



# MA-4.100 MA-4.600 MA-2.1200

## DSP Amplifiers

Please read this user manual through carefully before putting the system into operation and keep it for future reference.



# Contents

- 1. Introduction and General Instructions ..... 4
  - 1.1 Important Safety Instructions ..... 4
    - 1.1.1 Definition of Terms..... 4
    - 1.1.2 General Safety Instructions ..... 5
    - 1.1.3 Electrical Safety Information ..... 5
    - 1.1.4 Acoustic Safety Information ..... 6
    - 1.1.5 Connections and Cabling ..... 7
  - 1.2 Operating Conditions ..... 7
    - 1.2.1 Information on Abnormal Operation ..... 8
  - 1.3 Storage and Transportation ..... 8
- 2. The Product ..... 9
  - 2.1 Product Description..... 9
  - 2.2. Contents ..... 10
  - 2.3 Unpacking..... 10
- 3. Setting Up ..... 11
  - 3.1 Professional Rack Mounting..... 11
  - 3.2 Connection Instructions and Controls..... 12
    - 3.2.1 USB-C Configuration Port ..... 12
    - 3.2.2 Standard Connections ..... 13
    - 3.2.3 Optional Connection Interfaces ..... 14
    - 3.2.4 Status Displays..... 14
  - 3.3 Configuration..... 15
    - 3.3.1 System Requirements..... 15
    - 3.3.2 Downloading and Installing FOHHN AUDIO SOFT ..... 16
    - 3.3.3 FOHHN-NET Cabling and ID Allocation ..... 16
    - 3.3.4 Loading Loudspeaker Presets ..... 18
    - 3.3.5 Updating the Firmware ..... 18
    - 3.3.6 Connecting All Devices ..... 19
    - 3.3.7 Gain Structure and Signal Chain ..... 19
    - 3.3.8 Matrix Functions and DSP Routing..... 22
    - 3.3.9 Integration into a Dante™ Network ..... 24
    - 3.3.10 Integration into the AIREA-NET ..... 26
    - 3.3.11 Renaming Devices and Output Channels ..... 27

3.4 Further Functions .....	27
3.4.1 Auto Power Save .....	27
3.4.2 Switching Contact .....	30
3.4.3 Password Lock .....	30
4. Technical Specifications.....	31
5. Troubleshooting .....	34
6. Service and Repair .....	35
6.1 Maintenance Measures.....	35
7. Appendix.....	36
7.1 Environmental Information .....	36
7.2 CE Marking and Declaration of Conformity.....	36
7.3 Trademarks.....	36
7.4 Protection Classes and Protection Types .....	36
7.5 Disclaimer and Copyright .....	37
7.6 Contact Address .....	37

# 1. Introduction and General Instructions

Congratulations on the purchase of your **FOHNN®** DSP amplifier. Like all products in our **AMP CONTROLLER-SERIES, MA-SERIES** amplifiers are equipped with the latest CLASS D technology. These amplifiers have been developed to meet the highest demands for sound quality and reliability.

All DSP functions on a **MA-SERIES** amplifier can be controlled using a single piece of software, **FOHNN AUDIO SOFT**.

**In order to benefit from all the advantages of your DSP amplifier and to guarantee trouble-free operation, please read the following instructions carefully before starting up the system and keep this manual for future reference!**

## 1.1 Important Safety Instructions

Please read the following safety instructions in their entirety before starting up this device. Keep these instructions near the device at all times. Reading the instructions does **not** replace the need for awareness of and compliance with currently applicable national safety regulations and standards, or the observance of safe on-site working methods.

All information and technical specifications published here are based on data that was available at the time of publication. We expressly reserve the right to make any changes.

### 1.1.1 Definition of Terms

#### **Danger**

This signal word indicates a hazard with a high-risk level, which, if not avoided, could result in death or serious injury.

#### **Warning**

This signal word indicates a hazard with a medium risk level, which, if not avoided, could result in death or serious injury.

#### **Caution**

This signal word indicates a hazard with a lower risk level, which, if not avoided, could result in minor or moderate injury.

## 1.1.2 General Safety Instructions

### **Danger:**

To avoid danger to life or limb, please ensure that all personnel involved in installing or dismantling this type of system have read and understood the contents of this manual.

That said, the information presented here should be regarded as accompanying advice and it does not affect the ultimate responsibility of the user to ensure safe on-site operation of a **FOHHN** system.

### **Warning:**

To avoid injury,

- ⚠ the device must be stored, installed and operated well away from children.

To avoid injuries, this device must be taken out of operation, marked appropriately and protected against accidental use if it

- ⚠ shows visible signs of damage
- ⚠ appears to contain loose parts,
- ⚠ is not working correctly,
- ⚠ has been subjected to unfavourable conditions (e.g. moisture) for a prolonged period
- ⚠ has been subjected to poor transportation conditions (e.g. with unsuitable packaging or humidity).

**If necessary, please contact your FOHHN dealer or the transport company immediately. Our contact details can be found in the appendix to this user manual.**

## 1.1.3 Electrical Safety Information

**FOHHN** DSP amplifiers are Protection Class 1 appliances. They are built and certified in accordance with the VDE safety measures for electronic devices and, safety-wise, leave our factory in perfect condition. The devices comply with all currently applicable EMC directives, as confirmed by the attached CE marking.

**The relevant standards can be found in the appendix to this user manual.**

### **Warning:**

To minimize the risk of electric shock,

- ⚠ the mains contact grounding pin must never be separated and under no circumstances should the plug be taped up.
- ⚠ the device must **only** be connected to a professionally tested shockproof socket.
- ⚠ the device enclosure must never be opened. The device does not contain any components that can be repaired by the user. In the unlikely case of a defect, please consult qualified service personnel and/or the dealer from whom you purchased your system!

Please also ensure that the local mains supply voltage matches the power supply voltage specified on the device.

To minimize the risk of an electric shock or fire,

- ⚠ the device must not be subjected to moisture.
- ⚠ containers filled with liquid (e.g. beverage containers) must not be placed on the device.
- ⚠ ventilation slots must not be covered with objects (e.g. protective rain covers).
- ⚠ the device must not be subjected to excessive heat, sunshine, fire or similar.
- ⚠ no open sources of flame (e.g. pyrotechnics) must be placed on the device.

**Caution:**

To avoid damaging the device,

- ⚠ do not leave the power cable plugged in if the device will not be used for a prolonged period.  
(Remove the plug from the mains socket in order to completely disconnect the device!)

### 1.1.4 Acoustic Safety Information

**FOHNN** loudspeaker systems are capable of generating very high sound pressure levels, which can cause irreparable damage to hearing.

**Warning:**

To avoid potential hearing impairment,

- ⚠ never stand in close proximity (1 metre or less) to a loudspeaker device while it is in operation.

To prevent both hearing impairment and damage to the device, avoid the following while the device is in operation:

- ⚠ acoustic feedback
- ⚠ high powered, permanently distorted signals
- ⚠ impulse noises, which can occur when a device is switched on or off, connected or disconnected from the system

## 1.1.5 Connections and Cabling

Please note the following when wiring up your system:

- ⚠ Check that your cable is working faultlessly and only use cables with a sufficient cross section.
- ⚠ Only use cabling and connector materials that meet professional standards.
- ⚠ Only use properly shielded cables and plugs for the audio and data connections.
- ⚠ Only use power cables with a fully intact grounding pin and make sure that the device's mains plug is accessible at all times so that it can be quickly removed from the mains supply in the event of a malfunction.
- ⚠ Lay and secure the cabling so that it cannot be damaged by tools, or through being trapped by the device or by a fixing bracket.
- ⚠ Protect any laid cables from mechanical damage, or unnecessary traction.
- ⚠ Avoid excessive tightening of the screws on connection terminals!

**The wiring up of loudspeakers should only be done by suitably qualified personnel!**

**Important:** To enable communication between a Windows PC with **FOHNN AUDIO SOFT** installed and MA-Series amplifiers, a **FOHNN** network adapter (e.g. **NA-11 FOHNN-NET USB ADAPTER** or **NA-4 FOHNN-NET ETHERNET ADAPTER**) is recommended.

**More information can be found in Chapter 3 of this user manual!**

## 1.2 Operating Conditions

Please note the following when operating your system:

- ⚠ The permitted ambient temperature of the device during operation ranges from 0 °C to +40 °C.
- ⚠ The device is intended for use in a dry environment with normal levels of dust and humidity in the air.
- ⚠ If moisture has built up on the device's rear panel, either during transportation or storage, let the device acclimatise for ca. 2 hours before use.
- ⚠ Never expose the device to aggressive chemical fluids or vapours.
- ⚠ Always make sure that heat can be dissipated via the outer surfaces of the device enclosure.
- ⚠ Always make sure that the device is well ventilated. In order to ensure adequate cooling, the device must not be covered with towels or cloths. Avoid letting the enclosure become hot through exposure to sunlight or strong spotlights.
- ⚠ Never expose the device to strong vibrations.

### 1.2.1 Information on Abnormal Operation

If the permissible operating temperature is too high (over 75 °C), the device will shut down. As soon as the temperature returns to within the normal operating range, the device will automatically be switched on again.

The temperature of the **FOHHN** system is displayed in **FOHHN AUDIO SOFT**. Shutdown can also occur if the product is exposed to direct sunlight or very high environmental temperatures. Reliable operation is only guaranteed in compliance with the permissible ambient temperature range.

The device should be immediately inspected by a **FOHHN AUDIO AG** approved service partner if

- ⚠ the mains cable or power socket is damaged,
- ⚠ a foreign body or liquid has got into the interior of the device,
- ⚠ the device has been exposed to rain,
- ⚠ the device is not working normally, i.e. it is showing marked differences in performance,
- ⚠ the device is damaged (e.g. after a fall).

### 1.3 Storage and Transportation

Please note the following:

- ⚠ The device should only be transported in its original packaging
- ⚠ Store the device in a dry environment, with a constant ambient temperature, in order to avoid condensation.
- ⚠ The permitted ambient temperature range for storing the device is -10 °C to +70 °C.
- ⚠ Due to fluctuations in temperature during transportation and storage, condensation may start to build up on the surface of the device. Before operating the device, examine its surface for any signs of moisture. If this is the case, allow the unpacked device to acclimatise for a minimum of two hours in the environmental temperature before use.

## 2. The Product

### 2.1 Product Description

The digital, multi-channel DSP amplifiers belonging to the **MA-SERIES** are equipped with **FOHNN AUDIO DSPs** (digital signal processors). These DSPs contain (per amplifier channel) a programmable EQ, Delay, X-Over and dynamic processor.

**MA-SERIES** DSP amplifiers are equipped with four analog inputs or DANTE inputs. The outputs are terminal blocks designed for leads of up to 3.3 mm<sup>2</sup>. All amplifiers (regardless of the number of their output channels) always have four inputs with DSP input processing – in other words: their four input channels can each be mixed in the DSP.

In addition, presets are stored that contain loudspeaker protection data and sound optimization data for all **FOHNN** loudspeaker systems. These optimisations, together with multiband limiting, ensure the best possible sound performance and operational safety. Custom created user presets can also be stored.

Thanks to their integrated **FOHNN AUDIO DSP**, the amplifiers can be networked, remotely controlled and remotely monitored. A single piece of control software, **FOHNN AUDIO SOFT**, provides access to all DSP functions and presets. **(The current version of this software can be downloaded free of charge at: [www.fohnn.com](http://www.fohnn.com).)**

At the heart of each amplifier is a digital power supply that is significantly responsible for the sound. It constantly analyses the supply voltage and processes this accordingly (Power Factor Correction). The power supply enables the amplifier to deliver as much energy as possible in the shortest possible time, thus enabling the full dynamic range to be reproduced over the entire audible frequency spectrum during live music applications – while also turning the least amount of energy into heat. The result is a significant increase in the available peak power. An integrated microprocessor equips the power supply with measuring and monitoring functionality. As a result, important factors such as temperature, supply current and capacity are monitored and controlled accordingly. In the event of mains overvoltage, the amplifier will shut down.

The amplifier's fans are temperature controlled and optimised for extremely quiet operation. The fans are not used when the amplifier is in an idle state. The fan and filter foam can be manually cleaned, without the need for tools.

The amplifiers are additionally equipped with two programmable switching contacts for easy remote control and integration into building services.

## Overview of the different MA-SERIES product versions

MODEL	POWER per channel and load						
	2 $\Omega$	3 $\Omega$	4 $\Omega$	8 $\Omega$	16 $\Omega$	70 V	100 V
MA-4.100	-	-	65 W	35 W	18 W	-	-
MA-4.600	-	-	600 W	300 W	150 W	600 W	600 W
MA-2.1200	-	-	1200 W	600 W	300 W	1200 W	1200 W

## 2.2. Contents

Every product is examined in accordance with the highest quality and safety standards prior to despatch.

Please check your product carefully for any signs of transport damage and, in the event of any damage having occurred, inform your dealer and the transportation company immediately. Please also check that the packaging contains all the components belonging to the device.

Your **FOHNN** system contains the following:

- 1  $\times$  MA-SERIES DSP amplifier
- All plugs for rear panel connectors (inserted)
- 1  $\times$  mains cable with IEC connector
- 1  $\times$  Quick Start Guide
- 2  $\times$  Rackmount brackets

**If the contents are incomplete, please contact your FOHNN dealer!**

## 2.3 Unpacking

When unpacking the system, we recommend the following procedure:

1. Open the packaging and take out the product.
2. Examine the product for any visible signs of transport damage. If the product has been damaged, inform the transport company immediately. A claim for transport damage can only be made by the recipient (i.e. you). Keep the packaging for examination by the transportation company.
3. As a general rule, always retain the packaging. Despatch the product in appropriate outer packaging or in a suitable flightcase.

## 3. Setting Up

### 3.1 Professional Rack Mounting

For professional installation in mobile 19-inch racks or cabinets, the amplifier is equipped with the appropriate front and rear mounting brackets. The enclosure is torsion resistant. Please take care that the amplifier is well ventilated and cooled from all sides during use. Keep 1HU rackspace distance below and above rack mounted amplifiers.

Included in delivery are two rack mount brackets (Rackmount-Set).



To mount two Fohhn 9,5" devices together in a 19" Rack an optional 19"-Rackconnector, article **8022-00000** is available



To mount one MA-Series amplifier in a 19" rack an optional 19"-Rack bracket with 6 openings for Neutrik D Serie sockets is available. Fohhn article **8023-00000**.



## 3.2 Connection Instructions and Controls

Connection of any cabling should be done while the amplifier is switched off. Similarly, the mixing console should be switched on before the amplifier. This will avoid annoying and often dangerous switch-on noises.

### 3.2.1 USB-C Configuration Port

All **MA-SERIES** amplifiers come with an USB-C socket on the front panel of the enclosure. This allows for optional direct configuration of the device via PC and **FOHNN AUDIO SOFT** control software – without using a **FOHNN** network adapter.

To connect a network consisting of several devices, a **FOHNN** network adapter (e.g. an **NA-11 FOHNN-NET USB ADAPTER** or **NA-4 FOHNN-NET ETHERNET ADAPTER**) must be employed.

Please notice: While the USB-C socket is in use, the RS-485 interface on the rear panels is disabled.

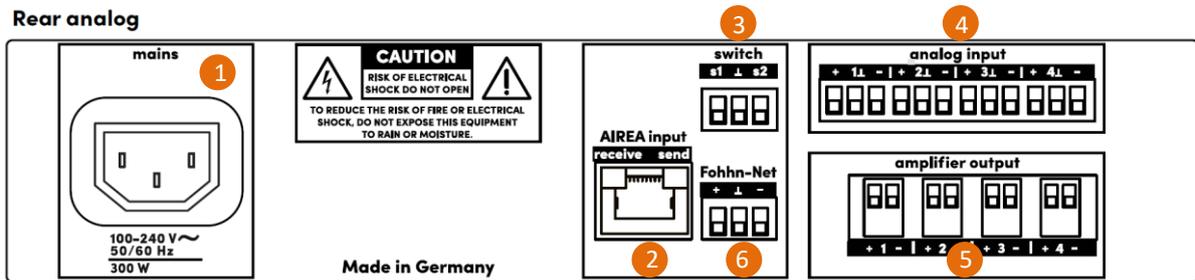
**For more information, please see chapter 3.3.3 “FOHNN-NET Cabling and ID Allocation”!**



USB-C socket on the left side of the front panel

### 3.2.2 Standard Connections

The following connectors can be found as standard on the rear panels of **MA-SERIES** amplifiers:



#### (1) mains

The mains cable is connected to this IEC power inlet. The universal power supply (with Power Factor Correction [PFC]) permits a supply voltage of 100 – 240 Vac / 50/60 Hz, thus enabling worldwide use of the amplifier.

**The amplifier is only fully disconnected from the mains if the IEC plug is completely removed from the socket!**

#### (2) Airea input

Airea-Net input enables connection to **AIREA** Systems

#### (3) switch

These terminal blocks serve as switching contacts for changing presets. They can be configured in **FOHNN AUDIO SOFT** (see Chapter 3.4.2 “Switching Contact”).

#### (4) analog input CH 1/2/3/4

Analog audio signals can be fed in using these terminal blocks. The terminals are intended for all 4 input channels **CH 1 .. CH4**.

#### (5) amplifier output CH 1/2/3/4

Loudspeaker systems are connected to these terminals (up to 3.3 mm<sup>2</sup> flexible or 3.3 mm<sup>2</sup> rigid conductor cross-section).

#### (6) Fohhn-Net input

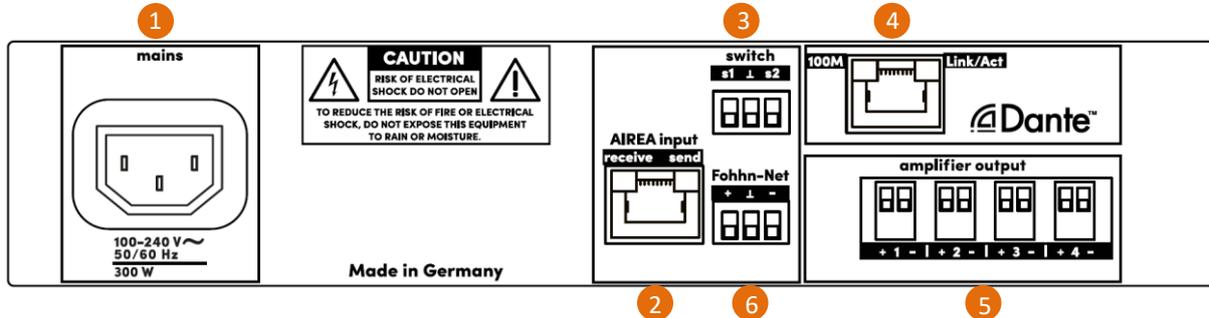
This terminal block is used to connect the amplifier to the **FOHNN-NET** remote control network.

**Only use a FOHNN network adapter for this (NA-11 FOHNN-NET USB ADAPTER or NA-4 FOHNN-NET ETHERNET ADAPTER).**

### 3.2.3 Optional Connection Interfaces

All **MA-SERIES** product versions are available with input interfaces for the Dante™ digital audio network or 4 x analogue audio signals.

#### Input option DANTE Interface

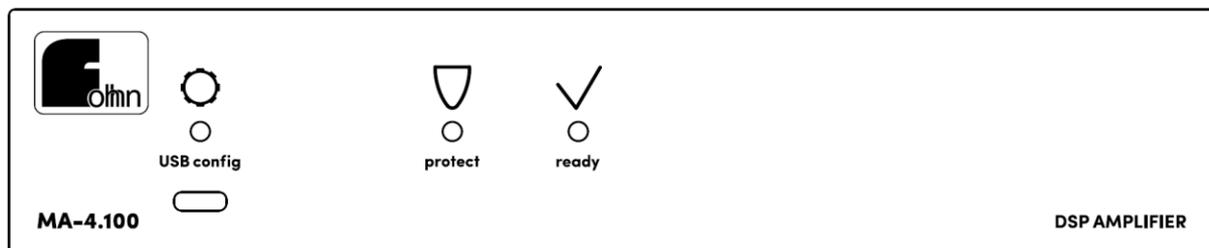


#### (4) Dante

Network socket for the connection of DANTE digital audio signals.

### 3.2.4 Status Displays

Status displays on **MA-SERIES** amplifiers take the form of illuminated symbols on the front panel of the enclosure:



Status LEDs for a 4-channel amplifier

#### USB config (gear symbol)

This symbol lights up when the amplifier is connected to a PC via the USB-C socket.

#### protect

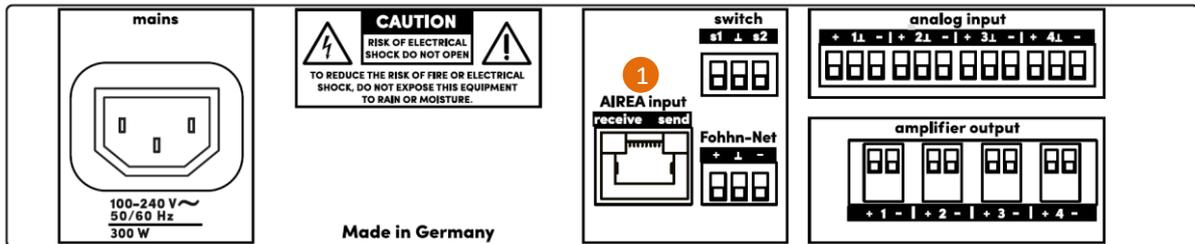
This symbol lights up if there is an error during operation.

#### ready

This symbol lights up when the amplifier is ready for use.

(1) The status leds for send and receive are located at the rear

#### Rear analog



Status LEDs of a 4-channel-amplifier at the rear side

#### send

This symbol lights up if **FOHNN-NET** control signals are transmitted from the DSP amplifier.

#### receive

This symbol lights up if the DSP amplifier receives **FOHNN-NET** control signals.

## 3.3 Configuration

Using the **FOHNN-NET** network, you can remotely control and monitor the functionality of your **FOHNN** amplifier's integrated digital signal processors (DSP). For this you will need a Windows PC with **FOHNN AUDIO SOFT** (Version 5.0.3 or later) installed.

### 3.3.1 System Requirements

To use **FOHNN AUDIO SOFT**, you need a commercially available computer with the following:

- **Computer and processor:** x86- or x64 multi-core system
- **Memory (RAM):** 4 Gigabyte (GB) RAM
- **Hard disk:** 40 Megabyte (MB) of free disk space
- **Display:** Minimum resolution 1366 x 768
- **Operating system:** Microsoft Windows 7 SP1 or Windows 10
- **.NET-Version:** Microsoft .NET Framework 4.6.1
- **Additional requirements:** current status of the operating system

Further information can be found in the separate **FOHNN AUDIO SOFT** user manual. You can download this from the **FOHNN** website [www.fohnn.com](http://www.fohnn.com)

### 3.3.2 Downloading and Installing FOHNN AUDIO SOFT

**FOHNN AUDIO SOFT** is directly compatible with all **FOHNN** active DSP systems. Therefore, you do not need any special **MA-SERIES** version of the software. Regardless of the amplifier, you can always work with the same software and within the same user interface.

The current version of **FOHNN AUDIO SOFT** can be downloaded free of charge from [www.fohnn.com](http://www.fohnn.com).

Proceed as follows to install **FOHNN AUDIO SOFT** on your computer:

1. Download the latest version of **FOHNN AUDIO SOFT** to your computer.
2. Locate the *Fohhn\_Audio\_Soft\_X.X.X\_Setup.exe* file on your computer (*X.X.X* represents the respective version number).
3. Start the installation program by double-clicking on the file: Follow the on-screen instructions.
4. Click on *Install* to install the program on your computer. Also confirm in the *User Account Control* dialog if this appears.
5. Click on *Finish* to complete the installation.

The software is immediately ready for use following installation and can either be opened via the program symbol on the desktop, or via the *Start > All Programs > Fohhn Audio AG > Fohhn Audio Soft* path.

### 3.3.3 FOHNN-NET Cabling and ID Allocation

To control a number of **MA-SERIES** amplifiers, each system in the **FOHNN-NET** must be allocated its own specific ID. Using this ID, each individual **FOHNN** amplifier can be clearly identified and controlled from within **FOHNN AUDIO SOFT**.

- ⚠ **All amplifiers have a factory setting of ID 1.**
- ⚠ **Duplicated IDs lead to ID conflict. In such a situation, it will no longer be possible to control the amplifiers concerned.**

### ***ID allocation for individual amplifiers:***

In order for an ID to be allocated, each amplifier must first be connected to **FOHNN AUDIO SOFT**.

Proceed as follows:

1. Connect the **FOHNN** amplifier to the mains power.
2. Connect the amplifier to a PC via the USB-C socket.
3. As an alternative to step 2, you can also use an **NA-4** or **NA-11 FOHNN** network adapter. For amplifiers with a Dante interface, you need an Ethernet Switch. For amplifiers with an Optocore interface, you need an Optocore network convertor.
4. Connect the USB-C socket, **FOHNN** network adapter, Ethernet Switch or Optocore network convertor to the amplifier using an appropriate cable.
5. Switch on the amplifier.
6. Start **FOHNN AUDIO SOFT**. The selected **FOHNN** network adapter will automatically be recognized.
7. When **FOHNN AUDIO SOFT** opens, an automatic search starts that results in the listing of all correctly connected **FOHNN** amplifiers.

If no amplifier is shown, check all the connections and re-run the search. When doing so, please also note the ID search range.

Proceed as follows:

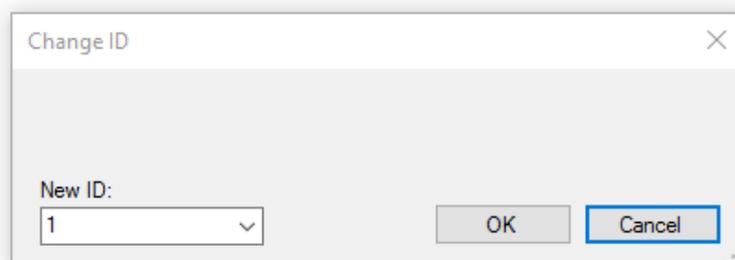
1. In the *Devices* menu, click on the *Search Device / Network Scan* dialog.
2. If the amplifier is still not shown, check the mains power supply and/or the network cabling. Then repeat Step 1.

If an amplifier is recognized, it appears with ID 1 (factory setting).

To change the ID directly in the *Find Devices* dialog, proceed as follows:

1. Click with the right mouse button on a loudspeaker system in the dialog's list view.
2. In the context menu select *Change Fohhn-Net ID*.
3. In the dialog with the same name, enter a new ID for the amplifier. Make sure that this ID is not already in use.

Confirm this by clicking *Ok*: The **FOHNN** amplifier will now have a newly assigned ID.



You can also change the ID of a **FOHHN** amplifier at any time while it is in use. To do this, the system must be in the **FOHHN-NET**. Proceed as follows:

1. Open the *Device List* view, either via the *View* menu or via the corresponding button on the Toolbar.
2. Click with the right mouse button on an amplifier in the list display.
3. In the context menu select *Change Fohhn-Net ID*.
4. In the same dialog, give the amplifier a new ID
5. Confirm this by clicking *Ok*: The **FOHHN** amplifier will now have a newly assigned ID.

**Further information on setting up a FOHHN-NET and on FOHHN-NET ID allocation can be found in Chapter 4.1 “Fohhn-Net Setup” of the FOHHN AUDIO SOFT user manual.**

### **3.3.4 Loading Loudspeaker Presets**

In their ex-factory state, **MA-SERIES** amplifiers do not have any preset limiters. Therefore, to ensure safe operation of all connected loudspeakers, the appropriate loudspeaker presets must be loaded into **FOHHN AUDIO SOFT**. Examples are saved in a preset list on the device. All available loudspeaker presets can also be loaded from a database.

**Further information on loading loudspeaker presets can be found in Chapter 4.2 “Presets” of the FOHHN AUDIO SOFT user manual.**

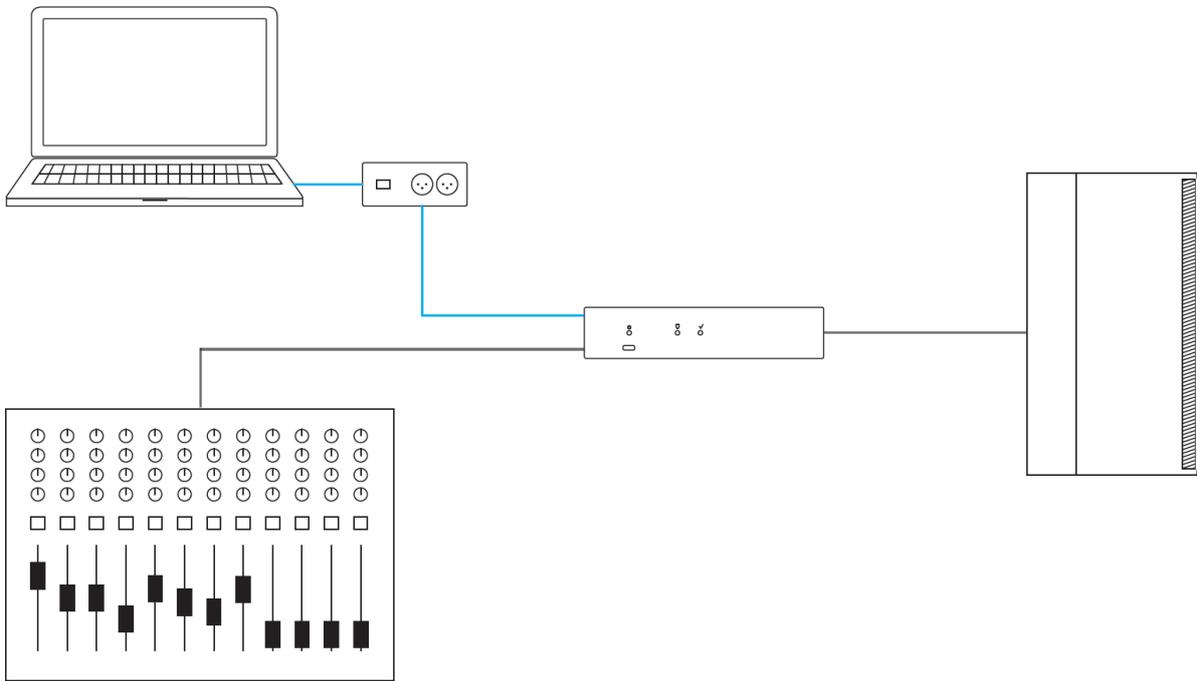
### **3.3.5 Updating the Firmware**

The range of functions in your **FOHHN** system depends not only on **FOHHN AUDIO SOFT**, but also on the firmware in your devices and on the loudspeaker database. From time to time, updates are available for these sets of data, which can be downloaded into **FOHHN AUDIO SOFT** (internet connection required!).

**Further information on this can be found in Chapter 6.1 “Updating the Firmware” of the FOHHN AUDIO SOFT user manual.**

### 3.3.6 Connecting All Devices

Connect your amplifier to the audio source and the loudspeakers, using the relevant inputs and outputs (see Chapter 3.2 “Connection Instructions and Controls”).



Connecting a MA-Series amplifier

### 3.3.7 Gain Structure and Signal Chain

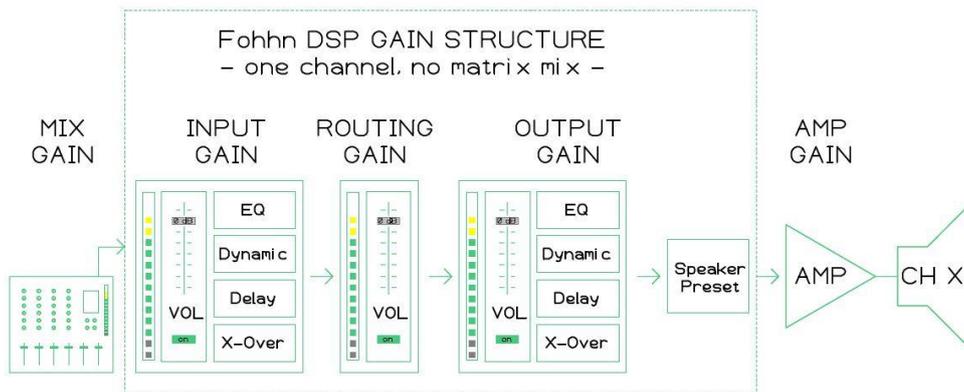


Fig. 1: Overview of the signal chain on a MA-Series amplifier channel

There are many gain options, both inside and outside the **FOHFN DSP**, that enable flexible handling of any application – even in complex situations where the matrix mixing functions are used.

Remember to check the level of all steps in the signal chain for each output channel in order to achieve best possible audio results.

The following instructions and tips illustrate this approach.

### Important tips

The best level is high enough to avoid noise and low enough to allow headroom for peaks!

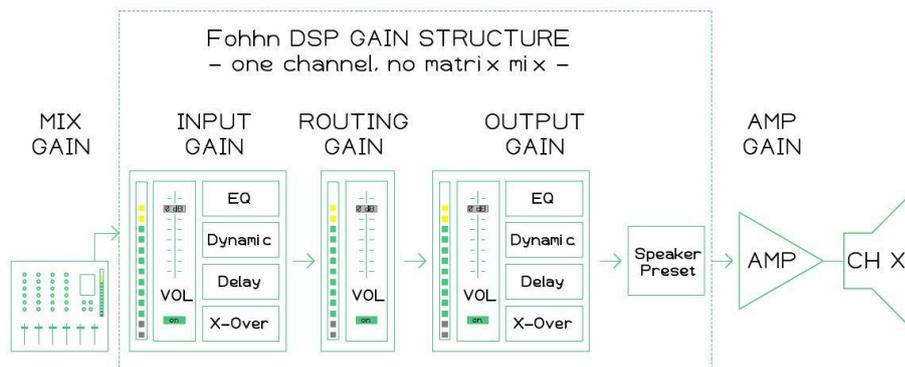
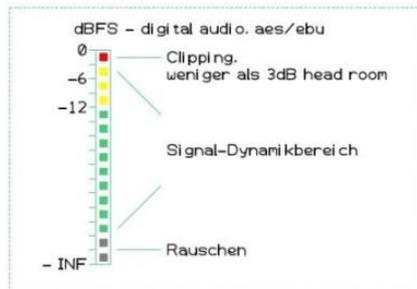
#### SPEAKER PRESETS

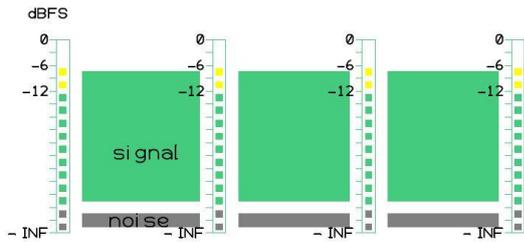
Using **FOHNN** speaker presets ensures that, within the **FOHNN DSP**, no audible clipping can occur.

#### ANALOG INPUTS

Please pay particular attention to the levels when using analog input signals! Analog signals are converted into digital audio signals. This always presumes a definition for 0 dBFS. **FOHNN** defines +15 dBu as 0 dBFS. However, this definition can vary significantly among manufacturers of mixing consoles and other similar equipment.

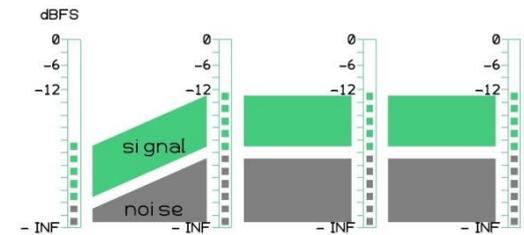
### Digital levels





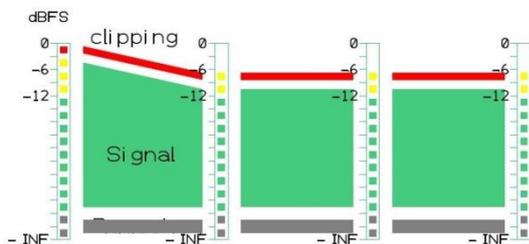
**Example 1**

Standard signal chain, input-, routing- and output-gain 0 dB  
 -> no change of input signal level



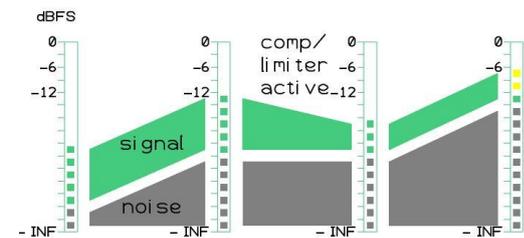
**Example 2**

Mix level too low; higher input gain also amplifies noise



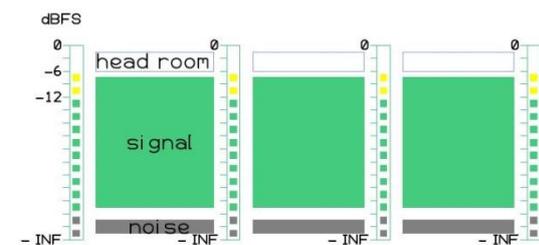
**Example 3**

Mix level too high leading to input signal clipping.  
 Lower input gain does not prevent audible clipping!



**Example 4**

Incorrect gain structure leads to loss of signal integrity; noise level rises!

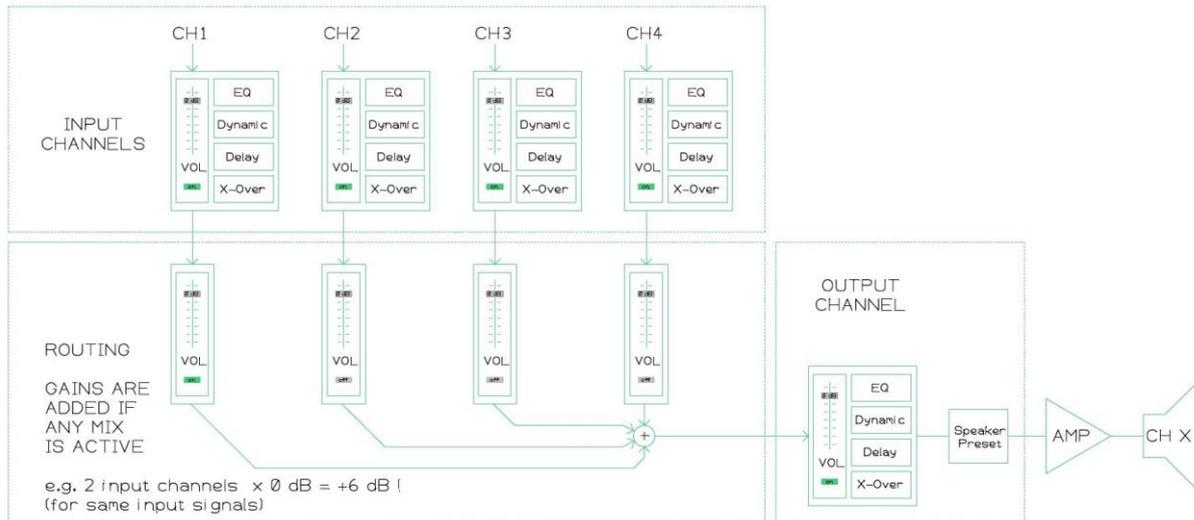


**Example 5**

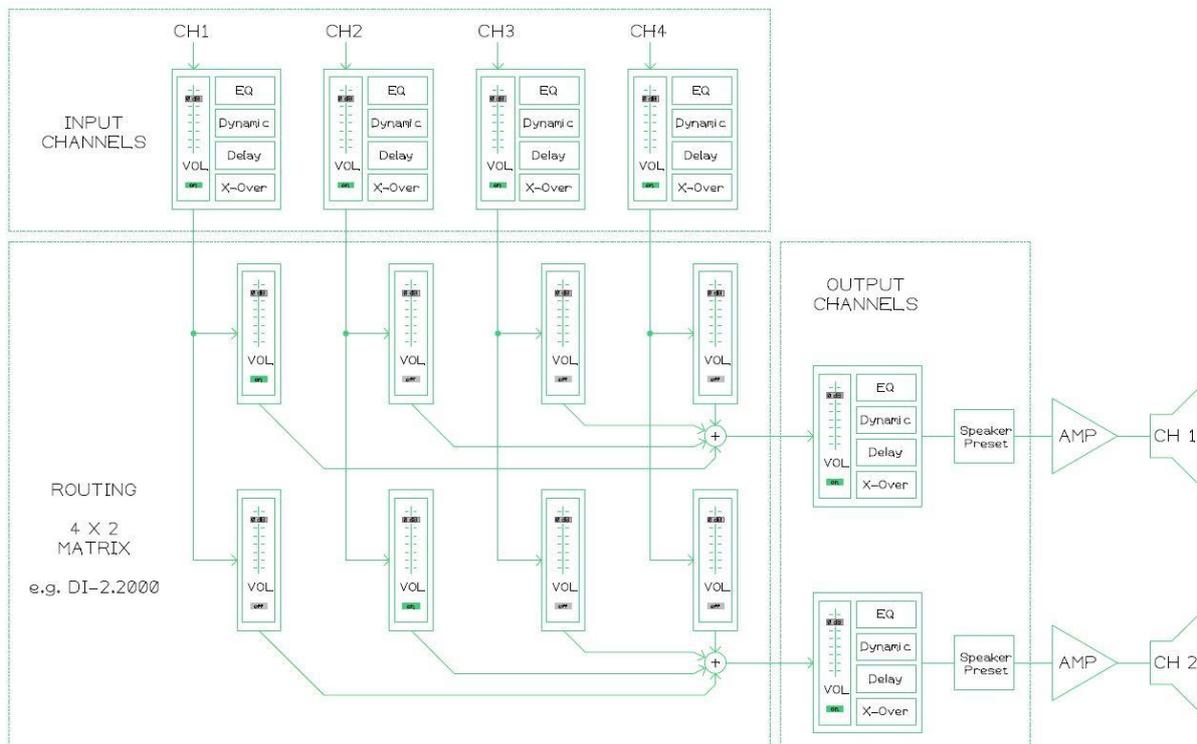
Optimum level for full signal integrity and sufficient headroom for peaks.

### 3.3.8 Matrix Functions and DSP Routing

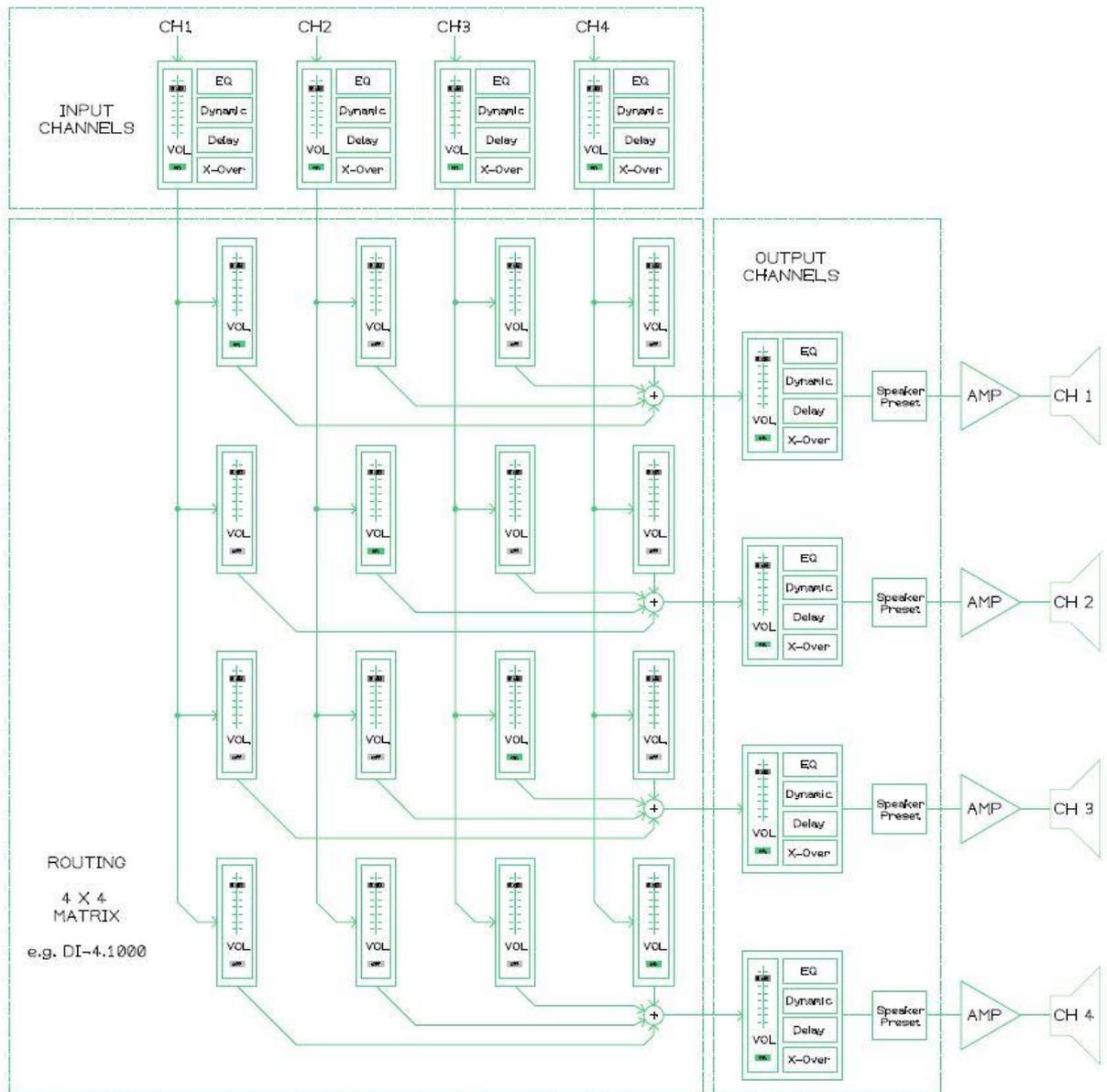
#### Fohhn DSP – Routing Matrix Functions



**Fig. 1: Four input channels are mixed to one output channel.  
The mix volume of each input can be adjusted by one routing gain.**



**Fig. 2: Four input channels are mixed to two output channels.  
The mix volume of each input to a specific output can be adjusted via one routing gain.**



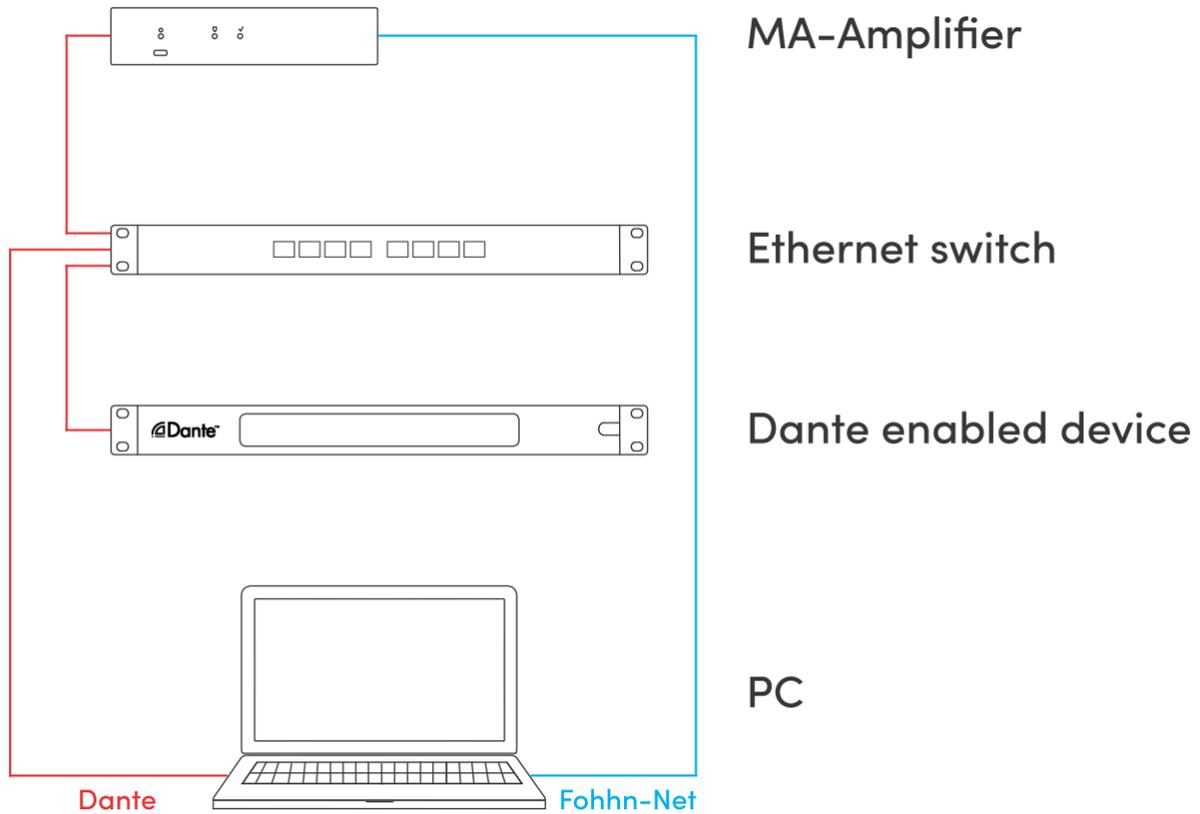
**Fig. 3: Four input channels are mixed to four output channels.**  
**The mix volume of each input to a specific output can be adjusted via one routing gain.**

### 3.3.9 Integration into a Dante™ Network

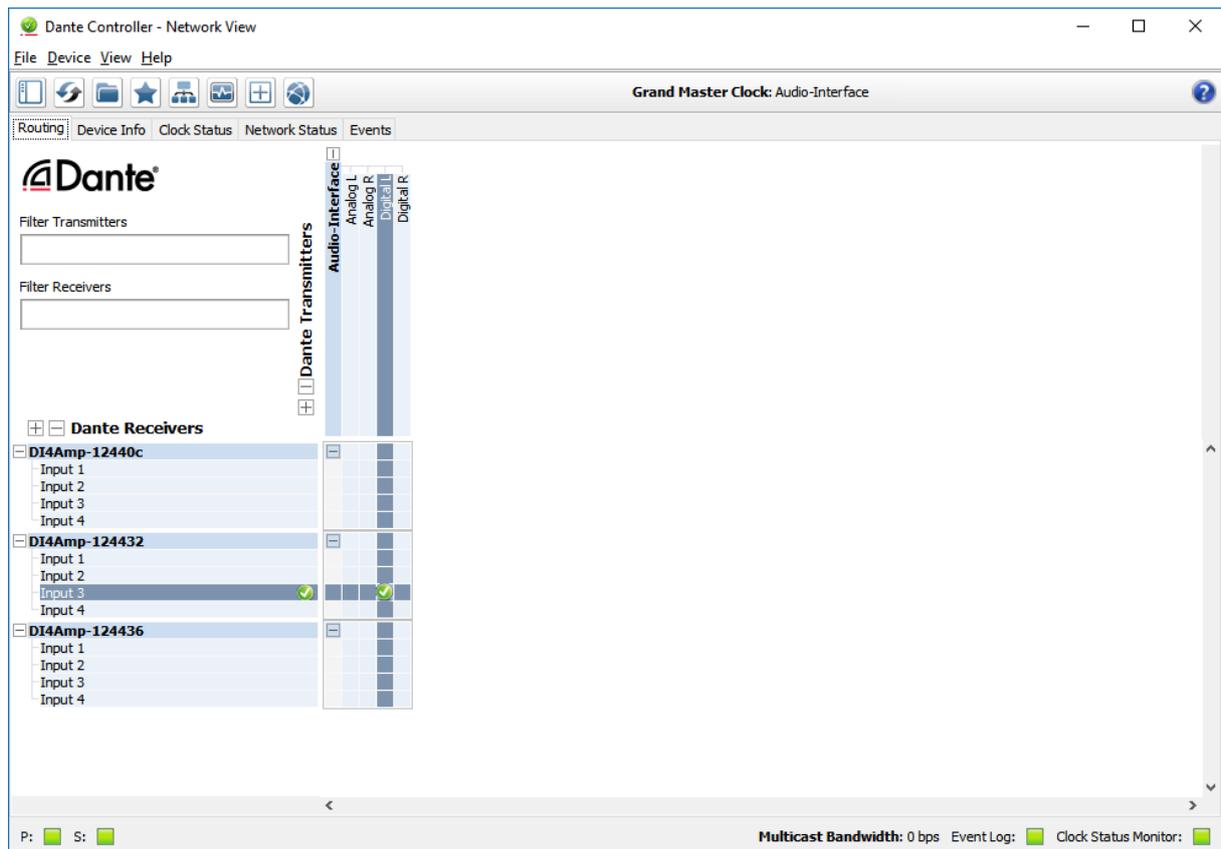
For amplifiers with a Dante™ interface the connection to the DANTE Audio Network is via an Ethernet switch. Controlling of the MA-Series amplifier is done via Fohhn-Net over USB or the Fohhn-Net connector. For control via PC, Audinate's Dante Controller software is required in addition to FOHNN AUDIO SOFT (see Chapter 3.3.3 "FOHNN-NET Cabling and ID Allocation").

You can download the Dante Controller software free of charge from here:

<https://www.audinate.com/products/software/dante-controller>



Example: Control of MA-Series amplifiers via computer and Ethernet switch using simple cabling.



All Dante™ input interface parameters (e.g. the audio routing within a Dante network) must be configured with the Dante Controller software.

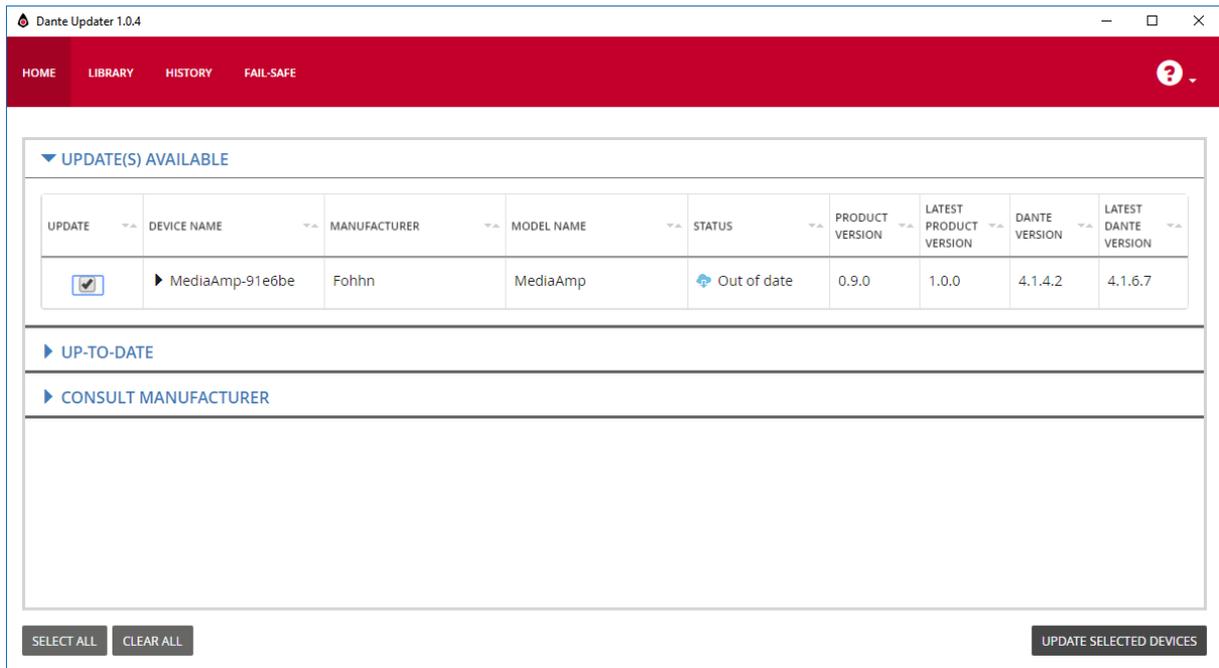
### ***Dante™ Interface Firmware Update***

To update the interface's Dante firmware, the **Dante Controller 4.2** (or newer) software is required. You can download this from the Audinate Website:

<https://www.audinate.com/products/software/dante-controller>

Perform the update as follows:

1. Start the **Dante Controller**.
2. Select *View -> Dante Updater*.
3. Select the listed Dante devices that are to be updated and click on UPDATE SELECTED DEVICES.
4. After a full update, the Dante devices should be restarted by switching off then on.



On the LIBRARY page you have the possibility to store the Fohhn Dante Firmware locally on your PC. Then the update can be done without an internet connection

**The Dante Firmware update only updates the firmware of the integrated Dante module. The FOHNN device firmware is unaffected and must, if necessary, be separately updated!**

Here you can find all of Audinate’s technical documentation relating to Dante:

<https://www.audinate.com/resources/technical-documentation>

Here you can find some helpful guidance on identifying a Dante device when the IP address is not known:

<https://www.audinate.com/faq/how-can-i-locate-dante-device-static-ip-address-unknown-subnet>

### 3.3.10 Integration into the AIREA-NET

The **MA-Series** amplifiers are equipped with an **AIRE-NET** Interface to give the possibility of being integrated into a **FOHNN AIREA** system: The **AIREA** system has its own network for transmitting supply voltage, digital audio signals (AES/EBU) and **FOHNN-NET** control signals – the **AIREA-NET**. The AES/EBU audio signals are routed to the input channels 3 and 4. For connection to this, an **AIREA BREAK OUT EXTENSION ABX-4** is required.

### 3.3.11 Renaming Devices and Output Channels

For better identification within **FOHNN AUDIO SOFT** it is recommended that, in an installation involving a number of **MA-SERIES** products, the individual amplifiers and/or their output channels are each given separate names. Proceed as follows:

1. Open the *Device List* or *Devices* view, either via the corresponding entry in the Menu view or via the respective button on the Toolbar.
2. Click with the right mouse button on the required system in the list (*Device List*), or in the workspace (*Devices*).
3. In the context menu, select the *Rename Device* option.
4. Enter a new name for the device in the *Edit name* dialog then close this by clicking *OK*.
5. To name individual output channels: In the *Devices* view, click on the desired amplifier with the right mouse button and select the *Rename Channels* option. Renaming individual output channels is also possible in the *Output Channels* view.

The new name will now appear in the *Device List*, *Devices* and *Channels* views.

## 3.4 Further Functions

### 3.4.1 Auto Power Save

**MA-SERIES** amplifiers have a configurable Auto Power Save mode, which enables energy to be saved and the longevity of the device to be extended. If no audio signal is received, the amplifier switches into Power Save Mode. As soon as an audio signal is detected, the amplifier is immediately ready for use again. In Power Save Mode, the amplifier's power consumption is < 10 W and no fans are used.

The amount of time before the device switches to Auto Power Save can be set as required – between 1 second and 12 hours. The mode can also be completely deactivated.

**We recommend using the *Auto Power Save* function with a switch-off time of 10 seconds! This function keeps the amplifier cool, even during short pauses and, as such, prevents thermal limiting. Furthermore, any noise will be fully suppressed.**

Proceed as follows to set up *Auto Power Save* in **FOHNN AUDIO SOFT**:

1. Select one or more amplifiers in the *Device List* and, with a right mouse click, open the context menu.
2. Select the *Options* entry. This opens the *Advanced device settings configuration* dialog.

Device	Name	ID
MA-4.100 DAN	MA-4.100 DAN	1
MA-4.100 DAN	MA-4.100 DAN	2
MA-4.100 DAN	MA-4.100 DAN	3

- Reassign offline devices
- Reload data from devices

---

- Load preset
- Save preset

---

- Window positions ▶

---

- Remove selected devices
- Options
- Speaker database utility

ID	Device	Name	Auto power save	Error on pilot tone fault	Switch 1	Switch 2	Password lock
3	MA-4.100 DAN	MA-4.100 DAN	10 seconds	-	Disabled	Disabled	...
2	MA-4.100 DAN	MA-4.100 DAN	10 seconds	-	Disabled	Disabled	...
1	MA-4.100 DAN	MA-4.100 DAN	10 seconds	-	Disabled	Disabled	Not locked

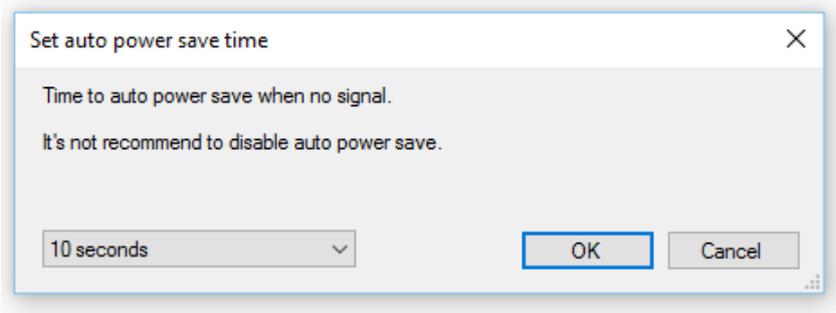
  

- Set auto power save
- Set pilot tone config
- Set switch config
- Password lock ▶

Set auto power save
Set pilot tone config
Close

3. In here, select one or more amplifiers and, with a right mouse click, open the context menu.
4. Select *Set auto power save*. The *Set auto power save time* window will open. (You can also open this window via the corresponding button at the bottom left of the *Advanced device settings* dialog.)



5. From the drop-down list (bottom left), select the desired switching time and confirm your selection by clicking *OK*.

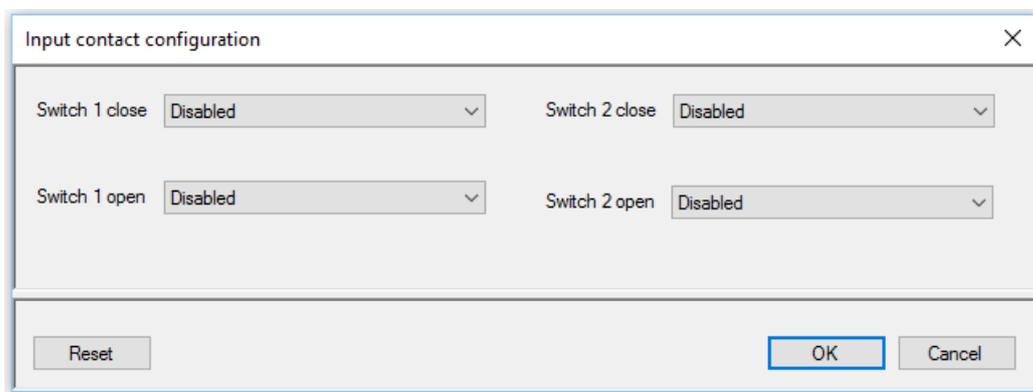
**Note:** During acoustic measurement of your loudspeaker systems, too short a switch-off time can lead to inaccuracies. We recommend a switch-off time of one hour or longer while you carry out your measurements.

### 3.4.2 Switching Contact

**MA-SERIES** amplifiers have two contact inputs (see Chapter 3.2 “Connection Instructions and Controls”), via which a preset change can be triggered.

This switching contact can be configured in **FOHNN AUDIO SOFT**:

1. Select one or more amplifiers in the *Device List* then, with a right mouse click, open the context menu.
2. In here, select the *Options* entry. This will open the *Advanced device settings configuration* dialog.
3. In here, select one or more amplifiers then, with a right mouse click, open a further context menu.
4. Select the entry *Set switch config*. This will open the *Input contact configuration* window.



5. Select a setting from the drop-down menus for the “close” (*Switch 1/2 close*) and “open” (*Switch 1/2 open*) status: for example, you can deactivate the current status (*Disabled*) or load one of up to 100 presets (*Load Preset*).
6. Confirm your selection by clicking *OK*.

When the amplifier is switched on, the selected presets will be loaded according to the current “close” or “open” status of the switching contact.

**Before configuring the switching contacts, we recommend that you first save all user presets!**

Further information on saving user presets can be found in the **FOHNN AUDIO SOFT** user manual. You can download this from the Fohhn website: [www.fohnn.com](http://www.fohnn.com)

### 3.4.3 Password Lock

**MA-SERIES** amplifiers and their parameter settings can be password protected (or locked) to prevent any subsequent changes. This password protection can be set up in **FOHNN AUDIO SOFT**.

Further information on password protection can be found in Chapter 6.6 “Password Lock” of the **FOHNN AUDIO SOFT** user manual. You can download this from the Fohhn website: [www.fohnn.com](http://www.fohnn.com)

## 4. Technical Specifications

	MA-4.100	MA-4.600	MA-2.1200
Amplifier technology	Class D		
Output power	4 × 65 W / 4 ohms	4 × 600 W / 4 ohms	2 × 1200 W / 4 ohms
	4 × 35 W / 8 ohms	4 × 300 W / 8 ohms	2 × 600 W / 8 ohms
	(1 kHz, THD+N < 1 %)		
Minimum impedance	4 ohms		
Input channels	4		
Amplifier outputs	4		2
DSP-routing (matrix)	4 × 4		4 × 2
Frequency response	20 Hz – 20 kHz		
S/N Ratio	> 103 dB/A		
THD+N	0.08%	0.15%	
	(1 kHz, 8 ohms, 3 dB below clipping)		
Dynamic range	> 120 dB		
Remote control	Fohhn Net over RS-485, USB-C, Fohhn Audio Soft		
Remote monitoring	temperature, protect, power supply, Fohhn Net, Fohhn Audio Soft		
Switching contact	load preset, standby on / off		
Password protection	yes		
Auto Power Save	adjustable from 1 s bis 12 h or never active		
Protection circuit	over voltage protection, over current protection, over temperature protection, short-circuit protection, DC protection, power on delay, soft start and inrush current limit		
Power supply	100 – 240 V AC 50/60 Hz, universal power supply with Power Factor Correction (PFC)		
Power consumption:			
- Maximum	300 W	700 W	700 W
- Idle state	7 W	35 W	45 W
- Auto Power Save	2 W	2 W	2 W
- Standby	2 W	2 W	2 W
Heat dissipation	max. 15 W, 51 BTU/h, 13 kcal/h	max. 120 W, 410 BTU/h, 104 kcal/h	max. 120 W, 410 BTU/h, 104 kcal/h
	(pink noise, 6 dB crest, 1/4 Pmax)		
Temperature range	0 – 40°C		
Cooling	temperature-controlled fan		
Weight	1.2 kg	5.2 kg	
Dimensions (W × H × D)	1 U / 1/2 19", 211 × 45 × 170 mm	1 U / 19", 440 × 45 × 370 mm	

<b>Controller</b>	
Digital signal processors	1
Independent limiters	20
Selective 3-band-limiting	bass / mid / high
Band specific time constants	yes
Filter technology	80-bit double precision
Input	analog or Dante, AES/EBU
Input DSP processing	yes
FIR filter	yes
Input gain	-80 dB – +12 dB
Routing gain	-80 dB – +12 dB
Output gain	-80 dB – +12 dB
EQ	8 × 10 fully parametric filters
	gain +/-12 dB, frequency 10 Hz – 20 kHz, Q 0.1 – 100
Limiter, compressor	8
Noise gate	8
X-over	8 × Linkwitz/Riley 4 <sup>th</sup> order, 24dB/octave
	highpass 10 Hz – 20 kHz, lowpass 10 Hz – 20 kHz
Delay	4 × 0 – 145 ms
	(0 – 50 m) outputs,
	4 × 0 – 30 ms
	(0 – 10 m) inputs
User presets	100
Speaker presets	100
System latency	1.2 ms
<b>Connections and controls</b>	
USB config	1 × USB-C socket
Mains connection	1 × C14 IEC socket
Switch 1 & 2	1 × Phoenix 3-pin
Airea Net	1 × RJ-45
<b>Input Interface (Analog)</b>	
Inputs	4 × analog
Signal inputs	analog, max. signal +18 dBu, phantompower (24 V DC) switchable
Frequency response	20 Hz – 20 kHz
THD	< 0.005 % typ.
	< 0.003 % 1 kHz 0 dBu
Signal / noise ratio	> 108 dB/A
Input impedance	10 kohms
Latency	1.0 ms

<b>Input interface (Dante)</b>		
Input	1 × RJ-45 100BASE-T Ethernet, Dante, 4 × 48 kHz	
Latency	Dante + 0.6 ms	
<b>Outputs (terminal block)</b>		
Outputs	1 × Phoenix 8-pin	1 × Phoenix 4-pin
Conductor cross section	max. 3.3 mm <sup>2</sup> flexible, 3.3 mm <sup>2</sup> rigid	
<b>Display (front)</b>		
Ready LED	blue = power on, blue flashing = sign	
Protect LED	red = error / protect / standby	
USB Config LED	blue = host, remote control over USB	
<b>Display (rear)</b>		
Receive / Send LED	remote control, Fohhn Net	

## 5. Troubleshooting

The following table describes how errors can be determined and shows the corrective measures that are recommended.

Problem	Probable Cause	Possible Remedies
No sound is audible. However, there is an audio signal.	The In- and Output routing in the User DSP is not correct.	Check the DSP settings in <b>FOHHN AUDIO SOFT</b> .
	The cable connection between amplifier and loudspeaker is defective or not plugged in.	Check the cable or connect the loudspeaker to the amplifier.
The amplifier is not recognised by <b>FOHHN AUDIO SOFT</b> .	Several products have the same <b>FOHHN-NET</b> ID. (An ID conflict will be displayed in <b>FOHHN AUDIO SOFT</b> .)	Change the ID - no ID can appear twice see 3.3.4 " <b>Fohhn-Net Cabling and ID Allocation</b> ").
	The ID search range is restricted.	Extend the search range from ID 1 to 254.
	The <b>FOHHN-NET</b> plug (see 3.3.1 " <b>Configuration</b> ") is not inserted.	Depending on the product variant, connect the system to the appropriate adapter.
The <i>Aux power</i> LED and the symbols on the device front panel are not lighting up.	There is no supply voltage.	Check whether a supply voltage is present.
	230 V not available. Mains fuse tripped.	Measure the supply voltage at the socket and check the fuse.
The <i>send</i> and <i>receive</i> LEDs are not lighting up.	The cable for the <b>FOHHN-NET</b> connection is defective or not plugged in.	Check the cable or connect the amplifier to an appropriate <b>FOHHN-NET</b> adapter.
The <i>protect</i> symbol lights up	There is an operational error.	Contact the Service department at <b>FOHHN AUDIO AG</b> immediately.
Distortion (Clipping) is audible.	No speaker preset loaded.	Load the preset for the speakers used in <b>FOHHN AUDIO SOFT</b> .
	The output impedance is too low. Short circuit.	Check the impedance of the loudspeakers (all outputs). Check all outputs for a short circuit.
	Input overdriven.	Check the input level.

If your problem does not appear in the above table, or if the problem is not fixed using the suggested solutions, please contact us at the following address:

### FOHHN AUDIO AG

Großer Forst 15  
72622 Nürtingen  
Germany

Tel. +49 7022 93323-0  
Fax +49 7022 93324-0

[www.fohhn.com](http://www.fohhn.com)  
[info@fohhn.com](mailto:info@fohhn.com)

## 6. Service and Repair

Servicing and/or repairs should only be undertaken by suitably qualified, **FOHHN**-trained personnel.

Do not carry out any servicing or any repairs to the device beyond what is listed under “**Maintenance Measures**” (below) or advised in the “**Cleaning Fan Filter Foam Without Tools**” section.

For details of a **FOHHN**® Service provider in your area, please contact us at the address on the previous page.

Keep the packaging for your device so that, in the event of any problem occurring, it can be returned in its original packaging. This will minimize the risk of any potential damage during transportation.

### 6.1 Maintenance Measures

- To clean your **FOHHN** amplifiers, only use a dry or slightly damp, well wrung out cloth.
- Do not use any aggressive cleaning agents, waxes or solvents (such as cleansing alcohol or paint thinner), as these could spoil the appearance of the device and/or affect the paintwork on the enclosure.
- There are no user-serviceable parts within the device.
- The device must only be repaired by suitably qualified personnel.

## 7. Appendix

### 7.1 Environmental Information

Please note that this product must not be disposed of in general household waste. It must be taken to a disposal centre for electrical/electronic waste. Please also note any applicable national or local regulations. Further information on these and on appropriate waste disposal facilities can be obtained from your city/town council as well as from your local distribution partner.

### 7.2 CE Marking and Declaration of Conformity

This DSP amplifier complies with the currently applicable conditions of EMC law and, as such, carries the CE marking.



The relevant Declarations of Conformity are available on request from

**Fohhn Audio AG**, 72622 Nürtingen

### 7.3 Trademarks

All trademarks and brand names referred to in this manual, which may be protected by third parties, are subject to the provisions of trademark law and the title rights of their respective owners. All trademarks, trade names or company names appearing here are, or may be, trademarks or registered trademarks of their respective owners. All rights are reserved, with the exception of those specifically granted.

In the absence of an explicitly labelled registered trademark in this manual, it cannot be necessarily concluded that a name is free of third-party rights.

### 7.4 Protection Classes and Protection Types



Protection Class I: All the equipment's electrical conductive housing components are connected with low resistance to the protective earth conductor of the installation.

#### **IP21**

The device's protection type (protection against solid objects with  $\geq 12.5$  mm in diameter, protection against manual contact and protection against dripping water)

## 7.5 Disclaimer and Copyright

### *Disclaimer*

The contents of this user manual have been created with great care. However, **FOHNN AUDIO AG** cannot guarantee that the information therein (images, text and other representations) is always complete, correct and current. **FOHNN AUDIO AG** therefore reserves the right to make changes or additions to the given information at any time. Neither Fohhn Audio AG (as a public limited company), nor its Executive Board or employees take any responsibility for direct or indirect damage, including loss of profit, which arises as a result of, or in connection with the information in this manual.

### *Copyright*

This manual as a whole, including its contents and works is, as such, subject to German copyright law. The reproduction, editing, distribution and any other kind of use outside the limits of the copyright requires the written consent of **FOHNN AUDIO AG**.

## 7.6 Contact Address

### **FOHNN AUDIO AG**

Großer Forst 15  
72622 Nürtingen  
Germany

Tel. +49 7022 93323-0  
Fax +49 7022 93324-0

[www.fohnn.com](http://www.fohnn.com)  
[info@fohnn.com](mailto:info@fohnn.com)

### **Fohhn on Social Media**



DB0082X 09/20