Ultimate Equalizer V4 in SPDIF - 96kHz/24bit all digital stereo

Background

When it comes to using a HTPC as an **audio music server with Ultimate Equalizer V4** running as well, you may consider fully utilizing internal sound card, with Realtek ALC889 HD audio codecs.

http://218.210.127.131/products/productsView.aspx?Langid=1&PFid=28&Level=5&Con n=4&ProdID=173

The specs are actually pretty good, with S/N = 104dB for DAC.

With the two Delta1010LT sound cards already installed, this is actually the third sound card you have at your disposal. Therefore, the simplest solution was to just use it. You can nominate Realtek Audio speaker system as the default player in Windows Sound system, so now, when I use Windows Media Centre (or JRivers, if you like) it will grab the internal sound card and play through it. The analogue stereo outputs from Realtek are for now connected to second Delta1010LT stereo input.

Full Digital Solution

If you are interested in **full digital chain of audio processing**, the solution is also very simple. It is based on the ability of ALC889 to up-sample musical files played through it. Ideally, you would end up with 96kHz/24bit processing chain arranged as follows.

A popular ASUS motherboard P6X58D-E has two PCI slots and digital RCA SPDIF connector. This is ideal setup for connecting the digital RCA line to Delta1010LT SPDIF connector, which is also RCA – so the connection carries digital signals (not optical). This motherboard will be used as an example in the explanations below.

As a side comment, I have second Windows7/64 computer, with MSI motherboard, also running UE4 with two Delta1010LT soundcards. The motherboard is X58 Pro-E, but the SPDIF output is optical only. Here, you would have to install optical-to-digital converter, for example:

http://www.jaycar.com.au/productView.asp?ID=KC5425 (\$25)



- 1. Start Realtek HD Audio Manager from the icons at the bottom right corner of your Windows7 PC.
- 2. Choose Digital Output (Optical) then Set Default Device, and Default Format as 24bits, 96000Hz as shown below.

📢 Realtek HD Audio Manager	X
Digital Output(Optical)	<u>Device advanced</u> settings
Main Volume	ANALOG Back Panel
Sound Effects Default Format	
Default For mat 24 Bits, 96000 Hz (Studio Quality)	Front Panel
CD Format DVD Format Select the sample rate and bit depth to be used when running in shared mode.	DIGITAL
	3
Rock Solid - Heart Touching	

3. Go to Windows 7 Sound manager

Sound	
Playback Re	ecording Sounds Communications
Select a pla	yback device below to modify its settings:
2	Line 7/8 M-Audio Delta 1010LT Ready
	Multichannel M-Audio Delta 1010LT Ready
	Speakers Realtek High Definition Audio Ready
	Realtek Digital Output Realtek High Definition Audio Ready
	Realtek Digital Output(Optical) Realtek High Definition Audio Default Device
Configur	e Set Default 👻 Properties
	OK Cancel Apply

The Realtek Digital Output (optical) should be already marked as "Default Device".

4. Right-click on it to get to "Properties" control.

For the P6X58D-E motherboard, you should see TWO SPDIF jacks:

🦚 Realtek Digital Output(Optical) Properties	X
General Supported Formats Levels Enhancements Advanced	
Realtek Digital Output(Optical) Change Icon	
Controller Information	
Realtek High Definition Audio Properties	
- Jack Information	
Device usage: Use this device (enable)	
OK Cancel Apply	

5. Go to "Supported Formats" tab, and tick only 96kHz checkbox.

🍕 Realtek Digital Output(Optical) Properties	x
General Supported Formats Levels Enhancements Advanced	
Encoded formats Which of the following formats is your Digital Receiver able to decode? DTS Audio DTS Audio Dolby Digital	
Sample Rates Which of the following sample rates are supported by your Digital Receiver? 44.1 kHz 96.0 kHz 48.0 kHz 95.0 kHz 48.0 kHz	
OK Cancel Apply	

6. Go to "Advanced" tab, and select "2 channel, 24 bit, 96000Hz", if not selected already. Also, clock "Apply" button is not grayed.

🕷 Realtek Digital Output(Optical) Properties	×
General Supported Formats Levels Enhancements Advanced	
🗆 Default Format	1
Select the sample rate and bit depth to be used when running in shared mode.	
2 channel, 24 bit, 96000 Hz (Studio Quality)	
Exclusive Mode	
Allow applications to take exclusive control of this device	
Give exclusive mode applications priority	
Restore Defaults	
OK Cancel Apply	

7. Close Windows 7 Sound dialogue.

Your Windows 7 computer is now set to up-sample music files to 96kHz/24bit format.

8. Open Delta1010LT Control Panel and make the following selections:

Please note, if you have two Delta1010LT sound cards, you need to know which card is N#1 and which is N#2. Card N#1 will be connected via SPDIF of the Realtek HD on the motherboard. Card N#2 must be connected to the Word Clock output of the Delta N#1.

Under ----select PCI card ----- click on the FIRST checkbox. This will select the first Delta1010LT for editing.

Sample Rate = 96000Hz

Buffer size = 256 (could be 512)

Check "external - spdif"

≫M-Audio Delta Control Panel		
mixer input output I	aardware about	
sample settings	sync source	settings load save
cample rate	locked	reset delete
96000 Hz	internal	
ASIO/WDM buffer size	external - spdif	select PCI card
256 sam	ples 📄 external - word clock	🔳 Delta 1010LT
		🔳 Delta 1010LT
spdif settings	other settings	
	disable asio direct monitoring	
mode emphasis		
consumer 💌 not indicated		
data type scms	invert analog ins	
audio 💌 none (00)	 ■ 1 2 3 4 5 6 7 8 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ 	
		M-AUDIO

9. Under ----select PCI card ----- click on the SECOND checkbox. This will select the second Delta1010LT for editing.

N-Audio Delta Control Panel		
mixer input output hardware	about	
sample settings	sync source	settings load save
sample rate	locked	reset delete
	internal	
AGTO/HEH Buffor size	🔲 external - spdif	select PCI card
256 samples	🔲 external - word clock	🔳 Delta 1010LT
		📕 Delta 1010LT
spdif settings	other settings	
mode emphasis	disable asio direct monitoring	
consumer not indicated data type scms	invert analog ins	
audio 🔻 none (00) 🔻		
		M-AUDIO

Sample Rate = 96000Hz Buffer size = 256 (could be 512) Check "external – word clock"

Now, your Delta1010LT sound cards are ready for 96kHz/24 bit SPDIF data stream.

10. Open Ultimate Equalizer and select Preferences screen and make the following selections:

Preferred Input WASAPI Device = SPDIF [M-Audio Delta 1010LT] Preferred Output Audio Device 1 = Multichannel [M-Audio Delta1010LT]

If you have TWO Delta1010LT sound cards, select Preferred Output Audio Device 2 = Multichannel [2- M-Audio Delta1010LT]

Check "Inputs 1-2" Check "8 Outputs"

If you have TWO Delta1010LT sound cards, select Check "16 Outputs" (NOT 8 Outputs)

Sampling Rate = 96000 Buffer Size = 2048 samples OR 4096 samples (preferred 4096)



Now your UE is also ready for 96kHz/24bit playback.

You can start Windows Media Player and UE4 and have some fun listening to your "studio quality" music.

Here is a proof, that the Realtek ALC889 HD audio codec is indeed up-sampling to 96kHz. I captured 44.1kHz SPDIF from a CD player, and 96kHz SPDIF played from the PC audio server.



44.1kHz SPDIF captured with 200ns timebase.



96kHz SPDIF captured with 200ns timebase.