

# MA Network Switch

English

## Take control of your network!



# Take control of your network with MA

## Network as a nervous system

A reliable and powerful network is important and crucial in today's projects. You can compare a network with a nervous system. It is essential for the performance of the whole system – independent of the data, like lighting, video or audio, that is being transmitted.

## The relevance of networking

The relevance of the network is constantly rising. This is based on the fact that the newest fixtures need more data, like LED fixtures with single pixel control for example, or for a function like Pixel Mapping. Also the demands of projects are constantly growing. Some keywords here are an application-neutral infrastructure, a higher network communication and multiple data streams.

## Easy and intuitive network management

As a manufacturer of professional control technology, MA Lighting's aim is to develop networking components that fulfil the highest MA standards and are intuitive and easy to operate. Where IT components often need specialised knowledge, MA system components speak one common language – thereby easing the task of network management.

# MA DNA

## Synchronicity and realtime

Over 35 years of being at the cutting-edge of lighting control technology, MA Lighting has acquired comprehensive knowledge in the development of professional control and network technology. Twenty-five years ago, MA successfully launched its own network protocol – MA-Net. Since then MA-Net has been under constant development, with synchronicity and real-time just two of many benefits helping make this protocol highly efficient.

## Quality

Furthermore, MA Lighting was and is involved in countless projects that utilise complex networks. Close communication with users, internal benchmark tests and continuous quality management as well as effective MA network training has established MA as a network specialist.

## Powerful backbone: The MA-Net2

MA-Net2 is the powerful backbone and language of all MA system components. Its far more than a DMX protocol. It is an integral part of the MA system architecture. All grandMA2 consoles, MA NPU (Network Processing Unit) as well as MA VPU (Video Processing Unit) are connected via the MA-Net2 and work in unison.

## Scalable System

The architecture of MA-Net2 allows for the scalability of the MA System – starting with the smallest backup solution right up to comprehensive multi-user/multi-console applications. As a central point the MA Network Switch guarantees the full grandMA2 system performance and fully synchronous fixture control with up to 256 DMX universes per session. This encompasses continuous backup and minimal configuration in parallel to a full system overview via the console.

## Regular performance tests

To ensure the best performance the MA System has to pass a regular stress test. During this test the reliability is checked and the system performance optimised. Doing this, it is guaranteed that the MA System can withstand interferences from outside and will perform the way you expect.



24/7

An important part of the MA DNA is the support that, together with the MA Network Switch, encompasses the whole data transfer process from the console to DMX distribution. Additionally, the MA support hotline offers help 24/7.

# The MA Network Switch

Based on this decades-long knowledge, MA has developed a network solution with convincing performance and reliability, giving users total control over the network – the MA Network Switch.

The MA Network Switch offers a simple solution for all types of networks. It uses all the entertainment industry protocols and makes the network management easier for users without deeper networking knowledge. The MA Network Switch is perfect for complex networks as well as for permanent installations and temporary projects.



MA Switch		IP: 192.168.100.17
Back Ports		
1	Lighting	SFP A
2	Lighting	9
3	Lighting	10
4	Lighting	SFP B
5	Video	11 7 Trunk
6	Video	12 7 Trunk
7	Sound	Front Port
8	Sound	13 8 Manage

NETWORK SWITCH

# Intuitive network access

Thanks to an intuitive **web browser** interface all setups can be easily achieved. It is also possible to set the MA Network Switch up via a **grandMA2 console** or the **grandMA2 onPC** software. This way, the grandMA2 user has control of the whole network.

The start menu offers an overview over all important settings.

**Overview for "MA Switch 1"** IP: 192.168.100.28

Port#	1   Port 1	2   Port 2	3   Port 3	4   Port 4	5   Port 5	6   Port 6	7   Port 7	8   Port 8	13   Port 13
Group	3   Lighting	3   Lighting	3   Lighting	3   Lighting	1   Video	1   Video	5   Sound	5   Sound	8   Manage
Link	No link	No link	No link	No link	No link	No link	No link	No link	1Gbit
MA-Net2									
Presets							3   Art-Net	3   Art-Net	
RSTP	RSTP ●	RSTP ●	RSTP ●	RSTP ●	RSTP ●	RSTP ●	RSTP ●	RSTP ●	RSTP ●
Speed	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto

Groups	IGMP Snooping	IGMP Querier	Unknown Flooding	VLAN ID
1   Video	No	No	Yes	100
2   Group02	No	No	Yes	200
3   Lighting	No	No	Yes	300
4   Group04	No	No	Yes	400
5   Sound	No	No	Yes	500
6   Group06	No	No	Yes	600
7   Trunk				
8   Manage	No	No	Yes	1

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# Easy grouping of ports

By grouping ports it is possible to separate different data streams in the network. The MA Network Switch offers six groups for applications like lighting, sound and video. Via the management group it is possible to access the web interface of the switch.

A port configured as trunk combines all groups without mixing the data streams and connects a switch to one or more switches. Otherwise there would be a connection from switch to switch in each group necessary.

**Group assignment of "MA Switch"**

Port#	1	2	3	4	5	6
Description	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Choose group	1 Video	1 Video	1 Video	1 Video	1 Video	1 Video
	2 Group02	2 Group02	2 Group02	2 Group02	2 Group02	2 Group02
	3 Lighting	3 Lighting	3 Lighting	3 Lighting	3 Lighting	3 Lighting
	4 Group04	4 Group04	4 Group04	4 Group04	4 Group04	4 Group04
	5 Sound	5 Sound	5 Sound	5 Sound	5 Sound	5 Sound
	6 Group06	6 Group06	6 Group06	6 Group06	6 Group06	6 Group06
	7 Trunk	7 Trunk	7 Trunk	7 Trunk	7 Trunk	7 Trunk
	8 Manage	8 Manage	8 Manage	8 Manage	8 Manage	8 Manage

RSTP	1	2	3	4	5	6
Rapid Spanning Tree Protocol	RSTP	RSTP	RSTP	RSTP	RSTP	RSTP

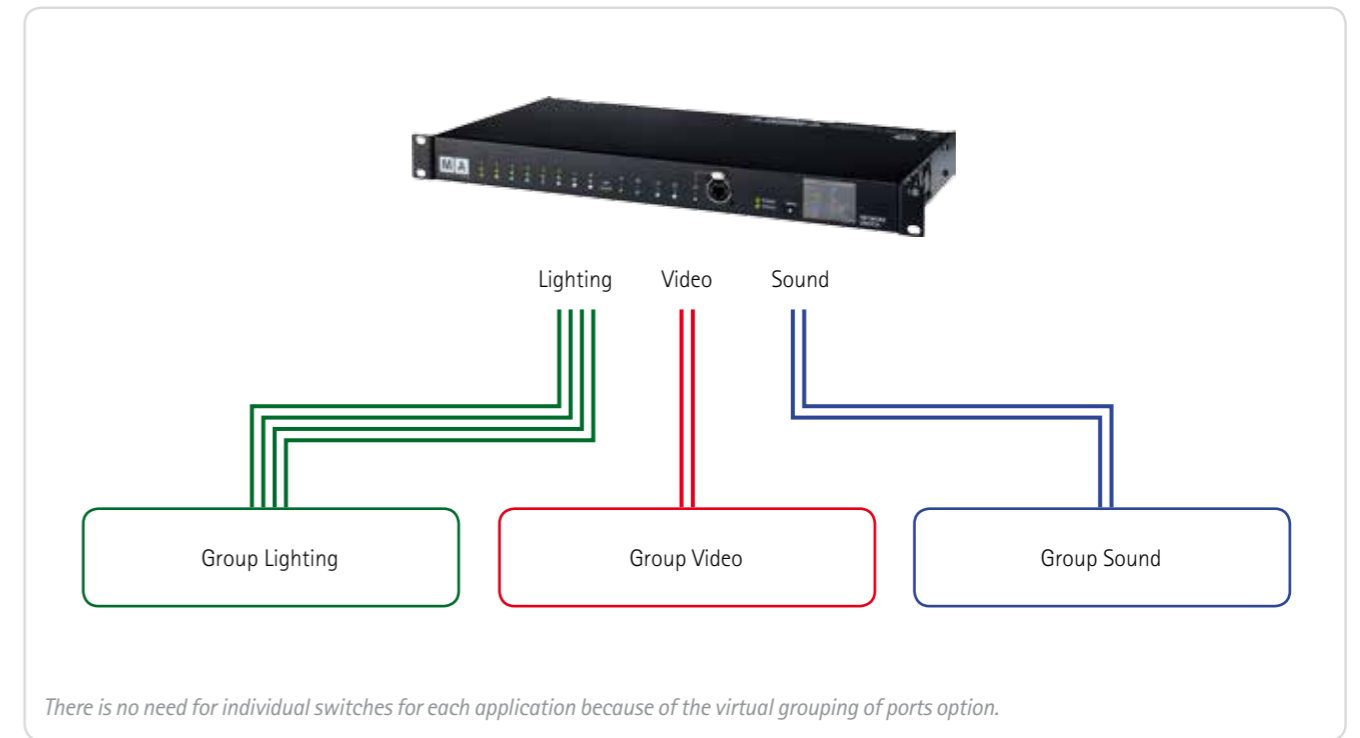
  

Speed setting	1	2	3	4	5	6
Auto	Auto	Auto	Auto	Auto	Auto	Auto
100Mbit	100Mbit	100Mbit	100Mbit	100Mbit	100Mbit	100Mbit
1Gbit	1Gbit	1Gbit	1Gbit	1Gbit	1Gbit	1Gbit

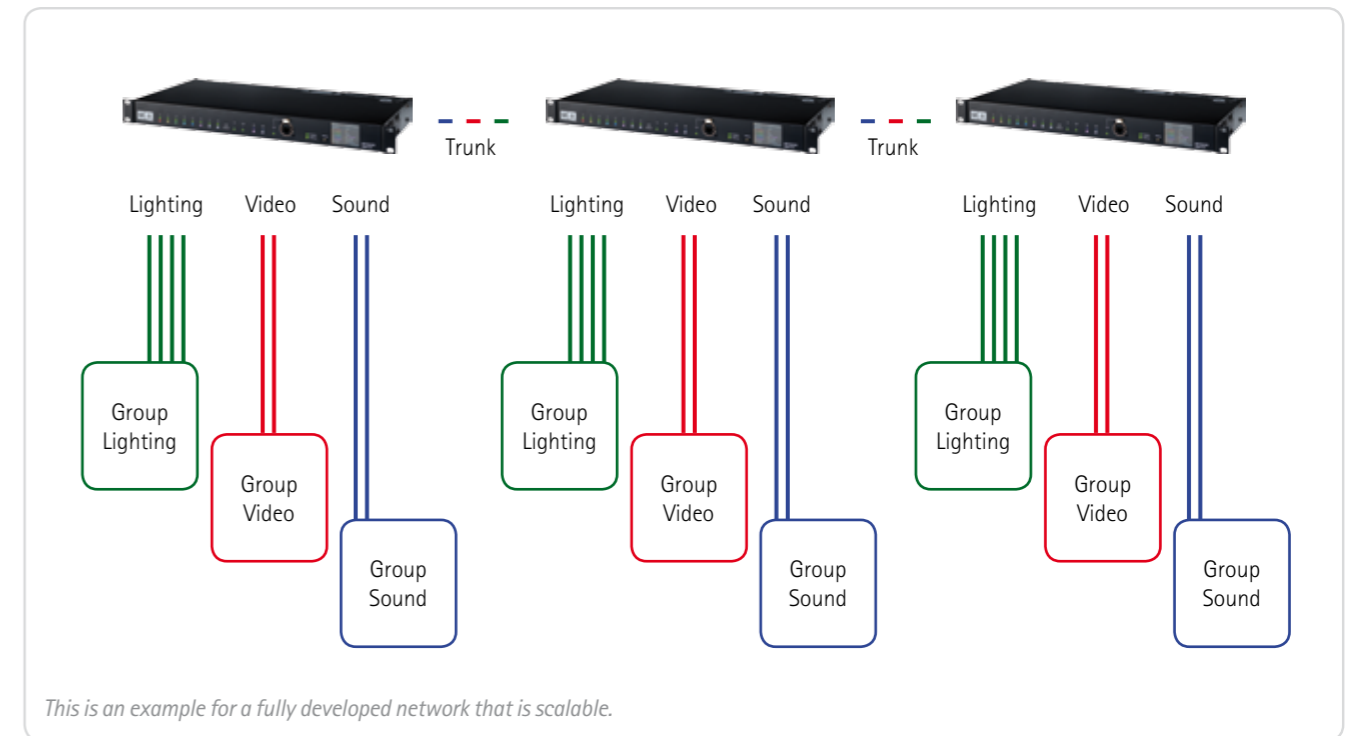
  

#	Group Names	IGMP Snooping	IGMP Querier	Unknown Flooding	VLAN ID edit
1	Video	No	No	Yes global setting for all groups	100
2	Group02	No	No		200
3	Lighting	No	No		300
4	Group04	No	No		400
5	Sound	No	No		500
6	Group06	No	No		600
7	Trunk	No	No		1
8	Manage	No	No	Yes	1

The ports are displayed clearly and can be easily assigned (lighting, video, audio etc.).



There is no need for individual switches for each application because of the virtual grouping of ports option.



This is an example for a fully developed network that is scalable.

# More efficiency thanks to presets and filters

With filters it is possible to significantly enhance the network communication, because you only send a fixture the data it actually needs. Superfluous data is filtered and not used. Additionally custom filters can be added or filters can be combined and saved as presets in the MA Network Switch, which simplifies and accelerates the workflow.

Filters and presets can be used to send only the data of the selected filter or to block defined data. The MA Network Switch comes with a standard set of filters and presets installed ex works for example the grandMA2 preset offers all protocols of the grandMA2 (like MA-Net2, sACN, Art-Net, CTP, Midi Show Control etc.)

Filters and presets can be edited quick and easy.

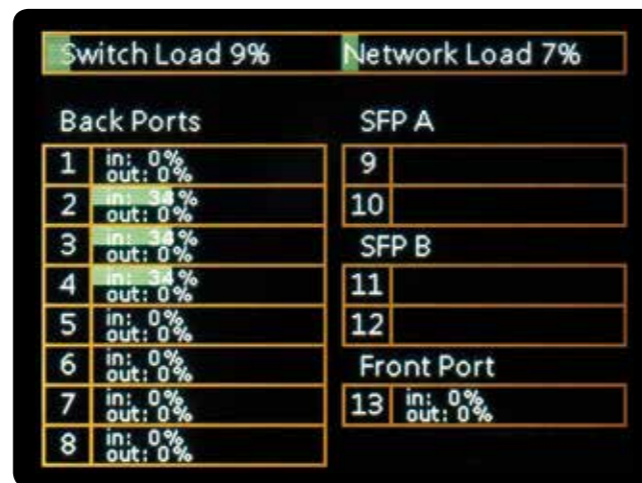


# Impressive power

Thanks to its Gigabit connectors, the MA Network Switch offers the full performance of the whole MA System. The display offers in parallel a status and a bandwidth monitor.



Status Monitor



Bandwidth Monitor

# Networking according to all standards

The MA Network Switch is compatible with IEEE 802.3ab Gigabit Ethernet and can be integrated into existing Ethernet networks. Experienced system technicians have access to functions like VLAN (Virtual Local Area Network), IGMP (Internet Group Management Protocol) and RSTP (Rapid Spanning Tree Protocol).

## Rapid Spanning Tree Protocol (RSTP) and Link Aggregation

### Avoiding loops with the Rapid Spanning Tree Protocol (RSTP)

RSTP is a protocol which eliminates redundant links. If two MA Network Switches are connected via two links, RSTP eliminates the improper loop. This mechanism is therefore needed to identify and delete this loops. This offers users the chance to connect switches with two links to have one as backup. If one link fails, due to a damaged cable, there is still another link available. RSTP discovers the doubled data stream while the network is setup, deactivates one and keeps it available for backup.

### Link aggregation for more safety and bandwidth

The bundling of links is known as link aggregation. It was originally intended to raise the bandwidth (four links with 1Gbit/s allow 4Gbit/s data bandwidth). But the link aggregation also balances the data traffic to the links and thereby increases the availability. The switch bundles physical ports to one logical port. If one link fails, the data stream keeps flowing using the remaining links.

### The advantage of link aggregation versus RSTP

When connecting two MA Network Switches with a dual link the link aggregation uses both links (with the benefits mentioned above) while RSTP deactivates one link. The web interface displays the status of each link being "active" or "blocked". Additionally it is highly recommended to check redundant links before each use, to ensure the correct status of each link.

# Port Mirroring for fault diagnosis

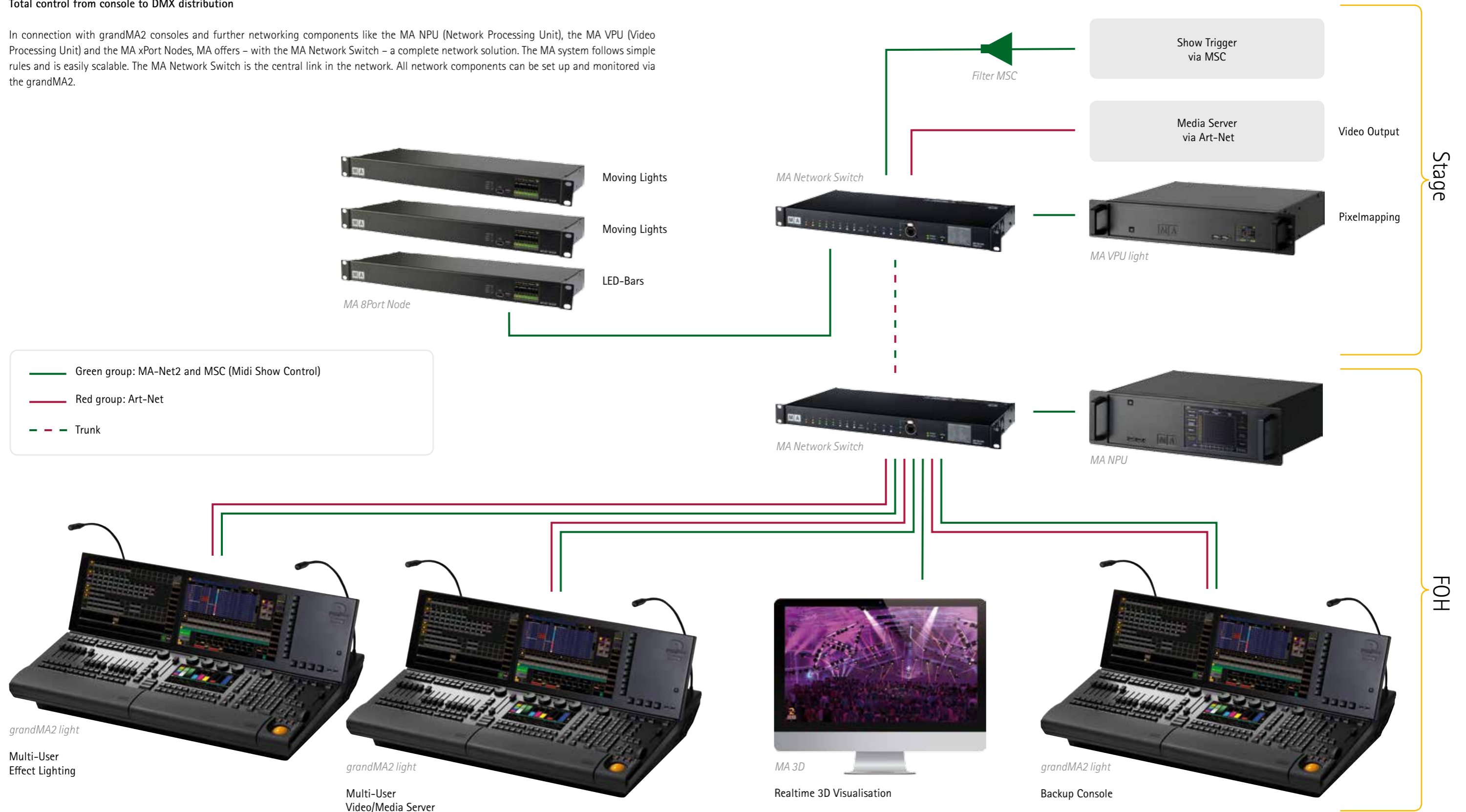
Port Mirroring is a function to mirror any port of the MA Network Switch to another free port of the switch. This mirrored port can be used for fault diagnosis, to discover and solve errors in the network or in the communication with a connected device.

# Application Example 1

## Temporary Project/Event

### Total control from console to DMX distribution

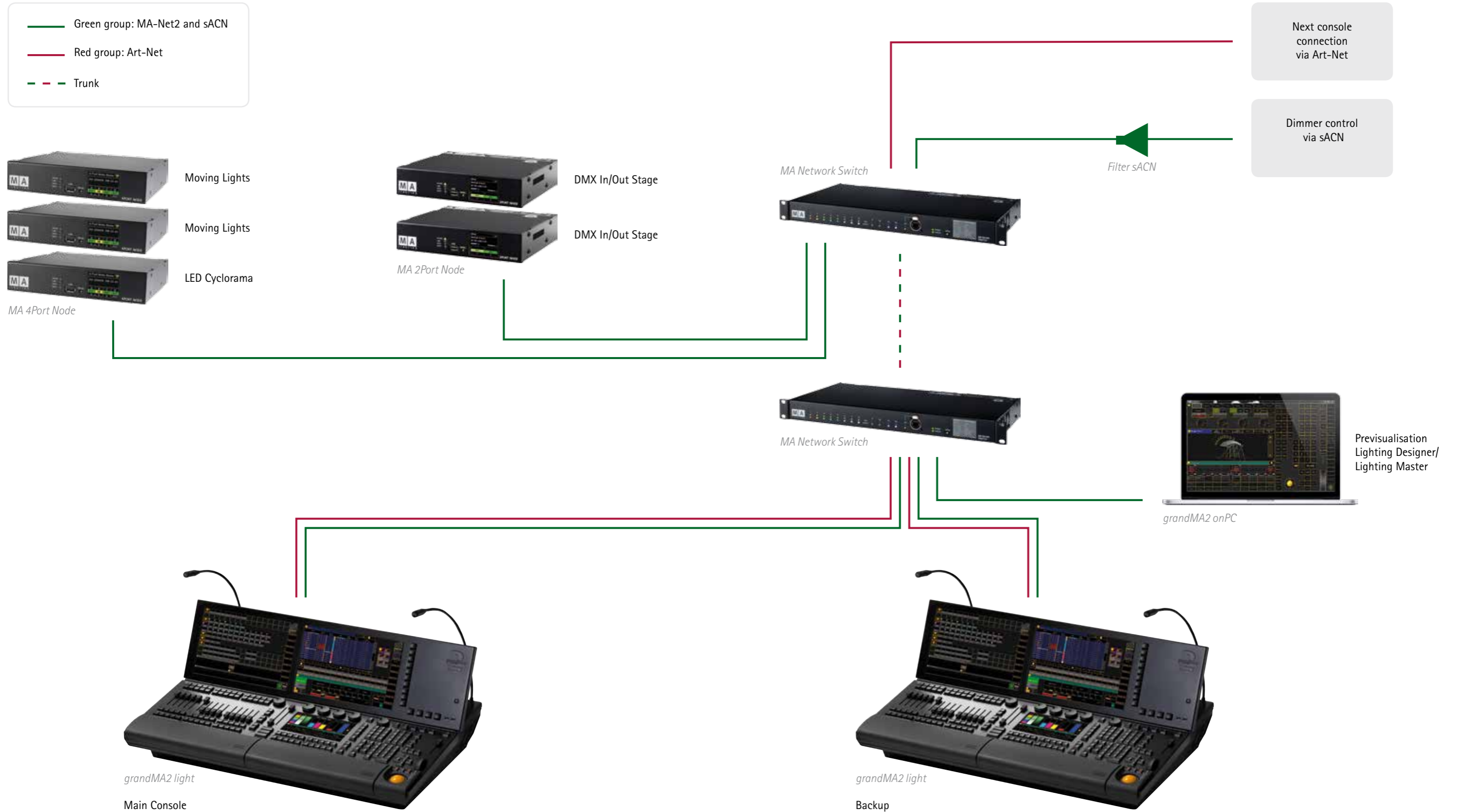
In connection with grandMA2 consoles and further networking components like the MA NPU (Network Processing Unit), the MA VPU (Video Processing Unit) and the MA xPort Nodes, MA offers – with the MA Network Switch – a complete network solution. The MA system follows simple rules and is easily scalable. The MA Network Switch is the central link in the network. All network components can be set up and monitored via the grandMA2.





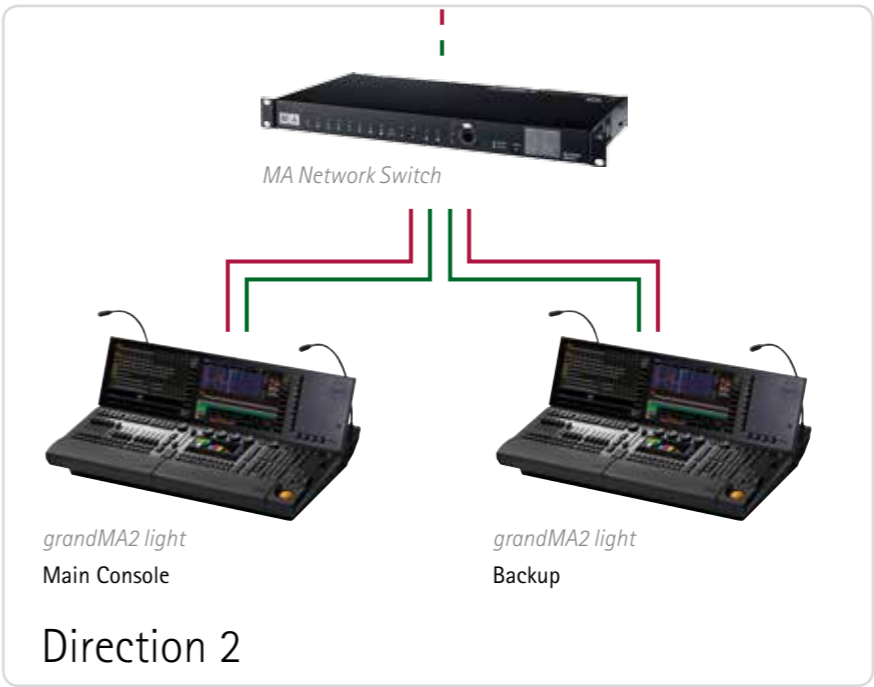
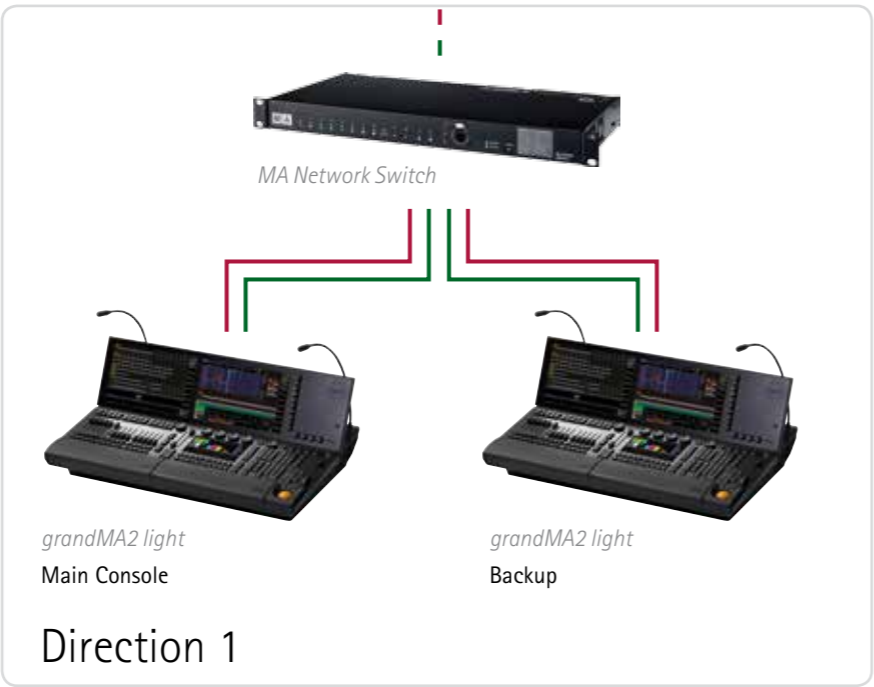
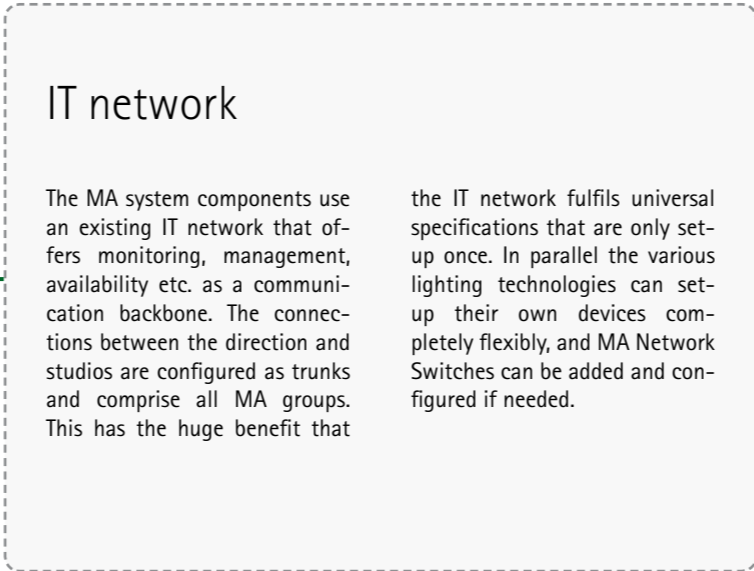
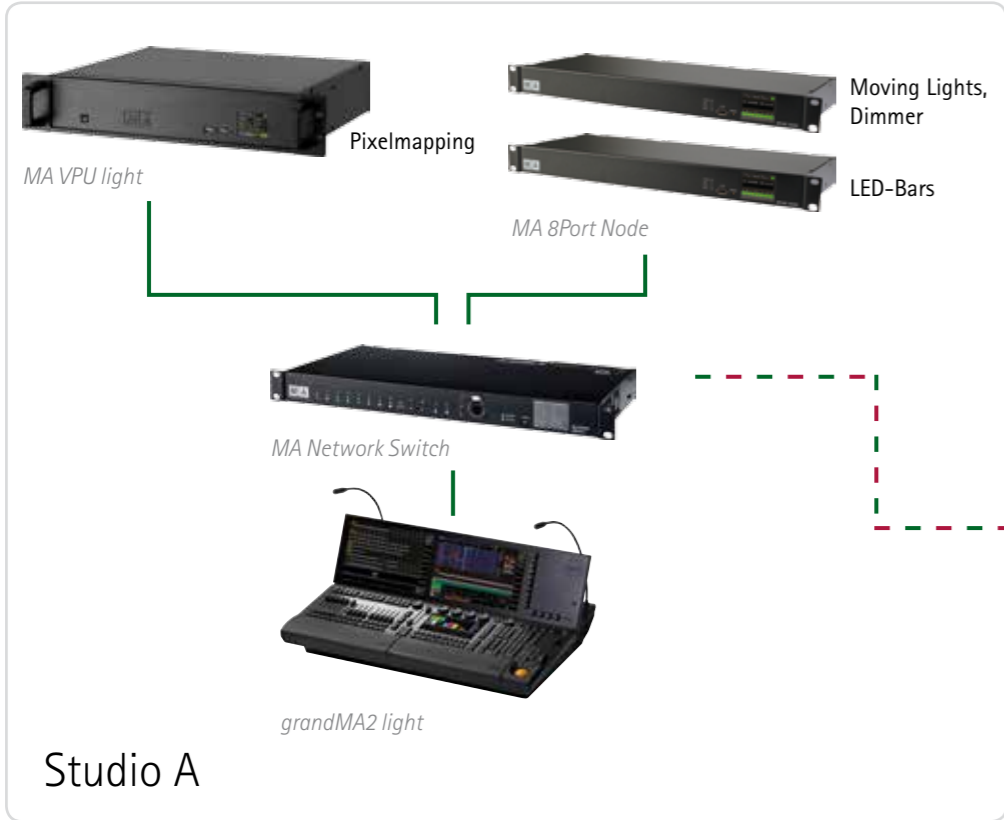
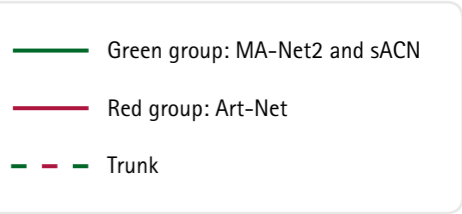
# Application Example 2

## Fixed Installation/Theatre



# Application Example 3

TV/Studio



# Proven hardware of MA Lighting

The MA Network Switch offers sophisticated hardware. All connections offer Gigabit Ethernet and are executed as Neutrik etherCON. Additionally fiber optic connectors are available, for example Neutrik or Fiberfox as well as others. The MA Network Switch is built into a sturdy 1HU housing and coloured LEDs on the front and back panel enable quick orientation of the groups.

Furthermore, the front display shows the port status, used filters and recognized MA system components in the network.

Technical specifications for Art.-No.: 130600  
(MA Network Switch)  
Further versions and accessories: [www.malighting.com](http://www.malighting.com)

Operating voltage/ Supply voltage 100/240V, 50/60Hz (automatic detection)

Power max. 100VA

Dimensions 483 x 43 x 233mm / 19 x 1.69 x 9.17inch

Net weight 3,5kg / 7.7lbs

Output connectors 9 x etherCON,  
4 x prepared SFP Cages for Mini-GBIC

Input connectors 1 x powerCON, 1 x USB Typ B

Art.-No.: 4000656 MA Network Switch incl.  
FIBERFOX fibre optic connection (MM)

Art.-No.: 4000658 MA Network Switch incl.  
Neutrik opticalCON fibre optic connection



Above: FIBERFOX LWL connector

Below: Neutrik opticalCON LWL connector



The picture shows MA Network Switch Art.-No.: 130600

## Your benefits

- Easy and intuitive network management
- Setup via a web browser interface, grandMA2 and grandMA2 onPC
- Clearly arranged grouping of ports
- Link aggregation for more safety and bandwidth
- Lighting, sound and video in one network
- Presets for efficient port filtering
- Custom filters can be added
- Guarantees full grandMA2 system performance
- Tailored for entertainment protocols
- For fixed installations and temporary projects
- Compatible with Ethernet standards
- Sturdy and reliable hardware
- Proven MA service and support



# Extend your network knowledge

With the MA University we offer MA System Specialist Training which focuses on the following:

- MA system philosophy, MA hardware and principles
- Ethernet – the basics
- Network and system design theoretical basics
- Specifics of networks in the lighting world
- Network protocol
- Troubleshooting, tips and tricks



Discover more:

[www.malighting.com/system-specialist](http://www.malighting.com/system-specialist)





# Videos

Find out more about the MA Network Switch in our YouTube videos.



## Stay in touch with us

You can find us in the internet on YouTube, Twitter, Facebook and Instagram

-  [www.youtube.com/user/MALightingInt](https://www.youtube.com/user/MALightingInt)
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MA  
LIGHTING

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Two bright green LEDs

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