

FOCUS-SERIES

FOCUS Venue

FV-100

FV-200



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

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1. Introduction and General Information

Congratulations on the purchase of your **Fohhn® Focus Venue** system. As with all our **Focus-Series** systems, **Focus Venue** loudspeakers are equipped with the very latest **Fohhn Beam Steering technology**. This 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 Venue** system can be controlled using a single piece of software, **Fohhn Audio Soft**. All **Focus Venue** systems are available in both mobile and fixed installation variants.

In order to benefit from all the advantages of your Focus Venue 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 this device into operation. Keep these instructions near the device at all times. 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 Venue 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.

All components required for the mounting or suspension of a **Focus Venue** 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 1300 kg. If the system is to be used in countries that have stricter requirements, the permissible load capacity must be reduced accordingly.



Caution!

To avoid injury, the device must be stored, installed and operated well away from children.

To avoid injuries, 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 Venue 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 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 in order to completely disconnect the device!)

1.1.4 Acoustic Safety Information

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



To avoid potential hearing impairment, never stand in close proximity (4 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.

1.1.5 Connections and wiring

Focus Venue loudspeaker systems have the following connectors located at the top connection panel:

- Audio and control data In (AIREA, etherCON)
- Audio In/Out (AES/EBU, XLR)
- Control data In/Out (Fohhn-Net, etherCON)
- Power supply In (powerCON)

At the bottom connection panel:

- Audio and control data Out (AIREA, etherCON)
- Audio Out (AES/EBU, XLR)
- Control data Out (Fohhn-Net, etherCON)
- Power supply Out (powerCON)

For further details, please refer to the section on wiring in this user manual (see Chapter 4)



Please note the following when wiring up your system:

- Check that your cable is working faultlessly and only use cables with a sufficient cross section.
- Only use cabling- and connector materials that meet professional standards.
- Only use properly shielded cables and plugs for the audio and data connections.
- Only use power cables with a fully intact grounding pin
- Lay and secure the cabling in a way that it cannot be damaged by tools or by the loudspeakers itself or its flying accessories.
- Protect any laid cables from unnecessary traction.

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

Important: To enable communication between a Windows PC with **Fohhn Audio Soft** installed and the **Focus Venue** loudspeaker system, a **Fohhn®** network adapter (e.g. **NA-11 Fohhn-Net USB Adapter**, **NA-3** or **NA-4 Fohhn-Net Ethernet Adapter**) or a connection to a **Fohhn®** AIREA output is required.

More information can be found in Chapter 4 of this user manual!

1.2 Operating Conditions



Caution!

Please note the following when operating your Focus Venue 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. In order to ensure adequate cooling, the device must not be covered with towels or cloths. Avoid letting the enclosure become hot through exposure to sunlight or strong spotlights.
- In order 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 Venue** 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).

1.3 Storage and Transportation

Please note the following:

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

2. The Product

2.1 Product Description

Fohhn® Focus Venue 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 Venue 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:

- **FV-100** high frequency module



The high frequency module FV-100 is equipped with 8 pcs of 1,5" exit / 4" VC compression drivers, 8 pcs of 1" exit/1,75" VC compression drivers and a preceding **Fohhn®** Waveguide system. Each high frequency driver is separately powered by a Class-D amplifier channel.

Their usable frequency range is 800 Hz to 3 kHz for the 1,5" drivers and 3 kHz to 20 kHz for the 1" drivers. A sophisticated filter design allow for perfect phase alignment of the two ways at a crossover steepness of 48 dB/oct. Thus, virtually no comb filter effects occur between the two ways.

FV-100 are linkable to longer stacks in an array with other FV-100 and have to be used in combination with one or more low-mid modules FV-200.

- **FV-200** low-mid module



The low-mid module FV-200 is equipped with 8 pcs of 10" / 2,5" VC long excursion cone speakers. The chassis are driven in pairs by 4 Class-D amplifier channels. The frequency range here is 60 Hz to 800 Hz.

FV-200 are linkable to longer stacks in an array with other FV-200.

The FV-200 features the Fohhn **Convertible Dispersion Technology (CDT)**: Its dispersion pattern is remotely switchable via Fohhn Audio Soft between omnidirectional (with enhanced low end) or cardioid (with rear sound attenuation)

To learn more about CDT and its use, please refer to chapter 5.4

Brief overview of the modules:

Module	FV-100	FV-200
Components	8 x 1,5"/4" drivers 8 x 1"/1,75" drivers	8 x 10"/2,5" chassis
Amplifier channels	16 x 250 W, Class-D	4 x 1 kW, Class-D
Frequency range	800 Hz – 20 kHz	60 Hz – 800 Hz
Frequency range	800 Hz – 20 kHz	60 Hz – 800 Hz
Horizontal dispersion	90°	90° cardioid or omnidirectional

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

2.2 Product Identification

The **Focus Venue** module's type designation can be found on the upper connection panel at the rear side of the speaker. The individual modules can also be identified by their respective sizes:

- **FV-100:** 639 mm
- **FV-200:** 1276 mm



2.3 Delivery and Unpacking

Every Focus Venue 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 Venue** system is delivered with the following:

- **1 x three-part cable set** for the electrical connection of two adjacent **Focus Venue** modules (PowerCON for supply voltage, XLR for audio signal, RJ45/etherCON for **Fohhn-Net** network or AIREA)
- **1 x PowerCON mains cable**
- **1x manual**



When unpacking the system, we recommend the following procedure:

- I. Examine the packed product for any signs of transport damage.
- II. Remove all packing material from the product.
- III. Examine the product for any signs of transport damage. Don't forget the bottom surface.
- IV. 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.

2.4 Accessories

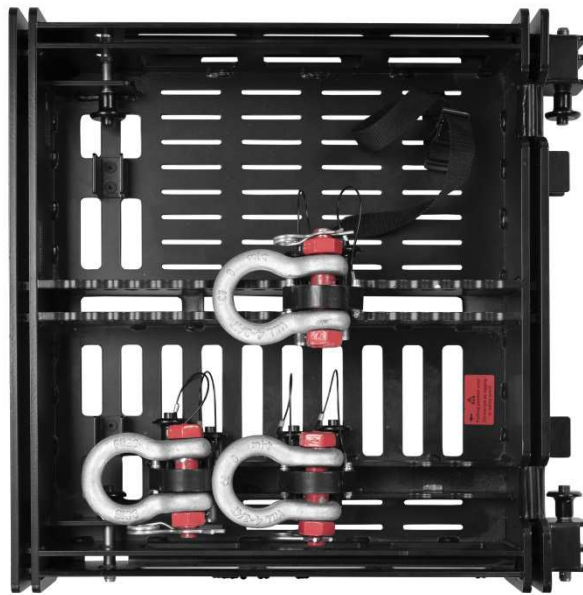
Setting up a **Focus Venue** module requires a Windows PC (Windows 7 or higher) with **Fohhn Audio Soft** installed and a **Fohhn®** network adapter or – if connected via Fohhn AIREA – an AIREA breakout box

Product ID	Article number	Description
NA-11	6115-00000	Fohhn-Net USB Adapter
NA-3	6104-00000	Fohhn-Net Ethernet 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-10	1710-00900	AIREA Master with 1x AES/EBU and 1x Fohhn-Net Input, 4x AIREA Output

The following accessories are available:

Product ID	Article number	Description
FF-FV-100/200	8331-B0000	Flying frame with a working load limit (WLL) of 1,3 tons for Focus Venue Arrays. 3 separate pickpoints for suspension and safety.
DO-FV-100/200	8161-00000	Transport dolly for 2x FV-200 or 4x FV-100 or mixed
PB-FV-100/200	8335-00000	Pull back frame and downfill adapter
RC-FV-Connect	8158-00000	Rain cover for connection panel, 2 pcs for both panels are mandatory for outdoor use!
RC-FF-FV-100/200	8159-00000	Rain cover for flying frame and top of one vertical array of Focus Venue, 3x shackles for suspension and safety included. Recommended for outdoor use.
TC-FV-DO	8320-B0000	Padded transport cover for a set of Focus Venue modules on dolly (2x FV-200, 4x FV-100 or mixed)

FF-FV-100/200



DO-FV-100/200



RC-FV-Connect



RC-FF-FV-100/200



TC-FV-DO



3. Mechanical Setup and Rigging

3.1 The Focus Venue Rigging and Interlock System (ILS)

Each **Focus Venue** module has four suspension points at the top, each equipped with a recessible steel latch and four respective slots for suspending further FV-modules at the bottom. The Fohhn ILS rigging system connects latch and slot. It is spring-loaded, self-securing, easy to use and without any loose parts like ball lock pins on steel cords.

Inside each cabinet are four steel flying tracks sustaining the weight and an aluminium frame to brace every individual module against shearing and bending forces. These structures carry the entire system, which may have a weight of up to 1,3 tons.



All four flying tracks have to be engaged at any time when rigging an array of Focus Venue modules!



To move the latch, a knurled-head screw acts as a handle and may be tightened as soon as the latch is connected to the above rigging pin to avoid rattling noise at high SPL of the system.

A yellow tag on the latch indicates, that the latch is not connected to the respective slot in the upper module or flying frame.

The ILS rigging system has to be disengaged before sliding the latch into its slot. To disengage the ILS, turn the handle disk counterclockwise to the left end stop, pull it back – and thus the rigging pin - against the spring and turn the disk clockwise to the right end stop, releasing the strain against the spring. If disengaged, a yellow tag appears under the handle disk.

To engage the ILS, turn the disk counterclockwise again. The spring-loaded rigging pin snaps into its locking position and secures automatically against accidental unlocking, the yellow tag is concealed.



Always make sure, no yellow tag is visible at all four ILS catches before hoisting the system!



3.2 Rigging and landing a Focus Venue system

3.2.1 Flying frame FF-FV-100/200, number of arrayable modules

To fly an array of Focus Venue modules, the flying frame FF-FV-100/200 is required.



Warning!

Using any other form of suspension is expressly forbidden!

Its load capacity is 1,3 tons, which is the limit for any possible array including cabling and accessories. Since the weight of a FV-100 is 107kg and of an FV-200 is 135kg, a total number of 9 modules may safely be suspended in any possible combination of FV-100 and FV-200.

If an FV-100 downfill adapter or a pull back frame/downfill adapter with Fohhn PT-70 or other fill systems is added, the number of cabinets has to be reduced accordingly.

The FF-FV-100/200 flying frame has four receptive slots for the four suspension latches of the top FV module with quick release rigging pins, a central suspension rail with numbered holes and a number of three adjustable rigging skids, each with a 4,75 to shackle and two 12mm quick release pins.

The plain surface of the frame faces to the front of the Focus Venue, the visible pins to the rear. It comes with plastic feet to protect the surface of the FV cabinets. The rigging skids are stored in their parking positions on the small rail inside the frame during transportation.



Danger!

Never try to use them for any purpose in their parking position!



To fasten a suspension latch to the frame, pull back the pin of the frame to the end stop while pressing the central release button, unclamp the knurled-head screw of the latch and push it in upmost position, then again press the release button of the pin and push the pin through the bores of frame and latch until the ball bearings are visible and protruding well outside the bore in the frame. Release the button.

⚠ Danger!

Please note: Make sure all four latches of the top module are at the upper stop (no yellow tag visible) and all four rigging pins are pushed through the frame, their ball bearings visible! Otherwise it is not safe to hoist the system!



To rig the system, take the rigging skids out of their parking position and insert them into the central suspension rail. Again, make sure the quick release pins are safely assembled, their ball bearings protruding on the opposite side of the rail.



Warning!

If any other shackle than the supplied one is used, be aware that the WLL must not be less than 4,75 tons at a safety factor of at least 6!

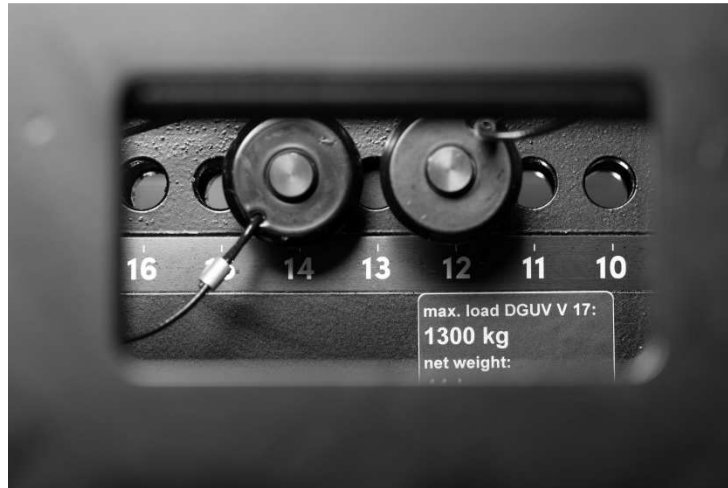


One or two skids are intended to be the motor pick points, while the remaining ones shall be fastened to safety chains, thus providing a minimum of array movement in case of faults like breaking motor chains or shackles. For details about single (SPR) and double point rigging (DPR) please refer to 3.2.4



The position of the rigging point (above the center of gravity) is different for FV-100 and FV-200. However, there is a general rule for rigging mixed arrays in order to keep the inclination angle as small as possible:

- **Pick point 13, quick release pins in hole 12 and 14:** The number of FV-200 modules is greater than or equal to the number of FV-100 modules in a straight array.
- **Pick point 12, quick release pins in hole 11 and 13:** The number of FV-200 modules is less than the number of FV-100 modules in a straight array.



Pick point 13

3.2.2 Forward inclination of a Focus Venue system

Focus Venue is a modular Beam Steering system. In its main mode of application, it is usually flown in a vertical, linear format. However, in some cases it can be advantageous – on acoustic or optical grounds – to carry out a mechanical inclination.

For arrays with up to three modules, this can be achieved by using the rearmost skid position for suspension. In this case it is recommended only to use one skid for a safety chain and place it as close as possible to the suspension skid.

For longer arrays or steeper inclination angles, you have to use a pull back frame PB-FV-100/200 under the bottom FV-module. It is dedicated for this purpose and has a fixed pick point for a shackle, sticking out over the rear edge of the system.



Warning!

The scope of mechanical inclination is limited, as follows:

1. Under no circumstances must a Focus Venue stack be tilted or inclined sideways – either during use, or during rigging or landing! This could cause structural overload and damage to the internal and/or external flying hardware. Viewed from the front, every Focus Venue system must hang vertically!
2. Single modules may be inclined sideways or front to back in any required angle – through to a horizontal position. A pull back frame/downfill adapter is required.
If a downfill spaker with TV-spigot is flown below the Focus Venue, the inclination angle is limited to 25° towards vertical position.
3. A straight array of up to two (2) Focus Venue modules may be inclined front-to back downwards or upwards in any required angle – through to a horizontal position, a pull back frame/downfill adapter is required.

If a downfill spaker with TV-spigot is flown below the Focus Venue, the inclination angle is limited to 25° towards vertical position.

4. A straight array of up to four (4) Focus Venue modules may be inclined front-to back downwards or upwards in a maximum angle of 40° towards vertical position, a pull back frame/downfill adapter is required.

If a downfill spaker with TV-spigot is flown below the Focus Venue, the inclination angle is limited to 25° towards vertical position.

5. A straight array of up to nine (9) Focus Venue modules may be inclined front-to back downwards or upwards in a maximum angle of 25° towards vertical position a pull back frame/downfill adapter is required.

3.2.3 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 point 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 Venue has been designed as a single-point-suspension system.

When selecting safety chains, their WLL has to be greater than the entire weight of the system (loudspeaker modules, flying frame, cables, motors etc.) plus a safety margin complying with local regulations. We recommend to use safety chains with a WLL of minimum 3,15 t 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.

Once the Focus Venue 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 in order to keep the dynamic forces as low as possible.

It is also necessary to ensure that the system can not 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.

3.2.4 Flying from the hook of a crane or chain hoist

Due to its weight and the way it is transported, it is not practical for a **Focus Venue** system to 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.

Rigging itself could be done in two ways:

- Using a single rigging point requires only one chain hoist, but the horizontal alignment of the array is not determined. After hoisting up, the array has to be fastened with cords or straps to aim it horizontally. In the following, this method is referred to as **SPR (single point rigging)**
- Using two rigging points a second synchronized chain hoist and a second suspension point at the truss or building are required. Thus, the horizontal alignment of the array is determined and no additional cords are needed. A re-alignment of the system is getting more complicated. In the following, this method is referred to as **DPR (double point rigging)**



Warning!

Using DPR it is possible to introduce shearing forces to the flying frame, when the suspension points of the motors are not vertically aligned with the pick points of the frame or a chain bridle is used. To maintain structural safety, the angle of chains or steels attached to the pick points of a Focus Venue array must not exceed 30° against the vertical!

Proceed as follows:

1. Each transport dolly bears two to four Focus Venue modules. Pull off the transport covers by unravelling the vertical Velcro connections on each side of the cover. Start with the narrow side, push it up on top of the cabinets and proceed with the second narrow side, then the broad sides. Lift off the cover from the cabinets and store it safely.



2. Connect each **Focus Venue** module to **Fohhn Audio Soft** and check its **Fohhn-Net ID**.

To avoid any confusion during the rigging procedure, 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 actually flown.

Further information on allocating and changing ID numbers can be found in chapter 4.5 as well as in the Fohhn Audio Soft user manual. This can be downloaded free of charge from our website: www.fohhn.com

It may also be helpful to put together a brief overview of all integrated **Fohhn-Net** devices, along with their respective ID numbers.

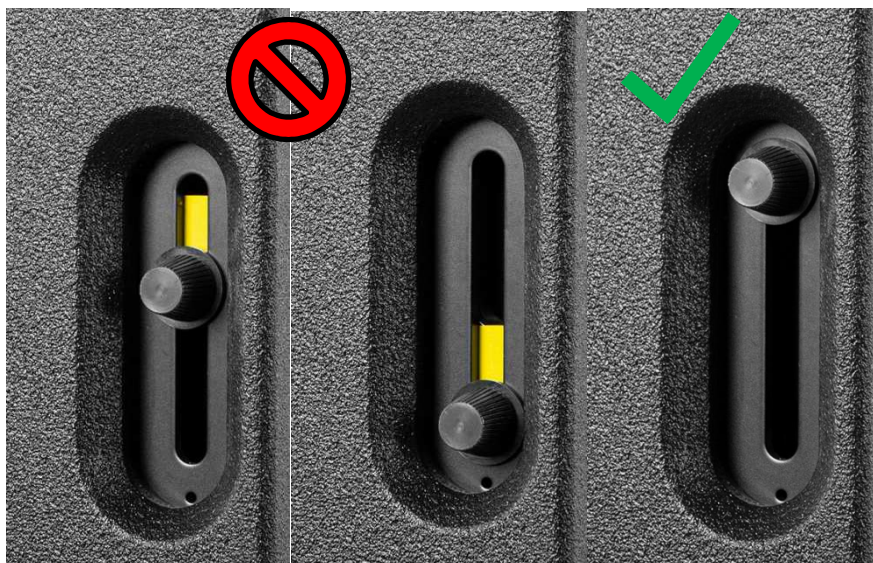
3. Connect the top FV module to the flying frame. Only use the ball lock rigging pins of the FF-FV-100/200.



Before operating any motors, a clear and loud warning should be issued! Make sure no persons are directly beneath and everyone is clear of the array!

Make sure that all four pins are fully inserted, their ball lock ends protrude from the surface of the flying frame, their ball bearings are released!

All four suspension latches of the top FV module has to be in the upmost position, if any yellow tag is visible, do not hoist the system!



4. Attach the flying frame to the hook(s) of the motor(s) or crane(s).



The supplied 4,75 t shackles are dedicated for this, in accordance with DIN 13889. If other shackles are used, they must guarantee a Working Load Limit (WLL) of at least 4,75 t with an operating ratio (safety factor) of at least 6.

For SPR take the center rigging skid for suspension, the external two skids for safety chains. For DPR it's the other way round.

For rigging or landing Focus Venue safely it is imperative to read and observe all instructions in chapter 1.1.2 to 1.1.4 and the entire chapter 3!



5. For SPR fasten the safety bridle to both of the external 4,75 t shackles. If using separate chains for both points rather than one chain bridle, make sure that these are exactly the same length and that they are attached to the same point.
For DPR fasten one safety chain to the central 4,75 t shackle.

To secure the system correctly, please pay careful attention to the “Safety Chains” section (3.2.3).

6. Connect the system to its supply cables for mains power, network (**Fohhn-Net**) and audio signal. **(For details on this, please refer to chapter 4)**

All cables have to be of sufficient length to form a loop. In the flying frame, a short lashing strap is integrated. To secure the cables from mechanical strain, tie the cable loop down to the bottom of the flying frame. Make sure the cables cross the edge of the frame over the rounded cable outlet gap.

Connect the system supply cables to the upper connection panel of the top FV module. For longer arrays, you will use more than one power supply cable. Make sure the power cables for the lower modules don't get damaged in the rigging procedure!

At this point, there are two different possibilities of setting the mains power switch, depending on how the array is wired. Please refer to chapter 4.1 and 4.2



7. Raise the flying frame and the top module to a suitable height that enables you to position the second module below it. Disengage all four ILS-catches by rotating the locking disk counterclockwise, pulling it to its outer stop and rotating the disk clockwise again, thus fixing the ILS in its released position.



Make absolutely sure, all four rigging points are fixed in this way and all four yellow tags are visible before going on! Otherwise the modules might get damaged!



8. Do NOT push up the rigging latches of the second module at this point! Lower the first module, until there is 1-3 cm of space left between the two modules. Now push up the rigging latches of the lower module and slide them directly into the slots of the upper one. This can easily be done now since the upper module is movable freely.



9. Lower the upper module onto the lower one. The latches will guide them into correct position. Please note the following:

- a. There shouldn't be any gap between the two modules.



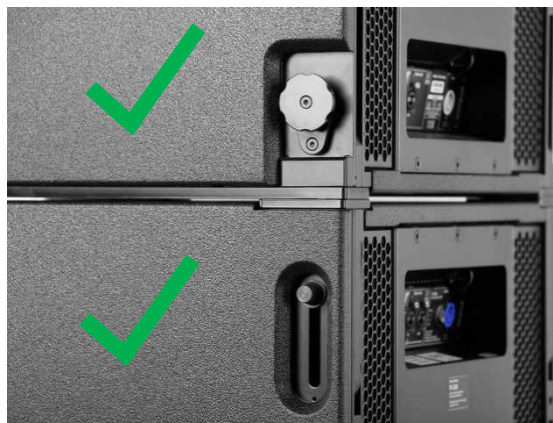
- b. **Stop the motor as soon as the chain loses its tension! Otherwise there is a risk for longer arrays to tilt and tip over!**
- c. **Normally, the lower module will rest on the transport dolly. After lowering the upper one(s) the weight of the entire array rests on the dolly. Make sure the floor is suitable to bear the weight, flat and even to prevent the dolly from moving.**
- d. **Under no circumstances put your fingers, hands or other parts of your body between two modules!**
- e. **Under no circumstances place your feet near the castors of the dolly in case it moves!**

10. Engage all four ILS-catches of the upper module by rotating the handle disk counterclockwise. The spring will push the rigging pin inwards until the ILS contacts the surface of the flying track.



Make sure the ILS is locked and no yellow tag is visible! The handle disk should be in its right stop position.

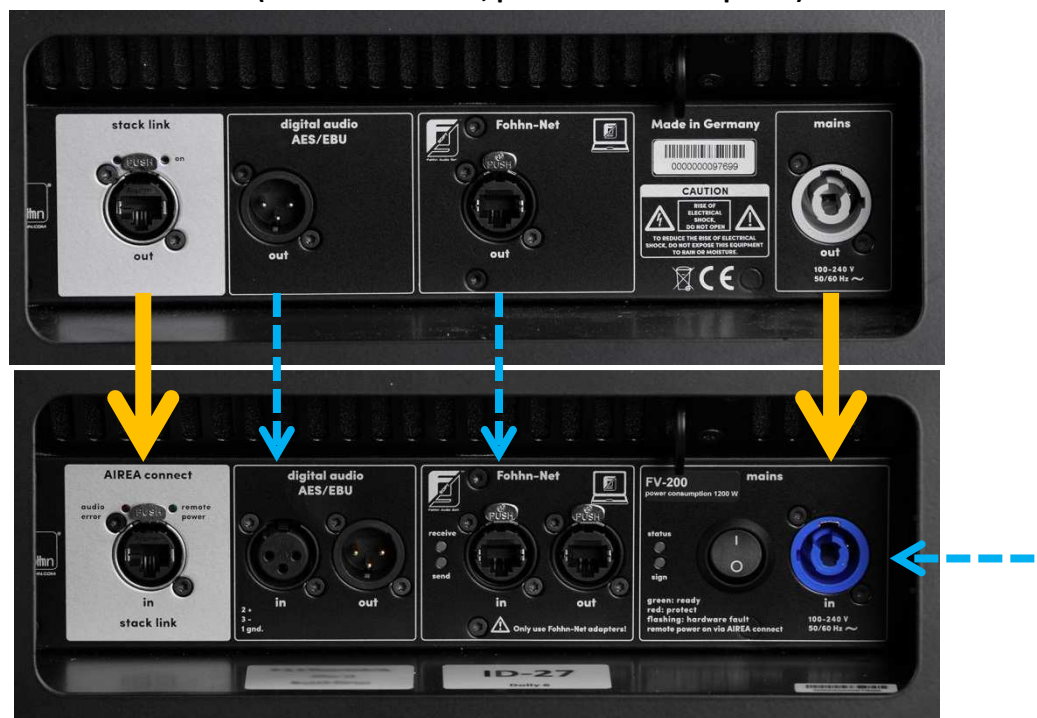
Push up the rigging latches of the lower module while locking the ILS! Make sure all four latches are in their upmost position and no yellow tag is visible!



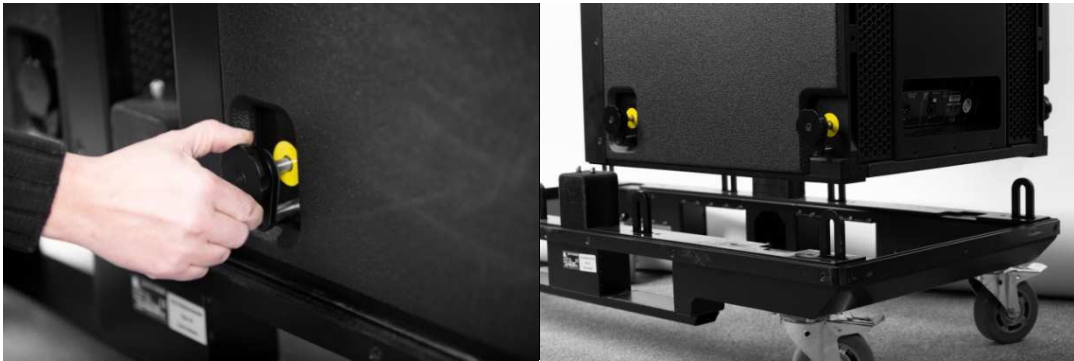
11. Gently tighten the four knurled head screws of the latches to avoid the latches from rattling against the flying tracks during operation. This is optional.



12. Wire the lower module by using the provided cable kit.
- a. Mains power may be supplied either from the upper module by daisy-chaining with the short powerCON-cable or separately with its own powerCON supply line, depending on the number of modules in the array and the available number of separate phase-circuits of the mains supply.
As a general rule, we recommend per individual supply line
 - i. Two FV-200
 - ii. One FV-200 and up to three FV-100
 - iii. Up to six FV-100
 - b. Network and audio interconnection can be done by connecting the AIREA out and AIREA in by the provided RJ45 cable (recommended)
 - c. Network and audio interconnection could alternatively be done by using separate cables for AES/EBU (XLR) and Fohhn-Net (RJ45). In this case, some features of the system cannot be used. **(For details on this, please refer to chapter 4).**



13. Disengage all four ILS catches of the lower module to release it from the transport dolly and raise the modules from the dolly



14. Repeat step 7 to 13 for all modules in the array.
15. Hoist the completed **Focus Venue** system to its final working height.
16. If not yet done, fasten the safety bridle or single safety chain to their suspension points (**see chapter 3.2.3 “Safety Chains”**)
17. Having chosen the double point rigging method (DPR) with two chain hoists, the horizontal aiming of the array is overall determined. However, slight changes of the alignment can be achieved, if the bottom of the array is – as common from line array rigging practice - tied up in two or more directions against some stable structure like a PA tower scaffold or similar. For single point rigging (SPR) this is mandatory, since there is no other way of horizontal alignment.

We recommend to fly a pull back frame PB-FV-100/200 at the bottom of the array and use the dedicated strap points at each side of the frame to attach a round sling for this purpose. If no pull back frame is available, the steel embraced bar handles of the lowest FV module do as well.



If Focus Venue is used outdoor, lashing up the array is even more important to prevent it from swaying through wind load.

3.2.5 Landing an array

Landing the system is basically done in reverse order. Therefore, please observe the following:



- Make sure the floor is suitable to bear the weight of the entire array, flat and even. If you have to work on sloping terrain, it could get hard to disengage the ILS between the modules and you have to take extra care to prevent the dolly from moving. In this case try to level the dolly with a wooden board or similar.
- Before operating any motors, a clear and loud warning should be issued! Make sure no persons are directly beneath and everyone is clear of the array!
- Lower the array as smooth as possible. If DPR is used, make sure both motors are synchronized.
- Stop the motor as soon as the chain loses its tension! Otherwise there is a risk for longer arrays to tilt and tip over!
- Never attempt to remove ball lock pins that are under load!
This leads to injury!
- Make sure that all cable connections have been removed before two modules are separated from one another.
- Make sure all ILS catches are disengaged (yellow tags visible) between two modules before the upper module is lifted to free the lower one.
- Make sure all ILS catches are engaged (yellow tags invisible) before the dolly is rolled away

3.3 Rain cover for connector panels

The connector panel rain covers are mandatory for any outdoor use of Focus Venue!

Without them, the electronics at the rear of the system are likely to get damaged by water seeping in from the in- and output sockets.

Their installation is simple and tool-free:

1. Fold out the rain cover lid and carefully bend the frame.



2. Start by inserting the frame on one side of the connector panel, then insert it on the other side



3. Fold out the bottom of the rain cover towards the connector panel



4. Tilt the lid outwards then fasten the velcro on each side.

Always make sure the air entrance (bottom panel) and outlet (top panel) are not blocked by the rain cover! The velcro has to be fastened as shown below, otherwise the system is likely to overheat and switch off.



Removal: Use the lug to pull up the bottom of the rain cover from the connector panel, then pull out the rain cover by bending it.



For transport of the Focus Venue, open the velcro on both sides and flatten the lid against the rear of the amplifier housing



3.4 Rain hood for the top of an array

Since Focus Venue is an active system with built-in electronics, we recommend for its outdoor use to protect each stack or array by a rain hood.

Though each module in combination with two rain covers for the connector panels is weatherproof up to a certain degree, in the long run an array may suffer from heavy rain or snow.

Besides that, the rain hood is useful to shield power distributors, cabling, adapters etc. from bad weather conditions.

To ensure the best possible level of protection, the rain hood comes with three forged rings with sealing collars. They are inserted into the line of suspension directly above the shackles of the flying frame.

The rain hood is secured to the handle bars of the top module by two elastic straps to prevent it from lifting in case of stormy winds.

1. Attach all three forged rings to the shackles of the flying frame.



2. Cover the flying frame with the rain hood and stick the rings through the sleeves



3. Let the elastic band slip into the slot of the sealing collar and pull it tight. Proceed with the other two rings.



4. If any of the three suspension skids of the flying frame is not in use, the band can be used to seal the odd sleeve.



5. Secure the rain hood to the handle bars of the top FV-module with the straps at both sides



4. Wiring and software setup

4.1 Wiring

Each Focus Venue is equipped with the same input- and output-panels. The connecting cables run inside the amplifier housing, link the two panels and provide an easy way of daisy-chaining the modules from top to bottom.

Since the input panels have additional audio- and Fohhn-Net link-sockets, all FV-modules have the capability to act as “master”-module i.e. as first in the line of connection.



FV top connection panel

1. Mains

The mains power supply cable is connected to the powerCON socket. The related **sign** LED shows the current mains supply status. The universal power supply permits a supply voltage of 100 – 240 V at a frequency of 50/60 Hz.

Focus Venue modules are equipped with a switch-on delay (or Soft start function).



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 Venue from the mains power **BEFORE** switching off all the other components! Otherwise this could result in hearing damage due to loud signals! Nobody should stand directly in front of the loudspeaker systems for any length of time!

2. Fohhn-Net Remote IN

The **Focus Venue** module is connected to the **Fohhn-Net** via an RJ45 etherCON socket. The **receive** and **send** LEDs (d) flash when **Fohhn-Net** control data is received and sent.

3. **Fohhn-Net Remote OUT**

Fohhn-Net control signals can be looped through via the parallel Link-Out RJ45 etherCON socket

4. **Audio Input**

The digital AES/EBU audio input is fed via a female XLR input socket. Pin configuration is 2 + / 3 - / 1 ground

5. **Audio Output**

The digital AES/EBU audio signal is looped through via a male XLR output socket. Pin configuration is 2 + / 3 - / 1 ground

6. **Fohhn AIREA Input / stack link**

A Focus Venue 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.

a. mains switch

The mains switch of the Focus Venue 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:

- i. Focus Venue Stack supplied and wired with AIREA coming from an AIREA Master AM-10/20/40/50: If the switch is off, you're able to switch the stack on or off via software by switching the corresponding output of the AIREA master.
The modules are powering up sequentially from top to bottom.
- ii. Focus Venue Stack supplied and wired with AIREA coming from an AIREA Master AM-10/20/40/50: If the hardware mains switch is on, the modules are switched on permanently.
- iii. Focus Venue 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. You're not able to alter its status unless you get to the connection panel and operate the switch manually!

b. status LED

- i. green permanently on: The module is ready
- ii. red permanently on: The module is in protect mode
- iii. red flashing: The module has some sort of hardware fault

c. sign LED

The blue sign LED can be manipulated using Fohhn Audio Soft.

It is connected with a corresponding blue LED at the front of the FV module below the Fohhn-Logo.

Its purpose is mainly the visual identification of a Focus Venue module in a stack to evaluate its correct position and Fohhn-Net ID. The LED may have three status:

- i. permanently on: Mains power is available, the module is switched on.
- i. permanently off: Makes the stack visually unobtrusive during the show
- ii. flashing (sign): if switched to “sign” in the Fohhn Audio Soft, it shows which particular FV-modul is operated.

d. Send /Receive LED

The receive and send LEDs flash when Fohhn-Net control data is received and sent.

e. Audio error LED

The red audio error LED indicates, that there is no AIREA-signal available at the AIREA input and no AES/EBU-signal available at the AES/EBU input of the FV module

OR

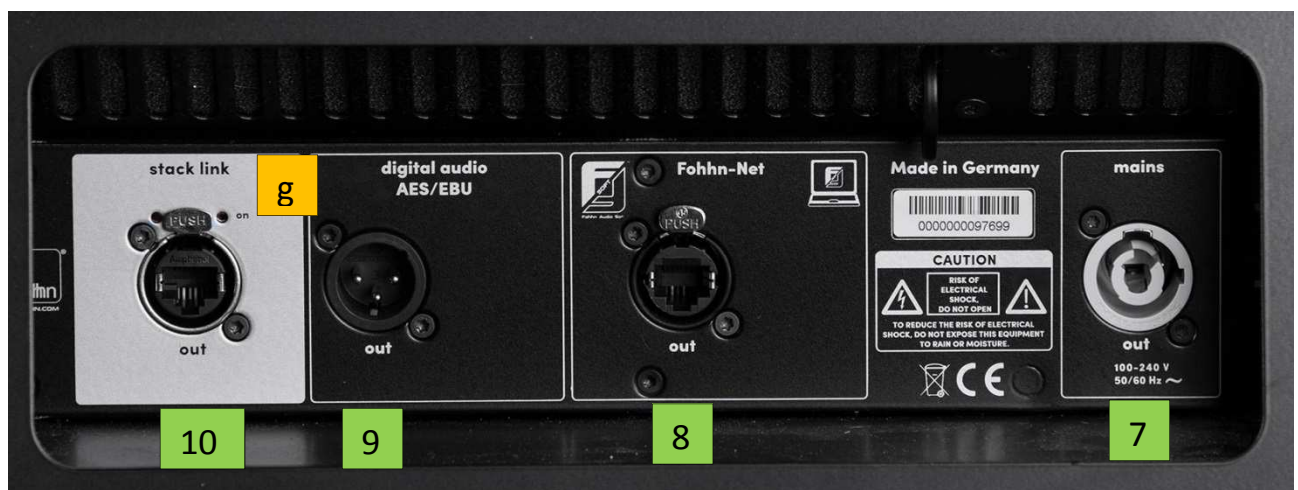
there is AIREA available from the AIREA master output but no AES/EBU-signal available at the corresponding input of the AIREA master.

f. Remote power

The green remote power LED indicates that the 48V AIREA supply voltage is available at the AIREA input of the FV 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 AM-10/20/40/50. Then the corresponding FV-module may remotely be switched on and off.



FV bottom connection panel

7. Mains Link

The PowerCON socket enables the mains supply voltage to be looped through to a subsequent module.

8. **Fohhn-Net Remote Out**

The parallel Link-Out socket enables **Fohhn-Net** control signals to be looped through via a RJ45 etherCON socket.

9. **Audio Output**

The digital AES/EBU audio output allows the audio signal to be looped through via a male XLR socket. Pin configuration is 2 + / 3 - / 1 ground

10. **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.

g. **On**

The green “on”- LED indicates, that the 48 V AIREA supply voltage is available for the next Focus Venue module.

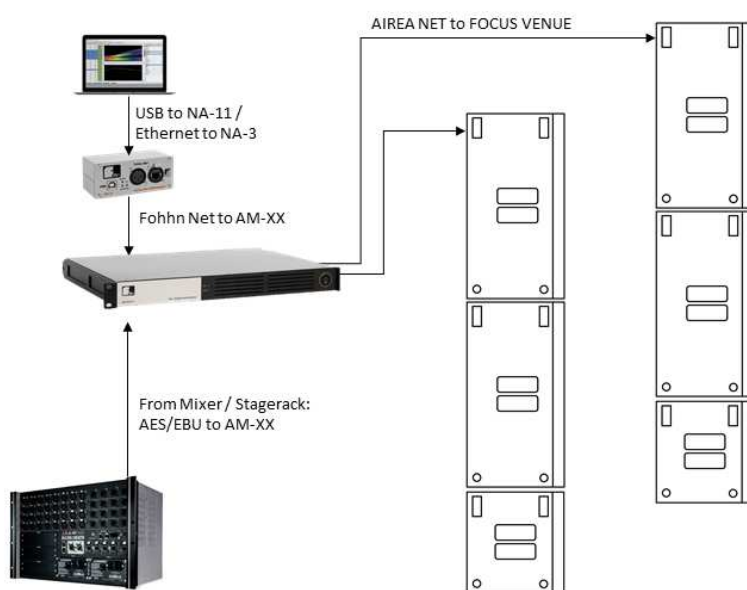
4.2 General configuration

To supply **Focus Venue with Fohhn-Net** and digital audio, there are several opportunities. Generally, you may use Fohhn AIREA or separate feeds for Fohhn-Net and audio.

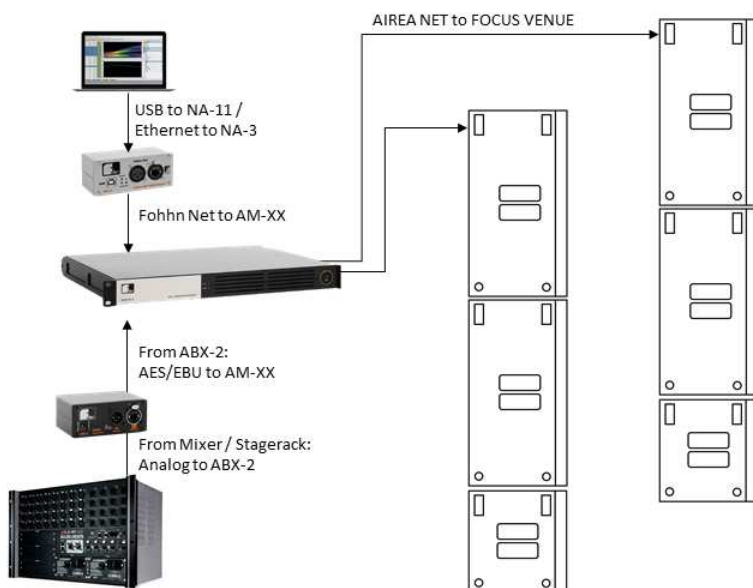
Using the AIREA input of the Focus Venue provides some advantages:

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 AIREA master AM-10/20/40/50
3. Sequential power-up of an entire stack is possible using AIREA master AM-10/20/40/50

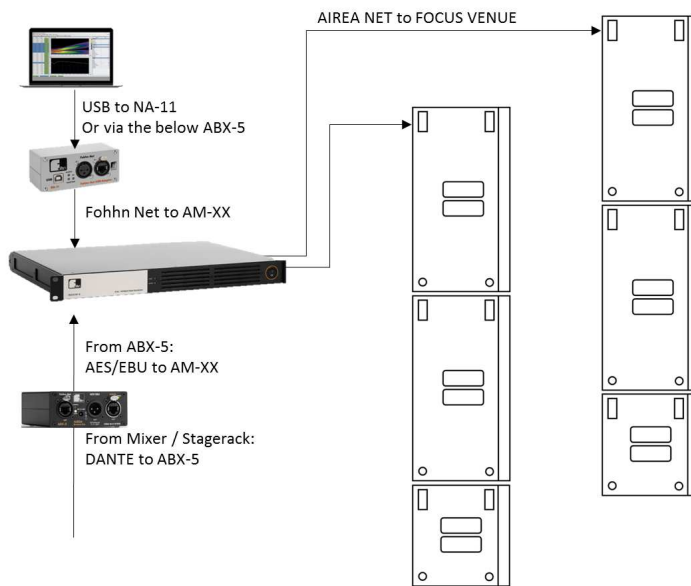
- **Fohhn-Net & AES/EBU via AIREA Master**



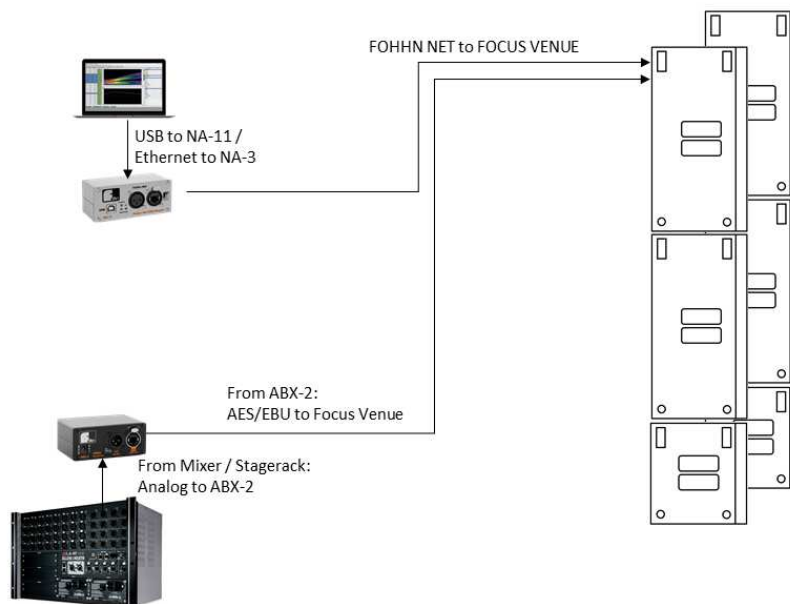
- **Fohhn-Net & analog audio via AIREA Master**



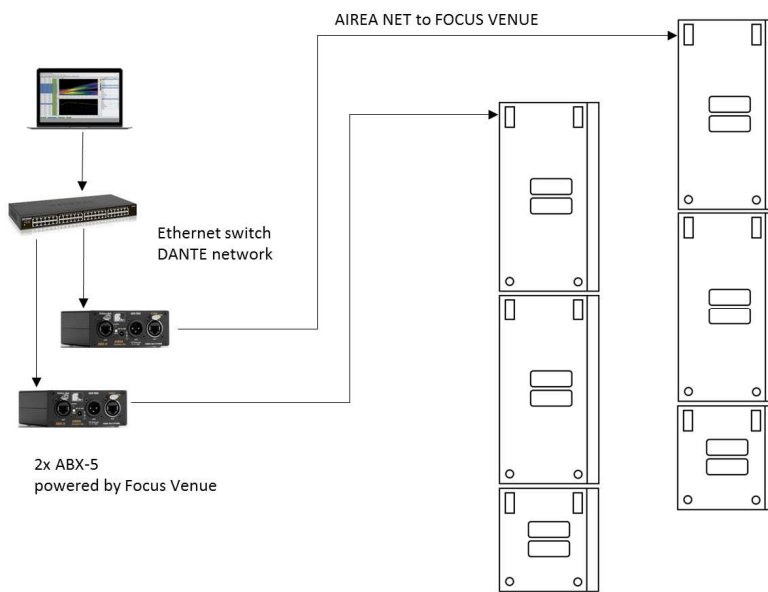
- **Fohhn-Net & DANTE via AIREA Master**



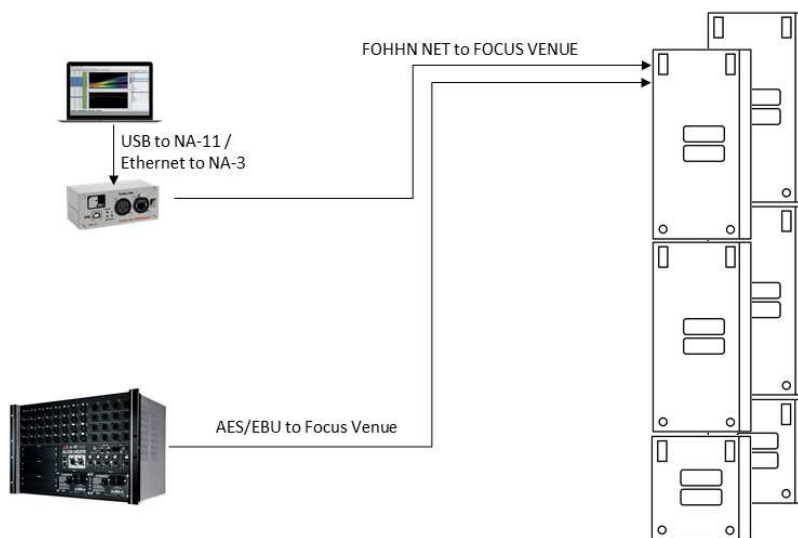
- **Fohhn-Net & analog audio separately**



- **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 Venue 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 Venue** systems, each module in the **Fohhn-Net** must be allocated its own specific ID. Using this ID, each individual **Focus Venue** 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 Venue** module must first be individually connected to **Fohhn Audio Soft**.

Proceed as follows for each individual module:

1. Connect the **Focus Venue** module to the mains power (**see section 3.3 “Cabling and networking”**).
2. Connect the **NA-11, NA-3 or NA-4 Fohhn-Net Adapter** to the computer.
3. Link the **Fohhn-Net** Adapter to the **Focus Venue** 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 Venue** 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.

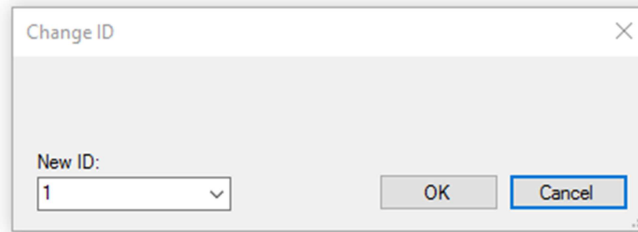
Proceed as follows:

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 Venue** 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 Venue** 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 Venue** module a new ID.
5. Confirm by clicking *OK*: The module will now have a newly assigned ID.

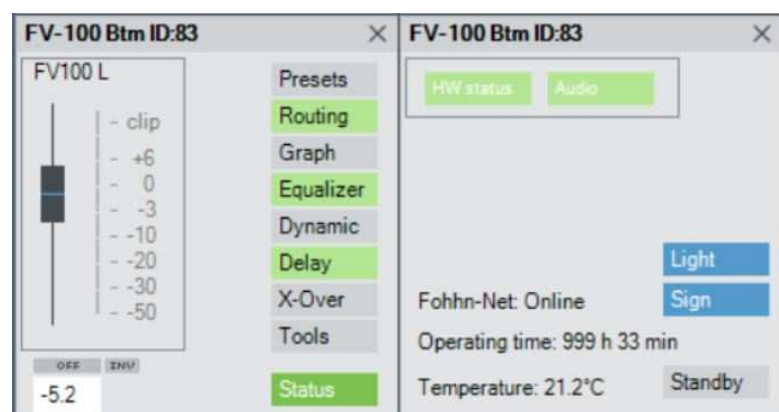
Further information on setting up a Fohhn-Net and on Fohhn-Net ID allocation can be found in Chapter 4.1 “Fohhn-Net Setup” of the Fohhn Audio Soft user manual.

4.6 Identifying Connected Systems

Visual identification

On the front of every **Focus Venue** 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 Venue 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 Venue** module.
2. Click on *Sign* in the opened context menu: The blue LED on the front of the selected **Focus Venue** 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.



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 Venue** 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 work space (*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 Systems

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!



Example: Focus Venue system pictograms in Fohhn Audio Soft

Proceed as follows to arrange your **Focus Venue** 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.

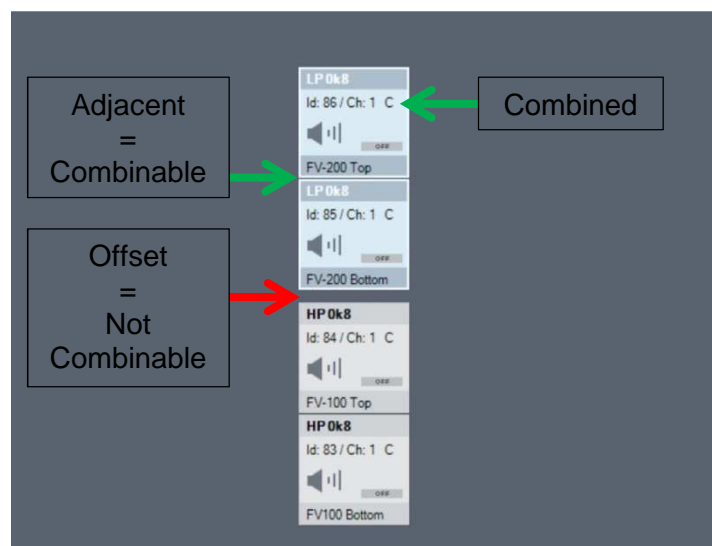
The arrangement will be saved in **Fohhn Audio Soft** and will remain until you change the configuration or arrangement.

4.9 Combining modules to a speaker stack

In **Fohhn Audio Soft**, **Focus Venue** modules can be combined into one unit. These modules will jointly behave like a single, longer loudspeaker module. Obviously, FV-100 only combine with FV-100, FV-200 with FV-200. 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 Venue** module.

To load loudspeaker presets, proceed as follows:

1. Select the appropriate **Focus Venue** 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 Venue** modules.

4.11 Further Options

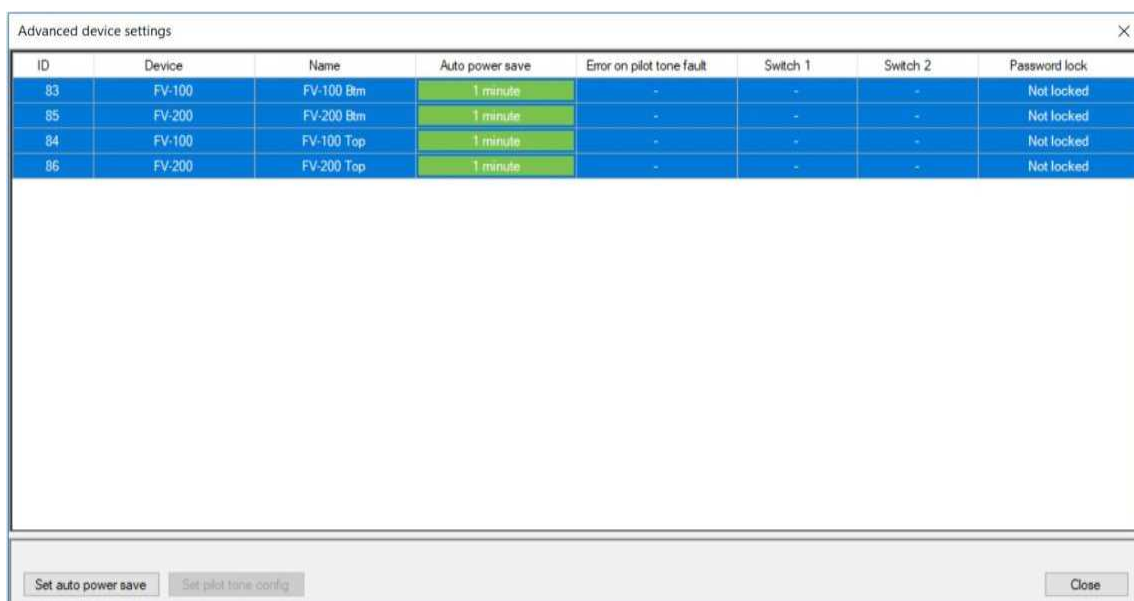
4.11.1 Auto Power Save

Focus Venue 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.

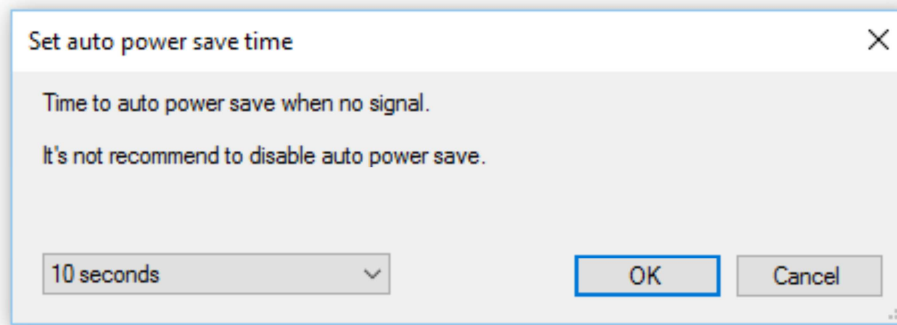
As soon as an audio signal is detected, the amplifiers are immediately ready for operation. The amount of time before the device switches to Auto Power Save can be set between 1 second and 12 hours. The mode can also be completely deactivated.

Proceed as follows to set up *Auto Power Save* in **Fohhn Audio Soft**:

1. Select one or more **Focus Venue** 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 Venue** 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 Venue 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 Chapter 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 Venue** 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 $\pm 1.0^\circ$.

Simply open the *Beam Steering view* and click on the *READ* button to the right of the parameter area.

Parameter	Value
Mechanical	
X-Pos [m]	0.10
Z-Pos [m]	2.00
Sensor [°] ($\pm 1.0^\circ$)	0.4
Pre-Angle [°]	0.0
UpSideDown	<input type="checkbox"/>

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 are available in Chapter 4.2 “Set-up in the Beam Steering View”.

4.12 Adjusting the level relation within an array

Now set the volume levels for your individual **Focus Venue** modules, depending on how many modules of each type are comprised in an array and how many of them are combined to speaker stacks.

1. Open the *Beam steering* view.
2. Set the level directly using the text box "Trim".

For consistent behaviour of the limiter within the system as a whole, it is important that level adjustments are carried out on the "trim"-control in the beam steering window (gain structure).

The below examples of trim levels are helpful to get started quickly. They are valid for basic configurations of Focus Venue stacks with steering angles and beam angles of 0-20° and simple layout.

For more sophisticated applications with two beams, more than one FV-100 speaker stack per array or three-way systems with low-mid extensions of FV-200, a proper simulation in Fohhn Audio Soft is essential and recommended!

Basically, the level of an **FV-100** module has been predefined in the speaker preset and is set for combination in a stack with two **FV-200** modules. If a different relation between the number of **FV-100** and **FV-200** modules is used, the level(s) must be adjusted accordingly. If two beams per speaker stack are used, the trim-level has to be set separately for each beam.

Examples of recommended level adjustments

Loudspeaker stack:

1x **FV-200** + 1x **FV-100**

2x **FV-200** + 1x **FV-100**

2x **FV-200** + 2x **FV-100**

Input level adjustment:

FV-100: -6 dB

FV-100: 0 dB

FV-100: -6 dB

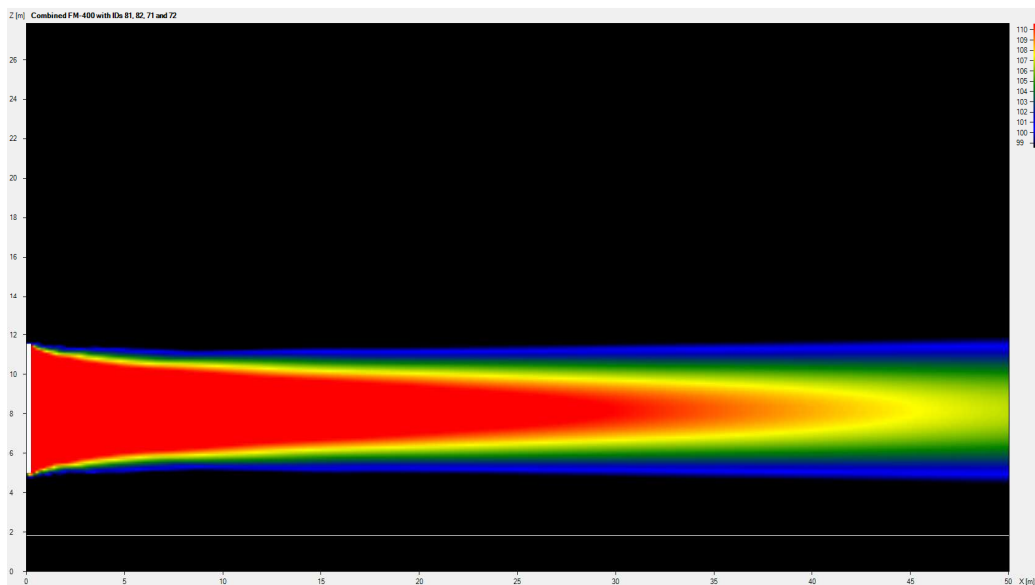
5. Control via Fohhn Audio Soft

The complete control of your **Focus Venue** 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.



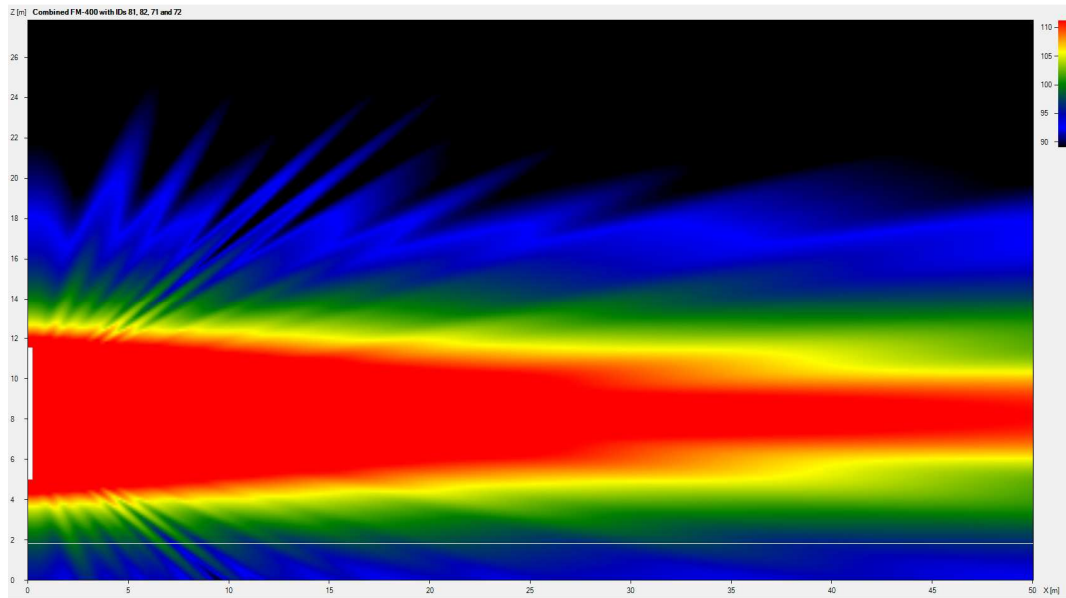
Graphic representation of a beam in the Fohhn Audio Soft Focus Simulation

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.

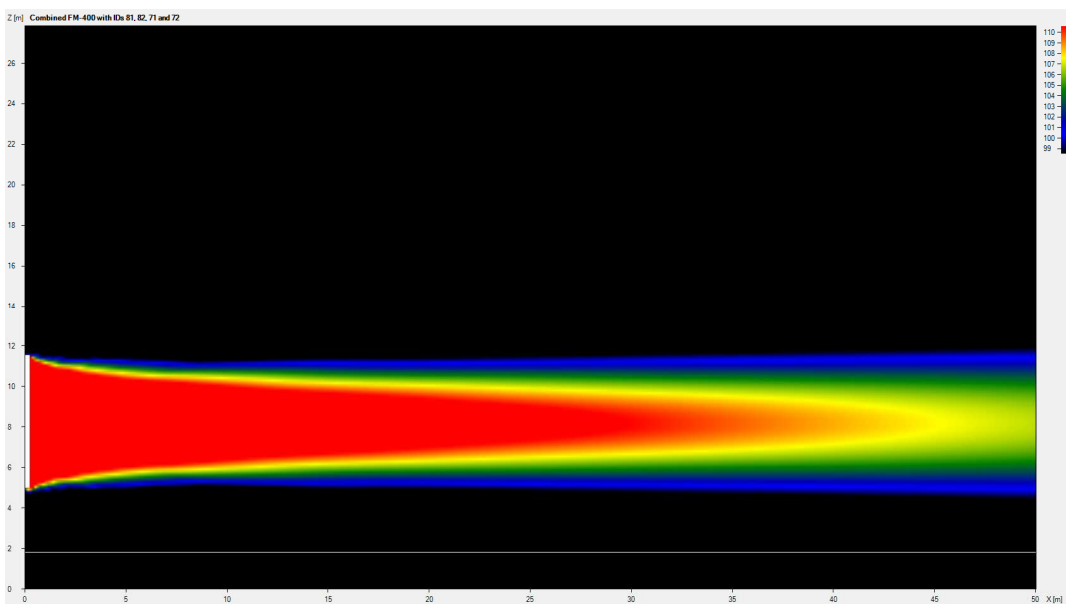
5.1.1 Side Lobe Free Technology

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

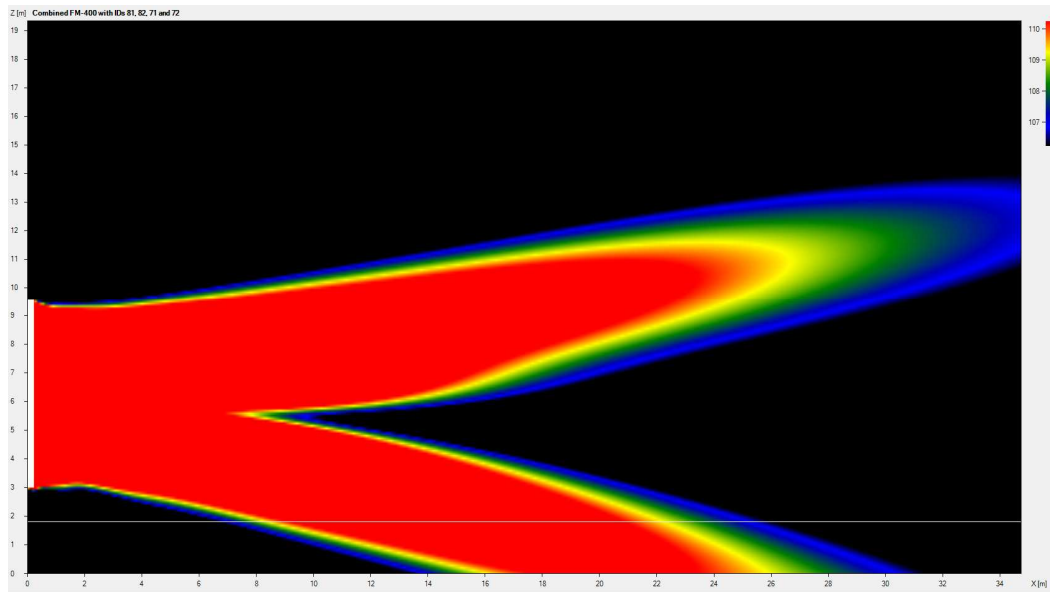
Focus Venue systems are equipped with **Fohhn Side Lobe Free Technology**: A specially developed algorithm effectively reduces the side lobes. This results in fewer unwanted sound reflections in the room. Consequently, levels of speech intelligibility are improved and feedback prevention is increased.



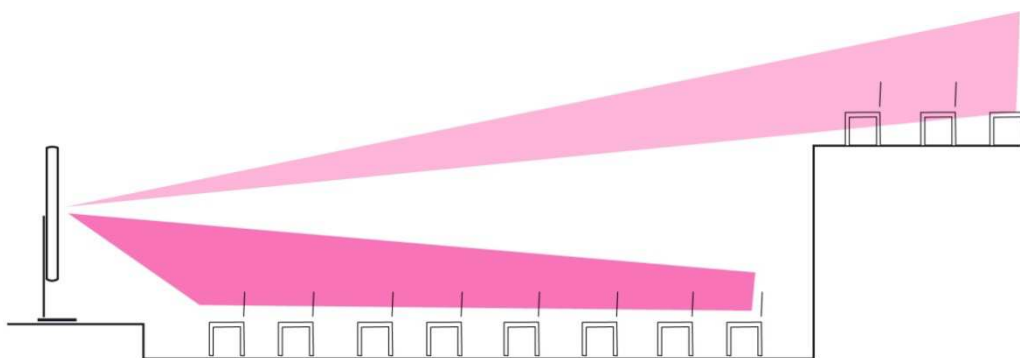
Optimized beam with Fohhn Side Lobe Free Technology

5.1.2 Two Beam Technology (Two Beam Mode)

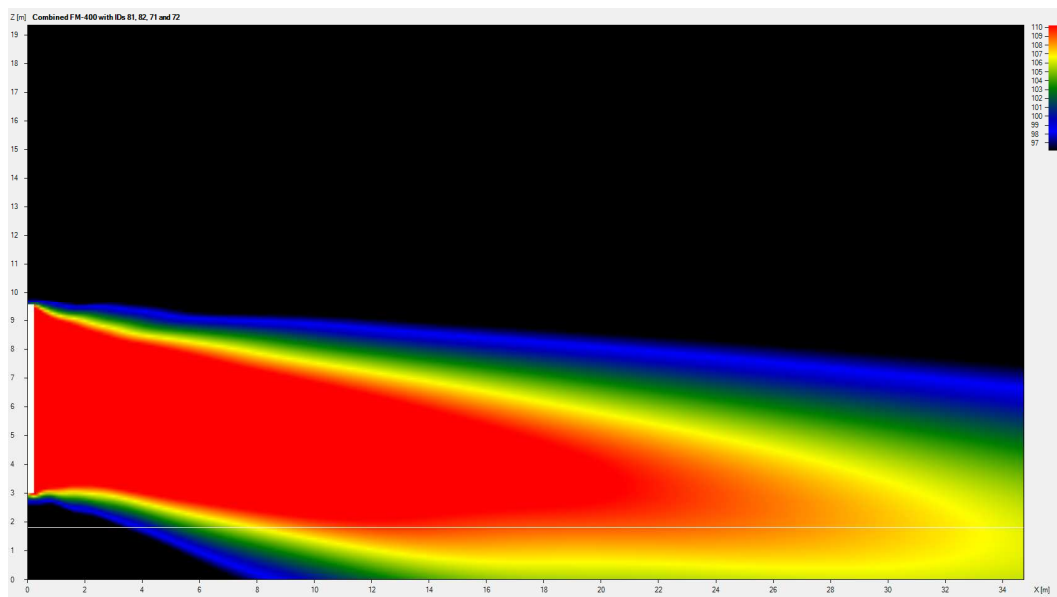
Fohhn's in-house developed **Two Beam Technology** enables the production of two independent beams with separately configurable parameters. In each case, the entire speaker line length is used for reproduction. So when activating the second beam, the sound dispersion still covers the entire frequency 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

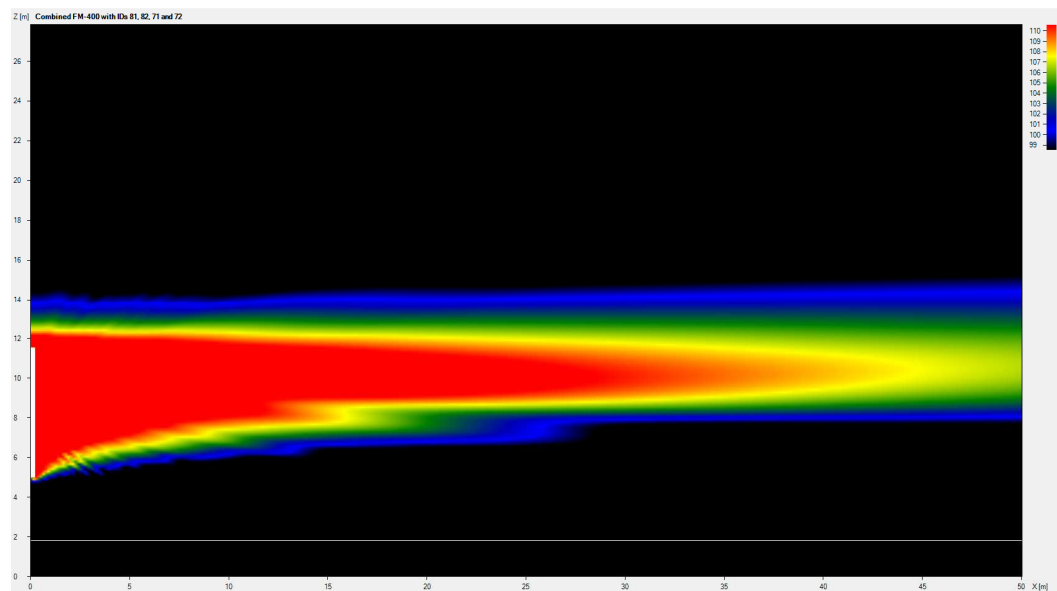


Example of an asymmetric beam

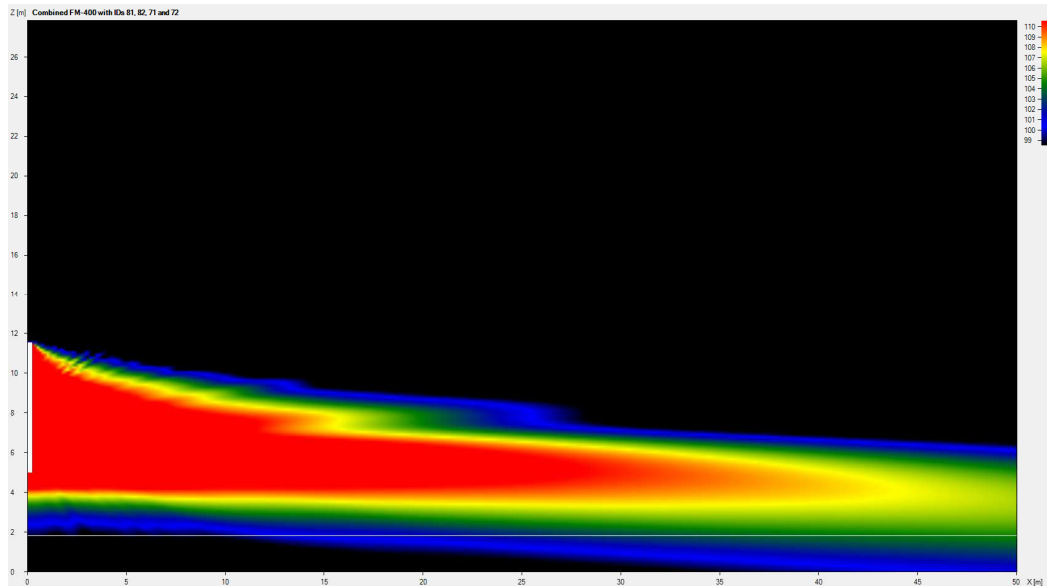
Further information on beam configuration and its associated parameters can be found in section 4.7.3 “System Setup (Focus-Series)” of the Fohhn Audio Soft user manual.

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 Venue** 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

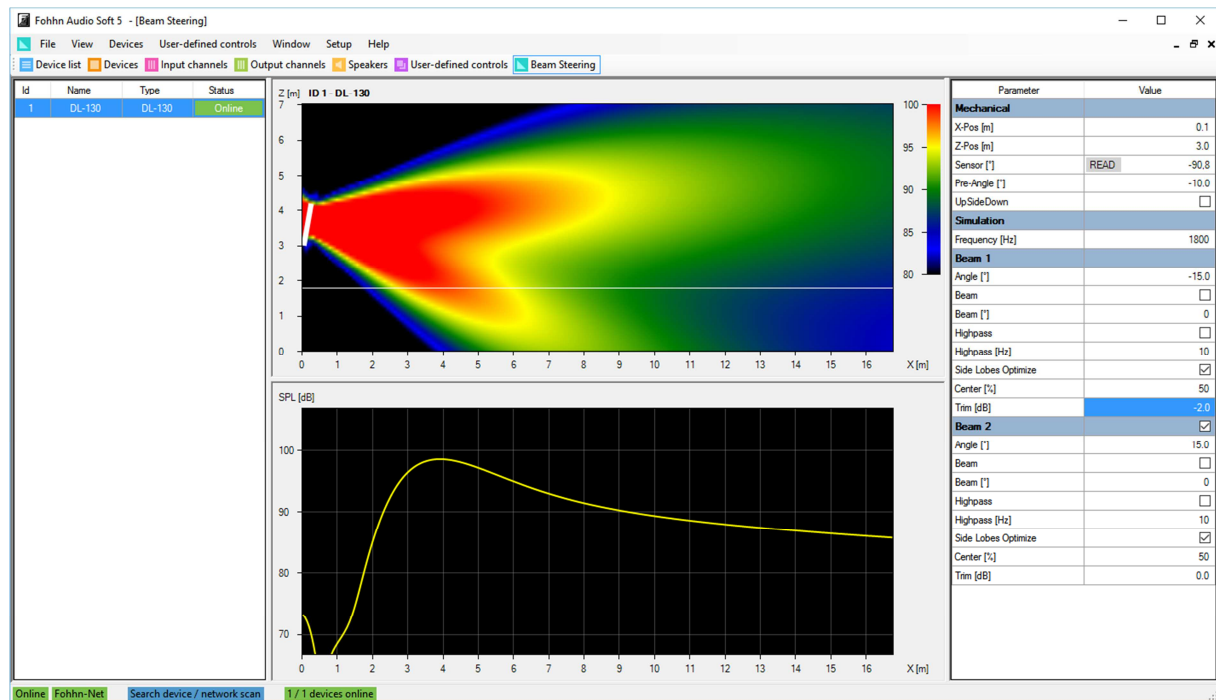
This shows all the **Focus-Series** devices that are in the system, along with their IDs, names, type/model classifications and current operating status.

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.
- Z-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 by 24 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.
- **Center (%)**
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 Venue** 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.

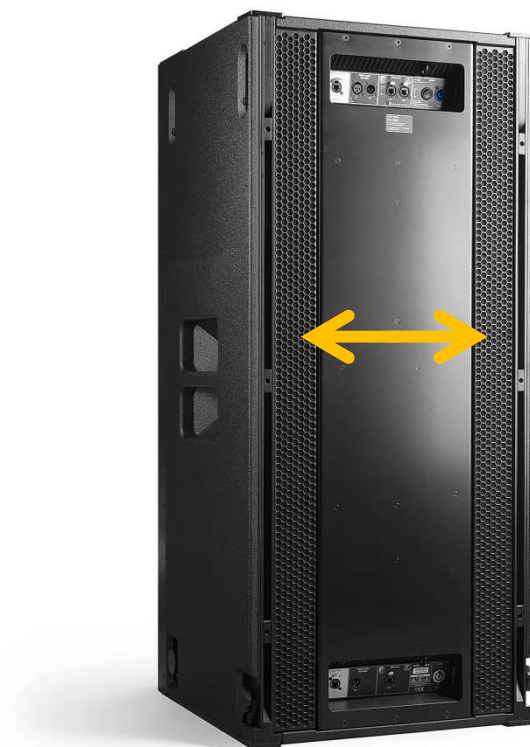
5.4 Using Convertible Dispersion Technology (CDT)

The FV-200 features the Fohhn **Convertible Dispersion Technology (CDT)**: The dispersion pattern of the FV-200 is remotely switchable between omnidirectional (enhanced low end) or cardioid (rear sound attenuation)

The conversion can be done at any stage of the setup-process, its completely independent from settings made in the beam steering section. If cardioid or omnidirectional mode is useful for a show depends - besides the characteristics of a venue - often on requirements like sound emission restrictions or desired low end headroom.

With CDT, the acoustic result may be tested, checked and changed at every time during system setup. Even shortly before the show a change of the dispersion pattern is possible – by a mouseclick.

Technically, it is achieved by varying the acoustic characteristics of the rear sound path with its outlets behind the rear grilles located on both sides of the amplifier housing. For this purpose a geared motor inside the cabinet is triggered via DSP and Fohhn Audio Soft.



In practise, there are minimum distances of acoustically relevant objects like walls or large parts of stage decoration to the rear surface of the FV-200 in order to let CDT work properly:

Mode	purpose	dispersion pattern	Minimum distance
Cardioid	rear sound attenuation	cardioid	>1m
Omni	low end enhancement	omnidirectional	>0,5m

To operate **CDT**, the specific FV-200 is connected to Fohhn-Net.

Important: If it is part of an already existing stack of FV-200, the software command sent by **Fohhn Audio Soft** addresses every member of this stack, thus all FV-200 are switched simultaneously to the same mode.

In **Fohhn Audio Soft**, click on the *Cardioid* checkbox in the *Beam steering* view. If checked, the FV-200 is in “cardioid” mode, if blank it is in “omni” mode.

Parameter	Value
Mechanical	
X-Pos [m]	1.00
Z-Pos [m]	5.00
Cardioid	<input checked="" type="checkbox"/>
Sensor [°] (±1.0°)	READ ...
Pre-Angle [°]	0.0
UpSideDown	<input type="checkbox"/>
Simulation	
Frequency [Hz]	500
Beam 1	
Angle [°]	-15.0
Beam	<input checked="" type="checkbox"/>
Beam [°]	20
Highpass	<input checked="" type="checkbox"/>
Highpass [Hz]	10
Side Lobes Optimize	<input type="checkbox"/>
Center [%]	50
Trim [dB]	0.0
Beam 2	

5.5 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. Technical Documentation

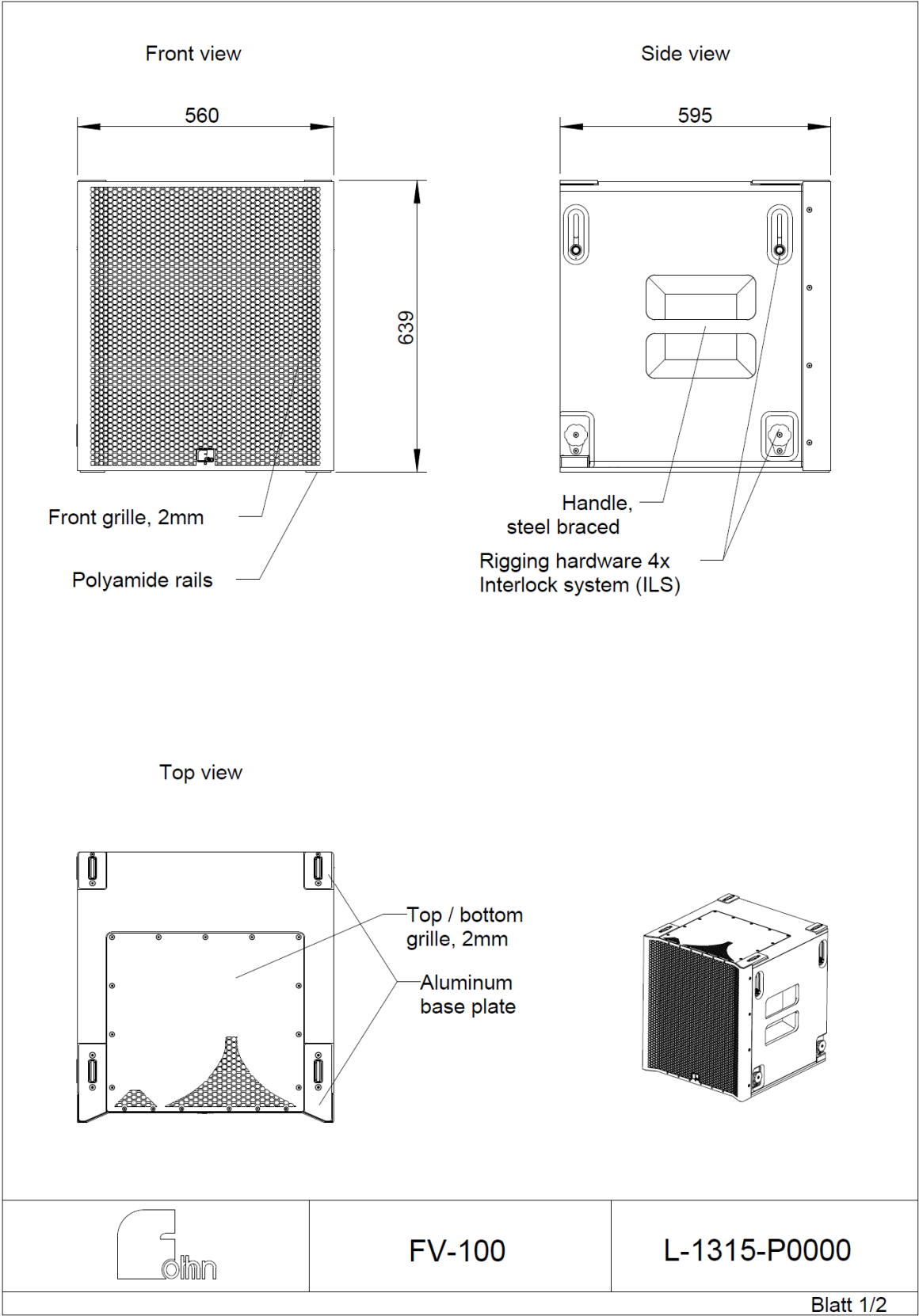
6.1 Technical Specifications

Technical specifications Focus Venue		
	FV-100	FV-200
Electroacoustic features		
Acoustic design	electronically steerable line array speaker	
Components	8 x 1" (1,75" VC) , 8 x 1,4" (4" VC) compression drivers Manifold hornloaded Waveguide Design	4 pairs of 10" (2,5" VC) long excursion speakers Hornloaded Waveguide Design
Operating mode	aktive, 16-channel DSP-amplifier, Class-D	aktive, 4-channel DSP-amplifier, Class-D
Maximum SPL [1]	150 dB (108dB @ 100m)	145 dB (103dB @ 100m)
Frequency range [2]	800Hz - 16 kHz	60 Hz – 800 Hz
Beam dispersion angle, horizontal [3]	90°	90° switchable cardioid/vented omnidirectional
		approx. 15 dB
Vertical beam width, digitally controlled [3]	0° - 90° in 0,1° increments	
Vertical inclination angle, digitally controlled	-40° - +40° in 0,1° increments	
Acoustic centre, both beams movable	0% (bottom) to 100% (top)	
Mechanical features		
Enclosure	multiplex birch plywood	
Protection grille	steel, ball impact resistant, powder coated	
Mounting points	integrated flying tracks, 4x M8-threads at rear tracks	
Standard colours	scratch-proof polyurethane coating, black	
Front design	Hexagonal perforated steel grille in cabinet colour , backed by acoustically transparent foam	
Dimensions (B x H x T)	560 x 639 x 595 mm	560 x 1276 x 595 mm
Weight [4]	ca. 107 kg	ca. 135 kg
Optional features		
Optional colours [5]	all RAL-colours	
Remote control, remote monitoring and simulation		
Remote control	Fohhn-Net, Fohhn Audio Soft	
Remote monitoring	temperature, protect, AES/EBU signals, power supply, Fohhn-Net, Fohhn Audio Soft	
Simulation Beam	Fohhn-Net, Fohhn Audio Soft	

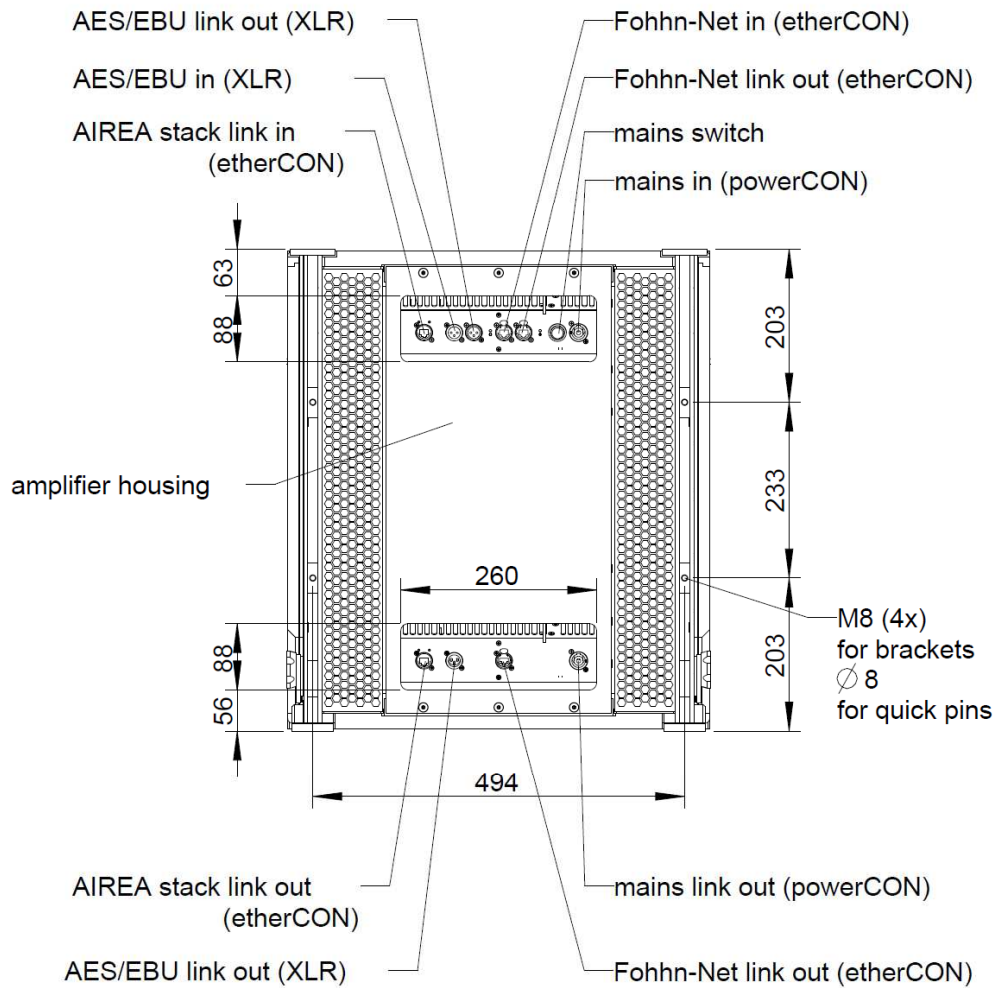
Electronic features		
Amplifier power	16 x 220 W	4 x 1000 W
Amplifier type	Class D, Pure Path Digital PWM	
Audio inputs	AES/EBU	
Audio outputs	AES/EBU	
DSP channels	16	4
Frequency response	20 Hz - 20 kHz	
Signal/Noise ratio	>105 dB/A	
Protective circuit	soft start, over temperature, short-circuit protection, 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) / 3,8A (115 V)	
Power consumption	500 W RMS, idle 58 W, standby 10 W	1200 W RMS, idle 70 W, standby 10 W
Heat Dissipation [6]	124 W, 427 BTU/h, 107 kcal/h	300 W, 1024 BTU/h, 258 kcal/h
Auto Power Save	yes, time adjustable from 1 s to 12 h, or never active	
Temperature range	0 – 40°C	
Cooling	temperature-controlled fan	
Weight electronics	10,9 kg	14,2 kg
Controller		
Digital signal processors	2	
Independent limiters	6	
Selective 3-band limiting	bass/ mid/ high	
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	
FIR Filter	yes	
Input Gain	-80 dB - +12 dB	
Routing Gain	-80 dB - +12 dB	
Output Gain	-80 dB - +12 dB	
EQ	10-band parametric EQ, gain +/-12 dB, frequency range 10 - 20 kHz, Q 0.1 - 100	
Limiter Compressor	yes	
Noise Gate	yes	
X-Over	Linkwitz-Riley 4th order (24 dB /octave), high pass 10 Hz – 20 kHz, low pass 10 Hz – 20 kHz	
Delay Output	0 - 640 ms (0 - 220 m)	
Delay Input	0 - 350 ms (0 - 120 m)	
System latency	1,2ms	
CAAD Simulationsdaten	Fohhn Designer, EASE	
Connections and control elements		
Control elements	mains switch (remote-controllable via AIREA connect)	

Mains connection	1 x PowerCON mains in, 1 x PowerCon mains out
Inputs	1 x etherCON Airea Connect / stack link, 1 x XLR AES/EBU, 1 x etherCON Fohhn-Net
Outputs	1 x etherCON stack link, 2 x XLR AES/EBU, 2 x 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 aktive, remote power on
On (stack link) LED	green = stack link aktive
<p>[1] Peak, 20 ms with bandpass filtered pink noise signal acc. to IEC 60268-2 at one octave above the lower limit of the frequency range.</p> <p>[2] usable frequency range</p> <p>[3] horizontal x vertical at -6 dB</p> <p>[4] net weight without optional equipment</p> <p>[5] RAL classic colours available as standard. Other RAL colours or NCS available on request.</p> <p>[6] Pink Noise, 6 dB crest, 1/4</p> <p>Pmax</p>	

6.2 Technical Drawings



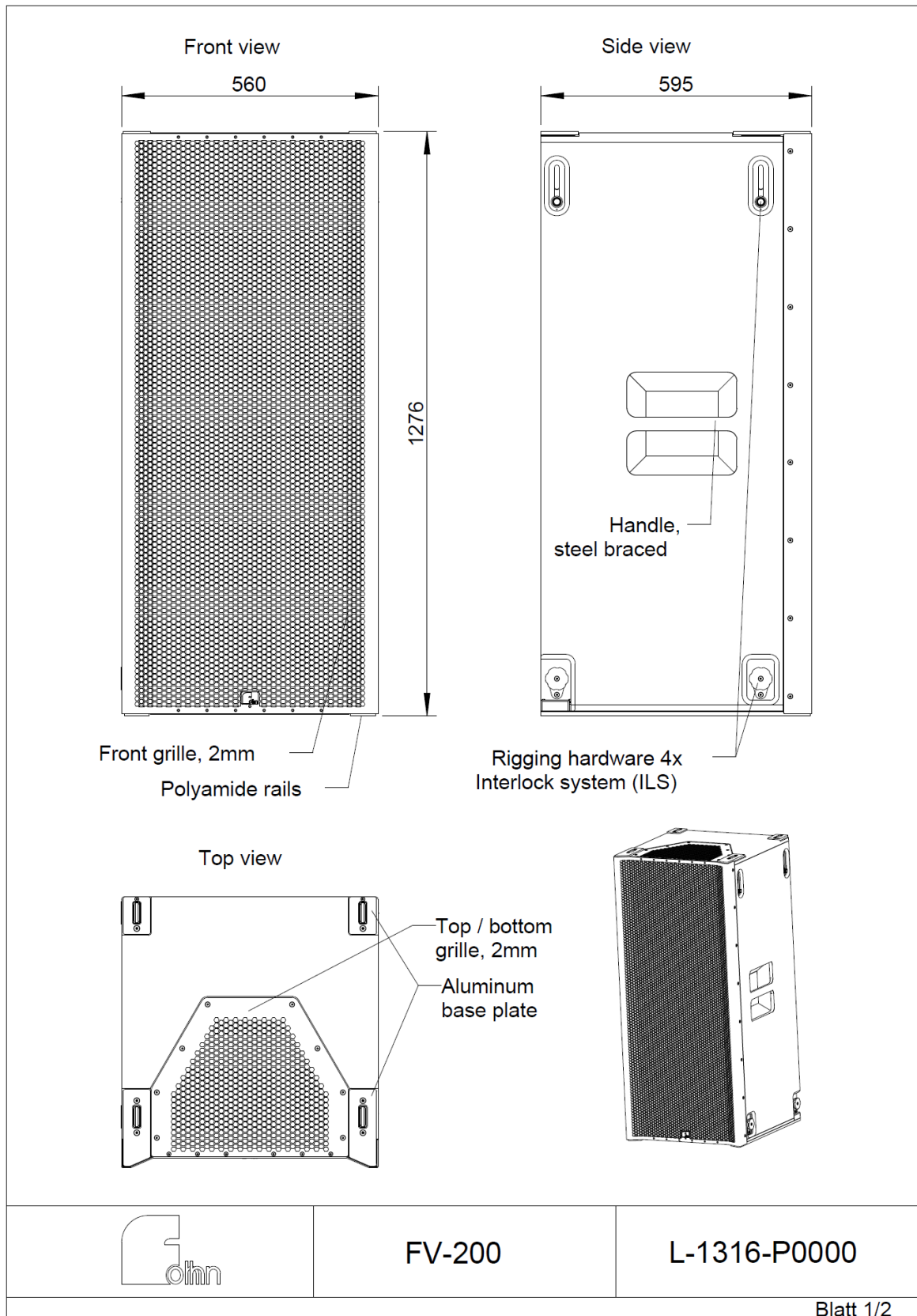
Rear view

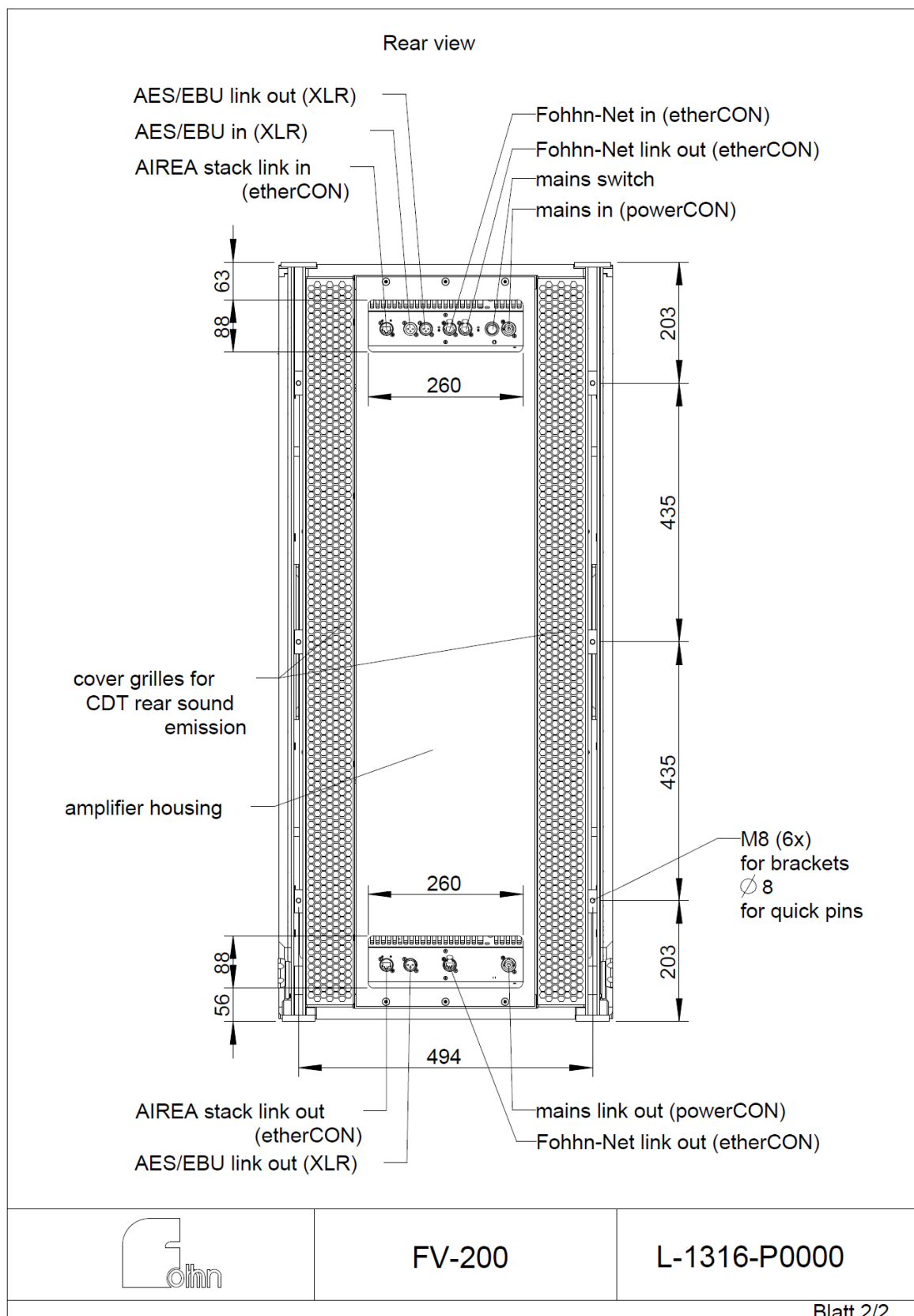


FV-100

L-1315-P0000

Blatt 2/2





6.3 Pin Assignments and Cable Lengths

For correct operation of your **Focus Venue** systems, you should only use properly supported, shielded and intact cables and plugs.

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.

Check the condition of the connection cable at regular intervals and change any damaged cable where necessary.

Important: Please also note the maximum permitted cable lengths. To ensure correct operation, these should **not** be exceeded!

6.3.1 CAT cable Fohhn net

For the transmission of **Fohhn Net** control data to, the following specifications apply:

RJ-45 Fohhn-Net Pinout

Pin	Signal
1	nc
2	nc
3	Data+
4	Data-
5	Data-
6	Data+
7	nc
8	nc

Cable lengths: Use shielded CAT5 cables with RJ45 connectors with a maximum length of 1000 m

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.

6.3.2 CAT cable AIREA net

AIREA includes Fohhn Net, AES/EBU and 48V Power in one cable.

RJ-45 Airea Pinout

Pin	Signal
1	Fohhn-Net+
2	Fohhn-Net-
3	AES/EBU+
4	Power+
5	Power+
6	AES/EBU-
7	Power-
8	Power-

Cable lengths: Use shielded CAT5 cables with RJ45 connectors with a maximum length of 100 m

6.3.3 Audio cable AES/EBU

XLR AES/EBU Pinout

Pin	Signal
1	Shield
2	AES/EBU+
3	AES/EBU-

Cable lengths: Use shielded cables with XLR connectors with a maximum length of 100 m

7. 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 In- 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 “ 4.5 Fohhn-Net ID Allocation ”).
	The ID search range is restricted.	Extend the search range from ID 1 to 254.
	The Fohhn-Net plug (see section “ 4.1 Wiring ”) is not inserted.	Connect the module to the NA-3 or NA-11 Fohhn-Net Adapter .
The Focus Venue module’s <i>power</i> , <i>send</i> and <i>receive</i> 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 <i>send</i> and/or <i>receive</i> LEDs are not lighting up.	The cable for the Fohhn-Net connection (“ 4.1 Wiring ”) is defective or not plugged in.	Check the cable or connect the module to the NA-3 or NA-11 Fohhn-Net Adapter .
The <i>power</i> 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 above table, or if the problem is not remedied using the suggested solutions, please contact us at the following address:

FOHHN AUDIO AG

Hohes Gestade 3-8
72622 Nürtingen
Germany

Tel. +49 7022 93323-0

Fax +49 7022 93324-0

www.fohhn.com

info@fohhn.com

8. Service and Repair

Servicing and/or repairs should only be undertaken by suitably qualified, **Fohhn®**-trained personnel. Do not carry out any servicing or any repairs to the device beyond what is listed in the “Maintenance Measures” section below.

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

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

8.1 Maintenance Measures

- To clean your **Focus Venue** systems, only use a dry or slightly damp, well wrung out towel.
- 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.

9. Glossary

Term	Explanation
Beam dispersion	Here, this refers to the directional characteristics of a loudspeaker: <i>Beam dispersion</i> describes the spread of the acoustic waves originating from a loudspeaker (with regard to a particular frequency). The vertical beam dispersion of your Focus Venue systems can be adjusted electronically and in real time.
Acoustic centre	The <i>acoustic centre</i> of the beam can be moved along the full line length – electronically and in real time.
Beam Steering	The term <i>Beam Steering</i> 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.
CDT	The Fohhn Convertible Dispersion Technology (CDT) is patented way to switch a loudspeaker enclosure between omnidirectional dispersion pattern with low-end enhancement (tuned system) and directional dispersion pattern (cardioid system) by mechanical means.
Combined Speaker (Combined Loudspeaker System)	Here, this refers to the formation of a single unit from a minimum of two combined Focus Venue low-mid modules or two Focus Venue high modules.
DPR	The Double Point Rigging method (DPR) is a term describing the suspension of a Focus Venue array with two motor hoists
DSP (Digital Signal Processor)	A <i>DSP</i> serves to process and control digitalized audio signals. Every Focus Venue 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 Venue 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 .
ILS	The Fohhn Interlock system (ILS) is a proprietary flying hardware to mechanically interconnect Focus Venue modules without any additional parts or tools.
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.
SPR	The Single Point Rigging method (SPR) is a term describing the suspension of a Focus Venue array with only one motor hoist or crane
Stack	The term describes a Focus Venue 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	see “Two Beam Technology”
Two Beam Technology	Every Focus Venue 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

10. Appendix

10.1 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.

10.2 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

10.3 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.

10.4 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)

10.5 Disclaimer and Copyright

10.5.1 Disclaimer

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