Maximinus

Audio DAC

by Thrax Audio

Operating Manual

Manual issued 15/01/2014

CAUTION

THE UNIT CONTAINS NO USER SERVICEABLE PARTS. DO NOT REMOVE THE COVERS. LETHAL VOLTAGES ARE PRESENT WITHIN THE CHASSIS.

NEVER OPERATE THE DAC WITH THE CHASSIS COVERS REMOVED.
DO NOT OPERATE THE UNIT IF WET OR NEAR WATER.

THE DAC IS FAIRLY HEAVY. BE SURE TO USE PROPER LIFTING TECHNIQUES TO AVOID BACK STRAIN AND INJURY. BE CERTAIN TO INSTALL IT IN A SECURE LOCATION FROM WHICH IT CAN NOT FALL OR TIP OVER.

TIME SPENT FAMILIARIZING YOURSELF WITH THIS MANUAL WILL BE WELL REWARDED.

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS: All the safety and operating instructions of your Thrax Audio equipment should be read before power is applied to the equipment.

RETAIN OWNER'S MANUAL: These safety and operating instructions should be retained for future reference.

HEED WARNING: All warnings on the unit and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS: All operating and use instructions should be followed.

CLEANING: Unplug the unit from the wall outlet before cleaning.

VENTILATION: Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers). The unit should not be installed in a built-in location such as a bookcase or rack unless proper ventilation is provided.

GROUNDING: Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

POWER CORD PROTECTION: Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the unit.

LIGHTNING: Unplug this unit during lightning storms or when unused for long period of time.

SERVICING: Refer all servicing to qualified service personnel. Servicing is required when the unit has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled inside the appliance or it has been exposed to moisture, the appliance does not operate normally, or has been dropped.

DO NOT OPEN THE CABINET: There are no user serviceable components inside this product. Opening the cabinet may present a shock hazard and any modification to the product will void your warranty.

WARNING: To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.

INTRODUCTION

The Maximinus is a universal DAC with some advanced DSP functions supporting up to 32bit/384kHz audio data rates.

Features

Versatile I/O:	7 digital inputs covering all popular interface formats
	Two sets of analogue outputs - RCA and XLR
The DSP functions:	Re-Clocking for synchronizing incoming data to internal clock reference generator
	Upsampling incoming data to 32bit 356/384kHz – two algorithms
	Selection of four digital filters with different impulse response
EMI/RFI protection:	Transformer decoupled I/O and power supplies
	True balanced interface

SPECIFICATION

- Inputs

    - 2 x COAX (RCA) connectors. Limited to 384 kHz, 24 bit data

    - 2 x AES/EBU (XLR) connectors

    - 2 x TOSLINK (optic) connectors. This format has limited bandwidth and works for maximum sample rates of 192 kHz

    - 1 x USB (optional)

- Output

    - 1 pair unbalanced RCA connectors

    - 1 pair balanced XLR connectors

- Power supply ……………................................……….. 115 or 230 V

- Power consumption ………......................................……........ 30W

- Dimensions ………………...........................…….. WxDxH - 432x400x120 mm

- Weight ……………...……….. 12Kg

- Finish ………...............................…….. Black or Silver anodized aluminium

UNPACKING AND INSTALLATION

This section describes the unpacking and installation procedures for your new component.

Unpacking

All Thrax Audio shipping boxes have been specially designed to protect their contents and special care has been taken to prevent damage under normal shipping conditions. Mishandling should be evident upon inspection of the shipping container. Carefully remove your new component from its packing and examine it closely for signs of shipping damage. We strongly recommend saving all original packing to protect your component from damage should you wish to store it or ship it at a later date.

Installation

• BE CERTAIN TO INSTALL THE UNIT IN A SECURE LOCATION FROM WHICH IT CAN NOT FALL OR TIP OVER

• Provide adequate ventilation - the chassis will become warm in normal use. Do not operate on carpet or any other surface that might block air flow

• Do not allow the chassis to touch any metal parts, such as the frame of an equipment rack. This might create a parallel ground path that could degrade the sound of your system

• Connect the input and output cables. Input connection is via COAX , AES/EBU TOSLINK or USB. Output can be via RCA or XLR jacks

IMPORTANT: READ THE SECTIONS "BACK PANEL"

WARNING: **The unit should be operated only at rated voltage, indicated on the power connector. If you are not sure what is the mains voltage supplied to your home, consult with your unit dealer.**

Connect the power supply to the power source indicated on the rear panel. Avoid power conditioners that float the ground pin. ALWAYS connect power cord to component before plugging it into an AC outlet, and make sure that unit main switch is set to the „off" position before making the final connection. For best performance, try to route the power cord away from signal cables.

Pay close attention to power quality, and be aware that different power cords can alter the sound.

"ON/OFF" Button:

Switches the unit "ON" and "OFF". See OPERATION SECTION for details

"MUTE" Button:

This button toggles between mute and normal volume modes. When the indicator above the mute button is green the system is muted

"MENU" Button:

Switches between menu and normal operation

"ENTER" Button

Validates the option selected

"MENU" Knob

Scrolls through the menu

LED Display

Shows the input selected, the signal sample/bit rate and the menu options. This display is auto dimmable – goes off in few seconds if no control is operated. It automatically goes on at power up, in case the input signal changes or user menu is selected
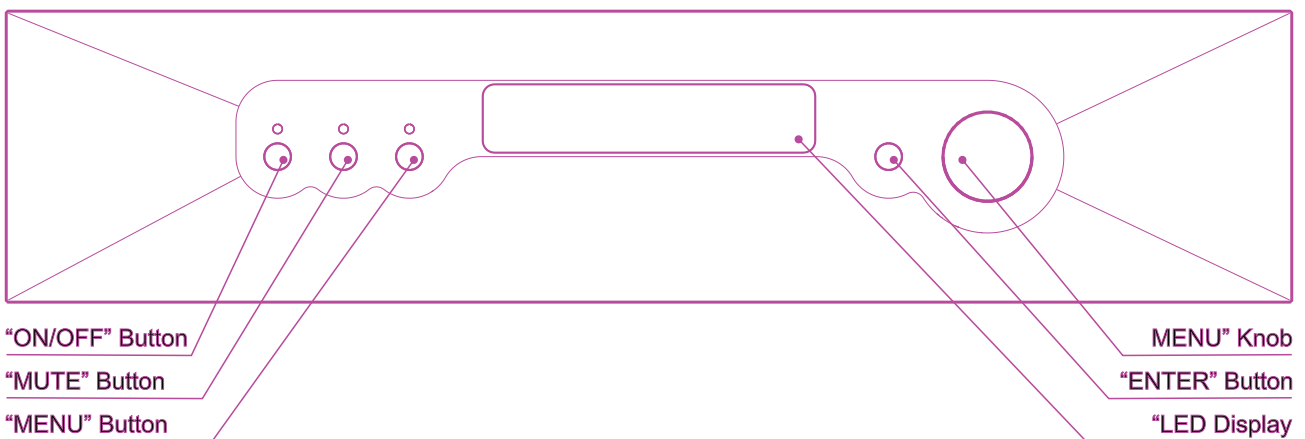

"ON/OFF" Button
"MUTE" Button
"MENU" Button

MENU" Knob
"ENTER" Button
"LED Display

Fig. 1

IEC Power Connector, Main Switch, Fuses and Input Voltage Selector:

There are fuses located in the IEC power connector on the back panel. For 230 volts operation a 0.63 amperes "Slow Blow" fuse is used. For 115 volts operation the fuse should be 1.25 amperes. If power does not come on, contact your authorized service representative.

Inputs:

2 x COAX jacks, labeled 1 and 2, accommodate signal from digital sources, good for short runs and lower frequencies

2 x TOSLINK inputs, labeled OPT 1 and OPT 2, provide ground isolation between the units and noise immunity over long runs

2 x AES/EBU inputs, labeled AES 1 and AES 2 to accommodate high quality signal, that uses professional protocol

1 x USB input (optional)

Currently a USB – input is available to accommodate digital signal from a computer source

Outputs:

Two sets of analog output jacks are provided – a pair single-ended RCA outputs and a pair of balanced XLR outputs.

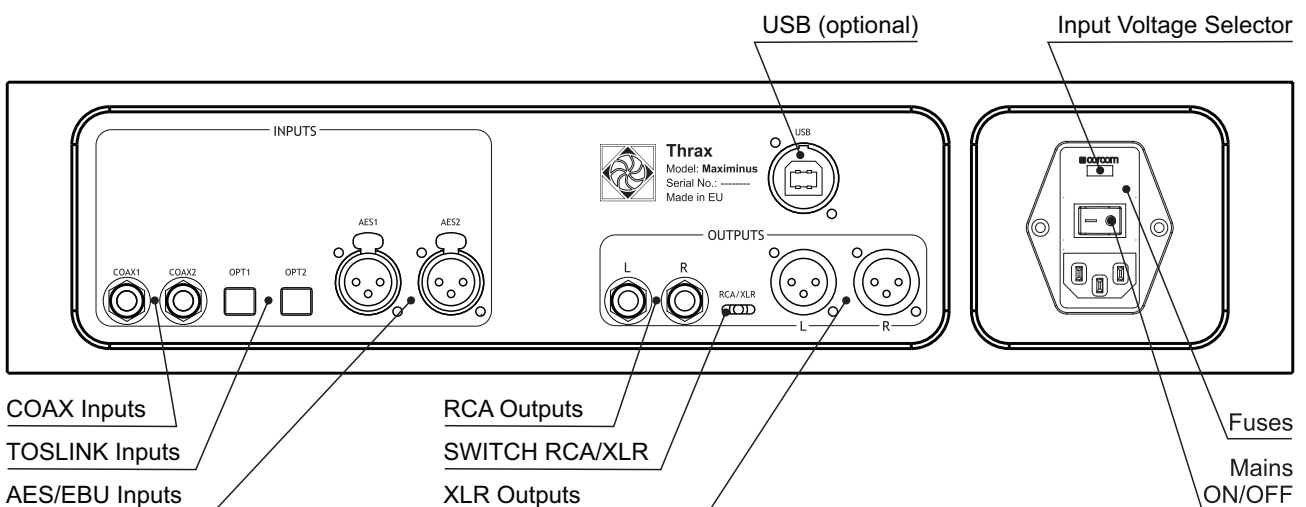**The switch between them activates the output selected.**

Fig. 2

OPERATION

For initial power up press the main switch located on the back panel. Red LED on the front panel next to the ON/OFF button (see Fig. 1) indicates the unit is now in STANDBY mode.

To switch the DAC on press the "ON/OFF" button on the front panel. The red standby indicator blinks green for approx 10 sec. whilst the unit warms up. When ready, the indicator will stop blinking and turns to green, also the last active source will be automatically selected.

The front panel display will be on while the unit is executing a command and then turns off after a short timeout period.

When an input signal is detected, the frequency and bit depth will be read out on the display.

Re-clocking

– Enable this function in the user menu (see "Menu structure" below) . This very important feature of the DAC, thath allow all jitter to be removed from the input source. Data is read into a memory and then independently read out using a ultra stable clock. When enabled, this option will completely replace the incoming clock with an ultra low jitter TCXO based clock. The DSP monitors the incoming sample frequency and detects standard sample rate signals, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 352.8 kHz and 384 kHz. The on-board clock then completely replaces the incoming clock. Other sampling frequencies use the incoming clock from the source. The DSP allocates a huge internal FIFO buffer (1/2 second at 44.1), that stores the incoming audio to decouple the incoming and outgoing data streams. Long absolute digital silences in the music stream, such as between tracks and during pauses, are selectively shortened or lengthened by the DSP to maintain data synchronization. This results in a significant delay between the audio source and the analog audio. You will not normally notice this delay unless video is synchronized to the audio. For this reason this feature may want to be turned off when watching video, or the video should be delayed.

Up-sampling - Enable this function in the user menu (see "Menu structure below) thus all input signals will be up-sampled to max resolution 32/352 or 32/384 depending on input signal. To achieve this, a digital filter takes a look at a window of the music being played, and because that music was received from a digital source, there are holes in it, between data bytes. The filter looks at the shape of the signal in the window and tries to figure out what the missing data is. The bigger the window, the better a job it does, and the bigger processor is needed. You can select the up-sampling algorithm to use (UPS F1 or F2 in the User Menu) in the process of filling in the gaps between the data.

Digital Filter - The digital filter is necessary because mirrored image frequencies created during the conversion process must be removed. If the DAC did not have a digital filter, an analog filter with an aggressive response must remove these image frequencies. Analog filters seriously damage the signal by corrupting the original phase of the sound and cannot fully remove the high frequency images. This results in harsh or rolled off high frequencies and poor soundstage focus.

OPERATION

Our DAC offers choice of 4 digital filters (F1, F2, F3 and F4), selectable in the User Menu. Each option provides a distinct, glorious listening experience. You may favor one or the other, or enjoy changing the filter response to suit the music you listen to.

To turn off the DAC press the ON/OFF button. All the unit circuitry will be turned off for minimum power consumption leaving only a small STANDBY circuit running. However, if you are not going to use the DAC for a long period we recommend turning it off, using the power switch on the back panel, to save power.

As with all high fidelity products, the sound characteristic changes somewhat as it warms up. Best sound will be achieved after about 15 minutes of operation.

Any time that the Maximinus DAC has not been used for a few weeks the sound may be different. This is also normal for high resolution audio equipment. Optimum sound should return after a few hours of operation, preferably with an audio signal.

Note that although your Thrax Audio System has been run for 72 hours at the factory, it will continue to "break in" for approximately 150 hours. Also be aware that many components display the need for a new break in period after being transported in unheated cargo aircraft.

Menu structure

1. Phase +/- – switches absolute phase of the signal
2. Reclock ON/OFF – turns the reclocking feature on/off (and uses the internal clock generator)
3. Upsa ON/OFF – turn the upsampling feature on/off (when on Upsamples all input signals to max resolution 32/352 or 32/384 depending on input signal)
4. UPS F1/F2 – Selects the upsampling algorithm to use
5. Filter F1/F2/F3/F4 – selects the digital filter to be used. Listen and select the filter that suits best to the original recording and the rest of your audio system

Options

As digital audio is developing at very fast pace and to protect your investment in our state of the art DAC we have provided 2 option slots that can accommodate whatever new technology or interface becomes a standard.

Currently USB is a de facto standard for interfacing a computer to audio DAC. There are a number of implementations and options for those as well. We constantly monitor the state of development of all and will offer the best implementations as options for your DAC.

There are a number of other technologies that we are currently monitoring and as soon as any of them has matured we will implement it as an option.

Please check our website regularly for updates.

NOTES