## Contents

1. Introduction 3  
2. Controls and connection ports 5  
3. Menu tree 7  
4. The Menus 8  
  4.1 The Main Display 8  
  4.2 The Info menu 8  
  4.3 The Config menu 9  
5. Update 13  
6. Commissioning 13  
7. Specifications 14  
8. Inputs and outputs 14  
9. Important safety instructions 15  
10. DECLARATION OF CONFORMITY 16
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: as a channel expansion with maximum 16 NSPs on 32,768 DMX channels / 16,384 parameters.
grandMA Ultralight: As channel expansion
grandMA Light: As channel expansion
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.

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.
**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:**

<table>
<thead>
<tr>
<th>Console</th>
<th>Max Param. w&amp;Exten. with Chip</th>
<th>Protocol for &lt;4096channels</th>
<th>Protocol for &gt;4096channels</th>
<th>Max channels with Exten. for x Universen</th>
<th>Max channels w x NSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>grandMA</td>
<td>2.048</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>32.768</td>
<td>16 NSPs</td>
</tr>
<tr>
<td>Light</td>
<td>2.048</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>32.768</td>
<td>16 NSPs</td>
</tr>
<tr>
<td>Ultralight</td>
<td>1.024</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>32.768</td>
<td>16 NSPs</td>
</tr>
<tr>
<td>Micro</td>
<td>1.024</td>
<td>ARTNET</td>
<td>--</td>
<td>1.024</td>
<td>noNSP possible</td>
</tr>
<tr>
<td>2 universes</td>
<td>1.024</td>
<td>ARTNET</td>
<td>--</td>
<td>1.024</td>
<td>noNSP possible</td>
</tr>
<tr>
<td>Replay</td>
<td>2.048</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>32.768</td>
<td>16 NSPs</td>
</tr>
<tr>
<td>Offline</td>
<td>4.096</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>4.096</td>
<td>2 NSPs</td>
</tr>
<tr>
<td>/ onPC</td>
<td>----</td>
<td>MA-NET and ARTNET</td>
<td>MA-NET</td>
<td>8 universes</td>
<td>2 NSPs</td>
</tr>
</tbody>
</table>
2 controls and connection ports

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

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.

**Vent - do not cover!**

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

**Fuse T 1 A**

**Mains 230V**

**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 B**
- **ARTNET and MA-NET:** Only DMX output

**OUT A**
- **ARTNET and MA-NET:** Only DMX output

**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.
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
  - confirm the new setting with OK (possible that the NSP will boot automatically)
3. The menu tree:
The menu tree gives you an overview of all menus available.

- **INFO menu**
  - Shows information about outputs, IP addresses and time / date

- **CONFIG menu**
  - ARTNET: to set and assign e.g. outputs
  - MA-NET: to set and assign e.g. outputs
  - General network settings

Main display

INFO menu

Setting the protocol

CONFIG menu

CONFIG menu, general network settings
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:

- **The NSP is active in the MA-Net**
  
  NSP <NAME>
  A01 B02 C03 D04

- **The NSP is active in the ARTNET**
  
  A:-A:A  B:-0:1
  C:-0:2   D:-0:3

- **The NSP is not active, because e.g. no compatible software had been loaded. Update the NSP over the console - see also chapter 5**
  
  NSP <NAME>
  MA-NET inactive

4.2 The INFO menu

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

- **This is where the current mode, i.e. MA-NET EXPANSION or ARTNET DMX NODE, and the loaded software version are displayed.**
  
  MA - Net Expansion
  S/W VERSION 5.xxx

- **Displays the set IP address.**
  
  IP ADDRESS >
  192.168.177.114

- **Displays the SUB-net mask.**
  
  SUB-NET MASK >
  255.255.255.0

- **Displays the current time and date.**
  
  TIME: 17:20:33
  DATE: 04/03/04
4.3 The CONFIG menu

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

This is where the configuration menu starts.

- Use NEXT, to enter the MODE selection.

Here, you can select the network mode:
- MA - NET EXPANSION
- ARTNET DMX-NODE

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

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

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 A does only have these two options!

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.
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!

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 :**
**SUB-NET:1**  **PORT:1**

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.

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 :**
**SUB-NET:1**  **PORT:1**

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.

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 :**
**SUB-NET:1**  **PORT:1**

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

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

**CONFIG > MERGER > DMX C=D**

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

**CONFIG > MERGER > DMX C-HTP-D**
**CONFIG > MERGER > DMX C-LTP-D**

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

**CONFIG > MERGER > DMX C-BACKUP-D**
ONLY IN MA-NET
Use NEXT, to proceed to assigning outputs A-D.

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.

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

Use NEXT, to proceed to setting the IP address.

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

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

Here, you can enter the SUB-NET mask.

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

CONFIG>DMX> UNIVERSE:1 (A)

CONFIG EN>IPADR 192.168.105.001

CONFIG>DMX>FAIL
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.

As an addition, if FADE BLACK was set:

**FADE BLACK**: 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.

**TIME OUT**: 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.

Use NEXT, to proceed to setting the date.

Here, you can set the current date.

**DATE**: 25/03/04

Use NEXT, to proceed to setting the time.

Here, you can set the current time of day.

**TIME**: 16:32:48

Use NEXT, to setting the language.

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.
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 3 = Data +
- pin 4 = not assigned
- 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

according to directives 89/336 EWG and 92/31 EWG:

Manufacturer's name: MA Lighting Technology GmbH
Manufacturer's address: Dachdeckerstr. 16
D-97297 Waldbüttelbrunn
Germany

declares that the product

Name of product: MA NETWORK SIGNAL PROCESSOR (NSP)

complies with the following product specifications:

Safety: EN60065, EN60950
EMV (EMC): EN55103-1 (E1), EN50081-1
EN55103-2 (E2), EN50082-1

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 all connected devices must be grounded safely.

Waldbüttelbrunn, 01.04.2004

leit. Dipl. Ing. Michael Adenau