



# lib\_audio\_dsp: Audio DSP Library (README)

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**vendor**  
Xmos

**version**  
1.5.0

**scope**  
General Use

**description**  
Audio DSP Library for xcore.ai

**category**  
Audio

**keywords**  
DSP, USB Audio

**devices**  
xcore.ai

## 1 Summary

lib\_audio\_dsp

**Note**

Some software components in this tool flow are prototypes and will be updated in Version 2 of the library. The underlying Digital Signal Processing (DSP) blocks are however fully functional. Future updates will enhance the features and flexibility of the design tool.

lib\_audio\_dsp is a DSP library for the Xmos xcore architecture. It facilitates the creation of multithreaded audio DSP pipelines that efficiently utilise the xcore architecture.

The library is built around a set of DSP function blocks, referred to in the documentation as "Stages", which have a consistent API and can be combined to create many different designs.



## 2 Features

lib\_audio\_dsp includes common signal processing functions optimised for the xcore, such as:

- ▶ biquads and FIR filters
- ▶ compressors, limiters, noise gates and envelope detectors
- ▶ adders, subtractors, gains, volume controls and mixers
- ▶ delays and reverb.

These can be combined together to make complex audio pipelines for many different applications, such as home audio, music production, voice processing, and AI feature extraction.

## 3 Known issues

- ▶ None

## 4 Development repo

- ▶ [lib\\_audio\\_dsp](#)

## 5 Required tools

- ▶ XMOS XTC Tools: 15.3.1

## 6 Host system requirements

- ▶ None

## 7 Required libraries (dependencies)

- ▶ lib\_xcore\_math ([www.github.com/xmos/lib\\_xcore\\_math](http://www.github.com/xmos/lib_xcore_math))
- ▶ lib\_logging ([www.github.com/xmos/lib\\_logging](http://www.github.com/xmos/lib_logging))
- ▶ lib\_locks ([www.github.com/xmos/lib\\_locks](http://www.github.com/xmos/lib_locks))

## 8 Related application notes

The following application notes use this library:

- ▶ [AN02014: Integrating DSP Into The XMOS USB Reference Design.](#)
- ▶ [AN02015: Run-time DSP control in a USB Audio Application.](#)

## 9 Support

This package is supported by XMOS Ltd. Issues can be raised against the software at: <http://www.xmos.com/support>





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