

DisplayPort Audio User Guide

The DisplayPort interface is used to connect computers and displays. The interface can include audio signals in the same cable as the video signals. In addition, most DisplayPort Sources (computers) support dual-mode, where DVI or HDMI signals can be sent from the DisplayPort connector using a low-cost cable adaptor. DisplayPort dual-mode Sources and adaptors may be marked with the “DP++” icon.



DisplayPort dual-mode icon

About this guide:

This guide provides information about DisplayPort systems and adaptors for the purpose of enabling audio capabilities. The information presented is representative of typical computers and operating systems but does not cover all possible combinations. The most up-to-date information can be obtained from the hardware manufacturer. For more information about DisplayPort visit www.displayport.org. This guide is presented for information only; no warranty or fitness for use is expressed or implied. VESA assumes no liability resulting from the use of this information.

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Enabling DisplayPort Audio

There are three components needed to enable DisplayPort audio:

A graphics output device (PC or laptop) that supports DisplayPort audio and/or dual-mode with audio.

A Sink device (display) that supports audio playback. For example, a DisplayPort monitor with speakers or a television with HDMI input if using dual-mode.

A dual-mode cable adaptor if using a Sink device with HDMI input.

The graphics output device i.e. graphics chip drives the DisplayPort output. That means that the graphics device has to send the audio signals along with the video signals. The first step in enabling audio is to determine that the graphics hardware and driver support this function.

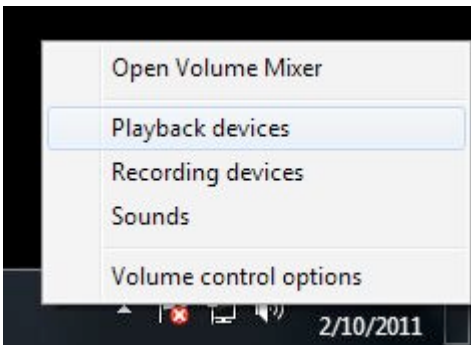
In the following examples, typical devices are shown. Your system may have different devices. For example, in the sample shown below, your system may have other hardware instead of Conexant Audio.

To determine if your graphics adaptor has an audio driver installed, follow these steps:

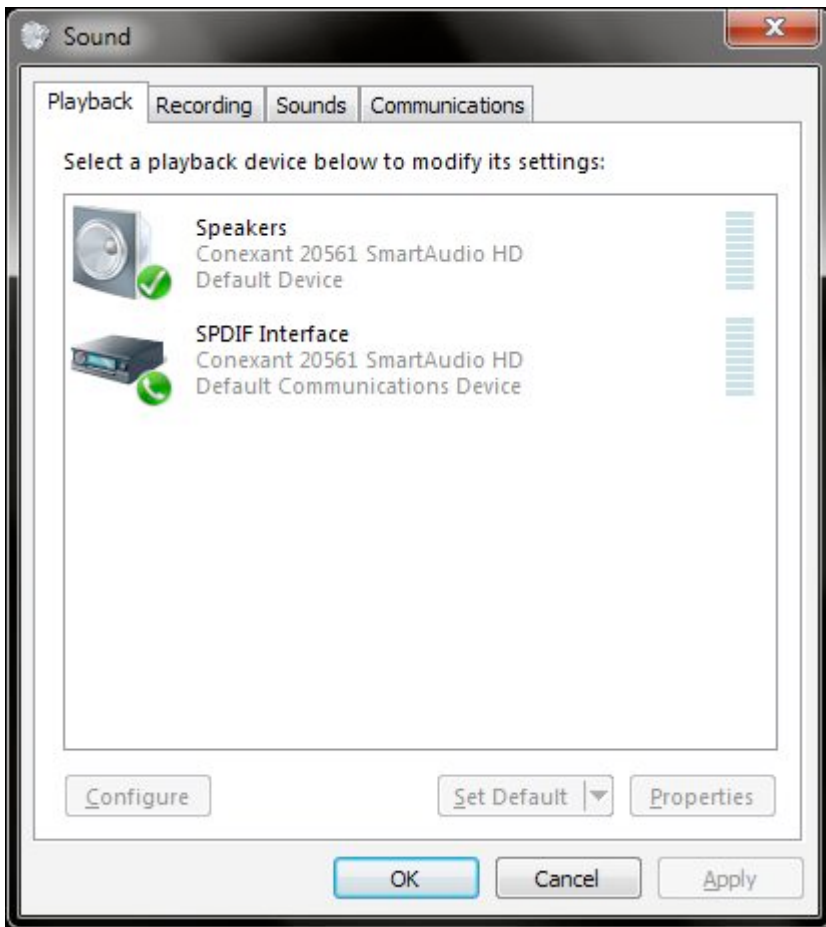
Windows Vista and Windows 7, AMD example:

Check that the latest graphics drivers for your system are installed before proceeding.

Right-click the speaker icon in the lower right corner of the Desktop and select "Playback Devices"

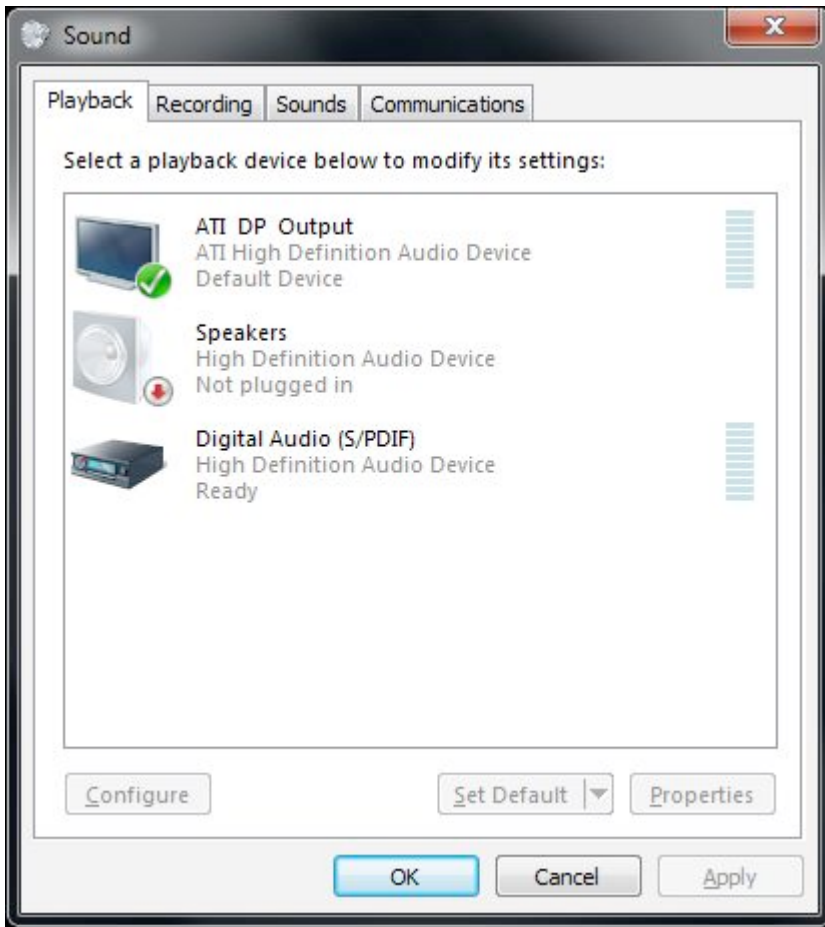


If no hardware or driver support for DisplayPort or dual-mode audio is present, the dialog box looks like this:



Note that there is no option for DP or HDMI output.

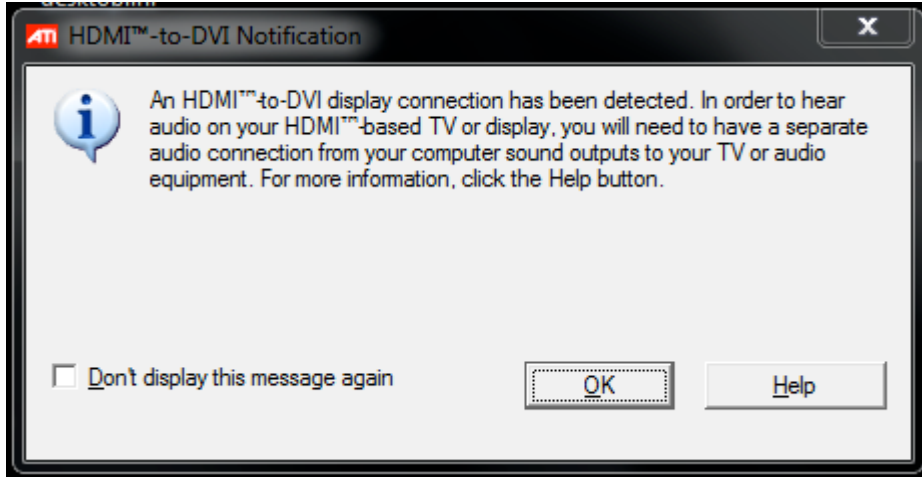
In the next example, the hardware and driver do support DisplayPort audio. In the Sound dialog box, note that “ATI DP Output” is selected. In this example, a display that supports DisplayPort audio is connected, and the operating system has automatically selected it as the preferred playback device.



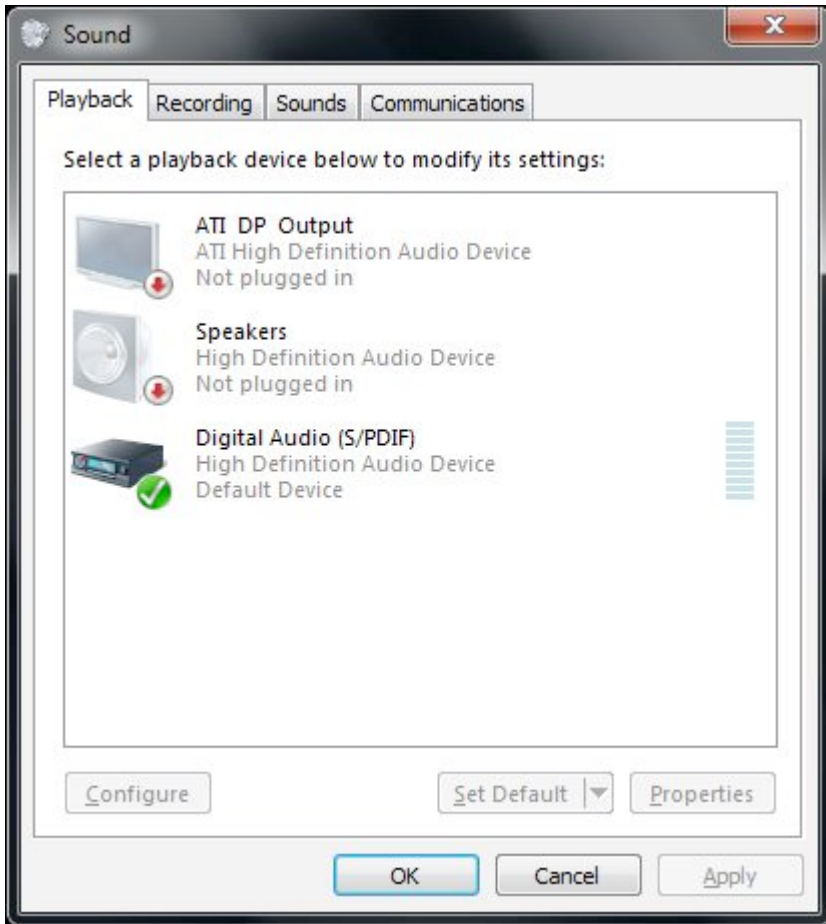
Cable Adaptors and HDMI ID ROM

Cable Adaptors that are DisplayPort dual-mode to HDMI should include a device that identifies the adaptor as an HDMI-output device. This device is called the HDMI ID ROM. When a cable adaptor is attached, the graphics driver reads the device to see if the ID is present. Some cable adaptors with HDMI outputs do not have this ID. When that happens, the graphics device assumes the adaptor is DVI and does not send audio to it. DVI devices do not support audio over the DVI interface.

The following dialog box appears when an AMD driver detects a cable adaptor without the HDMI ID ROM:



In the Sound dialog box, the ATI DP Output shows “Not plugged in”:

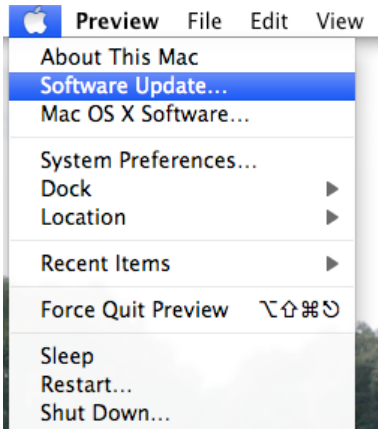


This shows that, while the hardware and driver support DisplayPort audio, there is no display or adaptor with audio connected.

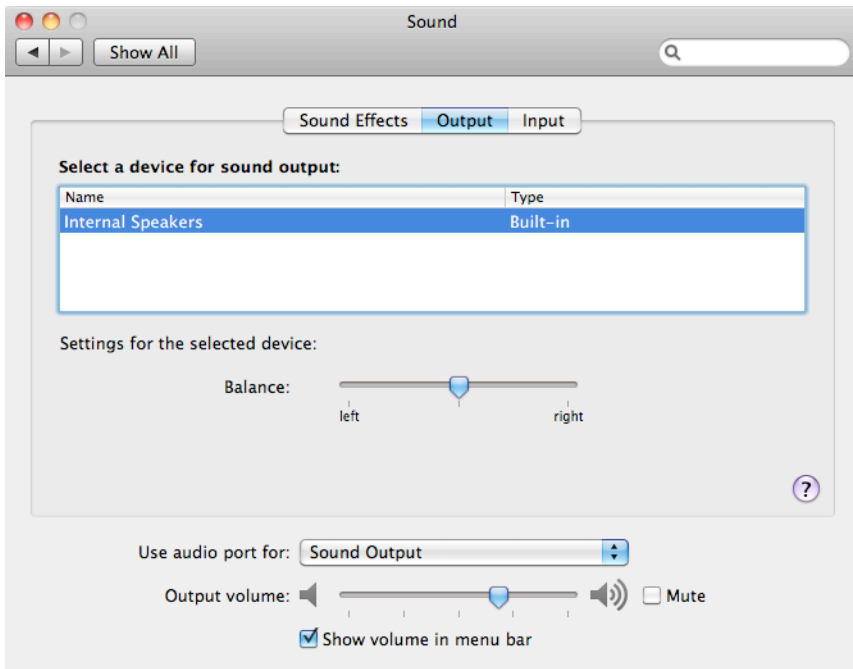
Apple Products:

Check that the system software is up to date before proceeding.

Click the Apple icon (upper left corner of the display), then System Preferences, Sound, and click the Output tab:

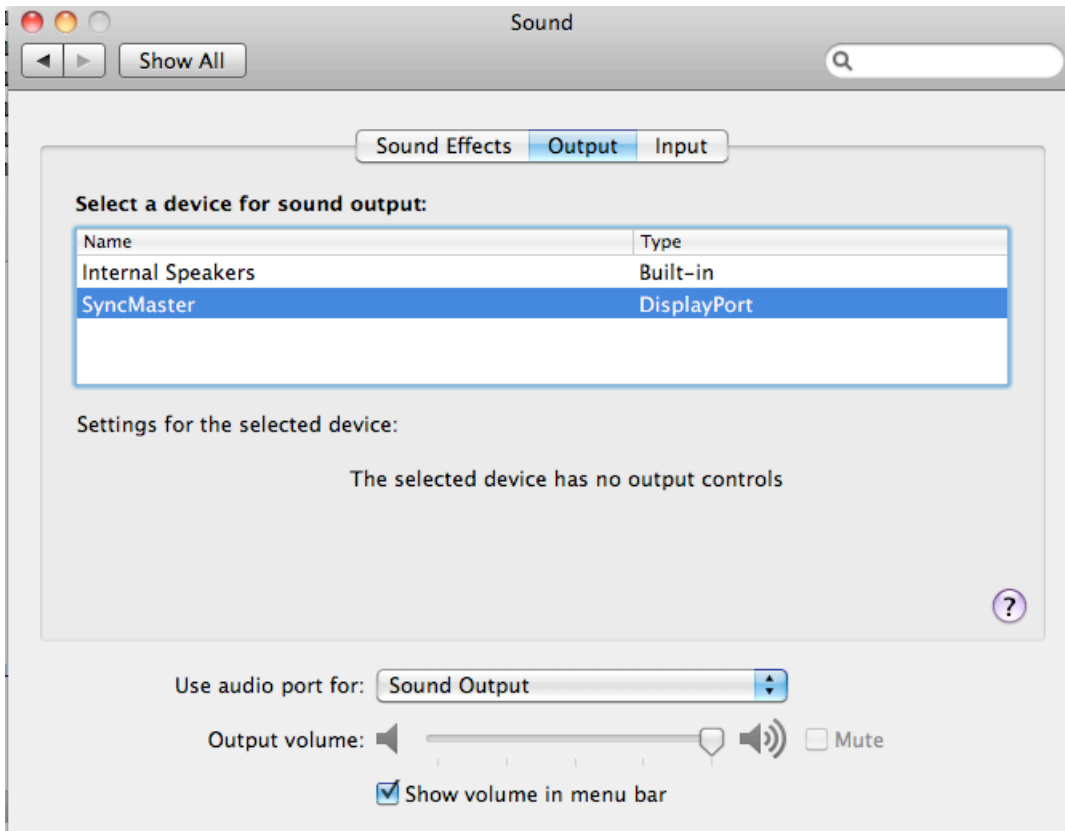


If no hardware or driver support for DisplayPort or dual-mode audio is present, the dialog box looks like this:



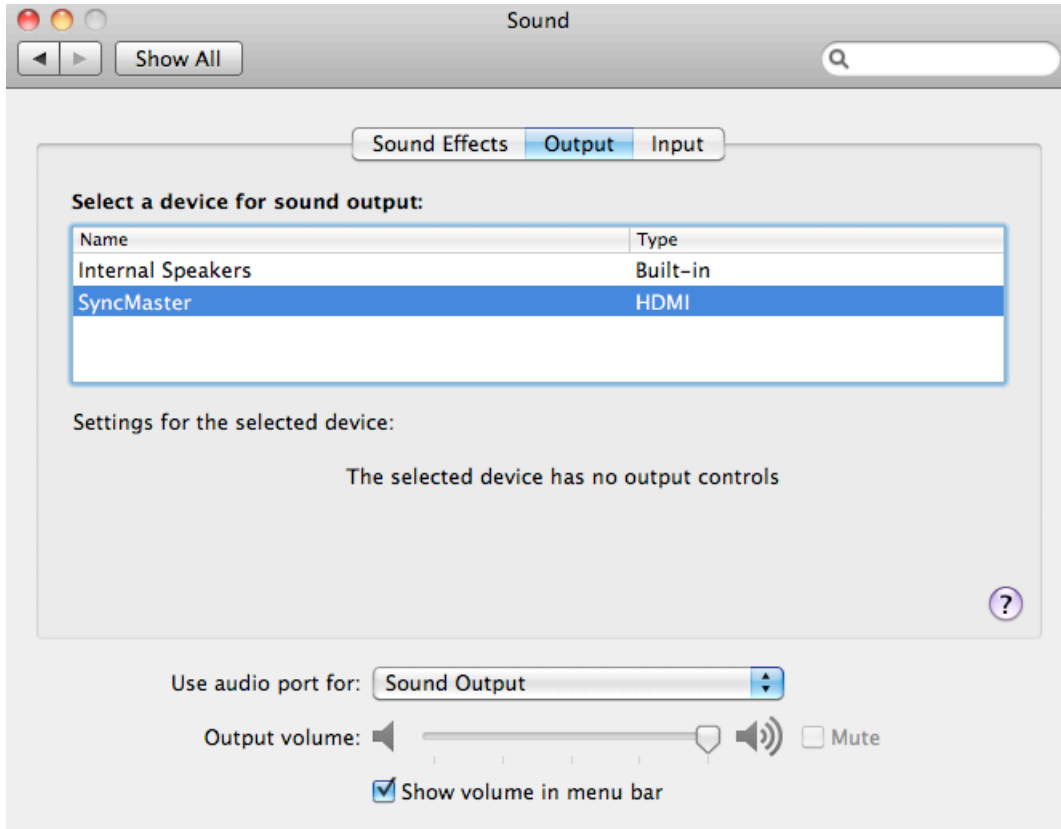
Note that there is no option for DP or HDMI output.

In the next example, the hardware and driver do support DisplayPort audio and a display that supports DisplayPort audio is connected. Note that “Sync Master” with “Type DisplayPort” is selected. The operating system has automatically selected it as the playback device.



Cable Adaptors

If a Cable Adaptor that does not have ID is connected, then the dialog box will be the same as the example above where audio is not supported. If a cable adaptor with ID is connected, and a display that supports audio, i.e. a DP-to-HDMI cable adaptor and a TV with HDMI input, then the following will be seen. Note that the “Type” is now “HDMI”:



Windows XP, Intel example:

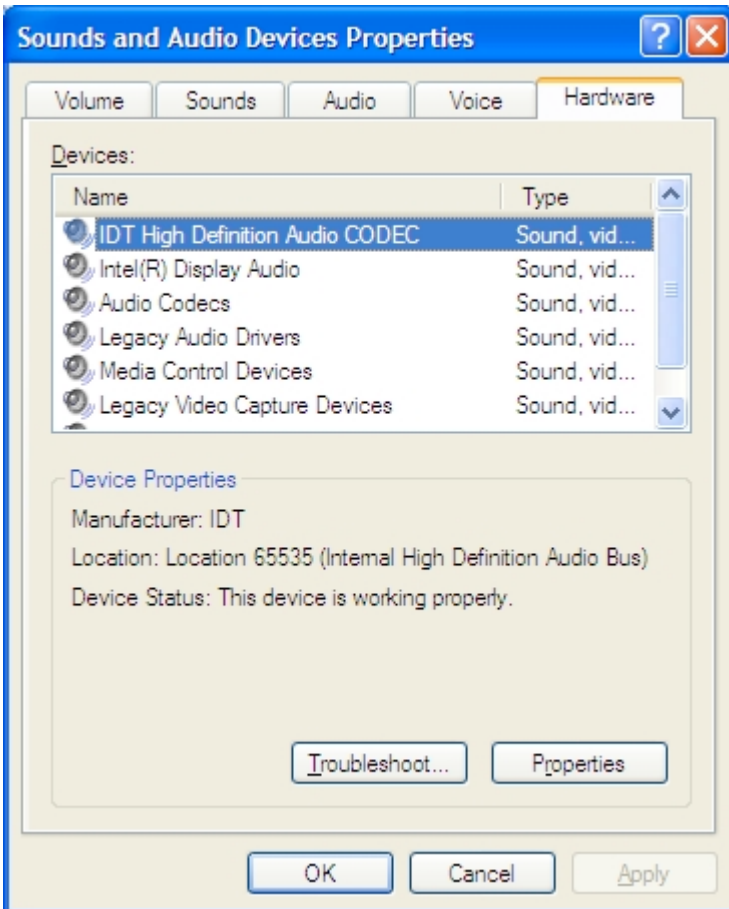
Note: Intel products support all current versions of Windows operating systems. This example illustrates the differences between Windows XP and other operating systems.

Check that the latest graphics drivers for your system are installed before proceeding.

Right-click the speaker icon in the lower right corner of the Desktop and select “Adjust Audio Properties”

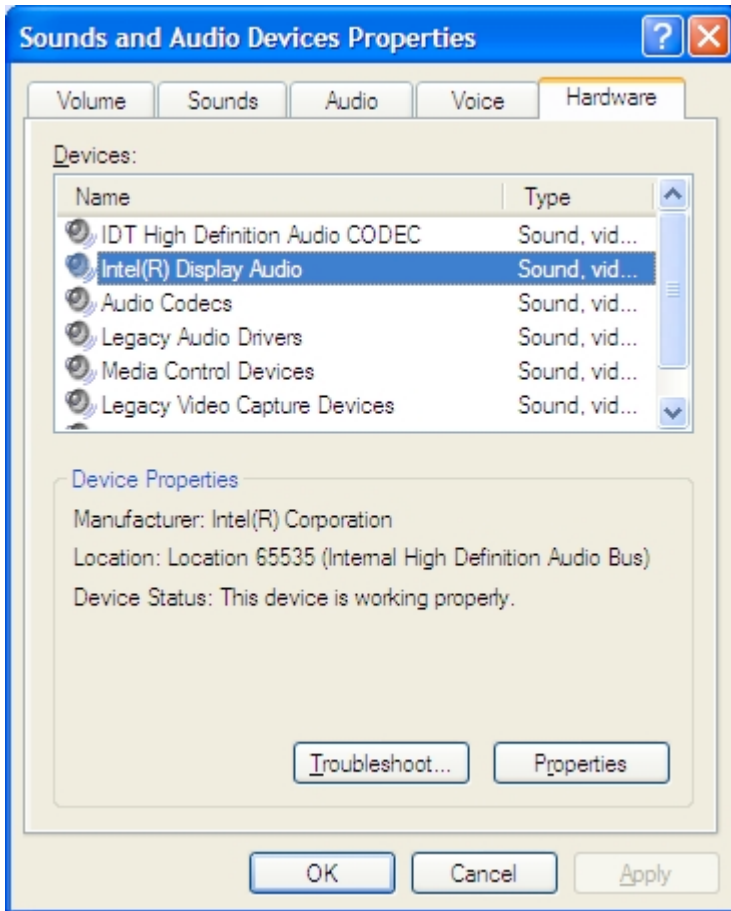


If no hardware or driver support for DisplayPort or dual-mode audio is present, the entry in the dialog below “Intel(R) Display audio would not be present.



Note that IDT High Definition Audio CODEC is selected as no external audio device is connected.

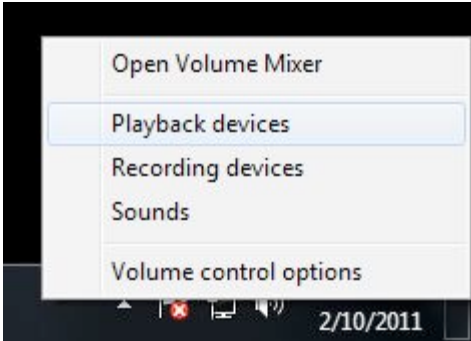
In this example, a display that supports DisplayPort audio is connected, or a cable adaptor and an HDMI display are attached and the operating system is set to use it as the preferred playback device.



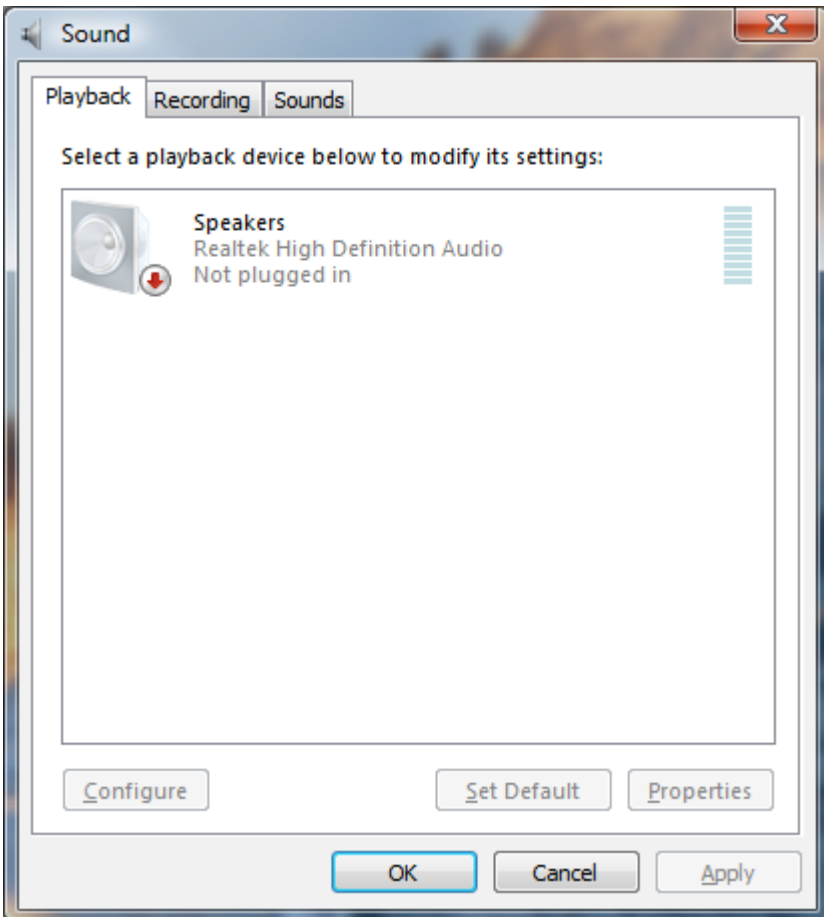
Nvidia on Windows 7:

Check that the latest graphics drivers for your system are installed before proceeding.

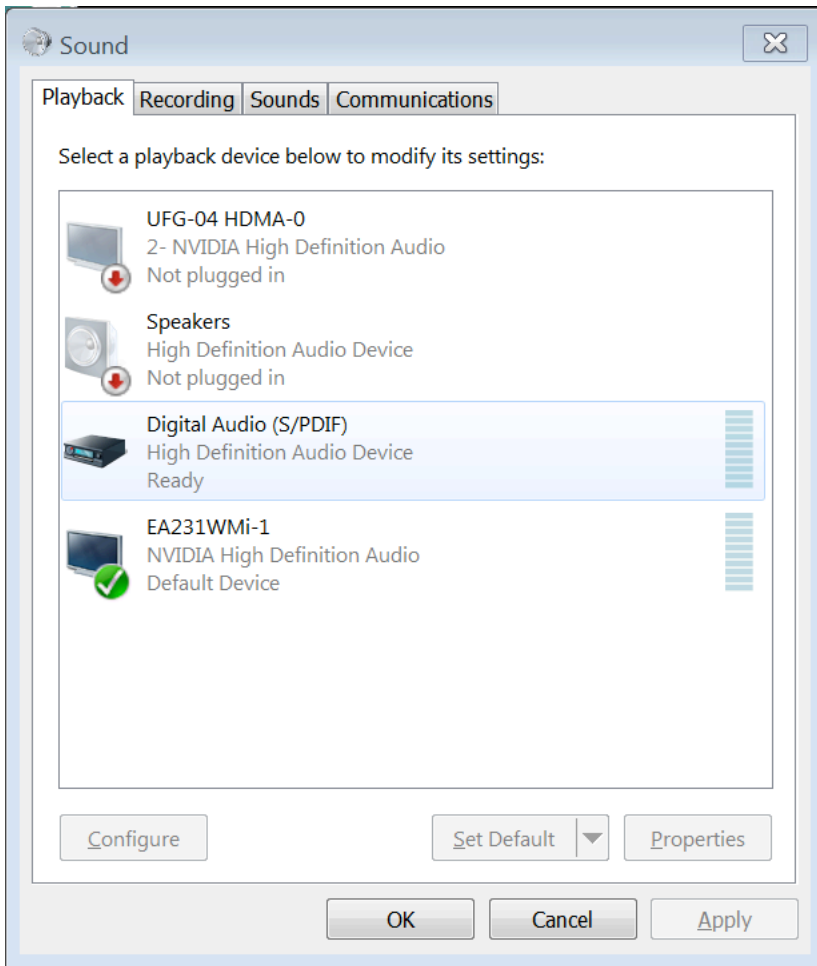
Right-click the speaker icon in the lower right corner of the Desktop and select “Playback Devices”



If no hardware or driver support for DisplayPort or dual-mode audio is present, the dialog box looks like this:

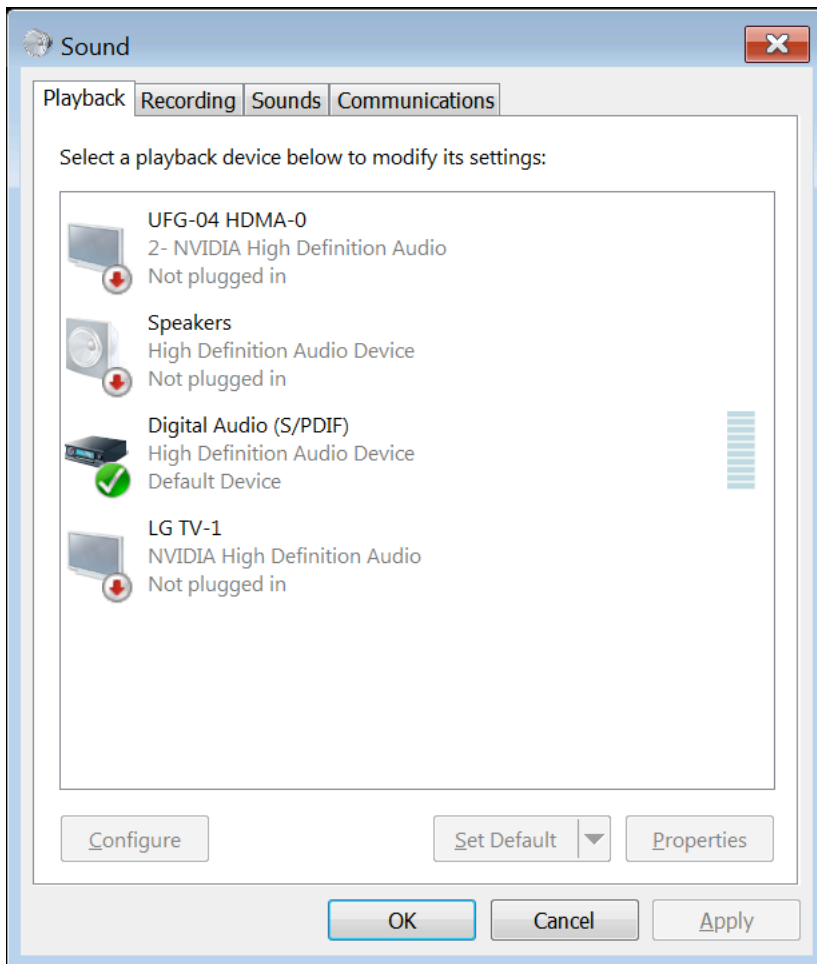


In the next example, the hardware and driver do support DisplayPort audio. Note that “Nvidia High Definition Audio” is selected. In this example, a display that supports DisplayPort audio (EA231Wmi-1) is connected, and the operating system has automatically selected it as the preferred playback device.

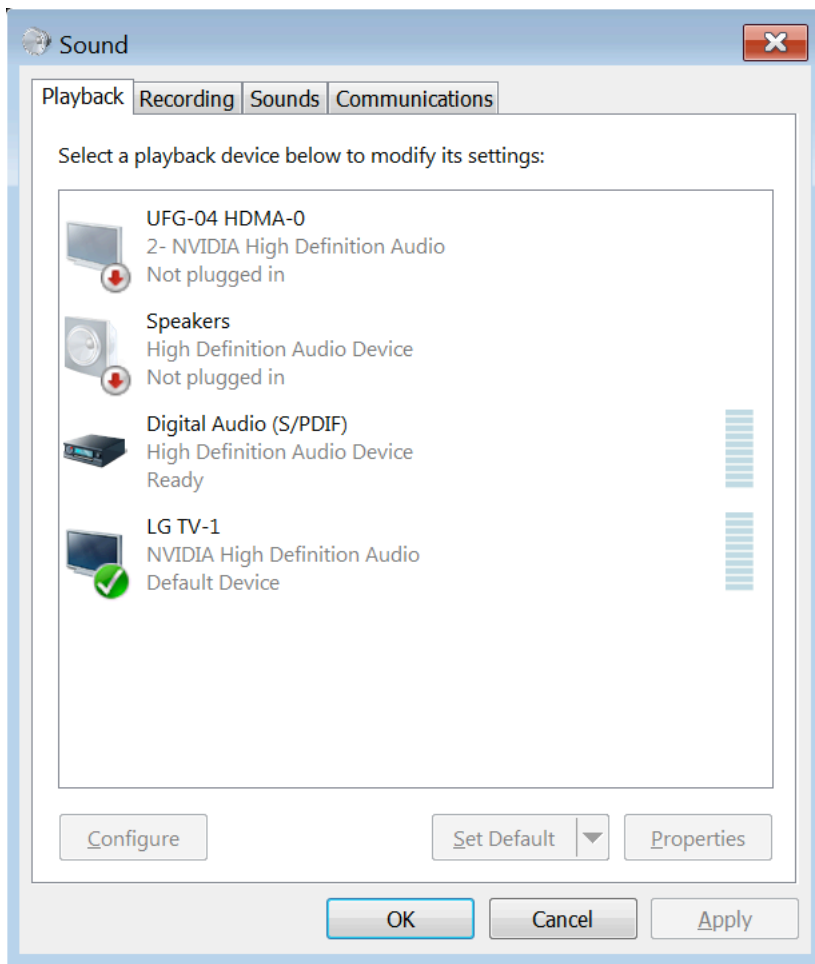


Cable Adaptors

If a cable adaptor without HDMI ID ROM is connected, audio will not be routed to the adaptor. Note that the TV, LG-TV1, is connected but audio is not being sent to it.



Connecting a cable adaptor that does have the ID to the same television, the system will route audio to the TV:



Does the Sink device have DisplayPort audio?

Following the guide above, if the Sink device is connected but DisplayPort audio is not enabled, then the Sink device is not reporting to the Source that audio is supported. This can be due to a cable adaptor that does not have HDMI ID ROM, or a display that does not have audio capability. Check the user manual first and then contact the sink device manufacturer to see if the Sink has audio support.

Troubleshooting:

If you follow the steps above and still cannot get audio from your Sink device, try the following:

Check the user manuals first and then contact the device manufacturers and ask if they support DisplayPort and/or dual-mode audio.

Check that you have the latest graphics driver installed. Check for a DP or HDMI device in the Playback devices dialog.

Try substituting devices. For example, if you are using a television and a cable adaptor, check the television input by connecting a DVD player or other HDMI Source.

Try a different cable adaptor. Many of the generic cable adaptors in the market do not have the HDMI ID ROM.

If using a DisplayPort monitor with audio, check that audio is enabled and not muted. Some monitors allow selecting the audio source. Check that DisplayPort is selected.

FAQ:

Do all DisplayPort Sources support audio?

No. Audio support is an optional feature. Some early DisplayPort Sources did not implement audio support. Almost all newer devices support both DisplayPort audio and dual-mode with audio. Some laptop computers have “switchable graphics” where the laptop can use on-board graphics for lower power consumption and switch to discrete (add-in) graphics hardware for higher performance. Some switchable graphics drivers do not support audio, even though the hardware does.

Do all DisplayPort Sources support dual-mode?

No. Dual-mode support is an optional feature. Most, but not all, systems do support it. Check the user manual first and then contact the manufacturer to see if your system has this feature.

Does the mini DisplayPort connector support audio or dual-mode?

Yes. The mini DisplayPort connector has all of the same signals or wires as standard DisplayPort, just in a smaller connector. As with standard DisplayPort, most, but not all, Sources support audio and dual-mode.

Do I need a special cable to use DisplayPort audio?

No. DisplayPort audio works with standard cables.

What is the difference between DisplayPort audio and dual-mode?

DisplayPort audio is “native” audio that is carried with the DisplayPort video signal. Dual-mode is a special operating mode where the DisplayPort Source can send DVI or HDMI signals through the DisplayPort connector. To use a dual-mode Source with an HDMI or DVI Sink, a cable adaptor is required.

Some cable adaptors are low cost, others much higher. What’s the difference?

Cable Adaptors for dual-mode are simple level shifters that adjust the voltage of the dual-mode signal. DisplayPort active protocol converters are devices that receive a DisplayPort signal on their input and convert it to DVI or HDMI on their output. These devices are more complex, hence the higher cost. A converter should be used when the Source device does not support dual-mode.

For more information about DisplayPort and a list of Certified Devices, visit www.displayport.org