

# LAB 12

Owner's Manual

**dac1** *reference*

Handcrafted Digital to Analog Converter

[www.lab12.gr](http://www.lab12.gr)

v1.6

# LAB 12

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## **IT IS YOURS!**

Thank you for selecting Lab12 handcrafted Digital to Analog Converter (DAC). Every component on it is designed to provide smooth and untreated sound. Pure analogue sound with non oversampling conversion by 8 matched parallel Phillips TDA1543 in a sophisticated configuration and smooth output through a pair of Dual triode tubes I/V stage. All components are carefully chosen after hours of listening and testing, while paying great attention to every detail affecting the outcome. Ultra solid construction with glass blasting anodized finishing and retro analogue V/U meters.

Do not forget that your DAC is totally handcrafted with perfectly matched parts of the finest selections. In order to reach the optimal performance your dac1 reference needs at least 200 hours of listening. In this time all components go from “burn in” period to stable.

Before setting up your new dac1 reference, we encourage you to read this manual thoroughly to properly acquaint yourself with its features. We love music and audio devices and we have built your new device with emotion and personal treatment.

The information contained in this manual is subject to change without notice. The most current version of this manual is available on our official website at <http://www.lab12.gr>

## **Unpacking**

Dac1 reference should be removed from its box with care. Remove all the foam protective pieces of the box before you unpack dac1 reference. Unpack dac1 reference with your hands on both sides of the device.

## **Warnings**

No user serviceable parts are included inside. Do not unscrew the cover; high voltages remain after disconnecting from mains. In case your device requires any kind of service or upgrade, please ship or take your equipment directly to Lab12 or to one of our authorized dealers.

Always use the same type of fuse for replacement.

## Features

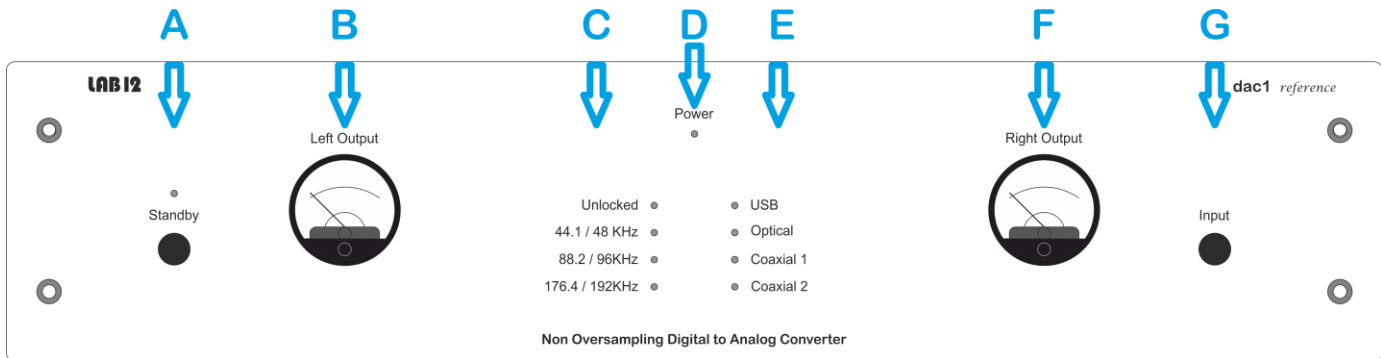
- Input Sampling Rate up to 24bit/192 kHz
- Non-Oversampling mode
- 8x Multibit Philips DACs network
- 2x Dual Triodes tubes I/V analog output stage
- 6 Separate Regulated Power Supplies
- Toroidal power transformer
- SRSG® implementation
- Fine symmetry® implementation
- Analog retro VU meters
- 6mm Aluminum face panel
- Five Years Guarantee

## Installation & Placement

**Lab12 dac1 reference** should be placed on a solid flat surface. You should avoid placing it near a heat source as this could compromise the performance and reliability. You should never place another component directly on top of this device. Make sure that your dac1 reference has an adequate flow of air around it.

Dac1 reference could be warm in some points; this is normal and within parts' specifications. Take care of the front panel's glass blasting anodized finishing using a soft dry cloth. No need to use any sprays or polishes. Never use cleaners containing abrasives, as this will damage the surface.

## Front Panel Indicators



DAC1 Front panel

In the front panel you will see ten (10) indication LEDs, two VU meters, one Input selector push button and one Standby push button.

The center LED **(D)** indicates that the device is powered on, in working condition.

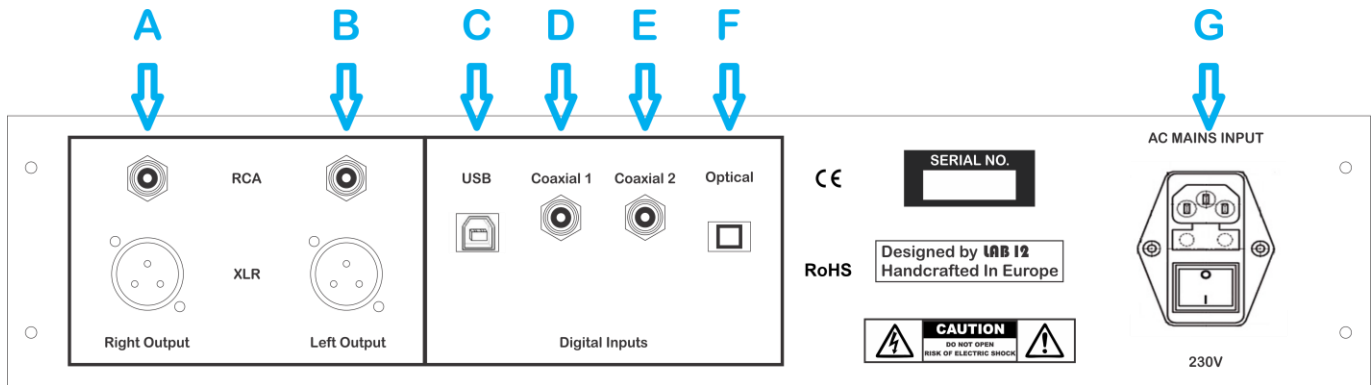
The 4 input LEDs **(E)** indicate the selected digital input. You can manually select the preferable input with the Input selector push button on the right of the front panel **(G)**.

The 4 status LEDs **(C)** indicate the locked sampling frequency rates of the input digital signal. The 'Unlocked' LED indicates that there is no digital signal on input or the sampling frequency of the digital signal is not compatible with dac1 reference.

On the left of the front panel, you will find the Standby push button and indication LED **(A)**. When active, it indicates that **dac1 reference** is in Standby Mode. You can leave the device in Standby Mode without the need to turn off the main power switch on the back panel.

To the left and right of the 8 center LEDs you will see two retro analog VU meters **(B & F)**. You can accurately monitor the output level of each channel on dB scale.

## Rear Panel Connections



DAC1 Rear panel

On the rear panel you will find the connection inputs and outputs.

On the left side, you will find a pair of single-ended RCA and a pair of unbalanced XLR (**A & B**) analog audio output connectors.

At the middle of rear panel, you will find the four digital inputs. You can directly connect a personal computer or streamer via USB2 input (**C**) or any other digital unit with SPDIF digital outputs on the two available coaxial inputs (**D & E**) or the Toslink optical (**F**).

To the right side of rear panel, you will find the **IEC AC input (G)**. Below IEC input, the main fuse holder and the main power switch are located (**G**).

## Main connections

Connect a High-Grade Power cable to the IEC input and to your wall socket. Make sure that your wall socket provides a good ground before connecting the power cable. You can supply 230 to 240 AC Volts /50Hz (115 to 120 AC Volts / 60Hz). Every **dac1 reference** is calibrated and tested with the usage of a **Lab12 Knack mk2 power cable**. We strongly suggest using this cable.

## Connect to your Preamplifier or Integrated Amplifier

Connect the analog output (RCA or XLR) to an analog line level input to your Preamplifier or Integrated Amplifier. Make sure of the correct channel connections. We suggest using an audio grade interconnect cable pair. You can choose between RCA or XLR connection. It is not recommended to use both type of outputs (RCA / XLR) at the same time. Prefer a Preamplifier or Integrated Amplifier with input impedance higher than 25Kohms. (Ideally input impedance 50-100Kohm).

## Connect a Digital SPDIF Output Source

Make sure that your digital source has a SPDIF 75ohm coaxial or optical Toslink digital output. Connect the digital interconnect cable (or fibre optical) from the source output to the correspondence input of **dac1 reference**. Turn on your **dac1 reference** and then your digital source unit and activate the digital audio output on it (if needed). Select the desirable input with input select push button on dac1 reference. Dac1 reference can accept resolutions up to 192KHz and up to 24 Bit Depth on any digital input.

Use an audio grade digital 75-ohm digital interconnect cable to ensure the best transfer of your digital signal.

- ❖ Please note that Coaxial 2 must be always locked in lower sampling rate frequency than Coaxial 1.
- ❖ Please note that official specifications for Toslink SPDIF protocol (Optical Input), are limited to 96KHz/24bit. Depending on connection and source, optical input higher sampling rate could be limited.

## Connect a PC

Connect dac1 reference to a USB2 or higher on your personal computer. Windows 7 or higher and IOS will automatically detect the official drivers for the USB receiver of dac1 reference. In other cases, you have to manually install drivers (you can find Windows and IOS drivers in our website). Please choose "Lab12 Dac1 reference" on output playback devices menu of your personal computer.



## For the safety of your equipment

**! Make sure that all your equipment is turned off before any connection.**

**! Please keep in mind that you have to turn on dac1 reference some seconds before turning on your amplifier and turn it off some seconds after turning off your amplifier.**

## Specifications

- Power: 210 - 240VAC 50Hz (110 - 120VAC 60Hz)
- Power consumption: 70 VA max
- Inputs: 2x SPDIF (Coaxial RCA), 1x USB2, 1x SPDIF (Optical Toslink)
- Outputs: 2x RCA, 2x XLR unbalanced (balanced version available)
- Frequency response: 20Hz to 20 KHz + 0dB/-1dB
- THD: lower than 0.15%
- Rated output level: 2.5Vrms
- Tube complement: 2x 6922 dual triode
- Available Colours: Matt Black, Frozen Silver
- Dimensions (WxHxD): 43x11x29 cm
- Weight: 7.5 Kg

## Warranty

Lab12 products are designed and manufactured to the highest standards and deliver high- quality performance, ease of use and ease of installation. We are confident that you will enjoy many years of good service from your product.

In the unlikely event of a failure of the product, we will arrange for your product to be serviced, free of charge, provided that the product was used in accordance with the instructions in the owner's manual.

Lab12 could modify the design or specifications of any product without obligation to purchasers of previously manufactured products.

**This Warranty is provided for the benefit of the first and original purchaser of the covered product and is not transferable to a subsequent purchaser.**

**Vacuum tubes are warranted for the original 90-day period only.**

**This warranty does not affect your statutory rights. EU rules 1999/44/EK.**

**This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.**

\*Το ακόλουθο κείμενο Εγγύησης περιέχει τις Συνθήκες της Πανευρωπαϊκής Εγγύησης και τις οποίες ο κατασκευαστής LAB12 SMPC εγγυάται προς τον τελικό καταναλωτή. Οι όροι της παρούσας εγγύησης είναι πλήρως εναρμονισμένοι με τις διατάξεις της Οδηγίας 1999/44/EK, έτσι όπως αυτή ενσωματώθηκε στην ελληνική έννομη τάξη και δε θίγουν σε καμία περίπτωση τα δικαιώματα που παρέχονται στον καταναλωτή βάσει του εφαρμοστέου δικαίου.

**Lab12 reserves the right to change or modify any of the terms and conditions contained in this Warranty Statement, at any time and in our sole discretion. Any changes or modification will be effective immediately upon posting of the revisions on the Lab12 website, and you waive any right you may have to receive specific notice of such changes or modifications. In the event that there is a difference between this warranty and the provisions in any owner's manuals, warranty leaflets, or packaging cartons, the terms of this warranty, as published on the official Lab12 website, will prevail to the fullest extent allowed by law.**

**For the warranty to be valid:**

1. The Warranty card, which is placed outside the box of the unit, must be filled out by the authorized seller with the Model of the device, Serial Number, Color, Date of Purchase, Customer's Name and Customer's Address, as well as the authorized seller's point sign.
2. A copy of the purchase receipt must also be attached to this card.
3. A photo of the completed Warranty card, along with the purchase receipt, must be sent to [contact@lab12.gr](mailto:contact@lab12.gr) by the end consumer within one month from the date of purchase.

**What is Covered and how long this coverage lasts?**

Only **new** products purchased through an authorized Lab12 dealer, importer or distributor are entitled for warranty coverage. The Warranty is limited to the first original purchaser and is inapplicable for secondhand products. This warranty covers defects in materials and workmanship in this product for 5 years (or a 90-Days Limited Warranty for vacuum tubes) after the date of purchase or no later than 6 years of the date of shipment to the authorized Lab12 dealer or distributor, whichever comes first.

**What is Not Covered**

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing, and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature.

This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any **Tubes Swaps, Repairs or Modifications** attempted by anyone unauthorized by Lab12, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product.

This limited warranty does not cover vacuum tubes (after the 90-Day Limited Warranty), cartons, scratches on equipment enclosures, cables or accessories used in conjunction with this product.

**What we will do to correct problem**

During the Warranty Period, we will repair or replace, at no charge, products or parts of a product that proves defective due to defects in materials or workmanship, under normal use and maintenance.

### **How To Obtain Service Under This Warranty:**

You are responsible for transporting your product to (as well as from, in the event that Lab12 finds no defect covered by this warranty) either Lab12 or an authorized point and for payment of all shipping charges. Lab12 will pay the return shipping charges (in the event you return the product to Lab12) if the repairs are covered by warranty, provided that, Lab12 reserves the right to choose the mode, the carrier and the timing of such return shipping (if Lab12 finds that there are no defects covered by this warranty, then you shall be responsible for all shipping charges).

Lab12 has authorized distribution in many countries of the world. In each country, the authorized importing retailer or distributor has accepted the responsibility for warranty of products sold by that retailer or distributor. Warranty service should normally be obtained from the importing retailer or distributor from whom you purchased your product. In the unlikely event that the technical service required is not possible to be fulfilled through the importer/distributor, this product must be returned to Lab12 main factory in Greece to fulfill the terms of this Limited Warranty at the purchaser's expense (except purchasers that purchase their product directly from our main facilities in Greece), along with the Warranty card and a copy of the proof of purchase for the product. As mentioned above, the Warranty card must list the date of purchase, the model, color and serial number of the product, the name and address of the purchaser and the authorized dealer/importer/retailer detailed sign. Additionally, you must provide detailed information on the symptoms or difficulties you have observed with the product's performance by completing a technical support form that will be provided to you by the authorized importing retailer, distributor or LAB12.

To obtain warranty service, you can also contact directly Lab12 at [contact@lab12.gr](mailto:contact@lab12.gr) or +30-2102845173, to determine the most appropriate solution for you. All warranty claims must be made in writing accompanied by the Warranty card and a copy of the proof of purchase.

Lab12 Single Member Private Company

[Contact@lab12.gr](mailto:Contact@lab12.gr)

[www.lab12.gr](http://www.lab12.gr)

We wish you to enjoy your new device exactly as we enjoyed it when we built it for you!

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