Ultimate Equalizer V5 – universal MME version

The MME release of Ultimate Equalizer has the following features:

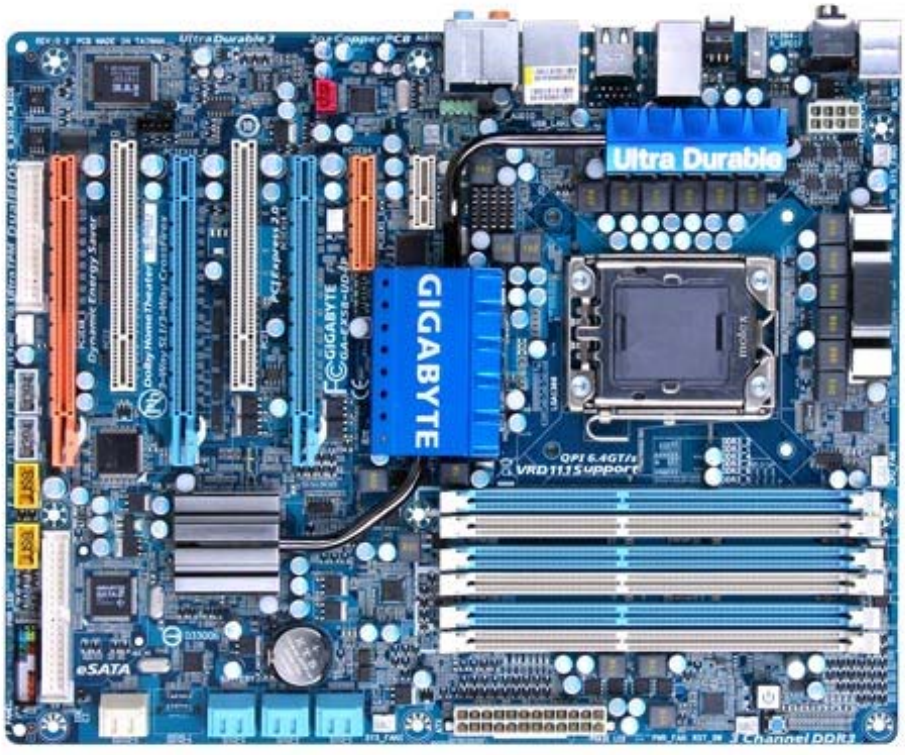
1. It can be used with contemporary motherboard DSP audio engine (eg: ALC889A, ALC899, ALC1150).

2. It can be used with sound cards with WDM/MME drivers, if the sound card presents itself to the Windows OS as a bunch of time-aligned channel pairs

1. It can be used with bus-synchronized, multi-channel sound cards with WDM/MME drivers up to 16in/16out configuration, if the sound cards present themselves to the Windows OS as a bunch of time-aligned channel pairs.

UE 5-MME - supporting motherboard audio

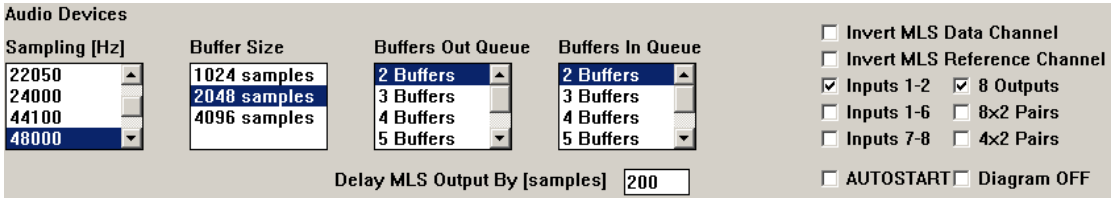
Virtually all contemporary computers incorporate a DSP-managed (for instance Realtek) audio engine on the motherboard. Motherboard audio is typically compliant with WDM/MME technology, as it natively uses Windows OS. Audio quality of contemporary PC has been documented in http://www.bodziosoftware.com.au/Computers_SNR.pdf
And it can be used with great success as an audio server or DSP device – such as Ultimate Equalizer. As an example, the motherboard is Gigabyte GA-EX58-UD4P, socket LGA1366.
http://www.gigabyte.com.au/products/product-page.aspx?pid=2986#sp
is shown below:



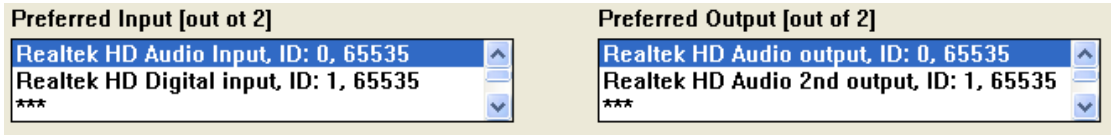
The DSP codec implemented on this motherboard is ALC889A, and all important settings are shown below:
The Realtek DSP needs to be set to 8CH Speaker.

The Front, Rear, Subwoofer, Centre and Side sliders in Mixer – all need to beset to maximum value – see below.

The UE5-MME Preferences screen is shown below. Here, you need to select inputs as “Input 1-2”, and outputs at “8 Outputs”. Buffer Size is set to 2048/4096 samples and sampling frequency to 48kHz. There are 4 buffers allocated for input and 4 buffers allocated for output processing in the UE Preferences screen.



Sound card selection is very simple: for the preferred Input device highlight “Realtek HD Audio Input, ID:0“, and for the output select “Realtek HD Audio output, ID:0“.

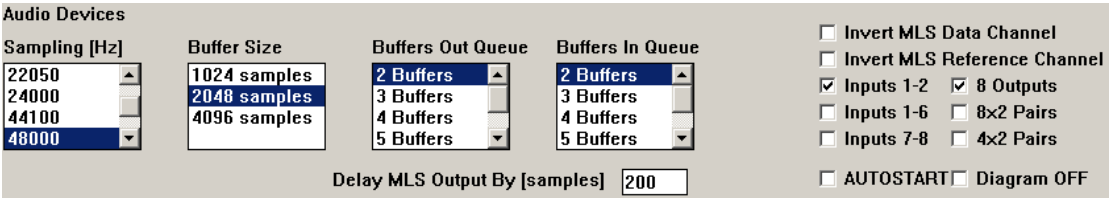


With this settings, UE5 requests DSP on-board audio to be set as 2-inputs and 8-outputs, and settings are matched.

On Windows7/64bit computer with the P6X58DE motherboard, the following needs to be adjusted:

http://www.asus.com.au/Motherboards/Intel_Socket_1366/P6X58DE/

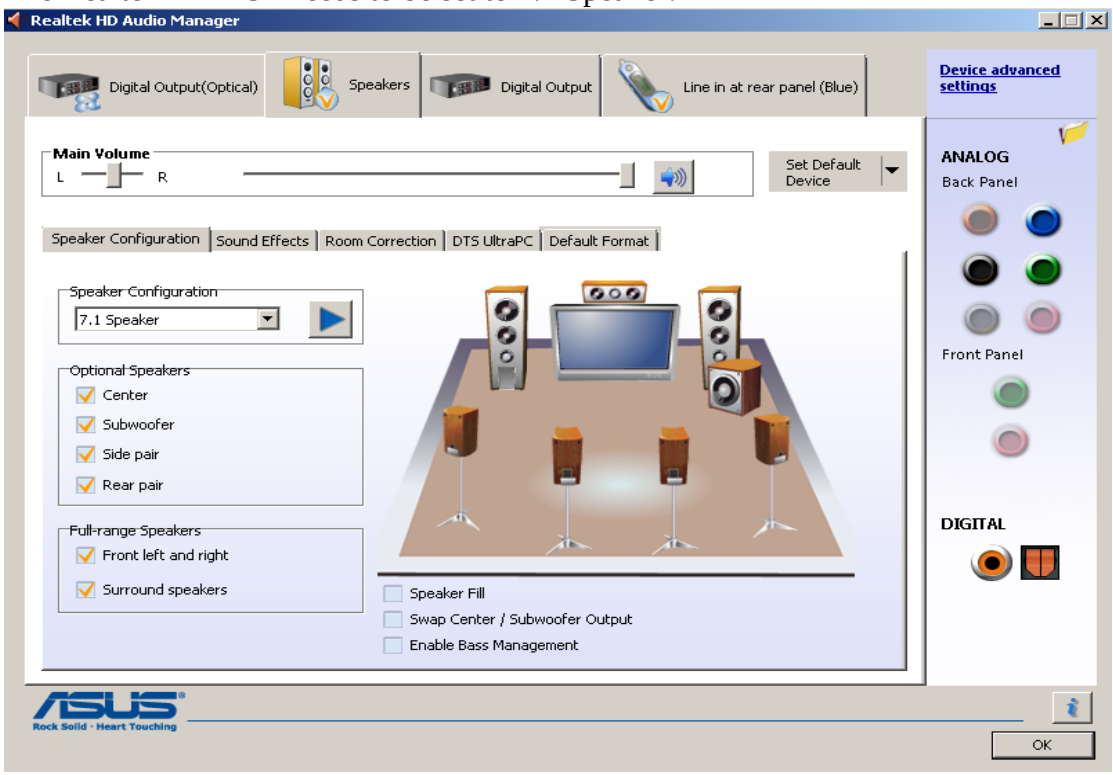
The UE5-MME Preferences screen is shown below. Here, you need to select inputs as “Input 1-2”, and outputs at “8 Outputs”. Buffer Size is set to 2048/4096 samples and sampling frequency to 48kHz. There are 2-4 buffers allocated for input and 2-4 buffers allocated for output processing in the UE Preferences screen.

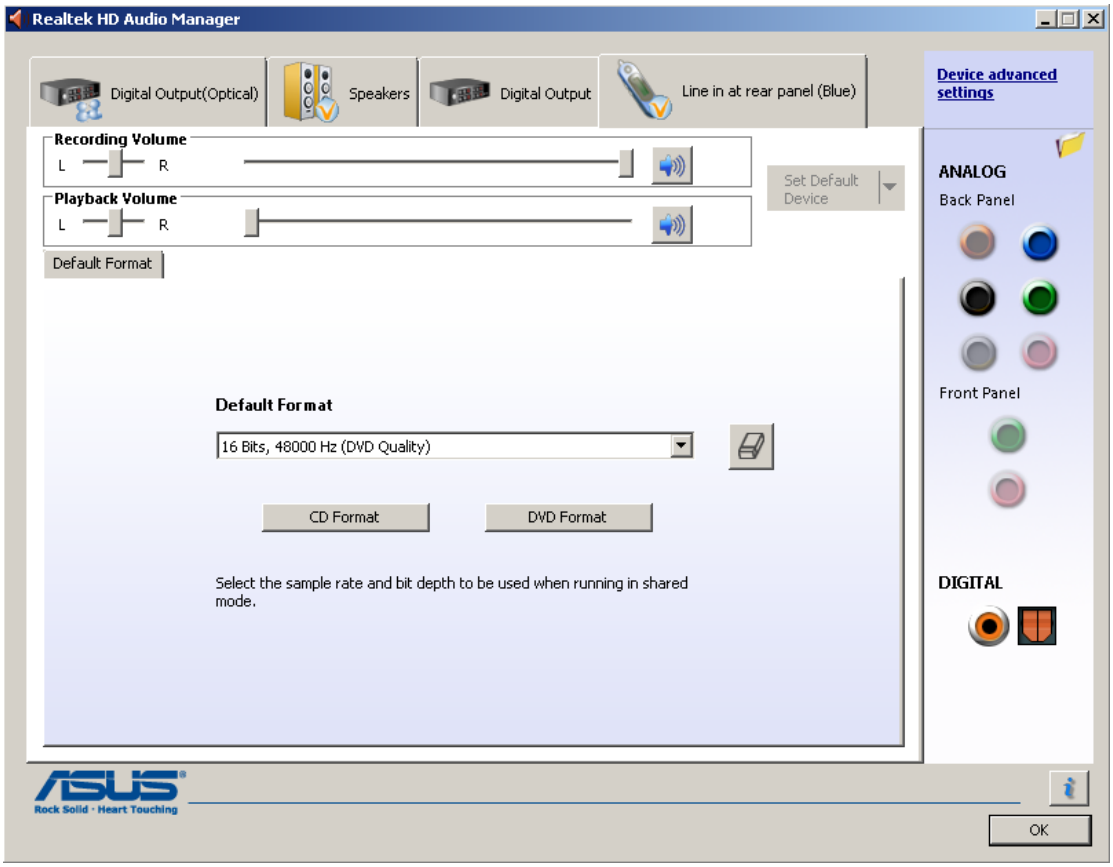


Sound card selection is very simple: for the preferred Input device highlight “Line in at rear panel (Blue)“, and for the output select “Speakers [Realtek High Definiti,…]“.

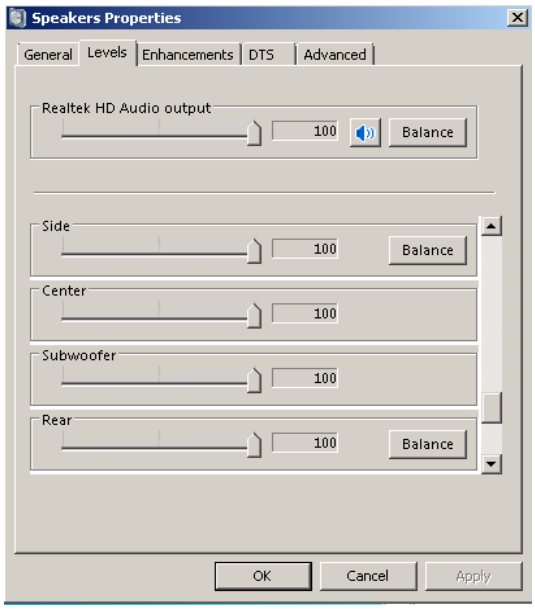
The DSP codec implemented on this motherboard is ALC889A, and all important settings are shown below:

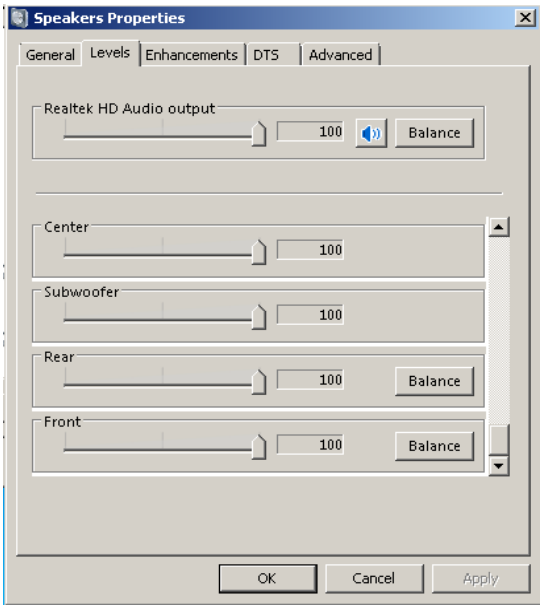
The Realtek HD DSP needs to be set to 7.1 Speaker.





The Front, Rear, Subwoofer, Centre and Side sliders in Mixer – all need to beset to maximum value – see below.



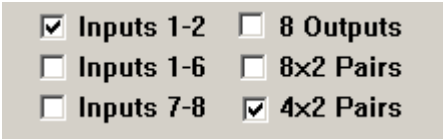


All other sliders need to be turned down to 0, to avoid signal feed-through.

The Realtek HD DSP codec implemented on the motherboard allows for 2 inputs and 8 outputs. Therefore, this solution will fit a 2 x 4-way stereo system. All 8 outputs are time aligned by the codec, so no additional efforts need to be made to synchronize them.

UE5-MME – supporting multi-channels sound cards with WDM/MME drivers

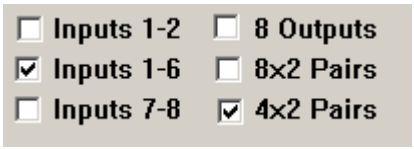
A typical sound card with 2 inputs and 8 outputs (presented as 4 pairs of stereo pairs) can use the following Preferences settings.



Buffer Size is set to 2048/4096 samples and sampling frequency to 48kHz. There are 2-4 buffers allocated for input and 2-4 buffers allocated for output processing in the UE Preferences screen.

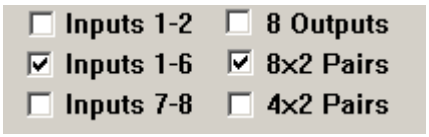
An example of such a sound card would be Marian GmbH Trace8.

If your sound card supports 8 inputs and 8 outputs (presented as 4 pairs of stereo pairs), and they are time aligned, you can connect 5.1HT signal lines (that is 3 stereo pairs) into the sound card for processing. Preferences settings are shown below.



An example of such a sound card would be again Marian GmbH Trace8.

Finally, if your sound cards could possibly be synchronized via an internal, proprietary bus, and this way you could extend the number of inputs and outputs to 16.



In the example above a 5.1HT signals are connected to 3 pairs on inputs (1+2, 3+4 and 5+6) all 8 pairs of outputs from two sound cards are used to create rather large crossover. An example of such an arrangement be again 2 x Marian GmbH Trace8.

UE5-MME Buffer settings

It is recommended to use UE5 buffer size setting of 2048 or 4096 . Number of input buffers and output buffers should be adjusted for the lowest latency, for which there is no perceptible sound degradation (no clicks or pops).

UE5-MME Latency

With UE4-MME buffer size of 2048 and two input buffers and two output buffers, the latency is around 270ms.

Conclusions

The MME version of Ultimate Equalizer is also specifically designed for users, who want to familiarize themselves with fully-equalized, linear-phase loudspeakers while being on the budget.

The motherboard DSP audio is already there, ready to be used, so this approach does not require any additional costs. You can start measuring drivers,

setting-up the UE for driver equalization and even use RoomEQ, as part of your learning curve into this exciting technology. Achievable audio quality is on par with a hi-fi CD-player http://www.bodziosoftware.com.au/Computers_SNR.pdf

Second important attribute of this release is the ability to work with WDM/MME sound cards presenting themselves as a bunch of input/output channel pairs. If the sound card driver is capable of synchronizing all output DACs, this system will work as a DSP-crossover and will deliver excellent audio. In addition, having motherboard audio free to use with Windows Media Player (or JRivers Player) you can use SPDIF link to create full-digital 96kHz/24bit audio server with loudspeaker management system provided by UE4-MME.

Finally, there is the Marian GmbH family of sound cards, that can now be used with Ultimate Equalizer. An excellent quality system can be built using 2 x Trace8 sound cards. The advantage of such solution is balanced inputs and balanced outputs of the Trace8 card. This will minimize (or eliminate) ground loops, and will interconnect well with other balanced studio equipment.

Disclaimer:

At the time of this release (August, 2013), Marian GmbH Trace8 sound card appears to have a bug in the driver software (Driver for Windows7/64bit – version 1.08). The bug affects the recording functionality of the sound card. Bodzio Software is cooperating with Marian GmbH to resolve this problem.

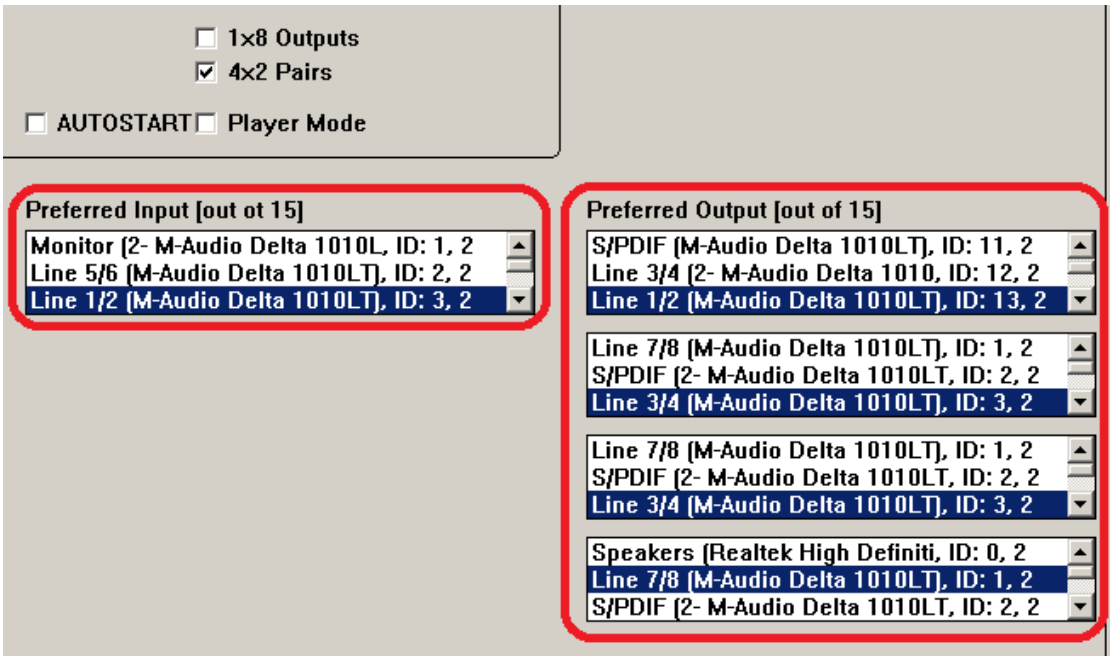
Ultimate Equalizer V5 “Lite” – universal MME version

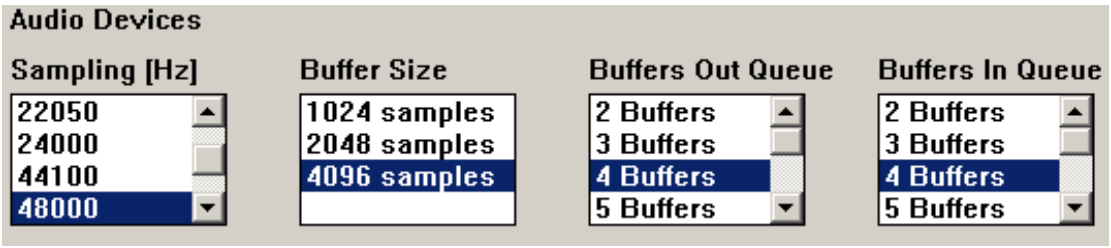
Ultimate Equalizer V5-MME Lite version is a “lighter” version of UE5-MME. It exhibits the following characteristics:

1. 2in/4out, 2in/6out and 2in/8out channel configuration with motherboard or sound card capable of processing 2 inputs and 8 outputs. For example: Delta410.
2. It is a single-core software, that does not require new, multi-core CPUs.
3. Runs on WinXP SP2.
4. Tested on Pentium 4 CPU, 2.6GHz with 512Mb RAM. CPU usage for 2in/8out options was 67%. The processing time, Pt = 53.
5. Runs on older sound cards such as Delta410 – tested with driver version 5.10.00.0026. Sampling 48kHz and buffer size 256 or 512 samples.

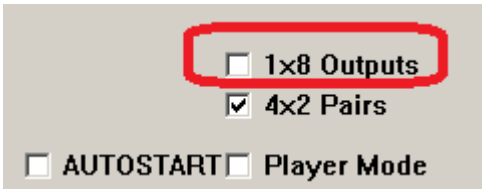
Typical UE5-MME-Lite preferences configuration would be as follows:

1. Sampling 48kHz
2. Buffer size = 4096 samples
3. 4 Input buffers
4. 4 Output buffers
5. Input Audio Devices selected as “1/2”.
6. Output Audio Devices selected as “1/2” + “3/4” + “5/6” + “7/8” lines





Some MME-type sound cards allow you to select all outputs at once, and provide such multichannel device as a single entity. This may be beneficial to you, as in this configuration, all 8 outputs would be time-aligned. In this case, the correct output selection in UE5 Preferences screen is shown below.



A typical Bar Graph display of input and output levels would look like this: