

Configure Windows Sound Output for BEE Systems software

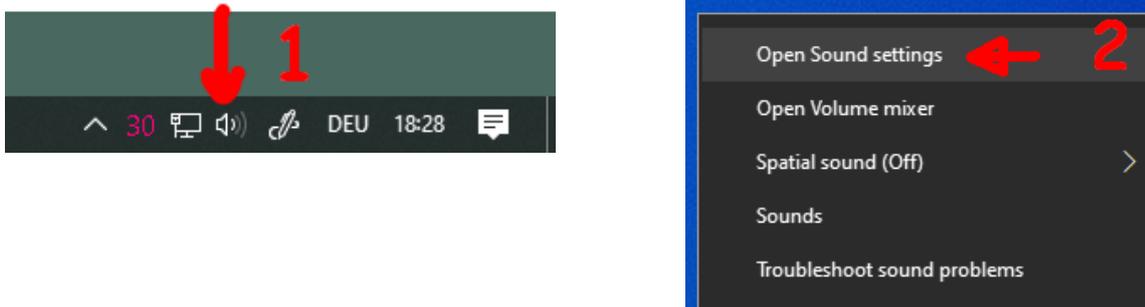
Windows Sound Settings for Cygnet, BEE Lab and ERPrec

Modern computers can have many different sound outputs. For example: built-in speakers, headphones, or the speakers in the 2nd screen. The operating system tries to make the use of the computer user friendly and tries to guess which device shall be used for sound output. When we plug in the 2nd screen, and the computer detects that it has built-in speakers, it assumes that we want to use these speakers. This is usually the case! So, it is ok that it switches to this way of sound output.

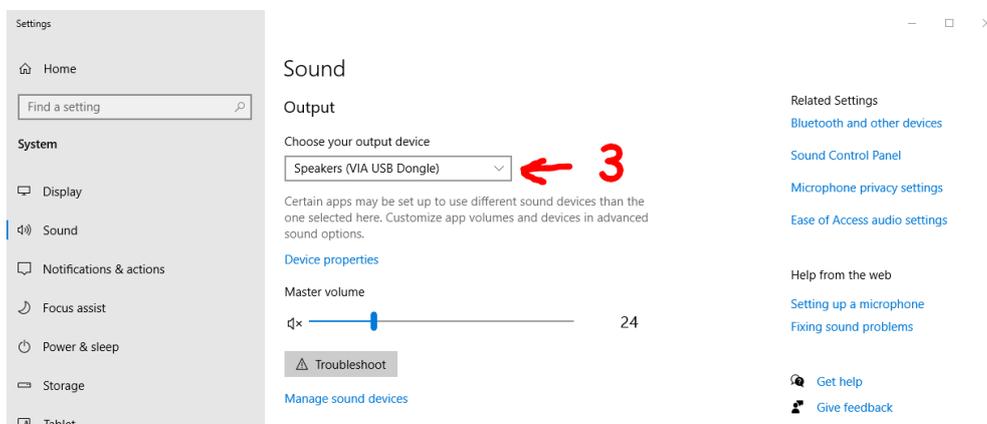
Check or change default sound device

But, in some case, we may want to use another output, e. g. the headphones output. So, we must tell the computer to use that output. Now, some computers are able to detect that we plug a cable into the headphones jack, and then ask if that output shall be used, or automatically switch to that.

So, best is to first connect the 2nd screen, then the audio cable. Maybe the computer recognizes this configuration and will do it right. it will be good to check, though. For that, right-click on the little speaker symbol (1) at the right end of the task bar (where the small clock is) and select “Open Sound settings” (2):

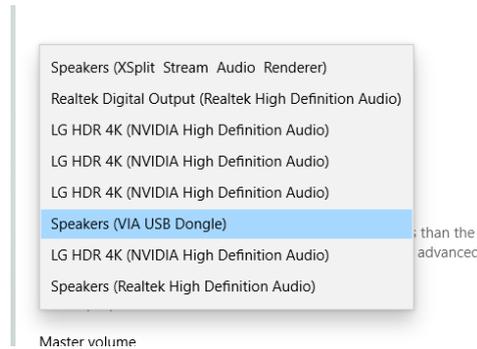


Now, the sound settings window appears and it shows which sound devices are used for sound “Output” and “Input” - we are mainly interested in the sound “Output” device (3).



To see which other sound output devices are available and/or to change it, click to the currently displayed output device (3).

Some computers may offer many options like in this example:



Here, we see that the computer system uses four monitors (“LG HDR 4K”), each of which has built-in speakers. Furthermore, the system has an USB sound device (in the picture marked blue), and the two internal sound devices “Speakers (Realtek High Definition Audio)” and “Speakers Digital Output (Realtek High Definition Audio)”.

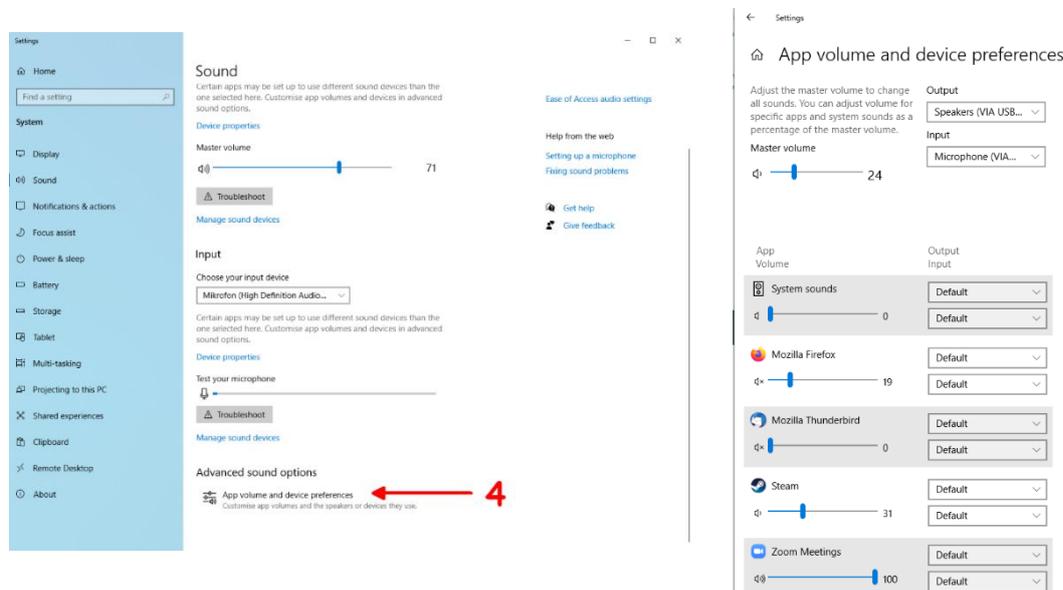
Cygnnet & BEE Lab: For most feedback animations in Cygnnet and BEE Lab, we want to select the sound output device that shall play the feedback sounds and music of the animation that is shown on the client screen.

ERPrec: In ERPrec, we need to select the sound output where we connect the cable that feeds the sound to the Sync Box, where we have the PC speakers or headphones connected to. Usually this is the internal sound device (“Speakers (Realtek High-Definition Audio)” in the example above)

So, if the sound does not work as expected, it is best to use the procedure described above to check that the correct sound output device is set and, if necessary, replace it with a more suitable device from the list.

Application-specific sound device

Windows can do even more: It can route the sound of specific applications to any sound device. The controls for that are in the same dialog window as shown above, just scroll a bit further down (4):



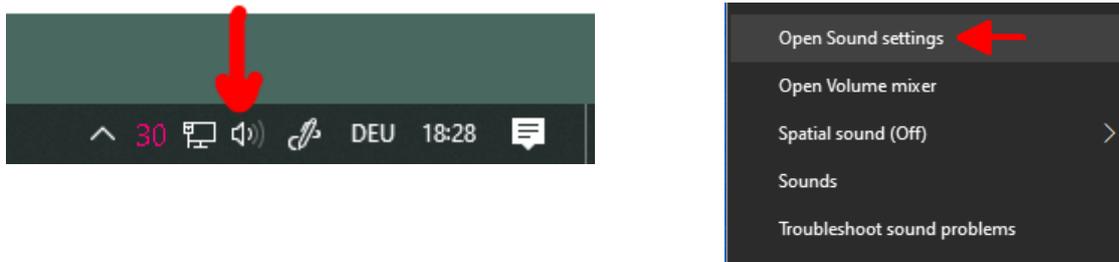
Here, any active sound source will show up, and we can assign a sound device to it. Windows will remember this setting:

So, we can, for example route the sound for Alpha Theta Reflections or Synchrony to the headphones jack, while the other games are played on the client screen’s speakers. System sounds could be routed to the built-in speaker of the computer.

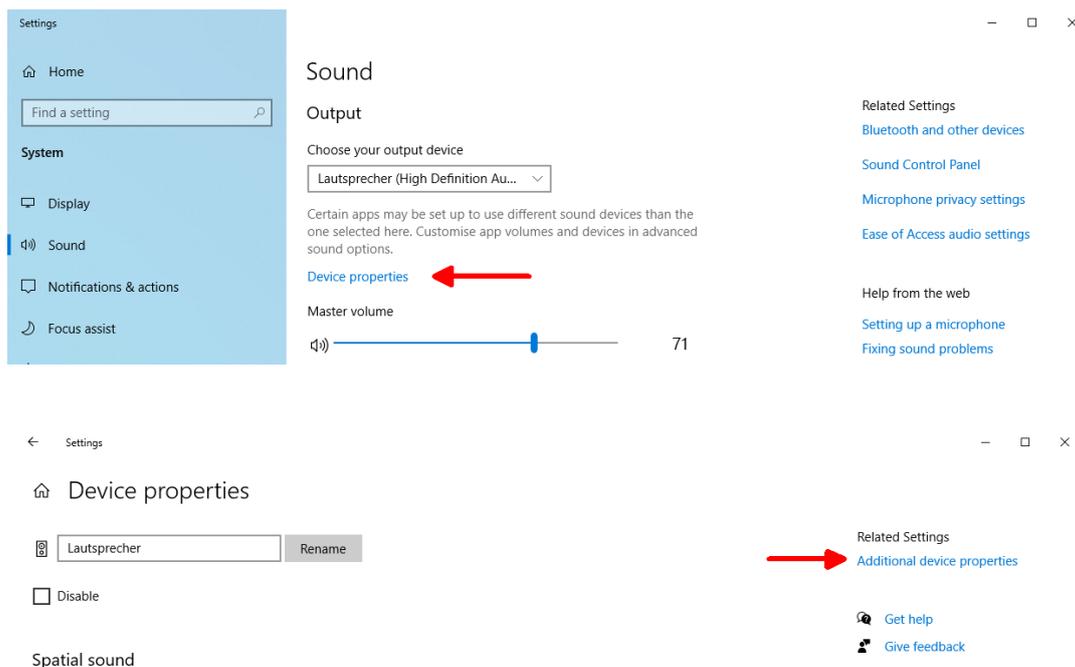
Important: Disable Sound Enhancements of audio device

ERPrec: For the Event-Related-Potential (ERP) recording functionality in ERPrec, it is important that the timing of auditory and visual stimuli is aligned. During every self-test, the software determines the actual timing and perform adjustments as needed. In some Windows versions, so-called “Sound Enhancements” are turned on by default. However, such “Sound-Enhancements” may add an audio delay that cannot be compensated by the real-time stimulus engine of ERPrec. Therefore, **all “Sound Enhancements” features need to be turned off!**

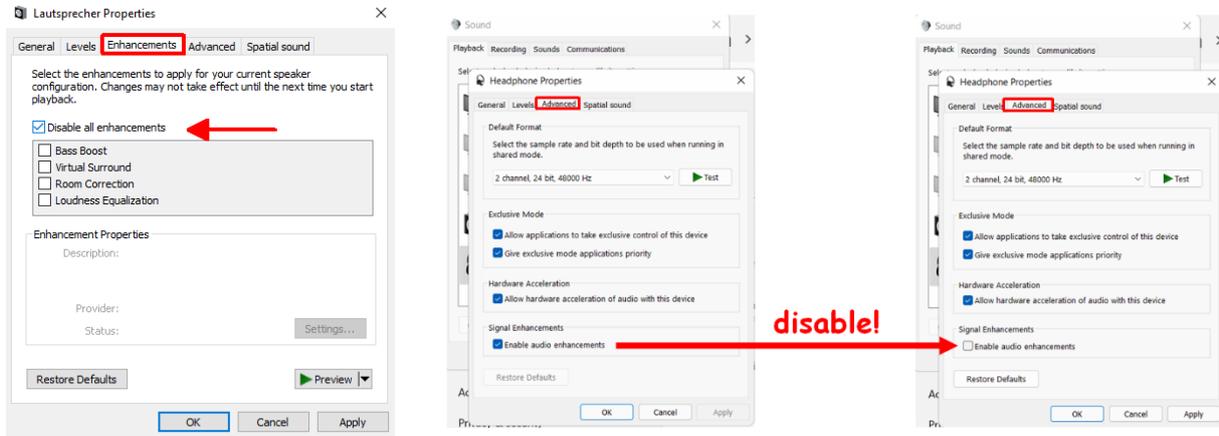
To do so open (again) audio settings by a right-click on the speaker symbol and select “*Open Sound settings*”:



In the “*Output*” sound device settings, we are mainly interested on the “*Device properties*” -> “*Additional Device properties*”:



The dialog that now opens may look different for various sound devices. Just click through all tabs – especially the “Enhancements” and “Advanced” tabs - and make sure to disable/deactivate all functions that are labelled “enhancements”:



In ERPrec, the sound calibration was successful, if the delay shown in the file “delay.log” is between -16 and -110ms. Typical values are around -50 to -80ms.