



# User Guide

AWE Core integrated  
XMOS Evaluation Board

06/2023

This User Guide provides an introduction to the XMOS evaluation board featuring Audio Weaver integration. It outlines the setup process for the board and provides guidance on exploring the reference playback design within Audio Weaver.

## **XMOS Evaluation Kit Introduction**

The xcore.ai multichannel audio platform provides a scalable and flexible hardware and software solution for a wide range of consumer and professional audio products.

The multichannel audio platform is based on an xcore.ai multicore controller; the XU316-1024-TQ128-C24, and includes a high-speed USB 2.0 PHY, flexible GPIO and 16 logical cores that deliver up to 2400 MIPS of deterministic processing power.

## **Audio Weaver Introduction**

The Audio Weaver platform sits in the center of a solution ecosystem.

The AWE Designer™ graphical design environment generates a net list for the AWE Core™ processing engine that tells the embedded target which modules to use and how to wire them up. AWE Designer™ hosts DSP Concepts proprietary designs together with 3rd party IP from leading algorithm developers.

AWE Core is the underlying framework that enables Audio Weaver to operate on a bare metal processor. It also encompasses highly optimized embedded versions of Audio Weaver's diverse audio modules.

The AWE Core has been seamlessly incorporated into the XMOS Evaluation Kit, facilitating the utilization of 2-channel USB audio input and 2-channel analog output via analog outputs 1/2. The AWE Core runs on 5 hardware threads in one tile in the reference design.

## Board Setup Procedures

### Hardware Connection

1. Connect Integrationd XTAG4 debugger to the build machine with the source code via micro-USB cable.
2. Connect USB Connector to Windows PC with Audio Weaver via micro-USB cable.
3. Connect the first Analog output connector (OUT 1/2) to a speaker.

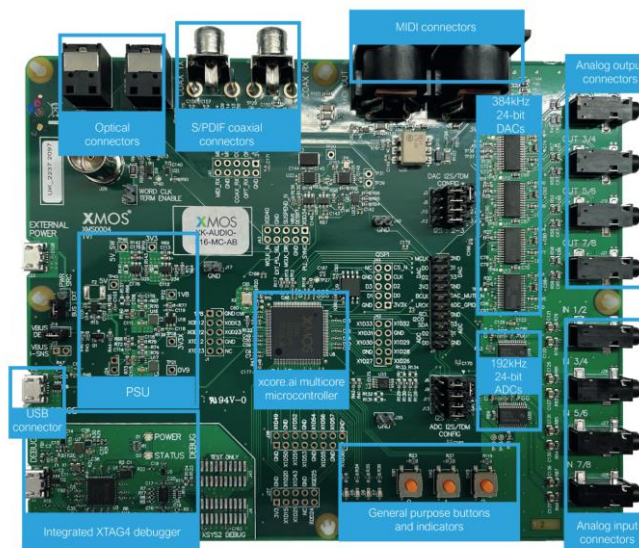


Figure 1: XMOS Evaluation Kit

### Software Build and Flash

1. Download the source code from XMOS GitHub repository.
2. Navigate to the README.rst file in the main directory and carefully follow the provided instructions to configure the toolchain and set the necessary environment variables.

3. Proceed with the instructions to build the application using the "xmake" command and execute the application using the "xrun" command.
4. If you require a permanent program on the chip, you can utilize the "xflash" command to flash the board.

## Connect to Audio Weaver

1. If you are using the XMOS Evaluation Kit for the first time, install the XMOS USB driver from the XMOS website.
2. Install Audio Weaver Designer Standard from the official DSP Concepts website.
3. Launch Audio Weaver Designer and configure the connection to the Audio Weaver Server by selecting "Target" and then "Change Connections."

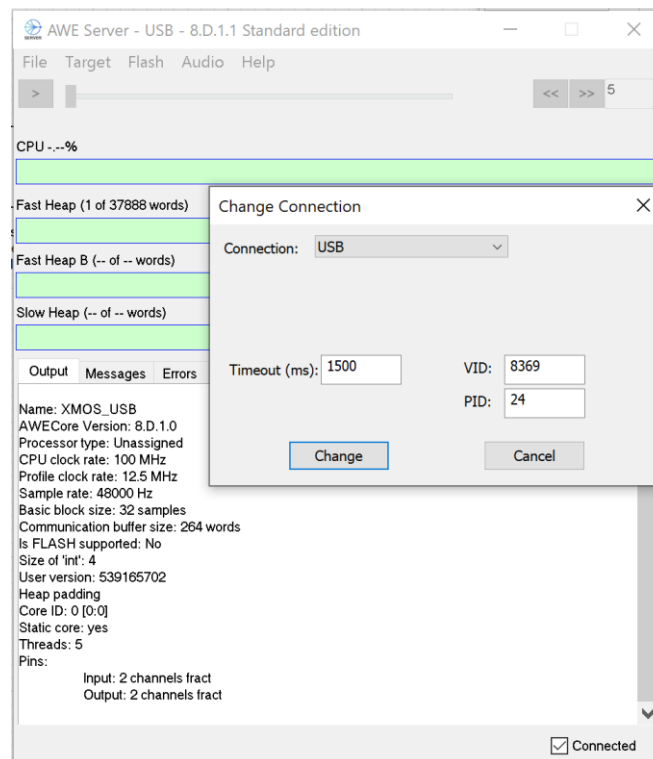


Figure 2: AWE Server connection



4. Open the playback design example named "playback\_3thread.awj" and click on the "Run" button.

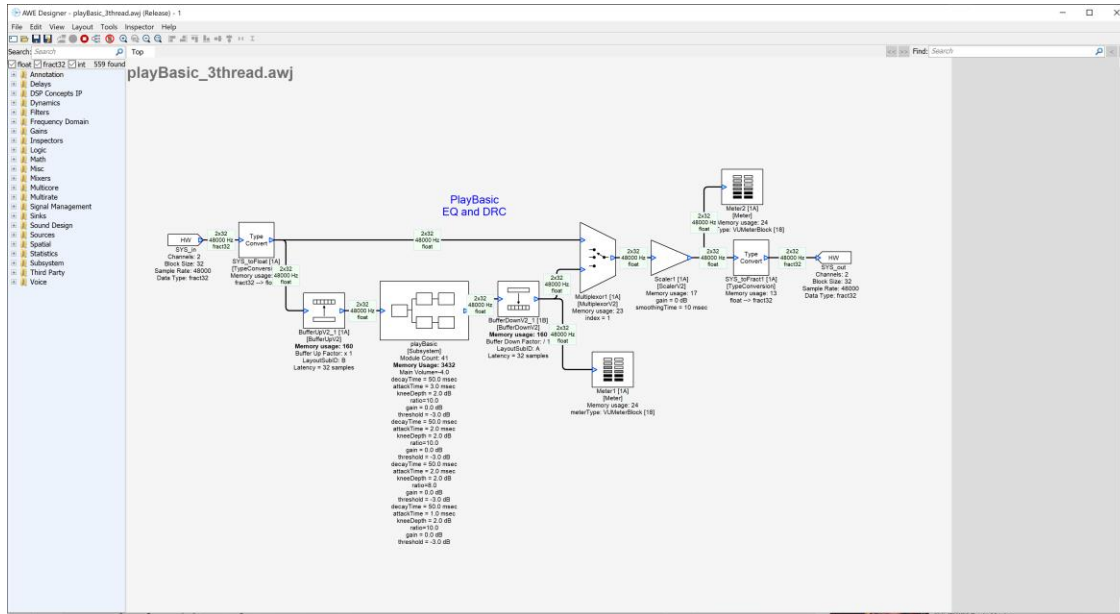


Figure 3: Audio Weaver playback design example with 3 threads

5. To access the inspector window, double-click on the inspector. This window allows you to monitor the status of the playback and make adjustments such as changing gain, EQ parameters, etc.
6. You should be able to hear the audio output from the speaker connected to OUT 1/2, which will change in response to your actions, such as adjusting the gain or EQ parameters.

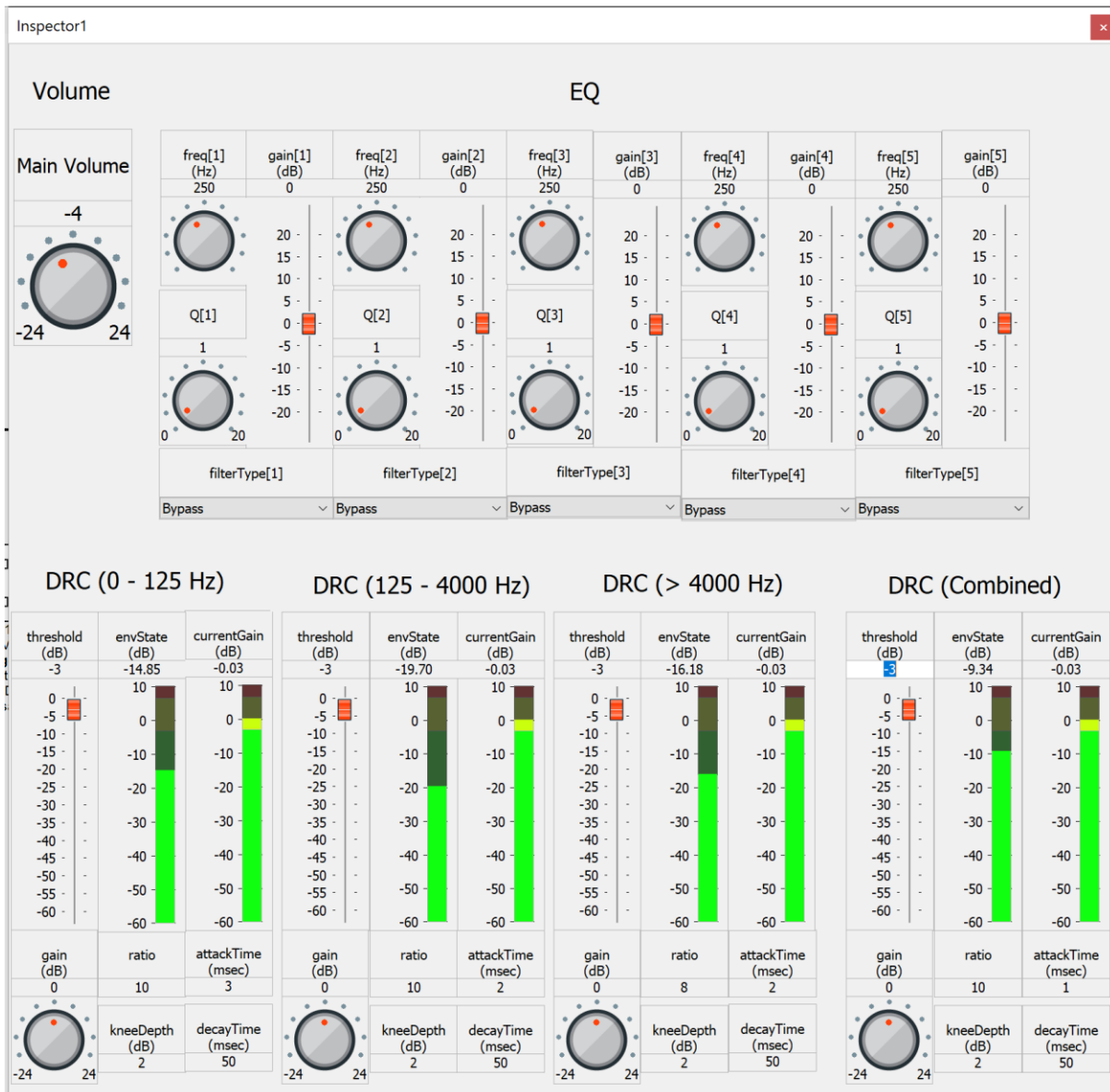


Figure 4: Inspector displaying playback status and tuning controls.

## Customer Customization

The stereo AudioWeaver reference design can be effortlessly customized for multi-channel USB audio applications, aligning with the specific requirements of the customer's product. This customization involves implementing audio I/O modifications at the Board Support Package (BSP) level and making corresponding adjustments within the Audio Weaver design to align it with the modified BSP.