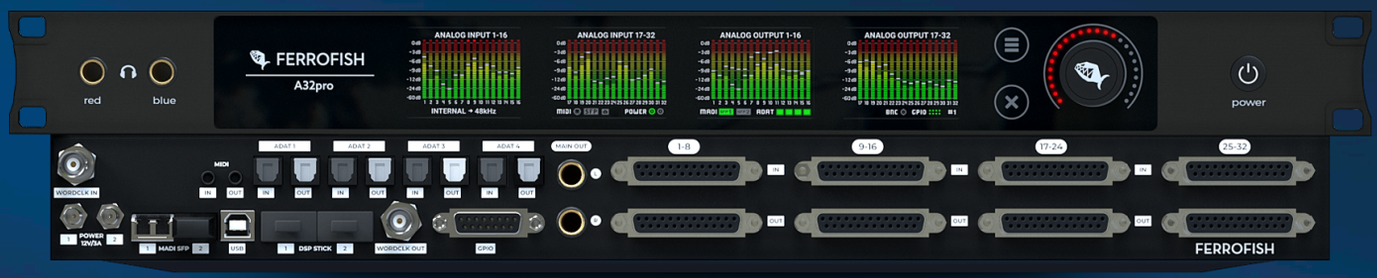
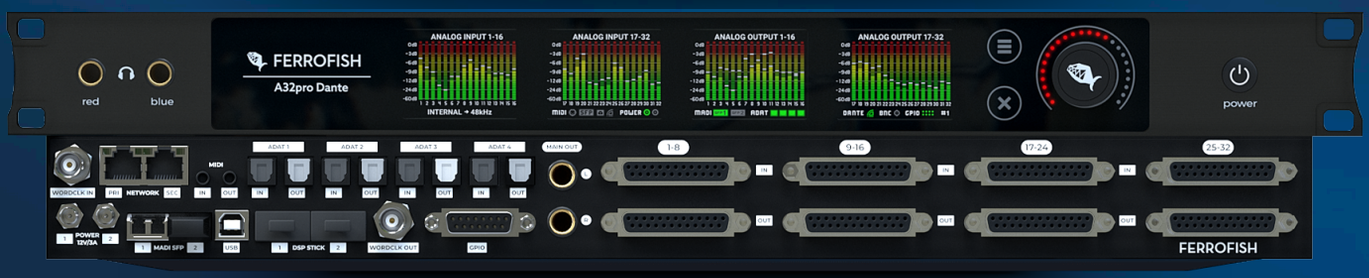




A32pro
A32pro Dante

32x32 Channel A/D-D/A Converter & Router

Manual

FERROFISH
advanced audio applications

Introduction

Dear users,
We are very pleased that you have chosen the A32pro series as your new converter.
With this device, we want to offer you a real added value in your daily tasks. During the development, we have followed the approach of the highest possible compatibility in both design and selection of interfaces in order to be able to cover as many scenarios as possible in practice. Hopefully you will have as much fun using the device as we had developing it.

JÜRGEN KINDERMANN

CEO & CTO FERROFISH GmbH

"With the A32pro series, FERROFISH is responding to the constant evolution in technological change with a new modular platform. The new possibilities for future expansions are truly breathtaking."

KLAUS HASE

CEO & CFO FERROFISH GmbH

"The development of the A32pro series took place in turbulent times. We are even more proud of the new A32pro series because it has already exceeded our own high expectations."

RUPERT

High Frequency Expert

"I was totally blown away by the resolution of the high frequency range and the precise stereo image of the new A32pro series. This is the result of the latest generation of ESS converters and the circuitry that significantly reduces jitter."

About Ferrofish:
Located in Linz on the Rhine, a team of developers, inventors, engineers and musicians has dedicated itself to building exceptional audio devices with real added value. As a starting project, the successful A16 converter was developed as the new A16 MKII version and became the bestseller in its class within a very short time. The success continued with the A32, Verto and Pulse16 series of converters until today.

Safety instructions

Safety instructions:

Please read and follow all instructions contained within this manual, and carefully observe all warnings and safety instructions.
This manual should be stored in a safe place for future reference.

ATTENTION:
his device can produce volume levels high enough to cause hearing damage. Please apply caution and common sense when working with loud audio signals. Avoid operating this device at uncomfortably loud volume levels for extended periods. Always take precautions to protect the hearing of yourself and others. If you notice any signs of loss or damage to your hearing, seek appropriate medical attention.

WARNING!
To avoid the risk of electric shock, do not expose the unit, the power supply unit or the power cable to rain or moisture.
Only use the power supply unit on mains sockets with a protective earth connection (PE).
Never bypass or remove safety devices such as the protective earth conductor on the power supply unit or the appliance.
Do not operate the unit or the power supply near water or in environments with condensing humidity.
Do not place liquid containers on the unit.
Avoid direct contact with liquids. Avoid spraying or splashing the unit or the power supply unit with liquids of any kind.
This may damage the unit. Use only a dry cloth for cleaning. The appliance is maintenance-free.
Never cover or block the ventilation openings of the appliance. This could cause the unit to overheat.
Disconnect the appliance from the mains if it is not going to be used for a long time or during a thunderstorm.
Only use the unit within its intended voltage range. This is printed on the power supply unit. If you are not sure which mains voltage prevails in your area of application, contact your local power supply company.
If the plug of the power supply unit supplied does not fit into the mains socket, contact an electrician.
Only use power supply units, spare parts and other accessories approved by the manufacturer.
Other mains adapters may cause the unit to malfunction or even become defective.
Observe the maximum electrical load capacity of your operating environment. Do not exceed this load limit, as overloading can lead to fires.
Do not make any modifications - electrical or otherwise to the unit or power supply unit. Doing so will void the warranty and the unit will lose its CE approval.
Do not insert any objects or foreign objects through the ventilation openings of the unit.
This could lead to a short circuit inside the unit and a defect.
Operate the unit only in safe positions. Prevent the unit from falling, which can cause injury to persons or damage to the unit.
When mounting the unit in a rack, use all four mounting holes to ensure a tight fit.

All service work and repairs must only be carried out by a customer service authorized by the manufacturer.

Service work is necessary as soon as the unit or its power supply unit has been damaged in any way, such as:

- Damage to the power supply unit or power cord.
- Liquids/object has entered the unit.
- The unit has been exposed to rain or moisture.
- If it is not working normally or has been dropped.

If your device has sustained damage, contact your dealer and/or the manufacturer to arrange a repair.

Front View

Welcome to the A32pro series. In this manual we would first like to welcome you with a virtual tour. Let's start with a description of the individual front sections of an A32pro Dante, beginning from the left. The front panels of the A32pro and A32pro Dante are identical in function:

Headphones outputs
The two independent headphones outputs are driven by high-quality amplifier components from Texas Instruments. Depending on the configuration, these can either function as two independent stereo outputs („unbalanced") or operate in balanced mode for use with high-end headphones. For balanced operation, each output is responsible for one driver side of the headphones.
For balanced operation, you need a balanced cable for the headphones - of course, the headphones must also support balanced operation due to their design. To access the headphone menu or the monitoring matrix, tap the encoder wheel in the main menu (analog I/O display). You will learn more about the headphone menu in the next chapters.

Section with device name, TFT screens
The area with the unit name and the company logo is touch-sensitive and intended for special functions, such as clearing the peak LEDs.
The four color screens, which are also touch-sensitive, show both the status of the 32 analog inputs and outputs and the status of the unit.

The status bar in the lower area represents the following, starting from the left:
· Synchronisation source and sample frequency
· MIDI activity on the MIDI sockets, SFP module(s), USB and Dante*.
· Status of power supply at inputs 1 & 2 Sync status of: MADI SFP ports, ADAT ports, Dante interface* and BNC.
· Activity of the GPIO ports: The top row shows the four inputs, the bottom row the four outputs.
· Number of the currently loaded preset

(* A32 Dante only)

Operating elements
The operating elements consist of the following elements:
· Menu (three bars/„hamburger key")
· Back/Escape („X" symbol)
· Encoder knob (touch sensitive)
· Power switch.

Please note that the touch keys and the touch sensitivity of the encoder are capacitive.

Operation with gloves may possibly impair the touch functionality of the screens.

Back View I

ATTENTION: The unit produces heat. Leave at least 1RU free above and below the unit to ensure sufficient ventilation.

The connections on an A32pro Dante are explained below. Differences to the A32pro are indicated with an asterisk. (* A32pro Dante only)

WORDCLOCK INPUT 1

The wordclock input is responsible for receiving a clock from other digital devices, when"BNC" is selected in the clock source menu. The A32pro Dante can then be used in a network of several digital devices, as a wordclock slave/ follower from an external wordclock signal.

MIDI IN/OUT 3

The MIDI inputs and outputs are provided in 1/8" (3.5mm) jack sockets. Adapters to 5-pin DIN plugs are available in stores or from the FERROFISH online-webshop. The pinout corresponds to the MIDI 2.0 (Type A) specification. This can be used to remotely control the unit or to update the firmware.

Remote control is either possible via the RemoteFish app or MIDI CC Control Mode.

MAIN OUT 5

A MAIN OUT connection in the form of two balanced 6.3mm (1/4") jacks is provided for the quick connection of devices such as studio monitors or analog stereo recording devices. The main out mirrors the signal of the red headphone output. The volume is thus controlled via the headphone menu.
The MAIN OUT accepts balanced and unbalanced devices.

NETWORK Pri/Sec Dante* 2

The Dante interface allows seamless integration into existing Dante audio networks, which are based on normal network data traffic (Layer3).
At higher sample rates, Dante also reduces the number of channels to be transmitted to 32x32 channels at double sample rates (SMUX/2, up to 96k) and to 16x16 at quadruple sample rates (SMUX/4, up to 192k). Furthermore, the Dante interface offers redundancy connectivity to increase transmission security. For more details, please visit: www.audinate.com.

ADAT I/O 4

The A32pro series has four ADAT input and output pairs of optical TOSLINK ports to transport all 32x32 channels at single sample rates (SMUX/1, up to 48kHz). The maximum cable length is 5m. When transmitting sample rates higher than 48kHz, the number of available channels is reduced by half (16x16) up to 96k and by half again (8x8) up to 192k.

The sockets with the bright-colored flap are the ADAT outputs,
the sockets with the black flap are the ADAT inputs.

ANALOG INPUTS (1-32) 6

Due to the compact housing, the analog inputs are in dSub25 (or db25) format. The pin assignment corresponds to the Tascam format.
The maximum input level is +20dBu.
All inputs are fully balanced.
Fitting breakout cables are available in stores or from the FERROFISH webshop.

Back View II

The connections on an A32pro Dante are explained below. Differences to the A32pro are indicated with an asterisk. (* A32pro Dante only)

Dual POWER Input (1/2) 1

The dual sockets of the power supply inputs enable redundant operation with two power supplies, which reduces the probability of the unit failing due to power supply failure. The A32pro series ship with one PSU as standard. Additional power supplies can be purchased from the manufacturer or from dealers. Both inputs can be permanently monitored. If the voltage at one input fails, this can trigger an alert.

USB - A PORT 3

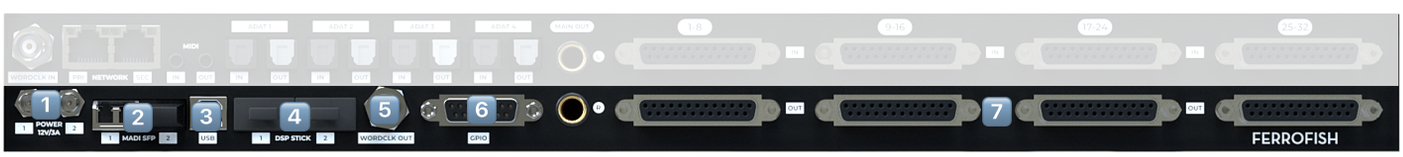
The USB port is used to control the A32pro Dante via MIDI-over-USB and to update the firmware.
When connected to a PC or Mac, a class-compliant USB MIDI interface is installed without any extra drivers. This virtual MIDI port can be used to remotely control the unit via the Remote Fish app (available for PC and Mac) or via MIDI CC mode.
Please note there is no audio transmission via USB.

DSP STICK SLOTS 4

The expansion ports are intended for later propietary expansion modules. For more information, please visit us at: www.ferrofish.com

WORDCLOCK OUT 5

The BNC jack for the wordclock output is active as soon as the device has been locked to a digital signal. This allows other digital devices that are set to clock slave/follower to be clocked by the A32pro (Dante).



DUAL MADI SFP SLOTS 2

MADI SFP modules are plugged into the SFP slots and can be exchanged by the user at any time. Optical MADI SFP modules in multi-mode and single- mode configuration are supported. Additional SFP modules such as coaxial MADI I/O will be available as an option. Also with MADI, at higher sample rates the original number of digital channels is reduced from 64x64 (SMUX/1, up to 48kHz) to 32x32 (SMUX/2 up to 96kHz and again to 16x16 with SMUX/4 (up to 192kHz). The use of two SFP modules for 32x32 channels at 192k is possible.

We recommend the use of original FERROFISH SFP modules.

GPIO PORT 6

The GPIO (General Purpose Input / Output) socket can be used to select any of the first four presets via the inputs. Alert messages can be queried and monitored externally via the outputs.
For the specifications of the I/O ports, please refer to the technical data in the appendix.

General Purpose Inputs:

GP Input 1-4: Load Preset#1-4 To trigger a GP input, set the corresponding pin to ground.

General Purpose Outputs:
GP Output1: "No Lock" Alert
This alert is triggered when the A32pro can no longer lock to the applied digital signal selected in the Clock Source Menu.

GP Output2: Power Supply 1/2 Alert
This alert is triggered when one of the two power supply inputs has measured a voltage outside the specifications.

GP Output3: MADI A/B Alert
This alert is triggered when the signal fails at one of the two MADI SFP modules.

GP Output4: Temperature Alert
This alert is triggered when the temperature selected in the ALERT menu (60 or 70°C) has been reached or exceeded.
In the event of this alert, please immediately ensure sufficient cooling of the device to guarantee continued trouble-free operation.

ANALOG Outputs (1-32) 7

Due to the compact housing, the analog outputs are in dSub25 format. The pin assignment corresponds to the Tascam format. The maximum input level is +20dBu.
All inputs are fully balanced. Fitting breakout cables are available in stores or from the FERROFISH webshop.

Digital Interfaces

All digital interfaces of the A32pro series can be operated in sample rates up to 192kHz.
The number of channels that can be used depends on the sample rate used.

Single sample rates are transmitted by all digital interfaces of the devices of the A32pro series without limitation of the number of channels. This range refers to sample rates up to 48kHz and is also called SMUX/1 or "Single Speed", as here the data is transmitted via the audio channels in a simple configuration. SMUX/2 operation (also called "Double Speed") describes the sample rate range up to 96kHz. Here, the number of channels is halved for all digital interfaces of the A32pro series, since (mostly for reasons of limited bandwidth) two channels are used to transmit the channel in 96kHz. The method used to bundle several channels to transmit an audio channel at higher sample rates is called "Signal Multiplexing" (SMUX for short). SMUX/4 operation (also called "Quad Speed") describes the range up to 192kHz. Here, the number of channels is halved again in relation to SMUX/2 (up to 96kHz) operation, since four channels must be combined to transmit one channel at 192kHz.

MADI I/O (64x64@24Bit/48k)
In its original format, the MADI protocol could transmit 56x56 channels in 24Bit and a maximum of 48kHz with the possibility of adjusting the speed by +/- 12.5% (Varispeed). This format was called "short frame" or called AES10-1991. Later, the protocol was extended by a "full frame" mode, which had no Varispeed and was able to transmit 64x64 channels. The usual limitations on the number of channels at higher sample rates apply:
SMUX/1 (up to 48k): 64x64 channels
SMUX/2 (up to 96k): 32x32 channels
SMUX/4 (up to 192k): 16x16 channels
The two SFP slots for the MADI modules work as specified in the MADI menu. If the priority is set, it is determined from which module to switch to the other in case of signal failure.

ADAT I/O (32x32@24Bit/48k)
The ADAT format is able to transmit a maximum of 8 channels at 24 bits at up to 48 kHz. For this purpose, plastic fibre optic cables with TOSLINK plugs and sockets are used for transmission. The maximum cable length is between 3 and 5m, depending on the quality of the cable. The units of the A32pro series are equipped with 4 pairs of optical I/O ADAT sockets to transmit all 32x32 channels at single sample rates (SMUX/1).

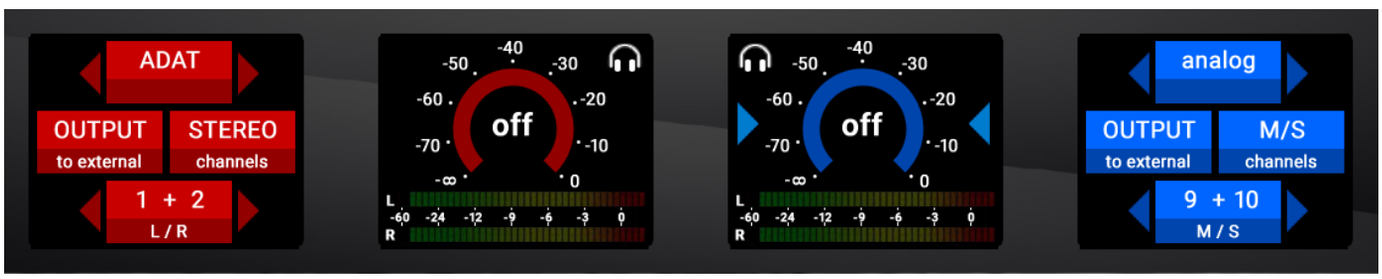
At higher sample rates, the number of available channels is as follows:
SMUX/1 (up to 48k): 32x32 channels
SMUX/2 (up to 96k):16x16 channels
SMUX/4 (up to192k): 8x8 channels

We recommend using MADI or DANTE* for SMUX/4 operation due to the higher number of channels.

DANTE I/O* (64x64@32Bit/48k)
The A32pro Dante is equipped with a Dante Brooklyn board from Audinate. With higher sample rates, the number of channels to be transmitted is also reduced with Dante. Thus, at double sample rates (SMUX/2: 88.2 and 96kHz), 32x32 channels are still transmitted and at quad sample rates (SMUX/4: 176.4 and 192kHz), 16x16 channels are still transmitted. Only with the Dante format it is possible to send and receive audio streams with 32 Bits. Furthermore, thanks to the two network sockets, the Dante interface offers redundancy connectivity, which automatically and inaudibly switches to the other network in the event of a failure of one Dante network (regardless of whether PRI or SEC). This switchover is automatic.
The configuration of the Dante board is done via the "Dante Controller" app from Audinate.

Operation

Headphones - Monitoring Matrix & Main Menu



HEADPHONE MONITORING MATRIX

A monitoring matrix is integrated into the Headphones Menu, which allows you to monitor any input or output channel (except MAIN OUT) of the device. This menu can be accessed by touching the encoder when you are in the main view of the unit, which displays the 32x32 analog inputs and outputs.

In general, the two headphone outputs can be operated in "unbalanced" (dual stereo) or "balanced" mode. You can switch between the modes in the Headphone Setup Menu. The screen above shows the "unbalanced" mode, which will probably be the most common mode.
The screens show the two headphone outputs in the color assignment of red for the left output and blue for the right output.

You can change the volume in two ways: Either by tapping one of the two virtual rotary controls and setting the desired volume value on the encoder or by tapping, holding and moving your finger on the virtual rotary control. This also works on the other touch buttons.

If the volume control is set to the lowest level (left stop), the message "off" appears in the display.
When the volume control is set to the highest level (right stop), the message "full" appears in the display.

Pressing the headphone symbol in the upper left or right corner will mute the corresponding channel.
Please note that you can select the overall amplification factor for the headphone outputs in the Headphone Setup Menu.

On the outer screens, make the following settings:
· Type of interface of the channel to be monitored: analog, MADI (1/2), ADAT or DANTE*.
· Input or output of the source to be monitored.
· Channel format of the source to be monitored: mono, stereo, M/S (requires an M/S encoded signal)
· Channel number of the source to be monitored

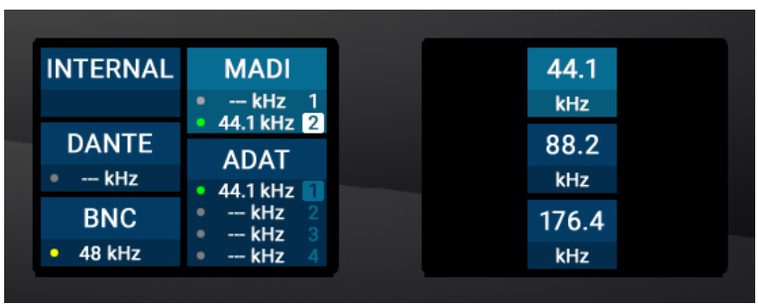
For MADI sources, select MADI 1 to monitor signals from the first SFP slot, or MADI 2 for the second SFP slot.

Operation - Main Menu

MAIN MENU

In the Main Menu you have access to the following fuctions:

- **CLOCK**: Setting the wordclock source and sample rate.
- **HEADPHONE SETUP**: Operating mode of the headphones output and maximum output level.
- **PRESET**: Load, save and rename a total of eight presets.
- **SETUP**: Further settings in separate sub menus (see next pages).
- **GAINS:** Determines the maximum input level for analog inputs.
- **LEVELS** : Determines the maximum output level for analog outputs.
- **ROUTING**: Access to the routing matrix to connect inputs and outputs.



CLOCK

The CLOCK menu allows you to select the clock source and sample frequency. The left screen is used to select the respective source, the right screen enables you to select the frequency of the wordclock in INTERNAL mode.
In all other modes except INTERNAL mode, the right screen shows the measured wordclock frequency.

In the lower field of the respective button, the measured sample frequency is displayed. The current frequency of the wordclock generator of the A32pro (Dante) is displayed in the "INTERNAL" field. If there is no readable frequency, "- - -" appears below the field.
To the left of the displayed sample frequency, a colored dot indicates the sync status of the applied signal:

- Grey: no signal has been detected.
- Yellow: a signal has been detected but cannot be synchronized to
- Green: synchronization was performed on this signal

INTERNAL

If you set the clock source to INTERNAL, the internal clock generator of the A32pro Dante is used.

MADI, ADAT

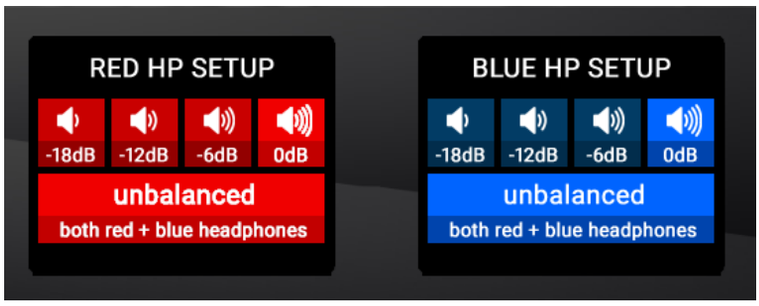
With MADI or ADAT, the wordclock is extracted from the respective data stream and processed with the help of the digital PLL.
The MADI and ADAT data stream also works at higher frequencies, where the number of available channels may be reduced.
The buttons for MADI and ADAT show the measured wordclock frequency in the lower field, which can be helpful when troubleshooting different digital devices. The number to the right of the sample rate display indicates which port is considered the preferred sync source by the device. Since neither format has native recognition of SMUX/2 and SMUX/4, the measured sample rate in the SMUX/1 standard and its possible multiples are displayed for selection.

BNC

An external wordclock can be connected directly to the device at the BNC-IN wordclock input. This is also processed by the jitter reduction circuit before use.

DANTE

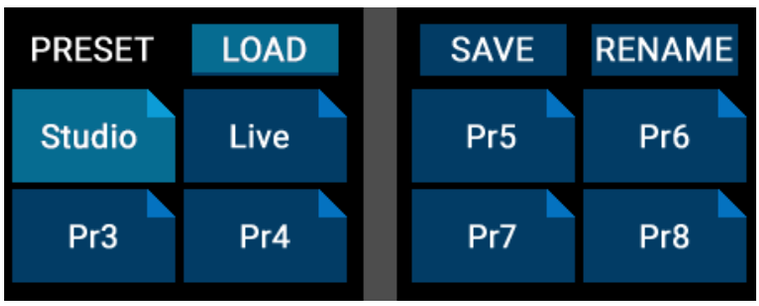
The wordclock of the DANTE device is displayed and used here. Note that if "Dante" is selected as the wordclock source, the wordclock of the internal Brooklyn board or the "Preferred Master/Leader" on the Dante network will be used.



HEADPHONES SETUP

In this setup menu, you can set the amplification levels of the two headphone outputs separately. These can be adjusted to limit the maximum volume of an headphone output or increased for higher impedance headphones.
In addition, the operating mode can be switched between "unbalanced" (dual stereo) and „balanced".

The most common mode of operation for the two stereo outputs is probably "dual stereo", while "balanced" is intended for high-end headphones with balanced cabling. In this case, the red output is used for the left driver of the headphones and the blue output for the right.
For the "balanced" mode, however, a special headphone cable is required from the headphone manufacturer. For safety reasons, large volume jumps are prevented when selecting the gain levels. This is to protect your ears.



PRESET

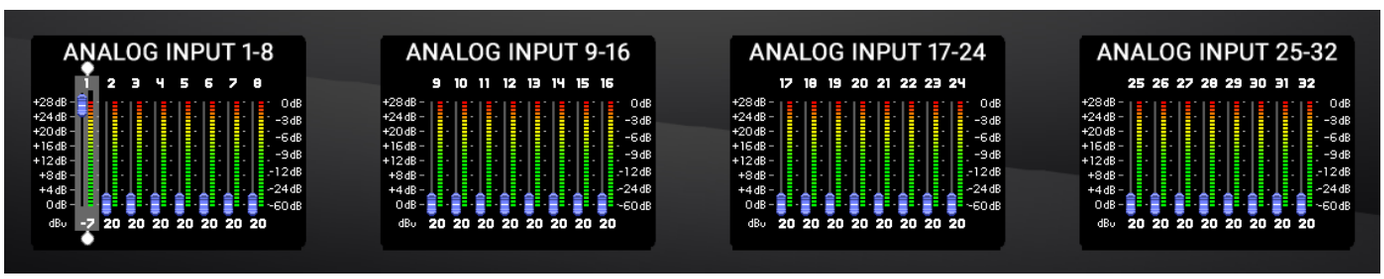
In the preset menu, you can either load (LOAD), save (SAVE) or rename (RENAME) one of eight presets.
Each preset can be assigned a name.
Naming and renaming of the preset names takes place via an on-screen keyboard.

SETUP MENU A32pro Dante

SETUP MENU A32pro

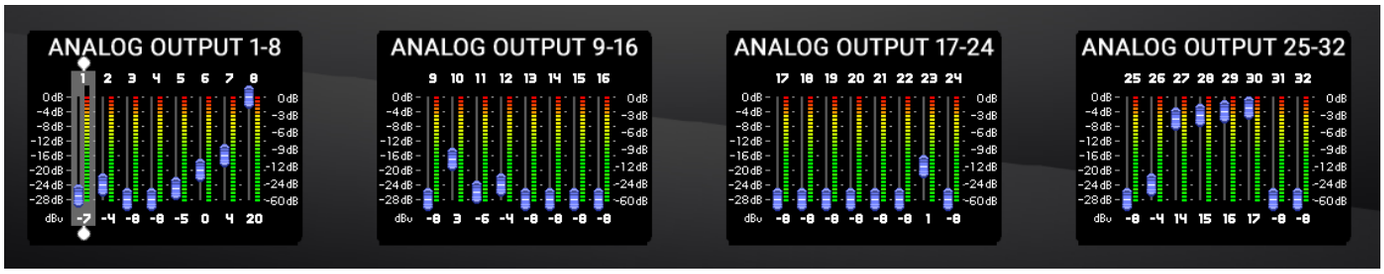
SETUP MENU

In the setup menu you have access to further adjustments and functions, which, among other things, concern the MADI and MIDI ports.
We will explain these in detail on the following pages.



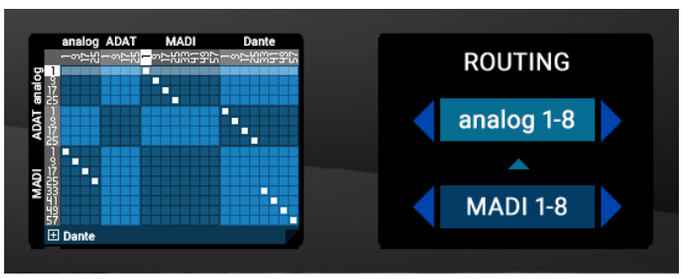
GAINS

The GAINS screen is used to adjust the sensitivity of the analog inputs. These are individually adjustable in 1dB steps from -8dBu to +20dBu. The number below the fader indicates the maximum level that the converter can process. If the fader is set to a value of -7 on channel 1, as in the picture above, the input can process a level of maximum -7dBu and would in this case output 0dBFS on the digital side. Values exceeding this limit would lead to digital clipping. The meters are post-fader. In addition, you can see the level displays of the analog inputs so that you can conveniently set the level correctly. You will find the dB scaling of the display on the right side of the screens. With a swipe gesture at the points above and below the fader, you can select several channels and then adjust their value together with the encoder wheel.
The value of -8dBu corresponds approximately to the level of -10dBV for consumer devices such as CD players or a tape deck.

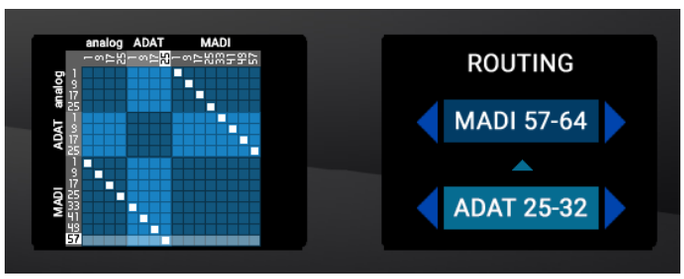


LEVELS

The LEVELS screen is similar to the GAINS screen, and determines the maximum levels of the analog outputs. Just like the inputs (GAINS), the outputs are individually adjustable in 1dB steps from -8dBu to +20dBu. Here, too, there is the level display of the outputs.
Please note that here the level does change when you adjust the gain, because you see the level before the digital and analog gain. With a swipe gesture at the points above and below the fader, you can select several channels and then adjust their value together with the encoder wheel. The meters are post-fader and don't chance when moving the fader.



ROUTING MENU A32pro Dante



ROUTING MENU A32pro

ROUTING

In the routing menu, you can assign the inputs to the outputs in the form of an X/Y matrix. In the horizontal row you see the inputs, in the vertical row the outputs. You can now connect them in groups of 8 channels each.
The numbers indicate the first channel of each group. The connection between input and output is indicated by a white square.
On the screen on the right, you can navigate the matrix display by changing the connection points of the inputs and outputs.

Due to its design, the matrix allows the distribution of a group of inputs to several output channels, but not the mixing of several channels in the matrix.

Main Menu > Setup

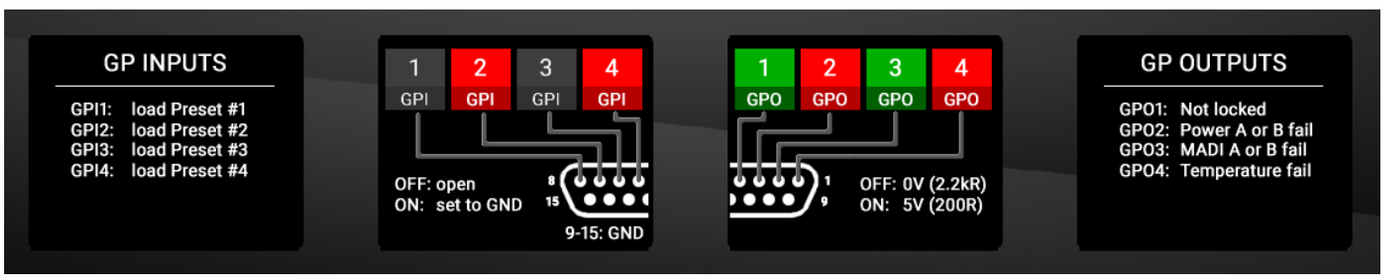
SETUP MENU A32pro Dante

SETUP MENU A32pro

SETUP MENU

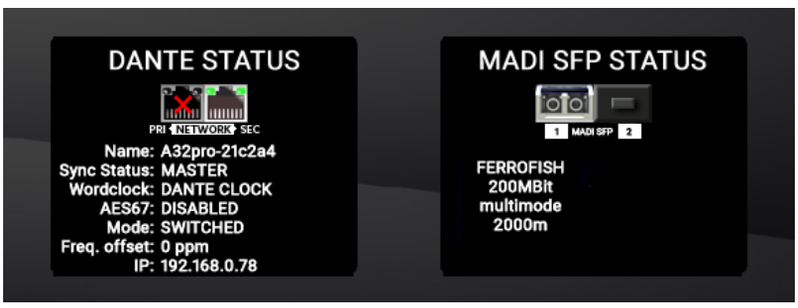
The settings menu provides access to the following functions:

- *SETTINGS:* Further settings (see next pages).
- *GPIO:* Loading of presets #1-4 and displaying of alerts.
- *DANTE/SFP:* SFP module Infos and Dante Infos*.
- *MADI:* MADI SFP Slot Priority Routing.
- *MIDI:* MIDI, USB-MIDI and MIDI-over-MADI Routing.
- *LOCK*: Locking the front panel.
- INFO: Further information about the device and the team.



GPIO (General Purpose Input & Output)

In the GPIO menu, you can check the status of all GP inputs and outputs at a glance. In addition, the outputs can also be activated and deactivated manually via the touch screen. The inputs can only be triggered via the hardware input. The exact functions of the four inputs and outputs can be found in the chapter of the interface description. *Please note that the inputs are always active.*
Do not connect the GPIO connector on the inputs if you want to prevent loading a preset by accident.



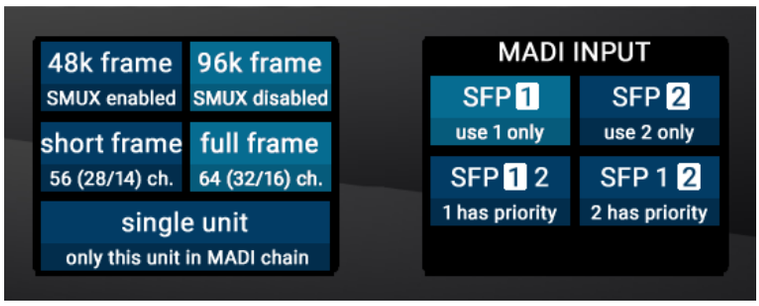
DANTE (SFP) / SFP INFO

The DANTE / SFP Info Menu displays information about the internal Dante module* and the installed SFP modules. Please note that the info screen about the installed Dante module only appears on an A32pro Dante.

On an A32pro you will only see the info screen for the SFP modules.

DANTE Status: In the DANTE Status Menu, the following parameters of the internal Brooklyn Board are displayed:
· *Name:* Name of the device inside the DANTE network
· *Sync Status:* Indicates whether the unit is configured as Master/Leader or Slave/Follower.
· *Wordclock:* Displays the wordclock speed.
· *AES67:* Indicates whether the AES67 interoperability standard is switched on or not.
· *MODE:* Indicates the mode of the rear dual Ethernet port. In SWITCHED, both ports work like a switch, in REDUNDANT, both single ports are used for single DANTE networks in redundancy mode.
· *FREQ. OFFSET:* Indicates the offset of the wordclock in the Dante network in relation to the device's own wordclock. Values of +/- 100 are normal.
· *IP:* Displays the IP address of the A32pro Dante on the Dante network.

MADI SFP Status: The MADI SFP status menu shows the parameters of the installed SFP MADI modules:
· *VENDOR ID:* Manufacturer name of the SFP module
· *I/O SPEED:* Speed of the SFP module
· *SFP CONFIGURATION:* Indicates whether a SingleMode or MultiMode module is installed.
· *SFP FIBER DISTANCE:* Displays the maximum usable distance (depending on the configuration).



MADI SETUP & ROUTING

In this menu you set the parameters of the MADI protocol and the latency compensation on the left screen and the routing priority of the two SFP modules on the right screen.

Please note that the routing priority (MADI INPUT) only works if both SFP modules are installed.

48k or 96k frame (only active in SMUX/2 mode - 64-96kHz)

In 48k frame mode, two channels are combined. In this way, the 64 MADI channels are bundled into 32 channels. In 96k frame mode, shorter frames of 32 channels each are sent directly. Both formats transmit the same number of channels (32), but the 96k frame mode has the advantage that the receiver can distinguish between SMUX/1 and SMUX/2 operation and switch automatically.
Make absolutely sure that in SMUX/2 mode the frame format is set identically on all devices.

Short frame (56Ch) or full frame (64Ch)

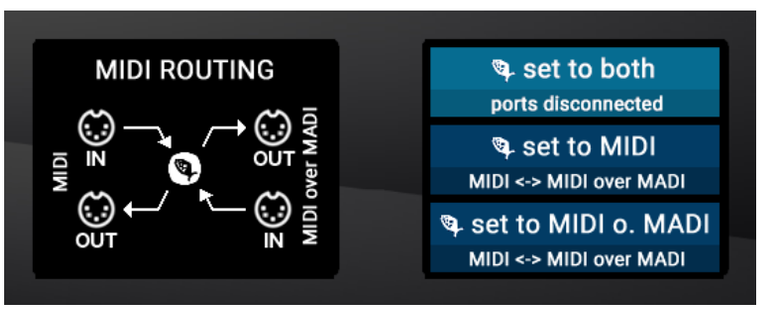
The MADI format in its first version (short frame) had a channel count of 56x56 channels. In addition, the speed of the channels could be shifted by 12.5% to enable synchronisation with tape machines ("Varispeed"). Later, the MADI format was extended to full frame mode, where Varispeed was dropped and the freed bandwidth was converted to a higher channel count of 64x64 channels. Make sure that the selection of the format is identical for all MADI devices.

Latency compensation

In the case of daisy-chaining, a latency of 3 samples occurs at the MADI interface. By choosing the correct position in the chain, this latency is compensated so that all signals are output coherently again. You can choose between "single device" (only one device), "1 of 2 devices" (first of two devices) and "2 of 2 devices" (second of two devices).

MADI Input (Priority)

Here you can select the priority of the two MADI SFP ports (1&2) via one of the four presets:
Use SFP1 only - uses only SFP slot 1
Use SFP2 only - uses only SFP slot 2
Use SFP1 with priority - uses SFP slot 1 and switches to SFP slot 2 in the event of an error.
Use SFP2 with priority - uses SFP slot 2 and switches to SFP slot 1 in the event of an error.



MIDI ROUTING

In the MIDI menu, you can set the routing of the individual MIDI ports (physical MIDI port (2x 1/8" (3.5mm) jacks on the back of the unit) as well as the MIDI stream from the MADI signal (MIDI-over-MADI). The MIDI data is embedded in the user bits of the MADI audio data stream.

There is a choice of three presets:

A32pro Dante set to both

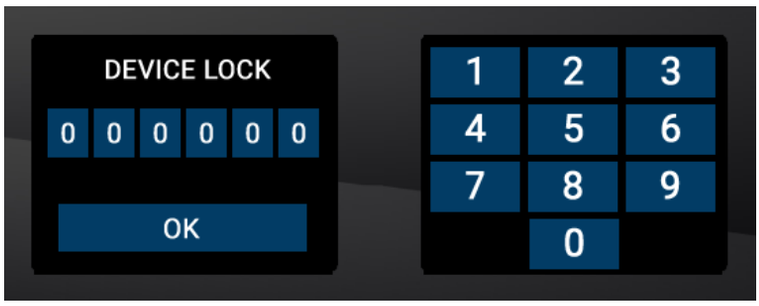
In this preset, the two ports are separated from each other. However, the A32pro (Dante) accepts remote control commands from both ports.

A32pro Dante set to MIDI

In this preset, the two MIDI ports are connected and the A32pro (Dante) receives remote control commands from the physical MADI port.

A32pro Dante set to MIDI-over-MADI

In this preset, the two MIDI ports are connected and the A32pro (Dante) receives remote control commands from the MIDI-over-MADI port.
Please note that to use the MIDI-over-MADI control commands you still need a MADI device that supports MIDI-over-MADI.



DEVICE LOCK

This menu allows you to lock the control panel of the unit. When the lock is active only the headphone menu is accessible. The unit is thus irrevocably locked.
The lock can only be unlocked again with the code previously provided on the sticker on the bottom of the unit.

Please note:
We strongly advise you to make a note of this code, and to store it in a safe place for future reference.
This code cannot be changed, and a locked device cannot be reset by the user – this requires a recovery code from the manufacturer, and is subject to a charge.

INFO

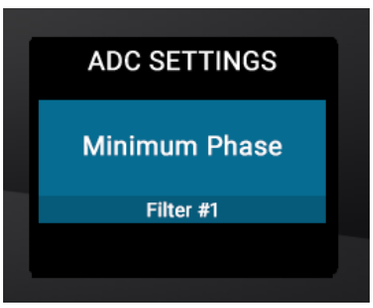
In the Info Menu you find additional information about the device and the developer crew. *Yay!*

Main Menu > Setup > Settings

SETTINGS

In the Settings Menu you have access to the following functions:

· A/D: Selection of the filters of the analog/digital converters.
· D/A: Selection of the filters and the operating mode for the digital/analog converters.
· ALERT: Management of alerts for Lock, MADI, temperature and power supply.
· VISUAL: Here you can adjust the parameters of the displays and the optical displays.
· BNC: Here the termination of the wordclock input can be switched on or off.
· DEVELOP: Developers can start and test their own software developments in this menu.
· CONFIG: Here you can reset the unit or start Vegas Mode.



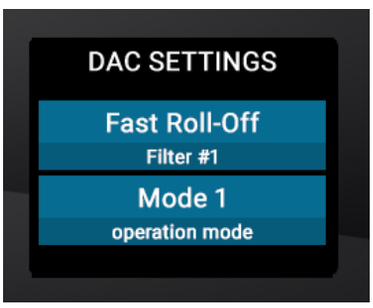
ADC SETTINGS

In the ADC Settings menu, one of the eight different anti-aliasing filters for the A/D converters can be selected. The user can choose between minimum and linear phase filter designs:

· Minimum Phase: Standard / Fast Roll-Off / Slow Roll-Off / Slow Roll-Off Low Dispersion
· Linear Phase: Apodizing / Fast Roll-Off / Fast Roll-Off Low Ripple / Slow Roll-Off

Please note that the chosen filter applies to all A/D channels.

In general, the group delay is lower with minimum-phase filters than with linear-phase filters.
However, due to their design, linear-phase filters may cause "ringing" (especially with percussive signals).
At 44.1 kHz, the group delay of the filters is all less than 1 ms; minimum- phase filters have the lower group delay.



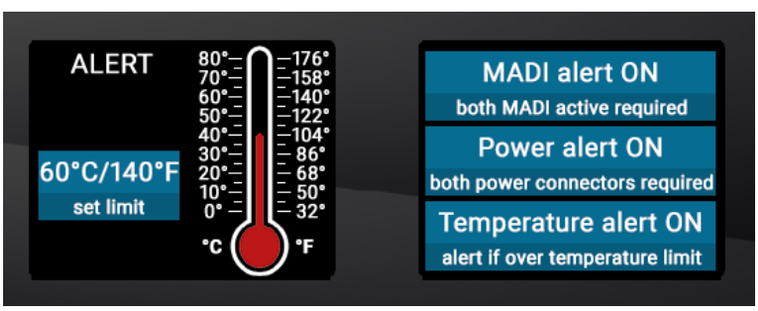
DAC SETTINGS

In the DAC Settings menu, you can choose between two different filters for the DA converters.
A minimum-phase filter and a linear-phase filter are available:

· Minimum Phase: Standard
· Linear Phase: Fast Roll-Off Low Ripple

The group delay of all filters is less than 1ms at 44.1kHz.
Please note that the chosen filter applies to all D/A channels.

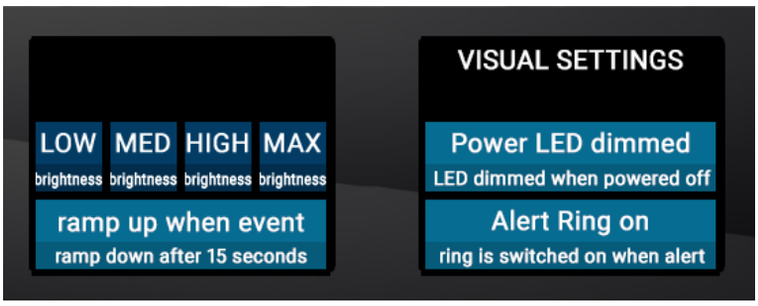
In addition, the D/A converter has three operation modes:
The MODE setting allows additional configuration of the D/A converter. MODE 1, 2 or 3 switches between different operating modes that offer different listening experiences.



ALERT

The following parameters can be monitored in the Alert Menu:

· MADI Alert ON/OFF: When using two SFP MADI modules, they can be monitored for signal failure.
· Power Alert: When using two power supplies, they can be monitored for signal failure.
· Temperature Alert: An alert is issued when a temperature limit is reached or exceeded.



VISUAL SETTINGS

Here you can determine the behavior of the encoder LED, the LED in the power button and the brightness of the displays.

Power LED: Determines the state of the POWER button's LED when switched off:
Off, pulsating (xfade) or dimly glowing (dimmed)

Alert Ring: Here you determine the behaviour of the white light corona of the encoder in the event of an alert: On, one of three flashing modes. (flashing 1-3) or one of four pulsating appearances (xfader 1-4). An "off/off" mode does not exist here for safety reasons - to switch off the alert LED entirely, disable this option in the ALERT menu.

In the left screen, the general brightness of the displays can be set as well as the display behaviour of the brightness related to time:
Ramp up when event 15s: The brightness is ramped up to the maximum brightness when the display is pressed and after 15s it is ramped back to the brightness set in the upper row.
Keep dimmed: The brightness of the display is kept at the level selected above.

BNC SETTINGS

The BNC wordclock input is internally terminated in the hardware with a 75 Ohm resistor. In normal daisy- chain wiring (wordclock out of unit#1 to wordclock in of unit 2, wordclock out of unit#2 to wordclock in of unit#3, etc.), you should always leave this termination switched on if your FERROFISH device is the last unit in the wordclock chain. In case of cabling with BNC T-connectors, the termination should be switched off. In this case, the termination is usually done by an extra termination BNC end-cap.

DEVELOP MODE

In DEVELOP mode, external developers can test their own plug-ins and software developments on our hardware platform. However, this requires a Software Development Kit (SDK) from FERROFISH.

Without this kit, an error message appears on the screen.
This is normal and does not indicate a malfunction of the unit.

CONFIG / MISC. CONFIGURATION

In the CONFIG menu, the unit can be reset to the factory settings or the so-called Las Vegas mode can be started.
Factory Reset: This resets the unit and sets all settings to default.
ATTENTION: THE FACTORY RESET RESETS ALL SETTINGS OF THE UNIT INLCUDING THE PRESETS!
So please make a note of any important settings before resetting the unit.
Las Vegas Mode: Displays a wave-like movement of the I/O meters for demo purposes.

Remote Control

The A32pro series can be remotely controlled in several ways:

Remote control via RemoteFish App (PC / Mac)
The A32pro Dante can be completely remote controlled via the RemoteFish app. The connection can be controlled either via the USB socket (MIDI-over-USB), MADI (MIDI-over-MADI), the MIDI I/O ports of the unit (via a separate MIDI interface) or via Dante* (Remote-over- Dante). In principle, all functions that can be controlled via the front panel can also be controlled via the RemoteFish app.

(* A32pro Dante only)

Remote control via MIDI CC
As an alternative to operation via the front panel or the RemoteFish app, the unit can be controlled via simple MIDI CC. Remote control can be done via USB (MIDI-over-USB), MADI (MADI-over-USB) or the MIDI I/O ports of the unit.
The assignment of the MIDI messages to the most important control parameters of the A32pro Dante can be found in the appendix.

Cascade Operation

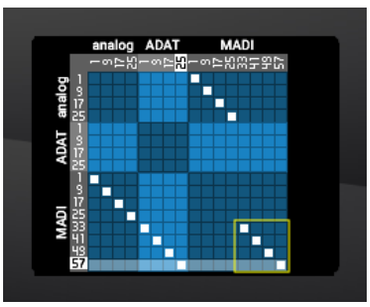
Cascading multiple A32pro (Dante) units

For some applications, the 32x32 channels may not be sufficient. Likewise, both Dante and MADI offer a channel count of 64x64 channels per cable at single sample rates (SMUX/1). To "fill" this channel count completely, several A32pro (Dante) units can be cascaded.
In the MADI network, this is done by daisy-chaining or, in rare cases, in star topology. In the Dante network, star cabling is used as standard to connect to an Ethernet network switch.

Cascade operation via MADI
Equipping the unit with a maximum of two SFP modules results in a wide range of possible application scenarios. A MADI connection offers 64 channels in each direction at a sample rate of up to 48 kHz (SMUX/1 operation). Due to a limited bandwidth, the number of channels is halved with SMUX/2 (64 to 96kHz), as two channels are bundled to transmit a 96kHz channel. This is called multiplexing. With SMUX/4 (128 to 192kHz) four channels are multiplexed to transmit one 192kHz channel, reducing the number of channels to 16x16. Generally possible with MADI is cabling in star topology as well as in series (daisy-chain). Which type of cabling makes sense depends on the respective application. For a star topology, the other device must have several MADI I/O ports. This would make sense, for example, if you were recording at 192kHz, because then all available channels (16x16) of a MADI I/O port would be occupied. So when using two A32pro units at 192kHz, you need another MADI device (e.g. MADI Audio Interface) with two MADI I/O ports.

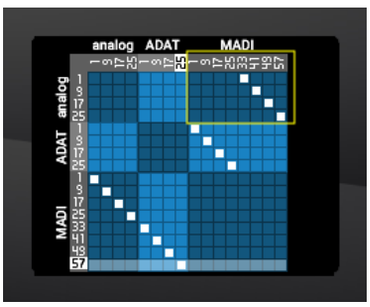
Wiring in series (daisy-chain) therefore only makes sense with sample rates in SMUX/1 mode (up to 48kHz), where you can use the remaining free channels for the next unit(s) in the chain. When MADI is wired in series at up to 48kHz (SMUX/1), a maximum of two A32pro units can be connected in series. At higher sample rates daisy-chaining is no longer possible due to the limited bandwidth of the MADI format. As the A32pro Dante has two SFP slots (so-called cages), the MADI data stream can be distributed over two ports.
This can be interesting for redundancy purposes as well as for scenarios with extended routing.

When daisy-chaining two A32pro (Dante) units via the MADI interface at single sample rates, the MADI channels 33-64 must be routed „passthru" to the second A32pro (Dante) in the routing menu of the first device. The settings would be:



MADI Routing Unit #1

In this configuration, MADI I/O channels 1-32 of unit #1 in the chain are routed to the analog I/Os.
At the same time, the MADI input channels 33-64 of unit #1 are routed through to the MIDI output channels 33-64 so that they can be used on unit #2.
On unit #2, the MADI I/O channels 33-64 are routed to the analog I/Os 1-32. Thus, all 64x64 analog audio channels of both A32pro units are available.



MADI Routing Unit #2

Cascade operation via Dante

Cascading of Dante units is done in star topology due to the network structure of Dante. A series connection via the PRI/SEC sockets is technically possible, but Audinate does not recommend it. A DANTE-compatible network switch is usually used as the star point. In this case, a series connection is not necessary, although most Dante units have a double network socket. However, this should only be used for redundant operation. In this case, two separate identical Dante networks are connected to both network sockets (PRI and SEC). If one of the Dante networks fails, the system automatically switches to the second network. This switching takes place directly in the Brooklyn module and cannot be influenced externally.

Troubleshooting

Various problem scenarios with approaches to solutions.

Scenario #1: *The unit cannot be switched on*
In this case, check the power supply and also connect it to the second PSU input of the A32pro (Dante) as a test.
Also check the output voltage of the power supply under load and replace it if necessary.

Scenario #2: *The signal seems to arrive in the unit, but it does not come out at the intended channel.*
First, go to the menu of the headphone listening matrix and select the interface and channel number on which you expect the incoming signal. If you do not hear the signal there, please check the cabling to the unit and the signal source from which the signal should come as well as the clock settings of the A32pro Dante. If you can hear the signal in the headphone monitoring matrix, check the ROUTING, GAINS and LEVELS settings. If this does not help, please perform a factory reset.

Scenario #3: *My signal has periodically constant dropouts (on-off-on-off...)*
Periodically regular dropouts often indicate an attempt to link two units in INTERNAL/MASTER/LEADER mode. Since there can only be one unit in a digital network of several units that sets the clock (INTERNAL/MASTER/LEADER unit), all other connected units must be set to SLAVE/FOLLOWER. Please note that the A32pro Dante does not come with sample rate converters (SRC) by default that would allow operation with multiple units set to wordclock master.

Scenario #4: *The signal on the headphones is relatively quiet/weak even in the "full" position.*
Make sure that the gain level in the Headphone Setup Menu is set to 0dB. This is the loudest possible level of the headphone preamplifier. When changing to another system (e.g. IEM) or one with lower impedance and / or higher sensitivity, make sure to set it to a lower value beforehand!

Technical Specifications

FERROFISH A32pro (Dante) - 32x32 + 2+ 4 A/D-D/A signal- and format converter

MADI I/O (AES10)	Dual SFP slot for SFP MADI modules, equipped with one SFP module as standard, optical in MultiMode. 64 channels @32kHz, 44.1kHz, 48kHz 32 channels @64kHz, 88.2kHz, 96kHz 32 channels @128kHz, 176.4kHz, 192kHz* * Parallel operation of both SFP modules for 32+32 channels at 192kHz MIDI over MADI implementation Latency: 3 samples Automatic switching between both SFP slots in case of signal loss of one signal branch.
ADAT I/O	4 + 4 optical interfaces 32x32 channels @32kHz, 44.1kHz, 48kHz 16x16 channels @64kHz, 88.2kHz, 96kHz 8x8 @128kHz, 176.4kHz, 192kHz Latency: 3 samples
GPIO	General Purpose Input & Output to dSub15 female connector. Trigger inputs: Set input pin to ground. Outputs: 5V, 10mA max for connecting an LED, optocoupler or similar.
DANTE	64 x 64 Audinate Brooklyn Board integrated. 2 standard ethernet connections (Pri/Sec).
Wordclock	BNC jack IN & OUT, 75 ohms termination of the input switchable in the unit
MIDI I/O	2x 1/8" (3.5mm) jack sockets for MIDI IN and MIDI Out, adapter to MIDI 5Pin available from FERROFISH. Pin assignment follows the MIDI 2.0 *Type A* standard.
A/D converter	32Bit ESS A/D converter, latest generation
Outputs (analog)	4 x D-Sub25, female / Tascam® standard Maximum output level: +20dBu Digital gain 0dB...-28dB in 1dB steps
D/A converter	32 Bit ESS D/A converter, latest generation.
MAIN OUT (analog)	2x balanced 1/4" (6.35mm) jacks with separate HP amp on dedicated ESS DAC (same as headphones). Main Out reproduces the signal of the red headphone output.
Inputs (analog)	4 x D-Sub25, female / Tascam® standard Maximum input level: +20dBu Digital gain: 0dB...+28dB in 1dB steps
Op-Amps	OPA1604 and OPA1664.
Display	4x color TFT screen 3" and capacitive multi-touch over the entire screen and FERROFISH logo area.
USB	USB-B connector with USB2 protocol for MIDI-over-USB (class compliant).
Headphones	2x 6.3mm jack output, gain adjustable in four steps, digital volume adjustment in 1dB resolution. Operating mode selectable between dual stereo (unbalanced) and balanced. Dedicated monitoring path on separate 32Bit ESS DAC in stereo mode (like Main Out).
DSP	SHARC DSP ADSP-2148x series built-in, expandable via optional propietary DSP stick modules.
PLL	Digitally controlled PLL with active jitter reduction Output jitter: 50ps ... 100ps typ.

Internal wordclock	Temperature compensated oscillator (TCXO) with high accuracy. Initial accuracy:+/- 1.5ppm Course during temperature range: +/- 2.5ppm Aging: +/- 1ppm
Voltage supply	12V at maximum 3A. 2 x sockets for 2.54mm hollow plug with securing nut for optional redundant power supply. Input voltage monitoring selectable, warning message and/or GP output in case of failure of a voltage source.
Fuse	Polyfuse, internal, self-resetting
Power supply	12V, 3A, center pin positive , 01x PSU included
Power requirement	24VA nominal, less then 1VA in standby mode.
Temperature range	+5° to +45° Celcius - +41° to +113° Fahrenheit
Humidity	< 75%, non-condensing.
Weight	3,5kg - 7,71 lbs.
Dimensions	Net size: 25.3cm x 44.4cm (19") x 4.4cm (1U) (D x W x H) Gross size: 29cm x 48.3cm x 4.4cm (1RU) (D x W x H) (including connectors, rack ears and knobs)

CE Conformity

EMV

This unit has been tested by a test laboratory and complies with the standards for the harmonization of the laws of the member states relating to electromagnetic compatibility (EMC Directive 2014/30/EU) as well as DIN EN 55103-1 (EMC interference emission) and DIN EN 55103-2 (EMC interference immunity).

RoHs II

Each appliance has been soldered lead-free and complies with the requirements of the EU Directive 2011/65/EU and the limit values defined therein for hazardous substances in electrical and electronic equipment. The documents on which this declaration is based are held by the manufacturer and can be viewed there at any time. Unauthorized modification of this product invalidates the validity of this CE declaration!

FCC declaration

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) The unit may not cause any interference, and
(2) The unit may be immune to any interference received, including interference that may cause undesired operation.

Please note:
This equipment complies with the limits for a Class B digital device, pursuant to Part 15 of the FCC radio interference regulations.
The purpose of these limits is to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy. If it is not connected and used in accordance with the instructions provided herein, the device may cause significant interference to radio transmissions. However, there is a possibility of interference with certain equipment even if the instructions are followed. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the distance between the unit and the receiver.
- Connect the unit to a mains source on a circuit other than the one to which the receiver is connected.
- Contact your dealer or an experienced radio and TV technician for help.

Use of an insulated cable is required to comply with the Class B limits in Subpart B of Part 15 of the FCC Rules.
Do not make any changes or modifications to the unit unless suggested in the operating instructions.

Old equipment disposal
According to the European WEEE Directive 2012/19/EU, electrical and electronic equipment may not be disposed of with household waste.
The consumer is legally obliged to dispose of these devices at the end of their life in the public waste collection system.
collection points or to the point of sale free of charge. Details are regulated by the respective national law.
The above symbol on the product, the packaging or in the user manual indicates this provision. If it is not possible to return the product for recycling, it can be sent back to the manufacturer with sufficient postage:
FERROFISH GmbH, Brüderstrasse 10, 53545 Linz am Rhein, Germany.

Maintenance
There are no serviceable components inside this unit.

Service
Repairs and modifications may only be carried out by a service workshop authorized by FERROFISH or by the manufacturer itself.
A list of certified service partners is available on request at: info@ferrofish.com. The service conditions of FERROFISH GmbH apply.

Limited Warranty
Each FERROFISH device is individually tested by us and undergoes a complete function check.
FERROFISH grants a limited manufacturer's warranty of two years. The proof of purchase / receipt serves as proof of warranty.
Please contact your dealer in the event of a defect, when the defect appears within the warranty period.
Damage caused by improper installation or improper handling is not covered by the warranty and is subject to a charge if repaired.
Claims for damages of any kind, in particular consequential damages, are excluded. Liability beyond the value of the goods of the device is also excluded. The general terms and conditions of FERROFISH GmbH apply.

State of the art
The product and this documentation are always adapted to the current state of the art. Changes in circuitry and design are therefore to be reserved without prior notice. The technical data as well as the appearance may therefore deviate if necessary.

Disclaimer

This documentation describes the current state of product development. FERROFISH GmbH does not assume any guarantees, neither explicit nor implicit, for the correctness of the contents of this documentation. In no event shall FERROFISH GmbH be liable for any form of data loss or data errors in connection with the use of the product or this documentation. In particular, FERROFISH GmbH excludes any liability for consequential damages resulting from the use of the product or the use of this documentation.
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Copyright

Package contents

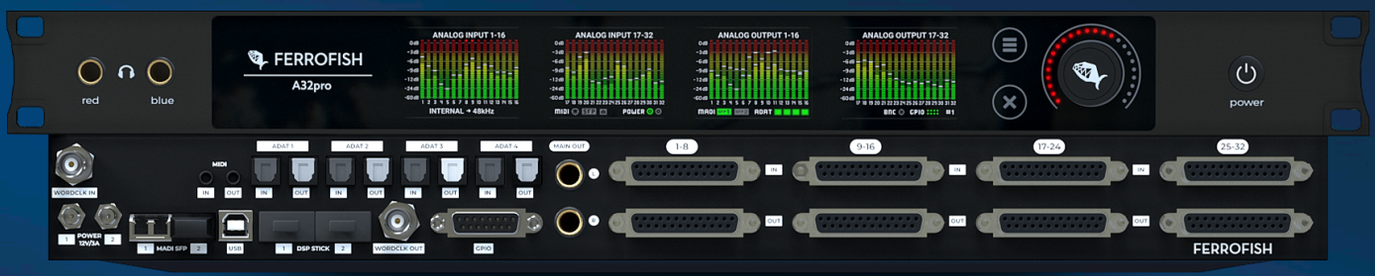
1x A32pro (Dante) unit
1x PSU
1x Power cable (country-specific)
1x Manual

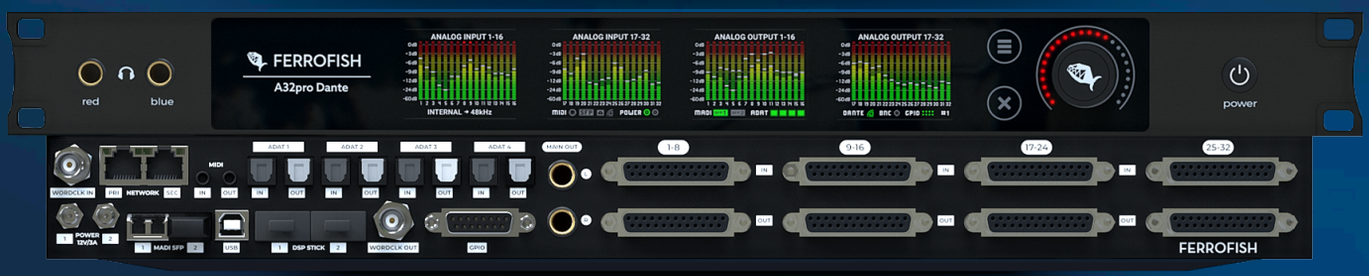
Outro (famous last words)

We are very pleased that you have now read this manual through to the end. That shows great perseverance and curiosity. Keep it up. Or as as a wise man once said, "Stay hungry. Stay foolish."

We'd like to also quote Douglas Adams here: „So long, and thanks for all the fish!"

Thank you, goodbye!
The team from FERROFISH.





FERROFISH
advanced audio applications

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