

CEMBALO

REAL EMOTION

OCEAN DAC  
Finest Sound In The World

*Handcrafted in Canada*

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# *Operating Manual*

Digital Analog Converter

OCEAN DAC

Notes:

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## Important safety instructions



Presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



Read and follow the safety and operating instructions contained in the instruction manual.



Never open the product as there is a risk of electric shock.

1. Read these 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 dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as 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.

15. Do not listen at high volume levels for long periods of time to prevent hearing damage.

16. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.

**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment. The mains plug of the power supply cord shall remain readily accessible. Keep the product, accessories and packaging parts out of reach of children and pets to prevent accidents and choking hazards.

## Design Philosophy

We often ask, what really is the best playback device? According to cembalo, the emotion at the heart of a musical performance is where the real charm and beauty is found, and it has also been approved at the highest standard among playback devices. Cembalo, in its music playback pursuits, wants to retain the true nature of the composition while transmitting the raw emotional intensity and passion of the music.

It's just like being at a performance of Mozart's <Serenade in G major>: with the resounding, bright and lively melody of the major chords, our hearts become stirred and we are even unable to resist singing and dancing along with the music.

But if it suddenly changes to Chopin's <Nocturne in b Flat Minor>, with the gentle, restrained, even melancholic and plaintive ambiance created by the minor chords, we can feel the grief and desolation of the composer.

But, in fact, a lot of expensive equipment manufacturers are unable to fully grasp this concept. Some emphasize the resolution and the sound stage, but with the sound itself lacking emotion and feeling; several sound warm and sweet but lack vitality, producing a singular emotion which lacks authenticity. In Cembalo way, audio reproduction is the art of music playback, expressing the emotion of the music and conveying the passion of the composition. Many compare the playback with the live sound.

We have only one goal: ***Real Emotion.***

Cembalo pursues excellence, with no cost constraint, and without rigidly adhering to the measure index.

Listen - we seek the real nature of the music and the expression of its true feeling – guided by the auditory sense and impressions of those artists with whom we cooperate - and thus deeply involve ourselves in the choice of the basic structure of the circuit; a choice which is not limited by traditional structures.

Design – A precise mathematical model is constructed for the whole system, and is repeatedly optimized, so the whole circuit system is at the theoretical optimum point. The product's entire design and technology has the sole objective of making music vivid, lifelike, rich and vibrant.

Listen again and fine tune –With repeated listening, we fine tune, in order to express the

truly rich emotion of the music and the unprecedented real-life quality

This process is just like the manufacture of jewels handed down for generations: first of all, an area containing minerals must be found in the boundless land; the gemstone of the best quality will then be selected among those extracted; then finally, through the craftsman's exquisite carving, a precious jewel emerges which lasts through the ages.

Cembalo, listen, hear the difference.

## German Descent

Philip Meyer, the founder of Cembalo Audio Laboratories, was born in Ladenburg Germany, a beautiful town on the right bank of the Neckar River. In 1989 Philip left his hometown to study electronic engineering and begin his career as an engineer in Hamburg, where Philip met the love of his life, his soul mate, a young violinist named Rose from Canada, and got hitched. They lived a very happy life in Hamburg. Unfortunately, Rose was injured and not able to play violin for the rest of her life after a car accident.

On account of the abrupt turnaround of the Philips life, Mr. and Mrs. Philip decided to come back to her hometown in Canada for a new life. Often, Philip played a CD recording of Rose's violin music, but he couldn't feel the emotion and the love in it, nor could he trace the uplifting, souled musical style of his loved one.

Shackled with nostalgia and longing, Philip hoped to bring back Rose's music that is full of beautiful memories. In the next few years, he dedicated his efforts entirely to the art of music playback and Cembalo Audio Laboratories was founded in 2015.

# General Information

## Introduction

From all of us at Cembalo Audio Laboratories, thank you for your choosing the Cembalo Ocean D/A converter.

A great deal of effort went into the design and construction of this “emotional” device, the Ocean DAC. It is built with the highest precision, taking into account every little detail. The "Listen, Design, Listen again" design process and our special technology (e. g. “Asynchronous Data” and “Isolated D/A Power System”) allow us to produce Ocean DAC with truly rich natural sound, creating an unimaginable musical experience.

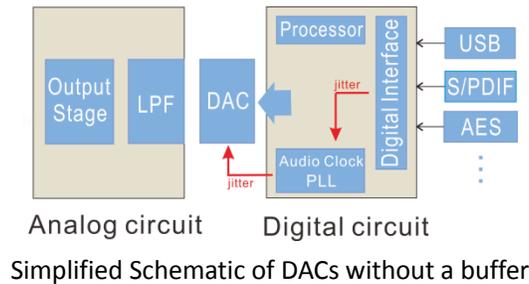
Used properly, it will give you many years of enjoyment.

## Key Special Features

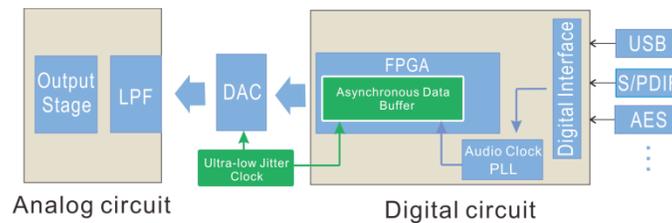
- Dual Mono design with two true balanced 32-bit D/A systems for each channel
- Support up to 384 kHz 32-bits PCM, DSD64 or DSD128
- Latest 55nm FPGAs architecture, the best solution for D/A converter
- "Isolated Digital/Analog System" keeps digital circuit noises away from analog circuit for the best analog sound and minimum THD
- Asynchronous Data technology, largely eliminates jitter distortions, low to 0.1Ps<sub>RMS</sub>
- Specially designed DC-coupling, Class A, balanced JFET analog output circuit
- Optimal Advanced Digital filters for the best sound
- 99.99998% (Ohno Continuous Cast) copper internal signal wires
- Super high end *Mundorf Silver/Gold foil* capacitors used
- Designed and Handcrafted in Canada

# Special Technology

## Asynchronous Data technology



In fact any PLL (phase locked loop) cannot be ideal. The noise from power supply or grounding, changing of temperature and the jitter from input clock all have negative impacts on the performance of PLL. That's why most DACs are highly dependent on the quality of the digital signal they are fed.

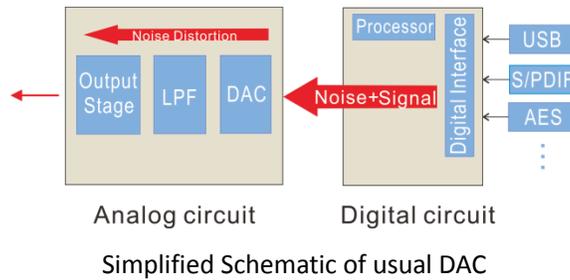


Simplified Schematic of Ocean series DACs with Asynchronous Data Buffer

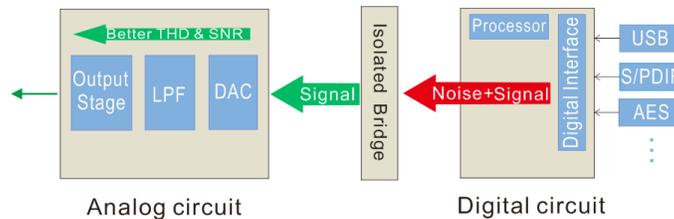
However, the OCEAN DAC delivers outstanding performance with even less-than-ideal digital signals.

It uses the **“Asynchronous Data technology”** in which the digital information is stored temporarily on its way to being converted to analog. An **“Asynchronous Data Buffer”** can provide a steady, consistent source of digital data to the DAC core which are responsible for changing that data into music. Even if there is significant **“jitter”** (inconsistencies in timing) in the incoming digital information, **the output of the “Asynchronous Data” is controlled by a special clock which tremendous accuracy**. The result largely eliminates the jitter and allows the musical information to be reproduced cleanly, without jitter-induced distortions.

## Isolated Digital/Analog System



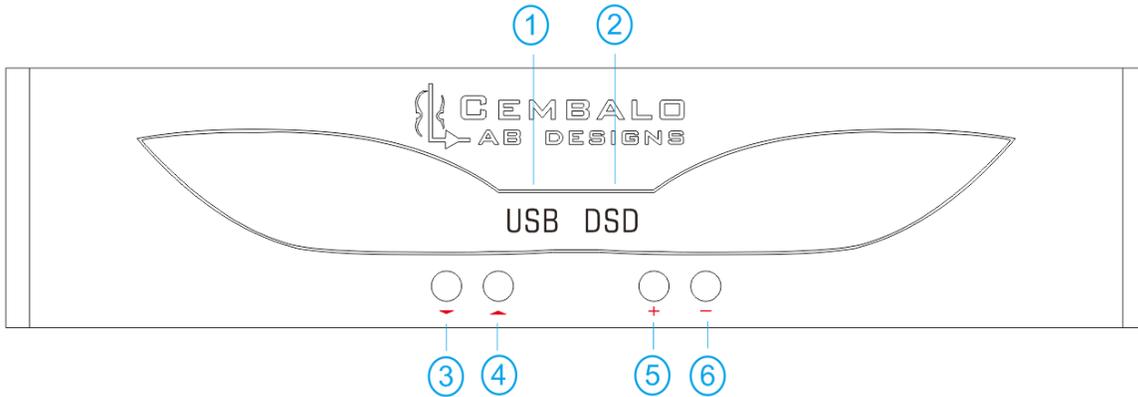
It is a fact of life that digital circuitry is so noisy. Saturating logic, such as TTL and CMOS, draws large, fast current spikes from its supply during switching. However, analog circuitry is quite vulnerable to noise—on both power supply rails and input signals. The noise on input signals will inevitably couple into the inside analog circuits through the stray capacitance,  $C_{STRAY}$ . Maintaining a wide dynamic range of analog circuitry with high SNR and ultra-low THD in a hostile digital environment is a real problem in a DAC design.



So it is sensible to use "Isolated Digital/Analog System" technology, which can eliminate noises and prevent digital noise from reducing analog performance. A separated Digital/Analog System is used in our DACs to reduce analog output distortions to a minimum. Ocean DAC makes truly rich natural and stirring sounds, which you never have experienced through your system before.

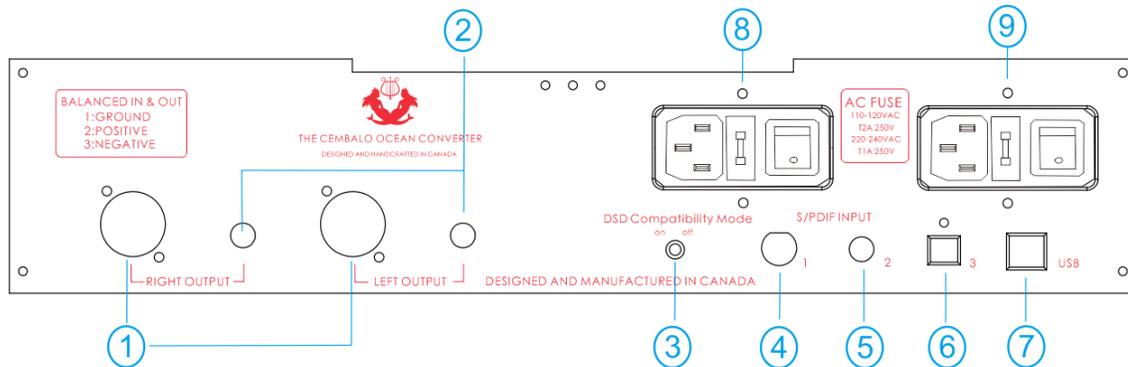
# Product overview

## Overview of the front panel



1. Input channel selection, CH1-CH4 or USB
2. Audio format, CD or DSD
3. Channel selection button
4. Channel selection button
5. Volume UP
6. Volume DOWN

## Overview of the rear panel



1. Balanced Analog Outputs
2. Single-Ended Analog Output

3. DSD Compatibility Mode on/off
4. BNC S/PDIF Electrical Digital Input-CH1
5. RCA S/PDIF Electrical Digital Input-CH2
6. EIAJ Optical ( Toslink ) Digital Input-CH3
7. USB Digital Input
8. Digital AC Power Connector
9. Analog AC Power Connector

# Using the Ocean series DAC

## Installation & Setup

Ensure sufficient ventilation. The Ocean DAC generates heat which is dissipated through the housing. It should not be installed near other heat sources or in tight enclosed areas.

Place the Ocean DAC amplifier on a **flat, horizontal and solid** surface.

## Connecting the DAC to the mains

Check your DAC complies with your local A/C voltage and frequency requirements. If you use an unsuitable power supply, this can cause damage to the product.

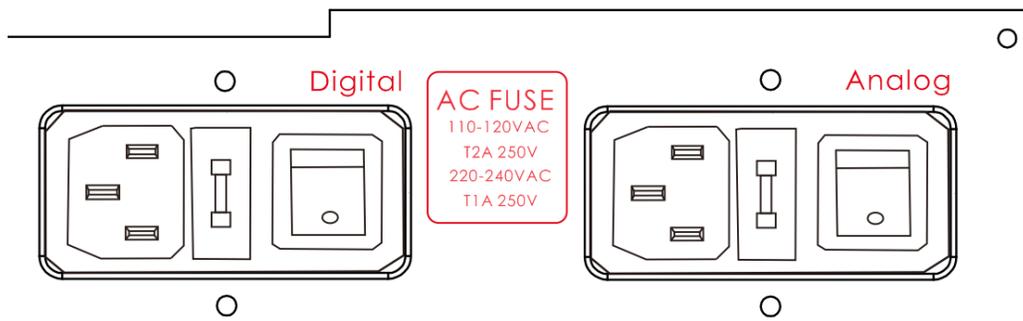
Ocean series DACs are set at the factory (internally) for 100v, 120v, 220v, 230v or 240v AC mains operation @ 50 or 60HZ. This voltage setting cannot be changed by the user.

The OCEAN DAC uses 4 fast acting fuses totally, two located in a fuse drawer on rear panel, two fuses inside on PCB. Turn off the unit and remove the power cord before attempting to remove and replace the fuse. Replace fuse with the same type and value.

For PCB fuse: F 1A/250V

For rear panel fuse: F 6A/250V

On the rear panel there are two AC sockets. One is for digital system, the other is for analog system. **Turn on/off two switches at the same time** as possible as you can. If one keeps on and the other keeps off for long time, this may cause damages to the DAC.



## Connecting the DAC to digital inputs

You can connect S/PDIF inputs from CH1~CH3. Also, the USB can be connected to PC/Mac through your preferred dedicated USB Audio cable. NO Drivers needed for Mac OS.

Accepted USB formats and sample rates:

PCM (Pulse Code Modulated): 44.1Khz, 48Khz, 88.2Khz, 96Khz 176.4Khz, 192Khz, 352.8Khz or 384Khz

DSD (Direct-Stream Digital): DSD64 and DSD128

Cembalo Streaming/ ASIO drivers and installation instructions for Ocean DAC can be downloaded at:

<http://www.cembalolab.com/index.php/Index/supportm.php>

Through channels can be changed easily by buttons on the front panel, we **suggest** you connect only one type digital input in use for the lowest digital noises.

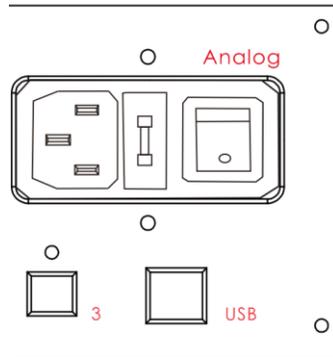
## Burn-In and Warm-Up the DAC

Your Ocean series DAC has been strictly tested and burned in for 72 hours before shipping. Sound performance will continue to improve during the first 40–50 hours of normal use. Anyway it should work in a room temperature (<24° C).

For the perfect performance the ocean DAC takes approximately 20 minutes to warm up it.

## Ground Connection

It is **necessary** to use Earth Ground connection to minimum digital noises. Internally the earth ground from analog AC power cord is connected to the digital circuit by default.



In order to avoid any noises from ground network, we recommend that the DAC is solely connected to the physical Earth. Use high quality ground connection as best as possible.

## Care and Maintenance

Please disconnect the product from the AC power before cleaning. Never pour even small amounts of any liquid directly on the DAC, as doing so may allow the liquid to reach the circuitry inside the unit. Any liquid inside the unit poses a hazard to both the user and to the unit and must be avoided. We suggest you only use a dry and soft cloth to clean the DAC.

## Specifications

Converters per channel	2 x true balanced 32 bits D/A system
Formats	
PCM via SPDIF input	Up to 192kHz 24bits
PCM via USB input	Up to 384kHz 24bits
DSD via USB input	DSD64,DSD128
Analog Output level balanced, max	4.3Vrms / 6.08Vpp
Output level single ended, max	2.15Vrms / 3.04Vpp
S/N Ratio, 20-20000hz	< -123dB
Distortion (THD+N)	<0.00017% @ 0dB
Channel Separation	> 125dB
Input Impedance, single ended (SPDIF)	75ohm
Analog output Impedance (20-20000Hz)	10ohm
Bandwidth (-3dB), max.	0 - 250kHz
Power consumption (Maximum)	60W
Power Capacity	120000uf
Dimensions	
Size (W x H x D), netto	
CM	43.5x11.5x25
Inch	17.2x4.5x10
Weight, netto	6.5kg/14.3 lbs.
Shipping weight	8.5kg/18.7 lbs.

\*Specifications can to be changed by Cembalo Audio Designs without further notice.

# Warranty and Registration card

Cembalo Lab Ocean series products are warranted to be free from manufacturing defects under normal use for two years from the date of purchase. During the warranty period, any Cembalo component exhibiting defects in materials and/or workmanship will be repaired or replaced, at our option, without charge for either parts or labor, at our factory. The warranty will not apply to any Cembalo component that has been misused, disassembled or modified.

End users are supported in the guarantee through their distributor. In such case, please contact your dealer for full guarantee condition and service.

Please register your products to obtain direct Cembalo products. Please fill out the registration card and send it directly to Cembalo. Or email all information shown in registration card to us, and PDF form can be downloaded at support of our website, [www.cembalolab.com](http://www.cembalolab.com).



First Name: ..... Given Name: .....

Email: ..... Date of Purchase: .....

Address: ..... Post Code: .....

Product Model: ..... Serial Number: .....

Dealer: ..... City and Country: .....

Where did you get to know Cembalo product?

Dealer       Acquaintance       Online       Magazine

What can be improved on Cembalo or Cembalo Products in the future?

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