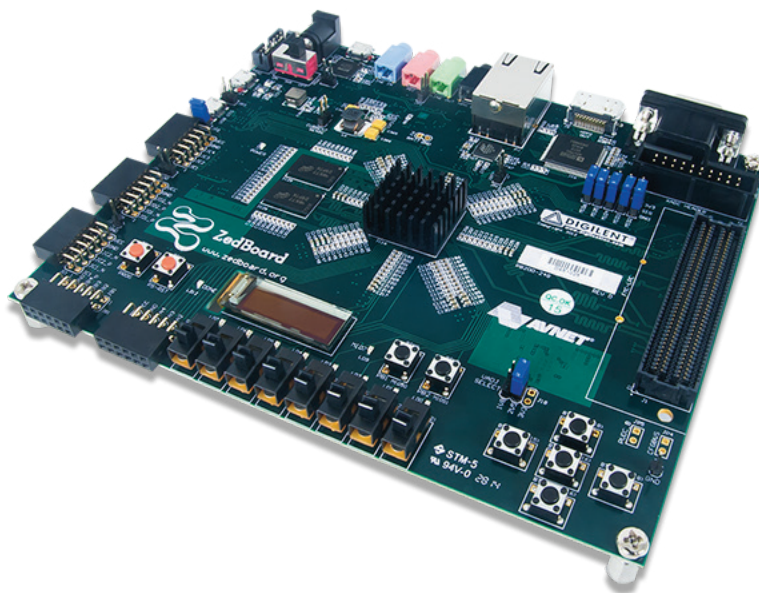


# Zedboard DMA Audio Demo



[https://reference.digilentinc.com/\\_media/reference/programmable-logic/zedboard/zedboard-0.png](https://reference.digilentinc.com/_media/reference/programmable-logic/zedboard/zedboard-0.png)

## Overview

### Description

The audio demo records a 5 second sample from microphone(J12) or line in (J13) and plays it back on headphone out(J10) or line out (J12). Recording and playback are started by push buttons.

### Features Used

	Not Used	Used
<b>8 User Switches</b>	X	
<b>9 User LEDs</b>	X	
<b>7 User Push Buttons</b>		X
<b>512 MB () DDR3 RAM ()</b>		X
<b>256 Mb QSPI Flash</b>	X	
<b>Five Digilent Pmod™ headers</b>	X	
<b>FMC Header</b>	X	
<b>USB-UART bridge</b>		X
<b>HDMI Output</b>	X	
<b>VGA (12-bit Color)</b>	X	
<b>FMC Header</b>	X	
<b>128×32 OLED () Display</b>	X	
<b>Audio Codec</b>		X
<b>SD Card Port</b>	X	

## Prerequisites

### Hardware

- Zedboard FPGA board
- Micro-USB cable

- **Zedboard Power Supply**
- **Headphones or Speakers**
- **Audio Input device (Aux-In, Guitar, etc.)**

**Software**

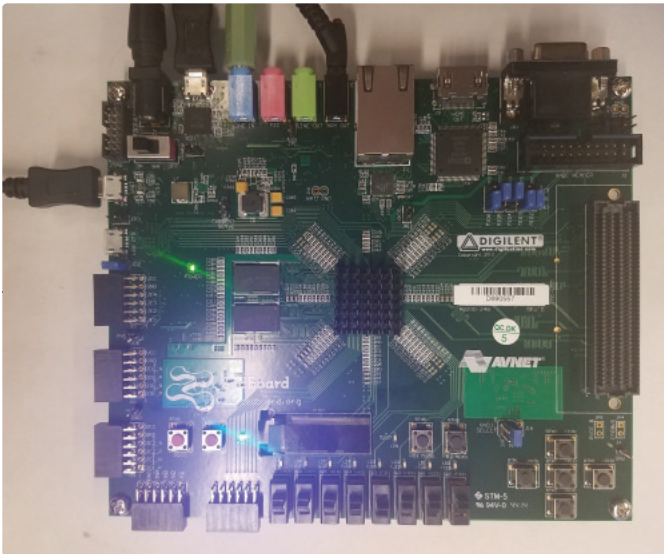
- **Vivado Design Suite 2016.4**
  - *Never versions can be used, but the procedure may vary slightly*
  - Xilinx SDK 2016.4 must be included in the installation
- **Digilent Board Support Files for Vivado**
  - Follow the [Vivado Board Files for Digilent 7-Series FPGA Boards \(https://reference.digilentinc.com/vivado/boardfiles\)](https://reference.digilentinc.com/vivado/boardfiles) guide on how to install Board Support Files for Vivado.

**Downloads**

Zedboard Project Repository – [ZIP \(https://github.com/Digilent/Zedboard-DMA/releases/download/v2016.4-1/Zedboard-DMA-2016.4-1.zip\)](https://github.com/Digilent/Zedboard-DMA/releases/download/v2016.4-1/Zedboard-DMA-2016.4-1.zip) [GIT Repo \(https://github.com/Digilent/Zedboard-DMA\)](https://github.com/Digilent/Zedboard-DMA)

**Download and Launch the Zedboard DMA Audio Demo**

- 1) Follow the [Using Digilent Github Demo Projects \(https://reference.digilentinc.com/learn/programmable-logic/tutorials/github-demos/start\)](https://reference.digilentinc.com/learn/programmable-logic/tutorials/github-demos/start) Tutorial. Since this is a Vivado SDK Project, you can either directly launch SDK and import the hardware handoff, or you can generate a bitstream in Vivado before launching SDK. Select the hardware handoff options in the tutorial if you don't want to modify the project block design later. Return to this guide when prompted to check for additional hardware requirements and setup.
- 2) In order to use the demo, you will need to plug in your microphone or aux input into the respective audio input jack on your Zedboard. Plug your speakers and/or headphones into the respective audio output jack.



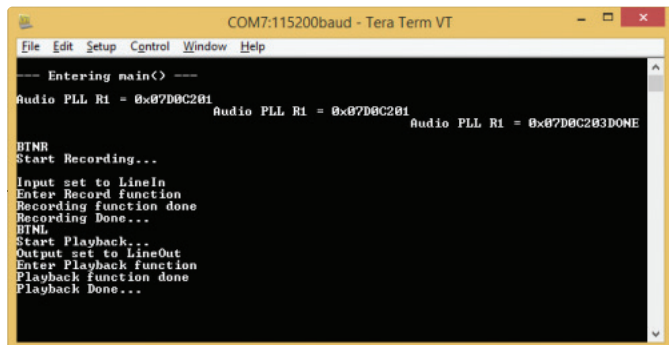
[https://reference.digilentinc.com/\\_detail/learn/programmable-logic/tutorials/zedboard-dma-audio-](https://reference.digilentinc.com/_detail/learn/programmable-logic/tutorials/zedboard-dma-audio-)

[demo/zed-dma.jpg?id=learn%3Aprogrammable-logic%3Atutorials%3Azedboard-dma-audio-demo%3Astart](https://reference.digilentinc.com/_detail/learn/programmable-logic/tutorials/zedboard-dma-audio-demo/zed-dma.jpg?id=learn%3Aprogrammable-logic%3Atutorials%3Azedboard-dma-audio-demo%3Astart)

- 3) Turn on your board and open a serial terminal (such as TeraTerm) on your computer to receive status messages. Setup the serial port to connect to the appropriate port for your board, with a baud rate of 115200. Then return to the Github Project Tutorial to finish programming and running the demo.

**Tip**

To make sure that you don't miss any startup messages, you can connect your serial terminal to your board before the board is programmed. If the demo is already running, you can restart the demo in SDK to make sure you get these messages.



[https://reference.digilentinc.com/\\_detail/learn/programmable-logic/tutorials/zedboard-dma-audio-](https://reference.digilentinc.com/_detail/learn/programmable-logic/tutorials/zedboard-dma-audio-)

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**Using the Zedboard DMA Audio Demo**

**1. Controls**

Audio playback and recording are controlled by push buttons as below.

Button	Function
<b>BTNL</b>	play on line out
<b>BTNU</b>	record from mic in
<b>BTND</b>	play on hph out
<b>BTNR</b>	record from line in

## 2. Recording from an input

To record from the microphone input, press **BTNU**. To record from the line input, press **BTNR**. Once the recording is activated, the message “Start Recording...” will be sent over UART and the demo will record 5 seconds of audio. If any buttons are pressed during the recording, the message “Still Recording...” will be sent over UART.

## 3. Playing to an output

To play to the headphone output, press **BTND**. To play to the line out, press **BTNL**. Once the playback is activated, the message “Start Playback...” will be sent over UART and the demo will play 5 seconds of audio. If any buttons are pressed during the playback, the message “Still Playing...” will be sent over UART.

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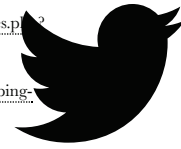
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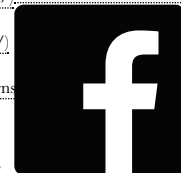
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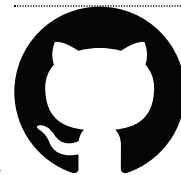
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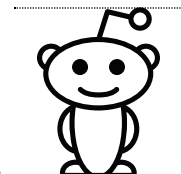
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