grandMA VPU
(former grandMA Video)
Operating Manual

Version 2.00
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Welcome to grandMA VPU

Thank you for placing your trust in this product.

This manual will provide all the necessary information for you to get the best out of your software.

The grandMA VPU is subject to continual development. It is therefore possible that the entire information printed in this manual is out-of-date.

Up-to-date information can always be found in the current readme.txt file on the CD or the downloaded program.

You can download the actual software version via the internet at: www.malighting.de

We need your help!

If you have wishes or suggestions please send us an e-mail tech.support@malighting.de.

Looking forward for a good cooperation

Your grandMA VPU team
Content

1 What is grandMA VPU ? ........................................................................................................ 6
1.1 Main Features .................................................................................................................. 6
1.2 Functions and Features ................................................................................................... 7
1.3 Transition from grandMA video to grandMA VPU ....................................................... 8

2 Installation and Maintenance ........................................................................................... 11
2.1 Startup of VPU ................................................................................................................ 11
2.2 Backup ........................................................................................................................... 11
2.3 Version of grandMA desk or grandMA onPC (off-line) .............................................. 12
2.4 IP Addresses .................................................................................................................. 13
   2.4.1 IP Address of the PC ............................................................................................... 13
   2.4.2 Artnet IP Address ................................................................................................. 13

3 Communication with the grandMA Desk Series ............................................................... 14
3.1 Connection with the grandMA desk .............................................................................. 14
3.2 grandMA 1 or grandMA 2 mode .................................................................................. 14
3.3 Connection with the grandMA onPC (off-line) software ....................................... 15
3.4 Connection States .......................................................................................................... 16
3.5 Preferred Operation Mode (Screen Layout) ............................................................. 18

4 Data management ............................................................................................................. 20
4.1 Master slave ................................................................................................................... 20
4.2 Principle function diagram .......................................................................................... 21
4.3 Layer properties ............................................................................................................ 23
4.4 Predefined Constellation .............................................................................................. 27
4.5 Supported Codecs ......................................................................................................... 27

5 Several grandMA VPU applications in one grandMA show ........................................ 28
Quick Guide ......................................................................................................................................... 30
6.1 Step 1 – Start master session and connect to the desk (grandMA series 1) ............ 30
6.2 Step 2 – Controlling Images and Videos via the MA desk ........................................ 31
7 Program surface .......................................................................................................................... 34
7.1 Menu bar .................................................................................................................................. 35
7.1.1 File .......................................................................................................................................... 35
7.1.2 View ....................................................................................................................................... 38
7.1.3 Mode ....................................................................................................................................... 39
7.1.4 Help ....................................................................................................................................... 39
7.2 Toolbar ..................................................................................................................................... 39
7.3 Preview ..................................................................................................................................... 39
7.4 Multi Preview ............................................................................................................................ 40
7.5 Content Editor .......................................................................................................................... 41
7.5.1 Image Pool (I-Pool) .................................................................................................................. 42
7.5.2 3D Objects ............................................................................................................................. 44
7.5.3 Eff1 Type...Eff4 Type ............................................................................................................... 45
7.6 Fullscreen View .......................................................................................................................... 46
7.7 Status Bar .................................................................................................................................. 46
8 Layer Functions and Effects .......................................................................................................... 47
9 Softedging .................................................................................................................................... 57
10 Keystoning .................................................................................................................................. 58
11 Pixel Mapper ............................................................................................................................... 60
11.1 Pixel Mapper Graphical View ................................................................................................. 61
11.1.1 Pixel Mapper Toolbar .......................................................................................................... 61
11.1.2 Pixel Mapper Editor ............................................................................................................... 62
11.2 Pixel Mapper Grid View .......................................................................................................... 64
11.3 Setup of an LED Wall............................................................................................................65
11.4 File Format of LED Panels in grandMA Series 1 ...............................................................67
  11.4.1 LED Panel Examples .......................................................................................................69
11.5 File Format of LED Panels in grandMA Series 2 ...............................................................72
12 Creation of customized 3D Objects ........................................................................................73
13 Example for the Splitting of an HD Video: .........................................................................78
14 How to create a Video Loop....................................................................................................81
15 Warnings ................................................................................................................................91
16 Keyboard Shortcuts ...............................................................................................................92
17 FAQ and Troubleshooting .....................................................................................................93
  17.1 Software Questions: ..........................................................................................................93
18 Index .........................................................................................................................................97
1 What is grandMA VPU?

grandMA VPU, the Video Processing Unit is a media server for both still and moving images, that is fully integrated into the grandMA lighting control system.

- A solution for controlling, live-accessing and altering video, still images and 3D-objects in real-time
- All videos, still images and 3D-objects can be scaled, positioned, tiled, colored and manipulated directly from any grandMA console
- Several 3D Video Layers with full effects capabilities for high-resolution projections (e.g. 1920 x 1080 pixels)
- Several Output Layers for Shaper, Iris, Effects, Scaling, Camera Positions, Keystone and Softedge
- One Master Layer for Shaper and Iris effects, Scaling and PC remote control functions
- Straightforward set-up and configuration that utilizes bi-directional communication with the grandMA console; grandMA VPU is an integrated part of the grandMA network session
- Instant live-access to any kind of image, 3D-object or video – including content-preview in your presets
- Video In feature to fade in live videos
- Synchronization of videos via MA network
- Blind Programming support
- Pixel Mapper to control several LED walls via Artnet

1.1 Main Features

grandMA VPU is the Video Processing Unit for the grandMA range of lighting control consoles. It uses a Windows PC to facilitate the control of video and still images directly from any grandMA console and runs on readily available PC hardware. As fully integrated part of the grandMA network system, grandMA VPU is not just triggered via DMX. This has many advantages. On the one hand a minimum of setup and configuration is required due to bi-directional communication between the console and the grandMA VPU. On the other hand the grandMA console allows for direct access to the server and previews the content as thumbnails in the preset.

The grandMA VPU enables a console operator to control and alter videos, still images and three-dimensional objects in real-time from a grandMA lighting console. Three-dimensional objects can be textured with video clips or animated images. Videos, still images and three-dimensional objects can be manipulated in multiple ways and in the same intuitive manner as a lighting fixture is manipulated from the grandMA console.
1.2 Functions and Features

At its most basic level, grandMA VPU allows for the control of several moving images and high-resolution images simultaneously. Videos and still images can be combined, mixed and controlled using any grandMA console like a regular multi-parameter fixture. For this, several 3D video layers are available plus one master layer for PC remote controlling, shaper, iris and scaling settings, Output layers for Shaper, Iris, Effects, Scaling, Camera Positions, Keystone and Softedge

In addition, grandMA VPU offers the possibility of choosing any three dimensional object as a surface for video or still images. Cubes, cylinders, spheres, extruded logos or any other three-dimensional shape can be “textured” with complimentary images or videos. The position and orientation of these three dimensional objects are fully controllable from the grandMA console. You could start with a cube rotating and progress to a three-dimensional logo flying around, but from then on, you are only limited by your imagination.

Each image or video that is used at the same time requires a layer. Since the brightness of each layer is controllable, it is possible to cross fade from one video image to another by cross fading from one layer to another. By controlling and mixing the output of the grandMA VPU, your grandMA console has become a video mixer.
1.3 Transition from grandMA video to grandMA VPU

This information conforms to grandMA video users changing to grandMA VPU.

As a user of a grandMA video dongle version (either on MA mediaPC or self designed media server) you will encounter most likely the following situation: grandMA video software is installed on a computer (self designed or mediaPC) with some content likely the MA original content plus additional custom-made content. Mainly this will be any QuickTime coded content. The grandMA video software might be also installed on additional computers like laptops to use it as pre-visualization or control suite stations without any dongles in use.

Now, you can choose from one of the following options:

1. Leave everything as it is.
   You can stay with the grandMA video software and your known content. Please be aware that the grandMA video software as known today will not be further developed nor be implemented in future grandMA software releases. The grandMA video software will only work with grandMA ‘series 1’ software 6.121 or lower.

2. Update your MA mediaPC or media server to MA VPU software and benefit from the features of MA VPU plus
   - Performance increased tremendously – at least 4+ layer of 1080p are possible with 60fps.
   - The VPU is more integrated into the network than grandMA video ever was
   - Effects are added per layer and per output – each of them can handle 4 effects at the same time.
   - Colorkeying is built in now – even with a tolerance value for smooth transitions.
   - 3D keystone is possible by adding a 3D model on the output layer (real warping to come in one of the next releases)
   - Much easier Fixture handling by only 3 fixture types – the output fixture includes keystone, master, softedge and so on…
   - Prepared for Pixelmapping “in the console” – but still all other ways are available.

The VPU is able to run either with grandMA ‘series 1’ or grandMA2 – safe investment. The VPU software comes with a new decoder to ensure best content results. That means – however – that new content is needed and the new one is based on MPEG-2! Attention: All custom-made content needs to be rendered into MPEG-2. All old show-files are obsolete due to the fact that the new fixture types are not equal to the grandMA video fixture types!

3. Trade in your grandMA video dongle for a MA VPU If you wish to benefit from the MA VPU’s hardware improvement and all future possibilities of the MA VPU as well as preinstalled content, you can trade in one grandMA video dongle per MA VPU basic, plus or pro. Please contact your local dealer for details.

Launching the MA Video Processing Units (VPU) there is no more split between software and hardware. The dongles are discontinued – only the full package including dedicated hardware is available, the dongle is “built-in”. For sure, everybody who invested into dongles will benefit of the new VPU functionality by installing the latest VPU release software.
With the MA VPU there is no “open” operating system with any kind of default driver – they are all improved to serve the best result for the VPU. Also the decoder has changed for best performance results. That means – however – that new content is needed and the new one is based on MPEG-2. With any MA VPU there is some Gigabyte of content pre-installed.

However, we also offer an exclusive MA-Content-Package from showfootage.com - which offers you over 500 free selectable clips. To be precise: from a huge content library of renowned designers you can download 320 SD clips, 120 HD720 clips and 100 HD1080 clips. This makes the MA-Content-Package the ideal way to individually extend the pre-installed content of the MA VPU. Please check http://www.malighting.com/showfootage.html for further details.

From grandMA video to VPU. How to update your system:
After downloading the software from our webpage you just need to install it. The look & feel will be like the grandMA2 software. Then you need to download a new MPEG-2 decoder from Main Concept (link: www.mainconcept.com/site/prosumer-products-4/mpeg-2-22078/information-22089.html?L=0 ) and actually pay for it.

Should not be more than 49€. Attention: Keep the key number!!
From now on the software is fully functional. Please be aware of the fact that old shows from grandMA video cannot be loaded anymore. Therefore the new showfile is absolutely compatible to grandMA2. All custom-made content might need to be re-rendered into MPEG-2.

As a former user of grandMA video you will easily discover the new functionality of the MA VPU software. Some functionality has changed as well as some naming. Please refer to the documentation like the online manual to learn about it. If you use the VPU software with an external dongle (old grandMA video) you will have the same performance like a MA VPU plus – in other words: there are no restrictions!

Major changes in a rough overview:

- Decoder and codec has changed! From QuickTime to MPEG-2! You need to buy it (with the VPU it is included)
- Old shows are obsolete
- Old content needs to be re-rendered
- New fixture types for VPU

What else to expect for the future?

- We are working on an integrated Pixelmapping – means the Pixelmapper of the VPU and the Bitmap-effects-engine will be “married” at a certain point. We divide Pixelmapping into two parts: PM by Art-Net (like it was before) and PM by MA-Net (the new style of PM).
- At a certain time 3D will be able to display the result of a VPU output for better preprogramming.
- 3D Keystone will get a real warping functionality

We hope that this document provides what you need to know about the transition from grandMA video to the VPU software. The grandMA video software ends with the first release of the MA VPU Software. For any further information please get in contact with us – we are glad to assist you!
About MPEG-2:

MPEG is the name of the “Moving Pictures Expert Group” who created a couple of international standards. One important one is the MPEG-1/2 (ISO/IEC 13818-part x) standard which will be used for the MA VPU. As MA uses Microsoft’s DirectShow to render the textures (pictures) it will need a Codec1 to be able to read in these pictures. This codec is the MPEG2 one from MainConcept. There are several formats that can contain MPEG2 videos, below are some well known ones:

- .mpg (MPEG-1 or MPEG-4 possible)
- .mpeg (MPEG-1 or MPEG-4 possible)
- .m2v (MPEG-2 Elementary Video Stream)
- .m2a (MPEG-2 Elementary Audio Stream)
- .m2s (MPEG-2 Elementary Data Stream)
- .vob (DVD Video Object)

The MPEG2 standard allows a couple of variation which are not so important to know but which will influence the quality of the picture. They are defined to be able to run several resolutions like full HD for example. That influences also the bitrate which can vary from approx. 3 to over 80 Mbit/s. As higher the bitrate as more workload for the CPU, RAM & so on.

Codec is short for ‘compressor-decompressor’, a piece of software that is able to decode and encode a certain format. By this definition, a DirectShow filter is not a codec.
2 Installation and Maintenance

The actual version of the video application can be downloaded from the MA Lighting support site: www.malighting.de

Dongle users: Please extract the downloaded file into a temporary folder and run the ‘Setup’ (gMA-VPU_[n.nn][n.n]_v-n.nn.exe) program.

Note:

You should have administration rights to install the program.

To work with grandMA VPU without administration rights you have to arrange the administration rights by the administrator on the installation path e.g.:

C:\Program Files\MA Lighting Technologies\grandMA VPU Software

2.1 Startup of VPU

This chapter describes the startup of the VPU application. grandMA VPU machines are already configured with this mechanism so the users don’t have to take care about this.

To realize an auto start of the VPU application a startup software ‘VPUShell.exe’ is installed on the target machine at:

C:\Program Files\MA Lighting Technologies\grandMA VPU Loader

This program is called by the operating system (e.g. Windows Vista) in startup of the VPU target machines. It takes care of the right program location and paths.

2.2 Backup

grandMA VPU is equipped with Acronis® backup software (Not for dongle users of former grandMA video).

Press ‘F11’ after booting and the Acronis software starts. You can make a backup of the VPU software or a restore for a system recovery. Only the system drive is saved, not the content.

3 scenarios are possible:

- Save content via the file browser to an external drive
- Save content via network to an external machine
- Save content via Acronis (F11)

It is recommended to make a backup of the content first. You can order memory sticks from MA Lighting containing the whole content in case it should be lost.
2.3 Version of grandMA desk or grandMA onPC (off-line)

You can determine by means of the version number of grandMA VPU if the software version fits to the software version of the desk or off-line.

grandMA VPU version number can be determined via:

- Filename of the setup:
  gMA-VPU_{[GMA2-Streaming][GMA1-Streaming]}_{VPU-Version}
- Splash screen (appears while startup)
- Info box (Menu – Help – Info)

Example: grandMAVPU_{[0.900][6.1]}_{v1.34}

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<th>Description</th>
</tr>
</thead>
<tbody>
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<td>GMA2-Streaming Version</td>
</tr>
<tr>
<td>6.1</td>
<td>GMA1-Streaming Version</td>
</tr>
<tr>
<td>V1.34</td>
<td>Version of grandMA VPU</td>
</tr>
</tbody>
</table>

This number should correspond to the grandMA 2 onPC streaming version

This number should correspond to the grandMA 1 onPC streaming version
2.4 IP Addresses

IP addresses are what allow the internet and most modern networks to work. It’s a way of identifying a computer by a unique set of numbers (an IP address). An IP address is made up of a set of four numbers. Each number can have a value between 0 and 255. IP addresses can be set via the network settings of the Windows system settings. grandMA VPU has to be restarted if the settings are changed. New addresses are read with the restart of grandMA VPU.

**Your PC and the console must have their respective IP addresses set up correctly.** The **first three sets of numbers** must be the same and the last set must be different.

For example:

GrandMA console IP address: 192.168.0.5

PC with grandMA VPU IP address: 192.168.0.10

To setup the IP address of the desk, please refer to the desk user’s manual.

**Note:**

The default IP address of grandMA VPU is 127.0.0.1 (the local host address of the PC). In this case grandMA VPU application can be connected only with the onPC application running on the same PC.

To work within the external network choose the network address e.g. 192.168.0.x. The actual IP address is shown within the Status Bar:

You can change the IP address via the menu entry: ‘File – Settings – Network’.

2.4.1 IP Address of the PC

Please note if you are already part of a network please check with your network administrator before changing your IP settings.

IP settings can be found at:

START – CONTROL PANEL – NETWORK CONNECTIONS (Windows XP)

START – CONTROL PANEL – NETWORK AND SHARING CENTER (Windows Vista)

2.4.2 Artnet IP Address

The Artnet Standard needs a class A IP address beginning with 2. for example 2.2.2.2 and a subnet mask 255.0.0.0.

This address can be added via the Windows dialog Advanced TCP/IP Settings.

Further information about the Artnet protocol under:

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3 Communication with the grandMA Desk Series

Notice that the DMX channels have to be 'patched' to communicate with grandMA VPU.

The simplest way of 'patching' is to set the switch 'Auto Patch' in the dialog 'Create New Fixtures or Channels' to 'On' at the desk or the 'on PC'.

3.1 Connection with the grandMA desk

Please make sure, that the program version of the grandMA desk meets the specifications described in: 2.3 Version of grandMA desk or grandMA onPC (off-line).

For communication you have to connect the VPU with the grandMA console or another PC running the grandMA onPC.

You can do this directly with a patch cable with two RJ-45 connectors or via a network switch.

If you use a network with a switch, connect the PC with a regular patch network cable to the switch.

- Connect the cable to the desk.
- Start the desk and load a video show
- Start the grandMA application and join the session or invite the video application from the desk

The application connects to the desk and receives the data of the current show.

If you do not get a connection to the desk, make sure that grandMA VPU has the right IP address as described in '2.4 IP Addresses' and that the corresponding mode: grandMA 1 or grandMA 2 accurate.

3.2 grandMA 1 or grandMA 2 mode
grandMA VPU supports series 1 and series 2 consoles. To set the right mode, start the application via double-click at the icon:

- grandMA VPU starts in the last used mode (grandMA 1 or grandMA 2 mode).
- The actual mode is displayed in the statusbar.
- To switch between the mode select the menu entry ‘File – Switch Desk Interface’. The application restarts in the next mode.

### 3.3 Connection with the grandMA onPC (off-line) software

Please make sure, that the program version of the grandMA onPC software meets the specifications described in: 2.3 *Version of grandMA desk or grandMA onPC (off-line)*

- Start the grandMA onPC and load a show (Backup Load Show)
- Start a new session at the grandMA onPC (MA Network Connections ‘Start New Session’)
- Start the grandMA VPU application

grandMA VPU searches for a running grandMA onPC session with a unique ID. If the session is found grandMA VPU connects automatically with this session and loads the current show.

If you do not get a connection to the desk, make sure that grandMA VPU doesn’t run a master session.
3.4 Connection States

When you launch grandMA VPU it tries to connect to a session with the same ID. The four possible states of the connection are indicated by the heart in the status bar. The blinking of the heart indicates the communication between the desk and grandMA VPU.

- Heart is broken and red:
  No connection to a session established

- Heart is blinking green:
  grandMA VPU has joined a session as slave

- Heart is blinking blue:
  grandMA VPU is the master of a session. The creation of a session with grandMA VPU can be used to transfer all data of a .gvs or .gz file (grandMA VPU 1 or 2 formats) to a desk or onPC. If the loading is completed, the desk automatic becomes the master and grandMA VPU gets the slave.

- Heart is blinking yellow:
  grandMA VPU has joined the session in the ‘Sniffer mode’, this is a simple receiver mode.
  In opposite to the slave mode no session data will be exchanged with the desk.

**ATTENTION:** With the start of a new session (Create) the session founder overwrites all data of the other members. I.e. if a new session is founded by the grandMA VPU all data in the desk will be overwritten!

If more than one console, visualizer or onPC editor is connected to the network the connections to the equipment will have to be properly assigned.

- The communication between consoles, visualizer, VPU applications and onPC editors takes place in sessions.
- A session has only one founder. This is e.g. the master. On connection the founder transfers its data (fixture types) to the slaves.
  From then on, all session members are synchronized and have equal rights. If a fixture is edited in the slave the change is reflected in the master and vice-versa.
- Devices not assigned to any session are not in the list.
  If you press the ‘Invite Station’ Button you get a list of these MA devices.

**Series 1 specifications:**
A Session always has one master and up to 31 Slaves, i.e. max. 32 devices. For example a slave can be another MA desk, an NSP, a grandMA onPC application, the grandMA 3D visualizer or a grandMA VPU station. In the ‘Sniffer mode’ more VPU sessions are possible because similar to the Artnet protocol a VPU station is only receiving data.
The network configuration can be managed by the ‘Settings Network’ dialog.

**Remark:** If the session entry appears in red, the streaming version is wrong. You have to update the software.

The upper part of the dialog shows the active sessions and their members in a tree view. grandMA VPU is marked green.

**Leave** (Session):
Leave the session.

**Join as Slave**:
Join the selected session as a member (usually as slave). After that data of the desk is transferred to the grandMA VPU.

**Join as Sniffer**:
Join the selected session as a sniffer i.e. the VPU application is only receiving data similar to an Artnet receiver application. If you change settings in the Video application no data is sent to the desk i.e. inserting of content from the desk is not possible in this mode.

**Create Session**:
grandMA VPU creates a new session as master. This function is used for example if a show already exists. The show with all data is sent to the slave. If the loading is completed, the desk automatically becomes the master and the VPU station gets the slave.

**Invite Station**:
Opens a dialog showing all connected MA members (desks and onPC) in the network. You can invite new members via the dialog.

**Settings:**

**MA Net IP**:
Use this listbox to choose an IP address for network communication. If there is more than one IP available (e.g. multiple network cards installed) select the IP address which is linked to the grandMA desk.

**Artnet IP**:
Use this listbox to select an IP address for the Artnet communication of the Pixel Mapper (receive data only).

**ID**:
Every session in the grandMA network has a unique ID. Only members with this ID can take part in this session.

**Session**:
Input or display for the name of a session.
3.5 Preferred Operation Mode (Screen Layout)

To get a direct access to the channel sets of the fixture layers we recommend the smart view. The “Smart View” offers a clearly arranged summary about the layer content and objects. All important functions can be accessed via short keys.

To configure a ‘Smart View’ follow the following instructions:

- Click on the empty touch screen to call the “Create a Window” dialog
- Select the “Smart” button

In the upcoming “Smart” window press the yellow button left above:

In the ‘Smart Window Options’ dialog select the ‘Enable Direct Select’ buttons ‘Preset’ + ‘Feature’ + ‘Attribute’

To create the “Group” buttons carry out the following instructions:

- Press the “Setup” key at the desk
- Push “Auto create” at the touch screen
- Set the “Select” entry in “Video Layer” and “Video Master” to “Yes” and press “Create single Groups only”
- Change into the “Smart” view and resize the smart window to get space for the group buttons
- Click into the blank area and select “Groups” in the upcoming dialog
4 Data management

This section describes how data is managed by the desk and grandMA VPU. Desk and VPU can work independently. Each package can be operated standalone. If they are connected in a MA network session the desk gets the master and the video application becomes the slave of a session. Data changed within the video application is transferred to the desk and vice versa.

4.1 Master slave

The MA console or onPC is always the master of a session. Only if the grandMA VPU is started as standalone it can be the master. If a desk is connected and a session is started within the VPU application the show file will be transferred to the desk and then this becomes the master and the VPU the slave. So the synchronization of desk and video data is guaranteed.
4.2 Principle function diagram

The following pattern demonstrates how data is processed.

If you connect the grandMA VPU to a grandMA desk you can compare the result with some slide projectors remote controlled by an MA desk.
In contrast to a slide projector the slides are not projected on the screen. The screens or 3D objects are active light emitters like monitors and can take the shape of any geometric form.
This takes place on so called “Layers”. Each Layer output feeds a virtual camera.

The virtual camera outputs can be mixed up to a resulting video output.
Each layer has its own magazine containing emitting 3D objects.
Each layer has its own magazine containing videos, images and masks.
The number of 3D video layers can vary in dependence of the complexity of your show.
You can patch up to 32 layers.

If the grandMA VPU is invited in a session by the desk, layers behave similar to a fixture.
All layers have access to the same content pool.
The application receives the amount of layers and each layer magazine is assembled with several images and videos. These are indicated by their relative paths and names.
If a layer 3D object or the content of a magazine is changed within grandMA VPU, the changed properties are immediately taken up by the desk.
Several grandMA VPU applications are shown in several ‘Layers’ on the MA-desk.
The following diagram shows a principle structure with 4 layers.
4.3 Layer properties

For a better overview shows can be arranged in Fixture Layers on the grandMA desks. E.g. the conventional lights can be separated from the multi functional fixtures and video engines.

In the example below you see a show in the Fixture Layer named ‘New Device Layer’ with two VL 2000 W and two VL 1000 A:

According to this example for each grandMA VPU station an own Fixture Layer is created. This Layer accepts several Video Layers. These Video Layers can be combined to meet your requirements.

In the following example the Fixture Layer with the name ‘Video’ contains 1 Master Layer, 6 Video Layers and 2 Output Layers as 2 outputs are used:

Layers for a video show can be arranged for your requirements on the desk. You can find them in the fixture library at the entry: ‘MA LIGHTING’.
The different Layer Types have the following meanings:

**Video Layer:**

This Layer can use several 3D Objects from the library to represent images and videos. The content can be shown on several outputs of the graphics card.

A grandMA VPU application can contain several 3D Video Layers for images and videos. You can patch up to 32 layers to be more flexible in programming. Please note that you cannot run Video Clips on all these layers at the same time!
Master:

One grandMA VPU application can contain only one Master Layer. This layer represents a total view on all other layers. It serves the shapers, iris and scaling for all outputs.

A control channel offers

- remote controlled PC shut down
- Switch into Fullscreen View
Output Layer:

**Each output has its own output fixture.**

Additional to the effects in the video layers this fixture layer serves separate effects for each output and:

- Shapers
- Softedging
- Keystoneing

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<th>SB+C Brightness: 32639</th>
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<td>Shaper 2A: 0</td>
</tr>
<tr>
<td>Shaper 2E: 0</td>
<td>Shaper 3A: 0</td>
</tr>
<tr>
<td>Shaper 3E: 0</td>
<td>Shaper 4A: 0</td>
</tr>
<tr>
<td>Shaper 4E: 0</td>
<td>Beam1 Filling 357</td>
</tr>
<tr>
<td>Beam1 Filling 357</td>
<td>VScale X: 32768</td>
</tr>
<tr>
<td>VScale Y: 32768</td>
<td>VScale ALL: 33639</td>
</tr>
<tr>
<td>Eff 1 Eff Type: 0</td>
<td>Eff 2 Eff X: 0</td>
</tr>
<tr>
<td>Eff 1 Eff Pos: 0</td>
<td>Eff 2 Eff Y: 0</td>
</tr>
<tr>
<td>Eff 2 Eff Type: 0</td>
<td>Eff 2 Eff Z: 0</td>
</tr>
<tr>
<td>Eff 2 Eff X: 0</td>
<td>Eff 2 Eff Par1: 0</td>
</tr>
<tr>
<td>Eff 2 Eff Y: 0</td>
<td>Eff 3 Eff X: 0</td>
</tr>
<tr>
<td>Eff 2 Eff Z: 0</td>
<td>Eff 3 Eff Y: 0</td>
</tr>
<tr>
<td>Eff 3 Eff X: 0</td>
<td>Eff 4 Eff X: 0</td>
</tr>
<tr>
<td>Eff 3 Eff Y: 0</td>
<td>Eff 4 Eff Y: 0</td>
</tr>
<tr>
<td>Eff 4 Eff X: 0</td>
<td>Eff 4 Eff Z: 0</td>
</tr>
<tr>
<td>Eff 4 Eff Y: 0</td>
<td>V 3D Key Pos X: 32639</td>
</tr>
<tr>
<td>V 3D Key Pos Y: 32639</td>
<td>V 3D Key Pos Z: 32639</td>
</tr>
<tr>
<td>V 3D Key Roll X: 32639</td>
<td>V 3D Key Roll Y: 32639</td>
</tr>
<tr>
<td>V 3D Key Roll Z: 32639</td>
<td>V 3D Key Scale X: 32639</td>
</tr>
<tr>
<td>V 3D Key Scale Y: 32639</td>
<td>V 3D Key Scale Z: 32639</td>
</tr>
<tr>
<td>V 3D Key 3D Objects: 0</td>
<td>Keystone ALL: 25542</td>
</tr>
<tr>
<td>Keystone 1A: 0</td>
<td>Keystone 2A: 23488</td>
</tr>
<tr>
<td>Keystone 3A: 0</td>
<td>Keystone 4A: 0</td>
</tr>
<tr>
<td>Keystone 5A: 0</td>
<td>Keystone 6A: 0</td>
</tr>
<tr>
<td>Keystone 7A: 0</td>
<td>Keystone 8A: 0</td>
</tr>
<tr>
<td>Keystone 9A: 0</td>
<td>KeyValence BIP: 32767</td>
</tr>
<tr>
<td>KeyValence BIP: 32767</td>
<td>Softedge 1A: 23656</td>
</tr>
<tr>
<td>Softedge 1B: 23656</td>
<td>Softedge 1C: 23656</td>
</tr>
<tr>
<td>Softedge 1D: 23656</td>
<td>Softedge ALL: 23656</td>
</tr>
<tr>
<td>Softedge 2A: 23656</td>
<td>Softedge 4A: 0</td>
</tr>
<tr>
<td>Softedge 4B: 0</td>
<td>Softedge Offset X: 32767</td>
</tr>
</tbody>
</table>
4.4 Predefined Constellation

With the installation of grandMA VPU the most common constellation is installed. This is available via the menu entry 'File – Default Show'.

If a grandMA VPU application is started, and a new show is created via 'File – Default Show' the application starts a show with the following configuration:

<table>
<thead>
<tr>
<th>Video Layer</th>
<th>Output</th>
<th>Master</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NewShow</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Will be loaded via 'File – New'.

Projection of 6 video layers

4.5 Supported Codecs

grandMA VPU uses the hardware acceleration of the graphics card, Microsoft® Direct Show and the Main Concept® MPEG2 decoder to get a high performance for video output.

So MPEG-1 and MPEG-2 compliant streams are supported.
5 Several grandMA VPU applications in one grandMA show

Several grandMA VPU applications can be operated via one desk simultaneously.

For each grandMA VPU application one fixture layer can be created in the desk.

A grandMA VPU application is working in the "MA-Net" and is identified via the fixture layer name.

All PCs running grandMA VPU with the same fixture layer name will "grab" what they need out of the data stream and show the same show with the same content. Several ‘Video-fixtures’ configured in the desk can be selected in the grandMA VPU application via a drop down menu in the status bar:

Example with one connected grandMA VPU application in one Fixture Layer:

![Fixture Layer: Video](image)

A layer in grandMA VPU is analog to a Fixture in the grandMA desk.
So if you use for example 6 video layers 6 fixtures are patched and shown in the Fixture Layer of the desk.

In this example a second Fixture Layer named ‘video2’ has been added for a second grandMA VPU application with one Master fixture named ‘Master 1’ and one Video Layer named ‘Layer 1’:
6 Quick Guide

This capture gives a brief description how to operate with the grandMA VPU application.

To give you a sense of achievement grandMA VPU is delivered with a short demo file that can be opened via the menu entry ‘File – Default Show’. This gives a survey of the possibilities of manipulation.

If you carry out this example the video application starts a master session and transfers its show to the connected desk or onPC.

**Attention!** Consider that the actual desk show will be overwritten if you carry out this example.

For the following steps a grandMA desk or the grandMA onPC should be connected.

Without the connected desk, or onPC editor, you are able to do the setup where the used pictures and videos are stored, but you cannot control the resulting output via the desk.

6.1 Step 1 – Start master session and connect to the desk (grandMA series 1)

- Start the connected desk or onPC with an empty show. 
  (Backup; Load Show; New Show)
- At: 'Tools' 'MA Network' make sure, that no session is running. 
  If not, stop the session with 'Leave Session'.
- Then start grandMA VPU.
- Start the 'New Show' via the menu entry ‘File – New Show’.

If no MA session is found, this is indicated by a red broken heart in the status bar. Please Note: If you are not in a session or the master there will be no output!

Create a new session by opening the network dialog (click 'Network'), and then click the 'Create Session' button. The Master state will be indicated by the blue heart.

Now you can invite the desk or onPC to the MA session:
Click the 'Invite Station' button (Settings - Network) and select the Station (Desk or onPC). Invite the station by clicking the OK button.

Show data of grandMA VPU will be transferred to the desk. 
This is signaled via a progress bar.
Note:
GrandMA VPU can create a session as a Master. If a desk joins into this session, the desk will become the master and grandMA VPU will become the slave. All show data on the desk will be overwritten!

From now on the desk becomes the master of the grandMA session and grandMA VPU joins as slave:

You also can join the session via the desk or onPC. Therefore select the ‘Tools’ button on the desk and open the ‘MA Network’ dialog. Select the ‘Active Network Session’ and click on ‘Join Session’. The show will be transferred to the desk and the desk will become the master of the session (if it was created from grandMA VPU).

6.2 Step 2 – Controlling Images and Videos via the MA desk

Now you have access to the images and videos arranged in the demo show of grandMA VPU.

The surface of the touch screen should look like this:

The column ‘Name’ shows all configured layers of the show file. In the columns beside all available effects for this layer are listed. Now we’ll see how to control grandMA VPU via the desk:
Click on the ‘Preview’ tab of grandMA VPU to watch the resulting output preview. If you prefer a Fullscreen view, apply the ‘Fullscreen’ button in the toolbar (back with the ‘Alt + Enter’ button).

Select a layer and open the dimmer. Now you can fade in the actual selected image for the layer.

If you want to change the image or video for the layer, scroll through the image selection with the encoder wheel or select the image or video from dialog after clicking on the image entry.

For example if you select the image ‘Color Test stepless.bmp’ the preview window shows this image.

Now you can test the effects and see how the change of a value on the desk affects the resulting output in the grandMA VPU preview window.

We will see how this Texture looks on a 3D Object:

Select the ‘3D-Objects’ at the desk:

In the next dialog you can select a 3D Object to project onto:

Select the ‘Cross’.

The resulting output in the Preview looks flat, because you are looking perpendicular on the 3D cross.

So let’s rotate the cross:
Therefore enter values e.g. 45° into the VRot field.

The result in the preview shows a rotated cross with the new texture.

Instead of a simple texture you also can map a running video on the 3D Object.
Feel free and change other parameters.
This is the best way to see how grandMA VPU works.
7 Program surface

After starting the program an empty show will be opened or if connected with a desk or on PC the show will be loaded. The surface should look like this:

As already known from other applications, the program surface is divided into several parts:

<table>
<thead>
<tr>
<th>Menu bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbar</td>
</tr>
</tbody>
</table>

| Preview, |
| Multi Preview, |
| Content Editor, |
| Pixel Mapper (if this mode is selected) |

| Overview window for images and videos of the channel functions or the LED panels in the Pixel Mapper |

| Status Bar |
7.1 Menu bar

Like in several other Windows application you can store and recall files, and adjust the settings of the program:

7.1.1 File...

**New Show**  Creates a new show with 6 Fixture Layers, 1 Master fixture and 2 Output fixtures.

**Load Show...**  Opens a dialog to load a showfile (.gvs or .gz file).

**Save show as...**  Opens a dialog to save the current show at a given filename.

**Settings...**  Opens the Settings dialog:
Within this dialog you can set:

- Display settings
- Network settings
- Main settings e.g. FOH feature

Set the display properties:

- Select the main display
- Resolution for output
- Refresh rate in Hz
- Fullscreen
- VSync, avoid the actualization of the display while the output image is created. (This should always be selected)
- DualHead
- Enable the output for two different monitors. Each output can display different layer content.
- Swap the monitors
- Select the display for the GUI (Graphical User Interface)
Settings…

Network

Within this dialog you can set the properties for the network. This is described in detail in chapter 3.4 Connection.

Settings…

Main

Within this dialog you can select the

- **FOH features:**
  If this button is checked an additional buttons appears at the toolbar. The button ‘Blind’ preserves the blind programming preview.

- **Extended Menus**
  switch additional menu entries on/off e.g. ‘View – Timing’ etc for troubleshooting purposes.

- **Frame Blending**
  allows smoother motion when you slow down or speed up a layer.

- **Clip Frame Cache**
  Frames are cached before sending to the output. This may cause problems for the sound output (delay). To avoid this, you can lower the cache.

**Note:** the following dialogs are only available in the Widowed Mode
Video In:
This interface allows the input of a live video stream. It is realized via the Microsoft Direct Show mechanism.

Video In 1…4:
In this dialog up to 4 different ‘Video In’ devices can be assigned. Every Video Capture Device supported by Windows can be used as input source for grandMA VPU.

Available Devices:
All recognized Video Capture Devices are listed in this selection bar. By selecting one device this will be assigned to the ‘Video In’ source and is available for grandMA VPU.

Start / Stop [D]
Additional options to restart drivers in case of synchronization faults.

Device…:
If a Capture Device with a driver is installed, its property dialog will be opened after the selection of this button. In this dialog the device specific properties of the manufacturer can be managed. The following example shows the property dialog of a webcam:

If no device property is available, nothing happens.

Stream…:
If a Capture Device with a driver is installed, its streaming dialog will be opened after the selection of this button. In this dialog the device specific streaming properties of the manufacturer can be managed. The following example shows the property dialog of a webcam:

If no device property is available, nothing happens.
Switch Desk Interface Switch between the grandMA 1 and grandMA 2 mode. The application restarts in the next mode.

Update Software... In the upcoming dialog you can browse to the software update. After selecting the VPU terminates, the setup is started and the application restarts in the last used mode.

Exit Leave the application.

7.1.2 View...

Start in Fullscreen The application always starts in the ‘Fullscreen Mode’

Show FpS in Fullscreen Show the frame rate in FpS (Frames per Second) in the fullscreen output.

The following entries are only visible if the option ‘Menu – File – Settings – Main – Extended Menus’ is selected:

Info Window Opens an Info window for internal purposes.

Timing Window Opens window with timing information to check the performance.

Layer Window Opens a window with information about the layers as type, Show on Head, Scale etc..

Video Clips Window Opens a window that offers information about the used video clips. This can be helpful for troubleshooting.

Memory Window Opens an overview window about the usage rate of the memory.

Statistics Window Opens an Info window for internal purposes.
7.1.3 Mode...

DVI
Switch the output signal to DVI (Digital Visual Interface) output.

Pixel Mapper
Enable the Pixel Mapper see also chapter: 11 Pixel Mapper.
Pixel Mapper Editor will be enabled and video output will be transformed into DMX values. Finally output via Ethernet adaptor (Artnet) to RGB devices/fixtures.

7.1.4 Help...

Release Notes…
Opens the release notes document.

Info…
Shows the about box with the current version number.
In the lower part of the box you can find the license information and the Dongle Serial Number.

7.2 Toolbar
The toolbar contains several buttons that are related to the general operations of the program.

Network…
Shows the actual network state or opens the MA Network dialog as described in 3.4 Connection.

Fullscreen:
Switches into ‘Full-Screen’ view. You can also use the ‘Alt + Enter’ key on the keyboard to switch into the full-screen mode.
Leave the full screen mode with the ‘Alt + Enter’ button

Blind: (Only enabled if the ‘FOH Features’ in the Options Dialog is enabled)
You can take or reject the ‘Blind Preview’ from the desk by selecting the appropriate check buttons. If the ‘Blind Preview is active, the button gets blue.

Channels: (Only enabled if ‘Multi Preview’ tab is selected)
Toggle the Channel controls in the ‘Multi Preview’.

7.3 Preview
This view offers a preview of the resulting output video.

If you enter the tab, grandMA VPU receives the commands from the desk and shows the resulting output but in opposite to the Fullscreen view the menus, the toolbar and the status bar are also active.
7.4 Multi Preview

This View allows an overview of all layers, their effects and the resulting output:

The example above shows 2 layers with the resulting output picture for a single head output. If ‘Dual Head’ is enabled via the menu entry ‘File - Settings – Display’ the output for the second display is presented too.
The content of each layer is shown in a small window.

The controls below allow watching the effect values for each channel in the layer. The horizontal bar in each control indicates the setting from 0…100 %.

Changing values are highlighted. Please note that these are no programmer values but all changes from the default values are indicated this way.

You can toggle the controls with the ‘Channels’ button in the toolbar:

---

### 7.5 Content Editor

By selecting the ‘Content Editor’ tab this view is activated.

In this view you can edit the content, videos images and 3D objects of the layers.

Content for all video layers is edited via the tab ‘Layer Mode 2’.

Content for the master and output fixture is edited via the tab ‘Output Mode 2’.

Both are handled equally.
7.5.1 Image Pool (I-Pool)

grandMA VPU comes with a sample library containing images, gobos and video clips. This content is preinstalled on the VPUs and can be ordered from MA Lighting.

Similar to the magazine of a slide projector such a folder behaves like a slide magazine. Up to 255 folders can be accessed directly from the desk. The different images and videos of a folder correspond to the ‘Channel Sets’ of the desk and can be accessed from there.

Items can be edited, changed or deleted via the context menu of the right mouse button.

Data of the items like size, framerate and length are shown in a grid. If an item is selected its preview is shown in the preview window at the lower left side of the screen.

To assign a new folder to a ‘Channel Function’ click with the left mouse button into an empty column.

A context dialog appears. After selecting the entry a browser window appears where you can navigate to the folder containing the videos.

After the selection of the folder its name is taken as a name for the ‘Channel Function’ as shown in this example ‘MALighting-Crips2’. You can change the name via the context menu with the right mouse button.
7.5.1.1 Inserting customized Videos and Images

To insert images and videos click with the right mouse button somewhere in the 'I-Pool Folder' or 'Channel Functions' field and navigate in the upcoming dialog to the folder where the images and videos are located. This can be an external drive.

After the selection of the folder and confirming with 'OK' it will take a while until the images are shown because grandMA VPU has to build a so-called thumbnail (little image) for all items. Therefore each file has to be opened and searched for a usable picture.

Note: The drive and its connection have to offer the necessary transfer rate to supply grandMA VPU with data!

Because the presentation area of the images and videos behaves like a normal Windows browser you also can copy the files into the shown directories by dragging them from your file browser and drop them into grandMA VPU. These images and videos are added to the channel sets.
7.5.2 3D Objects

The tab '3D-Objects' shows the projection objects of the layers. In the simplest case a layer contains a 2D plane object. This is a canvas were images or videos are shown like on a TV screen. But this screen mustn’t be flat. You can use 3D boxes, cones or other 3 dimensional objects to render your images or videos.

Items can be edited, changed or deleted via the context menu of the right mouse button.

Data of the items like name and size are shown in a grid.

To assign a new item insert a 'Channel Set' via click with the right mouse button.

Note:

If you use objects with the extension „@r” like „Plane@r.xob” the aspect ratio of the object fits automatically to the aspect ratio of the texture (Ratio of width / height e.g. 16/9). So we recommend using this object (Plane@r.xob) for the easy projection of videos.

Objects with the extension „@2D.xob“ are displayed as 2D Plane exact in that dimensions that are given by the used texture. This happens exactly as determined by the texture. Via the position parameter these objects can be moved. Rotation and scaling are blocked because the pixel precise displaying won’t work in that case. See example object PixelExact@2D.xob.
7.5.3  Eff1 Type...Eff4 Type

The tabs ‘Effect Type 1...4’ show the possible effect types for the layers (Video and Master):

<table>
<thead>
<tr>
<th>Effect Type</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Effect</td>
<td>01</td>
</tr>
<tr>
<td>Video Sepia</td>
<td>2-3</td>
</tr>
<tr>
<td>Video Shadows</td>
<td>1-2</td>
</tr>
</tbody>
</table>

The effect engine is based on the Direct3D standard. Effects are defined within .fx files. An effect file is a text file with an .fx extension. It defines how something is to be rendered. It includes state information along with vertex and shader declarations. The shader code is written in HLSL (High Level Shading Language).

The following example shows the assignment of a sepia effect the test image:

grandMA VPU comes with a default setup of effect files. New effect files can be added to the ,Channel Set' via the context menu in the ‘Effect Type’ view with the right mouse button.
7.6 Fullscreen View

**Note**: grandMA VPU always runs in Fullscreen View. Only if the VPU is installed on a PC with a protection dongle (former grandMA Video application) the switching between Windowed and Fullscreen is relevant.

This view uses the full screen to show the video output.

There are several ways to switch into the full-screen view:

- Select the ‘Fullscreen’ button from the toolbar.
- Press ‘Alt + Enter’ on the keyboard.
- Use the Master Layer control channel on the grandMA desk to switch remote controlled into the Fullscreen View.

If the application should always start in the Fullscreen View choose the menu entry ‘View -> 'Start in Fullscreen''

7.7 Status Bar

The status bar offers an overview about the system status:

- **Type of network**: grandMA 1 or grandMA 2
- **Connection state in network**: Not connected, Master, Slave or Sniffer as described in: 3.4 Connection States.
- **Name of the showfile**
- **Shows the status of the dongle**
- **Indicate the ‘Allow Invite’ status of the network settings.** (Yellow means enabled, red is disabled)
- **Used IP address for MA Net**
- **User of grandMA show rights**: 'Restricted' or 'Administrator'
- **Shows the used fixture layer. You can switch the fixture layer via this drop down menu.**
8 Layer Functions and Effects

To explain the layer effect engine it is illustrative to imagine grandMA VPU as a model of several movable cameras where every camera looks at a layer object like a 2D plane or a 3D cube.

In these examples an image may be a texture (picture), or a video.

<table>
<thead>
<tr>
<th>Layer Functions and Effects</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimmer</td>
<td>Dimmer 50 %</td>
</tr>
<tr>
<td></td>
<td>Dimmer 100 %</td>
</tr>
</tbody>
</table>

Dimmer function.

To facilitate fading between different layers the dimmer controls the transparency of an object. If the dimmer is 0 the object is transparent and the projection is invisible. If the dimmer is “full” the object is opaque and you can only see the front layer (front Z-position).
<table>
<thead>
<tr>
<th>Layer Functions and Effects</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colorkey</strong></td>
<td><strong>Layer 2</strong></td>
</tr>
<tr>
<td></td>
<td>Key R,G,B (100,0,0)</td>
</tr>
<tr>
<td></td>
<td>Tol R,G,B (10,0,0)</td>
</tr>
</tbody>
</table>

Set the transparency for the foreground object. For each RGB channel the value and tolerance can be set separately.

The switch ‘Alpha’ decides if the pixel gets complete transparent or opaque in dependency to the color key.

The switch ‘Type’ decides if the calculation is done in the RGB (Red Green Blue) or HSB (Hue Saturation Brightness) model.

**SB+C** (Saturation Brightness + Contrast)

<table>
<thead>
<tr>
<th></th>
<th>SBC (50,50,50)</th>
<th>SBC(0,50,50)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image Layer 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Image Layer 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resulting Output Image</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Set Hue, Saturation and Brightness of a layer.
### Layer Functions and Effects

<table>
<thead>
<tr>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colorboost</strong> (ColBoost-R; -G; -B)</td>
</tr>
</tbody>
</table>

Boost the red, green or blue color of the image.

---

**ColorMix** (CM1; CM2; CM3)

| Color (0,0,0) | Color(0,0,100) |

Tint the output with the CMY(Cyan; Magenta; Yellow ) color mixer.

---

**VObj. 3D-Objects**

| cross | sphere |

Select an 2D or 3D object on which surface the image or video is shown.
<table>
<thead>
<tr>
<th>Layer Functions and Effects</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>VObj. I-Pool</td>
<td>Pool 'Standard' selected</td>
</tr>
</tbody>
</table>

Selection of the 'I-Pool'. One 'Pool' can contain up to 255 images or videos.

<table>
<thead>
<tr>
<th>VObj. Images</th>
<th>Image 1</th>
<th>Image 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose the image or video from the selected 'Pool'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VPosition (X; Y; Z)</th>
<th>X= 50%; Y=50%; Z=50%</th>
<th>X=25%; Y=25%; Z=25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning of the projection object in X; Y; Z - direction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VRotation (X; Y; Z)</th>
<th>X=40%; Y=60%; Z=50%</th>
<th>X=40%; Y=40%; Z=40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotate the projection object around the X; Y; and Z-axis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer Functions and Effects</td>
<td>Example</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>with values in %</td>
<td></td>
</tr>
<tr>
<td><strong>VPosition &lt;&gt; (X; Y;Z)</strong></td>
<td>X= 50%; Y=50%; Z=50%</td>
<td>X= 60%; Y=60%; Z=50%</td>
</tr>
</tbody>
</table>

Animate continuous moving of the projection object in X; Y and Z - direction

| **VRotation <> (X; Y;Z)**    | X= 50%; Y=50%; Z=50% | X= 50%; Y=50%; Z=60% |

Animate continuous rotation of the object around the X; Y and Z - axis
<table>
<thead>
<tr>
<th>Layer Effects</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>VScale (X; Y; Z)</td>
<td>X = 50%; Y = 50%; Z = 50%</td>
</tr>
<tr>
<td></td>
<td>X = 50%; Y = 30%; Z = 50%</td>
</tr>
</tbody>
</table>

Scale the dimensions of the object in X; Y; Z direction

<table>
<thead>
<tr>
<th>VImage Split (Split X; Split Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split X 0; Split Y 0</td>
</tr>
<tr>
<td>Split X 2; Split Y 2</td>
</tr>
</tbody>
</table>

Split the image or video in X and Y

<table>
<thead>
<tr>
<th>VImage Offset (Offset X; Offset Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset X = 0; Offset Y = 0</td>
</tr>
<tr>
<td>Offset X = 50%; Offset Y = 0%</td>
</tr>
</tbody>
</table>

Split offset of the image or video

<table>
<thead>
<tr>
<th>VImage&lt;&gt; (X; Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 50%</td>
</tr>
<tr>
<td>Y = 50%; Z = 50%</td>
</tr>
<tr>
<td>X = 60%</td>
</tr>
<tr>
<td>Y = 50%; Z = 50%</td>
</tr>
</tbody>
</table>

Animate continuous scrolling of the image or video on the object
### Layer Effects

<table>
<thead>
<tr>
<th>VPlayer Playmode</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 100</td>
<td>Frame 200</td>
</tr>
</tbody>
</table>

(Only for videos)

- **Frame Index:** Select a single frame picture with the Index channel
- **Play:** Starts the Video once forward from the beginning to the end
- **Loop:** Starts the video endless looped forward from the beginning
- **Stop:** Stops immediately
- **Pause:** Pauses
- **Resume:** Continues after Pause (even with Bouncing or Looping)
- **Loop Index:** Plays the loops inside the index frames set at Frame Index Begin and End
- **Play Index:** Plays the video from the indexes frames at Frame Index Begin and End

<table>
<thead>
<tr>
<th>Sound SndVol 1</th>
<th>SndVol = 0%</th>
<th>SndVol = 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control the sound output for video files with a soundtrack</td>
<td>Sound is off</td>
<td>Sound is on</td>
</tr>
</tbody>
</table>

- **Effect 1…4**
  - **Eff Type = 0**
  - **Eff Type = Sepia**

Several effects based on the Direct3D standard can be selected. Effects are defined within .fx files as described in 7.5.3 Eff1 Type…Eff4 Type.
### Master \ Example Fullscreen View

<table>
<thead>
<tr>
<th>Master control</th>
<th>Multi Preview</th>
<th>Fullscreen View</th>
</tr>
</thead>
</table>

The Control channel of the Master Layer is used to switch to the Fullscreen View or to shut down the VPU via the desk. These functions are available as buttons in the Smart View:

- No Operation: ---
- Shutdown: Shutdown PC
- Restart: Restart PC
- Fullscreen: Fullscreen Mode
- Windowed: Windowed Mode
- Sniffer Mode: Sniffer mode
- Slave Mode: Slave Mode
- Enter PM: Start Pixel Mapper
- Leave PM: Leave Pixel Mapper

### Master Shaper; Beam; Scale

This Effects are similar to the layer effects
**Note:** Output effects manipulate the complete output signal:

<table>
<thead>
<tr>
<th>Output Effects</th>
<th>Example with values in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VCamera Position</strong></td>
<td></td>
</tr>
<tr>
<td>(Pos X; Pos Y; Pos Z)</td>
<td>X=50%; Y=50%; Z=50%</td>
</tr>
</tbody>
</table>

All layer views are mixed up to one view for the main camera.

This imaginary camera can be moved to show only parts of the whole image. So several applications can be connected together to project a huge image.

| Shaper                  |                          |
| (1A; 1B; 2A; 2B; 3A; 3B; 4A; 4B) | 1A=0; 1B=0; 2A=0; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 % |
|                         | 1A=30; 1B=0; 2A=30; 2B=0; 3A=30; 3B=0; 4A=30; 4B=0 % |

With the beam shapers the resulting image can be masked variable with four shapers each with 2 channels A and B.

| Beam Iris Image         |                         |
|                         | IrisImg = IrisCircle    |
|                         | Select an iris image of the Master Mode IrisImg pool. These images contain areas with alpha channels to work as masks. |

| Beam Iris               | Beam1 Iris = 50 %       | Beam1 Iris = 30 % |
|                         | With the Iris function the iris image can be scaled to cover the output. The value range 0…100% covers the range from closes to open. |

| Sound SndVol            | SndVol = 0%             | SndVol = 100%     |
|                         | Control the volume channels for the resulting sound output Sound is off Sound is on |
Output Effects | Example with values in %
--- | ---
**Keystone**
(1A; 1B; 2A; 2B; 3A; 3B; 4A; 4B) | 1A=0; 1B=0; 2A=0; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 %
| 1A=0; 1B=0; 2A=0; 2B=30; 3A=0; 3B=0; 4A=0; 4B=30 %

All layer views are mixed up to one view for the main camera.

Each edge of this view can be moved towards the opposite edge to generate a keystone effect.

---

(X - Corr.; Y – Corr.) | X Corr. = 0 %; Y Corr. = 0 %
| X Corr. = 75 %; Y Corr. = 0 %

If a picture is projected distorted on a surface, a perspective correction is necessary to distribute the content on the surface correctly.

Therefore the distribution of the picture content can be manipulated in X- and Y-direction.

---

**Softedge**
(1A; 1B; 2A; 2B; 3A; 3B; 4A; 4B) | 1A=0; 1B=0; 2A=0; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 %
| 1A=0; 1B=0; 2A=50; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 %

If several projectors should show one common image, the borders must be cross faded.
For every border one channel for the position and one channel for the dispensation of the black wedge exist. This example shows a soft edging for the left border of the image.
9 Softedging

Softedging or Soft Edge Blending is a technique to split a complete picture into several smaller tiles. Therefore the margins of the flanking edges overlap. Inside the overlapping range both images show the same content, but with decreasing brightness to the boarders. grandMA VPU supports this technique for videos and images. This is realized via four controllable grayscales (gray wedges) at the borders of the image. Position and distribution of the grayscale are controlled by the grandMA desk with each two channels:

![Softedging Diagram](image)

**Projector 1**
Softedge controlling of the left image with Shaper 14A; 14B

**Projector 2**
Softedge controlling of the right image with Shaper 12A; 12B

**Projection of the complete Image**

The following example shows the functionality of the Softedge control channels:

<table>
<thead>
<tr>
<th>Out Layer Softedge</th>
<th>Shaper 12A</th>
<th>Shaper 12B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>50%</td>
</tr>
</tbody>
</table>

![Softedge Examples](image)
10 Keystoneing

If a projector is parallel to the screen, the image is a right-angled plane.
If the projector is shifted horizontally or vertically the right-angled projection gets trapezoid.
This effect is called Keystoneing.

This effect can be minimized by using the Keystone Correction.

Keystone Correction recalculates the image that it is shown right-angled independent of the position of the projector. Therefore the pixels must be compressed and the image is made smaller.

Pay attention, the Keystone Correction always causes a compression of the projected image. This causes a loss of quality of your projection.
This correction is done in Output Fixture:

For every edge of the image 1…4 there exist two control channels (Keystone 1A-1B…Keystone 4A-4B). With these channels the edges can be moved in horizontal and vertical direction:

Channels Keystone. X and Y are for the distribution of the picture content in X and Y direction.

The resulting output image for this distorted Keystone Layer looks like the image beside.
11 Pixel Mapper

The Pixel Mapper allows the presentation of the video output to a DMX matrix. DMX data is sent directly from the grandMA VPU PC via Ethernet using the Artnet protocol.

The LED wall can be configured individually using several LED panels from different manufacturers. The operating on the desk is analog to the operating of a video wall.

LED Panels are defined similar to dimmer or multi function spots via fixture type text files. These files are located on the video PC in the default path:
C:\Program Files\MA Lighting Technologies\grandMA VPU\NEWPANELS
Here the properties of the LED panels are defined as a Fixture Types in single files (grandMA Serieies1: PanelName.txt).

The following example shows a test image mapped on a 20 x 20 LED wall

![Test image original](image1) ![Mapping on a 20 x 20 LED Wall](image2)

Switch to the Pixel Mapper mode via the menu: ‘Mode – Pixel Mapper’.
After the activation of the Pixel Mapper an extra tabbed window ‘Pixelmapper Editor’ appears. The general output of grandMA VPU is done now via the Ethernet protocol Artnet instead of the graphic card of the PC.

The ‘Fullscreen’ button changes his function into ‘Artnet Out’ view. The functionality of the button is analog to the ‘Fullscreen’ button i.e. after activation (corresponds, Alt + Return’ on the keyboard) the Preview shows the general view of all configured LED walls.

Also the toolbar is extended by new buttons.

### 11.1 Pixel Mapper Graphical View

This view presents the graphical LED wall arrangement and allows a comfortable editing and controlling of the used panels:

#### 11.1.1 Pixel Mapper Toolbar

- **Center**
  Shows the center of the Pixel Mapper Editor

- **Autofit**
  Zooms the Editor automatically so that all panels are visible.

- **Select**
  If this button is selected, **single LED fixtures** can be selected to arrange them inside the LED wall or show their attributes via a right mouse click.

- **Zoom**
  **Zoom** the render window to fit.
  **Zoom in** with the right mouse button
**Zoom out** with shift + right mouse button

**New**
If a rectangle is drawn up while holding the right mouse button down in the right window, this rectangle will be automatically equipped with the necessary number of the selected panels. See 11.3 Setup of an LED Wall

**Delete**
Delete the selected LED panel.

**Undo**
Undo the last action

**Prev**
Select the previous panel

**Next**
Select the next panel

### 11.1.2 Pixel Mapper Editor

#### Library:
In the left edge of the window all configured LED panels in the default directory are shown. You can change the width of the window by selecting the border and move the mouse holding the left mouse button down. If a panel is selected in the lower part, a detailed view of the panel is shown in the upper part.

A pop-up menu (right mouse click) offers possibilities for other operations and the navigation e.g. open the LED fixture as text file.

The pop-up menu of the preview offers the LED simulation of a panel that has been selected in the graphical window and the indication of the Universe/DMX addresses.

#### Area/Output:
The general output of grandMA VPU is done now via the Ethernet protocol Artnet instead of the graphic card of the PC. Therefore the physical dimensions of the LED wall (Area) and the number of pixels (Output) can be set:

**Area:** Here the physical width and height of the LED wall is determined. This must not conform to the whole size of the LED Panels. So e.g. only sub ranges of the general view of the LED Panels can be set. The units are set via the dialog of the menu entry, Options – Pixel Mapper’

**Output:** Mapping of the whole output to the Artnet output range. The output range is defined in n x m pixel.
**Example:** The physical dimensions of the source picture must not confirm to the whole size of the Panels. The LED Panels can picture, for example only a sub range of the whole output.

In this example the output area amounts 1,25m x 1,0 m with 25 x 20 pixel panels.

There are used only 16 panels (5 x 5 LEDs). The middle stripe is not equipped with LED Panels and is not used.

**Options:**

**Send Artnet:** Enable sending data sending to the Artnet IP that is selected in the dropdown field.

**Grid:** Displays a grid with n lines in X and Y direction.

**Panel Outlines:** Marks the panel borders.

**LED Outlines:** Marks the LED borders.

**DMX Addresses:** Show the universe + DMX start addresses of each panel.

**Name:** Display the fixture name of each panel.

**LEDs:** Preview content for each LED.

**Background:** If the part of the output area is not equipped with a panel, the background image is indicated transparent. Select the transparency.

**Statistic:**

This tab offers information about the used universes, DMX channels and the performance.
11.2 Pixel Mapper Grid View

Via the tab ‘Grid View’ you can switch to the Grid View of the Pixel Mapper:

This view offers an overview about all used LED panels. All values can be edited directly in the grid. Selected panels are displayed bold.
11.3 Setup of an LED Wall

An LED wall consists of several LED panels that are arranged in a grid. The LED wall in the following example exists of 4 5x5 LED panels with 25 RGB canals each. Therefore every panel needs 25 x 3 = 75 DMX channels. In the example each panel is assigned to an own DMX universe.

Panel 1: Universe 1
DMX Chan. 1…75

Panel 2: Universe 2
DMX Chan. 1…75

Panel 3: Universe 3
DMX Chan. 1…75

Panel 4: Universe 4
DMX Chan. 1…75

To configure the LED wall there are two possibilities 1. or 2.: 
1. Drag the LED Panel from the left field holding the left mouse button down into the output area.

To move the panels you can use the arrow keys:
Arrow key moves:
  1 grid snap
Arrow Key + Shift moves:
  ½ grid snaps
Arrow Key + Ctrl moves:
  2.5 grid snaps

2. Or choose the 'New' button in the tool bar.

Draw a rectangle while holding the left mouse button down. Draw from the upper left down to the lower right corner diagonally. The area will be filled automatically with the necessary amount of panels.

After dropping a dialog for the DMX values appears:

**Panel Count:** Number LED panels.

**Channels per Panel:** Number of the DMX channels per panel.

**Universe:** Address of the first DMX universe for patching.

**DMX Address:** DMX start address of the first panel.

**Panel Offset:** Distance between the start addresses of the single panels.

For example: With the offset of 512 for each panel a new DMX universe is taken. This happens because the DMX universe range reaches from 1 to 512.
The following example shows the distribution of the DMX addresses on the DMX universes:

11.4 File Format of LED Panels in grandMA Series 1

The properties of an LED panel are specified in a text file e.g. „5x5-25cm.txt“. This text files are located in the folder:

C:\ProgramFiles\MA Lighting Technologies\grandMA VPU Software\Data\NEWPANELS

Parallel to the text file is a bitmap (.bmp) with the same name in the folder for the visualization.

The file construction is similar to the fixture description file of the desk.

The LED panel file describes the physical dimensions of the panel, the optical visualization and the dimensions of the LEDs as well as the DMX channels and the patching order.

The file is structured hierarchically as a tree with single blocks. The blocks are described within {}. They contain tags (Keywords or marks) beginning with a ‘_’. A tag is followed by a set value.

<table>
<thead>
<tr>
<th>Block</th>
<th>Tag Name</th>
<th>Description</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>_LEDTYPE</td>
<td>{_NAME}</td>
<td>Displayed title of the LED Panel as text</td>
<td>5x5-25cm</td>
</tr>
<tr>
<td></td>
<td>{_PHYS_WIDTH}</td>
<td>Physical width of the panel in cm</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>{_PHYS_HEIGHT}</td>
<td>Physical height of the panel in cm</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>{_PHYS_WIDTH_LED}</td>
<td>Physical width of one LED in cm</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>{_PHYS_HEIGHT_LED}</td>
<td>Physical height of one LED in cm</td>
<td>0.4</td>
</tr>
<tr>
<td>Block</td>
<td>Tag Name</td>
<td>Description</td>
<td>Sample</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>ED</td>
<td>_LED_IS_ROUND</td>
<td>Flag for the visualization of the LED appearance (0 = false; 1 = true)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other appearances may follow. At the moment only circular or square.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_LED_SHIFT_X _LED_SHIFT_Y</td>
<td>1=&gt; Shift the first line / column right and the second line / column left</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1=&gt; Shift the first line / column up and the second line / column down</td>
<td>See the sample below: curtain</td>
</tr>
<tr>
<td>_LAYOUT</td>
<td>_COLS</td>
<td>Amount of LED columns</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>_ROWS</td>
<td>Amount of LED rows</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>_DELTAX</td>
<td>Counting direction for patching:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – left to right</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1 – right to left</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_DELTAY</td>
<td>Counting direction for patching:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – top down</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1 – down to top</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_DIRECTION</td>
<td>Patch order:</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 – first X then Y</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – first Y then X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_MEANDER</td>
<td>Not supported yet</td>
<td>0</td>
</tr>
<tr>
<td>_CHANNELS</td>
<td>_REPEAT</td>
<td>Count how often the following value is repeated.</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Here Value = LED_UNIT 25 times)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_VALUE</td>
<td>Patch rule for channel or following tag that is described in the following:</td>
<td>LED_UNIT or NONE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>While patching this list is processed. For each detected _VALUE = LED_UNIT a new LED_UNIT is inserted. The amount of '_COLS' multiplied</td>
<td></td>
</tr>
</tbody>
</table>
11.4.1 LED Panel Examples

Because LED Panels can take different shapes here some examples:

In the simplest case LEDs are numbered continuous:

```
_LEDTYPE
{
  _NAME "5x5-25cm"
  _WIDTH 25.000000
  _HEIGHT 25.000000
  _PHYS_WIDTH 25.000000
  _PHYS_HEIGHT 25.000000
  _PHYS_WIDTH_LED 4.0
  _PHYS_HEIGHT_LED 4.0
  _LED_IS_ROUND 1
  _LAYOUT
  {
    _COLS 5
    _ROWS 5
    _DELTAX 1
    _DELTAY 1
    _DIRECTION 0
    _MEANDER 0
  }
}
```

<table>
<thead>
<tr>
<th>Block</th>
<th>Tag Name</th>
<th>Description</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>with ‘_ROWS’ complies with the number of ‘SUBBLOCK’ entries. If _VALUE = NONE there is an DMX gap.</td>
<td></td>
</tr>
</tbody>
</table>
LED Curtain, LEDs have an offset in Y direction:

**_LEDTYPE**

{  
    _NAME   "Star Cloth"
    _PHYS_WIDTH         360.000000
    _PHYS_HEIGHT        280.000000
    _PHYS_WIDTH_LED     4.000000
    _PHYS_HEIGHT_LED    4.000000
    _LED_IS_ROUND 1
    _LED_SHIFT_Y -1
    _LED_SHIFT_X 0
    _LAYOUT
    {  
        _COLS 36
        _ROWS 28
        _DELTAX 1
        _DELTAY 1
        _DIRECTION 1
        _MEANDER 0
    }
    _CHANNELS
    {  
        _REPEAT 168
        _VALUE LED_UNIT
        _REPEAT 8
        _VALUE NONE
        _REPEAT 168
        _VALUE LED_UNIT
    }
}

LED curtain with 3072 channels and offset in Y-direction. This offset is described by the _LED_SHIFT_Y = -1 tag.

Dimensions 3.6 m X 2.8 m

LED curtain with 3072 channels and offset in Y-direction. This offset is described by the _LED_SHIFT_Y = -1 tag.

Dimensions 3.6 m X 2.8 m
}  
}  
_END_UNIT  

LED Panel unusual patching  
_ENDTYPE  

{  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  
_ENDUNIT  

8 x 8 LED Panel with strange DMX-Patch
11.5 File Format of LED Panels in grandMA Series 2

Coming soon…
12 Creation of customized 3D Objects

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

grandMA VPU supports the following formats for 3D objects:

- `.x` – DirectX file format
- `.3ds` – Format for drawing 3 dimensional objects

Note the following regulations:

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

The following example shows the creation of a cylinder with the ‘Cinema 4D’ (Copyright by MAXON Computer GmbH) software.

Insert an object of type ‘Cylinder’

Set the orientation to ‘Y+’.

For a correct visualization in grandMA VPU Z is the depth, Y the vertical and X the horizontal axis.
Make the object editable

Select not used polygons…

and delete them

Set the visibility of normal on.
Copy the object...

And reverse the normals of the copy.

Select both cylinder objects and connect them to one new cylinder.

The old cylinder objects can be deleted.
Now you can see two objects with normals in both directions.

Check the orientation of the resulting object.

Insert a new material for the texturing.
Assign an image to the texture and the material to the object.

Adjust the texture mapping parameter.

Assign the UV coordinates for the texture mapping.

Export the object to Direct 3D format.

Objects created in this way can be added to the 'Channel Set' via the context menu in the '3D Objects' view with the right mouse button.
13 Example for the Splitting of an HD Video:

To reduce the amount of data when playing a high resolution video, the staple should be separated into several lower resolved videos.

Example: An HD video is projected with 4 video projectors:

In the simplest way we create 4 outputs, move the cameras to the appropriate tiles and assemble the resulting image via Softedging. This solution will stress the PC with a high data rate of the video file because only approx. 25% of the data is used for every video engine.

So first the video should be separated with a video program into 4 smaller files. Now every video engine can process the smaller video and the data stream will be reduced to a minimum.

The resulting videos now have a resolution of 800 x 600 and overlap by 80 pixels for the X- and 60 pixels for the Y-direction.
Splitting a Video with 'Ulead Media Studio Pro 7'

To demonstrate how the splitting of a video file can be done, this example gives a brief introduction by using the video software 'Ulead Media Studio Pro 7'. Other applications work similar.

(Sorry for the german application surface)

The project settings:

Create video file:
The resulting file is a separate video with the new resolution:
14 How to create a Video Loop

This is a short tutorial on how to create a video loop with the software Ulead Video Editor.

Let's assume that you just returned home from a trip and now want to create a loop from one of your recorded scenes on your tape.

Video capture:
Insert the tape which contains your video material into the camera. Rewind the tape to the start if necessary.

Connect the camera with an i-link wire to the FireWire port of your computer.

To transfer the video material with the best possible quality from the tape to the computer, make sure that your computer has a FireWire adapter.

Switch your camera to Playback Mode

Every camera has two main operational modes. One is for recording and is often called the camera mode. The second mode is the playback-mode. This mode is for watching your video in the camera or capturing (transferring) it to an external device.

If you have any problems regarding the handling of your camera, you should look at the user operating manual for your camera.

Start the Ulead Video Capture software (Example is shows version 7.0)

Ulead divides the functions of capturing and editing video into two applications. The module which helps you to transfer the video material onto your hard drive is called Ulead Video Capture. You can find it in your start menu under the entry for Ulead Video Editor.

By now you should see an image of your tape in the main preview window.

If this isn't the case, just click the play button in the control panel in the lower screen area. Make sure that preview mode is active. You can find it at ‘menu/view’.
If you still see no image of your video, you have to make sure that your ‘recording-plug-in’ is configured correctly. You can do this under ‘menu/setup/recording-plug-in’.

Common types are:

Ulead VFW Recording Plug-in (for Adaptec/PAPI 1394 capture-adapters)

Ulead DirectShow Recording Plug-in (for TI 1394 capture-adapters)

Ulead DV Recording Plug-in (for other types of DV capture-adapters)
If your settings are correct, but you still see no image and many or all of the control panel-elements are not active, you have to make sure that the right entry for your camera is set under 'menu/setup/device-control'. In most cases, this will be one of the DV-cam drivers. You can see information about the selected driver in the info field under the dropdown menu.

Now I will explain the simplest procedure: capturing one video-clip

Recording a single video clip

This is the easiest way to capture a single clip from tape to your hard disk.

Wind your tape to the position where your clip starts.

Give your clip some extra space at the start (head) and the end (tail), because it will be safer for later editing to have a bit of overhang at the ends of the clip. From the position where your clip should start looping, wind the tape back approximately three seconds. You can trim the parts you don't want to see later in the video editor very easily.

You can see information about your position in the clip in the lower screen area. If you want to jump to an exact time, just go to 'menu/jump to' and enter the time you want to jump to.
Now that you have found your start position, click the ‘inpoint’ button to mark the starting point.

Repeat this step for the stopping point of your clip. Click the button for the ‘outpoint’ of the clip.

Click the Record Button in the Control Panel

Recording will not start immediately. First a dialogue window pops up, where you can set some parameters. Important at the beginning are:

The name and local path of the video file you want to save

The recording methods:
Auto (with time limit): records the video from the inpoint for the specified amount of time.
Auto (no time limit): records the video, until you stop it by left-clicking the mouse or hitting ESC
device control: you can specify when the recording shall start and when it should stop, by setting an inpoint and outpoint. You can also configure batch-capturing
For this example we choose ‘device control’, because we had already set the in and outpoints. Remember? ;-) Another window opens with parameters for the recording. Check the name and the path of the file. Make sure that there is only one clip in the lower area of the window, the one which you set up.
Start the recording by hitting OK.

Recording starts. You can observe the current status of the capture process in the status bar in the lower screen area.

Now you have your first clip ready for editing!

After the capturing has been finished, a message window pops up. It informs you about the result of the process. Usually everything is fine, so you can just close the window.
If you open the folder, where you saved your clip file, you should find an avi file. This can be, depending on the length of the clip, rather big, because it is uncompressed video.

You can quit Ulead Video Capture now.

**Video editing**

Start the software Ulead Video Editor.

A window will pop up first, asking what kind of project you want to create. Choose DV(PAL, 25 B/S, Audio 48 kHz).

Import the previously created clip.

You can import clips by double clicking one of the video tracks in the timeline. A file-open-dialog will appear, in which you can select your clip. When you open the file, the window will disappear and the clip „becomes glued“ to your mouse pointer. Place this clip at the beginning of the first videotrack Va.
Double-click the clip in the timeline.

The clip will appear in the source window. This is, as its name indicates, the video source from which you will work, and not the clip which will be created by editing the it.
When you hover with the mouse pointer a bit above the video tracks, the pointer will turn into a little „star“. If you press the mouse button now and move the mouse, you will move the play head on the timeline. The upper-left preview window will change now, because it always shows the video directly under the play head.

Reduce the length of the clip to the right duration.

You know now how to view your clip in the video editor. It’s very likely that the clip is not have the right length anymore. Changing the length (duration) is very simple. Move the mouse pointer over the right edge of the clip.

The mouse pointer will change into a symbol of two little arrows.

Left-click the mouse button and drag the edge of the clip toward the beginning of the clip. When you release the mouse button, you have reduced the length of the clip. It will stop now at the new end. You can do the same with the beginning of the clip.

If necessary: Move the clip back to the beginning of the video track

It is likely that you have now some spare room at the start of your clip, because you reduced its length. Drag the clip to the very beginning of the video track and drop it there. Notice that the clip will snap to the beginning of the video track.

Copy the clip and place the copy at the end of the original

Hit CTRL and left-click the clip. Drag it into the second video track Vb and place it there. Now you have created a copy of the original clip. Adjust the clip so that it starts approximately 3 seconds before the original clip ends. A cross-fade effect could later be placed in the area where both clips overlap each other.

Place a cross-fade effect between both clips
Drag the effect into the video track area. Cross fade effects can only be placed in the transition effects track. Place it right into the area where both video clips overlap. The cross fade effect will adjust its own length to the length of the overlapping area automatically. You now have created a soft cross fade from the end of the first clip into the beginning of the second.

A window pops up and gives you more options to configure the cross fade effect. But we are happy with the default-settings right now. Just click OK.

Notice that Ulead Video Editor computes the manipulated video frames each time you use an effect on the clip. This can lead to a short delay because you must wait until the application has finished rendering the new frames.

Reduce the length of the second clip

Reduce the length of the second clip until its end meets the end of the first clip. The whole movie is now as long as the first clip.

But what is the difference now?

The clip will cross fade now into its own beginning. For that we needed the copy. Now the clip is ready for a loop playback.

Save the project.

Compress and export the clip.

You can export the finished clip under ‘menu/file/create/video file’. Enter a path and a name for your file in the next dialog.

In the options section you can choose a specific compression codec, which will reduce the size of your video file significantly, though causing some loss of quality. This will help you to maintain constant playback without delays during which the video player would have to wait for new data.

You have to make a compromise here. You can get really good codecs which offer both: very good image-quality and very low file-size. However these codecs are often not free for commercial use. The DivX codec belongs in this section. But you cannot expect that this codec will be available on the target platform of your video. The worst thing that may happen is that you see a plain black rectangle instead of your clip.

You can set the output size of the video under the second tab ‘General’. Switch to „User Defined“ and enter 1024 x 768 to adjust the size to the resolution of a video projector. In the data track dropdown menu switch to ‘only video’ to drop the audio track.

Save the file with the chosen settings.

Good luck!
15 Warnings

SEIZURE WARNING

Some people (about 1 in 4000) may have seizures or blackouts triggered by light flashes or patterns, such as while watching TV or playing video games, even if they have never had a seizure before.

Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should consult a doctor before working with the application.

Parents should watch when their children while using the program. Stop working immediately and consult a doctor if you or your child has any of the following symptoms: **Convulsions, Eye or muscle twitching, Loss of awareness, Altered vision, Involuntary movements, Disorientation**.

TO REDUCE THE LIKELIHOOD OF A SEIZURE WHEN WORKING WITH THE PROGRAM:

1. Sit or stand as far from the screen as possible.
2. Use the smallest available screen.
3. Do not work if you are tired or need sleep.
5. Take a 10 to 15 minute break every hour.

REPETITIVE MOTION INJURIES WARNING

Working with the application can make your muscles, joints or skin hurt after a few hours. Follow these instructions to avoid problems such as Tendonitis, Carpal Tunnel Syndrome or skin irritation:

Take a 10 to 15 minute break every hour, even if you don’t think you need it.

If your hands, wrists or arms become tired or sore while working, stop and rest them for several hours before playing again.

If you continue to have sore hands, wrists or arms during or after play, stop working and see a doctor.
# 16 Keyboard Shortcuts

## Common shortcuts:

<table>
<thead>
<tr>
<th>View</th>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preview</td>
<td>Alt + Enter</td>
<td>Fullscreen Mode</td>
</tr>
<tr>
<td></td>
<td>Shift + Enter</td>
<td>GUI on/off (Graphical User Interface on / off)</td>
</tr>
<tr>
<td></td>
<td>Ctrl + l. Mouse</td>
<td>Add object to the selection with the mouse</td>
</tr>
<tr>
<td></td>
<td>Alt + Enter</td>
<td>Leave Fullscreen to Windowed Mode</td>
</tr>
<tr>
<td>Fullscreen</td>
<td>Shift + Mouse</td>
<td>Rotation of selected objects</td>
</tr>
<tr>
<td></td>
<td>Shift + Ctrl + Mouse</td>
<td>Rotation of the selected objects around their centre</td>
</tr>
<tr>
<td>Pixel Mapper</td>
<td>Arrow Key</td>
<td>If a panel is selected in the Graphical View it can be moved</td>
</tr>
<tr>
<td></td>
<td>Arrow Key + Ctrl</td>
<td>Move panel by 1/10 grid</td>
</tr>
<tr>
<td></td>
<td>Arrow Key + Shift</td>
<td>Move panel by 1/100 grid</td>
</tr>
<tr>
<td>Startup</td>
<td>F 11</td>
<td>Acronis software starts for backup purposes (Not for dongle users of former grand MA video)</td>
</tr>
</tbody>
</table>
17 FAQ and Troubleshooting

Please note, that possible installed drivers for example for graphic cards affect the keyboard shortcuts as well.

Should you have any problems with the application, you can refer to the frequently asked questions below:

17.1 Software Questions:

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>problems with the communication PC &lt;-&gt; desk</td>
<td>Check the TCP/IP settings:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Is a network card installed?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Is the TCP/IP protocol configured?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The TCP/IP subnet mask of the PC must be equal with the subnet mask of the desk for example 255.255.255.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The first 3 numbers of the IP address of the PC must be equal to the first three numbers of the desk for example:</td>
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<tr>
<td></td>
<td></td>
<td>PC: 192.168.0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Desk: 192.168.0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The last number of the IP address must be unique in the complete network.</td>
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<tr>
<td></td>
<td></td>
<td>- Please don’t use the automatic distribution of IP settings as offered by Windows because this IPs doesn’t fit the requirements.</td>
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<tr>
<td></td>
<td></td>
<td>- Check the version. Is it corresponding with the desk version?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Check the VPU mode. Does it match the desk you are using?</td>
</tr>
<tr>
<td>2.</td>
<td>Two network cards installed – no communication with the console</td>
<td>Select the IP address belonging to the network card attached to the grandMA desk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See: 3.4 Connection</td>
</tr>
<tr>
<td>3.</td>
<td>Cannot find the connected grandMA desk</td>
<td>Check the IP Settings.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See: 3.4 Connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check version</td>
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<tr>
<td>Nr.</td>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Check VPU mode</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Video codec’s</td>
<td>Recommended Video Codec’s:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At the moment we get the best results with the “MPEG2” codec.</td>
</tr>
<tr>
<td>5.</td>
<td>Fullscreen black</td>
<td>Check dongle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The “Fullscreen” mode requires the dongle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check connectivity. No output out of session.</td>
</tr>
<tr>
<td>6.</td>
<td>Fullscreen shuts off</td>
<td>Disable the screensaver and power management</td>
</tr>
<tr>
<td>7.</td>
<td>Firewalls and Antivirus Software. Program</td>
<td>The MS firewall that comes with SP 2 makes no problems. After the installation you must allow grandMA VPU and onPC the access to the network.</td>
</tr>
<tr>
<td></td>
<td>won’t start or</td>
<td>Third party firewalls and anti virus software must be configured. If this doesn’t help, the programs have to be disabled or de-installed.</td>
</tr>
<tr>
<td></td>
<td>PC looses connection</td>
<td>Note that in this case the virus protection etc. doesn’t work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(To configure your firewall enable the Remote Call TCP Port 7003 in your Firewall Options)</td>
</tr>
<tr>
<td>8.</td>
<td>Bad Performance</td>
<td>Disable virus checks on the content files like .AVI; .IMG or .MOV files!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change the Device Settings from, RGB Emulation to HAL: Settings/Options/Driver</td>
</tr>
<tr>
<td>9.</td>
<td>Content Browsing from desk doesn’t work</td>
<td>Check the IP-address (same subnet!) and configure or disable the firewall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Properties of Hardware Interface - disable Checksum Offload in the advanced Setting of the Network Adapter.</td>
</tr>
<tr>
<td>10.</td>
<td>Black output screen</td>
<td>- May be your graphics board has too less memory (64 MB or less) and you are using a high display resolution (e.g. 1400 *1050).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce the screen resolution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DMX channels are not patched</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check DMX sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check grandmaster</td>
</tr>
<tr>
<td>Nr.</td>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check shapers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dimmer, Grandmaster, Blades closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3D Object moved out of focus or wrong scaled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Keystoning parameter stupid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No valid Fixture Layer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output device (for example a projector) doesn’t support the high resolution</td>
</tr>
<tr>
<td>11</td>
<td>(Only for users with dongle!) Video Capture Cards:</td>
<td>If the card works with the Windows Direct Show this should work. We have tested the small SDI-In card and the PCI Express Extreme. Here we only have the possibility to choose one video (from the Decklink driver) – As mentioned, if there is a card that supports two interfaces via the driver we’ll support this.</td>
</tr>
<tr>
<td></td>
<td>The Decklink Blackmagic SDI Capture Cards can support two SDI Inputs.</td>
<td>Live Input (BM DeckLink Card) Stream freezes:</td>
</tr>
<tr>
<td></td>
<td>Does this work with grandMA VPU?</td>
<td>Enable the “Watchdog” (Settings/Options/Video)</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>See 11</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>To work with grandMA VPU without administration rights you have to arrange the administration rights by the administrator on the installation path e.g.: C:\Program Files\MA Lighting Technologies\grandMA VPU Software</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>The Widows XP Service Pack 2 must be installed</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Maybe codec problems.</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>The use of Dual Core processors can cause timing problems. Please use the actual drivers of the processor manufacturer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you have further problems set the switch via the</td>
</tr>
<tr>
<td>Nr.</td>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>menu entry ‘Settings – Options – Dual Core’.</td>
</tr>
<tr>
<td>18</td>
<td>Aspect Ratio of the output image is wrong</td>
<td>The aspect ratio can be set via the menu entry ‘Settings – Options – Main – Output Ratio’. The setting ‘Automatic’ is recommended. To play a simple video file on a screen you should use the layer object “<a href="mailto:Plane@r.xob">Plane@r.xob</a>”. Objects with the ending ‘@r.xob’ adapt automatically to the aspect ratio (Ratio of width / height e.g. 16:9) of the used image or video.</td>
</tr>
</tbody>
</table>
## 18 Index

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Effects</td>
</tr>
<tr>
<td>44</td>
<td>3D Objects</td>
</tr>
<tr>
<td>73</td>
<td>3D objects customizing</td>
</tr>
<tr>
<td>13</td>
<td>Art-Net Out Mode</td>
</tr>
<tr>
<td>63</td>
<td>ArtNet IP Address</td>
</tr>
<tr>
<td>44, 96</td>
<td>Aspect Ratio</td>
</tr>
<tr>
<td>11</td>
<td>auto start</td>
</tr>
<tr>
<td>11</td>
<td>Backup</td>
</tr>
<tr>
<td>39</td>
<td>Blind Preview</td>
</tr>
<tr>
<td>37</td>
<td>Capture Device</td>
</tr>
<tr>
<td>36</td>
<td>Clip Frame Cache</td>
</tr>
<tr>
<td>10</td>
<td>Codec</td>
</tr>
<tr>
<td>27</td>
<td>Codecs</td>
</tr>
<tr>
<td>48</td>
<td>Colorkey</td>
</tr>
<tr>
<td>49</td>
<td>ColorMix</td>
</tr>
<tr>
<td>16</td>
<td>Connection States</td>
</tr>
<tr>
<td>41</td>
<td>Content Editor</td>
</tr>
<tr>
<td>31</td>
<td>Controlling Images and Videos via the MA desk</td>
</tr>
<tr>
<td>43</td>
<td>customized Images</td>
</tr>
<tr>
<td>43</td>
<td>customized Videos</td>
</tr>
<tr>
<td>20</td>
<td>Data management</td>
</tr>
<tr>
<td>47</td>
<td>Dimmer</td>
</tr>
<tr>
<td>47</td>
<td>Effects</td>
</tr>
<tr>
<td>93</td>
<td>FAQ</td>
</tr>
<tr>
<td>67</td>
<td>File Format of LED Panels in grandMA Series 1</td>
</tr>
<tr>
<td>72</td>
<td>File Format of LED Panels in grandMA Series 2</td>
</tr>
<tr>
<td>36</td>
<td>FOH Features</td>
</tr>
<tr>
<td>16</td>
<td>founder</td>
</tr>
<tr>
<td>36</td>
<td>Frame Blending</td>
</tr>
<tr>
<td>39</td>
<td>Full screen</td>
</tr>
<tr>
<td>46</td>
<td>Fullscreen View</td>
</tr>
<tr>
<td>14</td>
<td>grandMA I or grandMA II mode</td>
</tr>
<tr>
<td>48</td>
<td>HSB+C</td>
</tr>
<tr>
<td>42</td>
<td>Image Pool</td>
</tr>
<tr>
<td>11, 15</td>
<td>Installation</td>
</tr>
<tr>
<td>17</td>
<td>IP</td>
</tr>
<tr>
<td>13</td>
<td>IP adress</td>
</tr>
<tr>
<td>42</td>
<td>I-Pool</td>
</tr>
<tr>
<td>55</td>
<td>Iris</td>
</tr>
<tr>
<td>92</td>
<td>Keyboard Shortcuts</td>
</tr>
<tr>
<td>56</td>
<td>Keystone</td>
</tr>
<tr>
<td>58</td>
<td>Keystoning</td>
</tr>
</tbody>
</table>
| 47, 48, 49, 50, 51, 52, 53 | Layer Effects
Layer properties ........................................ 23
LED Panel Examples .................................. 69
M
Master ...................................................... 20
Master control .......................................... 54
Master Layer ............................................ 25, 26
Menu bar .................................................... 35
Mode ....................................................... 39
MPEG-2 .................................................... 10
Multi Preview .......................................... 40
N
Network .................................................... 17
O
Output Layer Effects .................................. 55
P
Pixel Mapper ............................................ 60
Pixel Mapper Editor ..................................... 62
Pixel Mapper Graphical View ......................... 61
Pixel Mapper Toolbar .................................. 61
Predefined Constellations (.PED Files) ............. 27
Preview .................................................... 39
Principle function diagram ........................... 21
Program surface ....................................... 34
S
Screen Layout .......................................... 18
session ..................................................... 16
Session ID ................................................. 17
Settings Network ....................................... 17
Several grandMA VPU applications in one
grandMA show .......................................... 28
Shaper ..................................................... 55
shut down the PC via the desk....................... 54
slave ....................................................... 20
Slave ....................................................... 17
Sniffer ..................................................... 17
Sniffer mode ............................................. 16
Softedge ................................................... 56
Softedging ................................................. 57
Sound ...................................................... 53
sound output delay ..................................... 36
Start in Full screen .................................... 38
Start master session and connect to the
desk .......................................................... 30
Status Bar ................................................. 46
streaming dialog ....................................... 37
T
Toolbar ..................................................... 39
Transition from grandMA video to MA VPU
.............................................................. 8
Troubleshooting ....................................... 93
two monitors ............................................. 35
V
Video In .................................................... 37
Video Layer .............................................. 24
Video Loop .............................................. 81
VPU Loader ............................................. 11
VPU Startup ............................................. 11
W
Warnings ............................................... 91