USB Audio 2.0 MC Reference Design Quick Start

Version 1.0

XMOS®

1   Introduction

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-L2 dual-core event-driven processor. It contains a single XS1-L2 device enabling implementation of a complete USB 2.0 high-speed device compliant with release 2.0 of the USB Audio Class specification.


The XS1-L2 event-driven processor communicates with the USB host via a ULPI USB transceiver at the 480Mb/s high-speed rate. The XS1-L2 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-2 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 a set of free Development Tools from the XMOS website.

1.1 Connectors

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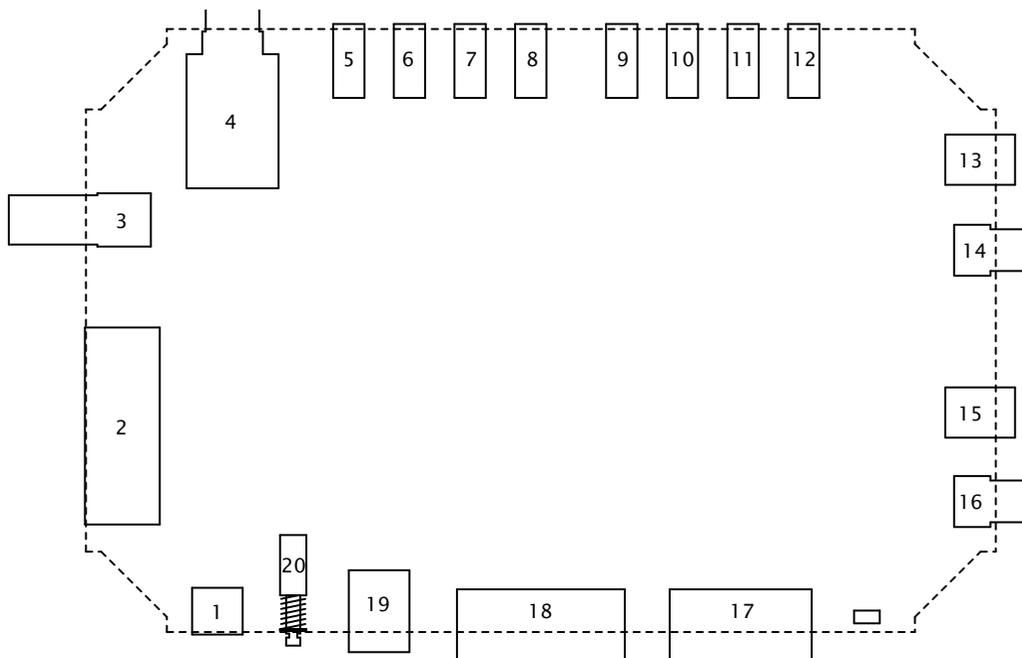
1	5V DC Power In	**11**	Analogue 5/6 OUT (Stereo 3.5mm Jack)
2	MIDI Input & Output (Via Gameport)	**12**	Analogue 7/8 OUT (Stereo 3.5mm Jack)
3	75Ω BNC Word Clock Input	**13**	Optical Digital Output
4	Instrument IN (Mono 1/4" Jack)	**14**	Coaxial Digital Output
5	Microphone IN (Mono 3.5mm Jack)	**15**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

2   Playing audio using the board

The USB Audio 2.0 Reference Design board requires a USB Audio 2.0 class compliant driver available on the host. This functionality is built into Mac OS 10.6.4 or later. A Windows demonstration driver is provided with the board.

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

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

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

4. 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.

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.

3   Programming the board

The XTAG-2 debug adapter supplied with the kit can be connected to the board to provide a JTAG interface from your development system that you can use to load and debug software. You need to install a set of drivers for the XTAG-2 debug adapter and download a set of free Development Tools (10.4 or later) from the XMOS website:

   http://www.xmos.com/tools

Instructions on installing and using the XMOS Tools can be found in the XMOS Tools User Guide **http://www.xmos.com/published/xtools_en**. The following table provides a summary tools support for the USB Audio 2.0 L1 development board.

Minimum tools version required	10.4
Board support file	XR-USB-AUDIO-2.0-MC.xn
USB-to-JTAG adaptor	XTAG-2
USB-to-JTAG driver	XMOS

4   The USB Audio 2.0 Reference Design Software

The latest USB Audio 2.0 Reference Design software is available from XMOS. Please register at http://www.xmos.com/ and send a request for the software from your *Account* page, or contact your local sales representative for further details: http://www.xmos.com/products/distributors

The software is distributed as an Eclipse archive that you can import into the XDE.

1. Import the software

   - Start the Tools and select a workspace.
   - Choose **File ▶ Import**.
   - Double-click the **General** folder, select the **Existing Projects into Workspace** option and click **Next**.
   - 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 behaviour.)
   - Browse to the USB Audio 2.0 Reference Design Software archive (ZIP file) and click **Open** to import the source code.

2. Build and run the source code on the board

   - Click the **Build** button to compile the project.
   - 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 code is contained in the XMOS Tools User Guide.

5   Next Steps

Further information on using the board and Tools is available from:

www.xmos.com/usbaudio2mc

Document History

Date	Release	Comment
2010-07-07	1.0	First release

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