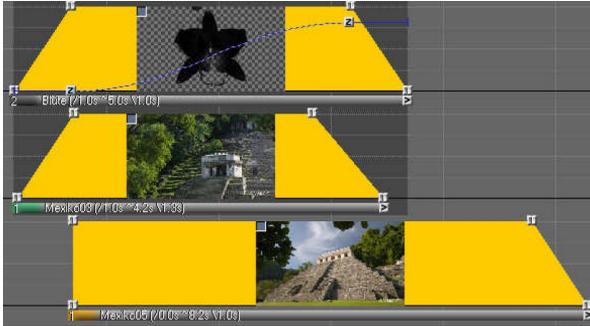
In the *Edit Image* window, the option *define Hue* is now set for *overlapping, Transparency* and the *pick* option underneath is ticked.

Now you can directly pick the desired color with the cursor from the Screen (the cursor now has the shape of a pipette), in this case the yellow of the flower. The flower is then shown

transparently. Activate *invert Transparency* to free the flower from its background instead and then use it as an image mask (as described for the circular mask). Now you have created a mask in the shape of a flower.

## Transition with an image mask

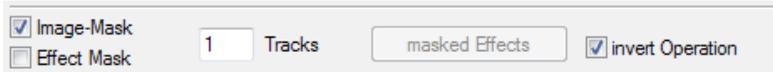
The mask in the form of the cut-out flower described in the previous section can be used for dynamic transition in just a few steps. To do this, insert Zoom objects in the light curve of the mask at the beginning and at the end of the Projection time.



For the first Zoom object, enter the zoom *Level 0%* in the properties (double-click on the Zoom object), so that the mask is not visible yet. For the second Zoom object, pull the zoom *Level* to a point so that the image in the lower track completely fills the Screen. In this way, the lower image in the form of the

flower is faded in growing larger and larger.

## Image masks with inverse effect



In the options for the image masks, you can inverse the effect by simply ticking the appropriate box.

As a result, the image under the mask is no longer masked, but a section of it is shown in the form of the mask.

The following example shows a text in track A that was created with the m.objects

*Titeleditor*. In

this case, there is a video sequence in the image track below. The video shows the surf on a rocky stretch of coast.



The goal is now to make only the text visible on the Screen with the movement of the waves being visible in its contours.

Since m.objects handles texts created with the Titeleditor the same way as images, you can also use the texts as masks. This makes the procedure very simple: Double-click on the bar below the light curve to open the *Edit Image* window and tick the *Image-Mask* option. In addition, you now tick the *invert Operation* option. In this way, the video underneath the text is only visible in the contours of the text.

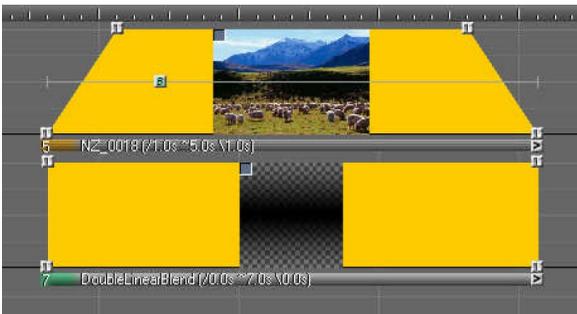
Of course, you can also apply the inverse effect of the image mask to a freeze frame instead.

You can find out more about creating texts in m.objects in the chapter *Create titles with the Titeleditor* on page 82.



## Effect masks

While an image mask has an immediate effect on an image, the effect of an effect mask is aimed at the m.objects special effects, such as *Blur*, *Passepartout*, *Shadow/Shine* and *Picture-/Video-Processing*, as well as *QuickBlending*. Effect masks can be used to define the area and intensity in which these special effects affect an image.



The following example shows how to use effect masks.

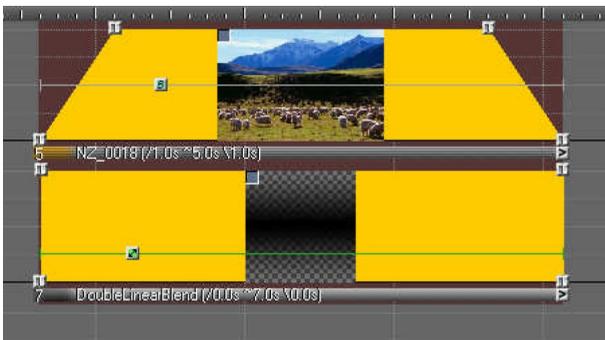
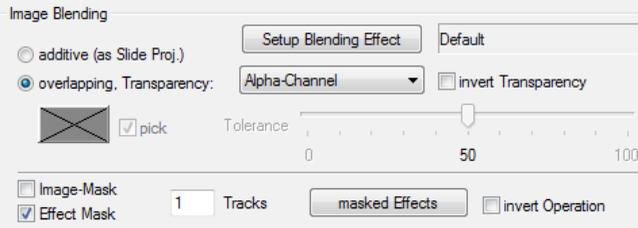
In contrast to image masks, effect masks are arranged below the tracks that mask them. Here you can see a landscape photo in image track A and below that in track B an image that shows a gradient from black in the

middle to the top and bottom. This gradient will serve as a mask. Effect masks can also have any shape, from a rectangle over a gradient like this to a text.



The landscape photo is provided with the special effect *Blur* here, which you can recognize by the *Blur* object (the small square with the letter *B*) on the light curve.

This *Blur* shall now be masked in a certain area with the effect mask, so that the landscape photo is shown sharply there. To do this, double-click on the bar underneath the light curve of the gradient image, select the *Effect Mask* option in the window that opens up and confirm with *OK*.



On the Screen you can now see that the photo is shown sharply in the middle, as the gradient in track B now acts as an effect mask.

You can also recognize the effect mask by the reddish brown shading on the tracks.

With the help of an Image Area object, you can now move the effect mask as desired and thereby freely position the focus area in the image.



An animation can also be created by using two or more Image Area objects so that, for example, the focus area moves from bottom to top through the landscape photo.

In this way you can mask any m.objects special effect so that it is only applied to a certain area of an image.

As with an image mask, you can

Image-Mask    1 Tracks    masked Effects     invert Operation

Effect Mask

**Mask Effects**

Select Dynamic Effects to be masked:

select all    deselect all

|  |   |
|--|---|
| <input checked="" type="checkbox"/> Brightness           | <input checked="" type="checkbox"/> Blur                  |
| <input checked="" type="checkbox"/> Contrast             | <input checked="" type="checkbox"/> Shadow / Shine        |
| <input checked="" type="checkbox"/> Gamma                | <input checked="" type="checkbox"/> Passepartout          |
| <input checked="" type="checkbox"/> Saturation           | <input checked="" type="checkbox"/> QuickBlending         |
| <input checked="" type="checkbox"/> Hue                  | <input checked="" type="checkbox"/> Chroma Keying (Video) |
| <input checked="" type="checkbox"/> White Balance / Tone |   |
| <input checked="" type="checkbox"/> Sharpen              |   |
| <input checked="" type="checkbox"/> Color-Grading        |   |

OK    Cancel

specify in the options (double-click on the bar below the light curve) for an effect mask how many tracks it should affect. With a click on the *masked Effects* button you will also find further settings.

If an image is provided with several special effects, for example with Blur and Shadow/Shine, you can specify here whether the effect mask should affect all (default) or only selected special effects. Set or remove the checkmark in front of the respective

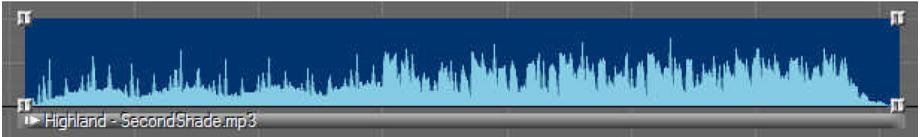
Image-Mask    1 Tracks    masked Effects     invert Operation

Effect Mask

option accordingly. For Picture-/Video-Processing, you even have the option of specifically masking certain parameters.

You can also reverse the effect for an effect mask by selecting the corresponding option.

## Audio

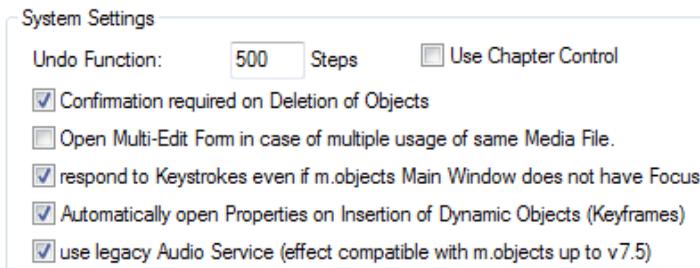


The soundtracking is an important step when working with m.objects, because it is just as important in an AV show as good image material. There are thoroughly different approaches to how a show is created. Whether you first arrange the pictures and videos and then insert the audio accordingly, or vice versa first create sound samples and then choose the images, is up to your personal preference or the theme of the respective show.

You use various media as the source for the soundtrack: MP3 files that are already available digitally, CDs or DVDs from which you import music, sound samples that you have created with a digital recording device, for example, or spoken text with comments about the show.

### The new audio engine of m.objects version 8

The use of the new audio engine is the default setting in the program for new projects.



If necessary, the classic, external technology can be activated under *Options / Program Options* with the activation of *use legacy Audio Service (effect compatible with*

*m.objects up to v7.5*). This should only happen if conventional DirectX plug-ins are supposed to be used for sound processing.

The internal audio engine does the work behind the *m.objects* audio tracks. It was completely reprogrammed for version 8.0 to make processing more flexible and independent of operating systems and driver updates. With the new audio engine, *m.objects* is also capable of processing practically all modern audio file formats directly. This also includes Ogg Vorbis, FLAC, DSD (dsf) and many more. It does not matter what sample frequency (e.g. 44.1, 48 or 96 kHz), quantization (e.g. 16 or 24 bit) or channel coding they are available in. The implementation when using material of different sample rates within a project is of superior quality.

## Quick change of the audio output

As a rule, depending on the peripherals connected, a computer offers several alternative outputs for the audio. For example, you can play the audio through the internal loudspeakers of a laptop or from a jack plug via cable to an amplifier that is connected to external loudspeakers. You can transmit the sound via USB transmitter or output it via HDMI to a TV set.

The desired output for the audio can be easily assigned in *m.objects* as part of the *Digital Audio* component. Simply click on the yellow arrow icon at the bottom right of the audio tracks.



A list with all available audio output devices will open up. By clicking on the desired entry, it is selected and appears as a permanently visible entry to the left of the icon.



This assignment also works if an audio device is connected after starting *m.objects* or after loading the show. You can even use the function during playback, for which it is briefly interrupted to initialize the selected output and then automatically continued.

In this context, *m.objects* also routes the sound of non-dubbed videos and sound samples set asynchronously to the selected output device.

## Targeted driver assignment for individual audio tracks

Of course, it is also possible to output multi-channel audio via the targeted driver assignment. Next to the icon below the audio tracks, the text *different Sound Outputs*

then appears.

To do this, select *View / Driver Assignment* in the menu above, which brings you to the corresponding view. You can now see the assigned output device on the audio tracks, while all available output devices are listed in the *Tools* window. You can now specifically delete the assignment on individual audio tracks (right-click on the desired entry, *Delete selected Object(s)* and confirm with *Yes*), select a different output in the *Tools* window and drag it to the corresponding audio track while holding down the left mouse button. The new assignment is now made, and at the end of the new assignment click on the flashing wrench icon in the toolbar to return to the normal view of the program.

## Integrate / record audio

If you have an m.objects user interface in front of you that does not yet have any audio tracks, you must first set them up. To do this, click the gear icon in the toolbar and select the *Digital Audio* component in the *Tools* window.

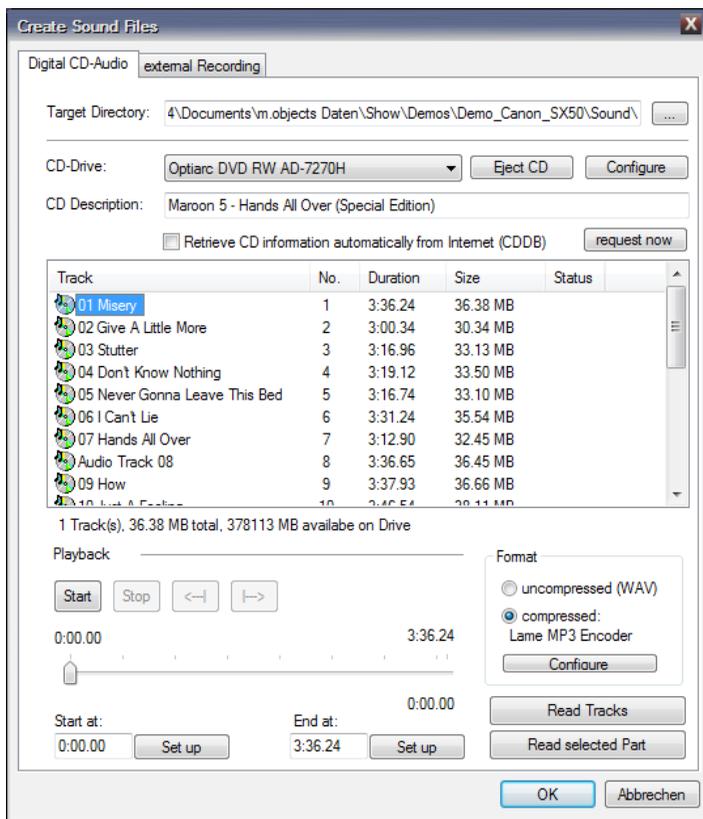


Use the cursor to drag the symbol into the light gray area in the working window to the right. In the following window you can enter the desired or possible number of audio tracks, which vary depending on the software expansion. Confirm with *OK* and then click on the gear icon again. Now you have the audio tracks in front of you on the user interface.

The easiest way to insert an audio file is via the red dot at the bottom right of the *Digital Audio* frame. If you click on it, two options appear: *record / insert Audio File* and *choose / insert Audio File*.

If you want to insert a file that already exists on the computer, select the second option. In the following selection window, first search for the corresponding file directory, select the file you are looking for and click on *Open*. The sound sample now sticks to the cursor and can be placed anywhere on the audio tracks, provided there is enough space at the relevant point.

However, if you want to integrate music from a CD or a sound sample from another external source, select the option *record / insert Audio File* after clicking on the red dot.



There you can record directly from the internal CD or DVD drive or from an external sound source. The recording of *Digital CD-Audio* can either be effected in uncompressed WAV format or directly in MP3 format.

If you have Internet access, you can retrieve information online about most of the audio CDs available on the market. Both the title of the CD and the names of the individual tracks

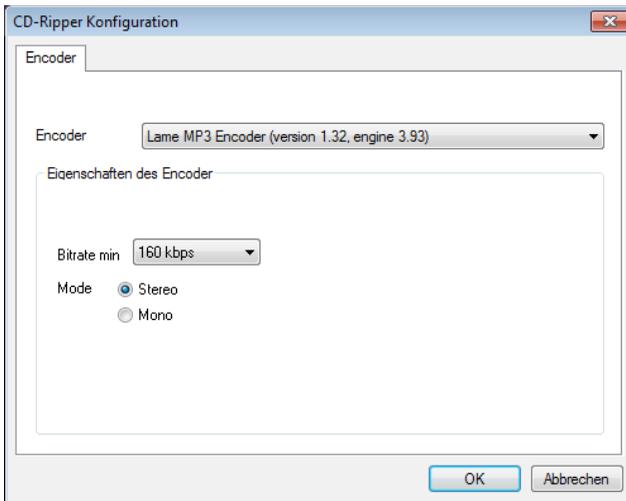
are automatically entered in the *Track* list. If Internet access is not available on your PC, you can give the CD a global name to make it easier to differentiate between the recordings that have been made, which is then automatically preceded to the track name. Of course, the tracks can still be named individually. Once named, CDs and tracks are automatically recognized by m.objects when used repeatedly.

As an alternative to recording from CD, the *external Recording* tab can also be used to record from external sources via the analog and digital inputs of a sound card. Recordings from external audio sources are always available in uncompressed format. The files can also be converted into MP3 format. However, the WAV files remain on the hard disk, since m.objects cannot tell whether they are still needed in

another production or by another program.

In both cases of creating MP3 files, the level of compression and thus the resulting audio quality can be set. The *Lame MP3 Encoder* (compressor) preferred by m.objects generates a quality at the preset Bitrate of 160 kbps (kilobits per second), that even under good listening conditions can not be distinguished from the uncompressed audio file.

The *Encoder* and the *Bitrate* can be set using the *Configure* button at the bottom right of the *Create Sound Files* window. The Lame Encoder basically allows data rates of up to 320kbps. The computing power required for recording and playback as well as the space required on the hard drive increase with a higher Bitrate, but the gain in quality is no longer perceptible with such high values, even under optimal studio conditions. It is therefore recommended not to set more than 192kbps for the Bitrate. On the other hand, a Bitrate of less than 96 kbps is also not recommended normally, since the compression losses can otherwise be heard very clearly. The default setting of 128kbps can be classified as uncritical for audio material of all kinds, 160kbps as very good.



Furthermore, MP3 files and uncompressed audio files can be used simultaneously in an m.objects show, regardless of the planned later use. This means that e.g. subsequent encoding of control information for the creation of audio CDs is also possible if the arrangement contained MP3 files.

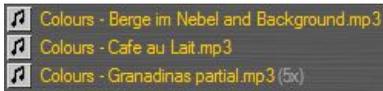
When recording, m.objects preferably creates the audio files in

the *Sound* folder within the current project folder. You can of course create subfolders here to structure the data when using numerous audio files. With regards to backing up the data later or transferring the complete production, you should not store the

files outside the current project folder.

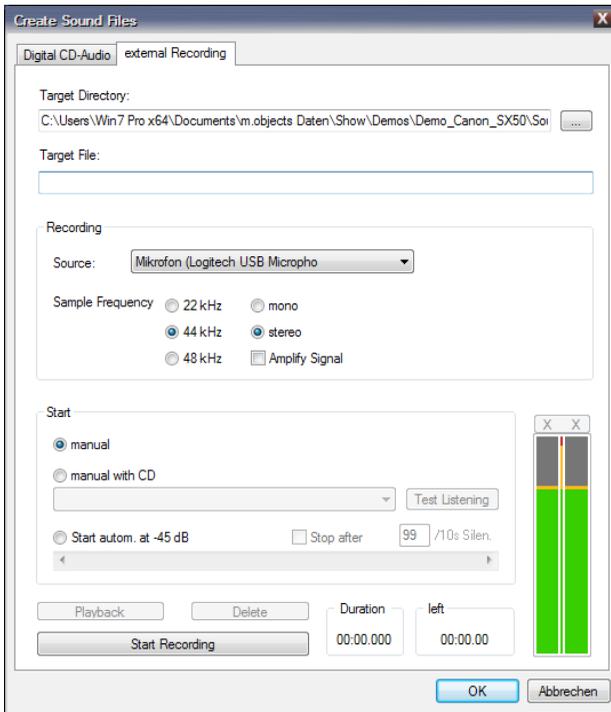
Drag and drop from Windows Explorer and other file management programs is also possible, either directly into the audio tracks or into the audio pool (*Media Files*), i.e. the *Tools* window of the *Digital Audio* component.

The Tools window is - provided that the audio tracks are the currently active component (if necessary, simply click on an audio track) - your audio pool. Here you can see all audio samples from your m.objects production.



All audio samples that are currently used on the audio tracks are marked in yellow. If they are used several times, the corresponding number is shown in brackets before the name. Audio

samples shown in white are not currently stored on the audio tracks, but can be dragged onto the tracks from the audio pool at any time.



In addition, you can also store video files directly on the audio tracks, which enables a much more differentiated post-processing compared to the audio output from the image track. The full length of the audio file is stored on the audio track and at the same time transferred to the audio pool in the Tools window. If you drag several audio samples onto at least two audio tracks at the same time, m.objects creates them with a cross-fade, in which the fade in begins 10s after the start of the samples. You can use this mode, for example, to prelisten to and select out

of larger amounts of audio files.

Through the *external Recording* tab in the *Create Sound Files* window you can also record audio live from analog or digital external sound sources.

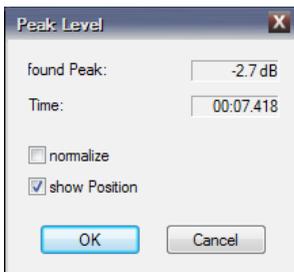
Here you assign a name to the audio file to be created and the signal source for the audio signal. Then click on *Start Recording* and after recording has been completed on *Stop Recording*.

## Optimization of the Signal Level

When recording via an external audio source, you should make sure that the signal level is sufficiently high without overdriving. The colored bars of the level indicator increase up to the red area. If the red area is touched, this is not yet critical. However, if there remains a red area at the upper end of the level display, there was an overload, the recording is then usually unusable.

When recording digitally from CD, you cannot influence the level; an exact image of the data contained on the CD is created. As a rule, this should be optimally controlled in the context of the entire CD.

Occasionally it happens that a recording shows only small level fluctuations. You can recognize this by the fact that the thin upper line of the volume envelope at the loudest passages of a sample used does not nearly reach the upper boundary line of the audio track.



If you have increased the volume manually or used sound effects (see below), the opposite may also occur, so there may be an overdrive. When using sound effects, this is not easily recognizable from the volume envelope.

In all of these cases, you can choose the *Peak Search (Selection only)* command from the context menu of the thin bar below the sample. If it shows a value unequal to 0dB in the field *found Peak*, you should tick the

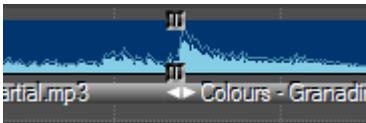
*normalize* option to bring the level to the optimal value.

If your arrangement seems balanced overall, i.e. you have adjusted the volume ratios

of all samples to your preferences, the mix of all audio passages used can of course in turn deviate from the optimal level. For example, sample overlap could result in overdriving. In order to avoid this, you should select the command *Peak Search (complete)*, which you will find in the context menu of the audio tracks (areas except from handles and bars). Again, you should *normalize* for deviations from 0dB. This function can be called any number of times since it has no effect except for the evenly correction of the levels of all samples.

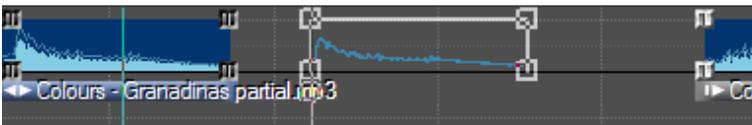
## Cut audio

Often you will not use the imported audio samples as they are, but cut them first. This is also very convenient in m.objects. You can cut the beginning or end of a sample directly on the audio track. For smaller sections, simply move the first or the last two handles of the volume envelope to the right or left. The audio sample is then shortened by the moved piece. If you want to cut off a longer piece, it is advisable to use the *Split Sample* command from the context menu (right mouse button at the desired position of the envelope).



The vertical line and the new handles show that the sample is now divided into two parts. Click on the narrow bar below a subsample to select it. The bar is then highlighted in color. You can now delete this subsample.

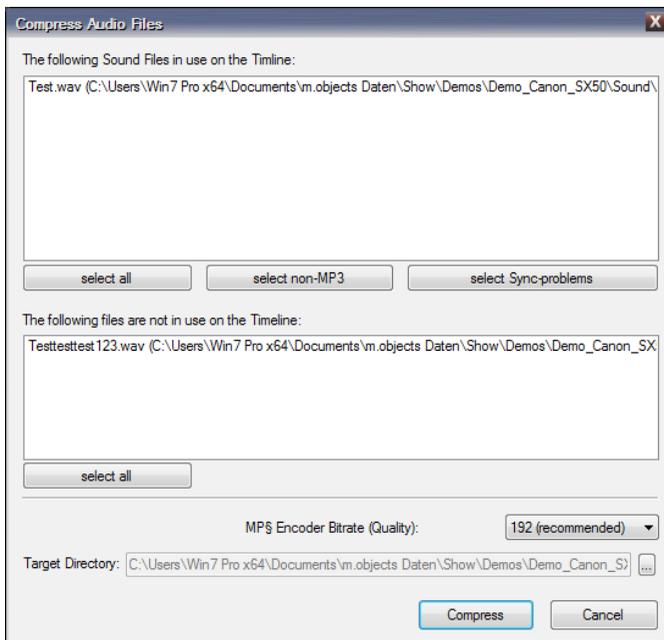
If you want to cut out passages within a sample, use the *Split Sample* command at the beginning and end of the section to be cut out. Even after you have removed the section, you can still change the cut part by marking all handles at the interface and then moving them to the correct position with the mouse. If too much or too little was cut out, this can be corrected by pulling apart the partial samples and moving the cut part (i.e. the last two handles of the left or the first two handles of the right partial sample).



By duplicating subsamples - e.g. a chorus cut out at a suitable point - you can extend a piece of music. To do this, drag the subsample with the mouse and press the *Ctrl* key before releasing it. Incidentally, this technique is basically suitable for duplicating all objects.

## Compress audio

After you have inserted the audio samples into your production and edited them, there may be different file formats on the audio tracks, such as uncompressed WAV files or different video formats. For reasons of better performance and less storage space, it is advisable to convert all files on the audio tracks to MP3 format. If, for example, you want to transfer a complete project to an external data medium, it takes up significantly less space there after the sound samples have been converted. On the other hand, MP3 delivers excellent sound quality, so that there is no audible loss of quality due to the conversion.



The procedure is very simple: Select the menu *File / Compress Audio Files*. The following window shows you all audio samples that can be compressed. In the upper part of the window, the program lists all the files that are stored on the audio tracks. Here you can manually select which files should now be compressed in mp3. The files can be selected individually, but you can also use the buttons below the

list to *select all* audio files that are non-mp3 formats.

The option *select Sync-problems* is only of importance if *m.objects* has been deliberately converted to use the old audio engine in the program settings. In this case the option *Use legacy Audio Service (effect compatible with m.objects up to v7.5)* is selected. If this is the case, *Sync-problems* indicate audio files with variable

Bitrates, which can cause problems with the synchronicity between image and audio during playback. By recompressing, m.objects creates a constant Bitrate here, which avoids these problems.

In the lower part of the window, the program lists all files from the audio pool that are not used on the timeline. You can also select these for recompression.

Enter the compression level below. 192 kbps are preset and deliver an excellent result. A higher setting would lead to significantly larger MP3 files, and significantly less would result in audible losses of quality.

Confirm the dialog with *OK*. Now the compression will be executed and m.objects automatically uses the MP3 files in the show and in the audio pool. The original files are preserved, since the software naturally cannot know whether they are still needed elsewhere.

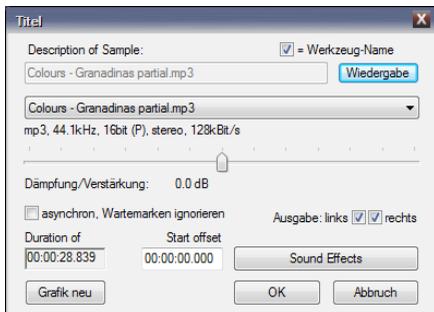
## Changing the playback speed of the audio - slow motion / time lapse

With the Dynamic object Speed you can change the playback of the audio in many ways. For example, you can boost the effect of atmospheric o-tones by slowing them down, for example to underpin scenes with a particularly impressive or dramatic tone.

A detailed description of the Speed object and its use on audio samples can be found in chapter *Speed - dynamic slow motion / time lapse* on page 134.

## Sound effects and global dynamic settings

The global dynamic settings are available in all m.objects expansion levels. Sound effects are available in all live, creative, ultimate and pro licenses.



To apply effects to an audio sample, double-click the bar below its volume envelope first. In the following window you will find a button labeled *Sound Effects*.

**Note:** *If you see the label Sound Effects (DirecX PlugIns), the external audio service is still activated, which was replaced with a completely new audio*

engine with the *m.objects* version 8.

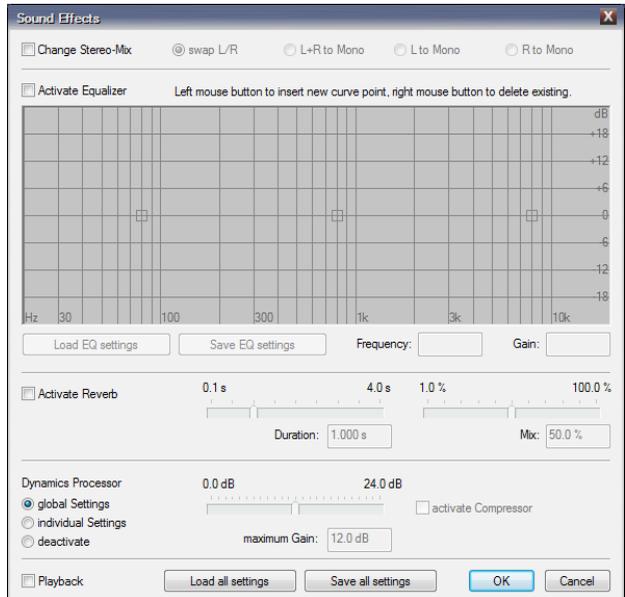
### Sound Effects (DirecX PlugIns)

*It is not advisable to use the external audio service because this technology is no longer up to date and, above all, is significantly less compatible with different audio formats than the new audio engine. In addition, it can be assumed that the external audio service will no longer be supported by future program versions. To use the new audio engine, select Program Options in the program menu Options and remove the checkmark in the following window for the option use legacy Audio Service (effect compatible with *m.objects* up to v7.5). Then continue editing as described.*

Clicking the *Sound Effects* button takes you to the associated window. By activating the *Playback* option in the lower area of the window, you can check the effect of the changes made directly. The audio runs in a loop as long as this option remains activated.

### Change stereo mix

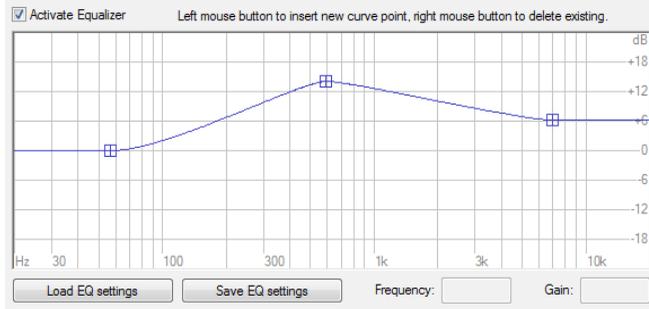
In the top line you will find the options for alternative stereo settings. To use it, check the *Change Stereo-Mix* checkbox.



Here you have the option of swapping the left and right audio outputs (*swap L / R*) or outputting both channels together as mono sound (*L+R to Mono*). You can also output the audio signal from the left or right channel on both outputs (*L to Mono* or *R to Mono*).

## Equalizer

Below you will find the equalizer that you can use with the *Activate Equalizer* option. This gives you the opportunity to adjust the highs, mids and lows of an audio sample separately.



You will see three handles here, which you can move up and down by dragging to adjust the pitch accordingly. The further you pull a handle upwards, the more the area is emphasized. The handles can also be

moved to the right and left, so that you can make adjustments within the highs, mids and lows.

By clicking with the left mouse button on the Equalizer diagram, any number of other handles can be added. This allows you to make differentiated adjustments accordingly. You can remove individual handles by clicking on them with the right mouse button.

If you have finished configuring the settings in the Equalizer, you can also save them by clicking on the *Save EQ settings* button and assigning a name. In this way, different Equalizer settings can be stored and later applied to other audio samples simply by clicking on *Load EQ settings*.

## Reverb effect

For the reverb effect, first check the *Activate Reverb* option. You have two possibilities for configuration here, the *Duration* of the reverb and the reverb *Mix*. You can change both values using the corresponding slider or by entering them numerically.



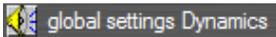
The Duration of the reverb determines how long the reverberation effect can be heard. With the reverb Mix you can adjust the intensity of the reverberation effect. The higher this value, the more the reverb is mixed into the audio sample.

## **Dynamics processor**

The *Dynamics Processor* plays a special role here. It makes it possible to compensate for deviations in loudness (i.e. the sensed volume). This is possible both within a single audio sample and across the entire presentation. That is why you will find both *global* and *individual* dynamic *Settings* in m.objects.

To make the global settings, first close the form for the Sound Effects and then the properties window of the audio sample - with *OK* or *Cancel*, depending on whether you want to save changes or not.

If audio tracks are active (if necessary, click in an empty area of the *Digital Audio* component with the left mouse button), you will find the tool *global settings Dynamics* in the *Tools* window.



Double-clicking this tool opens the associated form. To use the settings here, first check the *activate Dynamics Processor* box. The dynamics processor effectuates that larger deviations between quiet and loud passages in the reproduction of the audio are reduced without, however, leveling out short-term developments in the dynamics. So e.g. the character of a music with timpani beats etc. is preserved, but it is always suitably audible over the entire duration, even with strong fluctuations in loudness, but not too loud. Also, texts spoken with a different loudness or music pieces from different sources that differ greatly in their dynamics are also effectively coordinated.



*The picture shows the same piece of music on two separate audio tracks: in the upper track the unprocessed original, in the lower track the sample processed with the Dynamics Processor. It can be clearly seen that in particular the quiet passage was raised significantly at the beginning, while the loud passages were dulled a bit.*

You can determine the maximum degree of raising quiet passages (*maximum Gain*) using the slider or by entering a value numerically. Click *OK* to confirm the entry. The settings made now affect all the audio samples used in your m.objects production, in which the *global Settings* option is selected for the *Dynamics Processor* (this is the default setting).

Now return to the individual sound effects: Double-click on the bar below the volume envelope of a sample and then click on *Sound Effects*.

The *global Settings* option being preselected under *Dynamics Processor* means that the settings from the global tool just described are adopted. If you select the option *individual Settings* instead, you can enter a different value for the audio sample in question, which overwrites the global settings. Here as well, enter the value with the slider or numerically. With the option *deactivate* you switch off the Dynamics Processor specifically for the selected sample.

In the *global* as well as in the *individual Settings* for the Dynamics Processor you will also find the *activate Compressor* option.

activate Compressor

You should only choose this option if you are giving a presentation in a relatively noisy environment. The compressor works much more quickly, so that overall an even more constant and powerful loudness is achieved. However, this is audibly at the expense of the character of sophisticated music. The advantage is that the audio can always be heard in a louder environment.

You can save any settings you have made in the *Sound Effects* form.

Load all settings

Save all settings

Simply click on the *Save all settings* button and assign a suitable name. With the button *Load all settings* you can later apply these or other saved settings to other audio samples.

## Video

Videos in m.objects can be processed just as easily as pictures and audio samples. In the following chapter you will see that the software can do much more than just playing videos in the usual high quality. Video editing is just as possible as post-processing of the audio and the use of Dynamic Objects and Mask Effects.

Almost all digital cameras now offer the option to record videos, many of which even meet professional standards when it comes to quality. Mobile devices such as

smartphones also deliver videos of sometimes remarkable quality. And just as there are different file formats for pictures and audio samples, videos also come in different formats and resolutions.

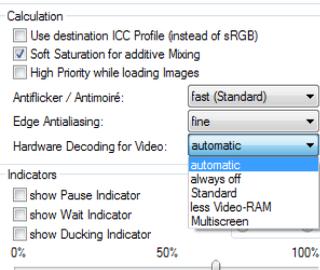
In order for a computer to be able to play different video formats, certain requirements must be met. First of all, this means that a corresponding decoder must be installed on the computer for each type of video. m.objects already contains the decoders for the common video containers and video formats for playback directly from the timeline. Only for Windows Media Video and a few very rare formats m.objects accesses the decoders installed globally under Windows.

## Hardware support for video decoding

Up to and including m.objects v7.1, the majority of the computing power for video playback had to be provided by the main processor of the system, while the graphics card was mainly used for animation and real-time effects. However, modern video formats (H.264, HEVC) and high resolutions (UHD, 4K and more) cause a considerable processor demand, in particular when playing several video clips at the same time, for example with a crossfade. On the other hand, graphics processors, which are the most complex component of modern computers, are sometimes significantly more powerful than the processor, especially in operations such as video decoding. To take advantage of this, since version 7.5 m.objects can completely outsource the decoding of modern formats (WMV3, VC1, H.264, H.265 / HEVC, VP9) to the graphics card. The result is smooth playback of even extremely high-resolution videos with high frame rates and modern coding.

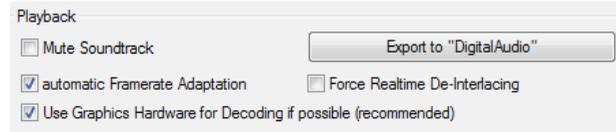
Please note the following:

For the processing of 4K videos, graphics hardware with at least 2GB, better still 4GB video memory is recommended. Older computers, in particular, and those with less powerful graphics hardware or little video memory can, however, possibly deliver a better result if the hardware decoding is not switched on.



When the program is started for the first time, m.objects generally recognizes the appropriate setting by itself and chooses either *automatic* with suitable or *always off* with unsuitable graphics hardware. You can find the settings for this under *Options / Screen Options* in the *Realtime Renderer* tab under the *Hardware decoding for Video* option.

If m.objects does not know the graphics hardware used and has set the option to *always off*, you can instead set the value *automatic*. Test your computer thoroughly for its suitability for hardware-assisted video decoding. If the display is jerky or if there are image errors, try the *Standard* or *Multiscreen* options instead. If this does not improve playback, the graphics hardware is not powerful enough and you should deactivate *Hardware Decoding for Video* with *always off*.



In m.objects, you can even control the use of hardware-based decoding individually for each video using its property form (double-click on the

bar below the light curve).

This means that the computing demand can often be optimally distributed among the CPU and the graphics chip, even if both of them only have a medium performance.

## Insert videos into the m.objects show

Video sequences can be inserted into an m.objects production in the same way as pictures.

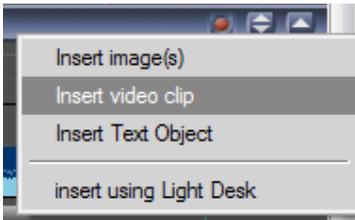
### ***Insert videos via Image Pool***

You can also use the Image Pool here, which you open up using the corresponding button in the toolbar. Double-clicking in one of the empty areas of the Image Pool takes you to the selection window, where you mark one or more videos and insert them into the Image Pool by clicking on *OK*. In this way, you can presort videos and possibly pictures at the same time in the Image Pool, mark them and drag them onto the image tracks with the left mouse button pressed. As with pictures, the video now sticks to the cursor. Release the mouse button at the appropriate point in the image track and the video is placed. Similar to the volume envelope of an audio file, a light curve with the length of the clip is created with frames from the video sequence. The larger you set up the display of the image tracks (e.g. using the plus/*Zoom in* button), the more images are displayed.



A detailed description of the Image Pool can be found in chapter *Insert images via Image Pool* on page 58.

### ***Insert videos using the red dot***



It is even faster by clicking on the red dot below the image tracks. Here you select *Insert video clip* and this will take you to the selection window, where you mark the desired video and confirm with *OK*.

The video sticks to the cursor and can be inserted into the image track.

### ***Insert videos from Explorer***

Alternatively, you can also simply open the Windows File Explorer, mark the video here in the corresponding directory, drag it onto the image tracks and drop it at the appropriate place.

As an alternative to displaying thumbnails across the entire width of the video light curve, only the first and last frame of the respective visible section can be displayed. To do this, select the option *Show only first and last Frame of Videoclips* under *Options / Program Options*.



For all three procedures, it is important to note that there has to be enough space

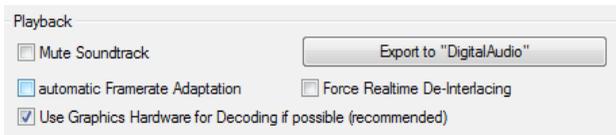
on the image track for the video to be inserted. So if you see a crossed-out circle symbol next to the mouse pointer when placing the video sequence, this means that there is not enough space here. Then either place the video elsewhere or move the subsequent images to create the required space.

If you drag several video files onto the image tracks at the same time, the *\*Standard* tool is used to determine the Transition and Projection times - just like with pictures.

Since the default value for videos is usually not reasonable, it is advisable to drag video files onto the image tracks individually.

## Smoothing the playback of video clips with unsuitable frame rates

When playing back video clips with frame rates that cannot be distributed evenly over the frame rate of the output device (e.g. 24, 25 or 50 frames / s on a 60Hz monitor or projector) there will usually be an even, but sometimes very annoying jerking during playback. This effect is called pull-down and cannot be avoided with conventional techniques. m.objects has a special technique for smoothing the playback of such problematic videos, which suppresses this annoying effect in most cases (up to certain movement speeds). The technology is only used automatically if the frame rates of video and output device do not match, but can also be suppressed specifically for each video clip. To do this, double-click on the bar below the thumbnails of the video and go to the properties window. Here you remove the check mark for the option *automatic Framerate Adaptation*.



The technology also works very effectively when the content of a presentation for which filming was deliberately done in 60 frames / s, a

video with 50 frames / s is later to be exported for European TV sets.

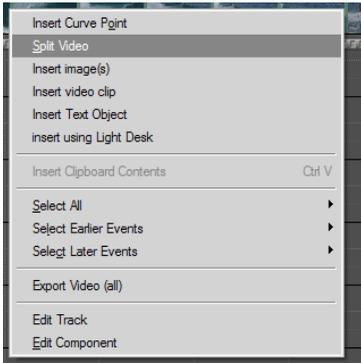
## Frame-accurate video editing in m.objects

Analogous to cutting audio samples, videos can also be cut easily and conveniently in m.objects.



With the preview enlargement, m.objects offers a very convenient way to cut exactly on the individual frame - i.e. on any frame from the video sequence.

If you drag the mouse over the light curve of the video while holding down the *Shift* key, the corresponding preview image is shown enlarged at the position of the mouse pointer. This function is also available if the display is set so that only the first and last frame appear in the light curve. It is advisable to enlarge the image tracks as much as possible with the magnifying glass button in the toolbar, because in conjunction with the accurate depiction of the timeline up to 1 / 1000s, the desired location for the cut can be found quickly and precisely.



As soon as you have found the desired position, right-click on the light curve of the video and select the command *Split Video* in the context menu.

You can see that the video now consists of two separate parts. You can now delete the front or back part from the timeline by clicking on the bar below the thumbnails, which marks the corresponding part. Then press the *Delete / Del* key and confirm with *Yes*. *m.objects* works non-destructively, so the changes made only take place on the timeline, while the original video

remains unchanged.

This way you can of course also shorten a video by removing part of it in the middle of the sequence. To do this, use the *Split Video* command a second time at a later point of the clip, mark the resulting middle part of the video and delete it. To close the gap, mark the rear part and pull it to the left until it latches to the anterior sequence.



Alternatively, you can create a transition from the first to the second part of the video sequence. To do this, drag the rear part of the video clip onto the image track below and move the handles as shown in the following image. Since the two videos are set to overlapping mode (image blending), you achieve a smooth transition from the first to the second part of the video clip and avoid a loss of brightness during the transition.

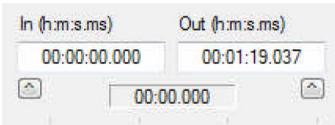
## Place cut video clips on the Image Pool

In most cases, you will not use full length videos in your production, you will only need a section of them. For this purpose, m.objects offers you the option of cutting videos appropriately before the production of your AV show, so that you can then simply paste them in at the appropriate place afterwards.

To do this, first proceed as described above, i.e. insert the video into an image track, create the desired section by cutting and then delete the video from the track. This puts it back on the Image Pool, where it keeps the in / out times, i.e. the information about the beginning and end of the section. If you then want to insert the video into your production, drag it from the Image Pool to the desired location in your production. This way you can manage video *clips transparently in the storyboard*.

### In / Out times - manual input and SMPTE timecode

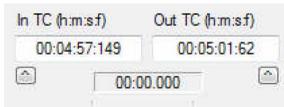
Double-click on the bar below the thumbnails to open the video properties window. Here you will find the information for *In* and *Out*, i.e. for the beginning and end of the video or the excerpt from the video.



The times for in / out are usually represented by m.objects in the format *h:m:s.ms* (ie hours, minutes, seconds and milliseconds). This information is relative to the beginning of the video stream within the file used. So here for an uncut video the value

00: 00: 00.000 is set for *In*. If the video is cut at the beginning, a varied value is set, for example 00: 00: 02.075.

You can also manually enter the entry point (*In*) and the exit point (*Out*) here, thereby defining a section of the video. To do this, either enter the values in the input fields or click on *Start* so that the video runs on the Screen, and then click on the button below the input field for *In* or *Out*. The corresponding times are then entered into the field. This automatically adjusts the playing time of the clip on the timeline.



If a video file also has an SMPTE timecode (in the format *h:m:s:f*, i.e. frame number instead of milliseconds), this information is used automatically.

It then usually contains an indication of the real time of the recording. This is used, for example, to synchronize takes that are overlapping in time and recorded from different camera perspectives.

## Frame-accurate and loss-free video trimming

In most cases, videos are not inserted into a presentation in full length, but cut to a specific section. With the help of a Wizard in m.objects you can then save this video section as a new video without any loss of quality and therefore replace the precedent video on the image tracks with the new video. A detailed description of this can be found in the chapter *Wizard: Loss-free trimming of Video files* on page 190.

## Video processing in m.objects

Starting with the expansion level m.objects live, with the *Picture-/Video-Processing* Dynamic tool m.objects offers extensive options for processing important video parameters such as brightness, contrast, sharpness and many more directly on the image tracks. Together with the m.objects cutting function, the use of external software is therefore redundant in many cases.

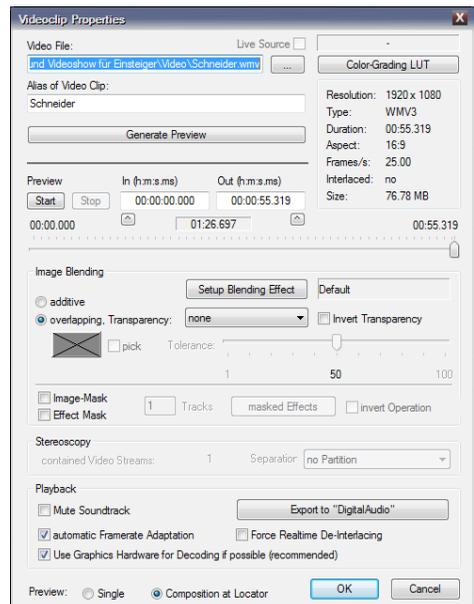
You can read more about how the *Picture-/Video-Processing* object works in chapter *Picture-/Video-Processing* on page 129.

## Audio dubbing of videos

Without further action, m.objects outputs the audio of a video - if available - directly coupled with the image via the image tracks. The audio will be faded in and out together with the footage this way.

However, if you want to export a video file as the end product from m.objects or if you want to edit the audio of the video differently, place the video on one of the audio tracks additionally. You do not have to carry out this step yourself, since one of the m.objects Wizards will do it for you: Double-click on the bar below the video to open the *Videoclip Properties* window.

Here, click on the button *Export to "DigitalAudio"* in the lower area,



whereupon the wizard will open up. Alternatively, you can find the wizard under *Edit / Wizards / separate Soundtrack from Video*.



Here you confirm with *OK*, and then the video's audio is stored on an audio track and at the same time the video on the image track is muted so that the audio output does not overlap. A detailed description can be found in the chapter *Wizard: separate Soundtrack from Video* on page 187.

This gives you all the options for editing the video's audio that you also have with other audio samples.

## Slow motion and time lapse

With the Dynamic object *Speed*, you can change the playback of a video in many different ways, for example you can create a slow motion effect by slowing it down or a time lapse effect by accelerating it. In addition, this object can also be used dynamically, so that the change of speed appears as a dynamic effect. For example, a video can be slowed down from normal speed to a freeze frame.

A detailed description of the *Speed* object and its use on videos can be found in chapter *Speed - dynamic slow motion / time lapse* on page 134.

## Application of objects and masks to videos

The Dynamic objects in m.objects offer numerous exciting options for integrating pictures into a multivision. They can also be applied to videos in the same way.

### ***Video in an Image Area object***

If you want to assemble a video as a picture-in-picture effect for design or resolution reasons, use the *Image Area* object.

You can see that the background image has been blurred with the image editing



functions of `m.objects`, so that the video in front of it is set off better against it. You can change the position of the video within the Screen as you wish by dragging an Image Area object onto the light curve of the video and either entering numerical values in the editing window of the Image Area object or moving the Image Area by dragging the mouse with the arrow controls. Make sure that the check mark is placed between the chaining symbols.

Or you can simply click on the Image Area symbol on the light curve and move the video directly to the desired position on the Screen. If you hold down the *Shift* key, you can move the Image Area with the video exactly horizontally or vertically.

### Video with Zoom object

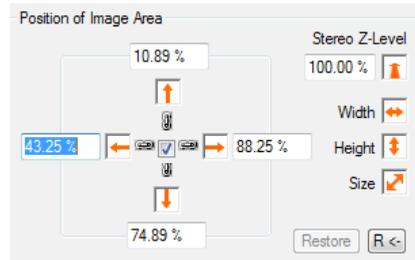
As with pictures, a static or dynamically moving image section can also be displayed with videos. This is particularly useful if the resolution of the video is better than its effective representation, for example if you are showing a video in 4K resolution on a screen with Full HD resolution.

In principle, you use the application by dragging and dropping one or more *Zoom* objects from the Tools window onto the video in the image track. The editing window of the Zoom object offers you the necessary options for changing the *Zoom Level* and positioning the *Zoom Center*. Alternatively, you can relocate the center of the zoom directly on the Screen.

As with pictures, both static zoom effects in the form of a section enlargement and dynamic zoom drives through a video can be created in this way. In any case, you should make sure that the video used has a sufficiently high resolution. Otherwise an enlargement would cause blurring and raster effects. On the other hand, you do not have to fear an additional demand on the processor or the graphics card by applying the Zoom object to a video.



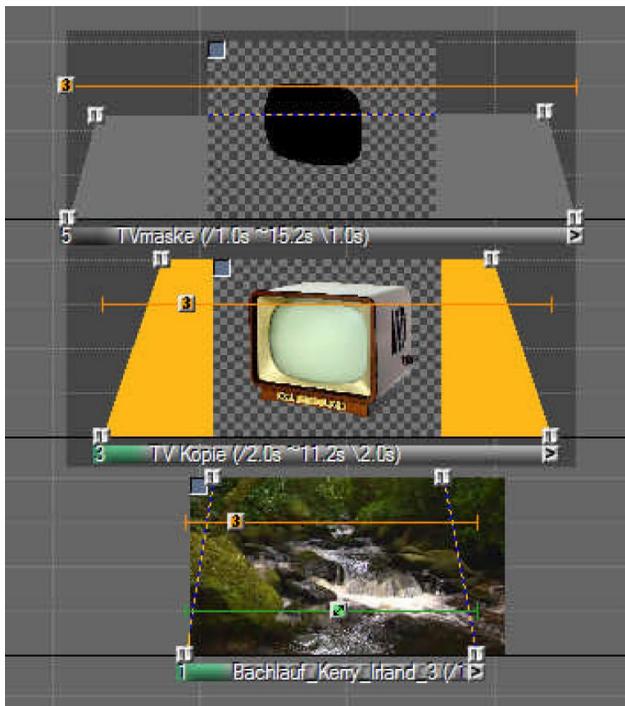
A zoom drive through a video is particularly useful when the footage was shot from a fixed camera position and with the focal length unchanged. Then you can subsequently zoom into the footage with the Zoom object in `m.objects` and install



camera pans.

Even if a video clip has already been recorded with zooms or camera pans, the additional use of the Zoom object in m.objects can lead to exciting results.

## Video and 3D object



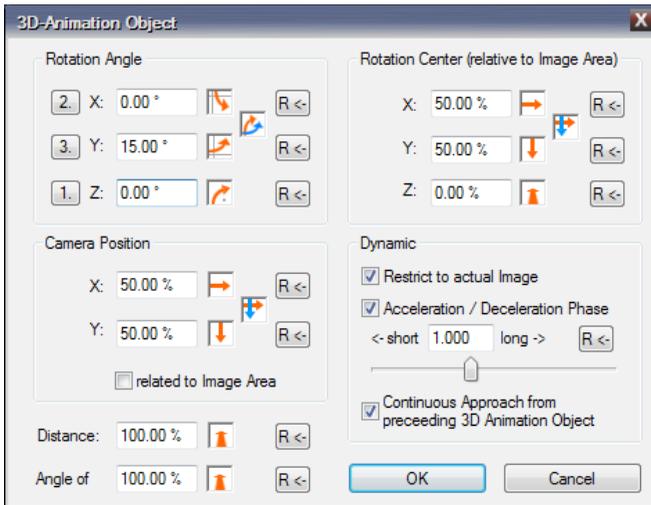
The 3D object can also be used in a versatile and creative way when used with videos. Basically, you can use it to turn and rotate videos in all imaginable directions and with different rotation centers. Here, too, the additional animation of the video with m.objects is only slightly more demanding for the computer.

It is also interesting to be able to display a video clip distorted in perspective using the 3D object and thus integrate it into an existing scene. This is shown here using the example of an old tube television. The aim is to let the video run on

the TV screen, an effect that can be implemented with relatively little effort.

To do this, a mask in the form of the TV screen is first created in Photoshop or another image processing program and placed on an image track in m.objects. In the lane below, the picture with the TV is stored and below that the video (see arrangement in the screenshot above). In the image properties of the mask (double-click on the bar below the light curve), it is specified that it serves as an image mask for one track. This makes the picture with the TV transparent so that the video from

the lower image track can be seen there.



An Image Area object brings the video to the right size and position. With a 3D object, the video is inserted into the scenery to match the perspective. Make the appropriate settings in the properties window of the 3D object.

Here it is particularly important to adjust the value for the *Y* axis so that the video is correctly on the Screen. The television

and mask are also provided with 3D objects in order to reinforce the perspective already present in the picture.

## Real-time chroma keying

This function is available from the expansion level m.objects creative upwards.

With chroma keying, you can create a transparent area in a video, through which an underlying image becomes visible. You define the transparent area via a *Brightness* value, a *Color* value or a *Hue* in the video. The separation between the visible and



the transparent area of the video becomes more distinct the more these areas in the video differ from one another in terms of their hue or brightness.

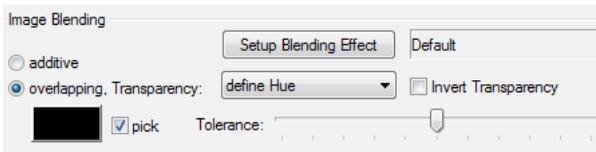
A classic application for chroma keying is the bluebox or the green screen, a technique that is often used in film or television productions: A person acts in front of a plain blue or green background, on which the viewer can then see an image or a graphic, so that the impression arises that the person is located in a corresponding scenery or in front of a weather map, for example.



The screenshot shows a video that was shot in a bluebox. It is in the upper image track A, in track B below there is an image that will later appear in the blue color area of the video.

To do this, double-click on the bar below the light curve of the video so that the editing

window opens up.



In the middle you can see the options for *Image Blending*. Detailed information on this can also be found in chapter *Image blending* on page

66.

Videos are inserted by m.objects - in contrast to pictures - by default in the mode *overlapping*. For *Transparency*, you will initially find *none*. Use the drop-down menu to select the *SmartKey* option and then click on the box next to *pick*. Then use the pipette to pick up a medium hue from the background. To reliably see the effect of

the exemption, select the *Single* option at the bottom of the video clip's properties window. With the *Tolerance* controller you can make a fine adjustment if necessary. The blue area of the video is now transparent and the woman appears in front of the background image as soon as you confirm the window with *OK*.

You can also choose *define Color* or *define Hue* here. The tolerance of the selection is much lower that way, so that darker or lighter areas may not be included in the selection and are therefore not or only partially gonna be transparent. In this example, SmartKey is the better alternative because the blue background is not evenly



illuminated. Another option, *SmartKey Reflection*, is useful if the motif to be cut out contains reflections of the background color. This can be the case, for example, if a person with a white shirt is filmed in front of a green screen and the green color of the background is reflected in the shirt. The *SmartKey Reflection* option then ensures that these reflections are also removed from the image.

Of course, chroma keying with *m.objects* does not require videos in the Bluebox technique. It offers exciting opportunities to experiment with transparency effects in videos. Thus you can also put a second video below it, which then appears in the transparent area, or a tracking shot or 3D animation.

It can also be particularly appealing to use the video that is exempted with chroma keying as a mask. As with freeze frames, simply select the *Image-Mask* option in the editing window of the video and then enter the corresponding number of *image Tracks* that are supposed to be masked. The moving image in the video will result in a moving mask.

## Video formats

### *Supported video files*

M.objects can use video files in the following containers and formats - among many others - directly in the timeline:

- Compression: H.264, H.265 (HEVC), VP9, MPEG-2, MPEG-4, MJPEG, DV, HDV, WMV, DivX, Apple ProRes and many more

- Containers: Apple Quicktime (\*.qt, \*.mov), ASF, MTS, M2TS, VOB, AVI, FLV and others

## Color grading for pictures and videos

### The use of lookup tables

With color grading, m.objects offers a processing technique that goes far beyond the mere correction of pictures and videos. With the help of so-called lookup tables (short: LUTs), videos and pictures can be changed in their color effect in a variety of ways. These changes range from the emphasis on certain colors to the significant alienation. For this purpose, a LUT assigns changed color values to certain color values or color combinations of the original material, or, to put in simple terms – a LUT gives instructions on how to interpret colors and color combinations. A typical application for color grading with lookup tables are feature films, in whose post-productions LUTs are almost always used to give the films a specific look, which we as viewers associate with certain emotions. There are countless LUTs available for this, each of which has its own effect. A very popular effect in post-processing is, for example, a color change in the direction of teal and orange, which is often seen in modern feature films.

With the color grading in m.objects you can give your presentation, certain sequences from it or just individual pictures and videos your own look. In this way, the message and intention of your m.objects show can be specifically influenced and emphasized.



The example shows a possible mode of operation of a LUT: The unprocessed part of the image can be seen on the left, using the LUT on the right.

In addition to the creative, artistic application of LUTs, there are also LUTs for correction purposes. With many professional and semi-professional cameras, video sequences / pictures are optionally initially recorded in a way so that they store the highest possible amount of image information. Similar to RAW images, such



videos/pictures initially appear flat and low in contrast when unprocessed. Correction LUTs that are precisely aligned to the respective camera model provide a remedy here. This type of application is of course also possible in m.objects.

Use of a correction LUT: the unprocessed part on the left, the corrected part on the right.

m.objects generally uses the so-called 3D LUTs, which are significantly more flexible in use than the 1D LUTs.

There is a large number of articles on the Internet for further information on the effects and working methods of lookup tables. Lookup tables are usually described here in connection with videos. m.objects offers you the possibility to use LUTs not only on videos, but also on single pictures.

For the application itself, there are two ways in m.objects: You assign a LUT in the properties window of the respective picture or video, or you carry out this step with the Dynamic object Picture-/Video-Processing. The second way also offers the option of affecting the efficiency of the LUT. In this case, you can also combine the use of the LUT with the other settings and correction options for Picture-/Video-Processing.

|   |                  |                   |
|---|------------------|-------------------|
|  Lut        | 10.12.2019 17:07 | Dateiordner       |
|  Midi       | 03.12.2019 12:42 | Dateiordner       |
|  mob_Auto   | 03.12.2019 13:52 | Dateiordner       |
|  Pic        | 03.12.2019 12:42 | Dateiordner       |
|  Sound      | 03.12.2019 13:05 | Dateiordner       |
|  Video      | 03.12.2019 12:42 | Dateiordner       |
|  Island.moa | 03.12.2019 14:13 | MOA-Datei         |
|  Island.mos | 03.12.2019 13:19 | m.objects AV Show |

As soon as you use a lookup table, m.objects offers you via file management to copy it into the project directory. It makes sense to carry out this step so that the project directory remains complete and m.objects can continue to access the LUT, for example

when transferring the show to another computer. A new folder named *Lut* is created in the directory structure of your project.

## Sources for lookup tables

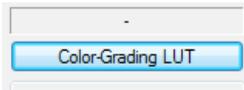
There are numerous websites on the Internet where lookup tables are available for download. With a Google search for keywords such as *lut* and *download* or also specifically for certain providers such as *ground control*, you will find corresponding links. In addition to an abundance of free LUTs, there are also chargeable offers for special purposes.

Correction LUTs for certain cameras can usually be downloaded from the manufacturer's website.

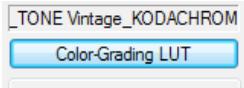
m.objects processes the following file formats for LUTs:

\*.3dl, \*.cube, \*.dat and \*.m3d

## Apply color grading in the properties window



Double-clicking on the bar under the light curve of a picture or video takes you to the associated properties window. Click the *Color-Grading LUT* button at the top right.



In the following window, select the folder in which you have saved the desired LUT, click on it and confirm with *Open*. The lookup table is immediately applied to the

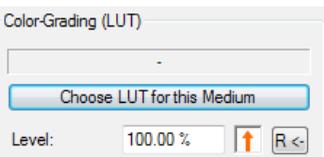
picture or video, so the mode of action is directly visible on the Screen. In this way, you can also try out different LUTs first. The selection made is shown above the button.

Then confirm the properties window with *OK*.

To deactivate a LUT again, click on *Color-Grading LUT* in the properties window again and in the following window on the bottom left on the button *Don't use LUT for Color-Grading*. This change is also immediately visible on the Screen. Then confirm the properties window again with *OK*.

## Use color grading in Picture-/Video-Processing

First drag the Dynamic object *Picture-/Video-Processing* from the Tools window onto the light curve of the picture or video. The editing window of the object then opens up. If such an object is already stored on the light curve, double-click on it.

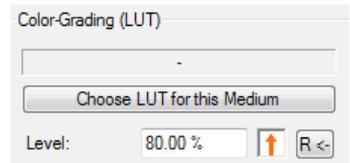


Click on the button *Choose LUT for this Medium* in the top right and select the corresponding directory and the desired LUT in the following window.

Confirm with *Open* so that the LUT is applied and its effect becomes visible on the Screen. The name of the activated LUT is now displayed above the

button. In the previous selection window, you can later deactivate the LUT again by clicking on *Don't use LUT for Color-Grading*, as already described above.

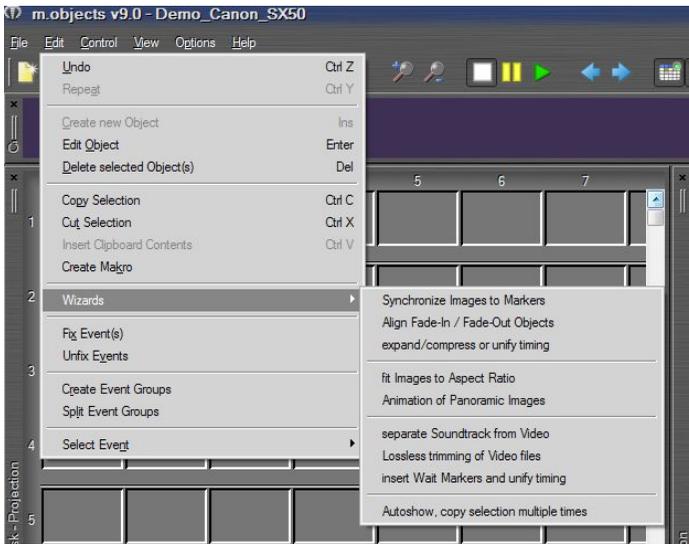
In contrast to the properties window of the object, the *Picture-/Video-Processing* also offers you the possibility to influence the efficiency of a LUT. You can set the *Level* directly underneath the *Choose LUT for this Medium* button.



The default value here is 100%. If you want to weaken the effect of the LUT, enter a corresponding value here or click on the orange arrow, hold the mouse button down and set the desired effect by dragging with the mouse. Of course, you can also monitor these changes directly on the Screen.

Since the Picture-/Video-Processing is a Dynamic object, you can also use a LUT dynamically here. To do this, drag another Picture-/Video-Processing object (or several if necessary) onto the light curve and then enter a changed value for the Level, i.e. the efficiency of the LUT. As with other dynamic effects, m.objects creates an animation between the objects, so that, for example, the effect of a LUT from Level 0% to Level 100% is slowly faded in. Please note, however, that you can only assign a specific LUT to several *Picture-/Video-Processing* objects within one light curve.

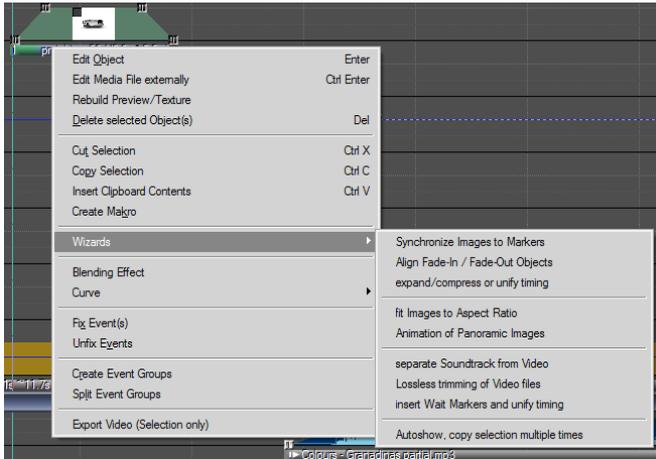
## Working with wizards



In m.objects there are a number of wizards that can perform complex tasks with just a few mouse clicks, which would otherwise require a number of work steps. Using the wizards simplifies and speeds up the production of an AV show and in many cases saves the time-consuming repetition of the same work steps.

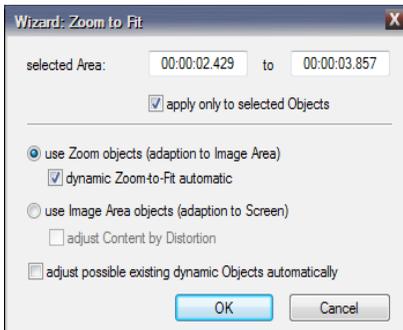
All actions that you carry out with the help of the wizards can be subsequently changed and individually adjusted so that you always have control over what is happening in your production. You will find the wizards in the *Edit / Wizards* menu.

Alternatively, you can also call up the wizards from the context menu by right-clicking on a selected object, for example on the bar under the light curve of an image.



With a wizard you can either edit a single object (for example an image), several objects at the same time or the entire show. Therefore, the *selected Area* is displayed for all m.objects wizards (except for *Autoshow*). For example, if you have marked several

images and then called the wizard, the selected area extends from the first to the last marked image.



For some wizards you will also find the option *apply only to selected Objects*. It is activated by default, which is important if not all objects in the selected Area are selected, e.g. one or more images have been left out. The wizard will then not be applied to these unselected objects. However, if the option is deactivated, it is always applied to all objects in the selected area. If you call the wizard without initially selecting an object, it affects the entire show.

## Wizard: Synchronize Images to Markers

This wizard makes it easy to synchronize images with the music in your AV show. To do this, you first create markings on the timeline in cadence with the music, with which the wizard then aligns the fading in and out of the images.

Therefore, start the locator at the desired point of the show and press the *Delete* key on the keyboard to match the cadence of the music. Each time the button is pressed, a so-called *Time Marker* is created on the timeline, which runs as a vertical line over the image and audio tracks.



If some individual Time Markers do not yet exactly match the cadence of the music, you can simply move them on the timeline with the mouse and orient yourself on the dynamic curve of the music in the audio track. In this way, the positioning of the Markers can be subsequently optimized.



The use of Time Markers is particularly useful when you want to create 'hard' image shifts, i.e. without cross-fading from one image to another. However, if you want to work with cross-fades, the so-called *Range Markers* are helpful. To create them, you also start the Locator, but now press the *Enter* key at the desired start of the transition, hold it down and then release it when the transition is supposed to be finished. Range Markers also appear on the timeline, but are connected with a blue line. This is the area in which the crossfade is supposed to take place.

You can also move the Range Markers on the timeline and thereby correct the position.

Before you call up the wizard via *Edit / Wizards / Synchronize Images to Markers*,

make sure that the created Markers are selected on the timeline.



In the lower area of the window you will find an input field in which you can enter a value for the *Dissolve Time at Single Markers*. This entry only applies to Time Markers, with Range Markers the transition time results from the marked area. If you use Time Markers, enter the value 0 for hard image shifts. Now confirm the window with *OK*.



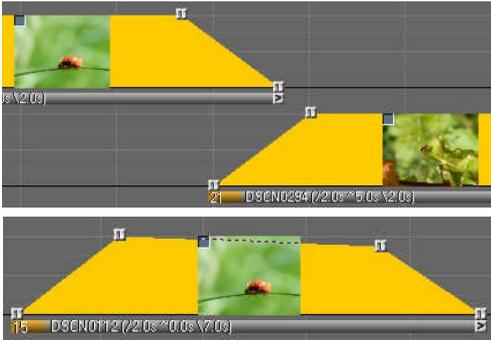
The wizard now precisely aligns the fade-ins and fade-outs to the individual Time Markers. For example, if you enter 1.00 s instead of 0.00 s, the wizard positions the transitions so that two thirds of a transition takes place before the Time Marker and the last third behind it. The transition is already clearly noticeable with the Time Marker.

If you use Range Markers, the input for the dissolve time does not matter. You simply confirm the window with *OK* and the wizard aligns the transitions with the Markers you have created.

*The option keep Positions of following Objects if possible*

ensures that the subsequent images on the image tracks are not moved, if feasible. In this case, the wizard adjusts the Projection time of the last image in the selected area accordingly. Moving cannot be avoided, however, if the selected images on the tracks are distinctly moved backwards as a result of the synchronization, so that the wizard must inevitably also move the subsequent images.

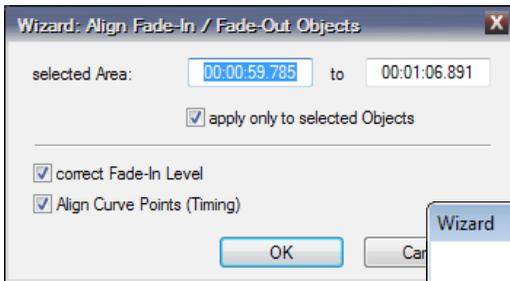
## Wizard: Align Fade-In / Fade-Out Objects



When working on a show, it can quickly happen that the fade-ins and fade-outs or cuts of individually stored or shifted images have a slight, undesired offset compared to the previous and subsequent images, as the example shows.

It can also happen that a handle for an image that is actually fully faded in accidentally slips below the 100 percent line when editing.

The *Align Fade-In / Fade-Out Objects Wizard* can intelligently recognize and automatically correct such inaccuracies. To do this, mark the area you want to check and select the wizard mentioned in the menu.



By clicking on *OK*, the wizard carries out the necessary corrections and gives an appropriate feedback.

However, if the deviations exceed



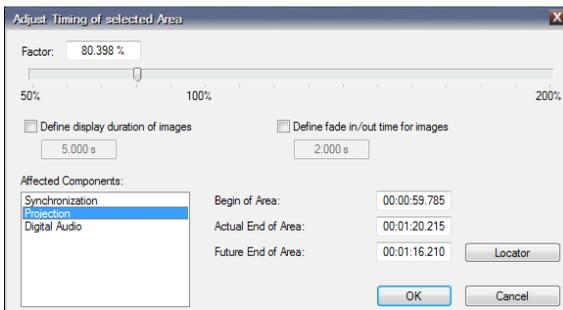
a certain amount, i.e. there is a very clear offset between the fade-in or fade-out or cuts or there is a strong deviation of a handle from the 100 percent line, the wizard does not carry out any corrections. In such cases, the wizard assumes that these deviations are intentional, so that fades that are set asynchronously or images that are not fully faded in remain untouched.

## Wizard: expand / compress or unify timing

With the Wizard expand / compress or unify timing, image sequences, entire presentations or individual animations and effects can be scaled in time. You can also change the Transition and Projection times.

Example 1: *Bring an image sequence to a stated length*

If you want to lengthen or shorten the duration of an image sequence in your presentation, first position the locator where the image sequence is supposed to end in the future. Then mark the sequence by drawing a frame with the left mouse button. It is also sufficient for this function to select only the first image and the last image. Then select the menu item *Edit / Wizards / expand / compress or unify timing*. Click



the *Locator* button at the bottom right to adopt the end point from the locator and confirm with *OK* to execute the function.

Alternatively, you can set the compression or expansion of the image sequence manually with the slider *Factor* or enter the end of the image sequence numerically as a time value (*Future End of Area*).

Example 2: *Scaling the area of a presentation*

In contrast to the first example, in this case you do not only influence the objects in the image tracks, but also adjust an entire area of your presentation. To do this, mark the area and select the function *Edit / Wizards / expand / compress or unify timing*. Now make sure that you select all the items in the list of *Affected Components* in order to adapt any audio arrangements, waiting times and index Markers on the time ruler or even comments. Then move the *Factor* slider or enter the desired future end time manually. Here, too, it is of course possible to transfer the locator time as in the first example. Confirm with *OK*.

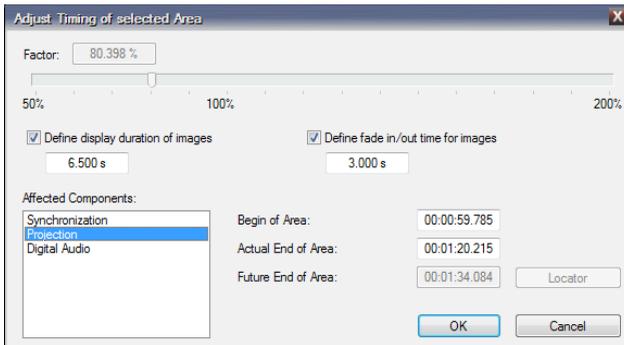
Note that cuts in audio samples within the scaled area may need to be revised. After stretching, it can of course also happen that audio samples are too short. You have to make corrections manually. By the way, owners of a DirectX plug-in *Time Stretching*

(e.g. Sonic Foundry, Acon AS) can elegantly expand or compress samples directly in m.objects without changing their pitch.

### Example 3: *Changing the Transition and Projection times in fixed values*

If you do not want to scale a selected area proportionally, you can instead enter fixed values for the Transition and Projection times. To do this, mark the area as described above and select the Wizard.

Now tick the checkbox for *Define display duration of images* or *Define fade in/out time for images*. Then enter the desired values in the input fields below and confirm with *OK*. It is, of course, no longer possible to enter a Future End of Area for the selected area, since this results from the Projection times and Transition times. Therefore, the button *Locator* cannot be selected in this case.



This function is the most effective and easiest to implement in simple image sequences, but in complex arrangements on the timeline, conflicts can arise, for example, with existing animations. If necessary, m.objects deviates from the specifications and carries out the changes in an

adapted form. Either way, you should check existing animations after the change and correct them if necessary.

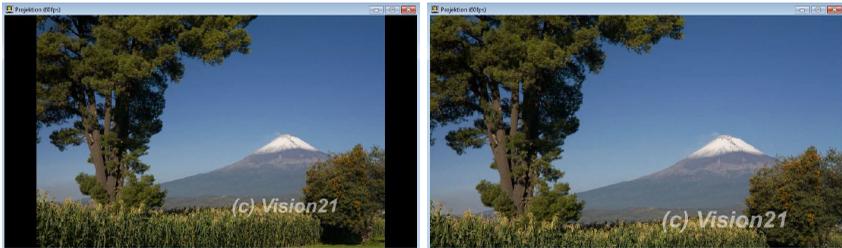
Videos are generally not taken into account by the *expand / compress or unify timing* Wizard, as they are usually deliberately aligned to a certain duration.

## Wizard: fit Images to Aspect Ratio

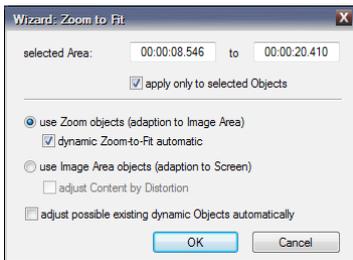
When you start the production of an m.objects show, one of the first steps is to determine a suitable aspect ratio for the m.objects Screen. If images in your show deviate from this aspect ratio, this means that they are displayed on the Screen with black bars at the top and bottom or on the right and left. With the help of the wizard, the images can now be enlarged so that they completely fill the Screen.

The same also applies to images that are displayed in a reduced size on the Screen

due to an Image Area object. Here, too, you can use the wizard to adjust the aspect ratio to ensure that the image completely fills its Image Area.



The fit Images to Aspect Ratio Wizard performs this action automatically. Therefore, open the wizard via the menu *Edit / Wizards*.



If you now confirm with *OK*, a *Zoom* object will be placed on the selected images, which is automatically set to the appropriate *Zoom Level*. If there is already a single *Zoom* object on an image, the wizard adjusts this object accordingly. The *dynamic Zoom-to-Fit automatic* option is also selected by default here. With this, *m.objects* defines a *Zoom Level* of 100% based on the Screen or the Image Area. In this case, 100%

means that the image completely fills the Screen or the Image Area.

Instead of the *Zoom* objects, *Image Area* objects can also be used to adapt to the aspect ratio of the Screen. To do this, simply activate the corresponding option in the Wizard. The wizard then places a correspondingly set *Image Area* on the light curve: The *Image Area* is enlarged far beyond the edges of the Screen until the image fills the Screen. Here, also, the wizard adjusts any existing *Image Area* accordingly.

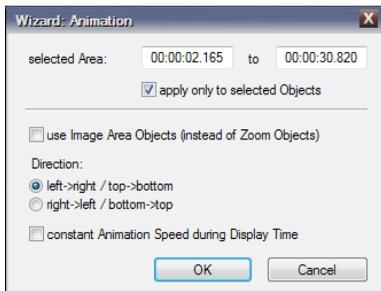
When using *Image Areas*, there is also the option of adapting to the Screen by distorting the image. To do this, select the corresponding option in the wizard. The advantage is that the image is not 'truncated', which cannot be avoided if the image is adjusted without distortion. If the image format differs slightly from the Screen format, such a distortion can make sense, since it can not be perceived by the viewer, whereas the distortion is usually too great with larger deviations.

Below this you will find the option *adjust possible existing Dynamic objects automatically*. If you have animated an image, for example with a *zoom run*, there

are two or more Dynamic objects on the light curve, i.e. Zoom, Image Area, Rotation or 3D objects. By selecting this option, the wizard ensures that the animation is adapted to the changed display of the image. Fine-tuning the Dynamic objects can still be useful.

## Wizard: Animation of Panoramic Images

This wizard takes care of the creation of camera pans / camera movements through panoramic images. It is very easy to use.



Open the wizard via the menu *Edit / Wizards* or via the context menu. In the following window you will find a few options that you can customize for the animation.

Animating a panoramic image works similarly to simply panning through an image with the help of two Zoom objects. By default, m.objects therefore also uses Zoom objects for the animation of panoramic images.

If you want to create the animation with Image Area objects instead, activate the corresponding option. This is particularly useful if you are using a panoramic picture in an extreme wide format (or portrait format) for which the maximum Zoom Level of the Zoom object of 800% is not sufficient to allow the image to completely fill the Screen. An Image Area, on the other hand, can be enlarged as required, so that it can also process such images for panorama panning.

The pan can be moved horizontally from *left* to *right* or from *right* to *left* and - for portrait pictures - from *top* to *bottom* or from *bottom* to *top*. Simply select the suitable option for this too.

You will also find the option *constant Animation Speed during Display Time* in the Wizard. Select this option if you want to achieve a constant movement speed across the entire pan. In this case, the panorama Wizard places the two Zoom or Image Area objects at the beginning of the fade-in or at the end of the fade-out, so that the panorama also moves in the fade-in and fade-out phase.



If this option is not activated, however, the pan is slowly accelerated at the beginning

and slowed down again at the end, i.e. it does not run at the same speed. In this case, the Wizard places the Zoom or Image Area objects at the beginning or at the end of



the fully exposed Projection Time of the image.

The pan only begins after the

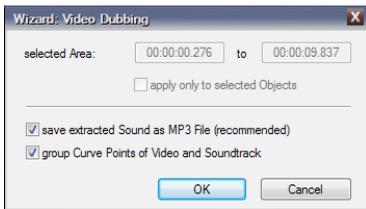
image has been completely faded in and ends at the beginning of the fade-out. Of course, you can move the objects as required and thus define the start and end of the pan yourself.

## Wizard: separate Soundtrack from Video

If you use videos in your AV production, m.objects offers you convenient options for editing the audio separately, e.g. cutting the audio, changing the volume or applying sound effects. The premise for this is that a video is not only stored on an image track, but also on an audio track. m.objects shows the volume envelope of the video's audio and provides all editing functions that you also have for all other audio samples. It is important for the exact synchronicity between image and audio that the video is positioned on the tracks at the exact same time. In addition, the video in the image track must be muted so that only the edited audio can be heard from the audio track. The Wizard *separate Soundtrack from Video* takes care of all this work for you and also converts the audio into MP3 format if required. So, if you have not already done so, place a video on an image track.

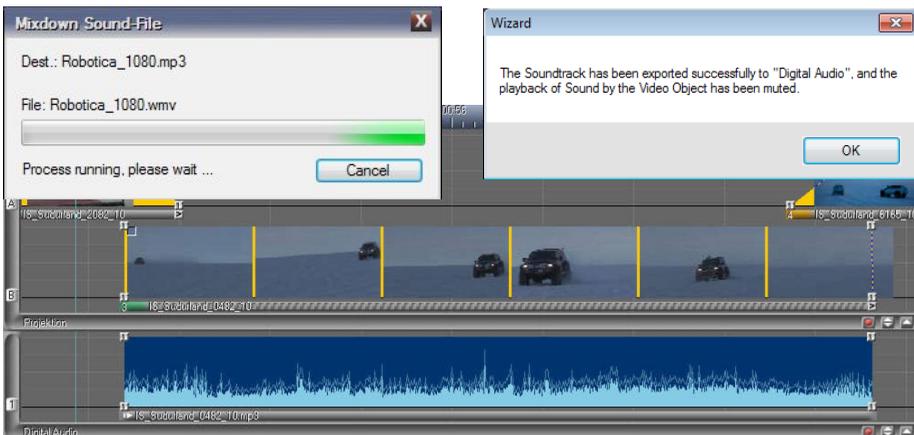


Right-click on the bar below the light curve. Now select the Wizard in the context menu.



The option *save extracted Sound as MP3 File (recommended)* is already selected. This also applies to the second option, *group Curve Points of Video and Soundtrack*. This groups the video in the image track with the video's audio in the audio track. If you later move the video on the image track, it will also be moved in the audio track, so the synchronicity is maintained. Within

this grouping, however, both the video and its audio can be dragged to other tracks if necessary. Here, too, the synchronicity is of course maintained.

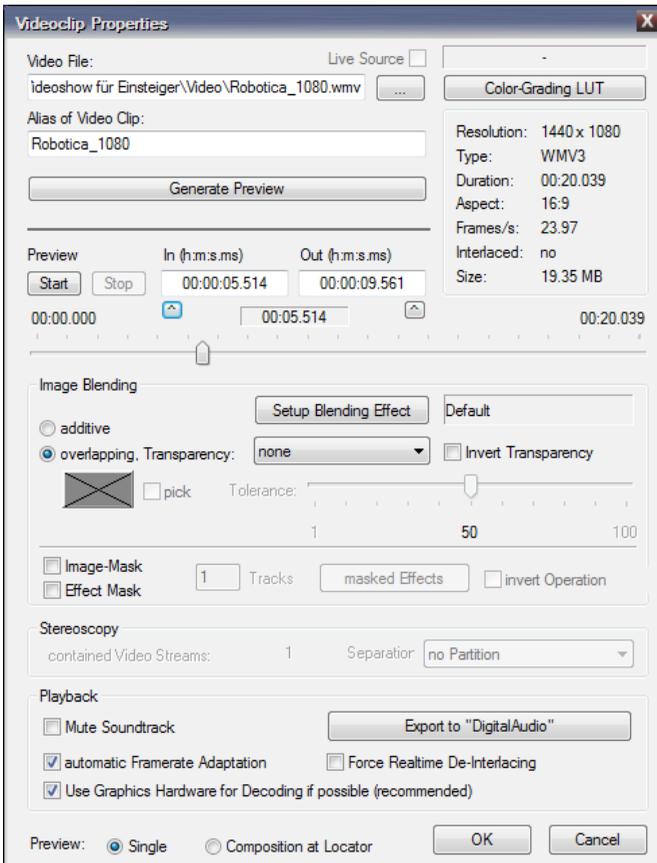


The grouping can be removed later via *Edit / Split Event Groups*.

Confirm the wizard with *OK*. m.objects now embeds the audio from the video into an audio track. If more than one audio track is available, m.objects uses the lowest one with enough space. If necessary, another audio track is created.

The audio from the video is now available separately on an audio track and can be further edited there.

Alternatively, you can call up the Wizard from the video editing window. To do this,



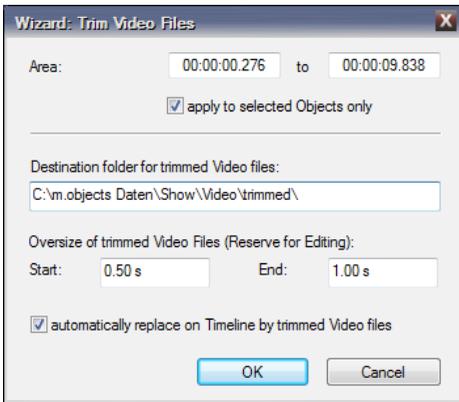
double-click on the bar below the light curve.

Particularly interesting in connection with the video Wizard is the option of setting a start offset for the video here, which means that the video does not start at the beginning, but at any other point in time that can be set. With the button *Export to „DigitalAudio“* you can now open the video assistant, which takes over the settings for the start offset. The video's audio then also starts in the audio track with the preselected starting value.

## Wizard: Loss-free trimming of Video files

In most cases, you will not use videos in their multivision in full length, but shorten them to a certain section. Since m.objects works non-destructively, the uncut original video is initially retained in the project directory, while only a short part of it is used in the image tracks. Especially with longer videos, this can lead to a considerable amount of data. Therefore, the program with the Wizard *Lossless trimming of Video files* allows you to shorten one or more videos to the required length, including a cut reserve at the beginning and end, and save them as new files. The crucial point here: This trimming is executed without another compression - i.e. without any loss of quality compared to the original. This procedure works with almost any encoded video files.

To do this, mark one or more cut videos on the image tracks and select *Edit / Wizards / Lossless trimming of Video files* in the program menu. If you want to trim all videos in your presentation, you can call up the Wizard without making a selection.



In the following window you can see the target directory for the trimmed videos. By default, m.objects creates the subdirectory *trimmed* in the video folder of your project. It is advisable to continue working with this specification, alternatively you can of course also specify a different directory here.

Below you will find the input options for a cutting reserve. Here you can enter how many seconds before the beginning and after the end of the cut

video should also be saved from the original. Such a reserve is useful to be able to make changes in the presentation later.

At the bottom of the Wizard's editing window, you will find the option *automatically replace on Timeline by trimmed Video files*.

If this option is ticked, m.objects will then replace the cut videos frame by frame with the trimmed versions.

```
mob_TrimLog_20-05-07_12-18 - Editor
Datei Bearbeiten Format Ansicht ?
Video File(s) was/were trimmed successfully. (The file(s) was/were replaced on the Timeline.)
Completed:
1: Projection, Track G @ 00:00.276
   In: "Z:\Office\Workshop\2019\Einsteiger\Foto- und Videoshow für Einsteiger\Video\Robotica_1080.vmw"
   Out: "C:\Users\win7\Pro x64\Documents\m.objects Daten>Show\Demos\demo_Canon_SX50\Video\Trimmed\Robotica_1080_trim_0_10595.vmw"
```

Confirm with *OK* to start trimming the videos. After m.objects has completed the process, you can view the log.

The log lists the processed videos and specifies the image track on which they are stored and the time at which they begin. Both the original videos and the trimmed videos are each displayed with their file path. The names of the trimmed videos are given the addition *\_trim*. Behind it, in milliseconds, is the information about the beginning and end of the video section from the original, including the cutting reserve. As a rule, the value for the beginning differs somewhat from the specified cutting reserve. The reason for this is that m.objects has to expand the cutting reserve up to a keyframe.

The log is also saved as a text file in the folder *trimmed* so that you can still access it later.

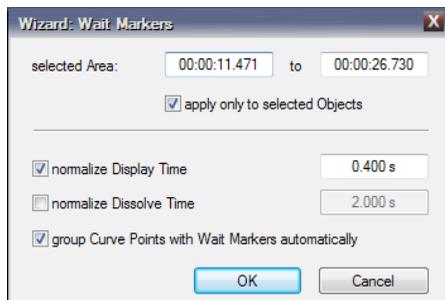
Videos that have already been trimmed can also be cut and trimmed again on the image tracks, of course also without loss of quality compared to the original.

After you have trimmed the videos, you can delete the corresponding originals from the video directory of your project and thus significantly reduce the data volume. It is important, of course, that the original videos - as well as basically all pictures, videos and audios - have backups elsewhere.

## Wizard: insert Wait Markers and unify timing

Wait Markers are part of the speaker support, which is available in the expansion levels m.objects live, creative and ultimate or in the earlier license types plus and pro. With m.objects basic, speaker support and thus this Wizard cannot be used.

This Wizard inserts Wait Markers in the timeline and offers the possibility to adjust the Projection times as well as the



fade-in and fade-out times of the images to the Wait Markers. This Wizard saves you a lot of work, especially if you need Wait Markers at many points in your presentation.

Select one or more images in your presentation and open the Wizard via *Edit / Wizards / insert Wait Markers and unify timing*. The *normalize Display Time* option is already selected with the default value *0.400 s*. With this specification, the Wizard ensures that the Projection times of the affected images immediately before and after the Wait Marker are kept very short.



You can control the effective Projection time of the image on the screen or m.objects Screen individually using the Waiting Marker. For more information on the use of Wait Markers and the use of speaker support, jump to chapter *Speaker Support* on page 225.



The second option in the Wizard offers the option of also standardizing the fade-in and fade-out times (*normalize Dissolve Time*) of the images that are marked with Wait Markers. This option is particularly useful

for a longer sequence of images and ensures even cross-fading between the individual images.

Here, also, you can of course change the default value of *2.000 s*.

In addition, the option group *Curve Points with Wait Markers automatically* is selected by default. The Wait Markers and associated images are thus combined into an event group so that their alignment with one another is always preserved, for example when objects are moved on the timeline. The grouping can be removed later via *Edit / Split Event groups*.

## Wizard: Autoshow, copy selection multiple times

The Autoshow Wizard is used to copy objects multiple times within a presentation, whereby you can freely select the number of copies. The Wizard can be used on any object, for example on Dynamic objects (Image Areas, Zoom objects, Rotation and 3D objects), Wait Markers, Time and Range Markers, audio samples or even entire light curves.



Select the objects that you want to copy and open up the Wizard via the menu *Edit / Wizards / Autoshow, copy selection multiple times*. Enter the desired number of copies here and confirm with *OK*.

The copies now 'stick' to the cursor. You can place them at the desired location with a mouse click. The specified number of copies is inserted.

A practical application example for the Autoshow Wizard can be found in the chapter *Rotation object* on page 111.

## Stereoscopy with m.objects

With m.objects you can arrange, animate and present digital stereoscopic images and video sequences on the timeline. All editing options are available that can also be used for two-dimensional presentations. Stereoscopy is part of the expansion levels m.objects creative and ultimate.

While in the two-dimensional presentation the spatial arrangement of objects is ultimately always depicted in two dimensions and therefore the depth cannot be perceived directly, stereoscopy means real spatial perception, i.e. the mapping of three dimensions. For this, some requirements must first be met.

Positioning in the depth and 3D animations can be carried out within m.objects with monoscopic and stereoscopic pictures and videos, also mixed with each other as desired. For the spatial representation of the image content itself, however, the source material must exist in stereoscopic form, i.e. as a right and left partial image, which were created with special 3D cameras or with special recording techniques and then prepared for output in a suitable software. It does not matter whether the partial images are available as separate files, as a Multi Picture Object (MPO) or Multistream Video, or already assembled side by side or one above the other. The

output itself is carried out using suitable devices such as 3D-capable monitors, TV sets or projectors. Almost all common display techniques are suitable, such as line-by-line polarized displays, various shutter-based devices or mirror boxes (Cobox, Planar), which consist of two screens and a partially transparent mirror at an appropriate angle between them. The right and left partial images are shown respectively on one of the two screens, and the three-dimensional image is then obtained on the mirror. 3D glasses are required for most forms of stereoscopic rendering.

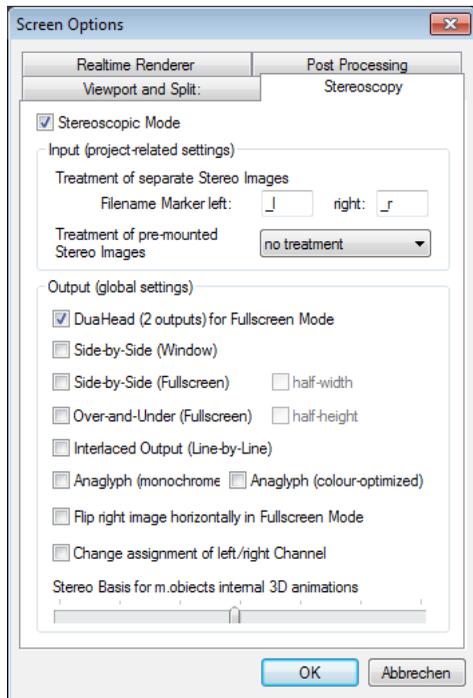
With m.objects, stereoscopic picture and video material can now be arranged in the usual way on the image tracks and presented with the output devices mentioned. The software - as in the two-dimensional presentation - ensures smooth, jerk-free transitions and motion sequences. Above all, with m.objects you can enrich stereoscopic presentations with animations, use mask effects or show additional graphic elements and texts and adapt them exactly to the spatial orientation of your images.

## Presets for stereoscopic presentations

To be able to insert stereoscopic picture and video material into the m.objects image tracks, you first have to make a few specifications. To do this, right-click in the open m.objects Screen and select the *Virtual Screen Options* from the context menu.

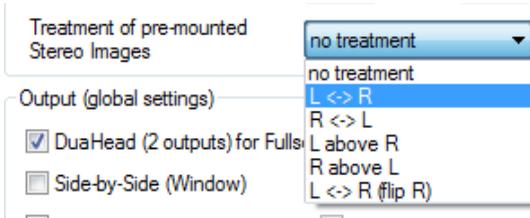
Now click on the *Stereoscopy* tab.

First activate the *Stereoscopic Mode*. Directly below you will find the entry *Input (project-related settings)*, this is about the image material that you use in your show. Next to the *Filename Marker*, enter the name extensions for the *left* and *right* partial images, provided that they are available as separate files. Which name extensions you use here is ultimately irrelevant for



m.objects, *\_l* and *\_r* have prevailed as the standard.

If you use pre-assembled stereo images in a single file, specify in the line below how m.objects should read them in, i.e. how the right and left partial images are arranged to each other. The left partial image can therefore be positioned on the left, right, above or below the right image.

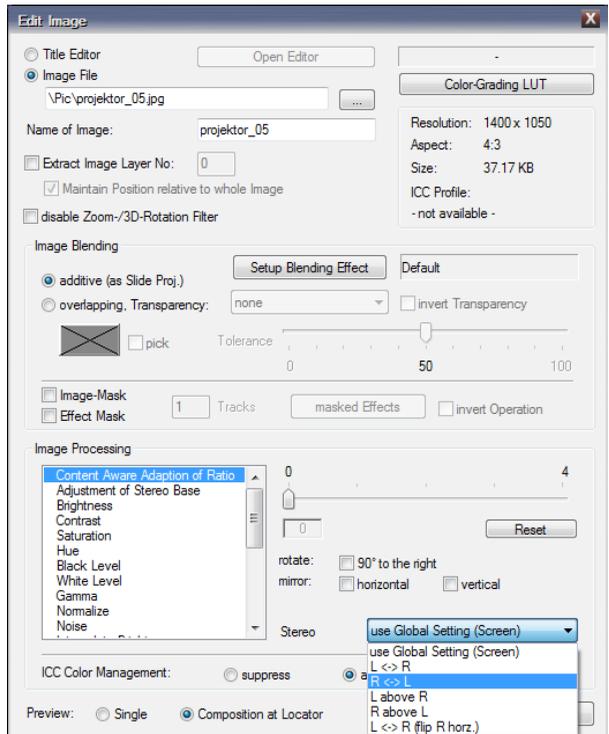


If the arrangement in individual images differs from this, you will also find this setting in the editing window (double-click on the bar below the light curve) of the respective image. Here you can now choose another option that is only valid for this image.

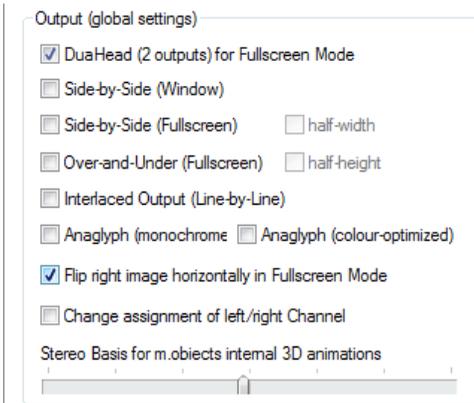
Please note that m.objects recognizes pre-assembled stereo images (side-by-side or over-and-under) only correctly if they are either marked with *\_s* or *\_cs* before the file name extension, or the file name extension is .jpg or .mpo. A file with the name Flower4\_s.jpg is therefore automatically interpreted by m.objects in the differently set mode for the show or for the respective image.

Videos and stereo pictures of various structures can be used in any show mixed with one another and with monoscopic material.

The settings made in the



Virtual Screen Options under *Stereoscopy / Input* apply to the entire current production, so they can differ from show to show.



Next, specify what type of *Output* device(s) you are using in the *Stereoscopy* presets. By default, the *DuaHead (2 outputs) for Fullscreen Mode* option is selected. This option applies if you are presenting with two digital projectors or a mirror box (RBT, Cobox, Planar etc.). If you are using a mirror box, also tick the option *Flip right image horizontally in Fullscreen Mode*.

If you find that the monitors of a mirror box or two projectors on the right and left output of the graphics card have been swapped and the stereo effect no longer works, simply select the *Change assignments of left/right Channel* option and the display will be correct again.

If you have set up a 'stretched desktop' to control two projectors or a mirror box via two outputs of your graphics hardware - possible for example with Nvidia hardware under Windows XP or with Matrox DualHead2Go / TripleHead2Go - select the option *Side-by-Side (Fullscreen)*. With m.objects, the use of the extended desktop (see chapter *Setup for the presentation* on page 17) has no disadvantages compared to the stretched desktop with NVidia graphics cards, on the contrary, the handling of the desktop is even more comfortable. It is therefore in no way worthwhile to switch to the older Windows operating system for stereo display.

For the presentation on a 3D monitor (e.g. from Zalman or Fujitsu) select the option *Interlaced Output (Line by Line)*. The sequence of the left and right partial images can deviate from the standard for some models. If, when using a 3D monitor, you find that the spatial depth is displayed incorrectly (inversely) on the m.objects Screen, tick the option *Change assignment of left/right Channel*, which corrects the sequence of the partial images accordingly and the spatial effect will be visible as desired.

By default, when the Screen is not in *Fullscreen Mode*, only the left partial image is

displayed. A stereoscopic display in a reduced window would also make little sense when presenting with a mirror box or with two digital projectors. However, this does not apply to the display on 3D monitors (Interlaced Output). Here, stereoscopic display is also possible on a reduced Screen, so in this case the stereo display is retained in window mode.

The *Side-by-Side (Window)* option enables stereoscopic display in parallel or cross view when the Screen is not set to Fullscreen Mode. The corresponding arrangement of the two partial images is done by setting or removing the check mark for *Change assignment of left/right Channel*.

Some TV sets and digital projectors require an input signal in FullHD resolution, in which the left and right partial images are compressed next to or on top of each other. Both partial images are then stretched to the correct size again by the output device and displayed using the interlaced method or the shutter method (depending on the model). This reduces the horizontal or vertical resolution by half, which, however, is practically imperceptible if certain viewing distances are given.

When controlling a 3D cinema projector or a projector or TV with shutter glasses via a single HDMI or DVI port, it ultimately does not matter for the resulting overall resolution whether the images are arranged side by side or one above the other in the so-called frame-compatible signal. It is therefore both possible to use the *Side-by-Side, half-width* as well as the *Over-and-Under, half-height* configuration, if the playback device is set accordingly.

When using a 3D TV set (e.g. LG Cinema3D) that is working line-by-line interlaced, it is important with regard to the overall resolution that the output in Fullscreen Mode is *Over-and-Under*, since the display technology in 3D mode can reproduce the full horizontal resolution of 1920 pixels, however, only halved vertical resolution of 540 pixels. A *Side-by-Side* signal (*half-width*) would result in an unnecessary loss of horizontal resolution and thus less sharp display.

To achieve maximum sharpness in the display, it is also recommended to deactivate the *overscan* function of the playback device, which is activated on many TVs by default and which leads to a digital zooming of the image with loss of image parts and sharpness. In the case of LG devices, the option to be selected is called *JustScan*, in other devices it can be referred to as *HDMI overscan: off, display: direct, display: 1:1* or similar. This note applies to both stereoscopic and monoscopic display.

For stereoscopic display on non-3D-capable output devices - i.e. on 2D monitors or 2D single projectors - m.objects can also play presentations using the anaglyph

technique. Appropriate red/green or red/cyan glasses are of course a precondition for viewing. In the options, choose *Anaglyph (monochrome)* or *Anaglyph (colour-optimized)*. In the first case you get a 3D representation in gray shades, in the second case the colors of the images are preserved as much as possible for a good separation of the right and left stereo channels.

After you have made the necessary entries, confirm the dialog box with *OK*.

## Insert pictures and video sequences

Now insert your images using the Image Pool, the red dot or the file explorer (see also chapter *Images in the m.objects show* on page 54), whereby you only ever place one of the two stereoscopic partial images on the image tracks. The corresponding second image part is automatically output simultaneously by m.objects during the presentation. You can either place the right or left partial images on the image tracks or even mix both, i.e. the right partial image from one motif and the left one from another. The software will find the corresponding counterpart using the specified name extension and assigns the partial images to the correct channel. m.objects interprets images without a corresponding name extension as two-dimensional, they are automatically output on both channels.

Stereoscopic video sequences are inserted into the image tracks in the same way. The procedure for creating animations described below also applies to videos. But keep in mind that in stereoscopy each video sequence is reproduced in two versions (right and left partial video). If you crossfade between two video sequences, four videos will be output at the same time. The PC must be powerful enough to ensure smooth playback. When outputting multiple FullHD videos at the same time, even smaller quad-core processors reach their limits.

As with stereoscopic pictures, m.objects can also be used to process fitted stereo videos (Side-by-Side or Over-and-Under). These can be both compressed, i.e. left and right partial video in half resolution, and 1:1, i.e. both partial videos in full resolution.

Further information on special functions such as video editing or the use of video codecs can be found in the chapter *Video* on page 160.

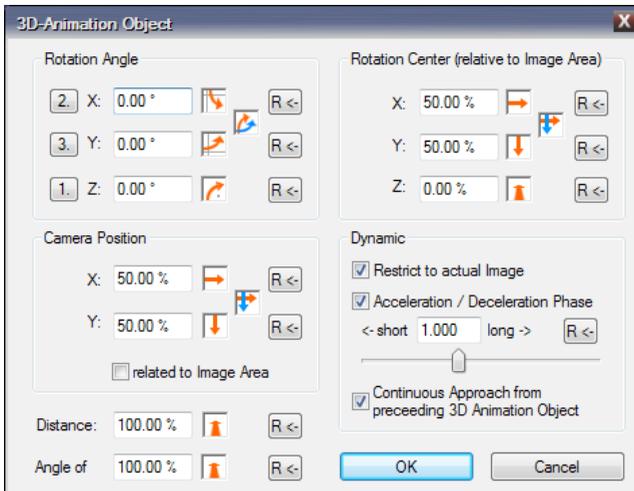
## Use of the 3D object with Image Area and Zoom object

The use of m.objects Dynamic objects in stereoscopy offers a lot of exciting possibilities. At the same time, however, the third dimension also brings some peculiarities with it compared to the use in 2D presentation, which must be

considered. More information on the basic handling of Dynamic objects can be found in chapter *Dynamic objects* on page 101.

For dynamic effects in stereoscopy, the 3D object is the most common means of choice when it comes to positioning in depth (Z axis), usually in connection with the Image Area object. A few examples should explain this.

First open a stereoscopic show in m.objects or, as described above, place some stereoscopic images on the image tracks. You should save an already finished show under a new name. Now drag a 3D object from the Tools window onto one of the light curves. Double-click on the orange square to open the 3D editing window.



In the lower left area of this window you will find the parameter *Distance* with the default value *100,00%*. If you click with the left mouse button on the orange arrow next to it, hold the mouse button down and pull upwards, you will see that the stereo image becomes smaller and spatially moves backwards. The stereo window is 100% by definition, so with increasing numerical

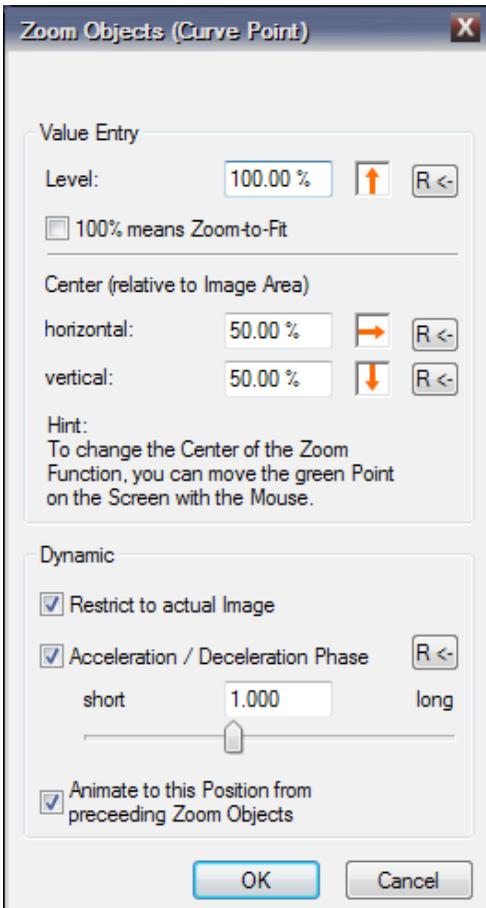
values, the whole scenery moves backwards. From a technical point of view, the distance between the right and left partial image increases, with the right partial image moving to the right and the left to the left. You can observe this if you look at the monitor or the screen when changing the Distance value without 3D glasses.

If you now also drag an Image Area object onto the light curve and then select the green square on the light curve, you can move the position of the image on the m.objects Screen as desired. The cursor turns into a four-way arrow then.

If you reduce the Distance value in the 3D editing window, the image moves closer to the viewer. The two partial images move in the opposite direction. It should be

noted here, of course, that the simultaneous enlargement of the object with the correct perspective can do harm to the stereo window if the used Image Area is too large.

For comparison, apply the Zoom object to another image. Drag a Zoom object from the Tools window onto the light curve and then double-click on the blue square.

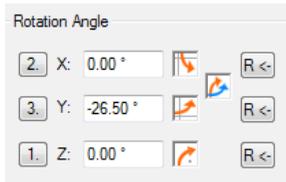


In the following window, reduce the *Zoom Level* at the top so that the image on the *m.objects* Screen becomes smaller. In contrast to the 3D object, the spatial position of the image itself does not change, the whole scenery is just shown smaller. There is therefore no shift in relation to the stereo window. Such a diminution effect can of course be desired, and with an additional *Image Area* object you can position the image anywhere on the Screen. However, the Zoom object does not have a real stereoscopic effect.

Of course, this also applies to increasing the Zoom Level. Here you zoom into the image, so you select a section of the image, but the spatial effect remains unchanged. You can also see this from the fact that the distance between the left and right partial image always remains the same regardless of where you move the Zoom Level. Depending on the desired effect, you can use the Zoom object (reduce/enlarge) or the 3D object (move in or out) in the stereoscopic presentation.

Another use of the 3D object is when integrating graphic elements into the presentation or when using the internal *m.objects* title generator. To do this, create a

short text in an empty image track above an image: right-click in the image track, Insert Text Object and enter the text in the following window. With an Image Area object you first set the size and position of the text. Then add a 3D object again and change the value for the *Distance*. If it is 100%, the text is on the level of the stereo window (unless this has been changed beforehand). If the value is greater, the text moves spatially into the scene, if you reduce the Distance, it moves forward beyond the level of the stereo window, i.e. spatially out of the image.

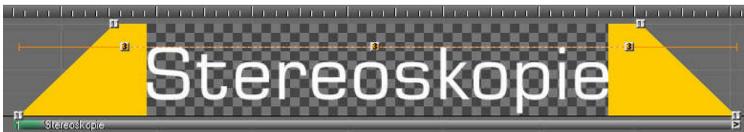


Change the values for the *Rotation Angle* as well.

When the Y value is changed, the text is spatially hanging in the scenery, for example, it protrudes from the front through the stereo window into the background. You can also change the spatial orientation of the text using the other values for the *Rotation Angle*. A change in the value for the '*Angle of*' increases or decreases the

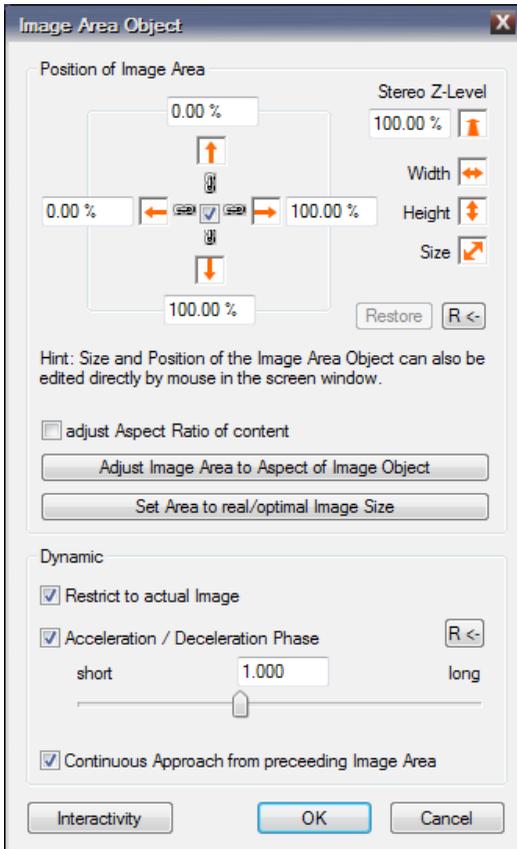
spatial effects. With a little trial and error, you quickly get a feel for what effects you can achieve and up to which limit these can be used reasonably.

To make animations out of the earlier static effects, only a few steps are necessary. The principle is that you use two or more Dynamic objects in a row for an animation and change the values there according to the desired animation. So if you want to animate a text, for example, place a 3D object with the default values at the beginning of its light curve and another with a changed *Distance* and *Y* value at the end of the light curve. If you now start the locator in front of the image, you will see the resulting animation. The greater the distance between the two objects, the longer the animation takes. The animation can be refined or elaborated with additional 3D objects.



## Use of the Image Area object

In addition to the combination with the 3D object, the Image Area object also has its own stereoscopic effect: it enables the position of the image to be shifted on the Z axis without changing the image size. This is particularly useful for setting the ultimately displayed size and depth of an object, without the values influencing each other.



First place an Image Area object on the light curve of an image and then double-click to open the editing window.

You get the best impression from the stereoscopic effect if you reduce the Image Area a bit. This change can be achieved quickly using the controller with the double arrows. Click on the arrow and then drag with the left mouse button pressed in one of the arrow directions. Then you can also change the value for the *Stereo Z-Level* by clicking and dragging. You can see that the image moves forward or backward on the spatial axis, i.e. the Z axis. The smaller the value for the Stereo Z-Level, the closer the image moves towards the viewer. You can of course also enter a numerical value in the input field.

In contrast to the 3D object, the size of the image does not change with this procedure.

## Tracking shot through an image

You can create a tracking shot through a stereoscopic image with 3D objects. In the two-dimensional presentation, the Zoom object is usually used here, but, as described above, has no stereoscopic effect and is therefore replaced here by the 3D object. A simple example of this, which you can of course change and expand at will:

Again drag a 3D object from the Tools window onto the start of a light curve.



In the editing window of the 3D object (double-click on the orange square), first reduce the *Distance* by dragging the cursor over the down

arrow. Alternatively, you can also enter a percentage value in the input field next to the arrow.



In this way you can now select a section of the image. On the m.objects Screen, you can follow the change in *Distance*, which is shown here immediately. The next step is to add an *Image Area*

object and place it on the light curve just below the 3D object. Click the green square so that a pink frame appears on the Screen. As described, the cursor inside the frame becomes a four-way arrow, with which you can position the image section precisely. Select the position so that the left part of the image is displayed.

In order to now pan through the image, simply insert a second *Image Area* object at the end of the light curve, in which the right part of the image is displayed.



Test the animation and, if necessary, correct the entered values until the pan is adequate to your ideas. If you insert a further 3D object above the second

*Image Area* and reduce the *Distance* further here, the camera pans into the scene at the same time.

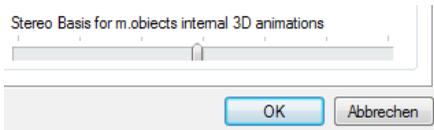


With further 3D objects and *Image Areas*, you can change the pan direction in the course of the camera pan by repositioning the section again. The

animation between the individual stations is automatically created appropriately by m.objects.

## Adjust the Stereo Basis

In the options for stereoscopy (right-click in the m.objects Screen / *Virtual Screen Options / Stereoscopy*) you will see a slider with which you can change the *Stereo Basis*.

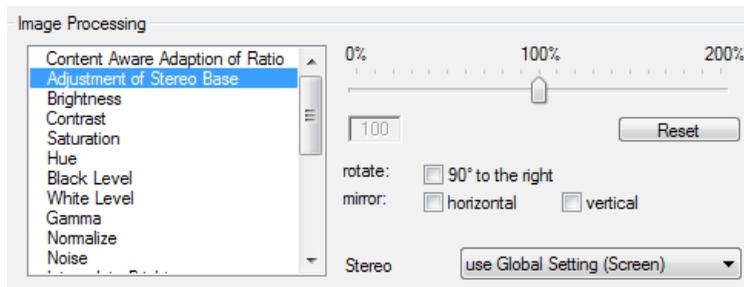


This option does not refer to the stereo basis of the stereoscopic pictures and videos themselves. This was already defined during the taking of the image by the distance of the optics, it cannot be

changed in m.objects. However, wherever you have used the 3D object or the *Distance* parameter of the Image Area object and thus changed the distance, for example, a change in the Stereo Basis has a corresponding effect. This way you can make a targeted adjustment to the stereo basis of your images or increase or decrease the spatial effect.

A change in the Stereo Basis in the Stereoscopy options has a global effect, which means that it affects all 3D objects in all image tracks. If you would like to make such an adjustment for a single image or 3D object instead, double-click in the image track on the bar below the corresponding image. The window for image editing then opens.

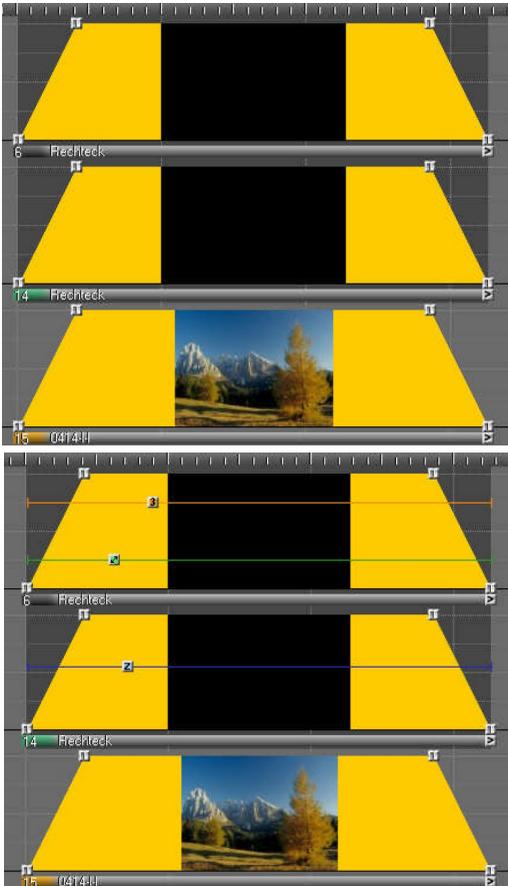
In the image editing options, the first thing you see is the *Adjustment of Stereo Base* as soon as you edit a show in Stereoscopic Mode.



Here too, select the desired value using the slider. In order to be able to track the effect on the Screen immediately, select the option *Composition at Locator* in the bottom line. With the button *Reset* you switch back to the initial value of the Stereo Base. The Stereo Basis set in the global Stereoscopy options of the Screen is amplified or weakened by the factor set here.

## Use of masks

The use of masks offers a lot of creative potential in m.objects. In stereoscopy, in particular, spatial effects can be realized specifically. General information on masks can be found in chapter *Masks* on page 139.



An example should illustrate the stereoscopic use of masks in m.objects. To do this, first load or create a presentation with stereo images, using at least three image tracks, and make the settings described above for the output device. In addition to images, you also need an image mask, preferably a black rectangle on a white background, which you can create in Photoshop, for example, and save in any file format.

Now place an image in the lower image track, in the two tracks above you place the black rectangle. In the image properties (double-click on the bar below the image), select the option *Image Blending / overlapping* for both rectangles, for the upper one additionally *Image-Mask, 1 Tracks*.

The image in the middle lane should serve as a frame. If necessary, enlarge it with a Zoom object until it completely fills the Screen size. The image in the top lane serves as the actual mask through which you

can see the image. Use an Image Area object to change the size of the mask. For this example, it should be significantly smaller than the Screen.



Place a 3D object on the light curve of the mask and increase the value for the *Distance* in the editing window (double click on the orange square). On the Screen you can observe that the image window is getting smaller and at the same time it is moving backwards. The stereo window therefore moves away from the viewer. When the *Distance* is reduced, the stereo window moves towards the viewer again, if the value is less than 100% it moves in front of the monitor level, i.e. seems to float in front of the monitor.

Now set the *Distance* back to 100% and change the *Rotation Angle* using the orange-blue double arrow.

In this way, the window can be tilted so that it runs more or less through the monitor level, for example. You increase this effect by reducing the value for *Angle of*. To adjust the image visible in the window (mask) a little bit to the window orientation, you can also drag a 3D object onto the light curve of the image and adjust the values for the *Rotation Angle* moderately in the options. Excessive changes, i.e. an extreme inclination of a stereo image, are not recommended and have an unrealistic effect, since the perspective on the scene shown in the image cannot change afterwards.

As described in the section on tracking shots, you can create animated motion sequences from static shifts by adding further Dynamic objects. Of course, this also applies to the use of masks. Exciting animations can also be created here.

# Presentation

## Real-time Rendering from m.objects

A show can be compiled on the screen and can be reproduced in whole or in part directly from m.objects at any time. Since m.objects relies on techniques for real-time rendering wherever possible, there are neither significant waiting times nor unnecessary quality losses. Real-time rendering means that all processing of image blending, image dynamics, video integration, audio mixing and sound effects takes place during playback. In m.objects, an elaborate system of computing load distribution ensures that each of these tasks is prepared in time so that it can be carried out at the right time. With this advanced core, m.objects is able to consistently deliver 60 frames per second in high resolution and, if necessary, even in split for several digital projectors at the same time.

m.objects usually has to share the PC with other programs. The software is quite indulgent in relation to other running processes. However, it is easy to see that a performance-hungry process that runs simultaneously with m.objects can compromise precise timing. Even a relatively short, but intensive peak, such as communication programs for PDAs can demand from the CPU, can lead to playback problems. Therefore, before starting playback, you should make sure that unnecessary programs such as task manager, temperature guard, internet browser and communication programs are shut off. The screen saver should also be deactivated. Notebooks should be operated on the power supply and power management for the power supply mode should be deactivated.

The demonstration directly from m.objects has the advantage that the lecturer has an optimal overview of the production via the notebook's display or a screen connected to the PC. In the meantime, the audience only gets to see the actual image content via the digital projector. In addition, any formatted help texts can be shown and hidden on the control display at pre-programmed times, which considerably facilitates the live presentation. In addition, m.objects ultimate can control additional peripheral devices such as headlights, motor screens, slide projectors and many other devices during playback. It is also possible to set the audio to up to 16 audio channels (8 x stereo).

# Real-time Rendering with EXE file

m.objects is able to export the entire show with freeze frames and stereo sound as a single, compact EXE file (presentation file). This file contains not only the images and audio, but also the playback software itself. This means that the file can be played on any hardware-compatible PC or notebook, even without m.objects being installed on it.

With conventional production systems, you usually have to create a video file to pass on a presentation to third parties that do not have access to the program themselves. Not only does this take much longer, the result is also much more voluminous and qualitatively far worse. The presentation file, on the other hand, uses the same renderer as m.objects and therefore also delivers the same image quality.

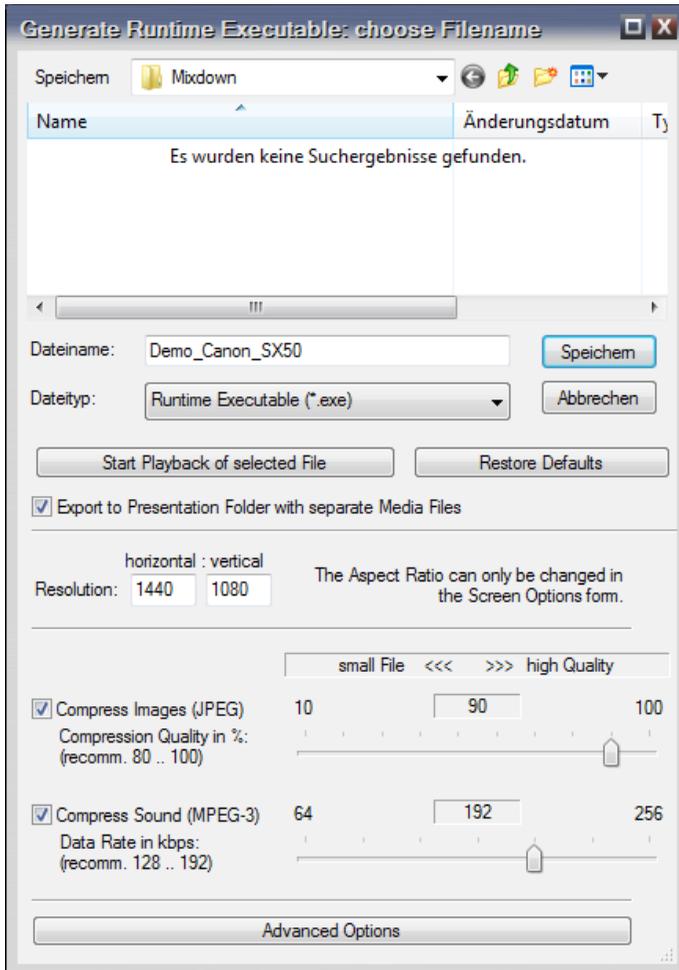
The contents of a finished EXE file can of course no longer be changed afterwards. The light curves and volume envelopes are no longer available for editing here. Therefore, you should always save the project with the associated mos file, the images, audio, videos etc. Make any changes in the project and then create a new EXE file from there, if necessary.

To create the EXE file, select *File / Create Presentation Runtime (\*.exe)* in the m.objects menu.

In the following window you can enter a new name for the presentation file. By default, m.objects uses the name of your show (i.e. the name of the .mos file). The finished presentation file is saved in the *Mixdown* folder, which m.objects created automatically during installation. You can also change this location here if necessary.

When creating an EXE file, you have the option of automatically recompressing images and audio to meet the requirements. You should choose this option if you want to keep the file size small.

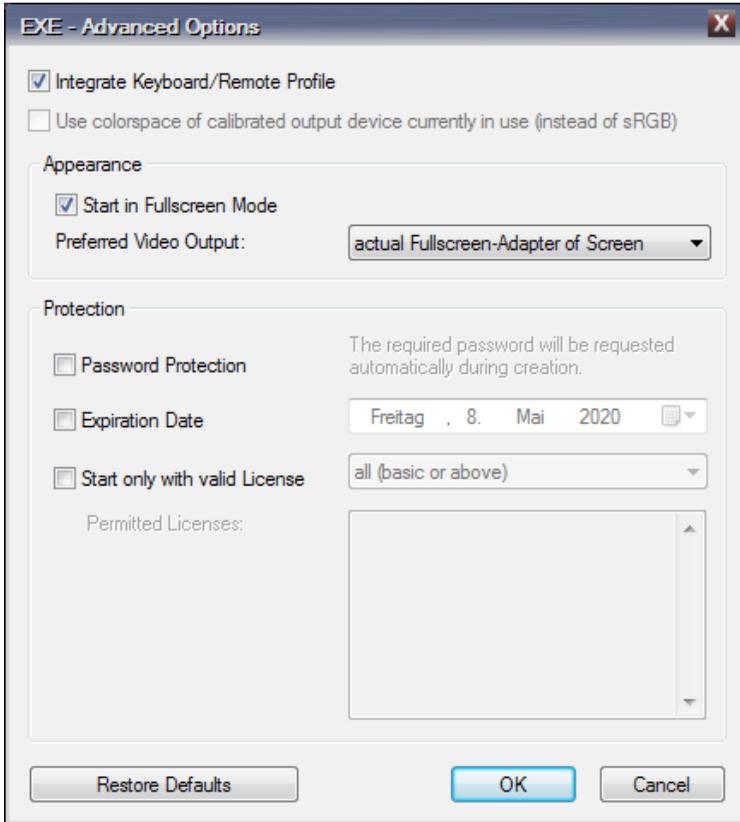
To generate an EXE file in exactly the quality that m.objects also renders itself, deselect the options *Compress Images (JPEG)* and *Compress Sound (MPEG-3)*. However, JPEG compression is usually not noticeable in presentations at a *Quality* setting of 85 or higher, but it requires a much smaller amount of memory for the EXE file. This also applies to the MPEG-3 compression of the audio. At a *Data Rate* of 160 to 192 kbps there is no audible loss of quality, whereas the memory size of the EXE file is significantly reduced.



Click the *Advanced Options* button to enter detailed specifications for the presentation file.

Here you will first find the option *Integrate Keyboard/Remote Profile*. If you activate this option, all individual settings that you have specified for the assignment of the keyboard or the keys of your remote control in m.objects (*Options / Keyboard /*

*Remote Control*) into the EXE file so that you can control it in the usual way with your PC keyboard or remote control. If this option is not activated, the standard settings apply to the EXE file.



## Export a predefined area of the timeline as EXE

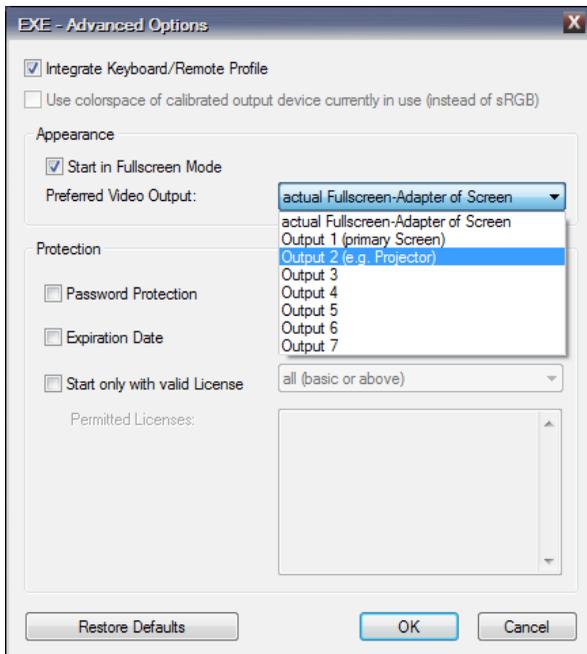
When outputting an EXE file, you have the option of exporting only a certain section instead of the entire timeline - i.e. the beginning to the end of the show. Read the chapter *Define time window for export* on page 215.

## Select output device

Under *Appearance*, enter whether the EXE file should start in fullscreen mode and on which video output it should open up. The *Fullscreen Mode* is usually the right choice for the presentation, so this option is also preselected.

The *Preferred Video Output* is of interest when several output devices are used, for example when using a notebook with a connected digital projector. By default, the finished presentation file always starts via the video output on which the Screen was output when it was created. If this output is not connected during playback, the file will be played on the primary display as defined in the Windows *Display* properties.

Instead, you can use the drop-down menu to select a specific video output for playing the EXE file. *Output 1* always corresponds to the *primary Screen*, for example the notebook monitor, while *Output 2* could be, for instance, the digital *Projector*. If available, other video outputs can also be selected.

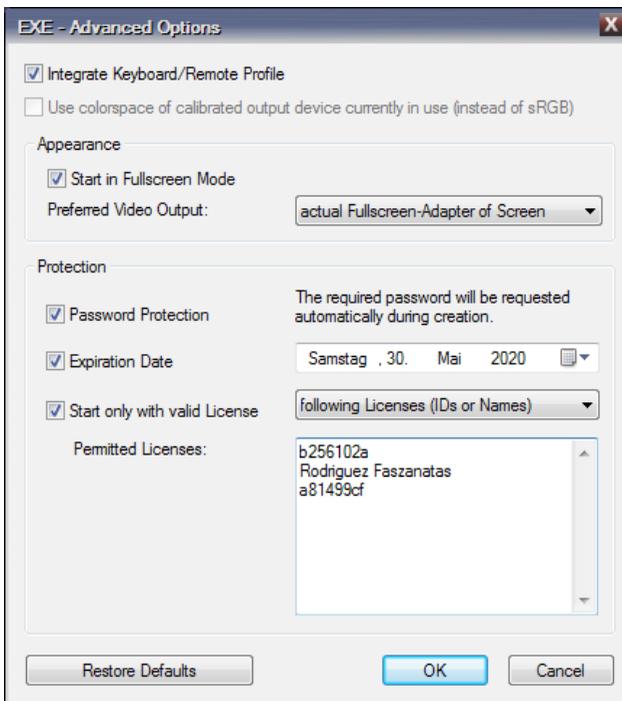


Even after you have started the presentation file, you can still switch the video output during playback. This is important, for example, if you are presenting your show on a third-party system on which, for example, the digital projector is set up as the primary screen while you have selected output 2 for playback. In this case, press the key combination *Ctrl + 1* after the start of the presentation so that the playback changes immediately to the projector. Accordingly, *Ctrl + 2* immediately brings the full-screen display to output device No. 2.

You can assign certain properties to an already completed EXE file by cue parameters, including the video output on which it should start. You can find more on this in the section *EXE file with call parameters* on page 214.

## Protect the EXE file

An EXE file is ideal for sharing a presentation with third parties. However, if you want to prevent your presentation from being disseminated in an unrestricted manner or being used for an unlimited period of time, m.objects offers effective protection options that restrict the use of your EXE file in different ways or are attach certain conditions to it.



The options for the *Protection* of the EXE file can also be found in the *Advanced Options*. You can choose from *Password Protection*, *Expiration Date* and *Start only with valid License*. All three options can also be combined.

If you activate the *Password Protection*, an input window appears after confirming the form with *OK* and saving the EXE file in the *Mixdown* directory in which you enter the password twice. When the EXE file is called up, this password is then requested and the file is

only started after correct entry. The password must not contain any spaces.

For the option *Expiry Date*, enter any date in the calendar that opens up. Once this date has been reached, the file can be started again a final time and will output a

corresponding message in advance. After that, playback is no longer possible.

For the Start only with valid License option, you have the possibility of entering the dongle ID or - in the case of a basic license - the user name of an m.objects license.

The EXE file can then only be started if the corresponding dongle is attached to the computer or the basic license mentioned is installed there. You can also enter a list with several dongle IDs or user names. Use a new line for each license. In this way, for example, several m.objects users of a photo club can exchange presentations with one another, with the certainty that playback is only possible with the listed licenses.

## EXE file with video

An EXE file that you generate from m.objects can of course also contain videos. There is a peculiarity: In addition to the option to export a single, compact EXE file that contains all the data - and thus also the videos - you can also export the video files separately. This is an advantage if you use a large number of video sequences and the amount of data becomes very large. EXE files that are larger than 2 GB are not started by the operating system, and a data volume of 2 GB is easily reached when using videos from modern cameras. This problem does not occur when the videos are exported separately. This option also offers the possibility of using videos in any format, whereas exporting to a single EXE file requires videos in WMV format.

To export videos separately, select the option *Export to Presentation Folder with separate Media Files* by ticking the box.



If your presentation contains videos in a format other than WMV, this option has already been selected by the program and cannot be deactivated.

m.objects now creates, by default in the *Mixdown* folder, a directory that contains the EXE file, the videos and also some system files, as shown in the following example:

You will need the complete folder with all the files it contains for later playback.

| Name             | Änderungsdatum   | Typ                     | Größe     |
|------------------|------------------|-------------------------|-----------|
| 0.mov            | 19.12.2003 18:40 | QuickTime-Video         | 19.814 KB |
| 1.flv            | 12.11.2002 19:11 | FLV Video for Flash ... | 871 KB    |
| avcodec-54.dll   | 28.12.2012 16:55 | Anwendungserweit...     | 8.047 KB  |
| avformat-54.dll  | 08.01.2014 16:12 | Anwendungserweit...     | 1.380 KB  |
| avutil-51.dll    | 28.12.2012 16:55 | Anwendungserweit...     | 183 KB    |
| Mexiko_2014.exe  | 16.01.2014 16:10 | Anwendung               | 27.386 KB |
| swresample-0.dll | 28.12.2012 16:55 | Anwendungserweit...     | 86 KB     |
| swscale-2.dll    | 28.12.2012 16:55 | Anwendungserweit...     | 337 KB    |

If you want to create a single EXE file and not a presentation directory instead, all videos must first be integrated in WMV format. WMV stands for Windows Media Video, so it is the standard video format for Windows and can be played on any PC, regardless of the installation of certain video decoders.

The advantage of this procedure is that you only need the EXE file for later playback and no additional files. An important point, especially when presenting on third-party computer equipment, because the entire presentation is therefore available in this one file.

The option Export to Presentation Folder with separate Media Files is of course not selected in this case.

If you use videos in your presentation that are not stored in WMV format, you must convert them first. You can do this directly in m.objects by creating a new show, placing a video on the timeline and then using the menu items *File / export as Video / Windows Media Video (WMV)* to store it as a new video in the desired WMV format.

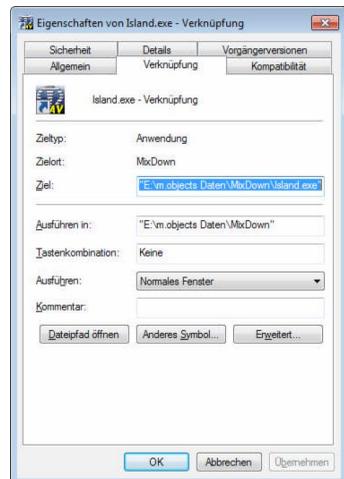
Please note that the computer on which the EXE file should be played must have a correspondingly powerful CPU, especially for FullHD videos. You will find information on this at the end of the manual in chapter *System requirements* on page 280.

## EXE file with call parameters

An already completed EXE file can be modified using so-called call parameters. The parameters cause, for example, a delay at the start of the presentation or playback on a specific output device.

To be able to use these functions, you first need a shortcut from the EXE file. Therefore, right-click on the EXE symbol and select *Create shortcut*. You can recognize the shortcut by the arrow on the new symbol. Right-click the new shortcut icon and select the *Properties*.

In the *Shortcut* tab under *Target* you can see the complete path to the file to which the shortcut refers, i.e. your EXE file. Click in this field and position the cursor at the very end of the path



behind the file name and - if available - after the quotation mark. Each of the call parameters described below has to be inserted at this point if required and should begin with a space. For example, it should look like this:

```
"C:\m.objects data\MixDown\Australia.exe" /loop
```

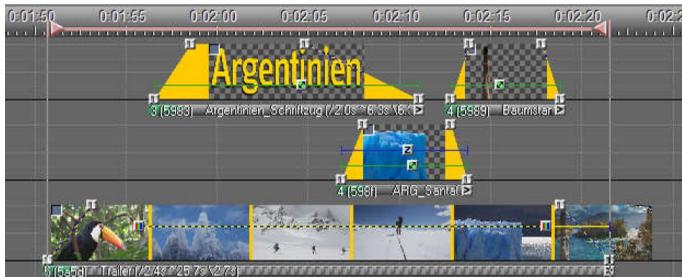
You can also use several parameters, which are separated by a space.

The following call parameters are available for use. It does not matter whether you choose the short or long spelling:

|                               |   |
|-------------------------------|---|
| /d or delay                   | 10 second delay before the start  |
| /d=30 or /delay=30            | 30 second delay before the start; useful if the EXE file is stored in the Autostart folder and is executed automatically after system start. The delay ensures that the system is done with starting up the system. |
| /1 to /7                      | Selection of the video output for the playback of the EXE file  |
| /l or /loop                   | The presentation runs in a loop, so it will start over after each playback  |
| /p=password or /pass=password | Enter the password: This way an EXE file with password protection can also be called up automatically from the Autostart folder   |

## Define time window for export

If you export an EXE file or a video from m.objects, the entire production is exported from start to finish. Alternatively, you also have the option of defining a limited area from the timeline for export, so that only the content within this time window is output as an EXE or video file.



If the timeline is activated (left-click on it), you will find the *Export Area* object in the *Tools* window. With the left mouse button pressed, drag the *Export Area* tool to the desired position on the timeline and release the mouse button there. You have now defined the start of the time window. Place another *Export Area* tool further back on the timeline to set the end of the time window. A solid line between the two objects now marks the defined export area. Then, under *File*, select the option *export as Video* or *Create Presentation Runtime (\*.exe)* to output the desired format. m.objects saves the exported file as usual in the *Mixdown* folder.



You can also define multiple export areas on a timeline. When exporting, m.objects saves each of these areas as a separate file.

## Multiscreen and softedge

For extensive projects, panoramic projections or large installations, the output of the AV show using just one digital projector or monitor is often not sufficient. For cases like this, m.objects offers the multiscreen function, which enables the use of up to 64 output devices at the same time.

A requirement for the use of multiscreen and softedge is the highest m.objects expansion level ultimate (or the older license version m.objects pro), which is capable of rendering on two output devices by default. The ancillary module *Multiscreen / Softedge* is required for each additional output device that is to be used.

There are two different applications for multiscreen: On the one hand, m.objects offers the option of connecting multiple projectors or screens and outputting separate content on each of them, from the same timeline. A separate m.objects Screen is used for each output device. The other option is to distribute the content of a single m.objects Screen across multiple output devices.

## Multiscreen with different content



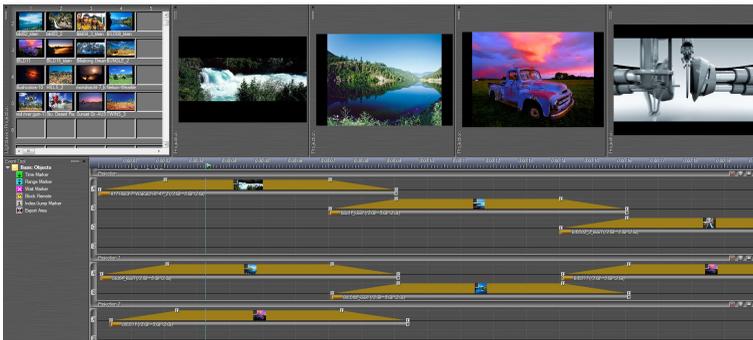
If you want to use m.objects to show different content on multiple output devices, you need a Projection component with its own image tracks and its own virtual screen for each output device.

Click the gear icon in the program toolbar to open the component setup view.



Usually you have already created image tracks in a show and the *Projection* component is therefore no longer listed in the *Tools* window. Right-click in the *Tools* window, select *Create new Object* in the context menu and in the following window the *Projection* option. Then confirm with *OK*. Now a new Projection component appears here, which you drag into the gray area to the

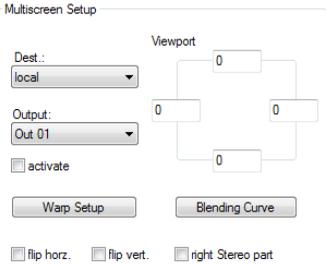
other components that are already used in the show to set up the image tracks. If you want to use further output devices, repeat this process as often as necessary. By clicking the gear icon again, you will return to the normal view.



You will now see several Projection components, each with their own image tracks and the associated Screens. If one or more Screens are not opened yet, do so now.

You can now fill each component with images independently of the others and edit them as usual. You can use the clipboard or the Image Pool to exchange images between the individual components.

To distribute the Screens to the desired output devices, open the Virtual Screen Options of one of the Screens (right-click in the Screen / *Virtual Screen Options*) and select the *Viewport and Split* tab. You can make all the necessary settings in the *Multiscreen Setup* area.



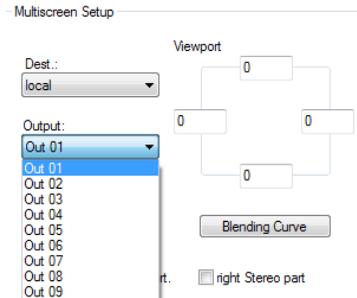
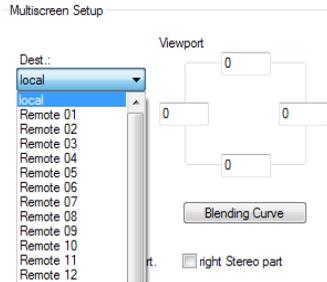
The option *Dest.* is relevant if multiple computers that are connected with one another and to which one or more output devices are connected are used for the control of many projectors.

*local* refers to the computer on which m.objects was started. As long as you control the presentation with just one PC, you do not need to change the input. *Remote 01* to *Remote 32* designate other computers that are connected to the main computer. m.objects can control up to 16 graphics outputs per computer. If necessary, select the computer with the output device on which the Screen should be displayed.

For the option *Output*, select the output device yourself and check the box next to *activate*.

*Out 01* is always the primary screen in the Windows Display properties. The following outputs (*Out 02*, *Out 03* ...) do not necessarily match

the Windows numbering, but this has no influence on the output itself. With the *flip horz.* and *flip vert.* you can mirror the display horizontally and / or vertically if necessary. As soon as you confirm with *OK*, the screen is displayed on the selected output device, provided that it is running in Fullscreen Mode. Repeat this process for all other Screens. Then start the locator. You will now see the created image sequences on each output device.

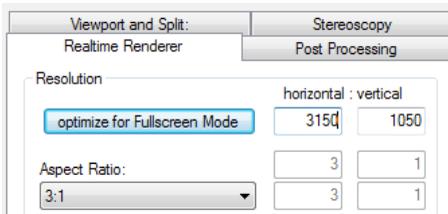


## One Screen on multiple output devices

The second type of multiscreen, the distribution of the content of a Screen over several screens or projectors works a little differently. Here you first create your presentation as usual, i.e. work with only one Projection component, the associated image tracks and accordingly with a single m.objects Screen in the aspect ratio of the overall presentation. Open the *Viewport and Split* tab in the *Virtual Screen Options* to set up the output devices. Here too, first select the PC used, if necessary, and the desired output device. Don't forget to check the box next to *activate*.

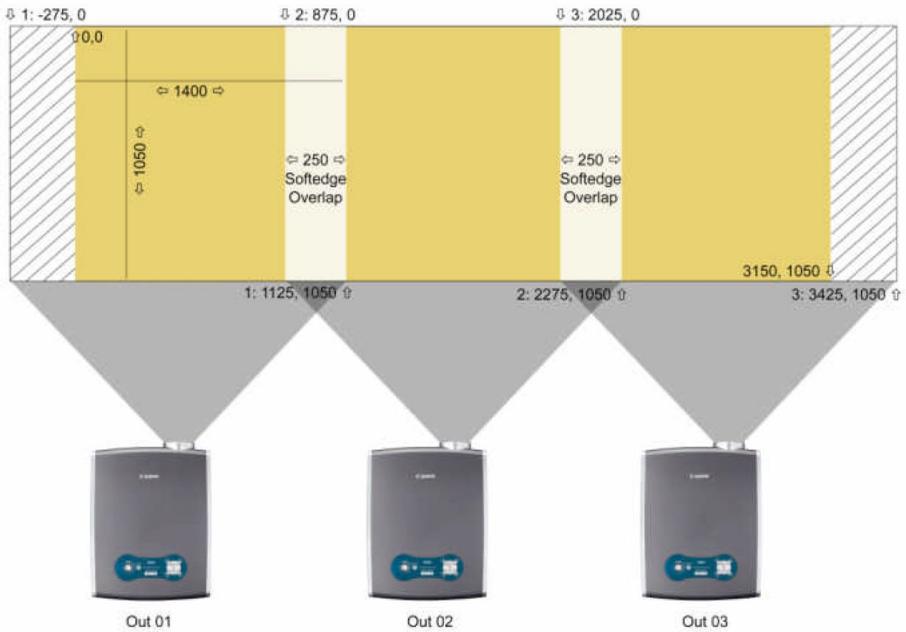
The *Viewport* option in the *Multiscreen Setup* section now offers to output only a section of the entire Screen on the selected screen or projector in order to distribute the remaining sections to the other devices. By entering the pixels, you precisely define the section from the m.objects Screen - the so-called viewport.

The m.objects Screen forms the coordinate system from which the distribution of the pixels on the projectors or screens results. The origin of this coordinate system is in the upper left corner, the extent of the x-axis (horizontal) and the y-axis (vertical) results from the setting for the screen *Resolution*. For operation with multiple output devices, you should manually set the overall resolution of the presentation in the *Virtual Screen Options* under *Realtime Renderer*. The *optimize for Fullscreen Mode* option is not useful for this.

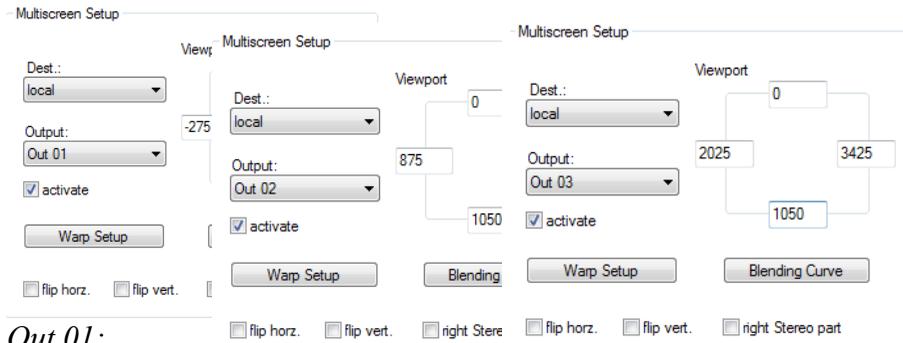


We have a screen resolution of 3150 x 1050 pixels here. As an example, this should now be distributed over three digital projectors, each with a resolution of 1400 x 1050 pixels. The projected partial images, in turn, should overlap each other with a width of 250 pixels and should ensure seamless transitions there by means of softedge overlap.

The following sketch shows the distribution of the Screen on the three projectors. The shaded areas on the left and right are outside the m.objects Screen. No image content is shown here, even though these areas are within the projection area of the right or left projector.



The *Viewport* inputs for the three projectors look like this:

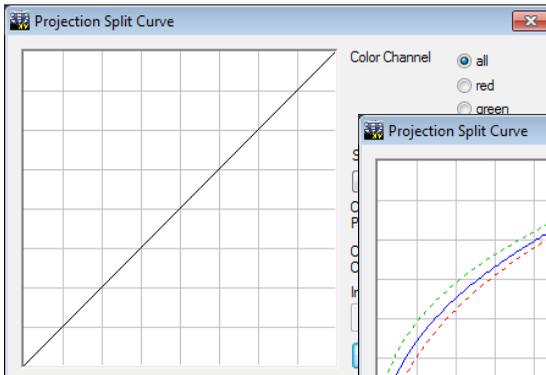


*Out 01:*

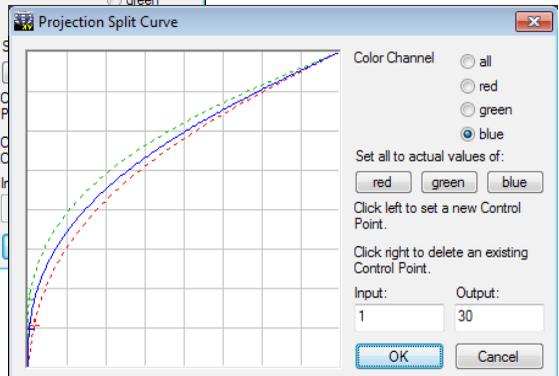
*Out 02:*

*Out 03:*

Softedge overlap is applied automatically where two partial images overlap due to the settings for the Viewport. On the respective side, the partial images have an outward gradient to black that is as wide as the overlap. Since both gradients are aligned reversely, they provide the full luminosity one above the other, the transition from one to the other partial image thus has no hard cutting edge and is practically not visible provided the contrast is sufficiently high in the projection.



As a rule, the initially specified, linear course of the gray scale does not yet lead to the optimal



result. Depending on the type of projector used, you have to make the necessary fine adjustments using the *Blending Curve* button. Clicking the button takes you to the *Projection Split Curve* window.

You can see that the progression for the overlap area is initially straight. By left-clicking on the line, you create curve points with which you can change the progression in the desired shape. Right-click to delete a curve point. As a rule, the insertion of a single curve point is completely sufficient for correction. The changes affect (of course in opposite directions) both progressions of the overlap area. The curve set up here exactly compensates for the specific gamma distribution of your projectors.

However, since with some projectors the gamma distribution is not completely identical for all primary colors, it is possible to set the distribution for the red, green and blue *Color Channel* separately. To do this, preselect the respective channel on the right. If the option *all* is selected again under *Color Channel*, the separate gamma

curves are discarded. The gamma setting for separate color channels should be configured if the split is not consistent solely for images with a specific color scheme.

In other applications, it can be useful to exclude certain sections when distributing the m.objects Screen to multiple output devices. This is the case, for example, if you divide the content of the Screen over several monitors that are positioned next to each other. Here it is important to take the frames and distances of the monitors into account. It seems unrealistic if, for example, an object moves from right to left and directly appears on the monitor next to the one it just left. Instead, leave out the respective sections by taking the appropriate gaps into account when entering the pixels in the *Viewports*.

Two more additions to Viewport:

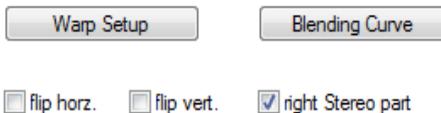
If, you do not set the m.objects Screen to Fullscreen Mode but to Window Mode for one of the output devices in a multiscreen application, the entire content of the m.objects Screen is displayed here, regardless of the Viewport settings.

The Viewport options can also be useful when using a single digital projector. You can move the entire projected image up or down by changing the upper and lower *Viewport* values accordingly. This can be particularly useful if you want to place a projector without lens shift so that it does not block the view of the audience.

## Multiscreen and stereoscopy

Even in stereoscopic presentations, the m.objects Screen can be distributed over several output devices and softedge can be used. The procedure does not change initially: The output devices are set up under *Viewport and Split* and, if necessary, provided with the necessary *Viewport* entries. When using projectors, Softedge is automatically used in the overlapping areas.

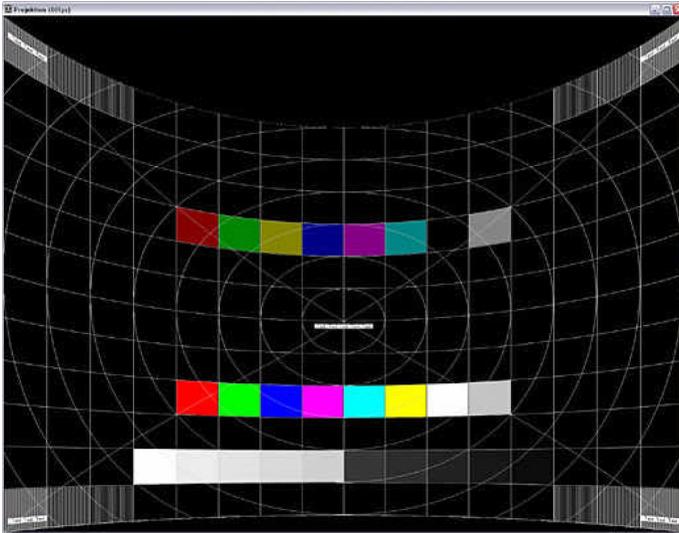
The decisive difference lies in the output of the right and left partial images of the stereoscopic presentation. For this there is the option *right Stereo part* in the *Multiscreen Setup*.



Select this option whenever you want the right stereo partial image to appear on the selected output device. This option remains deselected for the output of the associated left partial image.

# Warp setup for curved surfaces

A special application is the projection of an m.objects show onto a bended surface. In the case of large panorama projections, for example, it may happen that the image material is projected onto an inwardly curved projection surface.



Multiscreen Setup

Dest.:

local

Output:

Out 02

activate

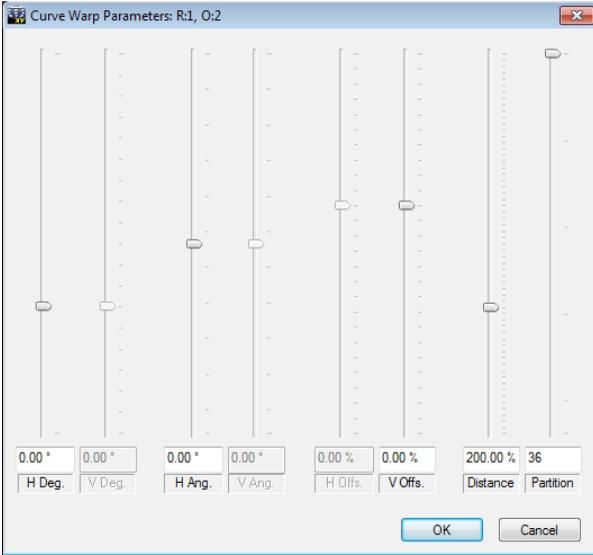
Warp Setup

Here you use the *Warp Setup* function, which you can also find in the *Virtual Screen Options* in the *Viewport and Split* tab.

Of course, several projectors can also be used at the same time, the projections of which give a large overall picture using softedge (see above). You then carry out the *Warp Setup* separately for each projector.

The *Warp Setup* option is only available in the m.objects ultimate expansion.

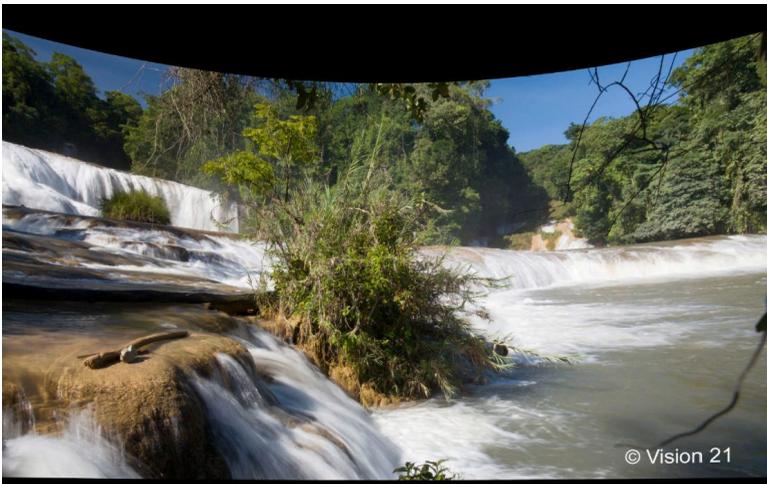
Clicking the *Warp Setup* button takes you to the *Curve Warp Parameters* window.



Here you can see five sliders with which you can change individual parameters for the projection exactly so that a suitable pre-distortion creates an undistorted image on the curved surface. The change of the parameters with the sliders is transferred to the projection in real time, so that you can see the effect immediately and correct it until the image appears correctly on the projection surface.

- *H Deg.*: Curvature of the screen segment covered by

the respective projector in horizontal direction in degrees (standard: 0°). This parameter describes the radius of the curvature of the screen.



- *H Part.*: Number of columns into which the image is broken down for perspective correction (standard: 32). The higher the number, the more accurate the correction, but the greater the computing power required.

- *H Ang.*: Deviation of the optical axis of the projector from the right angle to the screen in horizontal direction in degrees (standard: 0°). The 'perspective' of the projector, i.e. its orientation to the projection surface.



- *V Offs.*: Vertical offset of the projection image in relation to the projection axis, corresponds to the vertical lens shift of the projector.

- *Distance*: Throw ratio of the projector, 100% corresponds to throw ratio 1 (default: 100%). This value describes the distance between the projector and the projection surface depending on its focal length.

## Speaker Support

The speaker support is available in all licenses from m.objects live upwards. It contains a number of functions that make the live presentation of a show much more convenient and that are used intensively by lecturers who present their shows regularly in front of an audience.

## Control with Wait Markers

When presenting an AV show, commented and uncommented passages usually alternate. Especially when it comes to going into more detail about a certain picture or reactions from the audience, it is difficult to estimate the time required for this beforehand. At such points in a demonstration, it makes sense to stop the locator and only start it again at the end of the interruption.



This can be done very easily using the keyboard: If you press the spacebar while an m.objects presentation is running, the locator is put into pause mode, so the show stops. The locator continues to run after pressing the space bar again. This way you have a simple control over your presentation, which works in all expansion levels of the software including the freeware.

This control has some disadvantages and is also not very flexible. It requires you to always act close to your computer during the presentation. That is certainly not a problem in a smaller group, but at the latest when the lecturer is on stage, this solution is hardly viable. In addition, when using the keyboard, you always have to make sure that you do not miss the right time to stop the locator. If you press the spacebar too late, the locator may already be in the next crossfade and the following image is partially visible.

In order to safely avoid such unwanted effects, there is an extremely practical tool in m.objects with the Wait Markers. You can find the *Wait Markers* by clicking on the timeline with the mouse. The associated tools now appear in the *Tools* window, including a pink icon with a white cross.

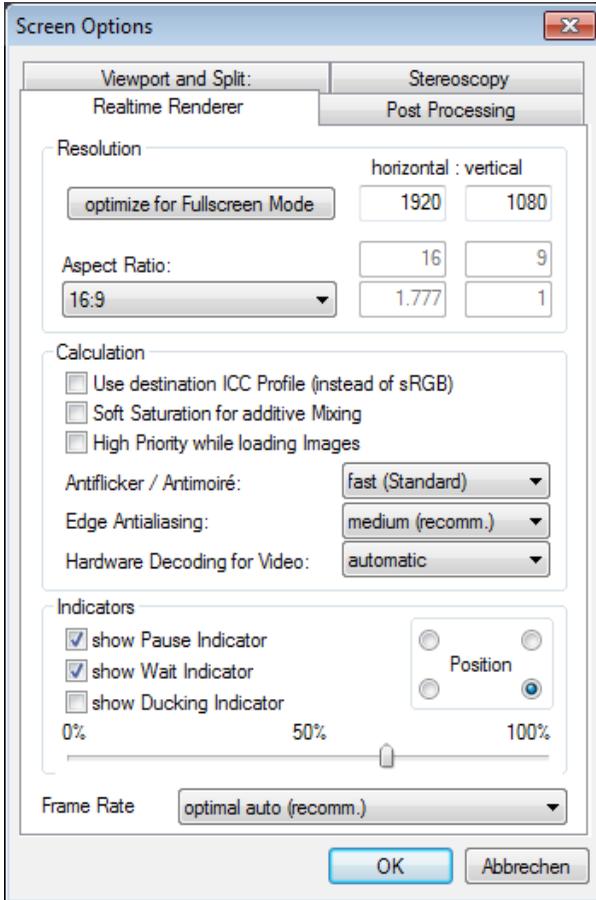
 To place a Wait Marker at a specific point, simply click on this symbol with the left mouse button, hold the mouse button down and drag it to the desired point on the timeline. Let go of the icon there. A pink cross will then appear on the timeline. If you want to change the Wait Markers later, you can move them around on the timeline as you wish.

Position the locator a bit in front of the Wait Marker and then start the playback. As expected, the locator stops at the Wait Marker.

*Note: Wait Markers are displayed in the basic license, but since there is no Speaker Support available, they have no effect.*

To continue the presentation, you can press the spacebar or use a remote control. This

way you can benefit from the Wait Markers to the full extent. This means that a speaker can act freely on stage and does not have to be near the computer to control his AV show. He simply presses the corresponding button on the remote control and the playback goes on. This ensures that you can concentrate fully on your presentation.



In this context, `m.objects` also offers you additional guidance: If you accidentally press a button on the remote control during the lecture or if you are unsure whether the presentation is already in Play mode after a Wait Marker, an optionally activatable indicator signals the Pause mode or a Wait Marker discreetly and barely noticeable to the viewer. To activate, open the Virtual Screen Options (right-click in the open Screen / *Virtual Screen Options*).

Here you can choose whether the *Indicators* for the *Pause* mode and / or for *Wait* Markers are displayed. If you remove the check marks, the respective indicator is deactivated again. You can also choose the *Position* of the indicator in one of the corners of the Screen and adjust the opacity with the slider.

During the presentation, the indicator is slowly faded in as soon as the pause button

is pressed or the locator stops at a Wait Marker. As soon as you continue the playback, the indicator slowly fades out again. Due to its subtle size and the adjustable opacity, it is hardly noticeable to the audience.

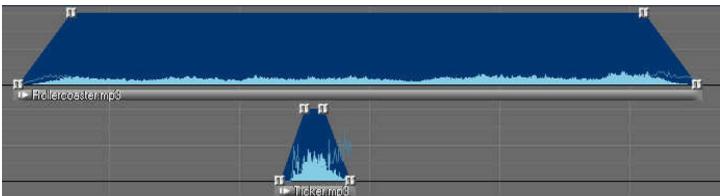
*Tip: When using a Wait Marker, the Projection time of the image should be as short as possible. As soon as you start the locator again after you have finished your commentary, the next transition is immediately visible and the presentation can continue without interruption. Otherwise you might have to wait until the next image appears on the Screen, which then leads to unnecessary pauses in which nothing happens on the screen.*

## Asynchronous audio

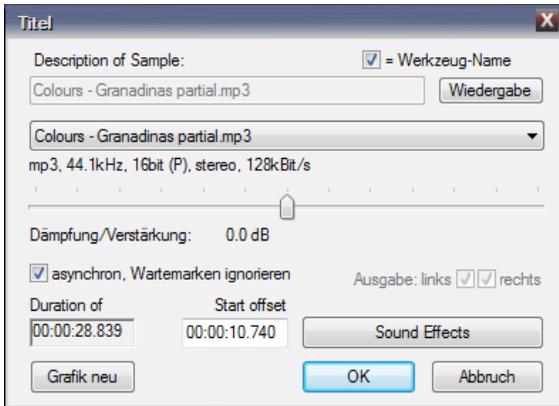
If the locator stops at a Wait Marker, this also affects the audio of course, because it is only played as long as the locator runs over the audio sample. So in order not to interrupt the audio abruptly, it would have to be faded out in front of the Wait Marker. On the other hand, a commentary accompanied by music can contribute to a better atmosphere of the lecture, while pausing the audio may even be perceived as disturbing.

For this purpose there is the possibility in the m.objects Speaker Support to use audio asynchronously: Normally a piece of music in an audio track always runs synchronously with the timeline. This way fade-ins and fade-outs can be set up to match the music. The asynchronous audio, on the other hand, runs independently of the timeline, which in turn means that it ignores Wait Markers.

In the following image you can see two audio tracks, on which mp3 files are stored. The short Projection time of the sample in the lower track is conspicuous. This audio sample is now to be set up as an asynchronous background audio for the commentary. There is already a Wait Marker.



Double-click on the bar below the volume envelope of the lower audio sample to open the properties window.

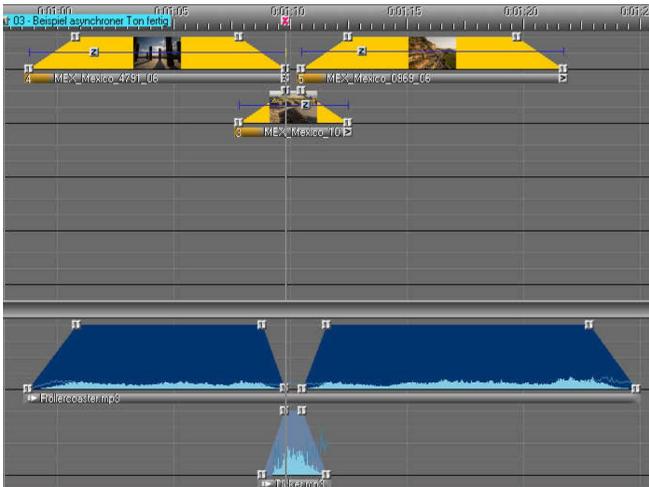


In the lower half you will see a check box labeled *asynchron, Wartemarken ignorieren*.

Place a checkmark here and confirm with *OK*. The change is immediately visible because the dynamic curve is now in front of a light blue background. This way you can determine immediately which audio sample is set to asynchronous.

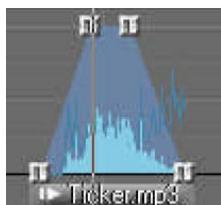
Transitions are now created between the two audio

samples, i.e. the upper sample - matching the fade-in of the lower one - is faded out and faded in again behind the Wait Marker. The following image shows how the arrangement on the audio tracks looks like afterwards.



The actual background music is hidden just before the Wait Marker and the music for the commentary is starting to play at the same time. The locator stops at the Wait Marker, the image track pauses, but the audio continues to play. After restarting the locator, the asynchronous audio is faded out and the

actual background audio is played again. Since the asynchronous audio continued to play independently of the locator during the pause, its dynamic curve no longer matches the audio being played.



A distinction must therefore be made between the volume envelope that surrounds the entire area of the audio sample and the inner dynamic curve of the asynchronous audio. While the dynamic curve no longer coincides with the audio being played, the volume envelope, in line with the position of the locator, shows exactly whether and in what intensity the asynchronous audio is output by the software.

Asynchronous audio runs in the loop automatically. It is repeated as often as necessary, so that even pauses that are longer than the audio sample are continuously accompanied with audio.

## Comments

m.objects offers you the option of storing comments on the timeline and displaying them during the presentation. The crucial point here: the comments can only be seen on the user interface of the program, but not on the Screen, so they remain hidden from the audience. If you present directly from the timeline, the comments serve as support during the presentation, and may even replace the manuscript. In addition, comments can also be a useful tool when programming an AV show.



You can insert comments, as with images and audio via a separate component. First, open any m.objects show and click on the *Select Components* icon.



Now hold down the left mouse button and drag the *Comments* symbol from the *Tools* window into the gray, empty area, where the other active components are already listed.

In the following window you can enter the desired number of comment *Tracks*, just like with image and audio tracks. You can choose as many comment tracks as you want, which in turn can be used to set up up to four different comment windows. You will find out what this is all about shortly.

Now confirm the entry with *OK* and click on the flashing icon in the toolbar. Now you have the usual user interface in front of you, supplemented by the comment tracks.

Component Add

Component:

Tracks:

Use Letters as Track Name

OK Cancel

To make it simpler, let's start with one comment track, which is perfectly sufficient in most applications. If you click on this track, the content of the Tools window is changed. You will now find an object labeled *Text Tool 1*.



To create a comment, drag the *Text Tool 1* object with the left mouse button pressed to the desired position on the comment track. A corresponding symbol will appear there and *Text Tool 1* can be read in the *Comments* window (usually to the right of the Tools window) after letting go of

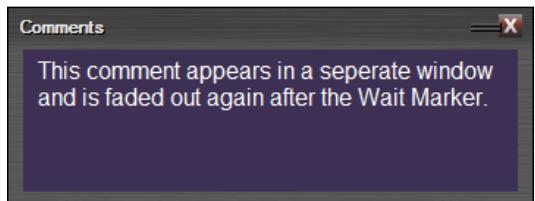
the mouse button. If necessary, the *Comments* window is automatically displayed as soon as you place a text object on the comment track.

To insert your own text, select the symbol just created in the comment track with a mouse-click, click in the *Comments* window and enter your text. Now start the locator prior to the symbol in the comment track. As soon as it moves over it, your text is displayed and will remain until it is replaced by a new text, which you create in the same way as described above by dragging a *Text Tool 1* symbol onto the comment track. You can also create an empty comment, i.e. without entering text, so that the *Comments* window remains blank from that point.

Of course, your text can also be formatted. Select the relevant text section by dragging with the left mouse button pressed and then right-click on the marked text. In the pop-up context menu you will find a number of formatting options, including the *Font* and *Background Color*. Here you can enter the adjustments for, for example, font, size, color or even for the background color of the text and thus change your comments individually.

You can also predefine different text formats that you will use later for different types of comments. To do this, create additional objects in addition to *Text Tool 1* in the Tools window: If the comment track is activated, click on the *Create Object* (plus) icon, enter a suitable *Name* and confirm with *OK*. Double-click the new object to open the *Properties* window again, select the *Font* and enter the desired formatting. Every time you use the new object edited in this way on the comment track, the text will appear in the predefined format.

The comment window itself can also be customized. For presentations in particular, it makes sense to remove the

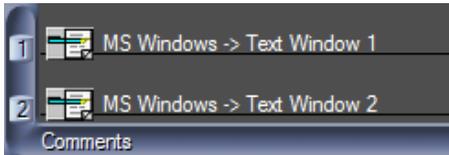


window from its original place and place it as a separate window above the image tracks. To do this, click on the light gray narrow bar next to the Comments window and drag it down a bit with the left mouse button pressed. If you let go now, the window is released from the bar and can be enlarged as desired by pulling on the sides. With the appropriate font size, comments are now easy to read from a distance from the screen, for example if you are not standing right next to the monitor during the presentation.

If you are working with several comment tracks, you can manage up to four Comments windows. This makes it possible to display several windows at the same time, which can be particularly useful for large presentations or complex topics. In this way, comments can be differentiated thematically, for example. You can change each of these windows individually, as described above. If you assign the same window to several comment tracks, the current text (in relation to the position of the locator) is displayed there.



You can see the assignment of the Comments windows to the tracks by clicking on the wrench in the toolbar.



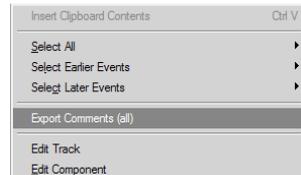
If you want to change an assignment here, simply move the respective text object to another comment track, that has the desired Comments window assigned to it.

Another tip for working with detached Comments windows: If you place blank comments on the assigned comment track, the window will disappear from the screen as soon as such a blank comment is reached and is only shown again with the next non-blank comment.

### **Export comments as a text file**

m.objects offers you the option of saving the comments from your show - either all or a selection of them - as a text file. This can be useful, for example, to create a script from the comments and print it out or to process them in another program.

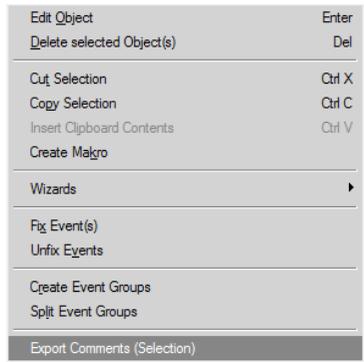
You can find the function for this in the context menu of the Comments component. If you want to export all comments, right-click in the empty area of a comment track and select the option *Export Comments (all)*.



To export only certain comments, select them and right-click on one of the selected comments. Now select the option *Export Comments (Selection)*.

In the following window, give the text file a name. m.objects saves the file in the project directory of your show by default. Alternatively, you can of course choose another directory here. The comments are then saved as a *.txt* file.

In addition to the actual comments, the file itself also contains the exact point of time of the respective comment on the timeline.



## Remote control

In addition to controlling a presentation using a mouse or keyboard, m.objects also offers the much more convenient option of using remote controls. This is particularly useful for lectures, because with a remote control you can move freely in the room or on the stage and carry out the desired actions simply by pressing a button. In combination with the Speaker Support functions described above, the use of a remote control is the means of choice.

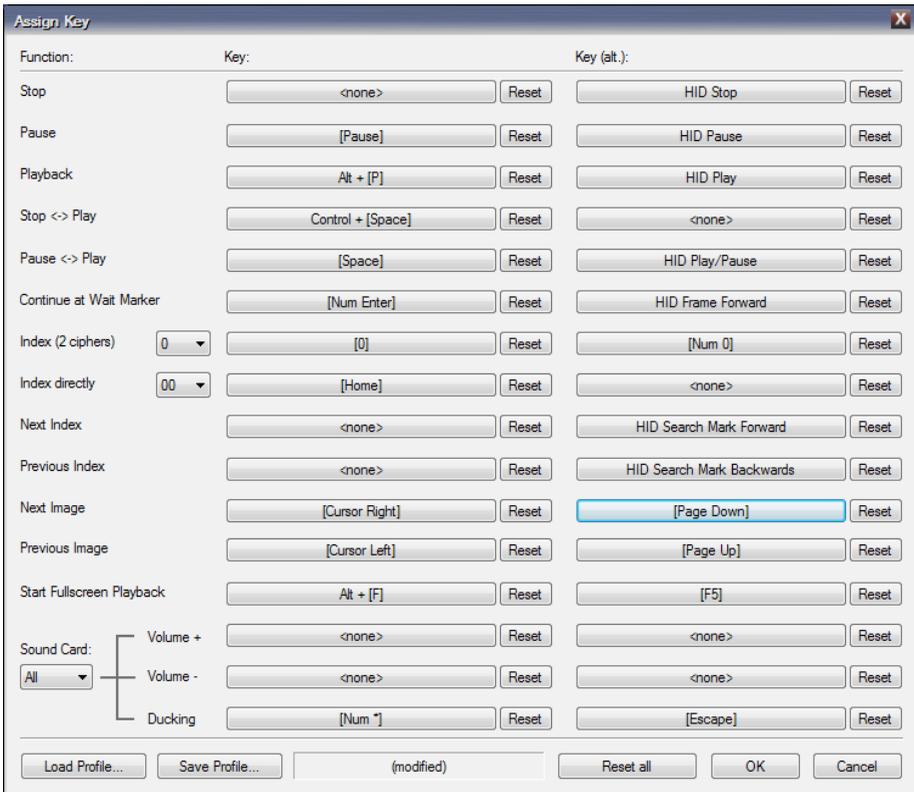
The device shown offers a range of approximately 20 meters. Windows detects the device automatically as soon as the supplied USB receiver is plugged in, a separate driver installation is not necessary. After plugging in the receiver, m.objects or the presentation file may need to be restarted, since the presence of the remote control is only requested when they are started. The remote control can be used for realtime rendering from both m.objects and EXE files.

You can use almost any remote control that can be connected to your computer. Above all, you have the option of freely assigning m.objects functions to the buttons on your remote control. This way you can set up your own individual m.objects control unit. This also applies to the keyboard.

Open the menu item *Options / Keyboard / Remote Control*.

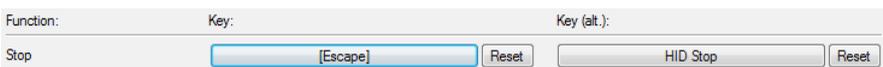


The *Assign Key* window will then open up.



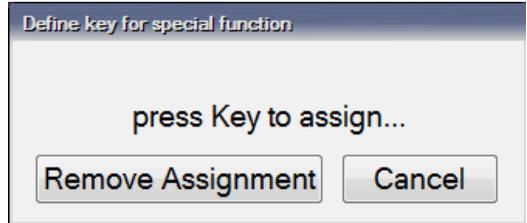
The window shows a complete overview of the assignment of the presentation functions to the keyboard or the remote control: In the left column you will find the individual functions, in the two subsequent columns the assigned keys. In the default settings, the buttons on the remote control can be found in the right column, those for the keyboard in the middle column. You can change this allocation however you like.

Every assignment that you see here is arranged as a button, so you can change it directly in this window. Here is an example: The *Stop* function for stopping the



presentation can be called up by default using the *Esc* key. On a remote control you will often find a standard button for this function, here denoted as *HID Stop*. HID stands for Human Interface Device, which is basically a technical term for remote control.

If you now want to assign a different key to the Stop function on the keyboard, click the *Escape* button. The following window appears, asking you to enter the 'new' key.



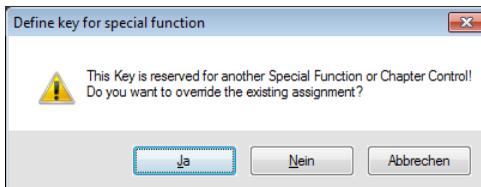
If you now press the *S* key (for example), the window just opened will disappear and the overview will show the new assignment.



You can now stop an ongoing presentation with the *S* key, of course after you have confirmed the Assign Key window with *OK*. To change assignment of keys on the remote control, do the same, i.e. click on *HID Stop* and press the desired key. The new assignment will appear immediately in the overview.

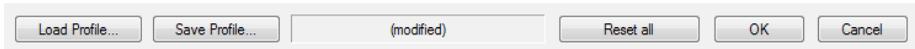


The image shows a possible variation, but may look different depending on the button you pressed. If you select a key that is already assigned to something else, a corresponding message will appear.



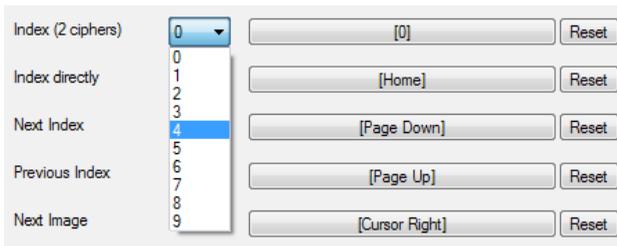
If you confirm this message with *Yes*, the previously assigned function to that key will be replaced by the new function. You should then assign a new key to the previous function if necessary.

If you want to reset a single key assignment to the default, simply click on the *Reset* button next to it. To reset all values, use the button *Reset all* in the bottom line.

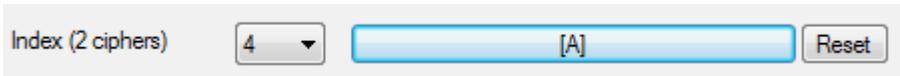


You also have the option of saving one or more key assignments as profiles. This allows you to permanently save your individual key assignment or also create profiles for several users of a presentation PC. Each of these users can access their own key assignments via *Load Profile...*

For key control of the index marks you will find the entries *Index (2 ciphers)* and *Index directly* in the overview. With *Index* single digits you can assign any key with the numerical values 0 to 9, so that you can then select double-digit indexes 00 to index 99. Let's say you want to assign the number 4 to the A key. Select 4 in the drop-down menu, then click on the broad button and enter A.



Key A is now assigned the value 4.



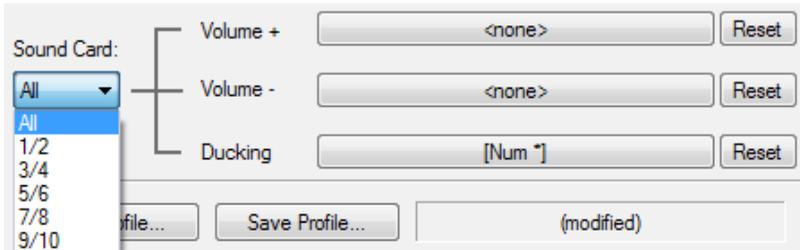
In the same way, you can assign a value of 2 to the B key, for example. To move the locator to the index mark 42, press the A and B keys in quick succession, which m.objects now interprets as 42.

With the function *Index directly*, on the other hand, you can assign a key to individual index marks from 00 to 99, so that you can select the corresponding index with just a single key.



You also have differentiated input options for the key control of the audio output. You can assign any key to the functions louder and quieter as well as ducking (see the following chapter *Manual ducking for spontaneous moderation* on page 237).

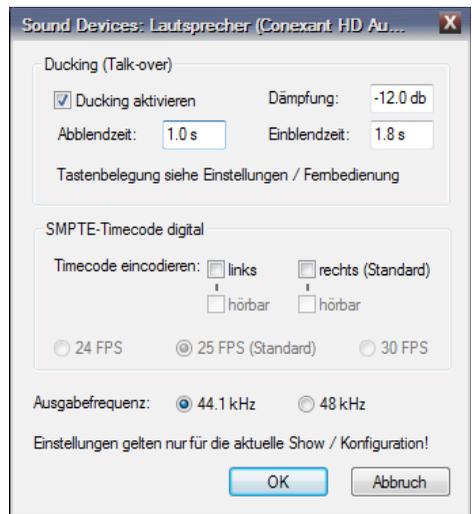
What's special about this: The control can either happen for the entire audio output or for individual sound cards. If you are working with a PC that has several sound cards, you can assign different sound cards to individual audio tracks in your presentation and control their volume separately by pressing the assigned keys. For example, while the volume of one or more audio tracks is turned down, the other audio tracks remain equally loud.



## Manual ducking for spontaneous moderation

It is not always possible to predefine the moderated parts of a presentation from the start and to set up corresponding Wait Markers. Therefore, there is the option of manual ducking for spontaneous moderation in m.objects as part of the Speaker Support. You can use a freely assignable key on your keyboard or remote control to reduce the volume of the m.objects Show by an adjustable value during playback, thus ensuring that your live commentary is understandable.

As described in the previous chapter *Remote control*, use the *Assign Key* selection window, which you can access via the menu items *Options / Keyboard / Remote Control*. You will find the entry *Ducking* at the very bottom. After assigning a key, you only need to press it once during the presentation and the audio is muted. Pressing the button again sets the audio back to its original volume.

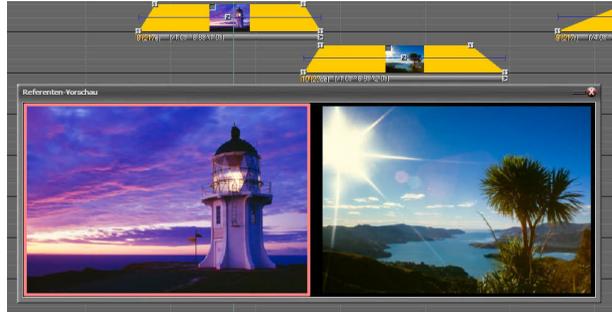


In most cases, you can work with the default values without any further adjustments. But you also have the option of customizing the attenuation of the audio and the times for fading-out and fading-in the volume. To do this, select the menu item *View / Driver Assignment* in the program menu, activate the audio tracks with a mouse click and double-click the sound card used for the audio output in the *Tools* window.

Here you tick the checkbox for *Ducking aktivieren*, enter the desired values for *Dämpfung* (muting), *Ablendzeit* (fade-out time) and *Aufblendzeit* (fade-in time) and confirm with *OK*.

## Speaker preview for live lectures

In addition to comments with important information for your presentation, you can display the *Speaker Preview* as additional support for the live presentation. You can find this in the program menu under *View*.



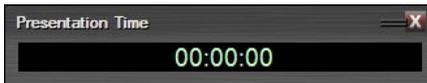
This will open up a new preview window, which shows the current image of the show, i.e. the image your audience is currently seeing, and the subsequent image. The current image appears - depending on the orientation of the Speaker Preview - on the left or above the subsequent image and is provided with a broad light red frame for better distinction.

Like the *Comments* windows, the Speaker Preview can be integrated into the m.objects user interface in docked mode, as well as placed and scaled anywhere on the screen in window mode. This way you can easily perceive the preview even from a distance from the screen.

## Display of Presentation Time and Time of Day

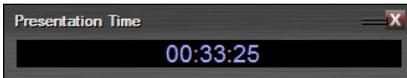
The factor time does sometimes play an important role in a live lecture. Therefore, m.objects offers two practical aids with the displays of the Presentation Time and Time of Day, with which you can keep an eye on the times. You can find both in the *View* menu. These displays can also be docked into the user interface as well as shown as floating windows and scaled as desired.

The Presentation Time shows you the progressive duration of your lecture. As soon as you start the locator, the timer will start to count. For the default setting, the time is counted up to the second, starting at 00:00:00.

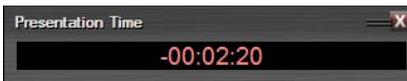
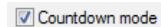


By double-clicking in the window, you can *Enter* a desired *Presentation Duration*, for example 30 minutes.

During the lecture, the window will show you the elapsed time. As soon as the specified duration is reached, the font color will change from light green to red.



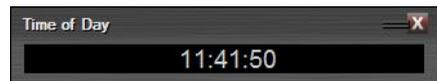
If you tick the *Countdown mode* option in the input window for the *Presentation Duration*, the specified time is counted down.



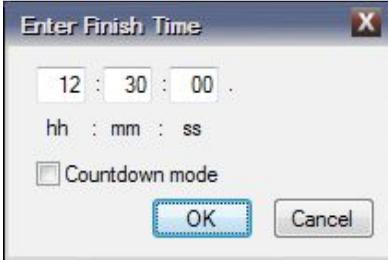
In contrast to the default mode, the time is shown in blue. Here, also, the color will change to red as soon as 00:00:00 is reached, and from then on the exceeded time is displayed.

Of course, the display for the Presentation Time continues even if you set the locator to Pause mode or if it stops at a Wait Marker. Only when you Stop the lecture, i.e. by pressing the *Esc* key or clicking on *Stop*, the Presentation Time will be reset to 00:00:00 or – for the Countdown mode – to the specified duration.

The Time of Day window initially shows you the current time of day.



Here, also, double-clicking in the window opens up window in which you can *Enter* the planned *Finish Time* for the lecture. If the lecture should end at 12:30, enter this time accordingly.



At 12:30, the font color in the Time of Day window will change from gray to red, signaling that the intended finish of the lecture has been reached.

If you have selected the *Countdown mode*, the remaining time is counted down to the specified Finish Time. The color will change to red as soon as this time is reached. Then the exceeded time is displayed here as well.

## Interactivity with m.objects

The interactivity functions are available in all licenses from m.objects live upwards.

For playing back an m.objects presentation, the standard functions *Playback*, *Pause* and *Stop* are available, either using the keyboard, the mouse or a remote control. You also got to know the use of Wait Markers as a means of controlling the m.objects timeline in the chapter on Speaker Support. This chapter deals with two additional m.objects tools with which you can influence the course of a presentation and create interactive applications:

*Index/Jump Markers* and *Range Markers* offer you the possibility to directly actuate freely definable positions in an m.objects presentation and to play freely definable parts as often as you like. In conjunction with interactive Image Areas, you can even call up individual presentations from a menu with a mouseclick. These functions are explained in detail subsequently using an example.

### Control with Index/Jump Markers

When you click the timeline in the program's user interface, the associated objects appear in the *Tools* window. A presentation must be opened up for this.

Here you can see - beside other tools - the *Range Marker* with a blue square and black arrow in front of it, as well as the *Index/Jump Marker*, symbolized by a gray square with the letter *i*.

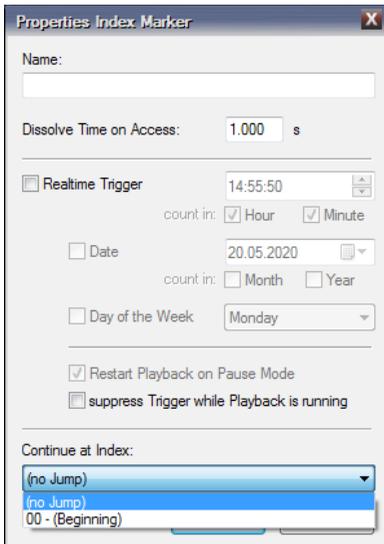


With the left mouse button pressed, drag the symbol for the Index/Jump Marker to any position on the timeline and release the mouse button there.



An Index/Jump Marker with the number *01* now appears on the timeline. If there are already other Index/Jump Markers on the timeline, the number may be accordingly higher. The properties window opens up automatically or is opened up by double-clicking the symbol.

Here you can assign a *Name*. While this is not mandatory, it can be very helpful if you are working with a larger number of Index/Jump Markers later on. The selection field *Continue at Index* now offers you at least the two options (*no Jump*) and *00 - (Beginning)*. The *00* Marker is automatically placed at the very beginning of the timeline as soon as you use Index/Jump Markers. In contrast to all other Markers, it has a fixed position and therefore cannot be further edited.

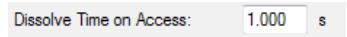


Now enter the selection *00 - (Beginning)*, confirm with *OK* and then start the locator before the new Index/Jump Marker. As soon as the locator reaches it, it will jump back to the beginning of your presentation. If you place the Marker at the very end subsequent to the last image or audio sample, the presentation will run in a loop. It will then always start from the beginning until you stop the locator.

The Transition time when jumping to an Index/Jump Marker can also be changed. In the *Index Marker* properties you will find the option *Dissolve Time on Access*.

Enter the desired value here. This determines how long the Transition lasts when the locator jumps to the selected Marker. The default value is 1 second.

You can easily create additional Index/Jump Markers by dragging the symbol from the *Tools* window to the desired position on the timeline as described above. These Markers are then also available under the *Continue at Index* drop-down menu in the properties window. If you have assigned names, these are



also shown here, so that the selection is easier, otherwise only the index number appears.

You can also select each Index/Jump Marker directly during the presentation and make the locator jumps there by entering the corresponding number on the number pad of the keyboard, e.g. 02, 06, 12 etc. First, make sure that the number pad is activated on your keyboard. If not, press the *Num Lock* key.

Especially with extensive presentations, you can provide structure and overview with Index/Jump Markers. All Index/Jump Markers are displayed in the Index List, which you open via *View / Index List*.

Here you will find the respective *Event Time*, the *Description* (the name you have assigned to the Index/Jump Marker) and the duration of the individual chapters, i.e. the time interval between the individual Index/Jump Markers. If you have defined an Index/Jump Marker for *Continue at Index*, this is also displayed here.

As an alternative to entering the Index number using the keyboard, you can navigate here to the corresponding Index on the timeline by clicking in the Index List. This way you keep an overview even with large productions and can reach certain areas of the show quickly and specifically.



| Event Time:  | Description:                 |
|--------------|------------------------------|
| 00:00:00.000 | 00 - (Beginning)             |
| 00:00:07.992 | 01 - Peru                    |
| 00:03:20.448 | 02 - Argentinien             |
| 00:06:06.692 | 03 - Brasilien - Acre        |
| 00:07:30.980 | 04 - Brasilien - Amazonas    |
| 00:10:28.296 | 05 - Brasilien - Mato Grosso |

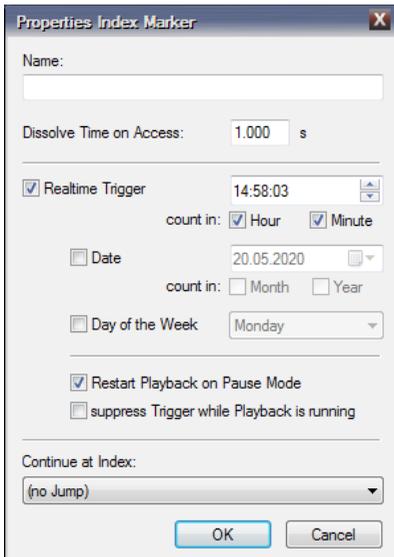
## Index/Jump Markers with Realtime Trigger

This function is available in m.objects ultimate or in m.objects licenses with the *Remote-In* module.

For Index/Jump Markers you can use it to set a real-time specification (time of day and/or day of the week or date) for execution. If this time limit is reached in Pause or Playback mode, the locator automatically jumps to the corresponding Index/Jump

Marker. This means that a one-time execution at a specific point in time can be set as well as recurring triggers (every minute, hourly, daily, weekly, monthly or yearly) - for example for an installation in which a certain part of a presentation should start daily at a fixed time.

To use this function, check the option *Realtime Trigger* in the properties window of the relevant Index/Jump Marker. If necessary, activate the *Restart Playback on Pause Mode* option if the presentation should wait for execution in Pause mode.



First enter the desired time in the properties window. If no further options are selected, the point of time for execution is the value for the seconds. If, for example, the entry 10:20:00 is specified, the index mark is executed every full minute (when the value for the seconds 00 is reached).

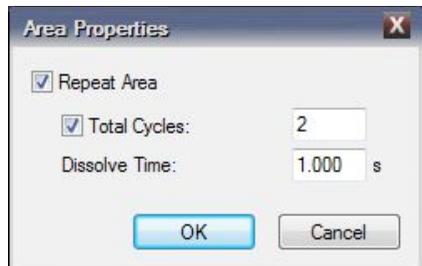
If you now tick the boxes for *Minute* or *Hour* next to *count in*, you specify the execution accordingly. It will then take place every 60 minutes (always 20 minutes after a full hour) or once a day at 10:20.

With the further options, you can now determine whether the execution should take place just once on a specific *Date*, once a year, once a month or on a specific *Day of the Week*.

## Control with Range Markers

As the name suggests, Range Markers enable you to control a certain area within your m.objects presentation. In contrast to the Index/Jump Markers, you always set a start and an end point here.

To do this, drag a Range Marker onto the timeline (with the timeline activated) while holding down the left mouse button and



release the mouse button at the desired point. A Range Marker symbol is now visible on the timeline, and a blue line extends from there towards the right.



Now place a second Range Marker a little to the right of the first one. The line now connects the two Range Markers.

The range marked by the line can now be repeated any



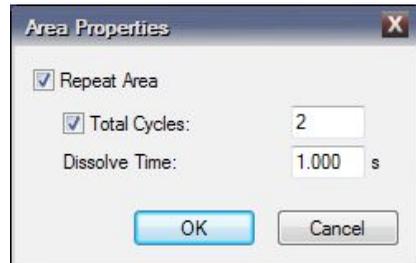
number of times. Unlike the Index/Jump Markers, you have the option of specifying a certain number of repetitions here. To do this, double-click on one of the Range Markers, which opens up the *Area Properties* window. It doesn't matter which of the Range Markers you double-click on, because the values you enter here are automatically transferred to the other Marker.

First check the *Repeat Area* option and confirm with *OK*. The blue line between the Range Markers will then turn green. If you now start the locator, it runs in a permanent loop between the two Markers until you stop it. Double-click on a Range Marker again and check the box for *Total Cycles* as well. In addition, enter any numerical value and confirm again with *OK*.

The selected number is now displayed next to the first Range Marker and the locator repeats the area the corresponding number of times.

Similar to the Index/Jump Markers, you can also change the *Dissolve Time* in the *Area Properties*, i.e. the duration of the Transition from the second back to the first Range Marker.

You can of course create several such areas on the timeline. However, these must not be overlapping each other, but must be one behind the other. For more complex



applications, combine Range Markers with Index/Jump Markers as described in the following section.

## Index/Jump Markers, Range Markers and interactive Image Areas

It becomes really exciting when you combine Index/Jump Markers and Range Markers with each other, supplement them with interactive Image Areas and underlay them with asynchronous audio. That sounds more complicated than it actually is and, above all, offers a variety of options for creating interactive applications.

An example should demonstrate how you can create such an application. The following screenshot shows an overview of the arrangement on the timeline.

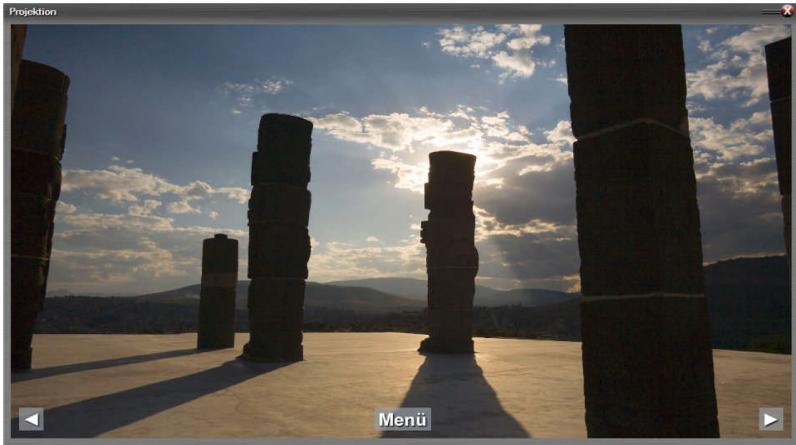


A title is initially stored in each of the top three image tracks. All three titles together represent a selection menu that is repeated with the help of Range Markers until the viewer switches to one of the three short presentations on „Mexico“, „Hawaii“ or „Munich“ with a mouseclick. The short presentations follow subsequently on the timeline. The selection menu is underlaid with images from the fourth and fifth image track. Asynchronous audio ensures that background music can be heard without interruption.



As soon as the viewer clicks on one of the titles - similar to a hyperlink on a website - the locator will jump to the associated Index/Jump Marker. There will be a smooth transition to the short presentation concerning the image material as well as the audio. At the end of the short presentation, the locator will jump back to the selection menu. If the locator is in the middle of one of the three short presentations, you can navigate back to the selection menu via a button that is shown at the bottom of the Screen. Two other buttons allow you to navigate forward or backward image by image. These buttons are also created as text in the top three image tracks and arranged behind the selection menu.





The texts in the selection menu at the front are provided with Passepartouts that take on different colors depending on the background image. They also each contain a Shadow/Shine object. From particular importance for understanding the application are the Index/Jump Markers and Range Markers that are stored on the timeline.

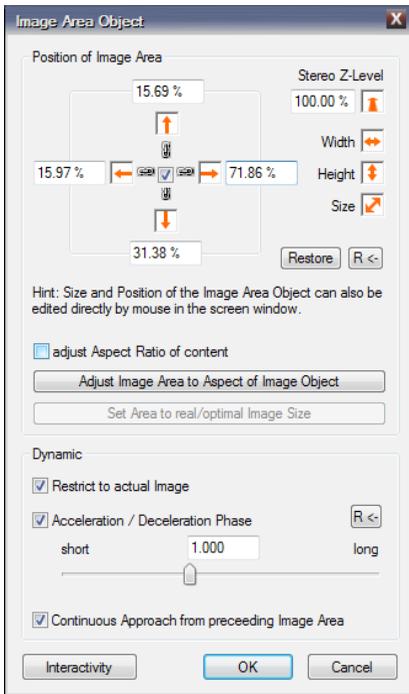


In the area of the selection menu there is the Index/Jump Marker *01 - Menü* and behind it two Range Markers, which are connected by a green line. After the start, the locator will run through to the second Range Marker and jump back to the first Range Marker from there. The *Repeat Area* option is set in the properties of the two Range Markers.

Analogously, there is an Index/Jump Marker at the beginning and end of each of the three short presentations. The locator will jump to the Marker at the beginning - e.g. *02 - Mexiko* - as soon as the corresponding 'link' is clicked on the Screen. When reaching the Index/Jump Marker at the end of a short presentation, the locator will jump back to the selection menu. These functions are set in the properties of the Index/Jump Markers.

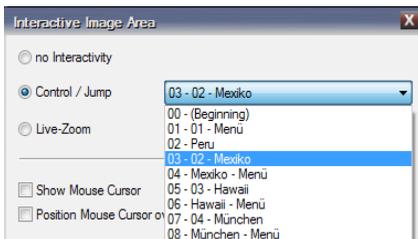
The linking, i.e. the possibility to select a presentation with a mouseclick, is achieved via interactive Image Areas.





The light curve of each text in the selection menu contains an Image Area object. The *Interactivity* button is located at the bottom left of the Image Area properties window. Clicking on it opens up the *Interactive Image Area* window, where you can specify which Index/Jump Marker a mouse click should lead to. All Index/Jump Markers that are stored on the timeline can be selected for *Control / Jump*.

You can also select the options here to have the cursor displayed in the range of the interactive Image Area (*Show Mouse Cursor*) and/or to have the cursor immediately positioned on this Image Area when faded in (*Position Mouse Cursor over Area*). The buttons that can be seen during the short presentations are also created in this way. The buttons for jumping one image forward or back do not refer to an Index/Jump Marker, but are accordingly assigned to *Image forward* or *Image back* in the properties for *Interactive Image Area* for *Control / Jump*.

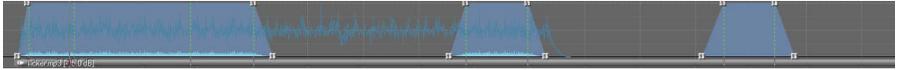


Interactive Image Areas are of course also suitable for use with touchscreens, where the presentation can be selected simply by touching the desired button. This makes such applications particularly interesting for exhibitions, museums, events and many other occasions in which the audience can actively participate.

In this example, a combination of asynchronous and synchronous audio is used to achieve a clean transition not only between the image sequences but also between the audio samples. The audio sample that can be heard during the selection menu runs asynchronously, of course, so that the audio continues within the Range Markers or

between the Index/Jump Marker and the Range Marker.

When jumping from the selection menu to the short presentations, there is a transition from asynchronous to synchronous audio. A simple but effective trick is used here: the asynchronous audio extends to the end of the whole timeline.



Only its volume envelope is lowered in the meantime and rises again at the corresponding points. This causes the asynchronous audio to be faded out when you jump from the selection menu to a short presentation, while the asynchronous audio cannot be heard in the area in between on the timeline. This creates a clean transition without disruptive interruptions. Further information on asynchronous audio can be found in chapter *Speaker Support* on page 225.

## Visual feedback of interactive Image Areas

Interactive Image Areas can also provide visual feedback - comparable to hyperlinks on websites - when the cursor is positioned over them, when they are clicked or when they are touched on a touch panel.

For this purpose, either place the Dynamic object Shadow/Shine, Passepartout or Picture-/Video-Processing on the light curve in which the interactive Image Area is located. Then set the desired effect in the properties of the Dynamic object.



In the example from the previous chapter, the visual feedback of the titles "Mexico", "Hawaii" and "Munich" in the selection menu is achieved with the help of Passepartout and Shadow/Shine objects on the light curves. Each of these titles is provided with several Passepartout objects, so that shifting background images are accompanied by shifting background colors of the titles. This ensures optimal legibility.

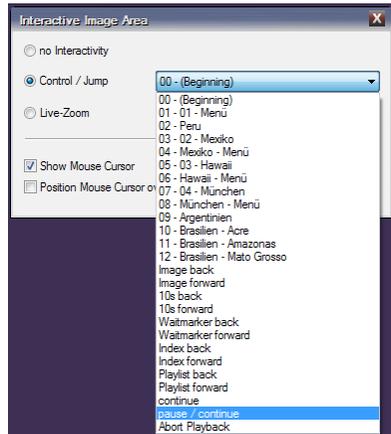
The *Opacity* is set to 70% in the properties of the Passepartout objects. If the cursor is now located over the sensitive range of the Image Area (or if it is clicked or touched on a touch panel), the value defined for this object is amplified to a certain degree so that the user immediately receives visual feedback for the planned or initiated action. In this case, the opacity of the buttons' background is significantly increased, as shown in the following screenshot for the "Hawaii" button.

At the same time, the Shadow/Shine effect is significantly enhanced.

A detailed description of working with the Dynamic objects mentioned above can be found in chapter *Dynamic objects* on page 101.

## Control functions of interactive Image Areas

With interactive Image Areas, you can not only actuate Index/Jump Markers. There are also a number of other functions that you can initiate using the interactive Image Areas. You can also find these in the properties window of the Image Area after clicking the *Interactivity* button:



- *Image forward/back*
- *10s forward/back*
- *Index forward/back*
- *Playlist forward/back*
- *Waitmarker forward/back*
- *pause / continue*
- *continue*
- *Abort Playback*

With these functions, for example, individual control modules can be created and firmly integrated into the presentation, so that the viewer can later pause / continue the playback, repeat or skip parts of the presentation.

All control functions of interactive Image Areas work both when playing a show from the timeline and when playing from a presentation (EXE) file.

## Interactive zoom

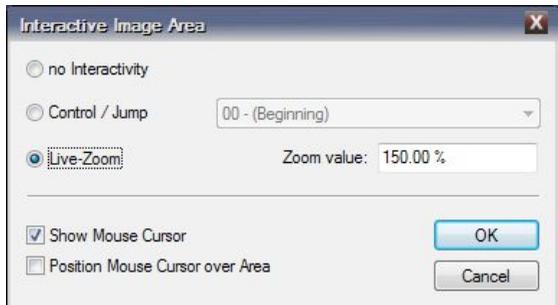
Interactive Image Areas can also be provided with a Live-Zoom factor instead of the control functions.

With this function, the viewer can magnify images with a soft animation by mouse clicking or by touching the screen, for example to make small fonts or image details more recognizable.

For this purpose, place an Image Area object in the light curve of the image to be enlarged. In the properties window, click on *Interactivity* and in the window that opens up, select *Live-Zoom*.

Enter the desired magnification here. Then confirm twice with *OK*.

The enlargement is then centered on the position of the image, which the viewer has selected by mouseclicking or touching. In the enlarged mode, the image section can also be



moved afterwards. A further mouseclick or a further touch will shrink the image again and return it to the original position.

It is irrelevant for the function whether m.objects or the EXE file is in Pause or Playback mode or whether it is currently waiting at a Wait Marker.

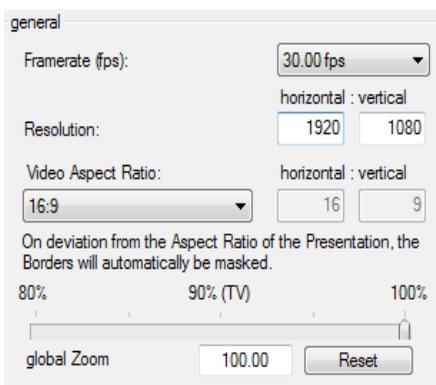
## Export video

A multivision can be exported from m.objects as a video in various formats. To do this, select the *export as Video* sub-item in the *File* program menu.

*H.264 / H.265 Video*, *Windows Media Video*, *AVI Video*, *MPEG-2 Video* and *Image Sequence* are the available options. Select the desired format with a mouseclick. This opens up a window which is identical for all the options in the section *general*.

The formats H.264 / H.265, WMV, AVI and Image Sequence are also suitable for the export of stereo 3D productions.

### General guidelines for video export



Here you can specify the values for *Framerate*, *Resolution* and *Video Aspect Ratio*.

Special presets are available for export in the H.264 / H.265 format, which already set specific inputs here. A more detailed description of this can be found below.

The appropriate Framerate value depends on the application for which you are creating the video or the output device on which you are planning to run the video. The abbreviation fps stands for frames per second.

A value of 60 fps is particularly suitable for playback on computer systems. On a powerful PC, videos with 60 fps lead to completely smooth playback. For most PC systems that are less powerful, the value 30 fps is the right decision for a good compromise between fluid transitions and motion sequences and the required computing power. 50 fps corresponds to the standard for European TV sets, but many of the integrated media players also reproduce 30 fps without any problems. For

other output devices, information on the preferred framerate should be available for checking in the operating instructions.

Resolution and Video Aspect Ratio also depend on the desired use of the exported video. For the output on a TV with Ultra HD resolution, the values  $3.840 \times 2.160$  for the *Resolution* and  $16:9$  for the *Video Aspect Ratio* should be entered here.

When exporting as MPEG-2 video, the values for Framerate and Resolution are already predefined, since in this case the video is always exported in PAL resolution.

With the *global Zoom*, the actual video content can be reduced in size if necessary, so that a black border is spanned around the video. This option is only useful in cases where the output device used for playback cuts off the outer edge of the image due to an incorrect setting (overscan). The setting  $100\%$  is normally recommended.

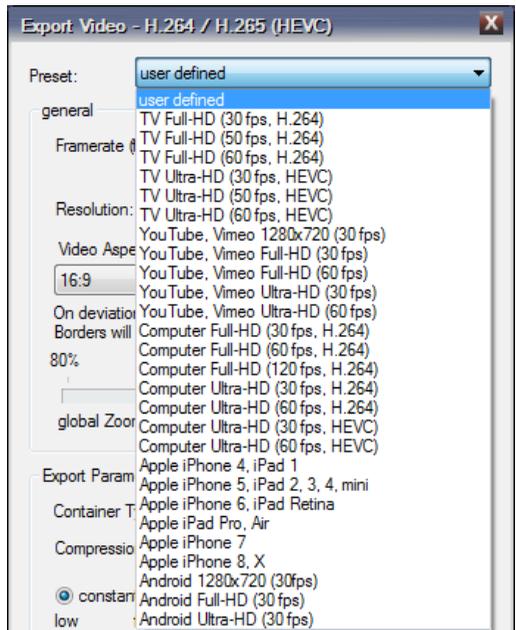
The other sections of the *Export Video* window offer different options depending on the selected video format.

## The specific export settings

### Export in H.264 / H.265 format

For many purposes, the video formats H.264 or H.265 are the right choice because they are very versatile and deliver a very good output quality. You can use these formats on all kinds of operating systems, i.e. in addition to Windows for example also on MacOS, Android or iOS and thus also for mobile devices such as tablets or smartphones. Most of the newer TV sets can also read these video formats directly, for example from a USB data stick.

In the *Export Video* settings for the format *H.264 / H.265* you will find the option *Preset* mentioned above. Clicking on the selection box opens



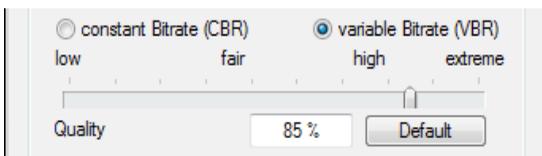
up a list in which you can find numerous specifications for different purposes. There are standards for mobile devices such as *iPhone*, *iPad* or *Android* devices or also for online videos on *YouTube* or *Vimeo*, and of course suitable standards for different resolutions and framerates up to *Ultra-HD* with *60 fps*. If you select such a preset, all other options in the export form will be set accordingly, so that you only have to confirm with *OK*. However, you can also – having selected a preset - individually adjust the other values as required.

Under *Container Type* you define, in which file format the video is saved. As a rule, you use *MP4* here. If the output device prefers a different format, select *MKV* or *MOV* instead.

Under *Compression* you have the choice between *H.264* and *H.265 (HEVC)*. *H.265* is much more efficient and generates approx. 40% smaller files with comparable quality, correspondingly higher quality with the same file size. The precondition for this format is that the output device supports *H.265*. You can find the relevant information in the manufacturer's documentation. If *H.265* is not supported, select *H.264* here.

### **Setting the bit rate for H.264 / H.265 Video and Windows Media Video**

If the *Bitrate* can be set in the export settings - this applies to *H.264 / H.265* and *WMV* - you first decide whether the exported video should have a constant or variable *Bitrate*.



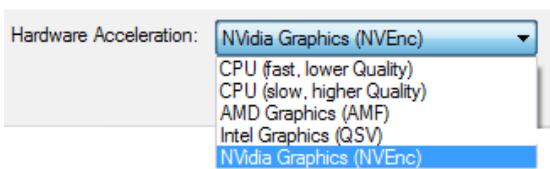
The *constant Bitrate (CBR)* is suitable for low-performance systems or connections, for example, for low-performance computer systems or for playback in slower networks

with low bandwidth. If this is not the case, select the *variable Bitrate (VBR)* instead.

Below you will find a slider with which you can set the *Bitrate* (for *CBR*) or the *Quality* (for *VBR*), which has an impact on the output quality of the video in both cases: the higher the value, the higher the quality and of course the file size. Values between the markings *high* and *extreme* only lead to a slightly noticeable increase in quality, but the file size increases significantly. You can also enter the value numerically in the input field. In most cases, the default value is recommended, which you can return to at any time by clicking on the corresponding *Default* button.

## Hardware support for H.264 / H.265 Video

Especially when exporting in H.264 / H.265 formats, you have the option of significantly accelerating the rendering of the video with the help of a suitable graphics card. Compared to exporting the video without such hardware support, the export is up to ten times faster. In this context, it is important that the graphics driver is up to date. The latest driver can be downloaded from the website of the respective manufacturer.



At the bottom of the Export Video form you will find the *Hardware Acceleration* option. Here you select the entry that matches your computer's graphics card.

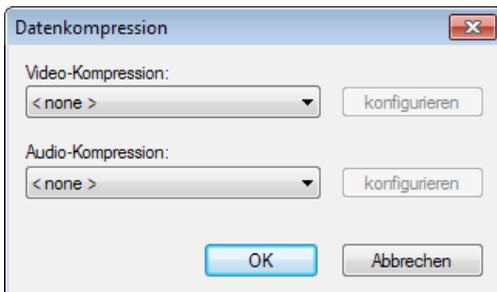
You can choose from *AMD Graphics* hardware, *Intel Graphics* hardware and *NVIDIA Graphics* hardware. If the subsequent export of the video fails despite the graphics driver being up to date (see above), either an incorrect entry has been selected - in this case correct your entry when exporting again - or the graphics card is not suitable for hardware support. In the latter case, select one of the two upper options *CPU (fast, lower Quality)* or *CPU (slow, higher Quality)* for Hardware Acceleration. These two options basically work on all PCs.

With AMD Graphics cards in particular (as of the end of 2019), exporting in H.264 format in many cases produces a reduced output quality. For computers with AMD Graphics hardware, it is therefore recommended to export in H.265 format or to select the *CPU (fast ...)* or *CPU (slow ...)* option.

## Export as AVI Video

The AVI format is ideal for further processing of the video with an editing program or another application as well as for uncompressed output. To export a video in AVI format, first select the appropriate option under *export as Video*, then enter the specifications for *Framerate*, *Resolution* and *Video Aspect Ratio* and, after confirming with *OK* you get to the *Mixdown Video* window.

As soon as you have also confirmed this after entering a name for the file, you can select the desired Codecs for *Video-* and *Audio-Kompression* in the following dialog or enter the option < none >. Note that in the latter case extremely large files might be created.



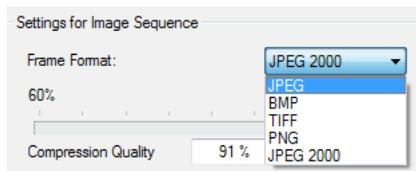
Which codecs are available here and which ones you should select depends on the software environment on your computer system and the later use of the video. After making a choice here and confirming, the video is created by the video generator.

Further information on video codecs can be found in chapter Video on

page 160.

## Export as an Image Sequence

If you select the export as *Image Sequence*, m.objects creates a sequence from individual full images in *JPEG*, *BMP*, *TIFF*, *PNG* or *JPEG 2000* format. Use the *Bildrate* option in the upper area of the *Videoexport* window to specify how many individual frames are created for one second of the timeline. This type of video is not intended for direct playback in a player, but rather for further processing in another program. The loss-free *TIFF* format guarantees high output quality, which is why professional video editing and post-production programs usually have an appropriate import option for this. For the *JPEG* and *JPEG 2000* formats, you can also use the slider below to set the *Compression Quality*.



## Export as MPEG-2 Video

You should only use this option for exporting videos, which you then want to burn to DVD with suitable authoring software and play back with a DVD player. The export results in PAL resolution, i.e. with 720 x 576 pixels. This corresponds to the resolution that a DVD player can reproduce. Due to these restrictions, the quality of such an MPEG-2 video is much lower than the direct output quality from the m.objects timeline.



The *Antiflimmer Filter verwenden* option is intended for playback on older TV sets, which might have problems with flickering in sharp areas of the image. You usually do not need this

option for playback on newer TV sets. The use of the Antiflimmer Filter slows down the video generation process and leads to a certain, in this case deliberately caused loss of vertical resolution and thus also of sharpness.

For the creation of higher quality DVDs, it is recommended to output a high-resolution H.264 or H.265 video instead, which is then further processed in suitable authoring software.

## The export process

After you have made all the entries and confirmed the *Export Video* window with *OK*, the *Mixdown Video* window appears. Enter a name for the video here and confirm with *Save*.

Only with an AVI video, the *Datenkompression* window needs to be confirmed with *OK* as well, as already described prior in *Export as AVI Video* .

Now you can follow the generation of the video on the Screen. As soon as the video generator is running, it progresses entirely independently, so you can use the PC for other tasks while the video is being created, including continuing your work with m.objects.

m.objects stores the exported videos in the *Mixdown* folder by default, unless you specify a different path when saving.

When outputting a video from m.objects, regardless of the video format, you have the option of exporting only a certain section instead of the entire timeline - i.e. the beginning to the end of the show. For more information, read the chapter *Define time window for export* on page 215.

## Export a selection as video

You can save particularly computationally demanding arrangements on the image tracks of your project separately as a video in order to then insert the newly created video into your presentation and thus relieve the processor or the graphics card of your computer. This procedure is useful, for example, for an extremely fast image sequence that you want to use as a timelapse.

The rapid sequence of individual images would overwhelm any computer when played back in real time, even with a very powerful graphics card. The generated video, on the other hand, only has moderate requirements.



Likewise, an extremely high-resolution video can be exported as a video with a lower resolution and thus with lower performance requirements and then

replaced by the new video.

First mark the objects that you want to export as a separate video. Then right-click on any marked handle or on the bar under a marked light curve and select the *Export Video (Selection only)* option in the context menu. The form for video export in H.264 / H.265 format then opens up, in which you can make the settings for the video export. A detailed description of this can be found in chapter *Export in H.264 / H.265 format* on page 253.

In contrast to exporting an entire show, m.objects creates the generated video in the *Video* directory of your project in the subdirectory *exported*.

The reason for this procedure is simply that you want to use the video directly in the timeline of your project in most cases. If, on the other hand, you would like to save the video in another folder, select the desired directory in the *Mixdown Video* window when exporting.

When exporting a selection as a video, you can of course also integrate the audio on the audio tracks by marking the corresponding audio sample(s) as well. For the

subsequent export, m.objects only takes into account the area of the audio tracks, which is within the selection area of the image tracks. Audio prior or subsequent to the selection on the image tracks is not included in the export.

## Jurying Mode

From the expansion level m.objects creative upwards (i.e. in m.objects pro and m.objects ultimate), the Jurying Mode is available. In Jurying Mode, both individuals and groups of up to 10 jurors can look at a large number of images together and rate them using various methods.

The main advantages of using m.objects compared to conventional solutions are:

- No program interactions (e.g. mouse clicks) required during an evaluation run
- high display quality, if necessary beyond UHD / 4K
- Fluent run without delays even with a very large number of images (e.g. competition)
- highly stable software environment with automatic data backup
- Evaluation runs are documentable
- Management of separate input devices for each judge
- Automatic score and statistics

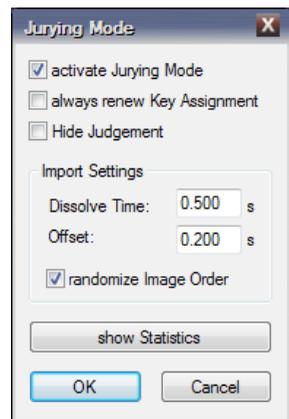
### Create evaluation project

In principle, a project for jurying is nothing else than an m.objects show, which you can create using the Project Wizard under *File / New Show*. You should implement at least two image tracks, and the aspect ratio should match the one of the display device used.

Before you import the images, first activate the *Jurying Mode...* in the *Control* menu.

In the following window, check the box for *activate Jurying Mode*.

You should select the *always renew Key Assignment* option if the input devices of the participating jurors might be reconnected or swapped in between several



evaluation runs. You can find more information on this in the text below.

You can also specify here whether the ratings of the jurors are shown open or hidden in the evaluation runs. If the check mark for *Hide Judgement* is set, it is only visible whether a rating has already been carried out by a juror without any information on the rating itself in an evaluation run.

Activating the option *randomize Image Order* entails that images are not inserted in the order from the Image Pool or (when importing via drag & drop directly from the explorer) from the folder structure, but mixed on the image tracks on a random basis. This way, contest images, for instance, are not displayed in the order of the photographer, shooting date, or camera model.

The *show Statistics* function is only utilisable after at least one evaluation run has been completed.

## Import images

Now import the images either via the Image Pool, via the context menu (right-click on an image track) or via drag & drop directly from Windows Explorer into the timeline. Of course, you can also drag a folder icon onto the image tracks so that m.objects distributes all images from this folder and any existing subfolders on the tracks.



When distributing, m.objects takes into account the settings for the *Dissolve Time* and the *Offset* specified in the *Jurying Mode* form. In addition, each image is automatically assigned a Wait Marker. The value for *Offset* determines the time interval after the start of the fading out of an image to the fading in of the next image. If the value is 0.00, a normal transition results. If the value corresponds to the one for *Dissolve Time*, there is a complete black screen before the next image is faded in. For all practical purposes, a slight overlap as in the example above has turned out to be aesthetic and fatigue-prove even for long evaluation runs.

## Start of an evaluation run

To start an evaluation run, it is sufficient to press the Playback button. Please note that the Jurying Mode (see above) must be activated for this. If you have closed and reopened the program in the meantime, it may have to be switched on again.

The *Define Keys* form now appears. Under *Num. of Judges* you can set the number of jurors involved (1 to 10). The specification 1 can be very useful for the quick and effective selection of images from a large stock of images for a show by a single person.

If a separate input device (e.g. a USB keyboard or a USB numeric keypad, a USB button, a USB remote control) is not available for each judge, different keys on the same input device can be used by different judges.

Each evaluation run can be interrupted at any time, saved and continued later.

Three different evaluation modes are available:

### ***Evaluation mode pos./neg.***

The +/- variant is useful for an initial selection of images, you can only vote *positive* or *negative* in this mode.

If this has not already been done in advance, the buttons for positive and negative rating of each juror now have to be assigned. It is sufficient for the jurors to press the keys requested on the screen one after the other.

After all assignments have been made, the evaluation run begins with the first image that has not yet been rated. If the locator is initially - e.g. after an interruption - placed ahead of images that have already been rated, m.objects can also reset the ratings of these subsequent images upon request.

During the evaluation, symbols in the bottom right corner of the Screen signal whether or how the currently displayed image was rated by each juror, depending on the setting that has been made for *Hide Judgement* previously. A gray question mark symbol signifies that the respective juror has not yet made his entry. As soon as a juror makes his entry, the color changes from gray to green. If the rating is not hidden, a green circle signifies a positive and a red circle a negative rating instead.

A submitted rating cannot be withdrawn without interrupting the evaluation run.

As soon as all jurors have submitted their rating, m.objects transitions to the next image without delay.

During the run, the status line at the bottom left of the m.objects user interface shows the number of images still to be rated as well as the total number of images.

After each individual rating, m.objects creates a backup so that in the case of a technical problem such as electricity failure, the last current status is automatically opened up again (file type \*.moa, m.objects Autosave).

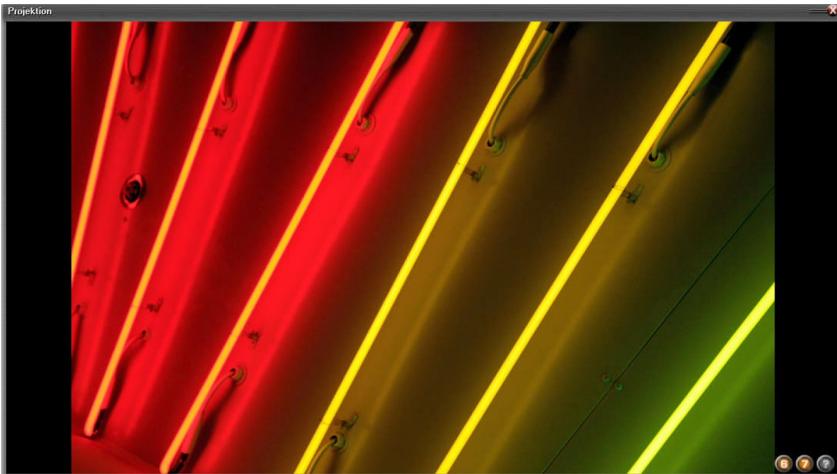
After completing the entire run, the current status can be saved again. For documentation purposes, this can be saved in the same project directory under a new name (*File / Save Show As*).

### **Evaluation mode 0 .. 9**

In this mode, you can rate images more differentiated with a score from 0 to 9, i.e. in 10 levels. If this evaluation run was preceded by a selection run (see *Evaluation mode pos./neg.*), only those images that were previously predominantly rated as positive are now included automatically. However, it is also possible to start this run directly and without prior selection.

Again, the *Key Assignment* opens up if not already configured.

By the way, it is also possible for all the jurors to use input devices of the same type and the same keys on them, so that blocks of ten numeric buttons are well suited for this evaluation run. The program can differentiate on which of the input devices the corresponding key was pressed.



In evaluation mode 0 .. 9, the differentiated evaluation now appears in the lower right corner of the Screen. If the rating is hidden (*Hide Judgement*), the question mark symbol changes its colour from gray to green again instead as soon as a rating has been submitted. After all ratings have been submitted, m.objects immediately switches to the subsequent image.

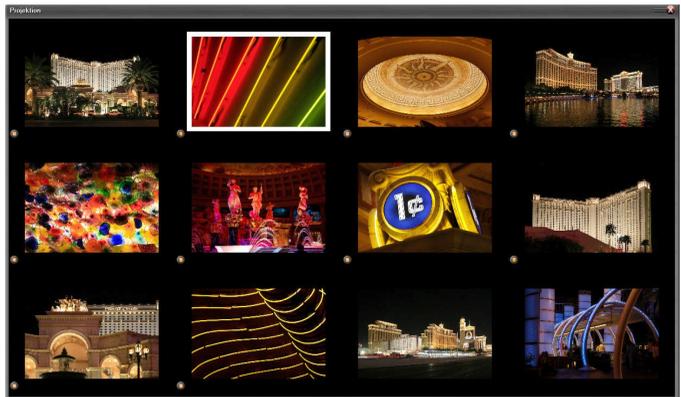
At the end of this run, with regard to the later documentation, you can save the new file in the same project directory using *File / Save Show As*.

### **Evaluation mode "final Discussion"**

The start of this evaluation mode requires at least one of the two runs described above to be completed beforehand, because the images now appear in a grid on the screen, sorted by the preceding ratings. Unlike with the previous modes, one input device per juror is not useful here. Instead, the control can be done using a single device, for example a normal keyboard.

The Discussion board (Screen) contains the rated images in descending order beginning at the top left. So the image with the best rating is in the top left corner. Ancillary to the top ten images, the ranking is shown (numbers 0 to 9, corresponding to places 1 to 10). The currently selected image is surrounded by a white frame. You can move the selection using the arrow keys. By pressing the *Enter* key, the currently selected image is displayed in Fullscreen Mode together with its ratings. You can also use the arrow keys to switch between images in Fullscreen Mode. Pressing the Enter key again switches back to the grid view.

To manually change the ranking of a selected image after a discussion, you only need to press the corresponding number key. The image is then moved to the corresponding position in the grid, and all other images are moved up accordingly.



## Evaluation of the final result

When starting an evaluation run in „final Discussion“ mode, the images are automatically arranged on the m.objects timeline according to the existing evaluation. The highest rated ones are stored at the end of the timeline. This order is updated immediately when the ranking is changed manually during the final Discussion.

If you only carry out a single evaluation run (*pos./neg.* or *0 .. 9* evaluation), you can also arrange the images on the timeline according to their evaluation immediately. To do this, select the *Sort by Rating* option in the *Control* menu.

In addition, you can also use the *Media List* from the *View* menu to keep up to date with the current status while the evaluation is in progress, or to inspect it after an evaluation run is finished. Next to each image entry you will find the rating(s) submitted. With the context menu of the Media List, a simple list with the file names and the respective rating can be exported for external processing. Here, also, the best-rated images can be found at the end.

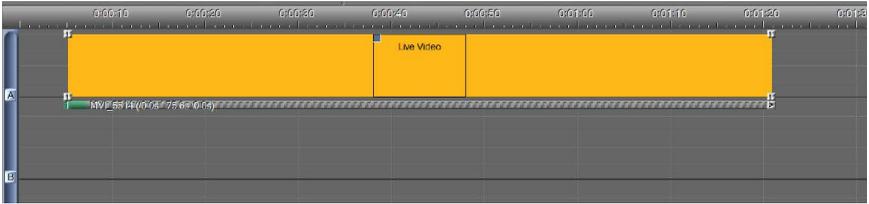
## Live Video

The Live Video function is available in all m.objects ultimate licenses as well as in older pro licenses with the *Live Video* add-on module.

Live Video offers you the option of integrating an external video source into your presentation. You can display it in Fullscreen Mode on the Screen or integrate it into the events on the Screen as a reduced window using an Image Area.

In this way, for example, the internal camera of the presentation notebook can record the speaker and transfer the image live into the presentation. You can also connect external devices via capture card, such as an external camera, another computer, a media player or a BluRay player. This external device then delivers its video signal via HDMI to the capture card, which in turn is connected to the presentation computer via USB.

To work with Live Video in m.objects, first insert any video into an image track. The properties of this video (Resolution, Framerate etc.) are completely irrelevant. If you want to position the live video against a background later on, make sure that the video is stored on one of the upper image tracks and is not overlaid by other content.

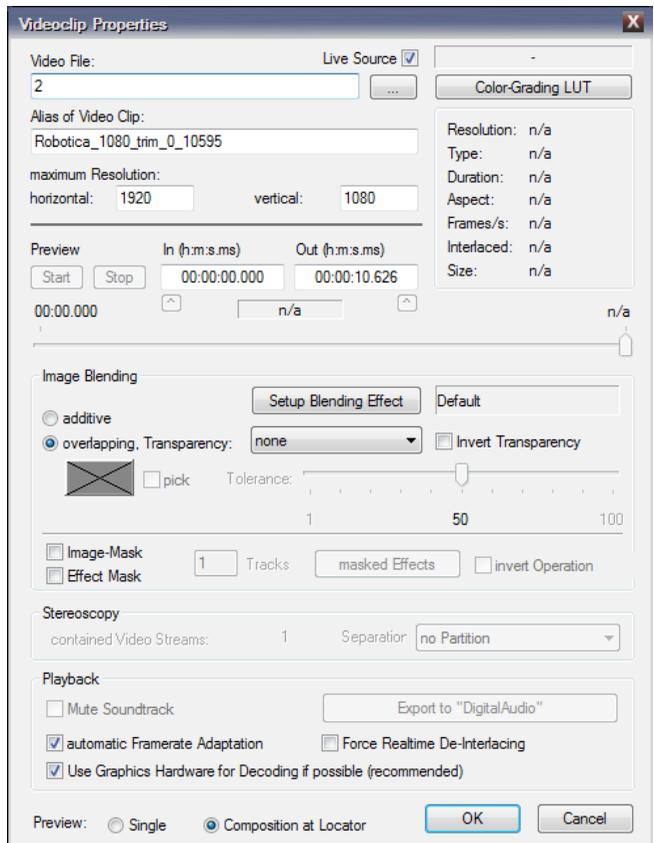


Now set up the Projection time. The length of the video on the timeline corresponds to the duration in which the live video can be seen on the Screen later.

Then double-click on the bar below the light curve to open the properties window of the video.

At the very top, tick the *Live Source* option.

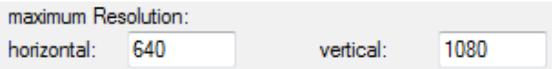
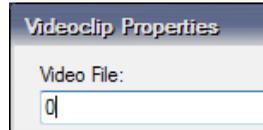
In the field *Video File* you have to tell m.objects which source should be used for the Live Video. This source - for example an internal or an external camera - is available as an index. The first device known under Windows has index 0, further devices, if available, follow accordingly with index 1, 2 and so on.



As soon as you have confirmed the form with *OK*, the live image can be seen in the *m.objects* Screen.

If the Live Video should be displayed in a reduced size, simply insert an Image Area object into the light curve, with which you can then set the desired size.

You can also enter the *maximum Resolution* used in the properties window of the video.



Especially in a reduced view, it will often not be necessary to output the Live Video in

full resolution. By reducing the resolution, you often achieve an improvement in the performance. Under certain circumstances, an internal notebook camera can deliver a better framerate and thus a smoother playback with a lower resolution.

It is also possible to integrate multiple Live Videos at the same time.

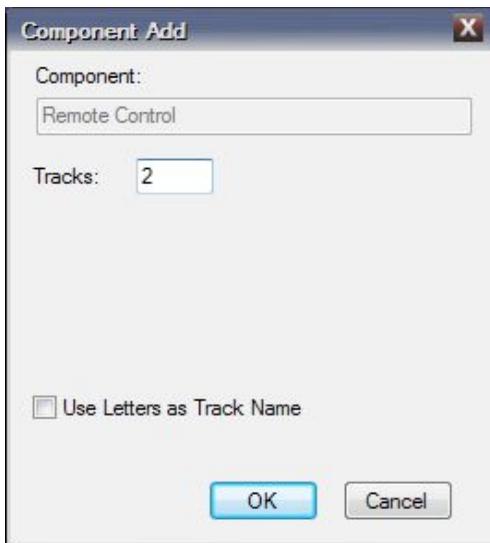


In this case, note that the same source is not output more than once. Therefore you have to assign multiple sources to multiple Live Videos.

## Remote - advanced control options

The function Remote is available in the expansion level *m.objects* ultimate and in the previous expansion level *m.objects* pro.

From *m.objects*, of course, you primarily control the image and audio of your AV show. In addition, devices with an appropriate interface to the computer can be remotely controlled from the *m.objects* timeline. This applies, for example, to electric shutters for darkening before the presentation or a fog gun for special effects. Likewise, the locator can be started in the timeline externally via a certain event. This can be a light barrier, for example, which initiates the start of a certain section of the presentation when someone enters a room.

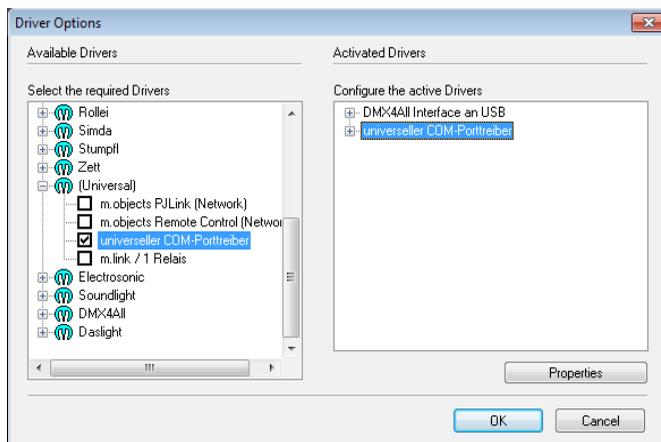


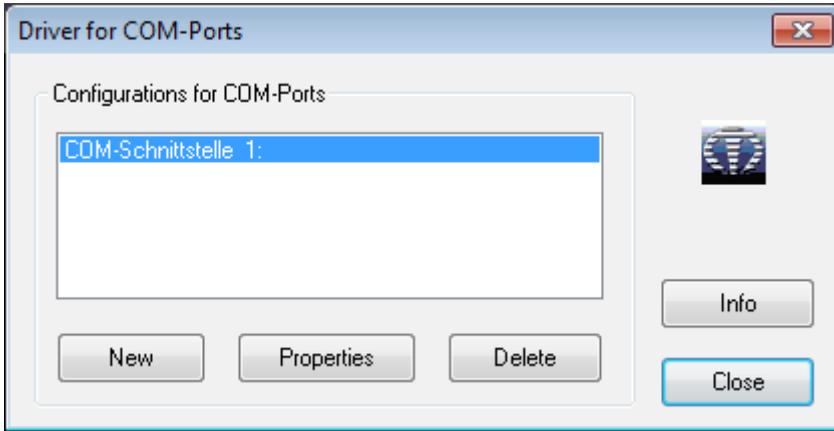
To be able to use Remote, you first need special tracks in the timeline, analogous to the image and audio tracks. For that, click on the gear icon so that you get to the *Select Components* view. Now drag the *Remote Control* symbol from the Tools window into the empty gray area, where all the other currently used components are listed and enter the desired number of *Tracks*. It makes sense to choose a separate track for each device to be controlled. Click the gear icon again so that it stops blinking.

## Remote control with m.objects

The next step is to set up the required driver. To do this, select *Options / Driver Options*, double-click on the driver (*Universal*) in the list below on the left and select *universeller COM-Porttreiber* below. Your selection appears in the field on the right, which you then select by double-clicking and configure in the following window.

The required settings for the configuration can be found in the manual of the device you want to control. Then confirm with *OK*.





You must now assign the newly set up driver to the Remote Control track. To do this, click the wrench icon.

This will take you to the *Configure Driver Assignment* view. With a mouseclick you activate the Remote Control component, drag the new driver from the Tools window onto the track with the mouse button pressed and release it. Where there was previously a red line, the driver is now stored.

Click on the wrench icon again so that you get to the standard view of the user interface. With the Remote Control track activated, you will see the *Data Output* tool in the Tools window. Double-clicking on it opens up the configuration window, where you can enter the required data, which you can also find in the device manual. When connecting a fog cannon, for example, the text "Warm up" could appear here, which is to trigger the device to warm up.



Use the plus symbol (*Create Object*) in the toolbar to create additional Remote Control Tools that you can assign the appropriate data and commands to.

You can now store the tools on the Remote Control track in the known manner by dragging them with the mouse to the desired positions and thus adapt the control of the device to the timing of your show.

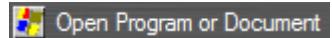
## Invocation of external programs and files from the timeline

External programs and files can be started directly from the timeline while an m.objects presentation is running. For example, you can start an EXE file at a specific point in your presentation that was exported from another m.objects presentation. The locator then stops as long as the EXE file is running, afterwards it starts again. This offers, for example, the option of calling up a series of presentations from a timeline without having to start them manually.

In this way you can also open up any other application or open up files of different formats. You also always have the option to keep the locator running in the meantime and to retain the m.objects Screen in the foreground.

If a driver is already stored on the Remote Control track, you must first remove it from the track in the driver assignment (*View / Driver Assignment* or through the wrench symbol as described above).

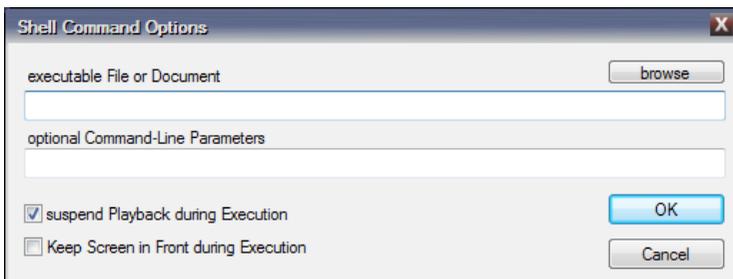
The control function is very easy to use: Click in one of the Remote Control tracks. In the Tools window you will see the *Open Program or Document* tool.



Drag this tool to a place on a Remote Control track where you want the application or file to be called up. It is placed there as a symbol.



Double-clicking on this symbol takes you to the associated editing window.



Use the *browse* button to select the application or file that should be started here.

You can enter additional parameters for applications in the optional Command-Line Parameters line. If you specify a presentation file that you have exported from an m.objects show, you can, for example, determine that it should run in a loop, i.e. start

over once finished. Simply enter "l" or "loop" for that. Read more in chapter *EXE file with call parameters* on page 214.

Please refer to the relevant documentation for the command line parameters that may be used in other applications.

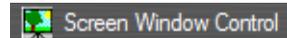
Below this, you specify whether the locator should wait until execution is finished, i.e. until the application ends itself or is ended manually (*suspend Playback during Execution*), and whether the m.objects Screen should stay in the foreground during execution (*Keep Screen in Front during Execution*).

When you have made these entries, confirm with *OK*.

Repeat this procedure for other applications that you want to call up elsewhere.

## Control of the Screen window

In the Tools window you will find the *Screen Window Control* tool when the Remote Control component is active.



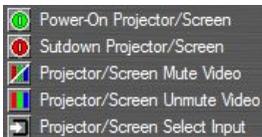
This allows you to instruct m.objects when to open, close, hide and restore the Screen during the presentation - both in windowed mode and in Fullscreen mode.

To use, drag the tool to a desired location on a Remote Control track. As soon as the locator reaches this object, the Screen is opened, closed, hidden or restored, depending on the specified setting.

Since the hiding and restoration of the Screen works without delay, these commands are well suited to make another application running in the background visible and cover it up again during a presentation.

## Remote control of digital projectors

With remote commands you can directly control certain functions of digital projectors. m.objects offers drivers for *PJLink (Network)* compatible projectors (this can also be found under (*Universal*)). After assigning the driver in the *Options / Driver Options* menu, further tools are available for the Remote Control component.



Projectors can be switched on and off with these tools by inserting them in the appropriate position on the Remote Control track. Additionally, the display of the image can be switched on and off (via a shutter, if present in the projector) or a specific signal input can be selected.

# Light control / DMX control

Light control / DMX control is available in the expansion level `m.objects ultimate`.

DMX is a digital protocol that is mainly used in event and stage technology to control lighting systems and effect devices. The range of DMX applications is large. For example, individual lamps can be specifically switched on and off or dimmed. You can also control headlights that have multiple colors in terms of their chromaticity, and DMX can also be used to control moving heads (movable headlights) or fog cannons.

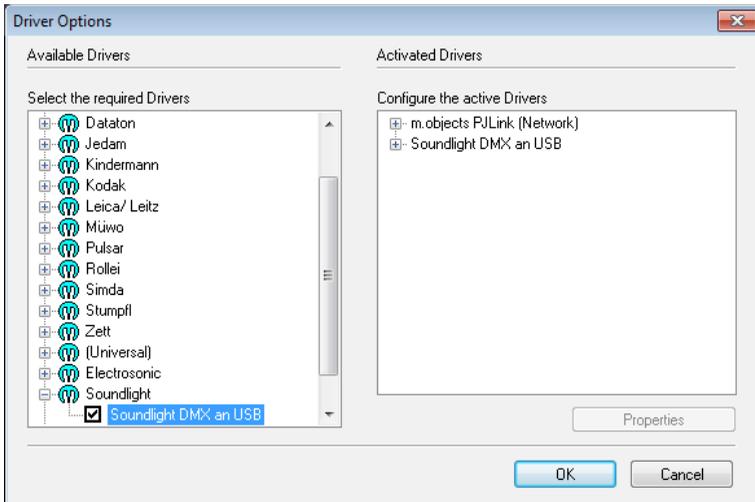
For DMX control via a PC, the PC is first connected to a DMX interface, which translates the control signals from the computer into DMX signals. Usually, this connection is made via USB. The interface in turn is connected to the first device to be controlled with a DMX cable. Each device that is controlled in this way usually has a DMX input and a DMX output, to which other devices may be connected.

The DMX protocol transmits 512 separate channels, each of which can control a specific function. In the case of a multi-colored headlight, for example, one channel can be responsible for regulating the brightness of the individual colors. Each channel in turn has 8 bits and can therefore transmit 256 different values. In the example mentioned, the brightness could be regulated in up to 256 levels. How the channels and values are assigned is determined by the manufacturer of the device and can be found in the corresponding documentation.

## Control set up

To be able to work with Light control / DMX control in `m.objects`, you must first set up the necessary drivers. To do this, select *Driver Options* in the *Options* menu. Now click on the + symbol in front of the manufacturer of the DMX interface used in the list on the left and tick the corresponding driver in the branch that opens up. When a driver is set up for the first time, the associated window opens up directly at this point. In this case, you can skip the description of the two following screenshots.

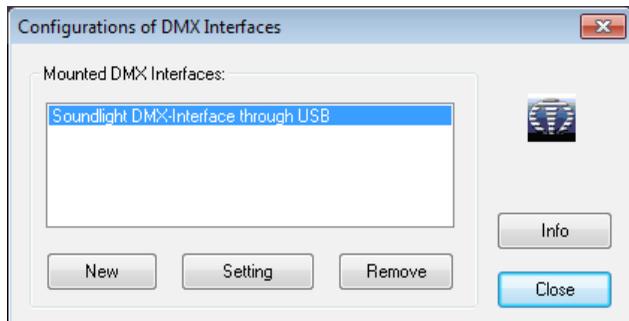
If the driver has been set up before, it will appear on the right side under *Activated Drivers*.



Double-click this entry, and in the window that opens up, click on *Setting*.

Another window opens up.

The value that you should enter for the



*Channels* option depends on how many and which channels you use for your DMX control.

For example, if you want to control eight dimmable lamps and an additional headlight that can regulate four colors, you need a total of 12 channels: eight channels for the brightness of the lamps and one each for the four headlight colors.

If you now want to use channel 122 for one of the functions, for example, you must enter this value here so that m.objects can provide the corresponding channel. This means that you enter the number of channels required or the highest channel that is to be used here.

With the option *Reset all Channels on Stop*, all DMX devices are reset to their initial state as soon as m.objects switches to Stop mode. So if you have switched on a spotlight via m.objects, for example, it will be switched off again as soon as you click on the *Stop* button in the program, press the *Esc* key or close the show.

Confirm the window with *OK* or close.



In the next step, click on the gear icon in the toolbar to access the *Select Components* view.

From the Tools window, drag the *Light control* component into the gray area.



Light control

Here you enter as many tracks as you need DMX channels. For the example mentioned, it would be 12 tracks.

Confirm the entry with *OK*. If an empty pop-up window then appears, you can simply close it again. Click the gear icon again to return to the normal view of the m.objects user interface.

A DMX channel is already assigned to each of the newly created tracks. If you want to change this assignment, click on the wrench symbol in the toolbar.

In the *Configure Driver Assignment* view, select the corresponding driver and remove it with the *Delete* key.



Then drag the desired driver from the Tools window onto the track. Click the wrench again to return to normal view.

Component Add

Component: Light control

Tracks: 12

Show Device Status: always

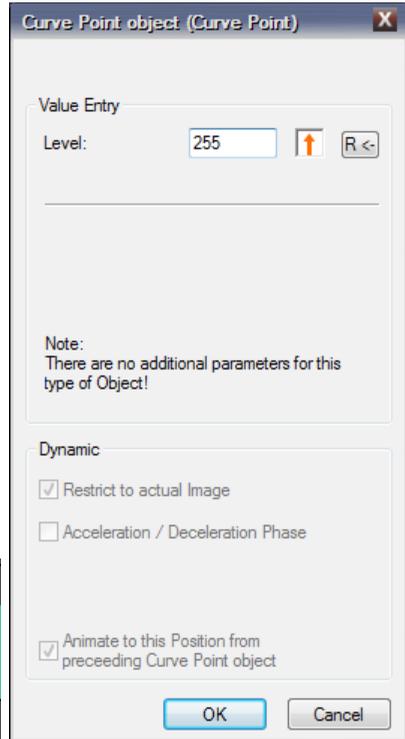
Use Letters as Track Name

OK Cancel

## Edit Light / DMX control

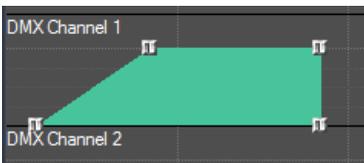
The Light control tracks are now ready and you can start creating the controls. Double-click on a track to create a new handle. The height of the handle stands for the defined value of the DMX channel and can be set from 0 to 255. By double-clicking on a handle, you open its properties window and there you can also enter the appropriate value manually.

On the Light track you will now see a green bar at the corresponding height, which extends over the entire length of the track. The control becomes active as soon as m.objects is in Pause or Playback mode. In this case, the control signal would remain active to the same extent throughout the presentation.



Now create a handle in front of the existing one, drag it down to the value 0. This way, you have created a continuous fade-in.

You set up the ending of the control signal with two additional handles.



Alternatively, you will find a number of tools in the Tools window (with active Light control tracks) that already contain a fade-in of the DMX signal in different lengths from 0 to 4 seconds. To use, simply drag one of these tools

onto the desired track. If necessary, change the settings of the handles there or add further ones.

When working with the DMX control, it is also advisable to save certain constellations that you use more than one time as macros. This can be, for example, a specific lighting mood that is created with several spotlights, or the adjustment of moving spotlights to the positions of changing speakers on the stage. For example, one macro contains the commands for switching on and aligning a headlight onto the first speaker. Another macro contains the control information for a pan to the second speaker and a third macro the commands to switch off the headlight during the break or at the end of the lecture.

To save such a sequence as a macro, select all handles contained in it, right-click on one of them and select the menu item *Create Makro* in the context menu. Then give the macro a *Name*. The macro is now stored in the Tools window and can be dragged onto the tracks at the desired point like a tool.

## Starting m.objects with call parameters



With the help of call parameters you have the possibility to start m.objects in a specific way. In the chapter *EXE file with call parameters* on page 214 you already got to know such parameters with finished presentation files. The procedure for the modified start of m.objects is very similar.



After the m.objects installation, you can use the program icon on the desktop to start.

(If it is missing, create a shortcut to the 'mobjects.exe' file in the 'Programs/m.objes' folder. To do this, right-click on the file and select *Create shortcut*. Then move the shortcut to the desktop.)

Right-click on the start symbol and select *Properties*.

Under *Target* you can see the complete path to the m.objects.exe file. Click in this field and position the cursor at the very end of the path behind the file name. This is the appropriate position for call paraters. They must always begin with a space:  
 C:\Program\m.objects\mobjects.exe /wait

The following call parameters are available. You can both use the short or long spelling:

|  |  |
|--|--|
| /“C:\m.objects<br>Daten\Show\Projekt1\Dateiname.mos“ | Calling up a specific presentation immediately when starting m.objects; the complete file path has to be quoted. The path has to be in quotes.   |
| /p or /play  | Start playback at the saved Locator position   |
| /c or /close   | Exit m.objects after the end of the presentation   |
| /m or /minimize                                      | Open m.objects on the taskbar; The program is stored on the Windows taskbar while the m.objects Screen opens up (if the file was saved like this); the thumbnails on the light curves are not loaded |
| /n or /nosplash                                      | m.objects is started without start screen  |
| /e or /empty   | Start with an empty window, the last open file is not loaded   |
| /x=5 or /xresume=5                                   | Wait Markers are triggered automatically afterthe preset time (seconds); if no time is set, they get triggered after 2 seconds   |
| /w=30 or /wait=30                                    | m.objects is initialized – for example when starting from the Autostart directory - but no presentation is loaded yet; useful for multi-screen applications  |

|                    |   |
|--------------------|---|
|                    | using networked computers so that all slave computers can log in to the master before the show starts; time is in seconds   |
| /d or /delay       | Delay the start of the program  |
| /d=30 or /delay=30 | Delay of the start in seconds; useful if m.objects is stored in the Autostart folder and opens up automatically after system start. The delay ensures that the graphics card and m.objects dongle have been initialized by the system when m.objects is started |

# m.objects - the system

## The m.objects expansion stages

|  | basic                   | live                      | creative  | ultimate  |
|--|-------------------------|---------------------------|-----------|-----------|
| Image tracks   | 3                       | 3                         | unlimited | unlimited |
| Stereo Audio tracks  | 3                       | 3                         | up to 256 | up to 256 |
| Maximum output resolution  | WQXGA<br>2.560 x 1.600  | Ultra-HD<br>3.840 x 2.160 | unlimited | unlimited |
| Internal title generator   | ✓                       | ✓                         | ✓         | ✓         |
| Mask effects   | ✓                       | ✓                         | ✓         | ✓         |
| Export of Video files (WMV, MPEG-2, MPEG-4 etc.)   | ✓                       | ✓                         | ✓         | ✓         |
| Export of standalone presentation files (EXE)  | ✓                       | ✓                         | ✓         | ✓         |
| Maximum resolution of integrated videos  | FullHD<br>1.920 x 1.080 | Ultra-HD<br>3.840 x 2.160 | unlimited | unlimited |
| Loss-free video trimming   | ✓                       | ✓                         | ✓         | ✓         |
| Blending effects (QuickBlending)   | ✓                       | ✓                         | ✓         | ✓         |
| Keyword management   | ✓                       | ✓                         | ✓         | ✓         |
| Import of keywords from Adobe Lightroom  | ✓                       | ✓                         | ✓         | ✓         |
| Animation: Zoom, tracking shot, Rotation, 3D-Animation   | ✓                       | ✓                         | ✓         | ✓         |
| Color Grading via LUT  | ✓                       | ✓                         | ✓         | ✓         |
| Animation: Passepartout, Shadow / Shine, Blur, Reflection  | -                       | ✓                         | ✓         | ✓         |
| Realtime Picture/Video processing (animatable): White Balance, Brightness, Contrast, Gamma, Hue, Tint, Sharpness, Color Grading adjustable | -                       | ✓                         | ✓         | ✓         |
| Dynamic slow motion/time lapse   | -                       | ✓                         | ✓         | ✓         |

|   |  |   |   |   |
|---|--|---|---|---|
| License transferable  | -  | ✓ | ✓ | ✓ |
| Suitable for commercial use   | -  | ✓ | ✓ | ✓ |
| Speaker Support for live presentations incl. configurable interface for wireless remote control | -  | ✓ | ✓ | ✓ |
| Interactivity via Markers and mouse sensitive Image Areas                                       | -  | ✓ | ✓ | ✓ |
| Multichannel audio, Sound effects, Interface to directX-Plugins                                 | -  | ✓ | ✓ | ✓ |
| Chroma keying and alpha channel for video   | -  | - | ✓ | ✓ |
| Stereoscopic mode (input and output)  | -  | - | ✓ | ✓ |
| Jurying mode  | -  | - | ✓ | ✓ |
| Programmed start of external data   | -  | - | - | ✓ |
| Relay control   | -  | - | - | ✓ |
| Multiscreen projection over multiple projectors or screens (expandable by Multiscreen module)   | -  | - | - | 2 |
| DMX light control via suitable DMX interface  | -  | - | - | ✓ |
| Network connectivity, timecode synchronization, PLink protocol, wired remote control possible   | -  | - | - | ✓ |
| Integration of live video transmission  | -  | - | - | ✓ |
| Multiscreen module  | Extends the output to up to 64 digital projectors or screens (max. 16 for one PC) with <b>ultimate</b> |   |   |   |

## **System requirements**

### ***Minimum requirements***

These are the features a PC that is used for high-quality m.objects presentations should at least have.

Standard PC or notebook with CPU AMD or Intel with a minimum of 1.5 GHz or Apple Mac with Intel CPU

MS Windows XP, Vista, Windows 7, Windows 8, Windows 10, 32/64 bit

3D graphics card (at least 512 MB Video RAM recommended)

Standard sound card, screen with at least 1024x768

### ***Tips for the system equipment***

#### **Operating system**

In addition to standard PCs, Intel-based Apple Macintosh hardware is also generally suitable, provided that it meets the graphics system requirements specified below and Microsoft Windows (7, 8, 8.1 or 10 recommended) is installed as an alternative operating system.

The use of a 64-bit operating system is highly recommended. m.objects has a special architecture of several independent and simultaneous processes. It therefore benefits greatly from its memory management, which is considerably more powerful than that of a 32-bit environment.

#### **Notebook vs. Desktop**

Notebooks with the appropriate equipment and desktop PCs are equally suitable for presentations with m.objects. Due to their compactness, notebooks are of course particularly suitable for mobile use. A digital projector can deliver the Fullscreen presentation at the external monitor output, while the m.objects user interface and additional m.objects facilities are shown on the display of the device.

#### **Processor**

The performance of the main processor (CPU) is largely uncritical due to the use of highly optimized algorithms within m.objects. An up-to-date CPU is usually only used very slightly during the playback of high-resolution images and stereo audio.

The following applies to the integration of videos: Decoding modern video formats

(VC-1, H.264, H.265/HEVC, VP9) is a computationally intensive task. Either this is done by the main processor, or a modern graphics processor takes over the main part of the load. Which component is used can be set globally within m.objects or individually for each video. If high-performance graphics hardware (see below) is available and the above-mentioned video formats are used, there is no need for a particularly fast CPU for perfectly smooth playback of demanding 4K video material.

However, if the graphics card is older, less powerful or if other video formats have to be processed in high resolution (e.g. Apple ProRes), then a powerful CPU should be used. Processors with 4 or more cores such as e.g. suitable Intel Core i5, i7 or i9 or correspondingly powerful XEON models. Systems with AMD processors (e.g. AMD Ryzen) or other compatible chips can also be used without restrictions, provided that they have the required performance. On systems with multiple processor cores, m.objects makes intensive use of the possibility of processing tasks simultaneously (multi-threading).

## **Graphics chip**

The suitability of the graphics card is even more important than the CPU performance. In particular for the playback of animations, it is essential that the graphics chip delivers a constant refresh rate. Pure image fades are less critical on this point.

Well-suited for the smooth flow of high-resolution digital projection or screen display are e.g. following graphic units:

- AMD: Sufficient for numerous applications are Radeon HD models with 100-digit numbers of at least 6, better 7, e.g. 77x0, 78x0 or the newer Radeon R7, R9 graphics chips. The newer types RX 4xx / 5xx / Vega are currently particularly recommended. The RX 470/480/580/590/5700 and RX Vega models have clear advantages, particularly when processing 4K video (HEVC).

- NVidia: For numerous applications, GeForce models with three-digit model numbers, the 10-digit number being 4 or higher are sufficient, e.g. GT74x, GTX 76x etc. Especially the newer models of type GTX 1050Ti / 1060/1070/1080 / 16x0 are particularly recommended. All of these models are capable of decoding 4K video. Models with higher performance, such as RTX 2060/2070/2080, are of course also very suitable.

- Intel: Systems with Intel i3 / 5/7/9 and Iris Pro 5200 or the newer HD or UHD 5x0 / 6x0 already provide sufficient performance for many arrangements, so that an

additional graphics chip is usually not necessary here. With the more powerful Intel Iris 5x0 or 6x0, which can be found on some processors from year of manufacture 2016, complex arrangements with numerous image tracks can be reproduced smoothly in Full HD resolution. Even the decoding of 4K video material (H.264) can be done with good performance. However, these graphics systems are only suitable to a very limited extent for output resolutions larger than Full HD and for hardware-supported decoding of HEVC video. Older systems with chipset-integrated graphics (e.g. Intel GM945) are only suitable for less demanding presentations.

- Flawless results can also be achieved with older generations of accelerated graphics cards. If the performance is not sufficient, an update of the graphics card driver ([www.amd.de](http://www.amd.de) or [www.nvidia.de](http://www.nvidia.de)) occasionally helps.

When buying hardware, also pay attention to the video memory of the card, as this is permanently installed on the graphics hardware and cannot be upgraded separately. GDDR5 storage technology brings performance benefits. You should also provide 512MB of video RAM or more for simple presentations. Projects with numerous image tracks benefit from significantly more video RAM. When it comes to working intensely with 4K video, 2GB of graphics memory should be the minimum.

Principally, several video outputs of a graphics card can be operated in different resolutions when using m.objects. This means that a modern notebook with an internal display resolution of, for example, 1,920 x 1,080 pixels can still make optimal use of an externally connected Ultra-HD television with a resolution of 3,840 x 2,160.

For the output of resolutions above 2,560 x 1,600 pixels (e.g. UHD: 3,840 x 2,160, 4K or higher) the device should have an output of the type HDMI 2.0 or Displayport (Thunderbolt) 1.2 or newer, otherwise the frame rate will not be high enough (Frames/s, fps) for smooth playback of animations. Lower resolutions can also be output without loss of quality via standard HDMI, DVI or display port of older versions.

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We are available for all questions about m.objects. For any suggestions for improvement, we are of course also grateful.

In particular, you should contact us if you are interested in adaptations for special requirements of your installations or if you as a provider of AV technology and computer peripherals wish for driver support for your devices by m.objects.