USB Audio 2.0 MC Reference Design Quick Start

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The USB Audio 2.0 Multichannel Reference Design (XS1-L2 Edition) is supplied with no firmware installed. The following steps explain how to install the latest firmware on the board and use it. Each step is explained in detail in the following sections.

1. Download the latest **USB Audio 2.0 XS1-L2 Software Release** firmware from **http://xmos.com ▶ MyXMOS ▶ Reference Designs ▶ USB Audio 2.0 Multichannel Reference Design**. The first time you download the software click **Request Access** link and complete the information required for the license.

   (Section §2.)

2. Download the **USB Audio Class 2.0 Evaluation Driver for Windows** from **http://xmos.com ▶ MyXMOS ▶ Reference Designs ▶ USB Audio 2.0 Multichannel Reference Design**. Install the driver.

   (Section §3.)

3. Download the **xTIMEcomposer** tools from: `http://xmos.com/tools` and install.

   The firmware must be compiled using a specific version of the tools. Make sure that you download the correct version of the tools.

   (Section §4)

4. Import the firmware into a new project in xTIMEcomposer.

   (Section: §5.)

5. Connect the board to your development system using the xTAG supplied, and program the firmware onto the board.

   (Section §6.)

6. Connect audio input and output devices, and play your audio.

   (Section §7.)

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1   Description

The USB Audio 2.0 Multichannel Reference Design (XS1-L2 Edition) is a hardware reference design for a multi-channel USB audio interface using the XMOS XS1-L16 multicore microcontroller. It contains a single XS1-L16 device enabling implementation of a complete USB 2.0 high-speed device compliant with release 2.0 of the USB Audio Class specification.
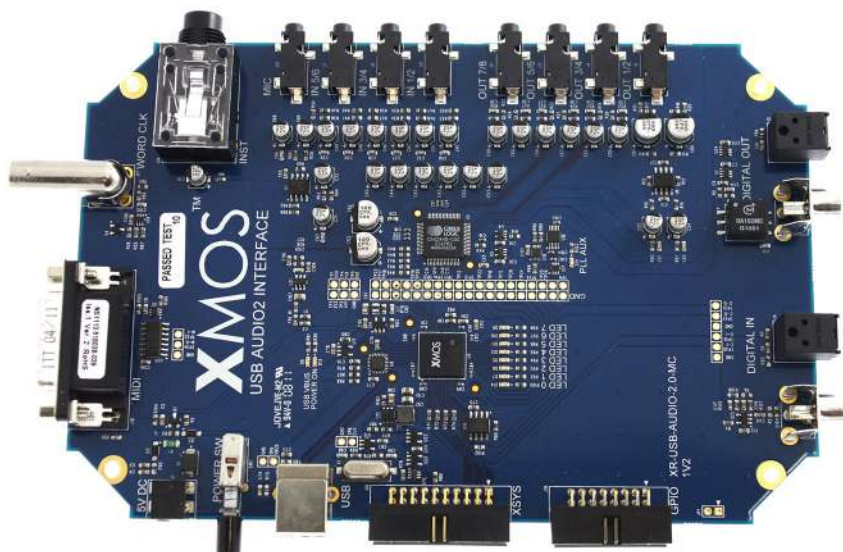

Figure 1:
USB Audio
2.0 MC
reference
design board

The XS1-L16 device communicates with the USB host via a ULPI USB transceiver at the 480Mb/s high-speed rate. The XS1-L16 controls the streaming of audio data over the USB connection and direct I2S interface to the audio CODEC, digital streams and MIDI communications. Multiple additional functions (for example Mixers/DSP) can be implemented by modifications to the standard software.

An xTAG debug adapter can be connected to the development board to provide a JTAG interface from your development system. To program the board you need to download the xTIMEcomposer Development Tools from the XMOS website.

1.1   Connectors

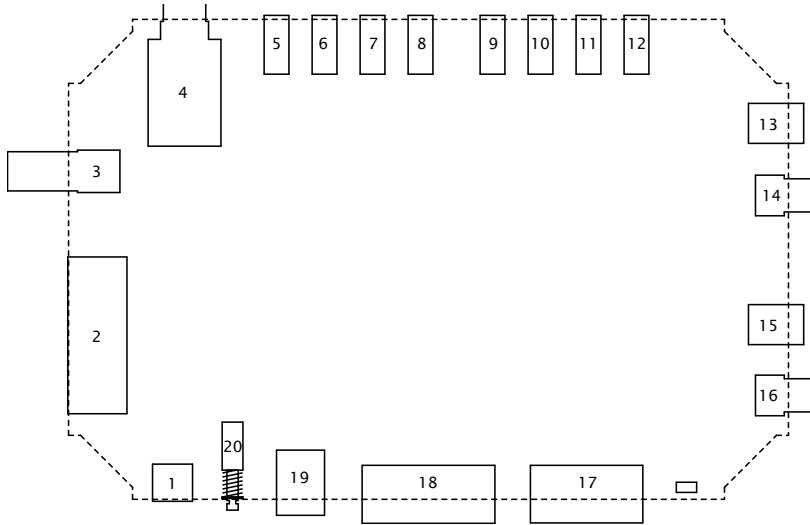The diagram below shows the layout of the connectors on the board:

Figure 2:
USB Audio
2.0 MC
reference
design
features

1	5V DC Power In	11	Analog 5/6 OUT (Stereo 3.5mm Jack)
2	MIDI Input & Output (Via Gameport)	12	Analog 7/8 OUT (Stereo 3.5mm Jack)
3	75Ω BNC Word Clock Input	13	Optical Digital Output
4	Instrument IN (Mono 1/4" Jack)	14	Coaxial Digital Output
5	Microphone IN (Mono 3.5mm Jack)	15	Optical Digital Input
6	Analog 1/2 IN (Stereo 3.5mm Jack)	16	Coaxial Digital Input
7	Analog 3/4 IN (Stereo 3.5mm Jack)	17	Expansion Header
8	Analog 5/6 IN (Stereo 3.5mm Jack)	18	XSYS Debug Interface
9	Analog 1/2 OUT (Stereo 3.5mm Jack)	19	USB B Connector
10	Analog 3/4 OUT (Stereo 3.5mm Jack)	20	Push Button Power Switch

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2   USB Audio 2.0 Reference Design Software

The latest USB Audio 2.0 Reference Design software is available free of charge from XMOS.

The first time you download the software you need to register at:

http://www.xmos.com/

To download the firmware:

1. Go to **MyXMOS ▶ Reference Designs ▶ USB Audio 2.0 Multichannel Reference Design** and click **Request Access** next to *USB Audio 2.0 XS1-L2 Software Release.*

2. Complete the Software Request form and click **Submit**.

3. Download the software when prompted.

The software is distributed as an Eclipse archive that you can import into xTIMEcomposer Studio.

Alternatively you can contact your local sales representative for further details:

http://www.xmos.com/products/distributors

3   USB Audio Class 2.0 Evaluation Driver for Windows

Apple OSX version 10.6.4 and above natively supports USB Audio Class 2.0 – no driver install is required.

Windows, however, 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 our partner Thesycon.

The evaluation driver is available from:

http://www.xmos.com/published/usb-audio-class-20-evaluation-driver-windows

Further information about the evaluation and production drivers is available in the *USB Audio Class 2.0 Windows Driver Overview* document available from:

http://www.xmos.com/published/usb-audio-20-stereo-driver-windows-overview

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4   xTIMEcomposer Development Tools

The xTIMEcomposer tools provide everything you need to develop applications for xCORE multicore microcontrollers. xTIMEcomposer Studio is a graphical environment for the tools based on the Eclipse platform, or the tools can also be driven from the command-line. The tools can be downloaded free of charge from:

http://www.xmos.com/tools

⚠ The firmware must be compiled using a specific version of the tools. Make sure that you download the correct version of the tools. Older versions of tools are available from:

http://www.xmos.com/products/design-tools-archive

Information on using xTIMEcomposer, including installation is provided in:

http://www.xmos.com/published/xtimecomposer-user-guide

5   Import the software into xTIMEcomposer

1. Start xTIMEcomposer and select a workspace.

2. Choose **File ▶ Import**.

3. Double-click the **General** option, select **Existing Projects into Workspace** and click **Next**. (Do not select the Archive File option as this results in different behavior.)

4. Browse to the **USB Audio 2.0 Reference Design Software** archive (ZIP file) and click **Open** to import the source code.

6   Build and run the source code on the board

The xTAG included with the board provides a high speed, low latency bridge between USB on the host and fast JTAG connection on the development board.

1. Click the **Build** button to compile the project.

2. Make sure that the board is connected to your development system using the xTAG debug adapter.

3. Click the **Run** button to load the compiled project onto the attached board.

Further details on how to build the project, load it onto the board and debug the mode is contained in the *xTIMEcomposer User Guide* (http://www.xmos.com/published/xtimecomposer-user-guide).

7 Playing audio using the board

1. Connect the board to the 5V power supply provided.

2. Connect the board to your USB Audio 2.0 compliant host computer using a high speed USB 2.0 cable.

3. Press the On/Off button to switch on the board.

   The USB LED on the USB Audio 2.0 board is lit when the device is correctly connected and powered up.

4. Install the Windows USB Audio 2.0 demonstration driver, if required.

5. Connect your audio input/output devices to the connectors on the board.

6. In your audio application, select the USB Audio 2.0 device.

7. Start playing and recording.

8 Next Steps

Further information on using the board and xTIMEcomposer Studio is available from:

USB Audio Software Design Guide

http://www.xmos.com/published/usb-audio-software-design-guide

USB Audio 2.0 Multichannel Hardware Manual

http://www.xmos.com/published/usb-audio-20-mc-hardware-manual

USB Audio 2.0 Stereo Driver Overview

http://www.xmos.com/published/usb-audio-20-stereo-driver-windows-overview

xTIMEcomposer User Guide

http://www.xmos.com/published/xtimecomposer-user-guide

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