User Manual

Focus Modular
DFM-100 / DFM-110 / DFM-400

Version 1.0 / Oct. 2021

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

Contents

1. Introduction and General Information

Congratulations on the purchase of your Fohhn Focus Modular system. The DFM modules are the new generation of the renowned FM modules, which are now fully digitized and provide further developed Fohhn DSP and digital signal connections. Acoustically redesigned and equipped with even more powerful drivers, DFM delivers excellent, audiophile sound and best speech intelligibility. A high-quality and high-performance solution for larger conference rooms, theatres and even open-air concerts. And all of this with an enclosure that is just about 22 cm wide and can be flown straight and integrated seamlessly thanks to beam steering. The Fohhn Beam Steering Technology allows users to adjust the system's vertical beam dispersion characteristics in real time, enabling optimum sound coverage – even in the most acoustically challenging venues.

All the functions of a Focus Modular system can be controlled using a single piece of software, Fohhn Audio Soft.

To benefit from all the advantages of your Focus Modular system and to guarantee smooth operation, please read the following user instructions carefully before putting the system into operation and keep this manual for future reference!

1.1 Safety Instructions

Please read the following safety instructions in their entirety before putting your Focus Modular system into operation. Always keep these instructions near the device. Reading the user manual 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 Explanation 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 deconstructing such a system have read and understood the contents of this manual.

All personnel should be aware of local regulations concerning workplace safety. It is strongly recommended to wear suitable helmets and safety footwear during the rigging procedure.

The information presented here should, however, be regarded as accompanying advice and it does not affect the ultimate responsibility of the user to ensure safe on-site operation of a Focus Modular system.

⚠️ **Warning!**

To prevent injury caused by a collapsing system,
- **this device must be securely mounted in accordance with the rigging instructions and current safety guidelines. Only use the specially designed Fohhn mounting accessories or components, which are explicitly specified in the rigging instructions.**
- **this device must be regularly inspected for any signs of wear or loosening of the rigging connections.**
- **it is necessary to ensure that the mounting points on a building, scaffolding or truss structure have sufficient load-bearing capacity and are structurally viable.**
- **all components of a hung (i.e. "flown") device must be visually inspected before installation. Any component showing missing parts, deformations, cracks, corrosion, fractured welds or other signs of wear must not be used under any circumstances.**
- **the load limit of any component that will be used for system suspension (including shackles, chains and hoists) must not be exceeded. In order to comply with local safety regulations, these load limits may, in certain circumstances due to underlying safety factors (operating ratios), need to be recalculated and, if necessary, reduced.**
- **it is strongly recommended that a flown (loudspeaker) system should be landed and dismounted if local wind intensity is equal or greater than 6 Bft (Beaufort Scale).**

All components required for the mounting or suspension of a Focus Modular system have been designed and constructed in accordance and compliance with the following regulations that are applicable in Germany: DGUV V17 (formerly BGV-C1), DGUV I215-313 (formerly BGI 810-3), DIN EN 1993-1-1 and DIN EN 1999-1-1.

The operating ratio against non-elastic deformation (yield strength) is equal to or better than 5:1, the operating ratio against fracture (tensile strength) is equal to or better than 7:1 for an array with a gross weight of 300 kg. If the system is to be used in countries that have stricter requirements, the permissible load capacity must be reduced accordingly.

⚠️ **Warning!**

To prevent injury through accidents, the stability of the entire Focus Modular system (e.g. during assembly, in a vertical stack or when using a pole-mounted flange) must be guaranteed. Make sure that the system cannot topple over (e.g. as the result of a sloping surface or wind) and that it is protected against being hit from people or vehicles, for example.

⚠️ **Caution!**

To avoid injury,

- **the device must be stored, installed and operated well away from children.**
- **no one must climb on either flown or stacked loudspeaker systems.**
- **the 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 poor transportation conditions (e.g. with unsuitable packaging).**

If necessary, please contact your Fohhn dealer and the transportation company immediately. Contact details can be found in the appendix to this user manual.

1.1.3   Electrical Safety Information

Focus Modular systems 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: Confirmed by the attached CE marking.

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

⚠️ **Warning!**

To minimize the risk of electric shock

- **the mains plug 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 amplifier housing and loudspeaker enclosure must never be opened. It does not contain any components that can be repaired by the user. In the case of a defect, please consult qualified service personnel and/or the dealer from whom you purchased the 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 / wet conditions for a long period of time.**
- **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 is not going to be used for a while. (Remove the plug from the mains socket to completely disconnect the device.)

1.1.4 Acoustic Safety Information

Focus Modular 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 (5 metre or less) to a 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 may occur when some other device in the signal chain is switched on or off, connected or disconnected from the system, e.g. a mixing desk, audio matrix or controller.**

1.2 Connections and Wiring

⚠️ **Warning!**

Please note the following when wiring up your system:

- **Make sure that all cables are working faultlessly.**
- **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 audio and data connections.**
- **Only use power cables with a fully intact grounding pin**
- **Lay and secure the cabling in a way that it cannot be damaged by tools, machinery, the loudspeakers itself or its flying accessories.**
- **Lay the cabling in such a way that it cannot be tripped over.**
- **Protect any laid cables from unnecessary traction.**
- **Note the respective pin assignment of audio and data cabling.**
- **Never use any signal or power cables for mounting, hoisting or securing a system.**

Wiring of loudspeakers should only be carried out by suitably qualified personnel.

More information can be found in section 4.1**Fehler! Verweisquelle konnte nicht gefunden werden.** of this user manual.

1.3 Operating Conditions

⚠️ **Caution!**

Please note the following when operating your Focus Modular system:

- **The permitted ambient temperature of the device during operation ranges from 0 °C to +40 °C. A short period of use outside this temperature range is possible, but not advisable.**
- **The device is intended for use in a dry environment with normal levels of dust and humidity in the air.**
- **Never expose the device to any aggressive chemical fluids or vapours.**

- **Always make sure that heat can be dissipated via the rear surface of the device enclosure.**
- **Always make sure that the device is well ventilated. 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.**
- **To guarantee sufficient cooling for the device, the following minimum gaps must be maintained: left/right side >5 cm, back >10 cm, top >10 cm.**
- **Never expose the device to strong vibration.**

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 power up again.

The temperature of the Focus Modular loudspeaker system will be displayed in Fohhn Audio Soft. Shutdown is getting more likely 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.

⚠️ **Warning!**

The device should be immediately inspected by a Fohhn Audio AG approved service partner if
- **the mains power socket is damaged,**
- **a foreign body or liquid has got into the interior of the device,**
- **the device is not working normally i.e. it is showing marked differences in performance,**
- **the device is damaged (e.g. after a fall).**

1.4 Storage and Transportation

Please note the following:
- The device should only be transported in its dedicated transport case.
- Store the device in a dry environment with a constant ambient temperature 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 two hours in the environmental temperature before using it.

2. The Product

2.1 Product Description

Fohhn Focus Modular loudspeaker systems, which form part of the Focus-Series, are active, modular loudspeaker systems designed both for touring applications and fixed installation use.

The special feature of these systems is their integrated Beam Steering Technology: Using dedicated control software, Fohhn Audio Soft, the systems' vertical beam dispersion characteristics can be intuitively controlled in real time and thereby optimally adjusted to suit the particular application. Conventional mechanical curving, i.e. the physical adjustment of the line curvature is no longer necessary, though in some cases mechanical inclination of a Focus Modular array may improve the acoustical result.

The current version of the required Fohhn Audio Soft software can be downloaded free of charge from www.fohhn.com.
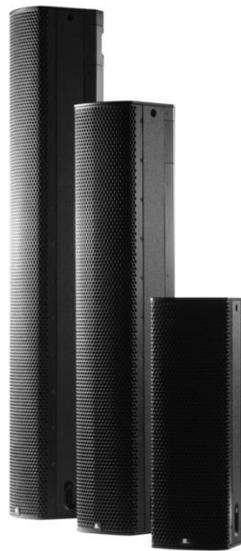
The following modules are available:
- **DFM-100: high frequency module**
- **DFM-110: high frequency module**
- **DFM-400: low-mid frequency module**

The high frequency modules are equipped with 8 or 16 1" compression drivers respectively, and a preceding Fohhn waveguide system. Each high frequency driver is separately powered by a Class-D amplifier channel. The high frequency modules have a frequency range of 1,7 kHz to 20 kHz and can only be used in combination with one or more low-mid modules.

The low-mid module is equipped with 32 long excursion cone speakers. The chassis are driven in pairs by 16 Class-D amplifier channels. The frequency range is 55 Hz to 1,7 kHz. DFM-400 modules are linkable to longer stacks in an array with other DFM-400.

A brief overview is given in the table below:

Module	DFM-100	DFM-110	DFM-400
Components	8x 1" driver	16x 1" driver	32x 4" chassis
Amplifier channel	8x 120 W, Class-D	8x 120 W, Class-D	16x 120 W, Class-D
Frequency range	1,7 - 20 kHz	1,7 – 20 kHz	55 Hz - 1,7 kHz

The modules can be acoustically and mechanically combined as required to suit the particular application and space situation. Long reach and optimal sound results can be achieved even in acoustically difficult situations.

2.2 Delivery and Unpacking

Every Focus Modular module 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 Focus Modular module is delivered with the following:
- 1x Focus Modular module DFM-100, DFM-110 or DFM-400
- 1x powerCON mains cable
- 1x powerCON mains link cable
- 1x etherCON link cable
- 1x safety instructions

When unpacking the system, we recommend the following procedure:
1. Examine the packed product for any signs of transport damage.
2. Remove all packing material from the product.
3. Examine the product for any signs of transport damage. Don´t forget the bottom surface.
4. If the product has been damaged, inform the transportation company immediately. Any claim for transport damage must be made by the you, the consignee. Keep the packing material for examination by the transportation company.

2.3 Product Identification

The Focus Modular module's type designation can be found below the upper connection panel at the rear side of the speaker.

2.4 Accessories

Setting up a Focus Modular module requires a Windows PC (Windows 7 or higher) with Fohhn Audio Soft installed and a Fohhn network adapter or – if connected via Fohhn Airea – an AIREA breakout box.

Product ID	Article number	Description
NA-11	6115-00000	Fohhn Net USB Adapter
NA-4	6122-00000	Fohhn Net Ethernet Adapter
ABX-2	1716-00000	Analogue NF and Fohhn Net to Airea converter
ABX-5	1719-00000	Dante to Airea converter and Fohhn Net Ethernet Adapter
AM-4.4	1714-xxxxx	Airea Master

The following accessories are available:

Product ID	Article number	Description
WFM-100	8441-B0000	Wall-mounting bracket for DFM-100, black
WFM-110	8442-B0000	Wall-mounting bracket for DFM-110, black
WFM-400	8443-B0000	Wall-mounting bracket for DFM-400, black
VFM-1	8444-B0000	Flying adapter, black, including: - 2 x shackles with 1000 kg WLL - 1 x shackle with 2000 kg WLL
CC-300	8320-B0000	Cardan Clamp, black, with rotation brake, for use with VFM-1, 300 kg SWL (Safe Working Load)
RC-FM-100	8147-00000	Rain cover for FM-100 / FMI-100, sound permeable, extendable via zip fastener
RC-FM-110	8148-00000	Rain cover for FM-110 / FMI-110, sound permeable, extendable via zip fastener
RC-FM-400	8149-00000	Rain cover for FM-400 / FMI-400, sound permeable, extendable via zip fastener
RC-FM-LID1	8150-00000	Lid for FM-/FMI rain cover, closed
RC-FM-LID2	8151-00000	Lid for FM-/FMI rain cover, open, for use with VFM-1
FM-CASE	8156-00000	System flight case for any two modules

3. Mechanical Setup and Rigging

3.1 Wall mount installation

On the back of each Focus Modular module, two M8 threaded inserts can be found at both the top and bottom. These are solely intended for attaching dedicated wall brackets.

3.2 Rigging a Focus Modular System

3.2.1 Rigging System of a Focus Modular Module

Each Focus Modular module has two aluminium supporting tubes integrated into its enclosure. These are located behind the right and left side panels respectively and can be accessed via slots in the aluminium covers that form the top and bottom ends of the enclosure. The two tubes carry the entire weight of the system – both must therefore always be used during installation.

At the lower end of each supporting tube is a steel latch. It can be extended, enabling the Focus Modular module to be joined to another module. A knurled-head screw acts as a handle when moving the latch and keeps the latch locked within the enclosure during transportation, or when the system is not in use. The knurled-head screw may be tightened as soon as the latch is connected to a rigging pin to avoid rattling noise at high SPL of the system.

A visible yellow tag on the latch indicates, that the latch is not connected to the respective slot in the lower module correctly.

To connect the Focus Modular modules to one another, or to flying adapters, two ball lock pins are used. During transportation, these ball lock pins can be securely housed in two pilot holes on the connector panel.

⚠ Danger!

Always make sure, no yellow tag is visible at the two latches and all ball lock pins are inserted correctly before hoisting the system.

3.2.2 Flying adapter VFM-1, number of arrayable modules

To fly an array of Focus Modular modules, the flying adapter VFM-1 is required. Its load capacity is 300 kg, which is the limit for any possible array combination including cabling and accessories. **The total number of 6 modules may safely be suspended.**

⚠ Warning!

Using any other form of suspension is expressly forbidden.
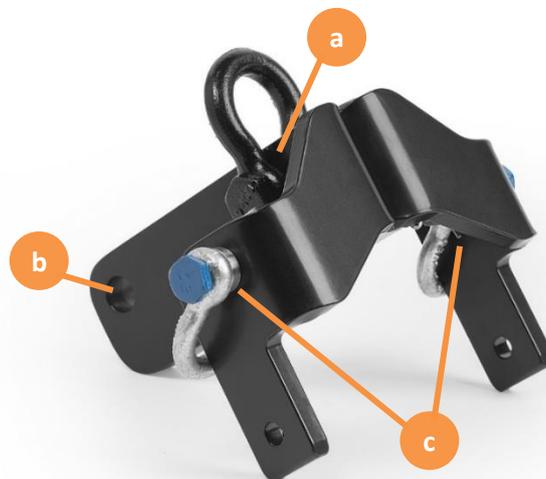
Focus Modular is a modular Beam Steering system. In its main mode of application, it is usually flown or suspended in a vertical, linear format. However, in some cases it can be advantageous – for acoustic or optical reasons – to carry out a mechanical inclination.

The VFM-1 has three suspension points for different purposes.

1. Vertically straight alignment: Use **(a)** as main rigging point to set up an array that hangs vertically straight without any degree of tilt. In this instance, the supplied 2t shackle in accordance with DIN 13889 must be used.
   Attach elements to **(b)** which enable horizontal alignment of the Focus Modular system. If cables are used for this purpose, the tensile direction should, ideally, be approximately horizontal to prevent the modules from tilting.

2. Vertically tilted alignment: Use **(b)** as main rigging point to set up an array with a slight forward tilt without the need for a second rigging point. In this instance, the supplied 2t shackle in accordance with DIN 13889 must be used.

The inclination angle depends on the numbers of modules in the array and their type and is given in the table below for serval module combinations.

Top	Middle	Bottom	Incl. angle
DFM-100			14,5°
DFM-110			8°
DFM-400			7,5°
DFM-400		DFM-100	4°
DFM-400		DFM-110	3,5°
DFM-400	DFM-400	DFM-100	2,5°
DFM-400	DFM-400	DFM-110	2,5°
DFM-100		DFM-400	5°
DFM-110		DFM-400	4°
DFM-100	DFM-400	DFM-400	3°
DFM-110	DFM-400	DFM-400	2,5°
DFM-400		DFM-400	4°

3. Safety chains: The two permanently attached 1t shackles at **(c)** are only to be used for safety cables or chains. Never use just one of these two suspension points.
    If **(b)** is chosen to be the main rigging point, the safety chain and a 2t shackle can be attached to **(a)**, provided that any potential outward swing of the module is also prevented in the event of a failure.
    Please refer to section 3.2.4.

⚠️ Danger!

Under no circumstances must a Focus Modular stack be tilted or inclined sideways – either during use, assembly or dismantling. This could cause structural overload and damage to the internal and/or external flying hardware. Viewed from the front, every Focus Modular system must hang vertically.

The use of a CC-300 Cardan Clamp guarantees vertical suspension, regardless of the installation situation, and is therefore mandatory in this particular case.

3.2.3   Cardan Clamp CC-300

The Cardan Clamp CC-300 can be used to mount a Focus Modular system to a traverse or bar, while the array remains in its centre of gravity without tilting sideways. Other advantages are an ease in rigging and in the horizontal alignment of the system.

The CC-300 consists of three components:

1. Half Coupler **(a)**: The Half Coupler used here is a fixed system component, which should not be removed or substituted for other components that may appear identical in construction. The coupler's clamping screw should always be secured to a bar via use of lock nuts.

2. Gimbal suspension **(b)**: This suspension ensures that, under all operating conditions, no load bending can affect the connection between the traverse/bar and the Focus Modular system and that, even in the case of vertically slanting traverses, the system can hang unhindered in its central position of gravity.

3. Y-branch with rotation brake **(c)**: Adapter to be attached to a VFM-1.

3.2.4 Safety chains

Despite all checks and worst-case scenario considerations, any component could fail during the flow of force between load and suspension point. This could either be a shackle or a motorized chain, or even the suspension points of the rig or building itself.

⚠️ **Warning!**

To guarantee the best possible degree of safety for staff, performers and public, we strongly recommend the use of safety chains as a secondary safety component at all times – even when using steel reinforced multi-layer slings and lifting belts like STEELFLEX and even if it´s not required by local safety regulations. This is most important since Focus Modular has been designed as a single-point-suspension system.

When selecting safety chains, their workload limit (WLL) has to be greater than the entire weight of the system (loudspeaker modules, flying adapter, cables, motors etc.) plus a safety margin complying with local regulations. We recommend using safety chains with a WLL of minimum 2t and a safety factor of 6. They should also be attached to a secure point that is structurally separate from the actual system suspension point at the truss, scaffold or building.

Never use just one of the safety chain suspension points of the VFM-1.

Once the Focus Modular system has reached its final working height, all safety chains have to be pulled tight and attached to the safety suspension point as tight as possible. Any failure of a suspension element should only lead to a minimal drop in height, the maximum drop distance should be not more than 10 cm to keep the dynamic forces as low as possible.

It is also necessary to ensure that the system cannot or only marginally rotate or swing when dropping into the safety chains. The best method of securement is via a chain bridle, which can be attached to the two shackles of the safety skids.

With flown systems that involve a CC-300 Cardan Clamp, it is important to ensure that rotation and alignment of the system remains possible.

| Main and secondary safety chains installed correctly | Safety chains are too loose | Safety chain suspension points must not be used as main rigging points |

3.2.5 Flying from the hook of a crane or chain hoist

Due to its slimline construction, a Focus Modular system cannot be horizontally pre-assembled on the ground and hoisted as a complete unit. Assembly requires that each individual module is first hoisted and then (by slightly lowering the rig/motor) placed on top of the next lowest, upright module.

Proceed as follows:

1. Start by connecting each Focus Modular module to Fohhn Audio Soft and check its Fohhn Net ID. To avoid any confusion during assembly, mark each module, e.g. with a sticker on its front grille that shows the Fohhn Net ID. This can be removed before the system is flown. It may be helpful to put together a brief overview of all integrated Fohhn Net devices, along with their respective ID numbers.

2. Connect the top module to the VFM-1 by inserting the VFM-1's latches into the slots on the top of the Focus Modular module. Only use the ball lock pins of the Focus Modular module located in their pilot holes in the connector panel. Therefore, the VFM-1 must be slightly raised.

⚠️ Danger!

Make sure that both pins are fully inserted and that their collars are fastened to the metal of the supporting tube.

3. Attach the VFM-1 to the hook of the motor or crane by using the supplied 2t shackle and the suspension point described in section 3.2.2.

4. Fasten the safety bridle to both 1t shackles. If using separate cables or chains for both points, make sure that these are exactly of the same length and that they are attached to the same point. Please refer to section 3.2.4.
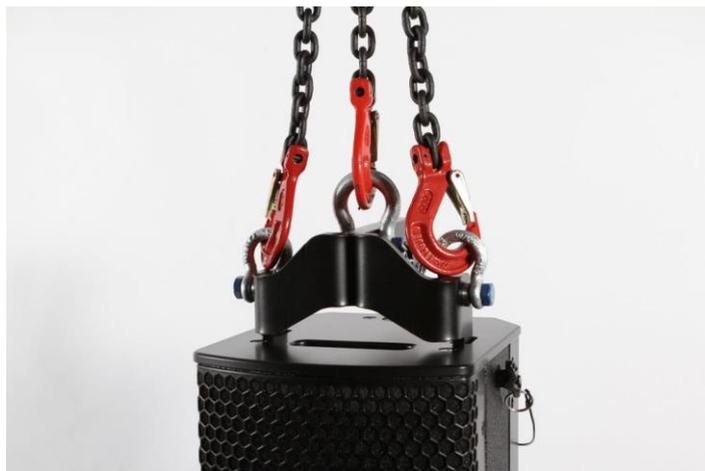
5. Wire power cable, Airea data or Fohhn Net and digital audio data. Relief the cables to avoid them from dragging on the VFM-1.

6. Raise the currently suspended module to a height that enables you to position the next module directly underneath it.

7. Carefully lower the suspended module until it sits on top of the standing module. Stop the motor as soon as the chain loses its tension. Then align both modules horizontally with one another.

⚠️ **Warning!**
Never put your hands in between the two modules.

8. Loosen the knurled-head screws on the upper module's latches and slide them into the lower module's supporting tubes. A visible yellow tag on the latch indicates that the latch is not fully inserted, and adjustment is needed. Keep the knurled-head screws loosened for the moment.

⚠ Danger!

Never hoist the system if a yellow tag is visible.

9. Connect the two modules. Only use the ball lock pins of the lower module located in their pilot holes in the connector panel. The knurled-head screws may now be tightened gently to avoid rattling noise of the Focus Modular system at high SPL.

⚠ Danger!

Make sure that both pins are fully inserted and that their collars are fastened to the metal of the supporting tube. If any yellow tag is visible, do not hoist the system.

10. Wire the upper module to the lower module using the supplied link cables.

11. Repeat steps 6 to 10 for each module in the array.
12. Hoist the completed Focus Modular system to its final working height and fasten the safety bridle to the relevant points. Please refer to section 3.2.4.
13. Align Focus Modular system horizontally. Therefore, the VFM-1's suspension point **(b)** may be used according to section 3.2.2.

14. Dismantling the system is done in reverse order.

⚠️ **Warning!**

- **Make sure that the surface onto which the system will be lowered can take the corresponding load and is also level.**
- **After the system has been lowered to the ground, the rigging motor must immediately be switched off. The chain should lose its tension, yet it must not be allowed to noticeably sag. Otherwise, the system could tip over.**
- **Never attempt to remove ball lock pins that are under load. This leads to risk of injury.**
- **Make sure that all cable connections have been removed before two modules are separated from one another.**

3.2.6 Flying from traverses or bars

It is recommended to use the Cardan Clamp CC-300 when flying a Focus Modular system from traverses or bars. This gimbal suspension ensures that, under all operating conditions, no load bending can affect the connection between the traverse/bar and the Focus Modular system and that, even in the case of vertically slanting traverses, the system can hang unhindered in its centre of gravity.

Follow the guideline of section 3.2.5 but instead of attaching the VFM-1 to a hook in step 3. do as follows:

1. Attach the VFM-1 to the CC-300. This is done by pushing the CC-300's Y-branch onto the VFM-1. Choose suspension point **(a)** of the VFM-1 for vertically straight alignment or **(b)** if an inclination angle is desired. Insert the ball lock pin of the CC-300 completely. The retaining ball must unlock without obstruction on the other side.

2. Lower the traverse or bar from which the system is to be flown until the CC-300's half coupler can be attached. Manually tighten the clamp in the first instance.

3. Raise the traverse until the first module is hanging freely above the floor. The CC-300 will have now aligned itself vertically. Then, tighten the nut of the half coupler firmly and secure it with the lock nut.

4. Resume at step 4 in guideline of section 3.2.5.
5. Align Focus Modular system horizontally. Therefore, turn the hoisted stack around the axis of the CC-300 and tighten the knurled-head screw of the CC-300's rotation brake to prevent the system from unwanted rotation.

3.2.7 Rain covers for outdoor use

Every Focus Modular module is fully active, containing not only the Class-D amplifiers for the various drivers and the switching power supplies, but also all the necessary DSPs for signal processing. To protect these electronics from moisture, a rain cover is essential if using a Focus Modular system at outdoor applications.

⚠️ **Warning!**

- **Never use a Focus Modular module in the rain without its original Fohhn rain cover. Water ingress can cause danger to life through electric shock. The system itself can get damaged.**
- **Only use original rain covers, otherwise the operational cooling process may be impaired. This can lead to the module overheating and shutting down.**

Fit the rain cover as follows:
1. Guide both of the VFM-1's latches through the slit in the lid of the rain cover. The fabric surface should be facing upwards.

2. Connect the VFM-1 to the Focus Modular as described in section 3.2.5. The VFM-1 must be completely flush with the Focus Modular system's rain cover to guarantee impermeability. Turn the rain cover lid's protruding collar upwards.

3. Join the lid with the covers' side elements using zippers. The actual positioning of the rain cover on the loudspeaker enclosure is determined by the sewn-in magnets, which adhere to the front grille. Move the magnets and pull the cover tightly forwards and downwards simultaneously.

4. Close the rain cover by pulling the zipper that runs the length of its side. The remaining opening above the connector panel will then be covered by the two flaps. Stick the flaps together using the Velcro strips. Therefore, hold the flaps in place from the inside.

5. The closed rain cover is kept away from the module's rear panel by clamping elements. The two connector panels through which the Focus Modular system maintains its air supply and extraction are also equipped with clamping elements.

⚠️ **Warning!**

Never shut these openings and never press the rain cover flat against the rear of the loudspeaker to avoid the system from overheating.

6. Further rain covers can be added to relevant modules during the hoisting process. These are fitted as described above and joined via zipper to the cover above.

4. Wiring and Software Setup

4.1 Wiring

Each Focus Modular module has an upper connection panel as input terminal and a lower as output, respectively. In an array of modules, cabling of the supply line may start at the uppermost module and is then connected daisy-chained to all modules below. However, since every input panels have additional audio- and Fohhn Net link sockets, all DFM modules have the capability to act as "master" module, i.e. as first in the line of connection.

4.1.1 Input panel
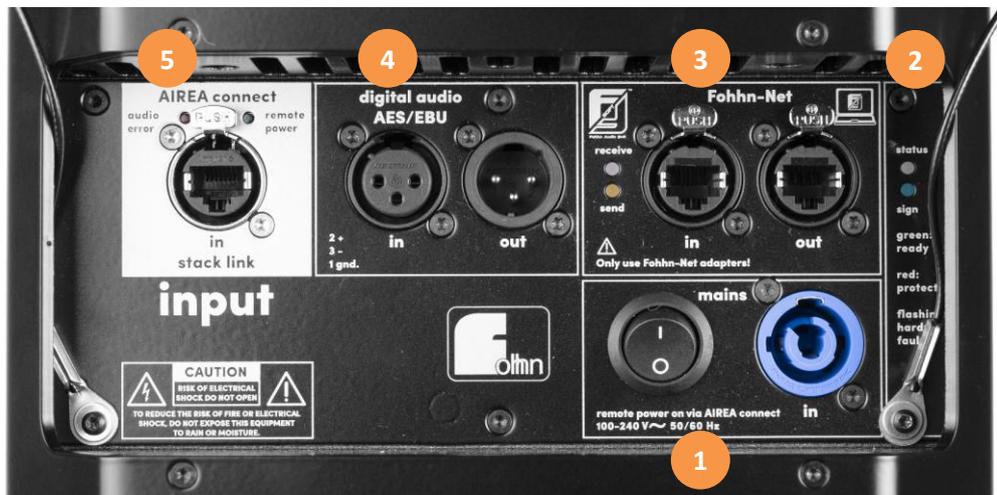
1. **Mains**

   The mains power supply cable is connected to the powerCON socket. The universal power supply permits a supply voltage of 100 - 240 V at a frequency of 50/60 Hz. Focus Modular modules are equipped with a switch-on delay (soft start function).
   The mains switch of the Focus Modular gives signal to power up to the system rather than be hardwired to break the contact of the mains supply. Thus, it has three different operation modes:

   a) Focus Modular stack supplied and wired with Airea coming from an Airea Master: If the switch is off, you´re able to switch the stack on or off via Fohhn Audio Soft by switching the corresponding output of the Airea master. The modules are powering up sequentially from top to bottom.

   b) Focus Modular stack supplied and wired with Airea coming from an Airea Master: If the hardware mains switch is on, the modules are switched on permanently.

   c) Focus Modular stack supplied with Airea from an Airea breakout box ABX-xxx or with separate feeds of AES/EBU and Fohhn Net: If the hardware mains switch is on/off, the module is permanently on/off, respectively.

⚠️ **Caution!**

Only connect the systems with the mains power supply after all the other system components (mixing desk, playback devices etc.) have been switched on. Switch off in reverse order, disconnecting the Focus Modular from the mains power before switching off all the other components. Otherwise, this could result in hearing damage due to loud signals.

2. **Status and Sign LEDs:**
   Green status LED permanently on: The module is ready.
   Red status LED permanently on: The module is in protect mode.
   Red status LED flashing: The module has some sort of hardware fault.

   The blue sign LED can be manipulated using Fohhn Audio Soft. It is connected to a corresponding blue LED at the front of the module below the Fohhn Logo. Its purpose is mainly the visual identification of a Focus Modular module in a stack to evaluate its correct position and Fohhn Net ID.
   Blue sign LED permanently on: Mains power is available, the module is switched on.
   Blue sign LED permanently off: Makes the stack visually unobtrusive during the show.
   Blue sign LED flashing: If "sign" in the Fohhn Audio Soft is enabled, the selected module's sign LEDs are flashing and thereby indicating the selected module.

3. **Fohhn Net IN / OUT**
   The Focus Modular module is connected to the Fohhn Net via an RJ45 etherCON socket labelled "IN". The receive and send LEDs flash when Fohhn Net control data is received and sent. Fohhn Net signals can be looped through using the socket labelled "OUT".

4. **Digital Audio Input / Output**
   The digital AES/EBU audio input is fed via a female XLR input socket. Use the output socket to loop through the audio signal.

5. **Fohhn Airea Connect / Stack Link**
   A Focus Modular stack or module can be supplied with both digital audio and Fohhn Net control data by using the Fohhn Airea input. If the entire array is supplied with Airea signal and each individual module is daisy-chained from Airea out/stack link in the bottom connection panel of the module above it, the modules switch on sequentially at power up. Additionally, only one RJ45 cable is necessary.

   The red "audio error" LED indicates that no Airea signal is available at the Airea input and no AES/EBU signal is available at the AES/EBU input of the DFM module or that Airea is available from an Airea master output but no AES/EBU signal is available at the corresponding input of the Airea master.

   The green "remote power" LED indicates that the 48V Airea supply voltage is available at the Airea input of the Focus Modular module. This is the case, when the mains switch is on and mains supply is available. Then the Airea stack link input is able to work as power supply for connected devices like a Fohhn ABX-2. Or it is the case, when the mains switch is off and Airea

supply voltage is provided externally by a connected Airea master. Then the corresponding DFM module may remotely be switched on and off.

4.1.2 Output panel

1. **Mains Link**
    The powerCON socket enables the mains supply voltage to be looped through to a subsequent module.

2. **Fohhn Net Out**
    The paralleled link-out socket enables Fohhn Net control signals to be looped through via a RJ45 etherCON socket.

3. **Audio Output**
    The digital AES/EBU audio output allows the audio signal to be looped through via a male XLR socket.

4. **Airea Out / Stack Link**
    The etherCON Airea stack link socket allows digital audio and Fohhn Net control data to be looped through via a single RJ45 cable. Its use is mandatory if the stack shall be switched on and off by software.

    The green "on" LED indicates, that the 48 V Airea supply voltage is available for the next Focus Modular module.

4.2 General configurations

There are several opportunities to supply a Focus Modular system with Fohhn Net and digital audio data. Generally, you may use Fohhn Airea Net, but separate feeds with Fohhn Net and audio data are also possible.

Using Fohhn Airea Net provides some advantages:
1. Easy wiring of the system with only one supply cable per stack.

2. Switching the mains power of an entire stack is possible using a Airea Master.
3. Sequential power-up of an entire stack is possible using a Airea Master.

Some possible configurations are given below.

Fohhn Net & AES/EBU via Airea Master
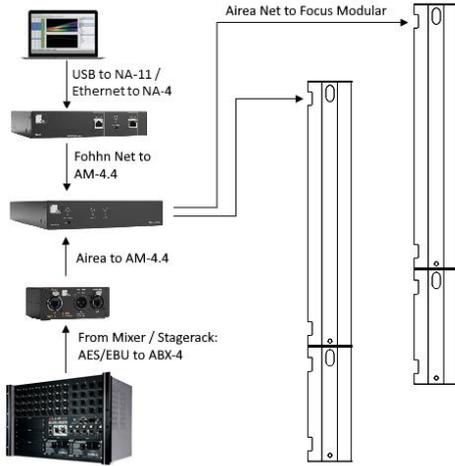
Fohhn Net & analog audio via Airea Master
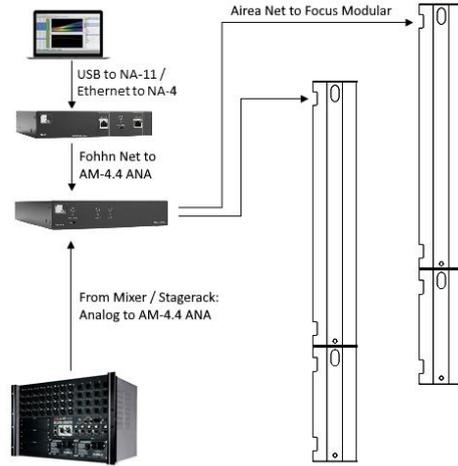

Fohhn Net & Dante via Airea Master
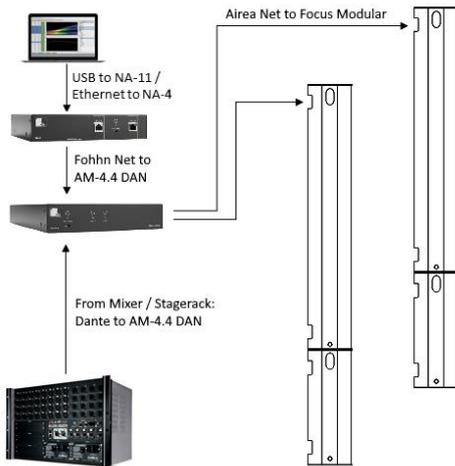
Fohhn Net & analog audio, separately
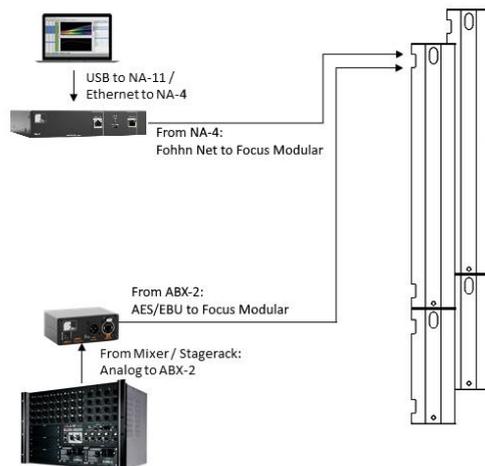
Fohhn Net & Dante (converted to Airea Net), separately

Fohhn Net & AES/EBU, separately
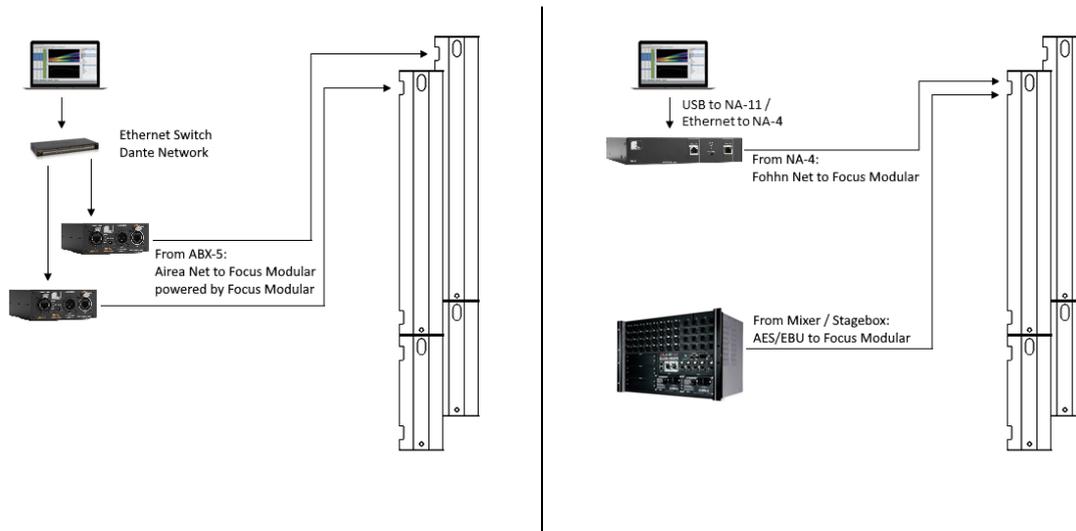
4.3 Hardware and Software Requirements

To use Fohhn Audio Soft, you will need a commercially available computer with the following:
- Computer and processor: x86- or x64 multi-core processor
- Random access memory (RAM): 4 gigabyte (GB) RAM
- Harddisk: 40 megabyte (MB) of free 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 update status of the operating system

Further tips for running under Windows 10 can be found in the separate Fohhn Audio Soft user manual. This can be downloaded free of charge from the Fohhn website: www.fohhn.com

The Fohhn Net connection is used for controlling the integrated digital signal processors (DSP).

4.4 Downloading and Installing Fohhn Audio Soft

Fohhn Audio Soft is directly compatible with all Fohhn active DSP systems, therefore, no special "Focus Modular series" version of this software is required. Regardless of the loudspeaker systems, you can always work with the same software and within the same user interface.

The current version of Fohhn Audio Soft can be downloaded free of charge from: www.fohhn.com

If a new version becomes available, proceed as follows to install Fohhn Audio Soft on your computer:
1. Download the latest version of Fohhn 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.

4.5 Fohhn Net ID Allocation

For the control of Focus Modular systems, each module in the Fohhn Net must be allocated its own specific ID. Using this ID, each individual Focus Modular module can be clearly identified and controlled from within Fohhn Audio Soft.

- All modules 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 modules concerned.

ID allocation for individual modules:

In order for an ID to be allocated, each Focus Modular module must first be individually connected to Fohhn Audio Soft. Proceed as follows for each individual module:
1. Connect the Focus Modular module to the mains power (see chapter 4).
2. Connect the NA-11 or NA-4 Fohhn Net Adapter to the computer.
3. Link the Fohhn Net Adapter to the Focus Modular module using an appropriate RJ45 cable.
4. Start Fohhn Audio Soft. The selected Fohhn Net Adapter will be automatically recognised.
5. When Fohhn Audio Soft opens, an automatic search starts that results in the listing of all correctly connected Focus Modular modules.

If any module is not 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 module still isn't shown, check the mains power supply and/or the network cabling in your system. Then repeat step 1.

If a new Focus Modular module is recognised, it appears with ID 1 (factory setting). To change the ID directly in the Find devices dialog, proceed as follows:
1. Right click on a module 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 component. Make sure that this ID is not already in use. IDs from 1 to 254 are valid.
4. Confirm by clicking OK: The module will now have a newly assigned ID.
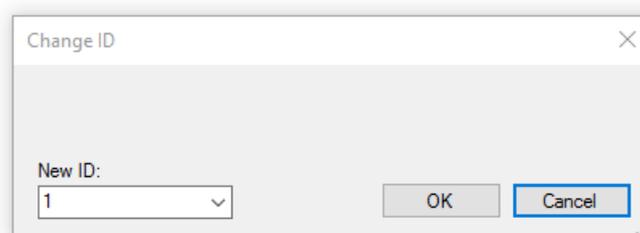
You may also change the ID of a Focus Modular module at any time while it is actually in use. To do this, the module must be in the Fohhn Net. Proceed as follows:

1. Open the Device List view, either via the View menu, or via the corresponding button on the Toolbar.
2. Right click on a module in the Device List display.
3. In the context menu select Change Fohhn Net ID.
4. In the same dialog, give the Focus Modular module a new ID.
5. Confirm by clicking OK: The module 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 section 4.1 "Fohhn-Net Setup" of the Fohhn Audio Soft user manual.

4.6   Identifying Connected Systems

Visual identification

On the front of every Focus Modular module is a function display with a blue LED. You can switch this LED on or off, or let it flash in order to visually identify the module.

1. In Fohhn Audio Soft, click on the *Status* button in the *Devices* view opens a window with information on the Fohhn-Net status, the operating time and temperature of the connected devices.
2. Left click on the *Sign* button: The blue LED on the front of the selected Focus Modular module will begin to flash.
3. Deactivate the button once the module has been identified.
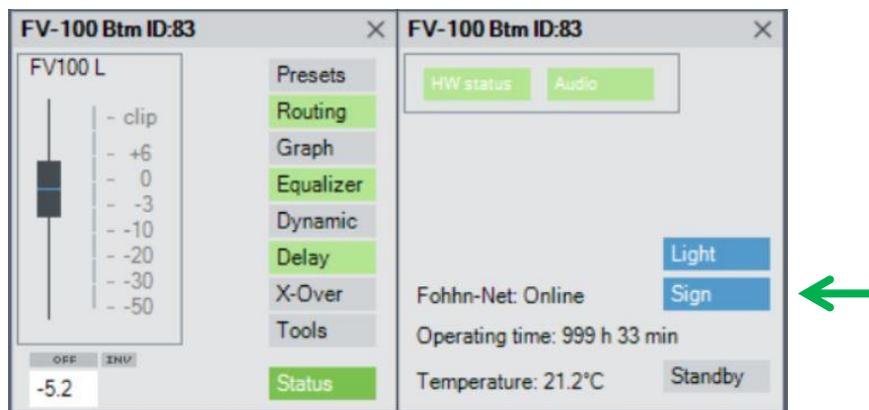
Using the *Light* button, you may switch off the blue LED on the front grille of the module as required.

Alternatively, you can do the same via the *Speakers* view:

1. Open the *Speakers* view and right click on the particular Focus Modular module.
2. Click on *Sign* in the opened context menu: The blue LED on the front of the selected Focus Modular module will begin to flash.
3. When you reset the selection for the module, the LED will revert to its previous mode.

Acoustic identification

Using Fohhn Audio Soft you can allocate either a sinus tone or pink noise to each loudspeaker system in the Fohhn Net.

1. Open the *Devices* view.
2. Click in the respective module on *Tools*.
3. In the *Tools* window, the *Sine* or *Noise* buttons start the corresponding signal. The appropriate button will now be highlighted.
4. The level of the test signal can be adjusted using the fader and the frequency set using the rotary control (if you have selected *Sine*). On multi-channel devices, select which channel should output the test signal.
5. Stop the test signal either by clicking again on the *Sine* or *Noise* buttons, or by closing the window. Alternatively, you can click on the *Tools* button.

⚠ **Caution!**

When activating the test signal, pay careful attention to the set signal level!

Start by moving the fader to lowest position BEFORE switching on the signal!

Make sure no one stands directly in front of the speaker(s)! If possible, use a pink noise signal rather than sine wave!

The test signal may produce sound pressure levels which are potentially harmful, putting not only you at risk, but also any other people who are in the same room as your loudspeaker!

If a Fohhn Net ID needs to be changed, either during identification or at a later date, proceed as described in section 4.5.

4.7 Renaming Devices / Channels

For better identification within Fohhn Audio Soft, it is recommended that the individual Focus Modular modules are 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. Right click on the required module 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 *Rename* dialog, then confirm with OK.

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

4.8 Graphically Arranging the Loudspeaker System

To make the Fohhn Audio Soft display easier to manage, all loudspeakers and devices in use can be graphically arranged on the software interface. With complex applications and/or in the case of permanent installations, it is particularly recommended that the arrangement of devices on the user interface corresponds with their physical positions in the room.

The name shown in the loudspeaker pictogram refers to the currently loaded loudspeaker preset. If a question mark is shown here, the loading process is not yet completed and the loudspeaker preset is not active!
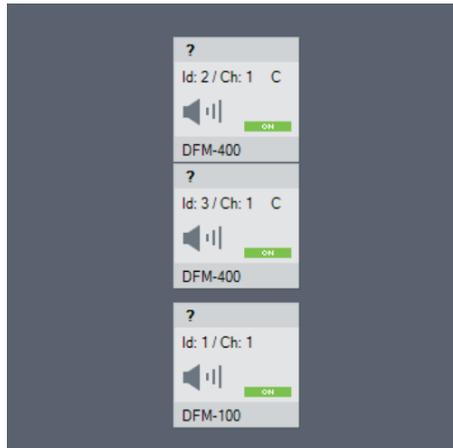
Proceed as follows to arrange your Focus Modular systems:
1. Open the *Devices* or *Speakers* view, either via the corresponding entry in the Menu view, or via the respective button on the Toolbar.
2. Arrange the individual loudspeaker pictograms and/or devices according to the physical positions of the actual loudspeaker systems and/or devices.

The arrangement will be saved in Fohhn Audio Soft and will remain until you change the configuration or arrangement.

4.9 Combining Modules to a Speaker Stack

In Fohhn Audio Soft, Focus Modular modules can be combined into one unit. These modules will jointly behave like a single, longer loudspeaker module. Obviously, DFM-100 only combine with DFM-100, DFM-400 with DFM-400.

To link the modules via Combine speakers, proceed as follows:
1. Open the *Speakers* view, either via the corresponding entry in the Menu view, or via the respective button on the Toolbar.
2. Arrange the individual module pictograms on top of one another, according to their physical arrangement, so that they touch one another on the screen! Be sure the arrays on the screen correspond exactly with the real world, otherwise the acoustic result will be unpredictable and definitely poor!
3. Select the pictograms collectively using the mouse.
4. Right click on one of the selected modules to open the context menu.
5. Select *Combine speakers*.

At this point, in addition to the Fohhn Net ID and the channel, the letter C will also have been added to the loudspeaker pictograms: This means that two or more modules have been linked together to form a "Combined Speaker".
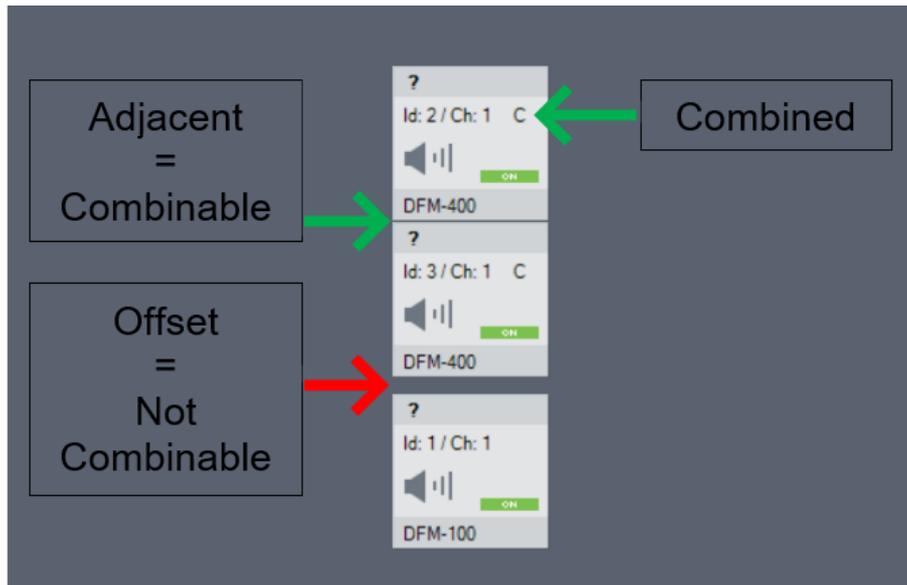
4.10 Loading Loudspeaker Presets

Fohhn Audio Soft enables factory-made speaker presets to be loaded into a Focus Modular module.

To load loudspeaker presets, proceed as follows:
1. Select the appropriate Focus Modular module in the *Output Channels* view.
2. Right click on the chosen module to open the context menu.
3. Select either *Select speaker preset from list* or *Select speaker preset from database.*
4. Select a preset from one of these lists.
5. Confirm your choice by clicking *OK*.

Your loudspeaker preset is now loaded. Repeat the process for all Focus Modular modules.

4.11 Further Options

4.11.1 Auto Power Save

Focus Modular systems 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 integrated CLASS-D amplifiers switch to power saving mode. As soon as an audio signal is detected, the amplifiers are immediately ready for operation. The amount of time before the device switches to Auto Power Save can be set between 1 second and 12 hours. The mode can also be completely deactivated.

Proceed as follows to set up Auto Power Save in Fohhn Audio Soft:
1. Select one or more Focus Modular system(s) in the *Device List*, then right click to open the context menu.
2. Select the *Options* entry. This will open the *Advanced device settings configuration* dialog.
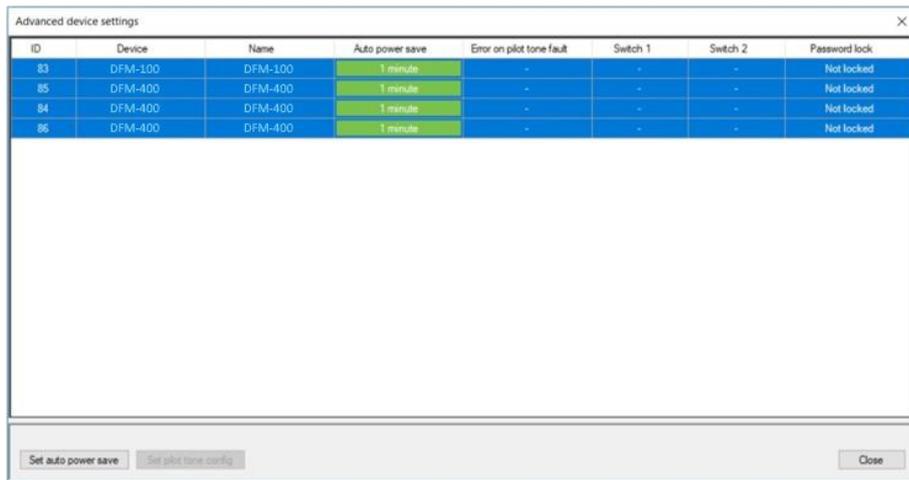
3. Select one or more Focus Modular system(s), then right click to open the context menu.
4. Select the *Set auto power save entry*. This will open the *Set auto power save* time window. (You can also open this window via the corresponding button at the bottom left of the Advanced device settings dialog.)
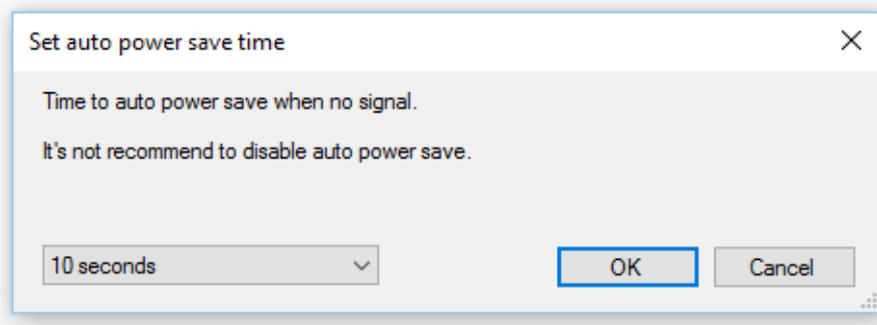
5. From the drop-down list (bottom left), select the desired switching time and confirm by clicking *OK*.

4.11.2 Password Lock

Focus Modular loudspeaker systems (and their parameter settings) can be password protected (or locked) to prevent any inadvertent changes. This password protection can be set up in Fohhn Audio Soft.

Further information on password protection can be found in section 6.6 "Password Lock" of the Fohhn Audio Soft user manual. It´s available at the Fohhn website: www.fohhn.com

4.11.3 Tilt Sensor

All Focus Modular systems have a tilt sensor whose data can be read out in Fohhn Audio Soft. The sensor detects the actual mechanical tilt of the installed loudspeaker systems. Please note that it has a tolerance of ± 1.0°. Simply open the *Beam Steering view* and click on the *READ* button to the right of the parameter area.

The displayed sensor data can be updated by clicking on the *READ* button again. You may transfer the displayed tilt values into the Focus Simulation: Simply enter the value in the *Pre-Angle [°]* parameter field below.

Further information on the Focus Simulation is available in section 5.2.

4.12 Adjusting level relations within an array

Basically, the volume level of a Focus Modular module has been predefined in the speaker presets for different combinations of Focus Modular modules. Load the appropriate speaker preset to each module in the array. The following presets are available:

Speaker Preset	Module		
	DFM-100	DFM-110	DFM-400
1	DFM-100 + 1x400	DFM-110 + 1x400	DFM-400 + 1x400
2	DFM-100 + 2x400	DFM-110 + 2x400	DFM-400 + 2x400
3	DFM-100 + 3x400	DFM-110 + 3x400	DFM-400 + 3x400

Further information on Loading Loudspeaker Presets can be found in section 4.10.

For more sophisticated applications with two beams or more than one DFM-100/110 module per array a proper simulation in Fohhn Audio Soft is essential and recommended!

5. Control via Fohhn Audio Soft

The complete control of your Focus Modular systems can be exclusively carried out via Fohhn Audio Soft.

A comprehensive description of the software and all its functions can be found in the separate Fohhn Audio Soft user manual. You can download this free of charge from our website: www.fohhn.com

5.1 Beam Steering – the functional principle

In the audio processing world, the term "Beam Steering" refers to the process of controlling the beam dispersion characteristics of loudspeaker systems using electronics and software. Through specific manipulation of signal sources that are tightly positioned in close proximity to one another, it is possible to control the vertical beam width and inclination angle of the loudspeaker system over a wide frequency range precisely. In general: the longer the loudspeaker, the lower the frequencies that can be controlled. Because each speaker driver can be individually controlled and adjusted, via use of a dedicated algorithm or DSP, this in turn influences the sound dispersion capability of the entire loudspeaker.
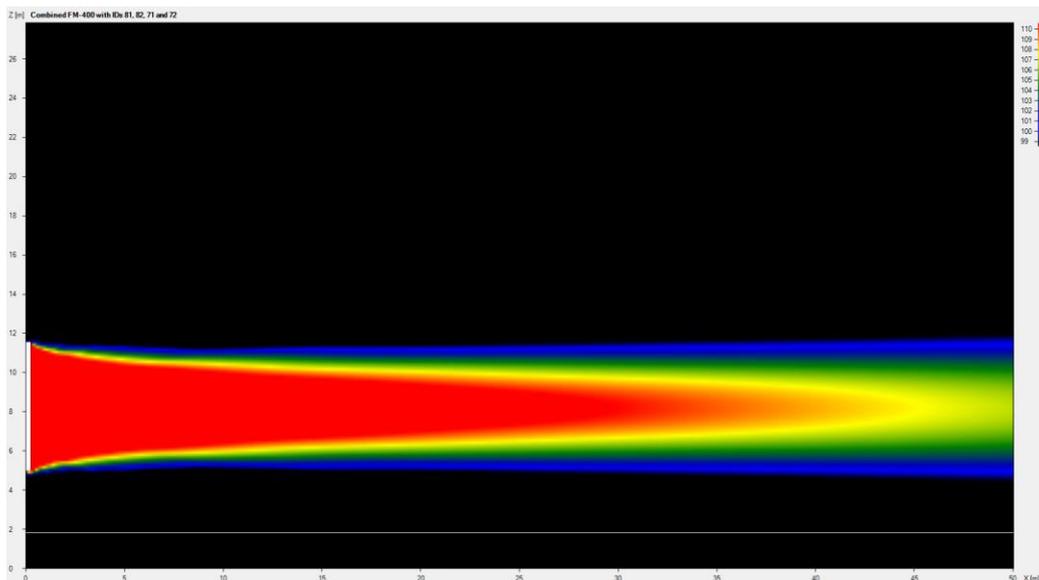
Graphic representation of a beam in the Fohhn Audio Soft Focus Simulation

All Fohhn Focus-Series loudspeaker systems work with Beam Steering Technology. Combining the DSPs with Fohhn Audio Soft makes it possible to electronically control the loudspeaker system's vertical inclination angle and vertical beam width – in real time!

Fohhn Audio Soft enables the entire audio system to be configured in advance, before the systems themselves are put into operation at the venue.

5.1.1 Side Lobe Free Technology

Due to their construction, line source and line-array speakers generate unwanted side lobes in their vertical axes. These result from the distances between the individual loudspeaker chassis and the finite length of an array.
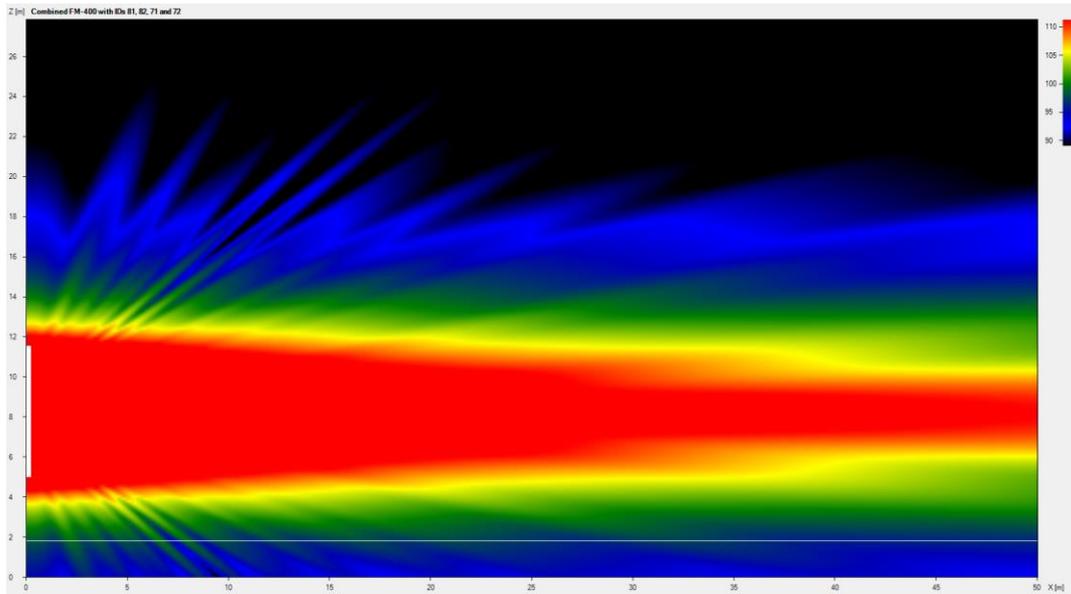
Beam with Side Lobes

Focus Modular systems are equipped with Fohhn Side Lobe Free Technology: A specially developed algorithm effectively reduces the side lobes. This results in fewer unwanted sound reflections in the room. Consequently, levels of speech intelligibility are improved and feedback prevention is increased.
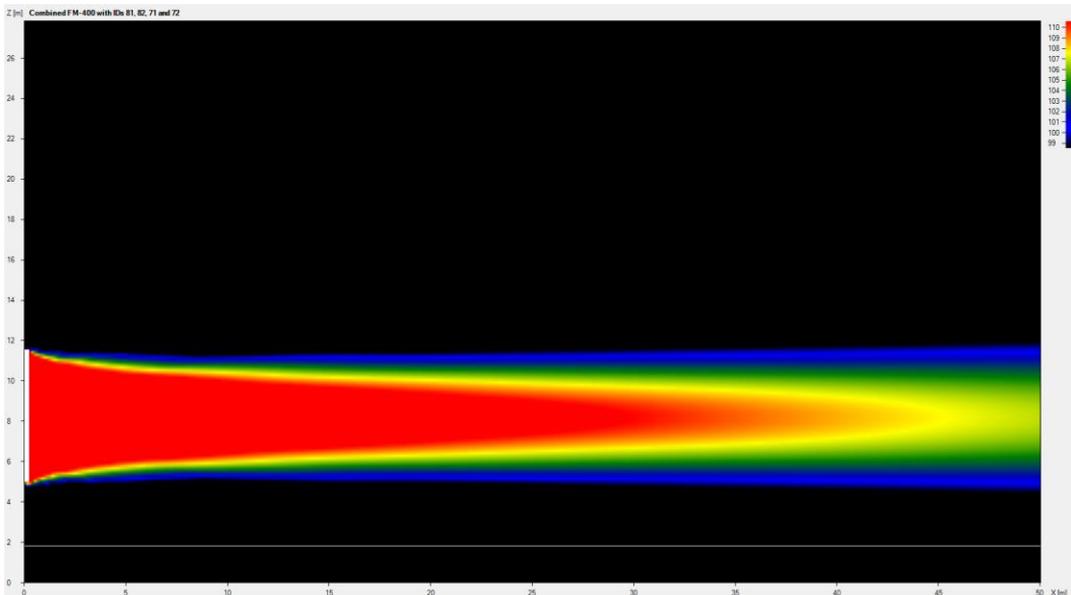

Optimized beam with Fohhn Side Lobe Free Technology

5.1.2   Two Beam Technology (Two Beam Mode)

Fohhn's in-house developed Two Beam Technology enables the production of two independent beams with separately configurable parameters. In each case, the entire speaker line length is used for reproduction. So when activating the second beam, the sound dispersion still covers the entire frequency bandwidth. All parameters such as the vertical inclination angle and vertical beam width, the acoustic centre position, level and high pass filtering can be separately configured for each beam.

This enables an asymmetric beam dispersion to be created for precise sound coverage of two separate listening areas (e.g. stalls and balcony).
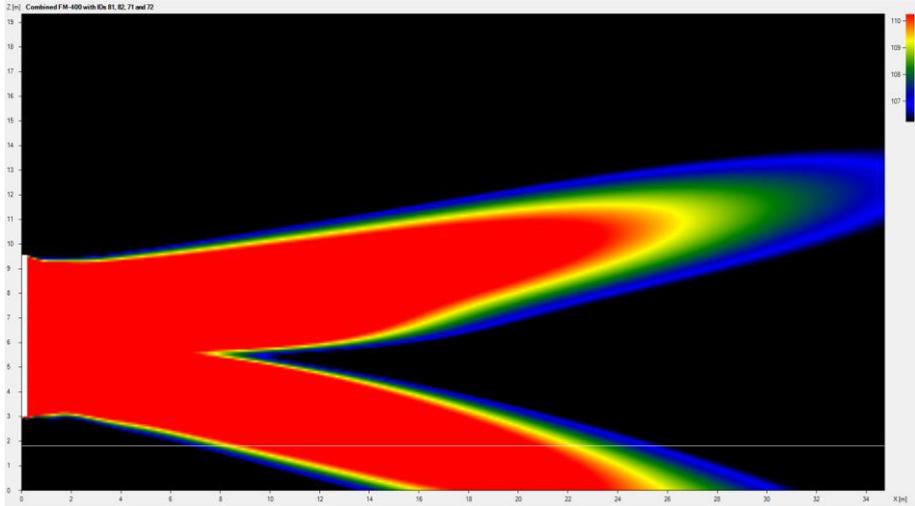
Two Beam Mode: The production of two separate beams
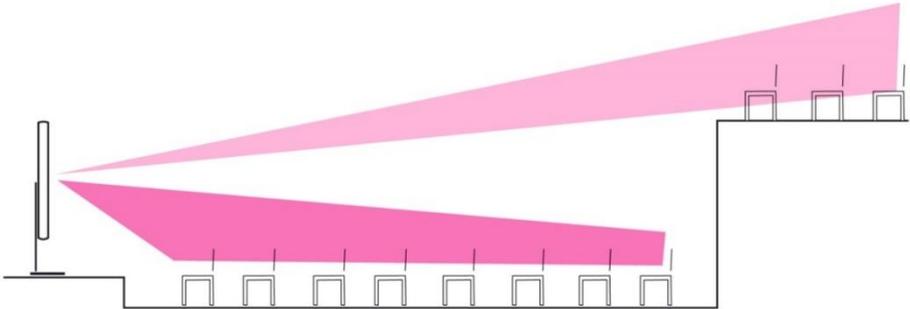
Simultaneous sound coverage of stalls and balcony using two beams from a single Fohhn Focus-Series system
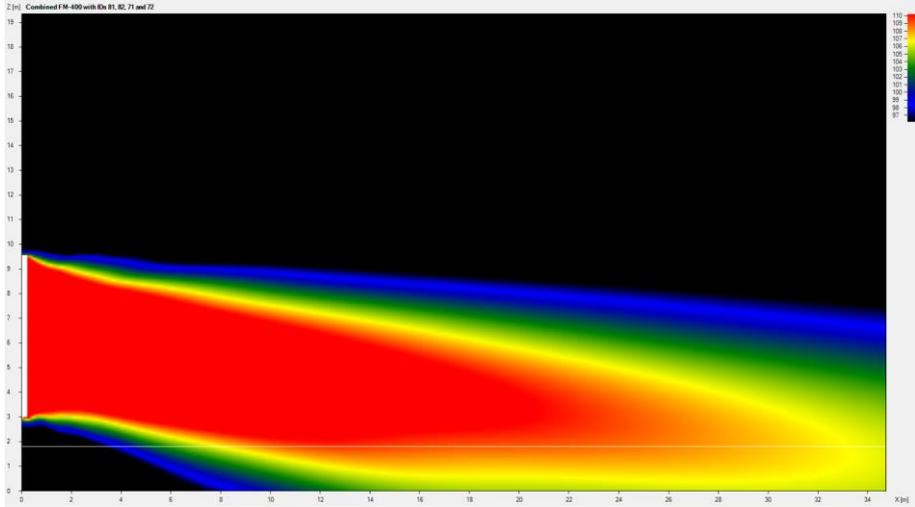
Example of an asymmetric beam

Further information on beam configuration and its associated parameters can be found in section 4.7.3 "System Setup (Focus-Series)" of the Fohhn Audio Soft user manual.

5.1.3   Acoustic Centre

This function allows you to move the vertical position of a beam's acoustic centre:
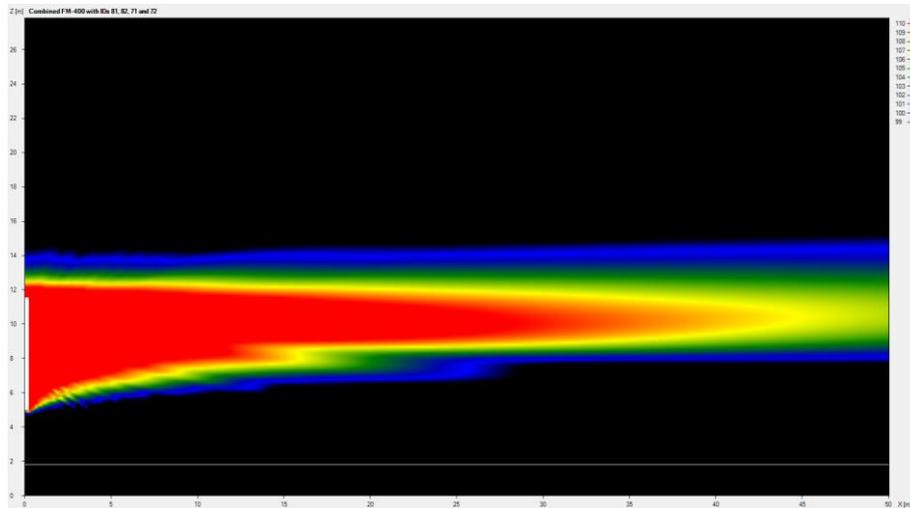
Acoustic centre at the top
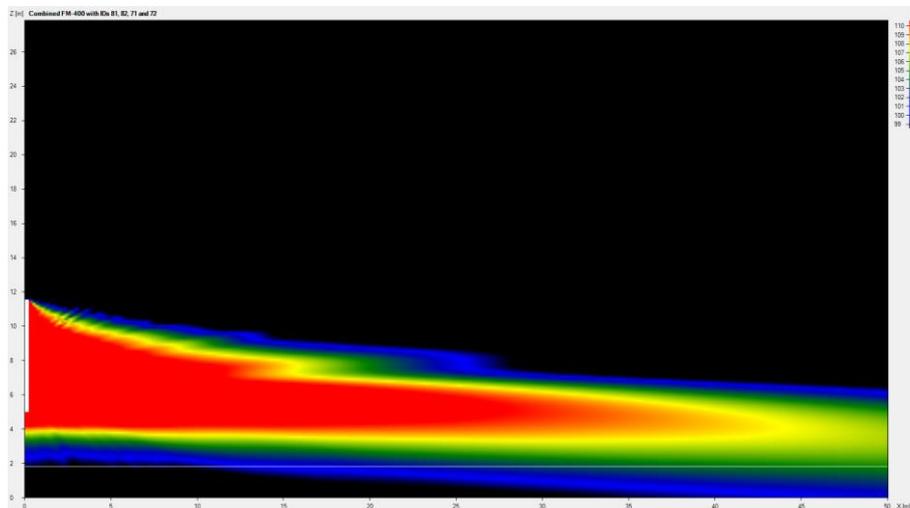
Acoustic centre at the bottom

Further information on setting the acoustic centre can be found in section 4.7.3 "System Setup (Focus-Series)" of the Fohhn Audio Soft user manual.

5.2   Setup in the Beam Steering View

To adjust your Focus Modular system to the venue and the particular application, open the Beam Steering view in Fohhn Audio Soft: This display lets you set all the parameters that are relevant to Beam Steering.

Its depiction and management are covered in the following sections:

The Device Selection

This shows all the Focus-Series devices that are in the system, along with their IDs, names, type/model classifications and current operating status.

The Parameter Field

This lets you configure the beam dispersion characteristics of the chosen module in the Device Selection.

The Focus Simulation

This shows a graphic representation of your selected module's beam dispersion characteristics, based on the settings made in the Parameter Field.
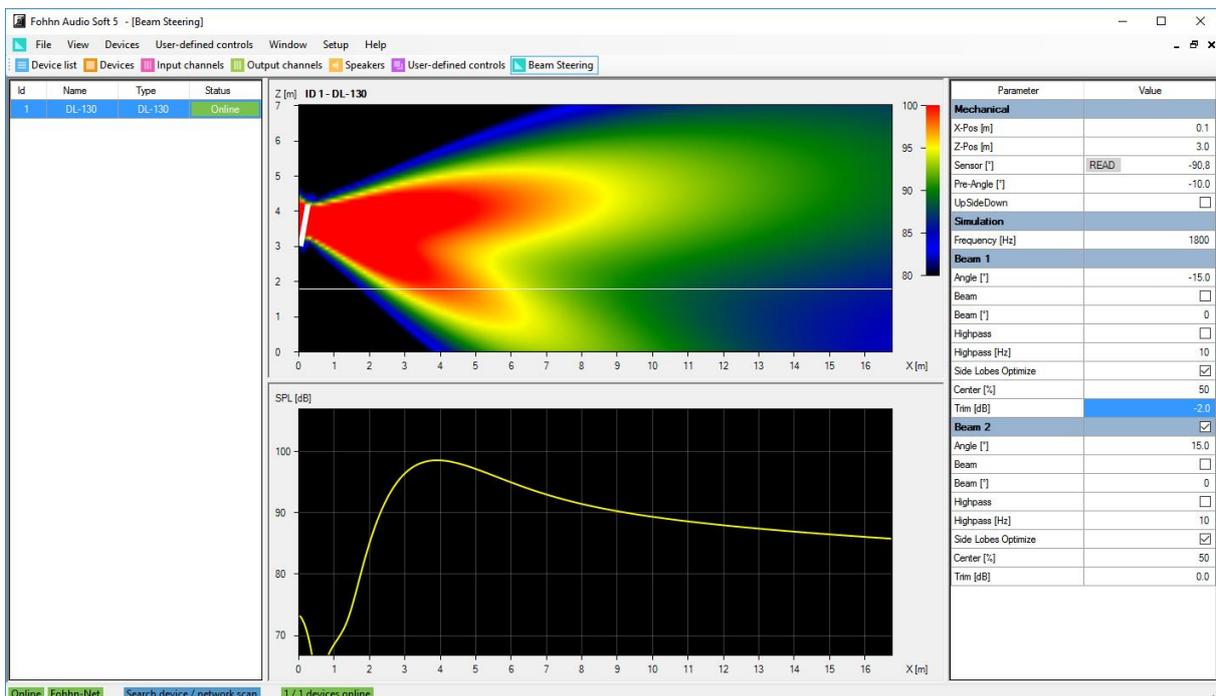
The Device Selection (left), Focus Simulation (centre) and Parameter Field (right)

Beam Steering settings in the Parameter Field:

- **X-Pos (m)**

  This defines the distance of the selected speaker (in metres) in relation to the vertical back wall.

- **Y-Pos (m)**

  Defines the height of the selected speaker's lower edge (in metres) in relation to the floor.

- **Pre-Angle (°)**

  Here you can enter the mechanical inclination of the loudspeaker. This value only influences the display in the Focus Simulation.

- **Freq. (Hz)**

  Here you can input the reference frequency for calculation and display in the neighbouring Focus Simulation. The frequency you input here will have no effect whatsoever on the sound being reproduced by your loudspeaker!

- **Upside Down**

Adding a check mark to this field means that the loudspeaker effectively turns upside down. This can be useful if your Focus-Series loudspeakers have to be installed head first.

- **Beam 2 (previously: Split)**
Adding a check mark to this field creates a second beam for the loudspeaker in question. The following parameters can then be set for both beams, individually and independently from each other.

- **Angle (°)**
Here you can enter the beam's vertical inclination angle – in 0.1° increments - within a range of +/-40°.

- **Beam (°)**
Adding a check mark to this field lets you set the vertical width of the beam – in 0.1° increments - within a range of +/-90°.

- **High-pass (Hz)**
Adding a check mark to this field lets you enter the frequency threshold (10 Hz to 10 kHz): The fundamental tone below this frequency will be attenuated by24 dB / Octave (fourth order). The high-pass is recommended for effective masking of the fundamental tone.

- **Side Lobes > Optimize**
When adding a check mark to this field, Side lobes will be removed, as far as is possible, by means of a dedicated Fohhn algorithm. Because this makes the room less "excited", levels of speech intelligibility will be significantly improved. With the overall volume level of the system now somewhat lower as a result, you can use the volume control in Fohhn Audio Soft to compensate for this.

- **Centre (%)**
When Optimize is active, you can change the acoustic centre of the loudspeaker. 0 % means that the acoustic centre moves to what is virtually the bottom end of the speaker, whereas 100 % takes it to the top end. In its default setting of 50 % (or if Optimize is not active) the acoustic centre sits at what is basically the optical centre of the speaker.

- **Trim (dB)**
Here you can attenuate the level of the selected beam over a range of 0 to -90 dB. If two beams are active, you can use these fields to set the relative levels of both in parallel.

Detailed descriptions of the individual fields can be found in section 4.7.3 "System Setup (Focus-Series)" of the Fohhn Audio Soft user manual**.**

5.3   Adjustment of DSP Functions

In addition to configuring the vertical beam dispersion characteristics of your Focus Modular systems, Fohhn Audio Soft also give you direct access to the parameters of the Fohhn Audio DSP.

The following DSP functions are available:
- Input level
- Output level
- Routing
- Delay
- High-pass- and Low-pass filter
- Equalizer
- Dynamics

- Signal Generator

Further information on the individual functions can be found in section 4.5 "DSP Functions" of the Fohhn Audio Soft user manual.

5.4 Saving Projects

To save the settings on the computer as a Fohhn Audio Soft Projekt (.fap), proceed as follows:
1. In the *File* menu, select Save *Project As*.
2. Select the location in which you want to save your project. Click on *Save* to confirm your choice.

6. Application Examples

The following examples show possible and useful combinations of the various Focus Modular modules in typical sound reinforcement scenarios. Individual parameter settings (e.g. vertical dispersion characteristics and inclination angles, level adjustments, acoustic centre etc.) are intentionally not shown here in detail. For planning, use the Focus Simulation in the Beam Steering view. Here you can simulate the direct sound dispersion of a system.

6.1 Smaller venues with a single audience level

Example 1a: The venue has a maximum room depth of ca. 30 metres and a single audience level. In this example, a DFM-400 module is combined with a DFM-100 module.

1a: 1x DFM-400 and 1x DFM-100 with a maximum room depth of 30 m.

Example 1b: You can use the lower of two connected modules (in this case, the DFM-100) in Two Beam mode and adjust one of those beams (Beam 2) to provide nearfield coverage.

1b: 1x DFM-400 and 1x DFM-100 with a maximum room depth of 30 m. A second DFM-100 beam covers the nearfield area.

6.2 Larger venue with a single audience level

Example 2a: The venue has a room depth of more than 30 metres and a single audience level. Here, it is equipped with a "Combined Speaker" (consisting of two DFM-400s) and an DFM-110. Due to the larger room size, an FM-110 module should be used for the high frequency range.

If a Focus Modular loudspeaker stack has several DFM-400 modules, it must always be operated as a "Combined Speaker". You can find more information on this in section 4.8 of this manual.
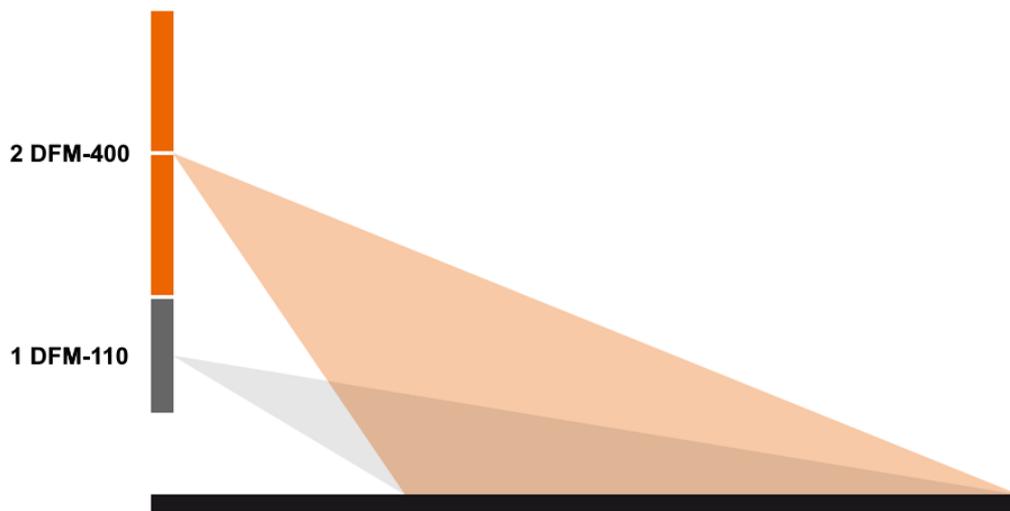
2a: 2x DFM-400 and 1x DFM-110 with a room depth of more than 30 m.

Example 2b: Depending on the application, it can make sense to use both the "Combined Speaker" (with the linked DFM-400 modules) and the DFM-110 in Two Beam mode to achieve a more even coverage of the listening area. The same applies with rising audience seating.
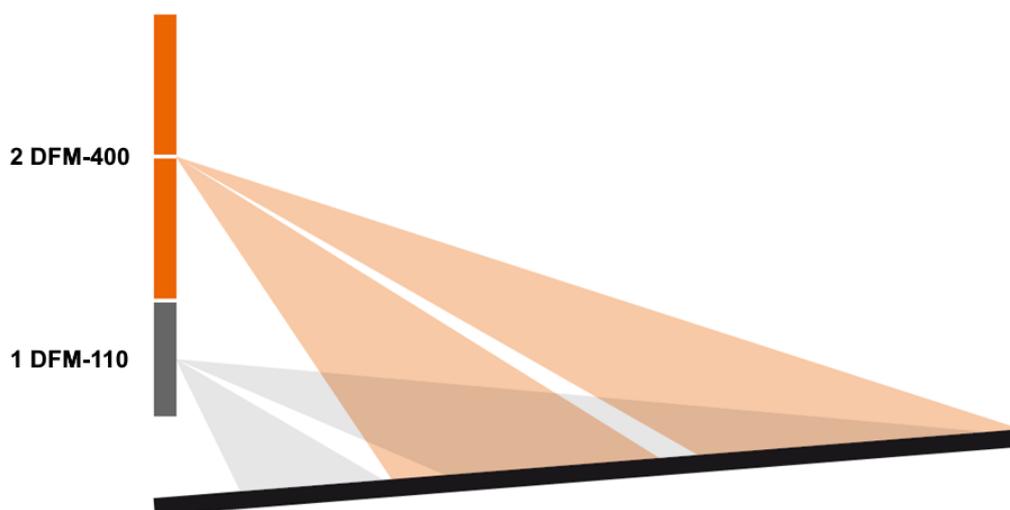
2b: 2x DFM-400 and 1x DFM-110 with a room depth of more than 30 m and rising audience seating.
A second beam from the DFM-110 covers the nearfield area.

Example 2c: In the following example, intended for venues with an even greater room depth (e.g. 50 metres or more), we have used at least two DFM-400s as a "Combined Speaker", in Two Beam mode, for the mid- and low-mid ranges, plus an DFM-100 and an DFM-110 for the high frequency range.

For this more distant coverage, you can install an DFM-110 above both DFM-400 modules – with an DFM-100 at the bottom of the stack to cover the nearfield area.

2c: 1x FM-110, 2 x FM-400 and 1 x FM-100 with a room depth of more than 50 m and rising audience seating.

⚠️ **Caution!**

Focus Modular high frequency modules (FM-100 or FM-110) cannot be linked to form a "Combined Speaker". They will be displayed as separate modules in the Beam Steering view. Always install the high frequency modules at the upper or lower end of a Focus Modular stack!
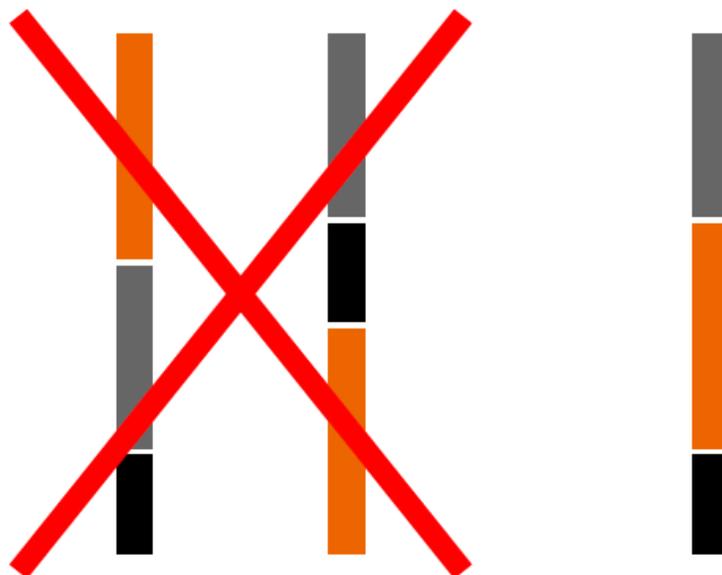
Incorrect combinations: FM-400 above an FM-110 and FM-100 / FM-110 above an FM-100 and FM-400 (left)
Correct combination: FM-110 above an FM-400 and FM-100 (right)

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6.3 Large venues with two audience levels

Example 3a: The venue has a room depth of more than 30 metres and two audience levels – for example a theatre with stalls and a circle, or a town hall with stalls and a gallery; covered here by two DFM-400s as a "Combined Speaker" and a DFM-110 installed below. Both the "Combined Speaker" and the single DFM-110 module are used in Two Beam mode. This provides each audience level with two completely independent beams, which can be adjusted to the acoustic conditions of the two levels. Moreover, one beam from the DFM-110 can be directed, from below, onto the upper audience level.
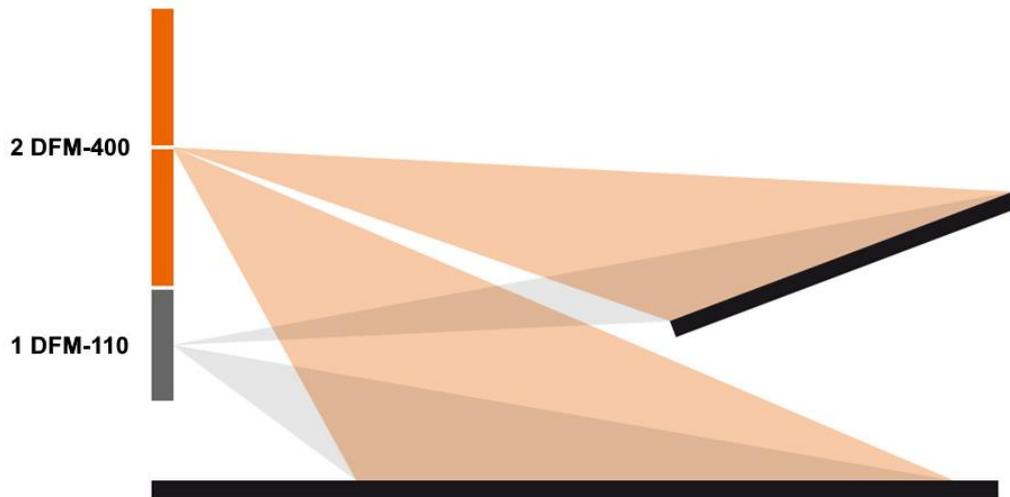
3a: 2x DFM-400 and 1x DFM-110 with a room depth of more than 30 m and two audience levels.

Example 3b: If an additional DFM-100 module is available, you can install this at the lower end of the Focus Modular stack: The DFM-100 is well suited to the lower audience area. Both high frequency modules can then be used without Two Beam mode. Each high frequency module covers one audience level respectively.
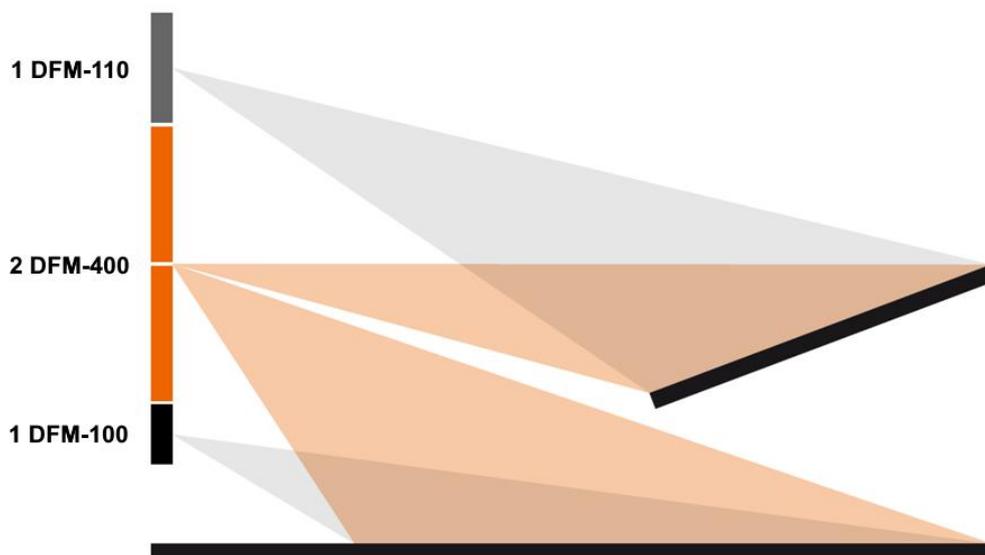
3b: 1x DFM-110, 2x DFM-400 and 1x DFM-100 with a room depth of more than 30 m and two audience levels.

Example 3c: If required, the DFM-110 and DFM-100 can be used in Two Beam mode and the beams directed accordingly: Here, the DFM-110's two beams only cover the upper audience level, while those of the DFM-100 only cover the lower. The "Combined Speaker", consisting of two DFM-400s, covers both audience levels, each with one beam.

3c: 1x DFM-110, 2x DFM-400 and 1x DFM-100 with a room depth of more than 30 m and two audience levels.
All Focus Modular modules are used in Two Beam mode.

6.4   Large venues with three or four audience levels

Example 4a: The venue has a room depth of more than 30 metres and und several audience levels – for example, a theatre with stalls and several balconies; here, a "Combined Speaker" is used, consisting of two DFM-400s, along with a high frequency module (DFM-100 or DFM-110) at each end of the stack. By using the modules in Two Beam mode, different levels can be individually covered.
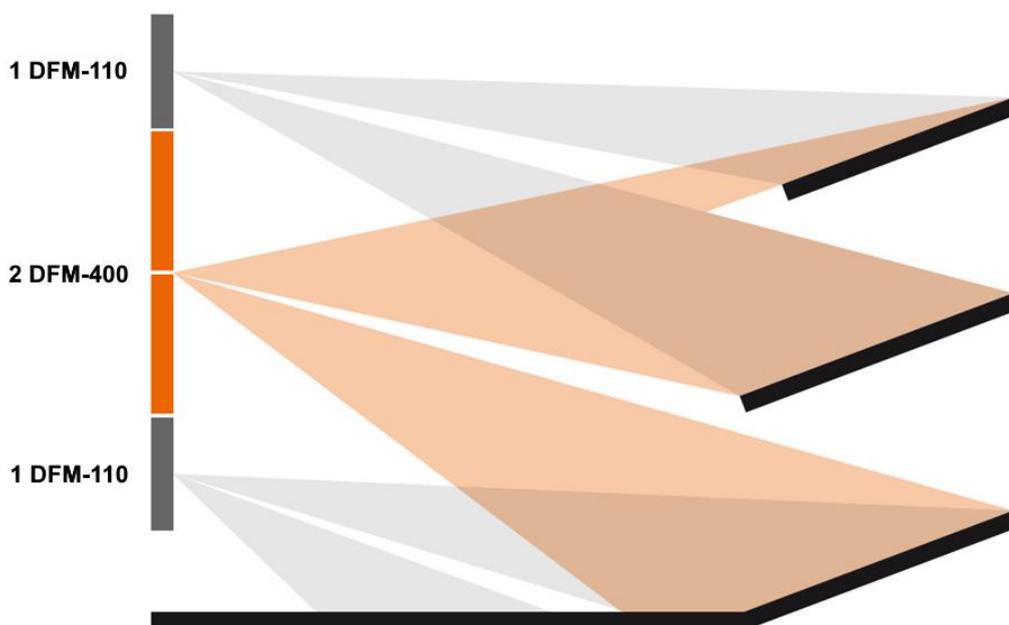
4a: 1x DFM-110, 2x DFM-400 and 1x DFM-110 with a room depth of more than 30 m and three audience levels.
All Focus Modular modules are used in Two-Beam mode.

Example 4b: Depending on the size of the venue and the number of audience levels, it may be necessary to use more than two DFM-400 modules in a "Combined Speaker": A "Combined Speaker" can consist of up to four DFM-400 modules.
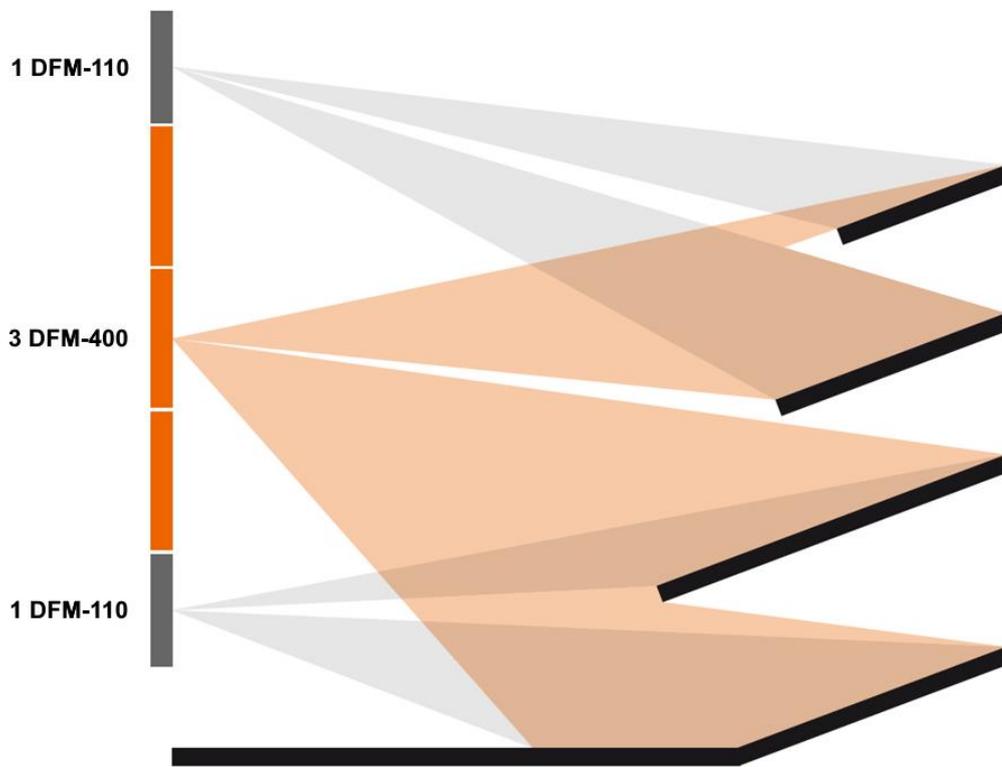
4b: 1x DFM-110, 3x DFM-400 and 1x DFM-110 with a room depth of more than 30 m and four audience levels. All Focus Modular modules are used in Two-Beam mode.

**Arrangement possibilities for the different modules**

Focus Modular high frequency and low-mid modules can be used in a stack, or side by side. However, modules of the same type, or with the same frequency range, should not be used side by side.

7. Technical Documentation

7.1 Technical Specifications

7.1.1 DFM-100

Electroacoustic features

acoustic design	electronically steerable line array speaker
components	8 × 1" (1.75" VC) compression drivers hornloaded waveguide design
maximum SPL	142 dB (102 dB @ 100 m)
frequency range	1.7 kHz – 16 kHz
operational mode	active, 8-channel DSP-amplifier, Class-D
horizontal dispersion	90°
vertical beam width, digitally controlled	0° – 90° in 0.1° increments
vertical inclination angle, digitally controlled	–40° – +40° in 0.1° increments
acoustic centre	0% (bottom) to 100% (top) movable, both beams

physical features

enclosure	multiplex birch playwood, Aluminium
front design	hexagonal perforated steel grille in enclosure colour, backed by acoustically transparent foam
protection grille	steel grille, ball impact resistant, powder-coated
weight	25 kg
standard colours	textured paint / powder coating, black
mounting points	integrated flying tracks, 4 × M8-threads at rear
dimensions (W × H × D)	224 × 700 × 274 mm

Optional features

optional colours	RAL Classic / NCS / Pantone on request

CAAD simulation data

simulation data	EASE, Fohhn Designer

Electronic features

amplifier type	Pure Path Digital PWM
audio inputs	AES/EBU
audio outputs	AES/EBU
amplifier power	8 × 120 W
DSP channels	8
frequency response	20 Hz – 20 kHz
signal/noise ratio	>105 dB/A
auto power save	adjustable from 1 s to 12 h, or never active
protective circuit	soft start, overtemperature, short circuit, overload
power supply	100 V – 240 V AC 50/60 Hz, power supply with Power Factor Correction (PFC)
inrush current	7,5 A (230 V) / 3,8 A (115 V)
power consumption	300 W RMS, idle 15 W, standby 5 W
heat dissipation	70 W, 239 BTU/h, 60 kcal/h
temperature range	0 – 40°C
cooling	temperature-controlled fan
weight (electronics)	3 kg

Controller

digital signal processors	2
independent limiters	6
FIR filter	yes
gain	–80 dB – +12 dB
EQ	10-band parametric EQ, gain, +/-12 dB, frequency 10 – 20 kHz, Q 0.1 – 100
selective 3-band limiting	bass / mid / high
limiter / compressor	yes
noise gate	yes
delay	input: 0 – 350 ms (0 – 120 m); output: 0 – 640 ms (0 – 220 m)
X-over	Linkwitz-Riley 4th order (24 dB / octave), high pass 10 Hz – 20 kHz, low pass 10 Hz – 20 kHz
system latency	1.2 ms
band-specific time constants	yes
filter technology	80-bit double precision
input	AES/EBU 32 kHz – 96 kHz, 16/24 bit
input DSP processing	yes

Remote control and remote monitoring

remote control	Fohhn Audio Soft, Fohhn Net
remote monitoring	temperature, protect, signals, power supply, Fohhn Net, Fohhn Audio Soft
simulation beam	Fohhn Net, Fohhn Audio Soft

Connections and controls

controls	mains switch (remote-controllable via Airea Connect)
mains connection	1 × PowerCON mains in, 1 × PowerCon mains out
inputs	1 × etherCON Airea Connect / stack link, 1 × XLR AES/EBU, 1 × etherCON Fohhn Net
outputs	1 × etherCON stack link, 2 × XLR AES/EBU, 2 × etherCON Fohhn Net
signal inputs	AES/EBU 32 kHz – 96 kHz, 16/24 bit
signal outputs	AES/EBU link-out from input

Display LEDs

Sign LED (connector panel and front grille)	blue = power on, blue flashing = sign
status LED	green = ready, red = protect / standby, red flashing = fault
receive / send LED	receive / send remote control LED
audio error LED	red = no AES/EBU
remote power LED	green = Airea Connect active, remote power on
on (stack link) LED	green = stack link active

power rating (peak); maximum SPL: peak, 20 ms with bandpass filtered pink noise signal according to IEC 60268-2 at one octave above the lower limit of the frequency range
frequency range: –10 dB under anechoic halfspace-conditions
weight: net weight without optional equipment
heat dissipation: pink noise, 6 dB crest, 1/4 Pmax
nominal dispersion, beam width: –6 dB compared to the main dispersion axis

7.1.2 DFM-110

Electroacoustic features

acoustic design	electronically steerable line array speaker
components	16 × 1" (1.75" VC) compression drivers Hornloaded Waveguide Design
maximum SPL	148 dB (108 dB @ 100 m)
frequency range	1.7 kHz – 16 kHz
operational mode	active, 16-channel DSP-amplifier, Class-D
horizontal dispersion	90°
vertical beam width, digitally controlled	0° – 90° in 0.1° increments
vertical inclination angle, digitally controlled	–40° – +40° in 0.1° increments
acoustic centre	0% (bottom) to 100% (top) movable, both beams

physical features

enclosure	multiplex birch playwood, Aluminium
front design	hexagonal perforated steel grille in enclosure colour, backed by acoustically transparent foam
protection grille	steel grille, ball impact resistant, powder-coated
weight	41 kg
standard colours	textured paint / powder coating, black
mounting points	integrated flying tracks, 4 × M8-threads at rear
dimensions (W × H × D)	224 × 1285 × 274 mm

Optional features

optional colours	RAL Classic / NCS / Pantone on request

CAAD simulation data

simulation data	EASE, Fohhn Designer

Electronic features

amplifier type	Pure Path Digital PWM
audio inputs	AES/EBU
audio outputs	AES/EBU
amplifier power	16 × 120 W
DSP channels	16
frequency response	20 Hz – 20 kHz
signal/noise ratio	>105 dB/A
auto power save	adjustable from 1 s to 12 h, or never active
protective circuit	soft start, overtemperature, short circuit, overload
power supply	100 V – 240 V AC 50/60 Hz, power supply with Power Factor Correction (PFC)
inrush current	7,5 A (230 V) / 3,8 A (115 V)
power consumption	500 W RMS, idle 30 W, standby 10 W
heat dissipation	140 W, 482 BTU/h, 121 kcal/h
temperature range	0 – 40° C
cooling	temperature-controlled fan
weight (electronics)	5.5 kg

Controller

digital signal processors	2
independent limiters	6
FIR filter	yes
gain	–80 dB – +12 dB
EQ	10-band parametric EQ, gain, +/-12 dB, frequency 10 – 20 kHz, Q 0.1 – 100
selective 3-band limiting	bass / mid / high
limiter / compressor	yes
noise gate	yes
delay	Input: 0 – 350 ms (0 – 120 m); Output: 0 – 640 ms (0 – 220 m)
X-over	Linkwitz-Riley 4th order (24 dB / octave), high pass 10 Hz – 20 kHz, low pass 10 Hz – 20 kHz
system latency	1.2 ms
band-specific time constants	yes
filter technology	80-bit double precision
input	AES/EBU 32 kHz – 96 kHz, 16/24 bit
input DSP processing	yes

Remote control and remote monitoring

remote control	Fohhn Audio Soft, Fohhn Net
remote monitoring	temperature, protect, signals, power supply, Fohhn Net, Fohhn Audio Soft
simulation beam	Fohhn Net, Fohhn Audio Soft

Connections and controls

controls	mains switch (remote-controllable via Airea Connect)
mains connection	1 × PowerCON mains in, 1 × PowerCon mains out
inputs	1 × etherCON Airea Connect / stack link, 1 × XLR AES/EBU, 1 × etherCON Fohhn Net
outputs	1 × etherCON stack link, 2 × XLR AES/EBU, 2 × etherCON Fohhn Net
signal inputs	AES/EBU 32 kHz – 96 kHz, 16/24 bit
signal outputs	AES/EBU link-out from input

Display LEDs

Sign LED (connector panel and front grille)	blue = power on, blue flashing = sign
status LED	green = ready, red = protect / standby, red flashing = fault
receive / send LED	receive / send remote control LED
audio error LED	red = no AES/EBU
remote power LED	green = Airea Connect active, remote power on
on (stack link) LED	green = stack link active

power rating (peak); maximum SPL: peak, 20 ms with bandpass filtered pink noise signal according to IEC 60268-2 at one octave above the lower limit of the frequency range
frequency range: -10 dB under anechoic halfspace-conditions
weight: net weight without optional equipment
heat dissipation: pink noise, 6 dB crest, 1/4 Pmax
nominal dispersion, beam width: -6 dB compared to the main dispersion axis

55

7.1.3 DFM-400

Electroacoustic features

acoustic design	electronically steerable line array speaker
components	32 × 4" long excursion speakers, neodymium
maximum SPL	134 dB (94 dB @ 100 m)
frequency range	55 Hz – 1.7 kHz
operational mode	active, 16-channel DSP-amplifier, Class-D
horizontal dispersion	90°
vertical beam width, digitally controlled	0° – 90° in 0,1° increments
vertical inclination angle, digitally controlled	–40° – +40° in 0,1° increments
acoustic centre	0% (bottom) to 100% (top) movable, both beams

physical features

enclosure	multiplex birch playwood, Aluminium
front design	hexagonal perforated steel grille in enclosure colour, backed by acoustically transparent foam
protection grille	steel grille, ball impact resistant, powder-coated
weight	42 kg
standard colours	textured paint / powder coating, black
mounting points	integrated flying tracks, 4 × M8-threads at rear
dimensions (W × H × D)	224 × 1636 × 274 mm

Optional features

optional colours	RAL Classic / NCS / Pantone on request

CAAD simulation data

simulation data	EASE, Fohhn Designer

Electronic features

amplifier type	Pure Path Digital PWM
audio inputs	AES/EBU
audio outputs	AES/EBU
amplifier power	16 × 120 W
DSP channels	16
frequency response	20 Hz – 20 kHz
signal/noise ratio	>105 dB/A
auto power save	adjustable from 1 s to 12 h, or never active
protective circuit	soft start, overtemperature, short circuit, overload
power supply	100 V – 240 V AC 50/60 Hz, power supply with Power Factor Correction (PFC)
inrush current	7,5 A (230 V) / 3,8 A (115 V)
power consumption	500 W RMS, idle 30 W, standby 10 W
heat dissipation	150 W, 517 BTU/h, 129 kcal/h
temperature range	0 – 40° C
cooling	temperature-controlled fan
weight (electronics)	6 kg

Controller

digital signal processors	2
independent limiters	6
FIR filter	yes
gain	–80 dB – +12 dB
EQ	10-band parametric EQ, gain, +/-12 dB, frequency 10 – 20 kHz, Q 0.1 – 100
selective 3-band limiting	bass / mid / high
limiter / compressor	yes
noise gate	yes
delay	input: 0 – 350 ms (0 – 120 m); output: 0 – 640 ms (0 – 220 m)
X-over	Linkwitz-Riley 4th order (24 dB / octave), high pass 10 Hz – 20 kHz, low pass 10 Hz – 20 kHz
system latency	1.2 ms
band-specific time constants	yes
filter technology	80-bit double precision
input	AES/EBU 32 kHz – 96 kHz, 16/24 bit
input DSP processing	yes

Remote control and remote monitoring

remote control	Fohhn Audio Soft, Fohhn Net
remote monitoring	temperature, protect, power supply, Fohhn Net, Fohhn Audio Soft, AES/EBU signals
simulation beam	Fohhn Net, Fohhn Audio Soft

Connections and controls

controls	mains switch (remote-controllable via Airea Connect)
mains connection	1 × PowerCON mains in, 1 × PowerCon mains out
inputs	1 × etherCON Airea Connect / stack link, 1 × XLR AES/EBU, 1 × etherCON Fohhn Net
outputs	1 × etherCON stack link, 2 × XLR AES/EBU, 2 × etherCON Fohhn Net
signal inputs	AES/EBU 32 kHz – 96 kHz, 16/24 bit
signal outputs	AES/EBU link-out from input

Display LEDs

Sign LED (connector panel and front grille)	blue = power on, blue flashing = sign
status LED	green = ready, red = protect / standby, red flashing = fault
receive / send LED	receive / send remote control LED
audio error LED	red = no AES/EBU
remote power LED	green = Airea Connect active, remote power on
on (stack link) LED	green = stack link active

power rating (peak); maximum SPL: peak, 20 ms with bandpass filtered pink noise signal according to IEC 60268-2 at one octave above the lower limit of the frequency range
frequency range: –10 dB under anechoic halfspace-conditions
weight: net weight without optional equipment
heat dissipation: pink noise, 6 dB crest, 1/4 Pmax
nominal dispersion, beam width: -6 dB compared to the main dispersion axis

7.2 Technical Drawings

7.2.1 DFM-100

Vorderansicht / Front view   Seitenansicht / Side view
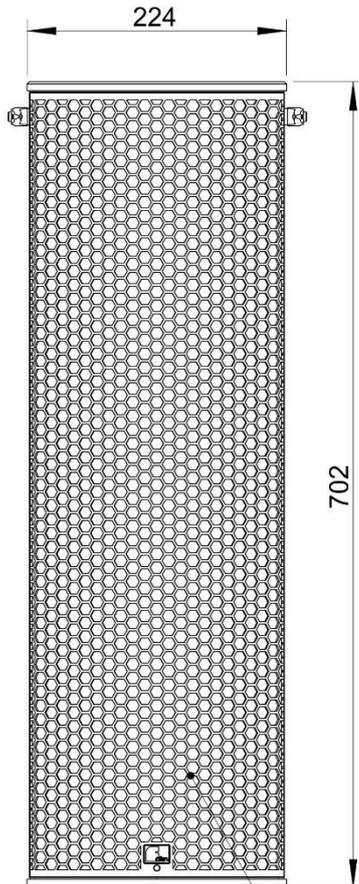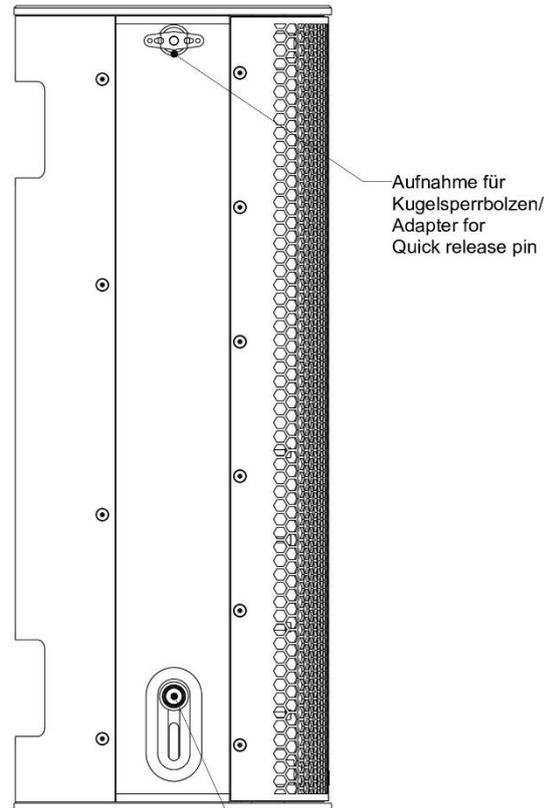
224

702

Aufnahme für
Kugelsperrbolzen/
Adapter for
Quick release pin

Stahlgitter, mit Akustikschaum
hinterlegt/
Steel grille, backed by
acoustically transparent foam

Verbindungsriegel für
weitere DFM-Module/
Suspension latch for
more DFM-Modules

All data and dimensions are subject to change

DFM-100
1340-xxxxx

Fohhn Audio AG, Grosser Forst 15, 72622 Nuertingen, Germany   www.fohhn.com   Date: 04.12.2020

Rückansicht / Rear view

29

80

AIREA stack link in (etherCON)

AES/EBU in (XLR)

AES/EBU link out (XLR)

Fohhn Net link out (etherCON)

Fohhn Net in (etherCON)

mains in (PowerCON)

mains switch

644

AES/EBU link out (XLR)

AIREA stack link out (etherCON)

Fohhn Net link out (etherCON)

mains link out (powerCON)

M8 (4x)

80

29

224

Draufsicht / Top view

274

Griff/
Handle

All data and dimensions are subject to change

DFM-100
1340-xxxxx

Fohhn Audio AG, Grosser Forst 15, 72622 Nuertingen, Germany   www.fohhn.com   Date: 04.12.2020

59
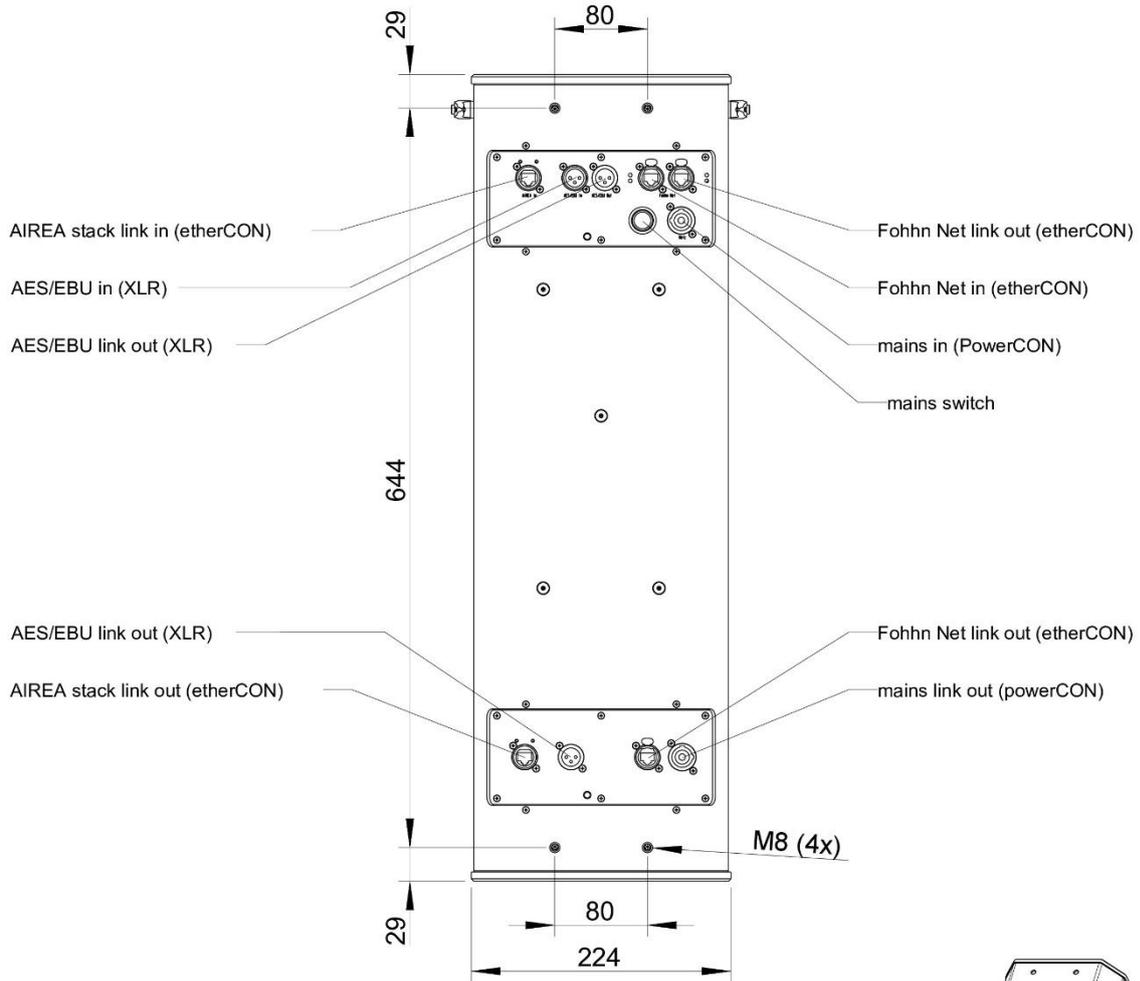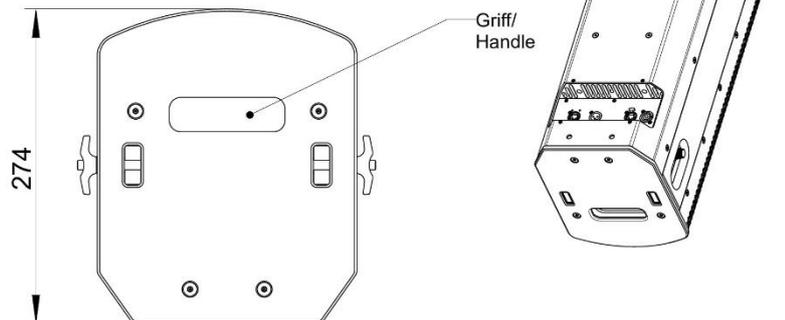
7.2.2 DFM-110

Vorderansicht / Front view   Seitenansicht / Side view
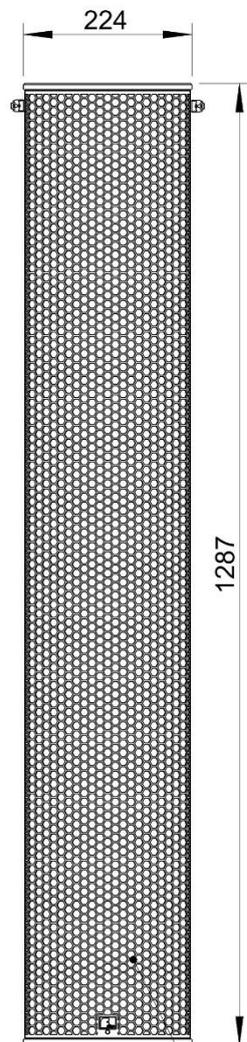
224   274

1287

Aufnahme für
Kugelsperrbolzen/
Adapter for
Quick release pin

Stahlgitter mit Akustikschaum
hinterlegt/
Steel grille, backed by
acoustically transparent foam

Verbindungsriegel für
weitere DFM-Module/
Suspension latch for more
DFM-Modules

All data and dimensions are subject to change

DFM-110
1341-xxxxx

Rückansicht / Rear view

29

80

AIREA stack link in (etherCON)

AES/EBU in (XLR)

AES/EBU link out (XLR)

Fohhn Net link out (etherCON)

Fohhn Net in (etherCON)

mains in (powerCON)

mains switch

1229

AES/EBU link out (XLR)

AIREA stack link out (etherCON)

Fohhn Net link out (etherCON)

mains link out (powerCON)

M8 (4x)

29

80

224

Draufsicht / Top view

274

Griff/
Handle

All data and dimensions are subject to change

DFM-110
1341-xxxxx

7.2.3 DFM-400

Vorderansicht / Front view   Seitenansicht / Side view
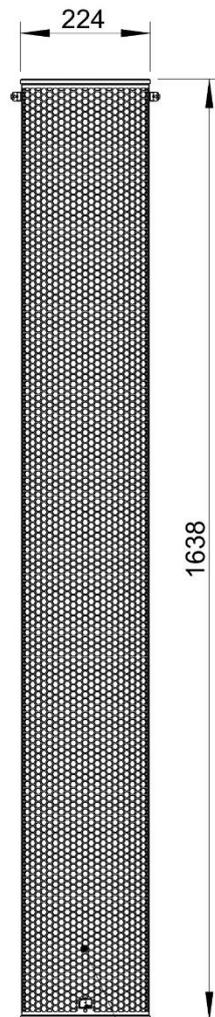
224

274

1638

Aufnahme für Kugelsperrbolzen/
Adapter for Quick release pin

Stahlgitter, mit Akustikschaum
hinterlegt/
Steel grille, backed by
acoustically transparent foam
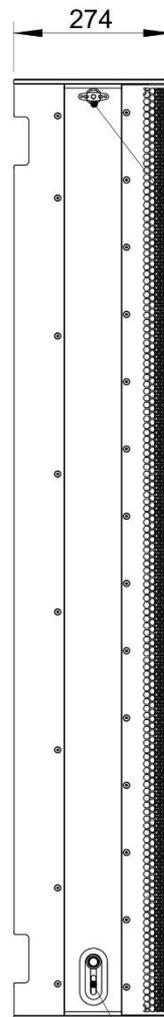
Verbindungsriegel für
weitere DFM-Module/
Suspension latch for
more DFM-Modules

All data and dimensions are subject to change

DFM-400
1342-xxxxx

Fohhn Audio AG, Grosser Forst 15, 72622 Nuertingen, Germany   www.fohhn.com   Date: 27.11.2020

Rückansicht / Rear view

29

80

AIREA stack link in (etherCON)

AES/EBU in (XLR)

AES/EBU link out (XLR)

Fohhn Net link out (etherCON)

Fohhn Net in (etherCON)

mains in (PowerCON)

mains switch

1580

AES/EBU link out (XLR)

AIREA stack link out (etherCON)

Fohhn Net link out (etherCON)

mains link out (powerCON)

M8 (4x)

29

80

224

Draufsicht / Top View

274

Griff / Handle

All data and dimensions are subject to change

DFM-400
1342-xxxxx

7.3 Pin Assignments and Cable Lengths

For correct operation of your Focus Modular systems, only properly supported, shielded and intact cables and plugs should be used. Check the condition of the connection cable at regular intervals and change any damaged cable where necessary.

⚠️ **Caution!**

- **Never use audio or CAT cables with defective shielding for example: This can lead to interference signals which in some cases may also result in damage to the system.**
- **Please also note the maximum permitted cable lengths. To ensure correct operation, the maximum permitted cable lengths should not be exceeded.**

The pin assignment and maximum cable lengths are given in the table below.

Cable Characteristics	Fohhn Net	Airea Net	Audio Signal AES/EBU
Type	CAT5 cable, RJ-45	CAT5 cable, RJ-45	XLR
Pin 1	nc	Fohhn Net +	Shield
Pin 2	nc	Fohhn Net -	AES/EBU +
Pin 3	Data +	AES/EBU +	AES/EBU -
Pin 4	Data -	Power +	
Pin 5	Data -	Power +	
Pin 6	Data +	AES/EBU -	
Pin 7	nc	Power -	
Pin 8	nc	Power -	
Max. cable length	1000 m (CAT5) *	100 m (CAT5)	100 m (shielded)

*For bridging greater distances, you can use a repeater/amplifier after 400 m. This processes the signal so that it can be newly transmitted over a distance of 1 km.

8. Troubleshooting

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

Problem	Probable Cause	Possible Remedies
No sound is audible. However, there is an audio signal.	The Input- and Output routing in the User DSP is not correct.	Check the DSP settings in Fohhn Audio Soft.
The module is not recognized by Fohhn Audio Soft.	Several products have the same Fohhn Net ID. An ID conflict will be displayed in Fohhn Audio Soft.	Change the ID – no ID can appear twice. (See section 4.3)
	The ID search range is restricted.	Extend the search range from ID 1 to 254.
	The Fohhn Net adapter or plug is not inserted.	Connect the module to the NA-3 or NA-11 Fohhn Net adapter.
The Focus Modular module's power, send and receive LEDs are not lighting up.	There is no supply voltage.	Check whether a supply voltage is present.
	Mains voltage not available. Mains fuse tripped.	Measure the supply voltage at the socket, check the fuse.
	With several modules: The connection cable is not plugged in.	Connect the module to the supplied cable set.
The send and/or receive LEDs are not lighting up.	The cable for the Fohhn Net connection is defective or not plugged in.	Check the cable or connect the module to the NA-3 or NA-11 Fohhn Net adapter.
The power LED flashes alternate red and green.	There is a hardware error.	Contact the service department at Fohhn Audio AG immediately.

If your problem does not appear in the table above, or if the problem is not remedied using the suggested solutions, please contact us.

9. Service and Repair

Servicing and/or repairs should only be done by suitably qualified, Fohhn-trained personnel. Do not carry out any servicing or any repairs to the device beyond what is listed in the section 9.1. For details of a Fohhn service provider in your area, please contact us.

Keep the packaging of 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.

9.1 Maintenance Measures

- Only use a dry or slightly damp, well wrung out towel, to clean your Focus Modular system.
- 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.

10. Glossary

Term	Explanation
Beam dispersion	Here, this refers to the directional characteristics of a loudspeaker: *Beam dispersion* describes the spread of the acoustic waves originating from a loudspeaker (with regard to a particular frequency). The vertical beam dispersion of a Focus Modular system can be adjusted electronically and in real time.
Acoustic centre	The *acoustic centre* of the beam can be moved along the full line length – electronically and in real time.
Beam Steering	The term *Beam Steering* denotes the control of loudspeaker system beam dispersion via electronics and software. Through the precise superimposition of closely positioned sound sources, it is possible to "bundle" the sound over a wide frequency and flexibly adjust a loudspeaker's beam dispersion angle.
Combined Speaker (Combined Loudspeaker System)	Here, this refers to the formation of a single unit from a minimum of two combined Focus Modular low-mid modules or two Focus Modular high modules.
DSP (Digital Signal Processor)	A *DSP* serves to process and control digitalized audio signals. Every Focus Modular system has three different areas of DSP functionality (User DSP, Speaker DSP und Beam Control DSP).
Fohhn Net	Here, this refers to a control network that is based on the RS-485 protocol.
Fohhn Net Adapter	To communicate with the Focus Modular systems, Fohhn Audio Soft requires an adapter for the Fohhn Net, which is connected to the control computer and transmits the data generated in Fohhn Audio Soft to the systems – e.g. an NA-3 or NA-11.
Listening Area	This term denotes the area in which sound coverage is required for spectators/listeners.
ID (Fohhn Net)	Here, this refers to the assigned address of an active Fohhn device in the Fohhn Net.
Side Lobes	Due to their construction, line arrays generate unwanted side lobes. These result from the finite distances between the individual loudspeaker chassis and the length of an array.
Side Lobe Free Technology	A specially developed algorithm suppresses the side lobes. As a result, relatively little reverberation is generated, as less acoustic energy is dispersed in unwanted directions.
Stack	The term describes a Focus Modular loudspeaker system or array consisting of several high frequency and low-mid modules that are electronically and mechanically connected to one another. (Minimum: one high frequency- and one low-mid module in each case).
Two Beam Mode/ Technology	Every Focus Modular module can generate two separate, completely independent acoustic beams over its entire line length. All parameters can be separately and individually set for each beam.
WLL	Working load limit

11. Appendix

11.1 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.

11.2 CE Marking and Declaration of Conformity

This loudspeaker 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.

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11.3 Trademarks

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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.

11.4 Protection Classes and Protection Types

Protection Class 1: All the equipment's electrical conductive components are connected with low resistance to the protective earth conductor of the installation.

IP54 The device's protection type (protection against dust in harmful amounts and protection against water spray)

11.5 Disclaimer and Copyright

11.5.1 Disclaimer

The contents of this user manual have been created with great care. However, Fohhn Audio AG cannot guarantee that the information therein (images, text and other representations) is always complete, correct and current. Fohhn 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.

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11.6 Contact Address

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