



NOS Differential DAC "Onyx"

User manual



Introduction

With the goal of creating a very affordable, yet superior DAC in mind the designers of Metrum Acoustics have developed a new DAC, the ONYX By Metrum Acoustics.

It was an unprecedented challenge, which was eventually solved by using an entirely new chip, which has been exclusively developed by Metrum Acoustics and was first used in the PAVANE.

The parallel driven R2R ladder networks as used in the four DAC modules performs , especially when combined with our FPGA-driven “forward correction module”, on a higher level. This module splits up the audio samples for each channel into new separate data streams. Each dac cluster processes a portion of the data in the most linear region of the dac chips. The result of this process is an extremely high linearity, right down to -145 dB, which gives the ONYX a realistic 24 bit dynamic range. Due to the new motherboard design an extremely high channel separation of 120 dB is realized over the entire frequency range. This contributes to the flawless positioning of instruments.

In short, the ONYX is a DAC that has taken all the lessons and experiences that her designer has learned over the years, and combined them in an ambitious DAC that can fit in every system. It is musical, honors the Non-oversampling principle while simultaneously incorporating the technological progress that has been made over the years.

Remark

The Onyx will reach its maximum performance after a three to four weeks of intensive use!



IMPORTANT SAFETY INSTRUCTIONS

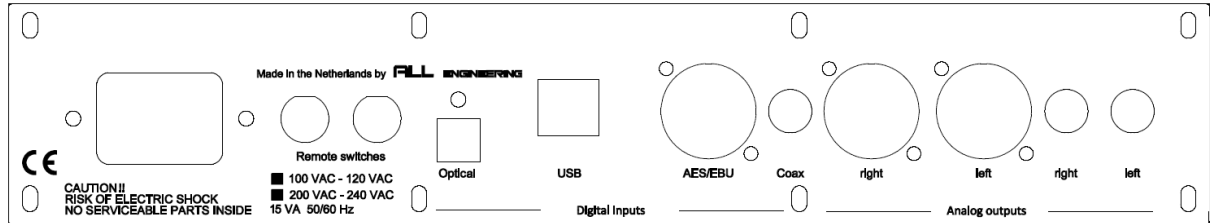
- 1.** Read Instructions.
- 2.** Keep these Instructions.
- 3.** Heed all Warnings.
- 4.** Follow all Instructions.
- 5.** Do not use this apparatus near water.
- 6.** Clean only with a dry cloth.
- 7.** Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 8.** Unplug this apparatus during lightning storms or when unused for long periods of time.
- 9.** Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 10.** The Onyx DAC must be placed on a firm, level surface where it is not exposed to dripping or splashing.
- 11.** Before making connections to the dac, ensure that the power is off and other components are in mute or stand-by mode. Make sure all cable terminations are of the highest quality, free from frayed ends, short circuits, or cold solder joints.
- 12.** THERE ARE NO USER SERVICEABLE PARTS INSIDE THE "Onyx" Dac.
Please contact All Engineering if you have any questions not addressed in this guide.
- 13.** All Engineering cannot be held accountable and/or responsible for any form of damage or health issues inflicted to you, other people, pets, companies and non-living objects, that are caused by any form of usage of the product which is not described in this manual.
- 14.** By actually using this product and turning it on for the first time, you agree to these terms



What is in the Box

- The Onyx dac
- Power cord (only Euro or USA based power cords)
- USB cable
- USB stick with user manual and USB drivers

Connections



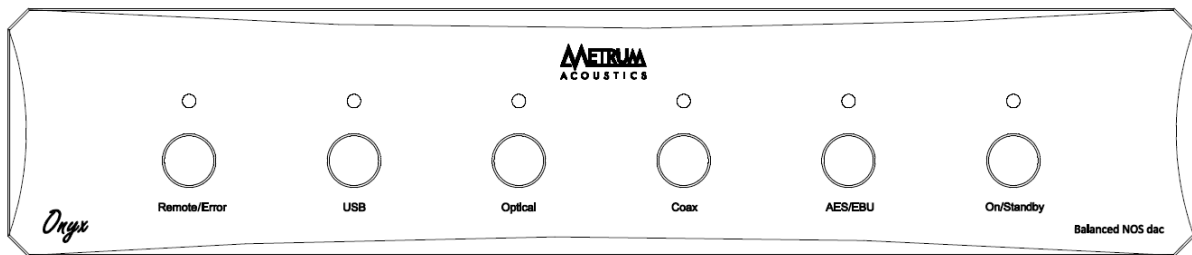
Caution! Please connect your interconnects first before connecting the mains power cable!

- **Power requirements:** Check if the product is made conform the power requirements of your area. On the back side the product is marked for the specific mains voltage.
- **Optical input:** Use an optical (Toslink) cable to use the optical input. The optical input can be used for sampling rates up to 96 kHz.
- **Coaxial input:** A 75 Ohm coaxial cable should be used to connect the dac to other digital equipment. To avoid ground loops both inputs has a galvanic isolation and can handle a maximum sample rate of 192 kHz.
- **AES/EBU digital input:** When using the AES /EBU digital input a special 110 Ohms XLR cable should be used. The AES/EBU interface has a galvanic isolation and can handle a maximum sampling rate of 192 kHz.
- **USB input:** Use an USB cable to connect the dac to your computer. Only when using a Windows operating system you should install special drivers. In case of Linux or MAC no drivers are required. The USB input can handle sampling rates up to 384 kHz.
- **RCA outputs:** Standard interlinks can be used to connect the dac to your amplifier. The "Onyx" is designed conform the "Red book standard" so the maximum output will be 2 Volts RMS or 5.7 Volts peak to peak. Your (pre)amplifier should handle this output level.
- **XLR outputs:** Standard XLR line cables should be used to connect the dac to your (pre) amplifier. The "Onyx" is designed conform the "Red book standard" so the maximum output for the XLR output will be 4 Volts RMS or 11.4 Volts peak to peak. Your (pre)amplifier should handle this output level.
- **Mains inlet:** Use the supplied power cable to a grounded power outlet.



- **Remote switches:** The Onyx shares the same back plate with our Jade pre-amplifier . In case of the remote switch connectors they are omitted in case of the Onyx.

Operation



- **On/Standby switch :** To reduce power the mother board will be switched off in stand-by mode. Just the front panel is activated to control the system and power consumption will be reduced to 0.5 Watts.
- **Mute function:** By powering up the dac the mute function will be released after five seconds. When switching the dac to standby mode muting will be active again.
- **Source selection:** The digital inputs can be selected by using four small buttons on the front . When switching the dac on, by default the last selected source will be active.
- **Error indication:** When no digital data is coming in, the orange Remote /Error led above the remote sensor will lit.
- **Remote indication:** When using the remote control the Remote/ Error led will flash rapidly.

Remote control



The remote control is made to control the available digital inputs. As opposed to the front panel buttons where you can select one of the digital sources directly, the remote will toggle through the entire range of available digital sources.

When the Onyx is set into the stand-by mode, it will remember the last input selection and is available again when the Onyx is switched on.

Replacing the battery

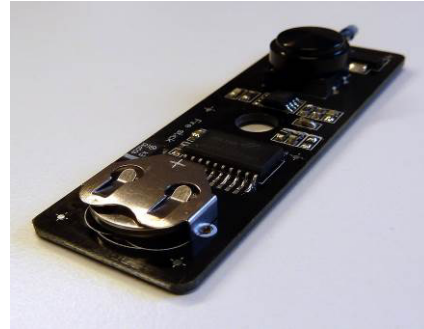
If the button is not activated there is no power consumption at all, which leads to a very long battery life cycle. The battery used is a CR1632 button type of 3 Volts and can be replaced on the following way:

Use a middle sized Philips screw driver to remove the screw from the back of the remote.

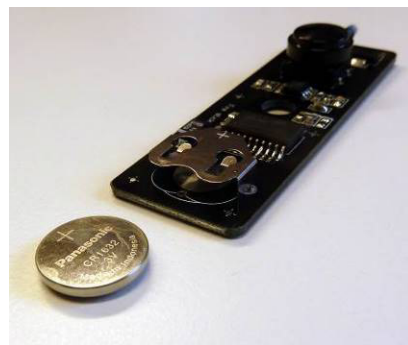


By removing the back cover the printed circuit board will be visible.

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By turning the housing upside down the printed circuit board will fall out and the component side will be visible now.



As shown above push the battery out of its holder by using the back side of a swab. Take the new battery and push it in the battery holder with the "+" mark on top.



When the new battery is placed, lay back this part of the board where the blue led is situated. The led will be positioned in front of the recess. Next you can lay down the whole board in the housing. Next you can place the cover and tighten the screw.



Technical specs :

Working principle:	Non oversampling dac. Two dacs per channel in differential mode.
Power supply:	15 VA
Power consumption:	Standby < 0.5 Watts Full operation 7 Watts
Power requirement:	110/115V AC or 220/230 V AC 60/50Hz
Inputs:	1x optical Toslink, 1x coaxial, 1x AES/EBU and 1x USB.
Outputs:	2x RCA gold plated Neutrik © connectors . 2x XLR 3 balanced outputs.
Output voltage:	RCA : 2 Volts RMS max output. XLR: 4 Volts RMS max output
Frequency response:	1Hz -0.8dB, 20 kHz -1.5 dB 44.1kHz sampling. 1Hz -0.8dB, 65 kHz -3dB 192-384 kHz sampling.
Distortion:	0,006 % THD
Noise:	-145 dB related to 2 Volt RMS
Output impedance:	RCA 100 Ohms , XLR 100 Ohms
Sampling frequency:	Optical : 44.1 - 96 kHz sampling , 16 or 24 bits. Coaxial: 44.1 - 192 kHz sampling, 16 or 24 bits. USB: 44.1- 384 kHz sampling , 16 or 24 bits
Dimensions hwxwd:	60 x 290 x 250 mm.
Weight:	3100 gram.

Subject to change without notice.

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