



dac1221 Users Manual

Discrete R-2R DAC



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Introduction

The Soekris dac1221 is a low cost Audiophile discrete R-2R DAC only, with USB and SPDIF inputs and line level outputs on rear mounted RCA Phono connectors. The dac1221 is not just any regular DAC, the sound quality is the absolute best available, thanks to the ultra high end design with a discrete R-2R sign magnitude DAC using a about 200 small and very precise resistors, high quality output amplifiers, powered by an external power supply, with two discrete linear low noise and low impedance power regulators and one low noise regulators for the digital parts.

The dac1221 R-2R DAC circuit is fully isolated from the noisy computer USB interface and the SPDIF inputs are also all transformer isolated. It supports input signals on the USB interface up to 24 bit / 384 Khz PCM audio, and up to DoP-128 (x2) and DSD-256 (x4) audio, or up to 24 bit / 192 Khz PCM audio on the various SPDIF interfaces. It has a fully digital volume control and four sets of digital reconstruction filters to fit any taste. The dac1221 is designed and built in Denmark, using advanced surface mount technology and parts from only the highest quality suppliers, with a full aluminum casing.

Quick Start

Plug in Power and the supplied USB Cable to the dac1221 and connect it to your computer, connect your amplifier to the RCA Line Out sockets, select “soekris dac1xxx” as output in your computer settings and start playing music. The default power up settings for volume and anti-aliasing filters are stored in flash memory and can be changed, see front view description for details.

Specifications

THD @ -1 dB	<0.008%
THD @ -60 dB	<0.03%
Clock Jitter RMS	0.8 pS typical
Discrete Resistor Network	26 bit, 0.02% - 0.05% Resistors
S/N 20 Khz Bandwidth	>126 dB unweighted
Frequency Range @ 44.1 Khz	20hz - 20Khz +0.1 -1.0 dB
Frequency Range @ 384 Khz	20hz - 80Khz +0.1 -1.0 dB
USB Input	Type B, Isolated, Full / High Speed
USB Input Mode	Audio Class 2.0
USB Input PCM	Up to 24 Bit / 384 Ksps
USB Input DSD	Up to DoP-128 and DSD-256
SPDIF Inputs	RCA / Toslink
SPDIF Inputs PCM	Up to 24 bit / 192 Khz
Digital volume control	-90 dB to +10 dB
Output Line	RCA, 2.0V RMS, Zout 50 ohm
Power Consumption	5V DC Plug, max 3W
Size	140 x 185 x 30 mm
Weight	0.4 Kg
Warranty	3 Years

dac1221 front view



The LED's on the front indicates input sample rate, input source, reconstruction filters selected and a clip indicator.

When input is Linear PCM audio		When input is DSD or DoP audio	
PCM 44/48 Khz	“X1” LED on	DoP/DSD-64	“DSD” on
PCM 88/96 Khz	“X2” LED on	DoP/DSD-128	“DSD” and “X2” on
PCM 176/192 Khz	“X4” LED on	DoP/DSD-256	“DSD” and “X4” on
PCM 352/384 Khz	“X8” LED on		

“INPUT” button: Select between the possible input source and an automatic mode, which is the default at power up.

“FILTER” button: Select between the different reconstruction filters. Hold for minimum 4 seconds to store the current volume level reconstruction filter selection.

“FILTER” LED color shows the current reconstruction filter selected	
Red	Linear Phase filter, also called brickwall filter
Orange	Mix between Linear and Minimum Phase filter
Green	Minimum Phase filter, also called butterworth filter
Off	Soft Minimum Phase filter, a soft butterworth filter

Volume LED: The volume LED brightness indicates current volume, from -90 dB to +10 dB. The volume knob is using a digital encoder to set the volume level digitally from -90 dB to +10 dB in precise 1 dB steps. If you connect the Line Out to a system with a volume knob you might want to set the dac1221 Line Out volume startup level to a fixed 0 dB, you can do that by turning the volume up to -4 or higher, easiest is just to turn it full up (without music playing), then store the startup setting by pressing and holding the “FILTER” button for 4 seconds. The volume control is then inactive, it can be made active again by holding the “FILTER” button for 4 seconds again.

“CLIP” The Volume LED will blink RED when the DAC output signal is clipping. You should not turn the volume knob higher than to where the red “CLIP” LED will not blink.

dac1221 rear view



Analog Out: The dac1221 have single ended line out using RCA sockets, the red one marked “R” is for the right channel, the white one marked “L” is for the left channel.

Digital In: The dac1221 have a total of 3 digital inputs.

“TOS”: SPDIF Optical Toslink.

“RCA”: SPDIF 75 ohms Coax, transformer isolated.

“USB”: USB type B socket: For connection to the USB interface on your computer or other audio source device. You need to use a high quality USB cable, like the USB cable included with the dac1221. The USB interface is optically isolated from the computer, to remove noise. The USB Input are running using USB Audio Mode 2, which require drivers for older Windows operating systems.

Windows Drivers: Drivers for using USB Audio Mode 2 on Windows operating systems are available for downloading on <http://www.soekris.dk/download.html>, Windows 10 and newer do not require drivers. Please note that most newer versions of Apple OS X or Linux don't require drivers but will support USB Audio Mode 2 directly, see manual for your operating systems as needed.

Power Socket: The dac1221 support power from an external 5V 1A DC power supply with a 5.5mm outside, 2.1mm inside female power plug with plus at center pin, like the included power supply.

Power Switch: Used to turn the dac1221 power on and off, push in for on.

Conformity Declarations

FC 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 the 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 of the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio & television reception.

CE Application for Council Directives 2011/65/EU, 2014/30/EU
Conformity declared for EN55022 Class B, EN55024



This marking indicates that this product should not be disposed with other household waste throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal and to conserve material resources, this product should be recycled responsibly. To dispose of your product, please use your local return and collection systems.

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