1. Overview

Figure 1: Soundskrit Smart Glasses Microphone Demo Kit (Cricket)

The Soundskrit Smart Glasses Microphone Kit (Cricket) is a tool to evaluate the smart Glasses design with Soundskrit microphone integrated. It demonstrates the performance in user voice isolation and front speech capture under a range of algorithms and positions on the demo kit. The kit includes Soundskrit Cricket board, which is a PCB with five dipole microphones SKR0710 pointing to different directions and three omni microphones across different positions, including nose bridge, left and right temple. The Cricket is connected to Soundskrit PARDI board, which is a convenient interface to connect MEMS microphones over USB. The PARDI board provides multichannel raw audio signals to Soundskrit Demo Kit Interface for processing.

There are a variety of audio processing algorithms for the Cricket kit. These algorithms include Omni, Linear Speech, Linear Ambient and Nonlinear Speech beamformers, as well as AI-based denoising models, all of which can be configured and evaluated using the Soundskrit Demo Kit Interface software. Through this, Cricket can demonstrate how different beamforming algorithms and AI denoiser can be used to enhance directionality, reduce background noise and interfering speech in different environments with different microphone configurations.

What's In the Box	
Cricket Board	PCB with five Soundskrit directional microphones and three omnidirectional microphones
Soundskrit PARDI audio interface	Multichannel audio interface to connect microphones over USB
Molex cable	Cable preconnected, linking the Cricket with the PARDI board
USB-A to USB-C Cable	A cable to connect the board to your PC.

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2. Hardware Introduction

2.1 Cricket Board

The Cricket board is a PCB with five dipole microphones (SKR0710) and three omnidirectional microphones. These microphones are integrated into different locations on the Cricket PCB board.

The signals of the microphones at certain locations are combined and tuned to get the best performance for the corresponding feature. See the SKR0710 product page on our website for detailed specifications. The microphone map is shown as below:

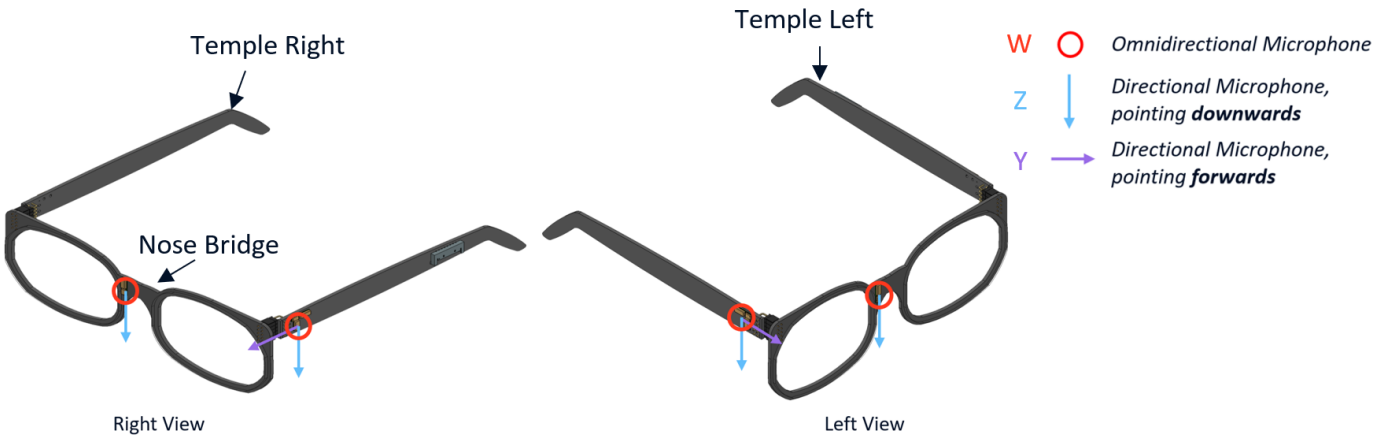


Figure 2: Left and Right Views of the Cricket Board and Microphone Directions

2.2 PARDI Board Interface

The PARDI audio interface has a USB-C connector to connect it to a PC and a Molex connector to connect the Cricket board. The cable comes pre-connected and only needs to be reattached if it becomes disconnected.

Figure 3: Cricket PARDI Board Interface

3. Software Introduction

The Soundskrit Demo Kit Interface is a platform used for evaluating performance of the Cricket demo kit. It enables users to quickly test the different algorithms provided by Soundskrit.

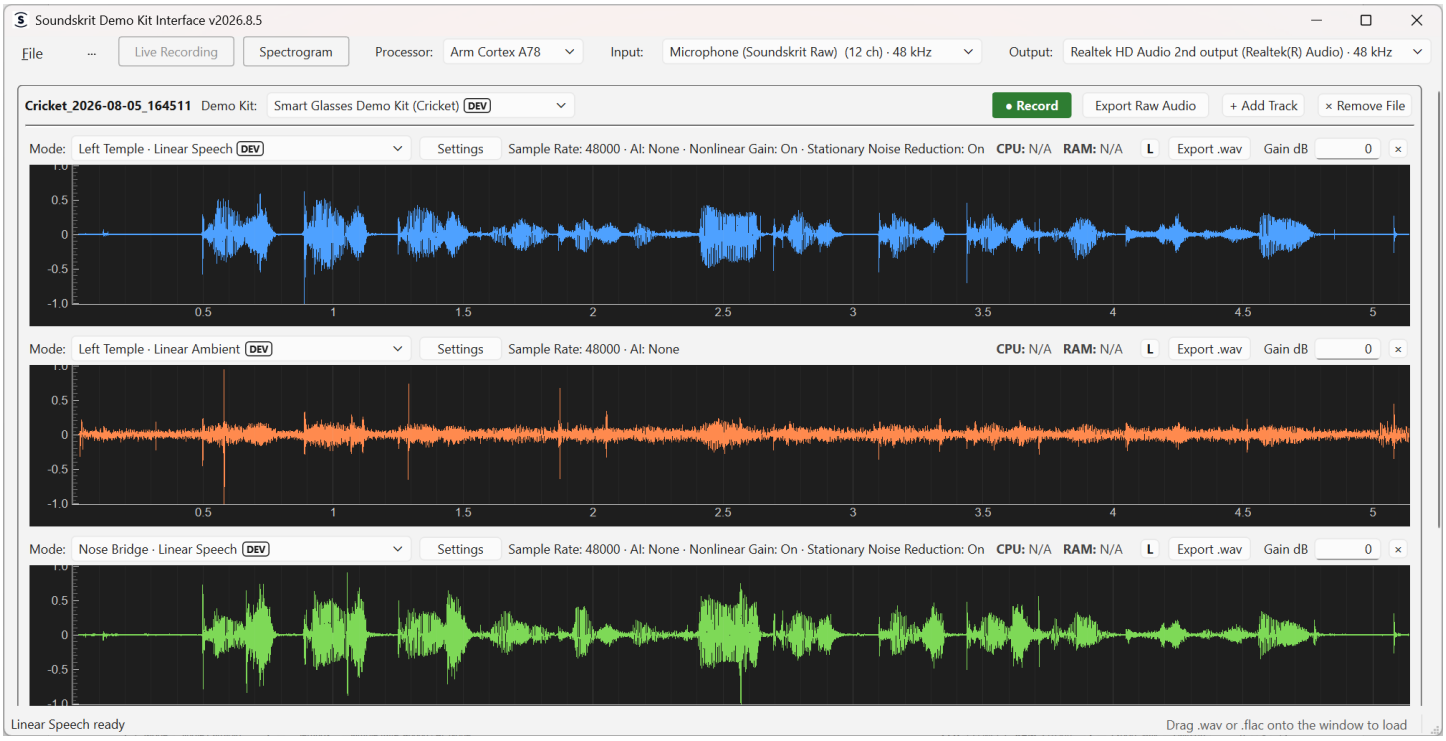


Figure 4: Soundskrit Demo Kit Interface

The software allows users to capture a recording via Live Recording mode and process the raw signals through various algorithms. This mode lets users compare algorithm performance side by side through playback.

The Demo Kit Interface also provides relevant computational metrics across all algorithms, including CPU usage and RAM usage for various processor cores to help customers understand the algorithm requirements in embedded implementation.

For more detailed introduction of Soundskrit Demo Kit Interface, please refer to Downloads → **Soundskrit Demo Kit Interface User Manual.**

4. Cricket Algorithm Introduction

To help customers understand the performance differences between algorithms and identify the most suitable solution for processing audio signals in their smart Glasses projects, Soundskrit provides various algorithm families across different locations with the dipole + omni pair. These algorithms are optimized for isolating voice pickup and suppressing background noise.

Note: For user voice isolation, the omni and dipole pair at three locations - nose bridge, left temple and right temple - are available for evaluation. For front speech capture, the omni and dipole pair at left and right temple work together to demonstrate the performance. Below is a detailed overview of these algorithms.

4.1. Beamformers

Soundskrit provides several beamforming algorithms for users to compare performance in terms of voice capture and noise suppression and further understand how linear array beamforming and AI denoiser could be used to enhance directionality and noise rejection. The table below shows the beamformers that can be evaluated with the Cricket.

Feature	Beamformer Descriptions*	
User Voice Isolation	Omni EQ	Outputs the equalized omnidirectional (W) microphone signal from the dedicated location's pair, used as a reference for performance comparison.
	Dipole EQ	Outputs the equalized dipole (Z) microphone signal from the dedicated location's pair, showcasing the pure hardware directionality.
	Linear Speech	A fixed, distortionless beamformer on the dedicated location's pair, steered toward the wearer's mouth preserving natural voice quality.
	Linear Ambient	A fixed anti-speech beamformer on the dedicated location's pair, rejects the wearer's voice to capture the surrounding ambient sound.
	Nonlinear Speech	A robust adaptive beam on the dedicated location's pair, blending the speech beam with coherence gain and stationary noise reduction.
Front Speech Capture	Linear Front	A fixed, front focused beamformer using the left and right omni and forward-facing dipole microphones.

** Please refer to the computational requirement shown in the GUI.*

4.2. AI Denoising

The GUI comes equipped with AI denoising models that are divided into three categories: Small, Medium, and X-Large. These models can be cascaded on top of a chosen beamformer. The table below shows the detailed description for each AI model.

AI Denoiser Description*	
Small	Small AI model for noticeable background noise suppression, with some distortion and artifacts.
Medium	Medium AI model for enhanced background noise suppression, with less distortion and artifacts
X-Large	Extra-large AI model for premium background noise suppression, with minimal distortion and artifacts

** Please refer to the computational requirements shown in the GUI.*

5. Setup Guide

5.1 Installation

Download and launch the Soundskrit Demo Kit Interface installer file from Downloads on Soundskrit's website and follow the installation steps. A prompt may appear requiring approval for an unknown publisher.

Connect the Cricket to your PC using the included USB-C to USB-A cable.

To start the software, search from the Windows start menu for 'Soundskrit Demo Kit Interface' or use the desktop shortcut generated by the installer.

Make sure the Cricket is correctly connected to the PC and that the PARDI board is in **raw mode**. If the PARDI board is not in raw mode (this may apply to units shipped before June 2026), a window will appear, prompting you to change the PARDI board to raw mode.

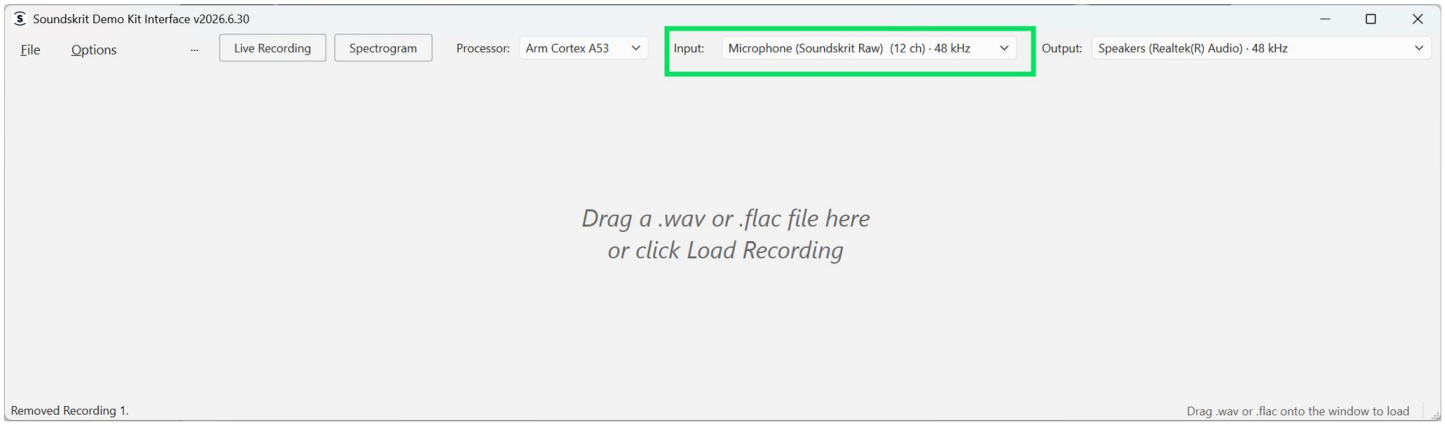


Figure 5: Raw Mode Detected

5.2 Audio Performance Evaluation

Use Live Recording (see image below) to capture audio with the Cricket and process it in real-time.

1. Click **Live Recording** to open the recording window. Set the **Demo Kit** as “Smart Glasses Demo Kit (Cricket)”. By default, three tracks representing the position on nose bridge are configured to compare performance across the algorithms in parallel.
2. Click **Record** to start and **Stop** to end. The audio is distributed across the tracks with preset algorithms applied. All audio tracks are normalized to facilitate easy comparisons. Recording again replaces the previous take. You can also add additional tracks by **Add Track** to compare multiple algorithms in parallel.
3. In **Mode** drop-down menu, select the position and algorithms that you want to evaluate;
4. To compare the performance with AI algorithm combined, set the AI options in **Settings** for corresponding track.
5. Click **Export Raw Audio** to keep all eight raw channels (re-loadable later for processing), or **Export .wav** to save a single processed track.

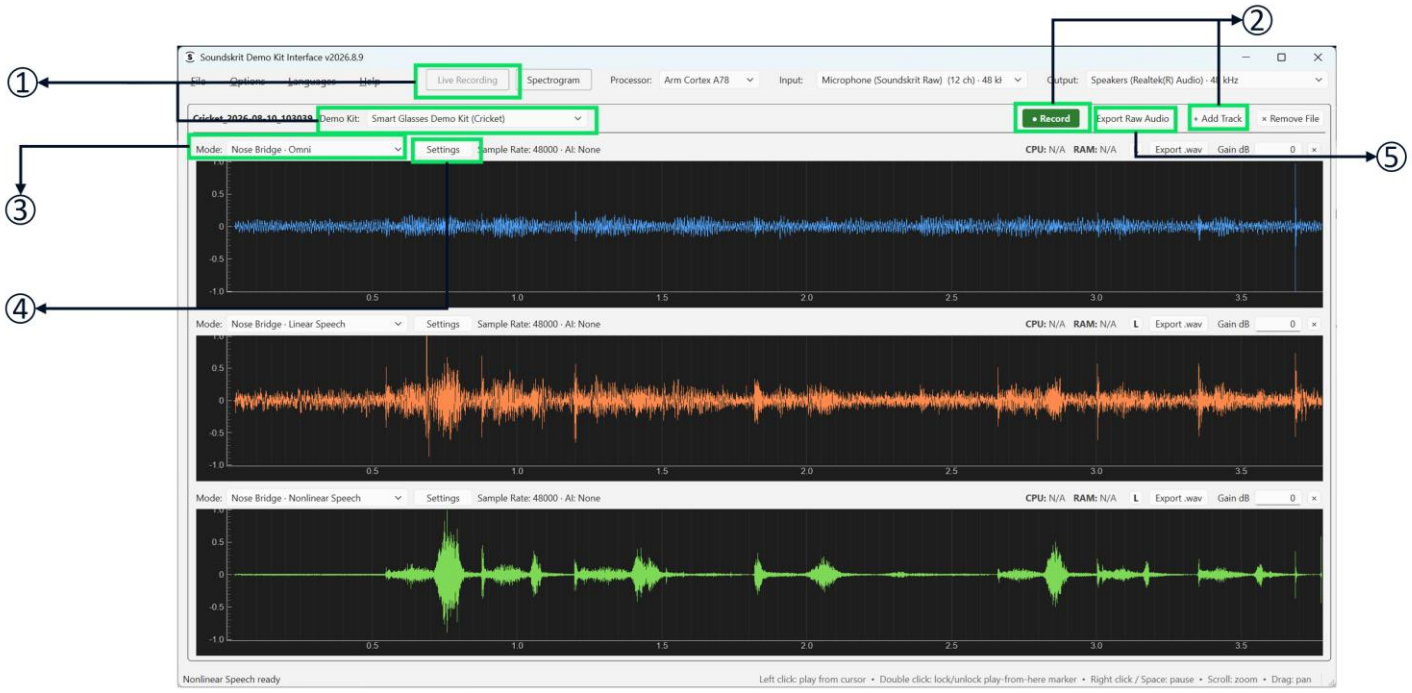


Figure 6: Operation Steps for Live Recording in the GUI

6. Troubleshooting

This section provides solutions to common issues encountered during installation and operation of the demo kit.

Problem	Possible Cause	Solution
Soundskrit Demo Kit Interface doesn't show **Microphone (Soundskrit Raw)** in the **Input**	Cricket is not correctly connected to PC	Verify the connection between PARDI board and Cricket, as well as between PARDI board and PC. A green LED indicator on PARDI board should be flashing if the connection is correct.

7. Additional Support

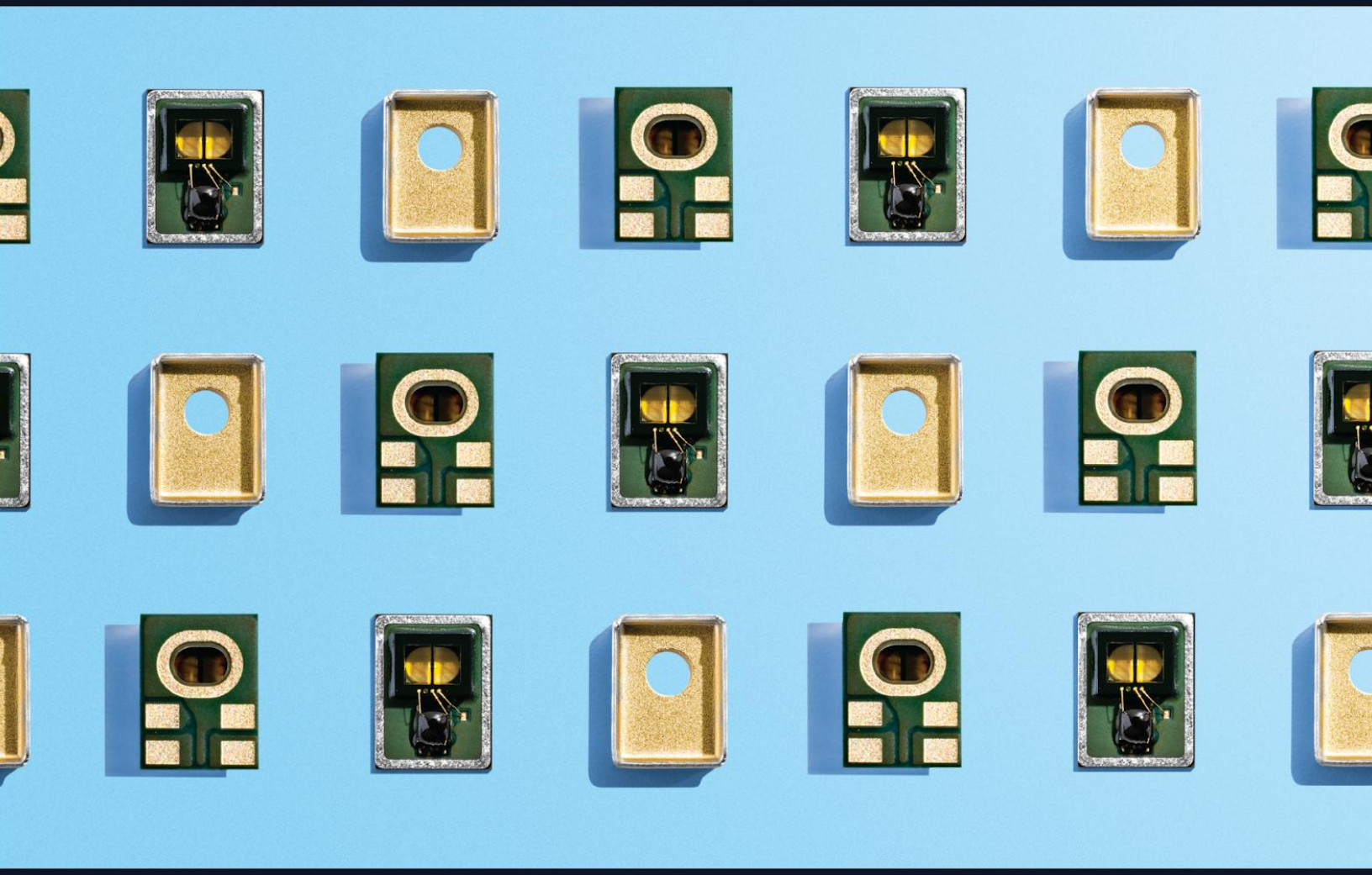
For further information on Soundskrit's products, visit our website at http://www.soundskrit.ca where you can find more application notes, datasheets, and purchasing information. If you have any questions or need technical support, please reach out to applications@soundskrit.ca.

8. Revision History

Revision Label	Revision Date	Sections Revised
-	Aug 2026	Initial release

Soundskrit developed the first high-performance directional MEMS microphone on the market, leveraging years of research in bio-inspired MEMS based on how spiders and other insects in nature hear. In combination with Soundskrit's in-house audio processing algorithms, directional microphones can be used to capture and isolate any sound in an environment with a fraction of the size, power, and computation of traditional omnidirectional-based microphone arrays.

Soundskrit was founded in 2019 and is headquartered in Montreal, Quebec with an R&D facility in Ann Arbor, Michigan.



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