



# **NETWORK SIGNAL PROCESSOR**

## **NSP**

### **User's Manual**

05.2017

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# 1. Introduction

The NETWORK SIGNAL PROCESSOR (NSP) can be used as a channel expansion or as an Artnet hub. Up to 2048 channels can be output to 4 separate DMX universes. ARTNET and MA-NET can be used as protocols.

Special Features:

- Simple handling due to few, distinct menus
- Free assignment of XLR outputs to 64 DMX universes.

Combinations possible with:

grandMA full size: as a channel expansion with maximum 16 NSPs on 32,768 DMX channels / 16,384 parameters.

grandMA2 full size: only extension of the DMX outputs by 4 x DMX per NSP

grandMA Ultralight: as a channel expansion with maximum 16 NSPs on 32,768 DMX channels / 16,384 parameters.

grandMA2 ultra-light: only extension of the DMX outputs by 4 x DMX per NSP

grandMA Light: as a channel expansion with maximum 16 NSPs on 32,768 DMX channels / 16,384 parameters.

grandMA2 light: only extension of the DMX outputs by 4 x DMX per NSP

grandMA Micro: Not possible, as the console can only network with the 3D Visualizer

offline / on PC: as a DMX output, for programming and playback, there is no "real" console necessary.

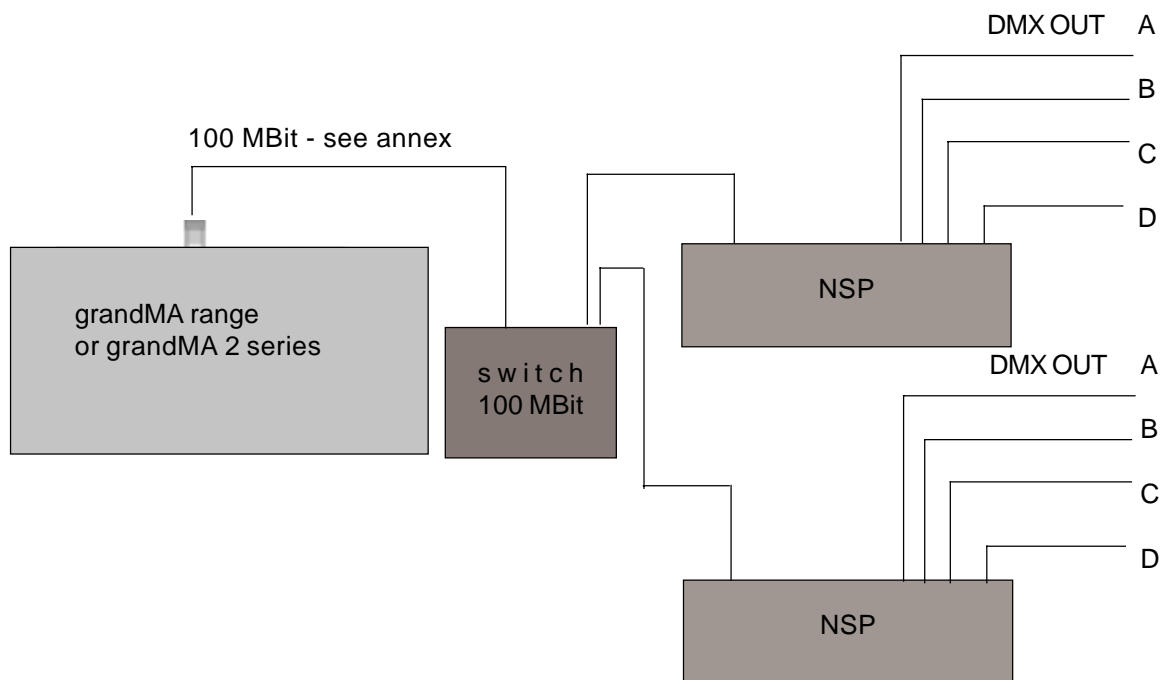
NOTE: Although you can run a grandMA 3D and a grandMA onPC/Offline with one loopback address on a PC at the same time, network failures can occur when running both applications on a „real“ network adapter (e.g. in order to connect a NSP or an external grandMA network). In this case, the installation of a second network adapter, and, if needed, of a second graphics adapter, can solve the occurring problems; in case of doubt, contact our technical service.

NOTE: The NSP is equipped with a data throughput of 100MBit - when used in a network with higher data throughput, the network must be equipped accordingly.

MA NETWORK:

The NSPs can be configured on the console from the TOOLS menu or from the NSP menus.

Updating the software can be performed in no time from the console. Using NSPs, depending on the console, up to a maximum of 16,384 parameters on 64 DMX lines are possible for 16 NSPs.

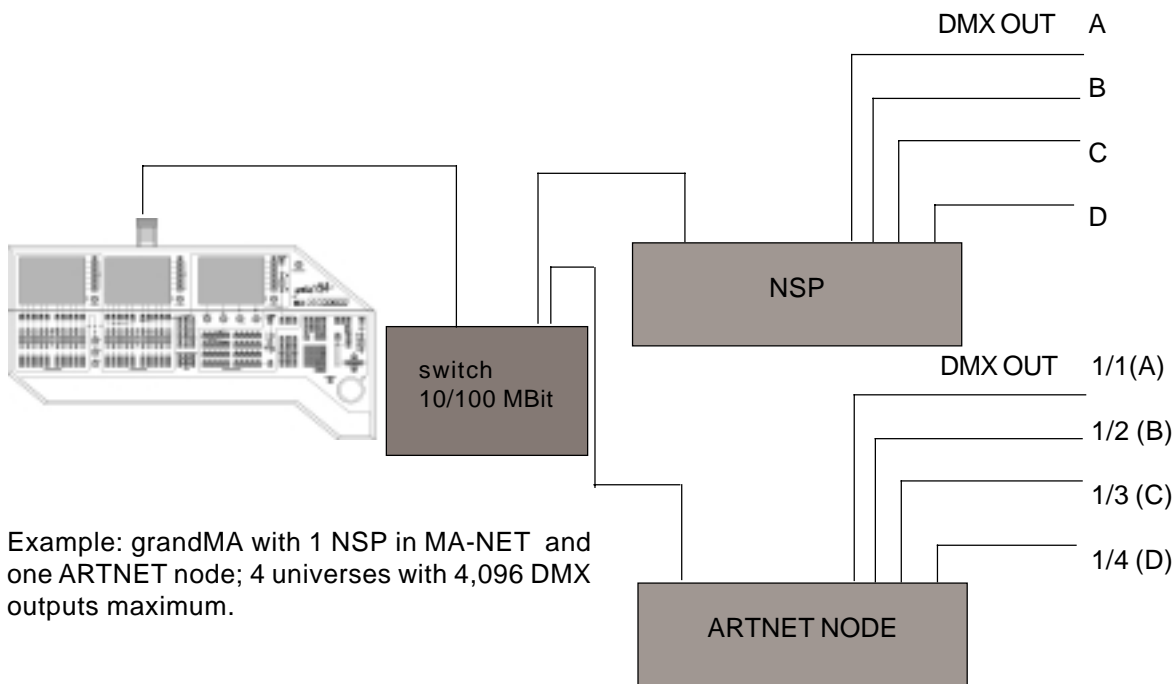


## NETWORK SIGNAL PROCESSOR

**ARTNET:**

This protocol can only handle up to 4,096 channels. Below this limit, it is possible to run ARTNET and MA-NET simultaneously, above it, there will be an automatic switch over to MA-NET. ARTNET nodes can only be configured in the NSP menu.

**Note: The NSP cannot be updated from the console and will not be visible under SETUP / SOFTWARE UPDATE. In order to update it, set the NSP to MA-NET.**



Example: grandMA with 1 NSP in MA-NET and one ARTNET node; 4 universes with 4,096 DMX outputs maximum.

NSP use on different consoles:

Max Param.w&oExten. Max Param. w Exten. with Chip	Protocol for <4096channels	Protocol for >4096channels	Max channels with Exten. for x Universen	Max channels* w x NSP
<b>grandMA</b> 2.048 4.096	MA-NET and ARTNET	MA-NET	32.768 64 universes	16 NSPs
<b>grandMA Light</b> 2.048 4.096	MA-NET and ARTNET	MA-NET	32.768 64 universes	16 NSPs
<b>grandMA Ultralight</b> 1.024	MA-NET and ARTNET	MA-NET	32.768 64 universes	16 NSPs
<b>grandMA Micro</b> 1.024	ARTNET	-----	1.024 2 universes	noNSP possible
<b>grandMA Replay</b> 2.048 4.096	MA-NET and ARTNET	MA-NET	32.768 64 universes	16 NSPs
<b>Offline / onPC</b> ----	MA-NET and ARTNET	MA-NET	4.096 8 universes	2 NSPs

## 2 controls and connection ports



**ON / OFF** switch

**Keyboard** port for a PS2 keyboard

**Mouse** port for a PS2 mouse

**VGA** port for a VGA monitor

Mouse, keyboard and monitor are important e.g. for trouble shooting, but are not necessary for setup and operation



**LINK** NSP has an active network connection

**DATA** displays the data communication in the network

**ACTV** indicates that the NSP is connected to the console and active

**D O/P** indicates that the NSP is sending data (OUTPUT)

**D I/P** indicates that the NSP is receiving data (INPUT)

**ERROR / BOOT** NSP is booting or is on error

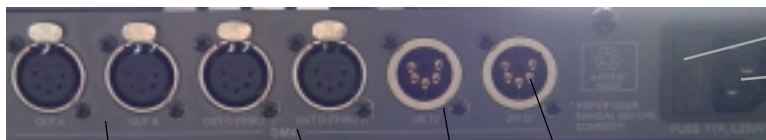


A continuous tone indicates that an incompatible entry has produced an error< the NSP will boot automatically using the setting before the changes



**Vent - do not cover!**

**ETHERNET 10/100 - base T/X** for RJ 45 plug-in connection



**Fuse T 1 A**  
**Mains 230V**

### **OUT B**

ARTNET and MA-NET:  
Only DMX output

### **OUT A**

ARTNET and MA-NET:  
Only DMX output

### **IN 2**

MA-NET: No function in this version  
ARTNET: IN jack for the THRU function, if OUT D is set to I/P.  
Must not be assigned, if OUT D is set to O/P!

### **IN 1**

MA-NET: No function in this version  
ARTNET: IN jack for the THRU function, if OUT C is set to I/P.  
Must not be assigned, if OUT C is set to O/P!

### **OUT D (THRU 2)**

MA-NET: DMX output  
ARTNET: DMX output (for O/P setting) or OUT jack for the THRU function, if OUT D is set to I/P.

### **OUT C (THRU 1)**

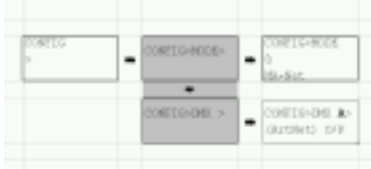
MA-NET: DMX output  
ARTNET: DMX output (for O/P setting) or OUT jack for the THRU function, if OUT C is set to I/P.

## NETWORK SIGNAL PROCESSOR

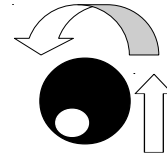
## 2 controls

There are 2 main menus you can scroll through using the PREV and NEXT keys or the Encoder. You can rotate the Encoder or use it as a push button; depending on the respective menu, it has different functions.

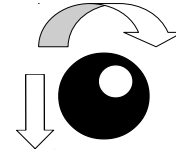
### Navigating in the menu tree:



Vertical navigation:



turn left = up



turn right = down



Horizontal navigation:  
only possible, if a >  
is displayed on the  
right display margin.



### Changing a setting:

- select the menu (navigate using the keys and Encoder in the menu - tree, see above)
- pressing on the Encoder to enter changes
  - The element that can be changed, will flash
- rotating the Encoder to select a new setting
- If multiple entries are possible in the menu, pressing on the Encoder will bring you to the next entry field; you can select again by rotating the Encoder (EDIT function)
  - the red LED light up and a check mark at the right margin indicates that a new selection has been made that you still to be confirm.
- Confirm yours entry
  - discard the setting with **ESC** - the previous setting will be kept or
  - confirm the new setting with **OK** (possible that the NSP will boot automatically)

Main display

INFO menu shows information about outputs, IP addresses and time / date

NSP 030  
A01 B02 C03 D04

oder

A: 0 1:2 B:0 1:3  
C: 1 1:4 D: 1 1:5

Info >

ARTNET DMX-Node  
S/W Version 1.1

oder

MA-NET Expansion  
S/W Version 1.1

IP-ADDRESS >  
192.168.000.077

SUB-NET MASK:  
255.255.255.0

TIME: 23:59:00  
DATE: 24/12/03

### 3. The menu tree:

The menu tree gives you an overview of all menus available.

Setting the protocol

CONFIG >

CONFIG>NODE >

CONFIG>NODE ↓  
MA-Net Expansion  
ArtNet DMX-Node

CONFIG menu ARTNET to set and assign e.g. outputs

CONFIG>DMX >

CONFIG>DMX A/B >  
(ArtNet) O/P

CONFIG>DMX A: ↓  
Sub-Net:1 Port:1

Optionen:  
O/P, OFF

CONFIG>DMX C/D >  
(ArtNet) I/P

CONFIG>DMX C: ↓  
Sub-Net:1 Port:1

Optionen:  
O/P, I/P, OFF

CONFIG menu MA-NET to set and assign e.g. outputs

CONFIG>MERGER >  
(ArtNet) DMX C=D

CONFIG>MERGER ↓  
DMX C-HTP-D

Optionen:  
HTP/LTP/BACKUP

CONFIG menu, general network settings

CONFIG>DMX A >

CONFIG>DMX A: ↓  
Universe: 1 (A)

Optionen:  
1(A)-8(H), 9-64

CONFIG>ETHERNET >

CONFIG>ETHERNET >  
IP-ADDRESS

CONFIG>EN>ADR ↓  
192.168.105.001

CONFIG>ETHERNET >  
SUB-NET MASK

CONFIG>EN>MASK ↓  
255.255.255.0

CONFIG>DMX-FAIL >

DMX-FAIL ↓  
HOLD LAST OUTPUT

Optionen: Fade  
Black / Hold Last

DMX FAIL ↓  
FADE BLACK: 0n00s

Optionen:  
0s bis 5n00s

DMX FAIL ↓  
Time out : 0n00s

Optionen:  
0s bis 5n00s

CONFIG>DATE >

CONFIG>DATE ↓  
DATE: 24/12/03

CONFIG>TIME >

CONFIG>TIME ↓  
TIME: 23:59:00

CONFIG>LANGUAGE >

CONFIG>LANGUAGE ↓  
ENGLISH

Optionen:  
ENGLISH, DEUTSCH..

## 4. The Menus

On the front side of the NSP, there is a back-lit LCD display. You can perform all settings using the four keys on the side of the display and by rotating the wheel (so-called Encoder or data entry wheel).

### 4.1 The Main display

After switching on the NSP, the main display will appear on the LCD. Depending on the set protocol, one of the followings screens will be displayed:

**NSP <NAME>  
A01 B02 C03 D04**

The NSP is active in the MA-Net

**A:-A:A    B:-0:1  
C:- 0:2    D:-0:3**

The NSP is active in the ARTNET

**NSP <NAME>  
MA-NET inactive**

The NSP is not active, because e.g. no compatible software had been loaded. Update the NSP over the console - see also chapter 5

### 4.2 The INFO menu

This menu contains only information relating to the NSP setup. You cannot make any changes in this menu.

**MA - Net Expansion  
S/W VERSION 5.xxx**

This is where the current mode, i.e. MA-NET EXPANSION or ARTNET DMX NODE, and the loaded software version are displayed.

**IP ADDRESS    >  
192.168.177.114**

Displays the set IP address.

**SUB-NET MASK    >  
255.255.255.0**

Displays the SUB-net mask.

**TIME: 17:20:33  
DATE: 04/03/04**

Displays the current time and date.



```
NSP 01 >
Console Logged in
```

Displays news, e.g. status messages.

```
TIME
DATE
```

Displays the time and date of the received message.

### 4.3 The CONFIG menu

Here, you can change parameters. Some menus are protocol-specific and not visible while using other protocols.

```
CONFIG >
```

This is where the configuration menu starts.

```
CONFIG > MODE >
```

Use NEXT, to enter the MODE selection.

```
CONFIG MODE >
XXXX
```

Here, you can select the network mode>

- **MA - NET EXPANSION**
- **ARTNET DMX -NODE**
- **4 Port DMX NODE**

● Having changed a parameter (red LEDs are on), confirm with NEXT.

```
CONFIG > DMX>
```

Use NEXT, to enter the DMX configuration menu (only in ARTNET or MA-Net mode) .

```
CONFIG > DMX A>
(ARTNET) XXXX
```

Here, you can set the address or deactivate the output. Rotate the Encoder to select outputs A-D.

- **O/P** to set the output to OUTPUT
- **OFF the output is deactivated.**

Note: Output A does only have these two options!

```
CONFIG > DMX A :
SUB-NET:1 PORT:1
```

Here, you can set the SUBNET and PORT addresses.

● By pressing on the Encoder, select the cell to be changed, by rotating the Encoder, select the entry and then confirm with OK or ESC.

CONFIG > DMX B >  
(ARTNET) XXXX

Only in ARTNET mode: Here, you can set the address or deactivate the output. Rotate the Encoder, to select outputs A-D.  
- **O/P** to set the output to OUTPUT.  
- **OFF the output is deactivated.**  
Note: Output B does only have these two options!

CONFIG > DMX B :  
SUB-NET:1 PORT:1

Here, you can set the SUBNET and PORT addresses.  
● By pressing on the Encoder, select the cell to be changed, by rotating the Encoder, select the entry and then confirm with OK or ESC.

CONFIG > DMX C >  
(ARTNET) XXXX

Only in ARTNET mode: Here, you can set the address or deactivate the output. Rotate the Encoder to select outputs A-D.  
- **O/P** to set the output to OUTPUT - **the (IN1) jack must not be assigned any more!**  
- **I/P** to set the output to INPUT.  
- **OFF the output is deactivated.**

CONFIG > DMX C :  
SUB-NET:1 PORT:1

Here, you can set the SUBNET and PORT addresses.  
● By pressing on the Encoder, select the cell to be changed, by rotating the Encoder, select the entry and then confirm with OK or ESC.

CONFIG > DMX D >  
(ARTNET) XXXX

Only in ARTNET mode: Here, you can set the address or deactivate the output. Rotate the Encoder to select outputs A-D.  
- **O/P** to set the output to OUTPUT - **the (IN1) jack must not be assigned then!**  
- **I/P** to set the output to INPUT.  
- **OFF the output is deactivated.**

CONFIG > DMX D :  
SUB-NET:1 PORT:1

Here, you can set the SUBNET and PORT addresses.  
● By pressing on the Encoder, select the cell to be changed, by rotating the Encoder, select the entry and then confirm with OK or ESC.

CONFIG > MERGER >  
(ARTNET) DMX C=D

Only available in ARTNET, if outputs C and D have identical settings. Use NEXT, to proceed to setting the MERGER function.

CONFIG >MERGER✓  
DMX C-HTP-D

Here, the highest input (HTP = Highest Takes Precedence) will be used.

CONFIG >MERGER✓  
DMX C-LTP-D

Here, the latest input (LTP = Latest Takes Precedence) will be used.

CONFIG >MERGER✓  
DMX C-BACKUP-D

Here, output C will be used, in case of a failure, it will switched over to output D.

CONFIG > DMX>

ONLY IN MA-NET  
Use NEXT, to proceed to assigning outputs A-D.

CONFIG >DMX A ✓  
UNIVERSE:1 (A)

By pressing and then rotating the Encoder, select the universe to be assigned to this output (A - D).  
Having completed the entries, or if no changes were made, use the Encoder to scroll to outputs A-D.

CONFIG > ETHERNET

From here, you can enter the configuration menu on the Ethernet.  
- mode

CONFIG>ETHERNET>  
IP ADDRESS

Use NEXT, to proceed to setting the IP address.

CONFIG EN>IPADR✓  
192.168.105.001

Here, you can set the NSP IP address. Take care not to assign one IP address more than once!

CONFIG>ETHERNET>  
SUB-NET MASK

Use **NEXT** , to proceed to changing the SUB-NET mask.

CONFIG EN>NASK✓  
255.255.255.0

Here, you can enter the **SUB-NET** mask.

CONFIG>DMX>FAIL>

Use **NEXT** , to proceed to defining what to do when NSP failures occur (e.g. interrupted network cable)

**CONFIG>DMX>FAIL  
HOLD LAST OUTPUT**

Here, you can set the output to be used in case of a NSP failure>  
**HOLD LAST OUTPUT:** if no signal was received from the console, the last DMX signal will remain active.  
**FADE BLACK:** if no signal comes in from the console, the DMX signal will be set to 0 after a specified period of time.

**CONFIG>DMX>FAIL  
FADE BLACK: xm xs**

As an addition, if FADE BLACK was set:  
**FADE BLACK: xm xxs:** if no signal comes in from the console, the DMX signal will be set to 0 after the period of time (5>59 minutes max.) specified here.

**CONFIG>DMX>FAIL  
TIME OUT : xm xs**

**TIME OUT : xm xxs:** if no signal comes in from the console, the DMX signal will be set to 0 after the period of time (5>59 minutes max.) specified here.

**CONFIG>DATE>**

Use NEXT, to proceed to setting the date.

**CONFIG>DATE  
DATE: 25/03/04**

Here, you can set the current date.

**CONFIG>TIME>**

Use NEXT, to proceed to setting the time.

**CONFIG>TIME  
TIME: 16:32:48**

Here, you can set the current time of day.

**CONFIG>LANGUAGE>**

Use NEXT, to setting the language.

**CONFIG>LANGUAGE  
English**

Here, you can set the display language.  
Presently (version 5.0), only English is available.

**Note:**

**If more than 4,096 parameters are to be used, you need a network having a transmission rate of 100 Mbit.** Make sure that no components are linked to the network that would reduce the rate to 10 Mbit. Consoles with the following serial numbers will be no problem in a network, as they already have a 100 Mbit network adapter plus a 256 MB memory installed>

- grandMA as of SN 490
- grandMA Light as of SN 317
- grandMA UltraLight as of SN 232
- grandMA Replay Unit as of SN 38

Consoles having lower serial numbers, must be upgraded with 256 MB RAM and a 100 Mbit network adapter.

## 5. Update

The best and fastest way to update the NSP is via a network. In order to do this, the NSP must be in the same network as the console (grandMA, grandMA-light, grandMA-ultralight , Offline, or onPC), i.e. the first 3 groups of the IP address must be identical. On this console, the desired software version must have been loaded.

- set the NSP in CONIG MODE to MA-NET (not possible in ARTNET)
- Mark the desired NSP on the console in SETUP / UPDATE SOFTWARE
- start the update with UPDATE CONSOLE
  - after the automatic reboot, the NSP should display the loaded software number in the INFO window.

## 6. Commissioning

Before commissioning the NSP, please read the general Safety Instructions (see chapter 9) and follow the material VDE or EN regulations!

The MA NSP can be mounted in a 19" rack (needs 1 U). To achieve a better stability, horizontal rack bars should be used.

### 6.1 Fan control

Please provide for a sufficient air supply. A fan on the rear side will aspirate air and will blow it out through a vent on the front side.

## 7. Specifications

Housing type:	19 inch 1U
Width:	483 mm (o.a.)
Height:	48.5 mm
Net mounting depth:	170 mm (w/o input or output plugs)
The <u>actual</u> gross depth depends on the plug type and of the cable outlet used.	
Weight:	3.3 kg
Power supply	100 - 240 V AC via Euro plug. No switching of voltage necessary.
Fuse	T1A (slow)

## 8. Inputs and outputs

### 8.1 DMX Input and Output

The DMX input complies with the USITT DMX 512 (1990) standard. Every device constructed according to this standard, can trigger the MA NSP.



**WARNING:** If the C or D output is set to OUT, the ancillary IN jacks may not be assigned, i.e. if the OUT C jack is set to OUT (from the CONFIG menu), the (IN 1) jack may not be assigned – same applies to OUT D and (IN 2). A wrong assignment can lead to the destruction of all devices connected or of the NSP!

The DMX input is protected against over-voltage with additional suppressor diodes and complies with the RS485 or RS 422a standard.

The OUT C DMX output (Thru 1) is connected 1:1 (pins 1 through 3) with the (IN 1) DMX input. Same applies to OUT D (Thru 2) with (IN 2).

Pin assignment:	pin 1 = earth (not connected to ground)
	pin 2 = Data -                      pin 4 = not assigned
	pin 3 = Data +                     pin 5 = not assigned

Please note that all DMX devices are connected “in series” and that you cannot build y connections. The DMX line has to be terminated by a 100 terminal resistance between pin 2 and 3.

Make the settings for DMX address etc. in the respective menus.

## 9. Important Safety Instructions

1. Read all the instructions in the user's manual.
2. Keep the user's manual for later use.
3. Follow all cautions and warnings indicated on the unit.
4. Pull the mains plug before cleaning the unit; don't use any liquid or spray cleanser. Clean with a dry cloth.
5. Do not use the unit near water.
6. Do not place the unit on unstable surfaces. It might fall down and be damaged.
7. Do not block or cover any ventilation slots in the housing - they guarantee the reliable functioning of the unit and protect it against overheating. Do not install the unit into a frame unless sufficient ventilation is guaranteed.
8. The unit is provided with a safety plug. This plug can only be used with safety sockets.
9. Do not place any objects on the power cord. Protect it from being walked on or pinched particularly at plugs and the point where they exit from the apparatus.
10. If using an extension cord, make sure the rated output of all units connected in aggregate does not exceed the maximum rated output of the extension cord.
11. Do not spill any liquid over the unit! Do not insert any objects through the slots of the unit, as these could get in contact with live parts or could cause short circuits. This may cause fires and electric shocks.
12. Only use power cords which are marked as safety-proof.
13. Do not use any high-power walkie-talkies or cellular phones near the unit.
14. The unit should be serviced by qualified personnel only, as live parts may be exposed when opening and/or removing coverings; besides others, you run the risk of suffering an electric shock. All service work should be exclusively performed by qualified service technicians.
15. If one of the following conditions occurs, please pull the mains plug and call the customer service!
  - A. Power cord or mains plug is damaged or worn.
  - B. Liquid has penetrated into the unit.
  - C. The unit was exposed to rain or high ambient humidity.
  - D. Having observed all regulations, the unit would not function properly. Do only manipulate the controls mentioned in the instructions, as wrong settings on other controls may damage the unit; all too often, it is very time-consuming to have damaged parts repaired by a service technician.
  - E. The unit dropped to the floor and the housing was damaged.

## 10. DECLARATION OF CONFORMITY

**Manufacturer's name:** MA Lighting Technology GmbH

**Manufacturer's address:** Dachdeckerstraße 16  
D-97297 Waldbüttelbrunn  
Germany

*declares that the product*

**Product category:** Control unit

**Name of product:** MA NETWORK SIGNAL PROCESSOR (NSP)

*complies with the following product specifications and harmonized standards :*

**Safety:** EN60065, EN60950

**EMV (EMC):** EN55103-1 (E1), EN50081-1  
EN55103-2 (E2), EN50082-

**Additional Information:**

DMX512 input and output cables must be shielded and the shielding must be connected to the earthing resp. to the housing of the corresponding plug.  
Furthermore, the NSP and alle connected devices must be grounded safely.

Waldbüttelbrunn, April 01, 2004

**Dipl. Ing. Michael Adenau**

