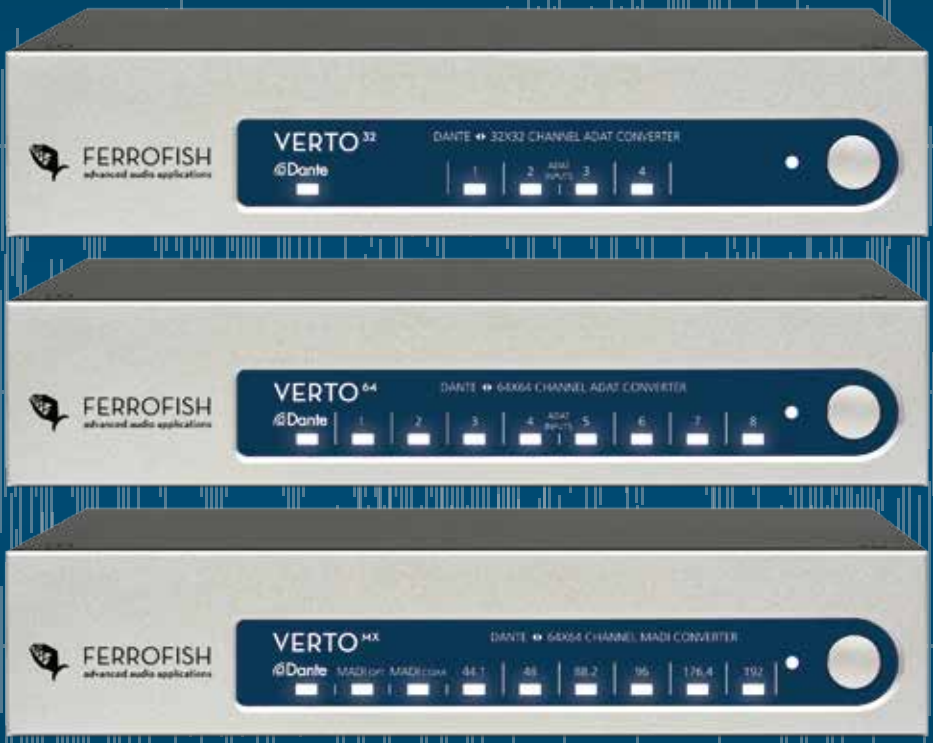
FERROFISH
advanced audio applications

VERTO^{32}
VERTO^{64}
VERTO^{MX}



OWNERS MANUAL

Version 1.0

Ferrofish
Advanced Audio Applications
Brüderstr. 10, D-53545 Linz (Rhine)
Germany

www.ferrofish.de

01. Table of contents

02. Safety instructions and warnings

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**
- **Heed all warnings**
- **Keep these instructions**
- **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.

03. Introduction

Dear Customer,

Thank you for purchasing our product. We are very pleased that you have chosen the Verto series from our product range. It is designed as an easy format converter between ADAT (Verto 32 & 64) or MADI (Verto MX) and the DANTE protocol. We have developed three different models so that you can choose the one most suited to your needs.

The Verto 32 and 64 have 32x32 and 64x64 I/O channels respectively, for an easy integration of devices with ADAT ports. When using MADI devices the Verto MX is the perfect solution; offering both optical and coaxial MADI I/O ports. All Verto models also incorporate MIDI I/O for sending and/or receiving MIDI commands via the MADI (Verto MX only) and DANTE data streams. This means it's possible to transmit 64x64 audio channels plus MIDI commands up to 2km with the Multimode MADI module. It is even possible to bridge distances of up to 10km via MADI glass fiber with the optional single-mode MADI module, installation of which can easily be done by the end-user.

We sincerely hope that you will enjoy using your Verto as much as we enjoyed developing it. Should you have any suggestions, praise or criticism for us, please visit us on Facebook or at www.ferrofish.de - a handwritten letter is of course also happily received.

Warm greetings from Linz near the river Rhine.

The Ferrofish Team

03.1 Scope of Delivery

This package includes:
1x Verto device
1x Instructions (German & English)
1x Power supply 12V
1x LC / SC adapter cable (Verto MX only)
1x Locking plate for ADAT cables including mounting accessories (Verto 32 only)
2x Locking plate for ADAT cables including mounting accessories (Verto 64 only)

Optional accessories and spare parts can be found at topic 07.

04. Product Description

The Verto series of devices serve as converters for your ADAT or MADI devices. They make the integration of existing gear into a DANTE environment quick and easy. All essential settings are made via DANTE. The fanless and low heat-generating design also makes the Verto series perfect for installation in acoustically sensitive environments.

04.1 Description of the front panel

04.1.1 Verto 32 and 64

The status LEDs and operating elements are explained as follows (from left to right):

1. **DANTE LED:** The DANTE LED indicates the state of the DANTE network. When the LED is lit permanently, a connection to the DANTE network exists. A flashing LED indicates that DANTE has muted all channels. This may have been caused by e.g. a missing network signal or a change of the sample rate in the DANTE network.
2. **ADAT Inputs** (Verto 32: 1-4, Verto 64: 1-8): These status LEDs indicate when an ADAT input has been successfully synchronized to the DANTE network's word clock. These LEDs are not input indicators. If the LED flashes, the synchronization process has failed. If it is lit continuously, interrupted by short flickering, both devices are „master".
3. **Power LED:** The LED lights up continuously when the device is switched on and ready for operation. It flashes slowly when the device is booting. If you hold down the power button, the LED will rapidly flash to indicate the imminent shutdown of the device.
4. **Power button:** This button turns the Verto on and off. To switch off the unit, press and hold the button for at least 3 seconds.

04.1.2 Verto MX

The status LEDs and operating elements are explained as follows (from left to right):

1. **DANTE LED:** The DANTE LED indicates the state of the DANTE network. When the LED is lit permanently, a connection to the DANTE network exists. A flashing LED

indicates that DANTE has muted all channels. This may have been caused by e.g. a missing network signal or a change of the sample rate in the DANTE network.

2. **MADI Input (optical):** This status LED is permanently lit when the optical MADI input receives a valid signal and the Verto has successfully synchronized to it. It is not an input indicator for MADI signals. If the LED flashes, the synchronization process has failed. If it is lit continuously, interrupted by short flickering, both devices are „master".
3. **MADI Input (coaxial):** This status LED is permanently lit when the coaxial MADI input receives a valid signal and the Verto has successfully synchronized to it. The LED is not an input indicator for MADI signals. If the LED flashes, the synchronization process has failed. If the LED is lit continuously, interrupted by short flickering, both devices are „master". If the LED is lit with half brightness a valid signal is detected at both MADI inputs, but MADI optical is used.
4. **Sample rate - LEDs:** These LEDs show the sample rate of the DANTE network.
5. **Power LED:** The LED lights up continuously when the device is switched on and ready for operation. It flashes slowly when the device is booting. If you hold down the power button, the LED will rapidly flash to indicate the imminent shutdown of the device.
6. **Power button:** This button turns the Verto on and off. To switch off the unit, press and hold the button for at least 3 seconds.

If a valid MADI signal is present on the optical and the coaxial port at the same time, the optical port is automatically used for conversion to DANTE. If you want to use the coaxial MADI input please remove the optical MADI cable.

04.2 Description of the rear panel

04.1.1 Verto 32 and 64

The connections of the Verto 32 and 64 are explained as follows (from left to right):

1. **Power supply:** Connect the power supply here and lock it with the coupling nut. Thus, the plug cannot slip out unintentionally.
2. **ADAT I/Os:** Connect your ADAT devices using optical Toslink cables. The black flaps are ADAT inputs, the white flaps are outputs.
3. **MIDI I/O:** Both the MADI and the DANTE data streams can be used to send and receive MIDI messages. These are embedded in the DANTE or MADI data stream.
4. **WORDCLOCK I/O:** Transmit word clock to or from the Verto using these connectors. We recommend setting the connected devices to "slave".

5. **DANTE (PRI/SEC):** Use this port to connect the unit to a DANTE network. Use a commercially available Ethernet cable (at least CAT5) and connect it to the PRI (primary) port.

04.2.2 Verto MX

The connections of the Verto MX are explained as follows (from left to right):

1. **Power supply:** Connect the power supply here and lock it with the coupling nut. Thus, the plug cannot slip out unintentionally.
2. **MADI I/O (coaxial):** Use these connectors for devices with coaxial BNC MADI.
3. **MADI I/O (optical):** Connect your optical fiber MADI equipment to these ports. Depending on the specification of your MADI equipment, this can be done either directly at the device via the LC connector or via the included SC-LC adaptor.
4. **MIDI I/O:** Both the MADI and the DANTE data streams can be used to send and receive MIDI messages. These are embedded in the DANTE or MADI data stream.
5. **WORDCLOCK I/O:** Transmit word clock to or from the Verto using these connectors. We recommend setting the connected devices to „slave".
6. **DANTE (PRI/SEC):** Use this port to connect the unit to a DANTE network. Use a commercially available Ethernet cable (at least CAT5) and connect it to the PRI (primary) port.

04.3 Clocking (important!)

Generally, in a network of DANTE devices, at least one of them must be set to „master". Therefore set all devices connected to the Verto to „slave".
If there are several DANTE devices connected to a network, then set your preferred device inside the DANTE controller to „Preferred Master".

05. Operation

Operating the Verto series is simple. Connect the included power supply to the corresponding connector on the back of the Verto.

Connect the ADAT (Verto 32 and 64) or MADI (Verto MX) devices to their respective ports on the back panel. Lastly, connect an Ethernet cable (at least CAT5) to an existing DANTE network or to a computer with DANTE Virtual Soundcard installed and the optionally available DANTE Controller application (recommended).

06. Technical specifications

DANTE I/O	· 2x Ethernet (PRI/SEC) sockets, 1GBit · 64x64 channel Brooklyn II board built-in
ADAT I/O **(Only Verto 32 & 64)**	· 4x ADAT Input + 4x ADAT Output, optical TOSLINK (Verto 32) · 32x32 channels at 48kHz, 16x16 channels at 96kHz · 8x ADAT Input + 8x ADAT Output, optical TOSLINK (Verto 64) · 64x64 channels at 48kHz 32x32 channels at 96kHz
MIDI I/O	· MIDI Standard 1.0 / 1996 · 2x DIN female 5pin In/Out for embedding / de-embedding MIDI-over-MADI messages
MADI I/O **(Verto MX only)**	· AES 10, 2x optical LC port, 2x coaxial BNC port · 64x64 channels at 48kHz, 32x32 channels at 96kHz, 16x16 channels at 192kHz
Wordclock	· 2x BNC In/Out, 75 Ohm termination set to on by default. Can be changed from software via DANTE.
Fuse	· Polyfuse internal, self-resetting
Power consumption	· 14.4VA (1.2A at 12V)
Temperature range	· +5°C to +45°C
Humidity	· <75%, non-condensing
Dimensions	· 22 x 9 x 4,5 mm (without rack ears)
Weight	· 0,9 kg

07. Optional accessories and spare parts

The following accessories and spare parts are available for the Verto series:

Description	Item code	For VERTO Series
19" Rack mountain kit, metal (for mounting 1 x Verto in a 19" rack-space)	7008	32, 64 and MX
Multi-range Power Supply 12V (EU)	7023	32, 64 and MX
ADAT Cable Locking Plate	7027	32 and 64
MADI Singlemode Module	7020	MX
MADI SC / LC Adapter	7026	MX

The accessories and the spare parts can be purchased from the dealer or the distributor as well as at *www.ferrofish.de*.

08. Troubleshooting

Error	Possible cause	Troubleshooting
POWER LED does not light	Power supply not plugged in or defective	Check the power supply
	The device is switched off	Switch on the device with the power button. Seriously.
POWER LED flashes quickly	Power button pressed	The power LED flashes quickly when the power button is pressed on a switched-on device.
POWER LED flashes slowly	The Verto unit is booting in the start-up process	Wait approx. 20 seconds for the boot-up-sequence to finish.
DANTE LED does not light up (see Power LED)	Mains cable defective or the wrong type (crossed) is used	Use a different network cable
	Verto is booting	Wait approximately 20s until the boot process is finished
	Error in the DANTE network	Check the functioning of the DANTE network.
DANTE LED is flashing	No connection to the Dante network	Check the functioning of the DANTE network.
	Device is „slave“, but no “Master“ was found on the DANTE network.	Set a device in the DANTE network to „Master“
	Sample rate on the network has been changed	When changing the sample rate, the outputs are muted briefly.
MADI coaxial LED lights low	Both ports (opto & coax) receive valid signal	Both signals are valid, but the optical port is automatically used for DANTE.
	This is a status indication, not an error.	
ADAT Input LED flashes	A sync process has failed	Set all connected ADAT devices to „Slave“.
ADAT Input LED is lit constantly, regularly interrupted by flickering	Both devices are „Master“.	Set all connected ADAT devices to „Slave“.

09. Legal information

09.1: Warranty

Every VERTO 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 VERTO is also not covered. We refer to the general terms and conditions of Ferrofish GmbH.

09.2: Disclaimer of liability

This documentation has been created to the best of knowledge and belief on the current state of technology. Ferrofish assumes no responsibility either expressed or implied for the accuracy, completeness and correctness of this documentation. In no event Ferrofish GmbH will be liable for any kind of data loss or data error caused thru the use of our product or documentation.

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10. Declarations of conformity, etc.

10.1: 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.

10.2: CE conformity - RoHS II

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.

10.3: FCC Declaration

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: VERTO

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.

10.4: Waste disposal (WEEE)

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.

10.6: Service & Maintenance

No serviceable parts inside. Do not open this device.

NOTES

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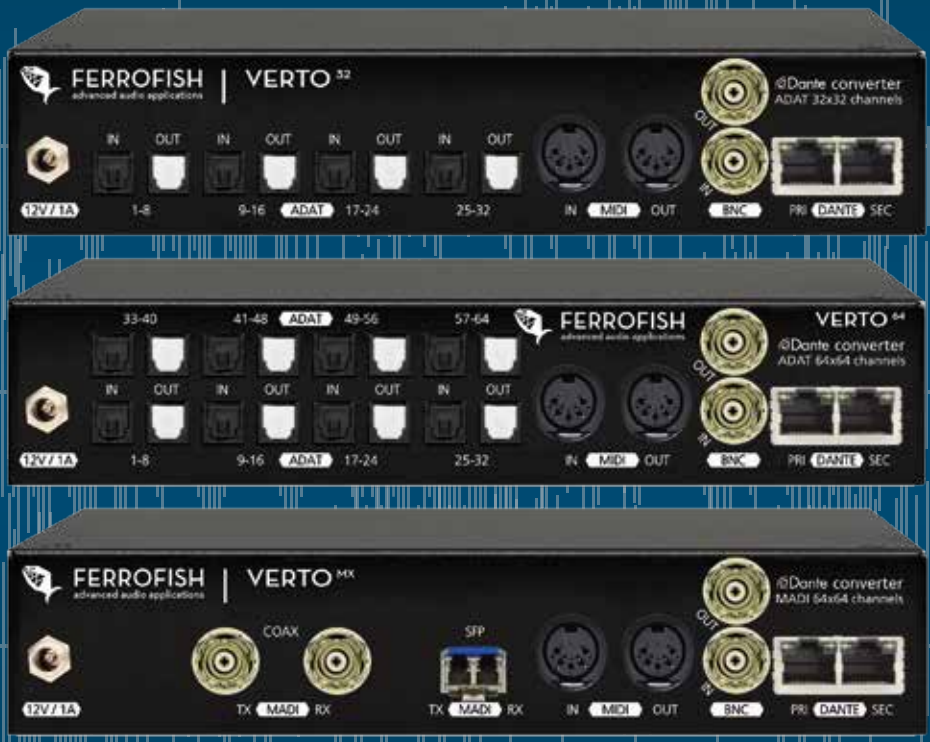

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