Owner's Manual

Ferrofish A32 DANTE

Professional 32 x 32-Channel AD/DA Converter

FERROFISH
advanced audio applications

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Version 1.3

IMPORTANT SAFETY INSTRUCTIONS

Safety symbols used in this manual:

This symbol is an alert that there are important maintenance and operating instructions in the literature.

This symbol warns the user of uninsulated, potentially dangerous voltage inside the unit that can cause an electric shock.

This symbol warns the user that the output connectors of the power supply contain voltages that can cause dangerous, potentially lethal shocks.

- **Read** these Instructions
- **Keep** these instructions
- **Heed** all warnings.
- **Follow** all instructions.

1. Do not use this device near water.
2. Clean only with a dry cloth. Do not spray liquid cleaner onto the faceplate or into the ventilation slots. This may damage the front panel or cause a dangerous condition.
3. Only install in accordance with the manufacturer's instructions.
4. Do not install or operate near heat sources such as stoves, radiators or other devices that may produce heat.
5. NEVER compromise the functioning of the power plug's ground connection. When the provided plug doesn't fit into the outlet, please consult a qualified electrician for assistance.
6. Use power adaptors and accessories specified by the manufacturer only.
7. Protect the power cord from being pinched or stepped on.

8. Unplug this device during lightning storms, or when not in use for extended periods of time.
9. Refer all servicing to qualified service personnel only. Servicing is required when the device has been damaged in any way. For example when liquids have been spilled on the device, objects have fallen onto it, or the device itself has been dropped. Servicing is also essential when the device no longer functions normally or has been exposed to rain or moisture.
10. This unit generates heat during normal operation. Use it in a well ventilated environment with at least 1RU space between any other equipment.
11. This product in combination with headphones or other external amplifiers and speakers may produce sound levels that could lead to permanent hearing damage. Do not operate at high or uncomfortable volume levels for a long time. If you are experiencing ringing in your ears, a loss of high frequency sound information or other hearing loss, please contact an audiologist immediately.
12. WARNING: To reduce the risk of an electric shock or fire, do not expose the device to rain or moisture.
13. The power supply of this audio device may cause electronic interference to surrounding equipment. If you find that this or any nearby unit is malfunctioning, try resetting the device, relocating it, or getting an electrician to install a powerline conditioner.

14. Always use a stand, 19" rack or table designed for the use of pro audio equipment. In a permanent installation make sure that damage or even injury will not result from the mounting of the device or from cables pulling on the device. When using a cart, use caution when moving the device inside the cart to avoid injury from it tipping-over.

Introduction

Thank you for choosing the A32 DANTE as your new converter!

The A32 DANTE is an A/D - D/A converter with 32 x 32 analog inputs and outputs, 64 x 64 Dante, 64 x 64 MADI and 32 x 32 ADAT digital channels.

Furthermore, the integrated FPGA and DSP enable routing of all channels to every I/O and creating submixes which can be monitored by an integrated monitoring matrix featuring a headphones output at the front of the A32 DANTE.

Four TFT screens show all analog input and output levels at a time. The intuitive one-knob-operation makes using the A32 DANTE a breeze. Last but not least a permanent help system explains the most important sections of the A32 DANTE so that you can operate the A32 DANTE even without using the manual.

We're sure that our A32 DANTE will become a valuable member of your studio gear.

Symbols used in this manual:


This symbol indicated sections of detailed explanation.

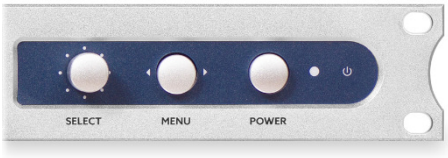

Paragraphs showing this symbol require the reader's particular attention.

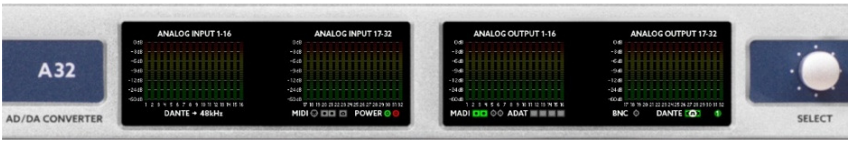
Software and updates

For more information, updates and support please visit our website: www.ferrofish.de

Operation

The A32 DANTE can be operated completely from the front panel by using the SELECT pot and the MENU button. The POWER button can be used as a „home- button" and for switching the unit on and off. For switching it off, keep the button pressed for longer than 3 seconds. When you do, a countdown will be shown on the screen to prevent accidentally shutting down the A32 DANTE. You can also control the A32 DANTE via Dante, MIDI or MIDI-over-MADI.





The status line beneath the meters shows the following (from left to right):

- The current synchronization source and sample frequency
- Whether there is MIDI input from the MIDI plugs, from MIDI-over-MADI and/or from USB
- If power is attached to the left and/or right mains input
- Any input present on optical MADI, coax MADI and/or ADAT 1-4. The symbol will be yellow if only data is received and green if the input is also synchronous to the sample frequency.
- BNC wordclock input is present
- Dante input is present (yellow), and is synchronized to the A32 DANTE (green)
- Current preset number (if available)

When using an external wordclock source (MADI, ADAT, BNC, or Dante), the corresponding icon shows a blinking pulse symbol.

Headphones

When turning the SELECT pot on the main screen the headphone menu is shown. You can select the volume of the headphone output now:

When pressing MENU again, you can change the following:

- **Source:** Choose between ANALOG IN / OUT, MADI IN / OUT, ADAT IN / OUT, DANTE IN /OUT and MIX 1-7.
- **Channel:** Once you have chosen a source you can then select the specific channel(s) to be monitored. Cycling thru the channels will let you first select mono channels, followed by stereo channel pairs.

Instead of listening to a mono or stereo signal you also can create up to seven different mixes and select them here.

For further information regarding mixer function and features please see the MIX-chapter.

Main Menu

By pressing MENU you engage the main menu. Use the SELECT pot to choose the desired menu point and press MENU to select it.

The *main menu* lets you choose from the following options:

CLOCK

Here you select if the A32 DANTE should generate the wordclock by itself (master) or if it should listen to an external wordclock signal (slave) from an external source. If choosing MASTER you can also select the sample rate here.

MIX

You can select, load and edit one of seven mixer presets in this menu. The mixes can be monitored over the headphones output.

DANTE

In this menu you can see the analog I/O's as meters and all digital I/O's as LED dots with a traffic light color scheme. This means that every dot shows a digital channel, which changes the color according to the level of the signal.
Pressing the MENU button again opens the Dante setup menu.

SETUP

The Setup lets you change the gain-levels of the analog inputs and the levels of the analog output. Additionally, you can influence the routing of the A32 DANTE, change the MIDI and MADI routing, change settings or lock the front panel.

DSP

In the DSP menu optional DSP plugins can be loaded and edited.

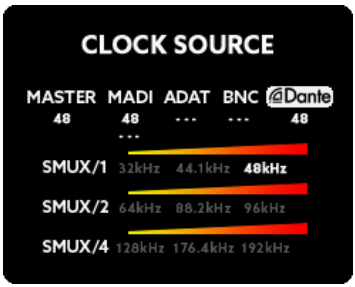
PRESET

Levels, gains and the routing of the A32 DANTE can be saved and loaded in up to six different preset slots.

HELP

You can change the language of the help system here and lookup the firmware version of the A32 DANTE.

The CLOCK SOURCE menu lets you select the wordclock source and the sample frequency of the A32 DANTE.



The numbers below the labels show the internally generated clock as Master or the measured external sample rate. If no sample rate is detected, „---“ will be displayed.

MASTER

If you set the clock source to MASTER, the internal A32 DANTE clock generator will be used.

MADI, ADAT

When selecting MADI or ADAT, the wordclock will be extracted from the corresponding data stream. This signal will be refreshed by the internal digital PLL. When using higher sample frequencies, SMUX will be used. Depending on the mode, you also need to select the correct SMUX mode manually.

BNC

Another option is to directly apply a wordclock signal to the BNC input. Same like with the other inputs, also this input will be refreshed by the digital PLL.

DANTE

Here you can select Dante as wordclock master. If you intend to use Dante, it’s generally recommended to use the Dante clock as wordclock.

main menu – CLOCK - SMUX operation

Internally the A32 DANTE always uses all 32 analog channels, but the number of digital MADI, ADAT and Dante channels is limited in relation to the SMUX mode currently in use.

SMUX/1

In SMUX/1 mode offers sample frequencies from 32kHz to 48kHz.

SMUX/2

When running higher sample rates (64kHz - 96kHz), the bandwidth limitation makes it necessary to split the digital data for MADI, ADAT and Dante into two separate channels (signal multiplexing). Thus, the channel count reduces by half.

Both SMUX/1 and SMUX/2 offer signal redundancy for MADI. When the MADI signal is lost, the A32 DANTE can switch automatically to the other port if configured that way. Dante features also redundancy using the two Dante ports.

SMUX/4

When running SMUX/4 Mode (128kHz-192kHz) the bandwidth increases again, so now one data stream needs to be divided into four channels. Therefore, the channel count reduces to a fourth of the original. ADAT is not specified in this mode, so it is switched off.

Dante and MADI only offer 16 channels in this mode. In order to use all 32 analog channels, both MADI ports are configured as follows:

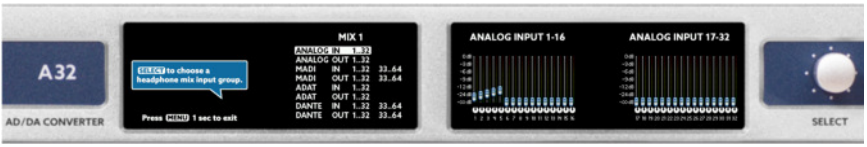
- optical MADI: sends and receives analog channels 1-16
- coaxial MADI: sends and receives analog channels 17-32

If Dante should be used in SMUX/4 mode instead of MADI, please go to the DANTE CONTROL screen, and switch “Use Dante for SMUX/4?” to ON. Dante only supports 16 channels in this mode, so the upper 16 analog channels are switched off.

Inside the MIX menu you can select and modify one of the seven mix presets. The A32 DANTE provides a downmix of all analog and digital I/O's which is sent to the stereo headphone output on the front panel of the unit.

Select one of these mix presets by using MIX 1 to MIX 7 as source in the headphones screen.

After pressing MENU you can edit the selected mix preset.



First, choose one of the 8 source groups. The actual settings of the group you can see on the right screen. When pressing MENU again, you can edit the settings in the following steps:

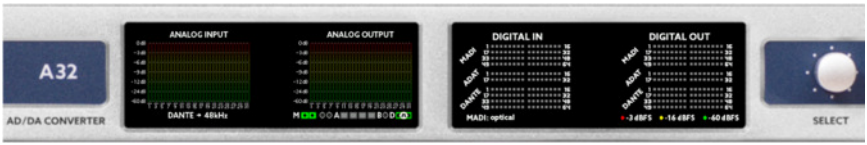
- Select the channel (single, stereo, 4 or 8 channels), then press MENU
- Now you can adjust the level of the selected channel(s), then press MENU again
- Finally, you select the pan. If more than one channel is selected the pan's work in opposite ways.

These steps you can repeat as desired. When finished, press MENU long to go back and select another source group.

main menu - DANTE DIGITAL

The DANTE DIGITAL menu shows all analog and digital inputs and outputs. All digital inputs and outputs are shown as dots with a traffic light color code.

This presents an overview about the signal flow between the interfaces.

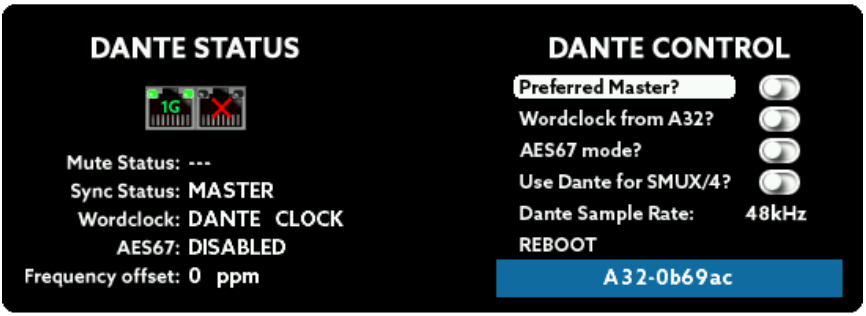


The LED traffic light colors have the following meaning:

Color	Level range
red	-3dBFS to 0dBFS
yellow	-16dBFS to -4dBFS
green	-60dBFS to -17dBFS
grey	-inf to -61dBFS

Pressing the MENU button again opens the *DANTE Status & Control* menu.

These screens allow a sophisticated analysis of the status of the Dante Interface. Additionally, you can change some fundamental Dante settings directly in this screen, which is very handy if you don't have access to the Dante Controller software from Audinate on your computer.



Ethernet Ports: Shows the status and speed of the Ethernet ports in use (Pri/Sec).

Mute Status: Shows if the device is muted. In most cases a muted device is an indication of a malfunction inside the Dante network.

Sync Status: Shows if the A32 DANTE has locked successfully to the Dante network in slave mode (LOCKED). If this device is master on the Dante network, MASTER is displayed.

Wordclock: Shows the actual clock source. Usually the wordclock comes from the Dante network, but also the internal A32 DANTE worclock can be used.

AES67: Shows if the AES67 compatibility mode is activated.

Frequency offset: Shows the offset between the received clock and the internal clock. This value should not exceed +/-100ppm.

Preferred Master: If this is set to on, the A32 DANTE is handled as a preferred clock generator. As long as no other device inside the Dante network is flagged as “preferred master”, the A32 DANTE is chosen as the master wordclock device.

Wordclock from A32: Uses the A32 DANTE internal wordclock generator. Please note, that Dante don’t support the following sample frequencies: 32kHz, 64kHz, 128kHz

AES67 Mode: Sets the AES67 compatibility mode to on or off.

Use Dante for SMUX/4: In SMUX/4 mode the A32 DANTE uses both MADI ports (optical and coaxial) to feed the 32 analog inputs and outputs. To use the Dante data stream instead of MADI, set this to “on”. Please note that in SMUX/4 (128 – 192kHz) Dante mode only 16 analog inputs and output channels (1-16) are available. Channels 17-32 are disabled.

Dante Sample Rate: Shows the actual sample frequency of the Dante device. Press MENU to change sample rate. Please note that all devices inside the Dante network have to be set to the same sample rate.

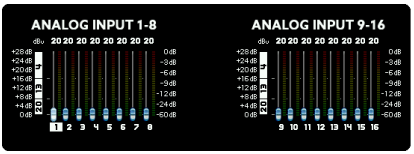
REBOOT: Reboots the Dante Interface.

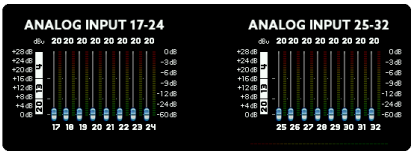
Feed external wordclock into an existing Dante network

To feed an external wordclock into the Dante network, please proceed as follows:

1. Set the “Preferred Master” setting to “on”. This shows the Dante network that your A32 DANTE is the wordclock master – if no other device is set to “Preferred Master” as well.
2. Set “Wordclock from A32” to “on”. This makes the Dante network use the wordclock signal provided by the A32 DANTE.
3. Inside the clock menu set the wordclock source to MASTER (or MADI, ADAT or BNC) and ensure the sample rate is identical to the one provided in the Dante Control menu.

The analog inputs of the A32 DANTE can each be set to different sensitivities. You can choose between three reference levels: +4dBu, +13dBu and +20dBu. Using the DSP, you can additionally set the reference levels from -8dBu to +20dBu in 1 dB steps. The DSP always calculates the optimum configuration. For example, if you set +12dBu, the analog reference will be set to +13dBu and the signal will be amplified by 1dB.



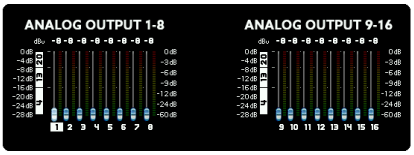


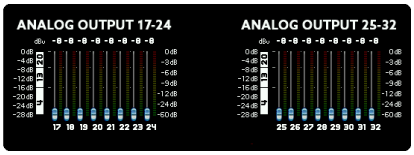
The number above the fader shows the maximum level (dBu), which the input can handle. When the fader is set to 20, like shown in the picture above, the input can handle a maximum input level of +20dBu. Avoid exceeding this maximum level to prevent digital clipping.

In addition, to assist finding the correct gain, also the current levels of the analog inputs are shown. The dB scale of these levels is found on the right hand side of the screens. For reference, you also see the levels of the channels here, referred to the dB scale on the right side.

The minimum value -8dBu corresponds (approximately) to the reference level of -10dBV used by consumer devices, like CD-players for example.

The LEVELS screen is similar to the GAINS screen described on the previous page and is responsible for the levels of the analog outputs. As with the inputs, you can set the level of each channel in 1dB steps from -8dBu to +20dBu. The A32 DANTE offers individual analog level switching of +4dBu, +13dBu and +20dBu. This means that this level is reached when the digital output reaches 0dBFS.

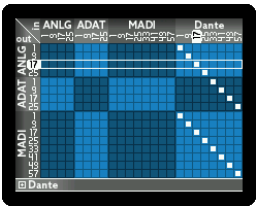


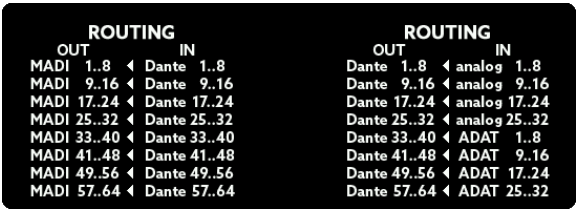


If you select one of the three reference levels exactly, the digital signal will be converted 1:1 to analog. However, if you select a value in between these reference levels, the DSP will calculate the optimal combination between analog and digital levelling. For example, if you select +12dBu the analog output will be switched to +13dBu and the digital signal will be attenuated by 1dB to reach the +12dBu output level.

Just like the inputs you can also meter the levels of the channels here. Please note, the level of the outputs will not change when adjusting the amplification here, because you see the digital level before digital and analog amplification.

The A32 DANTE features a sophisticated routing matrix. In the ROUTING screen you can see a graphical representation on the left side and a list view on the right screen.





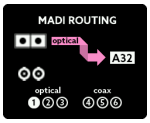
To change the routing, do the following:

- Choose the output: Turn the SELECT rotary to highlight a block of 8 outputs. It corresponds to a row on the graphical view and a line on the list view.
- Choose the input: Press MENU. You will now be able to connect an input to the chosen output by turning the SELECT pot. The inputs are shown as columns in the graphical view or as text on the right hand side of the list view line.

Hold down the MENU button for a few seconds to leave the routing screen.

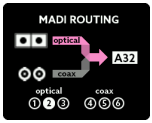
The A32 DANTE provides a flexible MADI routing using the two MADI ports:

1 - optical



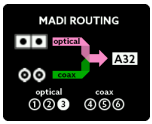
The A32 DANTE only uses the optical MADI input. No automatic switching between the formats will happen.

2 - optical



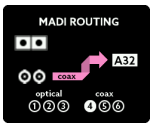
The A32 DANTE uses the optical MADI input. When the signal is lost, the A32 DANTE switches to coax MADI. It will only switch back to optical if the coax signal is subsequently removed.

3 - optical



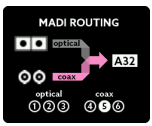
Same function as 2. In addition, both inputs are scanned constantly and if no signal is present on one a warning will be shown on the main screen.

4 - coax



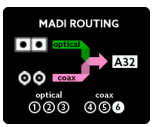
The A32 DANTE only uses the coax MADI input. No automatic switching between the formats will happen.

5 - coax



The A32 DANTE uses the coax MADI input. When the signal is lost, the A32 DANTE switches to optical MADI. It will only switch back to coax if the optical signal is subsequently removed.

6 - coax



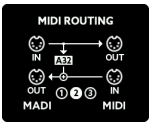
Same function as 5. In addition, both inputs are scanned constantly and if no signal is present on one a warning will be shown on the main screen.

The MIDI routing screen is intended to allow you to choose the way MIDI data is routed between MIDI and MIDI over MADI:

1 - separate

MIDI-over-MADI und MIDI are separated. MIDI commands and commands for controlling the A32 DANTE are being received from both ports and send out directly to the according MIDI output.

2 - MADI priority

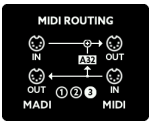


MIDI-over-MADI and MIDI are connected: Data from the MIDI-over-MADI port is sent to MIDI, and MIDI input is sent back to MIDI-over-MADI.

The A32 DANTE receives and sends control messages from/to the MIDI-over-MADI port.

This way you can convert between MIDI-over-MADI and MIDI while the A32 DANTE listens to the MIDI-over-MADI port.

3 - MIDI priority

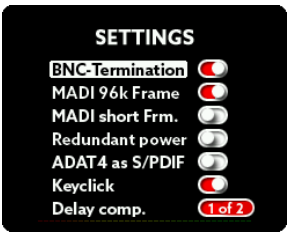


MIDI-over-MADI and MIDI are connected: Data from the MIDI-over-MADI port is sent to MIDI, and MIDI input is sent back to MIDI-over-MADI.

The A32 DANTE receives and sends control messages from/to the MIDI port.

This way you can convert between MIDI-over-MADI and MIDI while the A32 DANTE listens to the MIDI port.

Inside the SETTINGS menu the following items can be changed:



BNC Termination

The wordclock of the A32 DANTE is terminated internally with a 75 ohm resistor by default. When daisy chaining the wordclock of several units, you should leave this option set to ON. If you're using T-connectors, set this option to OFF.

MADI 96k Frame

There are two MADI transfer standards for the SMUX/2 mode (64kHz – 96kHz):

- **48k Frame:** Identical to SMUX/1. The signal of 1 channel is split (multiplexed) across a pair of 2 channels in order to double the bandwidth. The usual 64 MADI channels are therefore reduced to 32 channels.
- **96k Frame:** The MADI stream is natively reduced to 32 channels by increasing the frame size and allowing channels to be transmitted directly.

Both formats transfer the same number of channels (32). The advantage of the 96k frame mode is that the receiver can distinguish between SMUX/1 and SMUX/2 mode automatically and can switch appropriately. Please ensure all units use the same setting.

MADI short frame

Using the full bandwidth of MADI you can transfer 64 (SMUX/2: 32, SMUX/4: 16) channels. By setting MADI short frame, the A32 DANTE will

only transfer 56 (SMUX/2: 28, SMUX/4: 14) channels. This setting corresponds to an early MADI specification, which is capable of using the remaining bandwidth for varispeed. Nowadays varispeed is not commonly used in favor of having the full 64 channels.

Redundant Power

When using two power supplies for redundancy reasons, please set this menu option to ON. If switched on, the A32 DANTE monitors both PSU inputs. In case of a failure of one power supply, the A32 DANTE will display a warning message on the main screen.

ADAT4 as S/PDIF

The fourth ADAT I/O port can be switched to stereo S/PDIF operation. If the sample rate of the connected device differs from the sample rate of the A32 DANTE, the external sample rate will be converted to the A32 DANTE's sample rate using a sample rate converter (SRC).

The stereo S/PDIF input will be distributed on the ADAT 4 channels, the stereo output is sourced by the first two ADAT 4 channels.

Keyclick

This lets you switch the Keyclick sound on or off.

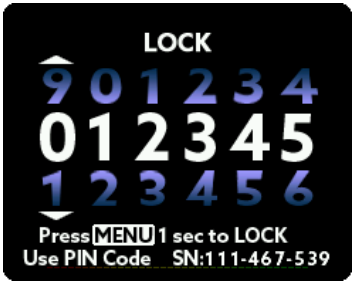
Delay compensation

When using MADI with more than one A32 DANTE unit in daisy chain mode, set each device to the according order:

- Single: only one unit attached to MADI
- 1 of 2: first unit in a chain of two
- 2 of 2: second unit in a chain of two.

Delay compensation is intended for MADI only. In case you connect via Dante, there is no need for manual correction, since the Dante algorithm takes care for proper timing.

To prevent accidental or forbidden operation of the A32 DANTE, you can lock the front panel. The headphone screen is still accessible, but all other functions are locked. To lock the A32 DANTE front panel, enter the PIN number printed on the bottom of the unit:



After entering the correct number, hold down the MENU button for a few seconds to activate the lock.

To unlock the A32 DANTE, repeat the procedure: Enter the correct number and hold down the MENU button for a few seconds.

The PIN number of each A32 DANTE is fixed and can't be changed by the user.

IMPORTANT: Keep the PIN code in a safe place!

Reconstruction of a PIN code by the manufacturer is subject to a fee.

main menu - DSP

The SHARC DSP built into the A32 DANTE is used for routing, mixing and gain/level settings.

But the DSP can do much more audio processing:

Using the USB connection, you can install Ferrofish-DSP plugins, which are able to process audio effects with high accuracy and without latency.

You can find more information on our website: www.ferrofish.com

DSP Plugins of 3rd party manufacturer, VST or Scope plugins cannot be used.

main menu - PRESET

The A32 DANTE's GAINS, LEVELS and the routing can be permanently stored in one of six preset slots. This lets you preconfigure the A32 DANTE and saves you time later by just recalling the presets.

The PRESET Menu lets you choose which preset to load:

After selecting the number of the preset to load, you can choose which parts of the preset you want to load: Gains of the analog inputs and/or levels of the analog outputs and/or routing.

To store a setting to a preset slot, enter the STORE menu :

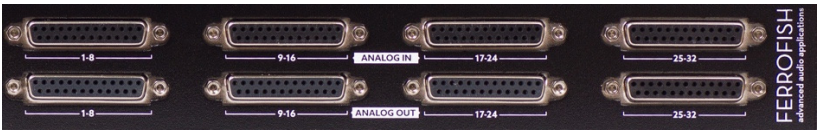
Here you can store the settings using one of the six preset slots.

main menu - HELP

The HELP screen shows you the schematic structure of the A32 DANTE, you can look up the firmware version and you can set the language of the help system.

The A32 DANTE provides a help system, which explains all key sections of the unit, to guide you through using the A32 DANTE without even consulting the manual.

A32 DANTE analog inputs and outputs: D-Sub25



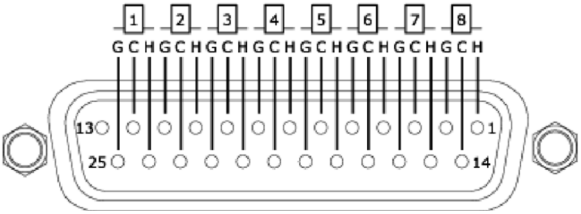
All analog inputs and outputs are fully balanced and can send or receive levels of +4dBu, +13dBu or +20dBu. Each channel can be set independently. You can also set levels between these three reference levels, which will be achieved digitally using the DSP. If setting the input and output levels exactly to one of the three reference levels, there is no digital gain calculation by the DSP.

Please note that unlike analog systems, digital systems do not have any soft clipping zone. When converting analog signals, leave sufficient headroom to avoid digital distortion.

D-Sub25 connectors are used for the analog inputs and outputs. The pin configuration corresponds to the TASCAM® standard.

When connecting an unbalanced device to the A32 DANTE input, please connect the inverting (cold) input channel to ground.

When connecting an unbalanced device to the A32 DANTE output, please leave the inverting (cold) output channel open (not connected).



A32 DANTE digital interfaces - MADI

MADI is a professional audio format, which can transfer 64 channels over a distance of up to 2 kilometers.

When connecting several MADI devices in series you need to put them in a daisy chain. This means that you connect the output of the first device to the input of the second device and so on. This way you can connect two units to transfer 64 analog inputs and 64 outputs.

The A32 DANTE has an optical and a coaxial MADI port. Both ports can be used simultaneously for redundancy purposes. When using the SMUX/4 mode, each port transfers only 16 channels, so both ports will be used to transfer all 32 analog channels.

Use either optical fiber cables (SC connectors) or coaxial cable with an impedance of 75 ohms (BNC connectors) for MADI.

Both kinds of cabling have their own advantages and disadvantages.

Due to optical transmission, fiber cables cannot be influenced by electromagnetic crosstalk and can be used for distances up to 2 km.

Ferrofish also offers a **single mode MADI** version of the A32 DANTE on request, which lets you transfer audio signals up to 10km. Please contact us for more information.

Keep in mind that an optical fiber may break if bent too much.

Coaxial cables with an impedance of 75 ohms are widely used and easy to source. Unless using armored optical fiber they are more robust, but are limited to a length of 100 meters.

When using sample rates higher than 48kHz, channels have to be bundled to transport that higher data rate. As a result, the maximum amount of usable channels is reduced according to the following chart:

Frequency	MADI channels
32kHz, 44.1kHz, 48kHz (SMUX/1)	64 (56) channels
64kHz, 88.2kHz, 96kHz (SMUX/2)	32 (28) channels
128kHz, 176.4kHz, 192kHz (SMUX/4)	16 (14) channels
128kHz, 176.4kHz, 192kHz (SMUX/4)	A32: 32 channels

The original MADI standard utilized a maximum channel count of 56 channels instead of 64 channels (numbers in brackets). This lower channel count allows the sample rate to vary by +/- 10%. Nowadays the variable sample rate is not commonly used anymore, in favor of having more usable channels.

In SMUX/4 Mode both MADI connections (optical and coax) will be used together to overcome the channel limitation of the MADI standard and transfer all 32 analog inputs and outputs at up to 192kHz. In this case the first 16 channels are transferred using the optical port and the remaining 16 channels via the coax port.

The A32 DANTE detects automatically if 64 or 56 channels are received. The number of channels it outputs can be set by using the **MADI short frame** switch.

A32 DANTE digital interfaces - ADAT

ADAT is a very common digital multichannel interface standard invented by Alesis. It is capable of transferring eight channels of audio at up to 48kHz over an optical plastic fiber cable. The maximum length of an ADAT connection is limited to 10 meters.

When using ADAT with sample rates higher than 48kHz, the channel count halves in SMUX/2 mode.

Frequency	ADAT channels (per jack)
32kHz, 44,1kHz, 48kHz (SMUX/1)	8 channels (x4)
64kHz, 88,2kHz, 96kHz (SMUX/2)	4 channels (x4)

The A32 DANTE has four ADAT pairs, capable of transferring 32 channels in SMUX/1 mode. The ports with the white door are the ADAT outputs, the ports with the black door are the inputs.

The ADAT ports are switched off when using the SMUX/4 mode.

A32 DANTE digital interfaces - Dante

Dante is an Audio-over-IP gigabit-Ethernet-based protocol by Audinate. It delivers uncompressed, multi-channel, low-latency digital audio data over standard networks, while using common network switches.

Dante allows both the connection to an existing Dante network with other Dante-enabled devices and the connection to a PC or Mac via the computer's internal gigabit Ethernet port. Using an optional *Audinate™ Virtual Soundcard* driver (paid option from Audinate.com) you can record and play up to 64 channels of audio via Dante right into your preferred DAW or Recording Software. The supported audio interface types are ASIO & WDM on PC's and CoreAudio on Macs.

Using the Dante Controller software, also available from Audionate, you are able to setup your Dante network, and freely route between all Dante devices.

More information concerning these programs you find on the website for Dante: www.audinate.com

When connecting the A32 DANTE to a network switch or your computer, you can always use standard type network cables. A special crossed Ethernet cable is not necessary. Please note, that daisy chaining from one Dante device to the next one is not supported.

The internal A32 DANTE module supports up to 64x64 I/O's (at SMUX/1). That said it is also possible to route some Dante signals to MADI or ADAT in order to include other devices (for example a "regular" A32) to the Dante stream.

A32 DANTE interfaces – BNC WORDCLOCK

Every digital audio system needs a wordclock frequency to work. This clock frequency can either be generated by the system itself (master mode) or it can be supplied externally (slave mode). There can be only one master clock in a digital system, all other connected devices must slave to this clock.

The A32 DANTE can generate its own clock or it can synchronize to an external clock.

For external synchronization the A32 DANTE can use the wordclock embedded in the MADI or ADAT data stream. Alternatively, you can connect an external wordclock directly using the BNC IN port.

Use the CLOCK screen to define where the wordclock should be obtained from, or if the A32 DANTE should generate the wordclock itself.

Please note, that the BNC-IN wordclock must be terminated by 75-ohms (see SETTINGS), except when you're using T-connectors for all units.

The BNC OUT port always outputs the refreshed wordclock used by the A32 DANTE.

A32 DANTE interfaces – USB and MIDI

USB

The USB port can be used to remote control the A32 DANTE. When connecting to the PC, the A32 DANTE will appear as a USB-MIDI device.

Also, USB will be used to flash new firmware to the A32 DANTE. Please visit our website to check for a new firmware version.

MIDI

It's also possible to use the MIDI input and MIDI output ports for remote control.

An advantage of the MIDI connection is the galvanic isolation, because the MIDI input has an optocoupler. Also, it's easy to daisy chain multiple A32 DANTE using MIDI to remote control more than one unit at the same time.

Another feature is that MIDI data from the MIDI port can be embedded into the MADI stream and vice versa. Use the MIDI screen to configure the routing of the MIDI data.

Remote software

The A32 DANTE can be controlled from a computer via the remote software. To do so, select one option to connect the PC with the A32 DANTE:

USB Interface

Connect the A32 DANTE using a USB cable with your PC. A USB-MIDI driver will be installed automatically, then the connection will be established.

MIDI Interface

Use a MIDI Interface to connect the A32 DANTE with your PC.

MADI Interface (MIDI over MADI)

You can also use the MADI connection to transfer MIDI. In this case, MIDI will be embedded in the MADI data stream. To use this feature, you need to have a MADI card which is capable of embedding MIDI data. Please check the documentation of your MADI card to find out if it supports this feature or contact the card manufacturer.

Dante Interface

If your computer is connected via Dante to your A32 DANTE, you also can use the remote software via this network. Please set the switch from MIDI to Dante in the remote software then.

After starting the software, the program scans automatically for all attached devices and shows them in a list.

Please visit our website to download the software and for more information.

technical specifications

MADI I/O: (AES10)	optical (multimode) + coaxial interface 64 channels @32kHz, 44.1kHz, 48kHz 32 channels @64kHz, 88.2kHz, 96kHz 32 channels @128kHz, 176.4kHz, 192kHz* * both interfaces work independent to achieve full 32+32 channels MIDI over MADI implemented latency: 3 samples automatic switching between optical <-> coax MADI when signal lost
ADAT I/O:	4+4 optical interfaces 32 channels @32kHz, 44.1kHz, 48kHz 16 channels @64kHz, 88.2kHz, 96kHz n/a @128kHz, 176.4kHz, 192kHz latency: 3 samples
S/PDIF:	ADAT 4 I/O can be reconfigured as S/PDIF input has sample rate converter included (performance of SRC: -128dB) output follows A32 sample frequency
DANTE:	64 x 64 channel Brooklyn II board, 2 Ethernet connectors
Wordclock:	BNC: 1 x input, 1 x output 75 Ohm Termination switchable for input
MIDI I/O:	two DIN5 jacks, for remote conversion MIDI <-> MIDI over MADI possible
A/D Converter:	4 x CS5368 (Cirrus Logic) 4 x DSub25 / Tascam analog switches: +20dBu, +13dBu, +4dBu digital gain: +20dBu...-8dBu, 1dB steps latency: @48kHz: 12/fs, 0.25ms, @96kHz: 9/fs, 0.09ms, @192kHz: 5/fs, 0.03ms OpAmps: RC4580 + OPA1664 level indicator: TFT screen, 28 levels
D/A Converter:	4 x CS4365 (Cirrus Logic) 4 x DSub25 / Tascam analog switches: +20dBu, +13dBu, +4dBu digital gain: +20dBu...-8dBu, 1dB steps latency: @48kHz: 7.8/fs, 0.16ms, @96kHz: 5.4/fs, 0.06ms, @192kHz: 6.6/fs, 0.03ms OpAmps: RC4580 + OPA1664 level indicator: TFT screen, 28 levels
USB:	USB 2.0 (remote, update)

Headphone:	independent stereo channel select any mono or stereo source select one of 5 mixes of all inputs and outputs digital volume control
audio processor:	Sharc DSP ADSP-21489 / 400MHz Routing of all 128+128 channels Mixing to headphone output independent mixing to selectable analog output pair DSP plugins
PLL:	digitally controlled PLL / Jitter reduction system output jitter: 50ps ... 100ps typ.
internal Clock:	temperature compensated oscillator, with high accuracy initial accuracy: +/-1.5ppm over temperature range: +/-2.5ppm aging: +/-1ppm
power supply:	2 x input jacks with screw lock for redundant power voltage supervision, warning message on screen when PSU input fails internal resettable polyfuse 1 x power supply included, 12V, 3A
dimensions:	1HU, depth: 27cm (10.6”) (including connectors)
weight:	4.1kg (9lbs)
ambient temp.:	41°F up to 113°F (+5°C up to +45°C)
rel. humidity:	<75%, non-condensing

CE conformity

EMC

This device fully complies to all harmonized standards for the approximation of laws of the member states for the electromechanical compatibility
(EMC:2014/30/EU) and European Low Voltage Directive 2014/35/EU.

RoHs

This device has been produced with lead free solder according to the EU directive 2011/65/EU and therein contained maximum permissible values for hazardous substances found in electronic devices.

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Responsible Party in USA: Synthax United States, 6600 NW 16th Street, Suite 10, Ft Lauderdale, FL 33313 T.:754.206.4220

Trade Name: Ferrofish, Model Number: A32 DANTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. 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 or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING: Any modifications or other changes to this unit not approved by the party responsible for compliance could void the user's authority to operate this equipment.

Note on Disposal

According to common law of the EU states directive RL2002/96/EG (WEEE – Directive on Waste Electrical and Electronic Equipment) this product must be recycled after final use and/or end of its lifetime.

In case a disposal of electronic waste is not possible, the recycling can also be done by the manufacturer. For this the device has to be sent **free to the door** to: Ferrofish GmbH, Brüderstraße 10, D-53545 Linz / Rhein, Germany. Not prepaid shipping's will be rejected and returned on the sender's costs.

Service

No serviceable parts inside. Do not open this device.

Warranty

Every A32 DANTE is thoroughly checked and tested. Ferrofish grants a warranty of two years after purchase thru an authorized dealer or distributor. The invoice is needed as a proof-of-purchase.

In case of an permanent malfunction or any other defect under warranty that can't be fixed by support, please contact your dealer and inquire a repair under warranty.

Damages caused by improper installation or inappropriate usage are not covered by warranty. Fixing these damages will be liable to pay costs.

Claim for damages of any kind, in particular consequential damage or loss are not covered. A liability exceeding the merchandise value of an A32 DANTE is also not covered.

We refer to the general terms and conditions of Ferrofish GmbH.

Exclusion of liability

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FERROFISH
advanced audio applications

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