

19OCT24 ETN 240019 D

Technical Note: User Guide for solanum-audio iOS app

1. Safety

USE THIS PRODUCT ONLY FROM THE INSIDE THE PASSENGER COMPARTMENT, WHILE FOLLOWING ALL VEHICLE MANUFACTURER RECOMMENDATIONS FOR SAFE OPERATION.

2. Requirements, downloading, starting

This product works with iOS 13.0 or later. Internet access is required. Vehicle must be an electric or gasoline-fired passenger car or light truck.

Download the app from Apple's App Store. A link is available at solanum-service.com, the download page can also be found by searching for 'solanum-audio' on the App Store. Once the software is downloaded, click the app icon on the device's home screen. The software will automatically launch.

In internal testing, we found many iOS devices that have been in use for 2 or more years exhibit a behavior whereby the microphone will record crunch-like noises that aren't really there. Something else we observed is some waterproof cases have a membrane over the microphone grille, and this membrane can chafe against the microphone in such a way it creates acoustic artifacts in the recording.

If your device is older or in a waterproof case, there's about a 50% likelihood it won't record cleanly enough for our software to make use of the recording sent in. Some older devices do work if they've had an easy life, so it's worth a try.

3. Environment for Use

Before using, find a safe location. If the sound causing concern only occurs when the vehicle is moving, plan a safe path forward. If an assistant is available, have the assistant drive the vehicle. Remain seated safely in the passenger compartment- the software is not trained to recognize the sound of problems from any other location, and will only work properly when used inside the vehicle.

Minimize extraneous noises, like talking or music. Turn off the vehicle's audio system and HVAC system. Find the quietest location possible. The software is trained to recognize and ignore most of the extraneous noises commonly heard around cars- for example, traffic noise and pedestrians' voices- but best results are achieved in a quiet environment. **Please note as well the sounds made by orthopterans (crickets, grasshoppers, etc.) are highly similar to the automotive noises the model is trained to recognize. In locations where the sounds of these insects are unavoidable, the software will most likely not work well enough to be useful.**

The orientation of the iOS device does not matter much. Keeping it on the passenger seat, or any other soft surface in the vehicle, is recommended, but other locations work satisfactorily if necessary.

4. Recording

Press the “Start Recording” button when the sound causing concern is heard. If using the software to figure out if any problems exist in the first place, press it shortly before taking off from a stop, since the majority of audible vehicle problems will be most salient then.

5. Receiving Outputs

After pressing the “Start Recording” button, no further action is required. The software will automatically stop recording, and in about 13 seconds an on-screen notification of results will be displayed.

Results will show the three most likely categories of problem classes, along with an estimate of the probability for each. The “NUL” category is a lack of problems, if this category is the top result, it usually means no likely malfunctions were identified in the recording.

6. Other Buttons

To hear exactly what sound was sent for analysis, press the “Play Recording” button that appears after a recording is created. To de-clutter the screen, press the “Clear Recording” button (which also appears only after recording).

7. Taking another recording

To submit a new sample, or to use the software on another vehicle, press the “Start Recording” button again. Output notifications and data from previous recordings will automatically be overwritten. We recommend recording at least 5 samples from the vehicle before acting on the information given.

8. Interpreting Outputs

The app is not a “direct” diagnostic tool like a code reader or a compression tester, it cannot be used to prove the existence or non-existence of any vehicle malfunction. It simply suggests a place to start looking. Furthermore, it does not recognize all malfunction sounds, but rather the majority of common ones. Currently, the model is trained to distinguish the sounds of no problem (“NUL”), brake grinding, loose suspension and brake components, bound steering and suspension, knocks from the interior, fan belt slippage, wheel bearing wear, and mechanical engine malfunctions.

9. Indicia

User interface and any written communications generated by the app, as well as this document, are Copyright 2024 by Solanum, LLC.

Solanum, LLC does not warrant the usefulness of this product for any particular purpose, the software is used and/or purchased on an “as-is” basis. User responsible for confirming any information the software provides or does not provide. By using the product, user agrees that liability of Solanum, LLC is limited to a refund of any fee paid for use of the product.