ZeroUno DAC

TUTORIAL - JRiver© MEDIA CENTER SETUP

INDEX

INTRODUCTION

This tutorial is dedicated to the users want to discover the ways to set up the audio playback software for the best interface with *ZeroUno* **DAC**.

It is intended for newbies and many things are written to explain to the users without any skill about computers setup and/or the audio playback software setup.

Sometimes the terms used should be not perfect from the academic point of view, or sometimes the explanations will be too superficial.
This because the tutorial is addressed everybody.

AUDIO PLAYBACK SOFTWARE CONFIGURATION

The audio playback software, or Music Player, to use is an important element of the audio chain and its engine can be fundamental in the quality of the music reproduction.
At the same time the Music Player can exhibit features that can exalt the performances of the DAC.

The Music Player chosen for this tutorial is the JRiver© Media Center.

The tutorial is not a guide to the use of JRiver© neither the *ZeroUno* **DAC** can play with JRiver© only.

The reasons of the choice are mainly because JRiver© can run under Mac OS, Windows and Linux.
It is a professional player with a license cost below 50USD (one time).
At the same time JRiver© is one of the members of the group that defined the DoP open format.

The screen-shoots below are from JRiver© Media Center 20.

Before to run JRiver© the Windows user has to install the USB XMOS driver coming with the *ZeroUno* **DAC**.

The tutorial is a guide let the user check if the *ZeroUno* **DAC** works at the maximum of its performances.

To be sure about the tracks to play, the suggestion is to download from the *2L - The Nordic Sound* website the *HiRes Download – test bench* http://www.2l.no/hires/index.html? Arnesen: album MAGNIFICAT (2L-106-SABD), track 4, Misericordia, performer is Nidarosdomens Jentekor & TrondheimSolistene. These the tracks avaible for free.

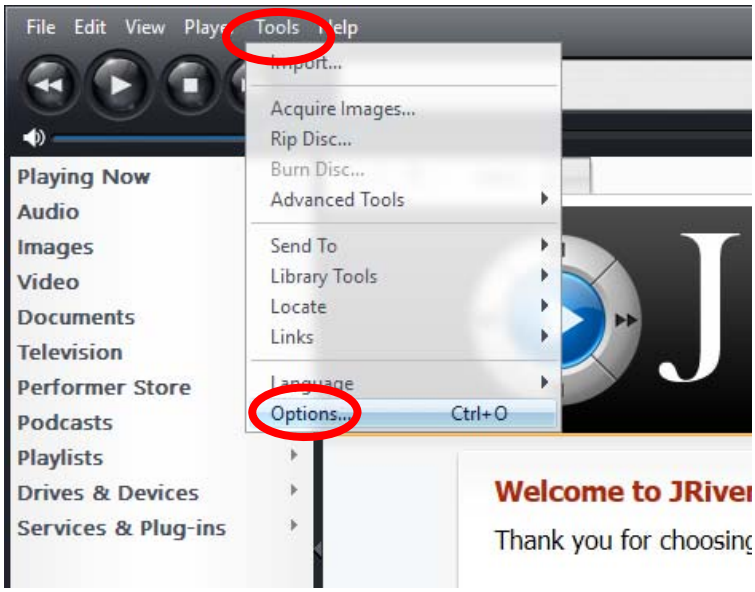
- Stereo PCM 24bit/352.8KHz
- Stereo PCM 24bit/192KHz
- Stereo PCM 24bit/96KHz
- Original resolution
- Stereo DSD256 11.2Mbit/s
- Stereo DSD128 5.6Mbit/s
- Stereo DSD64 2.8Mbit/s

After the download of the tracks import in the JRiver© Library to play with them.

TUTORIAL - JRiver© MEDIA CENTER

The tutorial is helpful if the user has already installed JRiver© MC on its system and has already worked for a while with it.

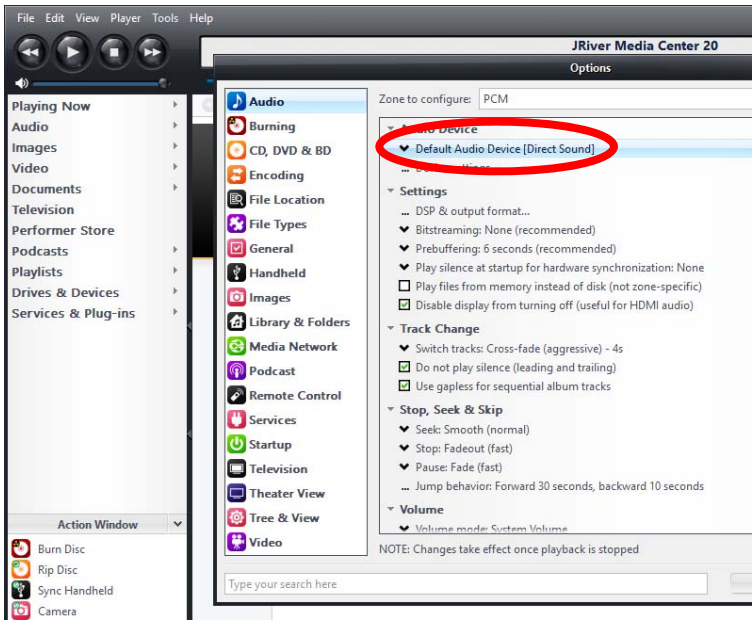
The *ZeroUno* DAC must be connected to the system to be seen by JRiver©.



Run JRiver© Media Center.

Double click on Tools.
The aside window will be opened.

Double click on Options

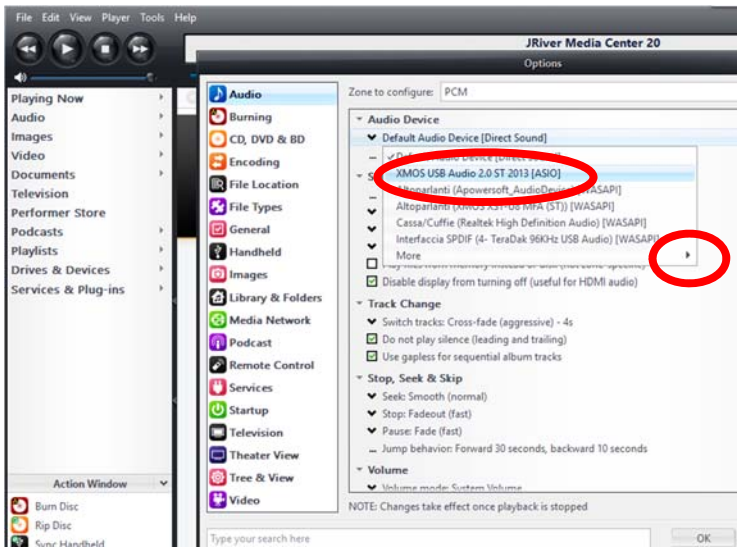


the window aside will appear.

The Audio Device is set for default to Direct Sound because this way works almost in any case, with any unit connected to the computer, without any driver needed.

But, as we said before, it is managed by Windows KMixer and all the tracks are deeply managed by Windows itself. It is not a bit-perfect playback.

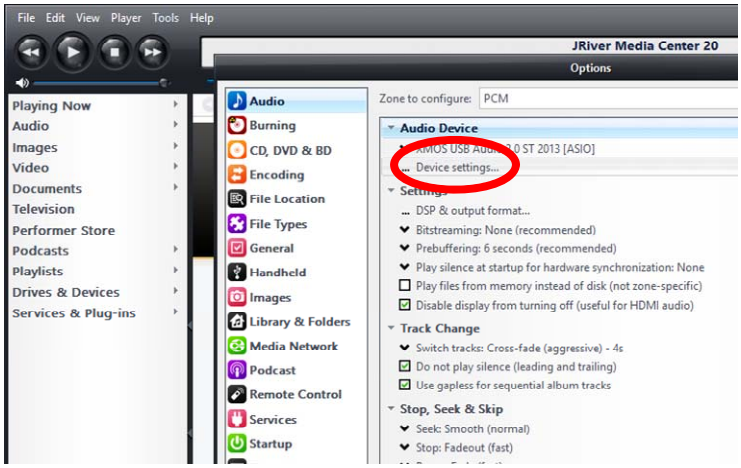
Click on Default Audio Device [Direct Sound]



the aside window appears and between the available units there is XMOS… [ASIO] and XMOS… [WASAPI] and.
Clicking on the TRIANGLE, the XMOS…[Direct-Sound] and exactly below XMOS…[Kernel-Streaming] will appear.

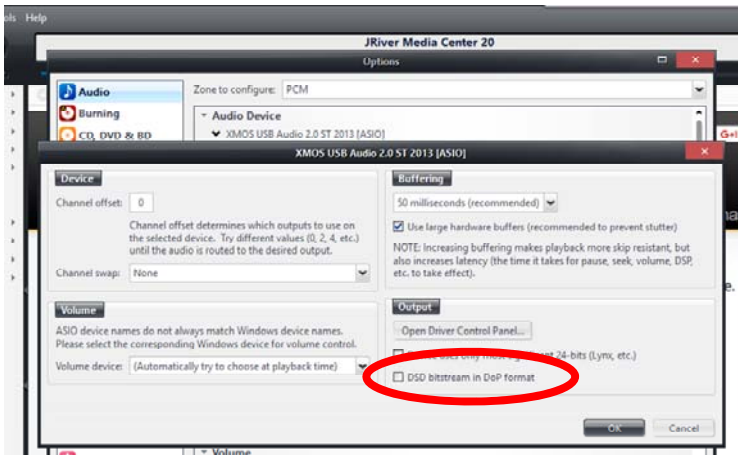
As explained before the best driver to work with is the ASIO one. Click over it.

The user wants to experiment can try with the WASAPI driver too so to test if the Windows drivers works “well” and can compare the performances with the ASIO one.



Now let become familiar with the ASIO driver setup.

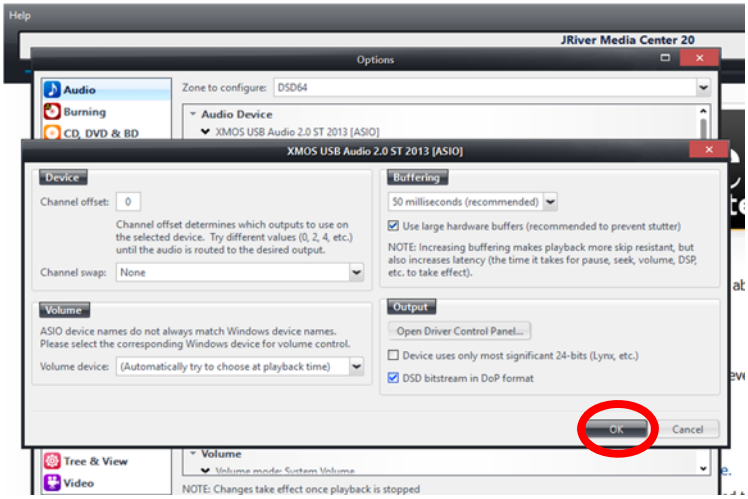
By a double click on Device Settings.



The aside window is opened.

Pay attention only to the DSD bitstream in DoP format. There is no need to change the other parameters reported. Let them how they are.

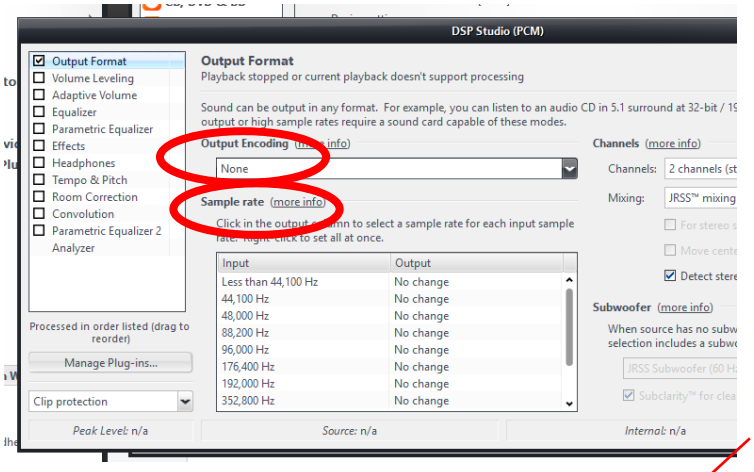
Select DSD bitstream in DoP format



click on OK and move ON

Same window of before.

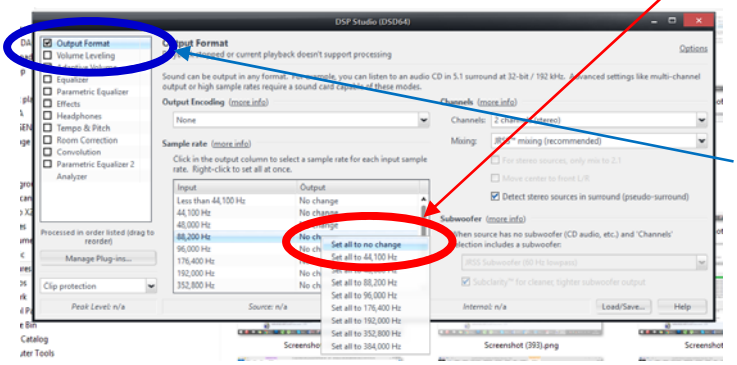
Now click on DSP & output format



Output Encoding must be set on None.
In this way the track is sent to the *ZeroUno* **DAC** like it is, without any encoding.

Note also the Sample Rate.
Here the user can decide if upsample or downsample something.

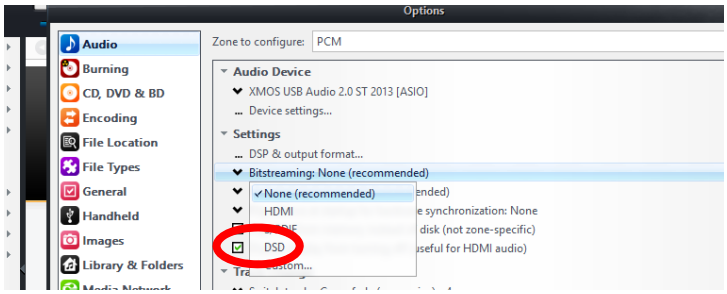
The suggestion is to leave the sets like they are.
Position the cursor over one of the Sample Rate, 96,000HZ for example.
Click the right button of the mouse, and select "Select all to no change".



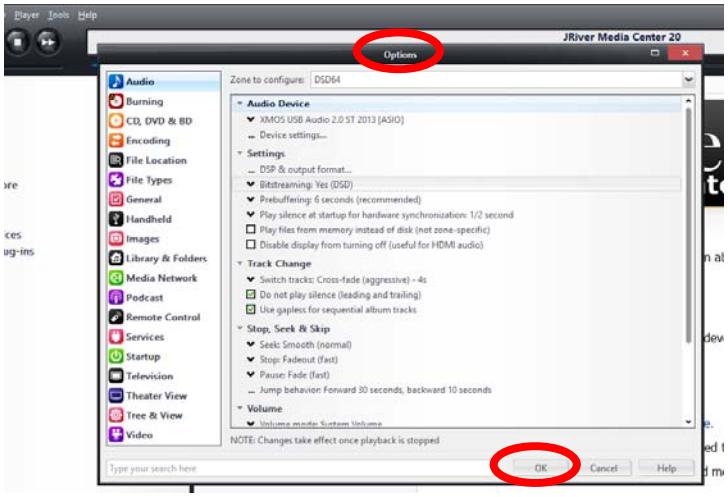
Alternatively you can un-select (un-click) the first option at top-left of the window.

Un-selecting, everything in the window is skipped and not applied.

Now click over Bitstreaming, probably set to None.



And be sure that DSD is selected..



This is the Options window at the end of the setup procedure.

Now the JRiver© player can play any PCM tracks and any DSD tracks without any output encoding.

Now the JRiver© MC is ready to play the users's favorites albums and tracks.

The *ZeroUno* **DAC** will receive what the Player is sending by the USB interface and on the *ZeroUno* **DAC** display the user can read the format and the sample rate received.

JRiver© ISSUES

There are two JRiver© MC issues to point out.

Playback Pause after a DSD track played

When the user plays a DSD file, JRiver© sends the DSD tracks directly to the *ZeroUno* **DAC** by DoP. DSD64 is sent by a 176.4KHZ PCM data signal and DSD128 is sent by a 352.8KHz PCM data signal.

ZeroUno **DAC** show at the display the lock to DSD and the sampling rate frequency in MHz.

When a DSD track is over, either DSD64 or DSD128, JRiver© moves to a pause condition. When in pause instead to stay in DSD format waiting for the new track before to change format, JRiver© move to PCM immediately.

ZeroUno **DAC** detects this condition and shows the lock goes from a DSD 2.8MHz to a PCM 176.3KHz.

The same between two tracks; the short pause between the tracks and the other lets JRiver© to switch to pause and PCM even if for a very short time..

The display of the *ZeroUno* **DAC** detects properly this behaviour and show it at the display. But when there is change in the lock the frequency is printed on big digits and the matter should be annoying.
To cancel the big frequency on the display select the related option in the SETUP menu of the *ZeroUno* **DAC.**

The frequency showed after a DSD playback, when the pause takes action even if for a very short time, are respectively 176.4KHz and 352.8KHz, exactly the frequencies used by PCM for the DoP.

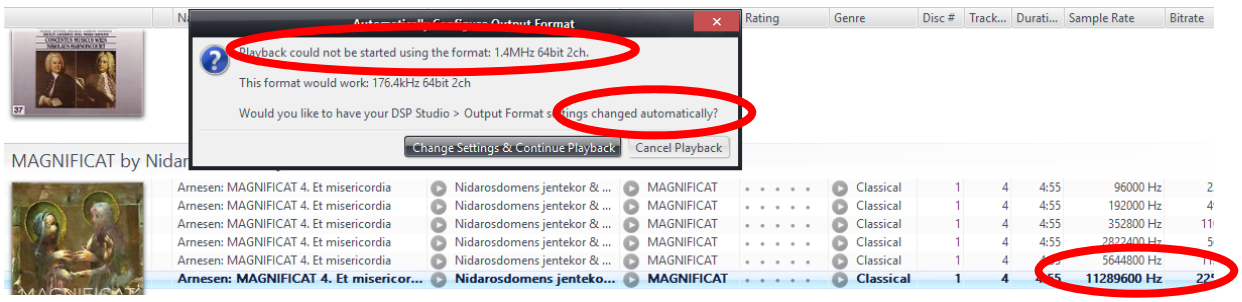
The issue was experimented also with DACs of other brands able to show the locked sample rate.
The issue is exactly the same and confirm it is a JRiver© issue and not a *ZeroUno* **DAC** malfunction.

Try to play a DS256 or a DSD512 track/album

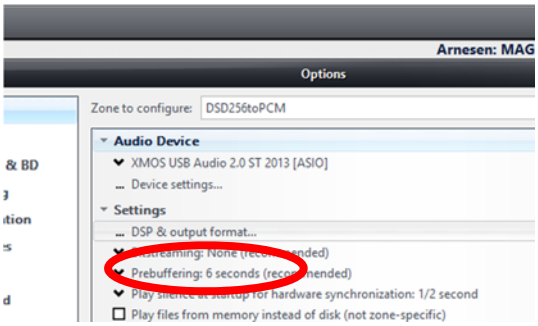
When a DSD256 (11289600Hz) or a DSD512 (22579200Hz) track is tried, the ASIO XMOS driver of the *ZeroUno* **DAC** for Windows users or the CoreAudio engine for Mac users detects the tentative to play a no possible format and block the JRiver© execution.

JRiver© stop the playback and open a pop-up window to signal the condition to the user and suggests an **automatic setup** of the Output Format.

The alert window is exactly as below.

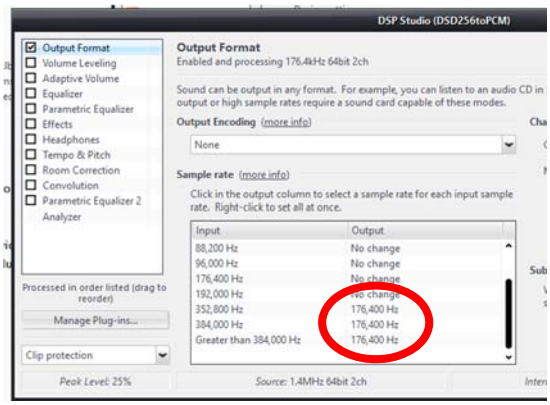


If the user cancels the playback nothing happens.



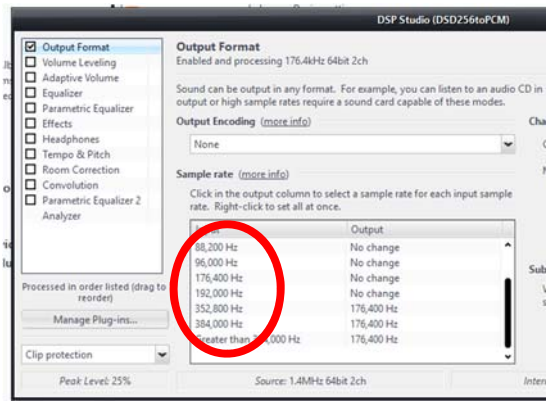
If the user accepts the JRiver© suggestion and lets JRiver© changes the setting, the result is set forever.

Taking a look to the *DSP & Output Format* by a click over *Tools* > *Options* > *DSP & Output Format* (see before about how to do if not clear) is possible to check the changes made automatically by JRiver©.

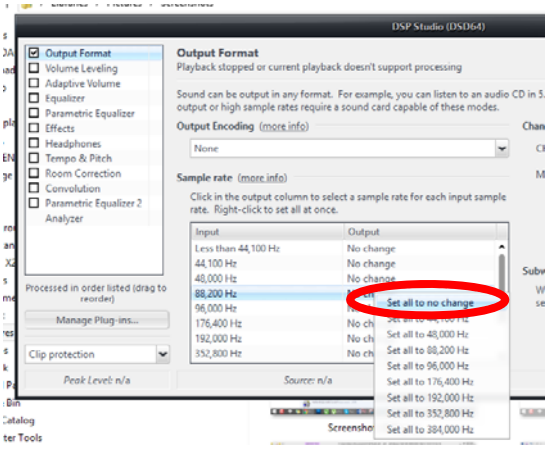


All the tracks over 352,800KHz will be downsampled to 176,400, not only the DSD256 but all the PCM tracks even if there are no troubles to play tracks at PCM 384,000 KHz.

This is a buyproduct of the JRiver© when the user let it automatically sets the DSP and Output Encoding.



To go back to the previous condition, the user has to position the mouse over any Sample Rate, and click with the right button of the mouse,



The aside window will appear.

And set “Set all to no change”.

Exit by choosing Exit/Save.

Please note the responsibility of the change is by the user and not by JRiver©.
JRiver© suggested only the change and the user has accepted.

GLOSSARY

USB Audio 2.0	specification of formats for Digital Audio involving with the USB capability of the personal computers
USB 2.0	physical interface available almost in all the personal computers
USB 3.0	physical interface available in the last generation of personal computers
ASIO	driver/firmware for Windows to implement USB Audio 2.0
CoreAudio	Mac Audio engine
PCM	Pulse Code Modulation. Audio format. Each sample is made of 16, 24 or 32 bits. Sampling frequency up to 384KHz. Includes I²S, LJ32, RJ32, RJ24, RJ20, RJ16.
I²S	Audio format. It is of the PCM family.
DSD	Direct Stream Digital. Audio format. One bit signal flux with sampling frequency up to 22.5792 MHz. Each sample define if the samples signal drops or rises.
DSD64	DSD at 2.8224MHz sampling frequency. It is 64 times the basic CD sampling rate of 44.1KHz.
DSD128	DSD at 5.6448MHz sampling frequency. It is 128 times the basic CD sampling rate of 44.1KHz.
DSD256	DSD at 11.2896MHz sampling frequency. It is 256 times the basic CD sampling rate of 44.1KHz.
DSD512	DSD at 22.5792MHz sampling frequency. It is 512 times the basic CD sampling rate of 44.1KHz.
DoP	DSD over PCM. Standard defined by USB Audio 2.0 to pack the DSD64 and DSD128 in a PCM frame.
Latency	The time needed by a software component to be executed.