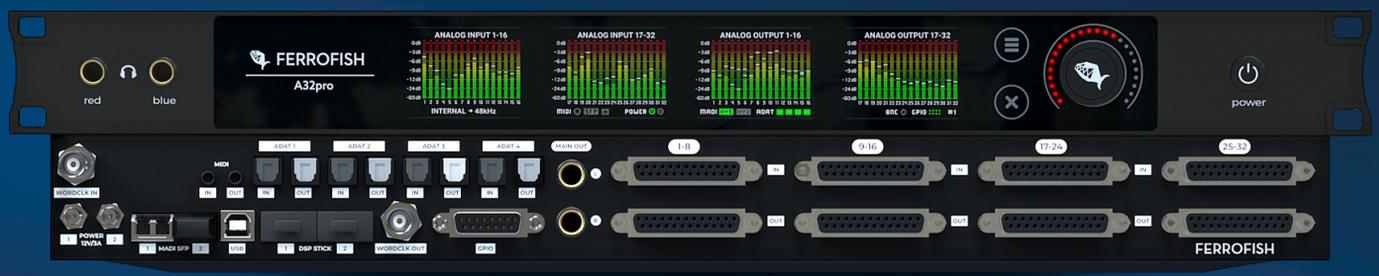
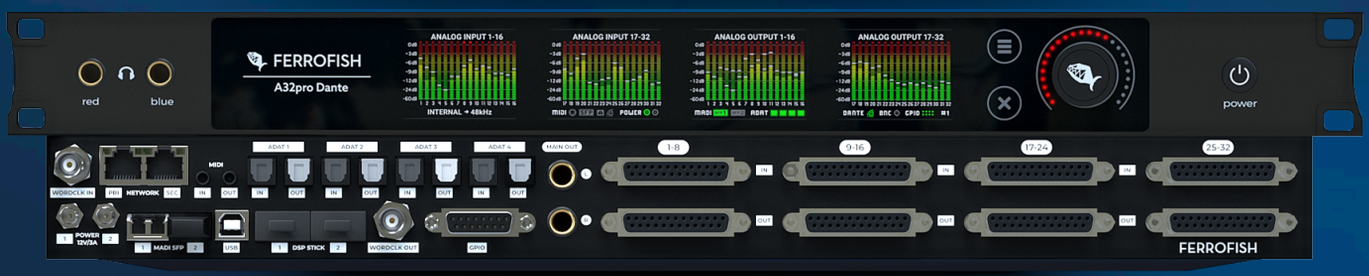




A32pro
A32pro Dante

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

Manual

FERROFISH
advanced audio applications

Introduction

Dear Users,
Thank you for choosing the A32pro as your new converter. Our goal is to provide you with genuine added value in your daily tasks. During its development, we prioritized maximum compatibility in both design and interface selection to serve a diverse range of practical scenarios. We hope you enjoy using this device as much as we enjoyed creating it for you.

JÜRGEN KINDERMANN

CEO & CTO FERROFISH GmbH

"With the A32pro / A32pro Dante, 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 / A32pro Dante took place in turbulent times. We are even more proud of the new A32pro because it has already exceeded our own high expectations."

About Ferrofish:
Located in Linz am Rhein, a team of developers, inventors, engineers, and musicians has dedicated itself to making exceptional audio devices with real added value. As a starting project, the successful A16 converter was developed into the new A16 MKII version and became the bestseller in its class in a very short time. The success has continued with the A32, VERTO, and Pulse16 series of converters to this day.

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:
This 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 with mains sockets that have 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 in wet environments or where humidity may condense.
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.
Liquids can 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're unsure
about the prevailing mains voltage in your location, consult your local power 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 the 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 should be carried out only by customer service personnel 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 or objects have 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. In this manual, we'll begin 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, where each output is responsible for one driver side. For this mode, you need a balanced cable for the headphones. Naturally, the headphones themselves must also be designed to support balanced operation. 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 section displaying the unit name and the company logo is touch-sensitive, intended for special functions such as clearing the peak LEDs. The four color screens, which are also touch-sensitive, display the status of both the 32 analog inputs and outputs as well as the overall 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 displays the four inputs, while the bottom row shows the four outputs.
- Number of the currently loaded preset

(* A32 Dante only)

Operating elements
The operating elements include:

- Menu (three bars)
- 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 generates heat. Ensure at least 1RU of space both above and below the unit for adequate 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 receives a clock from other digital devices when "BNC" is chosen as the clock source. This allows the A32pro Dante to function within a network of multiple digital devices, syncing as a slave or follower to an external wordclock signal.

MIDI IN/OUT 3

The MIDI inputs and outputs are featured as 1/8" (3.5mm) jack sockets. Adapters for 5-pin DIN plugs can be purchased in stores or from the FERROFISH online shop. The pinout aligns with the MIDI 2.0 (Type A) specification. These connections facilitate remote control and firmware updates.

Remote control can be achieved through the software RemoteFish.

MAIN OUT 5

A MAIN OUT connection, comprising two balanced 6.3mm (1/4") jacks, is available for swift linkage to devices like studio monitors or analog stereo recording equipment. The MAIN OUT reflects the signal from the red headphone output, with volume managed through the headphone menu. Both balanced and unbalanced devices are compatible with the MAIN OUT.

NETWORK Pri/Sec Dante* 2

The Dante interface enables seamless integration into existing Dante audio networks, which operate based on standard network data traffic (Layer 3). At elevated sample rates, Dante adjusts the number of transmittable channels: 32x32 channels at double sample rates (SMUX/2, up to 96 kHz) and 16x16 at quadruple sample rates (SMUX/4, up to 192 kHz). Additionally, the Dante interface provides redundancy connectivity to bolster transmission reliability. For comprehensive details, please visit www.audinate.com.

ADAT I/O 4

The A32pro features four pairs of ADAT input and output optical TOSLINK ports, capable of transmitting all 32x32 channels at single sample rates (SMUX/1, up to 48 kHz). A maximum cable length of 5m is recommended. For sample rates exceeding 48 kHz, the channel capacity is halved to 16x16 up to 96 kHz, and halved once more to 8x8 up to 192 kHz.

Ports with a brightly-colored flap denote ADAT outputs, while those with a black flap indicate ADAT inputs.

ANALOG INPUTS (1-32) 6

Given the compact design of the housing, the analog inputs are provided in the dSub25 (or db25) format. Their pin configuration aligns with the Tascam standard. These inputs can handle a maximum level of +20 dBu and are fully balanced. Suitable breakout cables can be purchased in stores or directly from the FERROFISH online shop.

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 power supply inputs allow for redundant operation using two power supplies. This setup significantly reduces the risk of unit failure due to a power supply malfunction. By default, the A32pro comes with one PSU. If needed, additional power supplies can be acquired either directly from the manufacturer or through authorized dealers. Both inputs are continuously monitored. If one input experiences a voltage drop or failure, an alert can be triggered.

USB - A PORT 3

The USB port on the A32pro Dante supports MIDI-over-USB and firmware updates. When connected to a PC or Mac, it creates a driverless MIDI interface. Use the software RemoteFish (available for PC and Mac) for remote control.

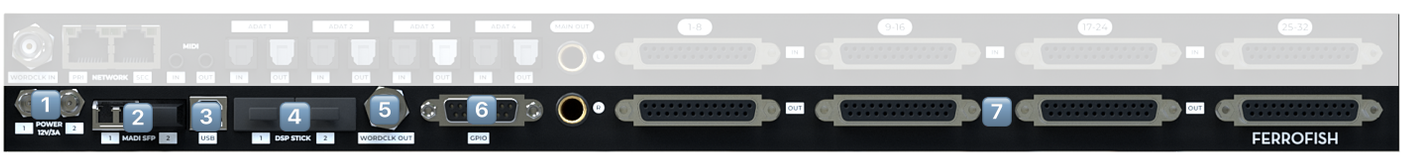
Note: Audio transmission via USB is not supported.

DSP STICK SLOTS 4

The expansion ports are designed for future proprietary modules. For more information, please visit us at: www.ferrofish.com

WORDCLOCK OUT 5

The BNC wordclock output jack activates once the device locks onto a digital signal. This lets other digital devices set to clock follower synchronize with the A32pro (Dante).



DUAL MADI SFP SLOTS 2

MADI SFP modules fit into the SFP slots and are user-replaceable. Both Multi Mode and Single Mode optical MADI SFP modules are compatible. Optional modules like coaxial MADI I/O will be available. With MADI, at increased sample rates, channels decrease from 64x64 (SMUX/1, up to 48 kHz) to 32x32 (SMUX/2, up to 96 kHz) and to 16x16 at SMUX/4 (up to 192 kHz). Using two SFP modules for 32x32 channels at 192 kHz is feasible.

We recommend the use of original FERROFISH SFP modules.

GPIO PORT 6

The GPIO (General Purpose Input/Output) port allows the selection of the first four presets via its inputs. Through the outputs, alert messages can be accessed and monitored externally. For detailed specifications on the I/O ports, see 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° C 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 output level is +20dBu. All outputs are fully balanced. Fitting breakout cables are available in stores or from the FERROFISH online shop.

Digital Interfaces

All digital interfaces of the A32pro can be operated in sample rates up to 192 kHz.
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 A32pro without limitation of the number of channels. This range refers to sample rates up to 48 kHz 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 96 kHz. Here, the number of channels is halved for both the A32pro and A32pro Dante, since (mostly for reasons of limited bandwidth) two channels are used to transmit the channel in 96 kHz. 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 192 kHz. Here, the number of channels is halved again in relation to SMUX/2 (up to 96 kHz) operation, since four channels must be combined to transmit one channel at 192 kHz.

MADI I/O (64x64@24Bit/48k)
In its original format, the MADI protocol could transmit 56x56 channels in 24Bit and a maximum of 48 kHz 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 48 kHz): 64x64 channels
SMUX/2 (up to 96 kHz): 32x32 channels
SMUX/4 (up to 192 kHz): 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 A32pro is equipped with 4 pairs of optical I/O ADAT sockets to transmit all 32x32 channels at single sample rates (SMUX/1).

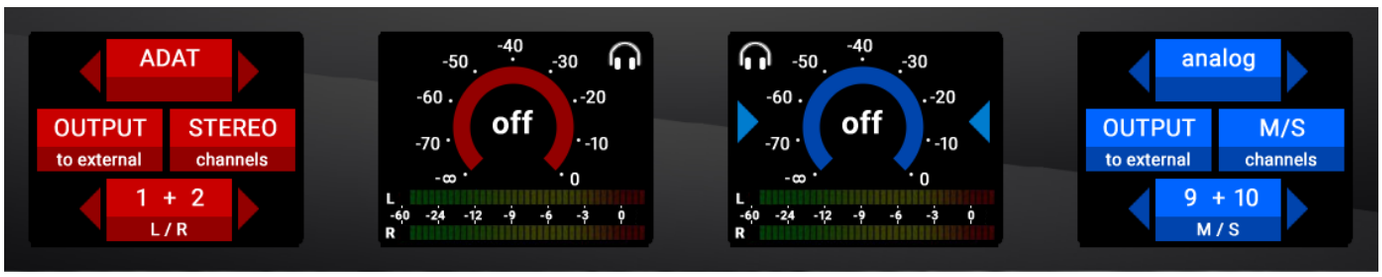
At higher sample rates, the number of available channels is as follows:
SMUX/1 (up to 48 kHz): 32x32 channels
SMUX/2 (up to 96 kHz):16x16 channels
SMUX/4 (up to192 kHz): 8x8 channels

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 96 kHz), 32x32 channels are still transmitted and at quad sample rates (SMUX/4: 176.4 kHz and 192 kHz), 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. Configuration of the Dante board is done via the software DanteController from Audinate.

Operation

Headphones - Monitoring Matrix & Main Menu



HEADPHONE MONITORING MATRIX

The A32pro Dante features an integrated monitoring matrix in its Headphones Menu, granting direct access to all input and output channels, excluding the MAIN OUT. From the main view, a simple touch on the encoder reveals this matrix, showcasing the 32x32 analog channels.

The dual headphone outputs can be set in either "unbalanced" (dual stereo) or "balanced" modes, switchable within the Headphone Setup Menu. The unbalanced mode, depicted by the red (left) and blue (right) color assignments, is the more commonly used setup.

Volume adjustments are intuitive:

- Use the virtual rotary controls either by tapping and using the encoder or through a touch-drag motion.
- The volume indicators display "off" at the lowest setting and "full" at the maximum.
- Tapping the headphone icon mutes the related channel.
- Amplification levels for headphone outputs are adjustable in the Headphone Setup Menu.

The external screen options let users:

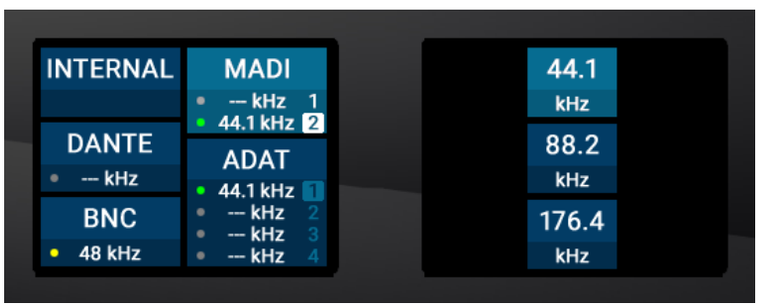
- Choose the interface type (analog, MADI (1/2), ADAT, or DANTE*).
- Determine the source's input or output.
- Select the source's channel format: mono, stereo, or M/S.
- Pick the specific channel number for monitoring.
- For MADI sources, users can select from either the first or second SFP slot (MADI 1 or MADI 2).

Operation - Main Menu

MAIN MENU

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

- **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

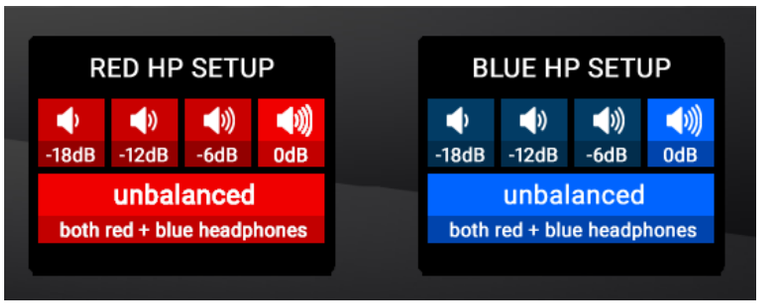
With MADI or ADAT, the wordclock is extracted from the respective data stream and processed with the help of the digital PLL.
The MADI and ADAT data stream also works at higher frequencies, where the number of available channels may be reduced.
The buttons for MADI and ADAT show the measured wordclock 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

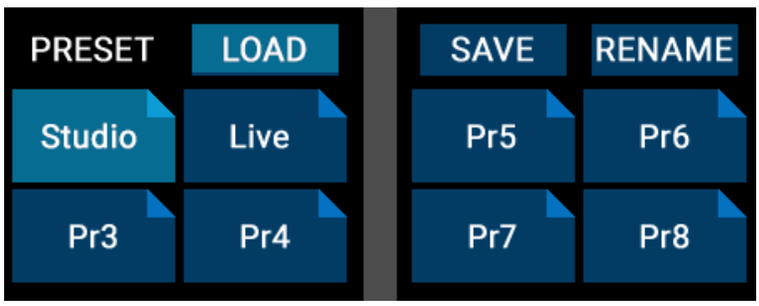
The wordclock of the DANTE device is displayed and used here. Note that if "Dante" is selected as the wordclock source, the wordclock of the internal Brooklyn board or the "Preferred Master/Leader" on the Dante network will be used.



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 a 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 operating mode for the two stereo outputs is likely 'dual stereo,' while 'balanced' is designed for high-end headphones with balanced cabling. In 'balanced' mode, the red output is used for the left driver of the headphones, and the blue output for the right. However, a special headphone cable from the headphone manufacturer is required for the 'balanced' mode. For safety reasons, large volume jumps are prevented when selecting the gain levels to protect your ears.



PRESET

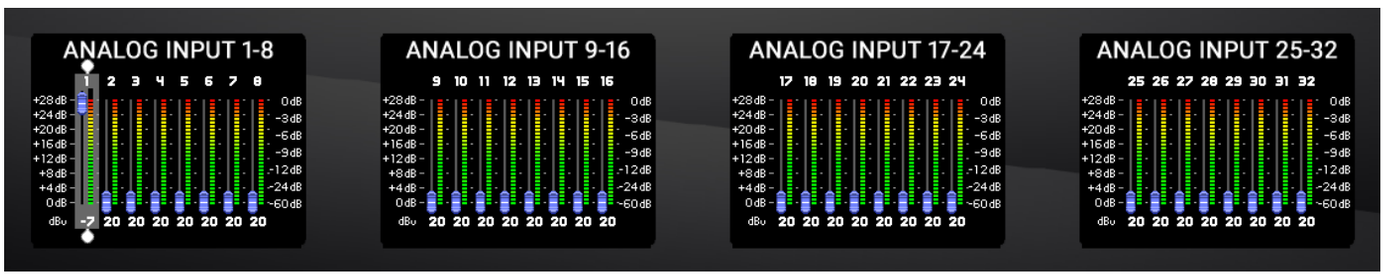
In the preset menu, you have the options to load (LOAD), save (SAVE), or rename (RENAME) any of the eight available presets. Each preset can be given a unique name, with the naming and renaming process facilitated through an on-screen keyboard.

SETUP MENU A32pro Dante

SETUP MENU A32pro

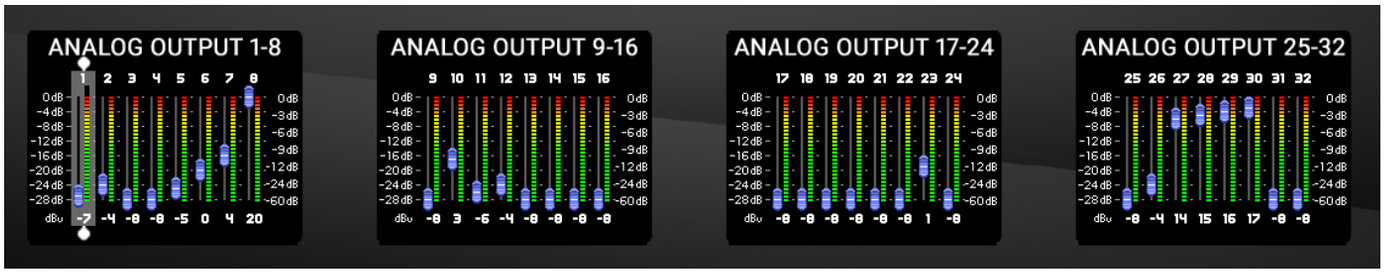
SETUP MENU

In the setup menu, you can access additional settings and functions, particularly related to the MADI and MIDI ports. These will be explained in detail on the following pages.



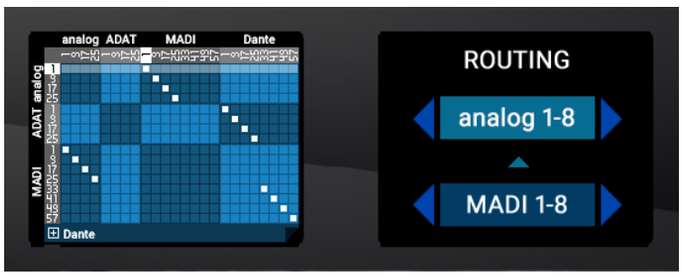
GAINS

The GAINS screen is utilized to adjust the sensitivity of the analog inputs, allowing for individual adjustment in 1 dB steps from -8 dBu to +20 dBu. Below the fader, a number indicates the maximum level that the converter can handle. For instance, setting the fader to -7 on channel 1, as shown in the example image, means the input can handle a maximum level of -7 dBu, resulting in a 0 dBFS output on the digital side. Any values surpassing this limit would cause digital clipping. The meters function post-fader. Additionally, the level displays of the analog inputs are visible, facilitating accurate level setting. The dB scaling for the display is located on the right side of the screens. By performing a swipe gesture at the points above and below the fader, multiple channels can be selected and adjusted simultaneously using the encoder wheel. A -8 dBu setting approximately corresponds to the -10 dBV level used in consumer devices, such as CD players or tape decks.

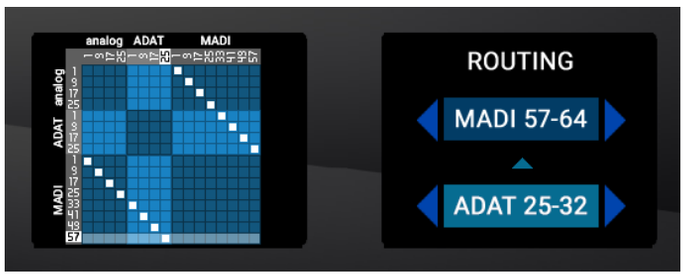


LEVELS

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 1 dB steps from -8 dBu to +20 dBu. Here, too, there is the level display of the outputs. Please note that here the level does not 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 change when moving the fader.



ROUTING MENU A32pro Dante



ROUTING MENU A32pro

ROUTING

In the routing menu, you can assign inputs to outputs using an X/Y matrix. The inputs are displayed in the horizontal row, and the outputs are displayed in the vertical row. You can now create connections in groups of 8 channels each. The numbers indicate the first channel of each group. A white square denotes the connection between an input and an output. On the right screen, you can navigate through the matrix display, altering the connection points of the inputs and outputs.

Due to its design, the matrix enables the distribution of a group of inputs to multiple output channels, but it does not support mixing multiple channels within the matrix itself.

Main Menu > Setup

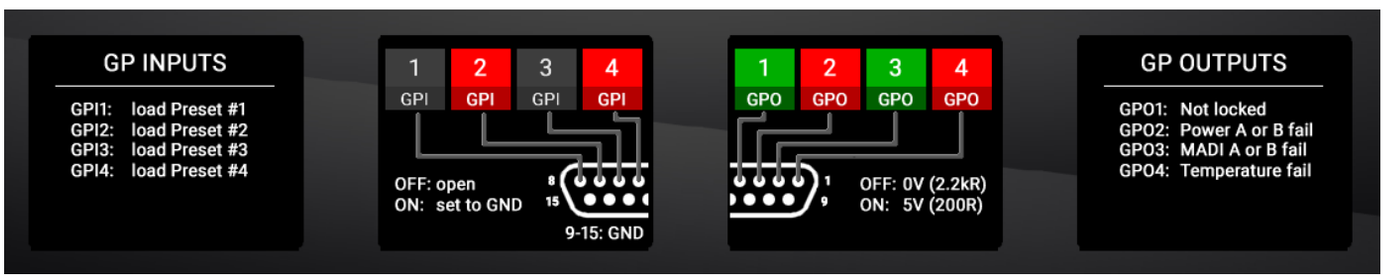
SETUP MENU A32pro Dante

SETUP MENU A32pro

SETUP MENU

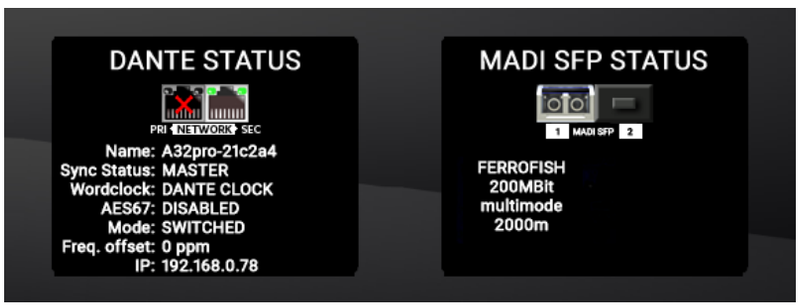
The settings menu provides access to the following functions:

- *SETTINGS:* Further settings (see next pages).
- *GPIO:* Loading of presets 1 to 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 swiftly check the status of all General Purpose (GP) inputs and outputs. Additionally, you have the option to manually activate or deactivate the outputs using the touch screen. Note that the inputs can only be triggered via the hardware input. You can find detailed descriptions of the functions for each of the 4 inputs and outputs in the chapter dedicated to interface description. Keep in mind that the inputs are always active; therefore, if you wish to avoid accidentally loading a preset, do not connect anything to the GPIO connector on the inputs.



DANTE (SFP) / SFP INFO

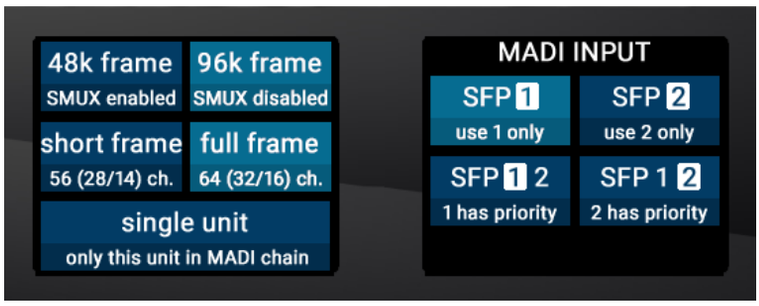
The DANTE / SFP Info Menu provides information about the internal Dante module* and the installed SFP modules. Note that the information screen pertaining to the installed Dante module will only appear on an A32pro Dante. For an A32pro, you will exclusively see the information screen for the SFP modules.

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 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 mode, both ports function like a switch; in REDUNDANT mode, both single ports are used for separate 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 Single Mode or Multi Mode 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.

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

In 48 kHz frame mode, two channels are combined, effectively bundling the 64 MADI channels into 32 channels. In contrast, the 96 kHz frame mode directly transmits shorter frames, each comprising 32 channels. While both formats transmit the same number of channels (32), the 96 kHz frame mode offers the advantage of enabling the receiver to distinguish between SMUX/1 and SMUX/2 operation, allowing for automatic switching. It is crucial to ensure that in SMUX/2 mode, the frame format is set identically across all connected devices.

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

The initial version of the MADI format, known as the short frame, supported a channel count of 56x56 channels. Additionally, it allowed for a 12.5% variation in channel speed to enable synchronization with tape machines, a feature referred to as 'Varispeed.' Later, the MADI format was updated to the full frame mode. In this update, Varispeed was omitted, and the freed-up bandwidth was utilized to increase the channel count to 64x64 channels. It is crucial to ensure that all MADI devices in your setup are configured to the same format.

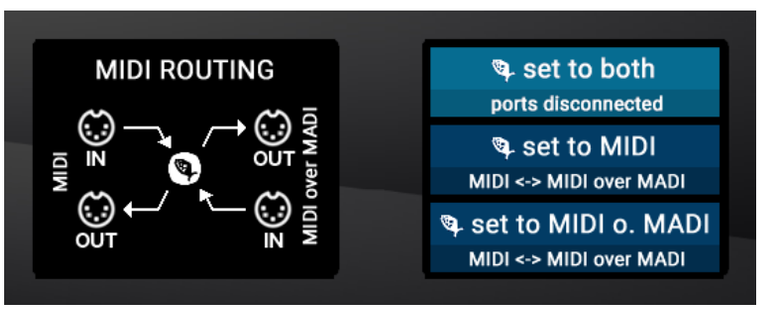
Latency compensation

In a daisy-chain configuration, the MADI interface introduces a latency of 3 samples. To compensate for this and ensure coherent signal output across all devices, it is crucial to select the appropriate position in the chain. The available options are 'single device' (for standalone operation), '1 of 2 devices' (for the first device in a two-device chain), and '2 of 2 devices' (for the second device in a two-device chain).

MADI Input (Priority)

In this section, you can assign priority to the two MADI SFP ports (1 & 2) through one of four preset options:

- *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 for the individual MIDI ports, which include the physical MIDI port with two 1/8" (3.5 mm) jacks located 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 data.

There are three preset options available for selection:

A32pro Dante set to both

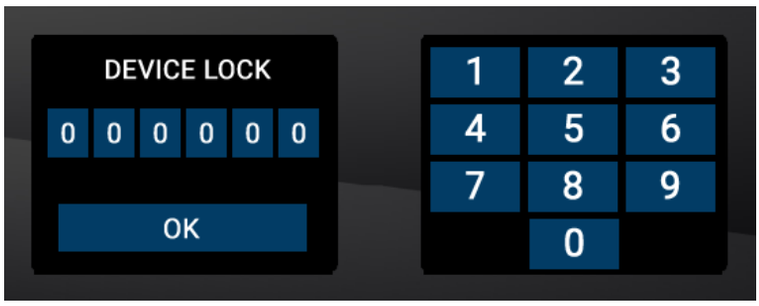
In this preset, the two ports are separated from each other. However, the A32pro (Dante) accepts remote control commands from both ports.

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 for using MIDI-over-MADI control commands you still need a MADI device which 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 store it in a safe place for future reference. This code cannot be changed, and a locked device cannot be reset by the user – it requires a recovery code from the manufacturer, which is subject to a charge.

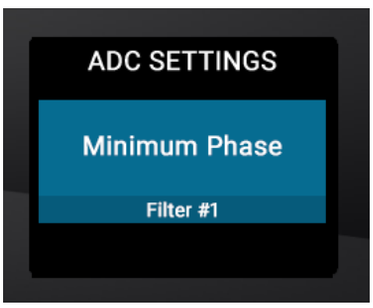
INFO

In the Info Menu you find additional information about the device and the developer team.

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 initiate and test their own software developments in this menu.
· CONFIG: Here you can reset the unit or start Vegas Mode.

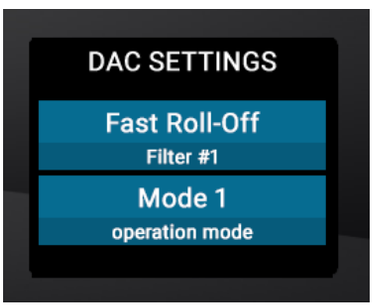


ADC SETTINGS

In the ADC Settings menu, you can select one of eight different anti-aliasing filters for the A/D converters. Users have the option to choose between minimum phase 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 selected 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 all the filters is less than 1 ms; minimum-phase filters have the lower group delay.

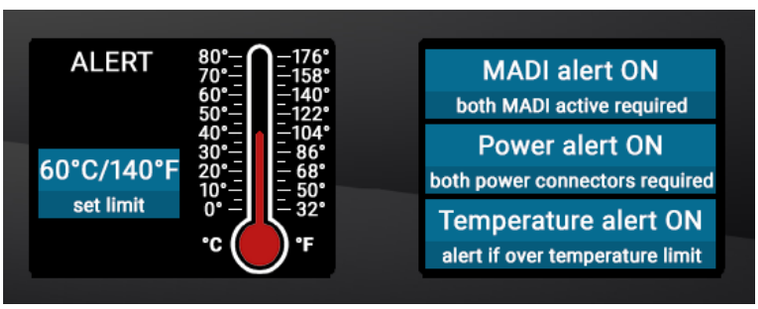


DAC SETTINGS

In the DAC Settings menu, you can choose between two different filters for the D/A converters.
A minimum-phase filter and a linear-phase filter are available:
· Minimum Phase: Standard
· Linear Phase: Fast Roll-Off Low Ripple

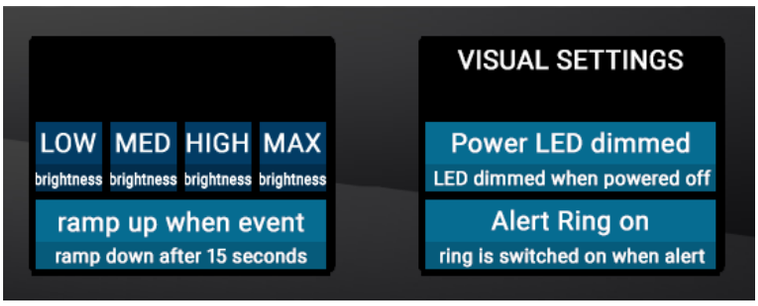
The group delay of all filters is less than 1ms at 44.1 kHz.
Please note that the chosen filter applies to all D/A channels.

In addition to filter settings, the D/A converter offers three operation modes that can be selected via the MODE setting.
MODE 1, 2, or 3 switches between different operating modes, each providing a unique listening experience.



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 behavior 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 to 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 behavior 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 with a 75 Ohm resistor. In standard 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 enabled if your FERROFISH device is the last unit in the wordclock chain. When using BNC T-connectors for cabling, you should disable the termination. In such cases, termination is typically achieved externally using an additional BNC termination 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.

If you do not have this kit, an error message will appear on the screen.
This is a standard behavior and does not indicate any 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 INCLUDING 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 can be remotely controlled:

Remote control via the software RemoteFish (PC / Mac)
The A32pro Dante can be completely remote controlled via the software RemoteFish. 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 software RemoteFish.

(* A32pro Dante only)

Cascade Operation

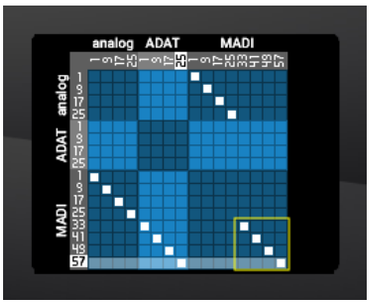
Cascading multiple A32pro (Dante) units

For some applications, 32x32 channels may not be sufficient. Both Dante and MADI offer a channel count of 64x64 channels per cable at single sample rates (SMUX/1). To fully utilize this channel count, multiple A32pro (Dante) units can be cascaded.
In the MADI network, this can be achieved through daisy-chaining or, in rare cases, in a star topology. In the Dante network, star cabling is the standard method for connecting to an Ethernet network switch.

Cascade operation via MADI
Equipping the unit with a maximum of two SFP modules opens up 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). However, due to limited bandwidth, the number of channels is halved with SMUX/2 (from 64 kHz to 96 kHz) as two channels are multiplexed to transmit a 96 kHz channel. This process is called multiplexing. With SMUX/4 (from 128 kHz to 192 kHz), four channels are multiplexed to transmit one 192 kHz channel, effectively reducing the number of channels to 16x16. Both star topology and daisy-chain wiring are generally possible with MADI. The choice between these types of cabling depends on the specific application. In a star topology, the other device must have several MADI I/O ports. This setup makes sense, for example, when recording at 192 kHz, as it fully utilizes all available channels (16x16) of a MADI I/O port. Therefore, when using two A32pro units at 192 kHz, you would require another MADI device (e.g., a MADI Audio Interface) with two MADI I/O ports.
These corrections provide a more precise explanation of MADI cabling options and their suitability for different scenarios.

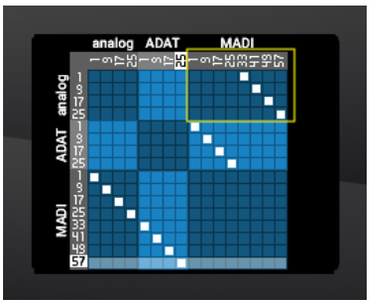
Wiring in series (daisy-chain) only makes sense with sample rates in SMUX/1 mode (up to 48 kHz), where you can utilize the remaining available channels for connecting additional unit(s) in the chain. When MADI is wired in series at sample rates up to 48 kHz (SMUX/1), a maximum of two A32pro units can be connected in series. However, at higher sample rates, daisy-chaining is no longer possible due to the limited bandwidth of the MADI format. On the other hand, the A32pro Dante features two SFP slots (referred to as cages), allowing the MADI data stream to be distributed over two ports. This can be advantageous for redundancy purposes and scenarios with extended routing options.

When daisy-chaining two A32pro (Dante) units via the MADI interface at single sample rates, the MADI channels 33-64 must be routed as "pass-thru" 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 typically done in a star topology due to the network structure of Dante. While a series connection via the PRI/SEC sockets is technically possible, 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 dual network sockets. However, these should primarily be used for redundant operation. In this scenario, 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 occurs 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 connect it to the second PSU input of the A32pro (Dante) for testing purposes. Also, measure 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, navigate to the menu of the headphone listening matrix and select the interface and channel number where you expect the incoming signal. If you cannot hear the signal there, please inspect the cabling to the unit and verify the signal source from which the signal should originate, as well as the clock settings of the A32pro Dante. If the signal is audible in the headphone monitoring matrix, examine the ROUTING, GAINS, and LEVELS settings. If this does not resolve the issue, consider performing a factory reset.

Scenario 3: *My signal has periodically constant dropouts (on-off-on-off...)*

Periodically regular dropouts often indicate an attempt to synchronize two units in INTERNAL/MASTER/LEADER mode. Since only one unit can set the clock in a digital network of multiple units (INTERNAL/MASTER/LEADER unit), ensure that all other connected units are configured as Followers. Please note that the A32pro Dante does not come with sample rate converters (SRC) by default, which 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.*

Ensure that the gain level in the Headphone Setup Menu is set to 0dB. This is the maximum possible level of the headphone preamplifier. When switching to another system (e.g., IEM) or one with lower impedance and/or higher sensitivity, be sure to adjust 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 @32 kHz, 44.1 kHz, 48 kHz 32 channels @64 kHz, 88.2 kHz, 96 kHz 32 channels @128 kHz, 176.4 kHz, 192 kHz* * Parallel operation of both SFP modules for 32+32 channels at 192 kHz 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 @32 kHz, 44.1 kHz, 48 kHz 16x16 channels @64 kHz, 88.2 kHz, 96 kHz 8x8 @128 kHz, 176.4 kHz, 192 kHz Latency: 3 samples
GPIO	General Purpose Input & Output to dSub15 female connector. Trigger inputs: Set input pin to ground. Outputs: 5 V, 10 mA max for connecting an LED, optocoupler or similar.
DANTE	64x64 Audinate Brooklyn Board integrated. 2 standard ethernet connections (Pri/Sec).
Wordclock	BNC jack IN & OUT, 75 ohm termination of the input switchable in the unit
MIDI I/O	2 x 1/8" (3.5 mm) 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	32 bit ESS A/D converter, latest generation
Outputs (analog)	4 x D-Sub25, female / Tascam® standard Maximum output level: +20 dBu Digital gain 0 dB...-28 dB in 1 dB steps
D/A converter	32 Bit ESS D/A converter, latest generation.
MAIN OUT (analog)	2 x balanced 1/4" (6.35 mm) 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: +20 dBu Digital gain: 0dB...+28 dB in 1 dB steps
Op-Amps	OPA1604 and OPA1664.
Display	4 x 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	2 x 6.3 mm jack output, gain adjustable in four steps, digital volume adjustment in 1 dB resolution. Operating mode selectable between dual stereo (unbalanced) and balanced. Dedicated monitoring path on separate 32 bit 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: 50 ps ... 100 ps typ.

Internal wordclock	Temperature compensated oscillator (TCXO) with high accuracy. Initial accuracy:+/- 1.5 ppm Course during temperature range: +/- 2.5 ppm Aging: +/- 1 ppm
Voltage supply	12 V at maximum 3 A. 2 x sockets for 2.54 mm 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	12 V, 3 A, center pin positive, 1 x PSU included
Power requirement	24 VA nominal, less then 1 VA in standby mode.
Temperature range	+5° to +45° Celcius, +41° to +113° Fahrenheit
Humidity	< 75%, non-condensing.
Weight	3,5 kg - 7,71 lbs.
Dimensions	Net size: 25.3 cm x 44.4 cm (19") x 4.4 cm (1U) (D x W x H) Gross size: 29 cm x 48.3 cm x 4.4 cm (1 RU) (D x W x H) including connectors, rack ears and knobs

CE Conformity

EMV

This unit has undergone testing by a certified laboratory and is in compliance with the standards for electromagnetic compatibility harmonization (EMC Directive 2014/30/EU), including DIN EN 55103-1 (EMC interference emission) and DIN EN 55103-2 (EMC interference immunity).

RoHs II

Each appliance has been manufactured using lead-free solder and is in accordance with the requirements of EU Directive 2011/65/EU, including the defined limits for hazardous substances in electrical and electronic equipment. The manufacturer maintains the necessary documents supporting this declaration, which are available for inspection at any time. Please note that any unauthorized modification of this product will void 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) This unit must not cause harmful interference.

(2) (2) This unit must accept 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 installed and used in accordance with the provided instructions, it may cause interference with radio transmissions. If this equipment does cause interference with radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to take the following measures to correct the interference:

- 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 insulated cables to comply with Class B limits in Subpart B of Part 15 of the FCC Rules.
Do not make any changes or modifications to the unit unless instructed in the operating instructions.

Old equipment disposal
Per the European WEEE Directive 2012/19/EU, electrical and electronic equipment must not be discarded with household waste. Consumers are legally obligated to dispose of these devices through established public waste collection points or return them to the point of sale at no cost, as dictated by national law. The symbol displayed on the product, packaging, or user manual indicates this requirement. If returning the product for recycling is not feasible, it can be sent to the manufacturer with sufficient postage to the following address: FERROFISH GmbH, Brüderstrasse 10, 53545 Linz am Rhein, Germany.

Maintenance
There are no serviceable components inside this unit.
Clean the device using a slightly damp microfiber cloth
The touch screens can be wiped using an eyeglass microfiber cloth. If there is significant dirt, you can use an optician's eyeglass cleaning solution. However, avoid using moistened eyeglass cleaning wipes since their chemical components may damage the glass coating.

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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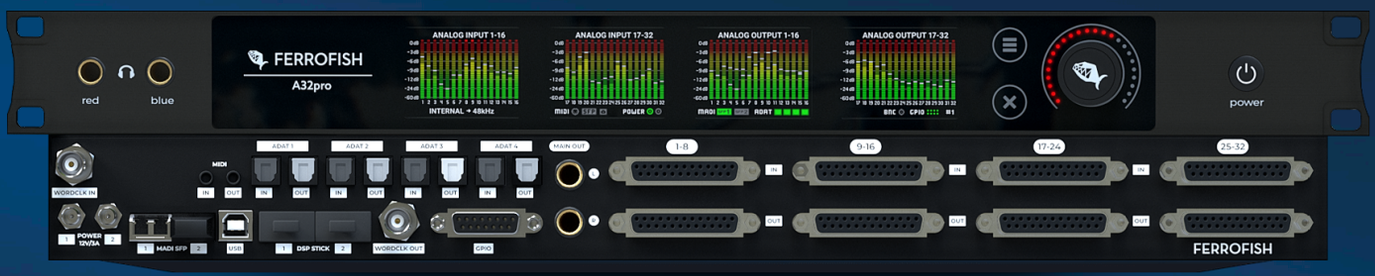
Copyright

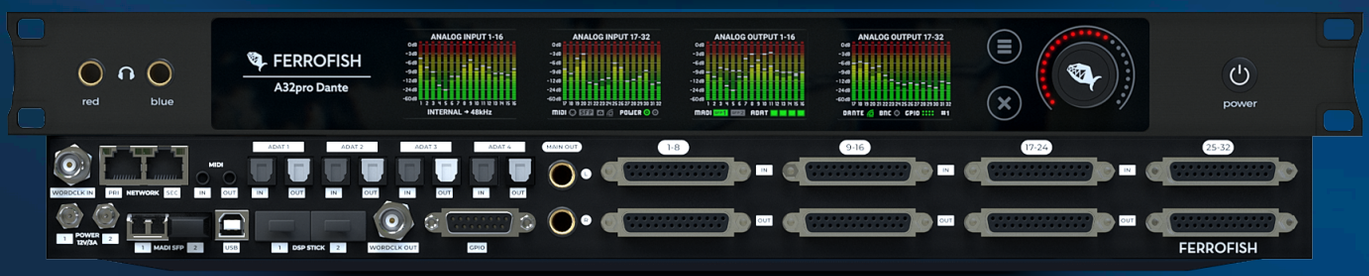
Package contents

1 x A32pro (Dante) unit
1 x SFP MADI Multi Mode module
1 x PSU
1 x Power cable (country-specific)
1 x Manual

Space for Notes

Use this page to note down anything relevant to the operation of your A32pro.





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