

# SoniControl User Documentation

SoniControl is a novel technology for the recognition and masking of acoustic tracking information. The technology helps end-users to protect their privacy. Technologies like Google Nearby and Silverpush build upon ultrasonic sounds to exchange information. More and more

of our devices communicate via this inaudible communication channel. Every device with a microphone and a speaker is able to send and receive ultrasonic information. The user is usually not aware of this inaudible and hidden data transfer. To overcome this gap SoniControl detects ultrasonic activity, notifies the user and blocks the information on demand. Thereby, we want to raise the awareness for this novel technology.



The project SoniControl is funded by Netidee ([www.netidee.at](http://www.netidee.at)) and is a project at the Media Computing Group at the Institute for Creative\Media/Technologies at Sankt Pölten University of Applied Sciences ([mc.fhstp.ac.at](http://mc.fhstp.ac.at)).



The project website of the SoniControl project with all published results and resources can be found here: [sonicontrol.fhstp.ac.at](http://sonicontrol.fhstp.ac.at). The SoniControl App is released under GNU General Public License version 3.0 ([fsf.org/](http://fsf.org/)). You can download it on the [Google Play Store](#).

## License

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## Permissions and Privacy Statement

To work properly, SoniControl needs the *microphone permission* for detection, and you can also use it as a blocking option. If you want to use location-based functionalities, it also needs the *location permission*.

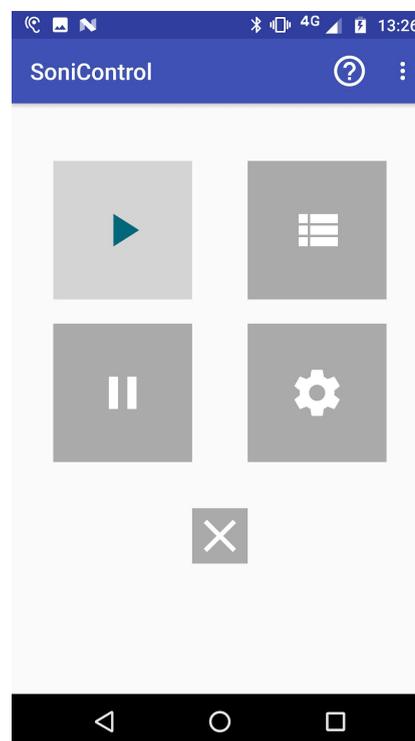
- We use the microphone to capture sound, but process only the ultrasonic part, we remove everything under 17kHz.
- Sounds are analyzed in real time on the phone. They are not sent to the web, nor stored on the phone.
- Detections are stored locally in a JSON file, including the time and location (if allowed by the user). The user can delete this file at any time via the Settings menu.
- If allowed, we check the user's location regularly in order to tell him when he enters an area where he previously detected ultrasonic communications.

# Starting the App

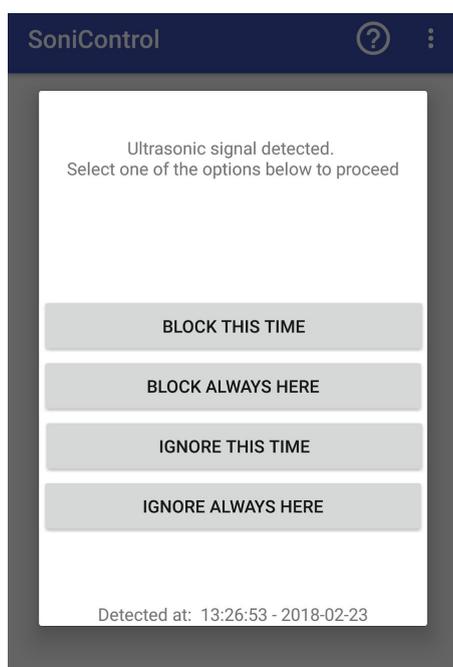
When you open the application, there are five buttons for "Start", "Pause", "Stored Locations" (top-right), "Settings" (bottom-right) and "Exit" (bottom-center). After starting the application, a notification symbol appears, "on hold" until you click on start. Default settings can be changed according to the users' preferences.



When you click on "Start", the app starts to scan the ultrasonic range and the notification symbol changes to a normal ear. After the start button is tapped, the app needs about 10s to initialize the detection system (learning the "normal" background noise). When an ultrasonic signal then is detected, an alert appears with four choices and the notification symbol changes to the "on hold"-version. The options are "Block this time", "Block always here", "Dismiss this time", and "Dismiss always here".



When choosing a "Block"-option, your smartphone will block the signal using one of the two possible methods, depending on your settings. Either the same frequency range as the signal will be sent from your smartphone's speaker to "jam" or, if the microphone is available, the app takes the access to the microphone, keeping other apps from recording. If you chose to "Block always here", we save the detection as an entry in the "Stored Locations" and it will be blocked automatically the next time it is discovered at this place.

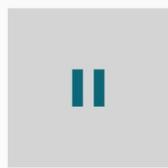


"Dismiss always here" would be the option if you want to use the detected technology and not block the signal. It will also be saved, and never be blocked at this location. Then there is the last choice: "Dismiss this time". When tapping on this button, the detection will be saved but not in the same list and it will only be dismissed once. You could get the same signal again after the detector starts scanning again. This allows you to see how big the range of the signal is, and how often you detect it.

After choosing one of the "Dismiss"-options the detection starts again and the notification symbol changes back to the normal ear.

After choosing a "Block"-option, the blocking process starts and the notification symbol changes to the ear with a little speaker.

## Pausing the App



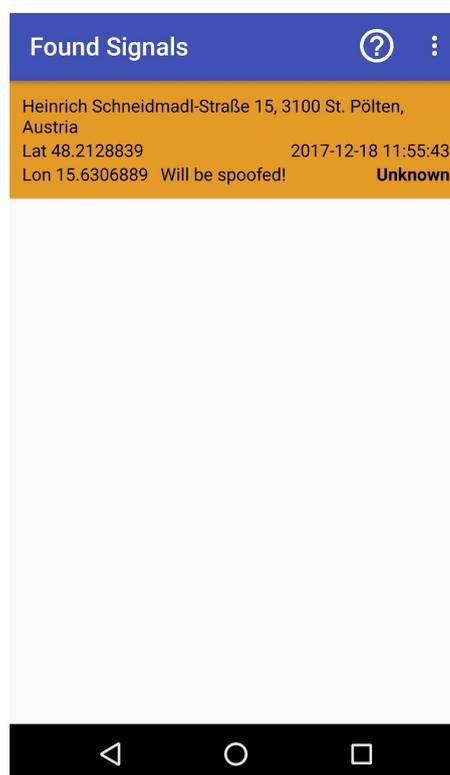
When the detector or the blocking part of the app runs, you can tap on the “pause”-button to stop every process running at the moment. You can also see what is running via the notification and its symbol. This symbol will be changed back to the “on hold” one, after hitting the stop button.

## Stored Locations



In the section "Stored Locations", all saved signals will be displayed. The detailed information about each signal are shown. First, we display the longitude and latitude values, but also a more readable address line, if available.

On the right side we display the latest date at which this specific signal was detected at this specific place. The user can also see the signal technology, if recognized. To see which signals should be blocked or not, we set a background colour (orange) for every signal that should always be blocked, otherwise it stays white. It is also stated as text.



## Settings

There are two different sections of the settings. One for the normal settings and the other one for “expert” usage of the app.

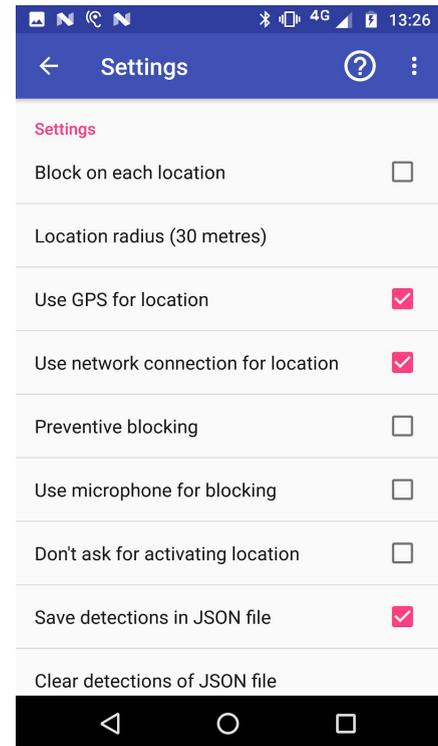
The normal part consists of :

- "Block on each Location", indicates whether the app should block immediately when detecting a signal or if the user should decide what to do with the found signal.
- "Location radius", indicates how far a signal should still be blocked.
- "Use GPS for Location" and "Use Network Connection for Location" are both ways to give or not access to the location service. When both are disabled, you cannot use the “Block always here” and “Dismiss always here” options.
- “Preventive blocking”, gives the opportunity to block as soon as a signal is detected (before the alert ask the user what to do with the signal)
- “Use the microphone for blocking”, if this is disabled, the blocking mechanism only uses the audio jammer for blocking.

- “Don’t ask for activating location”, the alert for activating the location hardware setting will not be shown
- "Save Data in JSON File", gives the user the opportunity to say if detections get saved or not.
- "Delete the JSON File", deletes the file where all detections are saved in.

Then there are the expert settings, which contain all jamming parameters and the reset of all settings to default.

- “Pulse duration”, decides how long a single pulse during the jamming process is
- “Pause duration”, decides how long a pause between two pulses should be
- “Bandwidth”, how many Hertz one jamming signal has
- “Blocking duration”, how long the app will block before it checks the location and distance to the detected signals location again
- “Reset all settings to default”, will reset all settings to the default state



## Exit



When you tap exit in the app, all processes will be closed, all resources will be released, and no background task will run anymore, so the notification can be canceled.