USB Audio 2.0 Driver for Windows - Overview

The XMOS USB Audio firmware supports both USB Audio Class 1.0 and USB Audio Class 2.0. Operation with a USB Audio Class 2.0 host is preferred because of its extended feature set and use of USB 2.0.

However, Windows only provides support for USB Audio Class 1.0. To use a USB Audio Class 2.0 device under Windows requires a driver.

XMOS therefore provides a free Windows USB Audio driver for evaluation and prototyping, a free stereo-only driver for production, and a path to a more feature-rich multichannel production driver from Thesycon.

Windows USB Audio 2.0 driver comparison

		Evaluation / Prototyping	Production	
		Evaluation Driver	**XMOS Stereo Driver**	**Thesycon Driver**
Features		USB Audio Class 2.0 & 1.0, asynchronous operation		
Technical	Audio channels	Multichannel in/out	Stereo in/out	Multichannel in/out
	Sample rate	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz, 358.2kHz, 384kHz		
	Sample depth	16[1], 24, 32bit, floating 32bit[1]	16[1], 24, 32bit	16[1], 24, 32bit, floating 32bit[1]
	DSD	Native DSD DSD over PCM (DoP)	DSD over PCM (DoP)	Native DSD DSD over PCM (DoP)
	Clock domains	Multiple	Single	Multiple
	Latency / buffering	Adjustable Down to 3ms round trip	Fixed, safe setting	Adjustable Down to 3ms round trip
	ASIO	ASIO 2.2, multiple clients	ASIO 2.2, one client	ASIO 2.2, multiple clients
	WDM / DirectX	MME, DirectSound, WASAPI		
	MIDI	Yes	No	Yes
	HID	Yes		
	DFU	Yes. Supplied with customizable DFU wizard application		
	OS Support	Windows XP, Vista, 7, 8 & 8.1 (32 & 64bit)		
Customization	PID / VID	XMOS VID XMOS EVK PIDs	XMOS VID XMOS assigned PID, EVK PIDs	Customizable Customer supplied VID & PID
	Branding	Thesycon	XMOS	Customizable splash screen, strings and icons
	Control panel	Yes	Yes (Read-only information)	Customizable SDK with C++ API
	Code signing	Thesycon VeriSign	XMOS VeriSign	Customer supplied certificate
Terms	Cost	Free	Free	License fee
	Restrictions / Licensing	XMOS designs only. Locked to XMOS VID & PIDs. Evaluation and prototyping. Fully featured evaluation version of Thesycon production driver. Beep tones every 5minutes after 60minutes.	XMOS designs only. XMOS VID & PIDs and XMOS assigned customer PID. Available after purchase of at least 150 XMOS devices. Maximum use of 10,000units.	Negotiable. Various licenses available including unlimited and royalty free.
	Support	Standard XMOS support	Standard XMOS support	Thesycon support contract
	Deliverable	EXE driver installer & kit	EXE driver installer	Customization kit
	Available from	xmos.com	xmos.com	Thesycon

1. Feature supported by the driver, but not by XMOS firmware.

Evaluation Driver

The Evaluation Driver is a fully featured evaluation version of the Thesycon 'TUSBAudio' USB Audio 2.0 Class Driver for Windows. The Evaluation Driver is therefore fully USB Audio Class 2.0 & 1.0 compliant, and supports USB high-speed (480Mbit/s) operation.

The Evaluation Driver is available as a free download from xmos.com for evaluation and prototyping purposes only and will work with all XMOS Reference Designs and Development Kits.

Note that the Evaluation Driver provides all the features of the Thesycon Driver but will generate a short beep tone every 5minutes after 60minutes of operation.

For a full description of the Evaluation Driver feature set see the Thesycon Driver section, below.

XMOS Stereo Driver

The XMOS Stereo Driver is based on the Thesycon 'TUSBAudio' USB Audio 2.0 Class Driver for Windows and is available free-of-charge to qualified XMOS customers for prototyping and production runs of up to 10,000units.

The XMOS USB Audio 2.0 Stereo Driver uses the XMOS USB VendorID (VID) and an XMOS assigned USB ProductID (PID); and when compared to the Evaluation/Thesycon driver has a reduced feature set:

- Stereo audio in/out only
- No MIDI support
- Single audio clock domain only
- Only one ASIO or WDN client connection to the driver at any one time

To qualify for access to the XMOS Stereo Driver requires:

- Purchase of at least 150 XMOS devices
- Request the XMOS Stereo Driver, using the XMOS Stereo Driver Request Form

Upon successful acceptance of an XMOS USB PID request, XMOS will assign the product a unique PID and unique GUIDs and will create an instance of the XMOS Stereo Driver. When complete, the finished driver will be made available on a secure section of the xmos.com website, and an automatic notification email containing a download link will be issued.

The XMOS USB Stereo Driver is not customizable. The USB Vendor and Product strings will always appear as "XMOS" and "USB Audio 2.0" respectively and the driver installer retains XMOS branding.

The XMOS Stereo Driver is delivered as an installer executable, which supports: first-time installation, un-installation and update of the driver; all through a wizard-style user interface.

A USB DFU (Device Firmware Update) application is included in the XMOS Stereo Driver installer executable and allows upgrading of the firmware in the XMOS device over a USB connection.

Files installed by the driver have a sequence number appended to them to distinguish them from an install of the same driver with a different PID on the same machine. Multiple products using the XMOS Stereo Driver can therefore co-exist on the same PC. Note that the XMOS Stereo Driver will work with the specific customer product and all XMOS Reference Designs and Development Kits (subject to the feature restrictions detailed above).

The XMOS Stereo Driver license agreement permits distribution the XMOS Stereo Driver to end customers for their use with the specified USB audio product and is valid for production volumes up to 10,000units. If production volumes of the XMOS VID and XMOS assigned PID exceed 10,000units, the XMOS Stereo Driver license agreement requires that an alternative driver solution be sought; for example, the production Thesycon Driver.

Thesycon Driver

The Thesycon Driver is a production version of Thesycon's 'TUSBAudio' USB Audio 2.0 Class Driver for Windows and is only available directly from Thesycon.

The Thesycon Driver is fully USB Audio Class 2.0 & 1.0 compliant, supports USB high-speed (480Mbit/s) operation, implements transparent (bit-perfect) playback and recording data paths, provides an ASIO 2.2 compliant software interface and integrates with Windows as a standard WDM / DirectX compatible sound device. Where the hardware and XMOS firmware provides MIDI features the driver exposes standard Windows MIDI ports.

To meet professional audio requirements, the Thesycon Driver is optimized for low latency and low CPU load. Developers can adjust buffer depths to optimize settings for a given computer.

The Thesycon Driver provides the ability to customize the driver. Customers can create a vendor-specific or product-specific driver package by following a customization procedure. Customization includes specifying a VID and PID, renaming of files and specifying logos and branding for the driver. Several customized driver packages can be installed and used independently on the same machine.

Where a customer creates more than one product, e.g. a product family, there are two options: either a specific package can be created for each product, or one driver package can be created for the entire product family.

A SDK (Software Development Kit) is also available from Thesycon to allow the development of a product-specific control panel, which includes:

- Device driver executables (.sys and .dll files) for 32 bit and 64 bit Windows versions
- Setup information (.inf) files
- Documentation - customization procedure, driver API, etc.
- Visual Studio 2005 C++ source code and project files for a sample control panel implementation
- Driver installer

Prerequisites to using the Thesycon Driver include:

- Customer specific USB VID and PID(s) – contact usb.org
- Customer code signing capability – for example VeriSign

Please contact Thesycon for full details about the production version of the Thesycon Driver; including licensing, pricing and support information.