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CN-0296 Software User Guide

OVERVIEW

CN-0296 is a low cost high performance sound bar system that can accept an analog stereo audio signal as an input and can output up to eight channels of audio with discrete processing on each channel. The circuit is ideal for small docking stations and portable media devices. The circuit offers low power consumption and high efficiency operation without sacrificing audio quality. The circuit is also capable of driving headphones without the need of additional components.

The ADAU1761 is a low power, stereo audio codec with integrated digital audio processing, also called SigmaDSP®. It has two ADCs to accept two audio channels and can apply digital processing with the integrated SigmaDSP® core.

SigmaDSP® processors are optimized for audio applications and programmed using SigmaStudio development software for ease of use and faster development. Its output can send up to eight channels of digital audio data to the output amplifiers using the serial interface. It allows different audio signal processing in each channel, such as volume control, custom equilization, filtering, and spatialization effects tuned to the specific speaker configuration.The ADAU1761 processes and converts analog audio to digital format and drives the SSM2518 power amplifier.

The SSM2518 is a digital input class-D audio power amplifier that can output two channels of audio with a continuous power of 2 watts each into a 4 Ωload. Its channel-mapping feature allows it to select the specific channel to output among those that are available in the interface. This makes it ideal for surround sound applications.

GENERAL SETUP

- EVAL-CN0296-SDPZ Evaluation Board
- EVAL-SDP-CB1Z Evaluation Board
- CN0296 Evaluation Software
  - (supplied with provided CD in kit)
- +5V DC power supply
- USB Type-A plug to USB Mini-B plug cable
- 4-ohm or 8-ohm speaker, rated at least 2 Watts

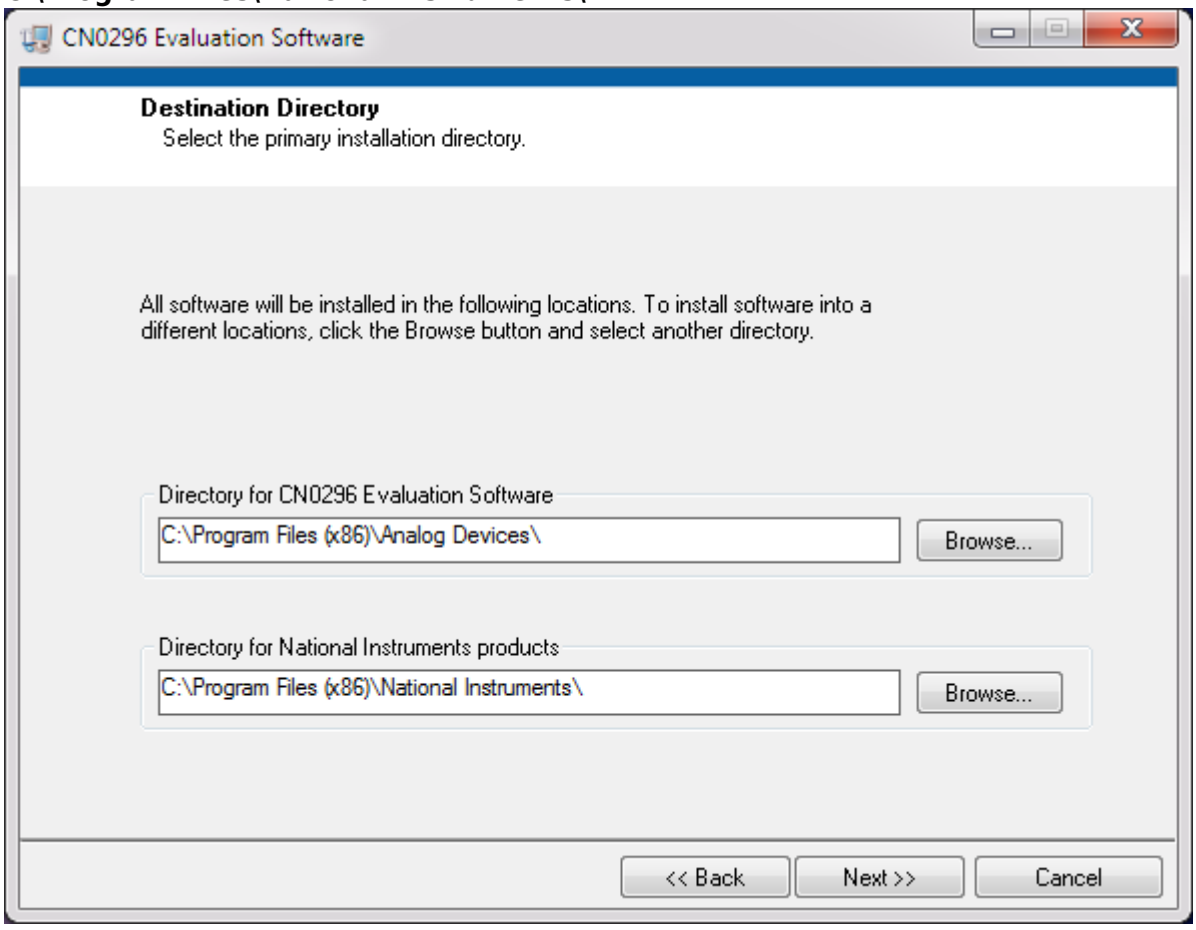
MINIMUM PC/SYSTEM REQUIREMENTS

- One PC with the following
  - Windows XP SP2, Windows Vista or Windows 7 Business/Enterprise/Ultimate editions
  - Intel Pentium processor (x86 compatible), 1GHz or faster
  - 512 MB RAM and 2 GB available hard disk space
  - .NET 3.5 Framework

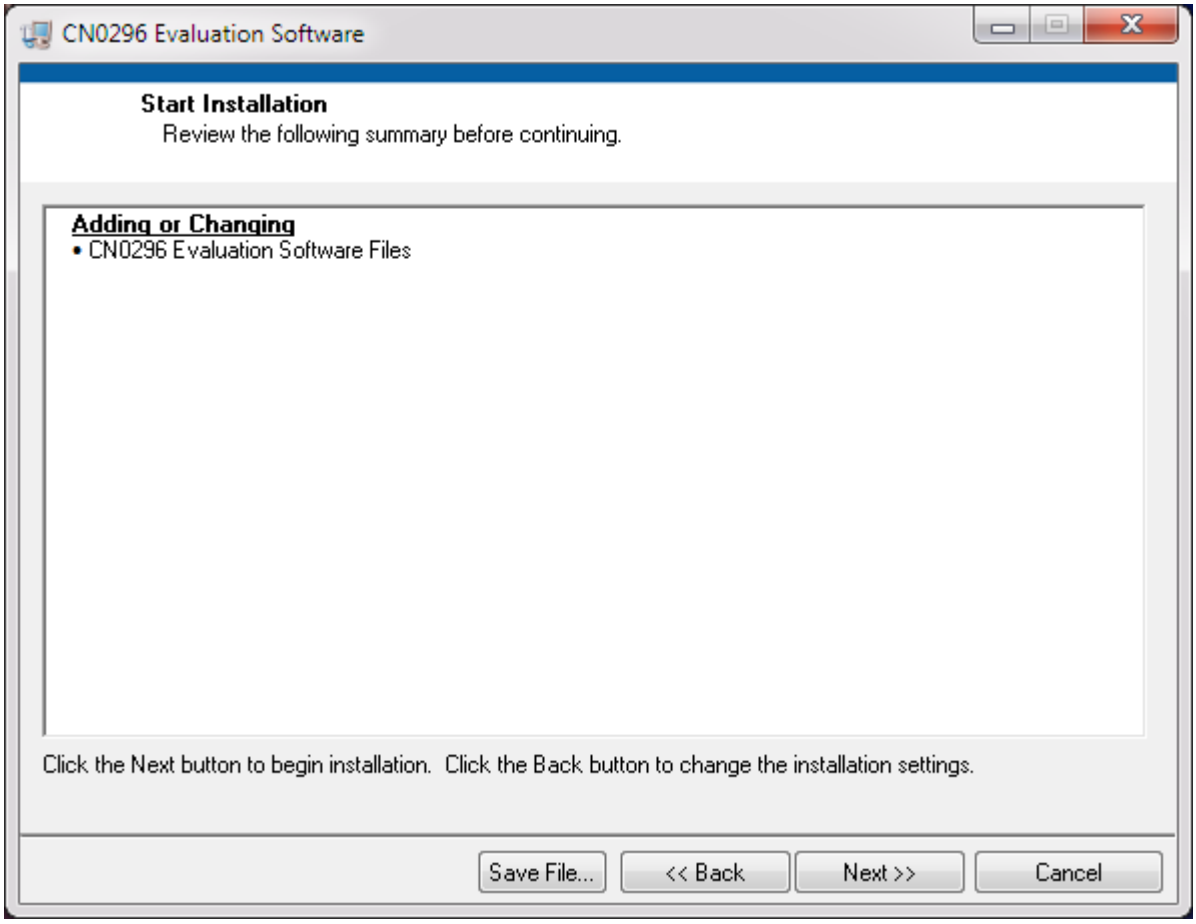
HOW TO INSTALL THE EVALUATION SOFTWARE

1. Extract the file **CN0296 Eval Software.zip** and open the file **setup.exe**.

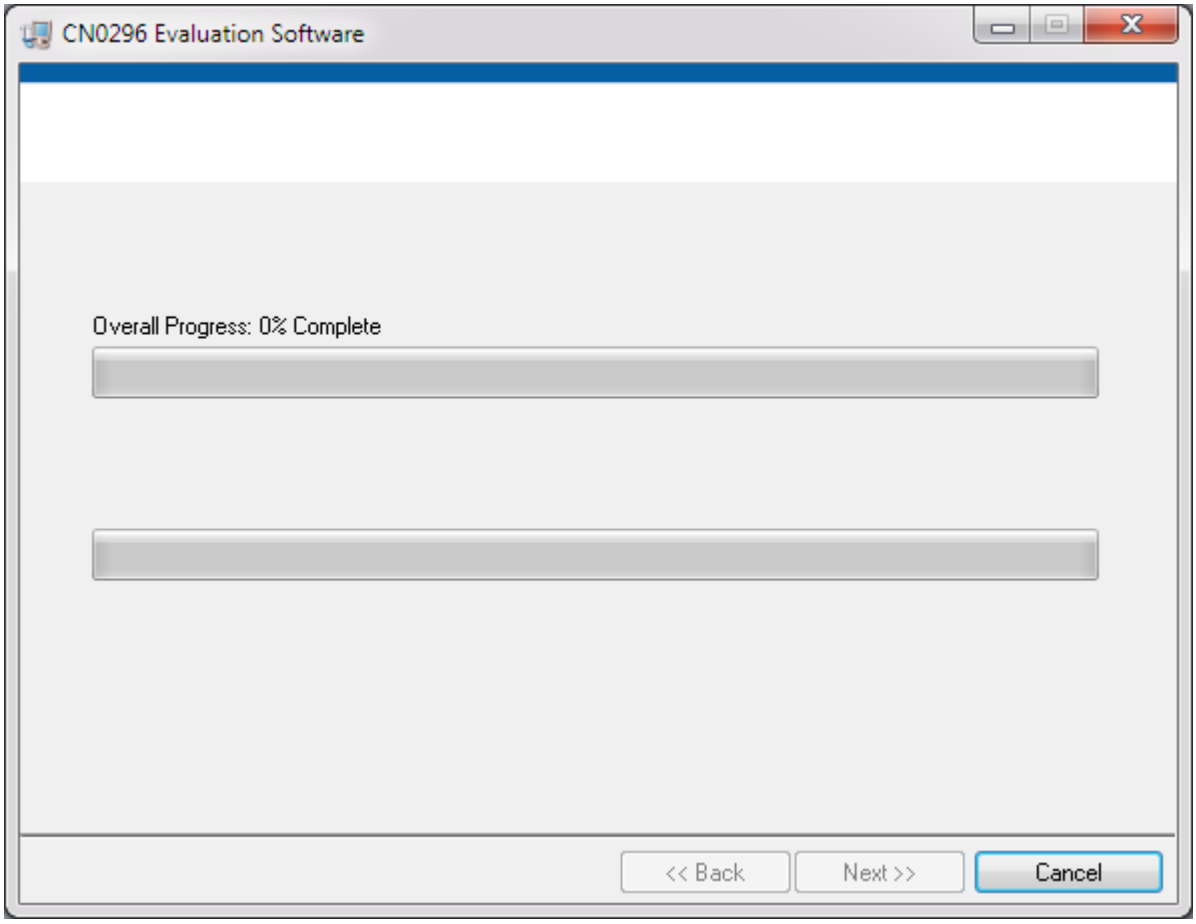
   NOTE: It is recommended that you install the CN0296 Evaluation Software to the default directory path **C:\Program Files\Analog Devices\CN0296** and all National Instruments products to **C:\Program Files\National Instruments**



2. Click **Next** to view the installation review page

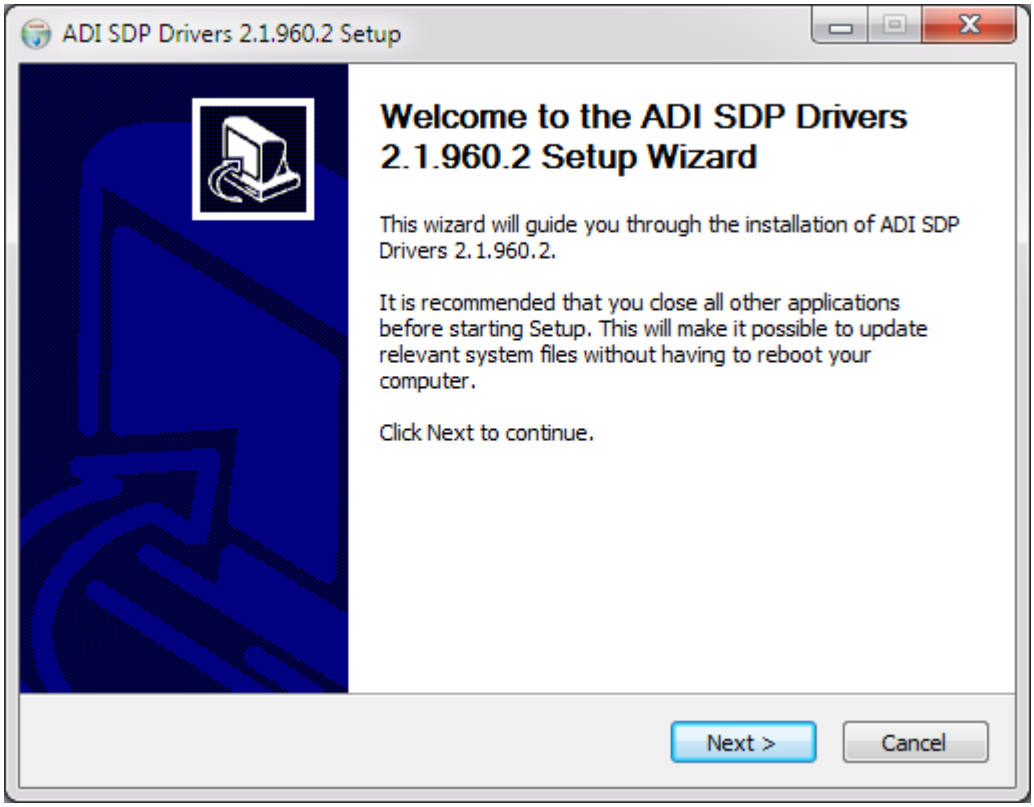


3. Click **Next** to start the installation



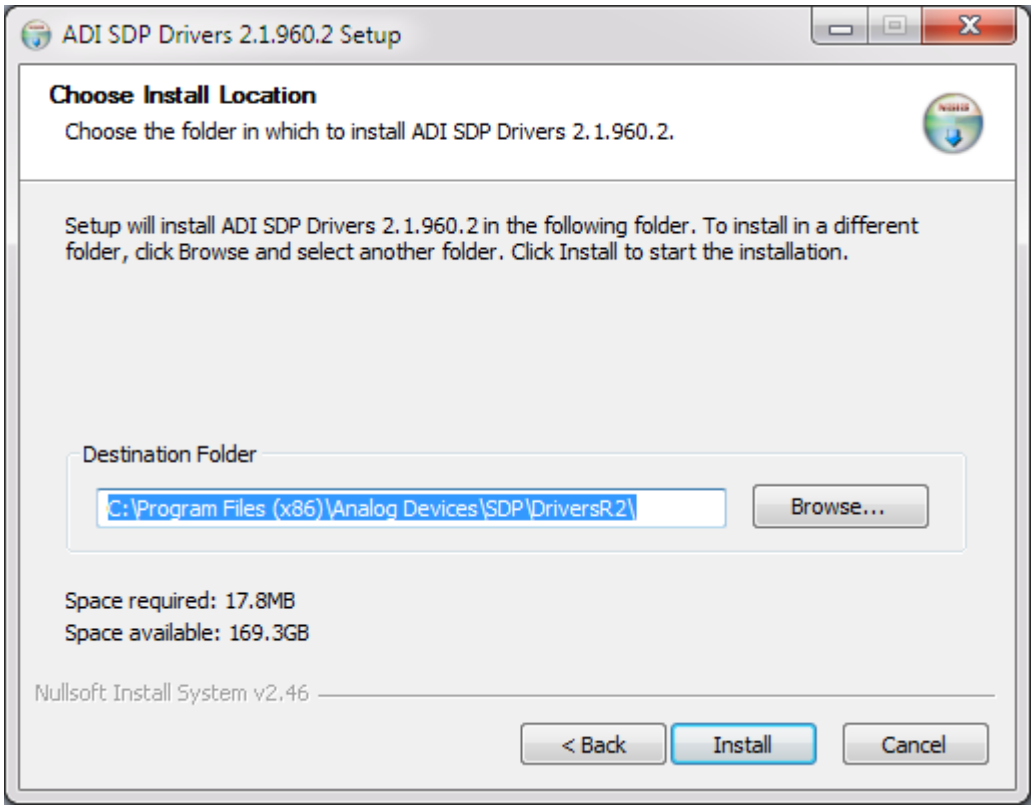
4. Upon completion of the installation of the **CN0296 Evaluation Software**, the installer for the **ADI SDP Drivers** will execute.

   NOTE: It is recommended that you close all other applications before clicking **"Next"**. This will make it possible to update relevant system files without having to reboot your computer.

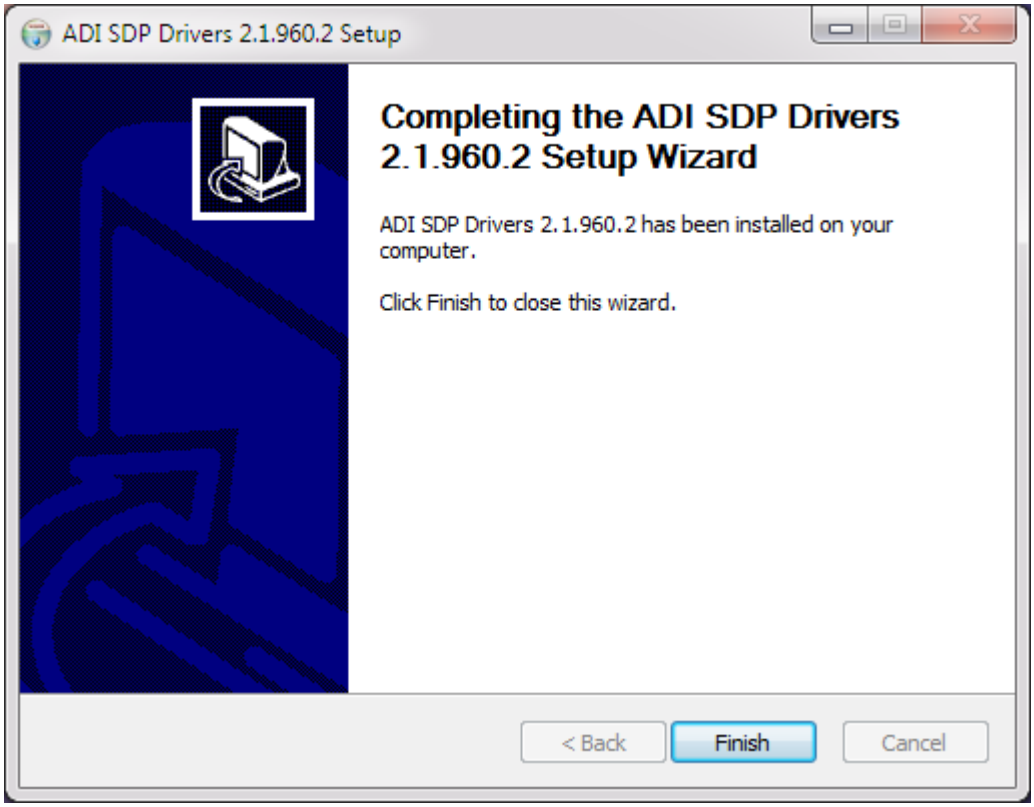


5. Press **"Next"** to set the installation location for the **SDP Drivers**.

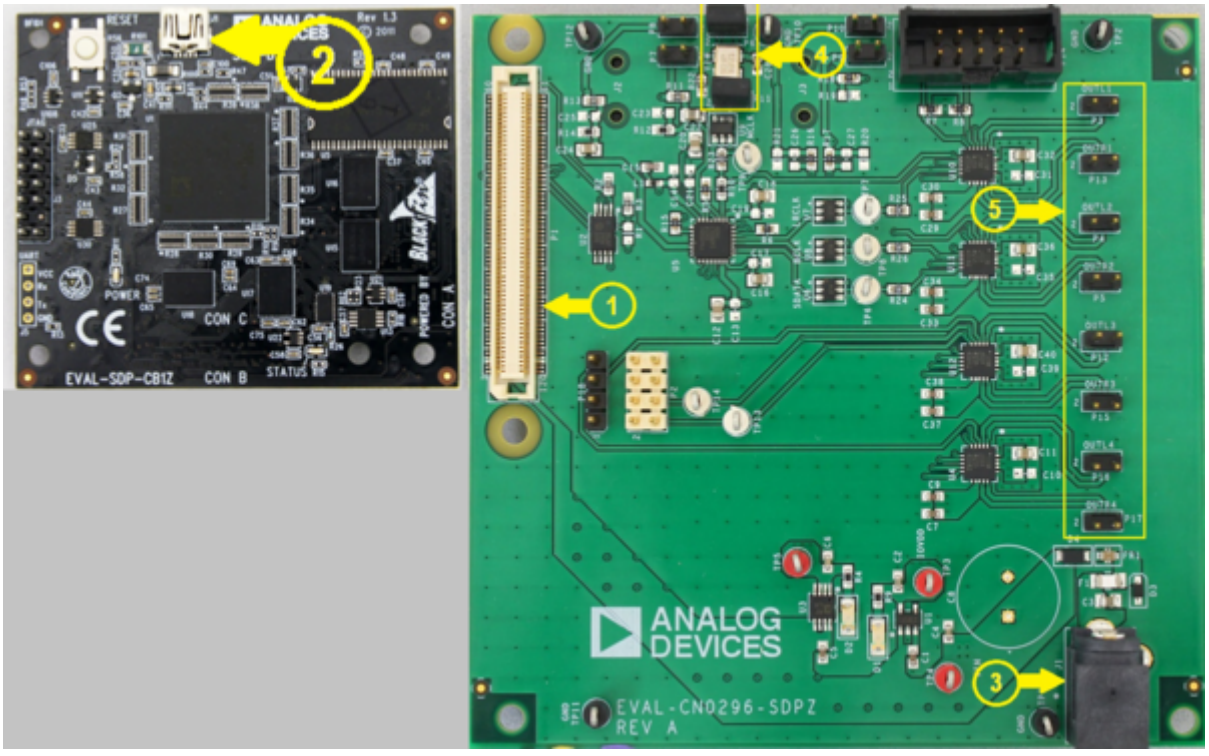
   It is recommended that you install the drivers to the default directory path **C:\Program Files\Analog Devices\SDP\Drivers**



6. Press **"Next"** to install the **SDP Drivers** and complete the installation of all software. Click **"Finish"** when done.

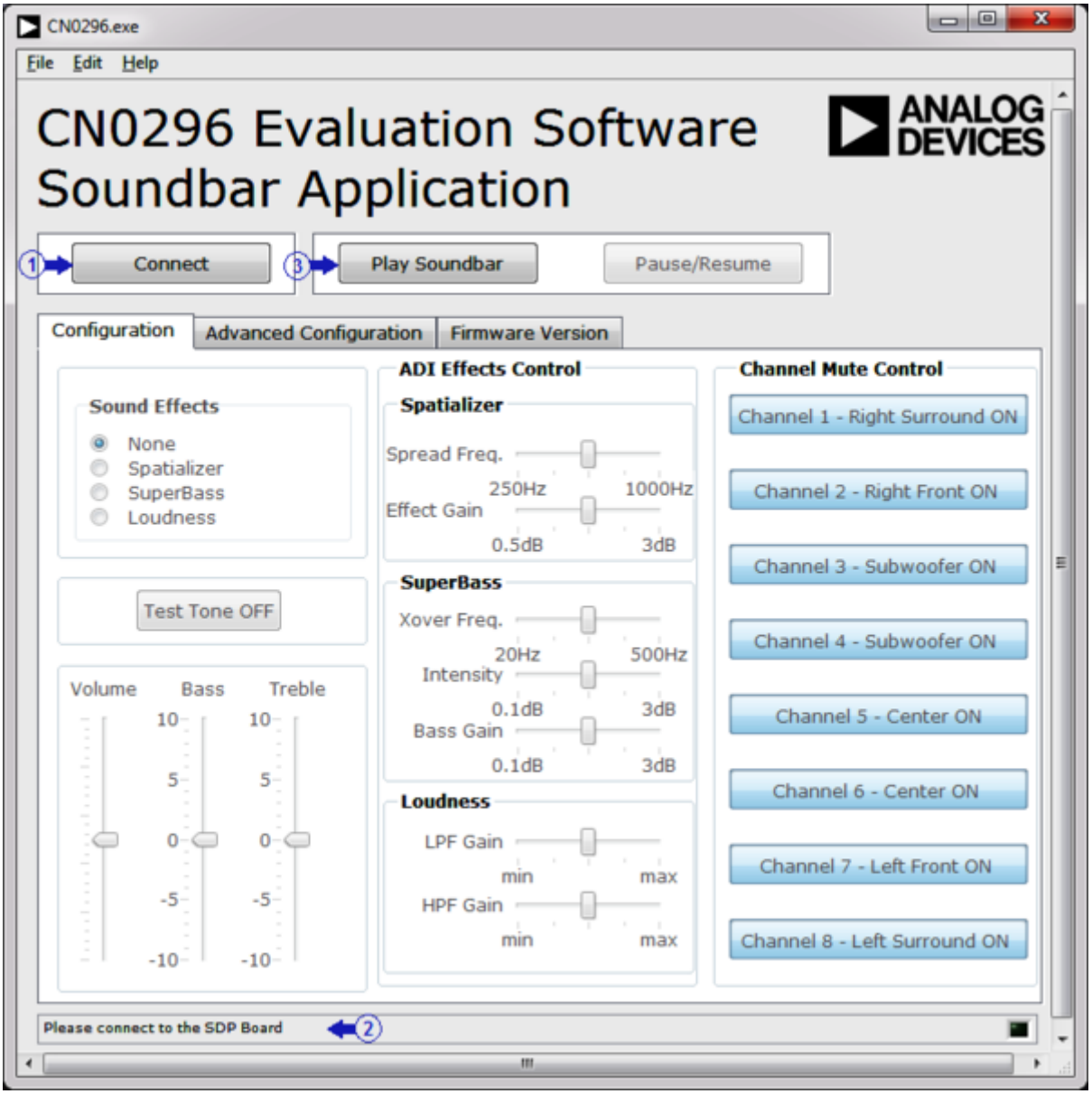


STEP BY STEP INSTRUCTION FOR CONNECTING THE HARDWARE



1. Connect the 120-pin connector on the EVAL-CN0296-SDPZ circuit board to the connector marked “CON A” on the EVAL-SDP-CB1Z evaluation (SDP) board. Nylon hardware should be used to firmly secure the two boards, using the holes provided at the ends of the 120-pin connectors.
2. Plug the mini end of the USB cable into connector **J2** of the EVAL-SDP-CB1Z and connect the other end of the USB cable into the Laptop or PC.
3. Plug in the wall wart and connect it to connector **J2** of the EVAL-CN0296-SDPZ.
4. Populate a jumper across **P6** and **P11** as depicted in the picture above
5. Connect speakers in the designated male headers

OPENING AND ENABLING THE EVALUATION SOFTWARE



1. Launch the executable found at **C:\Program Files\Analog Devices\CN0296** and press the **“Connect”** button.

2. After pressing the **“Connect”** button, a prompt will appear informing the user if the SDP is already connected.
3. Press the “Play Soundbar” button in order to start using the functions of the soundbar.

USING THE EVALUATION SOFTWARE

1. Below are the list of available software controls grouped according to their location int he software GUI:
    1. **System Controls**
        1. **Connect** - configures the ADAU1761 and SSM2518 by writing the necessary registers. THe display label at the bottom of the GUI will provide a prompt once the soundbar is configured properly.
    2. **Configuration**
        1. **Play Soundbar** - writes the preconfigured algorithms in ADAU1761 registers to enable it to demonstrate the ADI Effects
            1. **ADI Effects** - preconfigured algorithms from SigmaStudio
                1. **None** - Resets the soundbar to implement no special algorithms
                2. **Spatializer** - an advanced algorithm that allows for a wider stereo image to be played back from two closely spaced speakers. This spatializer algorithm is only meant to widen signals that are already in stereo format, in order to enhance the image. The function is similar to the Phat-Stereo algorithm but performs a more advanced implementation of the algorithm to achieve a better effect. .
                3. **Superbass** - provides input-level dependent bass boost. Lower level signals are boosted more than higher-amplitude signals. Using a variable-Q filter, this algorithm dynamically adjusts the amount of boost.
                4. **Loudness** - amplifies lower level and higher level amplitude signals to maximize the volume range.
                5. **Test tone** - Provides a 1-KHz test tone when to test the board even in the absence of an input signal
            2. **Volume, Bass, Treble Controls** - provides adjustable volume, bass and treble levels of the input signal
            3. **Channel Mute Control** - enables and disable the eight channels individually or collectively.
    3. **Advanced Configuration**
        1. **Configure ADAU1761** - configures the ADAU1761 using user-defined algorithms from Sigmastudio.
    4. **Firmware Version** - provides details on the firmware version of the Blackfin used by the SDP board.